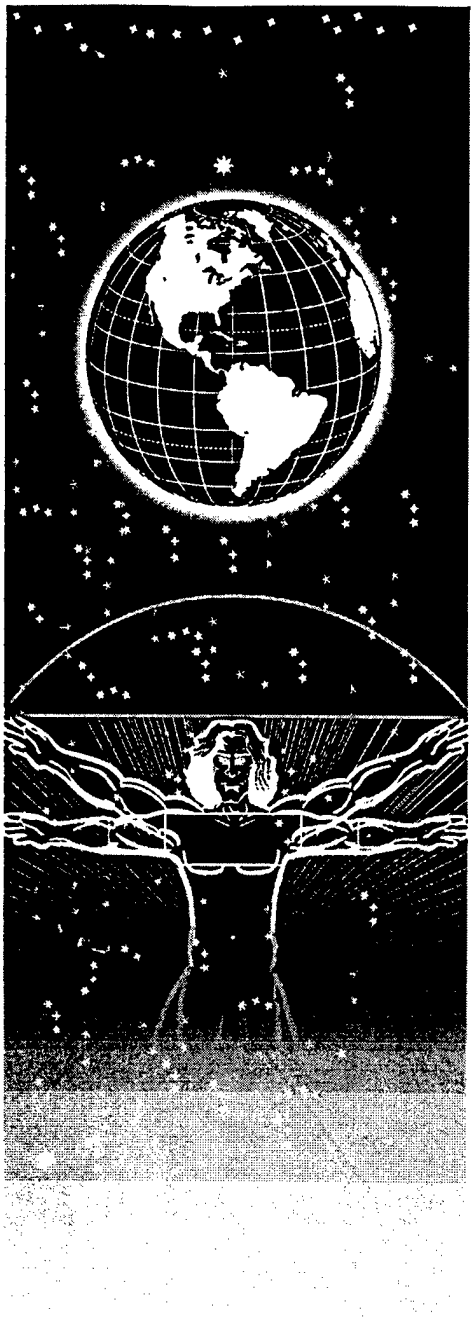
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Aircraft Engine and Auxiliary Power Unit Emissions Testing: Vol. 2, Detailed Sampling Approach and Results

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This report is the product of a 2-year emissions testing program designed to document, characterize, and evaluate emissions from sixteen aircraft engines, two helicopter engines, and two auxiliary power units (APUs) burning JP-8 fuel. The purpose of this engine testing program was to develop emission factors for the tested engines under representative engine load conditions. All testing was performed by the Environmental Quality Management Inc. (EQ) and Roy F. Weston, Inc. (Weston) team. Testing was conducted for criteria pollutants and select hazardous air pollutants (HAPs), e.g., aldehyde/ketones and semivolatile and volatile organic compounds.

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B	Emission Sampling Methods
C	Analytical Quality Assurance/Quality Control Data Package
D	JP-8 Fuel Analysis
E	References
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SECTION 1

INTRODUCTION

Volume 2 of this three-volume report presents a detailed account of the emission sampling results, procedures, and conclusions contained in Volume 1 (Executive Summary). This Test Report (Volume 2) has been prepared by Environmental Quality Management, Inc. (EQ) and Roy F. Weston (WESTON) under Delivery Order 0008 of the Occupational and Environmental Health Assessments Contract (Contract Number F41624-95-D-9019) supporting the Air Force Occupational and Environmental Health programs around the world. This contract is administered by the Human Systems Center, Brooks Air Force Base (AFB), Texas.

The project requirements are described in the delivery order and its attached Statement of Work and Contract Data Requirements Lists (CDRLs).

The project included:

- Preparation of the Environmental Sampling and Analysis Plan (SAP) (A004).
- Preparation of the Site Survey Report (A011).
- Preparation of monthly progress, status, and management reports (A001).
- Preparation of conference agenda and minutes (A008).
- Preparation of a summary Scientific and Technical Report (this document, A003).

A description of the project background and the original objectives that have been accomplished is provided in this section.

1.1 PROGRAM SUMMARY

Emission sampling was conducted to develop emission factors for 16 jet engines, 2 helicopter engines, and 2 auxiliary power units (APUs) burning military JP-8 jet fuel at eight government installations. Emission factors were developed for criteria pollutants, including nitrogen oxide (NO_x), carbon monoxide (CO), total hydrocarbons (THC), and particulate matter (PM_{10} as total particulate matter), and select hazardous air pollutants (HAPs) including aldehydes/ketones, and semivolatile and volatile organic compounds under varying engine load conditions. A summary of the engine designation, aircraft, test locations, and test dates is provided in Table 1-1.

Table 1-1. Test Engines And Locations

Location	Engine Designation	Aircraft or APU	Test Dates
Kelly AFB, TX	T56-A-7 TF-39-GE-1C GTCP85-180 GTCP165-1	C-130 C-5A/B C-130H (APU) C-5A/B (APU)	6 – 29 Jan. 1997
Corpus Christi Army Depot	T700-GE-700	UH60A, UH60G (helicopter)	3 – 11 Mar. 1997
Tinker AFB, OK	F110-GE-100 F101-GE-102 TF33-P-102 F108-CF-100 TF33-P-7/7A	F-16 C/D/N B-1B C/EC/RC-135E KC-135R C141	14 Apr. 1997 – 2 May 1997
Laughlin AFB, TX	J69-T-25 J85-GE-5A	T-37 T-38	12 – 20 Mar. 1997
Charleston AFB, SC	F117-PW-100	C-17	15 – 16 Oct. 1997
Edwards AFB, CA	F118-GE-100 F404-GE-F1D2/400 F110-GE-129 F100-PW-100 F100-PW-229	B-2 F-117A and F/A-18C/D F-16C/D F-15 F-15 and F-16	17 – 19 Nov. 1997 & 3 – 5 Dec. 1997
Naval Aviation Depot, Cherry Point, NC	T64-GE-100	MH53J (helicopter)	27 – 29 Jan. 1998
Barnes Air National Guard Base, MA	TF34-GE-100A	A-10	9 – 12 Feb. 1998

A source-specific sampling methodology that was economical and representative was used to sample the unique exhaust configuration at each facility. In the development of each sampling methodology, the acceptance criteria of the data were considered. Numerous sampling methods exist for the target pollutants. These methods vary from experimental to EPA Reference Methods. The sample team wanted to utilize test methods that are widely accepted by industry and government. Although aware that alternative test methods exist, EPA reference methods were used where possible in order to gain acceptance. The methods developed by the EPA are recognized, valid, and widely accepted. The EPA reference methods have some shortcomings in this testing application, but it was determined that the methodology provided the most representative results.

A comparison of some of the sampling methodologies and select particulate matter results are presented in Volume 3. This volume outlines the site-specific sampling methodologies, the theory involved in method development, emission results for criteria pollutants (NO_x, CO, THC, PM using EPA Method 5 protocol), and select HAPs, and a discussion of the emission results. The presentation of the particulate data collected using a modified version of EPA Method 5 and conventional sampling methodologies is also provided in Volume 3.

1.2 BACKGROUND

An Energy Task Force recommended that assertive action be taken to standardize U.S. Department of Defense (DOD) fuels. The Joint Logistics Coordinating Group, established to perform the standardization studies, recommended that the U.S. Air Force (USAF) replace naphtha-based JP-4 (MIL-T-5624), with the kerosene-based JP-8 (MIL-T-83133), as the standard turbine fuel. JP-8 is similar to commercial-grade jet engine fuel Jet A-1, with two additives previously required in JP-4. The hydrocarbon fuel is composed of various medium molecular weight organic compounds including

paraffins, olefins, and aromatics. JP-8 specifications require a maximum olefin and aromatic content of 5% and 25% by volume, respectively. The maximum allowable sulfur content to meet the specifications of JP-8 is 0.3% by weight. The guaranteed minimum net heating content of the fuel is 18,400 Btu/lb. Table 1-2 lists the general specifications of JP-8 jet fuel. JP-8 fuel also contains several additives. Ethylene glycol monomethyl ether (EGME) is added as a fuel system icing inhibitor. Corrosion inhibitors and antistatic additives are also required to meet JP-8 specifications. Antioxidant and metal deactivator additives are optional for JP-8.

The principal reasons for replacing JP-4 with JP-8 were the following:

- Standardize military fuels with commercial aviation kerosene (Jet A-1).
- Be consistent with the ongoing standardization efforts in the North Atlantic Treaty Organization (NATO).
- Improve safety (JP-8 is less volatile than JP-4).
- Eliminate expenditures required for fuel evaporative equipment.

1.3 OBJECTIVES

Although engine emissions from combustion of JP-4 are well documented for criteria pollutants,[1] little information exists for criteria pollutants and hazardous air pollutants (HAPs)[2] from combustion of JP-8 fuel. Due to intrinsic differences between these two raw fuels, and differences in engine technology, the combustion products may differ from historic testing. As part of a broader engine-testing program, the USAF, through the Institute for Environment, Safety, and Occupational Health Risk

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1 Criteria pollutants are pollutants for which National Ambient Air Quality Standards (NAAQS) (see 40 CFR 50) have been established. They include: carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, lead, and ozone (and its precursors).

2 Hazardous air pollutants (HAPs) are toxic chemicals and compounds regulated under Title III, Section 112(b) of the Clean Air Act Amendments of 1990 (CAAA). Presently, there are 189 HAPs.

Table 1-2. U.S. Military Specifications Of Turbine Fuels, JP-8 USAF MIL-T-83133A-AMD.1; 4 April 1980; Kerosene OR JP-8

Composition	(Acidity, Total; mg KOH/g)	0.015
	Aromatics	25.0
	Sulfur, Mercaptan; wt %	0.05
	Sulfur Total; wt %	0.3
	Color, Saybolt	0.001
Volatility	Residue; vol % for D-86	1.5
	Loss vol % for D-86	1.5
	Flash Point; ° C	38
	Gravity; ° API at 15° C	37-51
	Density; kg/m^3 at 15° C	775-840
Fluidity	Freezing Point; ° C (° F)	-50 (-58)
	Viscosity; cSt at -20° C	8.0
Combustion	Smoke Point	19.0
	Hydrogen Content; wt %	13.5
Stability	JFTOT delta P; mm HG	25
	JFTOT Tube Color Code	< 3
Contaminants	Existent Gum; mg/100 ml	7
	Particulates; mg/liter	1
	Water Separation Index, Modified	70[1]
Additives	Anti-icing; vol %	0.10 to 0.15
	Antioxidant	Option
	Corrosion Inhibitor	Required
	Metal Deactivator	Option
	Anti-static	Required
Other	Conductivity; pS/m	200 to 500
	Service	USAF
	NATO Code No.	F-34; F-35[2]

[1] With all additives except electrical conductivity additive

[2] Same as JP-8 without additives

Source: Handbook of Aviation Fuel Properties, Coordinating Research Council, Inc., Society of Automotive Engineers, Inc. General Publications, Warrendale, PA 15096, 1983.

Analysis/Risk Analysis Environmental Quality (IERA/RSEQ) at Brooks Air Force Base (AFB), TX, contracted EQ to characterize the emissions from sixteen aircraft engines, two helicopters, and two auxiliary power units (APUs) operating at a variety of settings. Criteria pollutants and targeted HAP emissions were quantified during the test program. Emission test results were used to develop emission factors for the aircraft engines and APUs tested. As part of this effort, a statistical correlation of the emission data collected during this project with historic data was performed.

1.4 PREVIOUS STUDIES

The USAF began to develop a database of known engine emissions data in the 1970s. The purpose of developing the database was to produce a catalog of smoke plume opacity and gaseous emissions from engine test facilities. Environmental managers could use data from the catalog to meet regulatory reporting requirements. Subsequently, the USAF and the U.S. Navy (USN) have attempted to amass and review existing engine emissions data, validate the data, and identify data gaps. The USAF's Engineering and Services Laboratory and Engineering Services Center, and the USN's Environmental Support Office have been the lead organizations for this effort. Available aircraft emissions technical references were compiled and reviewed by the U.S. Environmental Protection Agency (U.S. EPA) in 1993. The technical oversight of the current effort is being undertaken by the IERA/RSEQ.

1.5 BASE DESCRIPTIONS

The following subsections provide a description of each military base that was visited during the JP-8 fuel emission test program.

1.5.1 Kelly Air Force Base

Kelly AFB is a U.S. Air Force Material Command (AFMC) base and is the Headquarters of the San Antonio Air Logistics Center (SA-ALC). The base is located 5 miles southwest of San Antonio. The SA-ALC modernizes and performs heavy depot maintenance on the USAF's C-5 fleet. The facility also overhauls F100, TF39, and T56 engines, and manages over 75 percent of the USAF's engine inventory. Testing at Kelly AFB for the aircraft engines was conducted using SA-ALC's engine test facilities.

1.5.2 Corpus Christi Army Depot

Corpus Christi Army Depot (CCAD) is located on Corpus Christi Naval Air Station, southeast of Corpus Christi, TX. CCAD is the U.S. Army's depot-level maintenance facility for the Blackhawk (UH-1) helicopter. Aircraft-engine testing for the T700-GE-700 helicopter engine was conducted at CCAD.

1.5.3 Laughlin Air Force Base

Laughlin AFB is an Air Education and Training Command (AETC) base located in Del Rio, TX. Aircraft engine testing for the J69-T-25 and J85-GE-5A was conducted at Laughlin AFB. In addition to a number of activities, the primary mission of Laughlin AFB is to provide pilot training.

1.5.4 Tinker Air Force Base

Tinker AFB is an AFMC base and is the headquarters of the Oklahoma City Air Logistics Center (OC-ALC). The base is located 8 miles southeast of Oklahoma City, OK. The OC-ALC provides logistics support and depot-level maintenance for B1-B, B-2, B-52, and KC-135 aircraft. Testing at Tinker AFB was conducted on F101, F110, TF33, and F108 series engine using OC-ALC's engine test facilities.

1.5.5 Charleston Air Force Base

The 437th and 315th Airlift Wings are located at Charleston AFB, Charleston, SC. Charleston AFB is responsible for flying and maintaining the C-17 Globemaster III Jet Cargo Aircraft within the Air Mobility Command. The F117 engine was tested at Charleston AFB, SC.

1.5.6 Edwards Air Force Base

Edwards AFB is home to the Air Force Flight Test Center (AFFTC) located northeast of Lancaster, CA in the Mojave Desert. The Base supports activities to field the most effective air and space force. AFFTC conducts developmental and follow-on testing and evaluation of manned and unmanned aircraft.

1.5.7 Naval Aviation Depot Cherry Point

The Naval Aviation Depot at Cherry Point (NADCP), North Carolina is responsible for depot duties on the MH53J Aircraft. NADCP is located approximately 20 miles west of Morehead City, NC. The T64 series helicopter engine was tested at NADCP.

1.5.8 Barnes Air National Guard Base

The 104th Fighter Wing is located at Barnes ANGB in Westfield, MA. Barnes ANGB supports personnel and equipment for the A-10 Thunderbolt II Fighter Jet. The TF34 engine was tested at Barnes ANGB.

1.6 TEST ENGINES

The following subsections provide a description of each engine type that was tested during the JP-8 fuel emission test program.

1.6.1 T56-A-7

The T56-A-7 turboprop engine powers various versions of the C-130 aircraft by driving a Hamilton Standard type four-blade propeller. Four T56-A-7 turboprop engines power the C-130 aircraft. The 14-stage axial-flow compressor of this turbine develops an overall pressure ratio of 9.5 with the engine being rated at 3,362 kilowatts (kW). A four-stage turbine consists of a rotor assembly using four stainless steel discs. This engine is produced by the Allison Corporation.

1.6.2 TF39-GE-1C

The TF39-GE-1C two-shaft high-bypass ratio turbofan engine was designed to power the C-5A and C-5B. Four TF39-GE-1C turbofan engines power these aircraft. The compressor section consists of three fan stages (two in the inner flowpath and one in the outer) and sixteen axial stages with an overall pressure ratio of 22. The turbine section incorporates six low-pressure and two high-pressure stages. The engine is rated at 43,000 lbs thrust. The TF39-GE-1C is an improved version of the TF39-GE-1A engine with better durability and performance characteristics. It has a high-efficiency annular combuster, virtually eliminating visual emissions. The engine is produced by General Electric Aircraft Engines.

1.6.3 GTCP85-180

The GTCP85-180 engine is a turboshaft piece of auxiliary power equipment used to support the C130A, B, D, E, and H aircraft. This engine has a two-stage centrifugal compressor and a one-stage radial inflow turbine.

1.6.4 GTCP165-1

The GTCP165-1 engine is a turboshaft piece of auxiliary power equipment used to support the C-5A and C-5B aircraft. This engine has a one-stage centrifugal

compressor and a two-stage axial flow turbine. The GTCP165-1 is able to produce 128 shaft horsepower at 107 pounds per minute of bleed air.

1.6.5 T700-GE-700

The T700-GE-700 ungeared free-turbine turboshaft engine powers the U.S. Air Force and Army UH-60A Blackhawk helicopter as well as the UH-60G version. The combined axial centrifugal compressor of this turboshaft develops an overall pressure ratio of approximately 15. There are five axial stages and a single centrifugal stage on the same shaft within this compressor. The turbine for this engine consists of a two-stage gas generator with an intermediate performance rating of 1,210 kW and a maximum shaft horsepower of 1622 hp. This engine was designed to produce high performance with compact dimensions. The reduction in size and weight is realized by higher pressure ratios and higher turbine re-entry temperatures than with earlier small turboshafts. The T700 was selected to provide the power plant for the Army's utility tactical transport aircraft system as a proposed replacement for the UH-1. The engine is produced by General Electric Aircraft Engines.

1.6.6 J69-T-25

Two J69-T-25 turbojet engines power the Cessna T-37 aircraft. The engine is manufactured by Teledyne CAE. The performance of this engine at maximum thrust creates an output of 4.56 kilonewtons (kN) or 1,025 pounds each. The overall pressure ratio is 3.9:1. The T-37 aircraft was the first jet trainer designed for the United States Air Force. This aircraft is no longer in production.

1.6.7 J85-GE-5A

Two J85-GE-5A single-shaft, turbojet engines power the Northrup T-38 Talon. This engine is manufactured by General Electric and is used throughout the world. The engine consists of a nine-stage compressor section using axial flow, a two-stage axial

flow turbine section, and has afterburning capabilities. The overall pressure ratio is 7.0:1. The T-38 aircraft is used as a trainer aircraft due to its ability to reproduce the flying characteristics of a supersonic operational fighter aircraft.

1.6.8 F110-GE-100

The F110-GE-100 aircraft engine is the fighter derivative of the F101 engine. Both engines are manufactured by General Electric Aircraft Engines. This engine is rated at 129 kN (27,600 lbs thrust) with afterburning capabilities. Its augmented turbofan has a nine-stage compressor that develops an overall pressure ratio of 30.4:1. The combuster and high pressure turbine sections found on this engine are also located on the F101, F118, F108, and the F110-PW-129 engines. This engine is one of four different engines that power the USAF's F-16 C/D aircraft. It is also the power plant for the USN's F-16N, which is the aircraft that was selected for the adversary role in the Top Gun program. The F110-GE-129, the GE IPE (Improved Performance Engine), is the successor to the F110-GE-100. The F110-GE-129 is rated at 29,000 lbs thrust.

1.6.9 F101-GE-102

The F101-GE-102 is an augmented turbofan engine designed for the Rockwell B-1B bomber aircraft. Four F101-GE-102 augmented turbofan engines power the B-1B aircraft. The nine-stage compressor of this turbofan engine develops an overall pressure ratio of 26.8:1 and is rated at 133.0 kN (30,780 lbs static thrust output class). This engine is a dual rotor design with a bypass ratio close to two. The turbine section incorporates two low-pressure and one high-pressure stage. The engine maintains high turbine temperatures to maximize performance and operating efficiency. It has a very short combuster with dual cone nozzles to inject fuel into the dome area. The F101-GE-102 is manufactured by General Electric Aircraft Engines and is a descendant of the F101-GE-100 designed for the USAF's B-1 strategic aircraft competition. Design criteria for this engine included durability and operability. The F101 engine incorporates

technology that minimizes the impact of exhaust emissions and noise and is designed to be nearly smokeless.

1.6.10 TF33-P-102

The TF33-P-102 turbofan engine is the power plant for the KC/NKC-135E and the C/EC/RC-135E aircraft. Four TF33-P-102 turbofan engines power each C/EC/RC-135E aircraft. The compressor of this turbofan engine develops an overall pressure ratio over 13.6:1 and the engine is rated at 80 kN. Different models of the TF33 also power the B-52 Stratofortress bomber and most 707s and DC-8s. The Lockheed C-141B StarLifter military transport uses a variation of this engine. This engine is produced by Pratt & Whitney, a division of United Technologies.

1.6.11 F108-CF-100

The F108-CF-100 two-shaft turbofan engine powers the USAF's KC-135R aircraft. It is a high-bypass ratio engine, having a bypass ratio of 6. The compressor section of each engine consists of a single-fan stage, three low-pressure axial stages, and nine high-pressure stages. The F108-CF-100 engine is rated at 97.9 kN (25,000 lbs static thrust output class). The turbine section incorporates four low-pressure stages and one high-pressure stage. This engine is produced by CFM International (CFM). CFM is a joint company formed by SNECMA of France and General Electric Aircraft Engines. General Electric Aircraft Engines (GEAE) was responsible for the core engine design. The core engine is derived from GEAE's F101 engine, described previously.

1.6.12 TF33-P-7/7A

The TF33-P-7/7A is a turbofan version of the J57 turbojet engine manufactured by Pratt & Whitney. This engine is the power plant for the Lockheed C141-B StarLifter military transport. This version of the engine has incorporated an additional stage of compression, giving it the ability to produce an overall pressure ratio of 16.0:1.

1.6.13 F117-PW-100

Four F117-PW-100 turbofan engines power the McDonnell Douglas C-17A Globemaster III aircraft. The F117-PW-100, a military version of the engine that powers the Boeing 757, is manufactured by Pratt & Whitney. The C-17 had its first flight in 1991 and entered operational service with the F117 engine in 1993. The engine is capable of producing 41,700 pounds of thrust and consists of a 12-stage compressor section using axial flow and a two-stage, axial turbine section. The F117-PW-100 has an overall pressure ratio of 31.8:1.

1.6.14 F118-GE-100

Four F118-GE-100 turbofan engines power the B-2 aircraft. The F118-GE-100 is manufactured by General Electric Aircraft Engines. The engine is capable of producing 19,000 pounds of thrust and consists of a nine-stage variable compressor section and a single-stage high-pressure turbine section. The F118-GE-100 has an overall pressure ratio of 32.2:1.

1.6.15 F404-GE-F1D2/400

Two F404-GE-F1D2 low bypass turbofan engines power the F-117A aircraft. The F404-GE-F1D2 is manufactured by General Electric Aircraft Engines. This engine is also used by the navy F/A-18 fighter. The navy version, F404-GE-400, has afterburner capability. The engine is capable of producing 10,540 pounds of thrust and consists of a three-stage fan section, a seven-stage axial compressor section, and a single-stage high-pressure and low-pressure axial turbine section. The F404-GE-F1D2/400 has an overall pressure ratio of 25:1.

1.6.16 F110-GE-129

One F110-GE-129 augmented turbofan engine powers the Lockheed Martin F-16C and F-16D fighters as well as the Japanese FS-X aircraft. This engine has a three-

stage fan section, a nine-stage high-pressure axial compressor section, and a two-stage low-pressure and a one-stage high-pressure axial turbine section. It is capable of producing 29,685 pounds of thrust with an overall pressure ratio of 30.7:1. General Electric Aircraft Engines manufactures the F110-GE-129.

1.6.17 F100-PW-100

The F100-PW-100 was the initial F100 engine model manufactured by Pratt & Whitney. The first F100 entered service in 1974 after being chosen to power the McDonnell Douglas F-15 fighter. It represented a leap forward in technology due to its ability to operate in extreme temperature and pressure environments. This engine is an augmented turbofan capable of producing 23,480 pounds of thrust. It consists of a three-stage fan section, a ten-stage high pressure axial compressor section, and a two-stage low-pressure and a two-stage high-pressure axial turbine section. The F100-PW-100 has an overall pressure ratio of 24.9:1.

1.6.18 F100-PW-229

The F100-PW-229, manufactured by Pratt & Whitney, is considered an increased performance engine within the F100 family of engines. Joining the U.S. Air Force in 1991, the F100-PW-229 provides greater thrust for the F-15 and F-16 fighters in all areas of the flight envelope. This engine was designed to increase fan pressure ratio and airflow without increasing the size, thus making it an interchangeable engine for all existing and future F-15s and F-16s. This engine is able to produce 29,100 pounds when fully augmented. It has an overall pressure ratio of 32:1. The F100-PW-229 is made up of a three-stage fan section, a ten-stage high-pressure axial compressor section, and a two-stage low-pressure and a two-stage high-pressure axial turbine section.

1.6.19 T64-GE-100

The T64-GE-100 ungeared free-turbine turboshaft engine powers the U.S. Air Force MH-53J helicopter. The combined axial centrifugal compressor of this turboshaft develops an overall pressure ratio of approximately 14:1. There are 14 axial stages within this compressor. The turbine for this engine consists of a four-stage gas generator with a maximum performance rating of 4,330 shaft horsepower. The engine is produced by General Electric Aircraft Engines.

1.6.20 TF34-GE-100A

Two TF34-GE-100A turbofan engines power the A-10A and A-10B aircraft. The TF34-GE-100A is manufactured by General Electric Aircraft Engines. The engine is capable of producing 9,065 pounds of thrust. It consists of a one-stage fan section, a fourteen-stage high-pressure axial compressor section, and a two-stage high-pressure and a four-stage low-pressure axial turbine section. The TF34-GE-100A has an overall pressure ratio of 19.8:1.

SECTION 2

EMISSION SAMPLING METHODOLOGY AND APPROACH

The determination of emissions from each of the various engine types and facilities presented a unique challenge to accurately measure emission rates of pollutants. A number of constraints and unknown parameters presented themselves in this program that are not associated with more traditional emissions testing programs. These variables were difficult to anticipate because of the inability to measure outlet exhaust parameters at some of the facilities, such as flow rates, temperature, and dilution by ambient air in the exhaust gas stream. The test program was designed to allow for those variables so that representative data could be collected in a timely and economic manner.

2.1 ENGINE EMISSION TESTING CONSIDERATIONS/COMPLICATIONS

The unique feature in the determination of the emissions from the test facilities is that the exhaust stream is significantly diluted with ambient air. The sampling locations for four of the engine tests were contained in a single accessible exhaust duct, and conventional test methods were used to determine the mass emission rates at those locations. These facilities were the APU test cell at Kelly AFB, Test Cell 14 at Corpus Christi Army Depot, and the test cell at the Naval Aviation Depot, Cherry Point. The physical structure of the sampling locations at the other seven facilities required the use of innovative techniques for the determination of volumetric flow during the test program.

The impact of large and/or fluctuating quantities of ambient air in the exhaust of turbine engines required modifications on the sampling and calculation methods used

for emission determination. The SAE Aerospace Information Report 1533 "Procedure for the Calculation of Basic Emission Parameters for Aircraft Turbine Engines," which was used historically, applies a mass balance to the combustion equation to determine the mass emission rate for priority pollutants with the explicit measurement of a volumetric flowrate. This approach was not practical for this test program since a significant portion of the test effort was directed at the measurement of trace hazardous compounds. The formation of trace compounds cannot be predicted by the combustion equation used in the SAE procedure. It was necessary to develop a technique to measure the total volumetric flowrate from the test facilities. Several methods were evaluated to determine the exhaust flowrate.

A carbon balance was calculated using fuel firing data; emission concentrations of CO, CO_2, and total hydrocarbons; and ambient measurement of CO_2 and total hydrocarbons. This approach closely resembles the SAE method, but the calculation was modified to produce a volumetric flowrate which could be used for mass emission calculations. A comparison of these methods is provided in Section 4.3.

A tracer gas study was conducted that released a small quantity of sulfur hexafluoride into the engine exhaust stream, and measured the minute concentrations of SF6 at the sampling location. The dilution of the tracer gas by the emission stream was calculated, and the total volumetric flowrate was determined.

A traditional emission testing F-factor combustion equation based on fuel composition and oxygen content of the emission stream was employed to calculate the flowrate. Each method was evaluated for each sampling run, and the most representative flow was selected.

2.2 EMISSIONS SAMPLING APPROACH

Emissions testing was performed on a series of engines at various power settings. Aircraft engines were tested at actual flight settings, which varied between

three and five depending on the engine type. The engine conditions for emissions sampling are provided below:

- Idle
- Approach
- Intermediate
- Military
- Afterburner (Between Zone 1 and Zone 3)

Auxiliary Power Units (APUs) were tested at one power setting. The helicopter engines were each tested at four power settings. The T700-GE-700 was tested at ground idle, flight idle, flight maximum, and overspeed; the T64-GE-100 helicopter engine was tested at ground idle, 75% normal, normal, and military.

Emissions testing was comprised of three 1-hour emissions tests for each pollutant at each power setting for each engine. Due to the sample volume required to meet method detection limits, certain samples (semivolatiles, aldehydes, and ketones) were composited over the entire 3-hour period. Certain engines could not be operated continuously at maximum power (military, afterburner, or overspeed) because engine and/or test cell damage may have occurred. Sample run times in these operative modes were reduced to the "safe" operating duration. The sample collection procedures were adjusted to accommodate the reduced operating time. In order to reach the analytical detection limit for the target pollutants, the sample run was paused at the end of the safe operating period, waited to allow the engine to cool, then resumed sampling for the next operating period until the 1-hour sample run was completed. In the case of the F117-PW-100 engine, the engine could not be operated at the military setting for the necessary duration. No emissions data was collected for this setting.

Ambient air sampling was conducted only during emissions testing. Ambient samples were composited for each of the three 1-hour test runs at that power setting.

The test program was structured in such a manner that the first series of engine tests at Kelly AFB was used to provide the necessary information to assess the sampling program for the remaining engines and review the HAP emission results for potential modification. Based on the results of these tests, the program was modified by considering an additional particulate matter sampling method (hi-volume sampler) at the engine exhaust stream. This was done in an effort to collect a measurable amount of particulate in case the standard Method 5 sample had zero or negative filter weight. The target number of HAPs collected (ambient and/or source) was not altered. The goal was to provide a representative emissions database for target HAPs from the first four engines tested. The results from these tests did not provide a consistent pattern from engine to engine or engine setting to engine setting. Nor did they provide an adequate database to make definitive decisions. Therefore, sampling for the entire list of chosen HAPs continued for the remaining engines within the program.

2.2.1 Pretest Measurements

Preliminary test data was obtained at the engine exhaust locations during 10-minute shakedown runs at each engine setting. Stack geometry measurements were obtained and recorded, and (if needed) traverse point distances verified. A preliminary velocity traverse was performed at the facilities which had a single exhaust stack, utilizing a calibrated S-type pitot tube and a Dwyer inclined manometer. Flue gas temperatures were observed with a calibrated direct readout pyrometer equipped with a chromel-alumel thermocouple. Water vapor content was measured using EPA Method 4.

A check for the presence or absence of cyclonic flow was conducted at each test location. The cyclonic flow checks were less than 20°, thus verifying the suitability of each test site for obtaining representative samples.

Preliminary test data was used for nozzle sizing and sampling rate determinations. Probe nozzles, pitot tubes, metering systems, and temperature measurement devices were calibrated as specified in Section 5 of EPA Method 5 test procedures.

2.2.2 Emission Test Methods

Sampling was performed for criteria pollutants and those HAPs that are products of incomplete combustion (PICs). The following lists the compounds that were measured and the sampling/analytical method used on the engine exhaust streams:

- Filterable and condensable particulate (EPA Methods 5 and 202).
- Aldehydes and Ketones (BIF 0011 and TO-05).
- Semivolatiles (EPA Method 0010). Table 2-1 lists the analytical target compounds.
- Volatile organic compounds (VOCs) (EPA Method 0030). Table 2-1 lists the analytical target compounds.
- Oxygen and carbon dioxide (EPA Method 3A).
- Carbon monoxide (EPA Method 10).
- Nitrogen oxides (EPA Method 7E).
- Total hydrocarbons (THCs) (EPA Method 25A).

Sampling for metals and sulfur dioxide in the engine exhaust streams was not performed. Historic testing for metals provided random results with a number of interferences. Originally, the mass emission rate of metals was to be calculated by factoring the metals concentration found in the JP-8 fuel analysis with the fuel consumption rate and exhaust flow rate. During this sampling program, however, fuel analysis did not show the presence (above the analytical detection limits) of the following metals: antimony, arsenic, barium, beryllium, cadmium, cobalt, chromium, copper, lead, manganese, mercury, nickel, phosphorus, selenium, silver, thallium, and zinc.

The analytical procedure for metal determination involved the combustion of JP-8 fuel in an evaporative dish. The combustion residue was ashed in a muffle furnace. Ash product was treated with an aqua regia to digest any residual carbon. The solution was diluted, then analyzed via inductively Coupled Plasma Spectroscopy, Cold Vapor Atomic Absorption Spectroscopy (Hg), or treated with chelating agent and analyzed via colorimetric methodology (P). Table 2-2 lists the metals for which concentrations were determined.

Table 2-1. Summary of Source Target Compounds For Semivolatile and Volatile Organic Compounds

Semivolatile Compounds - Method Target List		VOST Compounds - Method Target List
Acenaphthene	Fluoranthene	Acetone
Acenaphthylene	Fluorene	Benzene
Anthracene	Hexachlorobenzene	Bromodichloromethane
Benzo(a)anthracene	Hexachlorobutadiene	Bromomethane
Benzo(b)fluoranthene	Hexachlorocyclopentadiene	Bromoform
Benzo(k)fluoranthene	Hexachloroethane	2-Butanone
Benzo(g,h,i)perylene	Indeno(1,2,3-cd)pyrene	Carbon disulfide
Benzo(a)pyrene	Isophorone	Carbon tetrachloride
Benzoic acid	2-Methylnaphthalene	Chlorobenzene
Benzyl alcohol	2-Methylphenol	Chlorodibromomethane
Bis(2-chloroethoxy)methane	4-Methylphenol	Chloroethane
Bis(2-chloroethyl)ether	Naphthalene	Chloroform
Bis(2-chloroisopropyl)ether	2-Nitroaniline	Chloromethane
Bis(2-ethylhexyl)phthalate	3-Nitroaniline	1,1-Dichloroethane
4-Bromophenyl phenyl ether	4-Nitroaniline	1,2-Dichloroethane
Butylbenzylphthalate	Nitrobenzene	1,1-Dichloroethene
4-Chloroaniline	2-Nitrophenol	cis-1,2-Dichloroethene
4-Chloro-3-methylphenol	4-Nitrophenol	trans-1,2-Dichloroethene
2-Chloronaphthalene	N-Nitroso-di-n-propylamine	1,2-Dichlorophropane
2-Chlorophenol	N-Nitrosodiphenylamine	cis-1,3-Dichloropropene
4-Chlorophenyl phenyl ether	Pentachlorophenol	trans-1,3-Dichloropropene
Chrysene	Phenanthrene	Ethylbenzene
Di-n-butyl phthalate	Phenol	2-Hexanone
Di-n-octylphthalate	Pyrene	Methylene chloride
Dibenzofuran	1,2,4-Trichlorobenzene	4-Methyl-2-pentanone
1,2-Dichlorobenzene	2,4,5-Trichlorophenol	Styrene
1,3-Dichlorobenzene	2,4,6-Trichlorophenol	1,1,2,2-Tetrachloroethane
1,4-Dichlorobenzene		Tetrachloroethene
3-3'-Dichlorobenzidine		Toluene
2,4-Dichlorophenol		1,1,1-Trichloroethane
Diethyl phthalate		1,1,2-Trichloroethane
2,4-Dimethylphenol		Trichloroethene
Dimethyl phthalate		Trichlorofluoromethane
4,6-Dinitro-2-methylphenol		Vinyl acetate
2,4-Dinitrophenol		Vinyl chloride
2,4-Dinitrotoluene		o-Xylene
2,6-Dinitrotoluene		m/p-Xylene

Table 2-2. Summary of Source Target Metals from JP-8 Fuel Analysis

Antimony	Arsenic
Barium	Beryllium
Cadmium	Cobalt
Chromium	Copper
Lead	Manganese
Mercury	Nickel
Phosphorus	Selenium
Silver	Thallium
	Zinc

Sulfur dioxide emissions are typically calculated based on the sulfur content of fuel samples taken at the particular facility. This follows the theory that the sulfur content of the fuel determines the emissions of sulfur dioxide for a given engine at each power setting. Analysis for sulfur in fuel samples taken at select facilities during this program showed that the sulfur content was consistent with the sulfur content found in previous studies. Sulfur dioxide emissions should be calculated for each individual facility based upon the discussion provided in Section 4.2.5 of Volume 2. Historically, this has been the protocol for determining the emission factor. The emission factor for sulfur dioxide is presented in Section 4.2.5 of Volume 2. Dioxins, furans, and other HAPs (not listed in Table 2-1) are not discussed in the subsequent text because they would have been emitted in quantities too small to be detected. Therefore, these pollutants were not included in the sampling program.

Detailed descriptions of all exhaust emissions test sampling trains, sample preparation, sample procedures, sample recovery, and analytical procedures are provided in Appendix B of this document.

2.2.3 Flow Rate Measurement

As stated previously, standard flow rate measurements (EPA Methods 1-4) could be performed at only three of the test locations (Table 2-3).

Traditional isokinetic sampling methodologies could not be employed due to the physical structure of Test Cells 54A and 58 at Kelly AFB, Test Cell 18 at Laughlin AFB, Test Cell 9 at Tinker AFB, the test cell at Charleston AFB, Test Cells 2 and 4 at Edwards AFB, and the hush house at Barnes ANGB. Some of the engine test cells contained as many as 56 separate stacks, and it was not economical nor practical to sample each stack. Based on these complications, one or more mass balance approaches were employed to determine total flow rate. These methods were tracer gas dilution rates, carbon balance, and F-factor calculations. A summary of the exhaust flow determination method at each site is summarized in Table 2-3.

The multiple flow measurement/calculation methods were used to provide a firm basis for identifying and rejecting outlier data. The flow data collected by any one method at a given condition was compared against the alternate measurement data collected at that same condition, as well as the flow data collected by all methods for the same engine/test cell configuration at different operating conditions. There is a relationship between engine operating level and total flow, and all flow measurement methods provide valid data at one or more operating conditions. The data evaluation identified which measurement deviates from that relationship, and whether that deviation can be attributed to a physical parameter such as temperature, oxygen concentration, etc. If the deviation was predicted (e.g., high oxygen concentration impact on F-factor calculation), that data was discarded. If there was no obvious physical explanation, best-fit estimates at other loads were used to identify and reject the outlier. This evaluation showed that the F-factor mass balance calculation which

Table 2-3. Site-Specific Exhaust Flow Determination Summary

Engine Test Location	Engine	Flow Determination Method
Kelly AFB	TE6-A-7	Calculated by carbon balance, tracer gas and F-factor.[1]
	TF39-GE-1C	Calculated by carbon balance, tracer gas and F-factor[1]
	GTCP85-180	Measured using EPA Method 1-4
	GCTP165-1	Measured using EPA Method 1-4
Corpus Christi Army Depot	T700-GE-700	Measured using EPA Method 1-4
Laughlin AFB	J69-T-25	Calculated by carbon balance, tracer gas and F-factor[1]
	J85-GE-5A	Calculated by carbon balance, tracer gas and F-factor[1]
Tinker AFB	F110-GE-100	Calculated by carbon balance, tracer gas and F-factor[1]
	F108-CF-100	Calculated by carbon balance, tracer gas and F-factor[1]
	TF33-P-7/7A	Calculated by carbon balance, tracer gas and F-factor[1]
	F101-GE-102	Calculated by carbon balance, tracer gas and F-factor[1]
	TF33-P-102	Calculated by carbon balance, tracer gas and F-factor[1]
Charleston AFB	F117-PW-100	Calculated by carbon balance, tracer gas and F-factor[1]
Edwards AFB	F118-GE-100	Calculated by carbon balance, tracer gas and F-factor[1]
	F404-GE-F102/400	Calculated by carbon balance, tracer gas and F-factor[1]
	F110-GE-129	Calculated by carbon balance, tracer gas and F-factor[1]
	F100-PW-100	Calculated by carbon balance, tracer gas and F-factor[1]
	F100-PW-229	Calculated by carbon balance, tracer gas and F-factor[1]
Naval Aviation Depot, Cherry Point	T64-GE-100	Measured using EPA Method 1-4
Barnes ANGB	TF34-GE-100A	Calculated by carbon balance, tracer gas and F-factor[1]

[1] As discussed in Section 2, the exhaust flow was calculated by these three methods and the most representative method was selected to determine the exhaust flow rate.

relied on oxygen concentration dilution factors was unreliable due to the near-ambient oxygen concentrations present in most exhaust streams. These items are discussed in more detail in Section 4.

As an additional verification of outlet flows, inlet flow rates were determined through measurement using anemometers. Up to 12 hot-wire anemometers (mass flow meters) were attached to the inlet locations of the test cells. The hot-wire outputs terminated at a data logger, where data was measured once per second and recorded as 1-minute averages during each test run. The flow data then was used to calculate inlet flow rates. EPA Method 1 was used to determine the placement of the hot-wire anemometers. Due to potential interference caused by the extreme turbulence at the test locations, the hot-wire anemometer data did not correlate with outlet flows. The data was rejected as suspect and not included in this report.

As part of the theoretical flow determination method using carbon balance and F-factors, the inlet concentration for select compounds was measured. At the inlet to each test cell/hush house, THC was measured using a hydrocarbon analyzer identical to the one that measured engine exhaust gas THC. The THC analyzer was challenged with a zero and span gas at the beginning and end of each test conditions to calibrate and assess the instrument's calibration. An inlet carbon dioxide (CO_2) measurement was required as input to the theoretical flow model. An ambient CO_2 monitor was used to measure the inlet CO_2 concentration during each test run. The CO_2 monitor was challenged with a zero and span gas at the beginning and end of each test condition to calibrate and assess the instrument's calibration.

2.2.4 Pollutant Distribution at the Outlet of the Test Cells

The test program was based on the assumption that by the time the exhaust gas exits the test cell, the exhaust stream from the engine and the dilution air would have reached a homogeneous mixture. This assumption was validated during testing conducted for this delivery order.

Particulate size distribution in the engine exhaust has been shown to be significantly less than 10 microns (μm) in size (Characterization of Chemicals on Engine Exhaust Particles: F101 and F110 Engines, ESL-TR-89-20, Air Force Engineering and Services Center Engineering and Services Laboratory and Source Sampling and Testing of Aerospace Equipment and Jet Engines - Test Protocol - Edwards AFB, CA, EQ December 1995). Because of the size of the particles, it was assumed that the particles would behave as an aerosol or gas, and that pollutants will be distributed evenly throughout each of the test cell stacks. Since it was assumed that all particulate (and those contaminants bound to the particulate) will behave as an aerosol, each stack or any point in the stack will have the same concentration of pollutants. This assumption was used as the basis to conduct single-point isokinetic sampling on only one stack or one point in the stack, which is representative of all other stacks or points in a given test cell.

Since particulate size is less than 10 μm, EPA Method 5 was used for particulate sampling. Exhaust was sampled using a full traverse (GTCP85-180, GTCP165-1, T700-GE-700 and the T64-GE-100) through a single stack.

Although it was assumed that pollutant concentrations in the stack would be homogeneous, the assumption was verified by using tracer gas at facilities where the exhaust was not emitted through a single stack. Tracer gas was not used at facilities where the exhaust was emitted through a single exhaust stack (GTCP85-180, GTCP165-1, T700-GE-700 and the T64-GE-100) and conventional EPA reference methods could be used to measure volumetric flow. The tracer gas, sulfur hexafluoride (SF_6), was dispersed into the exhaust gas stream and measured at the outlet. Based on the turbulent flow of the exhaust and the passage of the exhaust gases through the blast room, the SF_6 was dispersed equally in the exhaust. A random number of stacks was sampled at various engine settings to test that the tracer gas was dispersed equally. The results of the tracer gas dispersion are provided in Section 4.

2.2.5 Tracer Gas Methodology

Tracer gas was used at Kelly AFB, Laughlin AFB, Tinker AFB, Edwards AFB, and Barnes ANGB where exhaust flow could not be measured using standard EPA methods. By inputting a known amount of tracer gas into the exhaust stream and measuring a concentration at the outlet, the amount of dilution that had occurred was determined. The dilution rate was then used to calculate exhaust flow rates. Section 3 details those calculations.

The tracer gas release points within the augmenter tube were also monitored for temperature. It was important to monitor for temperature since SF_6 is stable up to 500° F before it begins to degrade. The tracer gas injection apparatus included thermocouples to determine temperatures at the injection point. The 500° F threshold was very conservative, because SF_6 will not decompose until 932° F. However, it was intended to maintain the conservative threshold as the point where the tracer method must be more seriously examined due to the more extreme conditions present in the test cell. During test cell operation the temperature in the augmenter tube at the tracer release points did not exceed 500° F in a nonafterburner power setting. Temperature measurements were not collected when the tracer gas release points were placed on the outside edge of the augmenter tube. The tracer gas was released opposite the flow to prevent the exhaust gas pressure from impacting the opening in the tracer gas manifold and possibly affecting tracer gas distribution. Tracer gas was introduced into the release manifold through a mass flow controller calibrated to SF_6. It then flowed into adjustable flow meters which regulated equal amounts of tracer gas into each of the tracer release steel tubes. Temperature was measured using a Type K thermocouple and recorded by a data logger.

2.3 POLLUTANT BACKGROUND CONCENTRATIONS

Ambient air sampling was performed for many of the same compounds that were sampled at the test cell exhausts. The ambient air sampling was conducted in conjunction with emissions testing to quantify and qualify background emissions concentrations. Ambient samples were collected inside of the test cells for the following compounds:

- Particulate - TSP (40 CFR, Part 60, Appendix B).
- Aldehydes and Ketones (EPA Method TO-5, Weston modification).
- Semivolatiles (EPA Method TO-13).
- VOCs (EPA Method TO-14).

Table 2-4 provides a comparison of emissions test method detection limits, ambient air test method detection limits, and actual observed maximum ambient concentrations for those pollutants. It should be noted that the 24-hour ambient values consist of an integrated sample collected over a 24-hour period, which consists of periods of lower ambient pollutant levels and higher pollutant levels, to arrive at a result for the integrated 24-hour sample. Therefore, it is reasonable to suspect that in any given 1-hour period the ambient air pollutant value could be higher than the exhaust concentration for that pollutant. The proximity of large local sources (i.e., exhaust from other test cells) can further add to the ambient air concentrations that already may be present. It can be concluded that the potential exists for ambient air concentrations to bias emissions estimates high, as the observed ambient concentrations may be detectable by emissions test methods. Therefore, it is important to quantify the background pollutant concentrations and qualify the exhaust emissions accordingly. This was the procedure utilized for this study.

Ambient air sampling, equipment operations, and calibration followed standard operating procedures (SOPs) for each method. All ambient air sampling was

Table 2-4. Comparison of Emission Test Methods, Ambient Test Methods, and Observed Ambient Results

	Source				Ambient				
Compound Class	Analytical Detection Limit	Sample Volume cu ft	Sample Volume m^3	Method Detection Limit [a]	Analytical Detection Limit	Sample Volume cu ft	Sample Volume m^3	Method Detection Limit [b]	Noted Maximum 24-hr ambient Values [c]
VOCs	10 ng	0.71	0.020	497 ng/m^3	NA	NA	NA	500 ng/m^3	<500 ng/m^3
	50 ng	0.71	0.020	2487 ng/m^3	NA	NA	NA	1800 ng/m^3	<1800 ng/m^3
Formaldehyde	3.1 mg	100	2.832	1.1 mg/m^3	0.12 ug	64	1.812	0.07 mg/m^3	1.9 mg/m^3
Semi-Volatiles	1.0 mg	106	3.002	0.33 mg/m^3	1.0 ng	1620	45.878	0.02 ng/m^3	0.045 mg/m^3
	10 mg	106	3.002	3.3 mg/m^3	10 ng	1620	45.878	0.22 ng/m^3	0.5 mg/m^3
Particulate	0.1 mg	50	1.416	0.07 mg/m^3	0.1 mg	7200	203.904	0.0005 mg/m^3	<0.1 mg/m^3

Notes:

[a] - Source emissions limits are based on the total expected sample volume; formaldehyde and semi-volatiles will consist of a composite of three 1-hour sample runs.

[b] - Ambient sample detection limits are based on a three-hour sample.

[c] - 24-hr 0.5 mg/m^3 results are primarily from naphthalene and phenol.

performed in conjunction with all emissions testing. Ambient air sampling commenced at the start of each emissions test run and concluded at the completion of the final emissions test run. The ambient air samples were composited over the three 1-hour test runs for each engine power setting. Representative ambient air samples were collected inside the test cell. Samplers were turned on and off from inside the test cell.

The following subsections present brief descriptions of the ambient air sampling and analytical methods which were used for each of the pollutants. The descriptions include overviews of the sampling equipment, collection media, and analytical techniques used for each pollutant.

2.3.1 Polynuclear Aromatic Hydrocarbons (PAHs)

The sampling and analytical methods for PAHs are based on EPA Method TO-13, Determination of Benzo(a)pyrene and Other Polynuclear Aromatic Hydrocarbons (PAHs) in Ambient Air Using Gas Chromatography (GC) and High Performance Liquid Chromatography (HPLC) (U.S. EPA, 1988a). In addition to the PAHs, sampling and analysis included all semivolatile PICs determined to be in the engine exhaust samples.

This method utilizes a General Metal Works Model PS-1 high-volume air sampler, which operates at a sampling rate of approximately 240 liters per minute (L/min) (approximately 15 cubic meters (m^3) per hour). The sample flow rate is monitored using a calibrated magnehelic gauge, and the sample volume is determined by the average of the pre- and post-sampling magnehelic gauge readings. The air sample is drawn through a quartz glass fiber filter to capture particle-born compounds, then through a series of two polyurethane foam (PUF) plugs, separated by XAD-2 adsorbent resin to adsorb vapor-phase compounds. The XAD-2 resin layer is a modification of Method TO-13, designed to prevent breakthrough of the lighter, more-volatile PAH compounds.

At the laboratory, the exposed filter and PUF/XAD are extracted and analyzed. The extract is concentrated, then cleaned up (interferents removed) using column chromatography. The mass spectrograph (MS) is operated in the standard mode.

Table 2-5 lists the semivolatiles that were analyzed for in each sample.

2.3.2 Aldehydes and Ketones

There are two EPA-approved methods for determining aldehydes and ketones in ambient air Method TO-5 and TO-11: Method for the Determination of Formaldehyde in Ambient Air Using High Performance Liquid Chromatography (HPLC) (U.S. EPA, 1984) and Determination of Formaldehyde in Ambient Air Using Adsorbent Cartridge Followed by High Performance Liquid Chromatography (HPLC) (U.S. EPA, 1988), respectively. Method TO-5 collects formaldehyde in impingers containing 2,4-dinitrophenylhydrazine (DNPH), and TO-11 uses adsorbent cartridges where the silica gel traps are coated with DNPH solution. TO-11 was developed to simplify the sampling procedure by eliminating the need for midget impingers containing liquid DNPH. The limited sample flow rates possible using TO-5 and TO-11, combined with typically high blank values, limit the detection limits range achievable by TO-5 and TO-11 to the 12- to 24-micrograms-per-cubic-meter (mg/m^3) range over a 1-hour period. Because Method TO-5 and TO-11 cannot meet the same level of sensitivity as the source test method, a method previously developed by WESTON was used, which has a detection limit of approximately one to two orders of magnitude lower.

The aldehyde and ketone sampling and analytical method is based on a modified U.S. EPA method developed by WESTON and DAT (formerly Triangle Labs of Columbus, OH), located in Dublin, OH. The modified method is based on the EPA Standard Method Determination of the Strong Acidity of Atmospheric Fine-Particles (<2.5 mm) Using Annular Denuder Technology (EPA, 1992). The key element of this method is the annular denuder technology for removal and collection of reactive gases. The annular denuder is a gas-collection technology that uses closely spaced concentric glass tubes coated with adsorbent solutions to collect various reactive gases by diffusion.

Table 2-5. Summary of Ambient Target Compounds for Semivolatile and Volatile Organic Compounds

Semivolatile Compounds - EPA Method TO-13		Volatile Organic Compounds - EPA Method TO-14 List
Acenaphthene	2-Nitrophenol	Freon 12
Acenaphthylene	4-Nitrophenol	Freon 114
Anthracene	N-Nitroso-di-n-propylamine	Chloromethane
Benzo(a)anthracene	N-Nitrosodiphenylamine	Vinyl Chloride
Benzo(b)fluoranthene	Pentachlorophenol	Bromomethane
Benzo(k)fluoranthene	Phenanthrene	Chloroethane
Benzo(g,h,i)perylene	Phenol	Freon 11
Benzo(a)pyrene	Pyrene	1,1-Dichloroethene
Benzoic acid	1,2,4-Trichlorobenzene	Freon 113
Benzyl alcohol	2,4,5-Trichlorophenol	Methylene Chloride
Bis(2-chloroethoxy)methane	2,4,6-Trichlorophenol	1,1-Dichloroethane
Bis(2-chloroethyl)ether		cis-1,2-Dichloroethene
Bis(2-chloroisopropyl)ether		Chloroform
Bis(2-ethylhexyl)phthalate		1,1,1-Trichloroethane
4-Bromophenyl phenyl ether		Carbon Tetrachloride
Butylbenzylphthalate		Benzene
4-Chloroaniline		1,2-Dichloroethane
4-Chloro-3-methylphenol		Trichloroethene
2-Chloronaphthalene		1,2-Dichloropropane
2-Chlorophenol		cis-1,3-Dichloropropene
4-Chlorophenyl phenyl ether		Toluene
Chrysene		trans-1,3-Dichloropropene
Di-n-butyl phthalate		1,1,2-Trichloroethane
Di-n-octylphthalate		Tetrachloroethene
Dibenzofuran		Ethylene Dibromide
1,2-Dichlorobenzene		Chlorobenzene
1,3-Dichlorobenzene		Ethyl Benzene
1,4-Dichlorobenzene		m,p-Xylene
3-3'-Dichlorobenzidine		o-Xylene
2,4-Dichlorophenol		Styrene
Diethyl phthalate		1,1,2,2-Tetrachloroethane
2,4-Dimethylphenol		1,3,5-Trimethylbenzene
Dimethyl phthalate		1,2,4-Trimethylbenzene
4,6-Dinitro-2-methylphenol		1,3-Dichlorobenzene
2,4-Dinitrophenol		1,4-Dichlorobenzene
2,4-Dinitrotoluene		Chlorotoluene
2,6-Dinitrotoluene		1,2-Dichlorobenzene
Fluoranthene		1,2,4-Trichlorobenzene
Fluorene		Hexachlorobutadiene
Hexachlorobenzene		Methanol
Hexachlorobutadiene		Ethanol
Hexachlorocyclopentadiene		Isopropanol
Hexachloroethane		Acrolein
Indeno(1,2,3-cd)pyrene		Acetone
Isophorone		Acetonitrile
2-Methylnaphthalene		Acrylonitrile
2-Methylphenol		Vinyl Acetate
4-Methylphenol		Tetrahydrofuran
Naphthalene		1 4-Dioxane
2-Nitroaniline		Ethyl Acetate
3-Nitroaniline		2-Butanone
4-Nitroaniline		Methyl Methacrylate
Nitrobenzene		4-Methyl-2-Pentanone

The EPA method was modified to use a coating solution intended to collect aldehydes and ketones. For aldehyde and ketone sampling, the denuder tubes are coated with a DNPH solution similar to the way in which silica gel is coated for TO-11. The coating solution used in the modified method is based on bench and field testing of a DNPH-coated annular denuder tube for collection of aldehydes (Possanzini et al., 1987).

The coating used by Possanzini (1987) has been field-tested for 24-hour sampling, with a sampling system configuration based on the EPA method. At the normal operational flow rates of 10.0 L/min, results of the field test indicate no measurable breakthrough from the first tube in a three-tube train. Based on the variability of several blank tubes collected as part of the test, the detection limit of the modified method was calculated as 0.05 mg/m^3 for a 24-hour sample or 1.2 $\mu g/m^3$ for a 1-hour sample.

The aldehyde and ketone samples were collected using a Model 3000 Annular Denuder Sampling (ADS) System, manufactured by University Research Glassware, Inc. The ADS drew air through the sampling train at a 10 L/min flow rate with the total air sample volume measured by calibrated flow totalizers. The sampling trains consisted of two DNPH-coated denuder tubes in series to collect aldehydes and ketones, preceded by a cyclone inlet to remove large particles (> 2.5 mm), and followed by a 47-millimeter (mm) diameter Teflon® filter to remove fine particles (the cyclone and filter particle catches were not to be analyzed). The second tube verified that no breakthrough occurred from the first tube.

At the laboratory, the DNPH coating was extracted from the denuder tubes and analyzed by high performance liquid chromatography (HPLC). The HPLC technique is the same analytical finish used in Methods TO-5 and TO-11, as well as in the work by Possanzini (1987). Based on the results obtained from the data collected in the first half of the program (Kelly AFB, CCAD, Laughlin AFB, and Tinker AFB), the concentrations did not reflect "typical" ambient concentrations. The ambient samples for aldehydes and ketones were not collected during the second half of the program. Instead, a quantitative observation was made at each facility to note the presence of any contributors to ambient

aldehyde and ketone concentrations. If no contributors existed, a typical ambient concentration was used for the inlet.

2.3.3 Particulates

Particulate matter (total suspended particulates) was sampled using General Metal Works high-volume (Hi-Vol) air samplers with volumetric flow controllers. The particulate sampling program was operated according to EPA guidelines as described in the Quality Assurance Requirements for Prevention of Significant Deterioration, 40 CFR, Part 50, Appendix B. Sample filters were analyzed by a gravimetric method using pre- and post-weights to determine total particulates. During each 1-hour sample run, 68 m^3 of sample was collected. For the composite 3-hour sample, a total of 204 m^3 of volume was sampled. With an analytical detection limit of 0.1 milligram (mg), the method detection is 0.5 $\mu g/m^3$.

2.3.4 Volatile Organic Compounds

Volatile organics were sampled using passivated stainless-steel Summa® canisters, which were analyzed by gas chromatography/mass spectrometry (GC/MS) per EPA Method TO-14.

A Summa® canister is a stainless-steel vessel that has had its internal surfaces specially passivated using a "Summa" process. This process combines an electropolishing step which is chemically inert. A Summa surface has the appearance of a bright and shiny mirror. A sample enters the canister through a stainless steel bellows valve. A Summa canister can hold a high vacuum (<1 m Torr: <28 inches Hg) for up to 30 days. After 30 days, it is necessary to evacuate the canister prior to use to ensure that it is free of contaminants.

Canisters are cleaned using a combination of exponential dilution, heat, and high vacuum. They are generally batch-certified (1 in 10) by filling them with ultra-high-purity air, which is subsequently analyzed using either GC/MS (TO-14) or GC/ flame ionization detection (FID) (TO-12). If the target analyte concentrations are below 0.2 part per billion

by volume (ppbv) (TO-14) or if the total hydrocarbon level is less than 0.2 ppbv, the batch of canisters is considered "clean" and they are certified for use.

Although 14 days is the most commonly cited holding time for a canister sample, the holding time is somewhat analyte-specific. For example, nonpolar analytes such as chloroform, benzene, and vinyl chloride are stable in a canister for at least 30 days. However, polar analytes such as methanol and acetone often will condense on the canister walls (the degree of which is a function of the sample humidity). Analysis of these samples is performed within 72 hours.

The passivated canister sampling used pre-set flow controller devices to regulate the sampling flow rate into the canister. The flow controllers allow an integrated sample to be collected without the canister achieving an equilibrium ambient pressure. Sampling was conducted using an evacuated-liter size Summa canister. The flow into the canister is controlled by an orifice to allow approximately 1.5 liters of sample to be collected during each 1-hour sample run for a total of 4.5 liters per three runs.

Table 2-5 lists the VOCs that were analyzed for in each sample.

2.4 ENGINE TEST CYCLE DATA

In order to correlate the aircraft engine and APU emissions data with the engine operation, selected engine test cycle data was compiled by government personnel during testing. The engine test monitoring system at each Test Cell can monitor a variety of engine parameters during engine testing. For the purpose of emissions sampling, a select number of these parameters were monitored during testing for emission factor development. It is important, for example, to distinguish between afterburner settings. The engine operating mode designated as afterburner is comprised of five zones. These zones are classified as one through five and directly correlate to an increase in fuel flow and thrust as the zones increase in value. During this sampling program all engines were tested at zone 1 except the F404-GE-F1D2/400, which was tested in zone 3. These parameters assisted in correlating the

effect of a specific pollutant for a specific engine load condition. The following list is a portion of the data that was compiled by government personnel:

- JP-8 fuel flow at each load
- Engine rpm at each load
- Thrust/horsepower at each load
- Engine pressure ratio (EPR)
- Test cell humidity and temperature.

2.5 JP-8 FUEL SAMPLING AND ANALYSIS

The JP-8 fuel proximate/ultimate analysis and level of nitrogen were determined for each facility to develop a custom F-factor and to document fuel characteristics during emissions testing. Table 2-6 lists the fuel analysis parameters analyzed. Two fuel samples were collected at each testing location during testing. These samples were collected and shipped to the appropriate Government laboratory for analysis.

Table 2-6. JP-8 Fuel Parameters Analyzed

Parameter	Analytical Method
Trace Sulfur	ASTM D-2622
Carbon, Hydrogen, and Oxygen	ASTM D-5291
Trace Nitrogen	ASTM 4629 (chemiluminescence)
Heating Value (Net and Gross)	ASTM D-240
Density	ASTM D-1480
API Gravity/Density	ASTM D-1298

[1] American Society of Testing and Material.

2.6 SITE-SPECIFIC SAMPLING PROTOCOLS

Engine testing was performed within eleven different engine test cells at eight separate base locations: Kelly AFB, TX; Corpus Christi Army Depot, TX; Laughlin, AFB, TX; Tinker AFB, OK; Charleston AFB, SC; Edwards AFB, CA; Naval Aviation

Depot Cherry Point, NC; and Barnes Air National Guard Base (ANGB), MA. The test program was broken down into two major phases: (1) Kelly AFB testing of aircraft engines and APUs and evaluation of results; CCAD engine testing; Laughlin AFB testing; and Tinker AFB engine testing; and (2) Charleston AFB engine testing; Edwards AFB engine testing; Edwards AFB CEM testing; Naval Aviation Depot Cherry Point engine testing; and Barnes ANGB engine testing.

Provided in this section is a summary of how emission sampling was conducted at each test cell. Findings and results are presented in Section 4 of Volume 2.

2.6.1 Kelly AFB, Test Cell 58

Figure 2-1 illustrates the general configuration of test cell 58. As can be seen in Figure 2-1, this exhaust configuration did not facilitate the use of conventional sampling methodologies. Therefore, single point sampling was performed and the flowrate was determined through calculation (carbon balance, tracer gas, F-factor). There are a total of 42 individual exhaust stacks over a 1,400-square-foot (ft^2) area. Airflow into the test cell is the result of the air draw created by the engine during operation. Engine exhaust gas is directed through the augmenter tube, through the perforated section of the augmenter tube into the blast room, and then exits through the multiple stacks. Because of the turbulent flow from the engine exhaust and the circuitous path that the exhaust gases must travel, it was assumed that there would be no stratification of the exhaust gases. Therefore single point sampling would be representative of the entire gas stream.

In order to calculate the exhaust flowrate by tracer gas and determine homogeneity, a tracer gas distribution system was set up inside the test cell near the corner against the augmenter tube wall. As shown in Figure 2-2, four stainless steel tubes (0.25-inch I.D.) were attached to the face of the augmenter tube entrance. Eight tracer gas collection points were selected from the 42 exhaust stacks (Figure 2-3).

Figure 2-1
Test Cell 58
Kelly AFB

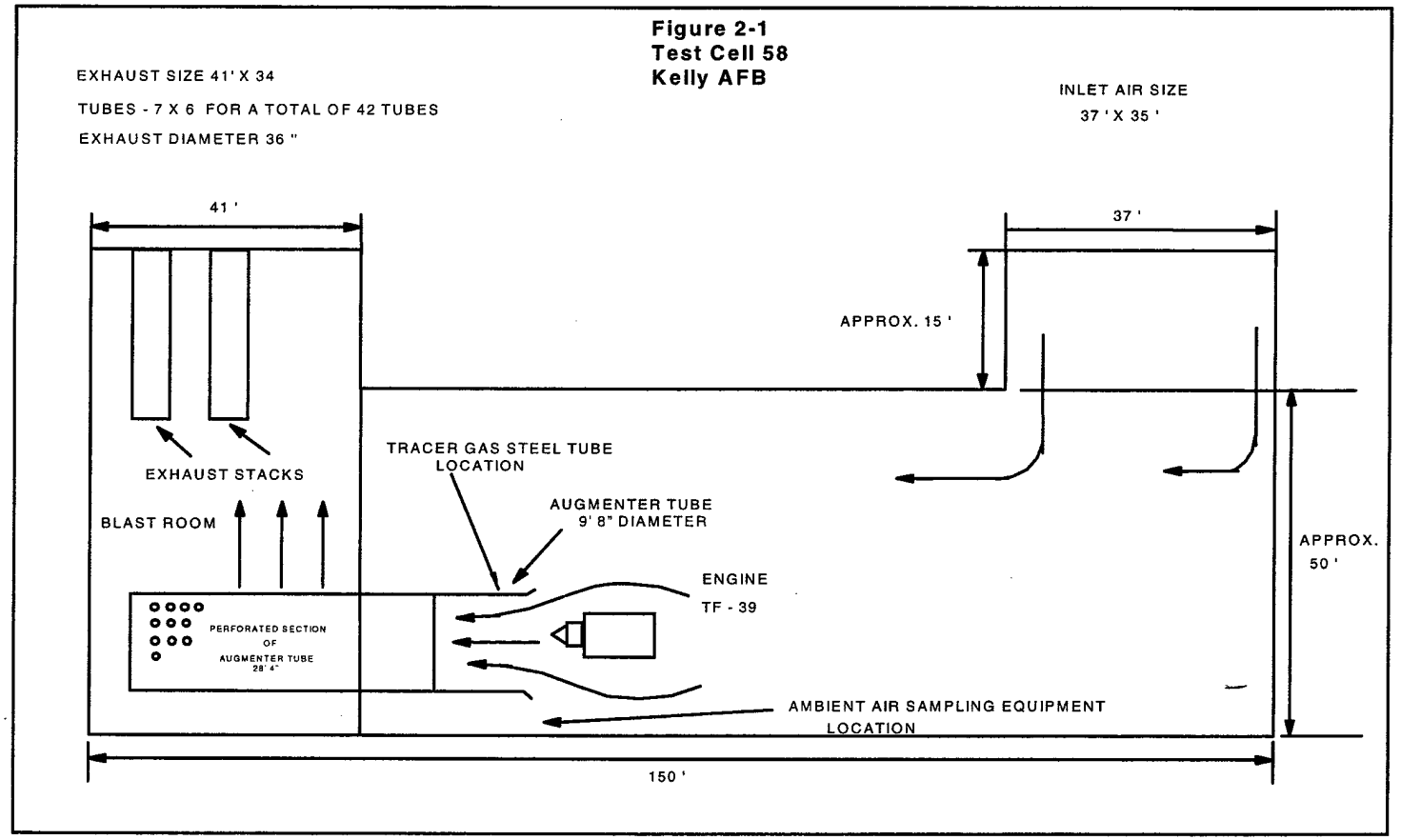


Figure 2-2.
Tracer gas distribution system for the augmenter tube at Laughlin AFB

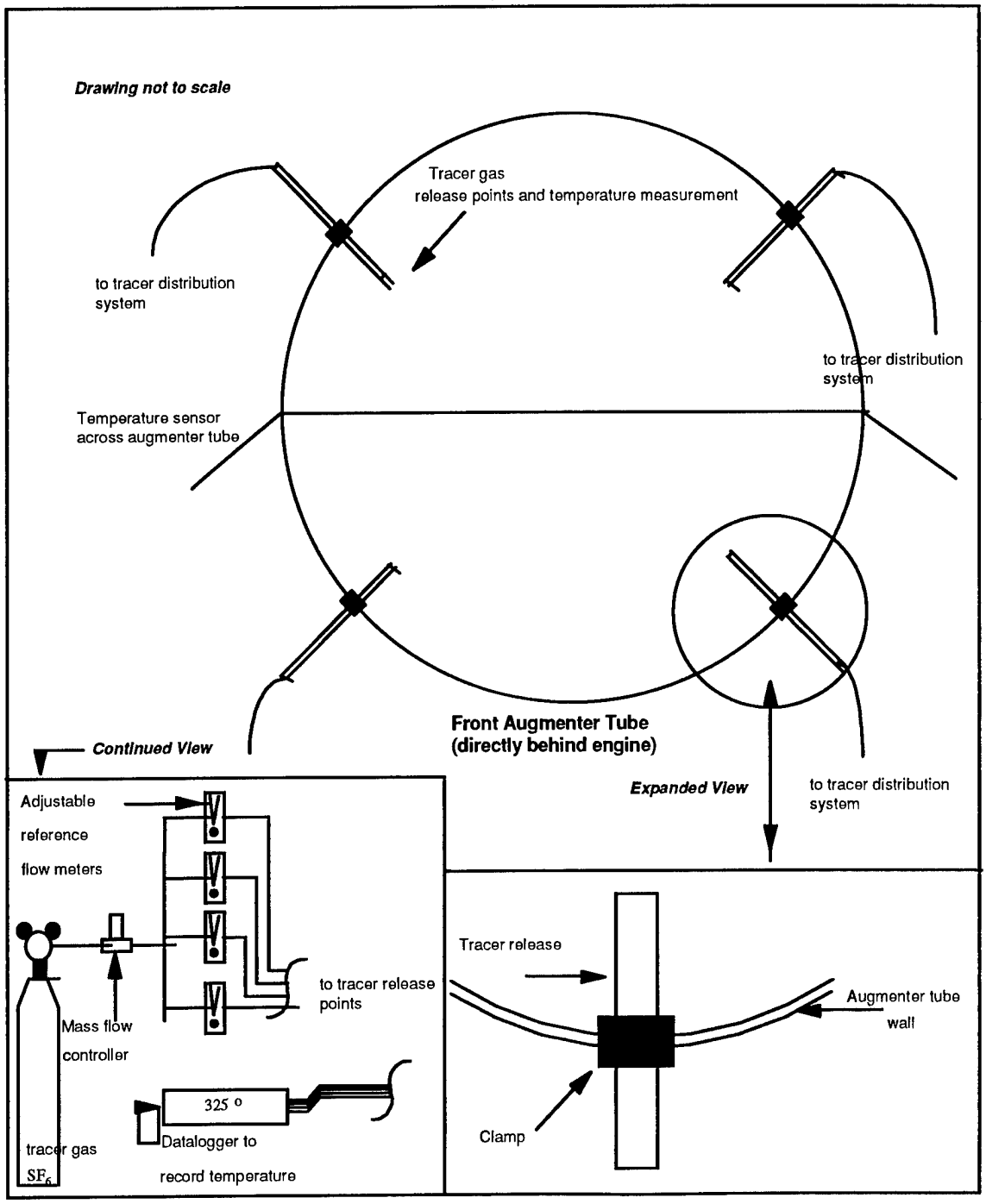
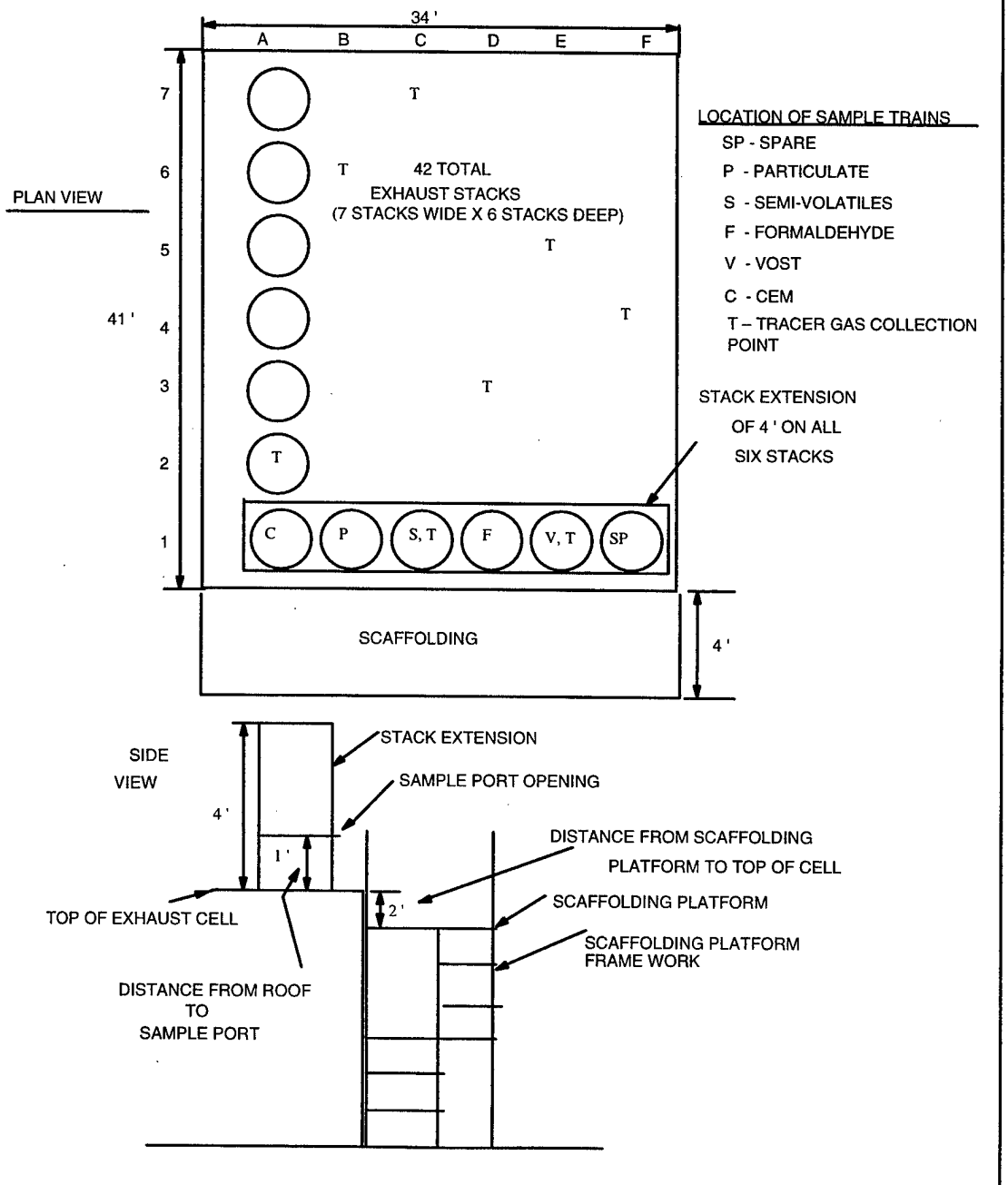


Figure 2-3
Kelly AFB Test Cell 58
Sample Locations



Dedicated pumps set at a constant pull rate were used at each point to collect the SF_6 sample in Tedlar bags during each run for analysis by FTIR. The assumption of a homogeneous exhaust mixture was demonstrated by these tracer gas measurements. The inlet flow rate was measured by 12 hot-wire anemometers that were placed over the air intake screen in a Method 1 configuration. However, as described in Section 2.2.3, due to potential interferences, the data did not correlate and was rejected as suspect. Inlet air pollutant concentrations were determined by placing the ambient samplers in the rear corner against the augmenter tube wall inside the test cell, in a manner that did not present a foreign object damage (FOD) hazard to the engine.

The stacks at the outlet of the blast room are flush with the top of the test cell. This presented both a safety hazard and a sampling dilemma. It was not possible to remain on the temporary test scaffolding during engine operation above idle conditions due to exhaust temperature and velocity. The configuration of the stacks also did not allow the stacks to be traversed in a reasonable amount of time as required by EPA Method 1. Since access to the platform and stacks was limited, all sampling was conducted at a single point for each sample train. In order to minimize wind interference for each sample train (PM, SVOC, VOC, CEM, ALD/KEY), it was necessary to install 4-foot stack extensions with 4-inch-diameter sample ports on six of the exhaust stacks. Figure 2-3 illustrates which exhaust stacks had extensions, the placement of sampling opening, and which pollutants were sampled from each stack. The size and placement of the scaffolding platform are also presented.

Velocity measurements were collected at each sampling point in order to maintain isokinetics. These velocity data were not used to calculate the entire exhaust flowrate since the face of the exhaust could not be traversed. The exhaust flowrate was calculated using either carbon balance, tracer gas, or F-factor.

2.6.2 Kelly AFB, Test Cell 54A

Figure 2-4 illustrates the general configuration of test cell 54A. As can be seen in Figure 2-4, this exhaust configuration did not facilitate the use of conventional sampling methodologies. Therefore, single point sampling was performed and the flowrate was calculated (carbon balance, tracer gas, F-factor). The exhaust outlet terminates in a triangular-shaped stack with rectangular outlets on either side. The engine exhaust is directed through the augmenter tube, into the blast box, which directs the exhaust gases to the roof outlet. Inlet air into the cell is provided by a fan, which was designed to simulate airflow during flight.

Because of turbulent flow from the engine exhaust through the augmenter tube and into the blast box, it was assumed that there would be no stratification of the exhaust gases and that the tracer gases introduced to the system would be mixed equally. Therefore, single point sampling would be representative of the entire gas stream. The tracer gas distribution system was set up inside the test cell behind the rectangular exhaust duct. Four stainless steel distribution tubes (0.25-inch I.D.) were attached to the rear of the short augmenter tube near the blast box in the configuration shown in Figure 2-5. One tracer gas collection point at the exhaust was placed in each of the four sample ports as shown in Figure 2-6. Dedicated pumps set at a constant pull rate were used on each collection point to collect the SF_6 sample in Tedlar bags during each run for analysis by FTIR. The assumption of a homogeneous exhaust mixture was demonstrated by these tracer gas measurements.

The inlet flow rate was measured by anemometers placed over the air intake screen. To facilitate these flow measurements, the 16-inch vacuum line inside the test cell was sealed temporarily during testing to limit air intake to only the main air stream.

Figure 2-4
Test Cell 54A
Kelly AFB

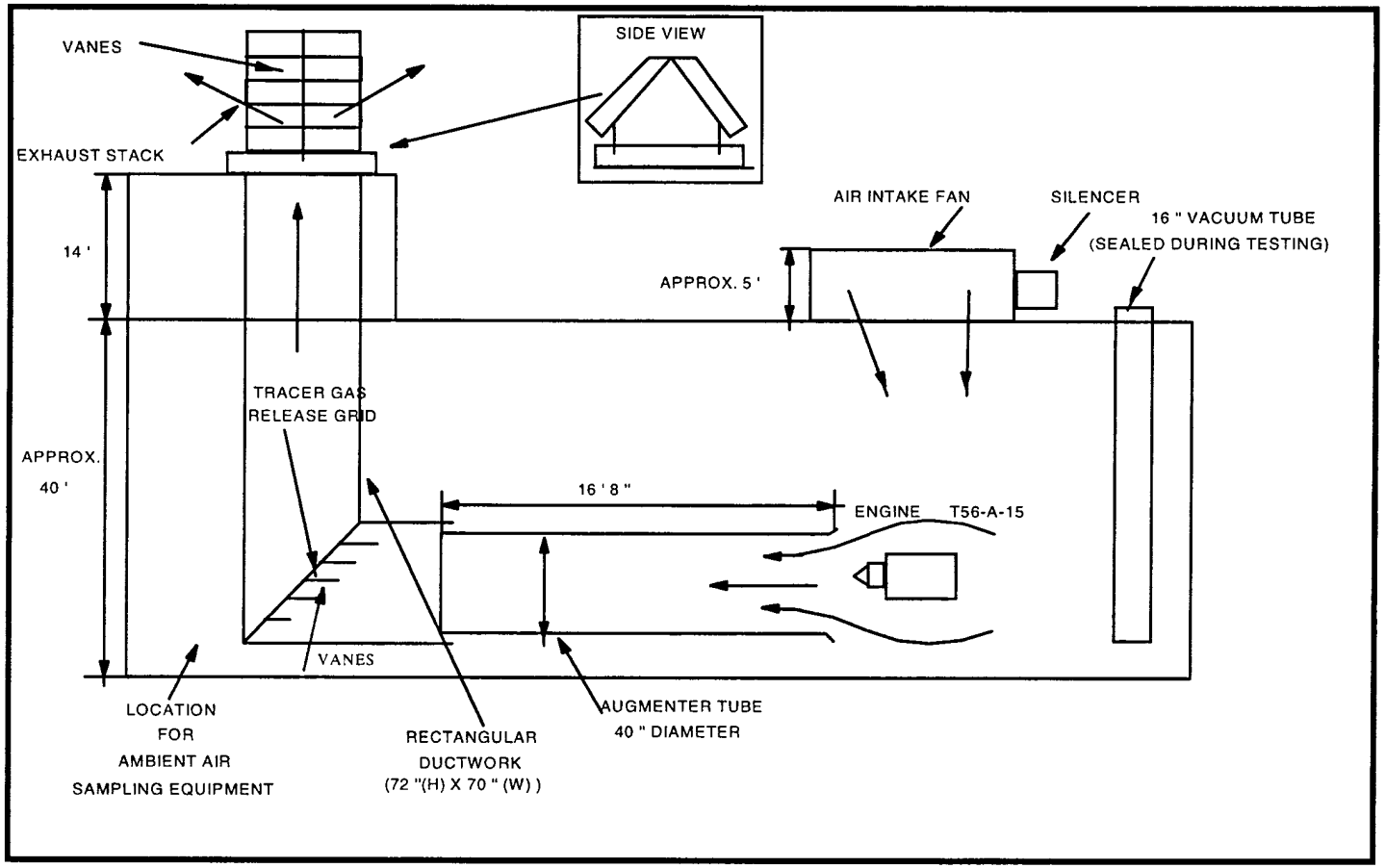


Figure 2-5. Tracer gas distribution system for the augmenter tube at Laughlin AFB

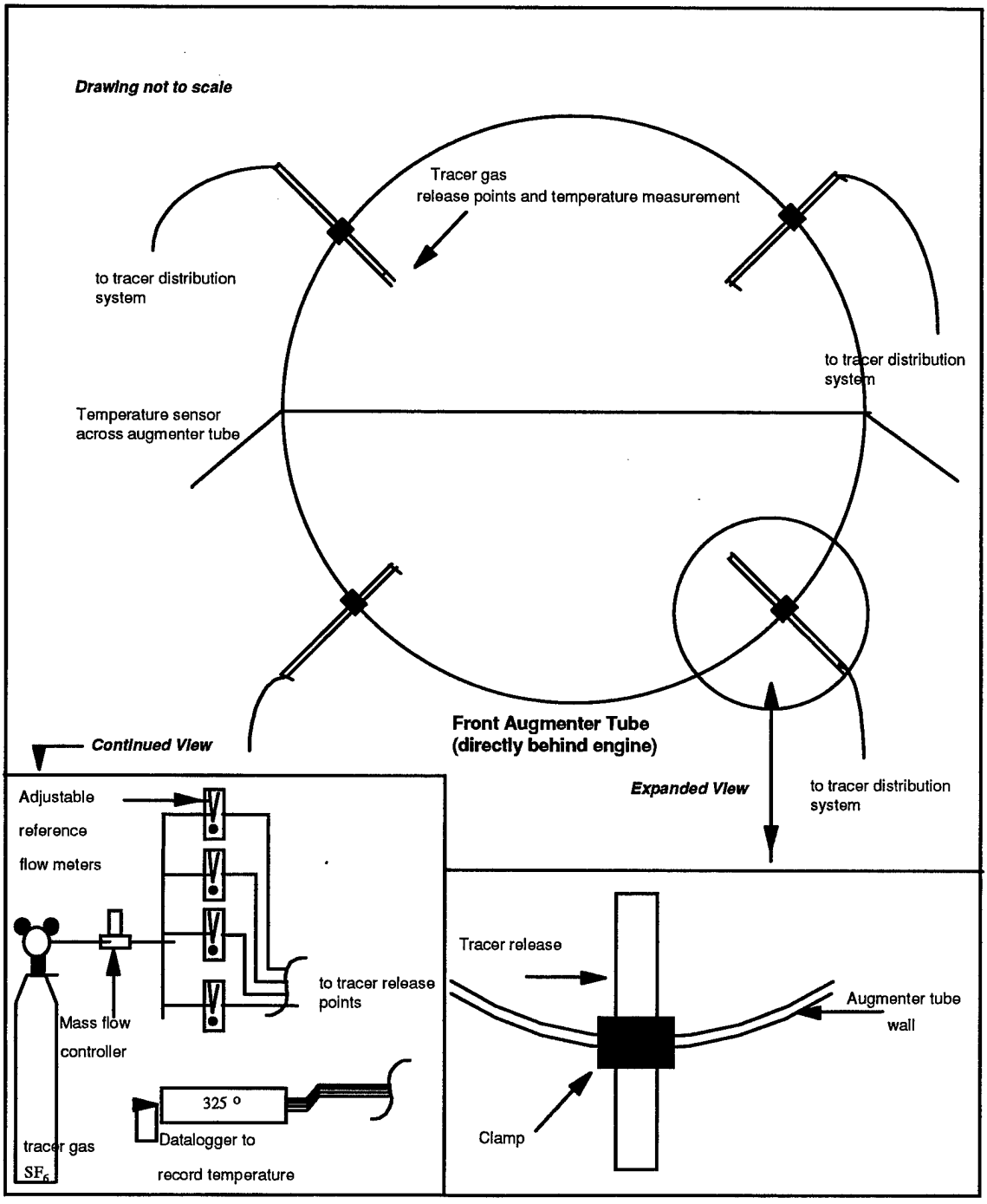
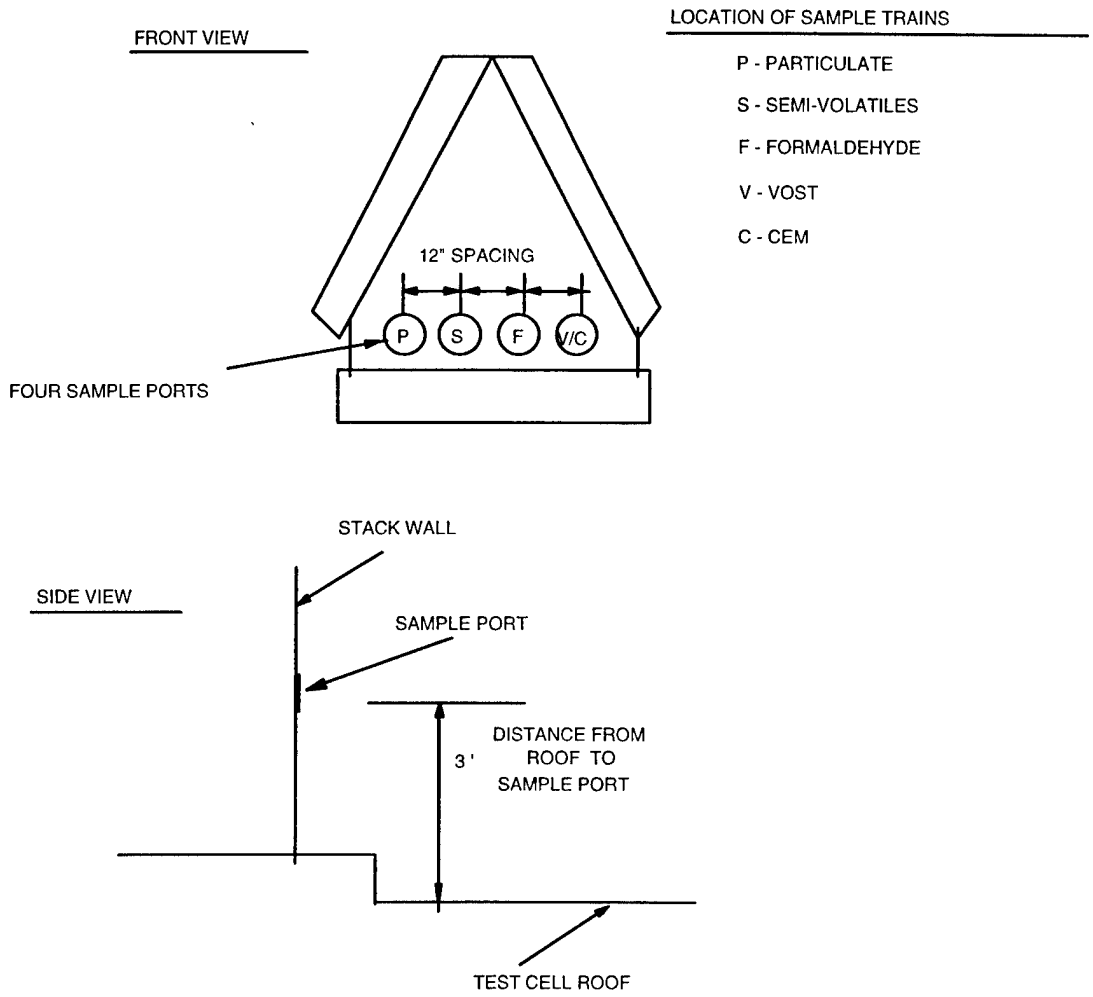


Figure 2-6
Kelly AFB Test Cell 54A
Sample Locations



Again, these flow measurements were considered suspect and rejected due to interferences.

Inlet air pollutant concentrations were determined by placing the ambient samplers behind the rectangular exhaust duct inside the test cell, in a location that did not present a FOD hazard to the engine.

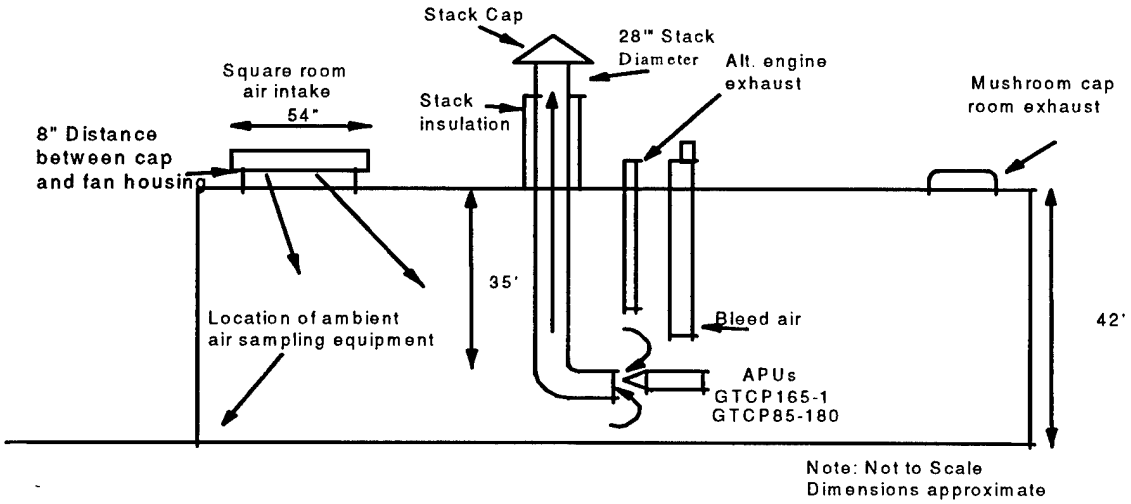
With the triangular exhaust stack it was not possible to remain on the roof during engine operation above idle. Therefore, the exhaust could not be safely traversed as required by EPA Method 1. Since access to the platform and exhaust stack was limited during engine operation, all sampling was conducted at a single point. Exhaust gases could not be sampled from the sides of the triangular stack, because wind interference made it difficult to sample isokinetically and collect a representative sample. Therefore, four sample ports were cut in the side of the exhaust stack. Figure 2-6 illustrates the placement of the sampling ports on the test cell 54A exhaust and which pollutants were sampled from each port.

Velocity measurements were collected at each sampling point in order to maintain isokinetics. These velocity data were not used to calculate the entire exhaust flowrate since the cross section of the exhaust could not be traversed. The exhaust flowrate was calculated using either carbon balance, tracer gas, or F-factor.

2.6.3 Kelly AFB, APU Test Cell

Figure 2-7 illustrates the general configuration of the APU test cell at Kelly AFB. The 28-inch-diameter exhaust outlet terminates on the roof of the APU facility and is shielded by a cap. The configuration of this test cell allowed the use of conventional emission sampling methodologies. Inlet air into the cell is provided by a fan in a square room air intake. APU engine exhaust is directed through the augmenter tube to the roof outlet. Since emissions were exhausted through a single stack, conventional isokinetic sampling methodologies were applicable at this test cell. The exhaust flowrate was determined by direct measurement during sampling.

Figure 2-7
APU Test Facility
Kelly AFB



Inlet flow rates were measured by 12 anemometers placed under the test cell air intake. The mushroom cap room exhaust and alternate engine exhaust were sealed temporarily during testing to limit air intake to the main inlet air intake, which facilitated inlet flow measurements. Three anemometers were placed on each of the four faces to this inlet. As discussed previously, the measurements provided by these instruments were considered suspect and were rejected. Inlet air pollutant concentrations were determined by placing the ambient samplers under the air intake inside the test cell, in a location that did not present a FOD hazard to the engine.

The APU test cell stack needed to be temporarily modified so that testing could be performed according to EPA Method guidelines. Figure 2-8 illustrates the modification that was required on the APU stack. The weather cap on the stack was removed, and a 6-foot extension with five sample ports was placed on the stack. Figure 2-9 illustrates the sampling port specifications. The size and placement of the scaffolding platform also are presented in Figure 2-8. Particulate, semivolatiles, and aldehyde and ketone sampling trains were rotated among the four ports offset by 90 degrees during the sample run. It took 5 to 10 additional minutes per traverse to rotate the trains among the sample ports. This added approximately 15 to 30 minutes to each 60-minute sample run and resulted in an overall 75- to 90-minute operational period for the APU per test. All continuous emission monitoring (CEM) parameters and volatile organic sampling trains (VOST) were sampled from the one sample port offset by 45 degrees from the other four sampling ports.

2.6.4 Corpus Christi Army Depot, Test Cell 14

The general configuration of engine test cell 14 at CCAD is illustrated in Figure 2-10. The approximately 44-inch-diameter exhaust outlet terminates on the roof of the test cell facility, which allowed the use of conventional emission test methodologies. Airflow into the cell air intake is the result of the air draw created by the engine during

Figure 2-8
Kelly AFB
APU Test Facility Sampling Locations

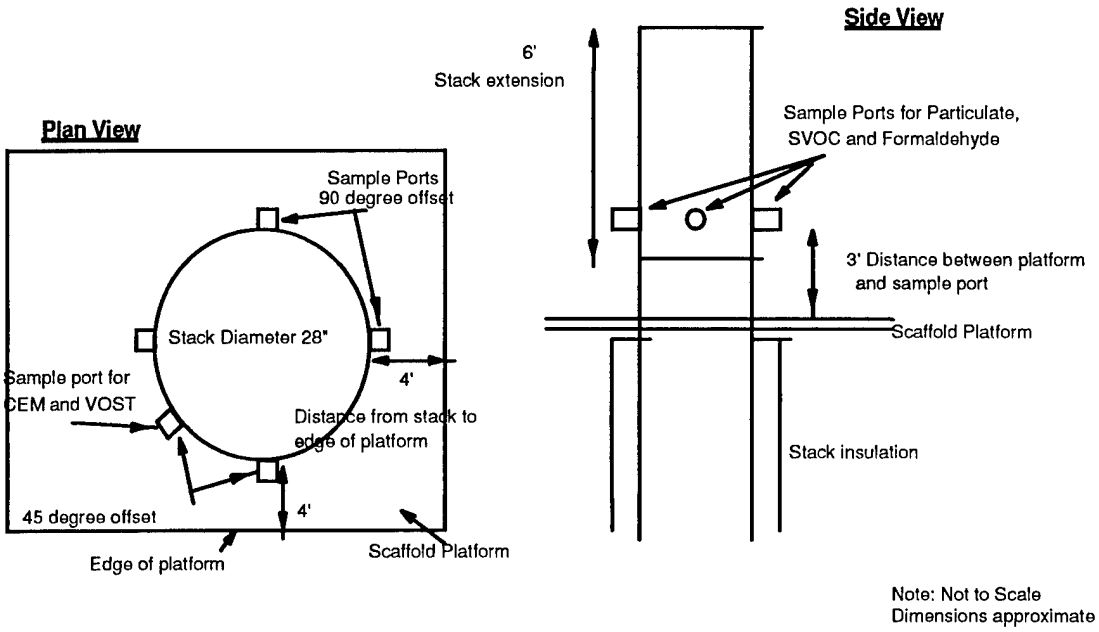


Figure 2-9
Side-View of Sampling Port

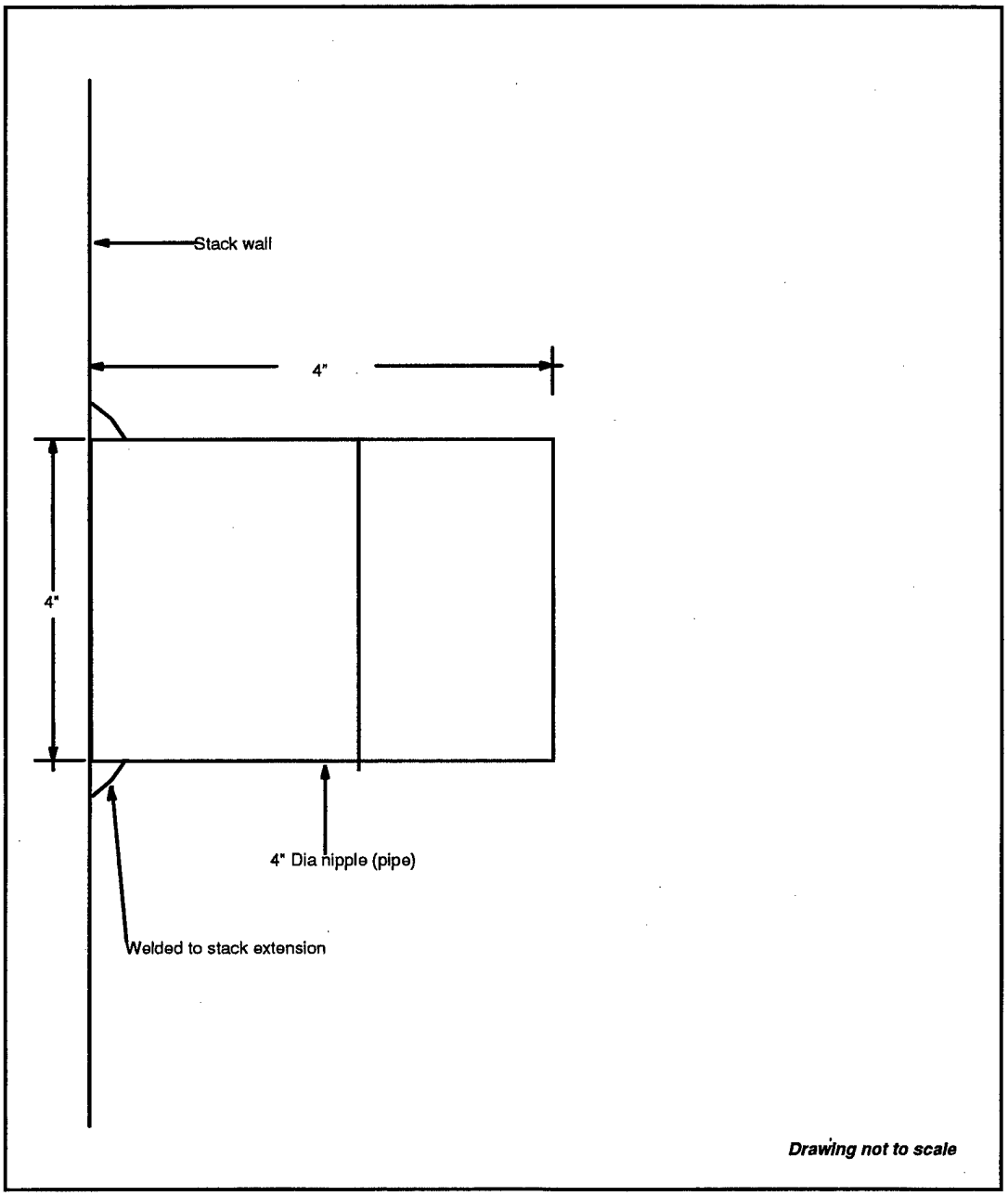
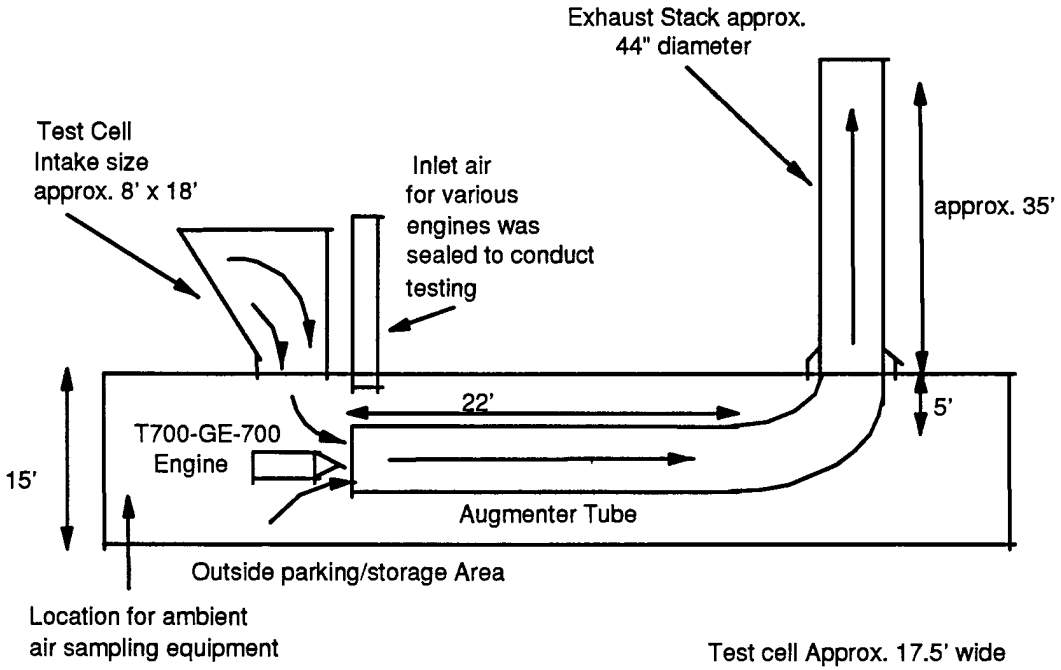


Figure 2-10
Test Cell 14
Corpus Christi Army Depot



Note: Not to Scale
Dimensions approximate

operation. Engine exhaust is directed through the augmenter tube to the roof outlet. Since conventional isokinetic sampling methodologies were applicable at this source, the exhaust flowrate was measured directly from the exhaust stack.

The inlet flow rate was measured by 12 anemometers positioned at the air intake. The inlet air tube for other engine types was sealed temporarily during testing to limit air intake to only the main air intake, which facilitated inlet flow measurements. As discussed previously, however, the inlet airflow numbers are suspect due to interference and have been rejected. Inlet air pollutant concentrations were determined by placing the ambient samplers under the air intake inside the test cell in a location that did not present an FOD hazard to the engine.

Test cell 14 was sampled using conventional isokinetic sampling methodologies; however, the stack was permanently modified so that testing could be performed according to EPA Method guidelines. Figure 2-11 illustrates the modifications to the test cell stack. A total of five sample ports were installed on the stack. Figure 2-12 illustrates the sampling port specifications. The size and placement of the scaffolding platform are also presented in Figure 2-11. Particulate, semivolatiles, and aldehyde and ketone sampling trains were rotated among the four ports which are offset by 90 degrees during the sample run. It took 5 to 10 additional minutes per traverse to rotate the trains among the sample ports. This added approximately 15 to 30 minutes to each 60-minute sample run and resulted in an overall 75- to 90-minute test period for the helicopter engine. All CEM parameters and VOST were sampled from the single sample port at the base of the stack.

2.6.5 Laughlin AFB, Test Cell 18

Figures 2-13 through 2-15 illustrate the general configuration of test cell 18. As can be seen in these figures, this test cell configuration did not facilitate the use of conventional sampling methodologies. Therefore, single point sampling was performed and the exhaust flowrate was determined through calculation (carbon balance, tracer

Figure 2-11
Corpus Christi Army Depot
Test Cell 14 Sampling Locations

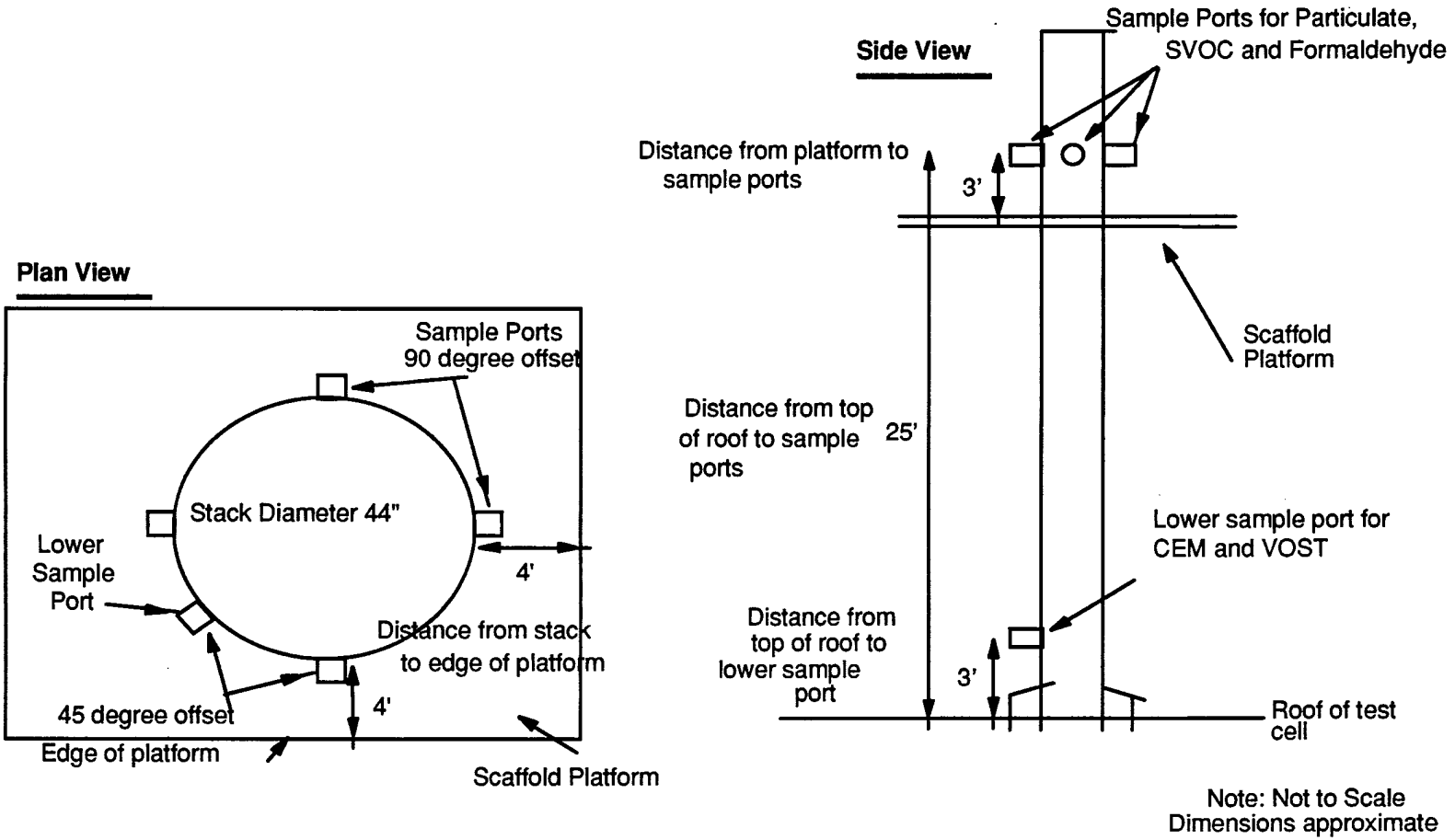


Figure 2-12
Side-View of Sampling Port

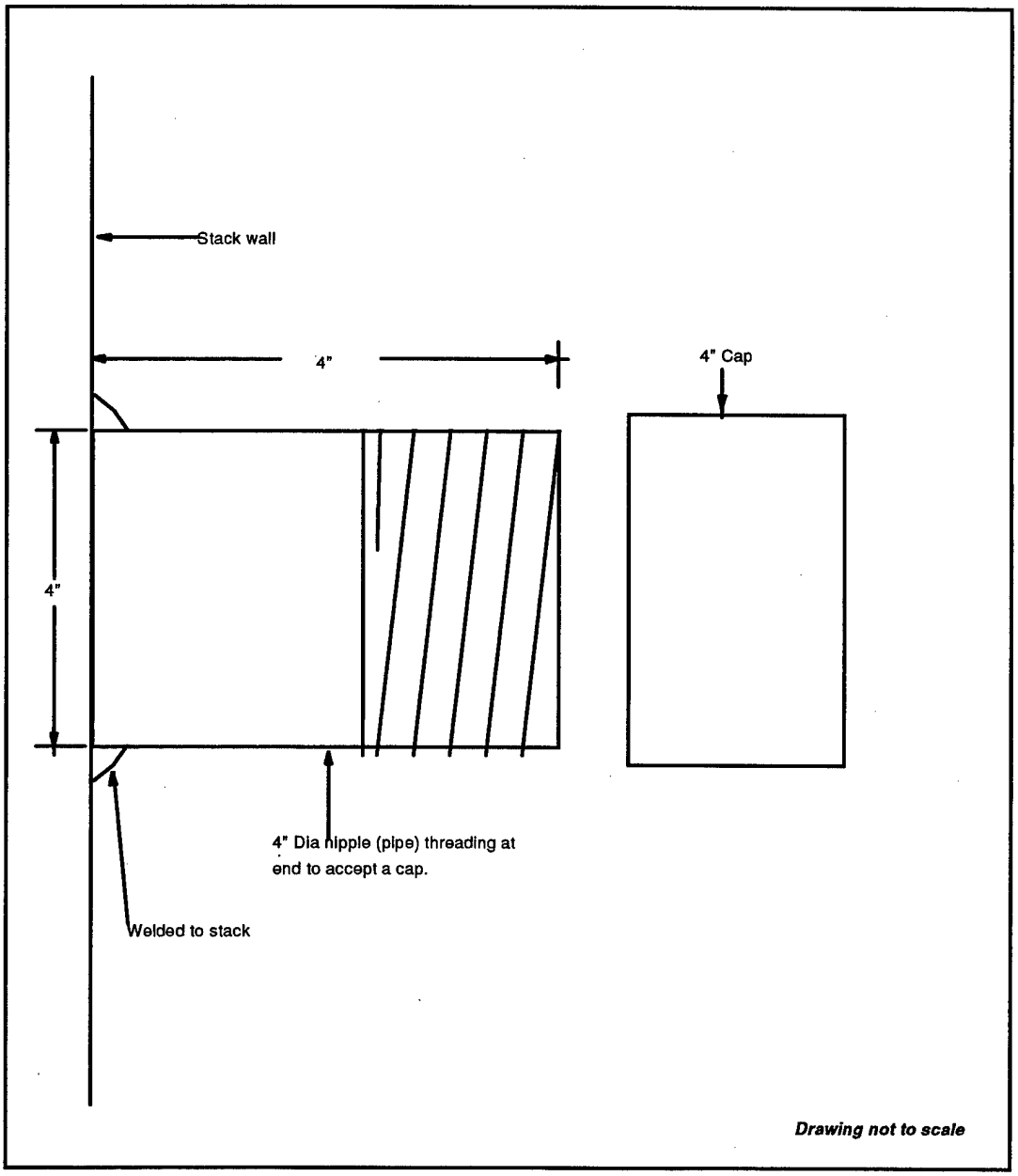


**Figure 2-13. Laughlin Air Force Base
Test Cell 18 - Side View**

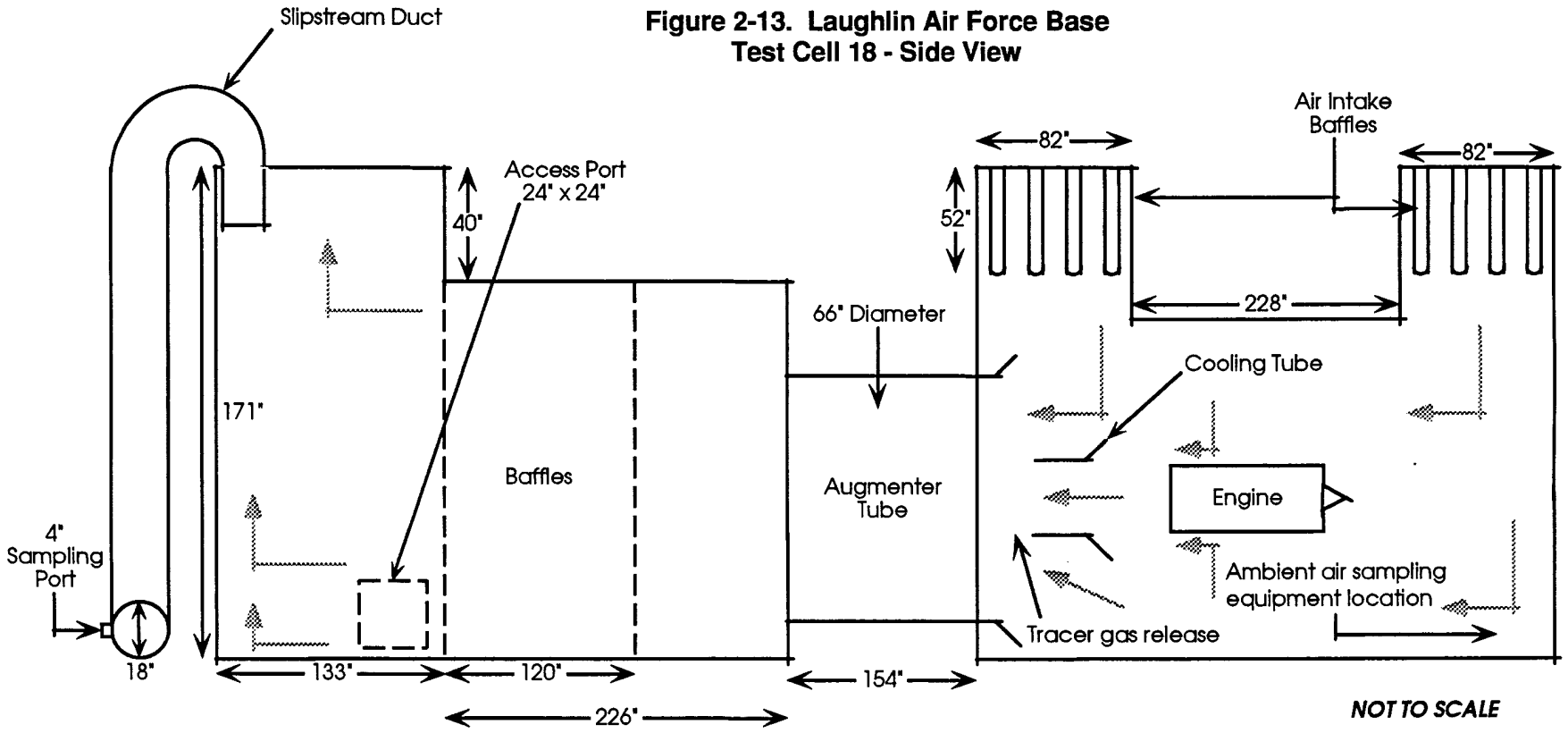


Figure 2-14. Laughlin AFB
Test Cell 18 View Looking to Rear of Test Cell

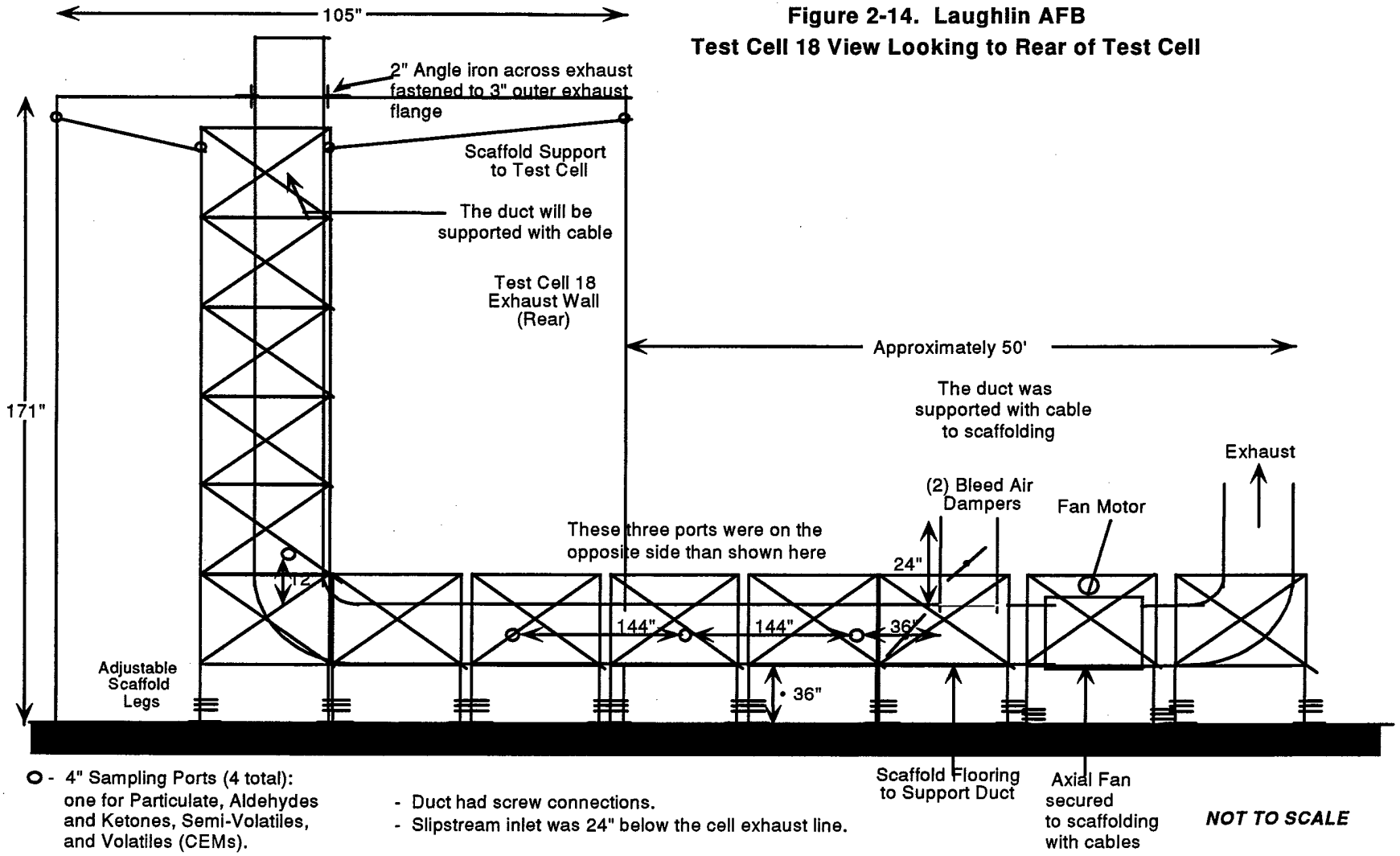
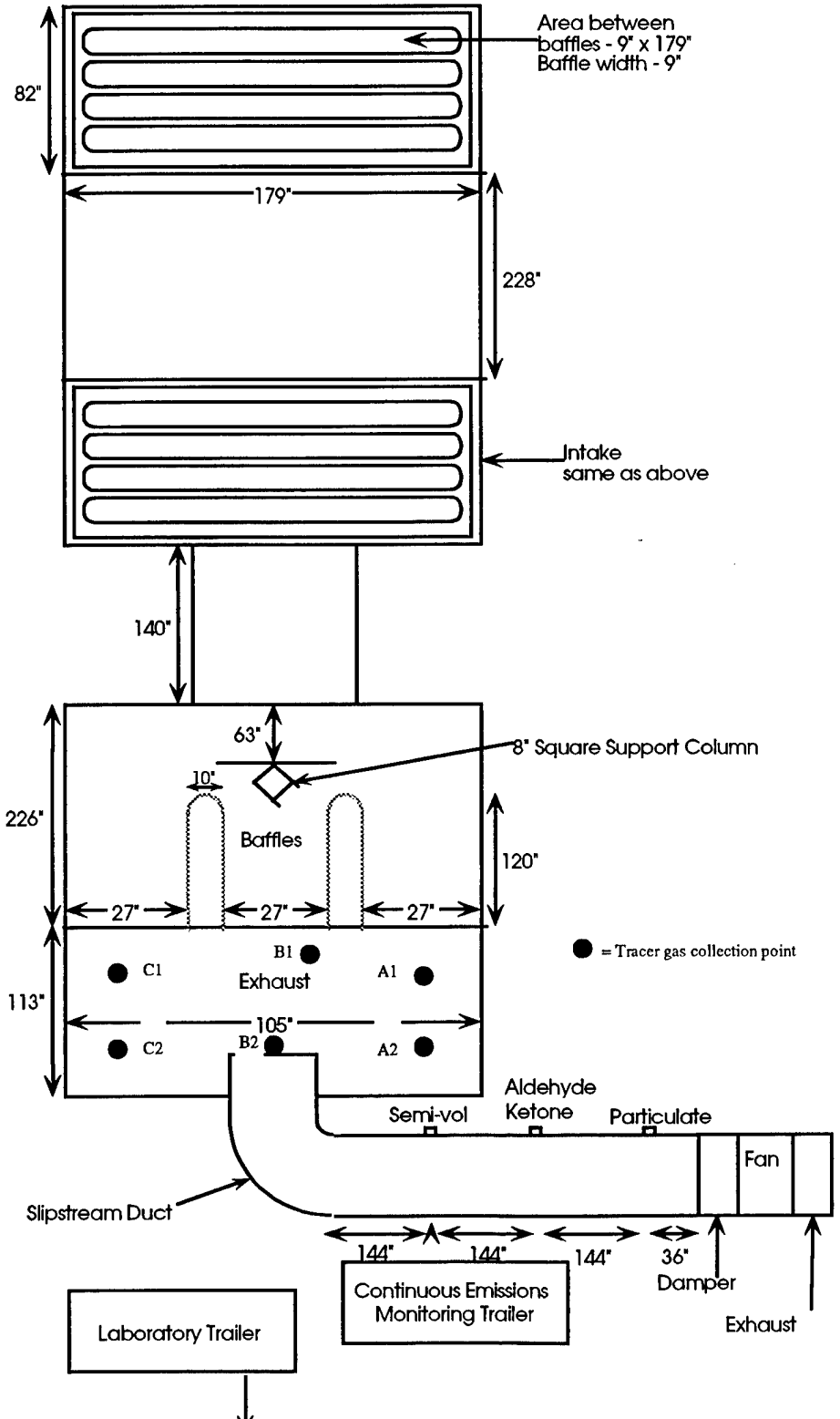


Figure 2-15. Test Cell 18
Laughlin AFB



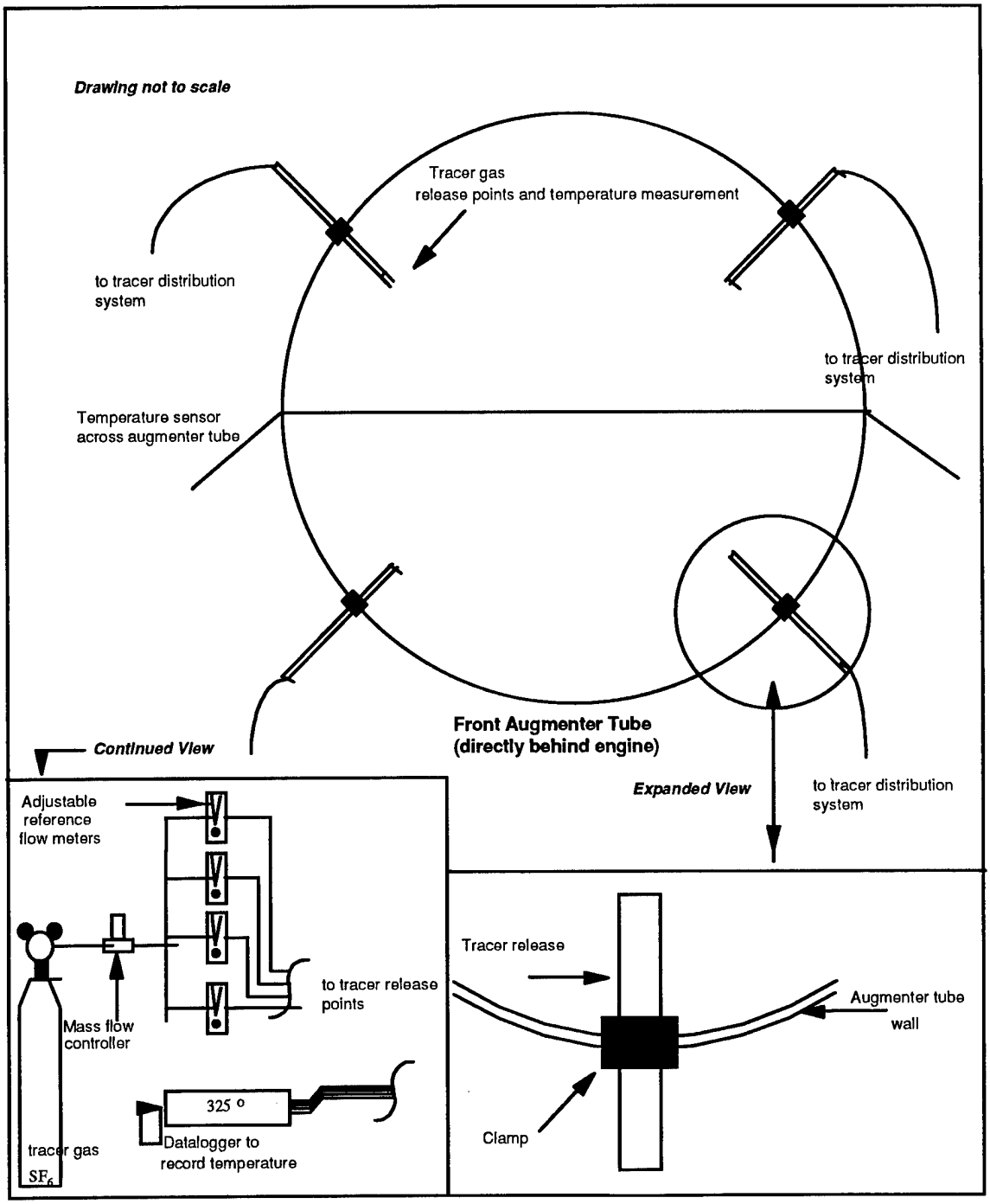
gas, F-Factor). Airflow into the test cell is the result of the air draw created by the engine during operation. Because of the turbulent flow from the engine exhaust and the circuitous path that the exhaust gases must travel, it was assumed that there would be no stratification of the exhaust gases. Engine exhaust gas is directed through an augmenter tube into a blast room, and then exits through a rectangular stack.

In order to verify homogeneity throughout the exhaust cross section, tracer gas was injected to the exhaust stream and sampled at a representative number of points at the outlet. The tracer gas manifold was located at the side of the test cell near the entrance doors. The four stainless steel (0.25-inch I.D.) tracer gas distribution tubes were located at the rear of the cooling tube near the entrance of the augmenter tube as shown in Figure 2-16. Seven of the eight tracer gas collection points were placed over the exhaust using wires strapped across the rectangular opening as shown in Figure 2-15. The eighth was placed in the sampling port also used by the semivolatile sampling train as shown in Figure 2-15. Dedicated pumps set at a constant pull rate were used at each point to collect the SF_6 sample in Tedlar bags during each run for analysis by FTIR. The inlet flow rate was measured by six anemometers placed over each of the front and rear air intakes. These flow rates were rejected due to interferences. Inlet air pollutant concentrations were determined by placing the ambient samplers under the air intake inside the test cell, in a manner that did not present a FOD hazard to the engine.

Since the exhaust configuration did not allow for safe collection of exhaust emission samples, a slipstream sample was collected to quantify engine emissions. A slipstream flow was diverted from the rear of the test cell exhaust to a location outside the exhaust path. The slipstream consisted of 18-inch-diameter, 18-gauge galvanized ductwork. The duct faced into the exhaust flow, traversed along the rear wall, and made a 90-degree bend towards the sampling location.

The slipstream approach is similar to that taken for many pilot-scale air pollution control device studies in industry to determine the applicability of a control device for a

Figure 2-16.
Tracer gas distribution system for the augmenter tube at Laughlin AFB



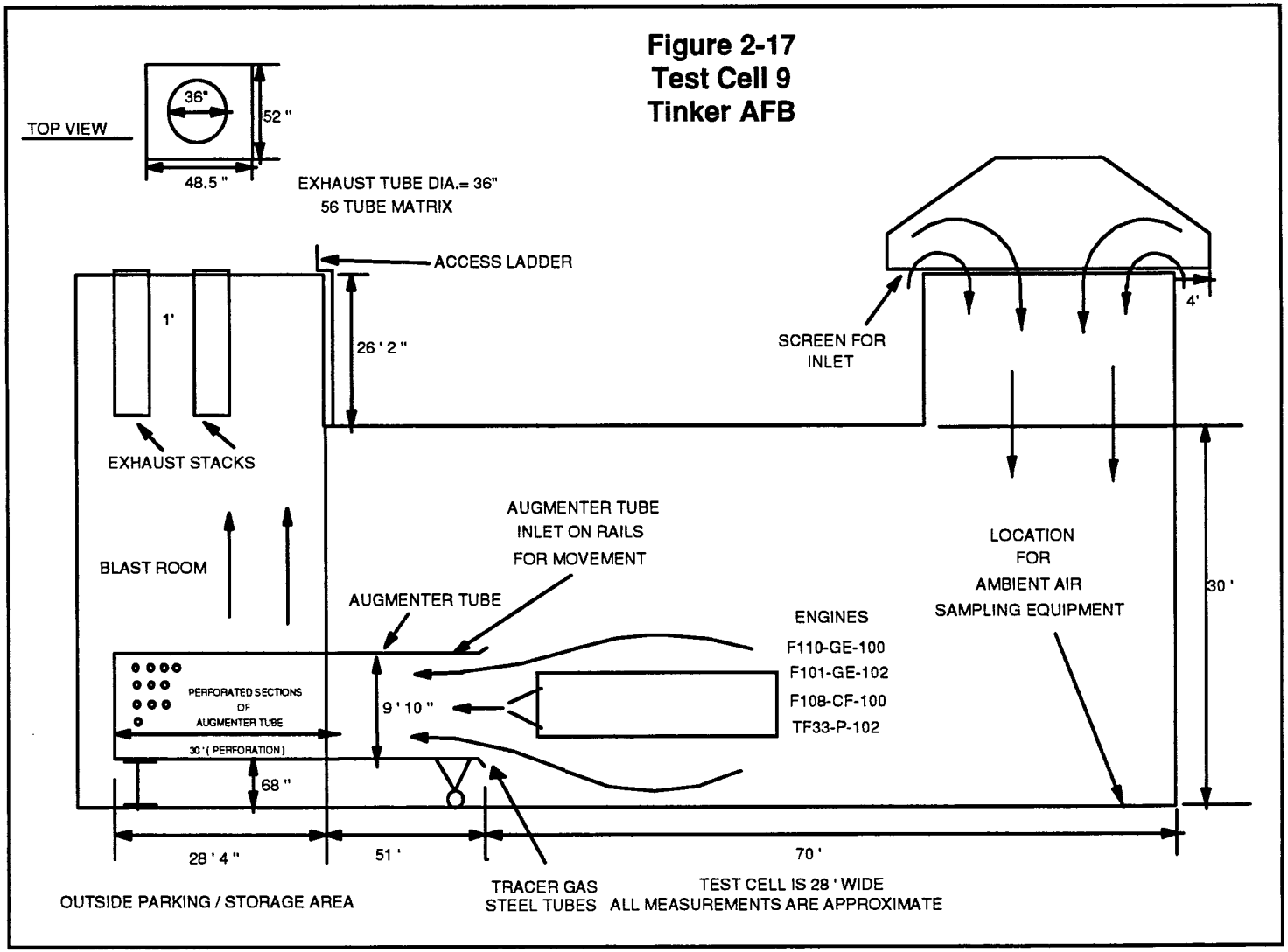
particular gas stream. The slipstream approach was also demonstrated at Edwards AFB, Langley AFB, and Cannon AFB to determine pollutant emission rates from aircraft engines. The slipstream sampling configuration allowed for safe, economical, and unobstructed emission sampling and minimal test cell modifications when compared to alternative scenarios collected from ground level at ports positioned to meet the criteria established in EPA Method 1. A single-speed in-line fan was incorporated into the slipstream. The purpose of the fan was to assure adequate sample flow at the idle engine setting. It was anticipated that at the lower engine setting, the exhaust flow might have bypassed the slipstream since the duct creates a path of resistance. The fan allowed for exhaust to be pulled through the slipstream at a rate comparable to the engine test cell exhaust. A velocity pressure drop was measured simultaneously at the test cell exhaust and in the slipstream. The velocity pressure within the slipstream was balanced to the test cell velocity pressure via damper adjustment. Two bleed air dampers were incorporated into the slipstream for velocity adjustment and gas temperature control to the fan. However, flow within the slipstream duct was not the critical parameter for determining the aircraft engine pollutant emission rate. The objective of the slipstream was to provide for a representative sampling environment for determining pollutant concentration. The tracer gas methodology was used to quantify the test cell exhaust rate.

The slipstream was supported at the test cell exhaust via two angle irons fastened to the cell exhaust. The slipstream duct was fastened to the angles and supported by scaffolding along the rear of the test cell and out to the sampling locations. The slipstream and fan were fastened to the scaffolding. The scaffolding was secured to the test cell during sampling.

2.6.6 Tinker AFB, Test Cell 9

Figure 2-17 illustrates the general configuration of test cell 9 at Tinker AFB. There are a total of 56 individual exhaust stacks over a 1,000-ft^2 area. This

Figure 2-17
Test Cell 9
Tinker AFB



configuration did not facilitate the use of conventional sampling methodologies. The air inlet is also approximately 1,000 ft^2 and is covered by a roof. There is approximately 4 feet of screened overhang between the edge of the roof and the air intake wall. Inlet flow measurements were collected in this overhang area. Engine exhaust is directed through the augmenter tube, through the perforated section of the augmenter tube into the blast room, and then exits through the various stacks. Because of the turbulent flow from the engine exhaust and the circuitous path the exhaust gases must travel, it was assumed that there would be no stratification of the exhaust gases.

In order to verify exhaust homogeneity throughout the cross section, tracer gas was injected to the exhaust stream and sampled at a representative number of points at the outlet. The tracer gas manifold was located against the wall midway downstream inside the augmenter tube. Stainless steel tracer gas distribution tubes (0.25-inch I.D.) were placed through holes in the augmenter tube shell located approximately 20 feet downstream in the augmenter tube. The tubes were placed in the configuration shown in Figure 2-18. Eight tracer gas collection points were selected from the 56 exhaust stacks as shown in Figure 2-19. Dedicated pumps set at a constant pull rate were used at each collection point to collect the SF_6 sample in Tedlar bags during each run for analysis. The assumption of a homogeneous exhaust mixture was demonstrated by SF_6 tracer gas measurements. The inlet flow rate was measured by 12 anemometers placed over the screened overhangs to the air intake. Three anemometers were placed on each of the four faces to the air inlet screen. Once again, the flow rate values measured by this method were rejected due to interferences. Inlet air pollutant concentrations were determined by placing the ambient samplers under the air intake inside the test cell in a location that did not present an FOD hazard to the engine.

The stacks at the outlet of the blast room are flush with the top of the test cell, making it unsafe to remain on the scaffolding during engine operation above idle conditions. This configuration of the stacks also did not allow the stacks to be safely traversed, as required by EPA methodology. Since access to the platform and the

Figure 2-18
Tracer gas distribution system for an augmenter tube

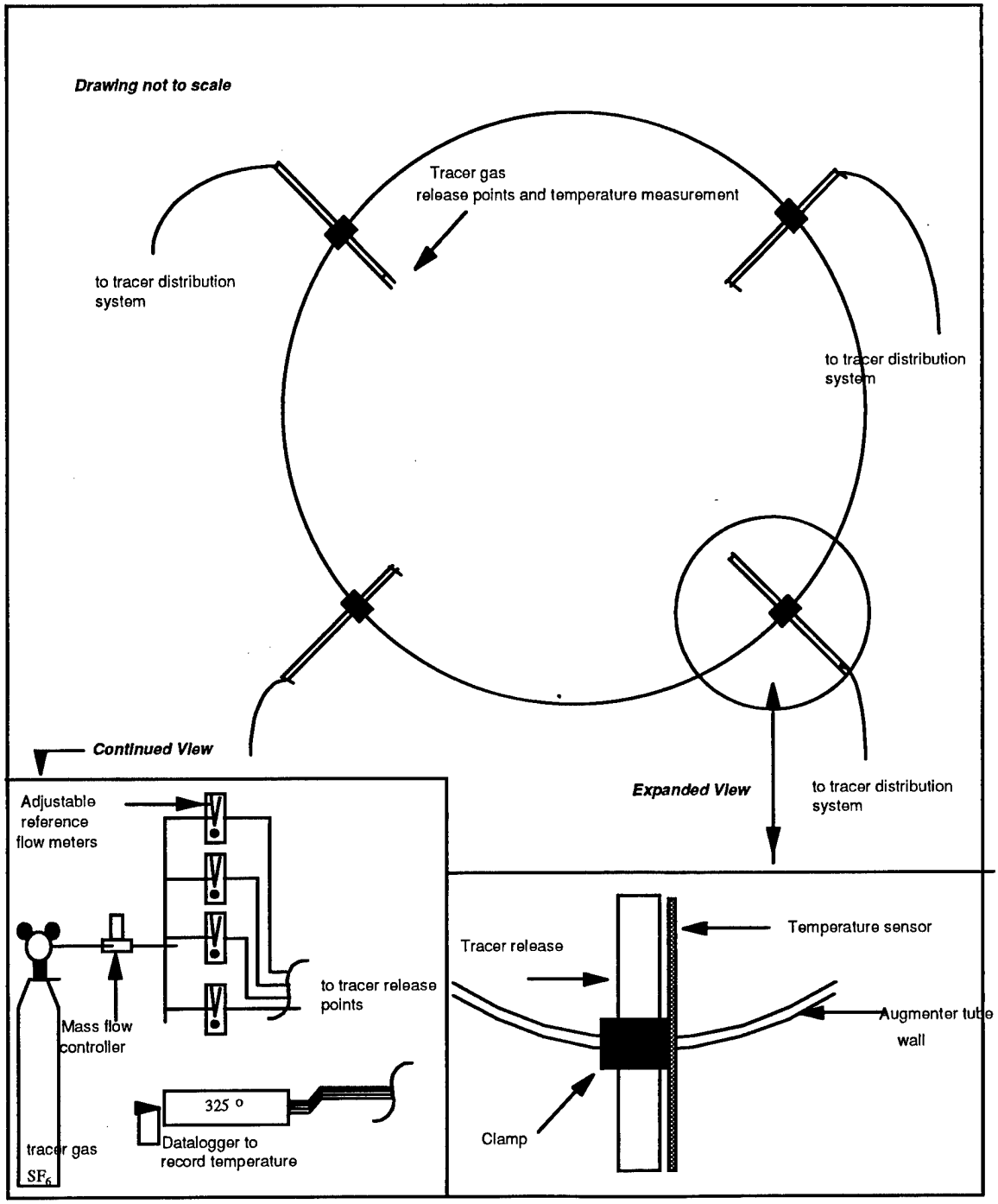
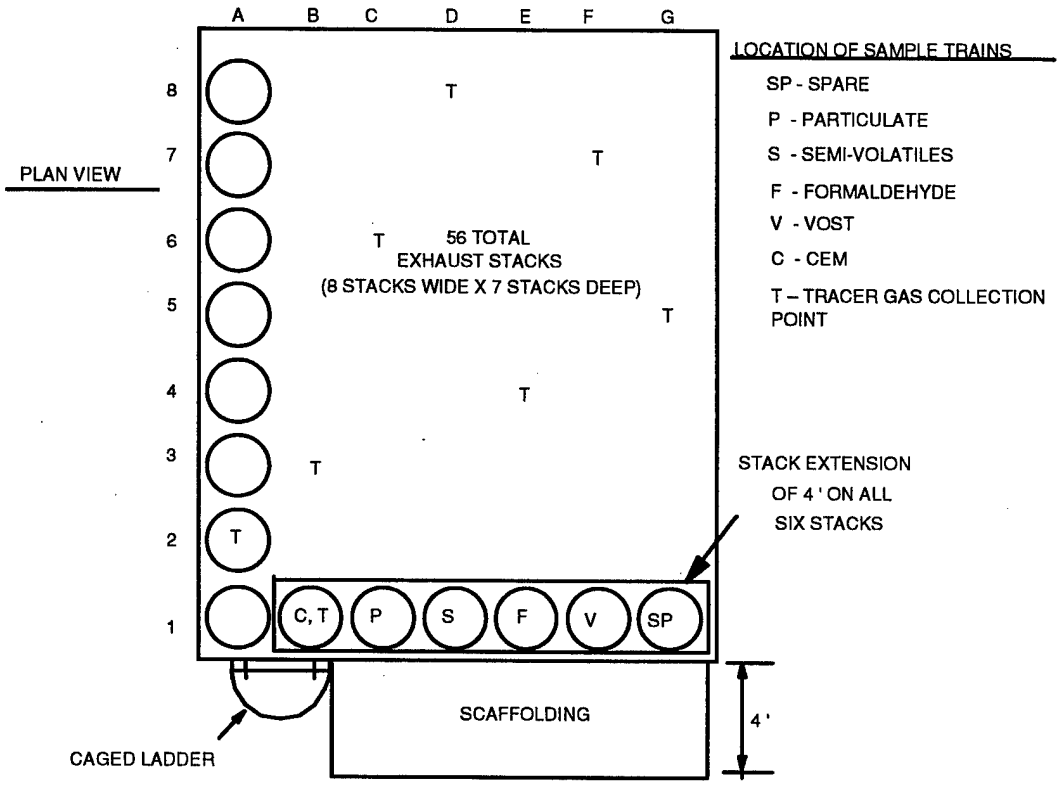
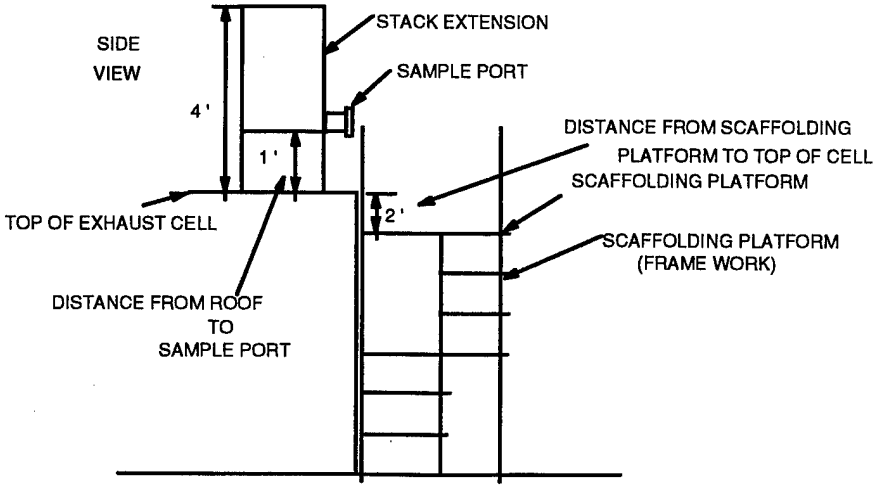


Figure 2-19
Tinker AFB Test Cell 9
Sampling Locations





stacks was limited, all sampling was conducted at a single point for each sampling train. In order to minimize wind interference for each sample train, it was necessary to install 4-foot stack extensions with 4-inch-diameter sample ports on six of the exhaust stacks. Figure 2-19 illustrates which exhaust stacks required extensions, the placement of sampling ports, and which pollutants were sampled from each stack.

Velocity measurements were collected at each sampling point in order to maintain isokinetics. These velocity data were not used to calculate the entire exhaust flowrate since the face of the exhaust could not be traversed. The exhaust flowrate was calculated using either carbon balance, tracer gas, or F-factor.

2.6.7 Charleston AFB, Test Cell

Figure 2-20 illustrates the general configuration of the test cell. The configuration of this test cell does not facilitate the use of conventional isokinetic sampling methodologies. The baffles in this cell impeded a stack traverse required to collect a sample using traditional methodologies. Single point sampling was performed and the exhaust flowrate was determined through calculations (carbon balance, tracer gas, F-factor). Airflow into the test cell is the result of the air draw created by the engine during operation. Inlet flow measurements were not conducted at this facility. Engine exhaust gas is directed through the augmenter tube, through the perforated section of the augmenter tube into the blast room, and then out through the sound-dampening baffles and the rectangular stack. Because of the turbulent flow from the engine exhaust and the circuitous path that the exhaust gases must travel, it is assumed that there will be no stratification of the exhaust gases and that the tracer gases will be mixed equally. The assumption of a homogeneous exhaust mixture was demonstrated by tracer gas measurements. The tracer gas manifold and supporting steel tracer gas distribution tubes were located at the beginning of the augmenter tube as shown in Figure 2-21. The exhaust flow rate was determined by the tracer gas release rate and the measured concentration at the exhaust. Eight tracer gas collection points at the exhaust were configured as shown in Figure 2-22. Tracer gas was drawn

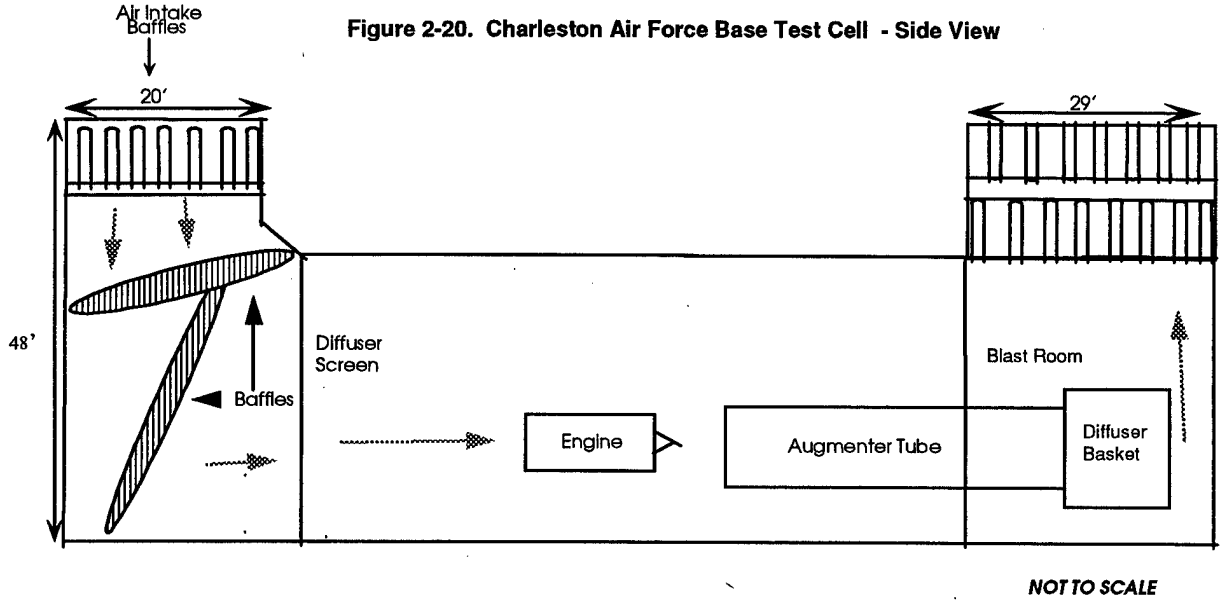


Figure 2-20. Charleston Air Force Base Test Cell - Side View

Figure 2-21
Tracer gas distribution system for an augmenter tube

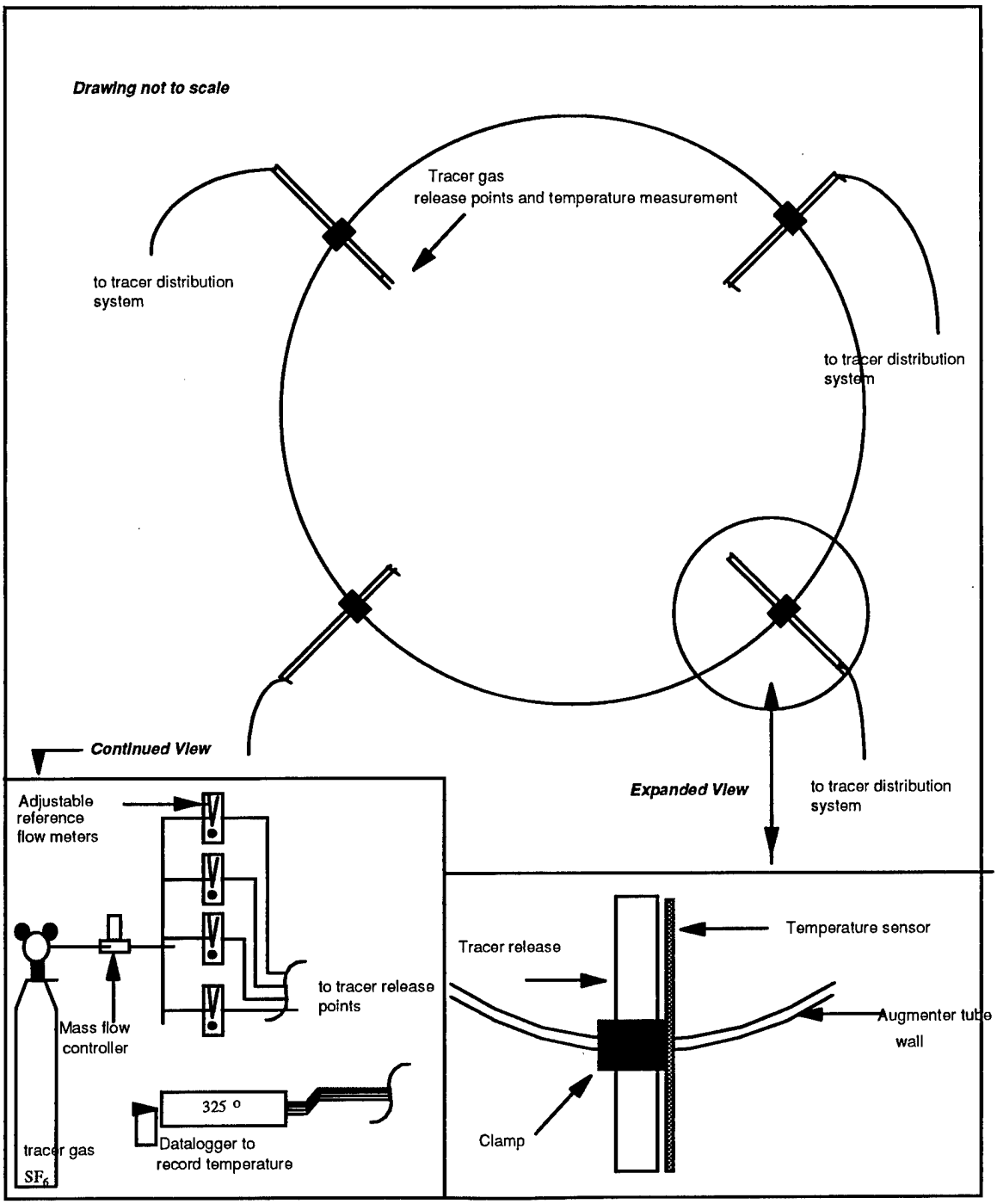
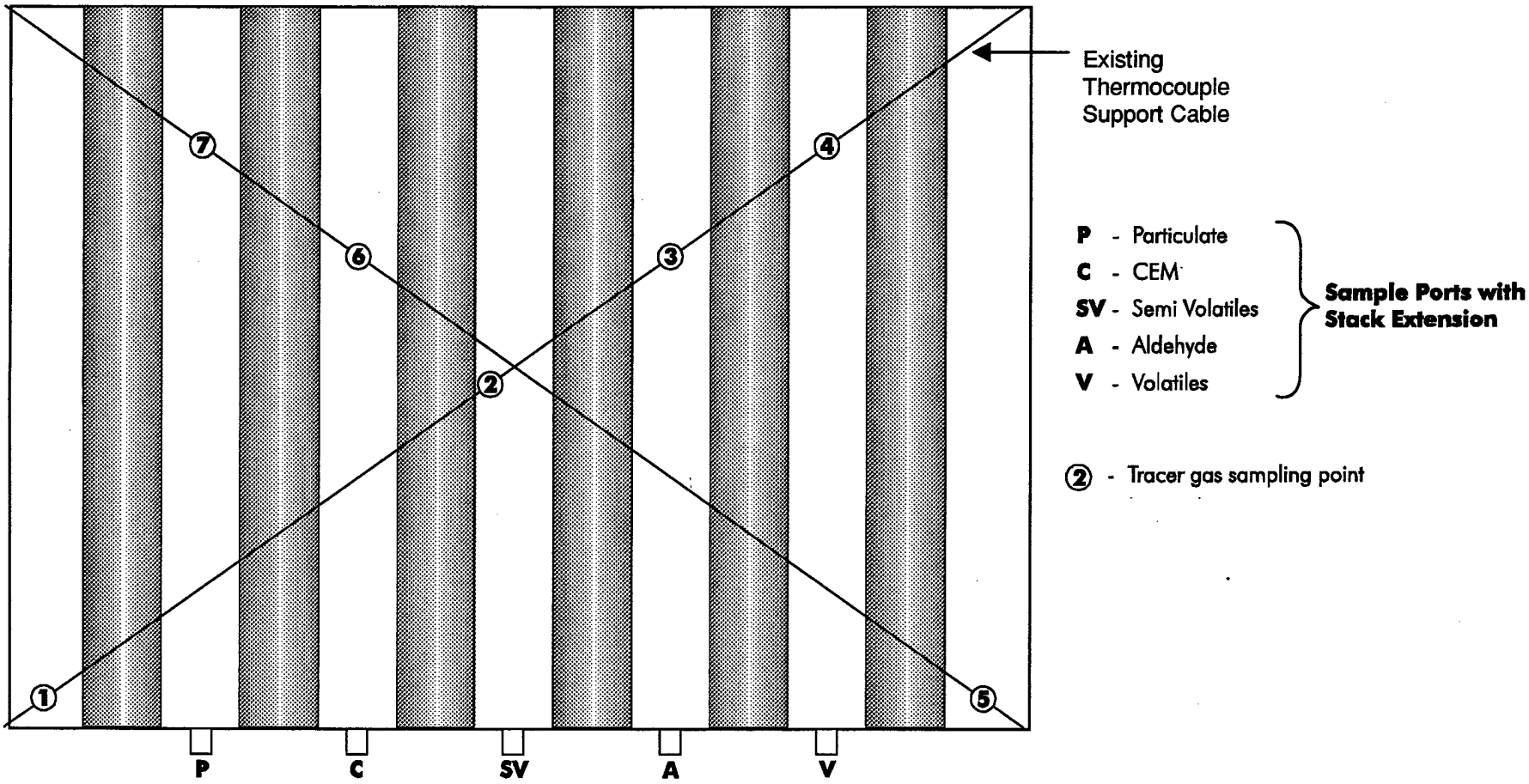


Figure 2-22.Charleston AFB Engine Test Cell
Tracer Gas Sampling Points and Typical Concentrations (ppb) at Approach



through a manifold and heated sample line for independent point sampling and direct analysis as opposed to the tedlar bag analysis used at previous facilities. This improved data collection and provided real time examination. This analysis verified that the single-point sample collection methodology, as opposed to a full exhaust cross section traverse, was representative of the engine emissions.

Inlet air pollutant concentrations were determined by placing ambient samplers under the air intake inside the test cell. The ambient sampling equipment was temporarily installed in a manner that did not present a FOD hazard to the engine.

The rectangular stack at the outlet of the blast room presented both a safety hazard and a sampling dilemma. The configuration of the exhaust stack (29 ft x 25 ft) did not allow it to be traversed, as required by EPA Method 1 methodology. Since access to the platform and stack was limited, all sampling was conducted at a single point between the acoustical baffles. Based on the proposed sampling strategy, it was necessary to install five 4-inch-diameter sample ports on the side of the test cell exhaust stack. Each port allowed access for each sample train. One port was dedicated for each sample type, VOST, semí-volatiles, formaldehyde, particulate matter, and the continuous emission monitor probe. Figures 2-23 and 2-24 illustrate the placement of sampling ports and the support scaffolding.

Velocity measurements were collected at each sampling point in order to maintain isokinetics. These velocity data were not used to calculate the entire exhaust flowrate. The exhaust flowrate was calculated using either carbon balance, tracer gas, or F-factor.

2.6.8 Edwards AFB, Test Cell 4

The general configuration of Test Cell 4 at Edwards AFB is illustrated in Figure 2-25. There are a total of 64 individual exhaust stacks over a 1,500-ft^2 area. This configuration did not facilitate the use of conventional emission sampling

Figure 2-23. Charleston AFB, Engine Test Cell Exhaust Top View

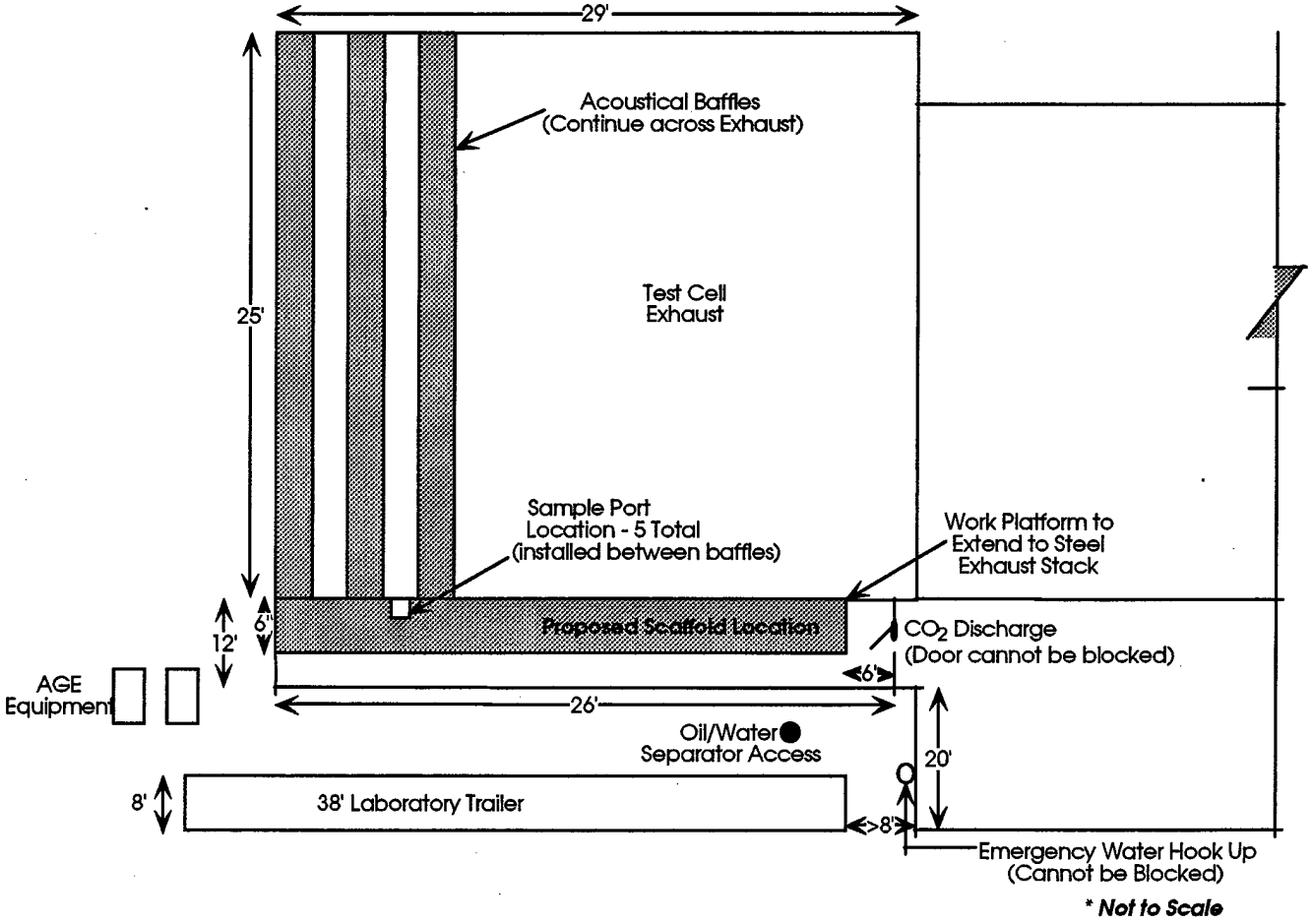


Figure 2-24. Charleston AFB, Engine Test Cell Exhaust Side View

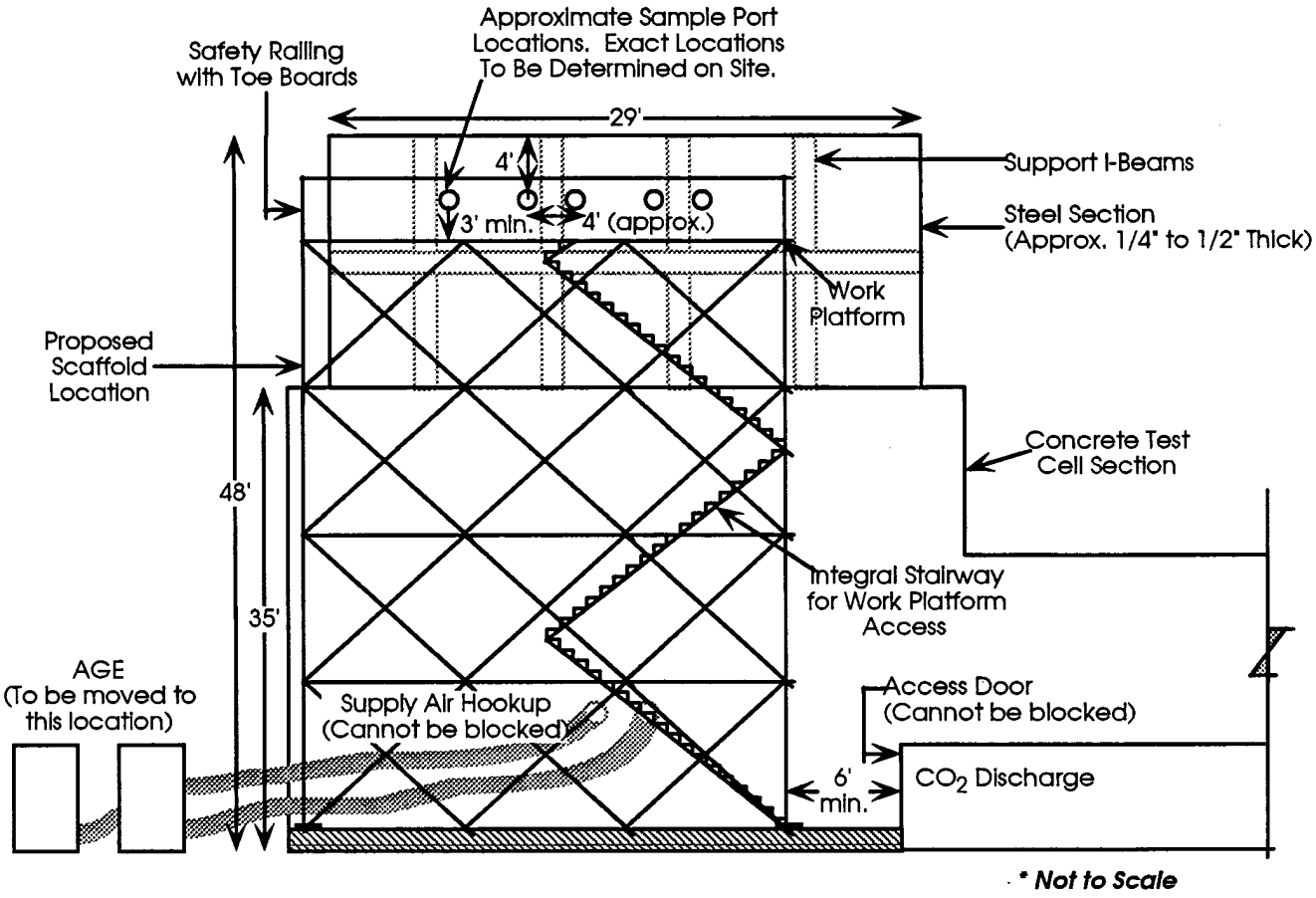
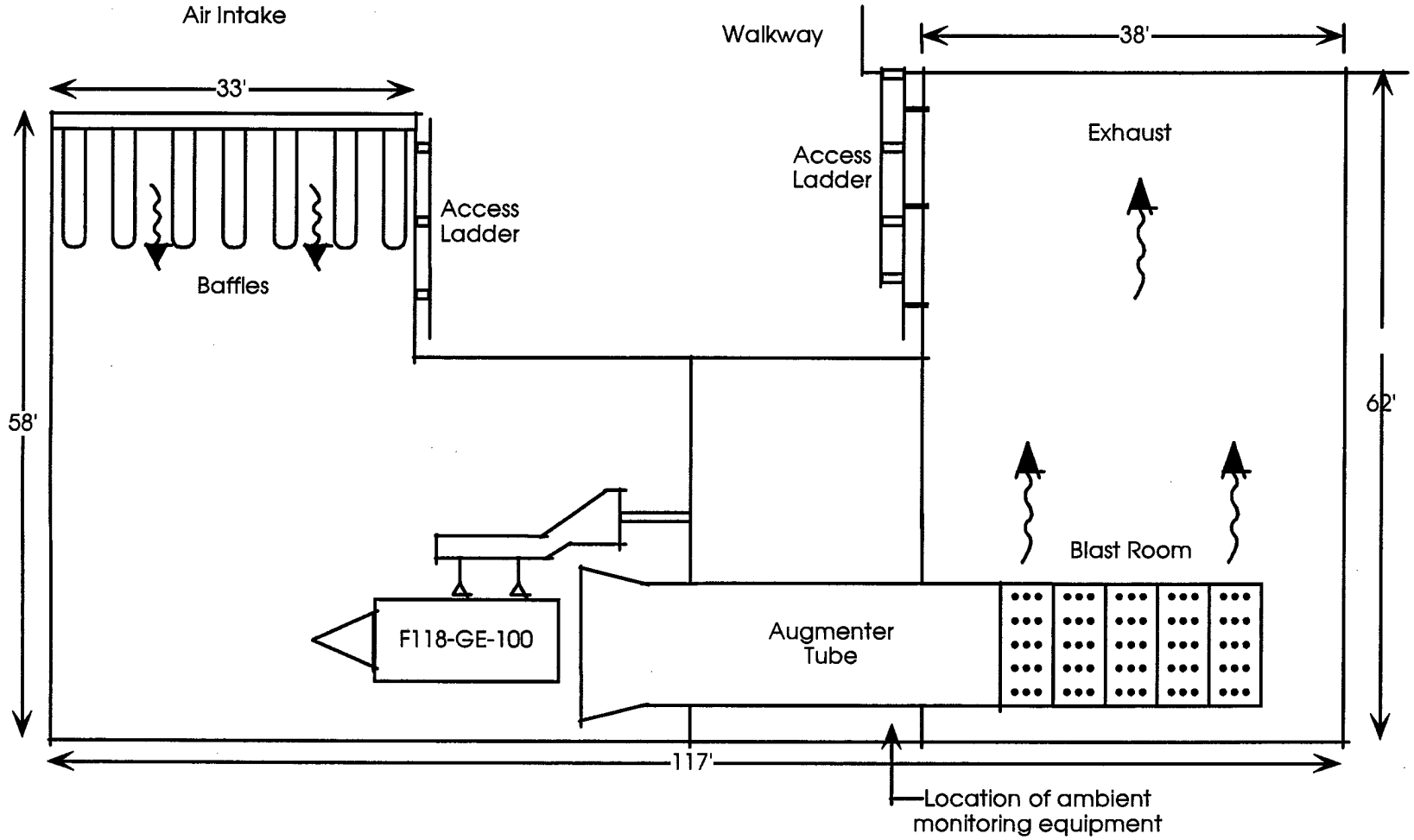


Figure 2-25. Test Cell 4 at Edwards Air Force Base - Side View



methodologies. Airflow into the test cell results from air draw created by the engine during operation. Engine exhaust gas is directed through the augmenter tube, through the perforated section of the augmenter tube into the blast room, and then out through the exhaust stacks. Because of the turbulent flow from the engine exhaust and the circuitous path that the exhaust gases must travel, it was assumed that there was no stratification of the exhaust gases.

The assumption of a homogeneous exhaust mixture was demonstrated by tracer gas measurements. The tracer gas manifold and supporting steel distribution tubes were located at the beginning of the augmenter tube as shown in Figure 2-26. The exhaust flow rate was determined by the tracer gas release rate and the measured concentration at the exhaust. Eight tracer gas collection points at the exhaust were configured as shown in Figure 2-27. Tracer gas was drawn through a manifold and heated sample line for independent point sampling and direct analysis as opposed to the tedlar bag analysis used at previous facilities. This provided real time examination. The analysis verified that the single point sample collection methodology was representative of the engine emissions.

Inlet air pollutant concentrations were determined by placing the ambient samplers under the air intake inside the test cell. The ambient sampling equipment was temporarily installed in a manner that did not present a FOD hazard to the engine.

The stacks at the outlet of the blast room are flush with the top of the test cell. It was not possible to remain on the scaffolding during engine operation above idle conditions. The configuration of the stacks did not allow them to be traversed, as required by EPA methodology. Since access to the platform and stacks was limited, all sampling was conducted at a single point. The termination of the blast room stacks at the top of the test cell could have made it difficult to collect a representative sample due to wind interference. It was necessary to install stack extensions with a 4-inch-diameter sample port on five of the exhaust stacks. Figure 2-27 illustrates the exhaust stacks that had extensions installed and which pollutants were sampled from each stack.

Figure 2-26
Tracer gas distribution system for an augmenter tube

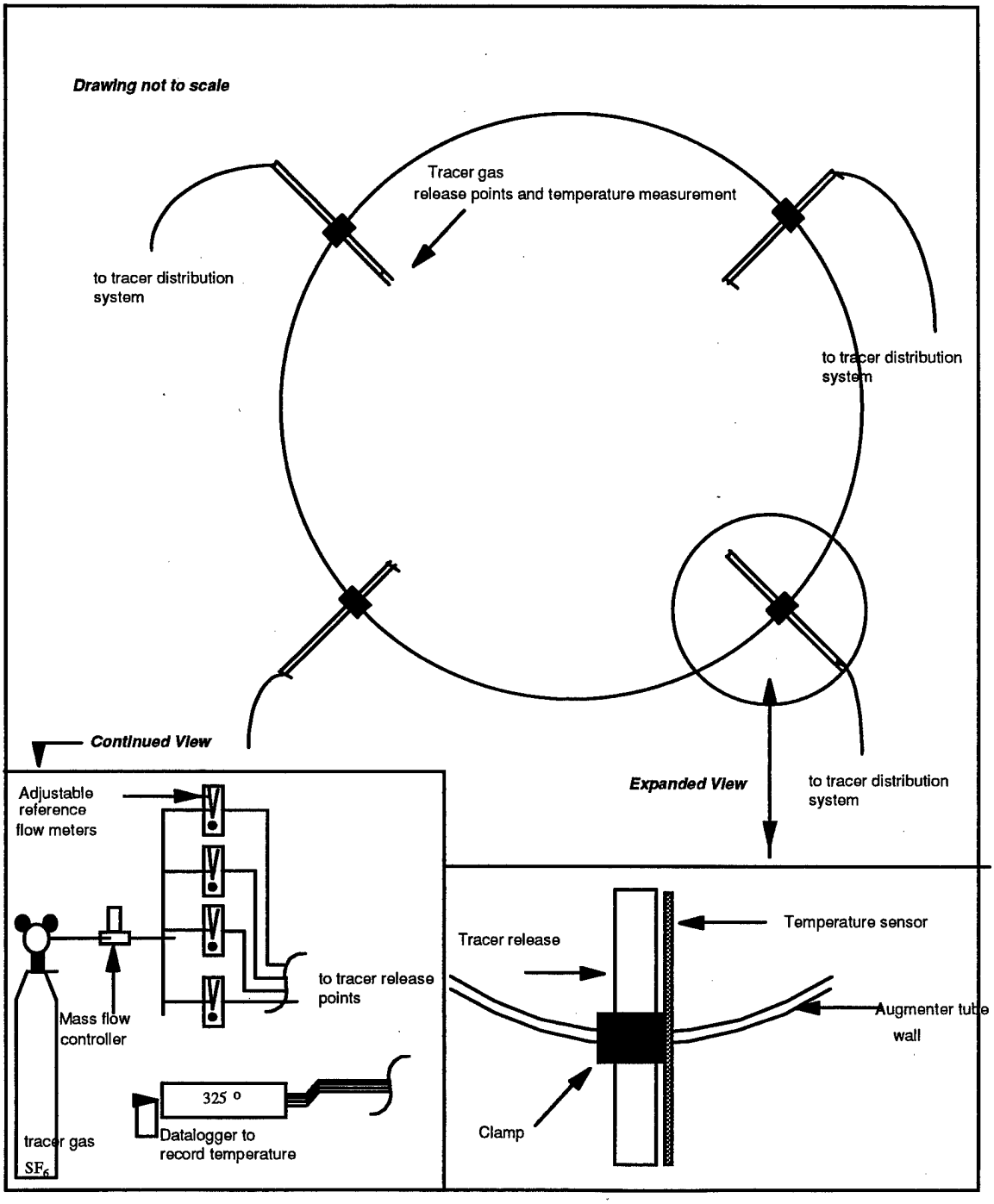


Figure 2-27. Edwards AFB Test Cell 4 Exhaust - Top View

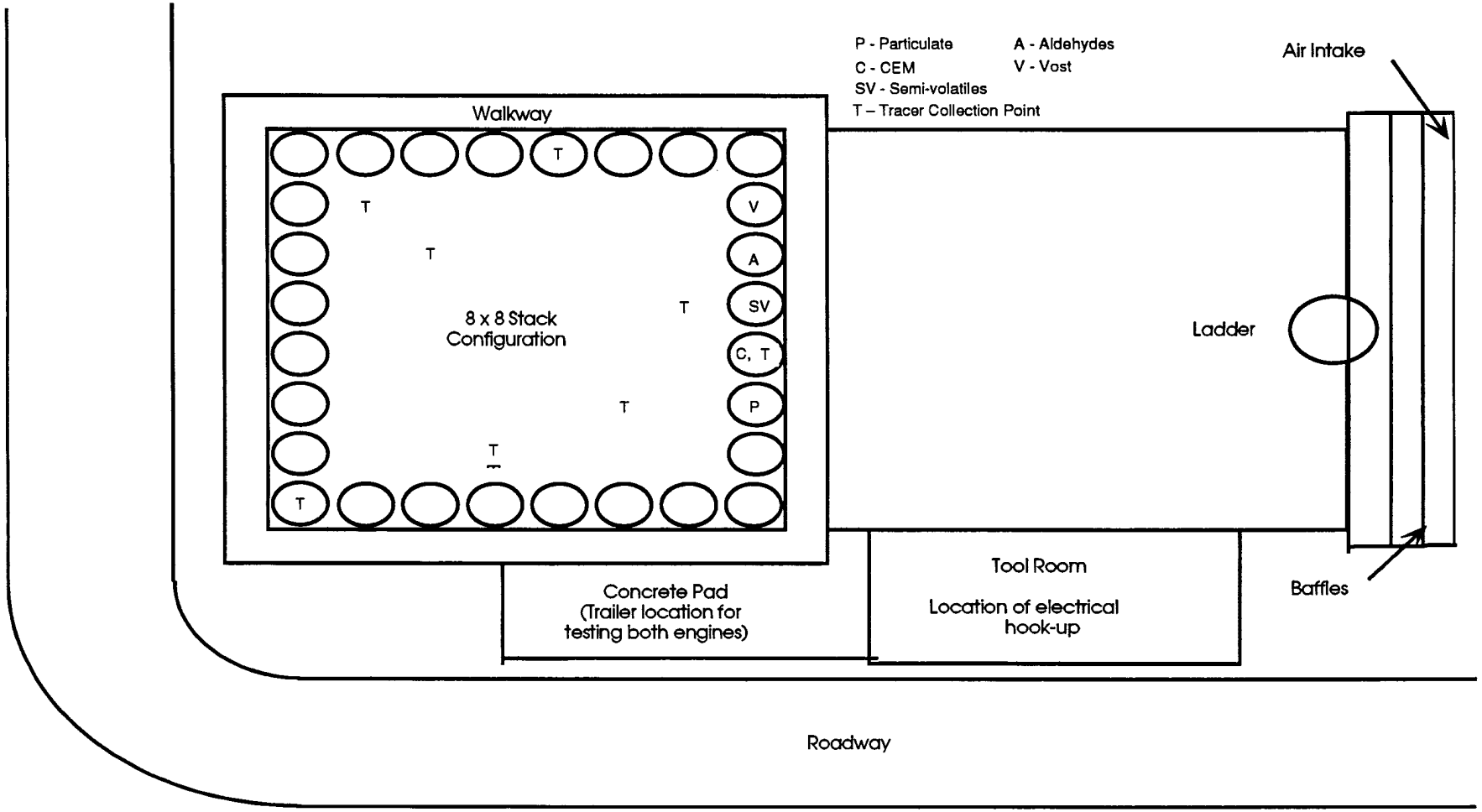


Figure 2-28 shows a side view of the roof for the test cell exhaust and a sample stack extension.

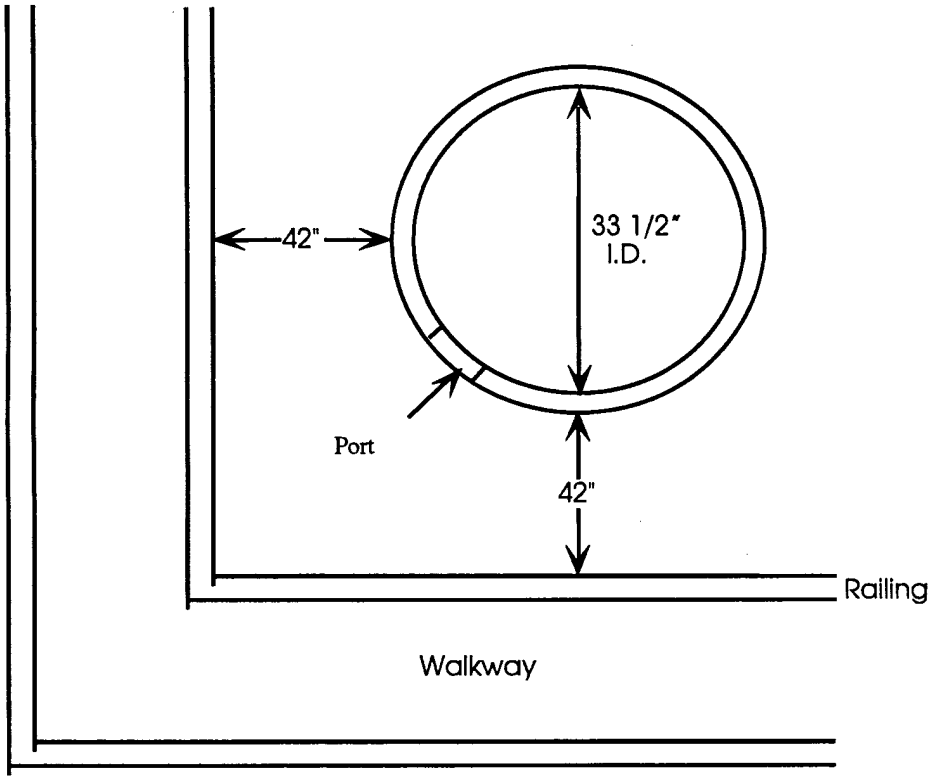
Velocity measurements were collected at each sampling point in order to maintain isokinetics. These velocity data were not used to calculate the entire exhaust flowrate since the exhaust flowrate was calculated using either carbon balance, tracer gas, or F-factor.

2.6.9 Edwards AFB, Test Cell 2

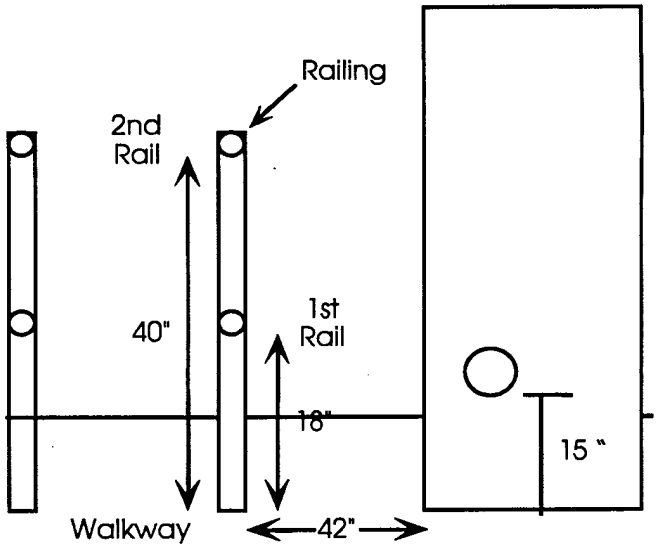
Figure 2-29 illustrates the general configuration of Test Cell 2 at Edwards AFB. There are a total of 40 individual exhaust stacks over a 650-ft^2 area. This configuration did not facilitate the use of conventional emission sampling methodologies. Airflow into the test cell is the result of the air draw created by the engine during operation. Engine exhaust gas is directed through the augmenter tube, through the perforated section of the augmenter tube into the blast room, and then out through the exhaust stacks. Because of the turbulent flow from the engine exhaust and the circuitous path that the exhaust gases must travel, it was assumed there was no stratification of the exhaust gases.

The assumption of a homogeneous exhaust mixture was demonstrated by tracer gas measurements. The tracer gas manifold and supporting steel distribution tubes were located at the beginning of the augmenter tube as shown in Figure 2-30. The exhaust flow rate was determined by the tracer gas release rate and the measured concentration at the exhaust. Eight tracer gas collection points at the exhaust were configured as shown in Figure 2-31. Tracer gas was drawn through a manifold and heated sample line for independent point sampling and direct analysis as opposed to the tedlar bag analysis used at previous facilities. This provided real time examination. The analysis verified that the single point sample collection methodology was representative of the engine emissions.

Figure 2-28. Edwards AFB Test Cell 4 Exhaust - Stack Extension Dimensions



Top View



Side View

Figure 2-29. Test Cell 2 at Edwards AFB - Side View

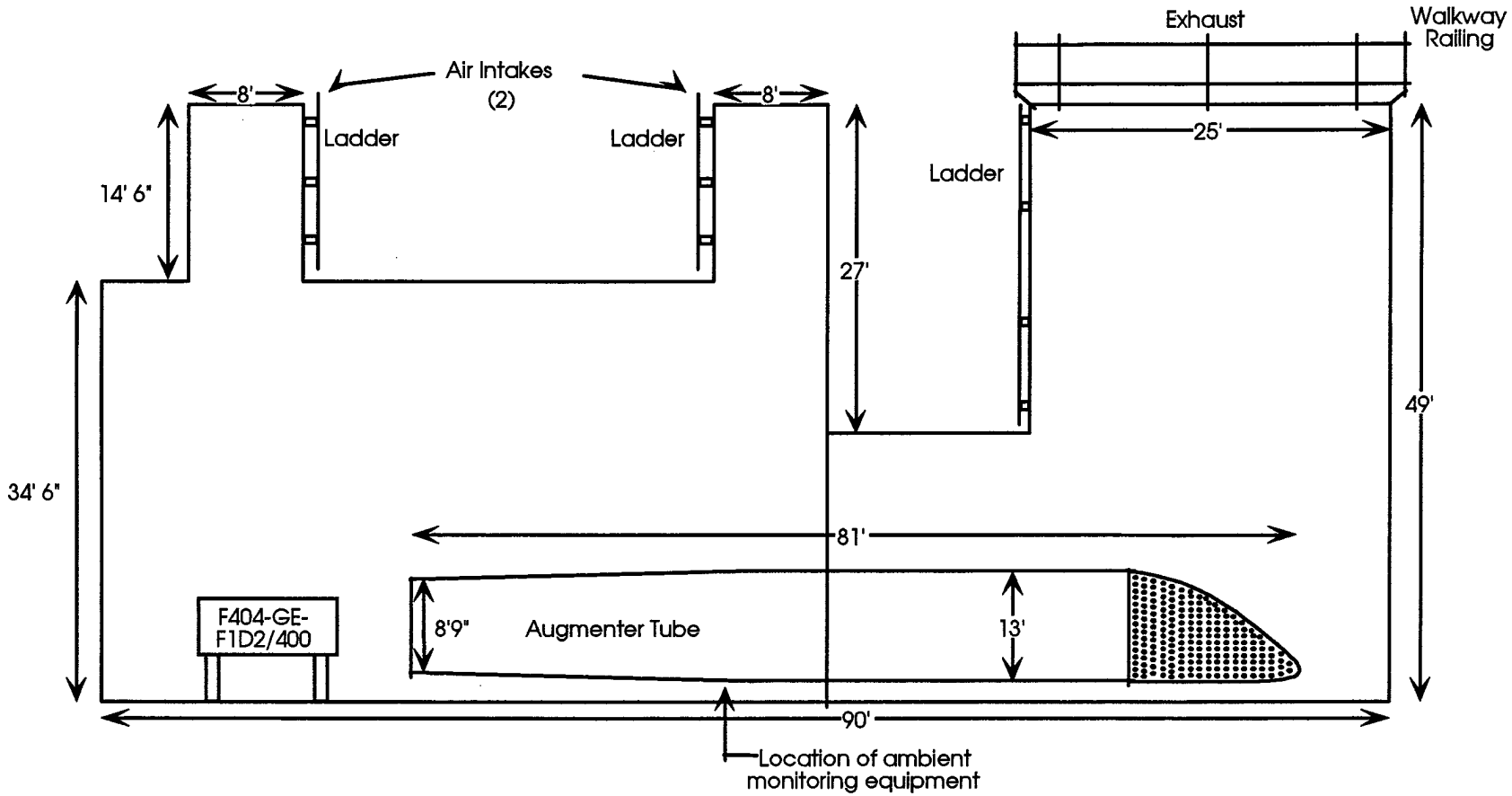


Figure 2-30
Tracer gas distribution system for an augmenter tube

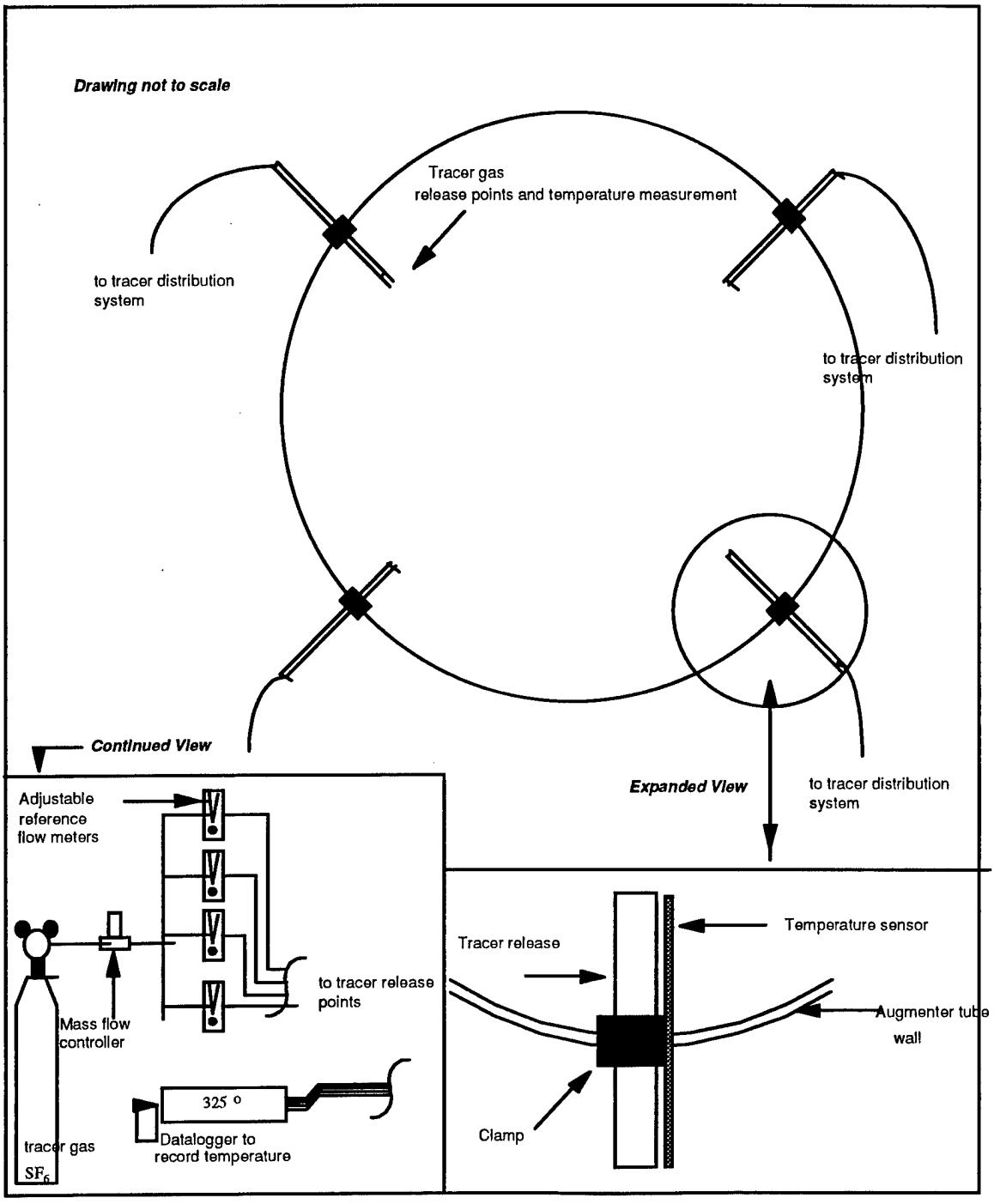
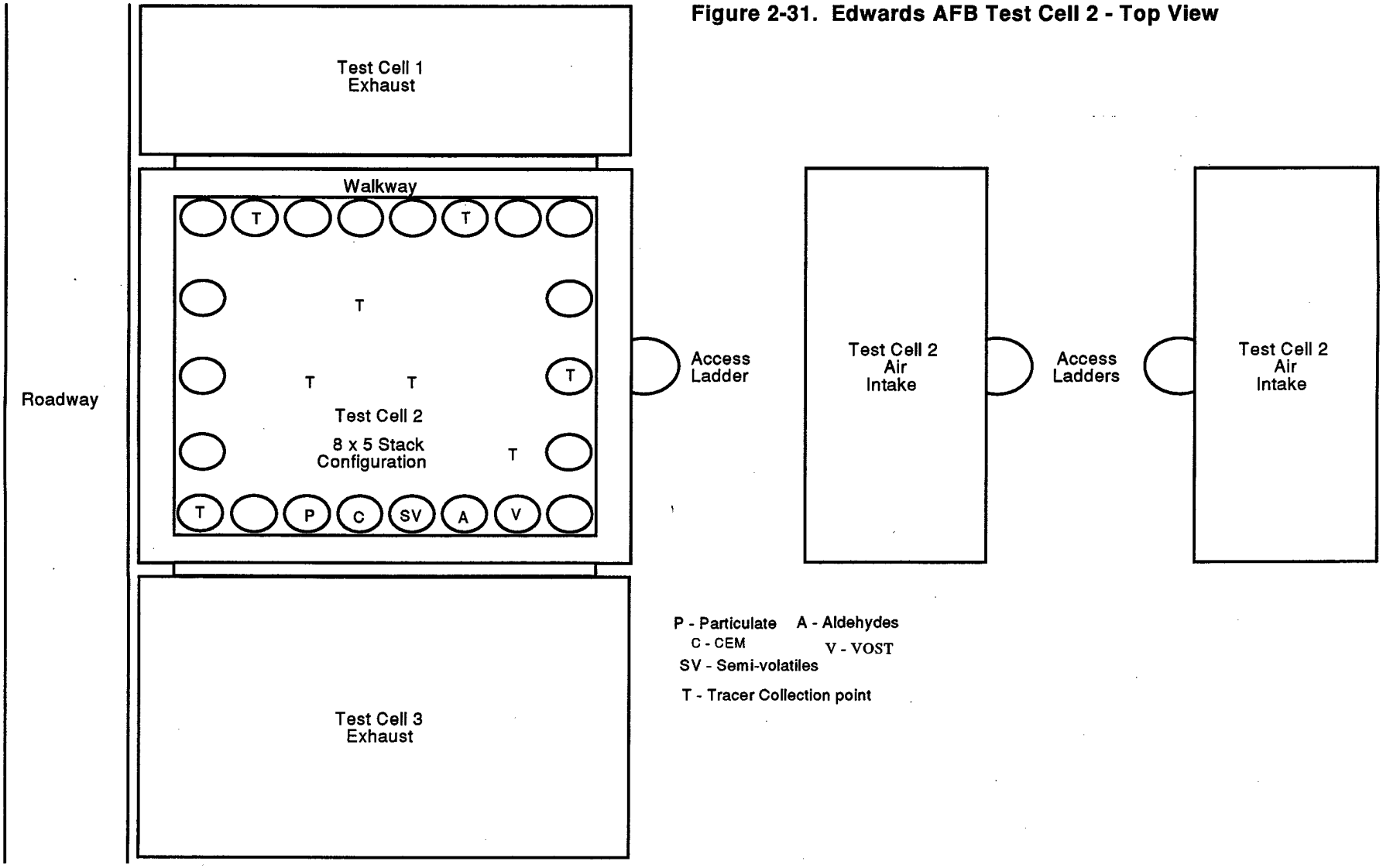


Figure 2-31. Edwards AFB Test Cell 2 - Top View



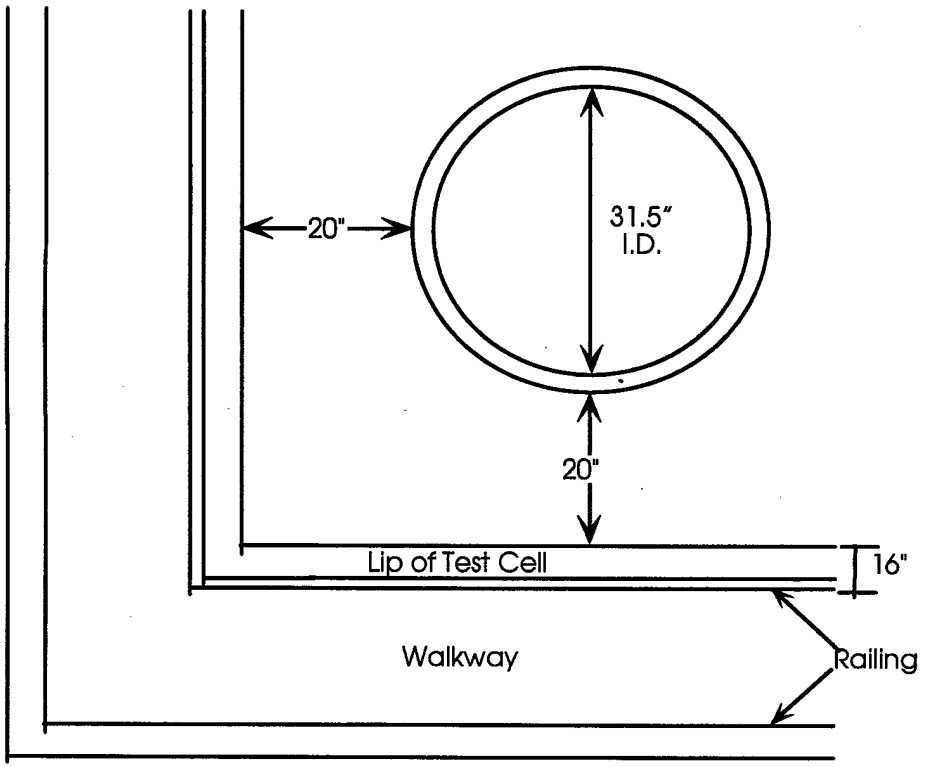
Inlet air pollutant concentrations were determined by placing the ambient samplers under the air intake, next to the augmenter tube, inside the test cell. The ambient sampling equipment was temporarily installed in a manner that did not present a FOD hazard to the engine. The stacks at the outlet of the blast room are recessed below the top of the test cell. Therefore, it was not possible to remain on the walkway during engine operation above idle conditions. The configuration of the stacks did not allow a full traverse of the exhaust, as required by EPA methodology. Since access to the platform and stacks was limited, all sampling was conducted at a single point. The termination of the blast room stacks at the top of the test cell would have made it difficult to collect a representative sample due to wind interference. It was necessary to temporarily install 9-foot-tall stack extensions with a 4-inch-diameter sample port on five of the exhaust stacks. Figure 2-31 illustrates which exhaust stacks required extensions and which pollutants were sampled from each stack. Figure 2-32 shows a side view of the roof for the test cell exhaust and a sample stack extension.

Velocity measurements were collected at each sampling point in order to maintain isokinetics. These velocity data were not used to calculate the entire exhaust flowrate since the exhaust flowrate was calculated using either carbon balance, tracer gas, or F-factor.

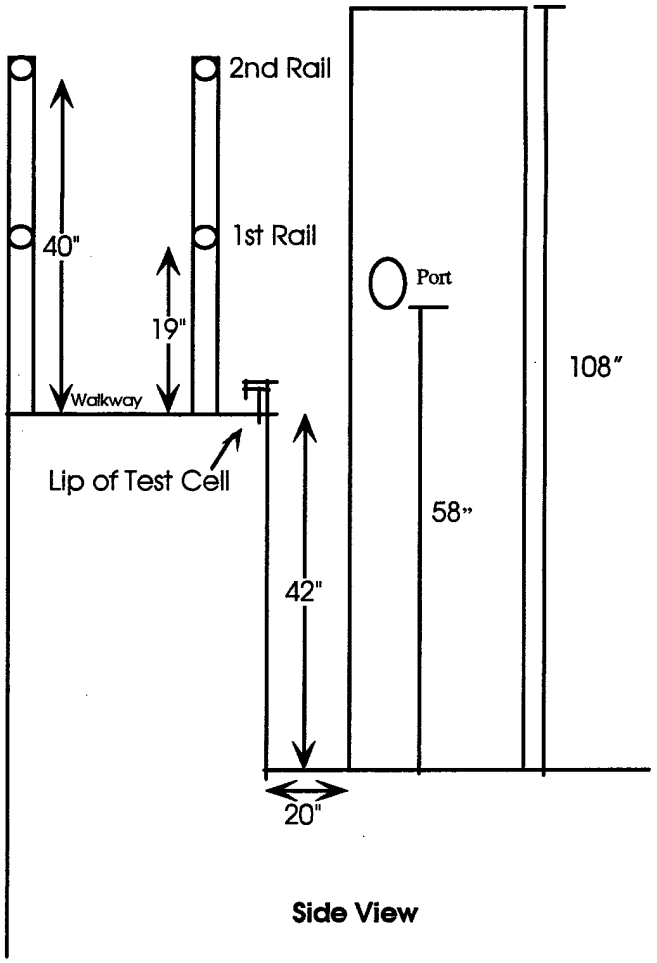
2.6.10 Naval Aviation Depot, Cherry Point, Test Cell

Figures 2-33 and 2-34 illustrate the general configuration of the engine test cell at Cherry Point. The configuration of this test cell allowed the use of conventional emission sampling methodologies. The 36-inch-diameter exhaust stack terminated out the side of the test cell facility. Airflow into the cell is the result of the air draw created by the engine during operation. Engine exhaust is directed through the augmenter tube

Figure 2-32. Edwards AFB Test Cell 2 Exhaust - Stack Extension Dimensions

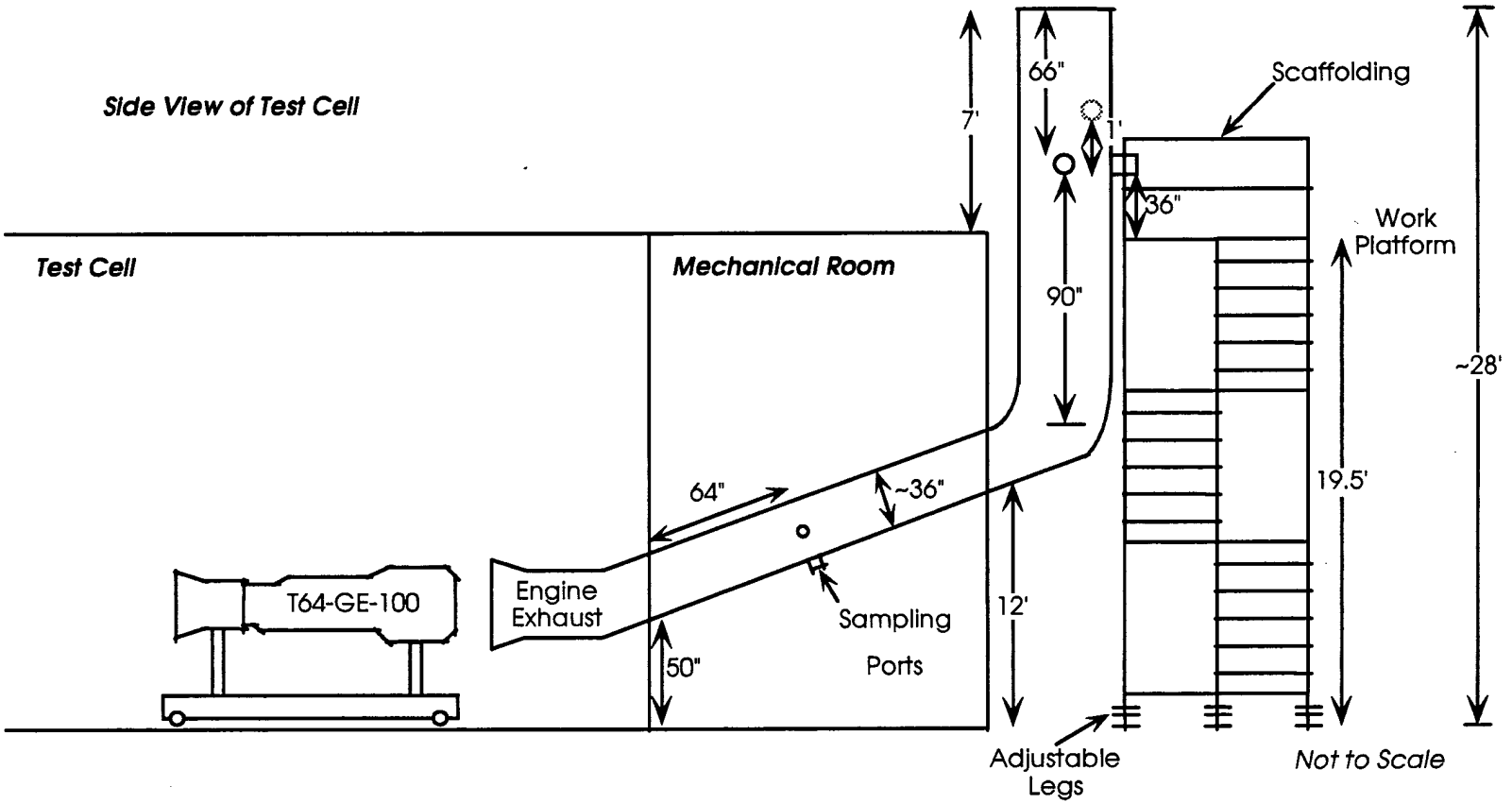


Top View



Side View

Figure 2-33. Naval Aviation Depot, Cherry Point Engine Test Cell



SECTION 2

EMISSION SAMPLING METHODOLOGY AND APPROACH

The determination of emissions from each of the various engine types and facilities presented a unique challenge to accurately measure emission rates of pollutants. A number of constraints and unknown parameters presented themselves in this program that are not associated with more traditional emissions testing programs. These variables were difficult to anticipate because of the inability to measure outlet exhaust parameters at some of the facilities, such as flow rates, temperature, and dilution by ambient air in the exhaust gas stream. The test program was designed to allow for those variables so that representative data could be collected in a timely and economic manner.

2.1 ENGINE EMISSION TESTING CONSIDERATIONS/COMPLICATIONS

The unique feature in the determination of the emissions from the test facilities is that the exhaust stream is significantly diluted with ambient air. The sampling locations for four of the engine tests were contained in a single accessible exhaust duct, and conventional test methods were used to determine the mass emission rates at those locations. These facilities were the APU test cell at Kelly AFB, Test Cell 14 at Corpus Christi Army Depot, and the test cell at the Naval Aviation Depot, Cherry Point. The physical structure of the sampling locations at the other seven facilities required the use of innovative techniques for the determination of volumetric flow during the test program.

The impact of large and/or fluctuating quantities of ambient air in the exhaust of turbine engines required modifications on the sampling and calculation methods used

for emission determination. The SAE Aerospace Information Report 1533 "Procedure for the Calculation of Basic Emission Parameters for Aircraft Turbine Engines," which was used historically, applies a mass balance to the combustion equation to determine the mass emission rate for priority pollutants with the explicit measurement of a volumetric flowrate. This approach was not practical for this test program since a significant portion of the test effort was directed at the measurement of trace hazardous compounds. The formation of trace compounds cannot be predicted by the combustion equation used in the SAE procedure. It was necessary to develop a technique to measure the total volumetric flowrate from the test facilities. Several methods were evaluated to determine the exhaust flowrate.

A carbon balance was calculated using fuel firing data; emission concentrations of CO, CO_2, and total hydrocarbons; and ambient measurement of CO_2 and total hydrocarbons. This approach closely resembles the SAE method, but the calculation was modified to produce a volumetric flowrate which could be used for mass emission calculations. A comparison of these methods is provided in Section 4.3.

A tracer gas study was conducted that released a small quantity of sulfur hexafluoride into the engine exhaust stream, and measured the minute concentrations of SF6 at the sampling location. The dilution of the tracer gas by the emission stream was calculated, and the total volumetric flowrate was determined.

A traditional emission testing F-factor combustion equation based on fuel composition and oxygen content of the emission stream was employed to calculate the flowrate. Each method was evaluated for each sampling run, and the most representative flow was selected.

2.2 EMISSIONS SAMPLING APPROACH

Emissions testing was performed on a series of engines at various power settings. Aircraft engines were tested at actual flight settings, which varied between

three and five depending on the engine type. The engine conditions for emissions sampling are provided below:

- Idle
- Approach
- Intermediate
- Military
- Afterburner (Between Zone 1 and Zone 3)

Auxiliary Power Units (APUs) were tested at one power setting. The helicopter engines were each tested at four power settings. The T700-GE-700 was tested at ground idle, flight idle, flight maximum, and overspeed; the T64-GE-100 helicopter engine was tested at ground idle, 75% normal, normal, and military.

Emissions testing was comprised of three 1-hour emissions tests for each pollutant at each power setting for each engine. Due to the sample volume required to meet method detection limits, certain samples (semivolatiles, aldehydes, and ketones) were composited over the entire 3-hour period. Certain engines could not be operated continuously at maximum power (military, afterburner, or overspeed) because engine and/or test cell damage may have occurred. Sample run times in these operative modes were reduced to the "safe" operating duration. The sample collection procedures were adjusted to accommodate the reduced operating time. In order to reach the analytical detection limit for the target pollutants, the sample run was paused at the end of the safe operating period, waited to allow the engine to cool, then resumed sampling for the next operating period until the 1-hour sample run was completed. In the case of the F117-PW-100 engine, the engine could not be operated at the military setting for the necessary duration. No emissions data was collected for this setting.

Ambient air sampling was conducted only during emissions testing. Ambient samples were composited for each of the three 1-hour test runs at that power setting.

The test program was structured in such a manner that the first series of engine tests at Kelly AFB was used to provide the necessary information to assess the sampling program for the remaining engines and review the HAP emission results for potential modification. Based on the results of these tests, the program was modified by considering an additional particulate matter sampling method (hi-volume sampler) at the engine exhaust stream. This was done in an effort to collect a measurable amount of particulate in case the standard Method 5 sample had zero or negative filter weight. The target number of HAPs collected (ambient and/or source) was not altered. The goal was to provide a representative emissions database for target HAPs from the first four engines tested. The results from these tests did not provide a consistent pattern from engine to engine or engine setting to engine setting. Nor did they provide an adequate database to make definitive decisions. Therefore, sampling for the entire list of chosen HAPs continued for the remaining engines within the program.

2.2.1 Pretest Measurements

Preliminary test data was obtained at the engine exhaust locations during 10-minute shakedown runs at each engine setting. Stack geometry measurements were obtained and recorded, and (if needed) traverse point distances verified. A preliminary velocity traverse was performed at the facilities which had a single exhaust stack, utilizing a calibrated S-type pitot tube and a Dwyer inclined manometer. Flue gas temperatures were observed with a calibrated direct readout pyrometer equipped with a chromel-alumel thermocouple. Water vapor content was measured using EPA Method 4.

A check for the presence or absence of cyclonic flow was conducted at each test location. The cyclonic flow checks were less than 20°, thus verifying the suitability of each test site for obtaining representative samples.

Preliminary test data was used for nozzle sizing and sampling rate determinations. Probe nozzles, pitot tubes, metering systems, and temperature measurement devices were calibrated as specified in Section 5 of EPA Method 5 test procedures.

2.2.2 Emission Test Methods

Sampling was performed for criteria pollutants and those HAPs that are products of incomplete combustion (PICs). The following lists the compounds that were measured and the sampling/analytical method used on the engine exhaust streams:

- Filterable and condensable particulate (EPA Methods 5 and 202).
- Aldehydes and Ketones (BIF 0011 and TO-05).
- Semivolatiles (EPA Method 0010). Table 2-1 lists the analytical target compounds.
- Volatile organic compounds (VOCs) (EPA Method 0030). Table 2-1 lists the analytical target compounds.
- Oxygen and carbon dioxide (EPA Method 3A).
- Carbon monoxide (EPA Method 10).
- Nitrogen oxides (EPA Method 7E).
- Total hydrocarbons (THCs) (EPA Method 25A).

Sampling for metals and sulfur dioxide in the engine exhaust streams was not performed. Historic testing for metals provided random results with a number of interferences. Originally, the mass emission rate of metals was to be calculated by factoring the metals concentration found in the JP-8 fuel analysis with the fuel consumption rate and exhaust flow rate. During this sampling program, however, fuel analysis did not show the presence (above the analytical detection limits) of the following metals: antimony, arsenic, barium, beryllium, cadmium, cobalt, chromium, copper, lead, manganese, mercury, nickel, phosphorus, selenium, silver, thallium, and zinc.

The analytical procedure for metal determination involved the combustion of JP-8 fuel in an evaporative dish. The combustion residue was ashed in a muffle furnace. Ash product was treated with an aqua regia to digest any residual carbon. The solution was diluted, then analyzed via inductively Coupled Plasma Spectroscopy, Cold Vapor Atomic Absorption Spectroscopy (Hg), or treated with chelating agent and analyzed via colorimetric methodology (P). Table 2-2 lists the metals for which concentrations were determined.

Table 2-1. Summary of Source Target Compounds For Semivolatile and Volatile Organic Compounds

Semivolatile Compounds - Method Target List		VOST Compounds - Method Target List
Acenaphthene	Fluoranthene	Acetone
Acenaphthylene	Fluorene	Benzene
Anthracene	Hexachlorobenzene	Bromodichloromethane
Benzo(a)anthracene	Hexachlorobutadiene	Bromomethane
Benzo(b)fluoranthene	Hexachlorocyclopentadiene	Bromoform
Benzo(k)fluoranthene	Hexachloroethane	2-Butanone
Benzo(g,h,i)perylene	Indeno(1,2,3-cd)pyrene	Carbon disulfide
Benzo(a)pyrene	Isophorone	Carbon tetrachloride
Benzoic acid	2-Methylnaphthalene	Chlorobenzene
Benzyl alcohol	2-Methylphenol	Chlorodibromomethane
Bis(2-chloroethoxy)methane	4-Methylphenol	Chloroethane
Bis(2-chloroethyl)ether	Naphthalene	Chloroform
Bis(2-chloroisopropyl)ether	2-Nitroaniline	Chloromethane
Bis(2-ethylhexyl)phthalate	3-Nitroaniline	1,1-Dichloroethane
4-Bromophenyl phenyl ether	4-Nitroaniline	1,2-Dichloroethane
Butylbenzylphthalate	Nitrobenzene	1,1-Dichloroethene
4-Chloroaniline	2-Nitrophenol	cis-1,2-Dichloroethene
4-Chloro-3-methylphenol	4-Nitrophenol	trans-1,2-Dichloroethene
2-Chloronaphthalene	N-Nitroso-di-n-propylamine	1,2-Dichlorophropane
2-Chlorophenol	N-Nitrosodiphenylamine	cis-1,3-Dichloropropene
4-Chlorophenyl phenyl ether	Pentachlorophenol	trans-1,3-Dichloropropene
Chrysene	Phenanthrene	Ethylbenzene
Di-n-butyl phthalate	Phenol	2-Hexanone
Di-n-octylphthalate	Pyrene	Methylene chloride
Dibenzofuran	1,2,4-Trichlorobenzene	4-Methyl-2-pentanone
1,2-Dichlorobenzene	2,4,5-Trichlorophenol	Styrene
1,3-Dichlorobenzene	2,4,6-Trichlorophenol	1,1,2,2-Tetrachloroethane
1,4-Dichlorobenzene		Tetrachloroethene
3-3'-Dichlorobenzidine		Toluene
2,4-Dichlorophenol		1,1,1-Trichloroethane
Diethyl phthalate		1,1,2-Trichloroethane
2,4-Dimethylphenol		Trichloroethene
Dimethyl phthalate		Trichlorofluoromethane
4,6-Dinitro-2-methylphenol		Vinyl acetate
2,4-Dinitrophenol		Vinyl chloride
2,4-Dinitrotoluene		o-Xylene
2,6-Dinitrotoluene		m/p-Xylene

Table 2-2. Summary of Source Target Metals from JP-8 Fuel Analysis

Antimony	Arsenic
Barium	Beryllium
Cadmium	Cobalt
Chromium	Copper
Lead	Manganese
Mercury	Nickel
Phosphorus	Selenium
Silver	Thallium
	Zinc

Sulfur dioxide emissions are typically calculated based on the sulfur content of fuel samples taken at the particular facility. This follows the theory that the sulfur content of the fuel determines the emissions of sulfur dioxide for a given engine at each power setting. Analysis for sulfur in fuel samples taken at select facilities during this program showed that the sulfur content was consistent with the sulfur content found in previous studies. Sulfur dioxide emissions should be calculated for each individual facility based upon the discussion provided in Section 4.2.5 of Volume 2. Historically, this has been the protocol for determining the emission factor. The emission factor for sulfur dioxide is presented in Section 4.2.5 of Volume 2. Dioxins, furans, and other HAPs (not listed in Table 2-1) are not discussed in the subsequent text because they would have been emitted in quantities too small to be detected. Therefore, these pollutants were not included in the sampling program.

Detailed descriptions of all exhaust emissions test sampling trains, sample preparation, sample procedures, sample recovery, and analytical procedures are provided in Appendix B of this document.

2.2.3 Flow Rate Measurement

As stated previously, standard flow rate measurements (EPA Methods 1-4) could be performed at only three of the test locations (Table 2-3).

Traditional isokinetic sampling methodologies could not be employed due to the physical structure of Test Cells 54A and 58 at Kelly AFB, Test Cell 18 at Laughlin AFB, Test Cell 9 at Tinker AFB, the test cell at Charleston AFB, Test Cells 2 and 4 at Edwards AFB, and the hush house at Barnes ANGB. Some of the engine test cells contained as many as 56 separate stacks, and it was not economical nor practical to sample each stack. Based on these complications, one or more mass balance approaches were employed to determine total flow rate. These methods were tracer gas dilution rates, carbon balance, and F-factor calculations. A summary of the exhaust flow determination method at each site is summarized in Table 2-3.

The multiple flow measurement/calculation methods were used to provide a firm basis for identifying and rejecting outlier data. The flow data collected by any one method at a given condition was compared against the alternate measurement data collected at that same condition, as well as the flow data collected by all methods for the same engine/test cell configuration at different operating conditions. There is a relationship between engine operating level and total flow, and all flow measurement methods provide valid data at one or more operating conditions. The data evaluation identified which measurement deviates from that relationship, and whether that deviation can be attributed to a physical parameter such as temperature, oxygen concentration, etc. If the deviation was predicted (e.g., high oxygen concentration impact on F-factor calculation), that data was discarded. If there was no obvious physical explanation, best-fit estimates at other loads were used to identify and reject the outlier. This evaluation showed that the F-factor mass balance calculation which

Table 2-3. Site-Specific Exhaust Flow Determination Summary

Engine Test Location	Engine	Flow Determination Method
Kelly AFB	TE6-A-7	Calculated by carbon balance, tracer gas and F-factor.[1]
	TF39-GE-1C	Calculated by carbon balance, tracer gas and F-factor[1]
	GTCP85-180	Measured using EPA Method 1-4
	GCTP165-1	Measured using EPA Method 1-4
Corpus Christi Army Depot	T700-GE-700	Measured using EPA Method 1-4
Laughlin AFB	J69-T-25	Calculated by carbon balance, tracer gas and F-factor[1]
	J85-GE-5A	Calculated by carbon balance, tracer gas and F-factor[1]
Tinker AFB	F110-GE-100	Calculated by carbon balance, tracer gas and F-factor[1]
	F108-CF-100	Calculated by carbon balance, tracer gas and F-factor[1]
	TF33-P-7/7A	Calculated by carbon balance, tracer gas and F-factor[1]
	F101-GE-102	Calculated by carbon balance, tracer gas and F-factor[1]
	TF33-P-102	Calculated by carbon balance, tracer gas and F-factor[1]
Charleston AFB	F117-PW-100	Calculated by carbon balance, tracer gas and F-factor[1]
Edwards AFB	F118-GE-100	Calculated by carbon balance, tracer gas and F-factor[1]
	F404-GE-F102/400	Calculated by carbon balance, tracer gas and F-factor[1]
	F110-GE-129	Calculated by carbon balance, tracer gas and F-factor[1]
	F100-PW-100	Calculated by carbon balance, tracer gas and F-factor[1]
	F100-PW-229	Calculated by carbon balance, tracer gas and F-factor[1]
Naval Aviation Depot, Cherry Point	T64-GE-100	Measured using EPA Method 1-4
Barnes ANGB	TF34-GE-100A	Calculated by carbon balance, tracer gas and F-factor[1]

[1] As discussed in Section 2, the exhaust flow was calculated by these three methods and the most representative method was selected to determine the exhaust flow rate.

relied on oxygen concentration dilution factors was unreliable due to the near-ambient oxygen concentrations present in most exhaust streams. These items are discussed in more detail in Section 4.

As an additional verification of outlet flows, inlet flow rates were determined through measurement using anemometers. Up to 12 hot-wire anemometers (mass flow meters) were attached to the inlet locations of the test cells. The hot-wire outputs terminated at a data logger, where data was measured once per second and recorded as 1-minute averages during each test run. The flow data then was used to calculate inlet flow rates. EPA Method 1 was used to determine the placement of the hot-wire anemometers. Due to potential interference caused by the extreme turbulence at the test locations, the hot-wire anemometer data did not correlate with outlet flows. The data was rejected as suspect and not included in this report.

As part of the theoretical flow determination method using carbon balance and F-factors, the inlet concentration for select compounds was measured. At the inlet to each test cell/hush house, THC was measured using a hydrocarbon analyzer identical to the one that measured engine exhaust gas THC. The THC analyzer was challenged with a zero and span gas at the beginning and end of each test conditions to calibrate and assess the instrument's calibration. An inlet carbon dioxide (CO_2) measurement was required as input to the theoretical flow model. An ambient CO_2 monitor was used to measure the inlet CO_2 concentration during each test run. The CO_2 monitor was challenged with a zero and span gas at the beginning and end of each test condition to calibrate and assess the instrument's calibration.

2.2.4 Pollutant Distribution at the Outlet of the Test Cells

The test program was based on the assumption that by the time the exhaust gas exits the test cell, the exhaust stream from the engine and the dilution air would have reached a homogeneous mixture. This assumption was validated during testing conducted for this delivery order.

Particulate size distribution in the engine exhaust has been shown to be significantly less than 10 microns (μm) in size (Characterization of Chemicals on Engine Exhaust Particles: F101 and F110 Engines, ESL-TR-89-20, Air Force Engineering and Services Center Engineering and Services Laboratory and Source Sampling and Testing of Aerospace Equipment and Jet Engines - Test Protocol - Edwards AFB, CA, EQ December 1995). Because of the size of the particles, it was assumed that the particles would behave as an aerosol or gas, and that pollutants will be distributed evenly throughout each of the test cell stacks. Since it was assumed that all particulate (and those contaminants bound to the particulate) will behave as an aerosol, each stack or any point in the stack will have the same concentration of pollutants. This assumption was used as the basis to conduct single-point isokinetic sampling on only one stack or one point in the stack, which is representative of all other stacks or points in a given test cell.

Since particulate size is less than 10 μm, EPA Method 5 was used for particulate sampling. Exhaust was sampled using a full traverse (GTCP85-180, GTCP165-1, T700-GE-700 and the T64-GE-100) through a single stack.

Although it was assumed that pollutant concentrations in the stack would be homogeneous, the assumption was verified by using tracer gas at facilities where the exhaust was not emitted through a single stack. Tracer gas was not used at facilities where the exhaust was emitted through a single exhaust stack (GTCP85-180, GTCP165-1, T700-GE-700 and the T64-GE-100) and conventional EPA reference methods could be used to measure volumetric flow. The tracer gas, sulfur hexafluoride (SF_6), was dispersed into the exhaust gas stream and measured at the outlet. Based on the turbulent flow of the exhaust and the passage of the exhaust gases through the blast room, the SF_6 was dispersed equally in the exhaust. A random number of stacks was sampled at various engine settings to test that the tracer gas was dispersed equally. The results of the tracer gas dispersion are provided in Section 4.

2.2.5 Tracer Gas Methodology

Tracer gas was used at Kelly AFB, Laughlin AFB, Tinker AFB, Edwards AFB, and Barnes ANGB where exhaust flow could not be measured using standard EPA methods. By inputting a known amount of tracer gas into the exhaust stream and measuring a concentration at the outlet, the amount of dilution that had occurred was determined. The dilution rate was then used to calculate exhaust flow rates. Section 3 details those calculations.

The tracer gas release points within the augmenter tube were also monitored for temperature. It was important to monitor for temperature since SF_6 is stable up to 500° F before it begins to degrade. The tracer gas injection apparatus included thermocouples to determine temperatures at the injection point. The 500° F threshold was very conservative, because SF_6 will not decompose until 932° F. However, it was intended to maintain the conservative threshold as the point where the tracer method must be more seriously examined due to the more extreme conditions present in the test cell. During test cell operation the temperature in the augmenter tube at the tracer release points did not exceed 500° F in a nonafterburner power setting. Temperature measurements were not collected when the tracer gas release points were placed on the outside edge of the augmenter tube. The tracer gas was released opposite the flow to prevent the exhaust gas pressure from impacting the opening in the tracer gas manifold and possibly affecting tracer gas distribution. Tracer gas was introduced into the release manifold through a mass flow controller calibrated to SF_6. It then flowed into adjustable flow meters which regulated equal amounts of tracer gas into each of the tracer release steel tubes. Temperature was measured using a Type K thermocouple and recorded by a data logger.

2.3 POLLUTANT BACKGROUND CONCENTRATIONS

Ambient air sampling was performed for many of the same compounds that were sampled at the test cell exhausts. The ambient air sampling was conducted in conjunction with emissions testing to quantify and qualify background emissions concentrations. Ambient samples were collected inside of the test cells for the following compounds:

- Particulate - TSP (40 CFR, Part 60, Appendix B).
- Aldehydes and Ketones (EPA Method TO-5, Weston modification).
- Semivolatiles (EPA Method TO-13).
- VOCs (EPA Method TO-14).

Table 2-4 provides a comparison of emissions test method detection limits, ambient air test method detection limits, and actual observed maximum ambient concentrations for those pollutants. It should be noted that the 24-hour ambient values consist of an integrated sample collected over a 24-hour period, which consists of periods of lower ambient pollutant levels and higher pollutant levels, to arrive at a result for the integrated 24-hour sample. Therefore, it is reasonable to suspect that in any given 1-hour period the ambient air pollutant value could be higher than the exhaust concentration for that pollutant. The proximity of large local sources (i.e., exhaust from other test cells) can further add to the ambient air concentrations that already may be present. It can be concluded that the potential exists for ambient air concentrations to bias emissions estimates high, as the observed ambient concentrations may be detectable by emissions test methods. Therefore, it is important to quantify the background pollutant concentrations and qualify the exhaust emissions accordingly. This was the procedure utilized for this study.

Ambient air sampling, equipment operations, and calibration followed standard operating procedures (SOPs) for each method. All ambient air sampling was

Table 2-4. Comparison of Emission Test Methods, Ambient Test Methods, and Observed Ambient Results

	Source				Ambient				
Compound Class	Analytical Detection Limit	Sample Volume cu ft	Sample Volume m^3	Method Detection Limit [a]	Analytical Detection Limit	Sample Volume cu ft	Sample Volume m^3	Method Detection Limit [b]	Noted Maximum 24-hr ambient Values [c]
VOCs	10 ng	0.71	0.020	497 ng/m^3	NA	NA	NA	500 ng/m^3	<500 ng/m^3
	50 ng	0.71	0.020	2487 ng/m^3	NA	NA	NA	1800 ng/m^3	<1800 ng/m^3
Formaldehyde	3.1 mg	100	2.832	1.1 mg/m^3	0.12 ug	64	1.812	0.07 mg/m^3	1.9 mg/m^3
Semi-Volatiles	1.0 mg	106	3.002	0.33 mg/m^3	1.0 ng	1620	45.878	0.02 ng/m^3	0.045 mg/m^3
	10 mg	106	3.002	3.3 mg/m^3	10 ng	1620	45.878	0.22 ng/m^3	0.5 mg/m^3
Particulate	0.1 mg	50	1.416	0.07 mg/m^3	0.1 mg	7200	203.904	0.0005 mg/m^3	<0.1 mg/m^3

Notes:

[a] - Source emissions limits are based on the total expected sample volume; formaldehyde and semi-volatiles will consist of a composite of three 1-hour sample runs.

[b] - Ambient sample detection limits are based on a three-hour sample.

[c] - 24-hr 0.5 mg/m^3 results are primarily from naphthalene and phenol.

performed in conjunction with all emissions testing. Ambient air sampling commenced at the start of each emissions test run and concluded at the completion of the final emissions test run. The ambient air samples were composited over the three 1-hour test runs for each engine power setting. Representative ambient air samples were collected inside the test cell. Samplers were turned on and off from inside the test cell.

The following subsections present brief descriptions of the ambient air sampling and analytical methods which were used for each of the pollutants. The descriptions include overviews of the sampling equipment, collection media, and analytical techniques used for each pollutant.

2.3.1 Polynuclear Aromatic Hydrocarbons (PAHs)

The sampling and analytical methods for PAHs are based on EPA Method TO-13, Determination of Benzo(a)pyrene and Other Polynuclear Aromatic Hydrocarbons (PAHs) in Ambient Air Using Gas Chromatography (GC) and High Performance Liquid Chromatography (HPLC) (U.S. EPA, 1988a). In addition to the PAHs, sampling and analysis included all semivolatile PICs determined to be in the engine exhaust samples.

This method utilizes a General Metal Works Model PS-1 high-volume air sampler, which operates at a sampling rate of approximately 240 liters per minute (L/min) (approximately 15 cubic meters (m^3) per hour). The sample flow rate is monitored using a calibrated magnehelic gauge, and the sample volume is determined by the average of the pre- and post-sampling magnehelic gauge readings. The air sample is drawn through a quartz glass fiber filter to capture particle-born compounds, then through a series of two polyurethane foam (PUF) plugs, separated by XAD-2 adsorbent resin to adsorb vapor-phase compounds. The XAD-2 resin layer is a modification of Method TO-13, designed to prevent breakthrough of the lighter, more-volatile PAH compounds.

At the laboratory, the exposed filter and PUF/XAD are extracted and analyzed. The extract is concentrated, then cleaned up (interferents removed) using column chromatography. The mass spectrograph (MS) is operated in the standard mode.

Table 2-5 lists the semivolatiles that were analyzed for in each sample.

2.3.2 Aldehydes and Ketones

There are two EPA-approved methods for determining aldehydes and ketones in ambient air Method TO-5 and TO-11: Method for the Determination of Formaldehyde in Ambient Air Using High Performance Liquid Chromatography (HPLC) (U.S. EPA, 1984) and Determination of Formaldehyde in Ambient Air Using Adsorbent Cartridge Followed by High Performance Liquid Chromatography (HPLC) (U.S. EPA, 1988), respectively. Method TO-5 collects formaldehyde in impingers containing 2,4-dinitrophenylhydrazine (DNPH), and TO-11 uses adsorbent cartridges where the silica gel traps are coated with DNPH solution. TO-11 was developed to simplify the sampling procedure by eliminating the need for midget impingers containing liquid DNPH. The limited sample flow rates possible using TO-5 and TO-11, combined with typically high blank values, limit the detection limits range achievable by TO-5 and TO-11 to the 12- to 24-micrograms-per-cubic-meter (mg/m^3) range over a 1-hour period. Because Method TO-5 and TO-11 cannot meet the same level of sensitivity as the source test method, a method previously developed by WESTON was used, which has a detection limit of approximately one to two orders of magnitude lower.

The aldehyde and ketone sampling and analytical method is based on a modified U.S. EPA method developed by WESTON and DAT (formerly Triangle Labs of Columbus, OH), located in Dublin, OH. The modified method is based on the EPA Standard Method Determination of the Strong Acidity of Atmospheric Fine-Particles (<2.5 mm) Using Annular Denuder Technology (EPA, 1992). The key element of this method is the annular denuder technology for removal and collection of reactive gases. The annular denuder is a gas-collection technology that uses closely spaced concentric glass tubes coated with adsorbent solutions to collect various reactive gases by diffusion.

Table 2-5. Summary of Ambient Target Compounds for Semivolatile and Volatile Organic Compounds

Semivolatile Compounds - EPA Method TO-13		Volatile Organic Compounds - EPA Method TO-14 List
Acenaphthene	2-Nitrophenol	Freon 12
Acenaphthylene	4-Nitrophenol	Freon 114
Anthracene	N-Nitroso-di-n-propylamine	Chloromethane
Benzo(a)anthracene	N-Nitrosodiphenylamine	Vinyl Chloride
Benzo(b)fluoranthene	Pentachlorophenol	Bromomethane
Benzo(k)fluoranthene	Phenanthrene	Chloroethane
Benzo(g,h,i)perylene	Phenol	Freon 11
Benzo(a)pyrene	Pyrene	1,1-Dichloroethene
Benzoic acid	1,2,4-Trichlorobenzene	Freon 113
Benzyl alcohol	2,4,5-Trichlorophenol	Methylene Chloride
Bis(2-chloroethoxy)methane	2,4,6-Trichlorophenol	1,1-Dichloroethane
Bis(2-chloroethyl)ether		cis-1,2-Dichloroethene
Bis(2-chloroisopropyl)ether		Chloroform
Bis(2-ethylhexyl)phthalate		1,1,1-Trichloroethane
4-Bromophenyl phenyl ether		Carbon Tetrachloride
Butylbenzylphthalate		Benzene
4-Chloroaniline		1,2-Dichloroethane
4-Chloro-3-methylphenol		Trichloroethene
2-Chloronaphthalene		1,2-Dichloropropane
2-Chlorophenol		cis-1,3-Dichloropropene
4-Chlorophenyl phenyl ether		Toluene
Chrysene		trans-1,3-Dichloropropene
Di-n-butyl phthalate		1,1,2-Trichloroethane
Di-n-octylphthalate		Tetrachloroethene
Dibenzofuran		Ethylene Dibromide
1,2-Dichlorobenzene		Chlorobenzene
1,3-Dichlorobenzene		Ethyl Benzene
1,4-Dichlorobenzene		m,p-Xylene
3-3'-Dichlorobenzidine		o-Xylene
2,4-Dichlorophenol		Styrene
Diethyl phthalate		1,1,2,2-Tetrachloroethane
2,4-Dimethylphenol		1,3,5-Trimethylbenzene
Dimethyl phthalate		1,2,4-Trimethylbenzene
4,6-Dinitro-2-methylphenol		1,3-Dichlorobenzene
2,4-Dinitrophenol		1,4-Dichlorobenzene
2,4-Dinitrotoluene		Chlorotoluene
2,6-Dinitrotoluene		1,2-Dichlorobenzene
Fluoranthene		1,2,4-Trichlorobenzene
Fluorene		Hexachlorobutadiene
Hexachlorobenzene		Methanol
Hexachlorobutadiene		Ethanol
Hexachlorocyclopentadiene		Isopropanol
Hexachloroethane		Acrolein
Indeno(1,2,3-cd)pyrene		Acetone
Isophorone		Acetonitrile
2-Methylnaphthalene		Acrylonitrile
2-Methylphenol		Vinyl Acetate
4-Methylphenol		Tetrahydrofuran
Naphthalene		1 4-Dioxane
2-Nitroaniline		Ethyl Acetate
3-Nitroaniline		2-Butanone
4-Nitroaniline		Methyl Methacrylate
Nitrobenzene		4-Methyl-2-Pentanone

The EPA method was modified to use a coating solution intended to collect aldehydes and ketones. For aldehyde and ketone sampling, the denuder tubes are coated with a DNPH solution similar to the way in which silica gel is coated for TO-11. The coating solution used in the modified method is based on bench and field testing of a DNPH-coated annular denuder tube for collection of aldehydes (Possanzini et al., 1987).

The coating used by Possanzini (1987) has been field-tested for 24-hour sampling, with a sampling system configuration based on the EPA method. At the normal operational flow rates of 10.0 L/min, results of the field test indicate no measurable breakthrough from the first tube in a three-tube train. Based on the variability of several blank tubes collected as part of the test, the detection limit of the modified method was calculated as 0.05 mg/m^3 for a 24-hour sample or 1.2 $\mu g/m^3$ for a 1-hour sample.

The aldehyde and ketone samples were collected using a Model 3000 Annular Denuder Sampling (ADS) System, manufactured by University Research Glassware, Inc. The ADS drew air through the sampling train at a 10 L/min flow rate with the total air sample volume measured by calibrated flow totalizers. The sampling trains consisted of two DNPH-coated denuder tubes in series to collect aldehydes and ketones, preceded by a cyclone inlet to remove large particles (> 2.5 mm), and followed by a 47-millimeter (mm) diameter Teflon® filter to remove fine particles (the cyclone and filter particle catches were not to be analyzed). The second tube verified that no breakthrough occurred from the first tube.

At the laboratory, the DNPH coating was extracted from the denuder tubes and analyzed by high performance liquid chromatography (HPLC). The HPLC technique is the same analytical finish used in Methods TO-5 and TO-11, as well as in the work by Possanzini (1987). Based on the results obtained from the data collected in the first half of the program (Kelly AFB, CCAD, Laughlin AFB, and Tinker AFB), the concentrations did not reflect "typical" ambient concentrations. The ambient samples for aldehydes and ketones were not collected during the second half of the program. Instead, a quantitative observation was made at each facility to note the presence of any contributors to ambient

aldehyde and ketone concentrations. If no contributors existed, a typical ambient concentration was used for the inlet.

2.3.3 Particulates

Particulate matter (total suspended particulates) was sampled using General Metal Works high-volume (Hi-Vol) air samplers with volumetric flow controllers. The particulate sampling program was operated according to EPA guidelines as described in the Quality Assurance Requirements for Prevention of Significant Deterioration, 40 CFR, Part 50, Appendix B. Sample filters were analyzed by a gravimetric method using pre- and post-weights to determine total particulates. During each 1-hour sample run, 68 m^3 of sample was collected. For the composite 3-hour sample, a total of 204 m^3 of volume was sampled. With an analytical detection limit of 0.1 milligram (mg), the method detection is 0.5 $\mu g/m^3$.

2.3.4 Volatile Organic Compounds

Volatile organics were sampled using passivated stainless-steel Summa® canisters, which were analyzed by gas chromatography/mass spectrometry (GC/MS) per EPA Method TO-14.

A Summa® canister is a stainless-steel vessel that has had its internal surfaces specially passivated using a "Summa" process. This process combines an electropolishing step which is chemically inert. A Summa surface has the appearance of a bright and shiny mirror. A sample enters the canister through a stainless steel bellows valve. A Summa canister can hold a high vacuum (<1 m Torr: <28 inches Hg) for up to 30 days. After 30 days, it is necessary to evacuate the canister prior to use to ensure that it is free of contaminants.

Canisters are cleaned using a combination of exponential dilution, heat, and high vacuum. They are generally batch-certified (1 in 10) by filling them with ultra-high-purity air, which is subsequently analyzed using either GC/MS (TO-14) or GC/ flame ionization detection (FID) (TO-12). If the target analyte concentrations are below 0.2 part per billion

by volume (ppbv) (TO-14) or if the total hydrocarbon level is less than 0.2 ppbv, the batch of canisters is considered "clean" and they are certified for use.

Although 14 days is the most commonly cited holding time for a canister sample, the holding time is somewhat analyte-specific. For example, nonpolar analytes such as chloroform, benzene, and vinyl chloride are stable in a canister for at least 30 days. However, polar analytes such as methanol and acetone often will condense on the canister walls (the degree of which is a function of the sample humidity). Analysis of these samples is performed within 72 hours.

The passivated canister sampling used pre-set flow controller devices to regulate the sampling flow rate into the canister. The flow controllers allow an integrated sample to be collected without the canister achieving an equilibrium ambient pressure. Sampling was conducted using an evacuated-liter size Summa canister. The flow into the canister is controlled by an orifice to allow approximately 1.5 liters of sample to be collected during each 1-hour sample run for a total of 4.5 liters per three runs.

Table 2-5 lists the VOCs that were analyzed for in each sample.

2.4 ENGINE TEST CYCLE DATA

In order to correlate the aircraft engine and APU emissions data with the engine operation, selected engine test cycle data was compiled by government personnel during testing. The engine test monitoring system at each Test Cell can monitor a variety of engine parameters during engine testing. For the purpose of emissions sampling, a select number of these parameters were monitored during testing for emission factor development. It is important, for example, to distinguish between afterburner settings. The engine operating mode designated as afterburner is comprised of five zones. These zones are classified as one through five and directly correlate to an increase in fuel flow and thrust as the zones increase in value. During this sampling program all engines were tested at zone 1 except the F404-GE-F1D2/400, which was tested in zone 3. These parameters assisted in correlating the

effect of a specific pollutant for a specific engine load condition. The following list is a portion of the data that was compiled by government personnel:

- JP-8 fuel flow at each load
- Engine rpm at each load
- Thrust/horsepower at each load
- Engine pressure ratio (EPR)
- Test cell humidity and temperature.

2.5 JP-8 FUEL SAMPLING AND ANALYSIS

The JP-8 fuel proximate/ultimate analysis and level of nitrogen were determined for each facility to develop a custom F-factor and to document fuel characteristics during emissions testing. Table 2-6 lists the fuel analysis parameters analyzed. Two fuel samples were collected at each testing location during testing. These samples were collected and shipped to the appropriate Government laboratory for analysis.

Table 2-6. JP-8 Fuel Parameters Analyzed

Parameter	Analytical Method
Trace Sulfur	ASTM D-2622
Carbon, Hydrogen, and Oxygen	ASTM D-5291
Trace Nitrogen	ASTM 4629 (chemiluminescence)
Heating Value (Net and Gross)	ASTM D-240
Density	ASTM D-1480
API Gravity/Density	ASTM D-1298

[1] American Society of Testing and Material.

2.6 SITE-SPECIFIC SAMPLING PROTOCOLS

Engine testing was performed within eleven different engine test cells at eight separate base locations: Kelly AFB, TX; Corpus Christi Army Depot, TX; Laughlin, AFB, TX; Tinker AFB, OK; Charleston AFB, SC; Edwards AFB, CA; Naval Aviation

Depot Cherry Point, NC; and Barnes Air National Guard Base (ANGB), MA. The test program was broken down into two major phases: (1) Kelly AFB testing of aircraft engines and APUs and evaluation of results; CCAD engine testing; Laughlin AFB testing; and Tinker AFB engine testing; and (2) Charleston AFB engine testing; Edwards AFB engine testing; Edwards AFB CEM testing; Naval Aviation Depot Cherry Point engine testing; and Barnes ANGB engine testing.

Provided in this section is a summary of how emission sampling was conducted at each test cell. Findings and results are presented in Section 4 of Volume 2.

2.6.1 Kelly AFB, Test Cell 58

Figure 2-1 illustrates the general configuration of test cell 58. As can be seen in Figure 2-1, this exhaust configuration did not facilitate the use of conventional sampling methodologies. Therefore, single point sampling was performed and the flowrate was determined through calculation (carbon balance, tracer gas, F-factor). There are a total of 42 individual exhaust stacks over a 1,400-square-foot (ft^2) area. Airflow into the test cell is the result of the air draw created by the engine during operation. Engine exhaust gas is directed through the augmenter tube, through the perforated section of the augmenter tube into the blast room, and then exits through the multiple stacks. Because of the turbulent flow from the engine exhaust and the circuitous path that the exhaust gases must travel, it was assumed that there would be no stratification of the exhaust gases. Therefore single point sampling would be representative of the entire gas stream.

In order to calculate the exhaust flowrate by tracer gas and determine homogeneity, a tracer gas distribution system was set up inside the test cell near the corner against the augmenter tube wall. As shown in Figure 2-2, four stainless steel tubes (0.25-inch I.D.) were attached to the face of the augmenter tube entrance. Eight tracer gas collection points were selected from the 42 exhaust stacks (Figure 2-3).

Figure 2-1
Test Cell 58
Kelly AFB

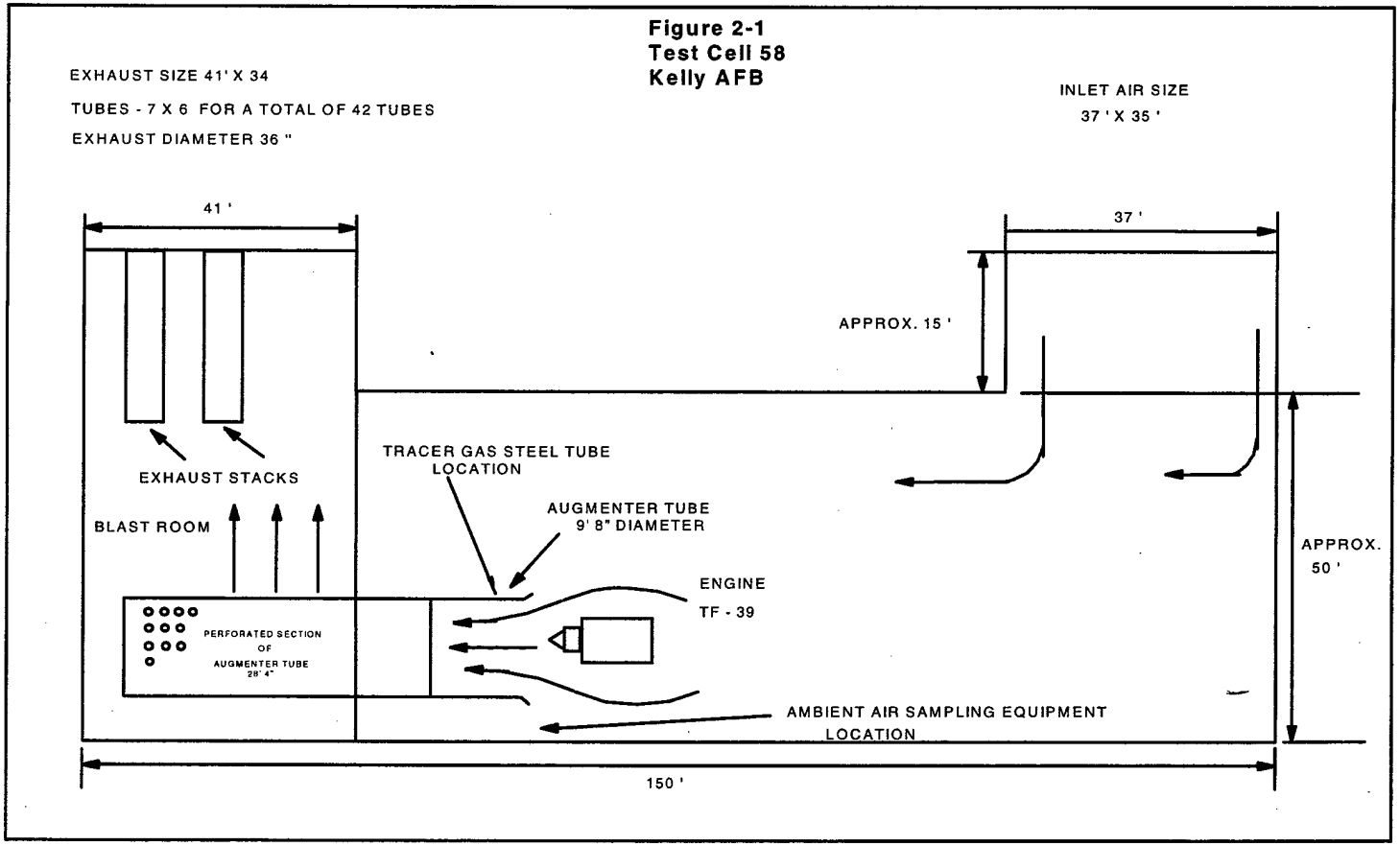


Figure 2-2.
Tracer gas distribution system for the augmenter tube at Laughlin AFB

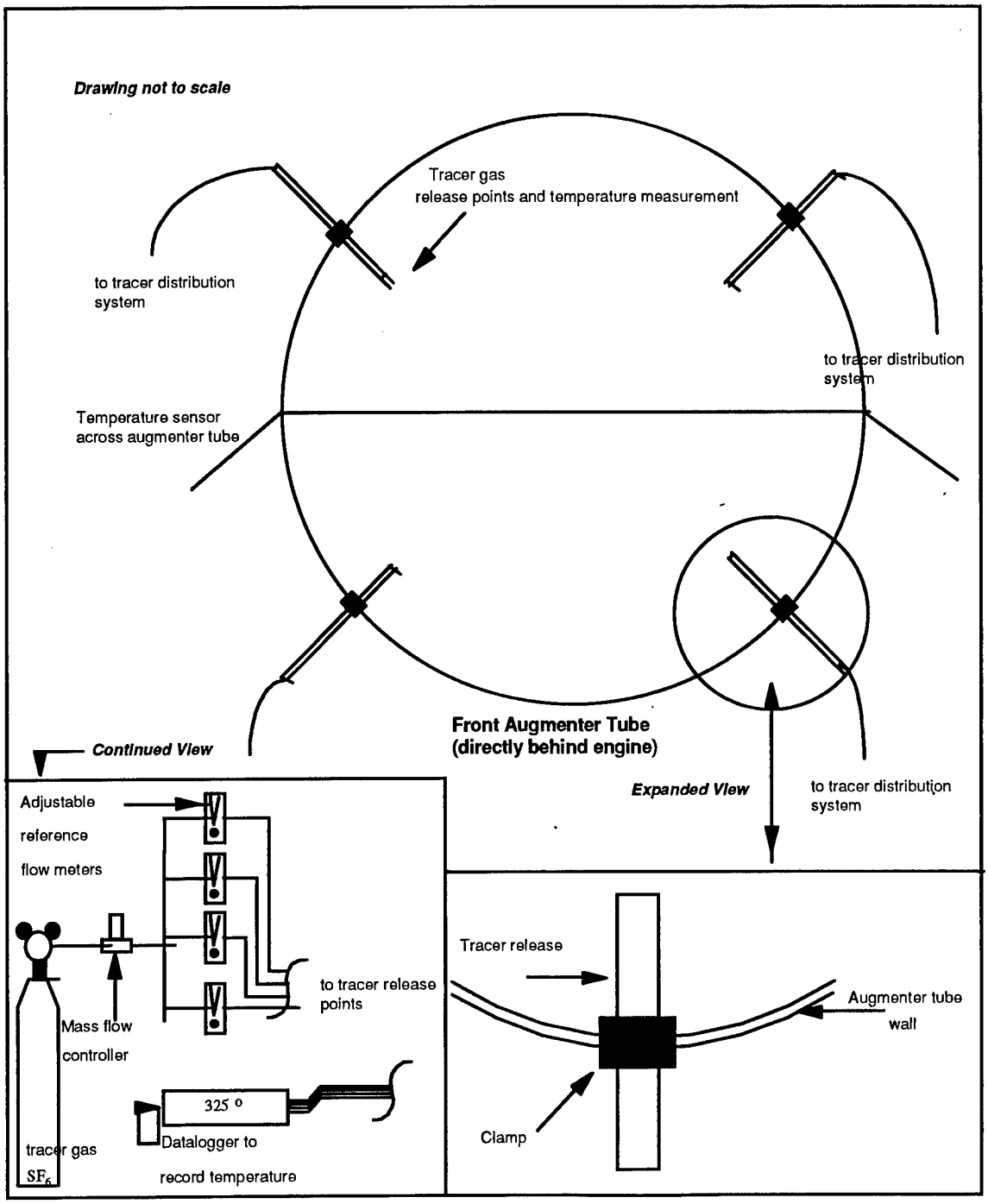
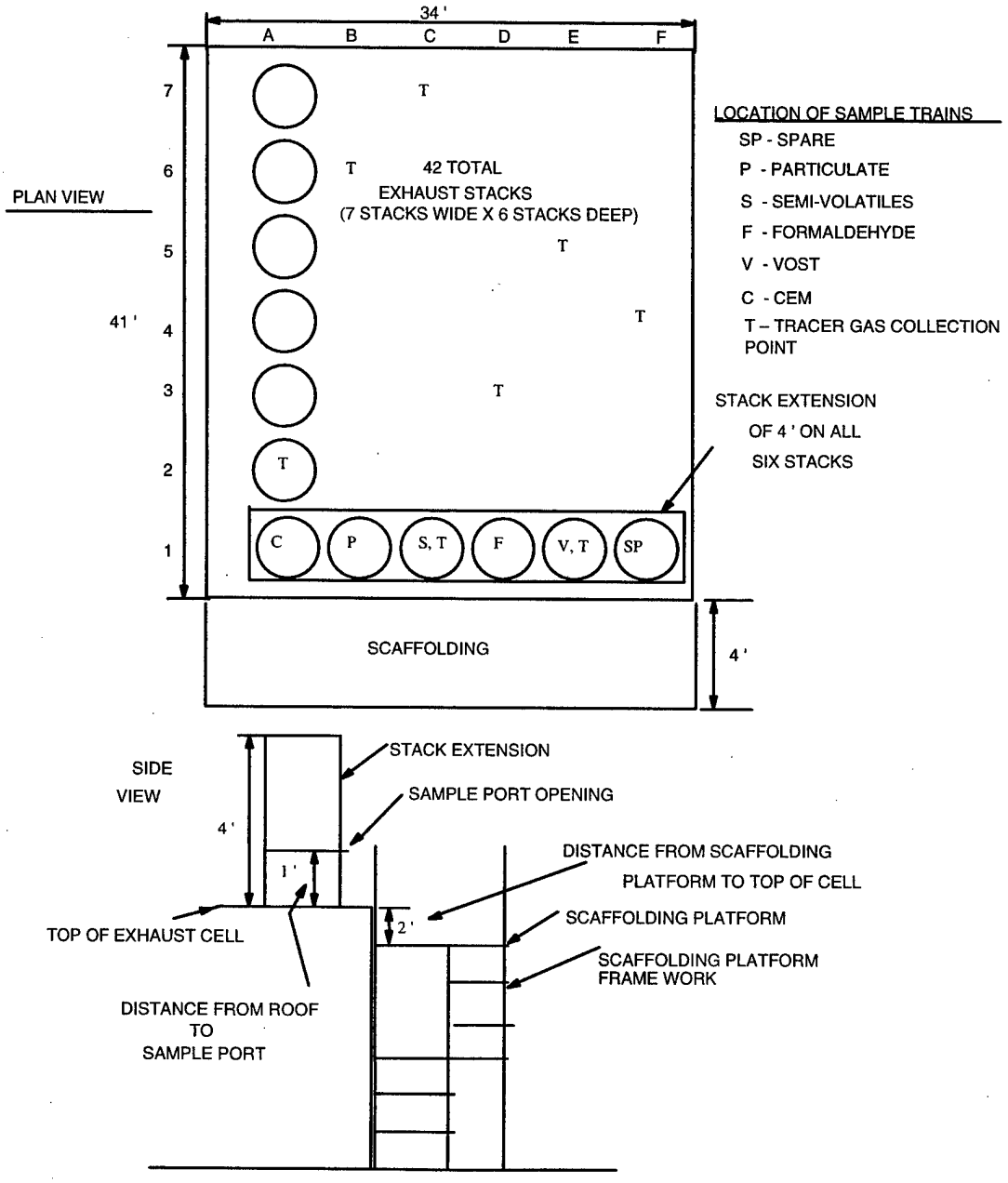


Figure 2-3
Kelly AFB Test Cell 58
Sample Locations



Dedicated pumps set at a constant pull rate were used at each point to collect the SF_6 sample in Tedlar bags during each run for analysis by FTIR. The assumption of a homogeneous exhaust mixture was demonstrated by these tracer gas measurements. The inlet flow rate was measured by 12 hot-wire anemometers that were placed over the air intake screen in a Method 1 configuration. However, as described in Section 2.2.3, due to potential interferences, the data did not correlate and was rejected as suspect. Inlet air pollutant concentrations were determined by placing the ambient samplers in the rear corner against the augmenter tube wall inside the test cell, in a manner that did not present a foreign object damage (FOD) hazard to the engine.

The stacks at the outlet of the blast room are flush with the top of the test cell. This presented both a safety hazard and a sampling dilemma. It was not possible to remain on the temporary test scaffolding during engine operation above idle conditions due to exhaust temperature and velocity. The configuration of the stacks also did not allow the stacks to be traversed in a reasonable amount of time as required by EPA Method 1. Since access to the platform and stacks was limited, all sampling was conducted at a single point for each sample train. In order to minimize wind interference for each sample train (PM, SVOC, VOC, CEM, ALD/KEY), it was necessary to install 4-foot stack extensions with 4-inch-diameter sample ports on six of the exhaust stacks. Figure 2-3 illustrates which exhaust stacks had extensions, the placement of sampling opening, and which pollutants were sampled from each stack. The size and placement of the scaffolding platform are also presented.

Velocity measurements were collected at each sampling point in order to maintain isokinetics. These velocity data were not used to calculate the entire exhaust flowrate since the face of the exhaust could not be traversed. The exhaust flowrate was calculated using either carbon balance, tracer gas, or F-factor.

2.6.2 Kelly AFB, Test Cell 54A

Figure 2-4 illustrates the general configuration of test cell 54A. As can be seen in Figure 2-4, this exhaust configuration did not facilitate the use of conventional sampling methodologies. Therefore, single point sampling was performed and the flowrate was calculated (carbon balance, tracer gas, F-factor). The exhaust outlet terminates in a triangular-shaped stack with rectangular outlets on either side. The engine exhaust is directed through the augmenter tube, into the blast box, which directs the exhaust gases to the roof outlet. Inlet air into the cell is provided by a fan, which was designed to simulate airflow during flight.

Because of turbulent flow from the engine exhaust through the augmenter tube and into the blast box, it was assumed that there would be no stratification of the exhaust gases and that the tracer gases introduced to the system would be mixed equally. Therefore, single point sampling would be representative of the entire gas stream. The tracer gas distribution system was set up inside the test cell behind the rectangular exhaust duct. Four stainless steel distribution tubes (0.25-inch I.D.) were attached to the rear of the short augmenter tube near the blast box in the configuration shown in Figure 2-5. One tracer gas collection point at the exhaust was placed in each of the four sample ports as shown in Figure 2-6. Dedicated pumps set at a constant pull rate were used on each collection point to collect the SF_6 sample in Tedlar bags during each run for analysis by FTIR. The assumption of a homogeneous exhaust mixture was demonstrated by these tracer gas measurements.

The inlet flow rate was measured by anemometers placed over the air intake screen. To facilitate these flow measurements, the 16-inch vacuum line inside the test cell was sealed temporarily during testing to limit air intake to only the main air stream.

Figure 2-4
Test Cell 54A
Kelly AFB

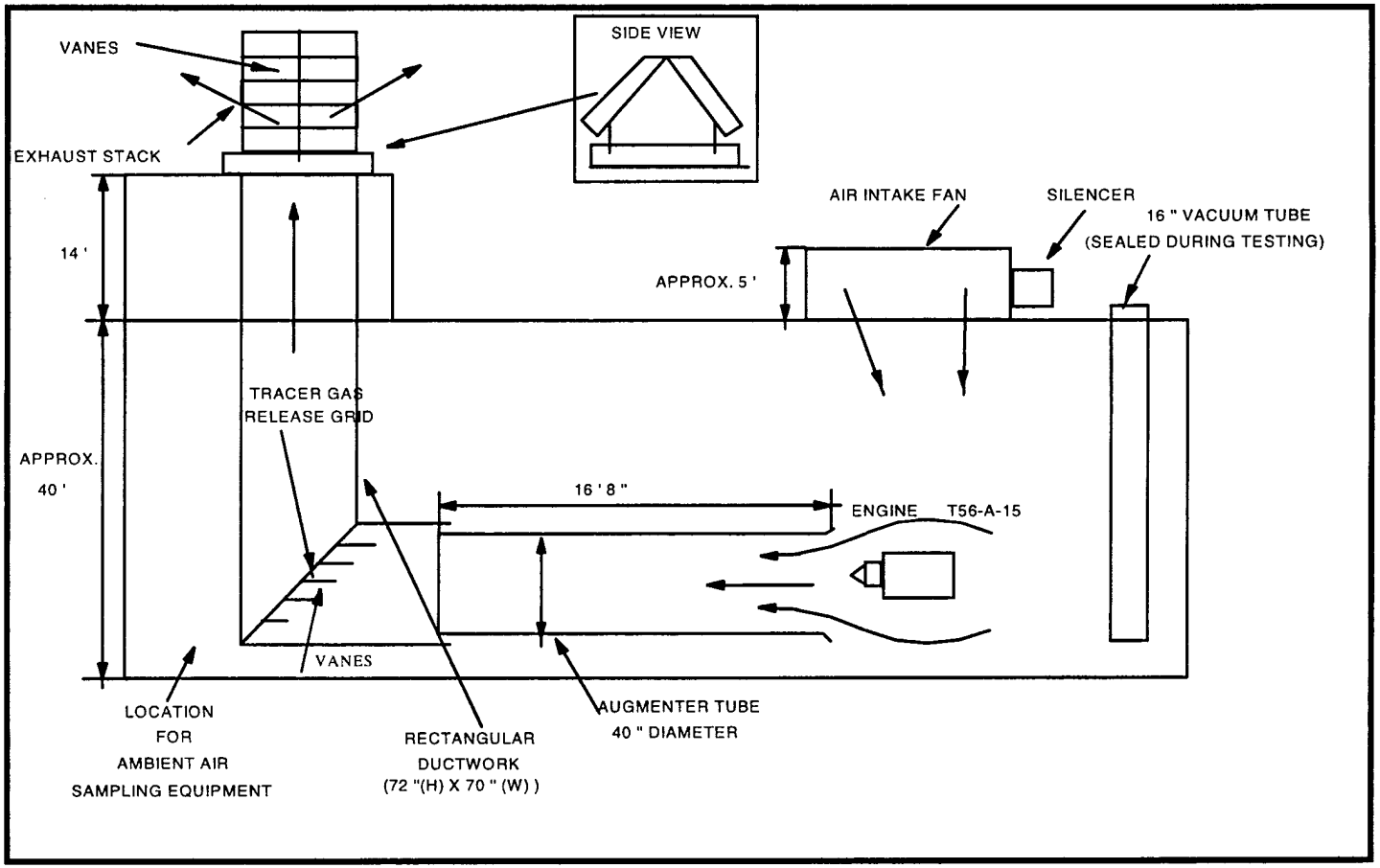


Figure 2-5. Tracer gas distribution system for the augmenter tube at Laughlin AFB

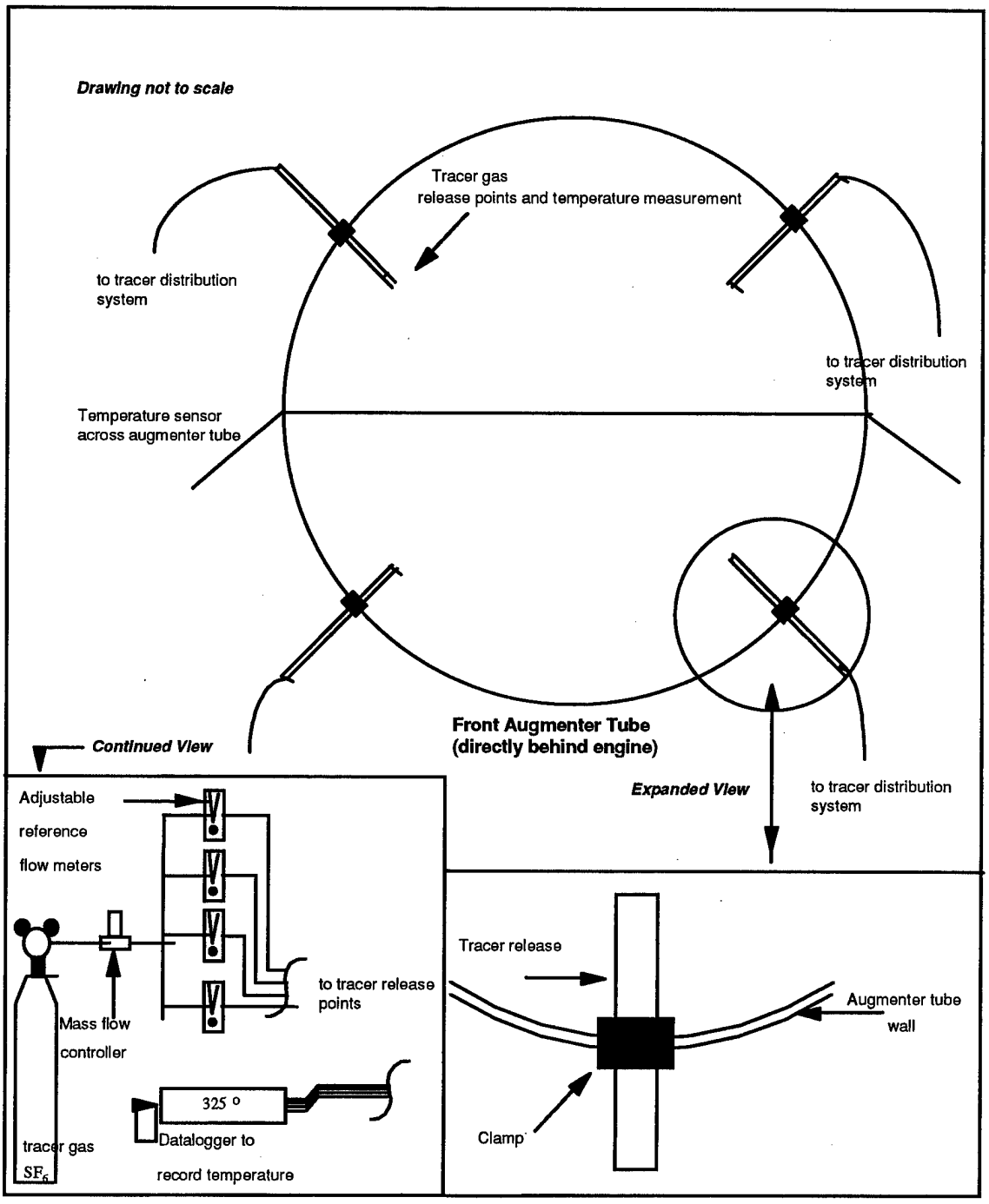
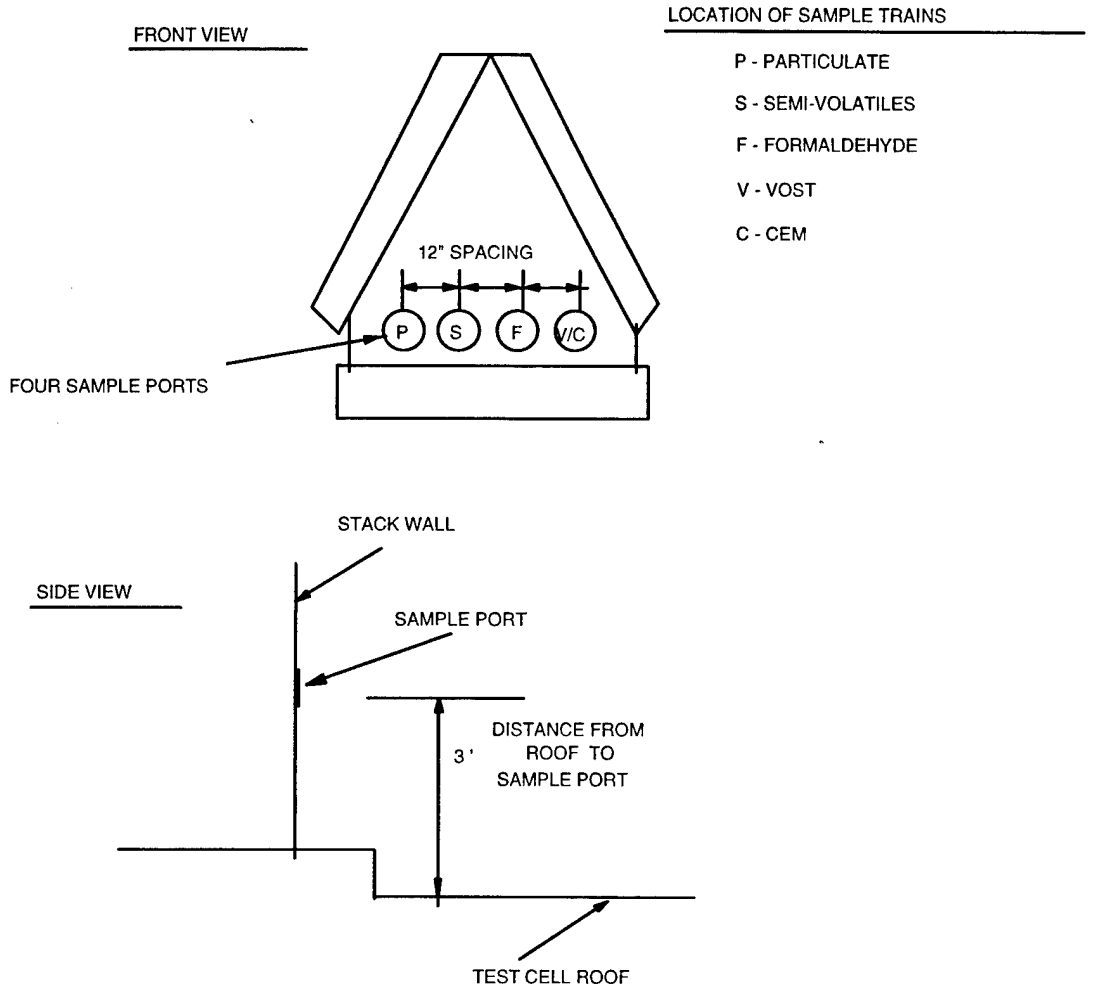


Figure 2-6
Kelly AFB Test Cell 54A
Sample Locations



Again, these flow measurements were considered suspect and rejected due to interferences.

Inlet air pollutant concentrations were determined by placing the ambient samplers behind the rectangular exhaust duct inside the test cell, in a location that did not present a FOD hazard to the engine.

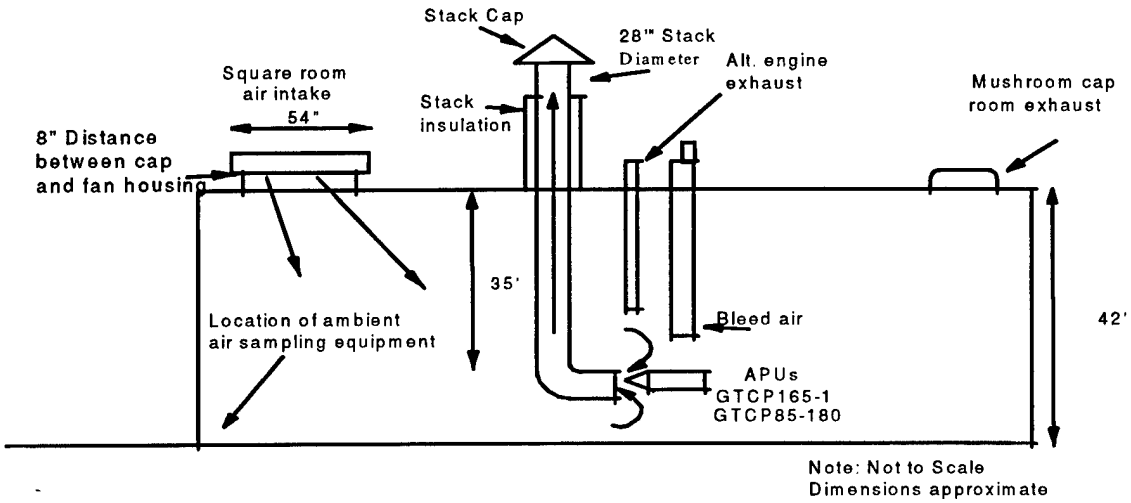
With the triangular exhaust stack it was not possible to remain on the roof during engine operation above idle. Therefore, the exhaust could not be safely traversed as required by EPA Method 1. Since access to the platform and exhaust stack was limited during engine operation, all sampling was conducted at a single point. Exhaust gases could not be sampled from the sides of the triangular stack, because wind interference made it difficult to sample isokinetically and collect a representative sample. Therefore, four sample ports were cut in the side of the exhaust stack. Figure 2-6 illustrates the placement of the sampling ports on the test cell 54A exhaust and which pollutants were sampled from each port.

Velocity measurements were collected at each sampling point in order to maintain isokinetics. These velocity data were not used to calculate the entire exhaust flowrate since the cross section of the exhaust could not be traversed. The exhaust flowrate was calculated using either carbon balance, tracer gas, or F-factor.

2.6.3 Kelly AFB, APU Test Cell

Figure 2-7 illustrates the general configuration of the APU test cell at Kelly AFB. The 28-inch-diameter exhaust outlet terminates on the roof of the APU facility and is shielded by a cap. The configuration of this test cell allowed the use of conventional emission sampling methodologies. Inlet air into the cell is provided by a fan in a square room air intake. APU engine exhaust is directed through the augmenter tube to the roof outlet. Since emissions were exhausted through a single stack, conventional isokinetic sampling methodologies were applicable at this test cell. The exhaust flowrate was determined by direct measurement during sampling.

Figure 2-7
APU Test Facility
Kelly AFB



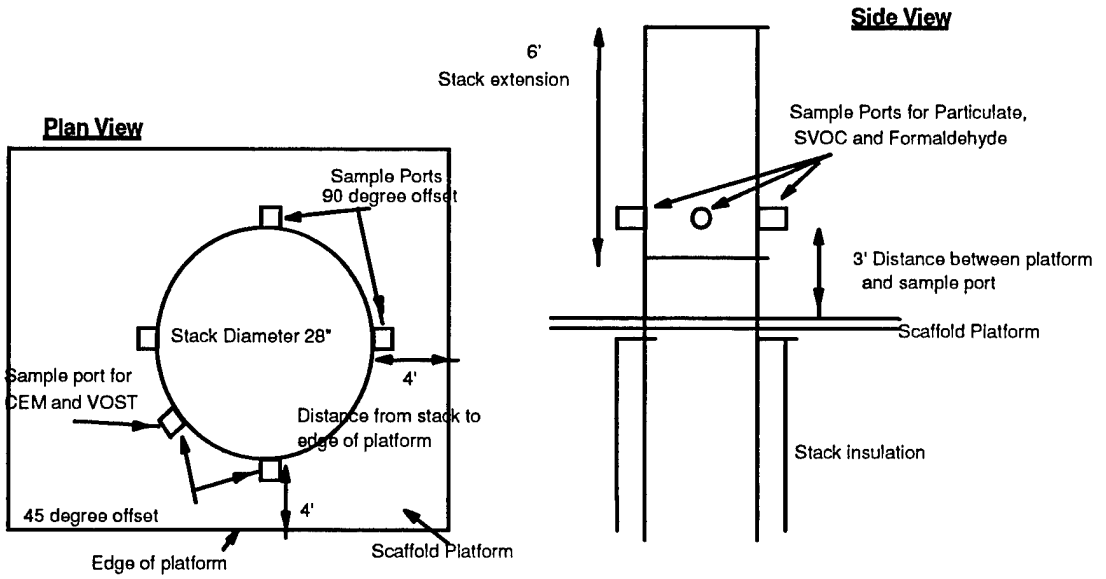
Inlet flow rates were measured by 12 anemometers placed under the test cell air intake. The mushroom cap room exhaust and alternate engine exhaust were sealed temporarily during testing to limit air intake to the main inlet air intake, which facilitated inlet flow measurements. Three anemometers were placed on each of the four faces to this inlet. As discussed previously, the measurements provided by these instruments were considered suspect and were rejected. Inlet air pollutant concentrations were determined by placing the ambient samplers under the air intake inside the test cell, in a location that did not present a FOD hazard to the engine.

The APU test cell stack needed to be temporarily modified so that testing could be performed according to EPA Method guidelines. Figure 2-8 illustrates the modification that was required on the APU stack. The weather cap on the stack was removed, and a 6-foot extension with five sample ports was placed on the stack. Figure 2-9 illustrates the sampling port specifications. The size and placement of the scaffolding platform also are presented in Figure 2-8. Particulate, semivolatiles, and aldehyde and ketone sampling trains were rotated among the four ports offset by 90 degrees during the sample run. It took 5 to 10 additional minutes per traverse to rotate the trains among the sample ports. This added approximately 15 to 30 minutes to each 60-minute sample run and resulted in an overall 75- to 90-minute operational period for the APU per test. All continuous emission monitoring (CEM) parameters and volatile organic sampling trains (VOST) were sampled from the one sample port offset by 45 degrees from the other four sampling ports.

2.6.4 Corpus Christi Army Depot, Test Cell 14

The general configuration of engine test cell 14 at CCAD is illustrated in Figure 2-10. The approximately 44-inch-diameter exhaust outlet terminates on the roof of the test cell facility, which allowed the use of conventional emission test methodologies. Airflow into the cell air intake is the result of the air draw created by the engine during

Figure 2-8
Kelly AFB
APU Test Facility Sampling Locations



Note: Not to Scale
Dimensions approximate

Figure 2-9
Side-View of Sampling Port

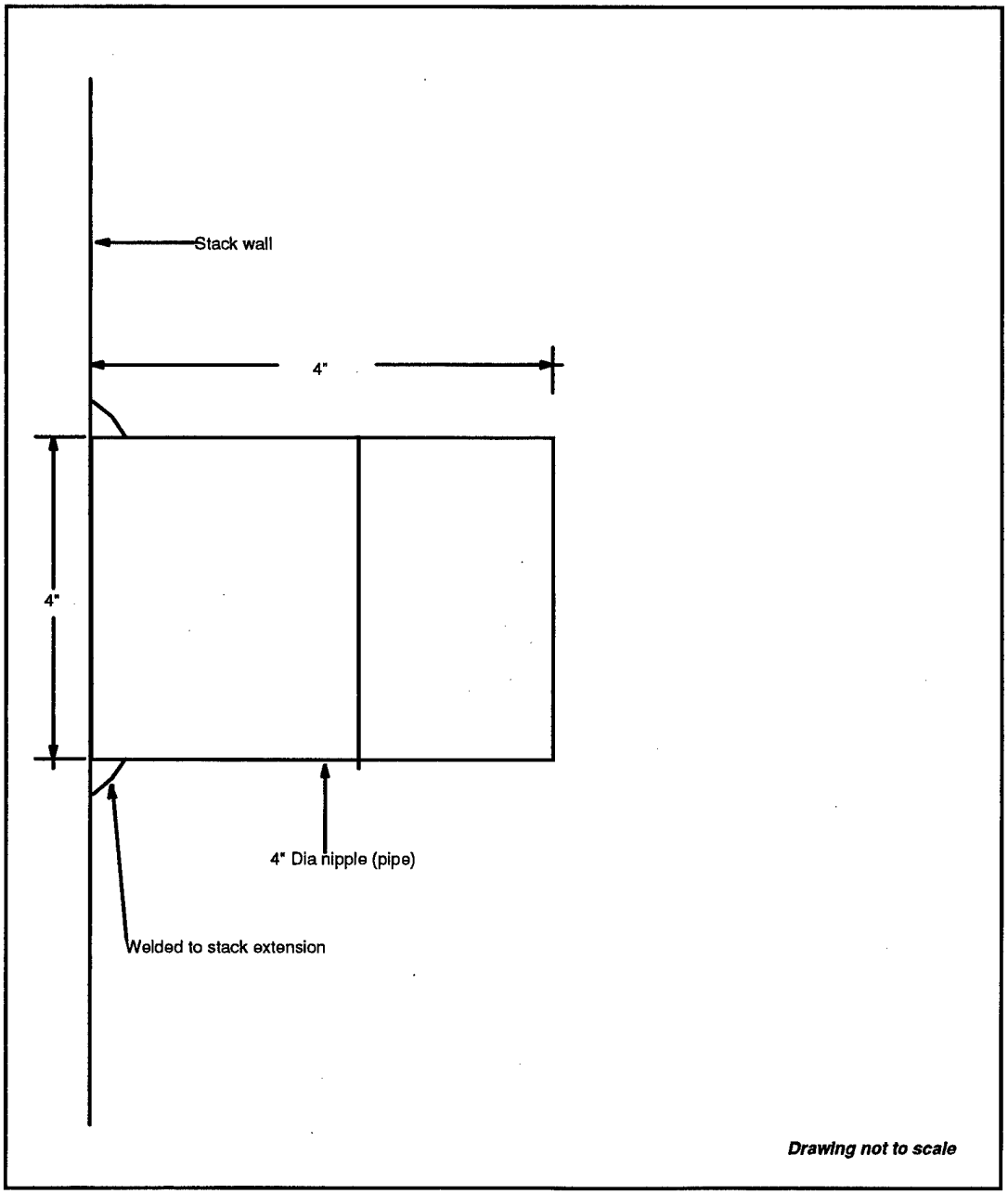
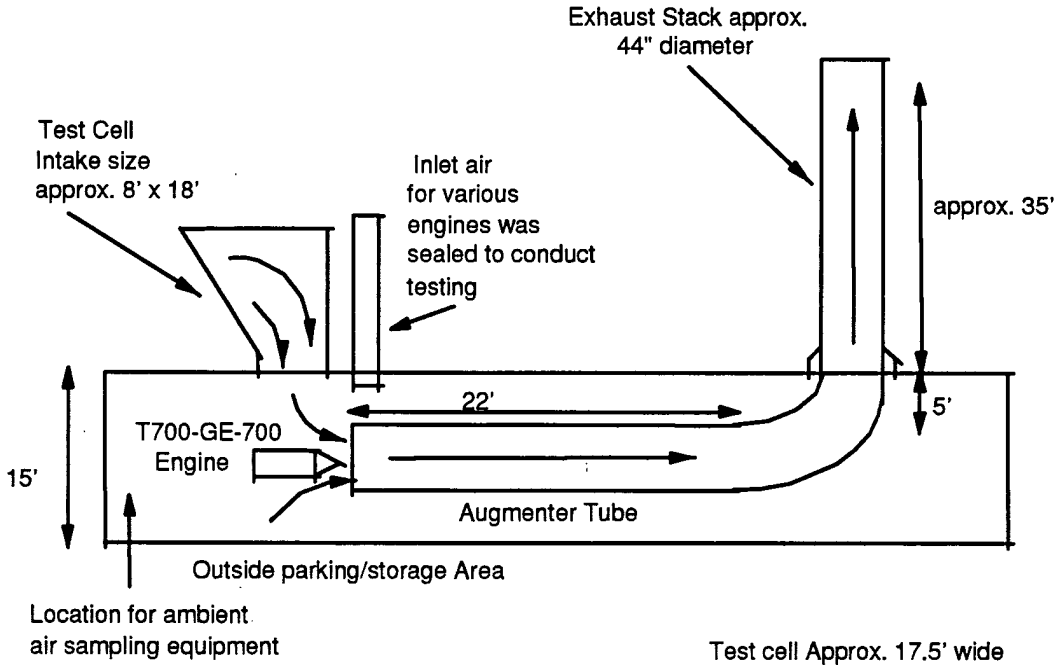


Figure 2-10
Test Cell 14
Corpus Christi Army Depot



Note: Not to Scale
Dimensions approximate

operation. Engine exhaust is directed through the augmenter tube to the roof outlet. Since conventional isokinetic sampling methodologies were applicable at this source, the exhaust flowrate was measured directly from the exhaust stack.

The inlet flow rate was measured by 12 anemometers positioned at the air intake. The inlet air tube for other engine types was sealed temporarily during testing to limit air intake to only the main air intake, which facilitated inlet flow measurements. As discussed previously, however, the inlet airflow numbers are suspect due to interference and have been rejected. Inlet air pollutant concentrations were determined by placing the ambient samplers under the air intake inside the test cell in a location that did not present an FOD hazard to the engine.

Test cell 14 was sampled using conventional isokinetic sampling methodologies; however, the stack was permanently modified so that testing could be performed according to EPA Method guidelines. Figure 2-11 illustrates the modifications to the test cell stack. A total of five sample ports were installed on the stack. Figure 2-12 illustrates the sampling port specifications. The size and placement of the scaffolding platform are also presented in Figure 2-11. Particulate, semivolatiles, and aldehyde and ketone sampling trains were rotated among the four ports which are offset by 90 degrees during the sample run. It took 5 to 10 additional minutes per traverse to rotate the trains among the sample ports. This added approximately 15 to 30 minutes to each 60-minute sample run and resulted in an overall 75- to 90-minute test period for the helicopter engine. All CEM parameters and VOST were sampled from the single sample port at the base of the stack.

2.6.5 Laughlin AFB, Test Cell 18

Figures 2-13 through 2-15 illustrate the general configuration of test cell 18. As can be seen in these figures, this test cell configuration did not facilitate the use of conventional sampling methodologies. Therefore, single point sampling was performed and the exhaust flowrate was determined through calculation (carbon balance, tracer

Figure 2-11
Corpus Christi Army Depot
Test Cell 14 Sampling Locations

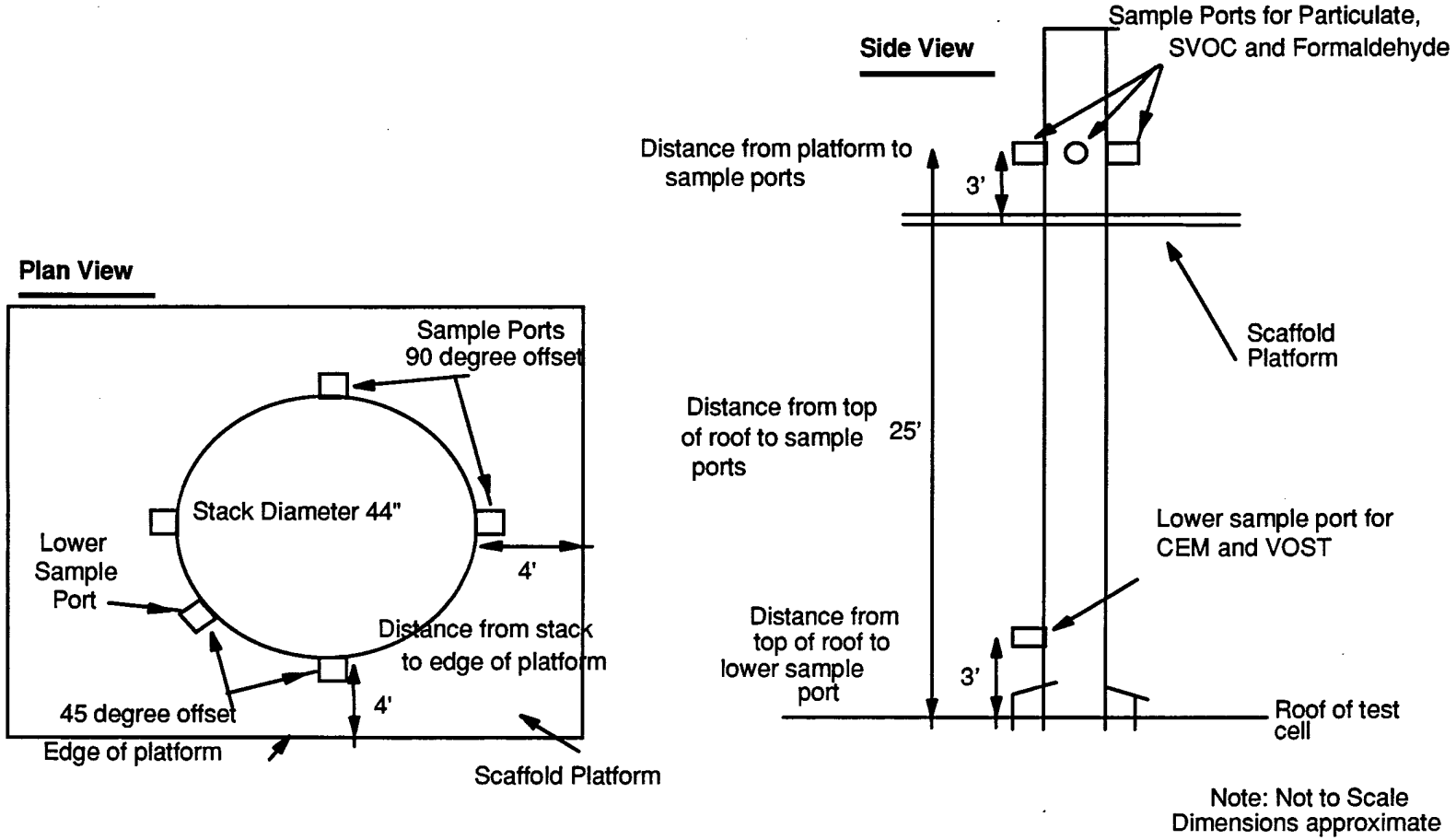


Figure 2-12
Side-View of Sampling Port

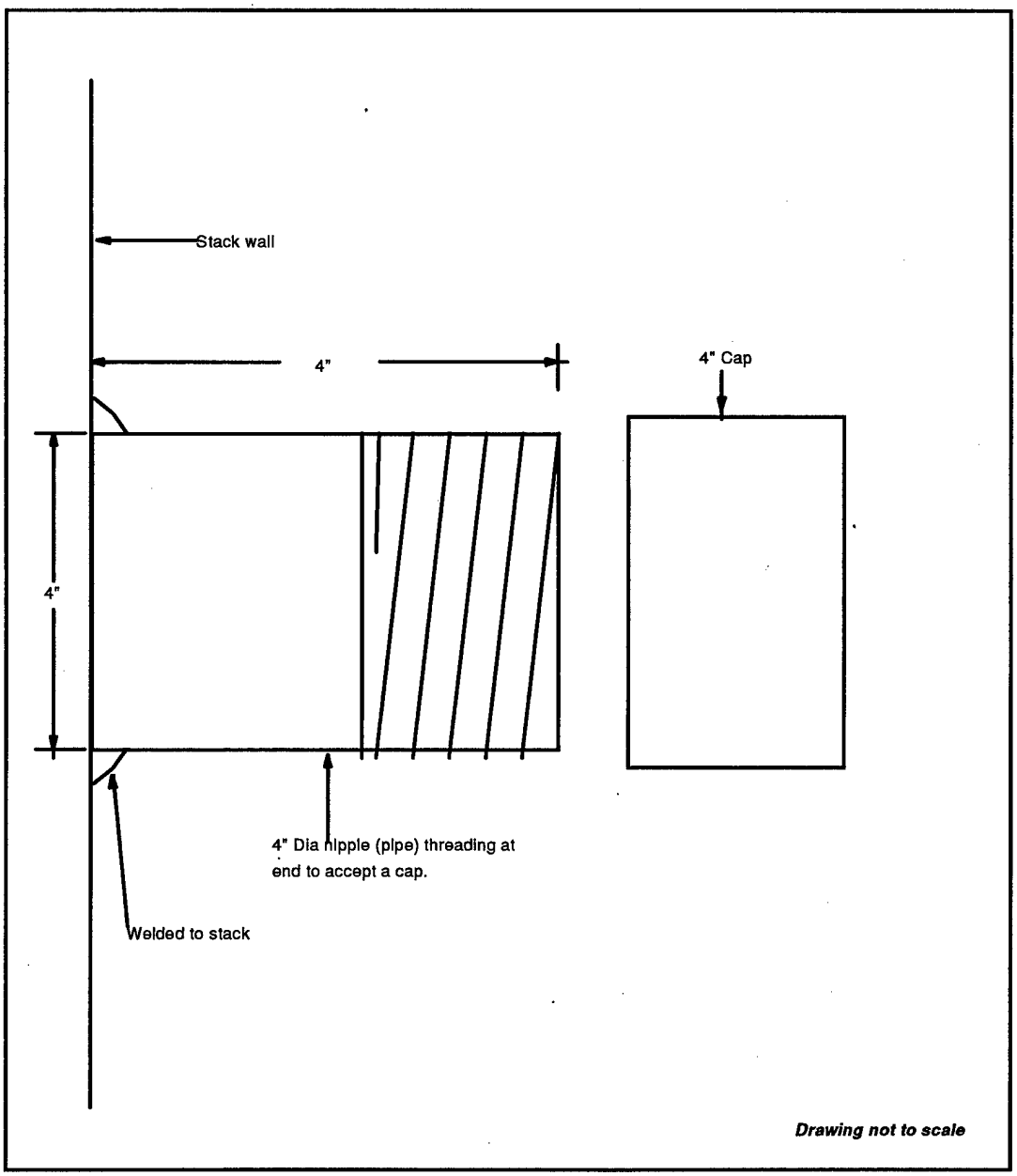


Figure 2-13. Laughlin Air Force Base
Test Cell 18 - Side View

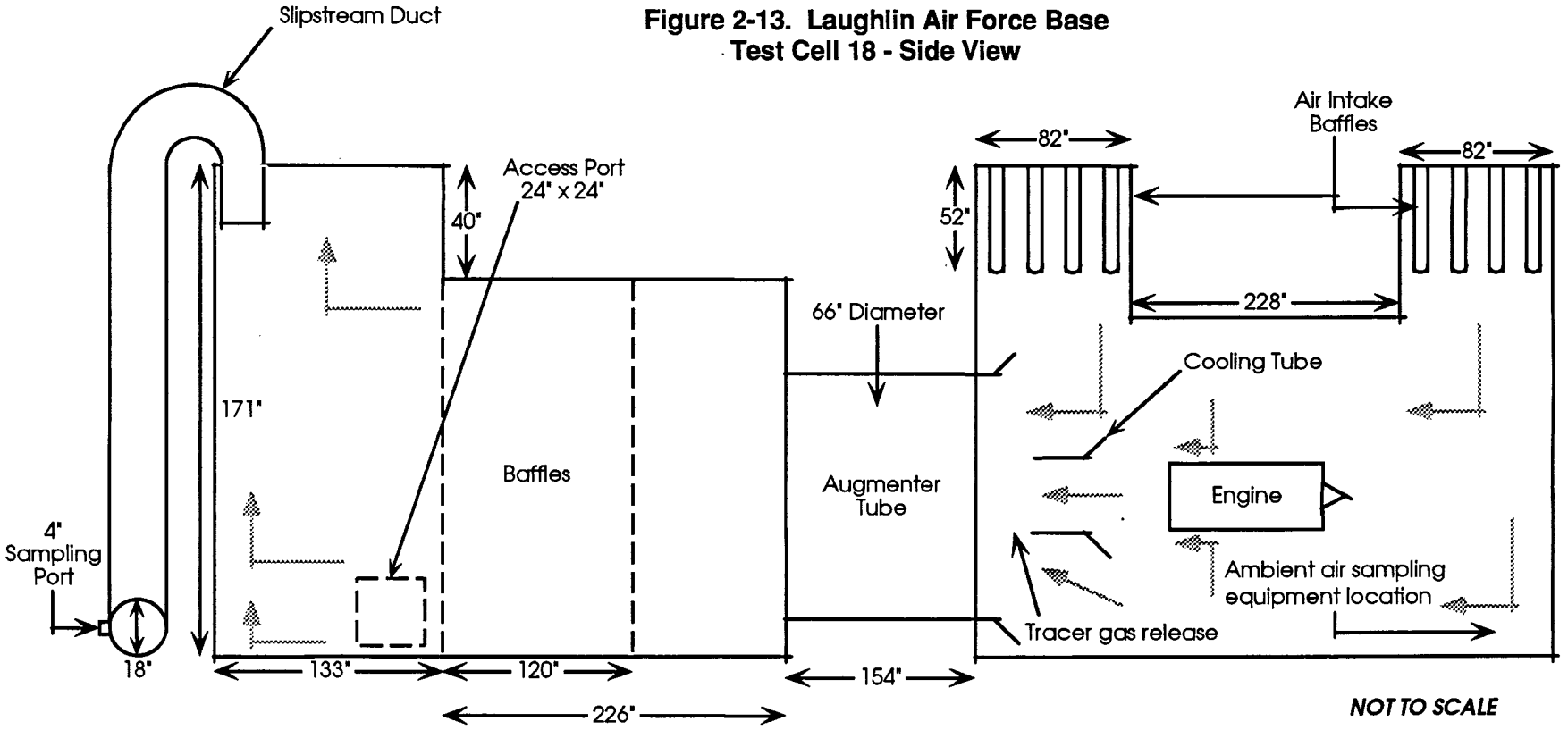


Figure 2-14. Laughlin AFB
Test Cell 18 View Looking to Rear of Test Cell

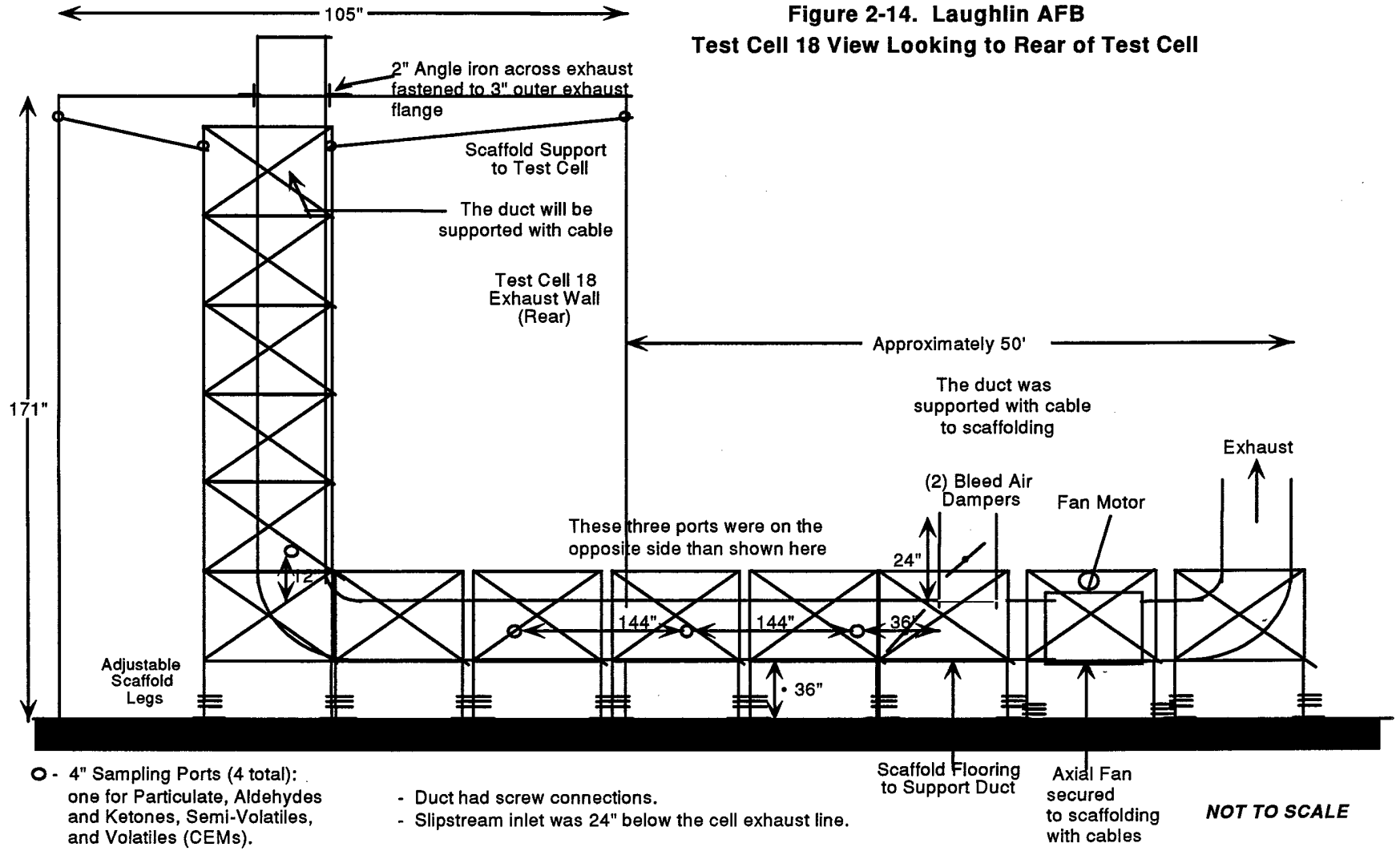
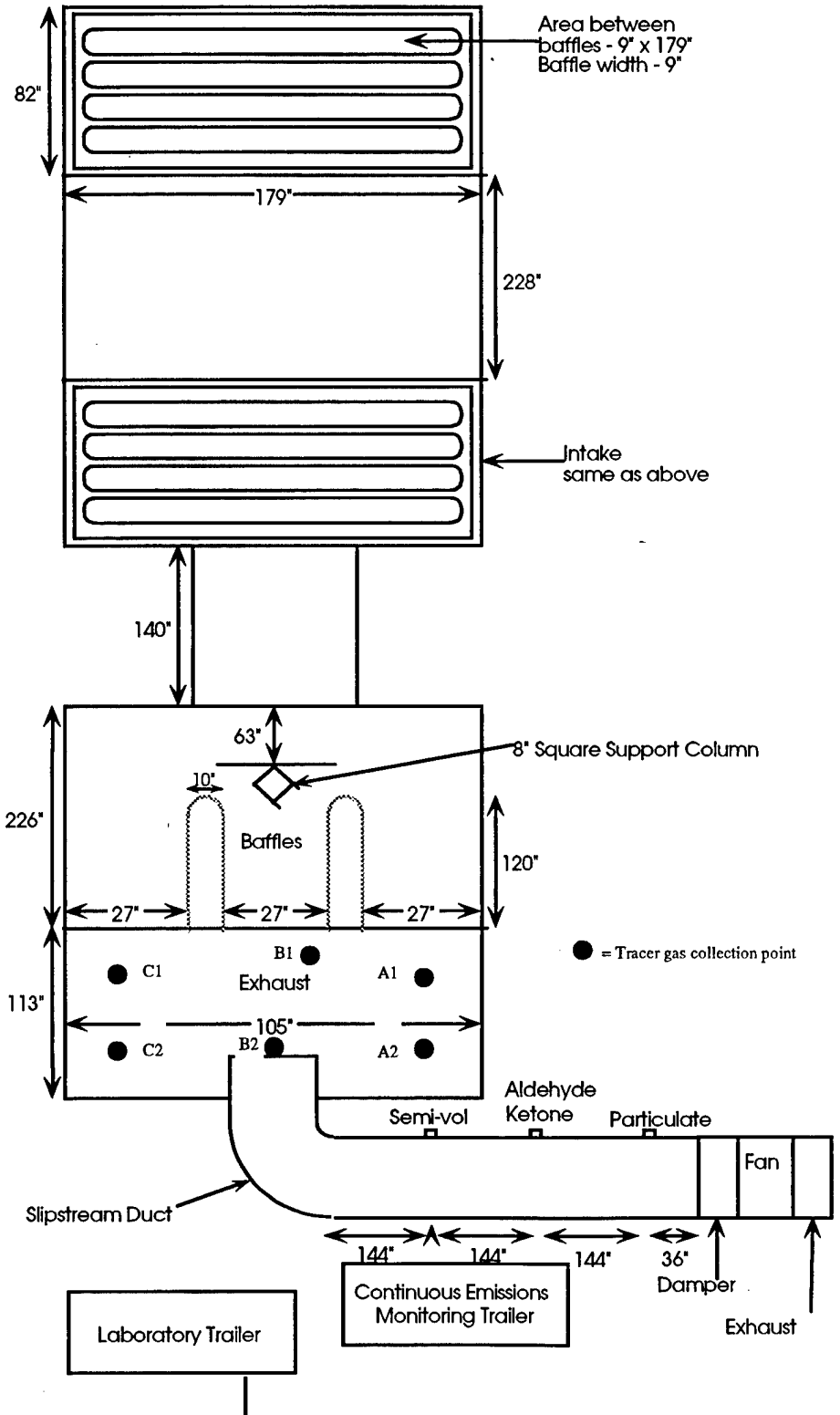


Figure 2-15. Test Cell 18
Laughlin AFB



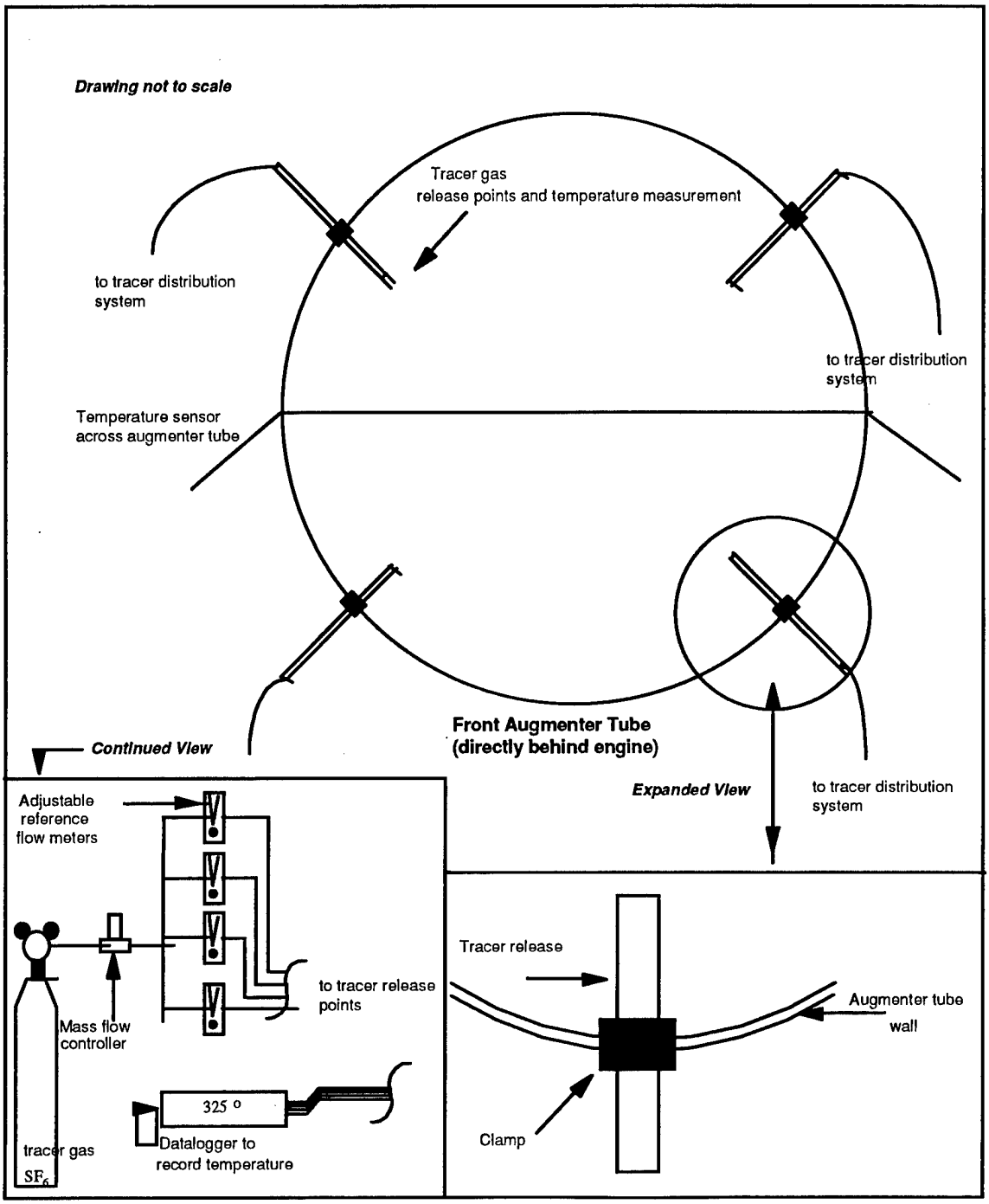
gas, F-Factor). Airflow into the test cell is the result of the air draw created by the engine during operation. Because of the turbulent flow from the engine exhaust and the circuitous path that the exhaust gases must travel, it was assumed that there would be no stratification of the exhaust gases. Engine exhaust gas is directed through an augmenter tube into a blast room, and then exits through a rectangular stack.

In order to verify homogeneity throughout the exhaust cross section, tracer gas was injected to the exhaust stream and sampled at a representative number of points at the outlet. The tracer gas manifold was located at the side of the test cell near the entrance doors. The four stainless steel (0.25-inch I.D.) tracer gas distribution tubes were located at the rear of the cooling tube near the entrance of the augmenter tube as shown in Figure 2-16. Seven of the eight tracer gas collection points were placed over the exhaust using wires strapped across the rectangular opening as shown in Figure 2-15. The eighth was placed in the sampling port also used by the semivolatile sampling train as shown in Figure 2-15. Dedicated pumps set at a constant pull rate were used at each point to collect the SF_6 sample in Tedlar bags during each run for analysis by FTIR. The inlet flow rate was measured by six anemometers placed over each of the front and rear air intakes. These flow rates were rejected due to interferences. Inlet air pollutant concentrations were determined by placing the ambient samplers under the air intake inside the test cell, in a manner that did not present a FOD hazard to the engine.

Since the exhaust configuration did not allow for safe collection of exhaust emission samples, a slipstream sample was collected to quantify engine emissions. A slipstream flow was diverted from the rear of the test cell exhaust to a location outside the exhaust path. The slipstream consisted of 18-inch-diameter, 18-gauge galvanized ductwork. The duct faced into the exhaust flow, traversed along the rear wall, and made a 90-degree bend towards the sampling location.

The slipstream approach is similar to that taken for many pilot-scale air pollution control device studies in industry to determine the applicability of a control device for a

Figure 2-16.
Tracer gas distribution system for the augmenter tube at Laughlin AFB



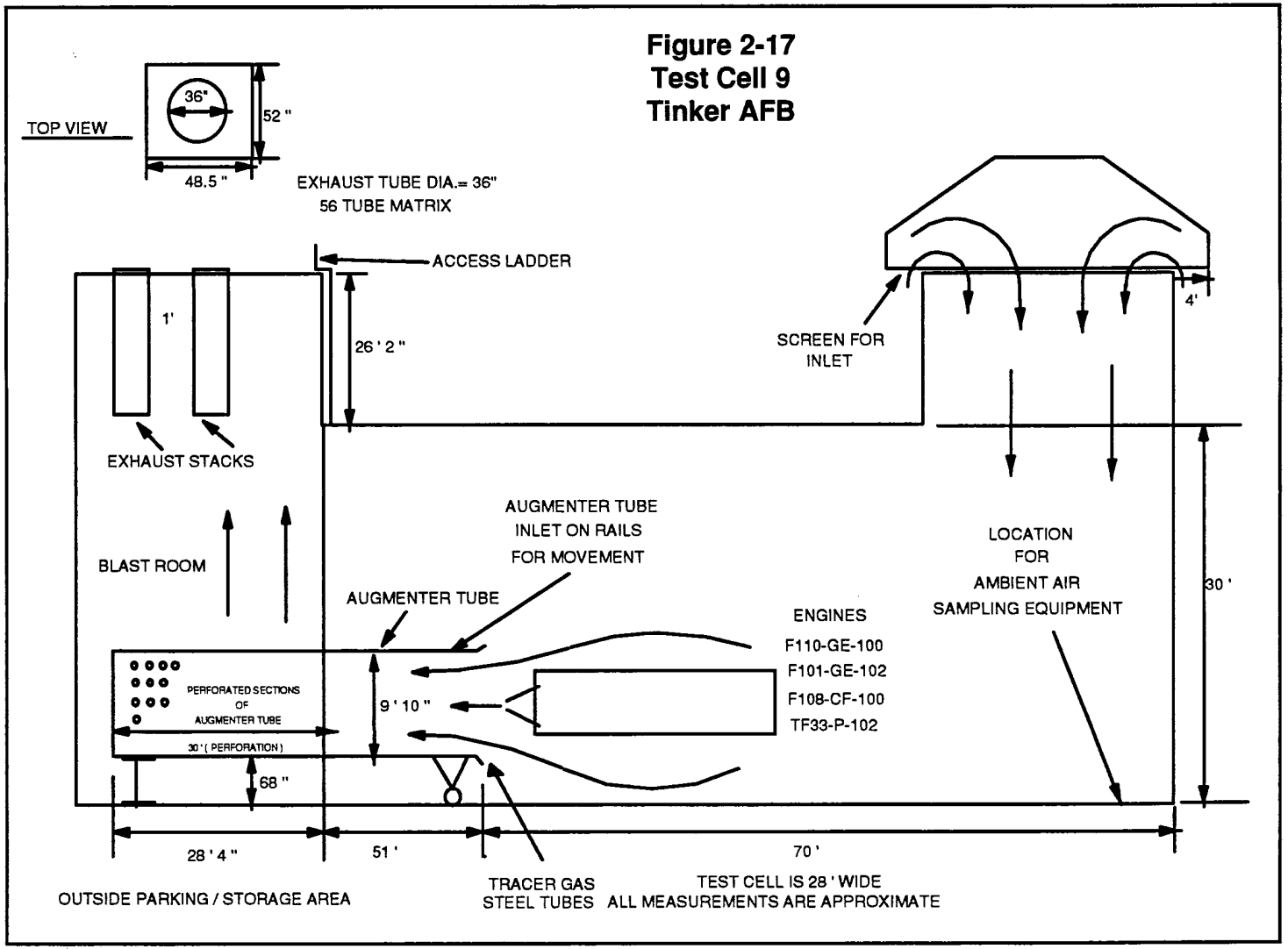
particular gas stream. The slipstream approach was also demonstrated at Edwards AFB, Langley AFB, and Cannon AFB to determine pollutant emission rates from aircraft engines. The slipstream sampling configuration allowed for safe, economical, and unobstructed emission sampling and minimal test cell modifications when compared to alternative scenarios collected from ground level at ports positioned to meet the criteria established in EPA Method 1. A single-speed in-line fan was incorporated into the slipstream. The purpose of the fan was to assure adequate sample flow at the idle engine setting. It was anticipated that at the lower engine setting, the exhaust flow might have bypassed the slipstream since the duct creates a path of resistance. The fan allowed for exhaust to be pulled through the slipstream at a rate comparable to the engine test cell exhaust. A velocity pressure drop was measured simultaneously at the test cell exhaust and in the slipstream. The velocity pressure within the slipstream was balanced to the test cell velocity pressure via damper adjustment. Two bleed air dampers were incorporated into the slipstream for velocity adjustment and gas temperature control to the fan. However, flow within the slipstream duct was not the critical parameter for determining the aircraft engine pollutant emission rate. The objective of the slipstream was to provide for a representative sampling environment for determining pollutant concentration. The tracer gas methodology was used to quantify the test cell exhaust rate.

The slipstream was supported at the test cell exhaust via two angle irons fastened to the cell exhaust. The slipstream duct was fastened to the angles and supported by scaffolding along the rear of the test cell and out to the sampling locations. The slipstream and fan were fastened to the scaffolding. The scaffolding was secured to the test cell during sampling.

2.6.6 Tinker AFB, Test Cell 9

Figure 2-17 illustrates the general configuration of test cell 9 at Tinker AFB. There are a total of 56 individual exhaust stacks over a 1,000-ft^2 area. This

Figure 2-17
Test Cell 9
Tinker AFB



configuration did not facilitate the use of conventional sampling methodologies. The air inlet is also approximately 1,000 ft^2 and is covered by a roof. There is approximately 4 feet of screened overhang between the edge of the roof and the air intake wall. Inlet flow measurements were collected in this overhang area. Engine exhaust is directed through the augmenter tube, through the perforated section of the augmenter tube into the blast room, and then exits through the various stacks. Because of the turbulent flow from the engine exhaust and the circuitous path the exhaust gases must travel, it was assumed that there would be no stratification of the exhaust gases.

In order to verify exhaust homogeneity throughout the cross section, tracer gas was injected to the exhaust stream and sampled at a representative number of points at the outlet. The tracer gas manifold was located against the wall midway downstream inside the augmenter tube. Stainless steel tracer gas distribution tubes (0.25-inch I.D.) were placed through holes in the augmenter tube shell located approximately 20 feet downstream in the augmenter tube. The tubes were placed in the configuration shown in Figure 2-18. Eight tracer gas collection points were selected from the 56 exhaust stacks as shown in Figure 2-19. Dedicated pumps set at a constant pull rate were used at each collection point to collect the SF_6 sample in Tedlar bags during each run for analysis. The assumption of a homogeneous exhaust mixture was demonstrated by SF_6 tracer gas measurements. The inlet flow rate was measured by 12 anemometers placed over the screened overhangs to the air intake. Three anemometers were placed on each of the four faces to the air inlet screen. Once again, the flow rate values measured by this method were rejected due to interferences. Inlet air pollutant concentrations were determined by placing the ambient samplers under the air intake inside the test cell in a location that did not present an FOD hazard to the engine.

The stacks at the outlet of the blast room are flush with the top of the test cell, making it unsafe to remain on the scaffolding during engine operation above idle conditions. This configuration of the stacks also did not allow the stacks to be safely traversed, as required by EPA methodology. Since access to the platform and the

Figure 2-18
Tracer gas distribution system for an augmenter tube

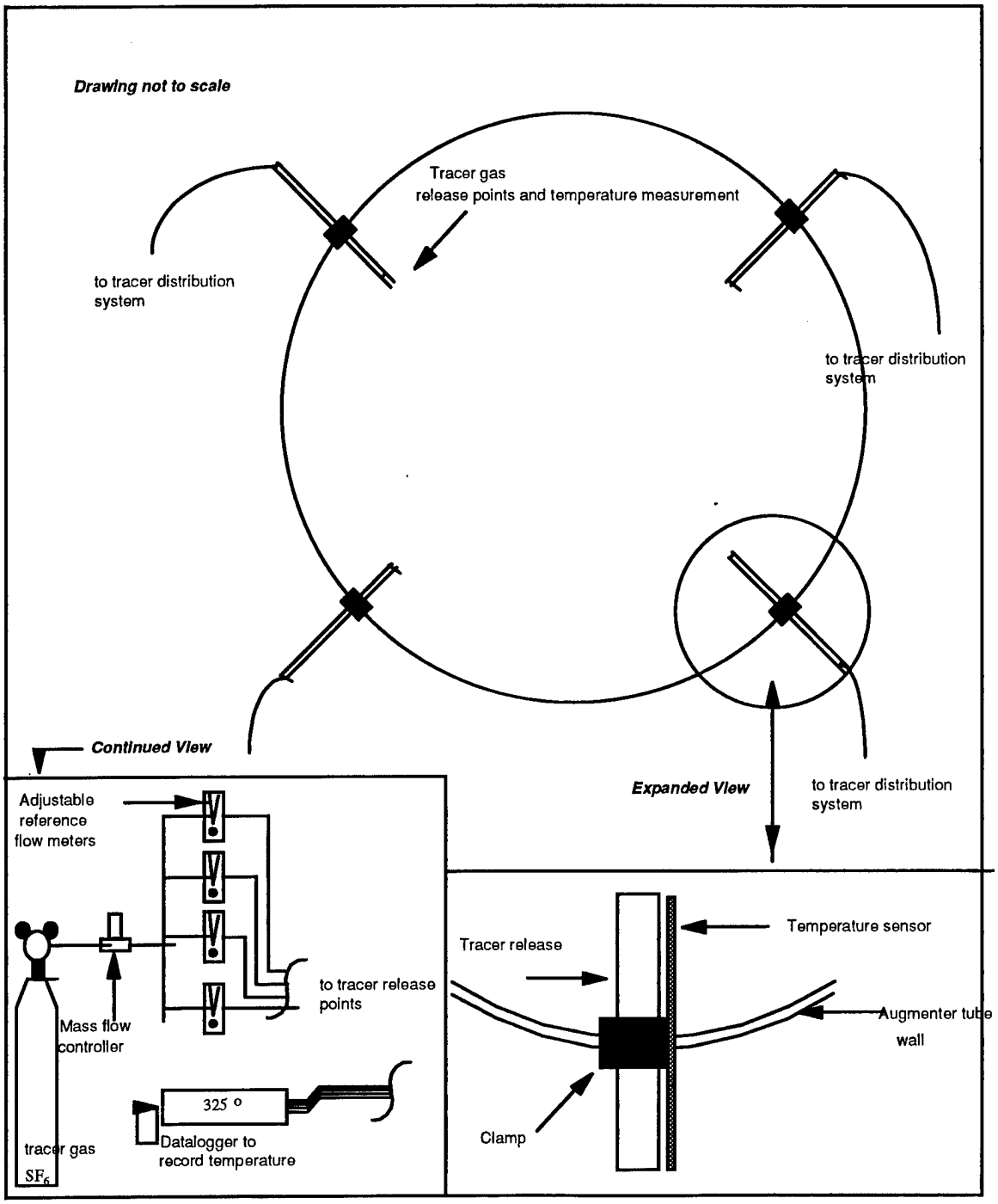
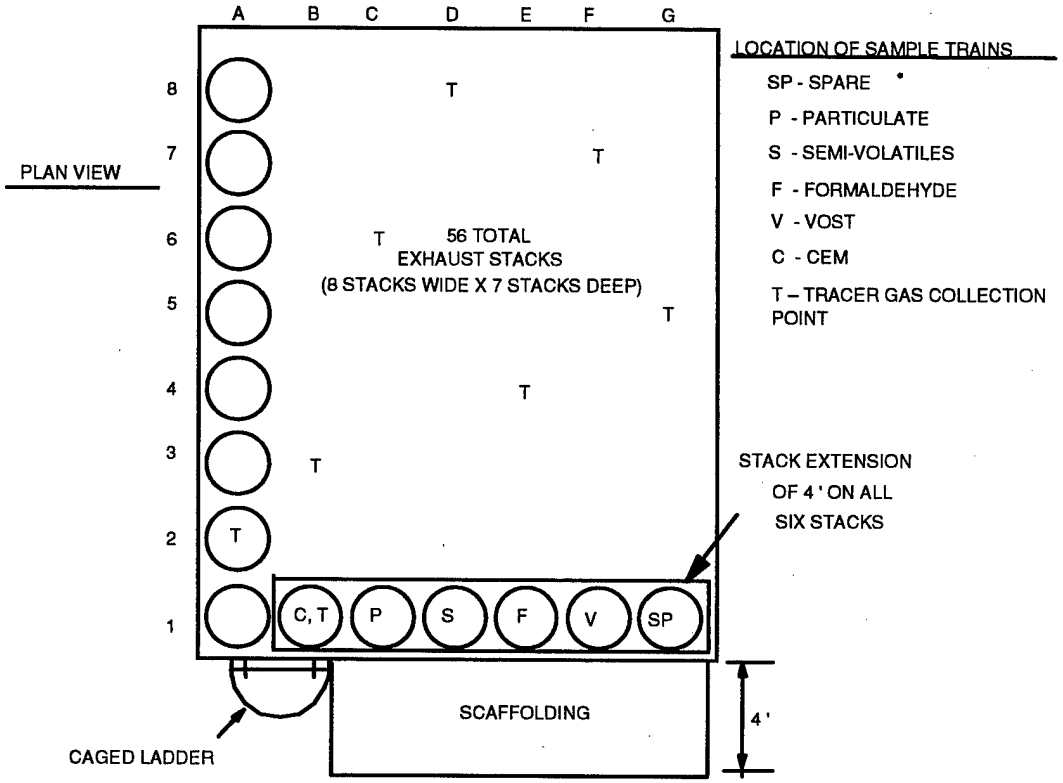
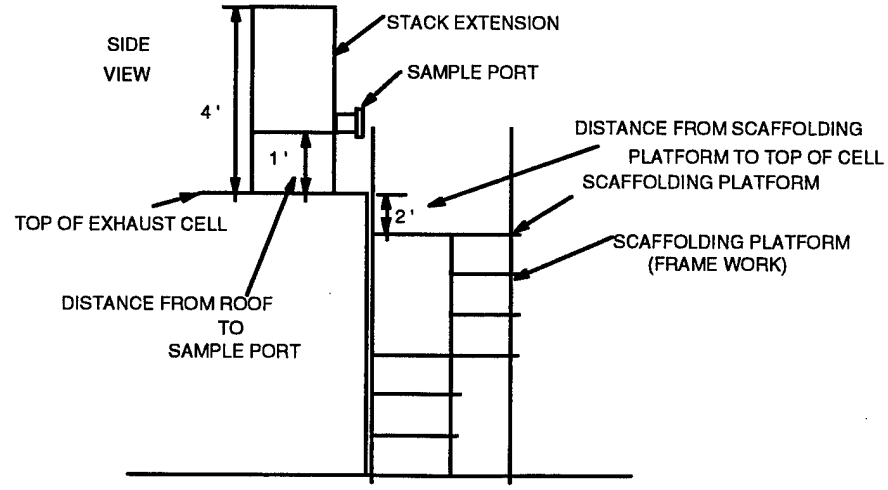


Figure 2-19
Tinker AFB Test Cell 9
Sampling Locations





stacks was limited, all sampling was conducted at a single point for each sampling train. In order to minimize wind interference for each sample train, it was necessary to install 4-foot stack extensions with 4-inch-diameter sample ports on six of the exhaust stacks. Figure 2-19 illustrates which exhaust stacks required extensions, the placement of sampling ports, and which pollutants were sampled from each stack.

Velocity measurements were collected at each sampling point in order to maintain isokinetics. These velocity data were not used to calculate the entire exhaust flowrate since the face of the exhaust could not be traversed. The exhaust flowrate was calculated using either carbon balance, tracer gas, or F-factor.

2.6.7 Charleston AFB, Test Cell

Figure 2-20 illustrates the general configuration of the test cell. The configuration of this test cell does not facilitate the use of conventional isokinetic sampling methodologies. The baffles in this cell impeded a stack traverse required to collect a sample using traditional methodologies. Single point sampling was performed and the exhaust flowrate was determined through calculations (carbon balance, tracer gas, F-factor). Airflow into the test cell is the result of the air draw created by the engine during operation. Inlet flow measurements were not conducted at this facility. Engine exhaust gas is directed through the augmenter tube, through the perforated section of the augmenter tube into the blast room, and then out through the sound-dampening baffles and the rectangular stack. Because of the turbulent flow from the engine exhaust and the circuitous path that the exhaust gases must travel, it is assumed that there will be no stratification of the exhaust gases and that the tracer gases will be mixed equally. The assumption of a homogeneous exhaust mixture was demonstrated by tracer gas measurements. The tracer gas manifold and supporting steel tracer gas distribution tubes were located at the beginning of the augmenter tube as shown in Figure 2-21. The exhaust flow rate was determined by the tracer gas release rate and the measured concentration at the exhaust. Eight tracer gas collection points at the exhaust were configured as shown in Figure 2-22. Tracer gas was drawn

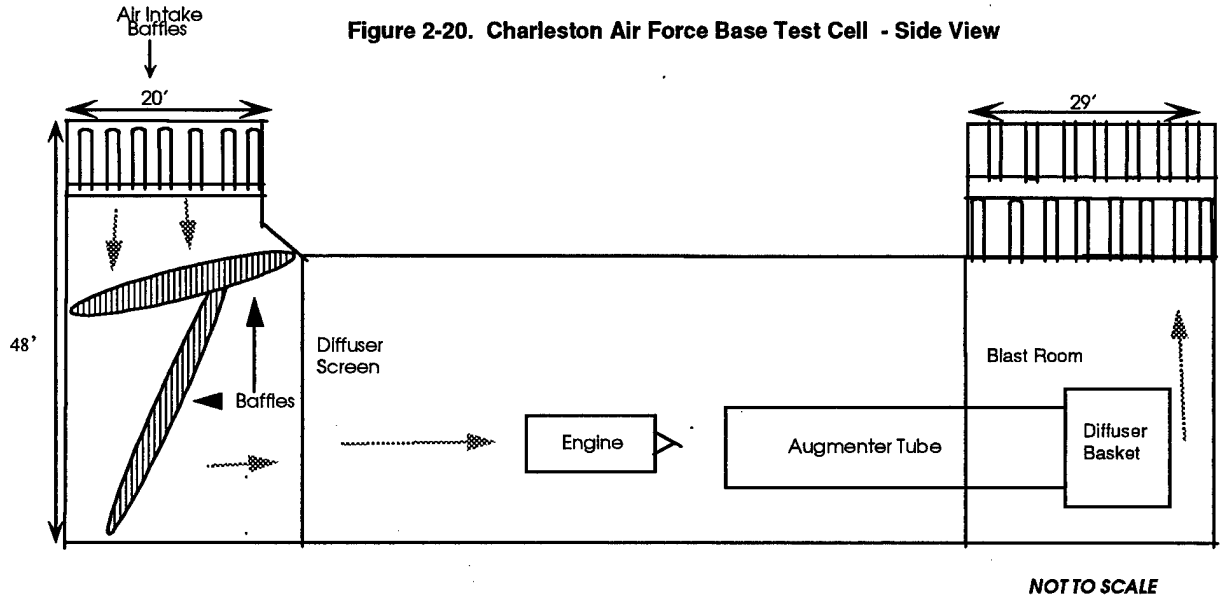


Figure 2-20. Charleston Air Force Base Test Cell - Side View

Figure 2-21

Tracer gas distribution system for an augmenter tube

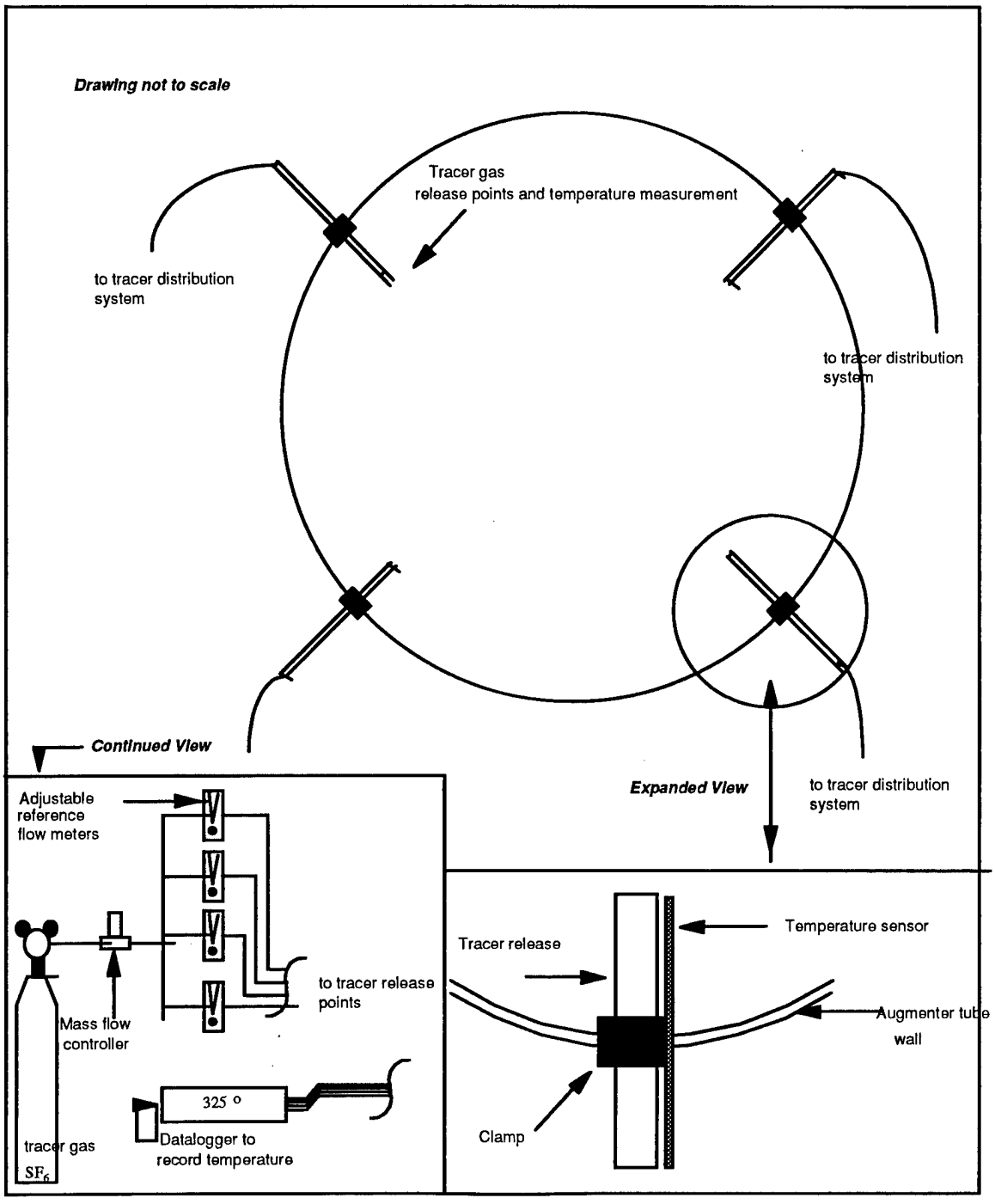
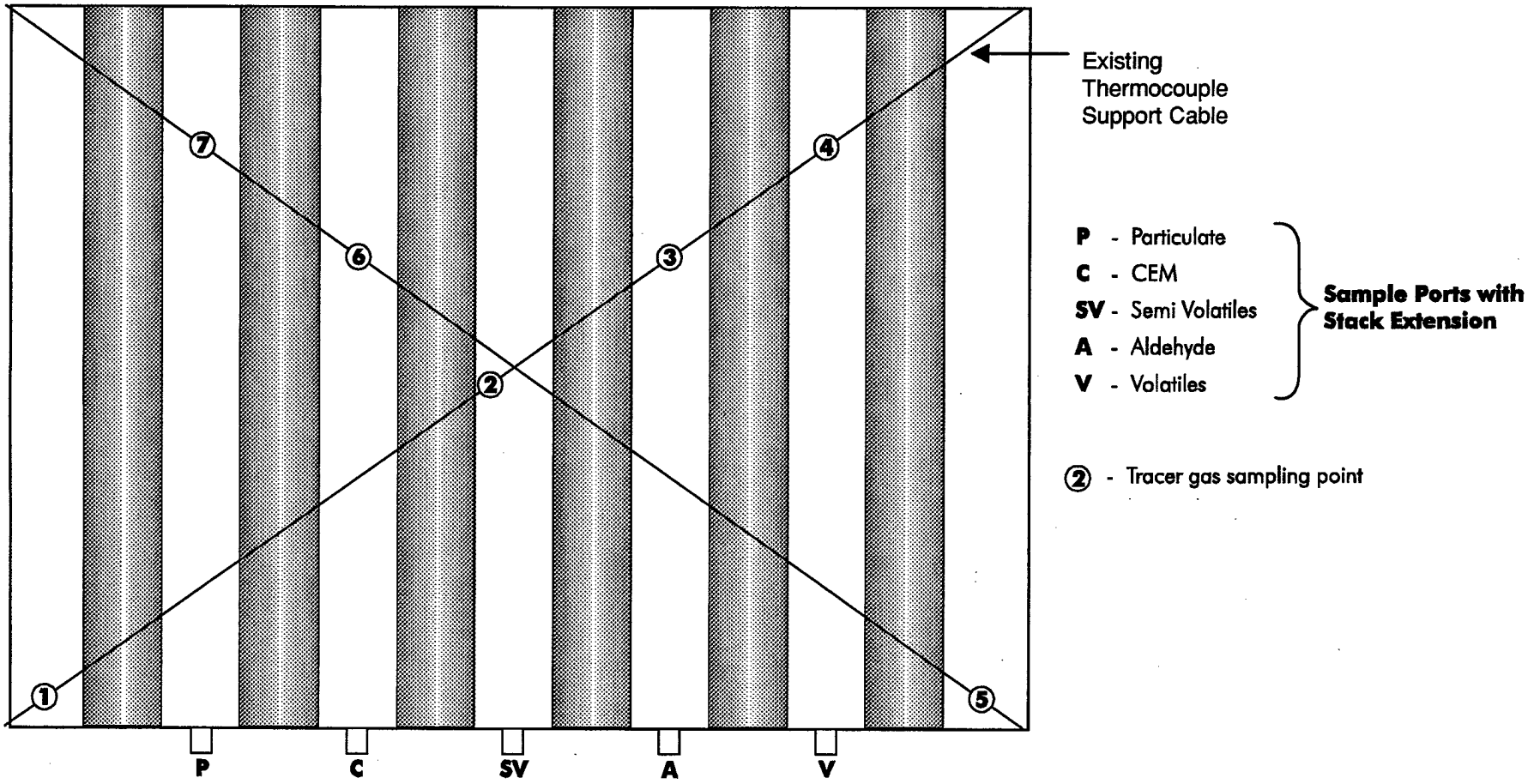


Figure 2-22.Charleston AFB Engine Test Cell
Tracer Gas Sampling Points and Typical Concentrations (ppb) at Approach



through a manifold and heated sample line for independent point sampling and direct analysis as opposed to the tedlar bag analysis used at previous facilities. This improved data collection and provided real time examination. This analysis verified that the single-point sample collection methodology, as opposed to a full exhaust cross section traverse, was representative of the engine emissions.

Inlet air pollutant concentrations were determined by placing ambient samplers under the air intake inside the test cell. The ambient sampling equipment was temporarily installed in a manner that did not present a FOD hazard to the engine.

The rectangular stack at the outlet of the blast room presented both a safety hazard and a sampling dilemma. The configuration of the exhaust stack (29 ft x 25 ft) did not allow it to be traversed, as required by EPA Method 1 methodology. Since access to the platform and stack was limited, all sampling was conducted at a single point between the acoustical baffles. Based on the proposed sampling strategy, it was necessary to install five 4-inch-diameter sample ports on the side of the test cell exhaust stack. Each port allowed access for each sample train. One port was dedicated for each sample type, VOST, semi-volatiles, formaldehyde, particulate matter, and the continuous emission monitor probe. Figures 2-23 and 2-24 illustrate the placement of sampling ports and the support scaffolding.

Velocity measurements were collected at each sampling point in order to maintain isokinetics. These velocity data were not used to calculate the entire exhaust flowrate. The exhaust flowrate was calculated using either carbon balance, tracer gas, or F-factor.

2.6.8 Edwards AFB, Test Cell 4

The general configuration of Test Cell 4 at Edwards AFB is illustrated in Figure 2-25. There are a total of 64 individual exhaust stacks over a 1,500-ft^2 area. This configuration did not facilitate the use of conventional emission sampling

Figure 2-23. Charleston AFB, Engine Test Cell Exhaust Top View

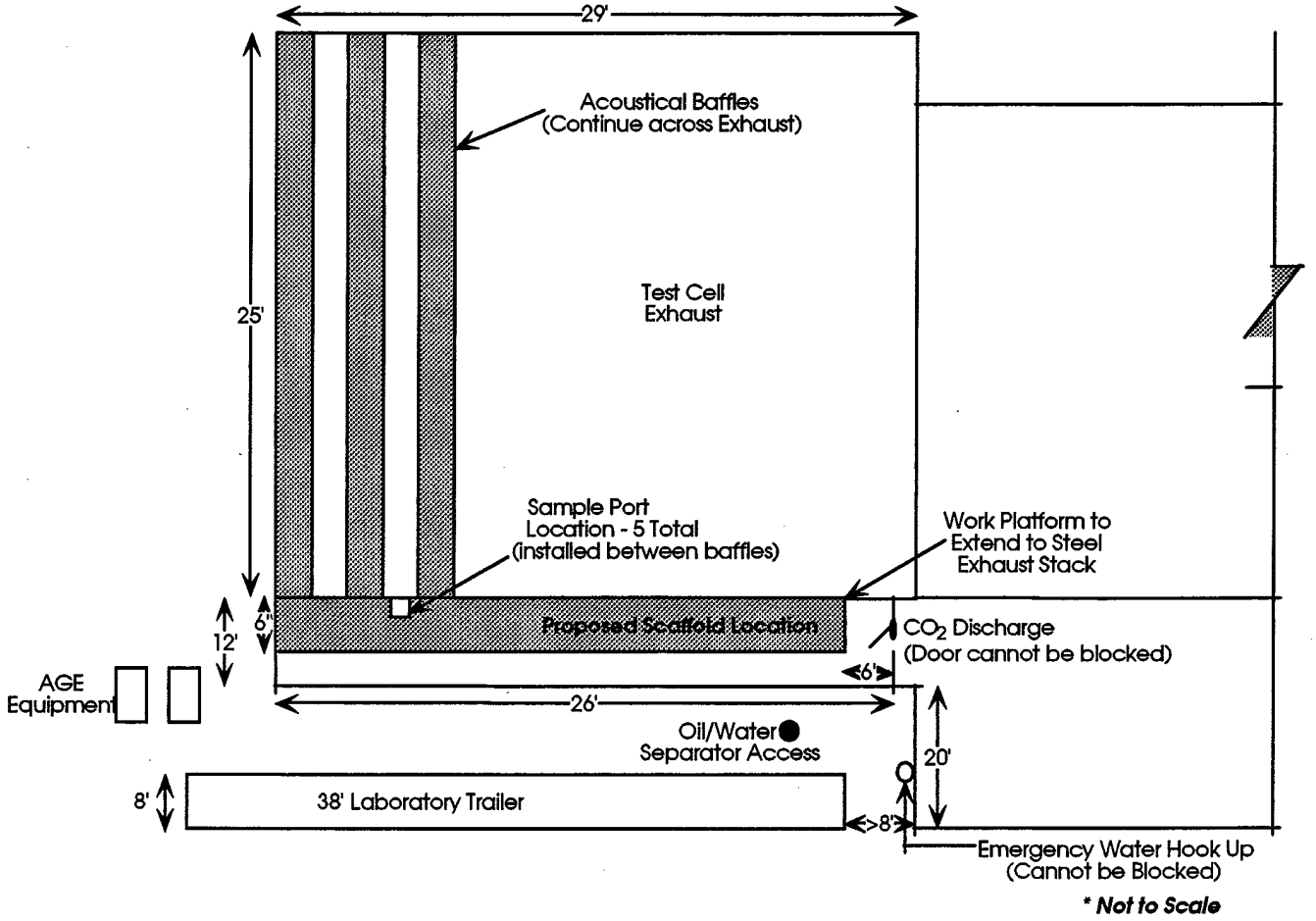


Figure 2-24. Charleston AFB, Engine Test Cell Exhaust Side View

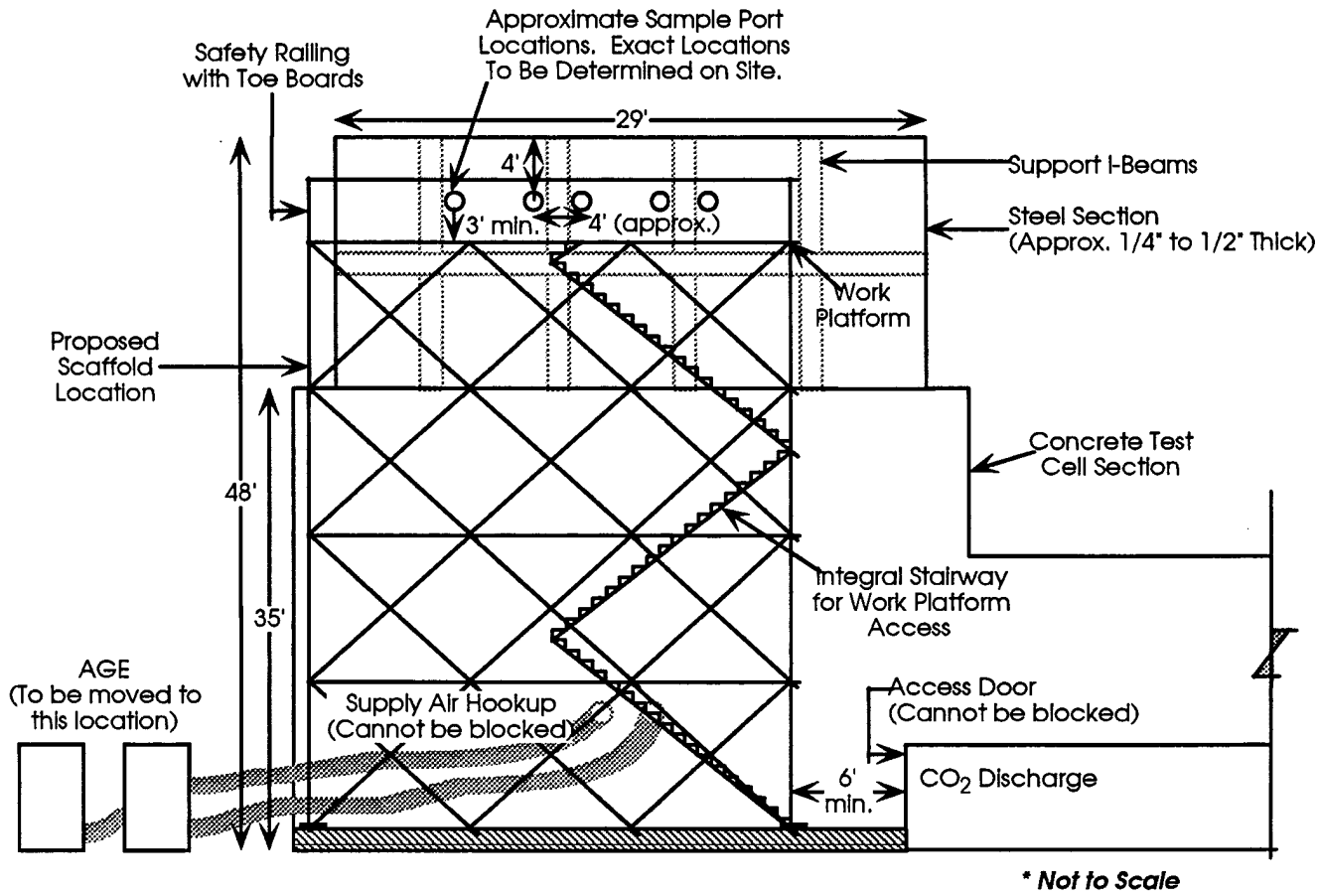
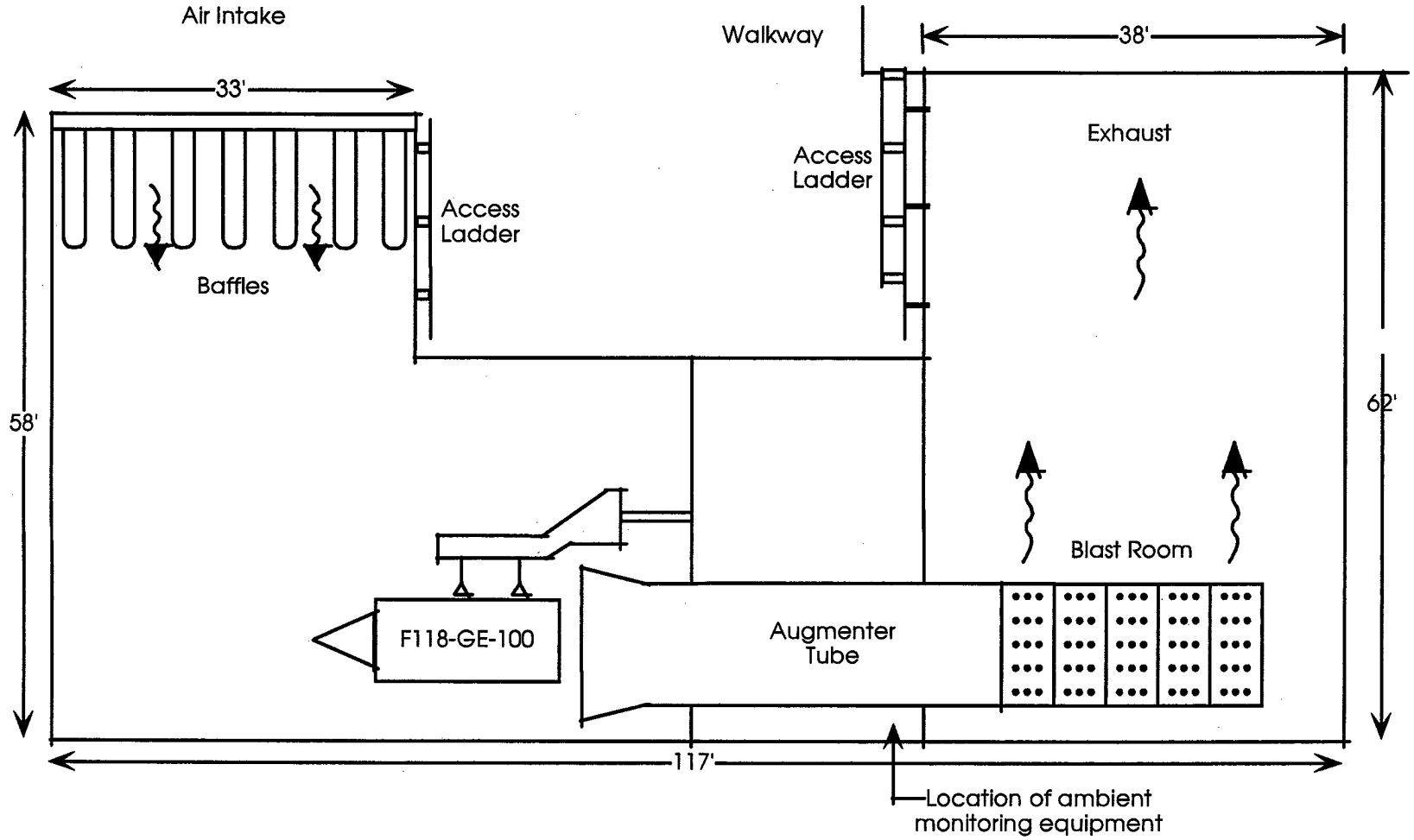


Figure 2-25. Test Cell 4 at Edwards Air Force Base - Side View



methodologies. Airflow into the test cell results from air draw created by the engine during operation. Engine exhaust gas is directed through the augmenter tube, through the perforated section of the augmenter tube into the blast room, and then out through the exhaust stacks. Because of the turbulent flow from the engine exhaust and the circuitous path that the exhaust gases must travel, it was assumed that there was no stratification of the exhaust gases.

The assumption of a homogeneous exhaust mixture was demonstrated by tracer gas measurements. The tracer gas manifold and supporting steel distribution tubes were located at the beginning of the augmenter tube as shown in Figure 2-26. The exhaust flow rate was determined by the tracer gas release rate and the measured concentration at the exhaust. Eight tracer gas collection points at the exhaust were configured as shown in Figure 2-27. Tracer gas was drawn through a manifold and heated sample line for independent point sampling and direct analysis as opposed to the tedlar bag analysis used at previous facilities. This provided real time examination. The analysis verified that the single point sample collection methodology was representative of the engine emissions.

Inlet air pollutant concentrations were determined by placing the ambient samplers under the air intake inside the test cell. The ambient sampling equipment was temporarily installed in a manner that did not present a FOD hazard to the engine.

The stacks at the outlet of the blast room are flush with the top of the test cell. It was not possible to remain on the scaffolding during engine operation above idle conditions. The configuration of the stacks did not allow them to be traversed, as required by EPA methodology. Since access to the platform and stacks was limited, all sampling was conducted at a single point. The termination of the blast room stacks at the top of the test cell could have made it difficult to collect a representative sample due to wind interference. It was necessary to install stack extensions with a 4-inch-diameter sample port on five of the exhaust stacks. Figure 2-27 illustrates the exhaust stacks that had extensions installed and which pollutants were sampled from each stack.

Figure 2-26
Tracer gas distribution system for an augmenter tube

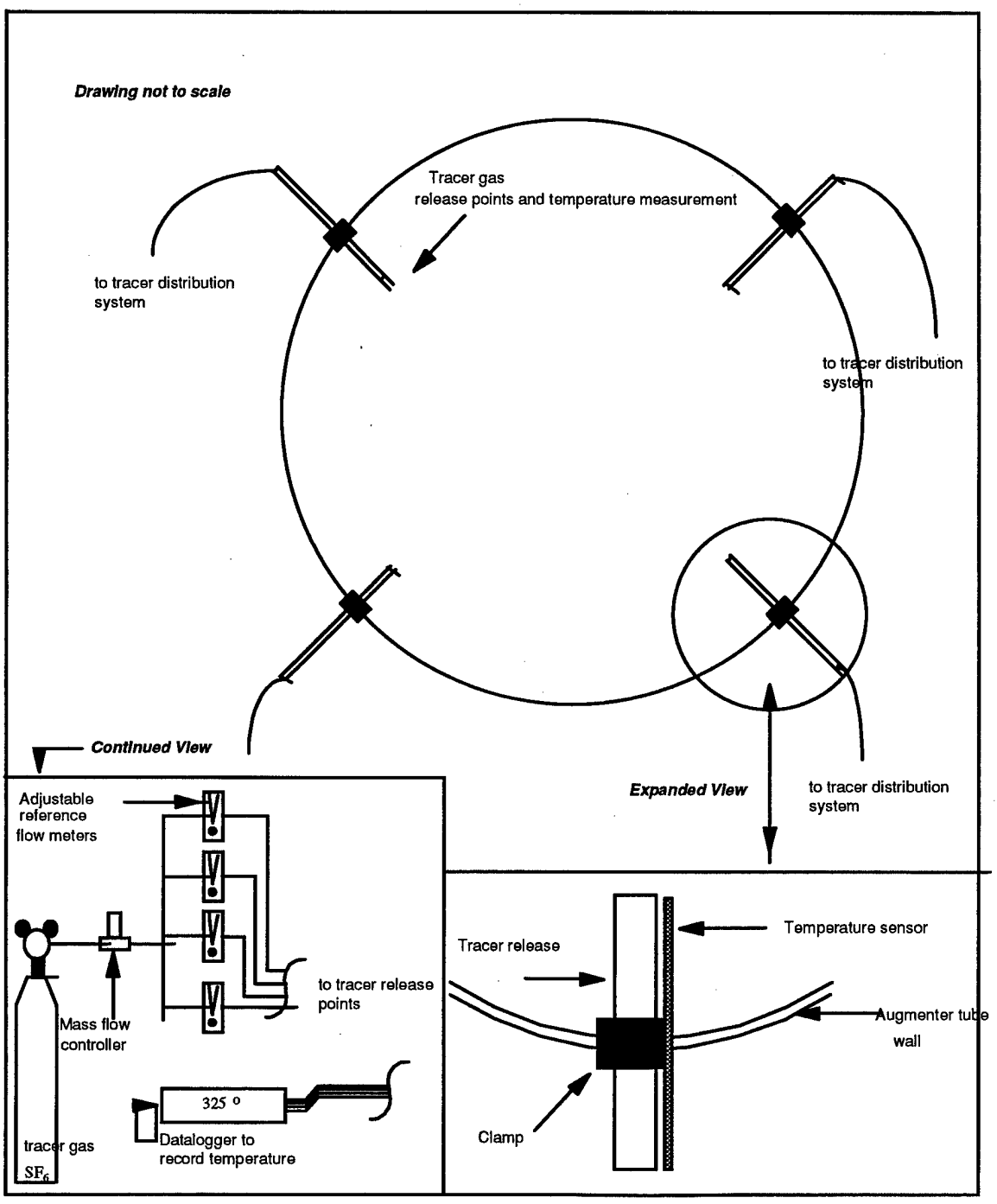


Figure 2-27. Edwards AFB Test Cell 4 Exhaust - Top View

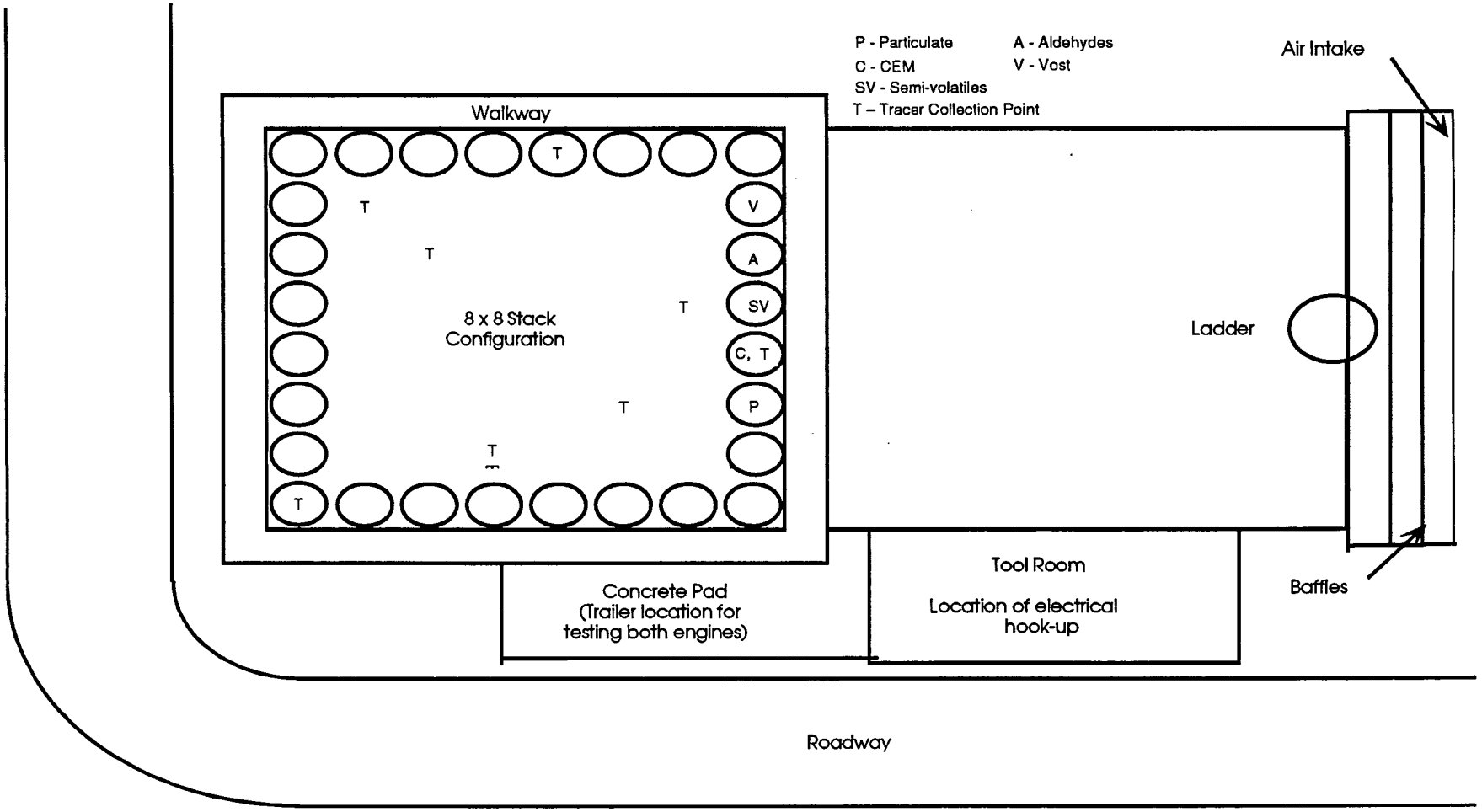


Figure 2-28 shows a side view of the roof for the test cell exhaust and a sample stack extension.

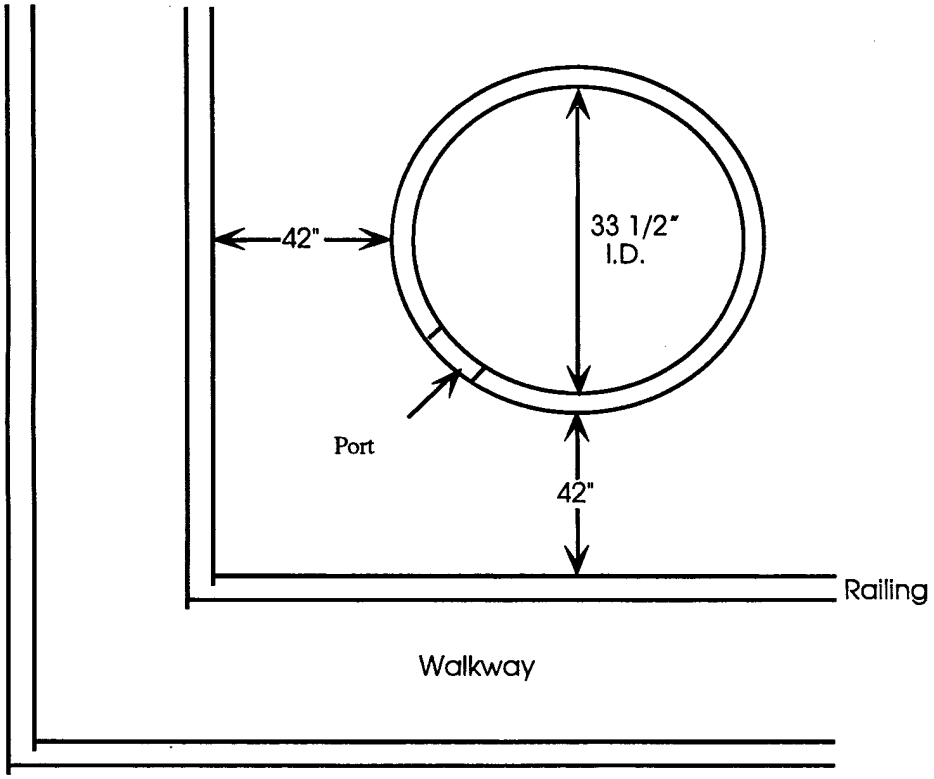
Velocity measurements were collected at each sampling point in order to maintain isokinetics. These velocity data were not used to calculate the entire exhaust flowrate since the exhaust flowrate was calculated using either carbon balance, tracer gas, or F-factor.

2.6.9 Edwards AFB, Test Cell 2

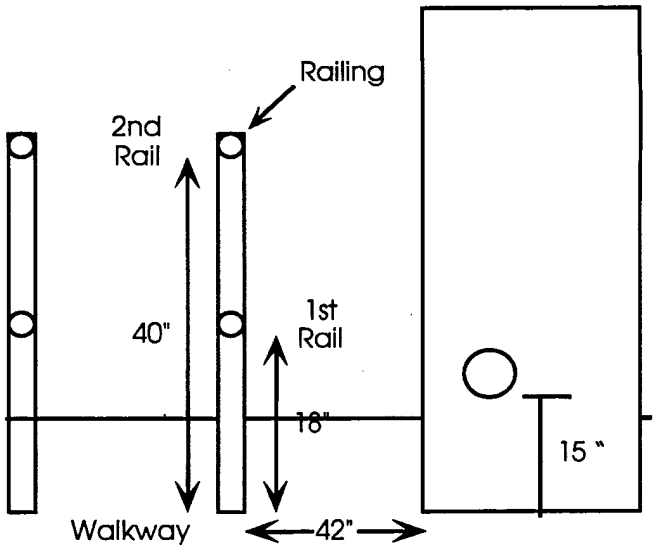
Figure 2-29 illustrates the general configuration of Test Cell 2 at Edwards AFB. There are a total of 40 individual exhaust stacks over a 650-ft^2 area. This configuration did not facilitate the use of conventional emission sampling methodologies. Airflow into the test cell is the result of the air draw created by the engine during operation. Engine exhaust gas is directed through the augmenter tube, through the perforated section of the augmenter tube into the blast room, and then out through the exhaust stacks. Because of the turbulent flow from the engine exhaust and the circuitous path that the exhaust gases must travel, it was assumed there was no stratification of the exhaust gases.

The assumption of a homogeneous exhaust mixture was demonstrated by tracer gas measurements. The tracer gas manifold and supporting steel distribution tubes were located at the beginning of the augmenter tube as shown in Figure 2-30. The exhaust flow rate was determined by the tracer gas release rate and the measured concentration at the exhaust. Eight tracer gas collection points at the exhaust were configured as shown in Figure 2-31. Tracer gas was drawn through a manifold and heated sample line for independent point sampling and direct analysis as opposed to the tedlar bag analysis used at previous facilities. This provided real time examination. The analysis verified that the single point sample collection methodology was representative of the engine emissions.

Figure 2-28. Edwards AFB Test Cell 4 Exhaust - Stack Extension Dimensions



Top View



Side View

Figure 2-29. Test Cell 2 at Edwards AFB - Side View

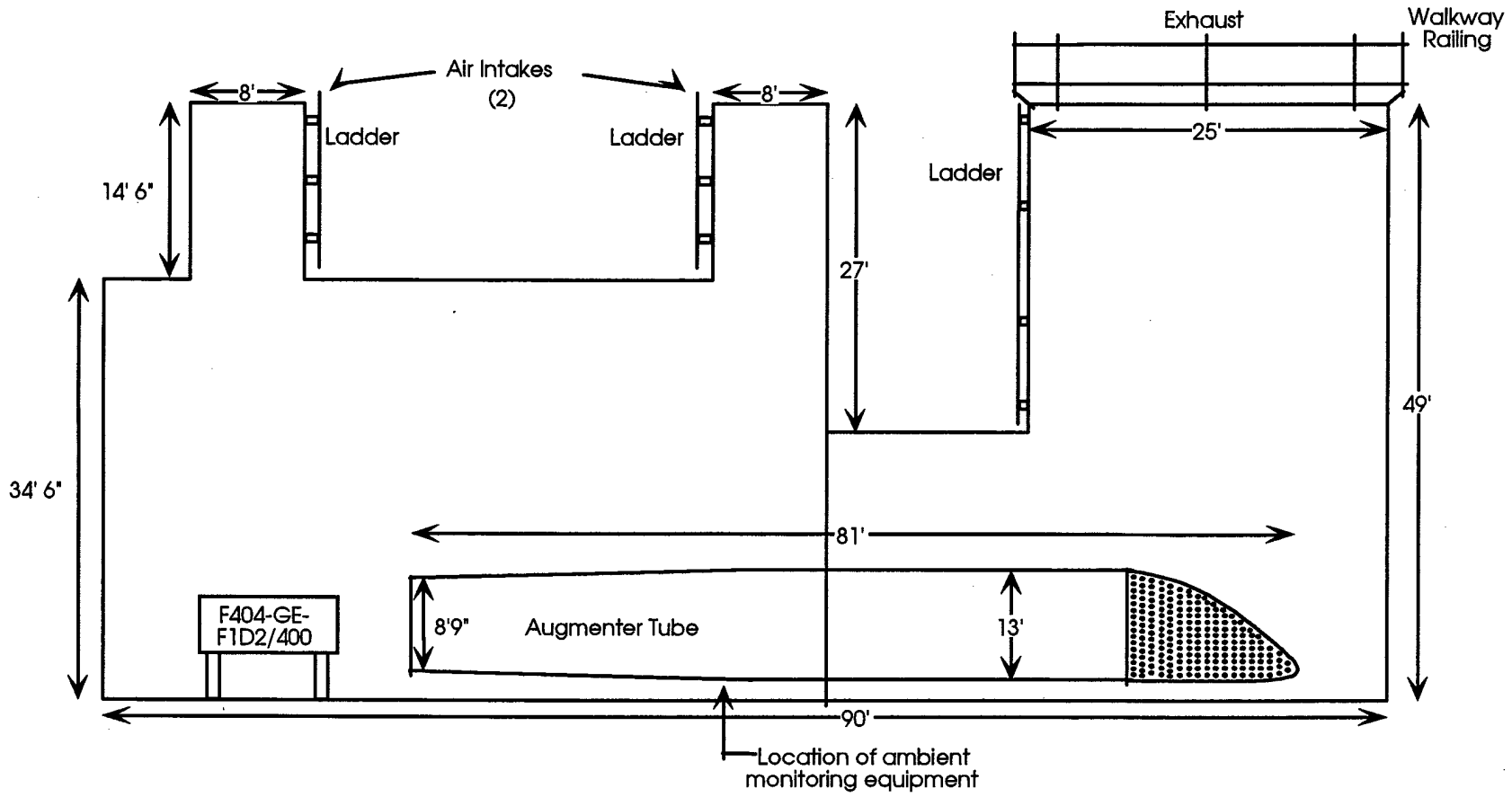


Figure 2-30
Tracer gas distribution system for an augmenter tube

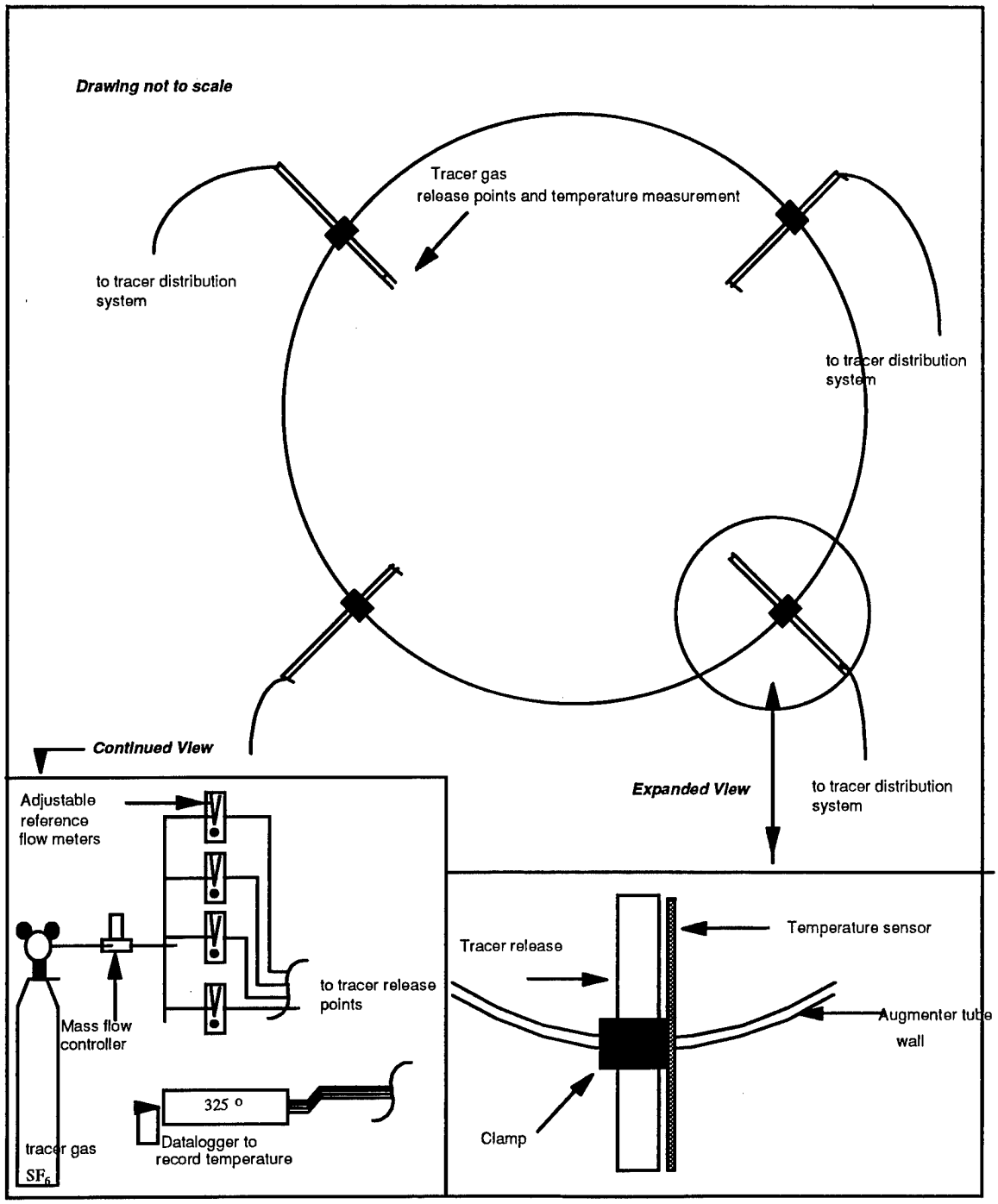
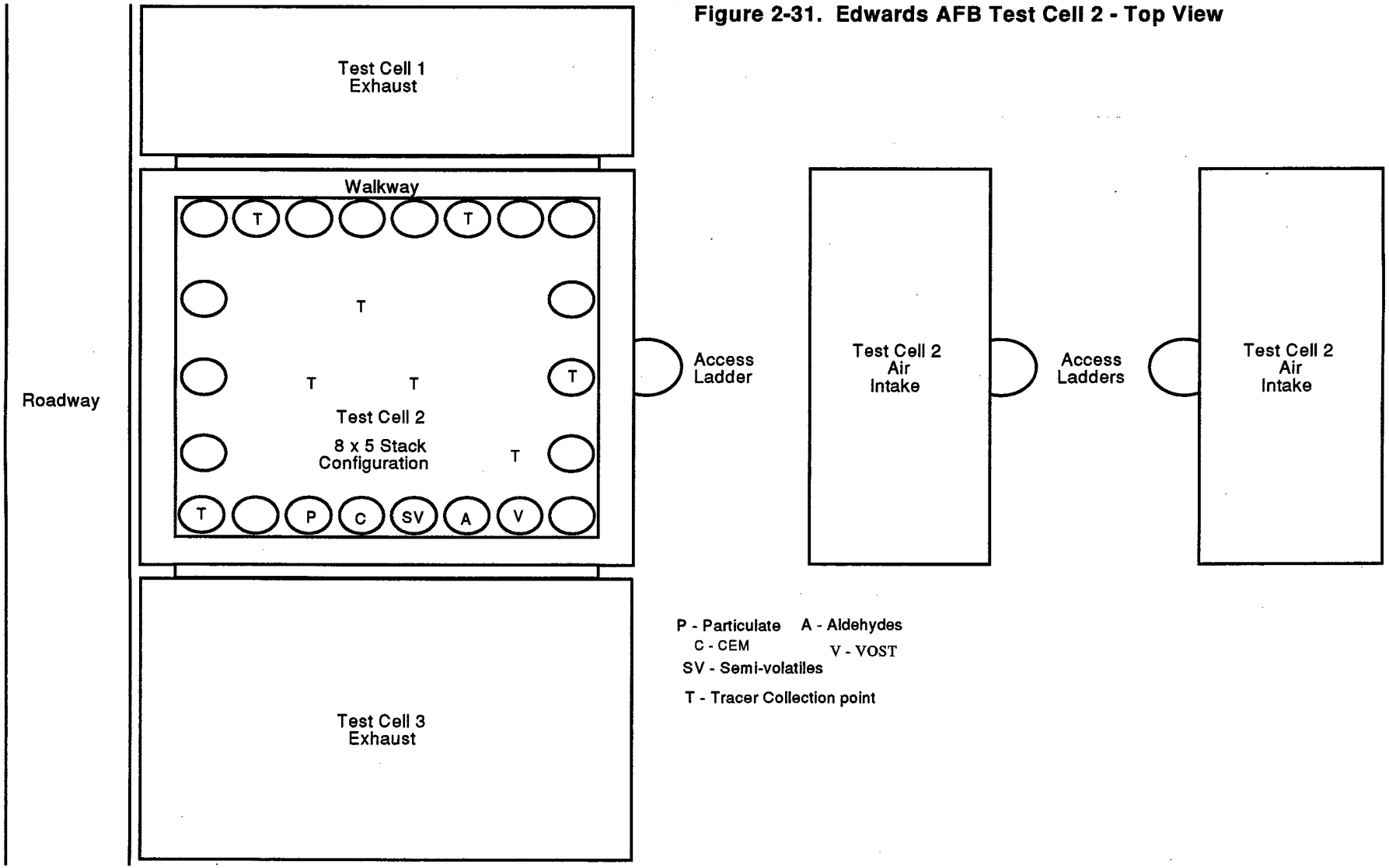


Figure 2-31. Edwards AFB Test Cell 2 - Top View



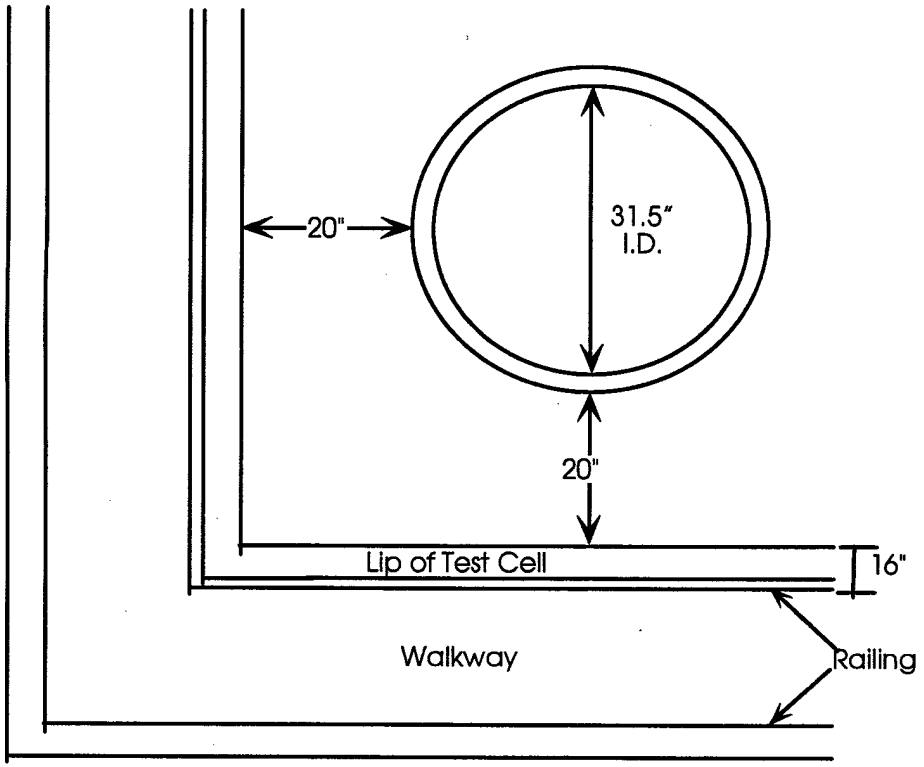
Inlet air pollutant concentrations were determined by placing the ambient samplers under the air intake, next to the augmenter tube, inside the test cell. The ambient sampling equipment was temporarily installed in a manner that did not present a FOD hazard to the engine. The stacks at the outlet of the blast room are recessed below the top of the test cell. Therefore, it was not possible to remain on the walkway during engine operation above idle conditions. The configuration of the stacks did not allow a full traverse of the exhaust, as required by EPA methodology. Since access to the platform and stacks was limited, all sampling was conducted at a single point. The termination of the blast room stacks at the top of the test cell would have made it difficult to collect a representative sample due to wind interference. It was necessary to temporarily install 9-foot-tall stack extensions with a 4-inch-diameter sample port on five of the exhaust stacks. Figure 2-31 illustrates which exhaust stacks required extensions and which pollutants were sampled from each stack. Figure 2-32 shows a side view of the roof for the test cell exhaust and a sample stack extension.

Velocity measurements were collected at each sampling point in order to maintain isokinetics. These velocity data were not used to calculate the entire exhaust flowrate since the exhaust flowrate was calculated using either carbon balance, tracer gas, or F-factor.

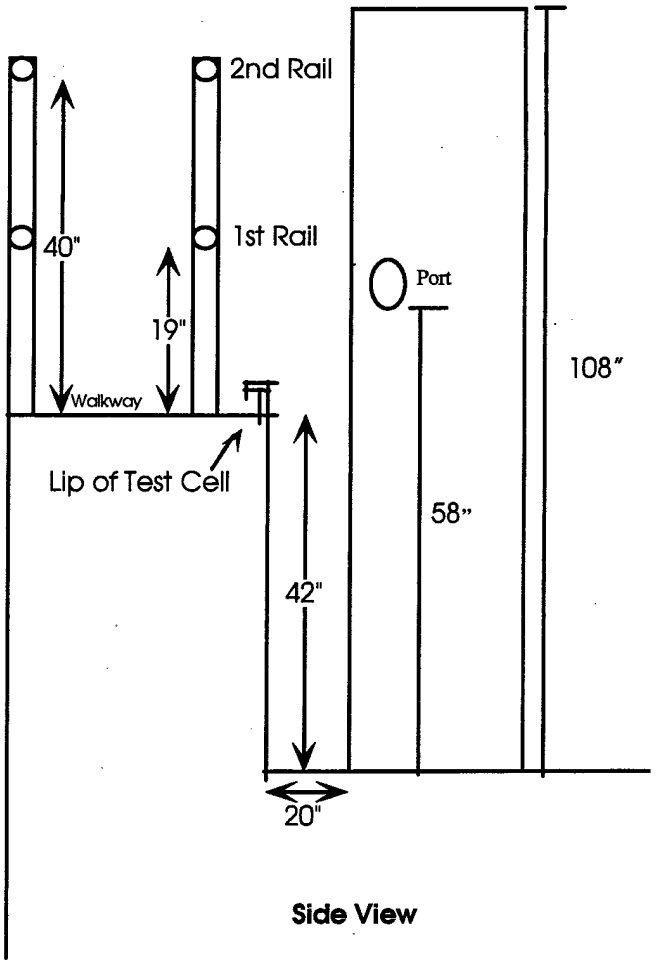
2.6.10 Naval Aviation Depot, Cherry Point, Test Cell

Figures 2-33 and 2-34 illustrate the general configuration of the engine test cell at Cherry Point. The configuration of this test cell allowed the use of conventional emission sampling methodologies. The 36-inch-diameter exhaust stack terminated out the side of the test cell facility. Airflow into the cell is the result of the air draw created by the engine during operation. Engine exhaust is directed through the augmenter tube

Figure 2-32. Edwards AFB Test Cell 2 Exhaust - Stack Extension Dimensions



Top View



Side View

Figure 2-33. Naval Aviation Depot, Cherry Point Engine Test Cell

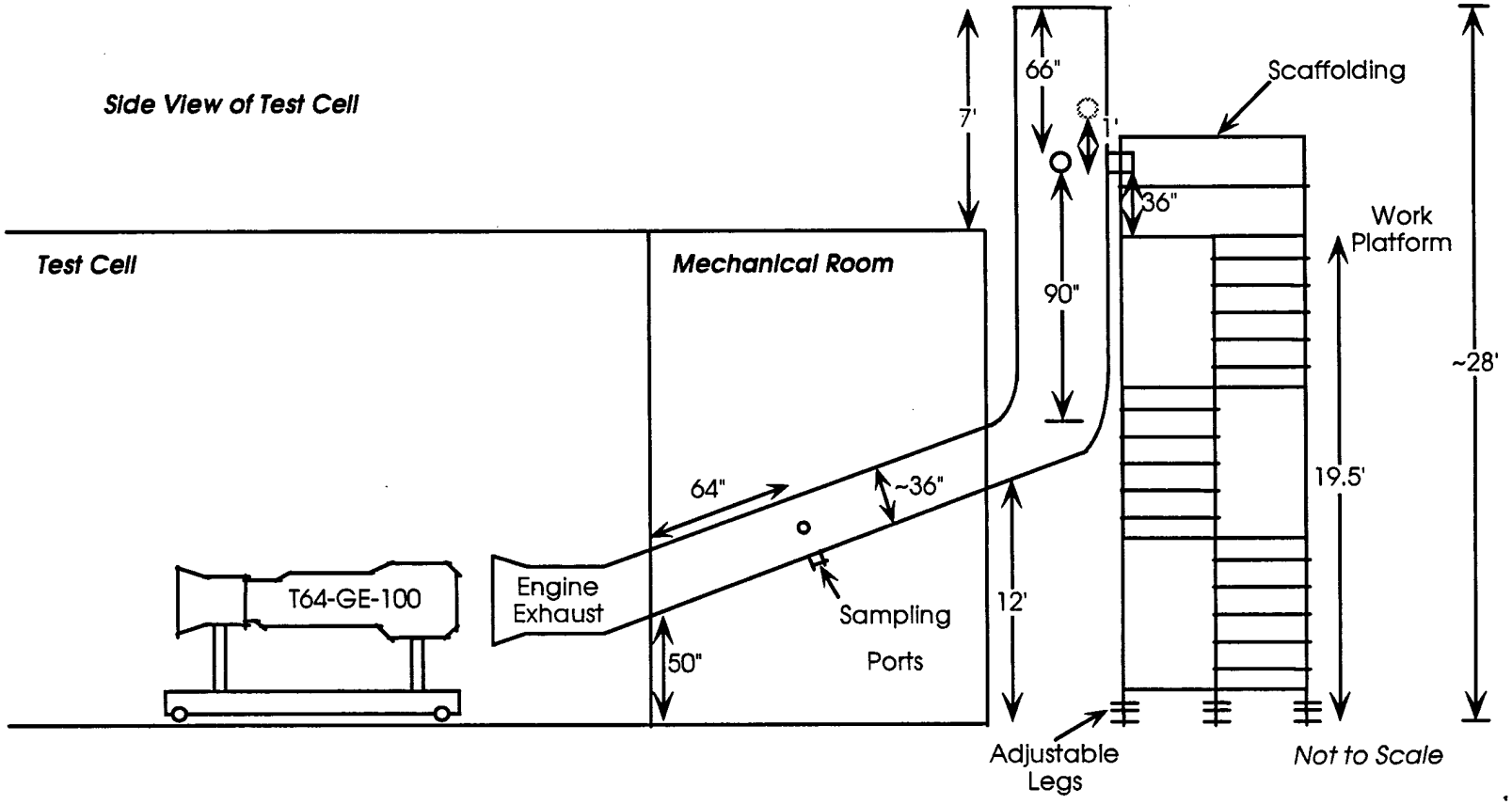
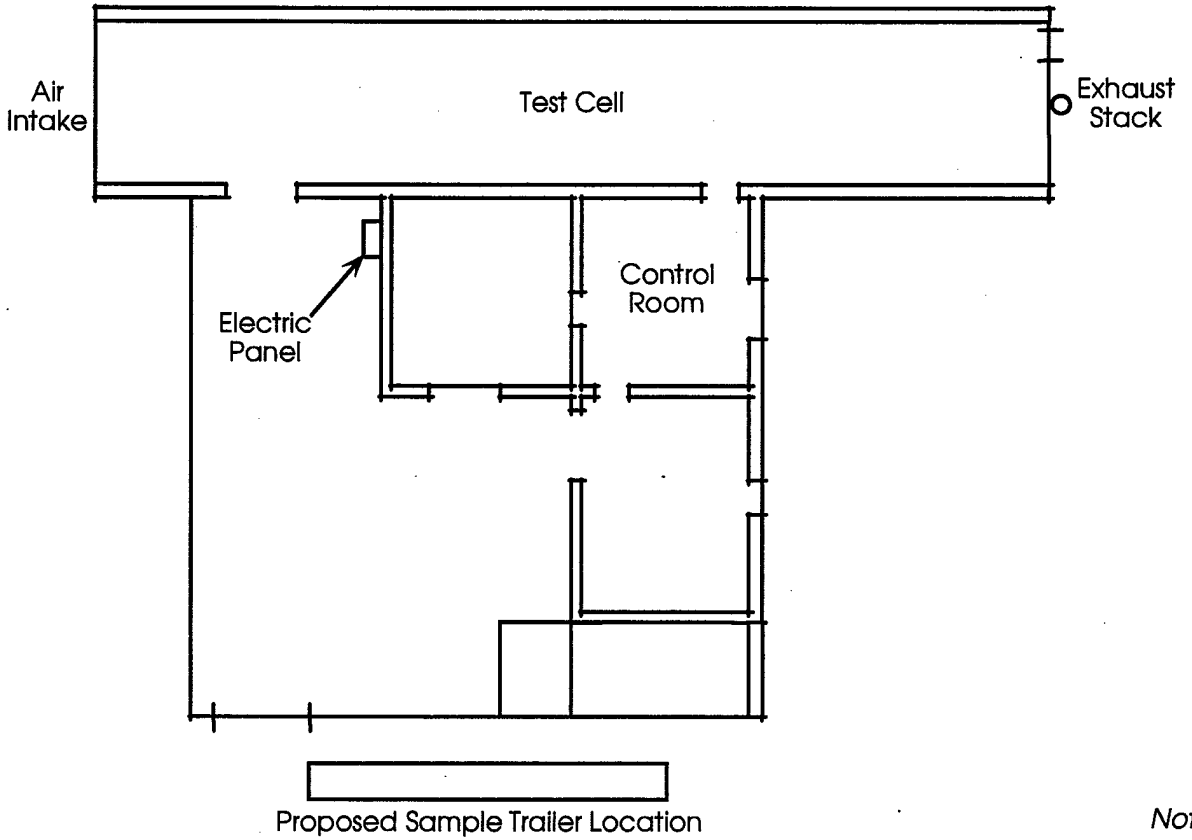


Figure 2-34. Naval Aviation Depot, Cherry Point General Test Cell Layout



Not to Scale

to the stack outlet. Since conventional isokinetic sampling methodologies are applicable at this source, tracer gas was not needed to determine exhaust gas stratification. Inlet air pollutant concentrations were determined by placing the ambient samplers near the air intake inside the test cell in a location that did not present an FOD hazard to the engine.

The engine exhaust was sampled using conventional isokinetic sampling methodologies; however, the stack needed to be temporarily modified so that testing could be performed according to EPA Method 1 guidelines. Figures 2-35 and 2-36 illustrate the modifications necessary for the test cell stack. A total of four sample ports were installed on the stack so that samples could be collected per EPA methodology. Figure 2-36 illustrates the sampling port specifications. The size and placement of the scaffolding platform also are presented in Figures 2-33 and 2-35. Particulate and semivolatiles sampling trains were rotated between the two upper ports, and the aldehyde and ketone sampling train was rotated between the lower ports. Each pair of sampling ports (upper and lower) was offset by 90 degrees. It took 5 to 10 minutes to rotate the trains among the sample ports. This added approximately 15 to 30 minutes to each 60-minute sample run and resulted in an overall 75- to 90-minute test period for the helicopter engine. Two additional sample ports were installed for CEM and VOST sampling. Sampling for these parameters was conducted at a single point. These ports were located in the mechanical room, as shown in Figures 2-33 and 2-36.

2.6.11 Barnes Air National Guard Base, Hush House

Figures 2-37 and 2-38 illustrate the general configuration of the Hush House at Barnes Air National Guard Base. The configuration of the Hush House did not facilitate the use of conventional emission sampling methodologies. Engine exhaust gas was directed upward to the top of the augmenter tube, then onto a deflector plate, and then out through a short rectangular blast box. Because of the turbulent flow from the engine exhaust and the circuitous path that the exhaust gases must travel, it was

Figure 2-35. Naval Aviation Depot, Cherry Point Engine Test Cell - Top View

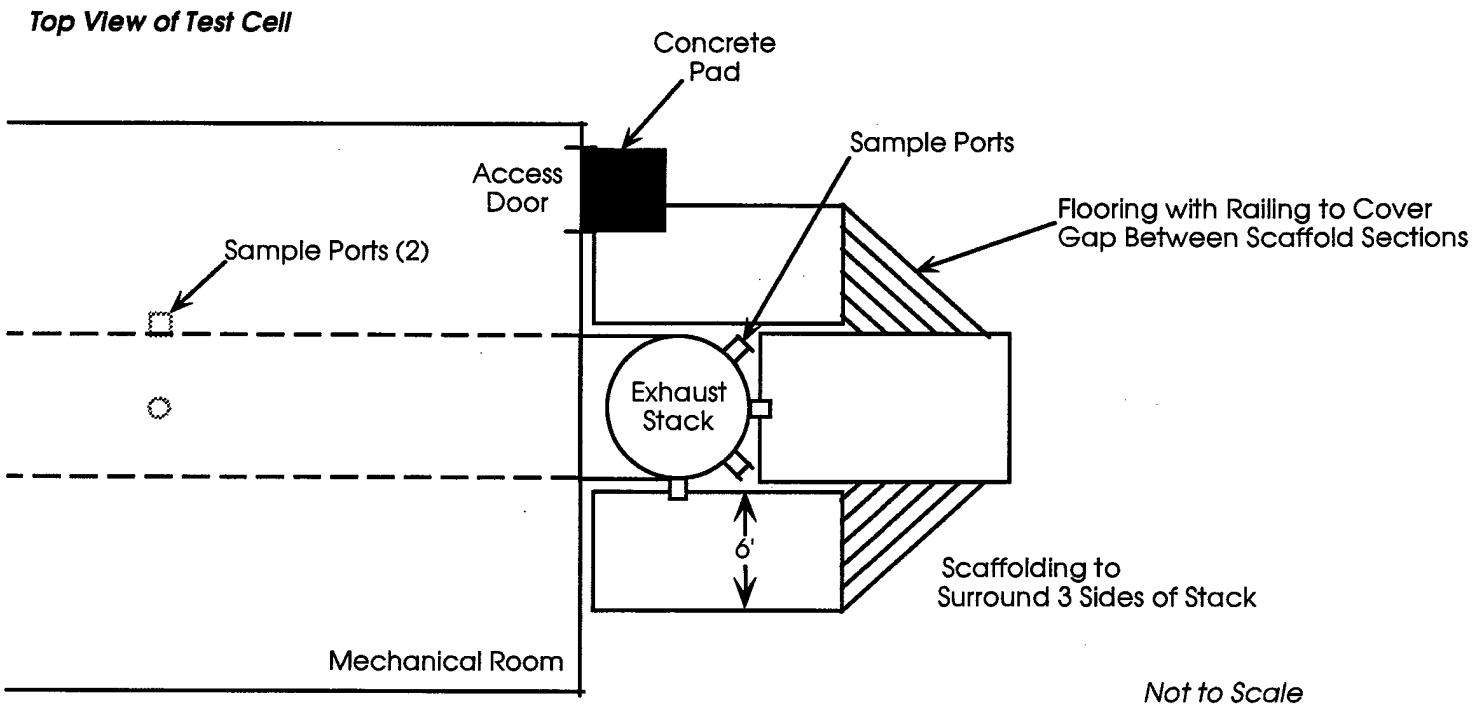
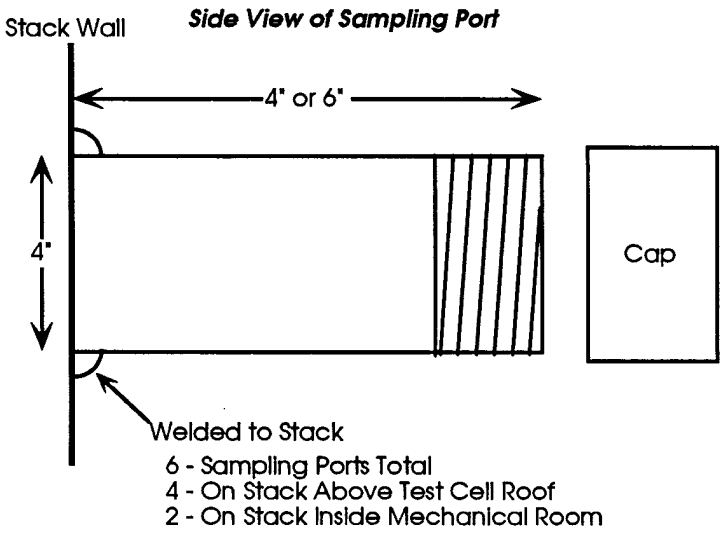
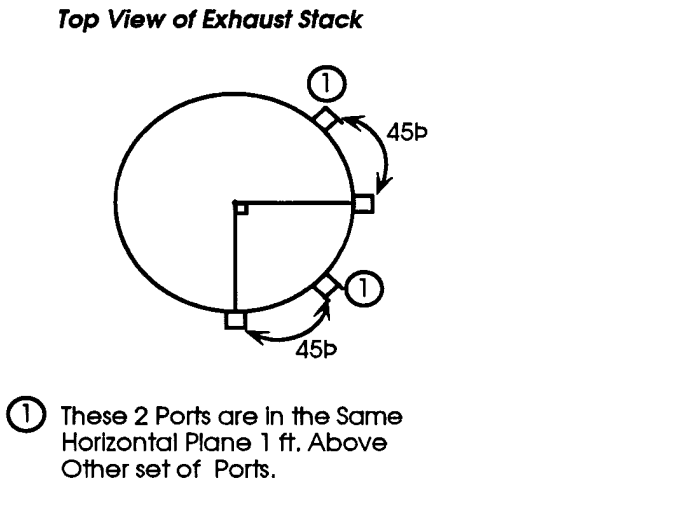
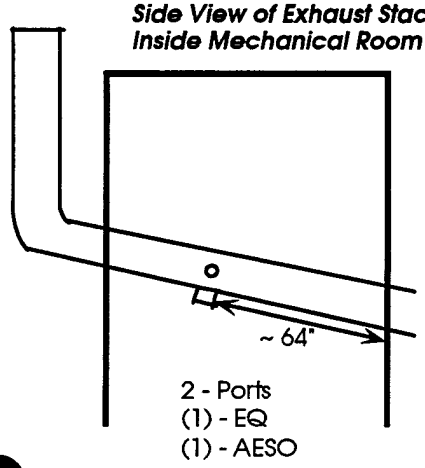


Figure 2-36. Naval Aviation Depot, Cherry Point Engine Test Cell, Sample Port Detail







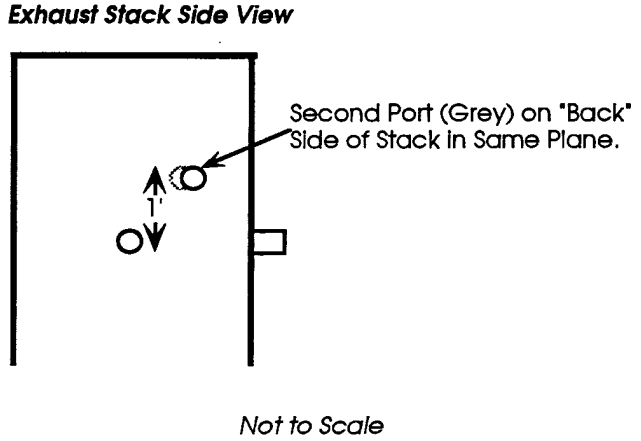
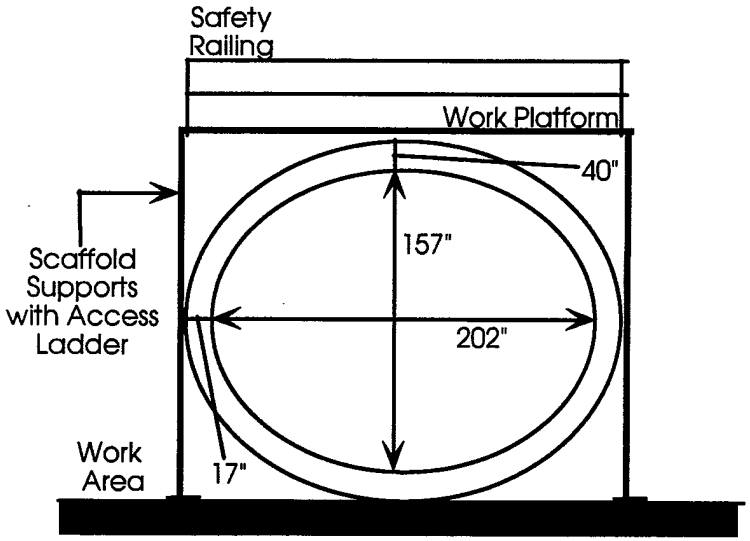
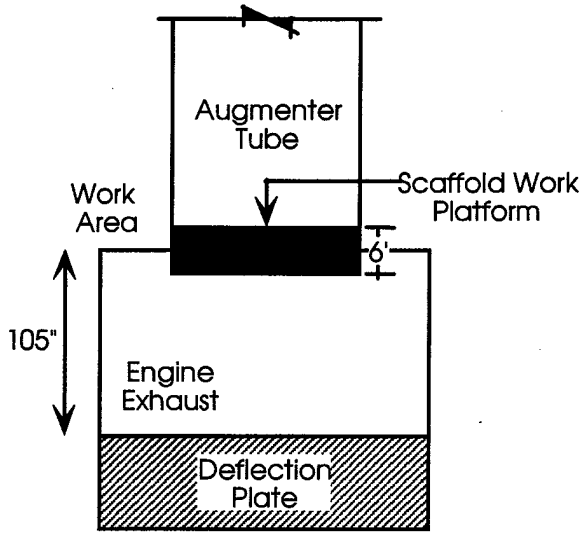


Figure 2-37. Barnes Air National Guard Base Augmenter Tube Detail

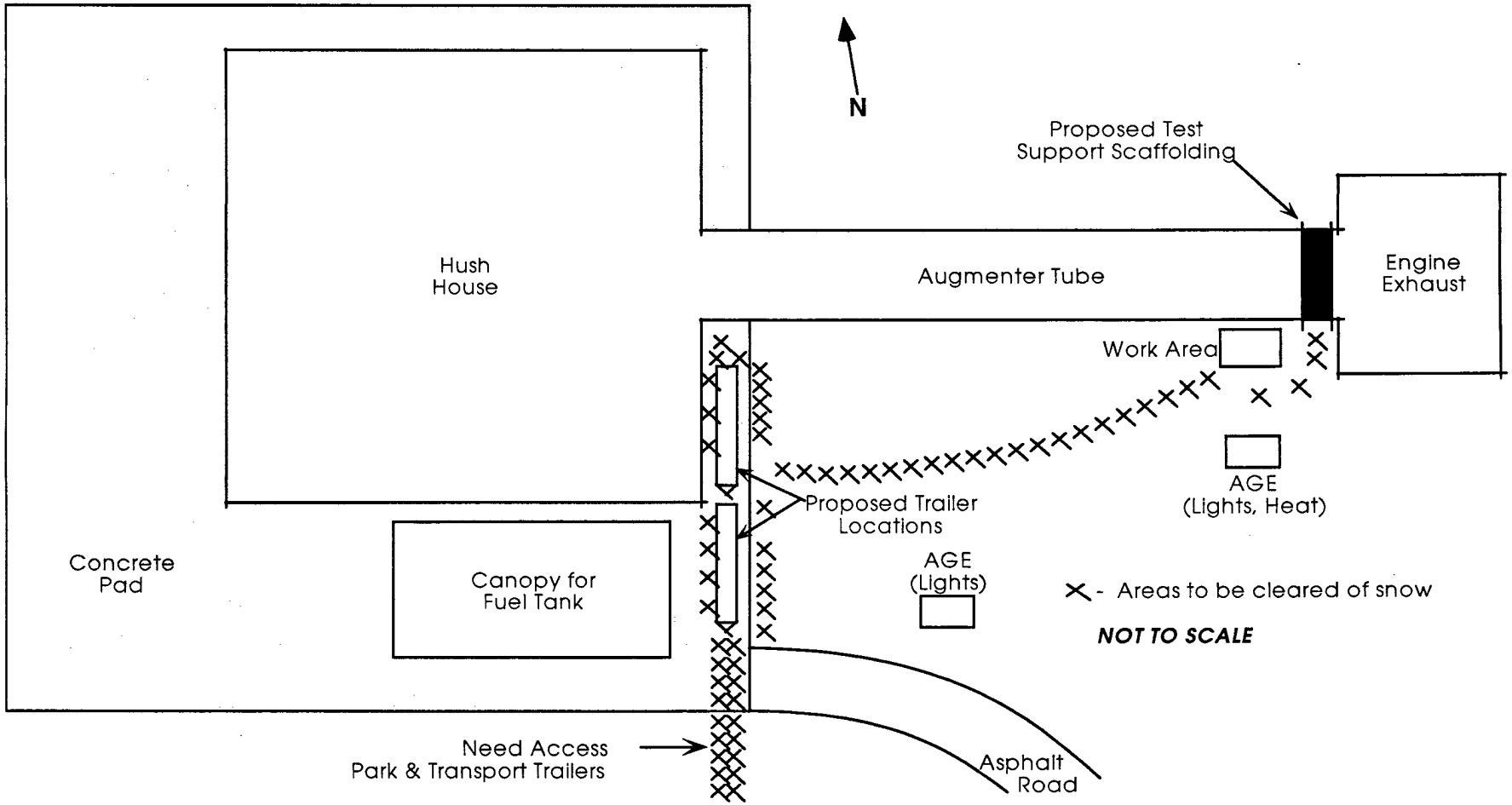


View Looking from Blast Box into Augmenter Tube



Top View of Augmenter Tube and Blast Box

Figure 2-38. Barnes Air National Guard Base Overview of Hush House



assumed that there was no stratification of the exhaust gases. To verify exhaust homogeneity, tracer gas was released into the engine exhaust and sampled at the test cell terminus. The tracer gas stainless steel distribution tubes (0.25-inch I.D.) were placed around the engine on the engine test stand as shown in Figure 2-39. Tracer gas measurements were collected across one diagonal at the exit of the augmenter tube as depicted in Figure 2-40. Eight sample points were selected based on Method 1 criteria. Some stratification was noted at the base of the augmenter tube. All sampling for the pollutant parameters was conducted in the upper half of the augmenter tube. Inlet air pollutant concentrations were determined by placing the ambient samplers inside the Hush House, in a manner that did not present a FOD hazard to the engine.

Since the exhaust configuration did not allow for safe collection of exhaust emission samples via typical stack test methodologies, an alternative approach was utilized. The augmenter tube terminus is shielded on three sides by the exhaust deflector plate and exhaust stack; therefore, samples were collected at the end of the augmenter tube. Each sample train (particulate, VOST, semi-volatiles, aldehyde/ ketones) as well as the CEM inlet were set up on top of the augmenter tube at the exhaust exit. A vertical sampling probe was extended from each train, down into the engine exhaust stream at approximately the top third of the augmenter tube cross-section. Samples were collected from a single point in the same manner as was done for Kelly AFB, Tinker AFB, Charleston AFB, and Edwards AFB. The sample probes were secured with cable in the face of the exhaust stream.

To verify that the sample location was representative of the entire engine exhaust, the tracer gas concentration was monitored at approximately eight locations across the end of the augmenter tube. The gas stratification and exhaust flow rate were determined through the use of tracer gas. The eight tracer gas intake points were secured in the exhaust stream via cables.

Figure 2-39
Tracer gas distribution system for an augmenter

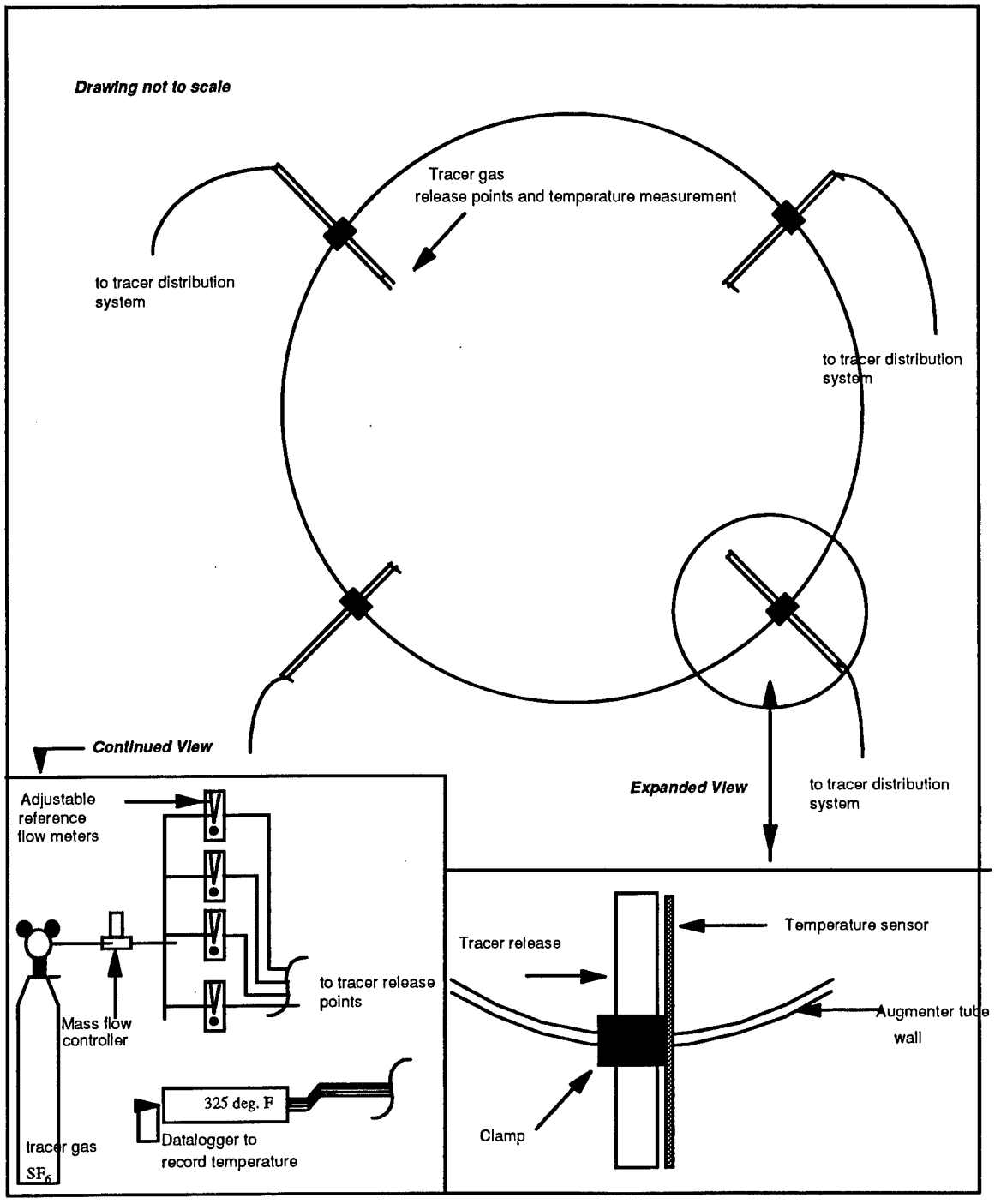
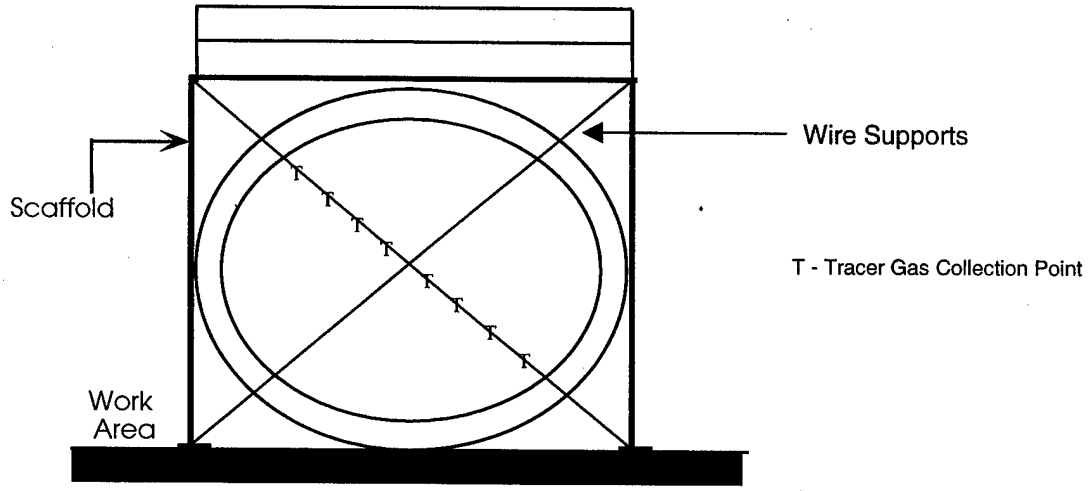


Figure 2-40. Barnes Air National Guard Base Tracer Collection Points



View Looking from Blast Box into Augmenter Tube

2.6.12 General Emission Test Schedule

The following is a breakout of the general tasks that were performed during emission testing at each location:

- **Equipment setup** - Depending on the facility, equipment setup and calibration took 2 to 3 days. This involved setting up sampling equipment, tracer gas systems (where appropriate), the flow measurement system, and the mobile laboratory. During this time the test cell was dedicated to equipment setup activities and remained inactive as the test team personnel were working inside and outside the cell.

- **Shakedown** - During this important period, both the test team and test cell operators became familiar with the operational procedures of the test program. The test team gathered preliminary information at each of the engine test settings. This information was vital to ensure that the scheduled test runs were conducted accurately and efficiently. The shakedown took approximately 1 hour for each engine.

- **Testing** - The test team completed a minimum of three test runs at a single test engine setting in one sample day. Specifically, more than three test runs in a day were performed at Kelly AFB test cell 58, Laughlin AFB, Tinker AFB, Charleston AFB, and Edwards AFB. This was accomplished by preparing triplicate test train glassware sets to minimize the turnaround time between tests and through additional efficiencies that were gained by the test team as the program progressed.

- **Demobilization** - At each test facility site location, demobilization was accomplished within 1 to 2 days.

SECTION 3

EXHAUST FLOW DETERMINATION

The calculation of pollutant emission rates for this test program required determination of the total exhaust flow (combustion products plus excess air). The total exhaust flow is required to quantify mass emission rates for the parameters being measured. The concentration of each pollutant is incorporated with the exhaust flow rate to calculate the mass emission rate.

Whenever possible, standard EPA flow measurement methods were used to quantify airflow. However, the test locations at Kelly AFB, Laughlin AFB, Tinker AFB, Charleston AFB, Edwards AFB, and Barnes ANGB were not configured to permit flow measurement using traditional EPA methods. Four alternate flow measurement techniques were evaluated at those locations. These measurement techniques are the following:

- Carbon balance for the calculation of inlet and total exhaust flow.
- F-factor for the calculation of inlet and total exhaust flow.
- Tracer gas concentration for total exhaust flow.
- Mass flow meters for measurement of inlet airflow.

Each method has advantages, disadvantages, and limitations that vary in significance depending on the specific conditions of each test run. The objective of the test program was to evaluate all flow measurement/calculation methodologies and results and select the most representative methodology for each engine and setting.

3.1 CALCULATION OF AIRFLOW USING EPA REFERENCE METHODS

When a single well-defined exhaust or inlet duct was present, and the duct could be modified by the use of extensions to meet the minimum criteria of EPA Reference Method 1 (40 CFR 60, Appendix A), then the standard methods of airflow measurement were employed. These methods were used at the APU test cell at Kelly AFB, the test cell located at CCAD, and the Naval Aviation Depot Cherry Point test cell. The procedure described in EPA Reference Method 2 (40 CFR 60, Appendix A) utilizes an S-type pitot tube and inclined manometer to measure air impact velocity, and a type-K thermocouple to measure temperature across the duct. The molecular weight of the gas stream was determined from the oxygen, carbon dioxide, and moisture content of measurements made during each run, as described in EPA Reference Methods 3, 3A, and 4 (40 CFR 60, Appendix A).

3.2 CALCULATION OF AIRFLOW USING CARBON BALANCE

This method was used to calculate both inlet and outlet airflow rates using a carbon mass balance. Conservation of matter requires that the total carbon mass rate in the exhaust (MCE) equal the sum of the total carbon mass rate in the fuel (MCF) and the carbon mass rate in the inlet air (MCI).

$$MCE = MCF + MCI \qquad \text{(Eq. 1)}$$

A similar conservation of total mass states that the total mass rate in the exhaust (ME) equals the total mass rate in the fuel (MF) plus the total mass rate at the inlet (MI).

$$ME = MF + MI \qquad \text{(Eq. 2)}$$

Finally, the mass rate of carbon also can be derived as the total mass rate at each location, times the percent carbon by weight (% C_x) in each stream.

$MCE = ME \times \% C_e/100$ (Eq. 3)

$MCF = MF \times \% C_f/100$ (Eq. 4)

$MCI = MI \times \% C_i/100$ (Eq. 5)

The percent carbon by weight can be measured in all streams, and the mass rate of fuel burned also can be measured. This leaves four unknown variables (ME, MI, MCE, and MCI) and five independent equations.

To solve for inlet mass flow rate, substitute Equation 2 into Equation 3.

$$MCE = (MF \times \% C_e/100) + (MI \times \% C_e/100)$$

Then substitute that equation into Equation 1.

$$(MF \times \% C_e/100) + (MI \times C_e/100) = MCF + MCI$$

Substitute Equations 4 and 5 to get:

$$(MF \times \% C_e/100) + (MI \times \% C_e/100) = (MF \times \% C_f/100) + (MI \times \% C_i/100)$$

Rearrange factors to get the inlet mass rate.

$$MI = MF\left(\frac{\% C_f - \% C_e}{100}\right)\Big/\left(\frac{\% C_e - \% C_i}{100}\right)$$

By similar derivation, rearrange Equation 2, substitute into Equation 5, substitute the results into Equation 1, and then substitute Equations 3 and 4 to get the following:

$MI = ME - MF$ (Eq. 2)

$MCI = (ME \times \% C_i/100) - (MF \times \% C_i/100)$ (Eq. 5 using Eq. 2)

$MCE = MCF + (ME \times \% C_i/100) - (MF \times \% C_i/100)$ (Eq. 1 using Eq. 5)

$$\left(ME \times \frac{\% C_e}{100}\right) = \left(MF \times \frac{\% C_f}{100}\right) + \left(ME \times \frac{\% C_i}{100}\right) - \left(MF \times \frac{\% C_i}{100}\right)$$ *Substitute Equations 3 and 4*

$$ME = MF\left(\frac{\%\ C_f\ -\ \%\ C_i}{100}\right)\Bigg/\left(\frac{\%\ C_e\ -\ \%\ C_i}{100}\right)$$

The mass emission rates can be converted to volumetric flow rates by dividing by molecular weight and multiplying by standard volume. For example:

$$QE = \frac{ME \times 385.35}{MW_e}$$

Where:

QE = Wet standard volumetric flow rate, $\frac{wscf}{min}$.

ME = Total exhaust flow rate, $\frac{lb}{min}$.

MW_e = Wet molecular weight exhaust stream, $\frac{lb}{lb\ mole}$.

385.35 = Standard molar volume, $\frac{scf}{lb\ mole}$.

The fuel mass rate was measured directly during each test run, and the % C_f was determined by the fuel analysis.

The wet molecular weights of the exhaust gas streams were determined by EPA Reference Methods 3A and 4 (40 CFR 60). These methods measure the percent moisture (% M) of the gas stream and percent carbon dioxide (% CO_2) and oxygen (% O_2) in the gas stream on a dry basis, which was used to calculate the molecular weight as follows:

$$MW_e = \left[\left\{\left(\%\ CO_2 \times 0.44\right) + \left(\%\ O_2 \times 0.32\right) + \left(\left(\%\ CO + \%\ N_2\right) * 0.28\right)\right\} * \left(1 - \frac{\%\ M}{100}\right)\right] + \left(\%\ M \times 0.18\right)$$

Where:

% M = Moisture content as a percent.

For the purpose of calculating a molecular weight, (% CO + % N_2) is assumed to be (100- % CO_2 - % O_2). The calculation of the carbon content of the exhaust gas stream used the % CO_2 as determined by Method 3A, plus additional measurements of carbon monoxide (% CO) and total hydrocarbons (% THC) by EPA Reference Methods 10 and 25A (40 CFR 60, Appendix A), respectively. The % THC is stated on the basis of methane (CH_4). The carbon monoxide (CO) and carbon dioxide (CO_2) concentrations were measured on a dry basis and were converted to a wet basis using the measured moisture content of the exhaust gas. THC was measured on a wet basis.

$$\%\ CO_2\ (wet) = \%\ CO_2\ (dry)\ x \left(1 - \frac{\%\ M}{100}\right)$$

$$\%\ CO\ (wet) = \%\ CO\ (dry)\ x \left(1 - \frac{\%\ M}{100}\right)$$

The total carbon content of the exhaust gas stream is equal to the sum of % CO_2, % CO, and % THC on a wet basis times the ratio of carbon molecular weight to the total wet molecular weight of the gas stream.

$$\%\ C_e = (\%\ CO_2\ wet + \%\ CO\ wet + \%\ THC)\ x \frac{12.01}{MW_e}$$

A similar calculation is required for the inlet air volumetric flow rate, but the following simplifying assumptions can be made:

- Dry ambient air is composed of 20.9% oxygen and 79.1% nitrogen.
- Ambient humidity represents the moisture content of the inlet air.

The major drawback to this measurement method is the use of extremely low carbon concentration values at the inlet, and relatively low concentrations at the exhaust compared with the very high carbon concentrations in the fuel. As excess air increases, the inlet flow becomes indistinguishable from the outlet flow. The major

advantage of this procedure is that the only additional data that are required to calculate flow are the inlet flow; CO, CO_2, and THC values; and ambient humidity.

3.3 CALCULATION OF AIRFLOW USING F-FACTORS

F-factors relate the volume of combustion products to the heat content of fuel. F-factors generally are used for combustion sources when the exhaust stream flow rate is known but the fuel heat input must be determined. In this case, the fuel input was determined but the exhaust stream flow rate needed to be determined. The F-factor relationship was used to calculate the total airflow based on the fuel-firing rate.

F-factors are published for a variety of fuels and usually are expressed in units of dry standard cubic feet per British thermal unit [(dscf/Btu or dscm/joule (J)]. For this test program, specific F-factors were determined through ultimate analysis (i.e., hydrogen, carbon, sulfur, nitrogen, and oxygen) of the fuel components on a weight percent basis and fuel density (lb/gal).

To determine the air volumetric flow rate, the following additional information was required:

- The concentrations of oxygen, carbon monoxide, and moisture content in the exhaust stream after combustion.
- Fuel firing rate, gallons per minute (gal/min).

The F-factor, dry basis, can be calculated from the ultimate analysis of the jet fuel as follows:

$$F_d = K[(K_{hd} \% H) + (K_c \% C) + (K_s \% S) + (K_n \% N) - (K_o \% O)]/GCV$$

(Equation 19-13, 40 CFR 60, Appendix A, Method 19)

If the heat input components (K, GCV) are eliminated from the equation, an F-factor based on fuel mass is derived.

$$F_{md} = [(K_{hd} \% H) + (K_c \% C) + (K_s \% S) + (K_n \% N) - (K_o \% O)]$$

Where:

F_d = Volume of combustion components per unit of heat content, scf/million Btu.
F_{md} = Volume of combustion component on a dry basis per pound of fuel, scf/lb.
% H, % C, % S, % N, % O = Weight percents of hydrogen, carbon, sulfur, nitrogen, and oxygen in the jet fuel.
GCV = Gross calorific value of the fuel consistent with the ultimate analysis, Btu/lb.
K = Conversion factor, 10^{-5}.
K_{hd} = 3.64 (scf/lb)/(%).
K_c = 1.53 (scf/lb)/(%).
K_s = 0.53 (scf/lb)/(%).
K_n = 0.14 (scf/lb)/(%).
K_o = 0.46 (scf/lb)/(%).

Stoichiometric combustion calculations assume that the carbon in the fuel is burned completely to produce carbon dioxide and water with no excess air (and no significant formation of nitrogen dioxide or carbon monoxide). The air stoichiometric volumetric flow rate (dry basis) can be determined by simply multiplying the measured fuel-firing rate by the F-factors.

$$\left(\text{Fuel firing rate, } \frac{\text{gal}}{\text{min}}\right)\left(\text{fuel density, } \frac{\text{lb}}{\text{gal}}\right)\left(F_{md}, \frac{\text{scf}}{\text{lb}}\right)$$

$$= \text{dry combustion air flow, } \frac{\text{scf}}{\text{min}}$$

The percent excess air (EA) during actual combustion can be calculated using the following formula:

$$\% \text{ EA} = \left[\frac{\% O_2 - 0.5\% \text{ CO}}{20.9 - (\% O_2 - 0.5\% \text{ CO})}\right] \text{x } 100$$

Where:

$\% O_2$, % CO = Measured percents of oxygen and carbon monoxide in the exhaust gas. 20.9 is the percent dry oxygen in ambient air.

Total dry combustion flow (including) excess air equals:

$$\text{Total dry air flow} = \left[(\text{dry combustion air flow})\left(1 + \frac{\%\,EA}{100}\right)\right]$$

This simplifies to:

$$\text{Total dry combustion flow, } \frac{scf}{min} = (\text{dry combustion air}) * \left(\frac{20.9}{20.9 - \%\,O_2 + 0.5\,\%\,CO}\right)$$

The inlet airflow is equal to the total dry combustion air plus the fraction of oxygen in the inlet used for the combustion of hydrogen in the fuel. The nitrogen associated with this oxygen fraction of the inlet air was included in the F_d calculation.

This inlet oxygen fraction can be derived from the same F-factor calculations presented in EPA Method 19.

$$F_{mo} = K\,[K_{hi}\,\%\,H]$$

Where:

F_{mo} = Volume of inlet oxygen used to combust hydrogen per unit of fuel fired, scf/lb.
K_{hi} = 0.96 (scf/lb)/%.
% H = Weight percent of hydrogen in the fuel as stated previously.

Then the total dry inlet airflow is the following:

$$\text{Dry inlet air} = \left[\text{fuel firing rate, } \frac{gal.}{min}\right]\left[\text{fuel density, } \frac{lb}{gal.}\right][F_{md} + F_{mo}] * \left[\frac{20.9}{20.9 - \%\,O_2 + 0.5\,\%\,CO}\right]$$

The inlet air then can be corrected back to actual conditions using the ambient temperature and humidity. The total exhaust flow can be adjusted to actual conditions using the measured exhaust moisture content and temperature.

There are limitations to the use of these F-factors for calculations of airflow from jet engines. The concentration of carbon monoxide in the combustion stream normally is so low that it is insignificant in the excess air calculation, but it has been included to cover operation during periods of incomplete combustion. If the combustion is so incomplete that large quantities of the fuel are exhausted as carbon (soot) or volatile hydrocarbons (THC), the % C of the fuel must be reduced to account for the reduced formation of combustion products.

The second limitation is that high levels of excess air are present. At high excess air levels, the carbon monoxide concentration becomes zero, but the oxygen content of the combustion gas approaches ambient concentrations (20.9 % O_2). The excess air equation becomes unreliable at a concentration at or near 20.9 % oxygen as this equation is undefined due to division by zero. As a general rule, these F-factor calculations will be unreliable any time the combustion gas contains more than 18.5 % oxygen.

3.4 CALCULATION OF AIRFLOW USING TRACER GAS

For sample locations that did not have a single well-defined exhaust stack (Kelly AFB Test Cells 58 and 54A, Laughlin AFB, Tinker AFB Test Cell 10, Charleston AFB Test Cell, Edwards AFB Test Cells 2 and 4, and Barnes Air National Guard Base) that could not be measured by EPA Reference Methods, the exhaust flow was calculated from tracer gas dilution ratios. In the tracer gas flow measurement technique, a precise mass flow of the sulfur hexafluoride (SF_6) tracer gas was injected into the exhaust stream after the engine and sampled at the exhaust of the test cell to the atmosphere. The tracer gas flow calculation is based on the assumption that the SF_6 is

dispersed uniformly throughout the exhaust gas. If this assumption is correct, then the following flow determination is valid simply by mass balance.

- The tracer gas flow calculation is based on the assumption that the SF_6 is dispersed uniformly throughout the exhaust gas.

$$S_m = Q_s \times C_s \times K$$

Where:

Q_s = Total exhaust flow, cubic meters per minute (m^3/min), wet basis.
S_m = Metered injection of SF_6, milligrams per minute (mg/min).
C_f = Concentration of SF_6 in sample, parts per billion (ppb).
C_s = Average concentration of SF_6 in the exhaust gas.
K = Physical constants required to attain consistent units.

Since the SF_6 is distributed uniformly, then the concentration in any sample will be equal to the average concentration; thus, by substitution and rearrangement, the following calculation can be derived:

$$Q_s \ \frac{m^3}{min} = \frac{1.64795 \times 10^5 \ Sm}{C_f}$$

Where:

1.6745×10^3 = Conversion constants times standard molar volume divided by molecular weight of SF_6 $\left[\left(\frac{24.05 \times 10^{-3} \ m^3}{gm - mole}\right) x \left(\frac{gm - mole}{146 \ gm}\right) x \left(\frac{10^{-3} g}{mg}\right) x \left(\frac{ppb}{1 \times 10^{-9}}\right)\right]$

with units of $\frac{m^3 \ - \ ppb}{mg}$

The flow rate calculation was presented on a metric basis for clarity. All flow rates and emissions were presented in both English and metric units.

Tracer gas was used as the primary method for flow determination, and carbon balance was used as the secondary method. Flow rates by F-factor were highly erratic and not comparable to either tracer gas or carbon balance. Differences were due to the high oxygen measurements resulting from high dilution of the exhaust gases. F-factor calculations would have been more reasonable if the measured oxygen results were not near ambient levels. By comparison, tracer gas and carbon balance showed good agreement. However, carbon balance is also a calculated flow and the exhaust gases were highly diluted with ambient air. Therefore, small differences in measured gaseous concentrations by the CEM resulted in occasional erratic results for carbon balance. The tracer gas method was biased at certain engine settings due to pollutant interference and sampling difficulties. These are discussed in Section 5.

3.5 MEASUREMENT OF INLET AIRFLOW

In the early stages of the test program, the inlet flow was measured in an attempt to provide a fourth data point to evaluate. At four test locations, up to 12 mass flow meters (anemometers) were attached to the inlet air screens. Each mass flow meter was fixed in a stub stack constructed from a short piece of 6-inch-diameter duct. The arrangement was different for the four test cells requiring anemometer inlet measurements. A description of the anemometer arrangement follows:

Tinker AFB Test Cell 9 - 12 anemometers were positioned inside the inlet stack, three per side. The placement was centered on the three equal areas that comprise each side to the extent that was possible from the catwalk access.

Kelly AFB Test Cell 58 - 12 anemometers were placed in a 4 x 3 grid across the screen that was in place at the inlet. Each grid section represented 1/12th of the total inlet area, consistent with EPA Reference Method 1.

Kelly AFB Test Cell 54A - The 12 anemometers were positioned across this opening by attaching them to the grid at locations representing equal areas, consistent with EPA Reference Method 1.

Laughlin AFB Test Cell – 6 anemometers were positioned across each of 2 inlet screens by attaching them at locations representing equal areas, consistent with EPA Reference Method 1.

The flow calculation averaged the flow measurements made over the equal areas to determine total flow. If one equal area was inaccessible due to safety concerns, that area was weighted equally with the average of the other measurements. Blocked areas were considered as zero flow. The sum of the airflow measured by the mass flow meters was multiplied by the ratio of the inlet area to the sum of the area of the 12 assemblies to determine inlet flow.

$$Q_i = \frac{A_i \bullet K}{2.3562} \times \sum m_i$$

Where:

Q_i = Inlet airflow, standard cubic feet per minute (scfm).

A_i = Inlet duct area, square feet (ft^2).

2.3562 = Total area of 6-inch mass flow measurement assemblies, ft^2.

K = Conversion factors for air at standard conditions, 0.2227 $\frac{scf - hr}{lb - min}$.

$\sum m_i$ = Sum of mass flow meter measurements, pounds per hour (lb/hr).

This method was intended to be used in conjunction with the tracer-gas-flow measurement method. It had the advantage of simplicity since the data from the 12 flow meters was collected in a data logger and required minimal attention after installation. The major disadvantage of this method was the assumption of uniform flow across the inlet. At some inlet locations, wind direction and speed altered the flow distribution. Also it is suspected that turbulence around the flow meters biased the results. The measured inlet flows did not compare well to the calculated and tracer outlet flow methods. Therefore, the inlet flow measurements misrepresent the total flow

and are not included in this report. The test cell inlet flow was not measured at Charleston AFB, Edwards AFB, Naval Aviation Depot Cherry Point, and Barnes Air National Guard Base.

3.6 COMPARISON OF EXHAUST FLOW DETERMINATION METHOD WITH HISTORICAL EMISSION CALCULATION METHODOLOGY

A review was made of the SAE Aerospace Information Report 1533, "Procedure for the Calculation of Basic Emission Parameters for Aircraft Turbine Engines" in an effort to complete particular emission index calculations to compare with the results published in this report. In brief, the emission index values that were calculated using the carbon balance volumetric flowrate were nearly identical to the values that are determined by the SAE 1533 calculation. This is not surprising because the two methods are based on the same mass balance principles.

The SAE 1533 procedure is based on a mass balance for the combustion equation with CO_2, CO, C_xH_y, NO/NO_2, and H_2O. The intent of the method is to determine an emission index (lb pollutant/ 1000 lb fuel) by measuring only CO_2, CO, NO/NO_2, and THC (as C1Ha) in the exhaust, and analyzing the fuel. A significant portion of the procedure is spent determining instrument measurement interferences that have been eliminated by improvements in instrument design since 1982. The instruments used during the test program (with the exception of the CO_2 analyzer) are not affected by the type of interferences treated in the method, and the CO_2 analyzer is now measured on a dry basis to remove the known H_2O interference. Other details of the mass balance manipulations are not meaningful for our specific program because of the large amount of excess air present in the test cell exhaust. The SAE 1533 method also assumed a steady inlet CO_2 concentration of 320 ppm. The measurements throughout this test program indicated that the test cells frequently experienced an elevated CO_2 level.

Despite these differences, it was relatively easy to input actual test cell concentration measurements for CO_2, CO, THC (as CH_4), and NO_x (as NO_2), as well as a few fuel parameters and ambient humidity, to calculate the emission indexes which are compared to the results reported in this section. Corrections for measured concentrations of CO_2 and THC at the inlet were included in the calculations. Table 3-1 presents the comparison of emission indices between calculation methods for the F101-GE-102 engine from Tinker AFB at idle, military, and afterburner.

The close comparison between the values calculated in this report and the values calculated by the SAE 1533 method was expected. As stated previously, the SAE Method uses an extensive mass balance equation, which at one point was used to determine the fuel-to-air ratio of the exhaust. The fuel-to-air ratio is directly dependent on the volumetric flow rate of the exhaust. This fuel-to-air ratio was then used to calculate the emission index. The carbon balance calculation used in this report's procedure focuses on the single carbon mass balance to determine the fuel-to-air ratio, then uses the measured fuel consumption to solve for the volumetric flow rate. The volumetric flow rate was then used to calculate the mass emission rate, and the mass rate was converted back to the emission index by dividing by fuel consumption.

While it is true that the carbon mass balance approach required more calculation steps, the determination of a volumetric flow rate is a critical component of the overall emissions calculation. It allows the determination of emission rates for the minor constituents such as aldehyde/ketones, PAH, etc., that cannot be derived from the SAE 1533 procedure.

Table 3-1. Emission Index Comparison

F101-GE-102 (B-1B)			
Engine Setting	NO_x (lbs/1,000 lbs fuel)	CO (lbs/1,000 lbs fuel)	THC (lbs/1,000 lbs fuel)
IDLE			
SAE1533	3.67	20.62	0[1]
EQ/WESTON – Carbon Balance	3.47	20.70	0[1]
EQ/WESTON – Tracer Gas	4.10	24.47	0[1]
MILITARY			
SAE1533	11.36	0.768	0.17
EQ/WESTON – Carbon Balance	11.62	0.75	0.10
EQ/WESTON – Tracer Gas	12.83	0.83	0.37
Afterburner			
SAE1533	16.19	44.33	61.09
EQ/WESTON – Carbon Balance	16.69	42.94	61.03
EQ/WESTON – Tracer Gas	16.91	43.47	61.82

[1] The measured outlet concentration was less than the measured inlet concentration.

SECTION 4

RESULTS

The following sections discuss the engine emission results. The results are presented to note data outliers, pollutant trends, and pollutant corrections. To assist in data interpretation, the emissions and engine summary tables are incorporated with the engine-specific emission discussion. Particulate matter results are provided for those engines where isokinetic samples were obtained via strict Method 5 procedures (i.e., full-stack traverse). The particulate matter results which were obtained utilizing a custom EPA Method 5 Protocol (single-point sampling) are presented in Volume 3. HAP emissions data presented are for those compounds that were target analytes of the methods employed.

4.1 CORRECTION OF SOURCE DATA FOR BACKGROUND POLLUTANTS

The concentration of each pollutant measured in the exhaust stream was corrected for ambient background concentrations. The following hierarchy was used in the correction of the source (engine exhaust) pollutant data.

- If the exhaust concentration was below the analytical detection limit, then the value reported is the method detection limit.
- If both the exhaust and the ambient background concentrations are above the detection limit, the ambient value is subtracted from the source value. If the ambient sample exhibited excessive blank contamination for a given compound, the source value was not corrected for ambient background for that compound.

- If the ambient concentration is greater than the exhaust concentration, then the source value is reported as zero for the hazardous air pollutants. For the criteria pollutants, total hydrocarbons was the only pollutant where the ambient concentration was greater than the exhaust concentration. In these instances, the detection limit of the analyzer is reported followed by "ND."

- Ambient corrections for the F118-GE-100 engine were not made. The engine exhaust was re-entrained into the test where the ambient sampling equipment was located. These ambient data were biased high.

The correction of the source data with the ambient data was based on the concentrations measured. Correction was possible because the mass of air entering the test cell was nearly equal to the mass exiting the test cell. The increase in mass flow at the exhaust as a result of fuel combustion was negligible.

4.1.1 Particulate

Particulate matter collected as part of the filterable portion of the sample train was corrected for the ambient background particulate concentration level. The condensable particulate portion of the sample was not corrected for ambient concentrations. Total particulate matter reported in this section is equal to the sum of the filterable particulate, corrected for the ambient background, and condensable particulate.

4.1.2 Volatile Organic Compounds

Source VOC data was corrected for ambient background levels of VOCs. This correction was made by directly subtracting ambient data from the source data. If the ambient background pollutant concentration was greater than the detected pollutant concentration in the exhaust stream, the detection limit of the analyzer is reported.

4.1.3 Semivolatile Organic Compounds

Source semivolatile organic compound data was corrected for ambient background levels of semivolatile compounds. This correction was accomplished by directly subtracting ambient data from the source data. If the ambient background pollutant concentration was greater than the detected pollutant concentration in the exhaust stream, a zero was reported for that pollutant.

4.1.4 Aldehydes and Ketones

The ambient aldehyde samples collected inside the test cells during Phase I (Kelly AFB, CCAD, Laughlin AFB, and Tinker AFB) of the monitoring program exhibited significant breakthrough to the second sample tube. Ambient concentrations of aldehydes were below those levels typically expected when using the denuder methodology. The probable explanation is that the coating on the denuder tubes was incorrectly applied, resulting in unrepresentatively low pollutant concentration measurements. Due to the coating problems, ambient aldehyde samples were not collected during Phase II (Charleston AFB, Edwards AFB, Naval Aviation Depot Cherry Point, Barnes ANGB) of the monitoring program. The exhaust concentrations were corrected with the typical detected ambient concentration (provided in Section 2, Table 2-2) where no blank contamination occurred.

4.1.5 Gaseous Emissions

Gaseous pollutant concentrations were measured at both the inlet and outlet locations. Because of the large amount of ambient air drawn through the engine test cells, the test team measured total hydrocarbons (THC) and CO_2 concentrations in the ambient air as well as the contributions from the engine exhaust. Double counting contributions, by assuming that all gaseous pollutants measured at the exhaust came from the engine, was avoided by subtracting the THC and CO_2 concentrations measured at the inlet from their respective concentrations measured at the outlet.

Because of low THC levels, 1 to 10 ppm, from a number of engines in combination with the large amount of dilution air through the test cell, THC concentrations at the exhaust were very close to concentrations measured at the inlet. Often the results were within tenths of a ppm.

The THC analyzers were operated in the lowest practical operating range of 0 to 100 ppm. As with any instrument, there is nominal instrument drift, and individual instrument accuracy and precision can result in differences between two analyzers. Therefore, it is very reasonable to assume that two identical analyzers measuring the same pollutant concentration can vary by several tenths of a ppm at the 0-100 ppm measurement range. During this test program, THC exhaust emissions varied depending on the engine and engine operating conditions. Exhaust levels of THC were generally 2 to 5 ppm and as high as 20 to 100 ppm. Inlet levels often ranged from 1 to 4 ppm. When exhaust concentrations were low, the net difference between inlet and exhaust levels were often 0.1 to 1.0 ppm. Likewise, the net difference at times was a negative value due to the ambient THC concentration being higher than the THC exhaust concentration. This was the result of instrument drift and individual instrument accuracy and precision.

Instrument accuracy was developed using a sample set of calibration data. An instrument accuracy of 0.8 ppm was determined by using three times the standard deviation of the initial bias calibration response to the 10-ppm calibration standard in the 0- to 100-ppm instrument range. Development of this project-specific instrument accuracy allows for factors such as power fluctuations, electronic data collection system bias, and sample line bias to be considered in the method accuracy. The method accuracy (0.8 ppm) was used when the result of correcting source THC data by the ambient THC data resulted in a zero or negative value. These results are flagged to indicate that the actual response is less than the present value.

Sampling for gaseous pollutants was conducted in conjunction with all other parameters being sampled at the source. Gaseous pollutants were broken into three

run segments to coincide with each particulate sample run. In order to minimize fuel usage, the turnaround time between particulate runs was generally on the order of minutes with three 1-hour sample runs being completed in less than 3 ½ hours. Therefore, there was not sufficient time to conduct bias calibration checks between each gaseous pollutant sample run. Bias calibration checks were conducted after the end of the three-run set. Due to instrument drift, it may appear that there is a trend between individual sample runs of pollutant concentrations increasing or decreasing. This difference may appear greater when the instrument response was at the lower end of the instrument range. Although the difference between 1 and 2 ppm may appear significant, this difference is normal and acceptable in contrast to a zero to 100 ppm sample range, instrument (system) accuracy, and sample line contamination. The results in each table are expressed as pounds per hour. Changes in the calculated exhaust flow rate could affect the reported results. Changes in flow could also result in apparent trends in the data between runs or appear as significant differences between runs. The three-run average presents the most representative value accounting for method variability.

4.1.6 Calculation of Pollutant Averages

The pollutant emission averages are typically the average of each of the three sample runs. There are a few exceptions to this process:

- If a sample run was void, the run is not included in the average.
- For the THC, CO, CO_2, and NO_x summary tables, if a method detection limit is presented and there was a detected sample for one or more of the other sample runs, the detection limit is included in the three-run average.
- In the VOC summary tables, if a non-detect was reported for all three runs, a non-detect was reported for the average. If there was a detectable concentration for one or more runs, the three-run average was taken. For example, if Run 1 and Run 2 had a detectable quantity and

Run 3 reported a non-detect, the detection limit for Run 3 would be averaged with the remaining two runs.

4.2 SOURCE ANALYTICAL DATA

Blank samples were collected for each sample group. Where appropriate, the analytical results were adjusted to reflect constant blank contamination in the sample media. Specific approaches for each pollutant category are discussed in the following subsections.

4.2.1 Particulate

All particulate data were corrected for solvent blank contamination as specified by EPA Methods 5 and 202. The filterable particulate portion of the sample was corrected for residue found in the acetone blank sample. The condensable portion was corrected for residue in both the distilled water and methlyene chloride blank samples. A correction for methlyene chloride residue was not made for engines GTCP85-180 and GTCP165-1. The residue in the blank was significantly greater than that found in any of the samples. The blank appears to have been biased since it was not consistent with other blank samples collected during the program.

A substantial influence in the particulate sample results and other measured parameters was the amount of dilution air that was present in the exhaust stream. Dilution air was the result of both ambient air drawn through the non-combustion portion of the engines and from the induced draft through the test cell from engine operation. The addition of dilution air resulted in very low pollutant concentrations at the exhaust. The low pollutant concentrations at the exhaust were compounded by the fact that many of the newer engines emit lower quantities of pollutants. This resulted in pollutant concentrations that were near the method detection limit. As previously stated in section 4.1.5, results near a method detection limit fluctuate as a result of normal method variability.

For particulate sampling, method variability is the combination of three factors: analytical, sample media, and sample collection variability. Both analytical and sample media variability can be estimated based on the method allowable differences and results from media blanks. Sample collection variability is more uncertain and can be based on many factors including sampling technique, sample recovery and cleanup methods, and the individual performing each task. Therefore, it is difficult to quantify. The analytical method requires that each pre-test and post-test sample fraction be weighed a minimum of two times with the difference between the two weighings not to exceed +/- 0.5 mg. This would equate to a maximum variation of 0.25 mg/m^3 based on both pre and post sample weights and a 70-cubic-foot (ft^3) sample volume. The results from media blank samples also vary and are dependent on several factors: media lot, blank media collection methods, laboratory handling, and analytical procedures. Based on several blanks collected during this program, it was not uncommon to have variations of 1.0 mg for the same media. The levels of contamination or the variation are not significant, but indicate that variations between individual samples do occur due to handling and analytical practices. A variation of 1.0 mg would equate to 0.5 mg/m^3. Sample results were extremely low, and results from individual particulate runs were often less than 2.0 mg/m^3 where method variability would have a significant influence. To decrease the effects of method variability, the sample size was increased. This was done for all sampled parameters which benefited from an increased sample size. The particulate sample size collected was generally greater than 70 ft^3 (normally 30-50 ft^3 are collected in a typical test) over a 1-hour sample period while maintaining an isokinetic sampling rate (70 ft^3 is near the limit for the sampling equipment over a 1-hour period). Alternatively, sample size can also be increased by extending the sample period. This was performed for the other methods, but it was thought beneficial to see if there was variability from run to run for the particulate samples. It appears the variability in the results is from method variability rather than engine variability. The conclusion is supported by the CEM data, which showed virtually no difference from

hour to hour, thus indicating that combustion parameters, which affect particulate emissions, remained constant. The three-run average for the particulate samples accounts for method variability and therefore presents the most representative value.

4.2.2 Volatile Organic Compounds

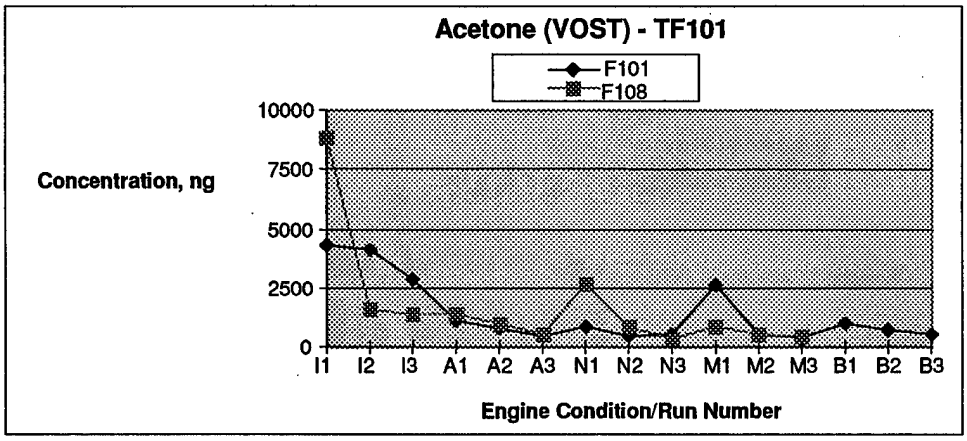
The Method 0030 (Volatile Organic Sampling Train - VOST) sampling train consists of two sample fractions: a pair of tubes (one TENAX and one TENAX/charcoal adsorbent) and a liquid condensate sample. Normal practice is to add the results from the two sample fractions together. A review of the blank data collected during Method 0030 (Volatile Organic Sampling Train - VOST) sampling indicated significant concentrations of methlyene chloride, chloroform, and acetone (typical laboratory and field contaminants) in the liquid condensate blank samples. The concentrations of methlyene chloride, chloroform, and acetone found in all the exhaust samples were similar to the concentrations in the blank samples. This strongly suggests that the results in the condensate samples were due to contamination and not from engine emissions. These compounds are not typical fuel combustion byproducts. Therefore, condensate sample results were not included in the overall result.

There appears to have been contamination in the tube pairs from several laboratory contaminants. It is difficult to distinguish between engine emissions and contamination. Emissions of a given compound should be consistent for each engine condition and are expected to follow a pattern based on that engine condition. At the idle setting, it is expected that emissions of VOC would be higher compared to other engine conditions. At idle, the engine is operating at a much lower temperature, i.e., combustion is not as efficient. In the afterburner power setting, a marked decrease in combustion efficiency is expected. The figure below for benzene emissions shows a typical emissions profile.

Based on tube pair blank samples, Freon 11 (trichlorofluromethane), methlyene chloride, chloroform, and acetone should be considered biased high. Figure A, as an

example, depicts acetone emissions for two different engines. Emissions are higher during idle, as expected, but unexpected spikes also exist at other engine conditions. Therefore, some of the spikes may likely be from those contaminants found in the blank samples. The higher values noted at idle exhibit the expected emission profile; therefore, it may be the result of engine emissions. The contribution of engine emissions is difficult to quantify because of blank contamination. Consequently, the results are reported as biased high and not typical fuel combustion byproducts.

Figure A. Acetone Emissions for Two Different Engines



4.2.3 Semivolatile Organic Compounds

No adjustments were made to the semivolatile organics samples based on the blank samples.

4.2.4 Aldehydes

No adjustments were made to the aldehyde samples based on the blank samples.

4.2.5 Sulfur Dioxide

It is assumed that during combustion, the sulfur in the fuel is primarily converted to sulfur dioxide (SO_2) with negligible amounts of sulfur trioxide being present. SO_2 emissions can be estimated when the sulfur content of JP-8 fuel is known. Fuel analyses were performed on JP-8 fuel samples that were taken directly from storage tanks at each testing facility during this monitoring program. These analyses provided sulfur content results that were very consistent with previous analyses. Previous analyses, historical emission testing results, and the conclusions reached by these analyses assumed a sulfur content of 0.02% for JP-8 fuel. In this case, there are 0.20 pound of sulfur in 1,000 pounds of fuel. When this sulfur is converted to SO_2, there will then be 0.40 pound of SO_2 per thousand pounds of fuel burned. Thus, as presented in a June 1990 report by the Aircraft Environmental Support Office entitled, "Summary Tables of Gaseous and Particulate Emissions From Aircraft Engines," the emission factor for SO_2 during engine operation at any setting is equal to 0.40 pound per thousand pounds of fuel. The subsequent results tables in this section do not show this SO_2 emission factor.

4.3 ENGINE SPECIFIC EMISSION DISCUSSION

This section provides descriptions of any testing or operational anomalies that occurred during this sampling program. This section is designed to supplement and provide additional information so that emissions for each engine can be properly evaluated. The tabulated emission results follow each one of the discussion sections. Please note that particulate matter emission factors are shown only for GTCP85-180, GTCP165-1, T700-GE-700, and T64-GE-100. These engines were tested at facilities where strict EPA Method 5 procedures were followed. Particulate matter results for the other engines, which were sampled using a custom Method 5 sampling procedure, can

be found in Volume 3. These results were calculated using tracer gas methodology and carbon balance and will be treated as sampling data for emission estimation.

All emissions data are reported as pounds per hour (lb/hr) and pounds per 1,000 pounds of fuel usage (lbs/1,000 lbs fuel). For particulate, gaseous (CEM), and VOC data, the average of the three runs for each engine condition is also reported. Emission rate averages were calculated following the guidelines presented in Section 4.1.6. When a run was lost for any reason, a blank is shown in the summary table and the reason for losing the run is discussed in the write-up preceding the tables.

The origin of the flow method (tracer gas, carbon balance, F-factor, EPA Method 2) used to calculate the emissions data is noted in the header of each table. Where the flow rate was not directly measured using EPA Method 2 procedures, flow was calculated by tracer gas, carbon balance calculation, or F-factor calculation.

A review of individual sampling runs (particulate and VOCs) for the same engine power setting identified inconsistencies between the runs. The evaluation of the significance of the run-to-run differences is made more difficult because many of the detected compounds were at or near the detection limit of the method. This is the result of analytical and sampling method uncertainties that occur at, or near, the detection limit. It is important to note that the relative differences in mass loading are very small even though the relative pollutant concentration is sometimes two to three times that of another run at the same engine setting. As the measured pollutant concentration increases, the percent difference between replicate samples decreases. Uncertainties are reduced when sample results are not near the detection limit.

4.3.1 Engine T56-A-7

Tracer gas was used for flow determination since it yielded the most consistent and reasonable results. The carbon balance calculations indicate that flow rates during idle and approach conditions were similar. Carbon balance flow at the intermediate power setting had a higher calculated flow than the flow at the military power setting.

Also, the velocity measurements collected during single point manual sampling confirmed the reasonableness of the flow rate calculated using tracer gas flow data.

During Run 3 of the approach and the military settings, the ambient CO_2 analyzer malfunctioned. Run 3 was voided and is not included in the average calculation.

Tables 4-1 through 4-10 present engine results for the T56-A-7 engine. Figure 4-1 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-11 summarizes the engine operating data collected during testing.

Table 4-1
Emissions Factor Summary
Gaseous Parameters
T56-A-7 (C-130)
Idle

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	125318		120574		120331			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	3.40	4.70	3.32	4.59	3.09	4.27	3.27	4.52
Nitrogen Dioxide (NO_2)	0.63	0.87	0.43	0.60	0.60	0.83	0.55	0.77
Nitrogen Oxides (NO_X)	5.75	7.95	5.44	7.51	5.26	7.26	5.48	7.58
Carbon Monoxide (CO)	3.72	5.14	3.58	4.94	3.67	5.07	3.66	5.05
Total Hydrocarbons (THC as CH_4)	3.23	4.47	2.60	3.59	1.97	2.72	2.60	3.59
Carbon Dioxide (CO_2)[1]	2200	3046	2041	2818	2119	2926	2120	2930

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 4 of this volume.

Table 4-2
Emissions Factor Summary
Gaseous Parameters
T56-A-7 (C-130)
Approach
Flow by Tracer

	Run Number							
	1		2		3		Average	
Flow Rate, dscfm	128884		121210		126865			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	4.03	4.57	3.45	3.92	3.91	4.46	3.80	4.32
Nitrogen Dioxide (NO_2)	0.74	0.84	0.69	0.79	0.91	1.04	0.78	0.89
Nitrogen Oxides (NO_X)	6.92	7.85	6.08	6.90	6.91	7.87	6.64	7.54
Carbon Monoxide (CO)	3.93	4.46	3.12	3.54	3.21	3.66	3.42	3.89
Total Hydrocarbons (THC as CH_4)	0.71	0.81	0.55	0.62	1.11	1.27	0.79	0.90
Carbon Dioxide (CO_2)	2825	3203	2318	2632	2778	3166	2640	3000

Table 4-3
Emissions Factor Summary
Gaseous Parameters
T56-A-7 (C-130)
Intermediate

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	125142		125162		125964			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	9.77	5.56	8.95	5.14	9.42	5.43	9.38	5.38
Nitrogen Dioxide (NO_2)	1.43	0.82	1.61	0.93	1.71	0.99	1.59	0.91
Nitrogen Oxides (NO_X)	16.32	9.29	15.33	8.81	16.15	9.32	15.93	9.14
Carbon Monoxide (CO)	3.55	2.02	3.33	1.91	3.24	1.87	3.37	1.93
Total Hydrocarbons (THC as CH_4)	1.63	0.93	0.77	0.44	1.01	0.59	1.14	0.65
Carbon Dioxide (CO_2)	4116	2344	3829	2200	3938	2272	3961	2272

Table 4-4
Emissions Factor Summary
Gaseous Parameters
T56-A-7 (C-130)
Military

Flow by Tracer

	Run Number									
	1		2		3			Average	
Flow Rate, dscfm	143531		143785		150265				
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	20.12	8.86	16.86	7.44	16.15	7.23		17.71	7.84
Nitrogen Dioxide (NO2)	1.54	0.68	1.34	0.59	0.43	0.19		1.10	0.49
Nitrogen Oxides (NOX)	32.29	14.21	27.09	11.96	25.19	11.28		28.19	12.48
Carbon Monoxide (CO)	4.82	2.12	4.77	2.10	6.03	2.70		5.20	2.31
Total Hydrocarbons (THC as CH4)	1.60	0.70	1.10	0.49	0.30	0.14	ND	1.00	0.44
Carbon Dioxide (CO2)	6236	2745	6355	2805	NA	NA		6296	2775

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.
NA - Data not available. Run void due to analyzer malfunction.

Table 4-5
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
T56-A-7 (C-130)
Idle
Flow by Tracer

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		125318					120574					120331					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Vinyl Chloride [H]	75-01-4		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Bromomethane [H]	74-83-9		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Chloroethane [H]	75-00-3		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	2.69E-04		3.73E-04		J,bb	2.84E-04		3.92E-04		J,bb	4.55E-04		6.29E-04		J,bb	3.36E-04	4.65E-04
1,1-Dichloroethene [H]	75-35-4		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Methylene Chloride [H]	75-09-2	3.14E-04		4.35E-04		J,bb	7.32E-04		1.01E-03		J,bb	5.05E-04		6.97E-04		J,bb	5.17E-04	7.14E-04
1,1-Dichloroethane [H]	75-34-3		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Chloroform [H]	67-66-3	3.37E-03		4.66E-03			4.97E-04		6.86E-04		J,bb	9.83E-04		1.36E-03		J	1.62E-03	2.23E-03
1,1,1-Trichloroethane [H]	71-55-6		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Benzene [H]	71-43-2	2.92E-03		4.04E-03			3.08E-03		4.25E-03			4.35E-03		6.00E-03			3.45E-03	4.76E-03
1,2-Dichloroethane [H]	107-06-2		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Trichloroethene [H]	79-01-6		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Toluene [H]	108-88-3	2.69E-03		3.73E-03			9.49E-04		1.31E-03		J	2.24E-03		3.09E-03			1.96E-03	2.71E-03
cis-1,3-Dichloropropene [H]	10061-01-5		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5	1.12E-03		1.55E-03		UJ	1.18E-03		1.63E-03		UJ	1.14E-03		1.58E-03		UJ	1.15E-03	1.59E-03
Tetrachloroethene [H]	127-18-4		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Chlorobenzene [H]	108-90-7		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Ethyl Benzene [H]	100-41-4		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
m,p-Xylene [H]	1330-20-7	2.24E-04		3.11E-04		J		1.18E-03		1.63E-03	ND	6.40E-04		8.84E-04		J	6.83E-04	9.43E-04
o-Xylene [H]	95-47-6		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND	2.75E-04		3.79E-04		J	8.60E-04	1.19E-03
Styrene [H]	100-42-5		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND	3.89E-04		5.37E-04		J	8.98E-04	1.24E-03
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Acetone	67-64-1	0.00E+00		0.00E+00			2.39E-03		3.31E-03		J	0.00E+00		0.00E+00			7.98E-04	1.10E-03
Carbon Disulfide [H]	75-15-0		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND	4.12E-04		5.68E-04		J	9.06E-04	1.25E-03
trans-1,2-Dichloroethene	156-60-5		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Bromodichloromethane	75-27-4		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
2-Hexanone	591-78-6		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
Bromoform [H]	75-25-2		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.12E-03		1.55E-03	ND		1.18E-03		1.63E-03	ND		1.14E-03		1.58E-03	ND	ND	ND
HAP Total		**1.06E-02**		**1.47E-02**			**6.44E-03**		**8.89E-03**			**1.09E-02**		**1.51E-02**			**1.20E-02**	**1.66E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-6
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
T56-A-7 (C-130)
Approach
Flow by Tracer

		Run Number													
		1					2					3					Average	
Flow Rate, dscfm		128884					121210					126865						
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel				
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	4.39E-04		4.98E-04		J	3.36E-04		3.82E-04		J	4.23E-04		4.82E-04		J	4.00E-04	4.54E-04
Vinyl Chloride [H]	75-01-4		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Bromomethane [H]	74-83-9		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Chloroethane [H]	75-00-3		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	8.30E-04		9.42E-04		J,bb	6.95E-04		7.89E-04		J,bb	6.32E-04		7.20E-04		J,bb	7.19E-04	8.17E-04
1,1-Dichloroethene [H]	75-35-4		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Methylene Chloride [H]	75-09-2	1.11E-03		1.26E-03		J,bb	9.63E-04		1.09E-03		J,bb	5.18E-04		5.90E-04		J,bb	8.64E-04	9.81E-04
1,1-Dichloroethane [H]	75-34-3		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Chloroform [H]	67-66-3	7.39E-04		8.38E-04		J,bb	4.04E-04		4.58E-04		J,bb	2.82E-04		3.21E-04		J,bb	4.75E-04	5.39E-04
1,1,1-Trichloroethane [H]	71-55-6		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		1.15E-03		1.31E-03	ND	2.24E-04		2.55E-04		J		1.17E-03		1.34E-03	ND	8.51E-04	9.67E-04
Benzene [H]	71-43-2	4.16E-03		4.72E-03			3.59E-03		4.07E-03			3.99E-03		4.55E-03			3.91E-03	4.45E-03
1,2-Dichloroethane [H]	107-06-2		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Trichloroethene [H]	79-01-6		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Toluene [H]	108-88-3	2.17E-03		2.46E-03			1.86E-03		2.11E-03			2.02E-03		2.30E-03			2.02E-03	2.29E-03
cis-1,3-Dichloropropene [H]	10061-01-5		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5	1.15E-03		1.31E-03		UJ	1.12E-03		1.27E-03		UJ	1.17E-03		1.34E-03		UJ	1.15E-03	1.31E-03
Tetrachloroethene [H]	127-18-4		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Chlorobenzene [H]	108-90-7		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Ethyl Benzene [H]	100-41-4	2.31E-04		2.62E-04		J		1.12E-03		1.27E-03	ND	2.82E-04		3.21E-04		J	5.45E-04	6.19E-04
m,p-Xylene [H]	1330-20-7	6.23E-04		7.06E-04		J	5.81E-04		6.60E-04		J	7.27E-04		8.29E-04		J	6.44E-04	7.32E-04
o-Xylene [H]	95-47-6	2.78E-04		3.15E-04		J	2.69E-04		3.06E-04		J	3.06E-04		3.48E-04		J	2.84E-04	3.23E-04
Styrene [H]	100-42-5	3.47E-04		3.93E-04		J	2.92E-04		3.31E-04		J	3.29E-04		3.75E-04		J	3.22E-04	3.66E-04
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Acetone	67-64-1	6.28E-02		7.12E-02		J	5.40E-02		6.13E-02		J	3.90E-03		4.44E-03			4.02E-02	4.56E-02
Carbon Disulfide [H]	75-15-0	1.90E-03		2.15E-03			2.11E-03		2.39E-03			3.06E-04		3.48E-04		J	1.44E-03	1.63E-03
trans-1,2-Dichloroethene	156-60-5		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Bromodichloromethane	75-27-4		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
2-Hexanone	591-78-6		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
Bromoform [H]	75-25-2		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.15E-03		1.31E-03	ND		1.12E-03		1.27E-03	ND		1.17E-03		1.34E-03	ND	ND	ND
HAP Total		**1.32E-02**		**1.49E-02**			**1.17E-02**		**1.33E-02**			**1.04E-02**		**1.18E-02**			**1.29E-02**	**1.47E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-7
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
T56-A-7 (C-130)
Intermediate
Flow by Tracer

		Run Number													
		1					2					3					Average	
Flow Rate, dscfm		125142					125162					125964						
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel				
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	4.46E-04		2.54E-04		J	5.86E-04		3.37E-04		J	6.09E-04		3.51E-04		J	5.47E-04	3.14E-04
Vinyl Chloride [H]	75-01-4		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Bromomethane [H]	74-83-9		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Chloroethane [H]	75-00-3		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	7.36E-04		4.19E-04		J,bb	7.60E-04		4.36E-04		J,bb	8.92E-04		5.15E-04		J,bb	7.96E-04	4.57E-04
1,1-Dichloroethene [H]	75-35-4		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	1.05E-03		5.95E-04		J,bb	1.60E-03		9.21E-04		bb	1.44E-03		8.30E-04		bb	1.36E-03	7.82E-04
1,1-Dichloroethane [H]	75-34-3		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Chloroform [H]	67-66-3	3.57E-03		2.03E-03			5.63E-04		3.23E-04		J,bb	9.15E-04		5.28E-04		J	1.68E-03	9.61E-04
1,1,1-Trichloroethane [H]	71-55-6		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5	2.45E-04		1.40E-04		J	2.60E-04		1.50E-04		J	2.40E-04		1.38E-04		J	2.48E-04	1.42E-04
Benzene [H]	71-43-2	2.23E-03		1.27E-03			2.39E-03		1.37E-03			2.40E-03		1.38E-03			2.34E-03	1.34E-03
1,2-Dichloroethane [H]	107-06-2		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Toluene [H]	108-88-3	1.50E-03		8.52E-04			1.67E-03		9.59E-04			1.85E-03		1.07E-03			1.67E-03	9.60E-04
cis-1,3-Dichloropropene [H]	10061-01-5		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5	1.12E-03		6.35E-04		UJ	1.08E-03		6.22E-04		UJ	1.09E-03		6.29E-04		UJ	1.10E-03	6.29E-04
Tetrachloroethene [H]	127-18-4		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4		1.12E-03		6.35E-04	ND	2.39E-04		1.37E-04		J	2.84E-04		1.64E-04		J	5.46E-04	3.12E-04
m,p-Xylene [H]	1330-20-7	6.00E-04		3.42E-04		J	7.36E-04		4.23E-04		J	8.30E-04		4.79E-04		J	7.22E-04	4.15E-04
o-Xylene [H]	95-47-6	2.68E-04		1.52E-04		J	3.03E-04		1.74E-04		J	3.05E-04		1.76E-04		J	2.92E-04	1.68E-04
Styrene [H]	100-42-5		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Acetone	67-64-1	2.68E-02		1.52E-02		J	9.72E-02		5.58E-02		J	6.53E-02		3.77E-02		J	6.31E-02	3.62E-02
Carbon Disulfide [H]	75-15-0	9.56E-04		5.45E-04		J	2.08E-03		1.20E-03			2.40E-03		1.38E-03			1.81E-03	1.04E-03
trans-1,2-Dichloroethene	156-60-5		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Bromodichloromethane	75-27-4		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
2-Hexanone	591-78-6		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
Bromoform [H]	75-25-2		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.12E-03		6.35E-04	ND		1.08E-03		6.22E-04	ND		1.09E-03		6.29E-04	ND	ND	ND
HAP Total		**1.20E-02**		**6.82E-03**			**1.15E-02**		**6.61E-03**			**1.24E-02**		**7.13E-03**			**1.23E-02**	**7.07E-03**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-8
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
T56-A-7 (C-130)
Military
Flow by Tracer

		Run Number															
		1					2					3					
Flow Rate, dscfm		143531					143785					150265					Average
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr / lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	5.34E-04		2.35E-04		J	6.03E-04		2.66E-04		J	1.32E-03		5.90E-04		UJ	8.18E-04 / 3.64E-04
Vinyl Chloride [H]	75-01-4		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Bromomethane [H]	74-96-4		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Chloroethane [H]	74-83-9		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.17E-03		5.16E-04		J,bb	9.70E-04		4.28E-04		J,bb	7.37E-04		3.30E-04		J,bb	9.60E-04 / 4.25E-04
1,1-Dichloroethene [H]	75-35-4		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Methylene Chloride [H]	75-09-2	1.42E-03		6.27E-04		bb	8.67E-04		3.83E-04		J,bb	5.80E-04		2.60E-04		J,bb	9.57E-04 / 4.23E-04
1,1-Dichloroethane [H]	75-34-3		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Chloroform [H]	67-66-3	7.37E-04		3.24E-04		J,bb	1.39E-03		6.13E-04			1.37E-03		6.12E-04			1.16E-03 / 5.17E-04
1,1,1-Trichloroethane [H]	71-55-6		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Carbon Tetrachloride [H]	56-23-5	2.80E-04		1.23E-04		J		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	9.70E-04 / 4.31E-04
Benzene [H]	71-43-2	1.91E-03		8.40E-04			1.73E-03		7.66E-04			1.68E-03		7.53E-04			1.78E-03 / 7.86E-04
1,2-Dichloroethane [H]	107-06-2		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Trichloroethene [H]	79-01-6		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
1,2-Dichloropropane [H]	78-87-5		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Toluene [H]	108-88-3	1.72E-04		7.57E-05			0.00E+00		0.00E+00			0.00E+00		0.00E+00			5.74E-05 / 2.52E-05
cis-1,3-Dichloropropene [H]	10061-01-5		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
1,1,2-Trichloroethane [H]	79-00-5	1.27E-03		5.58E-04		UJ	1.31E-03		5.80E-04		UJ		1.32E-03		5.90E-04	ND	1.30E-03 / 5.76E-04
Tetrachloroethene [H]	127-18-4	2.80E-04		1.23E-04		J		1.31E-03		5.80E-04	ND	5.26E-04		2.36E-04		J	7.07E-04 / 3.13E-04
Chlorobenzene [H]	108-90-7		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Ethyl Benzene [H]	100-41-4	5.09E-04		2.24E-04		J	3.41E-04		1.51E-04		J	3.68E-04		1.65E-04		J	4.06E-04 / 1.80E-04
m,p-Xylene [H]	1330-20-7	1.73E-03		7.62E-04			1.31E-03		5.80E-04			1.21E-03		5.42E-04		J	1.42E-03 / 6.28E-04
o-Xylene [H]	95-47-6	6.88E-04		3.03E-04		J	5.49E-04		2.43E-04		J	4.48E-04		2.00E-04		J	5.62E-04 / 2.49E-04
Styrene [H]	100-42-5		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Acetone	67-64-1	9.79E-03		4.31E-03			0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00		bb	3.26E-03 / 1.44E-03
Carbon Disulfide [H]	75-15-0	6.34E-04		2.79E-04		J		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	1.09E-03 / 4.83E-04
trans-1,2-Dichloroethene	156-60-5		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Vinyl Acetate [H]	108-05-4		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
2-Butanone (MEK) [H]	78-93-3		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Bromodichloromethane	75-27-4		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
2-Hexanone	591-78-6		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
Bromoform [H]	75-25-2		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
cis-1,2-Dichloroethene	156-59-2		1.27E-03		5.58E-04	ND		1.31E-03		5.80E-04	ND		1.32E-03		5.90E-04	ND	ND / ND
HAP Total		**1.02E-02**		**4.47E-03**			**8.11E-03**		**3.58E-03**			**7.50E-03**		**3.36E-03**			**1.12E-02 / 4.97E-03**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-9
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
T56-A-7 (C-130)
Flow by Tracer

		Engine Mode																	
		Idle					Approach					Intermediate					Military				
Flow Rate, dscfm		122033					125564					125427					145801				
		lb/hr		lbs/1,000 lbs			lb/hr		lbs/1,000 lbs			lb/hr		lbs/1,000 lbs			lb/hr		lbs/1,000 lbs		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Phenol [H]	108-95-2		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
Dichloroethyl ether [H]	111-44-4		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
2-Chlorophenol	95-57-8		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
1,3-Dichlorobenzene	541-73-1		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
1,4-Dichlorobenzene [H]	106-46-7		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
1,2-Dichlorobenzene	95-50-1		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
o-Cresol [H]	95-48-7		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
bis(2-Chloroisopropyl) Ether	39638-32-9		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
N-Nitroso-di-n-propylamine	621-64-7		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
p-Cresol [H]	106-44-5		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
Hexachloroethane [H]	67-72-1		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Nitrobenzene [H]	98-95-3		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Isophorone [H]	78-59-1		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
2-Nitrophenol	88-75-5		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
2,4-Dimethylphenol	105-67-9		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
Benzoic Acid	65-85-0	4.66E-03		6.44E-03			7.81E-03		8.87E-03		J	6.67E-03		3.83E-03			4.59E-03		2.03E-03		
bis(2-Chloroethoxy) Methane	111-91-1		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
2,4-Dichlorophenol	120-83-2		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
1,2,4-Trichlorobenzene [H]	120-82-1		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Naphthalene [H]	91-20-3	8.40E-04		1.16E-03			9.11E-04		1.04E-03			3.08E-04		1.77E-04			3.02E-04		1.34E-04		
4-Chloroaniline	106-47-8		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Hexachlorobutadiene [H]	87-68-3		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
4-Chloro-3-methylphenol	59-50-7		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
2-Methylnaphthalene	91-57-6	5.26E-04		7.27E-04			5.99E-04		6.80E-04			1.80E-04		1.03E-04			7.81E-05		3.45E-05		
Hexachlorocyclopentadiene [H]	77-47-4		1.46E-03		2.02E-03	ND		1.62E-03		1.84E-03	ND		1.39E-03		7.96E-04	ND		1.48E-03		6.54E-04	ND
2,4,6-Trichlorophenol [H]	88-06-2		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
2,4,5-Trichlorophenol [H]	95-95-4		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
2-Chloronaphthalene	91-58-7		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
2-Nitroaniline	88-74-4		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Dimethylphthalate [H]	131-11-3		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Acenaphthylene	208-96-8		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
2,6-Dinitrotoluene	606-20-2		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
3-Nitroaniline	99-09-2		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Acenaphthene	83-32-9		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
2,4-Dinitrophenol [H]	51-28-5		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
4-Nitrophenol [H]	100-02-7		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
2,4-Dinitrotoluene [H]	121-14-2		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Dibenzofuran [H]	132-64-9		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Diethylphthalate	84-66-2	6.99E-04		9.67E-04			2.27E-04		2.58E-04		bb		1.39E-04		7.96E-05	ND	9.61E-04		4.25E-04		
Fluorene	86-73-7		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
4-Chlorophenyl-phenyl Ether	7005-72-3		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
4-Nitroaniline	100-01-6		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
4,6-Dinitro-2-methylphenol	534-52-1		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
N-Nitrosodiphenylamine	86-30-6		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
4-Bromophenyl-phenyl Ether	101-55-3		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Hexachlorobenzene [H]	118-74-1		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Pentachlorophenol [H]	87-86-5		1.46E-03		2.02E-03	ND		1.62E-03		1.84E-03	ND		1.39E-03		7.96E-04	ND		1.48E-03		6.54E-04	ND
Phenanthrene	85-01-8		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Anthracene	120-12-7		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
di-n-Butylphthalate [H]	84-74-2	3.64E-04		5.04E-04			2.92E-04		3.32E-04		bb	1.94E-04		1.11E-04			2.37E-04		1.05E-04		
Fluoranthene	206-44-0		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Pyrene	129-00-0		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Butylbenzylphthalate	85-68-7		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
3,3'-Dichlorobenzidine [H]	91-94-1		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Chrysene	218-01-9		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Benzo(a)anthracene	56-55-3		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
bis(2-Ethylhexyl)phthalate [H]	117-81-7	1.75E-03		2.41E-03		B	2.92E-03		3.32E-03		B	2.08E-03		1.19E-03		B	0.00E+00		0.00E+00		B
Di-n-Octylphthalate	117-84-0		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Benzo(b)fluoranthene	205-99-2		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Benzo(k)fluoranthene	207-08-9		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Benzo(a)pyrene	50-32-8		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Indeno(1,2,3-c,d)pyrene	193-39-5		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Benzo(g,h,i)perylene	191-24-2		1.46E-04		2.02E-04	ND		1.62E-04		1.84E-04	ND		1.39E-04		7.96E-05	ND		1.48E-04		6.54E-05	ND
Benzyl alcohol	100-51-6		7.27E-04		1.00E-03	ND		8.09E-04		9.19E-04	ND		6.91E-04		3.97E-04	ND		7.43E-04		3.28E-04	ND
HAP Total		**2.95E-03**		**4.08E-03**			**4.12E-03**		**4.69E-03**			**2.58E-03**		**1.48E-03**			**5.39E-04**		**2.38E-04**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

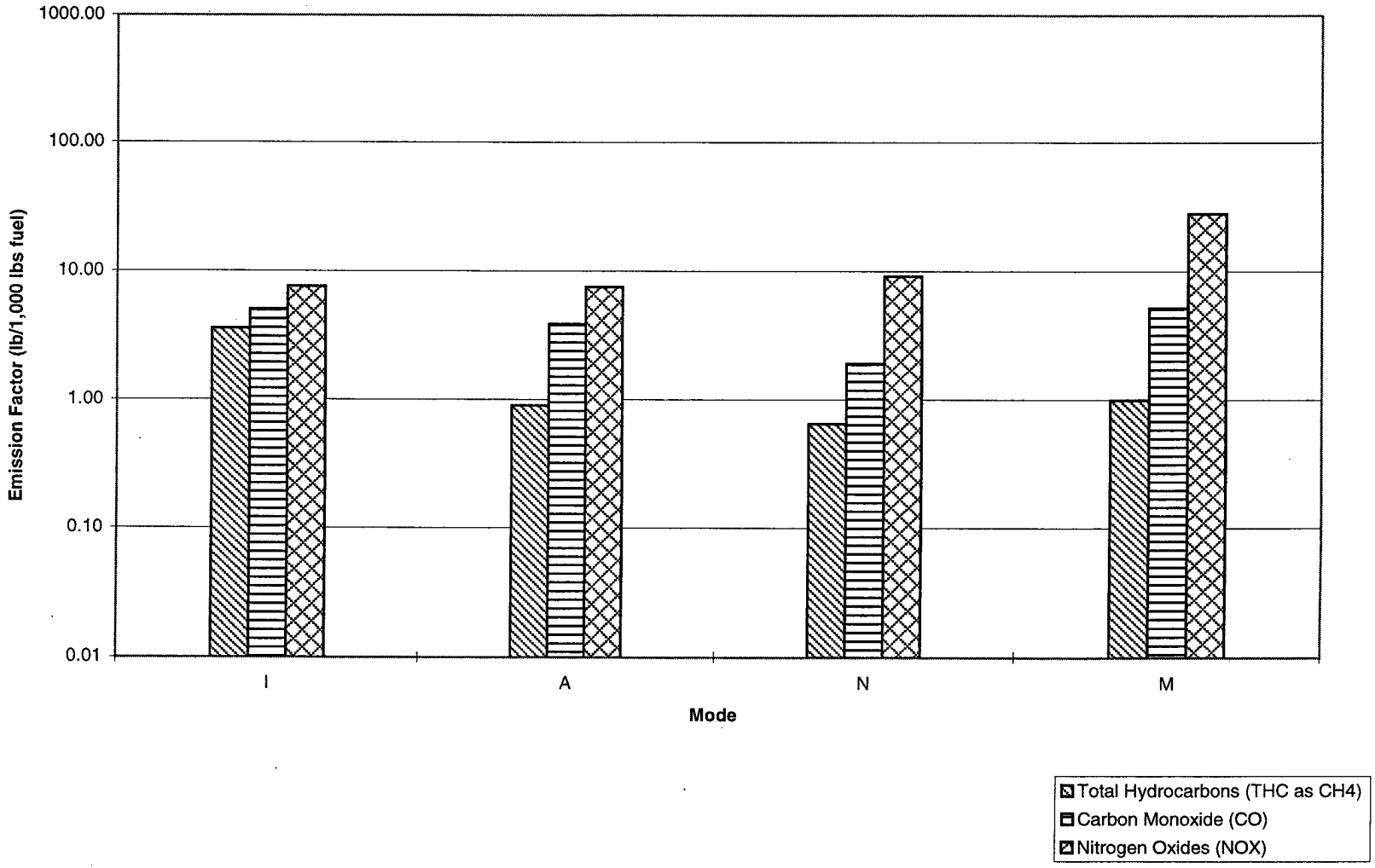
Table 4-10
Emissions Factor Summary
Aldehyde/Ketones
T56-A-7 (C-130)
Flow by Tracer

		Engine Mode															
		Idle					Approach					Intermediate					Military				
Flow Rate, dscfm		122033					125564					125427					145801				
		lb/hr		lbs/1,000 lbs			lb/hr		lbs/1,000 lbs			lb/hr		lbs/1,000 lbs			lb/hr		lbs/1,000 lbs		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Formaldehyde [H]	50-00-0	2.97E-02		4.11E-02		B	2.94E-02		3.34E-02		B	1.62E-02		9.27E-03			8.62E-04		3.81E-04		B,bb
Acetaldehyde [H]	75-07-0	7.54E-03		1.04E-02		B	0.00E+00		0.00E+00		B	9.46E-04		5.43E-04		B,bb	3.72E-04		1.64E-04		B,bb
Acrolein [H]	107-02-8		1.58E-04		2.18E-04	ND		1.41E-04		1.60E-04	ND		1.36E-04		7.80E-05	ND		7.05E-05		3.12E-05	ND
Acetone	67-64-1	9.84E-03		1.36E-02		B,bb	1.07E-02		1.21E-02		B,bb	6.49E-03		3.73E-03		B,bb	4.35E-02		1.92E-02		B
Crotonaldehyde	4170-30-3		1.58E-04		2.18E-04	ND		1.41E-04		1.60E-04	ND		1.36E-04		7.80E-05	ND		7.05E-05		3.12E-05	ND
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3	9.60E-05		1.33E-04			6.16E-05		7.00E-05				1.36E-04		7.80E-05	ND	1.40E-04		6.18E-05		
Benzaldehyde	100-52-7	8.18E-04		1.13E-03			7.71E-04		8.76E-04			8.13E-04		4.67E-04				7.05E-05		3.12E-05	ND
Isopentanal (Isovaleraldehyde)	590-86-3		1.58E-04		2.18E-04	ND		1.41E-04		1.60E-04	ND		1.36E-04		7.80E-05	ND		7.05E-05		3.12E-05	ND
Pentanal (Valeraldehyde)	110-62-3		1.58E-04		2.18E-04	ND		1.41E-04		1.60E-04	ND		1.36E-04		7.80E-05	ND		7.05E-05		3.12E-05	ND
o-Tolualdehyde	529-20-4		1.58E-04		2.18E-04	ND		1.41E-04		1.60E-04	ND		1.36E-04		7.80E-05	ND		7.05E-05		3.12E-05	ND
m-Tolualdehyde	620-23-5		1.58E-04		2.18E-04	ND		1.41E-04		1.60E-04	ND		1.36E-04		7.80E-05	ND		7.05E-05		3.12E-05	ND
p-Tolualdehyde	104-87-0		1.58E-04		2.18E-04	ND		1.41E-04		1.60E-04	ND		1.36E-04		7.80E-05	ND		7.05E-05		3.12E-05	ND
Hexanal (Hexaldehyde)	66-25-1		1.58E-04		2.18E-04	ND		1.41E-04		1.60E-04	ND		1.36E-04		7.80E-05	ND		7.05E-05		3.12E-05	ND
HAP Total		**3.74E-02**		**5.17E-02**			**2.95E-02**		**3.35E-02**			**1.71E-02**		**9.82E-03**			**1.37E-03**		**6.08E-04**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-1
T56-A-7 (C-130)
Emission Factors



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Table 4-11
Engine Operating Parameter Summary
T56-A-7 (C-130)

Parameter	Idle	Approach	Intermediate	Military
Throttle position (PLA), degrees	20	34	72	90
Engine speed (N1) , rpm	13,505	13,427	13,823	13,828
Barometric pressure (BAROM) , in. Hg	29.10	29.51	29.72	29.51
Compressor inlet temperature (CIT), deg. F	64	35	31	33
Fuel flow (WF), lbs/hr	723.6	880.2	1,741.9	2,261.7
Torque (TORQUE), inch pounds	1,011	3,231	12,802	18,754
Shaft horsepower	217	688	2,808	4,115
Percent maximum horsepower	4.7	15.0	61.2	89.6

4.3.2 Engine TF39-GE-1C

Carbon balance flow rate calculations yielded the most consistent results. Several problems occurred with the tracer gas distribution system during testing. The very high velocities in the augmenter tube damaged the original tracer gas distribution system. The tracer gas mass flow meter was also damaged by JP-8 fuel when the test cell experienced a fuel leak.

Tables 4-12 through 4-21 present engine results for the TF39-GE-1C engine. Figure 4-2 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-22 summarizes the engine operating data collected during testing.

Table 4-12
Emissions Factor Summary
Gaseous Parameters
TF39-GE-1C (C-5)
Idle

Flow by Carbon Balance

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	517942		515699		502514			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	1.21	0.83	1.20	0.82	0.94	0.65	1.12	0.77
Nitrogen Dioxide (NO_2)	2.60	1.77	2.96	2.02	2.88	2.01	2.81	1.93
Nitrogen Oxides (NO_X)	4.82	3.29	4.80	3.29	5.04	3.51	4.89	3.36
Carbon Monoxide (CO)	84.26	57.46	85.47	58.48	84.16	58.68	84.63	58.21
Total Hydrocarbons (THC as CH_4)	24.34	16.60	24.59	16.83	22.76	15.87	23.90	16.43
Carbon Dioxide (CO_2)	4446	3032	4427	3029	4345	3030	4406	3030

Table 4-13
Emissions Factor Summary
Gaseous Parameters
TF39-GE-1C (C-5)
Approach
Flow by Carbon Balance

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	1813616		1904586		1856384			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	155.93	15.13	166.42	15.38	164.81	15.64	162.39	15.38
Nitrogen Dioxide (NO_2)	10.39	1.01	12.28	1.13	11.97	1.14	11.55	1.09
Nitrogen Oxides (NO_X)	249.46	24.20	267.43	24.71	265.98	25.24	260.95	24.72
Carbon Monoxide (CO)	7.91	0.77	8.31	0.77	8.10	0.77	8.10	0.77
Total Hydrocarbons (THC as CH_4)	14.38	1.39	5.90	0.55	0.60	0.06	6.96	0.67
Carbon Dioxide (CO_2)	32541	3157	34186	3159	33308	3161	33345	3159

Table 4-14
Emissions Factor Summary
Gaseous Parameters
TF39-GE-1C (C-5)
Intermediate

Flow by Carbon Balance

	Run Number									Average	
	1			2			3				
Flow Rate, dscfm	1995085			2019638			2071746				
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	216.28	17.31		218.00	17.26		222.65	17.81		218.97	17.46
Nitrogen Dioxide (NO_2)	12.86	1.03		13.02	1.03		14.84	1.19		13.58	1.08
Nitrogen Oxides (NO_X)	347.31	27.79		351.58	27.84		360.65	28.86		353.18	28.16
Carbon Monoxide (CO)	20.01	1.60		17.62	1.40		19.88	1.59		19.17	1.53
Total Hydrocarbons (THC as CH_4)	4.04	0.32	ND	4.06	0.32	ND	4.19	0.33	ND	ND	ND
Carbon Dioxide (CO_2)	39487	3160		39876	3158		39486	3159		39617	3159

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-15
Emissions Factor Summary
Gaseous Parameters
TF39-GE-1C (C-5)
Military

Flow by Carbon Balance

	Run Number									Average	
	1			2			3				
Flow Rate, dscfm	2140043			2163941			2137957				
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	283.99	20.46		286.15	20.58		277.72	20.12		282.62	20.39
Nitrogen Dioxide (NO_2)	13.80	0.99		15.50	1.12		16.85	1.22		15.38	1.11
Nitrogen Oxides (NO_X)	452.26	32.58		458.87	33.01		447.23	32.40		452.79	32.66
Carbon Monoxide (CO)	16.80	1.21		22.65	1.63		13.99	1.01		17.81	1.28
Total Hydrocarbons (THC as CH_4)	4.33	0.31	ND	4.38	0.32	ND	4.34	0.31	ND	ND	ND
Carbon Dioxide (CO_2)	43866	3160		43926	3160		43648	3163		43814	3161

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-16
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF39-GE-1C (C-5)
Idle

Flow by Carbon Balance

		Run Number													
		1				2				3				Average	
Flow Rate, dscfm		517942				515699				502514					
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	4.83E-03		3.29E-03	UJ	1.42E-03		9.74E-04	J	3.92E-02		2.73E-02	UJ	1.51E-02	1.05E-02
Vinyl Chloride [H]	75-01-4		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Bromomethane [H]	74-83-9		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Chloroethane [H]	75-00-3		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	2.31E-03		1.57E-03	J,bb	2.57E-03		1.76E-03	J,bb		3.92E-02		2.73E-02 ND	1.47E-02	1.02E-02
1,1-Dichloroethene [H]	75-35-4		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Methylene Chloride [H]	75-09-2		4.83E-03		3.29E-03 ND	0.00E+00		0.00E+00	bb	0.00E+00		0.00E+00	J,bb	1.61E-03	1.10E-03
1,1-Dichloroethane [H]	75-34-3		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Chloroform [H]	67-66-3		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND	1.12E-02		7.80E-03	J	6.92E-03	4.78E-03
1,1,1-Trichloroethane [H]	71-55-6		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Benzene [H]	71-43-2	4.55E-01		3.10E-01	E	4.47E-01		3.06E-01	E	6.52E-01		4.55E-01		5.18E-01	3.57E-01
1,2-Dichloroethane [H]	107-06-2		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Trichloroethene [H]	79-01-6		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Toluene [H]	108-88-3	1.73E-01		1.18E-01	E	1.61E-01		1.10E-01	E	2.23E-01		1.56E-01		1.86E-01	1.28E-01
cis-1,3-Dichloropropene [H]	10061-01-5		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Tetrachloroethene [H]	127-18-4		4.83E-03		3.29E-03 ND	1.42E-03		9.74E-04	J		3.92E-02		2.73E-02 ND	1.51E-02	1.05E-02
Chlorobenzene [H]	108-90-7		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Ethyl Benzene [H]	100-41-4	2.89E-02		1.97E-02		2.67E-02		1.82E-02		3.16E-02		2.21E-02	J	2.91E-02	2.00E-02
m,p-Xylene [H]	1330-20-7	5.34E-02		3.64E-02		5.24E-02		3.58E-02		5.99E-02		4.18E-02		5.52E-02	3.80E-02
o-Xylene [H]	95-47-6	2.89E-02		1.97E-02		2.84E-02		1.94E-02		2.97E-02		2.07E-02	J	2.90E-02	2.00E-02
Styrene [H]	100-42-5	6.65E-02		4.54E-02		6.65E-02		4.55E-02		6.23E-02		4.34E-02		6.51E-02	4.48E-02
1,1,2,2-Tetrachloroethane [H]	79-34-5		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Acetone	67-64-1	9.43E-02		6.43E-02	E	8.29E-02		5.67E-02	E	2.94E-02		2.05E-02		6.88E-02	4.72E-02
Carbon Disulfide [H]	75-15-0		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Vinyl Acetate [H]	108-05-4		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	2.41E-02		1.64E-02		2.09E-02		1.43E-02			3.92E-02		2.73E-02 ND	2.80E-02	1.93E-02
Bromodichloromethane	75-27-4		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
2-Hexanone	591-78-6		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
Bromoform [H]	75-25-2		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		4.83E-03		3.29E-03 ND		4.75E-03		3.25E-03 ND		3.92E-02		2.73E-02 ND	ND	ND
HAP Total		**8.34E-01**		**5.69E-01**		**8.05E-01**		**5.51E-01**		**1.11E+00**		**7.74E-01**		**9.49E-01**	**6.54E-01**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
E - Results are estimated, value reported is outside linear working range.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-17
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF39-GE-1C (C-5)
Approach
Flow by Carbon Balance

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		1813616					1904586					1856384					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	9.17E-03		8.90E-04		J	8.06E-03		7.45E-04		J	1.72E-02		1.64E-03		UJ	1.15E-02	1.09E-03
Vinyl Chloride [H]	75-01-4		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Bromomethane [H]	74-83-9		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Chloroethane [H]	75-00-3		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	9.78E-03		9.49E-04		J,bb	9.70E-03		8.97E-04		J,bb	8.62E-03		8.18E-04		J,bb	9.37E-03	8.88E-04
1,1-Dichloroethene [H]	75-35-4		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Methylene Chloride [H]	75-09-2	0.00E+00		0.00E+00		J,bb	0.00E+00		0.00E+00		J,bb	0.00E+00		0.00E+00		J,bb	0.00E+00	0.00E+00
1,1-Dichloroethane [H]	75-34-3		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Chloroform [H]	67-66-3	1.50E-02		1.46E-03		J	2.00E-02		1.85E-03			2.07E-02		1.97E-03			1.86E-02	1.76E-03
1,1,1-Trichloroethane [H]	71-55-6		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		3.92E-02		3.80E-03	ND	3.68E-03		3.40E-04		J		1.72E-02		1.64E-03	ND	2.00E-02	1.93E-03
Benzene [H]	71-43-2	2.29E-02		2.22E-03		J	1.27E-02		1.17E-03		J	1.34E-02		1.27E-03		J	1.63E-02	1.56E-03
1,2-Dichloroethane [H]	107-06-2		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Trichloroethene [H]	79-01-6		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Toluene [H]	108-88-3	0.00E+00		0.00E+00		J	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
cis-1,3-Dichloropropene [H]	10061-01-5		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Tetrachloroethene [H]	127-18-4		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Chlorobenzene [H]	108-90-7		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Ethyl Benzene [H]	100-41-4		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND	0.00E+00		0.00E+00		J	1.86E-02	1.78E-03
m,p-Xylene [H]	1330-20-7	0.00E+00		0.00E+00		J	0.00E+00		0.00E+00		J	0.00E+00		0.00E+00		J	0.00E+00	0.00E+00
o-Xylene [H]	95-47-6		3.92E-02		3.80E-03	ND	4.35E-03		4.02E-04		J	5.17E-03		4.91E-04		J	1.62E-02	1.57E-03
Styrene [H]	100-42-5		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Acetone	67-64-1	8.49E-01		8.24E-02			6.69E-02		6.18E-03		bb	5.17E-02		4.91E-03		bb	3.23E-01	3.12E-02
Carbon Disulfide [H]	75-15-0		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Vinyl Acetate [H]	108-05-4		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Bromodichloromethane	75-27-4		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
2-Hexanone	591-78-6		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
Bromoform [H]	75-25-2		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		3.92E-02		3.80E-03	ND		1.67E-02		1.54E-03	ND		1.72E-02		1.64E-03	ND	ND	ND
HAP Total		**4.71E-02**		**4.57E-03**			**4.88E-02**		**4.51E-03**			**5.66E-02**		**5.37E-03**			**1.01E-01**	**9.68E-03**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-18
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF39-GE-1C (C-5)
Intermediate

Flow by Carbon Balance

		Intermediate													
		1					2				3				Average
Flow Rate, dscfm		1995085					2019638				2071746				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	7.62E-03		6.10E-04		J	1.04E-02		8.27E-04		J	5.09E-03		4.07E-04		J	7.72E-03	6.15E-04
Vinyl Chloride [H]	75-01-4		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Bromomethane [H]	74-83-9		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Chloroethane [H]	75-00-3		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	9.42E-03		7.53E-04		J,bb	1.01E-02		7.97E-04		J,bb	1.02E-02		8.13E-04		J,bb	9.88E-03	7.88E-04
1,1-Dichloroethene [H]	75-35-4		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Methylene Chloride [H]	75-09-2	0.00E+00		0.00E+00		J,bb	0.00E+00		0.00E+00		J,bb	0.00E+00		0.00E+00		J,bb	0.00E+00	0.00E+00
1,1-Dichloroethane [H]	75-34-3		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Chloroform [H]	67-66-3	2.19E-02		1.75E-03			1.62E-02		1.28E-03		J	1.90E-02		1.52E-03			1.90E-02	1.52E-03
1,1,1-Trichloroethane [H]	71-55-6	3.82E-03		3.06E-04		J	4.31E-03		3.42E-04		J	3.73E-03		2.99E-04		J	3.95E-03	3.15E-04
Carbon Tetrachloride [H]	56-23-5	3.82E-03		3.06E-04		J	3.95E-03		3.13E-04		J	4.07E-03		3.26E-04		J	3.95E-03	3.15E-04
Benzene [H]	71-43-2	2.05E-02		1.64E-03			1.69E-02		1.34E-03		J	1.56E-02		1.25E-03		J	1.76E-02	1.41E-03
1,2-Dichloroethane [H]	107-06-2		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Trichloroethene [H]	79-01-6		1.73E-02		1.39E-03	ND	4.67E-03		3.70E-04		J	1.16E-02		9.25E-04		J	1.12E-02	8.94E-04
1,2-Dichloropropane [H]	78-87-5		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Toluene [H]	108-88-3	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
cis-1,3-Dichloropropene [H]	10061-01-5		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Tetrachloroethene [H]	127-18-4		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Chlorobenzene [H]	108-90-7		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Ethyl Benzene [H]	100-41-4	6.26E-03		5.01E-04		J	5.39E-03		4.27E-04		J	7.13E-03		5.71E-04		J	6.26E-03	4.99E-04
m,p-Xylene [H]	1330-20-7	2.29E-02		1.84E-03			2.12E-02		1.68E-03			2.72E-02		2.17E-03			2.38E-02	1.90E-03
o-Xylene [H]	95-47-6	8.67E-03		6.94E-04		J	7.87E-03		6.23E-04		J	9.16E-03		7.33E-04		J	8.57E-03	6.83E-04
Styrene [H]	100-42-5		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Acetone	67-64-1	0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00		bb	0.00E+00	0.00E+00
Carbon Disulfide [H]	75-15-0		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Bromodichloromethane	75-27-4		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
2-Hexanone	591-78-6		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
Bromoform [H]	75-25-2		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.73E-02		1.39E-03	ND		1.79E-02		1.42E-03	ND		1.70E-02		1.36E-03	ND	ND	ND
HAP Total		**9.55E-02**		**7.64E-03**			**9.09E-02**		**7.20E-03**			**1.03E-01**		**8.20E-03**			**1.02E-01**	**8.14E-03**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-19
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF39-GE-1C (C-5)
Military

Flow by Carbon Balance

		Run Number													
		1					2				3				
Flow Rate, dscfm		2140043					2163941				2137957				Average
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	7.16E-03		5.16E-04		J	8.51E-03		6.12E-04		J	9.29E-03		6.73E-04		J	8.32E-03	6.00E-04
Vinyl Chloride [H]	75-01-4		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Bromomethane [H]	74-83-9		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Chloroethane [H]	75-00-3		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.11E-02		8.03E-04		J,bb	1.16E-02		8.34E-04		J,bb	1.13E-02		8.18E-04		J,bb	1.13E-02	8.18E-04
1,1-Dichloroethene [H]	75-35-4		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Methylene Chloride [H]	75-09-2	0.00E+00		0.00E+00		J,bb	0.00E+00		0.00E+00		J,bb	0.00E+00		0.00E+00		J,bb	0.00E+00	0.00E+00
1,1-Dichloroethane [H]	75-34-3		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Chloroform [H]	67-66-3	2.31E-02		1.66E-03			1.35E-02		9.74E-04		J,bb	1.81E-02		1.31E-03		J	1.82E-02	1.32E-03
1,1,1-Trichloroethane [H]	71-55-6		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5	4.37E-03		3.15E-04		J	3.87E-03		2.78E-04		J	4.43E-03		3.21E-04		J	4.22E-03	3.05E-04
Benzene [H]	71-43-2	5.61E-02		4.04E-03			4.86E-04		3.50E-05			3.32E-02		2.40E-03			2.99E-02	2.16E-03
1,2-Dichloroethane [H]	107-06-2		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Trichloroethene [H]	79-01-6		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Toluene [H]	108-88-3	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
cis-1,3-Dichloropropene [H]	10061-01-5		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Tetrachloroethene [H]	127-18-4	7.55E-03		5.44E-04		J	7.73E-03		5.56E-04		J		2.01E-02		1.46E-03	ND	1.18E-02	8.52E-04
Chlorobenzene [H]	108-90-7		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Ethyl Benzene [H]	100-41-4	0.00E+00		0.00E+00		J	0.00E+00		0.00E+00		J	0.00E+00		0.00E+00		J	0.00E+00	0.00E+00
m,p-Xylene [H]	1330-20-7	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
o-Xylene [H]	95-47-6	0.00E+00		0.00E+00		J	0.00E+00		0.00E+00		J	0.00E+00		0.00E+00		J	0.00E+00	0.00E+00
Styrene [H]	100-42-5	9.54E-03		6.87E-04		J		1.93E-02		1.39E-03	ND	9.69E-03		7.02E-04		J	1.28E-02	9.26E-04
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Acetone	67-64-1	0.00E+00		0.00E+00			0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00		bb	0.00E+00	0.00E+00
Carbon Disulfide [H]	75-15-0		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Bromodichloromethane	75-27-4		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
2-Hexanone	591-78-6		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
Bromoform [H]	75-25-2		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.99E-02		1.43E-03	ND		1.93E-02		1.39E-03	ND		2.01E-02		1.46E-03	ND	ND	ND
HAP Total		**1.08E-01**		**7.77E-03**			**3.41E-02**		**2.46E-03**			**7.47E-02**		**5.41E-03**			**8.53E-02**	**6.16E-03**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-20
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
TF39-GE-1C (C-5)
Flow by Carbon Balance

		Engine Mode																	
		Idle					Approach					Intermediate					Military				
Flow Rate, dscfm		510030					1844298					2028301					2147268				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
			Detection		Detection			Detection		Detection			Detection		Detection			Detection		Detection	
Analyte	CAS Number	Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit	
Phenol H	108-95-2	6.34E-02		4.38E-02				9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
Dichloroethyl ether H	111-44-4		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
2-Chlorophenol	95-57-8		3.48E-02		2.40E-02	ND		9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
1,3-Dichlorobenzene	541-73-1		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
1,4-Dichlorobenzene H	106-46-7	6.97E-03		4.82E-03		UJ	1.89E-03		1.81E-04		UJ	2.25E-03		1.79E-04		UJ	2.25E-03		1.62E-04		UJ
1,2-Dichlorobenzene	95-50-1		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
o-Cresol H	95-48-7		3.48E-02		2.40E-02	ND		9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
bis(2-Chloroisopropyl) Ether	39638-32-9		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
N-Nitroso-di-n-propylamine	621-64-7		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
p-Cresol H	106-44-5		3.48E-02		2.40E-02	ND		9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
Hexachloroethane H	67-72-1		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Nitrobenzene H	98-95-3		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Isophorone H	78-59-1		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
2-Nitrophenol	88-75-5		3.48E-02		2.40E-02	ND		9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
2,4-Dimethylphenol	105-67-9		3.48E-02		2.40E-02	ND		9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
Benzoic Acid	65-85-0		6.97E-02		4.82E-02	ND	6.81E-02		6.50E-03			8.81E-02		7.03E-03			9.49E-02		6.85E-03		
bis(2-Chloroethoxy) Methane	111-91-1		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
2,4-Dichlorophenol	120-83-2		3.48E-02		2.40E-02	ND		9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
1,2,4-Trichlorobenzene H	120-82-1		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Naphthalene H	91-20-3	1.41E-01		9.71E-02			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00		
4-Chloroaniline	106-47-8		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Hexachlorobutadiene H	87-68-3		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
4-Chloro-3-methylphenol	59-50-7		3.48E-02		2.40E-02	ND		9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
2-Methylnaphthalene	91-57-6	1.21E-01		8.36E-02			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00		
Hexachlorocyclopentadiene H	77-47-4		6.97E-02		4.82E-02	ND		1.89E-02		1.81E-03	ND		2.25E-02		1.79E-03	ND		2.25E-02		1.62E-03	ND
2,4,6-Trichlorophenol H	88-06-2		3.48E-02		2.40E-02	ND		9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
2,4,5-Trichlorophenol H	95-95-4		3.48E-02		2.40E-02	ND		9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
2-Chloronaphthalene	91-58-7		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
2-Nitroaniline	88-74-4		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Dimethylphthalate H	131-11-3		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Acenaphthylene	208-96-8		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
2,6-Dinitrotoluene	606-20-2		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
3-Nitroaniline	99-09-2		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Acenaphthene	83-32-9		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
2,4-Dinitrophenol H	51-28-5		3.48E-02		2.40E-02	ND		9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
4-Nitrophenol H	100-02-7		3.48E-02		2.40E-02	ND		9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
2,4-Dinitrotoluene H	121-14-2		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Dibenzofuran H	132-64-9		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Diethylphthalate	84-66-2		6.97E-03		4.82E-03	ND	3.03E-03		2.89E-04		bb	5.63E-03		4.49E-04		bb	8.12E-03		5.86E-04		bb
Fluorene	86-73-7		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
4-Chlorophenyl-phenyl Ether	7005-72-3		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
4-Nitroaniline	100-01-6		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
4,6-Dinitro-2-methylphenol	534-52-1		3.48E-02		2.40E-02	ND		9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
N-Nitrosodiphenylamine	86-30-6		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
4-Bromophenyl-phenyl Ether	101-55-3		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Hexachlorobenzene H	118-74-1		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Pentachlorophenol H	87-86-5		6.97E-02		4.82E-02	ND		1.89E-02		1.81E-03	ND		2.25E-02		1.79E-03	ND		2.25E-02		1.62E-03	ND
Phenanthrene	85-01-8		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Anthracene	120-12-7		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
di-n-Butylphthalate H	84-74-2		6.97E-03		4.82E-03	ND	6.81E-03		6.50E-04		B	4.28E-03		3.41E-04		B,bb	5.41E-03		3.90E-04		B,bb
Fluoranthene	206-44-0		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND	2.48E-03		1.98E-04				2.25E-03		1.62E-04	ND
Pyrene	129-00-0		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Butylbenzylphthalate	85-68-7		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND	2.70E-03		1.95E-04		bb
3,3'-Dichlorobenzidine H	91-94-1		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Chrysene	218-01-9		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Benzo(a)anthracene	56-55-3		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
bis(2-Ethylhexyl)phthalate H	117-81-7		6.97E-03		4.82E-03	ND	3.41E-02		3.25E-03		B	1.87E-02		1.49E-03		B,bb	6.53E-02		4.71E-03		B
Di-n-Octylphthalate	117-84-0		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Benzo(b)fluoranthene	205-99-2		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Benzo(k)fluoranthene	207-08-9		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Benzo(a)pyrene	50-32-8		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Indeno(1,2,3-c,d)pyrene	193-39-5		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Benzo(g,h,i)perylene	191-24-2		6.97E-03		4.82E-03	ND		1.89E-03		1.81E-04	ND		2.25E-03		1.79E-04	ND		2.25E-03		1.62E-04	ND
Benzyl alcohol	100-51-6		3.48E-02		2.40E-02	ND		9.46E-03		9.03E-04	ND		1.12E-02		8.97E-04	ND		1.13E-02		8.12E-04	ND
HAP Total		**2.11E-01**		**1.46E-01**			**4.28E-02**		**4.08E-03**			**2.52E-02**		**2.01E-03**			**7.30E-02**		**5.26E-03**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.

B - Compound present in the laboratory blank greater than reporting limit.

UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.

bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.

H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

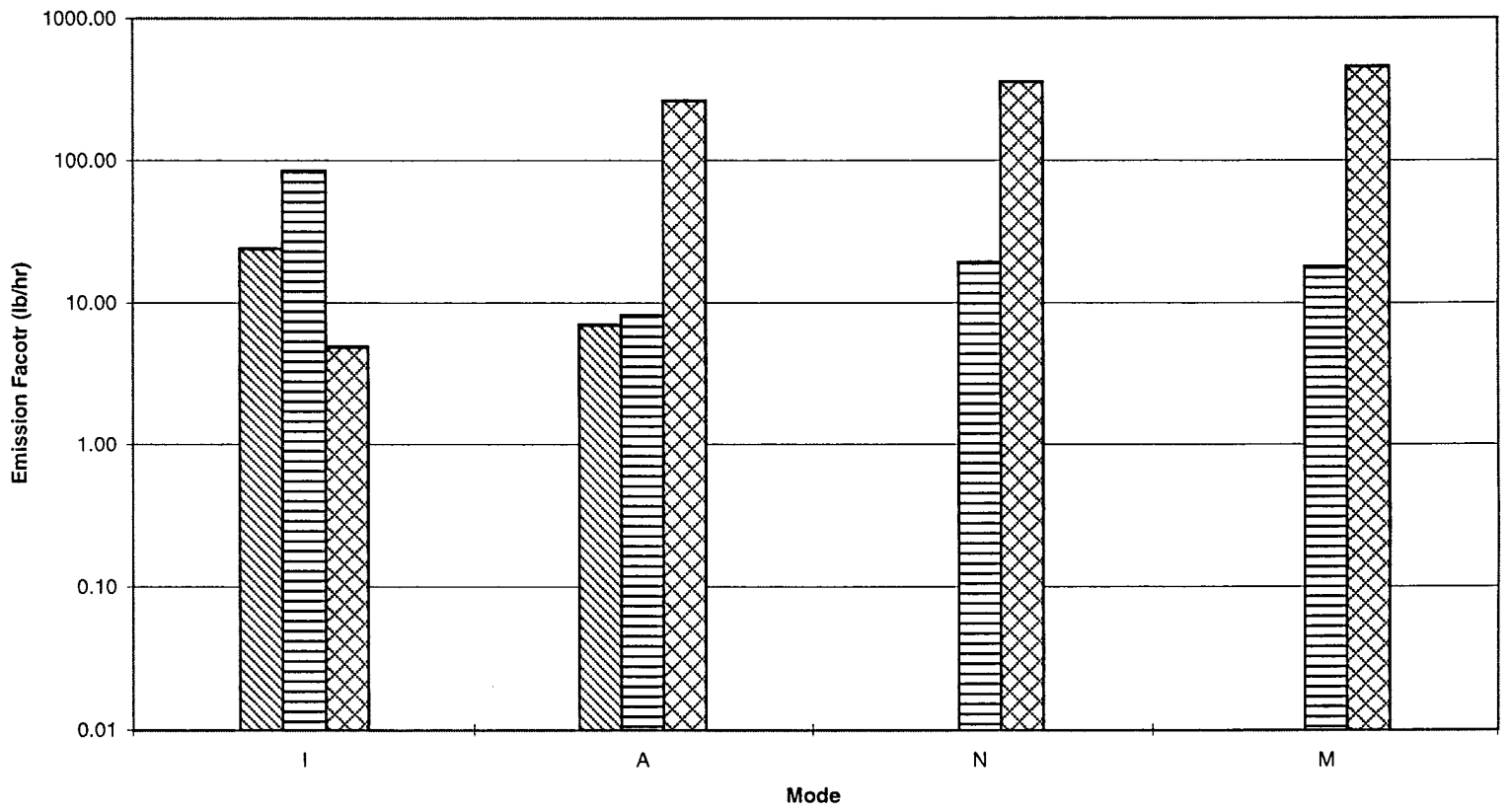
Table 4-21
Emissions Factor Summary
Aldehyde/Ketones
TF39-GE-1C (C-5)
Flow by Carbon Balance

		Engine Mode																	
		Idle					Approach					Intermediate					Military				
Flow Rate, dscfm		510030					1844298					2028301					2147268				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Formaldehyde [H]	50-00-0	2.06E+00		1.42E+00		B	8.54E-02		8.15E-03		B,bb	6.14E-02		4.90E-03		B,bb	1.46E-01		1.06E-02		B,bb
Acetaldehyde [H]	75-07-0	3.07E-01		2.12E-01		B	3.31E-02		3.16E-03		B	3.27E-03		2.61E-04		B,bb	8.55E-03		6.17E-04		B,bb
Acrolein [H]	107-02-8	2.99E-01		2.06E-01				1.20E-03		1.14E-04	ND		1.23E-03		9.81E-05	ND		1.71E-03		1.23E-04	ND
Acetone	67-64-1		6.69E-03		4.62E-03	ND	5.97E-02		5.70E-03		B,bb	3.69E-02		2.94E-03		B,bb	3.76E-02		2.71E-03		B,bb
Crotonaldehyde	4170-30-3	1.27E-01		8.76E-02				1.20E-03		1.14E-04	ND		1.23E-03		9.81E-05	ND		1.71E-03		1.23E-04	ND
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3	5.35E-02		3.69E-02		B		1.20E-03		1.14E-04	ND	2.95E-03		2.35E-04		B	3.41E-03		2.46E-04		B
Benzaldehyde	100-52-7	2.06E-01		1.42E-01			1.20E-02		1.14E-03			2.36E-02		1.88E-03			2.36E-02		1.70E-03		
Isopentanal (Isovaleraldehyde)	590-86-3		6.69E-03		4.62E-03	ND		1.20E-03		1.14E-04	ND		1.23E-03		9.81E-05	ND		1.71E-03		1.23E-04	ND
Pentanal (Valeraldehyde)	110-62-3	6.69E-01		4.62E-01		B		1.20E-03		1.14E-04	ND		1.23E-03		9.81E-05	ND		1.71E-03		1.23E-04	ND
o-Tolualdehyde	529-20-4		6.69E-03		4.62E-03	ND		1.20E-03		1.14E-04	ND		1.23E-03		9.81E-05	ND		1.71E-03		1.23E-04	ND
m-Tolualdehyde	620-23-5		6.69E-03		4.62E-03	ND		1.20E-03		1.14E-04	ND		1.23E-03		9.81E-05	ND		1.71E-03		1.23E-04	ND
p-Tolualdehyde	104-87-0		6.69E-03		4.62E-03	ND		1.20E-03		1.14E-04	ND		1.23E-03		9.81E-05	ND		1.71E-03		1.23E-04	ND
Hexanal (Hexaldehyde)	66-25-1		6.69E-03		4.62E-03	ND		1.20E-03		1.14E-04	ND		1.23E-03		9.81E-05	ND		1.71E-03		1.23E-04	ND
HAP Total		**2.72E+00**		**1.88E+00**			**1.18E-01**		**1.13E-02**			**6.76E-02**		**5.39E-03**			**1.58E-01**		**1.14E-02**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-2
TF39-GE-1C (C-5)
Emission Factors



THC for modes N and M is "Non detect."

Table 4-22
Engine Operating Parameter Summary
TF39-GE-1C (C-5)

Parameter	Idle	Approach	Intermediate	Military
Actual fan speed (N1), rpm	961	2,963	3,170	3,281
Percent maximum fan speed (PERCENT N1)	27	85	91	94
Actual core speed (N2), rpm	6,573	8,823	9,098	9,333
Percent maximum core speed (PERCENT N2)	67	90	93	95
Screen temperature (T2), deg. F	44	37	43	44
Engine pressure ratio (EPR)	1	4	5	5
Average thrust, lbs	2,955	31,880	36,617	39,486
Percent maximum thrust	7	76	87	94
Fuel flow (WF), lbs/hr	1,448.3	10,477.4	12,541.3	13,861.8

4.3.3 APU GTCP85-180

Actual flows were measured following EPA Method 2 procedures because emissions were exhausted through a single stack. The VOC measurements were not corrected for ambient concentrations for two reasons: 1) the bypass air (ambient air) is an insignificant component of the exhaust and 2) the high exhaust temperature. Any VOCs entering the APU are likely combusted in the high temperature stream. The emission results would be biased low if the ambient VOC concentrations were subtracted from the emission concentration.

Tables 4-23 through 4-27 present engine results for the GTCP85-180 engine. Figure 4-3 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-28 summarizes the engine operating data collected during testing.

Table 4-23
Emissions Factor Summary
Gaseous Parameters
GTCP85-180 (APU)
Constant

Flow as Measured

	Run Number										Average	
	1			2			3					
Flow Rate, dscfm	5478			5362			5517					
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel			lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	0.80	2.96		0.74	2.75		0.74	2.71			0.76	2.81
Nitrogen Dioxide (NO_2)	0.08	0.29		0.12	0.46		0.16	0.58			0.12	0.44
Nitrogen Oxides (NO_X)	1.30	4.85		1.25	4.63		1.28	4.71			1.28	4.73
Carbon Monoxide (CO)	2.08	7.74		2.01	7.46		2.05	7.51			2.04	7.57
Total Hydrocarbons (THC as CH_4)	0.02	0.06		0.01	0.04	ND	0.01	0.04		ND	0.01	0.05
Carbon Dioxide (CO_2)	903	3361		895	3319		920	3378			906	3353

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-24
Emissions Factor Summary
Particulates
GTCP85-180 (APU)
Constant

Flow as Measured

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	5478		5362		5517			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Particulate (filterable)	0.167	0.622	0.153	0.566	0.123	0.453	0.148	0.547
Particulate (condensable)	0.040	0.150	0.008	0.031	0.091	0.334	0.047	0.172
Particulate (total)	0.207	0.772	0.161	0.597	0.214	0.787	0.194	0.719

Table 4-25
Emissions Factor Summary
Volatile Organic Compounds (VOCs) [1]
GTCP85-180 (APU)
Constant
Flow as Measured

		Constant															
		1					2					3					Average
Flow Rate, dscfm		5478					5362					5517					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Vinyl Chloride [H]	75-01-4		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Bromomethane [H]	74-83-9	1.79E-05		6.68E-05		J		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	4.14E-05	1.53E-04
Chloroethane [H]	75-00-3		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.20E-04		4.45E-04		bb	1.70E-04		6.32E-04		bb	1.59E-04		5.84E-04		bb	1.50E-04	5.54E-04
1,1-Dichloroethene [H]	75-35-4		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	5.68E-04		2.12E-03		bb	7.35E-04		2.73E-03		bb	8.06E-04		2.96E-03		bb	7.03E-04	2.60E-03
1,1-Dichloroethane [H]	75-34-3		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Chloroform [H]	67-66-3	2.48E-05		9.24E-05		J,bb	6.91E-05		2.56E-04			7.42E-05		2.72E-04			5.60E-05	2.07E-04
1,1,1-Trichloroethane [H]	71-55-6		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Benzene [H]	71-43-2	5.89E-03		2.19E-02		S	3.62E-03		1.34E-02		E	2.65E-03		9.71E-03		J	4.05E-03	1.50E-02
1,2-Dichloroethane [H]	107-06-2		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Toluene [H]	108-88-3	1.20E-03		4.45E-03		J	1.17E-03		4.34E-03			1.17E-03		4.29E-03			1.18E-03	4.36E-03
cis-1,3-Dichloropropene [H]	10061-01-5		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7	2.48E-04		9.24E-04			7.13E-05		2.64E-04			5.31E-05		1.95E-04		J	1.24E-04	4.61E-04
Ethyl Benzene [H]	100-41-4	4.68E-05		1.74E-04		J	2.65E-05		9.83E-05		J	2.44E-05		8.95E-05		J	3.26E-05	1.21E-04
m,p-Xylene [H]	1330-20-7	8.17E-04		3.04E-03			5.32E-04		1.97E-03			5.62E-04		2.06E-03			6.37E-04	2.36E-03
o-Xylene [H]	95-47-6	1.29E-04		4.82E-04			7.45E-05		2.76E-04			6.16E-05		2.26E-04			8.85E-05	3.28E-04
Styrene [H]	100-42-5	6.77E-05		2.52E-04			4.58E-05		1.70E-04		J	4.13E-05		1.52E-04		J	5.16E-05	1.91E-04
1,1,2,2-Tetrachloroethane [H]	79-34-5		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Acetone	67-64-1	7.37E-03		2.74E-02		J	3.84E-03		1.42E-02		J	4.67E-03		1.71E-02		J	5.29E-03	1.96E-02
Carbon Disulfide [H]	75-15-0		4.99E-05		1.86E-04	ND	1.17E-05		4.34E-05		J		5.31E-05		1.95E-04	ND	3.82E-05	1.41E-04
trans-1,2-Dichloroethene	156-60-5		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	7.88E-04		2.93E-03			3.09E-04		1.15E-03			5.19E-04		1.90E-03			5.39E-04	1.99E-03
Bromodichloromethane	75-27-4		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
2-Hexanone	591-78-6		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
Bromoform [H]	75-25-2		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		4.99E-05		1.86E-04	ND		5.32E-05		1.97E-04	ND		5.31E-05		1.95E-04	ND	ND	ND
HAP Total		**1.73E-02**		**6.43E-02**			**1.07E-02**		**3.95E-02**			**1.08E-02**		**3.96E-02**			**1.29E-02**	**4.79E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
E - Results are estimated, value reported is outside linear working range.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).
S - Saturated peak - concentration is estimated.

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 3 of this volume.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-26
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
GTCP85-180 (PAH)
Flow as Measured

		Engine Mode				
		Constant				
Flow Rate, dscfm		5685				
		lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	
Phenol [H]	108-95-2	3.90E-05		1.44E-04		
Dichloroethyl ether [H]	111-44-4		7.50E-06		2.77E-05	ND
2-Chlorophenol	95-57-8		3.75E-05		1.39E-04	ND
1,3-Dichlorobenzene	541-73-1		7.50E-06		2.77E-05	ND
1,4-Dichlorobenzene [H]	106-46-7		7.50E-06		2.77E-05	ND
1,2-Dichlorobenzene	95-50-1		7.50E-06		2.77E-05	ND
o-Cresol [H]	95-48-7		3.75E-05		1.39E-04	ND
bis(2-Chloroisopropyl) Ether	39638-32-9		7.50E-06		2.77E-05	ND
N-Nitroso-di-n-propylamine	621-64-7		7.50E-06		2.77E-05	ND
p-Cresol [H]	106-44-5		3.75E-05		1.39E-04	ND
Hexachloroethane [H]	67-72-1		7.50E-06		2.77E-05	ND
Nitrobenzene [H]	98-95-3		7.50E-06		2.77E-05	ND
Isophorone [H]	78-59-1		7.50E-06		2.77E-05	ND
2-Nitrophenol	88-75-5		3.75E-05		1.39E-04	ND
2,4-Dimethylphenol	105-67-9		3.75E-05		1.39E-04	ND
Benzoic Acid	65-85-0	1.12E-03		4.15E-03		
bis(2-Chloroethoxy) Methane	111-91-1		7.50E-06		2.77E-05	ND
2,4-Dichlorophenol	120-83-2		3.75E-05		1.39E-04	ND
1,2,4-Trichlorobenzene [H]	120-82-1		7.50E-06		2.77E-05	ND
Naphthalene [H]	91-20-3	0.00E+00		0.00E+00		
4-Chloroaniline	106-47-8		7.50E-06		2.77E-05	ND
Hexachlorobutadiene [H]	87-68-3		7.50E-06		2.77E-05	ND
4-Chloro-3-methylphenol	59-50-7		3.75E-05		1.39E-04	ND
2-Methylnaphthalene	91-57-6	0.00E+00		0.00E+00		
Hexachlorocyclopentadiene [H]	77-47-4		7.50E-05		2.77E-04	ND
2,4,6-Trichlorophenol [H]	88-06-2		3.75E-05		1.39E-04	ND
2,4,5-Trichlorophenol [H]	95-95-4		3.75E-05		1.39E-04	ND
2-Chloronaphthalene	91-58-7		7.50E-06		2.77E-05	ND
2-Nitroaniline	88-74-4		7.50E-06		2.77E-05	ND
Dimethylphthalate [H]	131-11-3		7.50E-06		2.77E-05	ND
Acenaphthylene	208-96-8		7.50E-06		2.77E-05	ND
2,6-Dinitrotoluene	606-20-2		7.50E-06		2.77E-05	ND
3-Nitroaniline	99-09-2		7.50E-06		2.77E-05	ND
Acenaphthene	83-32-9		7.50E-06		2.77E-05	ND
2,4-Dinitrophenol [H]	51-28-5		3.75E-05		1.39E-04	ND
4-Nitrophenol [H]	100-02-7		3.75E-05		1.39E-04	ND
2,4-Dinitrotoluene [H]	121-14-2		7.50E-06		2.77E-05	ND
Dibenzofuran [H]	132-64-9		7.50E-06		2.77E-05	ND
Diethylphthalate	84-66-2	1.43E-04		5.31E-04		
Fluorene	86-73-7		7.50E-06		2.77E-05	ND
4-Chlorophenyl-phenyl Ether	7005-72-3		7.50E-06		2.77E-05	ND
4-Nitroaniline	100-01-6		7.50E-06		2.77E-05	ND
4,6-Dinitro-2-methylphenol	534-52-1		3.75E-05		1.39E-04	ND
N-Nitrosodiphenylamine	86-30-6		7.50E-06		2.77E-05	ND
4-Bromophenyl-phenyl Ether	101-55-3		7.50E-06		2.77E-05	ND
Hexachlorobenzene [H]	118-74-1		7.50E-06		2.77E-05	ND
Pentachlorophenol [H]	87-86-5	4.20E-04		1.55E-03		
Phenanthrene	85-01-8	6.24E-06		2.31E-05		
Anthracene	120-12-7		7.50E-06		2.77E-05	ND
di-n-Butylphthalate [H]	84-74-2	7.24E-05		2.68E-04		B
Fluoranthene	206-44-0	1.20E-05		4.43E-05		
Pyrene	129-00-0		7.50E-06		2.77E-05	ND
Butylbenzylphthalate	85-68-7	2.10E-05		7.75E-05		
3,3'-Dichlorobenzidine [H]	91-94-1		7.50E-06		2.77E-05	ND
Chrysene	218-01-9		7.50E-06		2.77E-05	ND
Benzo(a)anthracene	56-55-3		7.50E-06		2.77E-05	ND
bis(2-Ethylhexyl)phthalate [H]	117-81-7	1.24E-04		4.58E-04		B
Di-n-Octylphthalate	117-84-0		7.50E-06		2.77E-05	ND
Benzo(b)fluoranthene	205-99-2		7.50E-06		2.77E-05	ND
Benzo(k)fluoranthene	207-08-9		7.50E-06		2.77E-05	ND
Benzo(a)pyrene	50-32-8		7.50E-06		2.77E-05	ND
Indeno(1,2,3-c,d)pyrene	193-39-5		7.50E-06		2.77E-05	ND
Benzo(g,h,i)perylene	191-24-2		7.50E-06		2.77E-05	ND
Benzyl alcohol	100-51-6		3.75E-05		1.39E-04	ND
HAP Total		**6.55E-04**		**2.42E-03**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-27
Emissions Factor Summary
Aldehyde/Ketones
GTCP85-180 (APU)

Flow as Measured

		Engine Mode				
		Constant				
Flow Rate, dscfm		5489				
		lb/hr		lbs/1,000 lbs fuel		
Analyte	**CAS Number**	Detected	Detection Limit	Detected	Detection Limit	
Formaldehyde [H]	50-00-0	5.50E-03		2.03E-02		B
Acetaldehyde [H]	75-07-0	5.64E-04		2.09E-03		B
Acrolein [H]	107-02-8	8.22E-05		3.04E-04		J
Acetone	67-64-1	5.38E-04		1.99E-03		B,bb
Crotonaldehyde	4170-30-3	1.42E-04		5.26E-04		J
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3		1.87E-05		6.91E-05	ND
Benzaldehyde	100-52-7		1.87E-05		6.91E-05	ND
Isopentanal (Isovaleraldehyde)	590-86-3		1.87E-05		6.91E-05	ND
Pentanal (Valeraldehyde)	110-62-3		1.87E-05		6.91E-05	ND
o-Tolualdehyde	529-20-4		1.87E-05		6.91E-05	ND
m-Tolualdehyde	620-23-5		1.87E-05		6.91E-05	ND
p-Tolualdehyde	104-87-0		1.87E-05		6.91E-05	ND
Hexanal (Hexaldehyde)	66-25-1		1.87E-05		6.91E-05	ND
HAP Total		**6.15E-03**		**2.27E-02**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-3
GTCP85-180 (APU)
Emission Factors

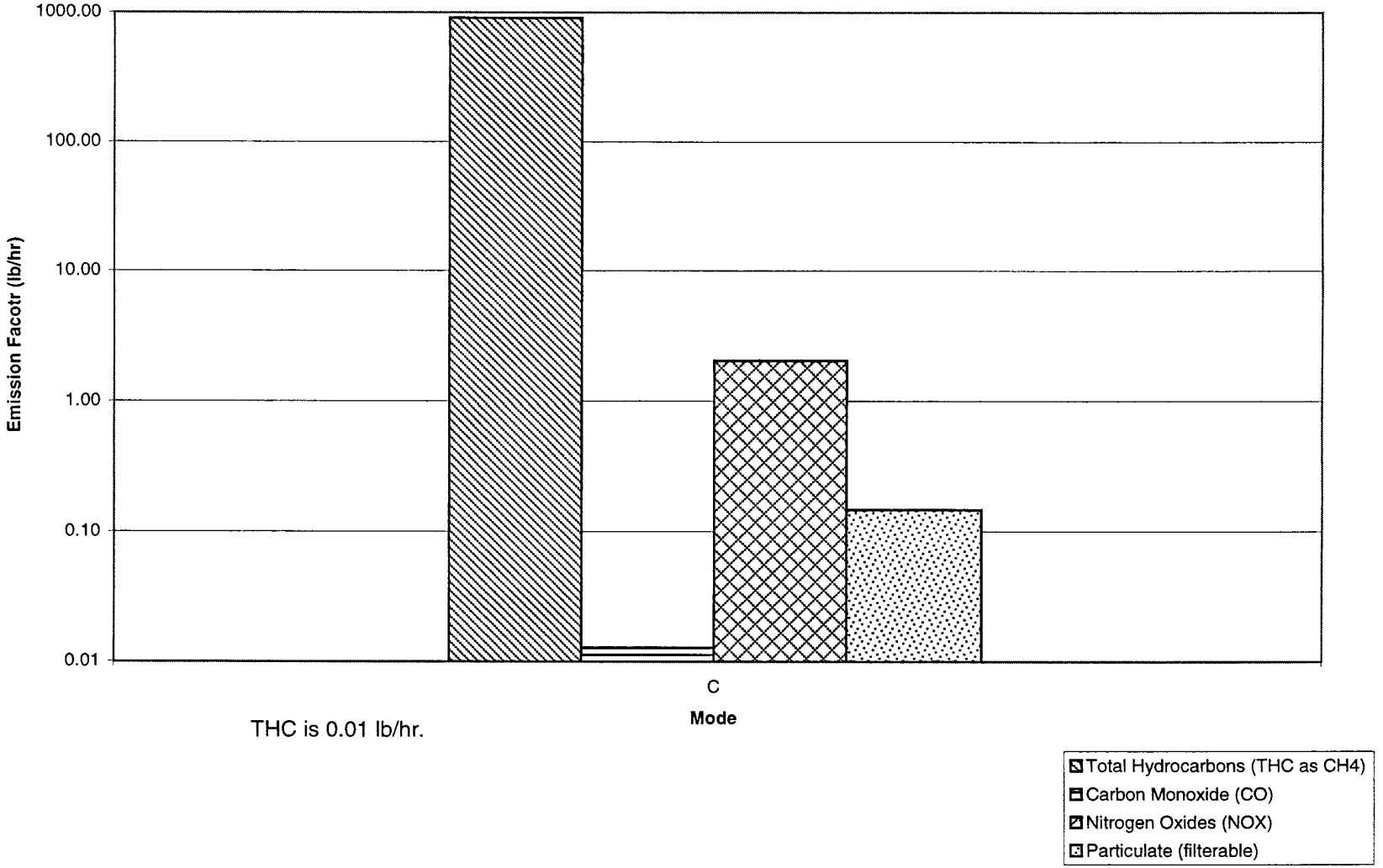


Table 4-28
Engine Operating Parameter Summary
GTCP85-180

Parameter	Constant Setting
Engine speed (N1) , rpm	42,054
Compressor inlet temperature (CIT), degrees F	85
Fuel flow (WF), lbs/hr	270.3
Torque (TORQUE), inch pounds	100
Shaft horsepower	67
Barometric pressure, in. Hg	29.4

4.3.4 APU GTCP165-1

Actual flows were measured following EPA Method 2 procedures because emissions were exhausted through a single stack. The VOC measurements were not corrected for ambient concentrations for two reasons: 1) the bypass air (ambient air) is an insignificant component of the overall exhaust and 2) the high exhaust temperature. Any VOCs entering the APU are likely combusted in the high temperature stream. The emission results would be biased low if the ambient VOC concentrations were subtracted from the emission concentration.

Tables 4-29 through 4-33 present engine results for the GTCP165-1 engine. Figure 4-4 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-34 summarizes the engine operating data collected during testing.

Table 4-29
Emissions Factor Summary
Gaseous Parameters
GTCP165-1 (APU)
Constant

Flow as Measured

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	5173		5210		5005			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	0.76	2.66	0.76	2.76	0.72	2.88	0.75	2.77
Nitrogen Dioxide (NO_2)	0.04	0.16	0.07	0.27	0.09	0.36	0.07	0.26
Nitrogen Oxides (NO_X)	1.21	4.26	1.24	4.52	1.20	4.79	1.22	4.52
Carbon Monoxide (CO)	3.95	13.91	3.75	13.64	3.58	14.24	3.76	13.93
Total Hydrocarbons (THC as CH_4)	0.08	0.28	0.07	0.25	0.05	0.20	0.07	0.24
Carbon Dioxide (CO_2)	905	3188	930	3382	893	3552	909	3374

Table 4-30
Emissions Factor Summary
Particulates
GTCP165-1 (APU)
Constant

Flow as Measured

	Run Number							
	1		2		3		Average	
Flow Rate, dscfm	5173		5210		5005			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Particulate (filterable)	0.086	0.304	0.118	0.427	0.078	0.311	0.094	0.348
Particulate (condensable)	0.044	0.154	0.046	0.167	0.021	0.084	0.037	0.135
Particulate (total)	0.130	0.458	0.163	0.594	0.099	0.395	0.131	0.482

Table 4-31
Emissions Factor Summary
Volatile Organic Compounds (VOCs) [1]
GTCP165-1 (APU)
Constant
Flow as Measured

		Run Number																	
		1					2					3					Average	
Flow Rate, dscfm		5173					5210					5005						
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel				
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	4.57E-05		1.61E-04		J		4.94E-04		1.80E-03	ND	2.59E-05		1.03E-04		J	1.88E-04	6.87E-04
Vinyl Chloride [H]	75-01-4		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Bromomethane [H]	74-83-9		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND	1.19E-05		4.75E-05		J	1.84E-04	6.69E-04
Chloroethane [H]	75-00-3		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	8.22E-05		2.89E-04		bb	2.83E-04		1.03E-03		J	2.98E-04		1.19E-03			2.21E-04	8.35E-04
1,1-Dichloroethene [H]	75-35-4		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	4.84E-04		1.71E-03		bb	3.43E-03		1.25E-02			1.19E-03		4.75E-03		E	1.70E-03	6.32E-03
1,1-Dichloroethane [H]	75-34-3		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Chloroform [H]	67-66-3	6.16E-05		2.17E-04				4.94E-04		1.80E-03	ND	7.67E-05		3.05E-04			2.11E-04	7.73E-04
1,1,1-Trichloroethane [H]	71-55-6		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Benzene [H]	71-43-2	3.15E-03		1.11E-02		S	1.80E-02		6.56E-02		E	9.83E-03		3.91E-02		S	1.03E-02	3.86E-02
1,2-Dichloroethane [H]	107-06-2		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Toluene [H]	108-88-3	4.71E-03		1.66E-02		E	6.13E-03		2.23E-02			4.45E-03		1.77E-02		E	5.10E-03	1.89E-02
cis-1,3-Dichloropropene [H]	10061-01-5		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7	4.38E-05		1.54E-04		J		4.94E-04		1.80E-03	ND	4.97E-05		1.98E-04		J	1.96E-04	7.16E-04
Ethyl Benzene [H]	100-41-4	2.05E-04		7.24E-04			2.42E-04		8.80E-04		J	2.59E-04		1.03E-03			2.35E-04	8.78E-04
m,p-Xylene [H]	1330-20-7	1.19E-03		4.18E-03			1.39E-03		5.06E-03			1.38E-03		5.48E-03			1.32E-03	4.91E-03
o-Xylene [H]	95-47-6	2.05E-04		7.24E-04			4.14E-04		1.51E-03		J	3.37E-04		1.34E-03			3.19E-04	1.19E-03
Styrene [H]	100-42-5	5.60E-04		1.97E-03			7.07E-04		2.57E-03			5.66E-04		2.25E-03			6.11E-04	2.26E-03
1,1,2,2-Tetrachloroethane [H]	79-34-5		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Acetone	67-64-1	9.57E-03		3.37E-02		E	5.34E-03		1.94E-02			5.88E-03		2.34E-02		E	6.93E-03	2.55E-02
Carbon Disulfide [H]	75-15-0		4.67E-05		1.64E-04	ND	1.51E-04		5.50E-04		J	1.19E-05		4.75E-05		J	7.00E-05	2.54E-04
trans-1,2-Dichloroethene	156-60-5		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	1.40E-03		4.93E-03		E	1.01E-03		3.67E-03			6.67E-04		2.65E-03			1.03E-03	3.75E-03
Bromodichloromethane	75-27-4		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
2-Hexanone	591-78-6		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
Bromoform [H]	75-25-2		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		4.67E-05		1.64E-04	ND		4.94E-04		1.80E-03	ND		4.97E-05		1.98E-04	ND	ND	ND
HAP Total		**1.21E-02**		**4.25E-02**			**3.15E-02**		**1.15E-01**			**1.89E-02**		**7.50E-02**			**2.15E-02**	**7.99E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
E - Results are estimated, value reported is outside linear working range.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).
S - Sturated peak - concentration is estimated.

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 3 of this volume.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-32
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
GTCP165-1 (APU)
Flow as Measured

		Engine Mode				
		Constant				
Flow Rate, dscfm		5526				
		lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	
Phenol [H]	108-95-2	1.22E-03		4.49E-03		
Dichloroethyl ether [H]	111-44-4		2.92E-05		1.07E-04	ND
2-Chlorophenol	95-57-8		1.46E-04		5.34E-04	ND
1,3-Dichlorobenzene	541-73-1		2.92E-05		1.07E-04	ND
1,4-Dichlorobenzene [H]	106-46-7		2.92E-05		1.07E-04	ND
1,2-Dichlorobenzene	95-50-1		2.92E-05		1.07E-04	ND
o-Cresol [H]	95-48-7		1.46E-04		5.34E-04	ND
bis(2-Chloroisopropyl) Ether	39638-32-9		2.92E-05		1.07E-04	ND
N-Nitroso-di-n-propylamine	621-64-7		2.92E-05		1.07E-04	ND
p-Cresol [H]	106-44-5		1.46E-04		5.34E-04	ND
Hexachloroethane [H]	67-72-1		2.92E-05		1.07E-04	ND
Nitrobenzene [H]	98-95-3		2.92E-05		1.07E-04	ND
Isophorone [H]	78-59-1		2.92E-05		1.07E-04	ND
2-Nitrophenol	88-75-5	3.37E-04		1.24E-03		
2,4-Dimethylphenol	105-67-9		1.46E-04		5.34E-04	ND
Benzoic Acid	65-85-0	4.49E-03		1.65E-02		
bis(2-Chloroethoxy) Methane	111-91-1		2.92E-05		1.07E-04	ND
2,4-Dichlorophenol	120-83-2		1.46E-04		5.34E-04	ND
1,2,4-Trichlorobenzene [H]	120-82-1		2.92E-05		1.07E-04	ND
Naphthalene [H]	91-20-3	1.51E-03		5.55E-03		
4-Chloroaniline	106-47-8		2.92E-05		1.07E-04	ND
Hexachlorobutadiene [H]	87-68-3		2.92E-05		1.07E-04	ND
4-Chloro-3-methylphenol	59-50-7		1.46E-04		5.34E-04	ND
2-Methylnaphthalene	91-57-6	6.40E-04		2.35E-03		
Hexachlorocyclopentadiene [H]	77-47-4		2.92E-04		1.07E-03	ND
2,4,6-Trichlorophenol [H]	88-06-2		1.46E-04		5.34E-04	ND
2,4,5-Trichlorophenol [H]	95-95-4		1.46E-04		5.34E-04	ND
2-Chloronaphthalene	91-58-7		2.92E-05		1.07E-04	ND
2-Nitroaniline	88-74-4		2.92E-05		1.07E-04	ND
Dimethylphthalate [H]	131-11-3		2.92E-05		1.07E-04	ND
Acenaphthylene	208-96-8		2.92E-05		1.07E-04	ND
2,6-Dinitrotoluene	606-20-2		2.92E-05		1.07E-04	ND
3-Nitroaniline	99-09-2		2.92E-05		1.07E-04	ND
Acenaphthene	83-32-9		2.92E-05		1.07E-04	ND
2,4-Dinitrophenol [H]	51-28-5		1.46E-04		5.34E-04	ND
4-Nitrophenol [H]	100-02-7	3.37E-04		1.24E-03		J
2,4-Dinitrotoluene [H]	121-14-2		2.92E-05		1.07E-04	ND
Dibenzofuran [H]	132-64-9	7.00E-05		2.57E-04		
Diethylphthalate	84-66-2	1.24E-04		4.56E-04		
Fluorene	86-73-7		2.92E-05		1.07E-04	ND
4-Chlorophenyl-phenyl Ether	7005-72-3		2.92E-05		1.07E-04	ND
4-Nitroaniline	100-01-6		2.92E-05		1.07E-04	ND
4,6-Dinitro-2-methylphenol	534-52-1		1.46E-04		5.34E-04	ND
N-Nitrosodiphenylamine	86-30-6		2.92E-05		1.07E-04	ND
4-Bromophenyl-phenyl Ether	101-55-3		2.92E-05		1.07E-04	ND
Hexachlorobenzene [H]	118-74-1		2.92E-05		1.07E-04	ND
Pentachlorophenol [H]	87-86-5		2.92E-04		1.07E-03	ND
Phenanthrene	85-01-8		2.92E-05		1.07E-04	ND
Anthracene	120-12-7		2.92E-05		1.07E-04	ND
di-n-Butylphthalate [H]	84-74-2		2.92E-05		1.07E-04	ND
Fluoranthene	206-44-0		2.92E-05		1.07E-04	ND
Pyrene	129-00-0		2.92E-05		1.07E-04	ND
Butylbenzylphthalate	85-68-7		2.92E-05		1.07E-04	ND
3,3'-Dichlorobenzidine [H]	91-94-1		2.92E-05		1.07E-04	ND
Chrysene	218-01-9		2.92E-05		1.07E-04	ND
Benzo(a)anthracene	56-55-3		2.92E-05		1.07E-04	ND
bis(2-Ethylhexyl)phthalate [H]	117-81-7	6.40E-05		2.35E-04		B
Di-n-Octylphthalate	117-84-0		2.92E-05		1.07E-04	ND
Benzo(b)fluoranthene	205-99-2		2.92E-05		1.07E-04	ND
Benzo(k)fluoranthene	207-08-9		2.92E-05		1.07E-04	ND
Benzo(a)pyrene	50-32-8		2.92E-05		1.07E-04	ND
Indeno(1,2,3-c,d)pyrene	193-39-5		2.92E-05		1.07E-04	ND
Benzo(g,h,i)perylene	191-24-2		2.92E-05		1.07E-04	ND
Benzyl alcohol	100-51-6	5.30E-04		1.94E-03		
HAP Total		**2.27E+06**		**1.66E-03**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-33
Emissions Factor Summary
Aldehyde/Ketones
GTCP165-1 (APU)

Flow as Measured

		Engine Mode				
		Constant				
Flow Rate, dscfm		5262				
		lb/hr		lbs/1,000 lbs fuel		
Analyte	**CAS Number**	Detected	Detection Limit	Detected	Detection Limit	
Formaldehyde [H]	50-00-0	5.12E-03		1.88E-02		B
Acetaldehyde [H]	75-07-0	1.53E-03		5.62E-03		B
Acrolein [H]	107-02-8	3.31E-03		1.21E-02		
Acetone	67-64-1		1.18E-05		4.33E-05	ND
Crotonaldehyde	4170-30-3	1.59E-03		5.84E-03		
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3	4.82E-04		1.77E-03		
Benzaldehyde	100-52-7	3.43E-03		1.26E-02		
Isopentanal (Isovaleraldehyde)	590-86-3		1.18E-05		4.33E-05	ND
Pentanal (Valeraldehyde)	110-62-3	1.47E-03		5.41E-03		
o-Tolualdehyde	529-20-4	1.06E-03		3.90E-03		
m-Tolualdehyde	620-23-5	1.53E-03		5.63E-03		
p-Tolualdehyde	104-87-0		1.18E-05		4.33E-05	ND
Hexanal (Hexaldehyde)	66-25-1		1.18E-05		4.33E-05	ND
HAP Total		**1.04E-02**		**3.83E-02**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-4
GTCP165-1 (APU)
Emission Factors

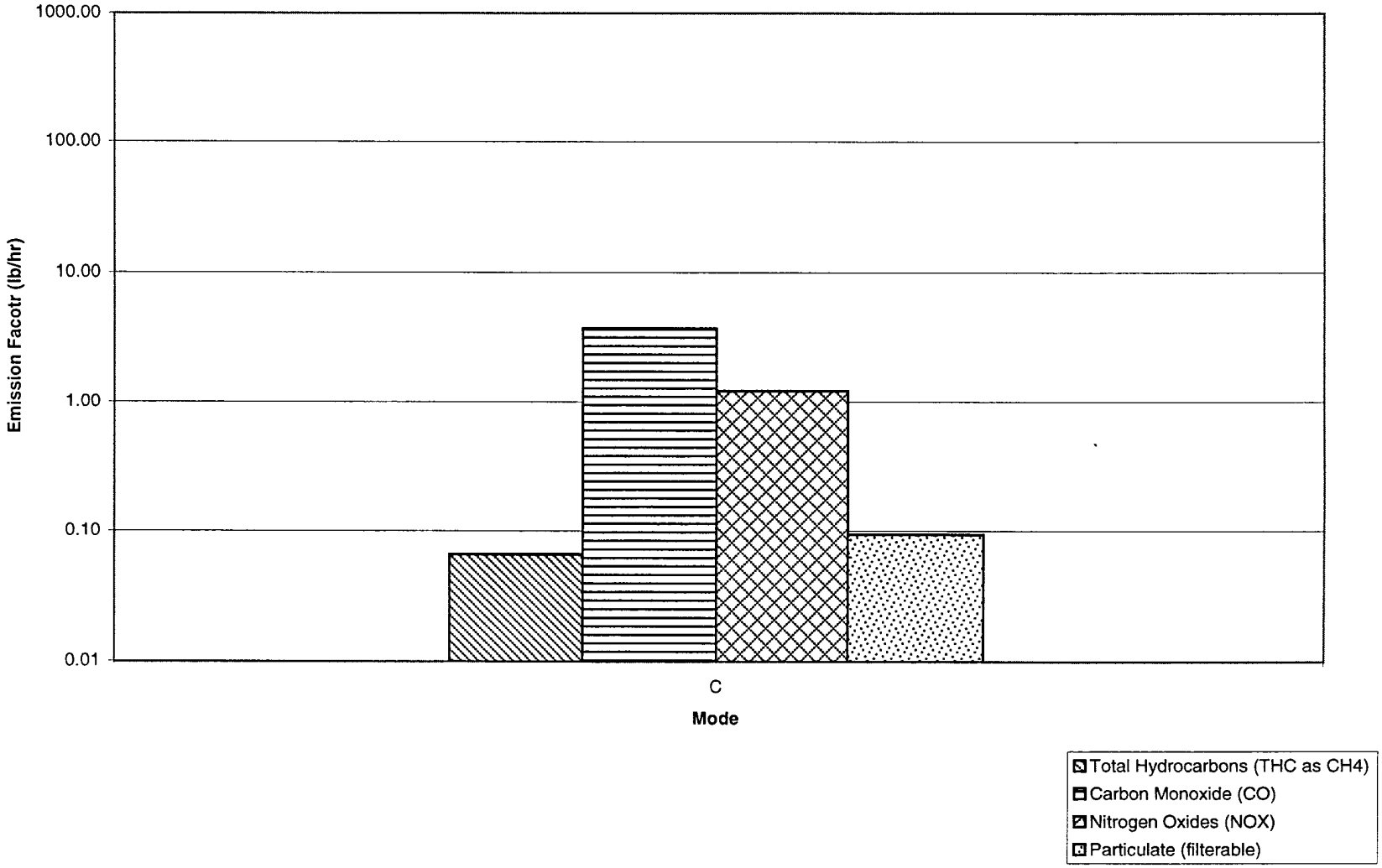


Table 4-34
Engine Operating Parameter Summary
GTCP165-1

Parameter	Constant Setting
Engine speed (N1) , rpm	38,166
Compressor inlet temperature (CIT), degrees F	96
Fuel flow (WF), lbs/hr	272.6
Torque (TORQUE), inch pounds	217
Shaft horsepower	132
Barometric pressure, in. Hg	29.4

4.3.5 Engine J69-T-25

Tracer gas was used to determine the flow rate at each power setting. This provided the most consistent flow rate values for each sampling run and engine setting.

Tables 4-35 through 4-42 present engine results for the J69-T-25 engine. Figure 4-5 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-43 summarizes the engine operating data collected during testing.

Table 4-35
Emissions Factor Summary
Gaseous Parameters
J69-T-25 (T-37)
Idle

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	37225		37272		37992			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	0.02	0.10	0.00	0.00	0.00	0.00	0.01	0.03
Nitrogen Dioxide (NO_2)	0.11	0.64	0.11	0.64	0.11	0.65	0.11	0.64
Nitrogen Oxides (NO_X)	0.13	0.80	0.13	0.80	0.14	0.81	0.13	0.80
Carbon Monoxide (CO)	27.44	164.06	26.50	158.43	26.26	157.03	26.73	159.84
Total Hydrocarbons (THC as CH_4)	2.41	14.39	2.61	15.59	2.51	15.03	2.51	15.00
Carbon Dioxide (CO_2)	538	3215	537	3211	543	3248	539	3224

Table 4-36
Emissions Factor Summary
Gaseous Parameters
J69-T-25 (T-37)
Intermediate

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	150022		146930		147364			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	1.33	1.53	1.10	1.26	1.10	1.26	1.18	1.35
Nitrogen Dioxide (NO_2)	0.43	0.49	1.05	1.21	1.06	1.21	0.85	0.97
Nitrogen Oxides (NO_X)	2.36	2.71	2.63	3.02	2.64	3.02	2.55	2.92
Carbon Monoxide (CO)	34.02	39.00	32.68	37.46	33.42	38.30	33.37	38.25
Total Hydrocarbons (THC as CH_4)	0.12	0.14	0.01	0.01	0.05	0.05	0.06	0.07
Carbon Dioxide (CO_2)	2454	2813	2480	2843	2505	2871	2480	2842

Table 4-37
Emissions Factor Summary
Gaseous Parameters
J69-T-25 (T-37)
Military

Flow by Tracer

	Run Number							
	1		2		3		Average	
Flow Rate, dscfm	183933		179954		177185			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	2.32	2.14	2.19	2.01	2.24	2.06	2.25	2.07
Nitrogen Dioxide (NO_2)	1.45	1.34	1.68	1.54	1.65	1.52	1.59	1.47
Nitrogen Oxides (NO_X)	4.88	4.49	4.90	4.51	4.95	4.56	4.91	4.52
Carbon Monoxide (CO)	36.10	33.26	35.32	32.54	35.55	32.75	35.65	32.85
Total Hydrocarbons (THC as CH_4)	0.53	0.48	0.06	0.05	0.06	0.05	0.21	0.20
Carbon Dioxide (CO_2)	3513	3237	3435	3165	3382	3116	3443	3173

Table 4-38
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
J69-T-25 (T-37)
Idle
Flow by Tracer

		Run Number													
		1					2					3					Average	
Flow Rate, dscfm		37225					37272					37992						
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel				
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	9.58E-05		5.73E-04		J	6.97E-05		4.17E-04		J	1.19E-04		7.11E-04		J	9.48E-05	5.67E-04
Vinyl Chloride [H]	75-01-4		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
Bromomethane [H]	74-83-9	6.85E-05		4.09E-04		J	7.67E-05		4.58E-04		J	1.05E-04		6.28E-04		J	8.34E-05	4.99E-04
Chloroethane [H]	75-00-3		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	2.59E-03		1.55E-02			6.76E-04		4.04E-03		bb	1.26E-03		7.53E-03			1.51E-03	9.03E-03
1,1-Dichloroethene [H]	75-35-4		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
Methylene Chloride [H]	75-09-2	1.23E-02		7.36E-02		J	3.07E-03		1.84E-02		bb	3.98E-03		2.38E-02		bb	6.46E-03	3.86E-02
1,1-Dichloroethane [H]	75-34-3		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
Chloroform [H]	67-66-3		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
1,1,1-Trichloroethane [H]	71-55-6		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
Benzene [H]	71-43-2	4.03E-02		2.41E-01		J	2.23E-02		1.33E-01		J	3.21E-02		1.92E-01		J	3.16E-02	1.89E-01
1,2-Dichloroethane [H]	107-06-2		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
Trichloroethene [H]	79-01-6		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
Toluene [H]	108-88-3	2.80E-02		1.68E-01		J	7.67E-03		4.58E-02		J	2.04E-02		1.22E-01		J	1.87E-02	1.12E-01
cis-1,3-Dichloropropene [H]	10061-01-5		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
Tetrachloroethene [H]	127-18-4	3.42E-04		2.04E-03		UJ	3.49E-04		2.09E-03		UJ	3.50E-04		2.09E-03		UJ	3.47E-04	2.07E-03
Chlorobenzene [H]	108-90-7		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
Ethyl Benzene [H]	100-41-4	5.13E-03		3.07E-02			1.54E-03		9.18E-03			3.50E-03		2.09E-02			3.39E-03	2.03E-02
m,p-Xylene [H]	1330-20-7	1.65E-02		9.84E-02		J	4.61E-03		2.76E-02			1.12E-02		6.70E-02			1.08E-02	6.43E-02
o-Xylene [H]	95-47-6	6.85E-03		4.09E-02			1.54E-03		9.18E-03			4.20E-03		2.51E-02			4.19E-03	2.51E-02
Styrene [H]	100-42-5	7.53E-03		4.50E-02			2.02E-03		1.21E-02			4.06E-03		2.43E-02			4.54E-03	2.71E-02
1,1,2,2-Tetrachloroethane [H]	79-34-5		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
Acetone	67-64-1	9.15E-03		5.47E-02		J	0.00E+00		0.00E+00		J	0.00E+00		0.00E+00		J	3.05E-03	1.82E-02
Carbon Disulfide [H]	75-15-0	2.05E-04		1.23E-03		J		3.49E-04		2.09E-03	ND	1.40E-04		8.37E-04		J	2.31E-04	1.38E-03
trans-1,2-Dichloroethene	156-60-5		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
Vinyl Acetate [H]	108-05-4		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	3.70E-03		2.21E-02		J	7.67E-04		4.58E-03		J	1.12E-03		6.70E-03		J	1.86E-03	1.11E-02
Bromodichloromethane	75-27-4		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	3.42E-04		2.04E-03		UJ	3.49E-04		2.09E-03		UJ	3.50E-04		2.09E-03		UJ	3.47E-04	2.07E-03
2-Hexanone	591-78-6	3.42E-04		2.04E-03		UJ	3.49E-04		2.09E-03		UJ	3.50E-04		2.09E-03		UJ	3.47E-04	2.07E-03
Dibromochloromethane (Chlorodibromomethane)	124-48-1		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
Bromoform [H]	75-25-2		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		3.42E-04		2.04E-03	ND		3.49E-04		2.09E-03	ND		3.50E-04		2.09E-03	ND	ND	ND
HAP Total		**1.21E-01**		**7.25E-01**			**4.44E-02**		**2.65E-01**			**8.16E-02**		**4.88E-01**			**8.25E-02**	**4.94E-01**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-39
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
J69-T-25 (T-37)
Intermediate
Flow by Tracer

		Run Number															
		1					2					3					
Flow Rate, dscfm		150022					146930					147364				Average	
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	2.93E-04		3.36E-04		J		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	1.02E-03	1.17E-03
Vinyl Chloride [H]	75-01-4		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Bromomethane [H]	74-83-9		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Chloroethane [H]	75-00-3		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	7.02E-03		8.05E-03			8.09E-03		9.27E-03			1.70E-02		1.95E-02			1.07E-02	1.23E-02
1,1-Dichloroethene [H]	75-35-4		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Methylene Chloride [H]	75-09-2	2.28E-02		2.62E-02			1.68E-02		1.93E-02		bb	2.75E-02		3.16E-02		J	2.24E-02	2.57E-02
1,1-Dichloroethane [H]	75-34-3		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Chloroform [H]	67-66-3		1.47E-03		1.68E-03	ND	3.51E-04		4.02E-04		J,bb	5.10E-04		5.84E-04		J,bb	7.76E-04	8.89E-04
1,1,1-Trichloroethane [H]	71-55-6		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Benzene [H]	71-43-2	4.10E-03		4.70E-03			2.30E-03		2.63E-03			2.69E-03		3.08E-03			3.03E-03	3.47E-03
1,2-Dichloroethane [H]	107-06-2		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Trichloroethene [H]	79-01-6		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Toluene [H]	108-88-3	1.79E-03		2.05E-03			1.27E-03		1.45E-03		J	1.02E-03		1.17E-03		J	1.36E-03	1.56E-03
cis-1,3-Dichloropropene [H]	10061-01-5		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Tetrachloroethene [H]	127-18-4	1.47E-03		1.68E-03		UJ	1.35E-03		1.55E-03		UJ	1.41E-03		1.62E-03		UJ	1.41E-03	1.62E-03
Chlorobenzene [H]	108-90-7		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Ethyl Benzene [H]	100-41-4		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
m,p-Xylene [H]	1330-20-7	8.49E-04		9.73E-04		J	5.40E-04		6.19E-04		J	4.81E-04		5.52E-04		J	6.23E-04	7.14E-04
o-Xylene [H]	95-47-6	3.52E-04		4.03E-04		J		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	1.04E-03	1.19E-03
Styrene [H]	100-42-5		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Acetone	67-64-1	0.00E+00		0.00E+00		J,bb	0.00E+00		0.00E+00		UJ	0.00E+00		0.00E+00		UJ	0.00E+00	0.00E+00
Carbon Disulfide [H]	75-15-0		1.47E-03		1.68E-03	ND	2.97E-04		3.40E-04		J		1.41E-03		1.62E-03	ND	1.06E-03	1.21E-03
trans-1,2-Dichloroethene	156-60-5		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	1.47E-03		1.68E-03		UJ	1.35E-03		1.55E-03		UJ	1.41E-03		1.62E-03		UJ	1.41E-03	1.62E-03
Bromodichloromethane	75-27-4		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	1.47E-03		1.68E-03		UJ	1.35E-03		1.55E-03		UJ	1.41E-03		1.62E-03		UJ	1.41E-03	1.62E-03
2-Hexanone	591-78-6	1.47E-03		1.68E-03		UJ	1.35E-03		1.55E-03		UJ	1.41E-03		1.62E-03		UJ	1.41E-03	1.62E-03
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
Bromoform [H]	75-25-2		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.47E-03		1.68E-03	ND		1.35E-03		1.55E-03	ND		1.41E-03		1.62E-03	ND	ND	ND
HAP Total		**3.46E-02**		**3.97E-02**			**2.56E-02**		**2.94E-02**			**3.65E-02**		**4.18E-02**			**3.55E-02**	**4.07E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-40
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
J69-T-25 (T-37)
Military
Flow by Tracer

		Run Number																	
		1					2					3					Average	
Flow Rate, dscfm		183933					179954					177185						
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel				
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Vinyl Chloride [H]	75-01-4		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Bromomethane [H]	74-83-9		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Chloroethane [H]	75-00-3		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	2.12E-02		1.96E-02			2.53E-02		2.33E-02			1.59E-02		1.47E-02			2.08E-02	1.92E-02
1,1-Dichloroethene [H]	75-35-4		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Methylene Chloride [H]	75-09-2	5.78E-02		5.33E-02		J	7.41E-02		6.82E-02		J	2.43E-02		2.24E-02		bb	5.20E-02	4.80E-02
1,1-Dichloroethane [H]	75-34-3		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Chloroform [H]	67-66-3	5.22E-04		4.81E-04		J,bb	1.19E-03		1.10E-03		J,bb	6.51E-04		6.00E-04		J,bb	7.89E-04	7.27E-04
1,1,1-Trichloroethane [H]	71-55-6		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Benzene [H]	71-43-2	2.27E-03		2.10E-03			2.13E-03		1.96E-03			1.67E-03		1.54E-03		J	2.02E-03	1.86E-03
1,2-Dichloroethane [H]	107-06-2		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Trichloroethene [H]	79-01-6		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Toluene [H]	108-88-3	8.20E-04		7.55E-04		J	1.01E-03		9.32E-04		J	8.69E-04		8.01E-04		J	9.00E-04	8.29E-04
cis-1,3-Dichloropropene [H]	10061-01-5		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Tetrachloroethene [H]	127-18-4	1.87E-03		1.72E-03		UJ	1.81E-03		1.66E-03		UJ	1.81E-03		1.66E-03		UJ	1.83E-03	1.68E-03
Chlorobenzene [H]	108-90-7		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Ethyl Benzene [H]	100-41-4		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
m,p-Xylene [H]	1330-20-7	5.97E-04		5.50E-04		J	5.05E-04		4.65E-04		J	7.96E-04		7.34E-04		J	6.33E-04	5.83E-04
o-Xylene [H]	95-47-6		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Styrene [H]	100-42-5		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Acetone	67-64-1	0.00E+00		0.00E+00		J,bb	0.00E+00		0.00E+00		UJ	0.00E+00		0.00E+00		UJ	0.00E+00	0.00E+00
Carbon Disulfide [H]	75-15-0		1.87E-03		1.72E-03	ND	1.01E-03		9.32E-04		J	1.59E-03		1.47E-03		J	1.49E-03	1.37E-03
trans-1,2-Dichloroethene	156-60-5		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	1.87E-03		1.72E-03		UJ	1.81E-03		1.66E-03		UJ	1.81E-03		1.66E-03		UJ	1.83E-03	1.68E-03
Bromodichloromethane	75-27-4		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	1.87E-03		1.72E-03		UJ	1.81E-03		1.66E-03		UJ	1.81E-03		1.66E-03		UJ	1.83E-03	1.68E-03
2-Hexanone	591-78-6	1.87E-03		1.72E-03		UJ	1.81E-03		1.66E-03		UJ	1.81E-03		1.66E-03		UJ	1.83E-03	1.68E-03
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
Bromoform [H]	75-25-2		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.87E-03		1.72E-03	ND		1.81E-03		1.66E-03	ND		1.81E-03		1.66E-03	ND	ND	ND
HAP Total		**6.76E-02**		**6.23E-02**			**8.53E-02**		**7.86E-02**			**3.53E-02**		**3.25E-02**			**6.34E-02**	**5.84E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.

Table 41
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
J69-T-25 (T-37)
Flow by Tracer

		Engine Mode											
		Idle				Intermediate				Military			
Flow Rate, dscfm		37490				148093				180388			
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel	
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit
Phenol [H]	108-95-2	4.76E-03		2.85E-02		8.60E-04		9.86E-04			8.04E-04		7.41E-04 ND
Dichloroethyl ether [H]	111-44-4		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
2-Chlorophenol	95-57-8		3.78E-04		2.26E-03 ND		7.54E-04		8.65E-04 ND		8.04E-04		7.41E-04 ND
1,3-Dichlorobenzene	541-73-1		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
1,4-Dichlorobenzene [H]	106-46-7		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
1,2-Dichlorobenzene	95-50-1		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
o-Cresol [H]	95-48-7	9.29E-04		5.55E-03			7.54E-04		8.65E-04 ND		8.04E-04		7.41E-04 ND
bis(2-Chloroisopropyl) Ether	39638-32-9		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
N-Nitroso-di-n-propylamine	621-64-7		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
p-Cresol [H]	106-44-5	1.08E-03		6.44E-03			7.54E-04		8.65E-04 ND		8.04E-04		7.41E-04 ND
Hexachloroethane [H]	67-72-1		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Nitrobenzene [H]	98-95-3		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Isophorone [H]	78-59-1		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
2-Nitrophenol	88-75-5		3.78E-04		2.26E-03 ND		7.54E-04		8.65E-04 ND		8.04E-04		7.41E-04 ND
2,4-Dimethylphenol	105-67-9		3.78E-04		2.26E-03 ND		7.54E-04		8.65E-04 ND		8.04E-04		7.41E-04 ND
Benzoic Acid	65-85-0	5.88E-03		3.52E-02		1.07E-02		1.23E-02		1.12E-02		1.03E-02	
bis(2-Chloroethoxy) Methane	111-91-1		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
2,4-Dichlorophenol	120-83-2		3.78E-04		2.26E-03 ND		7.54E-04		8.65E-04 ND		8.04E-04		7.41E-04 ND
1,2,4-Trichlorobenzene [H]	120-82-1		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Naphthalene [H]	91-20-3	5.92E-03		3.54E-02		2.97E-04		3.41E-04		2.41E-04		2.22E-04	
4-Chloroaniline	106-47-8		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Hexachlorobutadiene [H]	87-68-3		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
4-Chloro-3-methylphenol	59-50-7		3.78E-04		2.26E-03 ND		7.54E-04		8.65E-04 ND		8.04E-04		7.41E-04 ND
2-Methylnaphthalene	91-57-6	7.03E-03		4.20E-02		1.17E-04		1.34E-04		9.12E-05		8.41E-05	
Hexachlorocyclopentadiene [H]	77-47-4		7.56E-04		4.52E-03 ND		1.51E-03		1.73E-03 ND		1.61E-03		1.48E-03 ND
2,4,6-Trichlorophenol [H]	88-06-2		3.78E-04		2.26E-03 ND		7.54E-04		8.65E-04 ND		8.04E-04		7.41E-04 ND
2,4,5-Trichlorophenol [H]	95-95-4		3.78E-04		2.26E-03 ND		7.54E-04		8.65E-04 ND		8.04E-04		7.41E-04 ND
2-Chloronaphthalene	91-58-7		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
2-Nitroaniline	88-74-4		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Dimethylphthalate [H]	131-11-3		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Acenaphthylene	208-96-8	1.21E-04		7.22E-04			1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
2,6-Dinitrotoluene	606-20-2		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
3-Nitroaniline	99-09-2		7.56E-04		4.52E-03 ND		1.51E-03		1.73E-03 ND		1.61E-03		1.48E-03 ND
Acenaphthene	83-32-9		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
2,4-Dinitrophenol [H]	51-28-5		1.52E-03		9.07E-03 ND		3.02E-03		3.46E-03 ND		3.21E-03		2.96E-03 ND
4-Nitrophenol [H]	100-02-7		7.56E-04		4.52E-03 ND		1.51E-03		1.73E-03 ND		1.61E-03		1.48E-03 ND
2,4-Dinitrotoluene [H]	121-14-2		7.56E-04		4.52E-03 ND		1.51E-03		1.73E-03 ND		1.61E-03		1.48E-03 ND
Dibenzofuran [H]	132-64-9	4.07E-04		2.43E-03			1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Diethylphthalate	84-66-2		7.56E-05		4.52E-04 ND	1.76E-04		2.01E-04			1.61E-04		1.48E-04 ND
Fluorene	86-73-7	1.59E-04		9.53E-04			1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
4-Chlorophenyl-phenyl Ether	7005-72-3		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
4-Nitroaniline	100-01-6		7.56E-04		4.52E-03 ND		1.51E-03		1.73E-03 ND		1.61E-03		1.48E-03 ND
4,6-Dinitro-2-methylphenol	534-52-1		7.56E-04		4.52E-03 ND		1.51E-03		1.73E-03 ND		1.61E-03		1.48E-03 ND
N-Nitrosodiphenylamine	86-30-6		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
4-Bromophenyl-phenyl Ether	101-55-3		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Hexachlorobenzene [H]	118-74-1		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Pentachlorophenol [H]	87-86-5		7.56E-04		4.52E-03 ND		1.51E-03		1.73E-03 ND		1.61E-03		1.48E-03 ND
Phenanthrene	65996-93-2		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Anthracene	120-12-7		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
di-n-Butylphthalate [H]	84-74-2	0.00E+00		0.00E+00	B	3.32E-04		3.80E-04	B	4.82E-04		4.44E-04	B
Fluoranthene	206-44-0		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Pyrene	65996-93-2		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Butylbenzylphthalate	85-68-7		7.56E-05		4.52E-04 ND	1.66E-04		1.90E-04	B		1.61E-04		1.48E-04 ND
3,3'-Dichlorobenzidine [H]	91-94-1		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Chrysene	65996-93-2		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Benzo(a)anthracene	56-55-3		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
bis(2-Ethylhexyl)phthalate [H]	117-81-7	1.15E-04		6.89E-04	B	1.81E-03		2.07E-03	B	5.94E-04		5.47E-04	B
Di-n-Octylphthalate	117-84-0		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Benzo(b)fluoranthene	205-99-2		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Benzo(k)fluoranthene	207-08-9		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Benzo(a)pyrene	65996-93-2		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Indeno(1,2,3-c,d)pyrene	129-00-0		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Benzo(g,h,i)perylene	191-24-2		7.56E-05		4.52E-04 ND		1.51E-04		1.73E-04 ND		1.61E-04		1.48E-04 ND
Benzyl alcohol	100-51-6	7.92E-04		4.74E-03			7.54E-04		8.65E-04 ND		8.04E-04		7.41E-04 ND
HAP Total		**1.32E-02**		**7.90E-02**		**3.30E-03**		**3.78E-03**		**1.32E-03**		**1.21E-03**	

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-42
Emissions Factor Summary
Aldehyde/Ketones
J69-T-25 (T-37)
Flow by Tracer

		Engine Mode													
		Idle					Intermediate					Military				
Flow Rate, dscfm		37490					148093					180388				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
Analyte	**CAS Number**	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Formaldehyde [H]	50-00-0	1.53E-01		9.12E-01		B	2.37E-02		2.71E-02		B	1.26E-02		1.16E-02		B
Acetaldehyde [H]	75-07-0	1.63E-02		9.77E-02		B	1.86E-03		2.14E-03		B		1.56E-04		1.44E-04	ND
Acrolein [H]	107-02-8	3.27E-02		1.96E-01				2.15E-04		2.47E-04	ND		1.56E-04		1.44E-04	ND
Acetone	67-64-1		9.09E-05		5.43E-04	ND		2.15E-04		2.47E-04	ND	1.26E-03		1.16E-03		B
Crotonaldehyde	4170-30-3	2.04E-02		1.22E-01				2.15E-04		2.47E-04	ND		1.56E-04		1.44E-04	ND
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3	6.18E-03		3.69E-02				2.15E-04		2.47E-04	ND		1.56E-04		1.44E-04	ND
Benzaldehyde	100-52-7	1.74E-02		1.04E-01				2.15E-04		2.47E-04	ND		1.56E-04		1.44E-04	ND
Isopentanal (Isovaleraldehyde)	590-86-3	3.34E-03		2.00E-02				2.15E-04		2.47E-04	ND		1.56E-04		1.44E-04	ND
Pentanal (Valeraldehyde)	110-62-3	6.18E-03		3.69E-02				2.15E-04		2.47E-04	ND		1.56E-04		1.44E-04	ND
o-Tolualdehyde	529-20-4	1.02E-02		6.09E-02				2.15E-04		2.47E-04	ND		1.56E-04		1.44E-04	ND
m-Tolualdehyde	620-23-5	1.99E-02		1.19E-01				2.15E-04		2.47E-04	ND		1.56E-04		1.44E-04	ND
p-Tolualdehyde	104-87-0		9.09E-05		5.43E-04	ND		2.15E-04		2.47E-04	ND		1.56E-04		1.44E-04	ND
Hexanal (Hexaldehyde)	66-25-1		9.09E-05		5.43E-04	ND		2.15E-04		2.47E-04	ND		1.56E-04		1.44E-04	ND
HAP Total		**2.08E-01**		**1.24E+00**			**2.55E-02**		**2.92E-02**			**1.26E-02**		**1.16E-02**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-5
J69-25 (T-37)
Emission Factors

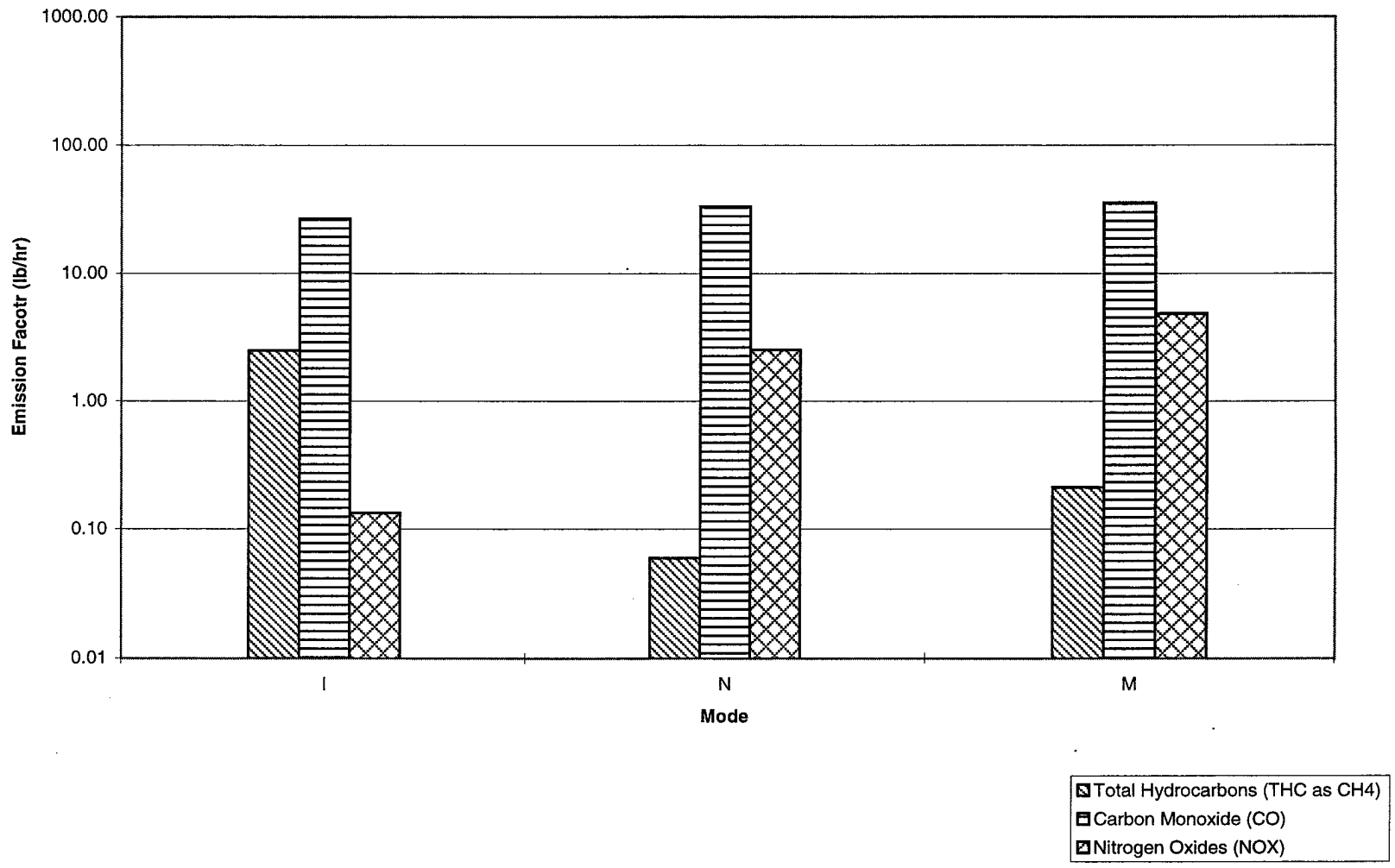


Table 4-43
Engine Operating Parameter Summary
J69-T-25 (T-37)

Parameter	Idle	Intermediate	Military
Fuel flow, lb/hr	167	872	1,085
Engine speed, rpm	7,884	19,548	21,709
Cell humidity, %	29.00	28.68	28.56
Cell temperature, deg. F	57.83	67.95	82.48
Thrust, pounds	73.22	643	864
Percent maximum thrust	4.3	62.7	84.3

4.3.6 Engine J85-GE-5A

Carbon balance was used to determine the flow rate at each power setting. Carbon balance was the most consistent. The flow rates calculated using tracer gas methodology matched the carbon balance at all power settings except afterburner. Tracer gas was not used in the afterburner power setting due to high temperatures in the augmenter tube. The tracer gas release points were located directly in the afterburner flame. If used, a significant portion of the SF_6 would have been dissociated. Carbon balance calculations indicate a higher flow rate at the military power setting than at the afterburner power setting. This does not compare favorably with anticipated engine operating conditions. The flow at the afterburner power setting should be considered biased low.

It is possible that the test cell is undersized for the particular engine setting. The test cell exhaust represents a critical orifice above a certain exhaust volume, resulting in a decrease in the total flow. This assumption is logical, as there was a significant increase in the exhaust temperature between military and afterburner conditions. The increased temperature would result in the exhaust gas occupying a greater volume within the augmenter tube.

Tables 4-44 through 4-53 present engine results for the J85-GE-5A engine. Figure 4-6 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-54 summarizes the engine operating data collected during testing.

Table 4-44
Emissions Factor Summary
Gaseous Parameters
J85-GE-5A (T-38)
Idle

Flow by Carbon Balance

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	56332		54662		51913			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	0.29	0.57	0.33	0.65	0.32	0.61	0.31	0.61
Nitrogen Dioxide (NO_2)	0.36	0.71	0.35	0.69	0.33	0.65	0.35	0.68
Nitrogen Oxides (NO_X)	0.56	1.11	0.59	1.14	0.60	1.16	0.58	1.14
Carbon Monoxide (CO)	111.05	217.74	110.14	214.28	104.60	203.90	108.59	211.97
Total Hydrocarbons (THC as CH_4)	19.03	37.31	17.44	33.94	15.81	30.81	17.43	34.02
Carbon Dioxide (CO_2)	1384	2714	1403	2729	1413	2754	1400	2732

Table 4-45
Emissions Factor Summary
Gaseous Parameters
J85-GE-5A (T-38)
Intermediate

Flow by Carbon Balance

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	132643		124121		124375			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	0.81	1.01	0.75	0.94	0.76	0.94	0.77	0.96
Nitrogen Dioxide (NO_2)	1.05	1.31	0.98	1.22	0.98	1.22	1.00	1.25
Nitrogen Oxides (NO_X)	1.43	1.78	1.33	1.67	1.43	1.78	1.39	1.74
Carbon Monoxide (CO)	103.55	129.60	97.44	121.64	95.47	119.04	98.82	123.43
Total Hydrocarbons (THC as CH_4)	4.70	5.89	4.72	5.89	4.17	5.20	4.53	5.66
Carbon Dioxide (CO_2)	2353	2945	2368	2957	2373	2959	2365	2953

Table 4-46
Emissions Factor Summary
Gaseous Parameters
J85-GE-5A (T-38)
Military

Flow by Carbon Balance

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	286753		283704		279354			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	4.29	1.72	3.58	1.44	3.26	1.33	3.71	1.50
Nitrogen Dioxide (NO_2)	1.64	0.66	1.63	0.66	1.60	0.65	1.62	0.66
Nitrogen Oxides (NO_X)	7.40	2.96	7.32	2.95	7.00	2.86	7.24	2.92
Carbon Monoxide (CO)	91.29	36.52	89.09	35.91	90.16	36.77	90.18	36.40
Total Hydrocarbons (THC as CH_4)	2.05	0.82	1.23	0.50	1.07	0.44	1.45	0.58
Carbon Dioxide (CO_2)	7774	3109	7705	3105	7611	3104	7696	3106

Table 4-47
Emissions Factor Summary
Gaseous Parameters
J85-GE-5A (T-38)
Afterburner (Zone 1)

Flow by Carbon Balance

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm [1]	228390		227162		242999			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	11.21	1.45	11.04	1.43	11.01	1.43	11.09	1.44
Nitrogen Dioxide (NO_2)	1.15	0.15	0.98	0.13	1.04	0.14	1.06	0.14
Nitrogen Oxides (NO_X)	16.36	2.11	16.11	2.09	15.84	2.05	16.10	2.09
Carbon Monoxide (CO)	108.67	14.03	107.00	13.89	112.87	14.64	109.51	14.19
Total Hydrocarbons (THC as CH_4)	20.13	2.60	17.85	2.32	14.97	1.94	17.65	2.29
Carbon Dioxide (CO_2)	24221	3128	24100	3129	24122	3129	24148	3129

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 3 of this volume.

Table 4-48
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
J85-GE-5A (T-38)
Idle
Flow by Carbon Balance

		Run Number													
		1				2				3				Average	
Flow Rate, dscfm		56332				54662				51913					
		lb/hr		lbs/1,000 lbs		lb/hr		lbs/1,000 lbs		lb/hr		lbs/1,000 lbs			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	1.30E-04		2.54E-04	J	2.56E-04		4.98E-04	J	1.51E-02		2.95E-02	UJ	5.17E-03	1.01E-02
Vinyl Chloride [H]	75-01-4	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Bromomethane [H]	74-83-9	5.40E-04		1.06E-03	UJ	2.56E-04		4.98E-04	J		1.51E-02		2.95E-02 ND	5.31E-03	1.03E-02
Chloroethane [H]	75-00-3	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Freon 11 (Trichlorofluoromethane)	75-69-4	3.88E-03		7.61E-03	J	3.46E-03		6.73E-03	J	4.36E-03		8.49E-03	J	3.90E-03	7.61E-03
1,1-Dichloroethene [H]	75-35-4	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Methylene Chloride [H]	75-09-2	1.85E-02		3.62E-02	J	8.15E-03		1.59E-02	J,bb	1.61E-02		3.14E-02		1.42E-02	2.78E-02
1,1-Dichloroethane [H]	75-34-3	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Chloroform [H]	67-66-3	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
1,1,1-Trichloroethane [H]	71-55-6	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Carbon Tetrachloride [H]	56-23-5	1.08E-04		2.11E-04	J	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.25E-03	1.02E-02
Benzene [H]	71-43-2	3.12E-02		6.12E-02	J	2.97E-02		5.78E-02	J	1.32E-01		2.58E-01		6.44E-02	1.26E-01
1,2-Dichloroethane [H]	107-06-2	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Trichloroethene [H]	79-01-6	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
1,2-Dichloropropane [H]	78-87-5	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
trans-1,3-Dichloropropene [H]	10061-02-6	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Toluene [H]	108-88-3	1.04E-01		2.03E-01	J	5.92E-02		1.15E-01	J	5.39E-02		1.05E-01		7.22E-02	1.41E-01
cis-1,3-Dichloropropene [H]	10061-01-5	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
1,1,2-Trichloroethane [H]	79-00-5	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Tetrachloroethene [H]	127-18-4	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Chlorobenzene [H]	108-90-7	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Ethyl Benzene [H]	100-41-4	1.73E-02		3.38E-02	J	1.12E-02		2.18E-02	J	1.13E-02		2.21E-02	J	1.33E-02	2.59E-02
m,p-Xylene [H]	1330-20-7	5.61E-02		1.10E-01	J	3.77E-02		7.33E-02	J	3.50E-02		6.82E-02		4.29E-02	8.39E-02
o-Xylene [H]	95-47-6	2.26E-02		4.43E-02	J	1.43E-02		2.78E-02	J	1.32E-02		2.58E-02	J	1.67E-02	3.26E-02
Styrene [H]	100-42-5	2.38E-02		4.68E-02	J	1.63E-02		3.18E-02	J	1.42E-02		2.76E-02	J	1.81E-02	3.54E-02
1,1,2,2-Tetrachloroethane [H]	79-34-5	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Acetone	67-64-1	4.04E-02		7.92E-02	J	1.97E-02		3.84E-02	J	3.68E-02		7.18E-02		3.23E-02	6.31E-02
Carbon Disulfide [H]	75-15-0	7.55E-04		1.48E-03	J	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.46E-03	1.07E-02
trans-1,2-Dichloroethene	156-60-5	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Vinyl Acetate [H]	108-05-4	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
2-Butanone (MEK) [H]	78-93-3	2.70E-02		5.30E-02	J	1.33E-02		2.58E-02	J	3.11E-02		6.07E-02		2.38E-02	4.65E-02
Bromodichloromethane	75-27-4	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
2-Hexanone	591-78-6	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Dibromochloromethane (Chlorodibromomethane)	124-48-1	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
Bromoform [H]	75-25-2	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
cis-1,2-Dichloroethene	156-59-2	5.40E-04		1.06E-03	UJ	5.10E-04		9.92E-04	UJ		1.51E-02		2.95E-02 ND	5.39E-03	1.05E-02
HAP Total		**3.12E-01**		**6.12E-01**		**2.01E-01**		**3.91E-01**		**3.22E-01**		**6.28E-01**		**3.79E-01**	**7.40E-01**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-49
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
Intermediate
J85-GE-5A (T-38)
Flow by Carbon Balance

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		132643					124121					124375					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	1.32E-03		1.65E-03		UJ	1.77E-02		2.21E-02		UJ	1.23E-02		1.54E-02		UJ	1.05E-02	1.31E-02
Vinyl Chloride [H]	75-01-4		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
Bromomethane [H]	74-83-9		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
Chloroethane [H]	75-00-3		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.63E-02		2.05E-02			2.32E-02		2.90E-02			2.39E-02		2.99E-02			2.12E-02	2.64E-02
1,1-Dichloroethene [H]	75-35-4		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
Methylene Chloride [H]	75-09-2	5.09E-02		6.37E-02		J	4.39E-02		5.49E-02			6.27E-02		7.81E-02			5.25E-02	6.56E-02
1,1-Dichloroethane [H]	75-34-3		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
Chloroform [H]	67-66-3	1.53E-03		1.92E-03				1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	1.05E-02	1.31E-02
1,1,1-Trichloroethane [H]	71-55-6		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5	2.64E-04		3.30E-04		J		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	1.01E-02	1.26E-02
Benzene [H]	71-43-2	1.24E-01		1.55E-01		J	1.39E-01		1.74E-01			1.18E-01		1.48E-01			1.27E-01	1.59E-01
1,2-Dichloroethane [H]	107-06-2		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
Trichloroethene [H]	79-01-6		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
Toluene [H]	108-88-3	5.57E-02		6.97E-02		J	4.55E-02		5.68E-02			3.86E-02		4.82E-02			4.66E-02	5.82E-02
cis-1,3-Dichloropropene [H]	10061-01-5		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
Tetrachloroethene [H]	127-18-4	1.32E-03		1.65E-03		UJ		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	1.05E-02	1.31E-02
Chlorobenzene [H]	108-90-7		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
Ethyl Benzene [H]	100-41-4	1.05E-02		1.32E-02			7.86E-03		9.81E-03		J	6.71E-03		8.37E-03		J	8.37E-03	1.05E-02
m,p-Xylene [H]	1330-20-7	3.17E-02		3.96E-02			2.20E-02		2.75E-02			1.91E-02		2.38E-02			2.42E-02	3.03E-02
o-Xylene [H]	95-47-6	1.29E-02		1.62E-02			9.35E-03		1.17E-02		J	8.25E-03		1.03E-02		J	1.02E-02	1.27E-02
Styrene [H]	100-42-5	1.71E-02		2.15E-02			1.06E-02		1.32E-02		J	8.99E-03		1.12E-02		J	1.22E-02	1.53E-02
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
Acetone	67-64-1	1.28E-02		1.60E-02			3.04E-02		3.80E-02			1.28E-02		1.59E-02			1.87E-02	2.33E-02
Carbon Disulfide [H]	75-15-0	3.96E-04		4.96E-04		J		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	1.02E-02	1.27E-02
trans-1,2-Dichloroethene	156-60-5		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	1.11E-02		1.39E-02				1.77E-02		2.21E-02	ND	1.65E-02		2.06E-02			1.51E-02	1.88E-02
Bromodichloromethane	75-27-4		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
2-Hexanone	591-78-6	1.32E-03		1.65E-03		UJ		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	1.05E-02	1.31E-02
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
Bromoform [H]	75-25-2		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.32E-03		1.65E-03	ND		1.77E-02		2.21E-02	ND		1.23E-02		1.54E-02	ND	ND	ND
HAP Total		**3.19E-01**		**3.99E-01**			**2.96E-01**		**3.70E-01**			**2.91E-01**		**3.63E-01**			**3.48E-01**	**4.35E-01**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-50
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
J85-GE-5A (T-38)
Military
Flow by Carbon Balance

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		286753					283704					279354					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	5.48E-04		2.19E-04		J	7.41E-04		2.99E-04		J	7.03E-04		2.87E-04		J	6.64E-04	2.68E-04
Vinyl Chloride [H]	75-01-4		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Bromomethane [H]	74-83-9		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Chloroethane [H]	75-00-3		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	2.79E-02		1.12E-02			2.28E-02		9.21E-03			4.54E-02		1.85E-02			3.21E-02	1.30E-02
1,1-Dichloroethene [H]	75-35-4		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Methylene Chloride [H]	75-09-2	8.30E-02		3.32E-02		J	6.39E-02		2.58E-02		J	8.75E-02		3.57E-02		J	7.82E-02	3.16E-02
1,1-Dichloroethane [H]	75-34-3		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Chloroform [H]	67-66-3	9.30E-04		3.72E-04		J,bb	2.85E-03		1.15E-03			2.00E-03		8.15E-04		J,bb	1.93E-03	7.78E-04
1,1,1-Trichloroethane [H]	71-55-6		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Benzene [H]	71-43-2	3.18E-02		1.27E-02			2.63E-02		1.06E-02			3.57E-02		1.46E-02			3.12E-02	1.26E-02
1,2-Dichloroethane [H]	107-06-2		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Trichloroethene [H]	79-01-6		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Toluene [H]	108-88-3	1.10E-02		4.38E-03			7.41E-03		2.99E-03			8.12E-03		3.31E-03			8.83E-03	3.56E-03
cis-1,3-Dichloropropene [H]	10061-01-5		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Tetrachloroethene [H]	127-18-4		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Chlorobenzene [H]	108-90-7		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Ethyl Benzene [H]	100-41-4	1.36E-03		5.46E-04		J	8.56E-04		3.45E-04		J	8.65E-04		3.53E-04		J	1.03E-03	4.14E-04
m,p-Xylene [H]	1330-20-7	4.98E-03		1.99E-03			2.85E-03		1.15E-03			2.81E-03		1.15E-03			3.55E-03	1.43E-03
o-Xylene [H]	95-47-6	1.80E-03		7.22E-04		J	1.20E-03		4.84E-04		J	1.03E-03		4.19E-04		J	1.34E-03	5.42E-04
Styrene [H]	100-42-5	1.75E-03		7.00E-04		J	1.08E-03		4.37E-04		J	1.30E-03		5.29E-04		J	1.38E-03	5.55E-04
1,1,2,2-Tetrachloroethane [H]	79-34-5		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Acetone	67-64-1	0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00		bb	0.00E+00	0.00E+00
Carbon Disulfide [H]	75-15-0	6.56E-04		2.63E-04		J	3.25E-03		1.31E-03				2.71E-03		1.11E-03	ND	2.21E-03	8.93E-04
trans-1,2-Dichloroethene	156-60-5		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Vinyl Acetate [H]	108-05-4		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Bromodichloromethane	75-27-4		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
2-Hexanone	591-78-6		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
Bromoform [H]	75-25-2		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		2.74E-03		1.10E-03	ND		2.85E-03		1.15E-03	ND		2.71E-03		1.11E-03	ND	ND	ND
HAP Total		**1.38E-01**		**5.51E-02**			**1.10E-01**		**4.45E-02**			**1.40E-01**		**5.71E-02**			**1.30E-01**	**5.26E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-51
Emissions Factor Summary
Volatile Organic Compounds (VOCs) [1]
J85-GE-5A (T-38)
Afterburner (Zone 1)
Flow by Carbon Balance

		Run Number													
		1					2					3					Average	
Flow Rate, dscfm [1]		228390					227162					242999						
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel				
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	1.06E-03		1.37E-04		J	5.19E-04		6.74E-05		J	2.49E-03		3.22E-04		UJ	1.36E-03	1.76E-04
Vinyl Chloride [H]	75-01-4		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Bromomethane [H]	74-83-9		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Chloroethane [H]	75-00-3		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.20E-02		1.55E-03			2.12E-02		2.75E-03			2.18E-02		2.83E-03			1.83E-02	2.38E-03
1,1-Dichloroethene [H]	75-35-4		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	5.07E-02		6.55E-03			4.71E-02		6.12E-03			5.95E-02		7.72E-03		J	5.25E-02	6.80E-03
1,1-Dichloroethane [H]	75-34-3		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Chloroform [H]	67-66-3		2.31E-03		2.98E-04	ND	1.56E-03		2.02E-04		J,bb	2.88E-03		3.73E-04			2.25E-03	2.91E-04
1,1,1-Trichloroethane [H]	71-55-6		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Benzene [H]	71-43-2	7.84E-02		1.01E-02		J	4.34E-02		5.63E-03			4.51E-02		5.86E-03			5.56E-02	7.20E-03
1,2-Dichloroethane [H]	107-06-2		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Toluene [H]	108-88-3	1.52E-02		1.97E-03			1.28E-02		1.66E-03			1.44E-02		1.87E-03			1.41E-02	1.83E-03
cis-1,3-Dichloropropene [H]	10061-01-5		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4	0.00E+00		0.00E+00		UJ		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	1.61E-03	2.09E-04
Chlorobenzene [H]	108-90-7		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4	4.29E-03		5.54E-04			3.58E-03		4.65E-04			4.92E-03		6.38E-04			4.26E-03	5.52E-04
m,p-Xylene [H]	1330-20-7	1.38E-02		1.78E-03			1.28E-02		1.66E-03			1.93E-02		2.50E-03			1.53E-02	1.98E-03
o-Xylene [H]	95-47-6	6.46E-03		8.34E-04			6.14E-03		7.97E-04			9.47E-03		1.23E-03			7.35E-03	9.53E-04
Styrene [H]	100-42-5	3.09E-03		3.99E-04			1.89E-03		2.45E-04		J	1.98E-03		2.57E-04		J	2.32E-03	3.01E-04
1,1,2,2-Tetrachloroethane [H]	79-34-5		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Acetone	67-64-1	6.44E-03		8.32E-04			0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00		bb	2.15E-03	2.77E-04
Carbon Disulfide [H]	75-15-0		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND	6.95E-04		9.02E-05		J	1.79E-03	2.32E-04
trans-1,2-Dichloroethene	156-60-5		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	5.07E-03		6.55E-04				2.36E-03		3.06E-04	ND	3.28E-03		4.25E-04			3.57E-03	4.62E-04
Bromodichloromethane	75-27-4		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
2-Hexanone	591-78-6	2.31E-03		2.98E-04		UJ		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	2.38E-03	3.09E-04
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
Bromoform [H]	75-25-2		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		2.31E-03		2.98E-04	ND		2.36E-03		3.06E-04	ND		2.49E-03		3.22E-04	ND	ND	ND
HAP Total		**1.78E-01**		**2.30E-02**			**1.30E-01**		**1.68E-02**			**1.64E-01**		**2.13E-02**			**1.62E-01**	**2.10E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 3 of this volume.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-52
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
J85-GE-5A (T-38)

Flow by Carbon Balance

		Engine Mode															
		Idle				Intermediate				Military				Afterburner (Zone 1)[1]			
Flow Rate, dscfm		54202				126973				283295				232628			
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel	
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit
Phenol H	108-95-2	3.11E-02		6.07E-02		1.18E-02		1.48E-02		4.17E-03		1.68E-03		7.64E-03		9.90E-04	
Dichloroethyl ether H	111-44-4		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
2-Chlorophenol	95-57-8		2.92E-03		5.71E-03 ND		7.47E-04		9.32E-04 ND		1.39E-03		5.61E-04 ND		1.00E-03		1.30E-04 ND
1,3-Dichlorobenzene	541-73-1		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
1,4-Dichlorobenzene H	106-46-7		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
1,2-Dichlorobenzene	95-50-1		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
o-Cresol H	95-48-7	3.49E-03		6.81E-03		1.24E-03		1.55E-03			1.39E-03		5.61E-04 ND		1.00E-03		1.30E-04 ND
bis(2-Chloroisopropyl) Ether	39638-32-9		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
N-Nitroso-di-n-propylamine	621-64-7		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
p-Cresol H	106-44-5	1.17E-02		2.28E-02		4.20E-03		5.24E-03			1.39E-03		5.61E-04 ND	1.39E-03		1.80E-04	
Hexachloroethane H	67-72-1		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Nitrobenzene H	98-95-3		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Isophorone H	78-59-1		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
2-Nitrophenol	88-75-5		2.92E-03		5.71E-03 ND	2.10E-03		2.62E-03			1.39E-03		5.61E-04 ND		1.00E-03		1.30E-04 ND
2,4-Dimethylphenol	105-67-9		2.92E-03		5.71E-03 ND		7.47E-04		9.32E-04 ND		1.39E-03		5.61E-04 ND		1.00E-03		1.30E-04 ND
Benzoic Acid	65-85-0		1.17E-02		2.28E-02 ND	2.70E-02		3.37E-02		5.00E-02		2.02E-02		7.24E-02		9.38E-03	
bis(2-Chloroethoxy) Methane	111-91-1		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
2,4-Dichlorophenol	120-83-2		2.92E-03		5.71E-03 ND		7.47E-04		9.32E-04 ND		1.39E-03		5.61E-04 ND		1.00E-03		1.30E-04 ND
1,2,4-Trichlorobenzene H	120-82-1		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Naphthalene H	91-20-3	4.19E-02		8.19E-02		1.22E-02		1.52E-02		3.47E-03		1.40E-03		6.64E-03		8.60E-04	
4-Chloroaniline	106-47-8		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Hexachlorobutadiene H	87-68-3		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
4-Chloro-3-methylphenol	59-50-7		2.92E-03		5.71E-03 ND		7.47E-04		9.32E-04 ND		1.39E-03		5.61E-04 ND		1.00E-03		1.30E-04 ND
2-Methylnaphthalene	91-57-6	5.37E-02		1.05E-01		1.28E-02		1.59E-02		2.92E-03		1.18E-03		9.88E-03		1.28E-03	
Hexachlorocyclopentadiene H	77-47-4		1.17E-02		2.28E-02 ND		3.00E-03		3.74E-03 ND		5.56E-03		2.24E-03 ND		4.03E-03		5.22E-04 ND
2,4,6-Trichlorophenol H	88-06-2		2.92E-03		5.71E-03 ND		7.47E-04		9.32E-04 ND		1.39E-03		5.61E-04 ND		1.00E-03		1.30E-04 ND
2,4,5-Trichlorophenol H	95-95-4		2.92E-03		5.71E-03 ND		7.47E-04		9.32E-04 ND		1.39E-03		5.61E-04 ND		1.00E-03		1.30E-04 ND
2-Chloronaphthalene	91-58-7		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
2-Nitroaniline	88-74-4		5.85E-03		1.14E-02 ND		1.50E-03		1.87E-03 ND		2.78E-03		1.12E-03 ND		2.01E-03		2.61E-04 ND
Dimethylphthalate H	131-11-3		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Acenaphthylene	208-96-8	1.17E-03		2.28E-03		3.90E-04		4.86E-04			2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
2,6-Dinitrotoluene	606-20-2		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
3-Nitroaniline	99-09-2		5.85E-03		1.14E-02 ND		1.50E-03		1.87E-03 ND		2.78E-03		1.12E-03 ND		2.01E-03		2.61E-04 ND
Acenaphthene	83-32-9		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
2,4-Dinitrophenol H	51-28-5		1.17E-02		2.28E-02 ND		3.00E-03		3.74E-03 ND		5.56E-03		2.24E-03 ND		4.03E-03		5.22E-04 ND
4-Nitrophenol H	100-02-7		1.17E-02		2.28E-02 ND		3.00E-03		3.74E-03 ND		5.56E-03		2.24E-03 ND		4.03E-03		5.22E-04 ND
2,4-Dinitrotoluene H	121-14-2		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Dibenzofuran H	132-64-9	4.78E-03		9.34E-03		1.02E-03		1.27E-03			2.78E-04		1.12E-04 ND	5.81E-04		7.53E-05	
Diethylphthalate	84-66-2		5.85E-04		1.14E-03 ND	9.05E-04		1.13E-03		4.40E-03		1.78E-03		8.21E-03		1.06E-03	
Fluorene	86-73-7	2.33E-03		4.55E-03		3.44E-04		4.30E-04			2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
4-Chlorophenyl-phenyl Ether	7005-72-3		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
4-Nitroaniline	100-01-6		5.85E-03		1.14E-02 ND		1.50E-03		1.87E-03 ND		2.78E-03		1.12E-03 ND		2.01E-03		2.61E-04 ND
4,6-Dinitro-2-methylphenol	534-52-1		1.17E-02		2.28E-02 ND		3.00E-03		3.74E-03 ND		5.56E-03		2.24E-03 ND		4.03E-03		5.22E-04 ND
N-Nitrosodiphenylamine	86-30-6		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
4-Bromophenyl-phenyl Ether	101-55-3		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Hexachlorobenzene H	118-74-1		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Pentachlorophenol H	87-86-5		1.17E-02		2.28E-02 ND		3.00E-03		3.74E-03 ND		5.56E-03		2.24E-03 ND		4.03E-03		5.22E-04 ND
Phenanthrene	85-01-8	6.44E-04		1.26E-03		5.73E-04		7.16E-04			2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Anthracene	120-12-7		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
di-n-Butylphthalate H	84-74-2	6.44E-04		1.26E-03	B	3.30E-04		4.12E-04	B	6.11E-04		2.47E-04	B	5.64E-04		7.31E-05	B
Fluoranthene	206-44-0		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Pyrene	129-00-0		5.85E-04		1.14E-03 ND	1.80E-04		2.24E-04			2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Butylbenzylphthalate	85-68-7		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND	3.06E-04		1.23E-04		2.49E-04		3.22E-05	
3,3'-Dichlorobenzidine H	91-94-1		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Chrysene	218-01-9		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Benzo(a)anthracene	56-55-3		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
bis(2-Ethylhexyl)phthalate H	117-81-7	7.06E-04		1.38E-03	B	7.16E-04		8.94E-04	B	1.06E-03		4.27E-04	B	1.08E-03		1.40E-04	B
Di-n-Octylphthalate	117-84-0		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Benzo(b)fluoranthene	205-99-2		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Benzo(k)fluoranthene	207-08-9		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Benzo(a)pyrene	50-32-8		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Indeno(1,2,3-c,d)pyrene	193-39-5		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Benzo(g,h,i)perylene	191-24-2		5.85E-04		1.14E-03 ND		1.50E-04		1.87E-04 ND		2.78E-04		1.12E-04 ND		2.01E-04		2.61E-05 ND
Benzyl alcohol	100-51-6	1.58E-02		3.08E-02		7.18E-03		8.97E-03		1.67E-03		6.72E-04		1.11E-03		1.43E-04	
HAP Total		9.43E-02		1.84E-01		3.15E-02		3.93E-02		9.31E-03		3.76E-03		1.79E-02		2.32E-03	

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 3 of this volume.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-53
Emissions Factor Summary
Aldehyde/Ketones
J85-GE-5A (T-38)
Flow by Carbon Balance

		Engine Mode																	
		Idle					Intermediate					Military					Afterburner (Zone 1)[1]				
Flow Rate, dscfm		54202					126973					283295					232628				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Formaldehyde [H]	50-00-0	9.81E-02		1.92E-01		B	5.18E-01		6.47E-01		B	2.02E-01		8.17E-02		B	1.95E-01		2.52E-02		B
Acetaldehyde [H]	75-07-0	5.12E-02		9.99E-02				8.66E-03		1.08E-02	ND		1.16E-02		4.67E-03	ND		4.06E-03		5.26E-04	ND
Acrolein [H]	107-02-8	1.17E-01		2.28E-01				8.66E-03		1.08E-02	ND		1.16E-02		4.67E-03	ND		4.06E-03		5.26E-04	ND
Acetone	67-64-1		2.92E-03		5.71E-03	ND		8.66E-03		1.08E-02	ND		1.16E-02		4.67E-03	ND		4.06E-03		5.26E-04	ND
Crotonaldehyde	4170-30-3	5.83E-02		1.14E-01				8.66E-03		1.08E-02	ND		1.16E-02		4.67E-03	ND		4.06E-03		5.26E-04	ND
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3		2.92E-03		5.71E-03	ND		8.66E-03		1.08E-02	ND		1.16E-02		4.67E-03	ND		4.06E-03		5.26E-04	ND
Benzaldehyde	100-52-7	4.79E-02		9.36E-02				8.66E-03		1.08E-02	ND		1.16E-02		4.67E-03	ND		4.06E-03		5.26E-04	ND
Isopentanal (Isovaleraldehyde)	590-86-3		2.92E-03		5.71E-03	ND		8.66E-03		1.08E-02	ND		1.16E-02		4.67E-03	ND		4.06E-03		5.26E-04	ND
Pentanal (Valeraldehyde)	110-62-3		2.92E-03		5.71E-03	ND		8.66E-03		1.08E-02	ND		1.16E-02		4.67E-03	ND		4.06E-03		5.26E-04	ND
o-Tolualdehyde	529-20-4		2.92E-03		5.71E-03	ND		8.66E-03		1.08E-02	ND		1.16E-02		4.67E-03	ND		4.06E-03		5.26E-04	ND
m-Tolualdehyde	620-23-5		2.92E-03		5.71E-03	ND		8.66E-03		1.08E-02	ND		1.16E-02		4.67E-03	ND		4.06E-03		5.26E-04	ND
p-Tolualdehyde	104-87-0		2.92E-03		5.71E-03	ND		8.66E-03		1.08E-02	ND		1.16E-02		4.67E-03	ND		4.06E-03		5.26E-04	ND
Hexanal (Hexaldehyde)	66-25-1		2.92E-03		5.71E-03	ND		8.66E-03		1.08E-02	ND		1.16E-02		4.67E-03	ND		4.06E-03		5.26E-04	ND
HAP Total		**2.66E-01**		**5.19E-01**			**5.18E-01**		**6.47E-01**			**2.02E-01**		**8.17E-02**			**1.95E-01**		**2.52E-02**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 3 of this volume.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-6
J85-GE-5A (T-38)
Emission Factors

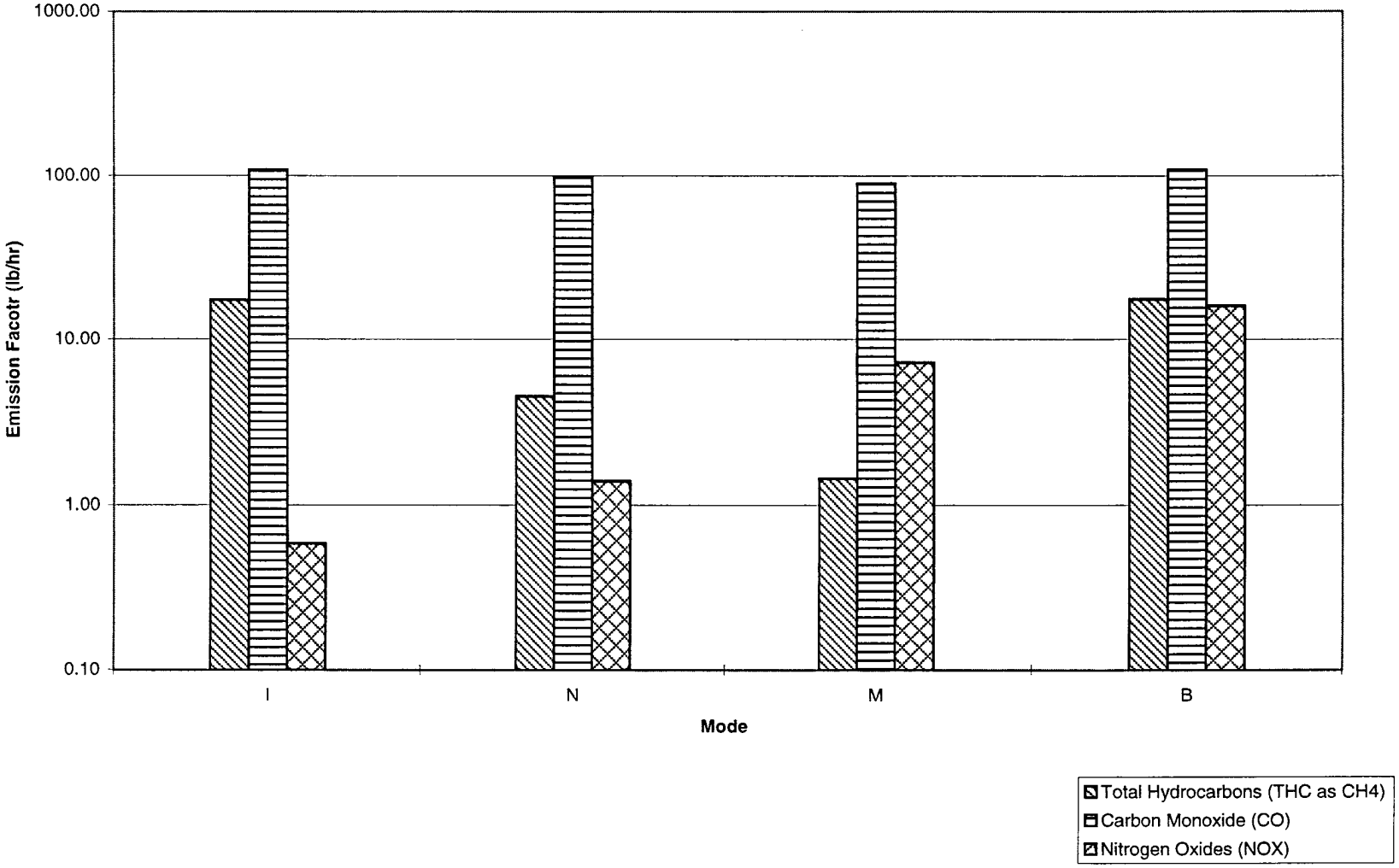


Table 4-54
Engine Operating Parameter Summary
J85-GE-5A (T-38)

Parameter	Idle	Intermediate	Military	Afterburner (Zone 1)
Fuel flow, lb/hr	434	950	2,740	8,138
Engine speed, rpm	8,162	12,479	16,542	16,542
Cell humidity, %	29.18	28.89	28.90	28.87
Cell temperature, deg. F	64.44	86.67	67.33	71.45
Thrust, pounds	97	400	2,349	3,310
Percent maximum thrust	3.6	15.0	88.0	116.0

4.3.7 Engine T700-GE-700

Actual flows were measured following EPA Method 2 procedures because emissions were exhausted through a single stack. Measured flows were consistent between the particulate, semivolatile, and formaldehyde sampling trains. However, measured flow values were inconsistent between engine power settings. The exhaust flow rate was less during the overspeed power setting than at the flight max power setting even though the engine combusted more JP-8 and created more shaft horsepower. The flow rate was measured in the field by several individuals and three sets of independent sampling equipment. After review, the field data confirmed that the flow rate results presented are valid.

It is possible that the test cell is undersized for the particular engine setting. The test cell exhaust represents a critical orifice above a certain exhaust volume, resulting in a decrease in the total flow. This assumption is logical, as there was a significant increase in the exhaust temperature between flight max and overspeed conditions. The increased temperature would result in the exhaust gas occupying a greater volume within the augmenter tube. Since the engine was not starved for combustion air (based on the engine operating parameters), the concentrations in our measurements may be higher since the dilution air and flow through the tube is decreased. The high concentration with the lowered exhaust flow results in the same mass flow of pollutants at the theoretical exhaust rate. For example, if the flow rate increased with a properly sized exhaust, the concentration would decrease resulting in a comparable mass emission rate to those presented in the report.

THC results were not available during ground idle conditions. Due to a delay in shipping the THC analyzer fuel cylinder, it was not available for use during the first day of testing. The THC results for the ground idle condition are represented by blanks in Table 4-55.

PM results between Run 2 and Runs 1 and 3 differed greatly at the flight max setting. The raw data for Run 2 was reviewed to note any errors. Field and analytical

data showed no errors. The difference can be attributed to method variability, since results are at or near the method detection limit.

Tables 4-55 through 4-68 present engine results for the T700-GE-700 engine. Figure 4-7 presents a comparison of THC, CO, and NO_x at each engine setting.

The formaldehyde sample for the flight max condition was lost in shipment. Results for flight max are represented by blanks in Table 4-68.

Table 4-69 presents a summary of engine operating parameters

Table 4-55
Emissions Factor Summary
Gaseous Parameters
T700-GE-700 (UH-60A)
Idle

Flow as Measured

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	15111		15063		14988			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	0.25	1.90	0.22	1.63	0.20	1.52	0.23	1.68
Nitrogen Dioxide (NO_2)	0.08	0.57	0.11	0.81	0.13	0.96	0.10	0.78
Nitrogen Oxides (NO_X)	0.47	3.47	0.44	3.30	0.44	3.29	0.45	3.35
Carbon Monoxide (CO)	6.04	45.05	6.18	46.08	6.37	47.51	6.19	46.22
Total Hydrocarbons (THC as CH_4) [1]	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Dioxide (CO_2)	518	3863	506	3774	513	3831	512	3823

NA - Hydrocarbon datalogger not operational during Idle engine setting.

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 4.3.7 of this volume.

Table 4-56
Emissions Factor Summary
Gaseous Parameters
T700-GE-700 (UH-60A)
Flight Idle

Flow as Measured

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	32079		32989		32133			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	3.10	6.66	3.08	6.56	2.99	6.35	3.06	6.52
Nitrogen Dioxide (NO_2)	0.30	0.64	0.47	1.01	0.48	1.03	0.42	0.89
Nitrogen Oxides (NO_X)	5.08	10.89	5.22	11.11	5.11	10.86	5.14	10.95
Carbon Monoxide (CO)	2.38	5.10	2.45	5.20	2.38	5.06	2.40	5.12
Total Hydrocarbons (THC as CH_4)	0.15	0.33	0.08	0.18	0.07	0.15	0.10	0.22
Carbon Dioxide (CO_2)	1641	3519	1731	3682	1707	3626	1693	3609

Table 4-57
Emissions Factor Summary
Gaseous Parameters
T700-GE-700 (UH-60A)
Flight Max

Flow as Measured

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	35643		36402		36050			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	4.75	7.47	4.54	7.27	4.33	7.01	4.54	7.25
Nitrogen Dioxide (NO_2)	0.28	0.44	0.50	0.79	0.52	0.84	0.43	0.69
Nitrogen Oxides (NO_X)	7.58	11.94	7.48	11.97	7.23	11.71	7.43	11.88
Carbon Monoxide (CO)	2.33	3.67	2.22	3.56	2.04	3.31	2.20	3.51
Total Hydrocarbons (THC as CH_4)	0.56	0.88	0.25	0.39	0.24	0.40	0.35	0.56
Carbon Dioxide (CO_2)	2424	3817	2429	3886	2306	3735	2386	3813

Table 4-58
Emissions Factor Summary
Gaseous Parameters
T700-GE-700 (UH-60A)
Overspeed

Flow as Measured

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	31204		31273		30949			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	5.48	7.46	5.30	7.32	5.09	7.10	5.29	7.30
Nitrogen Dioxide (NO_2)	0.07	0.09	0.13	0.19	0.18	0.25	0.13	0.17
Nitrogen Oxides (NO_X)	8.52	11.59	8.31	11.47	8.03	11.20	8.28	11.42
Carbon Monoxide (CO)	2.04	2.78	2.05	2.82	2.02	2.83	2.04	2.81
Total Hydrocarbons (THC as CH_4)	0.39	0.53	0.40	0.55	0.37	0.51	0.38	0.53
Carbon Dioxide (CO_2)	2354	3204	2338	3227	2038	2845	2243	3092

Table 4-59
Emissions Factor Summary
Particulates
T700-GE-700 (UH-60A)
Idle

Flow as Measured

	Run Number							
	1		2		3		Average	
Flow Rate, dscfm	15111		15063		14988			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Particulate (filterable)	0.132	0.985	0.059	0.442	0.013	0.095	0.068	0.507
Particulate (condensable)	0.214	1.601	0.099	0.740	0.079	0.589	0.131	0.977
Particulate (total)	0.346	2.585	0.158	1.182	0.092	0.684	0.199	1.484

Table 4-60
Emissions Factor Summary
Particulates
T700-GE-700 (UH-60A)
Flight Idle

Flow as Measured

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	32079		32989		32133			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Particulate (filterable)	0.514	1.103	0.661	1.406	0.496	1.053	0.557	1.187
Particulate (condensable)	0.034	0.072	0.048	0.102	0.014	0.029	0.032	0.068
Particulate (total)	0.548	1.176	0.709	1.508	0.509	1.082	0.589	1.255

Table 4-61
Emissions Factor Summary
Particulates
T700-GE-700 (UH-60A)
Flight Max

Flow as Measured

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	35643		36402		36050			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Particulate (filterable)	1.177	1.853	0.025	0.040	1.225	1.983	0.809	1.292
Particulate (condensable)	0.836	1.317	0.033	0.053	0.879	1.423	0.583	0.931
Particulate (total) 1	2.013	3.170	0.059	0.094	2.103	3.406	1.392	2.223

1 - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 5 of this volume.

Table 4-62
Emissions Factor Summary
Particulates
T700-GE-700 (UH-60A)
Overspeed

Flow as Measured

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	31204		31273		30949			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Particulate (filterable)	1.342	1.826	0.176	0.243	1.512	2.111	1.010	1.393
Particulate (condensable)	1.262	1.718	0.060	0.083	1.311	1.830	0.878	1.210
Particulate (total)	2.604	3.544	0.237	0.327	2.824	3.941	1.888	2.604

Table 4-63
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
T700-GE-700 (UH-60A)
Idle

Flow as Measured

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		15111					15063					14988					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Vinyl Chloride [H]	75-01-4		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Bromomethane [H]	74-83-9		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Chloroethane [H]	75-00-3		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	9.74E-05		7.27E-04		J,bb	2.12E-04		1.58E-03		bb	3.34E-04		2.49E-03		bb	2.15E-04	1.60E-03
1,1-Dichloroethene [H]	75-35-4		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Methylene Chloride [H]	75-09-2	2.15E-04		1.61E-03		bb	1.03E-03		7.66E-03		bb	3.03E-03		2.26E-02		E	1.42E-03	1.06E-02
1,1-Dichloroethane [H]	75-34-3		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Chloroform [H]	67-66-3		1.43E-04		1.07E-03	ND	1.52E-04		1.14E-03			1.94E-04		1.45E-03			1.63E-04	1.22E-03
1,1,1-Trichloroethane [H]	71-55-6	7.42E-05		5.53E-04		J	1.07E-04		8.00E-04		J	1.03E-04		7.71E-04		J	9.49E-05	7.08E-04
Carbon Tetrachloride [H]	56-23-5	3.15E-05		2.35E-04		J	3.88E-05		2.90E-04		J		1.52E-04		1.13E-03	ND	7.40E-05	5.52E-04
Benzene [H]	71-43-2	5.72E-03		4.27E-02		E	6.88E-03		5.14E-02		E	6.96E-03		5.20E-02		E	6.52E-03	4.87E-02
1,2-Dichloroethane [H]	107-06-2		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Trichloroethene [H]	79-01-6		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Toluene [H]	108-88-3	1.41E-03		1.05E-02			1.82E-03		1.36E-02			1.90E-03		1.42E-02			1.71E-03	1.28E-02
cis-1,3-Dichloropropene [H]	10061-01-5		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Tetrachloroethene [H]	127-18-4		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Chlorobenzene [H]	108-90-7		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Ethyl Benzene [H]	100-41-4	2.72E-04		2.03E-03			2.98E-04		2.23E-03			3.34E-04		2.49E-03			3.01E-04	2.25E-03
m,p-Xylene [H]	1330-20-7	5.83E-04		4.35E-03			5.30E-04		3.96E-03			6.34E-04		4.73E-03			5.83E-04	4.35E-03
o-Xylene [H]	95-47-6	3.72E-04		2.78E-03			3.58E-04		2.67E-03			3.95E-04		2.95E-03			3.75E-04	2.80E-03
Styrene [H]	100-42-5	6.00E-04		4.48E-03			7.17E-04		5.35E-03			7.58E-04		5.66E-03			6.92E-04	5.16E-03
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Acetone	67-64-1	4.47E-04		3.34E-03			7.39E-04		5.52E-03			7.69E-04		5.74E-03			6.52E-04	4.86E-03
Carbon Disulfide [H]	75-15-0		1.43E-04		1.07E-03	ND	4.18E-05		3.12E-04		J	3.64E-05		2.72E-04		J	7.38E-05	5.51E-04
trans-1,2-Dichloroethene	156-60-5		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	2.21E-04		1.65E-03			8.46E-05		6.32E-04			5.61E-06		4.19E-05			1.04E-04	7.74E-04
Bromodichloromethane	75-27-4		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	2.26E-04		1.69E-03				1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	1.76E-04	1.31E-03
2-Hexanone	591-78-6	2.32E-04		1.73E-03				1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	1.78E-04	1.32E-03
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
Bromoform [H]	75-25-2		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.43E-04		1.07E-03	ND		1.50E-04		1.12E-03	ND		1.52E-04		1.13E-03	ND	ND	ND
HAP Total		**9.72E-03**		**7.26E-02**			**1.21E-02**		**9.00E-02**			**1.44E-02**		**1.07E-01**			**1.22E-02**	**9.10E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
E - Results are estimated, value reported is outside linear working range.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-64
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
T700-GE-700 (UH-60A)
Flight Idle
Flow as Measured

		Approach															
		1					2					3					Average
Flow Rate, dscfm		32079					32989					32133					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr / lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Vinyl Chloride [H]	75-01-4		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Bromomethane [H]	74-83-9		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Chloroethane [H]	75-00-3		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Freon 11 (Trichlorofluoromethane)	75-69-4	6.81E-04		1.45E-03		bb	1.03E-03		2.21E-03		bb	1.10E-03		2.34E-03			9.38E-04 / 2.00E-03
1,1-Dichloroethene [H]	75-35-4		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Methylene Chloride [H]	75-09-2	1.45E-03		3.10E-03		bb	1.71E-03		3.64E-03		bb	2.58E-03		5.49E-03		bb	1.91E-03 / 4.08E-03
1,1-Dichloroethane [H]	75-34-3		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Chloroform [H]	67-66-3		2.84E-04		6.05E-04	ND	1.71E-04		3.64E-04		J,bb	1.71E-04		3.64E-04		J,bb	2.08E-04 / 4.44E-04
1,1,1-Trichloroethane [H]	71-55-6	7.94E-05		1.69E-04		J	1.22E-04		2.59E-04		J	1.16E-04		2.47E-04		J	1.06E-04 / 2.25E-04
Carbon Tetrachloride [H]	56-23-5		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Benzene [H]	71-43-2	1.19E-04		2.54E-04		J	1.58E-04		3.37E-04		J	1.41E-04		3.00E-04		J	1.39E-04 / 2.97E-04
1,2-Dichloroethane [H]	107-06-2		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Trichloroethene [H]	79-01-6	2.84E-04		6.05E-04		UJ	1.27E-04		2.71E-04		J	3.06E-04		6.52E-04		UJ	2.39E-04 / 5.09E-04
1,2-Dichloropropane [H]	78-87-5		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
trans-1,3-Dichloropropene [H]	10061-02-6		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Toluene [H]	108-88-3	1.42E-04		3.02E-04		J	2.00E-04		4.27E-04		J	1.29E-04		2.75E-04		J	1.57E-04 / 3.35E-04
cis-1,3-Dichloropropene [H]	10061-01-5		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
1,1,2-Trichloroethane [H]	79-00-5		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Tetrachloroethene [H]	127-18-4		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Chlorobenzene [H]	108-90-7		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Ethyl Benzene [H]	100-41-4		2.84E-04		6.05E-04	ND	6.69E-05		1.43E-04		J		3.06E-04		6.52E-04	ND	2.19E-04 / 4.66E-04
m,p-Xylene [H]	1330-20-7	1.48E-04		3.15E-04		J	2.25E-04		4.80E-04		J	7.33E-05		1.56E-04		J	1.49E-04 / 3.17E-04
o-Xylene [H]	95-47-6	7.94E-05		1.69E-04		J	1.22E-04		2.59E-04		J		3.06E-04		6.52E-04	ND	1.69E-04 / 3.60E-04
Styrene [H]	100-42-5		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
1,1,2,2-Tetrachloroethane [H]	79-34-5	2.84E-04		6.05E-04		UJ	3.04E-04		6.48E-04		UJ	3.06E-04		6.52E-04		UJ	2.98E-04 / 6.35E-04
Acetone	67-64-1	0.00E+00		0.00E+00			0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00		bb	0.00E+00 / 0.00E+00
Carbon Disulfide [H]	75-15-0		2.84E-04		6.05E-04	ND	2.13E-04		4.53E-04		J	6.72E-05		1.43E-04		J	1.88E-04 / 4.00E-04
trans-1,2-Dichloroethene	156-60-5		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Vinyl Acetate [H]	108-05-4		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
2-Butanone (MEK) [H]	78-93-3	2.84E-04		6.05E-04		UJ	3.04E-04		6.48E-04		UJ	3.06E-04		6.52E-04		UJ	2.98E-04 / 6.35E-04
Bromodichloromethane	75-27-4		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	2.84E-04		6.05E-04		UJ	3.04E-04		6.48E-04		UJ	3.06E-04		6.52E-04		UJ	2.98E-04 / 6.35E-04
2-Hexanone	591-78-6	2.84E-04		6.05E-04		UJ	3.04E-04		6.48E-04		UJ	3.06E-04		6.52E-04		UJ	2.98E-04 / 6.35E-04
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
Bromoform [H]	75-25-2		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
cis-1,2-Dichloroethene	156-59-2		2.84E-04		6.05E-04	ND		3.04E-04		6.48E-04	ND		3.06E-04		6.52E-04	ND	ND / ND
HAP Total		**3.16E-03**		**6.73E-03**			**4.02E-03**		**8.57E-03**			**4.50E-03**		**9.59E-03**			**4.38E-03 / 9.34E-03**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-65
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
T700-GE-700 (UH-60A)
Flight Max

Flow as Measured

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		35643					36402					36050					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr / lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Vinyl Chloride [H]	75-01-4		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Bromomethane [H]	74-83-9		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Chloroethane [H]	75-00-3		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.15E-03		1.83E-03			1.91E-03		3.05E-03			2.59E-03		4.14E-03			1.88E-03 / 3.01E-03
1,1-Dichloroethene [H]	75-35-4		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Methylene Chloride [H]	75-09-2	0.00E+00		0.00E+00		bb	3.76E-03		6.01E-03		J	2.44E-03		3.90E-03		J	2.07E-03 / 3.31E-03
1,1-Dichloroethane [H]	75-34-3		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Chloroform [H]	67-66-3		3.19E-04		5.10E-04	ND	2.18E-04		3.49E-04		J,bb	2.59E-04		4.14E-04		J	2.66E-04 / 4.24E-04
1,1,1-Trichloroethane [H]	71-55-6	1.54E-04		2.45E-04		J	1.30E-04		2.07E-04		J	1.23E-04		1.96E-04		J	1.35E-04 / 2.16E-04
Carbon Tetrachloride [H]	56-23-5		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Benzene [H]	71-43-2	2.80E-04		4.48E-04		J	1.36E-04		2.18E-04		J	1.70E-04		2.72E-04		J	1.96E-04 / 3.13E-04
1,2-Dichloroethane [H]	107-06-2		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Trichloroethene [H]	79-01-6	3.63E-04		5.80E-04		J	3.41E-04		5.45E-04		UJ		3.40E-04		5.44E-04	ND	3.48E-04 / 5.56E-04
1,2-Dichloropropane [H]	78-87-5		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
trans-1,3-Dichloropropene [H]	10061-02-6		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Toluene [H]	108-88-3	0.00E+00		0.00E+00			0.00E+00		0.00E+00		J	0.00E+00		0.00E+00		J	0.00E+00 / 0.00E+00
cis-1,3-Dichloropropene [H]	10061-01-5		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
1,1,2-Trichloroethane [H]	79-00-5		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Tetrachloroethene [H]	127-18-4		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Chlorobenzene [H]	108-90-7		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Ethyl Benzene [H]	100-41-4		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
m,p-Xylene [H]	1330-20-7	1.91E-04		3.05E-04		J	1.91E-04		3.05E-04		J	2.24E-04		3.58E-04		J	2.02E-04 / 3.23E-04
o-Xylene [H]	95-47-6	1.15E-04		1.83E-04		J	1.09E-04		1.74E-04		J	1.23E-04		1.96E-04		J	1.15E-04 / 1.84E-04
Styrene [H]	100-42-5		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
1,1,2,2-Tetrachloroethane [H]	79-34-5	3.19E-04		5.10E-04		UJ	3.41E-04		5.45E-04		UJ		3.40E-04		5.44E-04	ND	3.33E-04 / 5.33E-04
Acetone	67-64-1	0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00		bb	0.00E+00 / 0.00E+00
Carbon Disulfide [H]	75-15-0		3.19E-04		5.10E-04	ND	1.23E-04		1.96E-04		J	1.43E-04		2.29E-04		J	1.95E-04 / 3.11E-04
trans-1,2-Dichloroethene	156-60-5		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Vinyl Acetate [H]	108-05-4		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
2-Butanone (MEK) [H]	78-93-3	0.00E+00		0.00E+00		J	0.00E+00		0.00E+00		UJ		3.40E-04		5.44E-04	ND	1.13E-04 / 1.81E-04
Bromodichloromethane	75-27-4		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	3.19E-04		5.10E-04		UJ	3.41E-04		5.45E-04		UJ		3.40E-04		5.44E-04	ND	3.33E-04 / 5.33E-04
2-Hexanone	591-78-6	3.19E-04		5.10E-04		UJ	3.41E-04		5.45E-04		UJ		3.40E-04		5.44E-04	ND	3.33E-04 / 5.33E-04
Dibromochloromethane (Chlorodibromomethane)	124-48-1		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
Bromoform [H]	75-25-2		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
cis-1,2-Dichloroethene	156-59-2		3.19E-04		5.10E-04	ND		3.41E-04		5.45E-04	ND		3.40E-04		5.44E-04	ND	ND / ND
HAP Total		**1.74E-03**		**2.78E-03**			**5.69E-03**		**9.09E-03**			**3.49E-03**		**5.57E-03**			**4.19E-03 / 6.70E-03**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-66
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
T700-GE-700 (UH-60A)
Overspeed
Flow as Measured

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		31204					31273					30949					
		lb/hr		lbs/1,000 lbs			lb/hr		lbs/1,000 lbs			lb/hr		lbs/1,000 lbs				
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Vinyl Chloride [H]	75-01-4		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Bromomethane [H]	74-83-9		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Chloroethane [H]	75-00-3		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	5.66E-04		7.80E-04		bb	8.94E-04		1.23E-03		bb	1.13E-03		1.56E-03			8.63E-04	1.19E-03
1,1-Dichloroethene [H]	75-35-4		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	5.61E-04		7.74E-04		bb	3.16E-03		4.36E-03		bb	1.13E-02		1.55E-02		E	5.00E-03	6.89E-03
1,1-Dichloroethane [H]	75-34-3		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Chloroform [H]	67-66-3	8.71E-05		1.20E-04		J,bb	3.05E-04		4.20E-04			2.74E-04		3.77E-04		J	2.22E-04	3.06E-04
1,1,1-Trichloroethane [H]	71-55-6	1.43E-04		1.97E-04		J	1.37E-04		1.89E-04		J	1.37E-04		1.89E-04		J	1.39E-04	1.91E-04
Carbon Tetrachloride [H]	56-23-5		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Benzene [H]	71-43-2	2.36E-04		3.26E-04		J	2.03E-04		2.80E-04		J	2.14E-04		2.96E-04		J	2.18E-04	3.00E-04
1,2-Dichloroethane [H]	107-06-2		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Toluene [H]	108-88-3	4.58E-04		6.32E-04			1.77E-04		2.44E-04			0.00E+00		0.00E+00			2.12E-04	2.92E-04
cis-1,3-Dichloropropene [H]	10061-01-5		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4	8.09E-05		1.12E-04		J	1.55E-04		2.13E-04		J	1.96E-04		2.70E-04		J	1.44E-04	1.98E-04
m,p-Xylene [H]	1330-20-7	3.30E-04		4.55E-04			6.56E-04		9.05E-04			8.32E-04		1.15E-03			6.06E-04	8.36E-04
o-Xylene [H]	95-47-6	1.61E-04		2.22E-04		J	2.80E-04		3.86E-04		J	4.39E-04		6.06E-04			2.94E-04	4.05E-04
Styrene [H]	100-42-5		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Acetone	67-64-1	1.43E-03		1.97E-03			6.79E-04		9.37E-04			0.00E+00		0.00E+00			7.02E-04	9.68E-04
Carbon Disulfide [H]	75-15-0		3.11E-04		4.29E-04	ND	7.16E-05		9.87E-05		J		2.97E-04		4.09E-04	ND	2.26E-04	3.12E-04
trans-1,2-Dichloroethene	156-60-5		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
Bromodichloromethane	75-27-4		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
4-Methyl-2-pentanone (MiBK) [H]	108-10-1		3.11E-04		4.29E-04	ND	3.10E-04		4.28E-04			4.10E-04		5.66E-04			3.44E-04	4.74E-04
2-Hexanone	591-78-6		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
Bromoform [H]	75-25-2		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		3.11E-04		4.29E-04	ND		2.98E-04		4.10E-04	ND		2.97E-04		4.09E-04	ND	ND	ND
HAP Total		**2.06E-03**		**2.84E-03**			**5.46E-03**		**7.53E-03**			**1.38E-02**		**1.90E-02**			**7.30E-03**	**1.01E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
E - Results are estimated, value reported is outside linear working range.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-67
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
T700-GE-700 (UH-60A)

Flow as Measured

		Engine Mode																	
		Idle					Flight Idle					Flight Max					Overspeed				
Flow Rate, dscfm		15388					32965					36022					32396				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
			Detection		Detection			Detection		Detection			Detection		Detection			Detection		Detection	
Analyte	CAS Number	Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit	
Phenol [H]	108-95-2	8.36E-04		6.24E-03				1.56E-04		3.32E-04	ND		1.54E-04		2.46E-04	ND		1.52E-04		2.09E-04	ND
Dichloroethyl ether [H]	111-44-4		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
2-Chlorophenol	95-57-8		8.70E-05		6.50E-04	ND		1.56E-04		3.32E-04	ND		1.54E-04		2.46E-04	ND		1.52E-04		2.09E-04	ND
1,3-Dichlorobenzene	541-73-1		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
1,4-Dichlorobenzene [H]	106-46-7		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
1,2-Dichlorobenzene	95-50-1		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
o-Cresol [H]	95-48-7	1.05E-04		7.83E-04				1.56E-04		3.32E-04	ND		1.54E-04		2.46E-04	ND		1.52E-04		2.09E-04	ND
bis(2-Chloroisopropyl) Ether	39638-32-9		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
N-Nitroso-di-n-propylamine	621-64-7		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
p-Cresol [H]	106-44-5	1.62E-04		1.21E-03				1.56E-04		3.32E-04	ND		1.54E-04		2.46E-04	ND		1.52E-04		2.09E-04	ND
Hexachloroethane [H]	67-72-1		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Nitrobenzene [H]	98-95-3		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Isophorone [H]	78-59-1		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
2-Nitrophenol	88-75-5	1.07E-04		7.96E-04				1.56E-04		3.32E-04	ND		1.54E-04		2.46E-04	ND		1.52E-04		2.09E-04	ND
2,4-Dimethylphenol	105-67-9		8.70E-05		6.50E-04	ND		1.56E-04		3.32E-04	ND		1.54E-04		2.46E-04	ND		1.52E-04		2.09E-04	ND
Benzoic Acid	65-85-0	2.79E-03		2.08E-02			2.59E-03		5.53E-03			1.91E-03		3.06E-03			6.59E-04		9.09E-04		
bis(2-Chloroethoxy) Methane	111-91-1		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
2,4-Dichlorophenol	120-83-2		8.70E-05		6.50E-04	ND		1.56E-04		3.32E-04	ND		1.54E-04		2.46E-04	ND		1.52E-04		2.09E-04	ND
1,2,4-Trichlorobenzene [H]	120-82-1		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Naphthalene [H]	91-20-3	9.82E-04		7.33E-03			7.32E-05		1.56E-04			4.21E-05		6.73E-05			2.11E-05		2.91E-05		
4-Chloroaniline	106-47-8		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Hexachlorobutadiene [H]	87-68-3		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
4-Chloro-3-methylphenol	59-50-7		8.70E-05		6.50E-04	ND		1.56E-04		3.32E-04	ND		1.54E-04		2.46E-04	ND		1.52E-04		2.09E-04	ND
2-Methylnaphthalene	91-57-6	6.55E-04		4.89E-03			6.39E-05		1.36E-04			2.44E-05		3.90E-05			1.35E-05		1.86E-05		
Hexachlorocyclopentadiene [H]	77-47-4		1.75E-04		1.30E-03	ND		3.12E-04		6.66E-04	ND		3.06E-04		4.89E-04	ND		3.03E-04		4.18E-04	ND
2,4,6-Trichlorophenol [H]	88-06-2		8.70E-05		6.50E-04	ND		1.56E-04		3.32E-04	ND		1.54E-04		2.46E-04	ND		1.52E-04		2.09E-04	ND
2,4,5-Trichlorophenol [H]	95-95-4		8.70E-05		6.50E-04	ND		1.56E-04		3.32E-04	ND		1.54E-04		2.46E-04	ND		1.52E-04		2.09E-04	ND
2-Chloronaphthalene	91-58-7		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
2-Nitroaniline	88-74-4		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Dimethylphthalate [H]	131-11-3		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Acenaphthylene	208-96-8		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
2,6-Dinitrotoluene	606-20-2		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
3-Nitroaniline	99-09-2		1.75E-04		1.30E-03	ND		3.12E-04		6.66E-04	ND		3.06E-04		4.89E-04	ND		3.03E-04		4.18E-04	ND
Acenaphthene	83-32-9		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
2,4-Dinitrophenol [H]	51-28-5		3.49E-04		2.60E-03	ND		6.24E-04		1.33E-03	ND		6.13E-04		9.79E-04	ND		6.07E-04		8.37E-04	ND
4-Nitrophenol [H]	100-02-7		1.75E-04		1.30E-03	ND		3.12E-04		6.66E-04	ND		3.06E-04		4.89E-04	ND		3.03E-04		4.18E-04	ND
2,4-Dinitrotoluene [H]	121-14-2		1.75E-04		1.30E-03	ND		3.12E-04		6.66E-04	ND		3.06E-04		4.89E-04	ND		3.03E-04		4.18E-04	ND
Dibenzofuran [H]	132-64-9	2.79E-05		2.08E-04				3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Diethylphthalate	84-66-2	3.18E-05		2.37E-04			5.35E-05		1.14E-04			1.89E-04		3.01E-04			4.58E-05		6.32E-05		
Fluorene	86-73-7		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
4-Chlorophenyl-phenyl Ether	7005-72-3		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
4-Nitroaniline	100-01-6		1.75E-04		1.30E-03	ND		3.12E-04		6.66E-04	ND		3.06E-04		4.89E-04	ND		3.03E-04		4.18E-04	ND
4,6-Dinitro-2-methylphenol	534-52-1		1.75E-04		1.30E-03	ND		3.12E-04		6.66E-04	ND		3.06E-04		4.89E-04	ND		3.03E-04		4.18E-04	ND
N-Nitrosodiphenylamine	86-30-6		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
4-Bromophenyl-phenyl Ether	101-55-3		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Hexachlorobenzene [H]	118-74-1		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Pentachlorophenol [H]	87-86-5		1.75E-04		1.30E-03	ND		3.12E-04		6.66E-04	ND		3.06E-04		4.89E-04	ND		3.03E-04		4.18E-04	ND
Phenanthrene	85-01-8		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Anthracene	120-12-7		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
di-n-Butylphthalate [H]	84-74-2	5.01E-06		3.74E-05		B	0.00E+00		0.00E+00		B	0.00E+00		0.00E+00		B	4.74E-05		6.54E-05		B
Fluoranthene	206-44-0		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Pyrene	129-00-0		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Butylbenzylphthalate	85-68-7	1.75E-05		1.30E-04			8.73E-05		1.86E-04			5.09E-05		8.13E-05				3.03E-05		4.18E-05	ND
3,3'-Dichlorobenzidine [H]	91-94-1		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Chrysene	218-01-9		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Benzo(a)anthracene	56-55-3		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
bis(2-Ethylhexyl)phthalate [H]	117-81-7	1.34E-04		1.00E-03		B	6.87E-04		1.46E-03		B	3.92E-04		6.26E-04		B	1.65E-04		2.28E-04		B
Di-n-Octylphthalate	117-84-0		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Benzo(b)fluoranthene	205-99-2		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Benzo(k)fluoranthene	207-08-9		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Benzo(a)pyrene	50-32-8		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Indeno(1,2,3-c,d)pyrene	193-39-5		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Benzo(g,h,i)perylene	191-24-2		1.75E-05		1.30E-04	ND		3.12E-05		6.66E-05	ND		3.06E-05		4.89E-05	ND		3.03E-05		4.18E-05	ND
Benzyl alcohol	100-51-6	3.94E-04		2.86E-03				1.56E-04		3.32E-04	ND		1.54E-04		2.46E-04	ND		1.52E-04		2.09E-04	ND
HAP Total		**2.25E-03**		**1.68E-02**			**7.60E-04**		**1.62E-03**			**4.34E-04**		**6.93E-04**			**2.34E-04**		**3.23E-04**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-68
Emissions Factor Summary
Aldehyde/Ketones
T700-GE-700 (UH-60A)

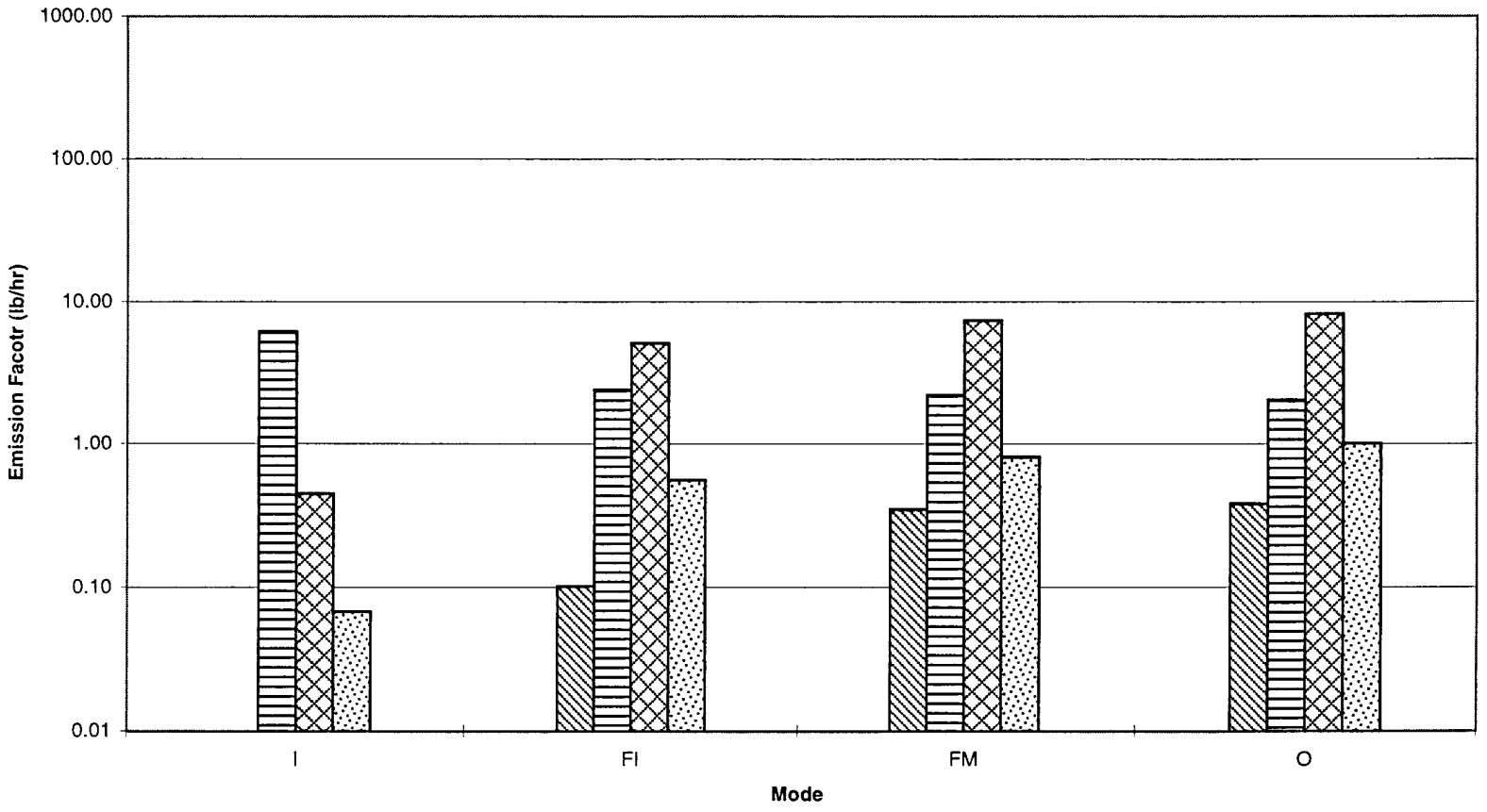
Flow as Measured

		Engine Mode															
		Idle					Flight Idle					Flight Max [1]					Overspeed				
Flow Rate, dscfm		14217					32641					38755					32611				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Formaldehyde [H]	50-00-0	2.94E-02		2.19E-01		B	1.92E-03		4.09E-03		B	1.31E-03		2.10E-03		B	3.49E-04		4.82E-04		B
Acetaldehyde [H]	75-07-0	2.42E-03		1.81E-02		B	1.42E-04		3.02E-04		B	1.25E-04		1.99E-04		B		1.59E-05		2.19E-05	ND
Acrolein [H]	107-02-8	9.69E-04		7.23E-03			4.54E-05		9.67E-05			6.90E-06		1.10E-05				1.59E-05		2.19E-05	ND
Acetone	67-64-1		8.63E-04		6.44E-03	ND	5.12E-05		1.09E-04		B	8.06E-05		1.29E-04		B		1.59E-05		2.19E-05	ND
Crotonaldehyde	4170-30-3	1.33E-03		9.94E-03				1.63E-05		3.47E-05	ND		1.91E-05		3.05E-05	ND		1.59E-05		2.19E-05	ND
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3		8.63E-04		6.44E-03	ND		1.63E-05		3.47E-05	ND		1.91E-05		3.05E-05	ND		1.59E-05		2.19E-05	ND
Benzaldehyde	100-52-7		8.63E-04		6.44E-03	ND	4.22E-04		8.99E-04			2.60E-04		4.15E-04				1.59E-05		2.19E-05	ND
Isopentanal (Isovaleraldehyde)	590-86-3		8.63E-04		6.44E-03	ND		1.63E-05		3.47E-05	ND		1.91E-05		3.05E-05	ND		1.59E-05		2.19E-05	ND
Pentanal (Valeraldehyde)	110-62-3		8.63E-04		6.44E-03	ND	4.22E-04		8.99E-04			2.60E-04		4.15E-04				1.59E-05		2.19E-05	ND
o-Tolualdehyde	529-20-4		8.63E-04		6.44E-03	ND		1.63E-05		3.47E-05	ND		1.91E-05		3.05E-05	ND		1.59E-05		2.19E-05	ND
m-Tolualdehyde	620-23-5		8.63E-04		6.44E-03	ND		1.63E-05		3.47E-05	ND		1.91E-05		3.05E-05	ND		1.59E-05		2.19E-05	ND
p-Tolualdehyde	104-87-0		8.63E-04		6.44E-03	ND		1.63E-05		3.47E-05	ND		1.91E-05		3.05E-05	ND		1.59E-05		2.19E-05	ND
Hexanal (Hexaldehyde)	66-25-1		8.63E-04		6.44E-03	ND		1.63E-05		3.47E-05	ND		1.91E-05		3.05E-05	ND		1.59E-05		2.19E-05	ND
HAP Total		**3.28E-02**		**2.45E-01**			**2.11E-03**		**4.49E-03**			**1.45E-03**		**2.31E-03**			**3.49E-04**		**4.82E-04**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 4.3.7 of this volume.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-7
T700-GE-700 (UH-60A)
Emission Factors



THC for mode I is not available.

Table 4-69
Engine Operating Parameter Summary
T700-GE-700 (UH-60A)

Parameter	Ground Idle	Flight Idle	Flight Max	Overspeed
Engine speed, rpm	10,031	21,161	20,958	21,078
Barometric pressure, in. Hg	30	30	30	30
Inlet temperature, degrees F	74	58	66	72
Fuel flow, lbs/hr	134	469	626	725
Torque in-lbs	384	2,700	4,008	4,848
Horsepower	62	906	1,333	1,620
Percent maximum horsepower	3.8	55.9	82.2	99.8

4.3.8 Engine TF33-P-102

Tracer gas was used to determine the flow rate at each power setting. Carbon balance was not consistent with the expected flows at each engine power setting.

THC emissions at the intermediate power setting, Run 1, may be biased high. The sample probe used to sample for THC was left in the stack during the warm-up of the engine. The hydrocarbon sample line may have been contaminated during the initial power-up from idle to the intermediate setting.

The TF33-P-102 engine exhibits high THC emissions at idle conditions with emissions an order of magnitude lower at higher engine power settings. During routine start-up the engine is operated at idle for a period of time before proceeding to a higher power setting. During this start-up period, residual THC is deposited in the engine test cell and THC sampling system, which resulted in slightly elevated THC readings during Run 1 at the Approach, Intermediate, and Military power settings.

Tables 4-70 through 4-79 present engine results for the TF33-P-102 engine. Figure 4-8 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-80 summarizes the engine operating data collected during testing.

Table 4-74 exhibits a large number of estimated detection limits (annoted by UJ). This cannot necessarily be attributed to the high THC concentration noted during Run 1. The VOC sampling system is not prone to residual THC because no sample is drawn through the sampling system until the engine is at the designated power setting. The number of detection limit estimates appears to be an analytical anomaly. As a conservative assumption, it is assumed that UJ is a detected value due to the uncertainty in the analysis. For example, the difference between assuming all UJs are detected values versus UJs as non-detect is only 20 percent.

Table 4-70
Emissions Factor Summary
Gaseous Parameters
TF33-P-102 (C/EC/RC-135E)
Idle

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	382061		385835		375791			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	0.36	0.32	0.36	0.32	0.35	0.32	0.36	0.32
Nitrogen Dioxide (NO_2)	1.09	0.97	1.11	0.99	1.08	0.98	1.09	0.98
Nitrogen Oxides (NO_X)	1.64	1.46	1.66	1.49	1.35	1.22	1.55	1.39
Carbon Monoxide (CO)	104.97	93.23	107.69	96.85	104.89	95.10	105.85	95.06
Total Hydrocarbons (THC as CH_4)	95.33	84.67	105.04	94.46	103.25	93.61	101.21	90.91
Carbon Dioxide (CO_2)	2570	2283	2606	2344	2564	2325	2580	2317

Table 4-71
Emissions Factor Summary
Gaseous Parameters
TF33-P-102 (C/EC/RC-135E)
Approach

Flow by Tracer

	Run Number							
	1		2		3		Average	
Flow Rate, dscfm	1181795		1103247		1128825			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	17.67	3.72	15.98	3.35	15.82	3.36	16.49	3.48
Nitrogen Dioxide (NO_2)	5.08	1.07	5.53	1.16	6.47	1.37	5.69	1.20
Nitrogen Oxides (NO_X)	31.33	6.60	29.24	6.14	29.92	6.35	30.16	6.37
Carbon Monoxide (CO)	25.77	5.43	24.06	5.05	24.62	5.23	24.81	5.24
Total Hydrocarbons (THC as CH_4)	11.19	2.36	4.27	0.90	4.08	0.87	6.51	1.37
Carbon Dioxide (CO_2)	15917	3355	15003	3149	15405	3271	15442	3259

Table 4-72
Emissions Factor Summary
Gaseous Parameters
TF33-P-102 (C/EC/RC-135E)
Intermediate

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	1198407		1175858		1224347			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	25.76	4.46	25.82	4.48	28.03	4.83	26.54	4.59
Nitrogen Dioxide (NO_2)	5.15	0.89	5.90	1.02	6.14	1.06	5.73	0.99
Nitrogen Oxides (NO_X)	43.78	7.58	44.65	7.75	48.24	8.31	45.56	7.88
Carbon Monoxide (CO)	15.68	2.71	10.26	1.78	10.68	1.84	12.21	2.11
Total Hydrocarbons (THC as CH_4) [1]	22.71	3.93	1.70	0.30	1.58	0.27	8.67	1.50
Carbon Dioxide (CO_2)	13218	2287	15838	2751	16767	2887	15274	2642

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 3 of this volume.

Table 4-73
Emissions Factor Summary
Gaseous Parameters
TF33-P-102 (C/EC/RC-135E)
Military

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	1657173		1346781		1377390			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	62.72	8.30	50.97	6.74	51.49	6.81	55.06	7.28
Nitrogen Dioxide (NO_2)	7.12	0.94	6.75	0.89	6.91	0.91	6.93	0.92
Nitrogen Oxides (NO_X)	103.28	13.67	84.90	11.22	85.85	11.35	91.35	12.08
Carbon Monoxide (CO)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Hydrocarbons (THC as CH_4)	8.00	1.06	2.09	0.28	2.48	0.33	4.19	0.55
Carbon Dioxide (CO_2)	29541	3909	23630	3124	24478	3237	25883	3423

Table 4-74
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF33-P-102 (C/EC/RC-135E)
Idle
Flow by Tracer

		Run Number													
		1				2				3				Average	
Flow Rate, dscfm		382061				385835				375791					
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Vinyl Chloride [H]	75-01-4	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Bromomethane [H]	74-83-9	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ	1.76E-02		1.60E-02	UJ	1.75E-02	1.57E-02
Chloroethane [H]	75-00-3	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Freon 11 (Trichlorofluoromethane)	75-69-4	8.36E-02		7.42E-02	J	1.60E-01		1.44E-01	J	6.31E-02		5.72E-02		1.02E-01	9.19E-02
1,1-Dichloroethene [H]	75-35-4	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Methylene Chloride [H]	75-09-2	0.00E+00		0.00E+00	J	0.00E+00		0.00E+00	J	0.00E+00		0.00E+00	J	0.00E+00	0.00E+00
1,1-Dichloroethane [H]	75-34-3	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Chloroform [H]	67-66-3	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
1,1,1-Trichloroethane [H]	71-55-6	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Carbon Tetrachloride [H]	56-23-5	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Benzene [H]	71-43-2	7.60E-01		6.75E-01	J	8.04E-01		7.23E-01	J	8.07E-01		7.31E-01		7.90E-01	7.10E-01
1,2-Dichloroethane [H]	107-06-2	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Trichloroethene [H]	79-01-6	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
1,2-Dichloropropane [H]	78-87-5	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
trans-1,3-Dichloropropene [H]	10061-02-6	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Toluene [H]	108-88-3	2.57E-01		2.28E-01	J	3.35E-01		3.01E-01	J	2.92E-01		2.65E-01		2.95E-01	2.65E-01
cis-1,3-Dichloropropene [H]	10061-01-5	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
1,1,2-Trichloroethane [H]	79-00-5	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Tetrachloroethene [H]	127-18-4	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Chlorobenzene [H]	108-90-7	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Ethyl Benzene [H]	100-41-4	9.12E-02		8.10E-02	J	1.02E-01		9.20E-02	J	9.53E-02		8.64E-02		9.63E-02	8.65E-02
m,p-Xylene [H]	1330-20-7	1.45E-01		1.28E-01	J	1.60E-01		1.44E-01	J	1.53E-01		1.39E-01		1.53E-01	1.37E-01
o-Xylene [H]	95-47-6	6.45E-02		5.73E-02	J	7.10E-02		6.38E-02	J	6.81E-02		6.18E-02		6.79E-02	6.10E-02
Styrene [H]	100-42-5	1.22E-01		1.08E-01	J	1.24E-01		1.12E-01	J	1.17E-01		1.06E-01		1.21E-01	1.09E-01
1,1,2,2-Tetrachloroethane [H]	79-34-5	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Acetone	67-64-1	0.00E+00		0.00E+00	J	0.00E+00		0.00E+00	UJ	0.00E+00		0.00E+00		0.00E+00	0.00E+00
Carbon Disulfide [H]	75-15-0	1.67E-02		1.49E-02	J	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.83E-02	1.64E-02
trans-1,2-Dichloroethene	156-60-5	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Vinyl Acetate [H]	108-05-4	7.21E-02		6.41E-02	UJ	1.02E-01		9.20E-02	UJ		8.80E-02		7.98E-02 ND	8.75E-02	7.86E-02
2-Butanone (MEK) [H]	78-93-3	7.60E-02		6.75E-02	J	1.02E-01		9.20E-02	UJ		8.80E-02		7.98E-02 ND	8.88E-02	7.98E-02
Bromodichloromethane	75-27-4	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	7.21E-02		6.41E-02	UJ	1.02E-01		9.20E-02	UJ		8.80E-02		7.98E-02 ND	8.75E-02	7.86E-02
2-Hexanone	591-78-6	7.21E-02		6.41E-02	UJ	1.02E-01		9.20E-02	UJ		8.80E-02		7.98E-02 ND	8.75E-02	7.86E-02
Dibromochloromethane (Chlorodibromomethane)	124-48-1	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
Bromoform [H]	75-25-2	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
cis-1,2-Dichloroethene	156-59-2	1.45E-02		1.28E-02	UJ	2.05E-02		1.85E-02	UJ		1.76E-02		1.60E-02 ND	1.75E-02	1.57E-02
HAP Total		**1.96E+00**		**1.74E+00**		**2.33E+00**		**2.10E+00**		**1.55E+00**		**1.41E+00**		**2.12E+00**	**1.90E+00**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-75
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF33-P-102 (C/EC/RC-135E)
Approach
Flow by Tracer

		Run Number																	
		1					2					3					Average	
Flow Rate, dscfm		1181795					1103247					1128825						
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel				
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	3.51E-03		7.40E-04			3.42E-03		7.18E-04				2.28E-03		4.84E-04	ND	3.07E-03	6.47E-04
Vinyl Chloride [H]	75-01-4		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
Bromomethane [H]	74-83-9	2.34E-03		4.94E-04		UJ	2.14E-03		4.49E-04		UJ	2.28E-03		4.84E-04		UJ	2.25E-03	4.76E-04
Chloroethane [H]	75-00-3		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	8.90E-02		1.88E-02			5.58E-02		1.17E-02			2.73E-01		5.80E-02		J	1.39E-01	2.95E-02
1,1-Dichloroethene [H]	75-35-4		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	3.12E-01		6.58E-02		J	1.22E-01		2.55E-02		J,bb	6.00E-01		1.27E-01		J	3.45E-01	7.29E-02
1,1-Dichloroethane [H]	75-34-3		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
Chloroform [H]	67-66-3		2.34E-03		4.94E-04	ND	7.48E-03		1.57E-03		bb	7.27E-03		1.54E-03		bb	5.70E-03	1.20E-03
1,1,1-Trichloroethane [H]	71-55-6		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		2.34E-03		4.94E-04	ND	2.14E-03		4.49E-04				2.28E-03		4.84E-04	ND	2.25E-03	4.76E-04
Benzene [H]	71-43-2	5.62E-02		1.19E-02			5.33E-02		1.12E-02			5.24E-02		1.11E-02			5.40E-02	1.14E-02
1,2-Dichloroethane [H]	107-06-2		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
Toluene [H]	108-88-3	9.65E-03		2.03E-03			8.31E-03		1.74E-03			1.44E-02		3.06E-03			1.08E-02	2.28E-03
cis-1,3-Dichloropropene [H]	10061-01-5		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		2.34E-03		4.94E-04	ND	2.78E-03		5.84E-04			2.50E-03		5.32E-04			2.54E-03	5.36E-04
Chlorobenzene [H]	108-90-7		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4	3.75E-03		7.89E-04			3.64E-03		7.63E-04			4.31E-03		9.16E-04			3.90E-03	8.23E-04
m,p-Xylene [H]	1330-20-7	1.00E-02		2.12E-03			1.07E-02		2.25E-03			1.34E-02		2.86E-03			1.14E-02	2.41E-03
o-Xylene [H]	95-47-6	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
Styrene [H]	100-42-5	6.06E-03		1.28E-03			5.79E-03		1.21E-03			4.99E-03		1.06E-03			5.61E-03	1.18E-03
1,1,2,2-Tetrachloroethane [H]	79-34-5		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
Acetone	67-64-1	1.08E+00		2.27E-01		J	7.15E-02		1.50E-02			0.00E+00		0.00E+00			3.82E-01	8.06E-02
Carbon Disulfide [H]	75-15-0		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.17E-02		2.46E-03	ND		1.07E-02		2.25E-03	ND		1.14E-02		2.42E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	2.58E-02		5.43E-03			1.26E-02		2.65E-03				1.14E-02		2.42E-03	ND	1.66E-02	3.50E-03
Bromodichloromethane	75-27-4		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.17E-02		2.46E-03	ND		1.07E-02		2.25E-03	ND		1.14E-02		2.42E-03	ND	ND	ND
2-Hexanone	591-78-6		1.17E-02		2.46E-03	ND		1.07E-02		2.25E-03	ND		1.14E-02		2.42E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
Bromoform [H]	75-25-2		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		2.34E-03		4.94E-04	ND		2.14E-03		4.49E-04	ND		2.28E-03		4.84E-04	ND	ND	ND
HAP Total		**4.29E-01**		**9.05E-02**			**2.34E-01**		**4.91E-02**			**7.02E-01**		**1.49E-01**			**4.63E-01**	**9.78E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-76
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF33-P-102 (C/EC/RC-135E)
Intermediate
Flow by Tracer

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		1198407					1175858					1224347					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		2.37E-03		4.09E-04	ND	3.61E-03		6.27E-04				2.35E-03		4.05E-04	ND	2.78E-03	4.80E-04
Vinyl Chloride [H]	75-01-4	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
Bromomethane [H]	74-83-9	2.37E-03		4.09E-04		UJ	2.41E-03		4.18E-04		UJ	2.35E-03		4.05E-04		UJ	2.37E-03	4.11E-04
Chloroethane [H]	75-00-3	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
Freon 11 (Trichlorofluoromethane)	75-69-4	3.08E-01		5.32E-02		J	1.08E-01		1.88E-02			1.65E-01		2.83E-02			1.94E-01	3.35E-02
1,1-Dichloroethene [H]	75-35-4	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
Methylene Chloride [H]	75-09-2	3.11E-01		5.38E-02		J	2.20E-01		3.83E-02		J	3.79E-01		6.52E-02		J	3.03E-01	5.24E-02
1,1-Dichloroethane [H]	75-34-3	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
Chloroform [H]	67-66-3	5.66E-03		9.79E-04		J,bb		2.41E-03		4.18E-04	ND	5.64E-03		9.71E-04		bb	4.57E-03	7.89E-04
1,1,1-Trichloroethane [H]	71-55-6	2.60E-03		4.51E-04		J		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.45E-03	4.24E-04
Carbon Tetrachloride [H]	56-23-5	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
Benzene [H]	71-43-2	4.98E-02		8.62E-03		J	7.71E-03		1.34E-03			1.27E-02		2.19E-03			2.34E-02	4.05E-03
1,2-Dichloroethane [H]	107-06-2	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
Trichloroethene [H]	79-01-6	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
1,2-Dichloropropane [H]	78-87-5	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
trans-1,3-Dichloropropene [H]	10061-02-6	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
Toluene [H]	108-88-3	3.08E-02		5.32E-03		J	5.07E-03		8.80E-04			1.01E-02		1.74E-03			1.53E-02	2.65E-03
cis-1,3-Dichloropropene [H]	10061-01-5	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
1,1,2-Trichloroethane [H]	79-00-5	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
Tetrachloroethene [H]	127-18-4	2.37E-03		4.09E-04		UJ	5.99E-03		1.04E-03		J	6.10E-03		1.05E-03			4.82E-03	8.33E-04
Chlorobenzene [H]	108-90-7	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
Ethyl Benzene [H]	100-41-4	5.93E-03		1.03E-03		J		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	3.56E-03	6.16E-04
m,p-Xylene [H]	1330-20-7	1.28E-02		2.21E-03		J		2.41E-03		4.18E-04	ND	4.00E-03		6.89E-04			6.40E-03	1.11E-03
o-Xylene [H]	95-47-6	0.00E+00		0.00E+00		J		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	1.59E-03	2.74E-04
Styrene [H]	100-42-5	5.21E-03		9.01E-04		J		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	3.32E-03	5.75E-04
1,1,2,2-Tetrachloroethane [H]	79-34-5	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
Acetone	67-64-1	0.00E+00		0.00E+00		J	9.38E-02		1.63E-02			0.00E+00		0.00E+00			3.13E-02	5.43E-03
Carbon Disulfide [H]	75-15-0	2.37E-03		4.09E-04		UJ	1.70E-02		2.96E-03				2.35E-03		4.05E-04	ND	7.26E-03	1.26E-03
trans-1,2-Dichloroethene	156-60-5	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
Vinyl Acetate [H]	108-05-4	1.18E-02		2.04E-03		UJ	1.20E-02		2.09E-03		UJ		1.17E-02		2.02E-03	ND	1.19E-02	2.05E-03
2-Butanone (MEK) [H]	78-93-3	1.18E-02		2.04E-03		UJ		1.20E-02		2.09E-03	ND		1.17E-02		2.02E-03	ND	1.19E-02	2.05E-03
Bromodichloromethane	75-27-4	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	1.18E-02		2.04E-03		UJ		1.20E-02		2.09E-03	ND		1.17E-02		2.02E-03	ND	1.19E-02	2.05E-03
2-Hexanone	591-78-6	1.18E-02		2.04E-03		UJ		1.20E-02		2.09E-03	ND		1.17E-02		2.02E-03	ND	1.19E-02	2.05E-03
Dibromochloromethane (Chlorodibromomethane)	124-48-1	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
Bromoform [H]	75-25-2	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
cis-1,2-Dichloroethene	156-59-2	2.37E-03		4.09E-04		UJ		2.41E-03		4.18E-04	ND		2.35E-03		4.05E-04	ND	2.37E-03	4.11E-04
HAP Total		**5.01E-01**		**8.68E-02**			**2.74E-01**		**4.76E-02**			**4.20E-01**		**7.23E-02**			**4.43E-01**	**7.66E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected amblent pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-77
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF33-P-102 (C/EC/RC-135E)
Military
Flow by Tracer

		Run Number															
		1					2					3				Average	
Flow Rate, dscfm		1657173					1346781					1377390					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		
Chloromethane [H]	74-87-3		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND	4.34E-03		5.74E-04		lb/hr	lbs/1,000 lbs fuel
Vinyl Chloride [H]	75-01-4		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND
Bromomethane [H]	74-83-9	3.23E-03		4.28E-04		UJ	2.61E-03		3.45E-04		UJ	2.71E-03		3.59E-04		UJ	2.85E-03	3.77E-04
Chloroethane [H]	75-00-3		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	5.49E-01		7.27E-02		J	2.88E-01		3.80E-02		J	1.71E-01		2.26E-02			3.36E-01	4.44E-02
1,1-Dichloroethene [H]	75-35-4		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	1.13E+00		1.50E-01		J	5.50E-01		7.27E-02		J	3.52E-01		4.66E-02		J	6.77E-01	8.96E-02
1,1-Dichloroethane [H]	75-34-3		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
Chloroform [H]	67-66-3	9.68E-03		1.28E-03		bb	6.00E-03		7.94E-04		bb	4.61E-03		6.10E-04		bb	6.77E-03	8.95E-04
1,1,1-Trichloroethane [H]	71-55-6		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5	3.56E-03		4.71E-04				2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	2.96E-03	3.92E-04
Benzene [H]	71-43-2	7.14E-03		9.45E-04			1.04E-02		1.38E-03			4.07E-03		5.38E-04			7.22E-03	9.55E-04
1,2-Dichloroethane [H]	107-06-2		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
Toluene [H]	108-88-3	7.45E-03		9.86E-04			7.87E-03		1.04E-03			6.24E-03		8.26E-04			7.19E-03	9.51E-04
cis-1,3-Dichloropropene [H]	10061-01-5		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4	3.23E-03		4.28E-04		UJ	2.61E-03		3.45E-04		UJ	2.71E-03		3.59E-04		UJ	2.85E-03	3.77E-04
Chlorobenzene [H]	108-90-7		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
m,p-Xylene [H]	1330-20-7	6.46E-03		8.54E-04			7.32E-03		9.67E-04			5.15E-03		6.82E-04			6.31E-03	8.34E-04
o-Xylene [H]	95-47-6		3.23E-03		4.28E-04	ND	2.61E-03		3.45E-04				2.71E-03		3.59E-04	ND	2.85E-03	3.77E-04
Styrene [H]	100-42-5		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
Acetone	67-64-1	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00		bb	0.00E+00	0.00E+00
Carbon Disulfide [H]	75-15-0		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4	1.61E-02		2.14E-03		UJ	1.31E-02		1.73E-03		UJ	1.36E-02		1.79E-03		UJ	1.43E-02	1.89E-03
2-Butanone (MEK) [H]	78-93-3		1.61E-02		2.14E-03	ND		1.31E-02		1.73E-03	ND		1.36E-02		1.79E-03	ND	ND	ND
Bromodichloromethane	75-27-4		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.61E-02		2.14E-03	ND		1.31E-02		1.73E-03	ND		1.36E-02		1.79E-03	ND	ND	ND
2-Hexanone	591-78-6		1.61E-02		2.14E-03	ND		1.31E-02		1.73E-03	ND		1.36E-02		1.79E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
Bromoform [H]	75-25-2		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		3.23E-03		4.28E-04	ND		2.61E-03		3.45E-04	ND		2.71E-03		3.59E-04	ND	ND	ND
HAP Total		**1.19E+00**		**1.57E-01**			**6.02E-01**		**7.96E-02**			**3.96E-01**		**5.23E-02**			**7.34E-01**	**9.71E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 78

Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
TF33-P-102 (C/EC/RC-135E)

Flow by Tracer

		Engine Mode															
		Idle				Approach				Intermediate				Military			
Flow Rate, dscfm		381184				1137616				1198803				1447905			
		lb/hr		lbs/1,000		lb/hr		lbs/1,000		lb/hr		lbs/1,000		lb/hr		lbs/1,000	
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit
Phenol [H]	108-95-2	9.37E-02		8.41E-02		8.32E-03		1.76E-03			7.05E-03		1.22E-03 ND		7.48E-03		9.90E-04 ND
Dichloroethyl ether [H]	111-44-4		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
2-Chlorophenol	95-57-8		1.81E-02		1.63E-02 ND		7.12E-03		1.50E-03 ND		7.05E-03		1.22E-03 ND		7.48E-03		9.90E-04 ND
1,3-Dichlorobenzene	541-73-1		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
1,4-Dichlorobenzene [H]	106-46-7		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
1,2-Dichlorobenzene	95-50-1		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
o-Cresol [H]	95-48-7		1.81E-02		1.63E-02 ND		7.12E-03		1.50E-03 ND		7.05E-03		1.22E-03 ND		7.48E-03		9.90E-04 ND
bis(2-Chloroisopropyl) Ether	39638-32-9		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
N-Nitroso-di-n-propylamine	621-64-7		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
p-Cresol [H]	106-44-5		1.81E-02		1.63E-02 ND		7.12E-03		1.50E-03 ND		7.05E-03		1.22E-03 ND		7.48E-03		9.90E-04 ND
Hexachloroethane [H]	67-72-1		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Nitrobenzene [H]	98-95-3		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Isophorone [H]	78-59-1		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
2-Nitrophenol	88-75-5		1.81E-02		1.63E-02 ND		7.12E-03		1.50E-03 ND		7.05E-03		1.22E-03 ND		7.48E-03		9.90E-04 ND
2,4-Dimethylphenol	105-67-9		1.81E-02		1.63E-02 ND		7.12E-03		1.50E-03 ND		7.05E-03		1.22E-03 ND		7.48E-03		9.90E-04 ND
Benzoic Acid	65-85-0		7.28E-02		6.54E-02 ND	4.39E-02		9.27E-03		5.34E-02		9.24E-03		4.78E-02		6.32E-03	
bis(2-Chloroethoxy) Methane	111-91-1		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
2,4-Dichlorophenol	120-83-2		1.81E-02		1.63E-02 ND		7.12E-03		1.50E-03 ND		7.05E-03		1.22E-03 ND		7.48E-03		9.90E-04 ND
1,2,4-Trichlorobenzene [H]	120-82-1		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Naphthalene [H]	91-20-3	2.39E-01		2.14E-01		5.22E-03		1.10E-03		4.25E-03		7.36E-04		9.82E-04		1.30E-04	
4-Chloroaniline	106-47-8		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Hexachlorobutadiene [H]	87-68-3		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
4-Chloro-3-methylphenol	59-50-7		1.81E-02		1.63E-02 ND		7.12E-03		1.50E-03 ND		7.05E-03		1.22E-03 ND		7.48E-03		9.90E-04 ND
2-Methylnaphthalene	91-57-6	2.57E-01		2.31E-01		4.90E-03		1.04E-03		7.09E-03		1.23E-03		4.36E-03		5.76E-04	
Hexachlorocyclopentadiene [H]	77-47-4		3.64E-02		3.27E-02 ND		1.42E-02		3.00E-03 ND		1.41E-02		2.43E-03 ND		1.49E-02		1.97E-03 ND
2,4,6-Trichlorophenol [H]	88-06-2		1.81E-02		1.63E-02 ND		7.12E-03		1.50E-03 ND		7.05E-03		1.22E-03 ND		7.48E-03		9.90E-04 ND
2,4,5-Trichlorophenol [H]	95-95-4		1.81E-02		1.63E-02 ND		7.12E-03		1.50E-03 ND		7.05E-03		1.22E-03 ND		7.48E-03		9.90E-04 ND
2-Chloronaphthalene	91-58-7		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
2-Nitroaniline	88-74-4		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Dimethylphthalate [H]	131-11-3		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Acenaphthylene	208-96-8	1.31E-02		1.18E-02			1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
2,6-Dinitrotoluene	606-20-2		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
3-Nitroaniline	99-09-2		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Acenaphthene	83-32-9		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
2,4-Dinitrophenol [H]	51-28-5		7.28E-02		6.54E-02 ND		2.85E-02		6.01E-03 ND		2.82E-02		4.87E-03 ND		2.99E-02		3.95E-03 ND
4-Nitrophenol [H]	100-02-7		1.81E-02		1.63E-02 ND		7.12E-03		1.50E-03 ND		7.05E-03		1.22E-03 ND		7.48E-03		9.90E-04 ND
2,4-Dinitrotoluene [H]	121-14-2		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Dibenzofuran [H]	132-64-9	7.28E-03		6.54E-03			1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Diethylphthalate	84-66-2		3.64E-03		3.27E-03 ND	2.14E-03		4.51E-04			1.41E-03		2.43E-04 ND	2.09E-03		2.77E-04	
Fluorene	86-73-7	4.37E-03		3.92E-03			1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
4-Chlorophenyl-phenyl Ether	7005-72-3		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
4-Nitroaniline	100-01-6		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
4,6-Dinitro-2-methylphenol	534-52-1		3.64E-02		3.27E-02 ND		1.42E-02		3.00E-03 ND		1.41E-02		2.43E-03 ND		1.49E-02		1.97E-03 ND
N-Nitrosodiphenylamine	86-30-6		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
4-Bromophenyl-phenyl Ether	101-55-3		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Hexachlorobenzene [H]	118-74-1		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Pentachlorophenol [H]	87-86-5		3.64E-02		3.27E-02 ND		1.42E-02		3.00E-03 ND		1.41E-02		2.43E-03 ND		1.49E-02		1.97E-03 ND
Phenanthrene	85-01-8	6.87E-03		6.17E-03			1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Anthracene	120-12-7		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
di-n-Butylphthalate [H]	84-74-2		3.64E-03		3.27E-03 ND	2.68E-03		5.67E-04		0.00E+00		0.00E+00		0.00E+00		0.00E+00	
Fluoranthene	206-44-0		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Pyrene	129-00-0		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Butylbenzylphthalate	85-68-7		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
3,3'-Dichlorobenzidine [H]	91-94-1		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Chrysene	218-01-9		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Benzo(a)anthracene	56-55-3		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
bis(2-Ethylhexyl)phthalate [H]	117-81-7		3.64E-03		3.27E-03 ND	1.06E-02		2.23E-03	B	2.21E-02		3.82E-03	B	1.29E-02		1.70E-03	B
Di-n-Octylphthalate	117-84-0		3.64E-02		3.27E-02 ND		1.42E-02		3.00E-03 ND		1.41E-02		2.43E-03 ND		1.49E-02		1.97E-03 ND
Benzo(b)fluoranthene	205-99-2		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Benzo(k)fluoranthene	207-08-9		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Benzo(a)pyrene	50-32-8		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Indeno(1,2,3-c,d)pyrene	193-39-5		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Benzo(g,h,i)perylene	191-24-2		3.64E-03		3.27E-03 ND		1.42E-03		3.00E-04 ND		1.41E-03		2.43E-04 ND		1.49E-03		1.97E-04 ND
Benzyl alcohol	100-51-6		1.81E-02		1.63E-02 ND		7.12E-03		1.50E-03 ND		7.05E-03		1.22E-03 ND		7.48E-03		9.90E-04 ND
HAP Total		**3.40E-01**		**3.05E-01**		**2.68E-02**		**5.66E-03**		**2.63E-02**		**4.55E-03**		**1.39E-02**		**1.83E-03**	

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

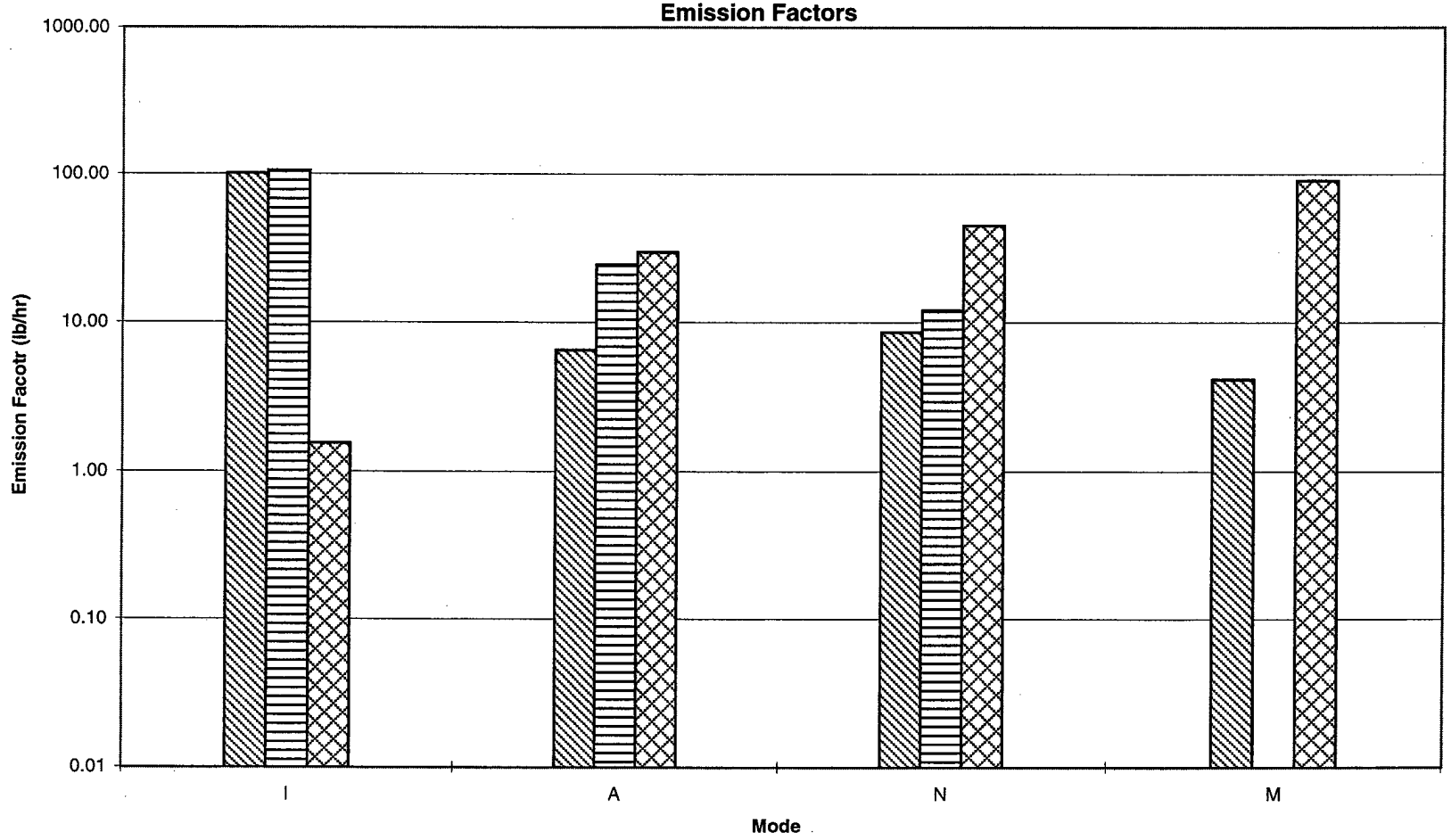
Table 4-79
Emissions Factor Summary
Aldehydes/Ketones
TF33-P-102 (C/EC/RC-135E)
Flow by Tracer

		Engine Mode															
		Idle				Approach				Intermediate				Military			
Flow Rate, dscfm		381184				1137616				1198803				1447905			
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel	
Analyte	**CAS Number**	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit
Formaldehyde [H]	50-00-0	1.05E+00		9.40E-01		3.15E-01		6.66E-02		1.31E-01		2.26E-02			7.38E-02		9.76E-03 ND
Acetaldehyde [H]	75-07-0		1.42E-02		1.28E-02 ND		7.20E-04		1.52E-04 ND		1.47E-03		2.54E-04 ND		7.38E-02		9.76E-03 ND
Acrolein [H]	107-02-8		1.42E-02		1.28E-02 ND		7.20E-04		1.52E-04 ND		1.47E-03		2.54E-04 ND		7.38E-02		9.76E-03 ND
Acetone	67-64-1		1.42E-02		1.28E-02 ND	5.33E-01		1.12E-01	B	8.67E-01		1.50E-01	B	7.21E+00		9.54E-01	B
Crotonaldehyde	4170-30-3		1.42E-02		1.28E-02 ND		7.20E-04		1.52E-04 ND		1.47E-03		2.54E-04 ND		7.38E-02		9.76E-03 ND
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3		1.42E-02		1.28E-02 ND		7.20E-04		1.52E-04 ND		1.47E-03		2.54E-04 ND		7.38E-02		9.76E-03 ND
Benzaldehyde	100-52-7		1.42E-02		1.28E-02 ND		7.20E-04		1.52E-04 ND		1.47E-03		2.54E-04 ND		7.38E-02		9.76E-03 ND
Isopentanal (Isovaleraldehyde)	590-86-3		1.42E-02		1.28E-02 ND		7.20E-04		1.52E-04 ND		1.47E-03		2.54E-04 ND		7.38E-02		9.76E-03 ND
Pentanal (Valeraldehyde)	110-62-3		1.42E-02		1.28E-02 ND		7.20E-04		1.52E-04 ND		1.47E-03		2.54E-04 ND		7.38E-02		9.76E-03 ND
o-Tolualdehyde	529-20-4		1.42E-02		1.28E-02 ND		7.20E-04		1.52E-04 ND		1.47E-03		2.54E-04 ND		7.38E-02		9.76E-03 ND
m-Tolualdehyde	620-23-5		1.42E-02		1.28E-02 ND		7.20E-04		1.52E-04 ND		1.47E-03		2.54E-04 ND		7.38E-02		9.76E-03 ND
p-Tolualdehyde	104-87-0		1.42E-02		1.28E-02 ND		7.20E-04		1.52E-04 ND		1.47E-03		2.54E-04 ND		7.38E-02		9.76E-03 ND
Hexanal (Hexaldehyde)	66-25-1		1.42E-02		1.28E-02 ND		7.20E-04		1.52E-04 ND		1.47E-03		2.54E-04 ND		7.38E-02		9.76E-03 ND
HAP Total		1.05E+00		9.40E-01		3.15E-01		6.66E-02		1.31E-01		2.26E-02		0.00E+00		0.00E+00	

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-8
TF33-P-102 (C/EC/RC-135E)
Emission Factors



CO for mode M is 0.0 lbs/hr.

Table 4-80
Engine Operating Parameter Summary
TF33-P-102 (C/EC/RC-135E)

Parameter	Idle	Approach	Intermediate	Military
Barometric pressure, in. Hg	28.38	28.24	28.31	28.41
Throttle position (PLA), degrees	53	74	79	87
Fuel flow, lbs/hr	1,114	4,737	5,782	7,561
Fan speed, rpm	1,988	5,215	5,607	6,112
Core speed, rpm	5,742	8,927	9,211	9,556
Cell temperature, deg. F	75	63	68	70
Average thrust, lbs.	976	8,783	10,676	13,551
Percent maximum thrust	5.4	49	59	75

4.3.9 Engine TF33-P-7/7A

Carbon balance was used to determine the flow rate at each power setting. The tracer gas system was not available until the military power setting. The spare SF_6 cylinder leaked during storage and was empty upon arrival for testing. During testing at the approach power setting, Run 2, an oil leak occurred in the engine. As described in Volume 3, particulate results are biased high because the probe and nozzle exhibited an oil residue after being pulled from the stack. For this reason, the semivolatile data for the approach condition may have also been biased high as a result of the oil leak.

THC concentrations were measured at the idle power setting. Before testing at the approach power setting, on the same day, the engine was warmed up at idle. Since sampling at the idle power setting was performed first that day, the high concentration of THC in the exhaust may have caused residual hydrocarbons to develop in the sample line. This occurrence may have biased the THC results high for the approach power setting.

Note that in Run 3 for the intermediate setting, a non-detect value of 2.82 lbs/hr and 0.44 lb/1,000 lbs fuel is greater than the detected value of 0.67 lb/hr and 0.11 lb/1,000 lbs fuel. For Run 3, the actual analyzed data showed that the ambient concentration was greater than the exhaust THC concentration. Therefore, a negative result would have been reported. An instrument detection limit of 0.8 ppm was reported as opposed to a zero or negative value. The 0.8 ppm value was input to the database with the exhaust flow rate to produce the result shown in Table 4-72. For Run 2 the exhaust concentration was greater than the ambient concentration, but the net difference is less than the detection limit (0.8 ppm) reported for Run 3. The difference in the exhaust and ambient concentration and the calculated flow rate provided a resulting emission rate and factor which is less than the "non-detect" value provided for Run 3.

Tables 4-81 through 4-90 present engine results for the TF33-P-7/7A engine. Figure 4-9 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-91 summarizes the engine operating data collected during testing.

Table 4-81
Emissions Factor Summary
Gaseous Parameters
TF33-P-7/7A (C-141)
Idle

Flow by Carbon Balance

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	400715		407177		409929			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	0.56	0.52	0.57	0.52	0.57	0.52	0.57	0.52
Nitrogen Dioxide (NO_2)	0.57	0.53	0.58	0.53	0.59	0.53	0.58	0.53
Nitrogen Oxides (NO_X)	0.86	0.80	0.88	0.79	0.88	0.80	0.87	0.80
Carbon Monoxide (CO)	148.55	138.31	149.17	135.36	144.81	131.05	147.51	134.91
Total Hydrocarbons (THC as CH_4)	141.95	132.17	157.59	143.01	157.62	142.65	152.39	139.27
Carbon Dioxide (CO_2)	2789	2597	2834	2572	2851	2580	2825	2583

Table 4-82
Emissions Factor Summary
Gaseous Parameters
TF33-P-7/7A (C-141)
Approach

Flow by Carbon Balance

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	1208116		1226820		1176182			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	16.37	3.40	16.62	3.40	15.94	3.23	16.31	3.34
Nitrogen Dioxide (NO_2)	7.79	1.62	8.79	1.80	8.43	1.71	8.33	1.71
Nitrogen Oxides (NO_X)	34.62	7.18	35.16	7.20	34.55	7.01	34.77	7.13
Carbon Monoxide (CO)	47.42	9.83	48.15	9.86	46.17	9.37	47.25	9.69
Total Hydrocarbons (THC as CH_4) [1]	44.24	9.17	20.47	4.19	10.13	2.06	24.95	5.14
Carbon Dioxide (CO_2)	15113	3134	15381	3148	15544	3154	15346	3145

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 4 of this volume.

Table 4-83
Emissions Factor Summary
Gaseous Parameters
TF33-P-7/7A (C-141)
Intermediate

Flow by Carbon Balance

	Run Number								Average	
	1		2		3					
Flow Rate, dscfm	1396614		1406587		1396170					
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	29.37	4.63	29.58	4.63	29.36	4.63		29.43	4.63
Nitrogen Dioxide (NO_2)	5.00	0.79	7.05	1.10	8.00	1.26		6.69	1.05
Nitrogen Oxides (NO_X)	50.03	7.89	52.40	8.20	52.01	8.20		51.48	8.10
Carbon Monoxide (CO)	30.45	4.80	24.54	3.84	24.36	3.84		26.45	4.16
Total Hydrocarbons (THC as CH_4) 1	7.01	1.11	0.67	0.11	2.82	0.44	ND	3.50	0.55
Carbon Dioxide (CO_2)	20074	3167	20256	3171	20115	3172		20148	3170

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

1- Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 4 of this volume.

Table 4-84
Emissions Factor Summary
Gaseous Parameters
TF33-P-7/7A (C-141)
Military

Flow by Carbon Balance

	Run Number										
	1			2			3			Average	
Flow Rate, dscfm	1420504			1407211			1412142				
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	51.77	6.23		49.97	6.08		50.81	6.15		50.85	6.15
Nitrogen Dioxide (NO_2)	5.09	0.61		6.05	0.74		6.07	0.73		5.74	0.69
Nitrogen Oxides (NO_X)	86.50	10.40		82.66	10.06		85.99	10.41		85.05	10.29
Carbon Monoxide (CO)	12.39	1.49		12.27	1.49		12.32	1.49		12.33	1.49
Total Hydrocarbons (THC as CH_4)	2.90	0.35	ND	2.87	0.35	ND	2.85	0.35	ND	ND	ND
Carbon Dioxide (CO_2)	26412	3177		26117	3178		26218	3174		26249	3176

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-85
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF33-P-7/7A (C-141)
Idle
Flow by Carbon Balance

		Run Number													
		1				2				3				Average	
Flow Rate, dscfm		400715				407177				409929					
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	1.08E-03		1.00E-03	J	1.12E-03		1.02E-03	J		9.60E-03		8.69E-03 ND	3.93E-03	3.57E-03
Vinyl Chloride [H]	75-01-4	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Bromomethane [H]	74-83-9	9.25E-04		8.61E-04	J	8.02E-04		7.28E-04	J	9.60E-03		8.69E-03	UJ	3.77E-03	3.42E-03
Chloroethane [H]	75-00-3	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Freon 11 (Trichlorofluoromethane)	75-69-4	2.01E-02		1.87E-02	J	2.81E-02		2.55E-02	J	3.62E-02		3.28E-02	J	2.81E-02	2.57E-02
1,1-Dichloroethene [H]	75-35-4	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Methylene Chloride [H]	75-09-2	3.96E-02		3.69E-02	J,bb	5.55E-02		5.04E-02	J	2.25E-01		2.04E-01	J	1.07E-01	9.71E-02
1,1-Dichloroethane [H]	75-34-3	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Chloroform [H]	67-66-3	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
1,1,1-Trichloroethane [H]	71-55-6	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Carbon Tetrachloride [H]	56-23-5	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Benzene [H]	71-43-2	2.63E-01		2.45E-01	J	2.73E-01		2.48E-01	J	1.18E+00		1.07E+00	J	5.72E-01	5.20E-01
1,2-Dichloroethane [H]	107-06-2	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Trichloroethene [H]	79-01-6	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
1,2-Dichloropropane [H]	78-87-5	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
trans-1,3-Dichloropropene [H]	10061-02-6	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Toluene [H]	108-88-3	4.86E-01		4.53E-01	J	2.56E-01		2.33E-01	J	4.81E-01		4.35E-01	J	4.08E-01	3.73E-01
cis-1,3-Dichloropropene [H]	10061-01-5	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
1,1,2-Trichloroethane [H]	79-00-5	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Tetrachloroethene [H]	127-18-4	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Chlorobenzene [H]	108-90-7	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Ethyl Benzene [H]	100-41-4	2.46E-01		2.29E-01	J	2.33E-01		2.12E-01	J	1.77E-01		1.60E-01	J	2.19E-01	2.00E-01
m,p-Xylene [H]	1330-20-7	4.23E-01		3.94E-01	J	4.01E-01		3.64E-01	J	2.73E-01		2.47E-01	J	3.66E-01	3.35E-01
o-Xylene [H]	95-47-6	1.55E-01		1.44E-01	J	1.44E-01		1.31E-01	J	1.18E-01		1.07E-01	J	1.39E-01	1.27E-01
Styrene [H]	100-42-5	2.93E-01		2.73E-01	J	2.88E-01		2.62E-01	J	2.13E-01		1.93E-01	J	2.65E-01	2.42E-01
1,1,2,2-Tetrachloroethane [H]	79-34-5	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Acetone	67-64-1	4.70E-01		4.37E-01	J	1.44E-01		1.31E-01	J	1.18E-01		1.07E-01	J	2.44E-01	2.25E-01
Carbon Disulfide [H]	75-15-0	7.72E-04		7.18E-04	UJ	8.83E-04		8.01E-04	J		9.60E-03		8.69E-03 ND	3.75E-03	3.40E-03
trans-1,2-Dichloroethene	156-60-5	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Vinyl Acetate [H]	108-05-4	3.86E-03		3.59E-03	UJ	4.01E-03		3.64E-03	UJ		4.81E-02		4.35E-02 ND	1.86E-02	1.69E-02
2-Butanone (MEK) [H]	78-93-3	1.67E-02		1.55E-02	J	4.26E-02		3.86E-02	J	3.52E-02		3.18E-02	J	3.15E-02	2.87E-02
Bromodichloromethane	75-27-4	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	3.86E-03		3.59E-03	UJ	4.01E-03		3.64E-03	UJ		4.81E-02		4.35E-02 ND	1.86E-02	1.69E-02
2-Hexanone	591-78-6	3.86E-03		3.59E-03	UJ	4.01E-03		3.64E-03	UJ		4.81E-02		4.35E-02 ND	1.86E-02	1.69E-02
Dibromochloromethane (Chlorodibromomethane)	124-48-1	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
Bromoform [H]	75-25-2	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
cis-1,2-Dichloroethene	156-59-2	7.72E-04		7.18E-04	UJ	8.02E-04		7.28E-04	UJ		9.60E-03		8.69E-03 ND	3.72E-03	3.38E-03
HAP Total		**1.95E+00**		**1.81E+00**		**1.72E+00**		**1.56E+00**		**2.71E+00**		**2.46E+00**		**2.20E+00**	**2.01E+00**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-86
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF33-P-7/7A (C-141)
Approach
Flow by Carbon Balance

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		1208116					1226820					1176182					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND	3.64E-03		7.39E-04			2.79E-03	5.71E-04
Vinyl Chloride [H]	75-01-4		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
Bromomethane [H]	74-83-9	2.37E-03		4.92E-04		UJ	2.36E-03		4.83E-04		UJ	2.02E-03		4.10E-04		UJ	2.25E-03	4.62E-04
Chloroethane [H]	75-00-3		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	3.32E-02		6.89E-03		bb	4.49E-02		9.18E-03			3.84E-02		7.79E-03			3.88E-02	7.95E-03
1,1-Dichloroethene [H]	75-35-4		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	7.38E-02		1.53E-02		bb	1.30E-01		2.66E-02		bb	1.05E-01		2.14E-02		bb	1.03E-01	2.11E-02
1,1-Dichloroethane [H]	75-34-3		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
Chloroform [H]	67-66-3	1.14E-02		2.37E-03			1.20E-02		2.46E-03			7.09E-03		1.44E-03		bb	1.02E-02	2.09E-03
1,1,1-Trichloroethane [H]	71-55-6		2.37E-03		4.92E-04	ND	2.36E-03		4.83E-04				2.02E-03		4.10E-04	ND	2.25E-03	4.62E-04
Carbon Tetrachloride [H]	56-23-5	2.85E-03		5.90E-04		J	2.84E-03		5.80E-04		J	2.02E-03		4.10E-04		J	2.57E-03	5.27E-04
Benzene [H]	71-43-2	2.14E-01		4.43E-02			1.11E-01		2.27E-02			9.08E-02		1.84E-02			1.38E-01	2.85E-02
1,2-Dichloroethane [H]	107-06-2		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
Toluene [H]	108-88-3	7.38E-02		1.53E-02			4.01E-02		8.21E-03			3.44E-02		6.97E-03			4.94E-02	1.02E-02
cis-1,3-Dichloropropene [H]	10061-01-5		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4	2.04E-02		4.23E-03			5.65E-03		1.16E-03			3.84E-03		7.79E-04			9.97E-03	2.06E-03
m,p-Xylene [H]	1330-20-7	3.08E-02		6.39E-03			1.14E-02		2.32E-03			7.67E-03		1.56E-03			1.66E-02	3.42E-03
o-Xylene [H]	95-47-6	1.33E-02		2.76E-03			4.25E-03		8.70E-04			3.23E-03		6.56E-04			6.93E-03	1.43E-03
Styrene [H]	100-42-5	2.61E-02		5.42E-03			1.32E-02		2.71E-03			1.09E-02		2.22E-03			1.68E-02	3.45E-03
1,1,2,2-Tetrachloroethane [H]	79-34-5		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
Acetone	67-64-1	1.66E-01		3.44E-02			1.02E-01		2.08E-02			1.03E-01		2.09E-02			1.24E-01	2.54E-02
Carbon Disulfide [H]	75-15-0		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.19E-02		2.46E-03	ND		1.18E-02		2.42E-03	ND		1.01E-02		2.05E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	1.78E-01		3.69E-02			1.70E-02		3.48E-03			1.11E-02		2.25E-03			6.87E-02	1.42E-02
Bromodichloromethane	75-27-4		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	1.19E-02		2.46E-03		UJ	1.18E-02		2.42E-03		UJ	1.01E-02		2.05E-03		UJ	1.13E-02	2.31E-03
2-Hexanone	591-78-6	1.19E-02		2.46E-03		UJ	1.18E-02		2.42E-03		UJ	1.01E-02		2.05E-03		UJ	1.13E-02	2.31E-03
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
Bromoform [H]	75-25-2		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		2.37E-03		4.92E-04	ND		2.36E-03		4.83E-04	ND		2.02E-03		4.10E-04	ND	ND	ND
HAP Total		**6.58E-01**		**1.36E-01**			**3.64E-01**		**7.45E-02**			**2.92E-01**		**5.93E-02**			**4.41E-01**	**9.07E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-87
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF33-P-7/7A (C-141)
Intermediate
Flow by Carbon Balance

		Run Number															
		1					2					3				Average	
Flow Rate, dscfm		1396614					1406587					1396170					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	4.23E-03		6.68E-04			6.01E-03		9.40E-04			3.04E-03		4.80E-04		4.43E-03	6.96E-04
Vinyl Chloride [H]	75-01-4		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
Bromomethane [H]	74-83-9	2.65E-03		4.18E-04		UJ	2.72E-03		4.26E-04		UJ	2.54E-03		4.00E-04		UJ	2.63E-03	4.14E-04
Chloroethane [H]	75-00-3		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	6.33E-02		9.99E-03			7.06E-02		1.11E-02			6.59E-02		1.04E-02			6.66E-02	1.05E-02
1,1-Dichloroethene [H]	75-35-4		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	1.90E-01		3.00E-02		bb	1.80E-01		2.81E-02		bb	2.03E-01		3.20E-02		bb	1.91E-01	3.01E-02
1,1-Dichloroethane [H]	75-34-3		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
Chloroform [H]	67-66-3	2.91E-03		4.59E-04		J,bb	1.12E-02		1.75E-03			1.22E-02		1.92E-03			8.76E-03	1.38E-03
1,1,1-Trichloroethane [H]	71-55-6		2.65E-03		4.18E-04	ND	2.72E-03		4.26E-04				2.54E-03		4.00E-04	ND	2.63E-03	4.14E-04
Carbon Tetrachloride [H]	56-23-5	2.91E-03		4.59E-04			3.26E-03		5.11E-04		J	2.54E-03		4.00E-04		J	2.90E-03	4.56E-04
Benzene [H]	71-43-2	5.28E-02		8.34E-03			3.54E-02		5.53E-03			3.56E-02		5.61E-03			4.13E-02	6.49E-03
1,2-Dichloroethane [H]	107-06-2		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
Toluene [H]	108-88-3	1.85E-02		2.92E-03			1.69E-02		2.64E-03			1.30E-02		2.05E-03			1.61E-02	2.54E-03
cis-1,3-Dichloropropene [H]	10061-01-5		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4	4.23E-03		6.68E-04			2.72E-03		4.26E-04			2.79E-03		4.40E-04			3.25E-03	5.11E-04
m,p-Xylene [H]	1330-20-7	7.95E-03		1.25E-03			6.27E-03		9.82E-04			5.60E-03		8.83E-04			6.61E-03	1.04E-03
o-Xylene [H]	95-47-6	3.18E-03		5.01E-04				2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	2.81E-03	4.42E-04
Styrene [H]	100-42-5	6.07E-03		9.57E-04			4.35E-03		6.81E-04			3.81E-03		6.00E-04			4.74E-03	7.46E-04
1,1,2,2-Tetrachloroethane [H]	79-34-5		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
Acetone	67-64-1	3.03E-01		4.79E-02		J	9.27E-02		1.45E-02			1.67E-02		2.64E-03			1.38E-01	2.17E-02
Carbon Disulfide [H]	75-15-0		2.65E-03		4.18E-04	ND	6.80E-03		1.06E-03				2.54E-03		4.00E-04	ND	3.99E-03	6.27E-04
trans-1,2-Dichloroethene	156-60-5		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.32E-02		2.09E-03	ND		1.36E-02		2.13E-03	ND		1.27E-02		2.00E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		1.32E-02		2.09E-03	ND		1.36E-02		2.13E-03	ND		1.27E-02		2.00E-03	ND	ND	ND
Bromodichloromethane	75-27-4		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	1.32E-02		2.09E-03		UJ	1.36E-02		2.13E-03		UJ	1.27E-02		2.00E-03		UJ	1.32E-02	2.07E-03
2-Hexanone	591-78-6	1.32E-02		2.09E-03		UJ	1.36E-02		2.13E-03		UJ	1.27E-02		2.00E-03		UJ	1.32E-02	2.07E-03
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
Bromoform [H]	75-25-2		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		2.65E-03		4.18E-04	ND		2.72E-03		4.26E-04	ND		2.54E-03		4.00E-04	ND	ND	ND
HAP Total		**3.09E-01**		**4.88E-02**			**2.92E-01**		**4.56E-02**			**2.97E-01**		**4.68E-02**			**3.04E-01**	**4.79E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-88
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF33-P-7/7A (C-141)
Military
Flow by Carbon Balance

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		1420504					1407211					1412142					
		lb/hr	Detection	lbs/1,000 lbs fuel	Detection		lb/hr	Detection	lbs/1,000 lbs fuel	Detection		lb/hr	Detection	lbs/1,000 lbs fuel	Detection		
Analyte	CAS Number	Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	4.19E-03		5.04E-04			6.91E-03		8.40E-04				2.64E-03		3.20E-04	ND	4.58E-03	5.55E-04
Vinyl Chloride [H]	75-01-4		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
Bromomethane [H]	74-83-9	2.62E-03		3.15E-04		UJ	2.57E-03		3.12E-04		UJ	2.64E-03		3.20E-04		UJ	2.61E-03	3.16E-04
Chloroethane [H]	75-00-3		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	5.75E-02		6.91E-03			1.05E-01		1.28E-02			6.88E-02		8.33E-03			7.72E-02	9.36E-03
1,1-Dichloroethene [H]	75-35-4		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	1.62E-01		1.95E-02		bb	2.83E-01		3.44E-02			2.30E-01		2.78E-02		bb	2.25E-01	2.72E-02
1,1-Dichloroethane [H]	75-34-3		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
Chloroform [H]	67-66-3	1.13E-02		1.36E-03			1.46E-02		1.78E-03			3.17E-03		3.84E-04		bb	9.68E-03	1.17E-03
1,1,1-Trichloroethane [H]	71-55-6	3.93E-03		4.73E-04			3.60E-03		4.37E-04			2.90E-03		3.52E-04			3.48E-03	4.21E-04
Carbon Tetrachloride [H]	56-23-5	2.88E-03		3.47E-04		J	4.36E-03		5.31E-04		J	2.90E-03		3.52E-04		J	3.38E-03	4.10E-04
Benzene [H]	71-43-2	8.41E-03		1.01E-03			1.49E-02		1.81E-03			1.32E-02		1.59E-03			1.21E-02	1.47E-03
1,2-Dichloroethane [H]	107-06-2		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
Toluene [H]	108-88-3	1.07E-02		1.29E-03			2.49E-02		3.03E-03			2.06E-02		2.49E-03			1.87E-02	2.27E-03
cis-1,3-Dichloropropene [H]	10061-01-5		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4		2.62E-03		3.15E-04	ND	4.62E-03		5.62E-04			3.70E-03		4.48E-04			3.64E-03	4.42E-04
m,p-Xylene [H]	1330-20-7	6.01E-03		7.23E-04			1.23E-02		1.50E-03			1.16E-02		1.41E-03			1.00E-02	1.21E-03
o-Xylene [H]	95-47-6		2.62E-03		3.15E-04	ND	4.88E-03		5.93E-04			4.49E-03		5.43E-04			3.99E-03	4.84E-04
Styrene [H]	100-42-5		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
Acetone	67-64-1	7.61E-02		9.15E-03			6.17E-02		7.51E-03			5.82E-02		7.05E-03		bb	6.53E-02	7.90E-03
Carbon Disulfide [H]	75-15-0		2.62E-03		3.15E-04	ND	2.57E-03		3.12E-04				2.64E-03		3.20E-04	ND	2.61E-03	3.16E-04
trans-1,2-Dichloroethene	156-60-5		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.31E-02		1.57E-03	ND		1.28E-02		1.56E-03	ND		1.32E-02		1.59E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		1.31E-02		1.57E-03	ND		1.28E-02		1.56E-03	ND		1.32E-02		1.59E-03	ND	ND	ND
Bromodichloromethane	75-27-4		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	1.31E-02		1.57E-03		UJ	1.28E-02		1.56E-03		UJ	1.32E-02		1.59E-03		UJ	1.30E-02	1.58E-03
2-Hexanone	591-78-6	1.31E-02		1.57E-03		UJ	1.28E-02		1.56E-03		UJ	1.32E-02		1.59E-03		UJ	1.30E-02	1.58E-03
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
Bromoform [H]	75-25-2		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		2.62E-03		3.15E-04	ND		2.57E-03		3.12E-04	ND		2.64E-03		3.20E-04	ND	ND	ND
HAP Total		**2.25E-01**		**2.71E-02**			**3.92E-01**		**4.76E-02**			**3.08E-01**		**3.73E-02**			**3.13E-01**	**3.79E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 3-89

Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
TF33-P-7/7A (C-141)

Flow by Carbon Balance

		Engine Mode															
		Idle				Approach				Intermediate				Military			
Flow Rate, dscfm		405704				1204556				1399791				1413363			
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel	
			Detection		Detection		Detection		Detection		Detection		Detection		Detection		Detection
Analyte	CAS Number	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit
Phenol [H]	108-95-2	1.82E-01		1.67E-01		1.73E-02		3.54E-03		8.13E-03		1.28E-03			8.74E-03		1.06E-03 ND
Dichloroethyl ether [H]	111-44-4		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
2-Chlorophenol	95-57-8		2.07E-02		1.89E-02 ND		7.85E-03		1.61E-03 ND		7.55E-03		1.19E-03 ND		8.74E-03		1.06E-03 ND
1,3-Dichlorobenzene	541-73-1		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
1,4-Dichlorobenzene [H]	106-46-7		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
1,2-Dichlorobenzene	95-50-1		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
o-Cresol [H]	95-48-7		2.07E-02		1.89E-02 ND		7.85E-03		1.61E-03 ND		7.55E-03		1.19E-03 ND		8.74E-03		1.06E-03 ND
bis(2-Chloroisopropyl) Ether	39638-32-9		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
N-Nitroso-di-n-propylamine	621-64-7		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
p-Cresol [H]	106-44-5	4.56E-02		4.17E-02			7.85E-03		1.61E-03 ND		7.55E-03		1.19E-03 ND		8.74E-03		1.06E-03 ND
Hexachloroethane [H]	67-72-1		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Nitrobenzene [H]	98-95-3		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Isophorone [H]	78-59-1		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
2-Nitrophenol	88-75-5		2.07E-02		1.89E-02 ND		7.85E-03		1.61E-03 ND		7.55E-03		1.19E-03 ND		8.74E-03		1.06E-03 ND
2,4-Dimethylphenol	105-67-9		2.07E-02		1.89E-02 ND		7.85E-03		1.61E-03 ND		7.55E-03		1.19E-03 ND		8.74E-03		1.06E-03 ND
Benzoic Acid	65-85-0		8.28E-02		7.58E-02 ND	8.35E-02		1.71E-02		5.87E-02		9.24E-03		3.67E-02		4.45E-03	
bis(2-Chloroethoxy) Methane	111-91-1		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
2,4-Dichlorophenol	120-83-2		2.07E-02		1.89E-02 ND		7.85E-03		1.61E-03 ND		7.55E-03		1.19E-03 ND		8.74E-03		1.06E-03 ND
1,2,4-Trichlorobenzene [H]	120-82-1		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Naphthalene [H]	91-20-3	4.06E-01		3.71E-01		1.53E-02		3.14E-03		2.25E-03		3.55E-04		0.00E+00		0.00E+00	
4-Chloroaniline	106-47-8		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Hexachlorobutadiene [H]	87-68-3		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
4-Chloro-3-methylphenol	59-50-7		2.07E-02		1.89E-02 ND		7.85E-03		1.61E-03 ND		7.55E-03		1.19E-03 ND		8.74E-03		1.06E-03 ND
2-Methylnaphthalene	91-57-6	4.97E-01		4.55E-01		1.21E-02		2.48E-03		1.05E-03		1.65E-04			1.75E-03		2.11E-04 ND
Hexachlorocyclopentadiene [H]	77-47-4		4.13E-02		3.78E-02 ND		1.57E-02		3.22E-03 ND		1.51E-02		2.38E-03 ND		1.75E-02		2.11E-03 ND
2,4,6-Trichlorophenol [H]	88-06-2		2.07E-02		1.89E-02 ND		7.85E-03		1.61E-03 ND		7.55E-03		1.19E-03 ND		8.74E-03		1.06E-03 ND
2,4,5-Trichlorophenol [H]	95-95-4		2.07E-02		1.89E-02 ND		7.85E-03		1.61E-03 ND		7.55E-03		1.19E-03 ND		8.74E-03		1.06E-03 ND
2-Chloronaphthalene	91-58-7		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
2-Nitroaniline	88-74-4		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Dimethylphthalate [H]	131-11-3		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Acenaphthylene	208-96-8	3.19E-02		2.92E-02			1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
2,6-Dinitrotoluene	606-20-2		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
3-Nitroaniline	99-09-2		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Acenaphthene	83-32-9		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
2,4-Dinitrophenol [H]	51-28-5		8.28E-02		7.58E-02 ND		3.15E-02		6.44E-03 ND		3.02E-02		4.75E-03 ND		3.50E-02		4.23E-03 ND
4-Nitrophenol [H]	100-02-7		2.07E-02		1.89E-02 ND		7.85E-03		1.61E-03 ND		7.55E-03		1.19E-03 ND		8.74E-03		1.06E-03 ND
2,4-Dinitrotoluene [H]	121-14-2		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Dibenzofuran [H]	132-64-9	1.20E-02		1.10E-02			1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Diethylphthalate	84-66-2		4.13E-03		3.78E-03 ND	1.73E-03		3.54E-04		6.79E-03		1.07E-03			1.75E-03		2.11E-04 ND
Fluorene	86-73-7	9.94E-03		9.09E-03			1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
4-Chlorophenyl-phenyl Ether	7005-72-3		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
4-Nitroaniline	100-01-6		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
4,6-Dinitro-2-methylphenol	534-52-1		4.13E-02		3.78E-02 ND		1.57E-02		3.22E-03 ND		1.51E-02		2.38E-03 ND		1.75E-02		2.11E-03 ND
N-Nitrosodiphenylamine	86-30-6		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
4-Bromophenyl-phenyl Ether	101-55-3		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Hexachlorobenzene [H]	118-74-1		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Pentachlorophenol [H]	87-86-5		4.13E-02		3.78E-02 ND		1.57E-02		3.22E-03 ND		1.51E-02		2.38E-03 ND		1.75E-02		2.11E-03 ND
Phenanthrene	85-01-8	1.37E-02		1.25E-02		1.89E-03		3.86E-04			1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Anthracene	120-12-7		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
di-n-Butylphthalate [H]	84-74-2		4.13E-03		3.78E-03 ND	0.00E+00		0.00E+00	B	9.23E-03		1.45E-03	B	0.00E+00		0.00E+00	B
Fluoranthene	206-44-0	5.38E-03		4.92E-03			1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Pyrene	129-00-0	7.87E-03		7.20E-03			1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Butylbenzylphthalate	85-68-7		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
3,3'-Dichlorobenzidine [H]	91-94-1		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Chrysene	218-01-9		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Benzo(a)anthracene	56-55-3		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
bis(2-Ethylhexyl)phthalate [H]	117-81-7		4.13E-03		3.78E-03 ND	1.31E-02		2.68E-03	B	1.14E-02		1.79E-03	B	1.31E-02		1.59E-03	B
Di-n-Octylphthalate	117-84-0		4.13E-02		3.78E-02 ND		1.57E-02		3.22E-03 ND		1.51E-02		2.38E-03 ND		1.75E-02		2.11E-03 ND
Benzo(b)fluoranthene	205-99-2		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Benzo(k)fluoranthene	207-08-9		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Benzo(a)pyrene	50-32-8		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Indeno(1,2,3-c,d)pyrene	193-39-5		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Benzo(g,h,i)perylene	191-24-2		4.13E-03		3.78E-03 ND		1.57E-03		3.22E-04 ND		1.51E-03		2.38E-04 ND		1.75E-03		2.11E-04 ND
Benzyl alcohol	100-51-6		2.07E-02		1.89E-02 ND		7.85E-03		1.61E-03 ND		7.55E-03		1.19E-03 ND		8.74E-03		1.06E-03 ND
HAP Total		**6.45E-01**		**5.91E-01**		**4.57E-02**		**9.36E-03**		**3.10E-02**		**4.87E-03**		**1.31E-02**		**1.59E-03**	

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

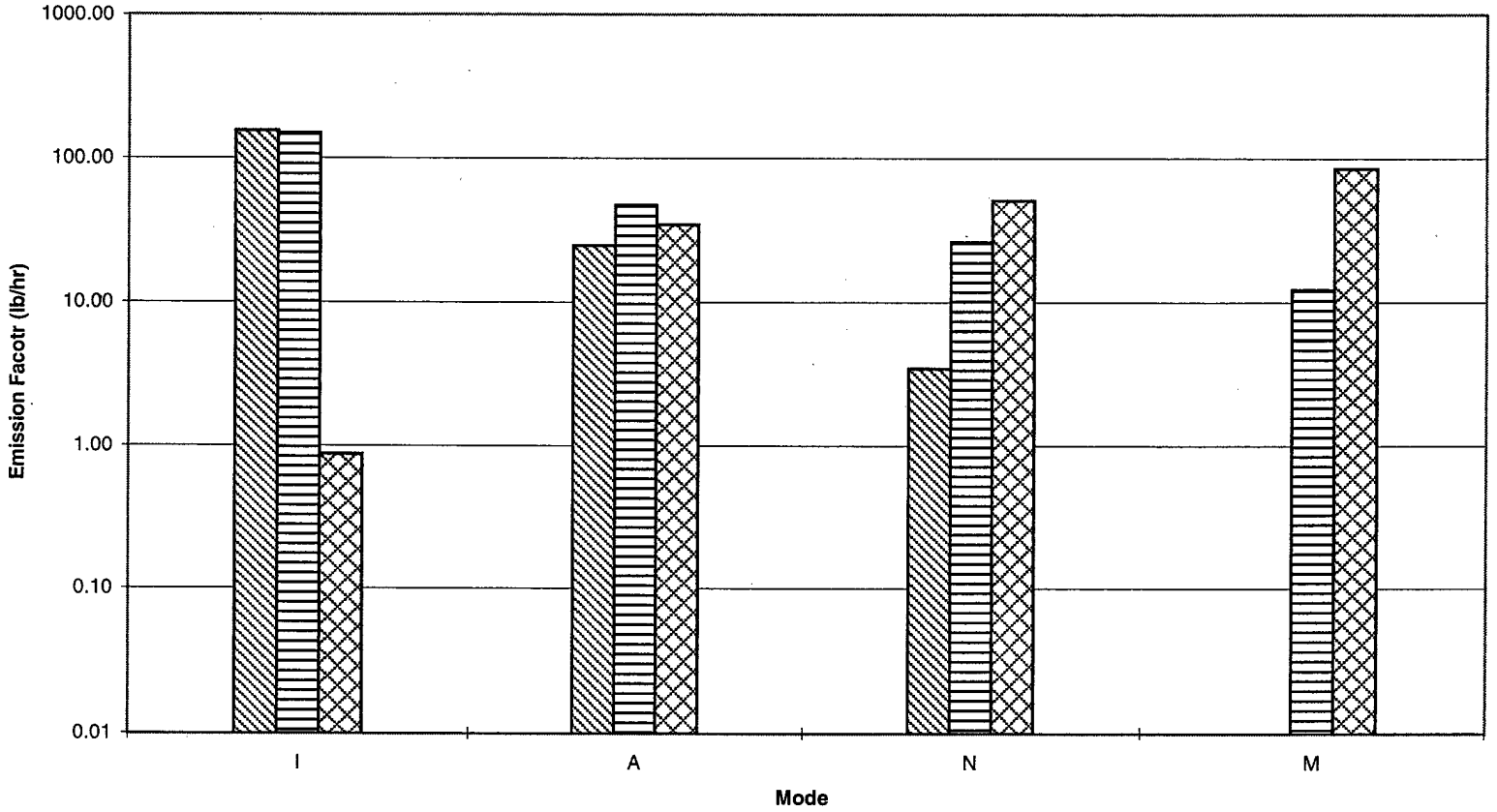
Table 4-90
Emissions Factor Summary
Aldehydes/Ketones
TF33-P-7/7A (C-141)
Flow by Carbon Balance

		Engine Mode															
		Idle					Approach					Intermediate					Military				
Flow Rate, dscfm		405704					1204556					1399791					1413363				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Formaldehyde [H]	50-00-0	2.52E+00		2.31E+00			6.14E-01		1.26E-01			1.78E-01		2.80E-02			4.36E-02		5.28E-03		
Acetaldehyde [H]	75-07-0		1.96E-02		1.79E-02	ND	4.26E-02		8.73E-03				7.50E-04		1.18E-04	ND		8.74E-04		1.06E-04	ND
Acrolein [H]	107-02-8		1.96E-02		1.79E-02	ND		1.58E-03		3.23E-04	ND		7.50E-04		1.18E-04	ND		8.74E-04		1.06E-04	ND
Acetone	67-64-1		1.96E-02		1.79E-02	ND	2.05E-01		4.20E-02		B	2.10E-01		3.30E-02		B	2.09E-02		2.53E-03		B
Crotonaldehyde	4170-30-3		1.96E-02		1.79E-02	ND		1.58E-03		3.23E-04	ND		7.50E-04		1.18E-04	ND		8.74E-04		1.06E-04	ND
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3		1.96E-02		1.79E-02	ND		1.58E-03		3.23E-04	ND		7.50E-04		1.18E-04	ND		8.74E-04		1.06E-04	ND
Benzaldehyde	100-52-7		1.96E-02		1.79E-02	ND		1.58E-03		3.23E-04	ND		7.50E-04		1.18E-04	ND		8.74E-04		1.06E-04	ND
Isopentanal (Isovaleraldehyde)	590-86-3		1.96E-02		1.79E-02	ND		1.58E-03		3.23E-04	ND		7.50E-04		1.18E-04	ND		8.74E-04		1.06E-04	ND
Pentanal (Valeraldehyde)	110-62-3		1.96E-02		1.79E-02	ND		1.58E-03		3.23E-04	ND		7.50E-04		1.18E-04	ND		8.74E-04		1.06E-04	ND
o-Tolualdehyde	529-20-4		1.96E-02		1.79E-02	ND		1.58E-03		3.23E-04	ND		7.50E-04		1.18E-04	ND		8.74E-04		1.06E-04	ND
m-Tolualdehyde	620-23-5		1.96E-02		1.79E-02	ND		1.58E-03		3.23E-04	ND		7.50E-04		1.18E-04	ND		8.74E-04		1.06E-04	ND
p-Tolualdehyde	104-87-0		1.96E-02		1.79E-02	ND		1.58E-03		3.23E-04	ND		7.50E-04		1.18E-04	ND		8.74E-04		1.06E-04	ND
Hexanal (Hexaldehyde)	66-25-1		1.96E-02		1.79E-02	ND		1.58E-03		3.23E-04	ND		7.50E-04		1.18E-04	ND		8.74E-04		1.06E-04	ND
HAP Total		**2.52E+00**		**2.31E+00**			**6.56E-01**		**1.34E-01**			**1.78E-01**		**2.80E-02**			**4.36E-02**		**5.28E-03**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-9
TF33-P-7/7A (C-141)
Emission Factors



THC for mode M is "Non-detect."

Table 4-91
Engine Operating Parameter Summary
TF33-P-7/7A (C141)

Parameter	Idle	Approach	Intermediate	Military
Barometric pressure, in. Hg	28.53	28.56	28.70	28.72
Throttle position (PLA), degrees	54	82	93	105
Fuel flow, lbs/hr	1,093	4,884	6,356	8,264
Fan speed, rpm	1,854	5,095	5,555	6,076
Core speed, rpm	5,408	8,594	8,902	9,224
Cell temperature, deg. F	65	63	58	58
Average thrust, lbs	814	9,349	12,236	15,349
Percent maximum thrust	4	45	58	73

4.3.10 Engine F108-CF-100

Tracer gas was used to determine the flow rate at each power setting. It showed more consistent results than carbon balance, which gave erratic results from run-to-run.

The ambient THC background concentrations were consistently greater than (slightly) the exhaust concentrations. Both concentrations were in the 1-5 ppm range. The instrument detection limit of 0.8 ppm was reported instead of a zero or negative value.

Problems occurred with the NO_x analyzer during calibration for the intermediate power setting during Runs 1 and 3. The analyzer did not meet the calibration bias specifications for these runs. The data provided representative results when compared with Run 2. Therefore, the average value for NO_x at the intermediate power setting is based on the data obtained from all three test runs.

During the military power setting for Run 1, ambient CO_2 was invalid. This run was voided and the average ambient CO_2 concentration for Runs 2 and 3 were used to correct Run 1 for background CO_2.

Tables 4-92 through 4-101 present engine results for the F108-CF-100 engine. Figure 4-1 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-102 summarizes the engine operating data collected during testing.

Table 4-92
Emissions Factor Summary
Gaseous Parameters
F108-CF-100 (KC-135R)
Idle

Flow by Tracer

	Run Number									Average	
	1			2			3				
Flow Rate, dscfm	569976			553813			556598				
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	2.40	2.12		2.33	2.05		2.34	2.06		2.36	2.07
Nitrogen Dioxide (NO_2)	3.67	3.24		3.57	3.14		3.59	3.15		3.61	3.18
Nitrogen Oxides (NO_X)	4.49	3.96		4.36	3.84		4.39	3.85		4.41	3.88
Carbon Monoxide (CO)	27.34	24.13		26.57	23.37		26.70	23.44		26.87	23.65
Total Hydrocarbons (THC as CH_4)	1.14	1.01	ND	1.11	0.97	ND	1.11	0.98	ND	ND	ND
Carbon Dioxide (CO_2)	2472	2182		2777	2443		2833	2487		2694	2371

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-93
Emissions Factor Summary
Gaseous Parameters
F108-CF-100 (KC-135R)
Approach
Flow by Tracer

	Run Number										
	1			2			3			Average	
Flow Rate, dscfm	1017798			982281			1004572				
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	9.99	3.92		9.18	3.61		9.86	3.86		9.67	3.80
Nitrogen Dioxide (NO_2)	0.73	0.29		1.41	0.55		1.44	0.56		1.19	0.47
Nitrogen Oxides (NO_X)	14.58	5.73		14.07	5.53		15.11	5.92		14.59	5.73
Carbon Monoxide (CO)	22.19	8.72		21.42	8.42		21.91	8.58		21.84	8.57
Total Hydrocarbons (THC as CH_4)	2.03	0.80	ND	1.96	0.77	ND	2.01	0.79	ND	ND	ND
Carbon Dioxide (CO_2)	7600	2985		6050	2377		6222	2438		6624	2600

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-94
Emissions Factor Summary
Gaseous Parameters [1]
F108-CF-100 (KC-135R)
Intermediate

Flow by Tracer

	Run Number									Average	
	1			2			3				
Flow Rate, dscfm	1527540			1490509			1484511				
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	38.54	6.84		37.61	6.66		37.46	6.61		37.87	6.70
Nitrogen Dioxide (NO_2)	4.38	0.78		4.27	0.76		4.25	0.75		4.30	0.76
Nitrogen Oxides (NO_X)	63.47	11.27		61.93	10.96		61.68	10.89		62.36	11.04
Carbon Monoxide (CO)	13.32	2.36		13.00	2.30		12.95	2.29		13.09	2.32
Total Hydrocarbons (THC as CH_4)	3.05	0.54	ND	2.98	0.53	ND	2.97	0.52	ND	ND	ND
Carbon Dioxide (CO_2)	15855	2814		16491	2919		16425	2899		16257	2877

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 3 of this volume.

Table 4-95
Emissions Factor Summary
Gaseous Parameters
F108-CF-100 (KC-135R)
Military

Flow by Tracer

	Run Number										
	1			2			3			Average	
Flow Rate, dscfm	1582971			1603917			1582971				
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	48.82	7.55		47.96	7.45		48.82	7.55		48.53	7.52
Nitrogen Dioxide (NO_2)	19.28	2.98		19.53	3.03		19.28	2.98		19.36	3.00
Nitrogen Oxides (NO_X)	77.11	11.93		78.13	12.13		78.25	12.09		77.83	12.05
Carbon Monoxide (CO)	0.00	0.00		0.00	0.00		6.90	1.07		2.30	0.36
Total Hydrocarbons (THC as CH_4)	5.21	0.81		3.24	0.50	ND	3.19	0.49	ND	3.88	0.60
Carbon Dioxide (CO_2)	18295	2830		18823	2923		18013	2784		18377	2846

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-96
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F108-CF-100 (KC-135R)
Idle
Flow by Tracer

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		569976					553813					556598					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	1.24E-03		1.09E-03			1.33E-03		1.17E-03				1.08E-03		9.45E-04	ND	1.21E-03	1.07E-03
Vinyl Chloride [H]	75-01-4		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
Bromomethane [H]	74-83-9		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
Chloroethane [H]	75-00-3		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.91E-02		1.69E-02		bb	2.20E-02		1.93E-02			1.72E-02		1.51E-02		bb	1.94E-02	1.71E-02
1,1-Dichloroethene [H]	75-35-4		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	8.88E-02		7.84E-02		bb	9.17E-02		8.06E-02		bb	4.94E-02		4.34E-02		bb	7.66E-02	6.75E-02
1,1-Dichloroethane [H]	75-34-3		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
Chloroform [H]	67-66-3		1.12E-03		9.91E-04	ND	3.32E-03		2.92E-03		bb	3.98E-03		3.50E-03		bb	2.81E-03	2.47E-03
1,1,1-Trichloroethane [H]	71-55-6		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND	1.51E-03		1.32E-03			1.24E-03	1.10E-03
Carbon Tetrachloride [H]	56-23-5		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
Benzene [H]	71-43-2	1.80E-02		1.59E-02			1.55E-02		1.36E-02			1.40E-02		1.23E-02			1.58E-02	1.39E-02
1,2-Dichloroethane [H]	107-06-2		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6	1.12E-03		9.91E-04		UJ	1.10E-03		9.71E-04		UJ	1.08E-03		9.45E-04		UJ	1.10E-03	9.69E-04
Toluene [H]	108-88-3	1.46E-02		1.29E-02			9.50E-03		8.36E-03			6.46E-03		5.67E-03			1.02E-02	8.97E-03
cis-1,3-Dichloropropene [H]	10061-01-5		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4	2.58E-03		2.28E-03			1.10E-03		9.71E-04			2.79E-03		2.45E-03			2.16E-03	1.90E-03
Chlorobenzene [H]	108-90-7		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4	1.24E-03		1.09E-03				1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	1.14E-03	1.00E-03
m,p-Xylene [H]	1330-20-7	2.24E-03		1.98E-03			1.66E-03		1.46E-03			1.72E-03		1.51E-03			1.87E-03	1.65E-03
o-Xylene [H]	95-47-6		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
Styrene [H]	100-42-5	1.68E-03		1.49E-03			1.77E-03		1.55E-03			1.61E-03		1.42E-03			1.69E-03	1.49E-03
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
Acetone	67-64-1	9.89E-01		8.73E-01		J	1.77E-01		1.55E-01		J	1.51E-01		1.32E-01		J	4.39E-01	3.87E-01
Carbon Disulfide [H]	75-15-0		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4	5.62E-03		4.96E-03		UJ	5.52E-03		4.85E-03		UJ	5.38E-03		4.72E-03		UJ	5.50E-03	4.84E-03
2-Butanone (MEK) [H]	78-93-3	1.24E-02		1.09E-02				5.52E-03		4.85E-03	ND		5.38E-03		4.72E-03	ND	7.75E-03	6.83E-03
Bromodichloromethane	75-27-4		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		5.62E-03		4.96E-03	ND		5.52E-03		4.85E-03	ND		5.38E-03		4.72E-03	ND	ND	ND
2-Hexanone	591-78-6		5.62E-03		4.96E-03	ND		5.52E-03		4.85E-03	ND		5.38E-03		4.72E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
Bromoform [H]	75-25-2		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.12E-03		9.91E-04	ND		1.10E-03		9.71E-04	ND		1.08E-03		9.45E-04	ND	ND	ND
HAP Total		**1.49E-01**		**1.32E-01**			**1.32E-01**		**1.16E-01**			**8.79E-02**		**7.72E-02**			**1.29E-01**	**1.14E-01**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-97
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F108-CF-100
Approach
Flow by Tracer

		Run Number													
		1					2				3				Average
Flow Rate, dscfm		1017798					982281				1004572				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	lb/hr	lbs/1,000 lbs fuel
Chloromethane H	74-87-3	3.00E-03		1.18E-03				1.93E-03		7.58E-04 ND	2.63E-03		1.03E-03		2.52E-03	9.89E-04
Vinyl Chloride H	75-01-4		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
Bromomethane H	74-83-9		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
Chloroethane H	75-00-3		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	3.00E-02		1.18E-02		bb	4.45E-02		1.75E-02		5.27E-02		2.06E-02		4.24E-02	1.66E-02
1,1-Dichloroethene H	75-35-4		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
Methylene Chloride H	75-09-2	8.46E-02		3.32E-02		bb	1.20E-01		4.70E-02	bb	1.36E-01		5.32E-02	bb	1.13E-01	4.45E-02
1,1-Dichloroethane H	75-34-3		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
Chloroform H	67-66-3		1.88E-03		7.37E-04	ND	7.14E-03		2.80E-03	bb	6.06E-03		2.37E-03	bb	5.02E-03	1.97E-03
1,1,1-Trichloroethane H	71-55-6	1.88E-03		7.37E-04			2.12E-03		8.34E-04		2.23E-03		8.73E-04		2.08E-03	8.15E-04
Carbon Tetrachloride H	56-23-5	2.06E-03		8.10E-04				1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	2.01E-03	7.87E-04
Benzene H	71-43-2	1.09E-02		4.27E-03			7.91E-03		3.11E-03		7.07E-03		2.77E-03		8.62E-03	3.38E-03
1,2-Dichloroethane H	107-06-2		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
Trichloroethene H	79-01-6		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
1,2-Dichloropropane H	78-87-5		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
trans-1,3-Dichloropropene H	10061-02-6	1.88E-03		7.37E-04		UJ	1.93E-03		7.58E-04	UJ	2.02E-03		7.93E-04	UJ	1.94E-03	7.63E-04
Toluene H	108-88-3	1.29E-02		5.08E-03			2.31E-02		9.09E-03		1.16E-02		4.53E-03		1.59E-02	6.23E-03
cis-1,3-Dichloropropene H	10061-01-5		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
1,1,2-Trichloroethane H	79-00-5		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
Tetrachloroethene H	127-18-4	3.00E-03		1.18E-03			1.31E-02		5.16E-03		8.50E-03		3.33E-03		8.21E-03	3.22E-03
Chlorobenzene H	108-90-7		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
Ethyl Benzene H	100-41-4	2.25E-03		8.84E-04				1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	2.07E-03	8.11E-04
m,p-Xylene H	1330-20-7	6.18E-03		2.43E-03			3.28E-03		1.29E-03		2.83E-03		1.11E-03		4.10E-03	1.61E-03
o-Xylene H	95-47-6	0.00E+00		0.00E+00				1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	1.32E-03	5.17E-04
Styrene H	100-42-5		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
1,1,2,2-Tetrachloroethane H	79-34-5		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
Acetone	67-64-1	4.58E-01		1.80E-01		J	1.10E-01		4.34E-02		1.39E-02		5.46E-03		1.94E-01	7.62E-02
Carbon Disulfide H	75-15-0		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
Vinyl Acetate H	108-05-4	9.38E-03		3.68E-03		UJ	9.64E-03		3.79E-03	UJ	1.01E-02		3.97E-03	UJ	9.71E-03	3.81E-03
2-Butanone (MEK) H	78-93-3		9.38E-03		3.68E-03	ND		9.64E-03		3.79E-03 ND		1.01E-02		3.97E-03 ND	ND	ND
Bromodichloromethane	75-27-4		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
4-Methyl-2-pentanone (MIBK) H	108-10-1		9.38E-03		3.68E-03	ND		9.64E-03		3.79E-03 ND		1.01E-02		3.97E-03 ND	ND	ND
2-Hexanone	591-78-6		9.38E-03		3.68E-03	ND		9.64E-03		3.79E-03 ND		1.01E-02		3.97E-03 ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
Bromoform H	75-25-2		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.88E-03		7.37E-04	ND		1.93E-03		7.58E-04 ND		2.02E-03		7.93E-04 ND	ND	ND
HAP Total		**1.38E-01**		**5.42E-02**			**1.88E-01**		**7.38E-02**		**1.89E-01**		**7.40E-02**		**1.77E-01**	**6.94E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-98
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F108-CF-100 (KC-135R)
Intermediate
Flow by Tracer

		Run Number													
		1					2				3				
Flow Rate, dscfm		1527540					1490509				1484511				Average
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	lb/hr / lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	4.34E-03		7.70E-04			5.64E-03		9.98E-04		3.48E-03		6.14E-04		4.48E-03 / 7.94E-04
Vinyl Chloride [H]	75-01-4		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
Bromomethane [H]	74-83-9		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
Chloroethane [H]	75-00-3		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
Freon 11 (Trichlorofluoromethane)	75-69-4	8.41E-02		1.49E-02			9.60E-02		1.70E-02		1.16E-01		2.04E-02		9.86E-02 / 1.74E-02
1,1-Dichloroethene [H]	75-35-4		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
Methylene Chloride [H]	75-09-2	2.57E-01		4.57E-02		bb	2.82E-01		4.99E-02		3.19E-01		5.62E-02		J / 2.86E-01 / 5.06E-02
1,1-Dichloroethane [H]	75-34-3		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
Chloroform [H]	67-66-3	1.18E-02		2.10E-03			9.32E-03		1.65E-03		bb	8.68E-03		1.53E-03		bb / 9.95E-03 / 1.76E-03
1,1,1-Trichloroethane [H]	71-55-6		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
Carbon Tetrachloride [H]	56-23-5		2.90E-03		5.14E-04	ND	2.82E-03		4.99E-04		2.90E-03		5.11E-04		2.87E-03 / 5.08E-04
Benzene [H]	71-43-2	5.50E-03		9.76E-04			4.23E-03		7.48E-04		4.34E-03		7.67E-04		4.69E-03 / 8.30E-04
1,2-Dichloroethane [H]	107-06-2		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
Trichloroethene [H]	79-01-6		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
1,2-Dichloropropane [H]	78-87-5		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
trans-1,3-Dichloropropene [H]	10061-02-6	2.90E-03		5.14E-04		UJ	2.82E-03		4.99E-04		UJ	2.90E-03		5.11E-04		UJ / 2.87E-03 / 5.08E-04
Toluene [H]	108-88-3	8.41E-03		1.49E-03			8.99E-03		1.59E-03		6.67E-03		1.18E-03		8.02E-03 / 1.42E-03
cis-1,3-Dichloropropene [H]	10061-01-5		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
1,1,2-Trichloroethane [H]	79-00-5		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
Tetrachloroethene [H]	127-18-4		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	4.34E-03		7.67E-04	3.35E-03 / 5.93E-04
Chlorobenzene [H]	108-90-7		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
Ethyl Benzene [H]	100-41-4		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
m,p-Xylene [H]	1330-20-7	4.63E-03		8.22E-04			3.10E-03		5.48E-04			2.90E-03		5.11E-04	ND / 3.54E-03 / 6.27E-04
o-Xylene [H]	95-47-6		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
Styrene [H]	100-42-5		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
Acetone	67-64-1	1.69E-01		3.00E-02			7.15E-02		1.26E-02		6.12E-02		1.08E-02		1.00E-01 / 1.78E-02
Carbon Disulfide [H]	75-15-0		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
trans-1,2-Dichloroethene	156-60-5		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
Vinyl Acetate [H]	108-05-4	1.45E-02		2.57E-03		UJ	1.41E-02		2.49E-03		UJ	1.45E-02		2.55E-03		UJ / 1.43E-02 / 2.54E-03
2-Butanone (MEK) [H]	78-93-3		1.45E-02		2.57E-03	ND		1.41E-02		2.49E-03	ND	1.45E-02		2.55E-03	ND / ND
Bromodichloromethane	75-27-4		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.45E-02		2.57E-03	ND		1.41E-02		2.49E-03	ND	1.45E-02		2.55E-03	ND / ND
2-Hexanone	591-78-6		1.45E-02		2.57E-03	ND		1.41E-02		2.49E-03	ND	1.45E-02		2.55E-03	ND / ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
Bromoform [H]	75-25-2		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
cis-1,2-Dichloroethene	156-59-2		2.90E-03		5.14E-04	ND		2.82E-03		4.99E-04	ND	2.90E-03		5.11E-04	ND / ND
HAP Total		**3.10E-01**		**5.50E-02**			**3.33E-01**		**5.89E-02**			**3.66E-01**		**6.47E-02**		**3.40E-01** / **6.02E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-99
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F108-CF-100 (KC-135R)
Military
Flow by Tracer

		Run Number															
		1					2					3					
Flow Rate, dscfm		1582971					1603917					1582971				Average	
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		
Chloromethane H	74-87-3	3.39E-03		5.25E-04				3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	3.23E-03	5.00E-04
Vinyl Chloride H	75-01-4		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
Bromomethane H	74-83-9		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
Chloroethane H	75-00-3		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	2.31E-02		3.58E-03		bb	3.58E-02		5.56E-03		bb	3.03E-02		4.68E-03		bb	2.97E-02	4.61E-03
1,1-Dichloroethene H	75-35-4		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
Methylene Chloride H	75-09-2	0.00E+00		0.00E+00		bb	3.79E-02		5.88E-03		bb	0.00E+00		0.00E+00		bb	1.26E-02	1.96E-03
1,1-Dichloroethane H	75-34-3		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
Chloroform H	67-66-3	8.66E-03		1.34E-03		bb	6.85E-03		1.06E-03		bb	7.29E-03		1.13E-03		bb	7.60E-03	1.18E-03
1,1,1-Trichloroethane H	71-55-6	3.08E-03		4.77E-04				3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	3.12E-03	4.84E-04
Carbon Tetrachloride H	56-23-5		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
Benzene H	71-43-2	4.32E-03		6.68E-04				3.26E-03		5.06E-04	ND	3.94E-03		6.09E-04			3.84E-03	5.94E-04
1,2-Dichloroethane H	107-06-2		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
Trichloroethene H	79-01-6		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
1,2-Dichloropropane H	78-87-5		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
trans-1,3-Dichloropropene H	10061-02-6	3.08E-03		4.77E-04		UJ	3.26E-03		5.06E-04		UJ	3.03E-03		4.68E-04		UJ	3.12E-03	4.84E-04
Toluene H	108-88-3	8.01E-03		1.24E-03			7.15E-03		1.11E-03			6.34E-03		9.81E-04			7.17E-03	1.11E-03
cis-1,3-Dichloropropene H	10061-01-5		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
1,1,2-Trichloroethane H	79-00-5		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
Tetrachloroethene H	127-18-4	5.24E-03		8.11E-04			1.47E-02		2.28E-03				3.03E-03		4.68E-04	ND	7.64E-03	1.19E-03
Chlorobenzene H	108-90-7		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
Ethyl Benzene H	100-41-4		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
m,p-Xylene H	1330-20-7		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND	3.34E-03		5.16E-04			3.23E-03	5.00E-04
o-Xylene H	95-47-6		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
Styrene H	100-42-5		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
1,1,2,2-Tetrachloroethane H	79-34-5		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
Acetone	67-64-1	3.27E-01		5.06E-02		J	2.17E-01		3.37E-02			6.23E-02		9.62E-03			2.02E-01	3.13E-02
Carbon Disulfide H	75-15-0		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
Vinyl Acetate H	108-05-4	1.54E-02		2.39E-03		UJ	1.63E-02		2.53E-03		UJ	1.52E-02		2.35E-03		UJ	1.56E-02	2.42E-03
2-Butanone (MEK) H	78-93-3		1.54E-02		2.39E-03	ND		1.63E-02		2.53E-03	ND		1.52E-02		2.35E-03	ND	ND	ND
Bromodichloromethane	75-27-4		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) H	108-10-1		1.54E-02		2.39E-03	ND		1.63E-02		2.53E-03	ND		1.52E-02		2.35E-03	ND	ND	ND
2-Hexanone	591-78-6		1.54E-02		2.39E-03	ND		1.63E-02		2.53E-03	ND		1.52E-02		2.35E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
Bromoform H	75-25-2		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		3.08E-03		4.77E-04	ND		3.26E-03		5.06E-04	ND		3.03E-03		4.68E-04	ND	ND	ND
HAP Total		**5.12E-02**		**7.92E-03**			**8.61E-02**		**1.34E-02**			**3.91E-02**		**6.05E-03**			**6.72E-02**	**1.04E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-100
Polynuclear Aromatic Hydrocarbons (PAHs)
Emissions Factor Summary
TF108-CF-100 (KC-135R)

Flow by Tracer

		Engine Mode																	
		Idle					Approach					Intermediate					Military				
Flow Rate, dscfm		560356					1001891					1502652					1588899				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Phenol H	108-95-2		2.94E-03		2.59E-03	ND		4.39E-03		1.72E-03	ND		7.66E-03		1.35E-03	ND		9.58E-03		1.48E-03	ND
Dichloroethyl ether H	111-44-4		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
2-Chlorophenol	95-57-8		2.94E-03		2.59E-03	ND		4.39E-03		1.72E-03	ND		7.66E-03		1.35E-03	ND		9.58E-03		1.48E-03	ND
1,3-Dichlorobenzene	541-73-1		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
1,4-Dichlorobenzene H	106-46-7		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
1,2-Dichlorobenzene	95-50-1		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
o-Cresol H	95-48-7		2.94E-03		2.59E-03	ND		4.39E-03		1.72E-03	ND		7.66E-03		1.35E-03	ND		9.58E-03		1.48E-03	ND
bis(2-Chloroisopropyl) Ether	39638-32-9		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
N-Nitroso-di-n-propylamine	621-64-7		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
p-Cresol H	106-44-5		2.94E-03		2.59E-03	ND		4.39E-03		1.72E-03	ND		7.66E-03		1.35E-03	ND		9.58E-03		1.48E-03	ND
Hexachloroethane H	67-72-1		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Nitrobenzene H	98-95-3		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Isophorone H	78-59-1		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
2-Nitrophenol	88-75-5		2.94E-03		2.59E-03	ND		4.39E-03		1.72E-03	ND		7.66E-03		1.35E-03	ND		9.58E-03		1.48E-03	ND
2,4-Dimethylphenol	105-67-9		2.94E-03		2.59E-03	ND		4.39E-03		1.72E-03	ND		7.66E-03		1.35E-03	ND		9.58E-03		1.48E-03	ND
Benzoic Acid	65-85-0	3.84E-02		3.38E-02			2.20E-02		8.63E-03			6.42E-02		1.14E-02			5.74E-02		8.89E-03		
bis(2-Chloroethoxy) Methane	111-91-1		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
2,4-Dichlorophenol	120-83-2		2.94E-03		2.59E-03	ND		4.39E-03		1.72E-03	ND		7.66E-03		1.35E-03	ND		9.58E-03		1.48E-03	ND
1,2,4-Trichlorobenzene H	120-82-1		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Naphthalene H	91-20-3	3.30E-03		2.91E-03			0.00E+00		0.00E+00				1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
4-Chloroaniline	106-47-8		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Hexachlorobutadiene H	87-68-3		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
4-Chloro-3-methylphenol	59-50-7		2.94E-03		2.59E-03	ND		4.39E-03		1.72E-03	ND		7.66E-03		1.35E-03	ND		9.58E-03		1.48E-03	ND
2-Methylnaphthalene	91-57-6	8.73E-04		7.69E-04				8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Hexachlorocyclopentadiene H	77-47-4		5.90E-03		5.19E-03	ND		8.78E-03		3.45E-03	ND		1.53E-02		2.71E-03	ND		1.92E-02		2.97E-03	ND
2,4,6-Trichlorophenol H	88-06-2		2.94E-03		2.59E-03	ND		4.39E-03		1.72E-03	ND		7.66E-03		1.35E-03	ND		9.58E-03		1.48E-03	ND
2,4,5-Trichlorophenol H	95-95-4		2.94E-03		2.59E-03	ND		4.39E-03		1.72E-03	ND		7.66E-03		1.35E-03	ND		9.58E-03		1.48E-03	ND
2-Chloronaphthalene	91-58-7		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
2-Nitroaniline	88-74-4		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Dimethylphthalate H	131-11-3		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Acenaphthylene	208-96-8		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
2,6-Dinitrotoluene	606-20-2		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
3-Nitroaniline	99-09-2		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Acenaphthene	83-32-9		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
2,4-Dinitrophenol H	51-28-5		1.18E-02		1.04E-02	ND		1.76E-02		6.91E-03	ND		3.06E-02		5.42E-03	ND		3.83E-02		5.93E-03	ND
4-Nitrophenol H	100-02-7		5.90E-03		5.19E-03	ND		8.78E-03		3.45E-03	ND		1.53E-02		2.71E-03	ND		1.92E-02		2.97E-03	ND
2,4-Dinitrotoluene H	121-14-2		5.90E-03		5.19E-03	ND		8.78E-03		3.45E-03	ND		1.53E-02		2.71E-03	ND		1.92E-02		2.97E-03	ND
Dibenzofuran H	132-64-9		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Diethylphthalate	84-66-2	9.97E-04		8.78E-04			1.31E-03		5.14E-04				1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Fluorene	86-73-7		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
4-Chlorophenyl-phenyl Ether	7005-72-3		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
4-Nitroaniline	100-01-6		5.90E-03		5.19E-03	ND		8.78E-03		3.45E-03	ND		1.53E-02		2.71E-03	ND		1.92E-02		2.97E-03	ND
4,6-Dinitro-2-methylphenol	534-52-1		1.18E-02		1.04E-02	ND		1.76E-02		6.91E-03	ND		3.06E-02		5.42E-03	ND		3.83E-02		5.93E-03	ND
N-Nitrosodiphenylamine	86-30-6		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
4-Bromophenyl-phenyl Ether	101-55-3		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Hexachlorobenzene H	118-74-1		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Pentachlorophenol H	87-86-5		5.90E-03		5.19E-03	ND		8.78E-03		3.45E-03	ND		1.53E-02		2.71E-03	ND		1.92E-02		2.97E-03	ND
Phenanthrene	85-01-8		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Anthracene	120-12-7		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
di-n-Butylphthalate H	84-74-2	0.00E+00		0.00E+00		B	0.00E+00		0.00E+00		B	0.00E+00		0.00E+00		B	0.00E+00		0.00E+00		B
Fluoranthene	206-44-0		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Pyrene	129-00-0		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Butylbenzylphthalate	85-68-7	8.25E-04		7.26E-04				8.78E-04		3.45E-04	ND	1.53E-03		2.71E-04				1.92E-03		2.97E-04	ND
3,3'-Dichlorobenzidine H	91-94-1		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Chrysene	218-01-9		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Benzo(a)anthracene	56-55-3		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
bis(2-Ethylhexyl)phthalate H	117-81-7	6.28E-03		5.53E-03		B	3.92E-03		1.54E-03		B	2.55E-02		4.51E-03		B	1.26E-02		1.95E-03		B
Di-n-Octylphthalate	117-84-0		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Benzo(b)fluoranthene	205-99-2		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Benzo(k)fluoranthene	207-08-9		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Benzo(a)pyrene	50-32-8		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Indeno(1,2,3-c,d)pyrene	193-39-5		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Benzo(g,h,i)perylene	191-24-2		5.90E-04		5.19E-04	ND		8.78E-04		3.45E-04	ND		1.53E-03		2.71E-04	ND		1.92E-03		2.97E-04	ND
Benzyl alcohol	100-51-6		2.94E-03		2.59E-03	ND		4.39E-03		1.72E-03	ND		7.66E-03		1.35E-03	ND		9.58E-03		1.48E-03	ND
HAP Total		**9.59E-03**		**8.44E-03**			**3.92E-03**		**1.54E-03**			**2.55E-02**		**4.51E-03**			**1.26E-02**		**1.95E-03**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

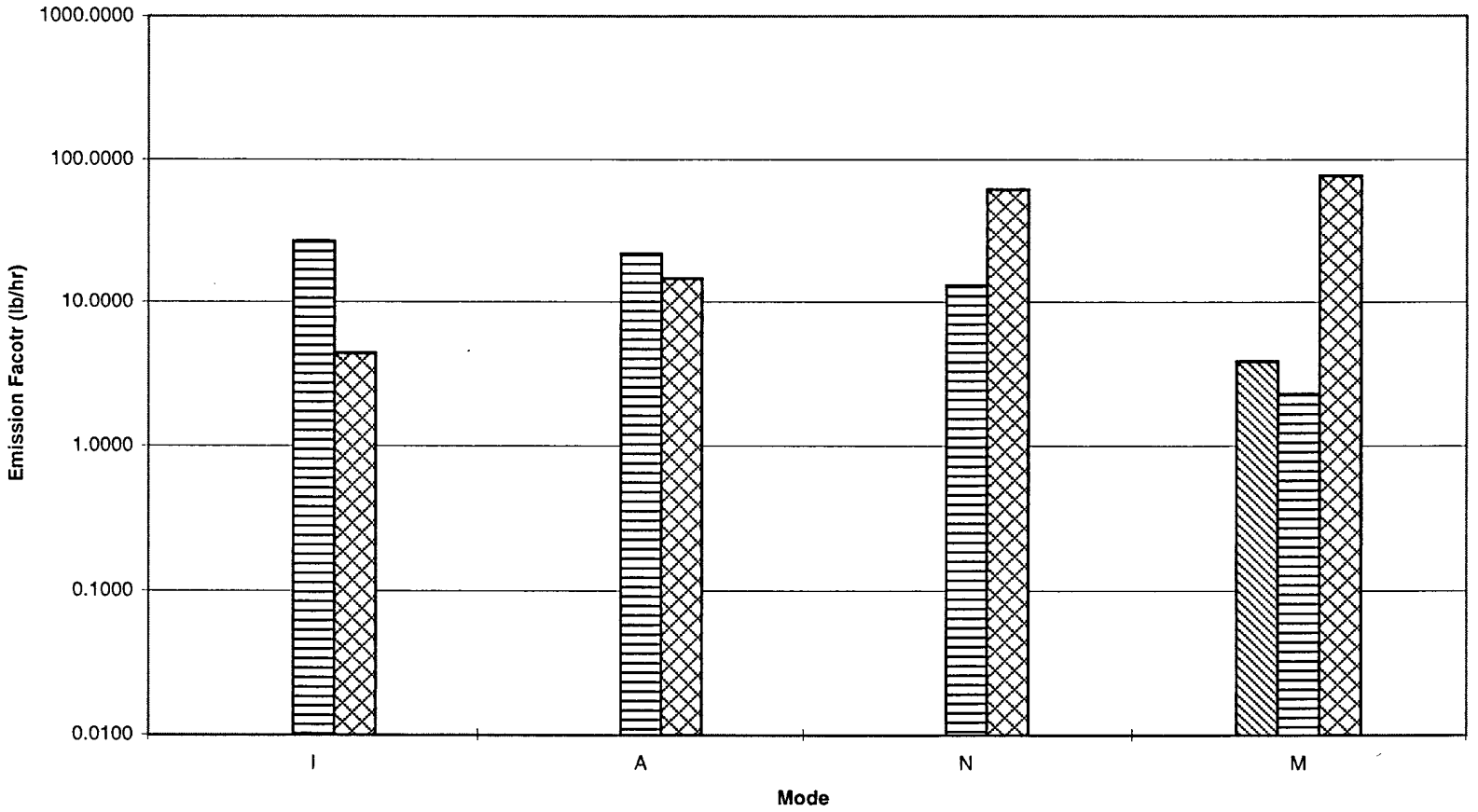
Table 4-101
Emissions Factor Summary
Aldehyde/Ketones
F108-CF-100 (KC-135R)
Flow by Tracer

		Engine Mode															
		Idle					Approach					Intermediate					Military				
Flow Rate, dscfm		560356					1001891					1502652					1588899				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
Analyte	**CAS Number**	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Formaldehyde [H]	50-00-0	1.08E-01		9.53E-02			3.83E-02		1.50E-02			3.15E-02		5.58E-03			4.53E-02		7.01E-03		
Acetaldehyde [H]	75-07-0	0.00E+00		0.00E+00				4.54E-04		1.78E-04	ND		4.50E-03		7.97E-04	ND		9.46E-04		1.47E-04	ND
Acrolein [H]	107-02-8		3.19E-04		2.81E-04	ND		4.54E-04		1.78E-04	ND		4.50E-03		7.97E-04	ND		9.46E-04		1.47E-04	ND
Acetone	67-64-1	1.02E-02		8.96E-03		B	2.36E-01		9.28E-02		B	3.15E-01		5.58E-02		B	3.51E-01		5.44E-02		B
Crotonaldehyde	4170-30-3		3.19E-04		2.81E-04	ND		1.88E-01		7.37E-02	ND		2.53E-01		4.48E-02	ND		2.68E-01		4.15E-02	ND
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3	6.21E-03		5.47E-03				1.07E-01		4.22E-02	ND		1.62E-01		2.86E-02	ND		1.71E-01		2.65E-02	ND
Benzaldehyde	100-52-7		3.19E-04		2.81E-04	ND		4.54E-04		1.78E-04	ND		4.50E-03		7.97E-04	ND	2.64E-02		4.09E-03		
Isopentanal (Isovaleraldehyde)	590-86-3		3.19E-04		2.81E-04	ND		4.54E-04		1.78E-04	ND		4.50E-03		7.97E-04	ND		9.46E-04		1.47E-04	ND
Pentanal (Valeraldehyde)	110-62-3		3.19E-04		2.81E-04	ND		4.54E-04		1.78E-04	ND		4.50E-03		7.97E-04	ND		9.46E-04		1.47E-04	ND
o-Tolualdehyde	529-20-4		3.19E-04		2.81E-04	ND	1.19E-02		4.66E-03				4.50E-03		7.97E-04	ND		9.46E-04		1.47E-04	ND
m-Tolualdehyde	620-23-5		3.19E-04		2.81E-04	ND		4.54E-04		1.78E-04	ND		4.50E-03		7.97E-04	ND		9.46E-04		1.47E-04	ND
p-Tolualdehyde	104-87-0		3.19E-04		2.81E-04	ND		4.54E-04		1.78E-04	ND		4.50E-03		7.97E-04	ND		9.46E-04		1.47E-04	ND
Hexanal (Hexaldehyde)	66-25-1		3.19E-04		2.81E-04	ND	2.46E-02		9.67E-03				4.50E-03		7.97E-04	ND		9.46E-04		1.47E-04	ND
HAP Total		**1.15E-01**		**1.01E-01**			**3.83E-02**		**1.50E-02**			**3.15E-02**		**5.58E-03**			**4.53E-02**		**7.01E-03**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-10
F108-CF-100 (KC-135R)
Emission Factors



THC for modes I, A, and N is "Non-detect."

Table 4-102
Engine Operating Parameter Summary
F108-CF-100 (KC-135R)

Parameter	Idle	Approach	Intermediate	Military
Barometric pressure, in. Hg	28.48	28.54	28.55	28.45
Compressor discharge pressure, in. Hg	46.78	201.82	280.05	399.08
Fuel flow, lbs/hr	1,136	2,547	5,650	6,458
Fan speed, rpm	1,636	2,850	4,080	4,313
Core speed, rpm	10,884	12,286	13,465	13,802
Cell temperature, deg. F	63	50	57	67
Average thrust, lbs	1,990	6,591	15,123	16,978
Percent maximum thrust	9	30	70	78

4.3.11 Engine F101-GE-102

Tracer gas was used to determine the flow rate at each power setting. THC values were reported as the instrument detection limit of 0.8 ppm.

The ambient THC background concentrations were consistently slightly greater than the exhaust concentrations. Both concentrations were in the 1-5 ppm range. The instrument detection limit of 0.8 ppm was reported instead of a zero or negative value.

Tables 4-103 through 4-114 present engine results for the F101-GE-102 engine. Figure 4-11 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-115 summarizes the engine operating data collected during testing.

Table 4-103
Emissions Factor Summary
Gaseous Parameters
F101-GE-102 (B-1B)
Idle

Flow by Tracer

	Run Number										Average	
	1			2			3					
Flow Rate, dscfm	377929			427661			369070					
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel			lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	2.30	2.03		2.40	2.16		1.90	1.71			2.20	1.97
Nitrogen Dioxide (NO_2)	0.81	0.72		1.23	1.10		1.06	0.95			1.03	0.92
Nitrogen Oxides (NO_X)	4.60	4.08		4.90	4.41		4.23	3.81			4.58	4.10
Carbon Monoxide (CO)	26.37	23.36		29.84	26.86		25.75	23.18			27.32	24.47
Total Hydrocarbons (THC as CH_4)	0.77	0.68	ND	0.88	0.79	ND	0.76	0.68	ND		ND	ND
Carbon Dioxide (CO_2)	4016	3557		4541	4088		3917	3525			4158	3723

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-104
Emissions Factor Summary
Gaseous Parameters
F101-GE-102 (B-1B)
Approach
Flow by Tracer

	Run Number								Average	
	1		2			3				
Flow Rate, dscfm	1059046		1079710			1060185				
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	25.73	5.72	25.73	5.67		25.26	5.54		25.58	5.65
Nitrogen Dioxide (NO_2)	2.28	0.51	3.87	0.85		3.80	0.83		3.31	0.73
Nitrogen Oxides (NO_X)	40.21	8.95	42.54	9.38		41.77	9.16		41.51	9.16
Carbon Monoxide (CO)	4.62	1.03	4.71	1.04		4.62	1.01		4.65	1.03
Total Hydrocarbons (THC as CH_4)	1.89	0.42	2.19	0.48	ND	2.17	0.48	ND	2.09	0.46
Carbon Dioxide (CO_2)	12915	2873	13204	2910		13735	3012		13284	2932

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-105
Emissions Factor Summary
Gaseous Parameters
F101-GE-102 (B-1B)
Intermediate

Flow by Tracer

	Run Number										Average	
	1			2			3					
Flow Rate, dscfm	1267737			1253283			1319553					
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel			lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	51.54	7.85		50.95	7.77		53.64	8.19			52.04	7.94
Nitrogen Dioxide (NO_2)	6.36	0.97		7.18	1.09		7.56	1.15			7.03	1.07
Nitrogen Oxides (NO_X)	84.46	12.87		84.40	12.87		89.80	13.71			86.22	13.15
Carbon Monoxide (CO)	5.53	0.84		5.47	0.83		5.75	0.88			5.58	0.85
Total Hydrocarbons (THC as CH_4)	2.56	0.39		2.55	0.39	ND	2.68	0.41		ND	2.60	0.40
Carbon Dioxide (CO_2)	18951	2888		18752	2859		19753	3016			19152	2921

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-106
Emissions Factor Summary
Gaseous Parameters
F101-GE-102 (B-1B)
Military

Flow by Tracer

	Run Number										Average	
	1			2			3					
Flow Rate, dscfm	1480754			1517840			1475604					
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel			lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	60.20	7.71		61.70	7.89		59.99	7.64			60.63	7.74
Nitrogen Dioxide (NO_2)	7.43	0.95		8.70	1.11		8.46	1.08			8.19	1.05
Nitrogen Oxides (NO_X)	98.65	12.64		102.21	13.06		100.42	12.78			100.43	12.83
Carbon Monoxide (CO)	6.46	0.83		6.62	0.85		6.44	0.82			6.50	0.83
Total Hydrocarbons (THC as CH_4)	2.65	0.34		3.08	0.39	ND	3.00	0.38		ND	2.91	0.37
Carbon Dioxide (CO_2)	27238	3490		27910	3567		27123	3453			27424	3503

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-107
Emissions Factor Summary
Gaseous Parameters
F101-GE-102 (B-1B)
Afterburner (Zone 1)

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	1659885		1631678		1707188			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	113.24	7.43	112.08	7.27	118.86	7.76	114.72	7.49
Nitrogen Dioxide (NO_2)	77.29	5.07	82.99	5.38	94.17	6.15	84.82	5.53
Nitrogen Oxides (NO_X)	249.72	16.39	253.65	16.45	273.95	17.89	259.11	16.91
Carbon Monoxide (CO)	687.72	45.15	647.57	41.99	662.64	43.27	665.98	43.47
Total Hydrocarbons (THC as CH_4)	920.20	60.41	936.89	60.75	984.55	64.29	947.21	61.82
Carbon Dioxide (CO_2)	44827	2943	44300	2873	47660	3112	45596	2976

Table 4-108
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F101-GE-102 (B-1B)
Idle
Flow by Tracer

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		377929					427661					369070					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		7.91E-04		7.01E-04	ND	9.31E-04		8.38E-04				7.31E-04		6.58E-04	ND	8.18E-04	7.32E-04
Vinyl Chloride [H]	75-01-4		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Bromomethane [H]	74-83-9	7.91E-04		7.01E-04		UJ	8.46E-04		7.61E-04		UJ	7.31E-04		6.58E-04		UJ	7.90E-04	7.07E-04
Chloroethane [H]	75-00-3		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	9.49E-02		8.40E-02		J	9.31E-02		8.38E-02		J	4.31E-02		3.88E-02			7.70E-02	6.89E-02
1,1-Dichloroethene [H]	75-35-4		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	1.64E-01		1.45E-01		J	1.47E-01		1.33E-01		J	6.93E-02		6.23E-02		J	1.27E-01	1.13E-01
1,1-Dichloroethane [H]	75-34-3		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Chloroform [H]	67-66-3		7.91E-04		7.01E-04	ND	3.12E-03		2.81E-03		bb	3.15E-03		2.84E-03			2.36E-03	2.12E-03
1,1,1-Trichloroethane [H]	71-55-6		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Benzene [H]	71-43-2	1.11E-02		9.81E-03			1.52E-02		1.37E-02			1.32E-02		1.18E-02			1.32E-02	1.18E-02
1,2-Dichloroethane [H]	107-06-2		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Trichloroethene [H]	79-01-6	7.91E-04		7.01E-04		UJ	8.46E-04		7.61E-04		UJ	7.31E-04		6.58E-04		UJ	7.90E-04	7.07E-04
1,2-Dichloropropane [H]	78-87-5		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Toluene [H]	108-88-3	7.52E-03		6.66E-03			6.26E-03		5.64E-03			4.83E-03		4.34E-03			6.20E-03	5.55E-03
cis-1,3-Dichloropropene [H]	10061-01-5		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
m,p-Xylene [H]	1330-20-7	1.03E-03		9.10E-04			1.18E-03		1.07E-03			8.78E-04		7.90E-04			1.03E-03	9.22E-04
o-Xylene [H]	95-47-6		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Styrene [H]	100-42-5	9.49E-04		8.40E-04			1.44E-03		1.29E-03			1.24E-03		1.12E-03			1.21E-03	1.08E-03
1,1,2,2-Tetrachloroethane [H]	79-34-5		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Acetone	67-64-1	1.76E-01		1.55E-01		J	9.45E-03		8.51E-03			0.00E+00		0.00E+00			6.17E-02	5.47E-02
Carbon Disulfide [H]	75-15-0		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4	3.95E-03		3.50E-03		UJ	4.23E-03		3.81E-03		UJ	3.66E-03		3.30E-03		UJ	3.95E-03	3.53E-03
2-Butanone (MEK) [H]	78-93-3	6.80E-03		6.02E-03			5.33E-03		4.80E-03				3.66E-03		3.30E-03	ND	5.26E-03	4.71E-03
Bromodichloromethane	75-27-4		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		3.95E-03		3.50E-03	ND		4.23E-03		3.81E-03	ND		3.66E-03		3.30E-03	ND	ND	ND
2-Hexanone	591-78-6		3.95E-03		3.50E-03	ND		4.23E-03		3.81E-03	ND		3.66E-03		3.30E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
Bromoform [H]	75-25-2		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		7.91E-04		7.01E-04	ND		8.46E-04		7.61E-04	ND		7.31E-04		6.58E-04	ND	ND	ND
HAP Total		**1.97E-01**		**1.75E-01**			**1.87E-01**		**1.68E-01**			**9.77E-02**		**8.79E-02**			**1.63E-01**	**1.45E-01**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-109
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F101-GE-102 (B-1B)
Approach
Flow by Tracer

		Run Number													
		1					2					3				
Flow Rate, dscfm		1059046					1079710					1060185				Average
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	lb/hr / lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	4.60E-03		1.02E-03				2.19E-03		4.82E-04	ND	3.69E-03		8.08E-04		3.49E-03 / 7.71E-04
Vinyl Chloride [H]	75-01-4		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND / ND
Bromomethane [H]	74-83-9	2.10E-03		4.67E-04		UJ	2.19E-03		4.82E-04		UJ	2.05E-03		4.49E-04		UJ	2.11E-03 / 4.66E-04
Chloroethane [H]	75-00-3		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.89E-01		4.20E-02			8.29E-02		1.83E-02			1.68E-01		3.68E-02			1.47E-01 / 3.24E-02
1,1-Dichloroethene [H]	75-35-4		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
Methylene Chloride [H]	75-09-2	4.21E-01		9.36E-02		J	2.62E-01		5.79E-02		J	3.48E-01		7.63E-02		J	3.44E-01 / 7.59E-02
1,1-Dichloroethane [H]	75-34-3		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
Chloroform [H]	67-66-3		2.10E-03		4.67E-04	ND	5.91E-03		1.30E-03		bb	7.15E-03		1.57E-03		bb	5.05E-03 / 1.11E-03
1,1,1-Trichloroethane [H]	71-55-6		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
Carbon Tetrachloride [H]	56-23-5		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
Benzene [H]	71-43-2	4.60E-03		1.02E-03			3.06E-03		6.75E-04			3.07E-03		6.73E-04			3.58E-03 / 7.91E-04
1,2-Dichloroethane [H]	107-06-2		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
Trichloroethene [H]	79-01-6	2.10E-03		4.67E-04		UJ	2.19E-03		4.82E-04		UJ	2.05E-03		4.49E-04		UJ	2.11E-03 / 4.66E-04
1,2-Dichloropropane [H]	78-87-5		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
trans-1,3-Dichloropropene [H]	10061-02-6		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
Toluene [H]	108-88-3	9.01E-03		2.00E-03			5.46E-03		1.20E-03			5.92E-03		1.30E-03			6.79E-03 / 1.50E-03
cis-1,3-Dichloropropene [H]	10061-01-5		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
1,1,2-Trichloroethane [H]	79-00-5		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
Tetrachloroethene [H]	127-18-4	3.36E-03		7.47E-04			2.19E-03		4.82E-04				2.05E-03		4.49E-04	ND	2.53E-03 / 5.59E-04
Chlorobenzene [H]	108-90-7		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
Ethyl Benzene [H]	100-41-4		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
m,p-Xylene [H]	1330-20-7	3.78E-03		8.40E-04				2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	2.67E-03 / 5.90E-04
o-Xylene [H]	95-47-6		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
Styrene [H]	100-42-5		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
Acetone	67-64-1	1.60E-01		3.56E-02			1.13E-01		2.50E-02			5.24E-02		1.15E-02			1.09E-01 / 2.40E-02
Carbon Disulfide [H]	75-15-0	2.52E-03		5.60E-04			2.41E-03		5.30E-04				2.05E-03		4.49E-04	ND	2.32E-03 / 5.13E-04
trans-1,2-Dichloroethene	156-60-5		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
Vinyl Acetate [H]	108-05-4	1.05E-02		2.33E-03		UJ	1.09E-02		2.41E-03		UJ	1.02E-02		2.25E-03		UJ	1.05E-02 / 2.33E-03
2-Butanone (MEK) [H]	78-93-3		1.05E-02		2.33E-03	ND		1.09E-02		2.41E-03	ND		1.02E-02		2.25E-03	ND	ND / ND
Bromodichloromethane	75-27-4		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.05E-02		2.33E-03	ND		1.09E-02		2.41E-03	ND		1.02E-02		2.25E-03	ND	ND / ND
2-Hexanone	591-78-6		1.05E-02		2.33E-03	ND		1.09E-02		2.41E-03	ND		1.02E-02		2.25E-03	ND	ND / ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
Bromoform [H]	75-25-2		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
cis-1,2-Dichloroethene	156-59-2		2.10E-03		4.67E-04	ND		2.19E-03		4.82E-04	ND		2.05E-03		4.49E-04	ND	ND / ND
HAP Total		**4.63E-01**		**1.03E-01**			**2.97E-01**		**6.54E-02**			**3.82E-01**		**8.38E-02**			**3.85E-01 / 8.50E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-110
Emissions Factor Summary
VOlatile Organic Compounds (VOCs)
F101-GE-102 (B-1B)
Intermediate
Flow by Tracer

		Run Number															
		1					2					3					
Flow Rate, dscfm		1267737					1253283					1319553					Average
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	8.60E-02		1.31E-02			2.96E-03		4.52E-04			3.91E-03		5.97E-04			3.09E-02	4.72E-03
Vinyl Chloride [H]	75-01-4		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
Bromomethane [H]	74-83-9	2.94E-01		4.48E-02		J	2.47E-03		3.76E-04		UJ	2.61E-03		3.99E-04		UJ	9.97E-02	1.52E-02
Chloroethane [H]	75-00-3		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.32E-01		2.02E-02			1.33E-01		2.03E-02			1.46E-01		2.23E-02			1.37E-01	2.09E-02
1,1-Dichloroethene [H]	75-35-4		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	2.76E-01		4.20E-02		J	3.03E-01		4.62E-02		J	2.94E-01		4.48E-02		J	2.91E-01	4.43E-02
1,1-Dichloroethane [H]	75-34-3		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
Chloroform [H]	67-66-3	1.20E-02		1.83E-03			8.17E-03		1.25E-03		bb	7.81E-03		1.19E-03		bb	9.33E-03	1.42E-03
1,1,1-Trichloroethane [H]	71-55-6		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND	3.91E-03		5.97E-04			4.01E-03	6.12E-04
Carbon Tetrachloride [H]	56-23-5		5.65E-03		8.61E-04	ND	2.47E-03		3.76E-04				2.61E-03		3.99E-04	ND	3.58E-03	5.45E-04
Benzene [H]	71-43-2	1.79E-02		2.73E-03			4.45E-03		6.78E-04			3.65E-03		5.58E-04			8.67E-03	1.32E-03
1,2-Dichloroethane [H]	107-06-2		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND	2.61E-03		3.99E-04		UJ	3.58E-03	5.45E-04
1,2-Dichloropropane [H]	78-87-5		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
Toluene [H]	108-88-3	7.12E-03		1.09E-03			1.23E-02		1.88E-03			1.38E-02		2.11E-03			1.11E-02	1.69E-03
cis-1,3-Dichloropropene [H]	10061-01-5		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		5.65E-03		8.61E-04	ND	9.39E-03		1.43E-03			7.81E-03		1.19E-03			7.62E-03	1.16E-03
Chlorobenzene [H]	108-90-7		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
m,p-Xylene [H]	1330-20-7	9.31E-03		1.42E-03			2.47E-03		3.76E-04				2.61E-03		3.99E-04	ND	4.80E-03	7.31E-04
o-Xylene [H]	95-47-6		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
Styrene [H]	100-42-5		5.65E-03		8.61E-04	ND	2.47E-03		3.76E-04		UJ		2.61E-03		3.99E-04	ND	3.58E-03	5.45E-04
1,1,2,2-Tetrachloroethane [H]	79-34-5		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
Acetone	67-64-1	1.58E-01		2.41E-02			6.43E-02		9.80E-03			8.35E-02		1.28E-02			1.02E-01	1.56E-02
Carbon Disulfide [H]	75-15-0	1.13E-02		1.71E-03			2.47E-03		3.76E-04			3.91E-03		5.97E-04			5.88E-03	8.96E-04
trans-1,2-Dichloroethene	156-60-5		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4	2.94E-02		4.48E-03		UJ		1.23E-02		1.88E-03	ND	1.30E-02		1.99E-03		UJ	1.83E-02	2.78E-03
2-Butanone (MEK) [H]	78-93-3		2.94E-02		4.48E-03	ND		1.23E-02		1.88E-03	ND		1.30E-02		1.99E-03	ND	ND	ND
Bromodichloromethane	75-27-4		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		2.94E-02		4.48E-03	ND		1.23E-02		1.88E-03	ND		1.30E-02		1.99E-03	ND	ND	ND
2-Hexanone	591-78-6		2.94E-02		4.48E-03	ND		1.23E-02		1.88E-03	ND		1.30E-02		1.99E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
Bromoform [H]	75-25-2		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		5.65E-03		8.61E-04	ND		2.47E-03		3.76E-04	ND		2.61E-03		3.99E-04	ND	ND	ND
HAP Total		**7.42E-01**		**1.13E-01**			**3.53E-01**		**5.37E-02**			**3.57E-01**		**5.45E-02**			**5.02E-01**	**7.65E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-111
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F101-GE-102 (B-1B)
Military
Flow by Tracer

		Run Number															
		1					2					3					
Flow Rate, dscfm		1480754					1517840					1475604					Average
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	2.19E-01		2.80E-02			1.09E-01		1.39E-02			4.00E-02		5.09E-03			1.22E-01	1.57E-02
Vinyl Chloride [H]	75-01-4		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Bromomethane [H]	74-83-9	8.93E-01		1.14E-01		J	4.83E-01		6.18E-02		J	1.43E-01		1.82E-02		J	5.06E-01	6.48E-02
Chloroethane [H]	75-00-3		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.26E+00		1.62E-01			1.66E-01		2.12E-02			8.57E-02		1.09E-02			5.05E-01	6.47E-02
1,1-Dichloroethene [H]	75-35-4		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	3.13E+00		4.02E-01		J	3.95E-01		5.05E-02		J	1.87E-01		2.38E-02		J,bb	1.24E+00	1.59E-01
1,1-Dichloroethane [H]	75-34-3		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Chloroform [H]	67-66-3		2.65E-02		3.39E-03	ND	8.13E-03		1.04E-03		bb	7.13E-03		9.08E-04		bb	1.39E-02	1.78E-03
1,1,1-Trichloroethane [H]	71-55-6		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Benzene [H]	71-43-2	8.93E-02		1.14E-02			2.12E-02		2.70E-03			1.82E-02		2.32E-03			4.29E-02	5.49E-03
1,2-Dichloroethane [H]	107-06-2		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Toluene [H]	108-88-3		2.65E-02		3.39E-03	ND	8.47E-03		1.08E-03			8.57E-03		1.09E-03			1.45E-02	1.85E-03
cis-1,3-Dichloropropene [H]	10061-01-5		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		2.65E-02		3.39E-03	ND	8.13E-03		1.04E-03			7.68E-03		9.78E-04			1.41E-02	1.80E-03
Chlorobenzene [H]	108-90-7		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
m,p-Xylene [H]	1330-20-7	3.45E-02		4.42E-03			1.63E-02		2.09E-03			6.85E-03		8.73E-04			1.92E-02	2.46E-03
o-Xylene [H]	95-47-6		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Styrene [H]	100-42-5		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Acetone	67-64-1	2.36E-01		3.02E-02			1.56E-01		2.00E-02			5.97E-02		7.60E-03			1.51E-01	1.93E-02
Carbon Disulfide [H]	75-15-0		2.65E-02		3.39E-03	ND	1.24E-02		1.58E-03			1.20E-02		1.53E-03			1.69E-02	2.17E-03
trans-1,2-Dichloroethene	156-60-5		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4	1.33E-01		1.70E-02		UJ	3.62E-02		4.63E-03		UJ	3.42E-02		4.36E-03		UJ	6.77E-02	8.66E-03
2-Butanone (MEK) [H]	78-93-3		1.33E-01		1.70E-02	ND		3.62E-02		4.63E-03	ND		3.42E-02		4.36E-03	ND	ND	ND
Bromodichloromethane	75-27-4		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.33E-01		1.70E-02	ND		3.62E-02		4.63E-03	ND		3.42E-02		4.36E-03	ND	ND	ND
2-Hexanone	591-78-6		1.33E-01		1.70E-02	ND		3.62E-02		4.63E-03	ND		3.42E-02		4.36E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
Bromoform [H]	75-25-2		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		2.65E-02		3.39E-03	ND		6.94E-03		8.86E-04	ND		6.58E-03		8.37E-04	ND	ND	ND
HAP Total		**4.50E+00**		**5.77E-01**			**1.10E+00**		**1.40E-01**			**4.64E-01**		**5.91E-02**			**2.06E+00**	**2.63E-01**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-112
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F101-GE-102 (B-1B)
Afterburner (Zone 1)
Flow by Tracer

		Run Number																	
		1					2					3					Average		
Flow Rate, dscfm		1659885					1631678					1707188							
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel					
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel	
Chloromethane [H]	74-87-3		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND	5.43E-01		3.55E-02			2.11E-01	1.38E-02	
Vinyl Chloride [H]	75-01-4		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Bromomethane [H]	74-83-9	5.10E-03		3.35E-04		J	9.35E-01		6.06E-02		J	3.12E+00		2.04E-01		J	1.35E+00	8.82E-02	
Chloroethane [H]	75-00-3		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Freon 11 (Trichlorofluoromethane)	75-69-4	5.10E-02		3.35E-03		J,bb	9.96E-02		6.46E-03			1.09E-01		7.10E-03			8.65E-02	5.64E-03	
1,1-Dichloroethene [H]	75-35-4		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Methylene Chloride [H]	75-09-2	1.64E-01		1.07E-02		J	4.57E-01		2.96E-02		J	3.85E-01		2.51E-02		J	3.35E-01	2.18E-02	
1,1-Dichloroethane [H]	75-34-3		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Chloroform [H]	67-66-3		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
1,1,1-Trichloroethane [H]	71-55-6		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Carbon Tetrachloride [H]	56-23-5		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Benzene [H]	71-43-2	3.19E+00		2.09E-01		J	3.54E+00		2.29E-01			3.73E+00		2.43E-01			3.49E+00	2.27E-01	
1,2-Dichloroethane [H]	107-06-2		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Trichloroethene [H]	79-01-6		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
1,2-Dichloropropane [H]	78-87-5		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
trans-1,3-Dichloropropene [H]	10061-02-6		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Toluene [H]	108-88-3	2.26E+00		1.49E-01		J	1.58E+00		1.02E-01			1.97E+00		1.29E-01			1.94E+00	1.26E-01	
cis-1,3-Dichloropropene [H]	10061-01-5		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
1,1,2-Trichloroethane [H]	79-00-5		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Tetrachloroethene [H]	127-18-4		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Chlorobenzene [H]	108-90-7		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Ethyl Benzene [H]	100-41-4	1.53E+00		1.00E-01		J	1.06E+00		6.90E-02			1.36E+00		8.85E-02			1.32E+00	8.60E-02	
m,p-Xylene [H]	1330-20-7	2.52E+00		1.65E-01		J	1.96E+00		1.27E-01			2.65E+00		1.73E-01			2.38E+00	1.55E-01	
o-Xylene [H]	95-47-6	1.21E+00		7.96E-02		J	7.70E-01		4.99E-02			1.19E+00		7.77E-02			1.06E+00	6.91E-02	
Styrene [H]	100-42-5	1.44E-01		9.43E-03		J	1.80E-01		1.17E-02			2.34E-01		1.53E-02			1.86E-01	1.21E-02	
1,1,2,2-Tetrachloroethane [H]	79-34-5		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Acetone	67-64-1	1.19E+00		7.84E-02		J	1.14E+00		7.41E-02			7.99E-01		5.22E-02			1.05E+00	6.82E-02	
Carbon Disulfide [H]	75-15-0		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
trans-1,2-Dichloroethene	156-60-5		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Vinyl Acetate [H]	108-05-4	1.60E-02		1.05E-03		UJ	4.50E-01		2.92E-02		UJ	2.37E-01		1.55E-02		UJ	2.34E-01	1.52E-02	
2-Butanone (MEK) [H]	78-93-3	6.72E-01		4.41E-02		J	8.99E-01		5.83E-02			7.80E-01		5.09E-02			7.83E-01	5.11E-02	
Bromodichloromethane	75-27-4		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.60E-02		1.05E-03	ND		4.50E-01		2.92E-02	ND		2.37E-01		1.55E-02	ND	ND	ND	
2-Hexanone	591-78-6		1.60E-02		1.05E-03	ND		4.50E-01		2.92E-02	ND		2.37E-01		1.55E-02	ND	ND	ND	
Dibromochloromethane (Chlorodibromomethane)	124-48-1		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
Bromoform [H]	75-25-2		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
cis-1,2-Dichloroethene	156-59-2		3.19E-03		2.09E-04	ND		8.68E-02		5.63E-03	ND		4.75E-02		3.10E-03	ND	ND	ND	
HAP Total		**1.17E+01**		**7.69E-01**			**1.18E+01**		**7.67E-01**			**1.62E+01**		**1.06E+00**			**1.33E+01**	**8.66E-01**	

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-113
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
F101-GE-102 (B-1B)
Flow by Tracer

		Engine Mode																			
		Idle					Approach					Intermediate					Military					Afterburner (Zone 1)				
Flow Rate, dscfm		390036					1065678					1280338					1491164					1667881				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
			Detection		Detection			Detection		Detection			Detection		Detection			Detection		Detection			Detection		Detection	
Analyte	CAS Number	Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit	
Phenol [H]	108-95-2	2.56E-03		2.29E-03			5.55E-03		1.22E-03				6.52E-03		9.95E-04	ND		7.15E-03		9.13E-04	ND	4.15E-01		2.71E-02		
Dichloroethyl ether [H]	111-44-4		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
2-Chlorophenol	95-57-8		2.00E-03		1.79E-03	ND		4.63E-03		1.02E-03	ND		6.52E-03		9.95E-04	ND		7.15E-03		9.13E-04	ND		8.12E-02		5.30E-03	ND
1,3-Dichlorobenzene	541-73-1		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
1,4-Dichlorobenzene [H]	106-46-7		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
1,2-Dichlorobenzene	95-50-1		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
o-Cresol [H]	95-48-7		2.00E-03		1.79E-03	ND		4.63E-03		1.02E-03	ND		6.52E-03		9.95E-04	ND		7.15E-03		9.13E-04	ND		8.12E-02		5.30E-03	ND
bis(2-Chloroisopropyl) Ether	39638-32-9		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
N-Nitroso-di-n-propylamine	621-64-7		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
p-Cresol [H]	106-44-5		2.00E-03		1.79E-03	ND		4.63E-03		1.02E-03	ND		6.52E-03		9.95E-04	ND		7.15E-03		9.13E-04	ND		8.12E-02		5.30E-03	ND
Hexachloroethane [H]	67-72-1		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Nitrobenzene [H]	98-95-3		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Isophorone [H]	78-59-1		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
2-Nitrophenol	88-75-5		2.00E-03		1.79E-03	ND		4.63E-03		1.02E-03	ND		6.52E-03		9.95E-04	ND		7.15E-03		9.13E-04	ND		8.12E-02		5.30E-03	ND
2,4-Dimethylphenol	105-67-9		2.00E-03		1.79E-03	ND		4.63E-03		1.02E-03	ND		6.52E-03		9.95E-04	ND		7.15E-03		9.13E-04	ND		8.12E-02		5.30E-03	ND
Benzoic Acid	65-85-0	1.84E-02		1.65E-02			2.87E-02		6.34E-03			4.43E-02		6.75E-03			6.14E-02		7.85E-03			3.24E-01		2.12E-02	
bis(2-Chloroethoxy) Methane	111-91-1		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
2,4-Dichlorophenol	120-83-2		2.00E-03		1.79E-03	ND		4.63E-03		1.02E-03	ND		6.52E-03		9.95E-04	ND		7.15E-03		9.13E-04	ND		8.12E-02		5.30E-03	ND
1,2,4-Trichlorobenzene [H]	120-82-1		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Naphthalene [H]	91-20-3	2.00E-03		1.79E-03			0.00E+00		0.00E+00				1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND	1.94E+00		1.27E-01		
4-Chloroaniline	106-47-8		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Hexachlorobutadiene [H]	87-68-3		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
4-Chloro-3-methylphenol	59-50-7		2.00E-03		1.79E-03	ND		4.63E-03		1.02E-03	ND		6.52E-03		9.95E-04	ND		7.15E-03		9.13E-04	ND		8.12E-02		5.30E-03	ND
2-Methylnaphthalene	91-57-6	2.94E-04		2.63E-04				9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND	2.59E+00		1.69E-01		
Hexachlorocyclopentadiene [H]	77-47-4		4.02E-03		3.60E-03	ND		9.26E-03		2.04E-03	ND		1.30E-02		1.99E-03	ND		1.42E-02		1.82E-03	ND		1.62E-01		1.06E-02	ND
2,4,6-Trichlorophenol [H]	88-06-2		2.00E-03		1.79E-03	ND		4.63E-03		1.02E-03	ND		6.52E-03		9.95E-04	ND		7.15E-03		9.13E-04	ND		8.12E-02		5.30E-03	ND
2,4,5-Trichlorophenol [H]	95-95-4		2.00E-03		1.79E-03	ND		4.63E-03		1.02E-03	ND		6.52E-03		9.95E-04	ND		7.15E-03		9.13E-04	ND		8.12E-02		5.30E-03	ND
2-Chloronaphthalene	91-58-7		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
2-Nitroaniline	88-74-4		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Dimethylphthalate [H]	131-11-3		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Acenaphthylene	208-96-8		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
2,6-Dinitrotoluene	606-20-2		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
3-Nitroaniline	99-09-2		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Acenaphthene	83-32-9		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
2,4-Dinitrophenol [H]	51-28-5		8.04E-03		7.19E-03	ND		1.86E-02		4.10E-03	ND		2.60E-02		3.97E-03	ND		2.85E-02		3.64E-03	ND		3.24E-01		2.12E-02	ND
4-Nitrophenol [H]	100-02-7		4.02E-03		3.60E-03	ND		9.26E-03		2.04E-03	ND		1.30E-02		1.99E-03	ND		1.42E-02		1.82E-03	ND		1.62E-01		1.06E-02	ND
2,4-Dinitrotoluene [H]	121-14-2		4.02E-03		3.60E-03	ND		9.26E-03		2.04E-03	ND		1.30E-02		1.99E-03	ND		1.42E-02		1.82E-03	ND		1.62E-01		1.06E-02	ND
Dibenzofuran [H]	132-64-9		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND	5.35E-02		3.49E-03		
Diethylphthalate	84-66-2	8.72E-04		7.81E-04				9.26E-04		2.04E-04	ND	1.56E-03		2.38E-04				1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Fluorene	86-73-7		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
4-Chlorophenyl-phenyl Ether	7005-72-3		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
4-Nitroaniline	100-01-6		4.02E-03		3.60E-03	ND		9.26E-03		2.04E-03	ND		1.30E-02		1.99E-03	ND		1.42E-02		1.82E-03	ND		1.62E-01		1.06E-02	ND
4,6-Dinitro-2-methylphenol	534-52-1		8.04E-03		7.19E-03	ND		1.86E-02		4.10E-03	ND		2.60E-02		3.97E-03	ND		2.85E-02		3.64E-03	ND		3.24E-01		2.12E-02	ND
N-Nitrosodiphenylamine	86-30-6		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
4-Bromophenyl-phenyl Ether	101-55-3		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Hexachlorobenzene [H]	118-74-1		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Pentachlorophenol [H]	87-86-5		4.02E-03		3.60E-03	ND		9.26E-03		2.04E-03	ND		1.30E-02		1.99E-03	ND		1.42E-02		1.82E-03	ND		1.62E-01		1.06E-02	ND
Phenanthrene	85-01-8		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Anthracene	120-12-7		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
di-n-Butylphthalate [H]	84-74-2	1.88E-03		1.69E-03		B	0.00E+00		0.00E+00		B	2.73E-03		4.17E-04		B	0.00E+00		0.00E+00		B	1.62E-02		1.06E-03	ND
Fluoranthene	206-44-0		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Pyrene	129-00-0		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Butylbenzylphthalate	85-68-7	5.27E-04		4.72E-04		B	1.39E-03		3.06E-04		B	2.09E-03		3.18E-04		B		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
3,3'-Dichlorobenzidine [H]	91-94-1		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Chrysene	218-01-9		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Benzo(a)anthracene	56-55-3		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
bis(2-Ethylhexyl)phthalate [H]	117-81-7	6.43E-03		5.76E-03		B	6.87E-03		1.51E-03		B	9.40E-03		1.43E-03		B	8.55E-03		1.09E-03		B	1.62E-02		1.06E-03	ND
Di-n-Octylphthalate	117-84-0		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Benzo(b)fluoranthene	205-99-2		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Benzo(k)fluoranthene	207-08-9		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Benzo(a)pyrene	50-32-8		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Indeno(1,2,3-c,d)pyrene	193-39-5		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Benzo(g,h,i)perylene	191-24-2		4.02E-04		3.60E-04	ND		9.26E-04		2.04E-04	ND		1.30E-03		1.99E-04	ND		1.42E-03		1.82E-04	ND		1.62E-02		1.06E-03	ND
Benzyl alcohol	100-51-6		2.00E-03		1.79E-03	ND		4.63E-03		1.02E-03	ND		6.52E-03		9.95E-04	ND		7.15E-03		9.13E-04	ND		8.12E-02		5.30E-03	ND
HAP Total		1.29E-02		1.15E-02			1.24E-02		2.74E-03			1.21E-02		1.85E-03			8.55E-03		1.09E-03			2.41E+00		1.57E-01		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

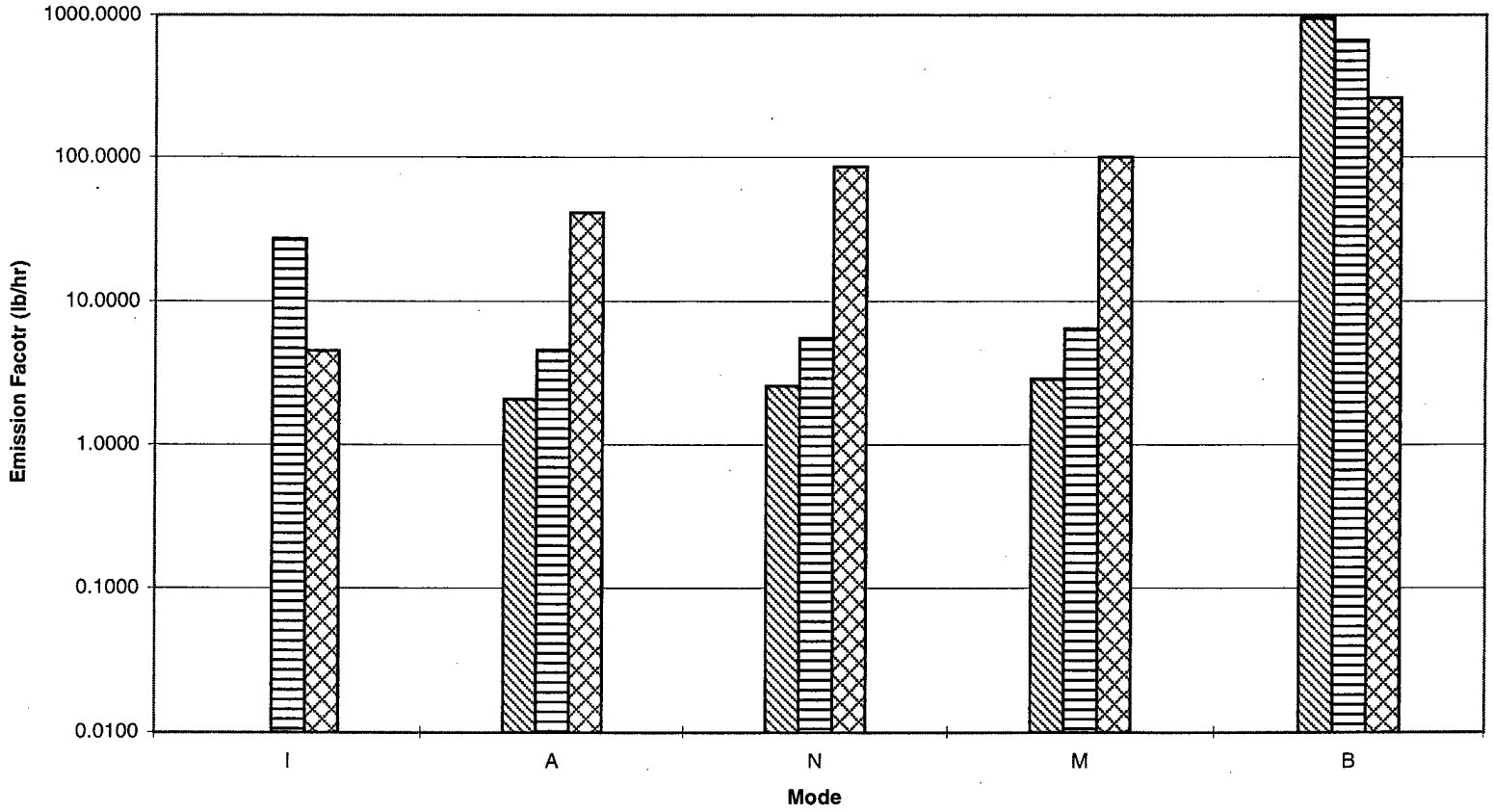
Table 4-114
Emissions Project Summary
Aldehydes/Ketones
F101-GE-102 (B-1B)
Flow by Tracer

		Engine Mode																			
		Idle					Approach					Intermediate					Military					Afterburner (Zone 1)				
Flow Rate, dscfm		390036					1065678					1280338					1491164					1667881				
Analyte	CAS Number	lb/hr Detected	Detection Limit	lbs/1,000 lbs Detected	Detection Limit		lb/hr Detected	Detection Limit	lbs/1,000 lbs Detected	Detection Limit		lb/hr Detected	Detection Limit	lbs/1,000 lbs Detected	Detection Limit		lb/hr Detected	Detection Limit	lbs/1,000 lbs Detected	Detection Limit		lb/hr Detected	Detection Limit	lbs/1,000 lbs Detected	Detection Limit	
Formaldehyde [H]	50-00-0	1.16E-01		1.04E-01			2.32E-02		5.12E-03			3.04E-02		4.64E-03			3.47E-02		4.44E-03			5.96E-01		3.89E-02		
Acetaldehyde [H]	75-07-0		4.46E-04		3.99E-04	ND		4.83E-04		1.07E-04	ND		6.91E-04		1.05E-04	ND		7.54E-04		9.63E-05	ND	2.71E-01		1.77E-02		
Acrolein [H]	107-02-8		4.46E-04		3.99E-04	ND		4.83E-04		1.07E-04	ND		6.91E-04		1.05E-04	ND		7.54E-04		9.63E-05	ND	1.26E+00		8.24E-02		
Acetone	67-64-1	3.04E-02		2.72E-02		B	1.74E-02		3.84E-03		B	3.31E-01		5.05E-02		B	1.46E-01		1.87E-02		B		1.62E-03		1.06E-04	ND
Crotonaldehyde	4170-30-3		4.46E-04		3.99E-04	ND		4.83E-04		1.07E-04	ND		6.91E-04		1.05E-04	ND		7.54E-04		9.63E-05	ND	5.50E-01		3.59E-02		
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3		4.46E-04		3.99E-04	ND		4.83E-04		1.07E-04	ND		6.91E-04		1.05E-04	ND		7.54E-04		9.63E-05	ND	2.27E-01		1.48E-02		
Benzaldehyde	100-52-7		4.46E-04		3.99E-04	ND		4.83E-04		1.07E-04	ND		6.91E-04		1.05E-04	ND	1.51E-02		1.93E-03			7.62E-01		4.98E-02		
Isopentanal (Isovaleraldehyde)	590-86-3		4.46E-04		3.99E-04	ND		4.83E-04		1.07E-04	ND		6.91E-04		1.05E-04	ND		7.54E-04		9.63E-05	ND		1.62E-03		1.06E-04	ND
Pentanal (Valeraldehyde)	110-62-3		4.46E-04		3.99E-04	ND		4.83E-04		1.07E-04	ND		6.91E-04		1.05E-04	ND		7.54E-04		9.63E-05	ND	1.78E-01		1.16E-02		
o-Tolualdehyde	529-20-4		4.46E-04		3.99E-04	ND		4.83E-04		1.07E-04	ND		6.91E-04		1.05E-04	ND		7.54E-04		9.63E-05	ND	1.29E-01		8.45E-03		
m-Tolualdehyde	620-23-5		4.46E-04		3.99E-04	ND		4.83E-04		1.07E-04	ND		6.91E-04		1.05E-04	ND		7.54E-04		9.63E-05	ND	2.27E-01		1.48E-02		
p-Tolualdehyde	104-87-0		4.46E-04		3.99E-04	ND		4.83E-04		1.07E-04	ND		6.91E-04		1.05E-04	ND		7.54E-04		9.63E-05	ND		1.62E-03		1.06E-04	ND
Hexanal (Hexaldehyde)	66-25-1		4.46E-04		3.99E-04	ND		4.83E-04		1.07E-04	ND		6.91E-04		1.05E-04	ND		7.54E-04		9.63E-05	ND	2.76E-01		1.80E-02		
HAP Total		1.16E-01		1.04E-01			2.32E-02		5.12E-03			3.04E-02		4.64E-03			3.47E-02		4.44E-03			2.36E+00		1.54E-01		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-11
F101-GE-102 (B-1B)
Emission Factors



THC for mode I is "Non-detect."

Table 4-115
Engine Operating Parameter Summary
F101-GE-102 (B-1B)

Parameter	Idle	Approach	Intermediate	Military	Afterburner (Zone 1)
Barometric pressure, in-Hg	28.25	28.38	28.47	28.51	28.54
Throttle position (PLA), degrees	19	41	50	59	79
Fuel flow, lbs/hr	1,117	4,533	6,557	7,828	15,314
Fan speed, rpm	3,262	6,172	6,799	7,030	7,475
Core speed, rpm	10,538	12,890	13,536	13,885	14,490
Cell temperature, deg. F	79	64	64	65	61
Average thrust, lbs	892	8,143	11,507	13,477	18,460
Percent maximum thrust	5	47	66	77	106

4.3.12 Engine F110-GE-100

Tracer gas was used to determine the flow rate at each power setting. The tracer gas methodology exhibited consistency between all engine power settings except afterburner. There was an increase in the exhaust flow rate when moving from the military to the afterburner power setting. However, the increase in the flow rate was less than expected. The flow measured at the afterburner power setting may be biased low due to excessive interference of ethylene with the tracer gas during FTIR analysis. Ethylene was measured to be approximately 10 ppm, whereas SF_6 was measured to be 150 ppb. Alternately, the exhaust volume may have exceeded the test cell capacity for this engine. This was explained previously in Section 4.3.7 for the T700-GE-700 helicopter engine.

During all three runs at the idle power setting, the NO_x analyzer experienced a zero calibration drift problem. The NO, NO_2, and NO_x results are biased high.

Tables 4-116 through 4-127 present engine results for the F110-GE-100 engine. Figure 4-12 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-128 summarizes the engine operating data collected during testing.

Table 4-116
Emissions Factor Summary
Gaseous Parameters
F110-GE-100 (F16 C/D)
Idle

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	320783		305459		311208			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO) [1]	2.40	2.16	2.14	1.93	2.18	1.97	2.24	2.02
Nitrogen Dioxide (NO_2) [1]	4.14	3.73	3.94	3.55	4.01	3.62	4.03	3.63
Nitrogen Oxides (NO_X) [1]	4.60	4.14	3.94	3.55	4.01	3.62	4.18	3.77
Carbon Monoxide (CO) [1]	26.58	23.97	26.64	24.02	27.14	24.48	26.79	24.16
Total Hydrocarbons (THC as CH_4)	1.70	1.53	0.93	0.84	0.79	0.71	1.14	1.03
Carbon Dioxide (CO_2)	4395	3963	4185	3774	4051	3653	4211	3797

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 4 of this volume.

Table 4-117
Emissions Factor Summary
Gaseous Parameters
F110-GE-100 (F16 C/D)
Approach

Flow by Tracer

	Run Number								Average	
	1		2		3					
Flow Rate, dscfm	1080116		1041068		1064411					
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	30.28	5.98	30.16	5.93	29.34	5.77		29.93	5.89
Nitrogen Dioxide (NO_2)	13.93	2.75	13.42	2.64	13.73	2.70		13.69	2.70
Nitrogen Oxides (NO_X)	50.30	9.93	49.22	9.68	49.56	9.74		49.69	9.78
Carbon Monoxide (CO)	28.26	5.58	27.24	5.36	32.49	6.39		29.33	5.78
Total Hydrocarbons (THC as CH_4)	1.12	0.22	0.61	0.12	2.17	0.43	ND	1.30	0.26
Carbon Dioxide (CO_2)	14629	2888	14100	2774	14329	2816		14353	2826

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-118
Emissions Factor Summary
Gaseous Parameters
F110-GE-100 (F16 C/D)
Intermediate

Flow by Tracer

	Run Number										Average	
	1			2			3					
Flow Rate, dscfm	1355147			1328044			1363494					
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel			lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	76.62	10.25		75.71	10.32		79.64	10.93			77.32	10.50
Nitrogen Dioxide (NO_2)	15.53	2.08		15.22	2.07		15.63	2.14			15.46	2.10
Nitrogen Oxides (NO_X)	121.35	16.23		121.78	16.60		128.94	17.69			124.02	16.84
Carbon Monoxide (CO)	17.73	2.37		34.75	4.74		23.79	3.26			25.42	3.46
Total Hydrocarbons (THC as CH_4)	0.69	0.09		2.68	0.37	ND	2.75	0.38		ND	2.04	0.28
Carbon Dioxide (CO_2)	23739	3175		23219	3165		23848	3272			23602	3204

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-119
Emissions Factor Summary
Gaseous Parameters
F110-GE-100 (F16 C/D)
Military

Flow by Tracer

	Run Number								Average	
	1		2		3					
Flow Rate, dscfm	1516032		1428004		1449829					
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	218.89	19.10	207.52	18.30	211.37	18.79		212.59	18.73
Nitrogen Dioxide (NO_2)	16.29	1.42	16.37	1.44	17.66	1.57		16.77	1.48
Nitrogen Oxides (NO_X)	337.77	29.48	322.25	28.41	328.21	29.17		329.41	29.02
Carbon Monoxide (CO)	46.28	4.04	43.59	3.84	25.29	2.25		38.39	3.38
Total Hydrocarbons (THC as CH_4)	1.96	0.17	0.77	0.07	2.93	0.26	ND	1.89	0.17
Carbon Dioxide (CO_2)	37027	3232	34916	3079	35440	3150		35794	3153

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-120
Emissions Factor Summary
Gaseous Parameters
F110-GE-100 (F16 C/D)
Afterburner

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm [1]	1651796		1470502		1357918			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	144.33	7.81	118.87	6.64	111.67	6.25	124.96	6.90
Nitrogen Dioxide (NO_2)	53.25	2.88	67.42	3.76	71.01	3.97	63.89	3.54
Nitrogen Oxides (NO_X)	276.90	14.99	251.77	14.06	245.14	13.71	257.94	14.25
Carbon Monoxide (CO)	1486.88	80.49	1134.49	63.34	1036.38	57.96	1219.25	67.27
Total Hydrocarbons (THC as CH_4)	553.01	29.94	438.95	24.51	385.10	21.54	459.02	25.33
Carbon Dioxide (CO_2)	51464	2786	45924	2564	42435	2373	46608	2574

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 3 of this volume.

Table 4-121
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F110-GE-100 (F-16 C/D)
Idle
Flow by Tracer

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		320783					305459					311208					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	6.97E-04		6.28E-04				5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	6.31E-04	5.69E-04
Vinyl Chloride [H]	75-01-4		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Bromomethane [H]	74-83-9		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Chloroethane [H]	75-00-3		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	2.79E-03		2.51E-03		bb	5.68E-03		5.12E-03		J,bb	5.69E-03		5.13E-03		bb	4.72E-03	4.25E-03
1,1-Dichloroethene [H]	75-35-4		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	1.59E-02		1.43E-02		bb	2.61E-02		2.35E-02		J,bb	1.75E-02		1.58E-02		bb	1.98E-02	1.79E-02
1,1-Dichloroethane [H]	75-34-3		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Chloroform [H]	67-66-3		6.33E-04		5.71E-04	ND	2.25E-03		2.03E-03		J	3.70E-03		3.33E-03			2.19E-03	1.98E-03
1,1,1-Trichloroethane [H]	71-55-6		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Benzene [H]	71-43-2	3.48E-02		3.14E-02			3.02E-02		2.72E-02		J	3.26E-02		2.94E-02			3.26E-02	2.94E-02
1,2-Dichloroethane [H]	107-06-2		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Toluene [H]	108-88-3	1.45E-02		1.31E-02			1.12E-02		1.01E-02		J	1.09E-02		9.82E-03			1.22E-02	1.10E-02
cis-1,3-Dichloropropene [H]	10061-01-5		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4	2.54E-03		2.29E-03			1.83E-03		1.65E-03		J	2.30E-03		2.07E-03			2.22E-03	2.00E-03
m,p-Xylene [H]	1330-20-7	3.48E-03		3.14E-03			2.84E-03		2.56E-03		J	3.15E-03		2.84E-03			3.16E-03	2.85E-03
o-Xylene [H]	95-47-6	1.65E-03		1.48E-03			1.42E-03		1.28E-03		J	1.52E-03		1.37E-03			1.53E-03	1.38E-03
Styrene [H]	100-42-5	4.11E-03		3.71E-03			3.96E-03		3.57E-03		J	4.23E-03		3.82E-03			4.10E-03	3.70E-03
1,1,2,2-Tetrachloroethane [H]	79-34-5		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Acetone	67-64-1	3.64E-01		3.28E-01		J	4.97E-02		4.48E-02		J	4.42E-02		3.98E-02			1.52E-01	1.37E-01
Carbon Disulfide [H]	75-15-0		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		3.16E-03		2.85E-03	ND		2.96E-03		2.67E-03	ND		3.02E-03		2.72E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	5.25E-03		4.74E-03			4.97E-03		4.48E-03		J	4.59E-03		4.14E-03			4.94E-03	4.45E-03
Bromodichloromethane	75-27-4		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		3.16E-03		2.85E-03	ND		2.96E-03		2.67E-03	ND		3.02E-03		2.72E-03	ND	ND	ND
2-Hexanone	591-78-6		3.16E-03		2.85E-03	ND		2.96E-03		2.67E-03	ND		3.02E-03		2.72E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
Bromoform [H]	75-25-2		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		6.33E-04		5.71E-04	ND		5.92E-04		5.33E-04	ND		6.05E-04		5.46E-04	ND	ND	ND
HAP Total		**8.30E-02**		**7.48E-02**			**8.48E-02**		**7.65E-02**			**8.05E-02**		**7.26E-02**			**8.34E-02**	**7.52E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-122
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F110-GE-100 (F16 C/D)
Approach
Flow by Tracer

		Run Number													
		1					2					3					Average	
Flow Rate, dscfm		1080116					1041068					1064411						
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel				
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND	2.27E-03		4.47E-04		J	2.13E-03	4.19E-04
Vinyl Chloride [H]	75-01-4		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Bromomethane [H]	74-83-9		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Chloroethane [H]	75-00-3		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	2.49E-02		4.92E-03		bb	2.85E-02		5.61E-03		bb	2.48E-02		4.87E-03		J,bb	2.61E-02	5.13E-03
1,1-Dichloroethene [H]	75-35-4		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	6.23E-02		1.23E-02		bb	6.79E-02		1.33E-02		bb	4.59E-02		9.01E-03		J,bb	5.87E-02	1.16E-02
1,1-Dichloroethane [H]	75-34-3		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Chloroform [H]	67-66-3	9.99E-03		1.97E-03			1.06E-02		2.08E-03			9.09E-03		1.79E-03		J	9.88E-03	1.95E-03
1,1,1-Trichloroethane [H]	71-55-6		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND	2.07E-03		4.07E-04		J	2.06E-03	4.06E-04
Carbon Tetrachloride [H]	56-23-5		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Benzene [H]	71-43-2	7.69E-03		1.52E-03			6.90E-03		1.36E-03			1.24E-02		2.44E-03		J	9.00E-03	1.77E-03
1,2-Dichloroethane [H]	107-06-2		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Toluene [H]	108-88-3	9.99E-03		1.97E-03			4.06E-03		7.98E-04			6.42E-03		1.26E-03		J	6.82E-03	1.34E-03
cis-1,3-Dichloropropene [H]	10061-01-5		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4	2.49E-03		4.92E-04				2.04E-03		4.00E-04	ND	2.48E-03		4.87E-04		J	2.34E-03	4.60E-04
m,p-Xylene [H]	1330-20-7	6.43E-03		1.27E-03			2.44E-03		4.80E-04			3.72E-03		7.31E-04		J	4.20E-03	8.27E-04
o-Xylene [H]	95-47-6	2.49E-03		4.92E-04				2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	2.20E-03	4.33E-04
Styrene [H]	100-42-5		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND	2.48E-03		4.87E-04		J	2.20E-03	4.33E-04
1,1,2,2-Tetrachloroethane [H]	79-34-5		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Acetone	67-64-1	2.02E-01		3.99E-02		J	1.79E-01		3.52E-02		J	1.81E-01		3.56E-02		J	1.87E-01	3.69E-02
Carbon Disulfide [H]	75-15-0		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.04E-02		2.05E-03	ND		1.02E-02		2.00E-03	ND		1.03E-02		2.03E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		1.04E-02		2.05E-03	ND		1.02E-02		2.00E-03	ND		1.03E-02		2.03E-03	ND	ND	ND
Bromodichloromethane	75-27-4		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.04E-02		2.05E-03	ND		1.02E-02		2.00E-03	ND		1.03E-02		2.03E-03	ND	ND	ND
2-Hexanone	591-78-6		1.04E-02		2.05E-03	ND		1.02E-02		2.00E-03	ND		1.03E-02		2.03E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
Bromoform [H]	75-25-2		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		2.08E-03		4.11E-04	ND		2.04E-03		4.00E-04	ND		2.07E-03		4.07E-04	ND	ND	ND
HAP Total		**1.01E-01**		**2.00E-02**			**9.18E-02**		**1.81E-02**			**8.68E-02**		**1.71E-02**			**9.95E-02**	**1.96E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-123
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F110-GE-100 (F16 C/D)
Intermediate
Flow by Tracer

		Run Number																	
		1					2					3					Average		
Flow Rate, dscfm		1355147					1328044					1363494							
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel					
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel	
Chloromethane [H]	74-87-3		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Vinyl Chloride [H]	75-01-4		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Bromomethane [H]	74-83-9		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Chloroethane [H]	75-00-3		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Freon 11 (Trichlorofluoromethane)	75-69-4	3.78E-02		5.05E-03		bb	4.95E-02		6.75E-03			4.31E-02		5.91E-03		bb	4.34E-02	5.90E-03	
1,1-Dichloroethene [H]	75-35-4		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Methylene Chloride [H]	75-09-2	1.65E-01		2.21E-02		bb	2.04E-01		2.79E-02			1.57E-01		2.15E-02		bb	1.76E-01	2.38E-02	
1,1-Dichloroethane [H]	75-34-3		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Chloroform [H]	67-66-3		2.70E-03		3.61E-04	ND	1.35E-02		1.84E-03			1.13E-02		1.55E-03			9.16E-03	1.25E-03	
1,1,1-Trichloroethane [H]	71-55-6		2.70E-03		3.61E-04	ND	3.02E-03		4.12E-04			3.23E-03		4.44E-04			2.99E-03	4.06E-04	
Carbon Tetrachloride [H]	56-23-5		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Benzene [H]	71-43-2	5.69E-03		7.61E-04			8.26E-03		1.13E-03			2.10E-02		2.88E-03			1.16E-02	1.59E-03	
1,2-Dichloroethane [H]	107-06-2		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Trichloroethene [H]	79-01-6		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
1,2-Dichloropropane [H]	78-87-5		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
trans-1,3-Dichloropropene [H]	10061-02-6		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Toluene [H]	108-88-3	8.63E-03		1.15E-03			1.24E-02		1.69E-03			2.07E-02		2.84E-03			1.39E-02	1.90E-03	
cis-1,3-Dichloropropene [H]	10061-01-5		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
1,1,2-Trichloroethane [H]	79-00-5		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Tetrachloroethene [H]	127-18-4		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Chlorobenzene [H]	108-90-7		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Ethyl Benzene [H]	100-41-4		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND	5.36E-03		7.36E-04			3.60E-03	4.91E-04	
m,p-Xylene [H]	1330-20-7	4.59E-03		6.14E-04			4.95E-03		6.75E-04			1.18E-02		1.63E-03			7.13E-03	9.71E-04	
o-Xylene [H]	95-47-6		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND	0.00E+00		0.00E+00			1.82E-03	2.45E-04	
Styrene [H]	100-42-5		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND	8.07E-03		1.11E-03			4.51E-03	6.14E-04	
1,1,2,2-Tetrachloroethane [H]	79-34-5		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Acetone	67-64-1	4.10E-01		5.48E-02		J	4.78E-01		6.51E-02		J	1.58E-01		2.17E-02			3.48E-01	4.72E-02	
Carbon Disulfide [H]	75-15-0		2.70E-03		3.61E-04	ND	2.75E-03		3.75E-04				2.69E-03		3.69E-04	ND	2.71E-03	3.68E-04	
trans-1,2-Dichloroethene	156-60-5		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Vinyl Acetate [H]	108-05-4		1.35E-02		1.81E-03	ND		1.37E-02		1.87E-03	ND		1.35E-02		1.85E-03	ND	ND	ND	
2-Butanone (MEK) [H]	78-93-3		1.35E-02		1.81E-03	ND		1.37E-02		1.87E-03	ND		1.35E-02		1.85E-03	ND	ND	ND	
Bromodichloromethane	75-27-4		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.35E-02		1.81E-03	ND		1.37E-02		1.87E-03	ND		1.35E-02		1.85E-03	ND	ND	ND	
2-Hexanone	591-78-6		1.35E-02		1.81E-03	ND		1.37E-02		1.87E-03	ND		1.35E-02		1.85E-03	ND	ND	ND	
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
Bromoform [H]	75-25-2		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
cis-1,2-Dichloroethene	156-59-2		2.70E-03		3.61E-04	ND		2.75E-03		3.75E-04	ND		2.69E-03		3.69E-04	ND	ND	ND	
HAP Total		**1.84E-01**		**2.47E-02**			**2.49E-01**		**3.40E-02**			**2.38E-01**		**3.27E-02**			**2.33E-01**	**3.17E-02**	

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-124
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F110-GE-100 (F-16 C/D)
Military
Flow by Tracer

		Run Number															
		1					2					3				Average	
Flow Rate, dscfm		1516032					1428004					1449829					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND	3.35E-03		2.98E-04		3.02E-03	2.66E-04
Vinyl Chloride [H]	75-01-4	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Bromomethane [H]	74-83-9	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Chloroethane [H]	75-00-3	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Freon 11 (Trichlorofluoromethane)	75-69-4	5.41E-02		4.72E-03		J	8.13E-02		7.17E-03		J	5.87E-02		5.21E-03			6.47E-02	5.70E-03
1,1-Dichloroethene [H]	75-35-4	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Methylene Chloride [H]	75-09-2	1.98E-01		1.73E-02		J,bb	3.53E-01		3.11E-02		J	3.07E-01		2.73E-02			2.86E-01	2.53E-02
1,1-Dichloroethane [H]	75-34-3	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Chloroform [H]	67-66-3	1.17E-02		1.02E-03		J	1.52E-02		1.34E-03		J	1.03E-02		9.17E-04		bb	1.24E-02	1.09E-03
1,1,1-Trichloroethane [H]	71-55-6	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Carbon Tetrachloride [H]	56-23-5	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Benzene [H]	71-43-2	5.74E-03		5.01E-04		J	3.26E-02		2.87E-03		J	1.65E-02		1.47E-03			1.83E-02	1.61E-03
1,2-Dichloroethane [H]	107-06-2	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Trichloroethene [H]	79-01-6	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
1,2-Dichloropropane [H]	78-87-5	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
trans-1,3-Dichloropropene [H]	10061-02-6	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Toluene [H]	108-88-3	3.00E-03		2.62E-04		UJ	1.33E-02		1.17E-03		J	8.96E-03		7.96E-04			8.43E-03	7.44E-04
cis-1,3-Dichloropropene [H]	10061-01-5	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
1,1,2-Trichloroethane [H]	79-00-5	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Tetrachloroethene [H]	127-18-4	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Chlorobenzene [H]	108-90-7	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Ethyl Benzene [H]	100-41-4	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
m,p-Xylene [H]	1330-20-7	3.00E-03		2.62E-04		UJ	4.34E-03		3.83E-04		J	4.19E-03		3.73E-04			3.85E-03	3.39E-04
o-Xylene [H]	95-47-6	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Styrene [H]	100-42-5	3.00E-03		2.62E-04		UJ	4.62E-03		4.07E-04		J		2.79E-03		2.48E-04	ND	3.47E-03	3.06E-04
1,1,2,2-Tetrachloroethane [H]	79-34-5	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Acetone	67-64-1	3.36E-01		2.93E-02		J	2.41E-01		2.12E-02		J	1.38E-01		1.23E-02		J	2.38E-01	2.09E-02
Carbon Disulfide [H]	75-15-0	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
trans-1,2-Dichloroethene	156-60-5	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Vinyl Acetate [H]	108-05-4	1.50E-02		1.31E-03		UJ		1.36E-02		1.20E-03	ND		1.40E-02		1.24E-03	ND	1.42E-02	1.25E-03
2-Butanone (MEK) [H]	78-93-3	1.50E-02		1.31E-03		UJ		1.36E-02		1.20E-03	ND		1.40E-02		1.24E-03	ND	1.42E-02	1.25E-03
Bromodichloromethane	75-27-4	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	1.50E-02		1.31E-03		UJ		1.36E-02		1.20E-03	ND		1.40E-02		1.24E-03	ND	1.42E-02	1.25E-03
2-Hexanone	591-78-6	1.50E-02		1.31E-03		UJ		1.36E-02		1.20E-03	ND		1.40E-02		1.24E-03	ND	1.42E-02	1.25E-03
Dibromochloromethane (Chlorodibromomethane)	124-48-1	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
Bromoform [H]	75-25-2	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
cis-1,2-Dichloroethene	156-59-2	3.00E-03		2.62E-04		UJ		2.71E-03		2.39E-04	ND		2.79E-03		2.48E-04	ND	2.84E-03	2.50E-04
HAP Total		**3.36E-01**		**2.93E-02**			**4.23E-01**		**3.73E-02**			**3.51E-01**		**3.12E-02**			**4.27E-01**	**3.76E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-125
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F110-GE-100 (F16 C/D)
Afterburner (Zone 1)
Flow by Tracer

		Run Number													
		1				2				3				Average	
Flow Rate, dscfm [1]		1651796				1470502				1357918					
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	1.01E-02		5.49E-04	J	1.37E-02		7.66E-04	J	7.63E-02		4.27E-03	UJ	3.34E-02	1.86E-03
Vinyl Chloride [H]	75-01-4	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
Bromomethane [H]	74-83-9	9.53E-03		5.16E-04	J	8.48E-03		4.74E-04	J		7.63E-02		4.27E-03 ND	3.14E-02	1.75E-03
Chloroethane [H]	75-00-3	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
Freon 11 (Trichlorofluoromethane)	75-69-4	1.40E-01		7.57E-03	J	1.14E-01		6.37E-03	J	3.68E-01		2.06E-02		2.07E-01	1.15E-02
1,1-Dichloroethene [H]	75-35-4	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
Methylene Chloride [H]	75-09-2	5.40E-01		2.92E-02	J	4.67E-01		2.61E-02	J	1.05E+00		5.89E-02		6.87E-01	3.81E-02
1,1-Dichloroethane [H]	75-34-3	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
Chloroform [H]	67-66-3	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
1,1,1-Trichloroethane [H]	71-55-6	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
Carbon Tetrachloride [H]	56-23-5	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
Benzene [H]	71-43-2	2.51E+00		1.36E-01	J	1.87E+00		1.04E-01	J	5.80E+00		3.24E-01		3.39E+00	1.88E-01
1,2-Dichloroethane [H]	107-06-2	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
Trichloroethene [H]	79-01-6	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
1,2-Dichloropropane [H]	78-87-5	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
trans-1,3-Dichloropropene [H]	10061-02-6	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ	7.63E-02		4.27E-03	UJ	2.75E-02	1.53E-03
Toluene [H]	108-88-3	3.01E+00		1.63E-01	J	2.13E+00		1.19E-01	J	2.47E+00		1.38E-01		2.54E+00	1.40E-01
cis-1,3-Dichloropropene [H]	10061-01-5	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
1,1,2-Trichloroethane [H]	79-00-5	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
Tetrachloroethene [H]	127-18-4	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
Chlorobenzene [H]	108-90-7	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
Ethyl Benzene [H]	100-41-4	1.14E+00		6.20E-02	J	7.60E-01		4.24E-02	J	5.24E-01		2.93E-02		8.10E-01	4.46E-02
m,p-Xylene [H]	1330-20-7	1.55E+00		8.41E-02	J	1.05E+00		5.87E-02	J	6.82E-01		3.81E-02		1.10E+00	6.03E-02
o-Xylene [H]	95-47-6	7.30E-01		3.95E-02	J	4.96E-01		2.77E-02	J	3.15E-01		1.76E-02		5.14E-01	2.83E-02
Styrene [H]	100-42-5	1.46E-01		7.91E-03	J	6.44E-02		3.60E-03	J	9.97E-02		5.58E-03		1.03E-01	5.69E-03
1,1,2,2-Tetrachloroethane [H]	79-34-5	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
Acetone	67-64-1	2.55E+00		1.38E-01	J	1.15E+00		6.44E-02	J	1.17E+00		6.52E-02		1.62E+00	8.92E-02
Carbon Disulfide [H]	75-15-0	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
trans-1,2-Dichloroethene	156-60-5	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
Vinyl Acetate [H]	108-05-4	1.58E-02		8.58E-04	UJ	1.46E-02		8.15E-04	UJ	3.68E-01		2.06E-02	UJ	1.33E-01	7.41E-03
2-Butanone (MEK) [H]	78-93-3	7.61E-01		4.12E-02	J	4.96E-01		2.77E-02	J	6.31E-01		3.53E-02		6.29E-01	3.47E-02
Bromodichloromethane	75-27-4	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	1.58E-02		8.58E-04	UJ	1.46E-02		8.15E-04	UJ		3.68E-01		2.06E-02 ND	1.33E-01	7.41E-03
2-Hexanone	591-78-6	1.58E-02		8.58E-04	UJ	1.46E-02		8.15E-04	UJ		3.68E-01		2.06E-02 ND	1.33E-01	7.41E-03
Dibromochloromethane (Chlorodibromomethane)	124-48-1	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
Bromoform [H]	75-25-2	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
cis-1,2-Dichloroethene	156-59-2	3.17E-03		1.72E-04	UJ	2.92E-03		1.63E-04	UJ		7.63E-02		4.27E-03 ND	2.75E-02	1.53E-03
HAP Total		**1.05E+01**		**5.69E-01**		**7.44E+00**		**4.15E-01**		**1.21E+01**		**6.76E-01**		**1.05E+01**	**5.79E-01**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 3 of this volume.

Table 4-126
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
F110-GE-100 (F-16 C/D)
Flow by Tracer

		Engine Mode																					
		Idle					Approach					Intermediate					Military					Afterburner (Zone 1)[1]				
Flow Rate, dscfm		312424					1060895					1349638					1462603					1483825				
		lb/hr		lbs/1,000			lb/hr		lbs/1,000			lb/hr		lbs/1,000			lb/hr		lbs/1,000			lb/hr		lbs/1,000		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Phenol [H]	108-95-2	3.28E-03		2.95E-03				4.97E-03		9.78E-04	ND		6.88E-03		9.38E-04	ND		7.34E-03		6.46E-04	ND	1.02E+00		5.65E-02		
Dichloroethyl ether [H]	111-44-4		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
2-Chlorophenol	95-57-8		1.95E-03		1.76E-03	ND		4.97E-03		9.78E-04	ND		6.88E-03		9.38E-04	ND		7.34E-03		6.46E-04	ND		8.78E-02		4.86E-03	ND
1,3-Dichlorobenzene	541-73-1		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
1,4-Dichlorobenzene [H]	106-46-7		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
1,2-Dichlorobenzene	95-50-1		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
o-Cresol [H]	95-48-7		1.95E-03		1.76E-03	ND		4.97E-03		9.78E-04	ND		6.88E-03		9.38E-04	ND		7.34E-03		6.46E-04	ND		8.78E-02		4.86E-03	ND
bis(2-Chloroisopropyl) Ether	39638-32-9		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
N-Nitroso-di-n-propylamine	621-64-7		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
p-Cresol [H]	106-44-5		1.95E-03		1.76E-03	ND		4.97E-03		9.78E-04	ND		6.88E-03		9.38E-04	ND		7.34E-03		6.46E-04	ND	2.11E-01		1.17E-02		
Hexachloroethane [H]	67-72-1		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Nitrobenzene [H]	98-95-3		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Isophorone [H]	78-59-1		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
2-Nitrophenol	88-75-5		1.95E-03		1.76E-03	ND		4.97E-03		9.78E-04	ND		6.88E-03		9.38E-04	ND		7.34E-03		6.46E-04	ND	5.11E-01		2.82E-02		
2,4-Dimethylphenol	105-67-9		1.95E-03		1.76E-03	ND		4.97E-03		9.78E-04	ND		6.88E-03		9.38E-04	ND		7.34E-03		6.46E-04	ND		8.78E-02		4.86E-03	ND
Benzoic Acid	65-85-0	1.84E-02		1.66E-02			4.69E-02		9.23E-03			7.28E-02		9.93E-03			6.47E-02		5.69E-03			2.47E+00		1.36E-01		
bis(2-Chloroethoxy) Methane	111-91-1		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
2,4-Dichlorophenol	120-83-2		1.95E-03		1.76E-03	ND		4.97E-03		9.78E-04	ND		6.88E-03		9.38E-04	ND		7.34E-03		6.46E-04	ND		8.78E-02		4.86E-03	ND
1,2,4-Trichlorobenzene [H]	120-82-1		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Naphthalene [H]	91-20-3	2.68E-03		2.42E-03			0.00E+00		0.00E+00			0.00E+00		0.00E+00			3.76E-03		3.31E-04			1.76E+00		9.72E-02		
4-Chloroaniline	106-47-8		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Hexachlorobutadiene [H]	87-68-3		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
4-Chloro-3-methylphenol	59-50-7		1.95E-03		1.76E-03	ND		4.97E-03		9.78E-04	ND		6.88E-03		9.38E-04	ND		7.34E-03		6.46E-04	ND		8.78E-02		4.86E-03	ND
2-Methylnaphthalene	91-57-6	1.76E-04		1.58E-04			0.00E+00		0.00E+00			2.63E-04		3.59E-05			1.35E-03		1.19E-04			9.32E-01		5.15E-02		
Hexachlorocyclopentadiene [H]	77-47-4		7.79E-03		7.03E-03	ND		1.99E-02		3.92E-03	ND		2.75E-02		3.74E-03	ND		2.94E-02		2.59E-03	ND		3.52E-01		1.95E-02	ND
2,4,6-Trichlorophenol [H]	88-06-2		1.95E-03		1.76E-03	ND		4.97E-03		9.78E-04	ND		6.88E-03		9.38E-04	ND		7.34E-03		6.46E-04	ND		8.78E-02		4.86E-03	ND
2,4,5-Trichlorophenol [H]	95-95-4		1.95E-03		1.76E-03	ND		4.97E-03		9.78E-04	ND		6.88E-03		9.38E-04	ND		7.34E-03		6.46E-04	ND		8.78E-02		4.86E-03	ND
2-Chloronaphthalene	91-58-7		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
2-Nitroaniline	88-74-4		3.90E-03		3.51E-03	ND		9.94E-03		1.96E-03	ND		1.37E-02		1.87E-03	ND		1.47E-02		1.29E-03	ND		1.76E-01		9.74E-03	ND
Dimethylphthalate [H]	131-11-3		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Acenaphthylene	208-96-8		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
2,6-Dinitrotoluene	606-20-2		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
3-Nitroaniline	99-09-2		3.90E-03		3.51E-03	ND		9.94E-03		1.96E-03	ND		1.37E-02		1.87E-03	ND		1.47E-02		1.29E-03	ND		1.76E-01		9.74E-03	ND
Acenaphthene	83-32-9		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
2,4-Dinitrophenol [H]	51-28-5		7.79E-03		7.03E-03	ND		1.99E-02		3.92E-03	ND		2.75E-02		3.74E-03	ND		2.94E-02		2.59E-03	ND		3.52E-01		1.95E-02	ND
4-Nitrophenol [H]	100-02-7		7.79E-03		7.03E-03	ND		1.99E-02		3.92E-03	ND		2.75E-02		3.74E-03	ND		2.94E-02		2.59E-03	ND	5.84E-01		3.23E-02		
2,4-Dinitrotoluene [H]	121-14-2		3.90E-03		3.51E-03	ND		9.94E-03		1.96E-03	ND		1.37E-02		1.87E-03	ND		1.47E-02		1.29E-03	ND		1.76E-01		9.74E-03	ND
Dibenzofuran [H]	132-64-9		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND	2.29E-02		1.27E-03		
Diethylphthalate	84-66-2	1.51E-03		1.36E-03			2.24E-03		4.40E-04			2.96E-03		4.04E-04			1.22E-03		1.07E-04		J		1.76E-02		9.74E-04	ND
Fluorene	86-73-7		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
4-Chlorophenyl-phenyl Ether	7005-72-3		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
4-Nitroaniline	100-01-6		3.90E-03		3.51E-03	ND		9.94E-03		1.96E-03	ND		1.37E-02		1.87E-03	ND		1.47E-02		1.29E-03	ND		1.76E-01		9.74E-03	ND
4,6-Dinitro-2-methylphenol	534-52-1		7.79E-03		7.03E-03	ND		1.99E-02		3.92E-03	ND		2.75E-02		3.74E-03	ND		2.94E-02		2.59E-03	ND		3.52E-01		1.95E-02	ND
N-Nitrosodiphenylamine	86-30-6		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
4-Bromophenyl-phenyl Ether	101-55-3		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Hexachlorobenzene [H]	118-74-1		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Pentachlorophenol [H]	87-86-5		7.79E-03		7.03E-03	ND		1.99E-02		3.92E-03	ND		2.75E-02		3.74E-03	ND		2.94E-02		2.59E-03	ND		3.52E-01		1.95E-02	ND
Phenanthrene	85-01-8		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Anthracene	120-12-7		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
di-n-Butylphthalate [H]	84-74-2	0.00E+00		0.00E+00		B	0.00E+00		0.00E+00		B	6.32E-03		8.62E-04		B	0.00E+00		0.00E+00		B		1.76E-02		9.74E-04	ND
Fluoranthene	206-44-0		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Pyrene	129-00-0		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Butylbenzylphthalate	85-68-7	0.00E+00		0.00E+00		B		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
3,3-Dichlorobenzidine [H]	91-94-1		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Chrysene	218-01-9		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Benzo(a)anthracene	56-55-3		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
bis(2-Ethylhexyl)phthalate [H]	117-81-7	0.00E+00		0.00E+00		B	0.00E+00		0.00E+00		B	1.85E-02		2.52E-03		B	0.00E+00		0.00E+00		B		1.76E-02		9.74E-04	ND
Di-n-Octylphthalate	117-84-0	4.68E-04		4.22E-04				9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Benzo(b)fluoranthene	205-99-2		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Benzo(k)fluoranthene	207-08-9		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Benzo(a)pyrene	50-32-8		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Indeno(1,2,3-c,d)pyrene	193-39-5		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Benzo(g,h,i)perylene	191-24-2		3.90E-04		3.51E-04	ND		9.94E-04		1.96E-04	ND		1.37E-03		1.87E-04	ND		1.47E-03		1.29E-04	ND		1.76E-02		9.74E-04	ND
Benzyl alcohol	100-51-6		1.95E-03		1.76E-03	ND		4.97E-03		9.78E-04	ND		6.88E-03		9.38E-04	ND		7.34E-03		6.46E-04	ND		8.78E-02		4.86E-03	ND
HAP Total		5.96E-03		5.37E-03			0.00E+00		0.00E+00			2.48E-02		3.39E-03			3.76E-03		3.31E-04			3.02E+00		1.67E-01		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.

B - Compound present in the laboratory blank greater than reporting limit.

J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.

H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 3 of this volume.

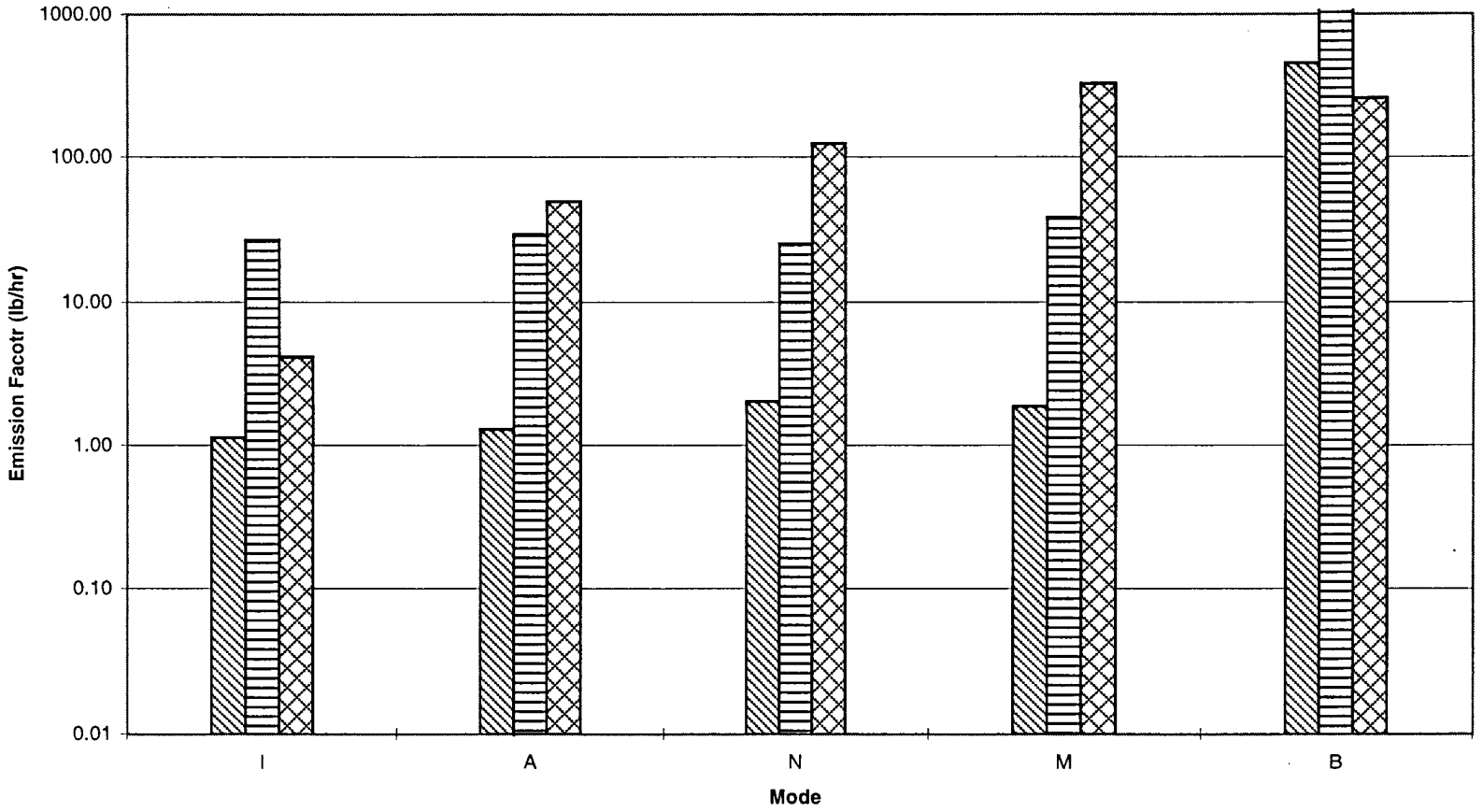
Table 4-127
Emissions Factor Summary
Aldehydes/Ketones
F110-GE-100 (F-16 C/D)
Flow by Tracer

		Engine Mode																			
		Idle					Approach					Intermediate					Military					Afterburner (Zone 1)[1]				
Flow Rate, dscfm		312424					1060895					1349638					1462603					1483825				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs			lb/hr		lbs/1,000 lbs		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Formaldehyde [H]	50-00-0	1.12E-01		1.01E-01		B	5.09E-02		1.00E-02		B	1.42E-01		1.94E-02		B	1.74E-01		1.53E-02		B	2.76E-01		1.52E-02		B
Acetaldehyde [H]	75-07-0	7.36E-03		6.64E-03				4.89E-04		9.63E-05	ND	1.21E-03		1.65E-04			1.64E-03		1.45E-04			2.24E-01		1.24E-02		
Acrolein [H]	107-02-8		9.69E-04		8.74E-04	ND		4.89E-04		9.63E-05	ND		7.08E-04		9.65E-05	ND		1.45E-03		1.28E-04	ND	7.06E-01		3.90E-02		
Acetone	67-64-1		9.69E-04		8.74E-04	ND	3.52E-02		6.93E-03		B	2.27E-01		3.10E-02		B	1.38E-01		1.22E-02		B	1.72E+00		9.53E-02		B
Crotonaldehyde	4170-30-3		9.69E-04		8.74E-04	ND		4.89E-04		9.63E-05	ND		7.08E-04		9.65E-05	ND		1.45E-03		1.28E-04	ND	1.10E+00		6.08E-02		
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3		9.69E-04		8.74E-04	ND		4.89E-04		9.63E-05	ND		7.08E-04		9.65E-05	ND		1.45E-03		1.28E-04	ND	1.00E-01		5.53E-03		
Benzaldehyde	100-52-7	3.87E-02		3.49E-02				4.89E-04		9.63E-05	ND	3.12E-02		4.26E-03			3.48E-02		3.07E-03			1.29E+00		7.13E-02		
Isopentanal (Isovaleraldehyde)	590-86-3		9.69E-04		8.74E-04	ND		4.89E-04		9.63E-05	ND	1.70E-02		2.32E-03			1.27E-02		1.11E-03				3.45E-03		1.91E-04	ND
Pentanal (Valeraldehyde)	110-62-3		9.69E-04		8.74E-04	ND		4.89E-04		9.63E-05	ND		7.08E-04		9.65E-05	ND		1.45E-03		1.28E-04	ND		3.45E-03		1.91E-04	ND
o-Tolualdehyde	529-20-4		9.69E-04		8.74E-04	ND		4.89E-04		9.63E-05	ND		7.08E-04		9.65E-05	ND		1.45E-03		1.28E-04	ND	2.58E-01		1.43E-02		
m-Tolualdehyde	620-23-5		9.69E-04		8.74E-04	ND		4.89E-04		9.63E-05	ND		7.08E-04		9.65E-05	ND		1.45E-03		1.28E-04	ND	2.93E-01		1.62E-02		
p-Tolualdehyde	104-87-0		9.69E-04		8.74E-04	ND		4.89E-04		9.63E-05	ND		7.08E-04		9.65E-05	ND		1.45E-03		1.28E-04	ND		3.45E-03		1.91E-04	ND
Hexanal (Hexaldehyde)	66-25-1		9.69E-04		8.74E-04	ND		4.89E-04		9.63E-05	ND		7.08E-04		9.65E-05	ND		1.45E-03		1.28E-04	ND	2.07E-01		1.14E-02		
HAP Total		**1.19E-01**		**1.07E-01**			**5.09E-02**		**1.00E-02**			**1.43E-01**		**1.95E-02**			**1.76E-01**		**1.55E-02**			**1.31E+00**		**7.22E-02**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

[1] - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 3 of this volume.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-12
F110-GE-100 (F16 C/D)
Emission Factors



CO for mode B is 1219.3 lbs/hr.

Table 4-128
Engine Operating Parameter Summary
F110-GE-100 (F16 C/D)

Parameter	Idle	Approach	Intermediate	Military	Afterburner (Zone 1)
Barometric pressure, in. Hg	28.91	28.87	28.91	28.83	28.63
Compressor discharge pressure, in. Hg	46.79	201.85	280.05	399.08	395.11
Throttle position (PLA), degrees	17	41	60	87.58	97
Fuel flow, lbs/hr	1,111	5,080	7,332	11,358	18,088
Fan speed, rpm	3,410	6,667	7,419	8,255	8,226
Cell temperature, deg. F	55	57	58	68	64
Average thrust, lbs	592	7,645	11,595	17,460	19,780
Percent maximum thrust	3	44	66	100	113

4.3.13 Engine F117-PW-100

Tracer gas was used to determine the flow rate at each power setting. Emissions sampling was only conducted at three power settings: idle, approach, and intermediate. Testing could not be conducted at the military power setting due to this engine's operational time limitation within a test cell environment.

Tables 4-129 through 4-136 present engine results for the F117-PW-100 engine. Figure 4-13 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-137 summarizes the engine operating data collected during testing.

Table 4-129
Emissions Factor Summary
Gaseous Parameters
F117-PW-100 (C-17)
Idle

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	360323		358433		356676			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	2.36	2.38	2.18	2.20	2.33	2.36	2.29	2.31
Nitrogen Dioxide (NO_2)	0.26	0.26	0.26	0.26	0.00	0.00	0.17	0.17
Nitrogen Oxides (NO_X)	3.87	3.91	3.59	3.63	3.58	3.61	3.68	3.72
Carbon Monoxide (CO)	22.79	23.02	22.04	22.26	21.78	22.00	22.20	22.43
Total Hydrocarbons (THC as CH_4)	3.36	3.40	1.25	1.27	1.46	1.47	2.03	2.05
Carbon Dioxide (CO_2)	3796	3835	3795	3833	3777	3816	3790	3828

Table 4-130
Emissions Factor Summary
Gaseous Parameters
F117-PW-100 (C-17)
Approach

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	1263280		1252281		1235224			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	44.86	9.65	43.89	9.44	45.60	9.81	44.78	9.63
Nitrogen Dioxide (NO_2)	3.62	0.78	3.59	0.77	2.65	0.57	3.29	0.71
Nitrogen Oxides (NO_X)	72.40	15.57	70.87	15.24	72.56	15.60	71.94	15.47
Carbon Monoxide (CO)	2.75	0.59	1.09	0.23	3.23	0.70	2.36	0.51
Total Hydrocarbons (THC as CH_4)	3.50	0.75	1.89	0.41	0.64	0.14	2.01	0.43
Carbon Dioxide (CO_2)	21656	4657	21542	4633	21301	4581	21500	4624

Table 4-131
Emissions Factor Summary
Gaseous Parameters
F117-PW-100 (C-17)
Intermediate

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	1915415		1829600		1913469			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	217.49	20.91	207.74	19.98	218.16	20.98	214.46	20.62
Nitrogen Dioxide (NO_2)	12.35	1.19	11.80	1.13	10.97	1.05	11.70	1.13
Nitrogen Oxides (NO_X)	345.79	33.25	330.30	31.76	345.44	33.22	340.51	32.74
Carbon Monoxide (CO)	5.01	0.48	1.60	0.15	3.34	0.32	3.32	0.32
Total Hydrocarbons (THC as CH_4)	4.40	0.42	3.76	0.36	3.91	0.38	4.02	0.39
Carbon Dioxide (CO_2)	45684	4393	44033	4234	46020	4425	45246	4351

Table 4-132
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F117-PW-100 (C-17)
Idle
Flow by Tracer

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		360323					358433					356676					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr / lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Vinyl Chloride [H]	75-01-4		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Bromomethane [H]	74-83-9		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Chloroethane [H]	75-00-3		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Freon 11 (Trichlorofluoromethane)	75-69-4	3.29E-03		3.33E-03		bb	4.78E-03		4.83E-03		bb	4.94E-03		4.99E-03		bb	4.34E-03 / 4.38E-03
1,1-Dichloroethene [H]	75-35-4		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Methylene Chloride [H]	75-09-2	0.00E+00		0.00E+00			0.00E+00		0.00E+00			2.27E-03		2.29E-03			7.57E-04 / 7.65E-04
1,1-Dichloroethane [H]	75-34-3		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Chloroform [H]	67-66-3		7.17E-04		7.24E-04	ND	1.54E-03		1.56E-03		bb	1.71E-03		1.73E-03		bb	1.32E-03 / 1.34E-03
1,1,1-Trichloroethane [H]	71-55-6		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Carbon Tetrachloride [H]	56-23-5		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Benzene [H]	71-43-2	1.80E-02		1.81E-02			2.19E-02		2.21E-02			2.61E-02		2.63E-02			2.20E-02 / 2.22E-02
1,2-Dichloroethane [H]	107-06-2		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Trichloroethene [H]	79-01-6	9.31E-04		9.41E-04		B	7.75E-04		7.83E-04		B	8.24E-04		8.33E-04		B	8.43E-04 / 8.52E-04
1,2-Dichloropropane [H]	78-87-5	1.93E-03		1.95E-03		B	2.82E-03		2.85E-03		B	1.79E-03		1.81E-03		B	2.18E-03 / 2.20E-03
trans-1,3-Dichloropropene [H]	10061-02-6		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Toluene [H]	108-88-3	5.87E-03		5.93E-03			5.49E-03		5.55E-03			8.24E-03		8.33E-03			6.54E-03 / 6.60E-03
cis-1,3-Dichloropropene [H]	10061-01-5		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
1,1,2-Trichloroethane [H]	79-00-5		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Tetrachloroethene [H]	127-18-4		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Chlorobenzene [H]	108-90-7		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Ethyl Benzene [H]	100-41-4		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND	7.55E-03		7.63E-03			2.99E-03 / 3.02E-03
m,p-Xylene [H]	1330-20-7	2.15E-03		2.17E-03			1.83E-03		1.84E-03			2.75E-03		2.78E-03			2.24E-03 / 2.26E-03
o-Xylene [H]	95-47-6	8.60E-04		8.68E-04			7.75E-04		7.83E-04			1.24E-03		1.25E-03			9.57E-04 / 9.66E-04
Styrene [H]	100-42-5	1.50E-03		1.51E-03			1.20E-03		1.21E-03			1.86E-03		1.88E-03			1.52E-03 / 1.53E-03
1,1,2,2-Tetrachloroethane [H]	79-34-5	2.65E-03		2.67E-03		B	4.15E-03		4.19E-03		B	2.95E-03		2.98E-03		B	3.25E-03 / 3.28E-03
Acetone	67-64-1	0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00		bb	0.00E+00 / 0.00E+00
Carbon Disulfide [H]	75-15-0		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
trans-1,2-Dichloroethene	156-60-5		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Vinyl Acetate [H]	108-05-4		3.58E-03		3.61E-03	ND		3.52E-03		3.55E-03	ND		3.43E-03		3.47E-03	ND	ND / ND
2-Butanone (MEK) [H]	78-93-3		3.58E-03		3.61E-03	ND		3.52E-03		3.55E-03	ND		3.43E-03		3.47E-03	ND	ND / ND
Bromodichloromethane	75-27-4		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		3.58E-03		3.61E-03	ND		3.52E-03		3.55E-03	ND		3.43E-03		3.47E-03	ND	ND / ND
2-Hexanone	591-78-6		3.58E-03		3.61E-03	ND		3.52E-03		3.55E-03	ND		3.43E-03		3.47E-03	ND	ND / ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
Bromoform [H]	75-25-2		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
cis-1,2-Dichloroethene	156-59-2		7.17E-04		7.24E-04	ND		7.04E-04		7.11E-04	ND		6.87E-04		6.94E-04	ND	ND / ND
HAP Total		**3.38E-02**		**3.42E-02**			**4.05E-02**		**4.09E-02**			**5.72E-02**		**5.78E-02**			**4.46E-02 / 4.50E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-133
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F117-PW-100 (C-17)
Approach
Flow by Tracer

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		1263280					1252281					1235224					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	3.61E-03		7.75E-04				2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	2.73E-03	5.87E-04
Vinyl Chloride [H]	75-01-4		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Bromomethane [H]	74-83-9		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Chloroethane [H]	75-00-3		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.90E-02		4.08E-03			1.68E-02		3.62E-03		bb	2.47E-02		5.30E-03			2.02E-02	4.34E-03
1,1-Dichloroethene [H]	75-35-4		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
1,1-Dichloroethane [H]	75-34-3		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Chloroform [H]	67-66-3	7.71E-03		1.66E-03		bb	3.74E-03		8.05E-04		bb	4.72E-03		1.01E-03		bb	5.39E-03	1.16E-03
1,1,1-Trichloroethane [H]	71-55-6	2.89E-03		6.21E-04				2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	2.49E-03	5.36E-04
Carbon Tetrachloride [H]	56-23-5		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Benzene [H]	71-43-2	5.77E-03		1.24E-03			3.04E-03		6.54E-04			3.59E-03		7.72E-04			4.13E-03	8.89E-04
1,2-Dichloroethane [H]	107-06-2		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Trichloroethene [H]	79-01-6	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
1,2-Dichloropropane [H]	78-87-5	7.48E-03		1.61E-03		B	7.74E-03		1.66E-03		B	6.94E-03		1.49E-03		B	7.39E-03	1.59E-03
trans-1,3-Dichloropropene [H]	10061-02-6		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Toluene [H]	108-88-3	9.37E-03		2.02E-03			4.21E-03		9.05E-04			6.06E-03		1.30E-03			6.55E-03	1.41E-03
cis-1,3-Dichloropropene [H]	10061-01-5		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
m,p-Xylene [H]	1330-20-7	4.57E-03		9.83E-04				2.34E-03		5.03E-04	ND	2.92E-03		6.27E-04			3.28E-03	7.04E-04
o-Xylene [H]	95-47-6		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Styrene [H]	100-42-5		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5	3.85E-03		8.27E-04		B	1.10E-02		2.36E-03		B	1.12E-02		2.41E-03		B	8.67E-03	1.87E-03
Acetone	67-64-1	0.00E+00		0.00E+00		bb		1.17E-02		2.51E-03	ND		1.12E-02		2.41E-03	ND	7.63E-03	1.64E-03
Carbon Disulfide [H]	75-15-0		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.20E-02		2.58E-03	ND		1.17E-02		2.51E-03	ND		1.12E-02		2.41E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		1.20E-02		2.58E-03	ND		1.17E-02		2.51E-03	ND		1.12E-02		2.41E-03	ND	ND	ND
Bromodichloromethane	75-27-4		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.20E-02		2.58E-03	ND		1.17E-02		2.51E-03	ND		1.12E-02		2.41E-03	ND	ND	ND
2-Hexanone	591-78-6		1.20E-02		2.58E-03	ND		1.17E-02		2.51E-03	ND		1.12E-02		2.41E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
Bromoform [H]	75-25-2		2.40E-03		5.17E-04	ND		2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2	0.00E+00		0.00E+00				2.34E-03		5.03E-04	ND		2.24E-03		4.83E-04	ND	1.53E-03	3.29E-04
HAP Total		**4.52E-02**		**9.73E-03**			**2.97E-02**		**6.39E-03**			**3.54E-02**		**7.62E-03**			**4.06E-02**	**8.74E-03**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-134
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F117-PW-100 (C-17)
Intermediate
Flow by Tracer

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		1915415					1829600					1913469					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Vinyl Chloride [H]	75-01-4		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Bromomethane [H]	74-83-9		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Chloroethane [H]	75-00-3		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	3.55E-02		3.42E-03			2.28E-02		2.19E-03		bb	3.79E-02		3.65E-03			3.21E-02	3.08E-03
1,1-Dichloroethene [H]	75-35-4		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	7.79E-02		7.49E-03			3.88E-02		3.73E-03			7.86E-02		7.55E-03			6.51E-02	6.26E-03
1,1-Dichloroethane [H]	75-34-3		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Chloroform [H]	67-66-3	6.75E-03		6.49E-04		bb	4.82E-03		4.64E-04		bb	7.60E-03		7.31E-04		bb	6.39E-03	6.15E-04
1,1,1-Trichloroethane [H]	71-55-6		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Benzene [H]	71-43-2	7.46E-03		7.18E-04			6.20E-03		5.96E-04			5.86E-03		5.64E-04			6.51E-03	6.26E-04
1,2-Dichloroethane [H]	107-06-2		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Trichloroethene [H]	79-01-6	0.00E+00		0.00E+00		B	0.00E+00		0.00E+00		B	0.00E+00		0.00E+00		B	0.00E+00	0.00E+00
1,2-Dichloropropane [H]	78-87-5	1.21E-02		1.16E-03		B	4.13E-03		3.97E-04		B	3.45E-03		3.32E-04		B	6.54E-03	6.29E-04
trans-1,3-Dichloropropene [H]	10061-02-6		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Toluene [H]	108-88-3	1.10E-02		1.06E-03			1.21E-02		1.16E-03			1.20E-02		1.16E-03			1.17E-02	1.12E-03
cis-1,3-Dichloropropene [H]	10061-01-5		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
m,p-Xylene [H]	1330-20-7	6.39E-03		6.15E-04			5.17E-03		4.97E-04			5.52E-03		5.31E-04			5.69E-03	5.47E-04
o-Xylene [H]	95-47-6		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Styrene [H]	100-42-5		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5	1.67E-02		1.61E-03		B	7.26E-03		6.99E-04		B	7.24E-03		6.96E-04		B	1.04E-02	1.00E-03
Acetone	67-64-1		1.78E-02		1.71E-03	ND		1.72E-02		1.65E-03	ND	0.00E+00		0.00E+00		bb	1.17E-02	1.12E-03
Carbon Disulfide [H]	75-15-0		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND	8.24E-03		7.93E-04			5.08E-03	4.89E-04
trans-1,2-Dichloroethene	156-60-5		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.78E-02		1.71E-03	ND		1.72E-02		1.65E-03	ND		1.72E-02		1.65E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		1.78E-02		1.71E-03	ND		1.72E-02		1.65E-03	ND		1.72E-02		1.65E-03	ND	ND	ND
Bromodichloromethane	75-27-4		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.78E-02		1.71E-03	ND		1.72E-02		1.65E-03	ND		1.72E-02		1.65E-03	ND	ND	ND
2-Hexanone	591-78-6		1.78E-02		1.71E-03	ND		1.72E-02		1.65E-03	ND		1.72E-02		1.65E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
Bromoform [H]	75-25-2		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND		3.45E-03		3.32E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		3.55E-03		3.42E-04	ND		3.45E-03		3.31E-04	ND	0.00E+00		0.00E+00			2.33E-03	2.24E-04
HAP Total		**1.38E-01**		**1.33E-02**			**7.84E-02**		**7.54E-03**			**1.29E-01**		**1.24E-02**			**1.17E-01**	**1.13E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-135
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
F117-PW-100 (C-17)
Flow by Tracer

		Engine Mode															
		Idle					Approach					Intermediate					
Flow Rate, dscfm		358477					1250171					1885330					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		
Phenol [H]	108-95-2	3.71E-03		3.75E-03				6.93E-03		1.49E-03	ND		9.82E-03		9.44E-04	ND	
Dichloroethyl ether [H]	111-44-4		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
2-Chlorophenol	95-57-8		1.91E-03		1.93E-03	ND		6.93E-03		1.49E-03	ND		9.82E-03		9.44E-04	ND	
1,3-Dichlorobenzene	541-73-1		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
1,4-Dichlorobenzene [H]	106-46-7		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
1,2-Dichlorobenzene	95-50-1		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
o-Cresol [H]	95-48-7		1.91E-03		1.93E-03	ND		6.93E-03		1.49E-03	ND		9.82E-03		9.44E-04	ND	
bis(2-Chloroisopropyl) Ether	39638-32-9		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
N-Nitroso-di-n-propylamine	621-64-7		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
p-Cresol [H]	106-44-5		1.91E-03		1.93E-03	ND		6.93E-03		1.49E-03	ND		9.82E-03		9.44E-04	ND	
Hexachloroethane [H]	67-72-1		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Nitrobenzene [H]	98-95-3		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Isophorone [H]	78-59-1		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
2-Nitrophenol	88-75-5		1.91E-03		1.93E-03	ND		6.93E-03		1.49E-03	ND		9.82E-03		9.44E-04	ND	
2,4-Dimethylphenol	105-67-9		1.91E-03		1.93E-03	ND		6.93E-03		1.49E-03	ND		9.82E-03		9.44E-04	ND	
Benzoic Acid	65-85-0	1.25E-02		1.27E-02				2.77E-02		5.96E-03	ND	7.66E-02		7.37E-03			
bis(2-Chloroethoxy) Methane	111-91-1		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
2,4-Dichlorophenol	120-83-2		1.91E-03		1.93E-03	ND		6.93E-03		1.49E-03	ND		9.82E-03		9.44E-04	ND	
1,2,4-Trichlorobenzene [H]	120-82-1		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Naphthalene [H]	91-20-3	2.34E-03		2.37E-03				1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
4-Chloroaniline	106-47-8		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Hexachlorobutadiene [H]	87-68-3		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
4-Chloro-3-methylphenol	59-50-7		1.91E-03		1.93E-03	ND		6.93E-03		1.49E-03	ND		9.82E-03		9.44E-04	ND	
2-Methylnaphthalene	91-57-6	1.53E-03		1.55E-03				1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Hexachlorocyclopentadiene [H]	77-47-4		7.63E-03		7.70E-03	ND		2.77E-02		5.96E-03	ND		3.93E-02		3.78E-03	ND	
2,4,6-Trichlorophenol [H]	88-06-2		3.81E-03		3.85E-03	ND		1.39E-02		2.98E-03	ND		1.96E-02		1.89E-03	ND	
2,4,5-Trichlorophenol [H]	95-95-4		3.81E-03		3.85E-03	ND		1.39E-02		2.98E-03	ND		1.96E-02		1.89E-03	ND	
2-Chloronaphthalene	91-58-7		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
2-Nitroaniline	88-74-4		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Dimethylphthalate [H]	131-11-3		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Acenaphthylene	208-96-8		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
2,6-Dinitrotoluene	606-20-2		3.81E-03		3.85E-03	ND		1.39E-02		2.98E-03	ND		1.96E-02		1.89E-03	ND	
3-Nitroaniline	99-09-2		3.81E-03		3.85E-03	ND		1.39E-02		2.98E-03	ND		1.96E-02		1.89E-03	ND	
Acenaphthene	83-32-9		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
2,4-Dinitrophenol [H]	51-28-5	7.20E-03		7.28E-03		UJ	2.62E-02		5.63E-03		UJ	3.71E-02		3.57E-03		UJ	
4-Nitrophenol [H]	100-02-7		3.81E-03		3.85E-03	ND		1.39E-02		2.98E-03	ND		1.96E-02		1.89E-03	ND	
2,4-Dinitrotoluene [H]	121-14-2		3.81E-03		3.85E-03	ND		1.39E-02		2.98E-03	ND		1.96E-02		1.89E-03	ND	
Dibenzofuran [H]	132-64-9		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Diethylphthalate	84-66-2	8.28E-03		8.37E-03			2.49E-02		5.35E-03			2.54E-02		2.44E-03			
Fluorene	86-73-7		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
4-Chlorophenyl-phenyl Ether	7005-72-3		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
4-Nitroaniline	100-01-6		3.81E-03		3.85E-03	ND		1.39E-02		2.98E-03	ND		1.96E-02		1.89E-03	ND	
4,6-Dinitro-2-methylphenol	534-52-1		7.63E-03		7.70E-03	ND		2.77E-02		5.96E-03	ND		3.93E-02		3.78E-03	ND	
N-Nitrosodiphenylamine	86-30-6		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
4-Bromophenyl-phenyl Ether	101-55-3		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Hexachlorobenzene [H]	118-74-1		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Pentachlorophenol [H]	87-86-5		7.63E-03		7.70E-03	ND		2.77E-02		5.96E-03	ND		3.93E-02		3.78E-03	ND	
Phenanthrene	85-01-8		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Anthracene	120-12-7		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
di-n-Butylphthalate [H]	84-74-2	6.66E-04		6.72E-04		B	3.79E-03		8.14E-04		B	2.39E-03		2.30E-04		B	
Fluoranthene	206-44-0		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Pyrene	129-00-0		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Butylbenzylphthalate	85-68-7		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND	3.04E-03		2.92E-04		B	
3,3'-Dichlorobenzidine [H]	91-94-1		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Chrysene	218-01-9		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Benzo(a)anthracene	56-55-3		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
bis(2-Ethylhexyl)phthalate [H]	117-81-7	2.96E-03		2.99E-03		B	8.67E-03		1.87E-03		B	1.76E-02		1.69E-03		B	
Di-n-Octylphthalate	117-84-0		3.81E-03		3.85E-03	ND		1.39E-02		2.98E-03	ND		1.96E-02		1.89E-03	ND	
Benzo(b)fluoranthene	205-99-2		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Benzo(k)fluoranthene	207-08-9		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Benzo(a)pyrene	50-32-8		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Indeno(1,2,3-c,d)pyrene	193-39-5		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Benzo(g,h,i)perylene	191-24-2		3.81E-04		3.85E-04	ND		1.39E-03		2.98E-04	ND		1.96E-03		1.89E-04	ND	
Benzyl alcohol	100-51-6		1.91E-03		1.93E-03	ND		6.93E-03		1.49E-03	ND		9.82E-03		9.44E-04	ND	
HAP Total		**1.69E-02**		**1.71E-02**			**3.87E-02**		**8.31E-03**			**5.71E-02**		**5.49E-03**			

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-136
Emissions Factor Summary
Aldehyde/Ketones
F117-PW-100 (C-17)

Flow by Tracer

		Engine Mode													
		Idle					Approach					Intermediate				
Flow Rate, dscfm		358477					1250171					1885330				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
Analyte	**CAS Number**	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Formaldehyde [H]	50-00-0	2.31E-01		2.33E-01			7.68E-02		1.65E-02		bb	9.89E-02		9.51E-03		bb
Acetaldehyde [H]	75-07-0	1.17E-02		1.18E-02				6.09E-03		1.31E-03	ND		1.12E-02		1.07E-03	ND
Acrolein [H]	107-02-8		6.35E-03		6.42E-03	ND		6.09E-03		1.31E-03	ND		1.12E-02		1.07E-03	ND
Acetone	67-64-1	7.68E-03		7.76E-03		B,bb	4.40E-02		9.46E-03		B,bb	5.11E-01		4.91E-02		B
Crotonaldehyde	4170-30-3	1.17E-02		1.18E-02				6.09E-03		1.31E-03	ND		1.12E-02		1.07E-03	ND
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3		6.35E-03		6.42E-03	ND		6.09E-03		1.31E-03	ND		1.12E-02		1.07E-03	ND
Benzaldehyde	100-52-7		6.35E-03		6.42E-03	ND	1.47E-02		3.15E-03			3.83E-02		3.69E-03		
Isopentanal (Isovaleraldehyde)	590-86-3		6.35E-03		6.42E-03	ND	8.57E-03		1.84E-03		bb		1.12E-02		1.07E-03	ND
Pentanal (Valeraldehyde)	110-62-3		6.35E-03		6.42E-03	ND		6.09E-03		1.31E-03	ND		1.12E-02		1.07E-03	ND
o-Tolualdehyde	529-20-4		6.35E-03		6.42E-03	ND		6.09E-03		1.31E-03	ND		1.12E-02		1.07E-03	ND
m-Tolualdehyde	620-23-5	1.71E-02		1.72E-02		M	1.96E-02		4.21E-03		bb	2.23E-02		2.15E-03		bb
p-Tolualdehyde	104-87-0	7.35E-03		7.42E-03				6.09E-03		1.31E-03	ND		1.12E-02		1.07E-03	ND
Hexanal (Hexaldehyde)	66-25-1		6.35E-03		6.42E-03	ND		6.09E-03		1.31E-03	ND		1.12E-02		1.07E-03	ND
HAP Total		**2.43E-01**		**2.45E-01**			**7.68E-02**		**1.65E-02**			**9.89E-02**		**9.51E-03**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.

B - Compound present in the laboratory blank greater than reporting limit.

bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.

H - This compound is listed as a hazardous air pollutant (HAP).

M - Data was generated with information obtained by manually integrating peak area due to peak interference.

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-13
F117-PW-100 (C-17)
Emission Rates

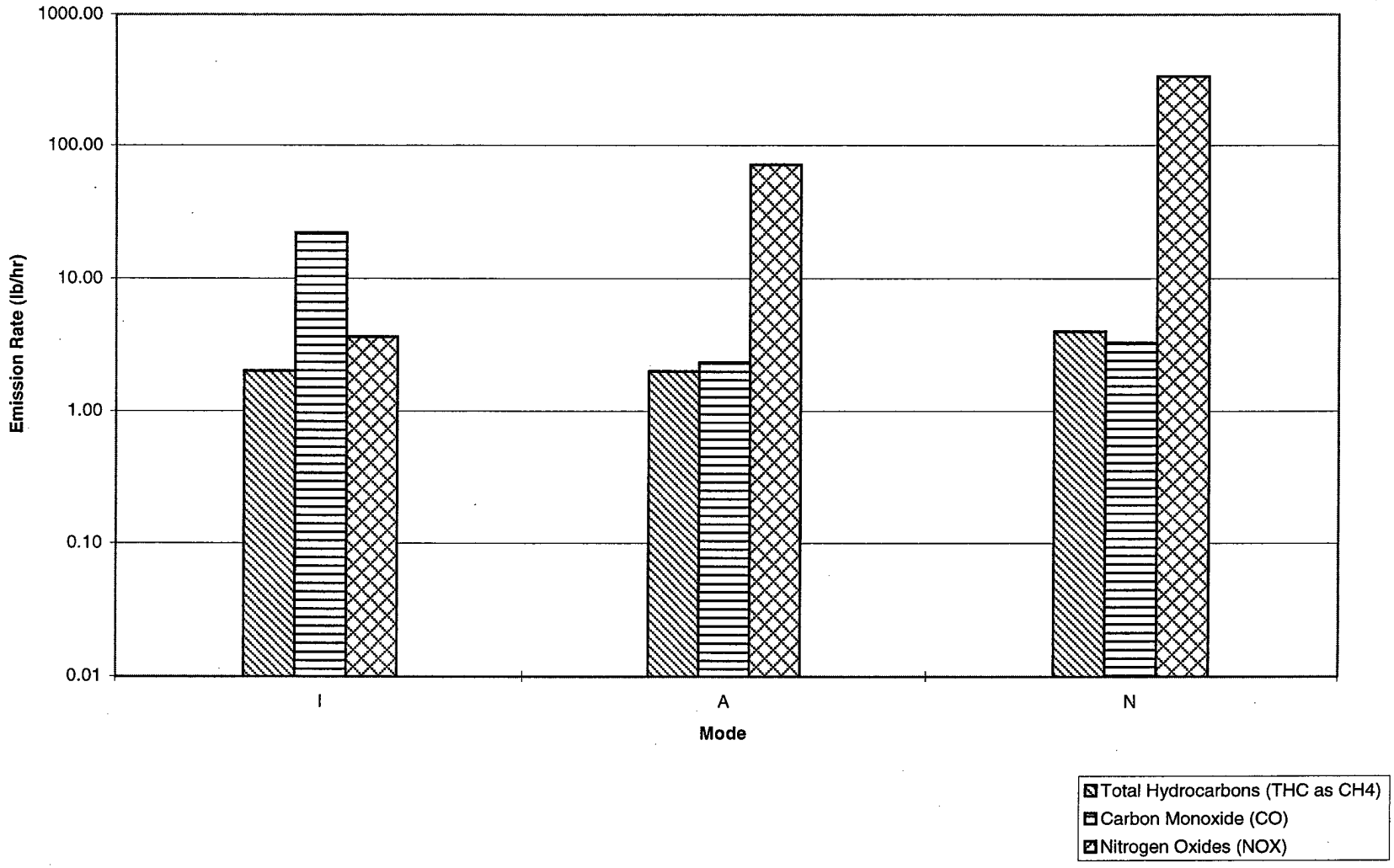


Table 4-137
Engine Operating Parameter Summary
F117-PW-100 (C-17)

Parameter	Idle	Approach	Intermediate
Barometric pressure, in. Hg	30.02	30.06	30.00
Throttle position (PLA), degrees	38	49	68
Fuel flow, lbs/hr	978	4,645	10,408
Fan speed, rpm	982	2,749	3,759
Core speed, rpm	7,719	10,157	11,209
Average thrust, lbs	1,478	13,088	28,526
Percent maximum thrust	4	31	68

4.3.14 Engine F118-GE-100

Tracer gas was used to determine the flow rate at each power setting.

The ambient THC analyzer failed and was not available for sampling at power settings approach, intermediate, and military. During this period, the source THC analyzer was intermittently used to collect ambient THC. Ambient samples for PAHs were collected in the front of the test cell along the wall separating the test cell from the augmenter tube blast room. It was apparent after testing that this wall did not provide a proper seal and exhaust gases re-entered the test cell at this point. This resulted in elevated PAH concentrations. PAH samples may be biased high. VOC samples were collected further away from the cell wall and may have a less significant bias.

The CO_2 data collected during the approach power setting showed significantly higher results when compared to results from the next lower and higher engine power settings (idle and intermediate). A review of the raw data and analyzer calibrations shows that the analyzer experienced unacceptable instrument drift during the sample period. An attempt to correct the data for the drift resulted in values that were significant outliers and not representative of actual emissions. As an alternative, the FTIR data was reviewed to determine if CO_2 concentrations could be determined from the spectra that were collected during the approach sample runs. Because no reference spectra were available for CO_2 at similar levels to those observed during testing, a direct quantitation by FTIR could not be made. The spectra were reviewed for relative peak heights (signal strength) for CO_2 at the idle, approach, and intermediate power settings. The incremental increase of CO_2 by FTIR was consistent between the idle, approach, and intermediate power settings. This incremental increase matched the CO_2 values as reported by the CO_2 analyzer for the idle and intermediate power settings. This analysis justifies using the average of the idle and intermediate power setting results to extrapolate appropriate CO_2 values for the approach power setting. These results are presented.

Tables 4-138 through 4-147 present engine results for the F118-GE-100 engine. Figure 4-14 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-148 summarizes the engine operating data collected during testing.

Table 4-138
Emissions Factor Summary
Gaseous Parameters
F118-GE-100 (B-2)
Idle

Flow by Tracer

	Run Number									
	1		2			3			Average	
Flow Rate, dscfm	308039		303165			301646				
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	2.59	2.36	2.41	2.20		3.24	2.95		2.75	2.50
Nitrogen Dioxide (NO_2)	0.44	0.40	0.65	0.59		0.43	0.39		0.51	0.46
Nitrogen Oxides (NO_X)	4.41	4.03	4.34	3.96		5.40	4.92		4.72	4.30
Carbon Monoxide (CO)	25.53	23.29	23.40	21.33		20.13	18.33		23.02	20.98
Total Hydrocarbons (THC as CH_4)	0.79	0.72	0.61	0.55	ND	0.55	0.50		0.65	0.59
Carbon Dioxide (CO_2)	3416	3116	3337	3042		3337	3039		3363	3066

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-139
Emissions Factor Summary
Gaseous Parameters
F118-GE-100 (B-2)
Approach
Flow by Tracer

	Run Number									
	1			2			3		Average	
Flow Rate, dscfm	720500			720138			713996			
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	27.27	7.13		26.58	7.05		26.69	7.16	26.85	7.12
Nitrogen Dioxide (NO_2)	0.52	0.13		1.03	0.27		1.02	0.27	0.86	0.23
Nitrogen Oxides (NO_X)	41.81	10.93		41.79	11.09		41.94	11.25	41.85	11.09
Carbon Monoxide (CO)	7.23	1.89		7.85	2.08		7.78	2.09	7.62	2.02
Total Hydrocarbons (THC as CH_4)	1.45	0.38	ND	4.22	1.12		4.17	1.12	3.28	0.87
Carbon Dioxide (CO_2)	10484	2742		10491	2784		10297	2763	10424	2763

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-140
Emissions Factor Summary
Gaseous Parameters
F118-GE-100 (B-2)
Intermediate

Flow by Tracer

	Run Number										Average	
	1			2			3					
Flow Rate, dscfm	864812			850567			860037					
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel			lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	72.74	11.46		72.73	11.45		72.74	11.45			72.74	11.45
Nitrogen Dioxide (NO_2)	2.48	0.39		3.05	0.48		3.08	0.49			2.87	0.45
Nitrogen Oxides (NO_X)	114.00	17.95		114.56	18.04		114.60	18.04			114.38	18.01
Carbon Monoxide (CO)	5.66	0.89		5.94	0.93		4.50	0.71			5.36	0.84
Total Hydrocarbons (THC as CH_4)	1.74	0.27	ND	1.72	0.27	ND	1.72	0.27	ND		ND	ND
Carbon Dioxide (CO_2)	15634	2462		27001	4251		27307	4300			23314	3671

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-141
Emissions Factor Summary
Gaseous Parameters
F118-GE-100 (B-2)
Military

Flow by Tracer

	Run Number									Average	
	1			2			3				
Flow Rate, dscfm	1076278			1064220			1033653				
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	239.38	21.74		235.71	21.57		227.49	21.21		234.19	21.51
Nitrogen Dioxide (NO_2)	3.86	0.35		0.76	0.07		0.74	0.07		1.79	0.16
Nitrogen Oxides (NO_X)	370.87	33.69		361.37	33.07		349.51	32.59		360.59	33.12
Carbon Monoxide (CO)	7.04	0.64		6.50	0.59		7.66	0.71		7.07	0.65
Total Hydrocarbons (THC as CH_4)	2.17	0.20	ND	2.15	0.20	ND	2.09	0.19	ND	ND	ND
Carbon Dioxide (CO_2)	41573	3776		41081	3760		39908	3721		40854	3752

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-142
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F118-GE-100 (B-2)
Idle
Flow by Tracer

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		308039					303165					301646					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	9.27E-04		8.45E-04				6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	7.15E-04	6.52E-04
Vinyl Chloride [H]	75-01-4		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Bromomethane [H]	74-83-9		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Chloroethane [H]	75-00-3		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.48E-02		1.35E-02			1.74E-02		1.58E-02			3.11E-02		2.83E-02			2.11E-02	1.92E-02
1,1-Dichloroethene [H]	75-35-4		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	1.21E-02		1.11E-02		B	1.07E-02		9.73E-03		B	1.75E-02		1.60E-02		B	1.34E-02	1.22E-02
1,1-Dichloroethane [H]	75-34-3		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Chloroform [H]	67-66-3		6.17E-04		5.63E-04	ND	1.81E-03		1.65E-03		bb	1.91E-03		1.74E-03		bb	1.44E-03	1.32E-03
1,1,1-Trichloroethane [H]	71-55-6		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Benzene [H]	71-43-2	3.77E-02		3.44E-02			2.74E-02		2.49E-02			2.38E-02		2.17E-02			2.96E-02	2.70E-02
1,2-Dichloroethane [H]	107-06-2		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Toluene [H]	108-88-3	1.48E-02		1.35E-02			9.95E-03		9.07E-03			7.76E-03		7.07E-03			1.08E-02	9.87E-03
cis-1,3-Dichloropropene [H]	10061-01-5		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4	1.86E-03		1.70E-03			1.18E-03		1.08E-03			1.01E-03		9.24E-04			1.35E-03	1.23E-03
m,p-Xylene [H]	1330-20-7	6.17E-03		5.63E-03			3.72E-03		3.40E-03			2.69E-03		2.45E-03			4.20E-03	3.83E-03
o-Xylene [H]	95-47-6	2.16E-03		1.97E-03			1.49E-03		1.36E-03			1.07E-03		9.79E-04			1.57E-03	1.43E-03
Styrene [H]	100-42-5	3.09E-03		2.82E-03			2.36E-03		2.15E-03			1.97E-03		1.79E-03			2.47E-03	2.26E-03
1,1,2,2-Tetrachloroethane [H]	79-34-5	6.17E-04		5.63E-04		UJ	6.21E-04		5.66E-04		UJ	5.97E-04		5.43E-04		UJ	6.12E-04	5.58E-04
Acetone	67-64-1	1.43E-02		1.31E-02			0.00E+00		0.00E+00			0.00E+00		0.00E+00			4.77E-03	4.35E-03
Carbon Disulfide [H]	75-15-0		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND	1.20E-03		1.09E-03			8.12E-04	7.40E-04
trans-1,2-Dichloroethene	156-60-5		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		3.09E-03		2.82E-03	ND		3.11E-03		2.84E-03	ND		2.98E-03		2.72E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	6.80E-03		6.20E-03			3.17E-03		2.89E-03				2.98E-03		2.72E-03	ND	4.32E-03	3.94E-03
Bromodichloromethane	75-27-4		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		3.09E-03		2.82E-03	ND		3.11E-03		2.84E-03	ND		2.98E-03		2.72E-03	ND	ND	ND
2-Hexanone	591-78-6	3.09E-03		2.82E-03		UJ	3.11E-03		2.84E-03		UJ	2.98E-03		2.72E-03		UJ	3.06E-03	2.79E-03
Dibromochloromethane (Chlorodibromomethane)	124-48-1		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
Bromoform [H]	75-25-2		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		6.17E-04		5.63E-04	ND		6.21E-04		5.66E-04	ND		5.97E-04		5.43E-04	ND	ND	ND
HAP Total		**8.62E-02**		**7.87E-02**			**6.23E-02**		**5.68E-02**			**5.96E-02**		**5.43E-02**			**7.14E-02**	**6.51E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-143
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F118-GE-100 (B-2)
Approach
Flow by Tracer

		Run Number													
		1					2					3				Average	
Flow Rate, dscfm		720500					720138					713996					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		
Chloromethane [H]	74-87-3	0.00E+00		0.00E+00				1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	1.00E-03	2.68E-04
Vinyl Chloride [H]	75-01-4		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Bromomethane [H]	74-83-9		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Chloroethane [H]	75-00-3		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	2.14E-02		5.59E-03			2.23E-02		5.91E-03			3.82E-02		1.03E-02			2.73E-02	7.26E-03
1,1-Dichloroethene [H]	75-35-4		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	3.43E-02		8.96E-03		B	3.26E-02		8.66E-03		B	5.64E-02		1.51E-02		B	4.11E-02	1.09E-02
1,1-Dichloroethane [H]	75-34-3		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Chloroform [H]	67-66-3		1.43E-03		3.73E-04	ND	2.83E-03		7.52E-04		bb	2.44E-03		6.56E-04		bb	2.23E-03	5.93E-04
1,1,1-Trichloroethane [H]	71-55-6		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Benzene [H]	71-43-2	3.99E-03		1.04E-03			2.67E-03		7.09E-04			3.05E-03		8.18E-04			3.24E-03	8.57E-04
1,2-Dichloroethane [H]	107-06-2		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Toluene [H]	108-88-3	7.26E-03		1.90E-03			3.86E-03		1.02E-03			4.12E-03		1.11E-03			5.08E-03	1.34E-03
cis-1,3-Dichloropropene [H]	10061-01-5		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4	2.70E-03		7.06E-04				1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	1.90E-03	5.03E-04
m,p-Xylene [H]	1330-20-7	9.99E-03		2.61E-03			3.56E-03		9.45E-04			3.05E-03		8.18E-04			5.53E-03	1.46E-03
o-Xylene [H]	95-47-6	4.13E-03		1.08E-03				1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	2.38E-03	6.28E-04
Styrene [H]	100-42-5		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5	1.43E-03		3.73E-04		UJ	1.49E-03		3.94E-04		UJ	1.53E-03		4.10E-04		UJ	1.48E-03	3.92E-04
Acetone	67-64-1	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
Carbon Disulfide [H]	75-15-0		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		7.13E-03		1.86E-03	ND		7.42E-03		1.97E-03	ND		7.65E-03		2.05E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		7.13E-03		1.86E-03	ND		7.42E-03		1.97E-03	ND		7.65E-03		2.05E-03	ND	ND	ND
Bromodichloromethane	75-27-4		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		7.13E-03		1.86E-03	ND		7.42E-03		1.97E-03	ND		7.65E-03		2.05E-03	ND	ND	ND
2-Hexanone	591-78-6	7.13E-03		1.86E-03		UJ	7.42E-03		1.97E-03		UJ	7.65E-03		2.05E-03		UJ	7.40E-03	1.96E-03
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
Bromoform [H]	75-25-2		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.43E-03		3.73E-04	ND		1.49E-03		3.94E-04	ND		1.53E-03		4.10E-04	ND	ND	ND
HAP Total		**6.38E-02**		**1.67E-02**			**4.71E-02**		**1.25E-02**			**7.06E-02**		**1.89E-02**			**6.40E-02**	**1.70E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-144
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F118-GE-100 (B-2)
Intermediate
Flow by Tracer

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		864812					850567					860037					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Vinyl Chloride [H]	75-01-4		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Bromomethane [H]	74-83-9		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Chloroethane [H]	75-00-3		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	6.28E-02		9.90E-03			4.49E-02		7.07E-03			2.34E-02		3.68E-03			4.37E-02	6.88E-03
1,1-Dichloroethene [H]	75-35-4		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	8.20E-02		1.29E-02		B	5.38E-02		8.48E-03		B	1.74E-02		2.74E-03		B	5.11E-02	8.04E-03
1,1-Dichloroethane [H]	75-34-3		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Chloroform [H]	67-66-3		1.75E-03		2.75E-04	ND	3.63E-03		5.72E-04		bb	3.67E-03		5.78E-04		bb	3.02E-03	4.75E-04
1,1,1-Trichloroethane [H]	71-55-6		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Benzene [H]	71-43-2	2.80E-03		4.40E-04			2.43E-03		3.82E-04			1.84E-03		2.89E-04			2.35E-03	3.71E-04
1,2-Dichloroethane [H]	107-06-2		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Toluene [H]	108-88-3	1.75E-03		2.75E-04			2.08E-03		3.28E-04			1.84E-03		2.89E-04			1.89E-03	2.97E-04
cis-1,3-Dichloropropene [H]	10061-01-5		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
m,p-Xylene [H]	1330-20-7		1.75E-03		2.75E-04	ND	2.25E-03		3.55E-04			2.34E-03		3.68E-04			2.11E-03	3.32E-04
o-Xylene [H]	95-47-6		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Styrene [H]	100-42-5		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5	1.75E-03		2.75E-04		UJ	1.73E-03		2.73E-04		UJ	1.67E-03		2.63E-04		UJ	1.72E-03	2.70E-04
Acetone	67-64-1	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
Carbon Disulfide [H]	75-15-0		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		8.75E-03		1.38E-03	ND		8.67E-03		1.36E-03	ND		8.34E-03		1.31E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		8.75E-03		1.38E-03	ND		8.67E-03		1.36E-03	ND		8.34E-03		1.31E-03	ND	ND	ND
Bromodichloromethane	75-27-4		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		8.75E-03		1.38E-03	ND		8.67E-03		1.36E-03	ND		8.34E-03		1.31E-03	ND	ND	ND
2-Hexanone	591-78-6	8.75E-03		1.38E-03		UJ	8.67E-03		1.36E-03		UJ	8.34E-03		1.31E-03		UJ	8.59E-03	1.35E-03
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
Bromoform [H]	75-25-2		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.75E-03		2.75E-04	ND		1.73E-03		2.73E-04	ND		1.67E-03		2.63E-04	ND	ND	ND
HAP Total		**8.82E-02**		**1.39E-02**			**6.60E-02**		**1.04E-02**			**2.87E-02**		**4.53E-03**			**6.22E-02**	**9.79E-03**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-145
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F118-GE-100 (B-2)
Military
Flow by Tracer

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		1076278					1064220					1033653					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Vinyl Chloride [H]	75-01-4		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Bromomethane [H]	74-83-9		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Chloroethane [H]	75-00-3		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	2.56E-02		2.33E-03			3.91E-02		3.58E-03			7.01E-02		6.53E-03			4.49E-02	4.15E-03
1,1-Dichloroethene [H]	75-35-4		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	0.00E+00		0.00E+00		B	0.00E+00		0.00E+00		B	0.00E+00		0.00E+00		B	0.00E+00	0.00E+00
1,1-Dichloroethane [H]	75-34-3		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Chloroform [H]	67-66-3		2.13E-03		1.94E-04	ND	3.91E-03		3.58E-04		bb		2.20E-03		2.05E-04	ND	2.75E-03	2.52E-04
1,1,1-Trichloroethane [H]	71-55-6		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Benzene [H]	71-43-2	3.84E-03		3.49E-04			3.70E-03		3.39E-04			3.51E-03		3.27E-04			3.68E-03	3.38E-04
1,2-Dichloroethane [H]	107-06-2		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Toluene [H]	108-88-3	4.68E-03		4.25E-04			4.58E-03		4.20E-04			3.30E-03		3.07E-04			4.19E-03	3.84E-04
cis-1,3-Dichloropropene [H]	10061-01-5		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
m,p-Xylene [H]	1330-20-7	2.99E-03		2.71E-04			2.61E-03		2.39E-04				2.20E-03		2.05E-04	ND	2.60E-03	2.38E-04
o-Xylene [H]	95-47-6		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Styrene [H]	100-42-5		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5	2.13E-03		1.94E-04		UJ	2.18E-03		1.99E-04		UJ	2.20E-03		2.05E-04		UJ	2.17E-03	1.99E-04
Acetone	67-64-1	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
Carbon Disulfide [H]	75-15-0		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.07E-02		9.70E-04	ND		1.09E-02		9.96E-04	ND		1.10E-02		1.03E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		1.07E-02		9.70E-04	ND		1.09E-02		9.96E-04	ND		1.10E-02		1.03E-03	ND	ND	ND
Bromodichloromethane	75-27-4		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.07E-02		9.70E-04	ND		1.09E-02		9.96E-04	ND		1.10E-02		1.03E-03	ND	ND	ND
2-Hexanone	591-78-6	1.07E-02		9.70E-04		UJ	1.09E-02		9.96E-04		UJ	1.10E-02		1.03E-03		UJ	1.09E-02	9.97E-04
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
Bromoform [H]	75-25-2		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		2.13E-03		1.94E-04	ND		2.18E-03		1.99E-04	ND		2.20E-03		2.05E-04	ND	ND	ND
HAP Total		**1.36E-02**		**1.24E-03**			**1.70E-02**		**1.55E-03**			**9.00E-03**		**8.39E-04**			**1.54E-02**	**1.41E-03**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-146
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
F118-GE-100 (B-2)
Flow by Tracer

		Engine Mode																	
		Idle					Approach					Intermediate					Military				
Flow Rate, dscfm		304256					718198					858447					1057742				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Phenol [H]	108-95-2	1.32E-03		1.20E-03				6.78E-03		1.80E-03	ND		8.91E-03		1.40E-03	ND		1.23E-02		1.13E-03	ND
Dichloroethyl ether [H]	111-44-4		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
2-Chlorophenol	95-57-8		2.64E-03		2.41E-03	ND		6.78E-03		1.80E-03	ND		8.91E-03		1.40E-03	ND		1.23E-02		1.13E-03	ND
1,3-Dichlorobenzene	541-73-1		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
1,4-Dichlorobenzene [H]	106-46-7		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
1,2-Dichlorobenzene	95-50-1		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
o-Cresol [H]	95-48-7		2.64E-03		2.41E-03	ND		6.78E-03		1.80E-03	ND		8.91E-03		1.40E-03	ND		1.23E-02		1.13E-03	ND
bis(2-Chloroisopropyl) Ether	39638-32-9		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
N-Nitroso-di-n-propylamine	621-64-7		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
p-Cresol [H]	106-44-5		2.64E-03		2.41E-03	ND		6.78E-03		1.80E-03	ND		8.91E-03		1.40E-03	ND		1.23E-02		1.13E-03	ND
Hexachloroethane [H]	67-72-1		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Nitrobenzene [H]	98-95-3		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Isophorone [H]	78-59-1		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
2-Nitrophenol	88-75-5		2.64E-03		2.41E-03	ND		6.78E-03		1.80E-03	ND		8.91E-03		1.40E-03	ND		1.23E-02		1.13E-03	ND
2,4-Dimethylphenol	105-67-9		2.64E-03		2.41E-03	ND		6.78E-03		1.80E-03	ND		8.91E-03		1.40E-03	ND		1.23E-02		1.13E-03	ND
Benzoic Acid	65-85-0	2.73E-02		2.49E-02		J	6.34E-02		1.68E-02		J	4.93E-02		7.77E-03		J	1.33E-01		1.22E-02		J
bis(2-Chloroethoxy) Methane	111-91-1		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
2,4-Dichlorophenol	120-83-2	2.20E-03		2.01E-03		UJ	6.54E-03		1.73E-03		UJ	8.29E-03		1.31E-03		UJ	1.17E-02		1.07E-03		UJ
1,2,4-Trichlorobenzene [H]	120-82-1		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Naphthalene [H]	91-20-3	0.00E+00		0.00E+00				6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
4-Chloroaniline	106-47-8		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Hexachlorobutadiene [H]	87-68-3		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
4-Chloro-3-methylphenol	59-50-7		2.64E-03		2.41E-03	ND		6.78E-03		1.80E-03	ND		8.91E-03		1.40E-03	ND		1.23E-02		1.13E-03	ND
2-Methylnaphthalene	91-57-6	0.00E+00		0.00E+00				6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Hexachlorocyclopentadiene [H]	77-47-4		2.64E-03		2.41E-03	ND		6.78E-03		1.80E-03	ND		8.91E-03		1.40E-03	ND		1.23E-02		1.13E-03	ND
2,4,6-Trichlorophenol [H]	88-06-2		2.64E-03		2.41E-03	ND		6.78E-03		1.80E-03	ND		8.91E-03		1.40E-03	ND		1.23E-02		1.13E-03	ND
2,4,5-Trichlorophenol [H]	95-95-4		2.64E-03		2.41E-03	ND		6.78E-03		1.80E-03	ND		8.91E-03		1.40E-03	ND		1.23E-02		1.13E-03	ND
2-Chloronaphthalene	91-58-7		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
2-Nitroaniline	88-74-4		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Dimethylphthalate [H]	131-11-3		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Acenaphthylene	208-96-8		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
2,6-Dinitrotoluene	606-20-2		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
3-Nitroaniline	99-09-2		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Acenaphthene	83-32-9		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
2,4-Dinitrophenol [H]	51-28-5		5.28E-03		4.81E-03	ND		1.36E-02		3.59E-03	ND		1.78E-02		2.81E-03	ND		2.47E-02		2.27E-03	ND
4-Nitrophenol [H]	100-02-7		5.28E-03		4.81E-03	ND		1.36E-02		3.59E-03	ND		1.78E-02		2.81E-03	ND		2.47E-02		2.27E-03	ND
2,4-Dinitrotoluene [H]	121-14-2		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Dibenzofuran [H]	132-64-9		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Diethylphthalate	84-66-2	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00		
Fluorene	86-73-7		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
4-Chlorophenyl-phenyl Ether	7005-72-3		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
4-Nitroaniline	100-01-6		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
4,6-Dinitro-2-methylphenol	534-52-1		5.28E-03		4.81E-03	ND		1.36E-02		3.59E-03	ND		1.78E-02		2.81E-03	ND		2.47E-02		2.27E-03	ND
N-Nitrosodiphenylamine	86-30-6		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
4-Bromophenyl-phenyl Ether	101-55-3		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Hexachlorobenzene [H]	118-74-1		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Pentachlorophenol [H]	87-86-5		5.28E-03		4.81E-03	ND		1.36E-02		3.59E-03	ND		1.78E-02		2.81E-03	ND		2.47E-02		2.27E-03	ND
Phenanthrene	85-01-8		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Anthracene	120-12-7		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
di-n-Butylphthalate [H]	84-74-2	0.00E+00		0.00E+00			3.92E-04		1.04E-04		bb	2.68E-04		4.23E-05		bb	0.00E+00		0.00E+00		
Fluoranthene	206-44-0		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Pyrene	129-00-0		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Butylbenzylphthalate	85-68-7		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
3,3'-Dichlorobenzidine [H]	91-94-1		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Chrysene	218-01-9		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Benzo(a)anthracene	56-55-3		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
bis(2-Ethylhexyl)phthalate [H]	117-81-7	0.00E+00		0.00E+00		B	9.32E-03		2.47E-03		B	2.01E-03		3.16E-04		B	0.00E+00		0.00E+00		B
Di-n-Octylphthalate	117-84-0		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Benzo(b)fluoranthene	205-99-2		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Benzo(k)fluoranthene	207-08-9		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Benzo(a)pyrene	50-32-8		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Indeno(1,2,3-c,d)pyrene	193-39-5		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Benzo(g,h,i)perylene	191-24-2		2.64E-04		2.41E-04	ND		6.78E-04		1.80E-04	ND		8.91E-04		1.40E-04	ND		1.23E-03		1.13E-04	ND
Benzyl alcohol	100-51-6		2.64E-03		2.41E-03	ND		6.78E-03		1.80E-03	ND		8.91E-03		1.40E-03	ND		1.23E-02		1.13E-03	ND
HAP Total		**1.32E-03**		**1.20E-03**			**9.71E-03**		**2.57E-03**			**2.27E-03**		**3.58E-04**			**0.00E+00**		**0.00E+00**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-147
Emissions Factor Summary
Aldehyde/Ketones
F118-GE-100 (B-2)

Flow by Tracer

		Engine Mode															
		Idle					Approach					Intermediate					Military				
Flow Rate, dscfm		304256					718198					858447					1057742				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	
Formaldehyde [H]	50-00-0	1.97E-01		1.80E-01			4.60E-02		1.22E-02		bb	7.43E-02		1.17E-02		bb	7.13E-02		6.55E-03		bb
Acetaldehyde [H]	75-07-0	8.62E-03		7.85E-03				5.33E-03		1.41E-03	ND		6.27E-03		9.87E-04	ND		8.20E-03		7.53E-04	ND
Acrolein [H]	107-02-8		5.56E-03		5.07E-03	ND		5.33E-03		1.41E-03	ND		6.27E-03		9.87E-04	ND		8.20E-03		7.53E-04	ND
Acetone	67-64-1	2.39E-02		2.18E-02		B,bb	1.80E-01		4.76E-02		B	5.85E-02		9.22E-03		B,bb	1.01E-01		9.24E-03		B,bb
Crotonaldehyde	4170-30-3		5.56E-03		5.07E-03	ND		5.33E-03		1.41E-03	ND		6.27E-03		9.87E-04	ND		8.20E-03		7.53E-04	ND
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3		5.56E-03		5.07E-03	ND		5.33E-03		1.41E-03	ND		6.27E-03		9.87E-04	ND		8.20E-03		7.53E-04	ND
Benzaldehyde	100-52-7	7.23E-03		6.59E-03			6.00E-03		1.59E-03			1.05E-02		1.65E-03			2.11E-02		1.94E-03		
Isopentanal (Isovaleraldehyde)	590-86-3		5.56E-03		5.07E-03	ND	5.33E-03		1.41E-03		bb	8.49E-03		1.34E-03		bb	8.80E-03		8.08E-04		bb
Pentanal (Valeraldehyde)	110-62-3		5.56E-03		5.07E-03	ND		5.33E-03		1.41E-03	ND		6.27E-03		9.87E-04	ND		8.20E-03		7.53E-04	ND
o-Tolualdehyde	529-20-4		5.56E-03		5.07E-03	ND		5.33E-03		1.41E-03	ND		6.27E-03		9.87E-04	ND		8.20E-03		7.53E-04	ND
m-Tolualdehyde	620-23-5	1.25E-02		1.14E-02			1.80E-02		4.76E-03		bb	2.51E-02		3.96E-03		bb	3.28E-02		3.01E-03		bb
p-Tolualdehyde	104-87-0		5.56E-03		5.07E-03	ND		5.33E-03		1.41E-03	ND		6.27E-03		9.87E-04	ND		8.20E-03		7.53E-04	ND
Hexanal (Hexaldehyde)	66-25-1		5.56E-03		5.07E-03	ND		5.33E-03		1.41E-03	ND		6.27E-03		9.87E-04	ND		8.20E-03		7.53E-04	ND
HAP Total		**2.06E-01**		**1.88E-01**			**4.60E-02**		**1.22E-02**			**7.43E-02**		**1.17E-02**			**7.13E-02**		**6.55E-03**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.

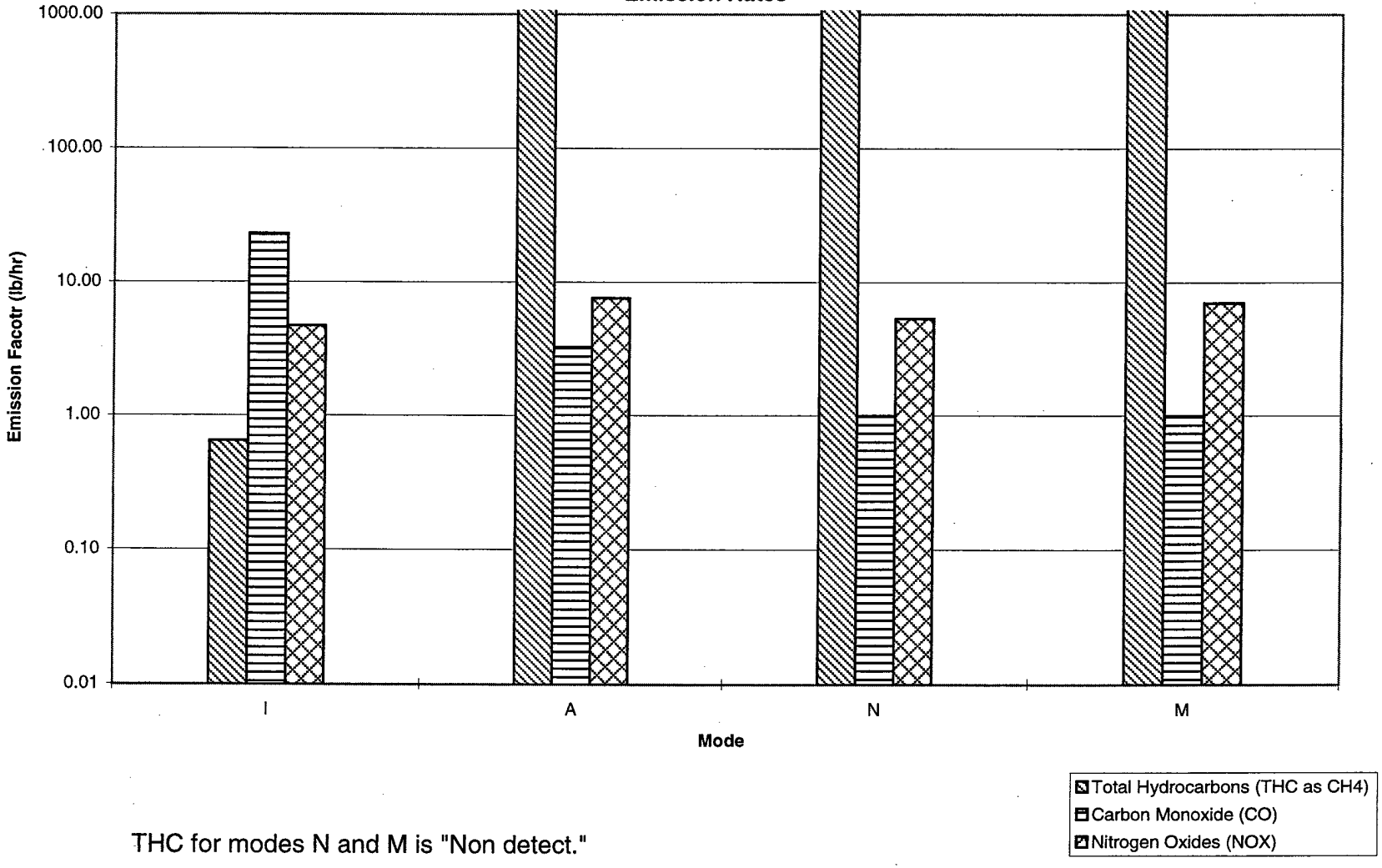
B - Compound present in the laboratory blank greater than reporting limit.

bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.

H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-14
F118-GE-100 (B-2)
Emission Rates



THC for modes N and M is "Non detect."

Table 4-148
Engine Operating Parameter Summary
F118-GE-100 (B-2)

Parameter	Idle	Approach	Intermediate	Military
Throttle position (PLA), degrees	17	37	46	73
Fuel flow, lbs/hr	1,097	3,773	6,350	10,887
Fan speed, rpm	3,341	6,228	7,339	8,275
Core speed, rpm	10,568	12,687	13,808	14,783
Average thrust, lbs	NA	NA	NA	NA
Percent maximum thrust	---	---	---	---

NA - Engine thrust value not available on engine operating parameter printout.

4.3.15 Engine F404-GE-F1D2/400

Tracer gas was used to determine the flow rate at each power setting.

The afterburner power setting was run between afterburner zones 2 and 3 (mid-afterburner) power setting. All other engines tested during this program were run at afterburner zone 1 (minimum afterburner) power setting. The higher afterburner setting appears to have resulted in relatively lower emissions when compared to other engines tested during this program.

Tables 4-149 through 4-160 present engine results for the F404-GE-F1D2/400 engine. Figure 4-15 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-161 summarizes the engine operating data collected during testing.

Table 4-149
Emissions Factor Summary
Gaseous Parameters
F404-GE-F1D2/400 (F-117A & F/A-18C/D)
Idle

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	151484		147428		145179			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	0.78	1.15	0.76	1.11	0.75	1.08	0.76	1.11
Nitrogen Dioxide (NO_2)	0.04	0.06	0.01	0.02	0.02	0.03	0.02	0.04
Nitrogen Oxides (NO_X)	1.19	1.76	1.16	1.71	1.14	1.66	1.17	1.71
Carbon Monoxide (CO)	76.77	112.89	76.26	112.14	73.38	106.51	75.47	110.51
Total Hydrocarbons (THC as CH_4)	32.30	47.50	38.96	57.30	34.16	49.58	35.14	51.46
Carbon Dioxide (CO_2)	2691	3957	2636	3877	1588	2305	2305	3380

Table 4-150
Emissions Factor Summary
Gaseous Parameters
F404-GE-F1D2/400 (F-117A & F/A-18C/D)
Approach

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	554469		561488		563186			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	15.54	5.00	15.48	4.99	15.53	4.98	15.52	4.99
Nitrogen Dioxide (NO_2)	0.64	0.20	0.52	0.17	0.48	0.16	0.55	0.18
Nitrogen Oxides (NO_X)	24.63	7.91	24.54	7.92	24.21	7.76	24.46	7.86
Carbon Monoxide (CO)	4.59	1.48	7.10	2.29	7.12	2.28	6.27	2.02
Total Hydrocarbons (THC as CH_4)	3.96	1.27	4.02	1.30	3.30	1.06	3.76	1.21
Carbon Dioxide (CO_2)	9972	3204	10012	3230	10030	3215	10005	3216

Table 4-151
Emissions Factor Summary
Gaseous Parameters
F404-GE-F1D2/400 (F-117A & F/A-18C/D)
Intermediate

Flow by Tracer

	Run Number								Average	
	1		2		3					
Flow Rate, dscfm	889798		881785		893404					
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel			lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	69.85	10.96	70.46	10.71	72.22	11.22			70.84	10.96
Nitrogen Dioxide (NO_2)	1.91	0.30	1.26	0.19	1.28	0.20			1.49	0.23
Nitrogen Oxides (NO_X)	109.00	17.10	109.28	16.62	112.00	17.39			110.10	17.04
Carbon Monoxide (CO)	10.48	1.64	9.61	1.46	9.74	1.51			9.94	1.54
Total Hydrocarbons (THC as CH_4)	1.20	0.19	2.10	0.32	0.22	0.03	ND		1.18	0.18
Carbon Dioxide (CO_2)	21967	3445	21852	3322	22196	3447			22005	3405

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-152
Emissions Factor Summary
Gaseous Parameters
F404-GE-F1D2/400 (F-117A & F/A-18C/D)
Military

Flow by Tracer

	Run Number							
	1		2		3		Average	
Flow Rate, dscfm	987066		985084		986075			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	129.14	16.66	128.42	16.59	127.17	16.47	128.24	16.57
Nitrogen Dioxide (NO_2)	1.84	0.24	1.98	0.26	2.12	0.27	1.98	0.26
Nitrogen Oxides (NO_X)	200.82	25.91	200.42	25.88	198.50	25.71	199.91	25.83
Carbon Monoxide (CO)	11.62	1.50	11.60	1.50	11.18	1.45	11.47	1.48
Total Hydrocarbons (THC as CH_4)	0.06	0.01	0.11	0.01	2.55	0.33	0.91	0.12
Carbon Dioxide (CO_2)	31229	4029	31101	4017	31110	4029	31147	4025

Table 4-153
Emissions Factor Summary
Gaseous Parameters
F404-GE-F1D2/400 (F-117A & F/A-18C/D)
Afterburner (Zone 3)

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	1007868		1028865		1027830			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	56.04	3.53	51.92	3.27	48.99	3.09	52.32	3.30
Nitrogen Dioxide (NO_2)	6.35	0.40	4.79	0.30	3.76	0.24	4.97	0.31
Nitrogen Oxides (NO_X)	93.14	5.87	84.76	5.34	80.26	5.07	86.05	5.43
Carbon Monoxide (CO)	784.17	49.45	809.92	51.01	798.35	50.41	797.48	50.29
Total Hydrocarbons (THC as CH_4)	432.25	27.26	439.42	27.67	404.97	25.57	425.55	26.83
Carbon Dioxide (CO_2)	45679	2880	53662	3380	53636	3387	50992	3216

Table 4-154
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F404-GE-F1D2/400 (F-117A & F/A-18C/D)
Idle
Flow by Tracer

		Run Number															
		1					2					3					
Flow Rate, dscfm		151484					147428					145179					Average
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	6.36E-04		9.35E-04		J		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.42E-03	5.00E-03
Vinyl Chloride [H]	75-01-4	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Bromomethane [H]	74-83-9	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Chloroethane [H]	75-00-3	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Freon 11 (Trichlorofluoromethane)	75-69-4	2.66E-03		3.91E-03		J		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	4.10E-03	5.99E-03
1,1-Dichloroethene [H]	75-35-4	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Methylene Chloride [H]	75-09-2	9.05E-03		1.33E-02		J	6.10E-03		8.97E-03			9.27E-03		1.35E-02			8.14E-03	1.19E-02
1,1-Dichloroethane [H]	75-34-3	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Chloroform [H]	67-66-3	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
1,1,1-Trichloroethane [H]	71-55-6	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Carbon Tetrachloride [H]	56-23-5	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Benzene [H]	71-43-2	3.67E-02		5.40E-02		J	5.45E-01		8.01E-01		J	4.74E-01		6.89E-01			3.52E-01	5.15E-01
1,2-Dichloroethane [H]	107-06-2	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Trichloroethene [H]	79-01-6	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
1,2-Dichloropropane [H]	78-87-5	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
trans-1,3-Dichloropropene [H]	10061-02-6	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Toluene [H]	108-88-3	1.15E-01		1.69E-01		J	2.28E-01		3.35E-01			1.91E-01		2.77E-01			1.78E-01	2.60E-01
cis-1,3-Dichloropropene [H]	10061-01-5	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
1,1,2-Trichloroethane [H]	79-00-5	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Tetrachloroethene [H]	127-18-4	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Chlorobenzene [H]	108-90-7	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Ethyl Benzene [H]	100-41-4	5.73E-02		8.43E-02		J	5.47E-02		8.05E-02			4.18E-02		6.06E-02			5.13E-02	7.51E-02
m,p-Xylene [H]	1330-20-7	1.33E-01		1.95E-01		J	1.28E-01		1.88E-01			8.38E-02		1.22E-01			1.15E-01	1.68E-01
o-Xylene [H]	95-47-6	6.02E-02		8.85E-02		J	5.80E-02		8.53E-02			4.77E-02		6.92E-02			5.53E-02	8.10E-02
Styrene [H]	100-42-5	7.55E-02		1.11E-01		J	5.47E-02		8.05E-02			4.77E-02		6.92E-02			5.93E-02	8.69E-02
1,1,2,2-Tetrachloroethane [H]	79-34-5	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Acetone	67-64-1	4.32E-02		6.35E-02		J	7.52E-02		1.11E-01			6.75E-02		9.80E-02			6.19E-02	9.07E-02
Carbon Disulfide [H]	75-15-0	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
trans-1,2-Dichloroethene	156-60-5	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Vinyl Acetate [H]	108-05-4	1.51E-03		2.22E-03		UJ		2.28E-02		3.35E-02	ND		2.53E-02		3.68E-02	ND	1.66E-02	2.42E-02
2-Butanone (MEK) [H]	78-93-3	3.12E-03		4.59E-03		J	2.05E-02		3.01E-02			2.03E-02		2.95E-02			1.46E-02	2.14E-02
Bromodichloromethane	75-27-4	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	1.51E-03		2.22E-03		UJ		2.28E-02		3.35E-02	ND		2.53E-02		3.68E-02	ND	1.66E-02	2.42E-02
2-Hexanone	591-78-6	1.51E-03		2.22E-03		UJ		2.28E-02		3.35E-02	ND		2.53E-02		3.68E-02	ND	1.66E-02	2.42E-02
Dibromochloromethane (Chlorodibromomethane)	124-48-1	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
Bromoform [H]	75-25-2	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
cis-1,2-Dichloroethene	156-59-2	3.02E-04		4.44E-04		UJ		4.56E-03		6.71E-03	ND		5.07E-03		7.36E-03	ND	3.31E-03	4.84E-03
HAP Total		**4.99E-01**		**7.34E-01**			**1.09E+00**		**1.61E+00**			**9.16E-01**		**1.33E+00**			**9.17E-01**	**1.34E+00**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-155
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F404-GE-F1D2/400 (F-117A & F/A-18C/D)
Approach
Flow by Tracer

		Run Number															
		1					2					3				Average	
Flow Rate, dscfm		554469					561488					563186					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	1.39E-03		4.47E-04				1.17E-03		3.76E-04	ND	1.09E-03		3.50E-04		1.22E-03	3.91E-04
Vinyl Chloride [H]	75-01-4		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND
Bromomethane [H]	74-83-9		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND
Chloroethane [H]	75-00-3		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.93E-02		6.19E-03			5.83E-02		1.88E-02			2.30E-02		7.37E-03		3.35E-02	1.08E-02
1,1-Dichloroethene [H]	75-35-4		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND
Methylene Chloride [H]	75-09-2	3.09E-02		9.94E-03			7.93E-02		2.56E-02			2.72E-02		8.72E-03		4.58E-02	1.47E-02
1,1-Dichloroethane [H]	75-34-3		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND
Chloroform [H]	67-66-3		1.07E-03		3.44E-04	ND	1.86E-03		6.01E-04		bb	1.96E-03		6.30E-04		bb	1.63E-03	5.25E-04
1,1,1-Trichloroethane [H]	71-55-6		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND	1.09E-03		3.50E-04			1.11E-03	3.56E-04
Benzene [H]	71-43-2	1.93E-03		6.19E-04			1.86E-03		6.01E-04			3.27E-03		1.05E-03			2.35E-03	7.56E-04
1,2-Dichloroethane [H]	107-06-2		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
Toluene [H]	108-88-3	3.09E-03		9.94E-04			2.21E-03		7.12E-04			2.85E-03		9.13E-04			2.72E-03	8.73E-04
cis-1,3-Dichloropropene [H]	10061-01-5		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4	1.93E-03		6.19E-04			1.28E-03		4.13E-04			1.31E-03		4.20E-04			1.51E-03	4.84E-04
m,p-Xylene [H]	1330-20-7	6.96E-03		2.24E-03			4.90E-03		1.58E-03			4.58E-03		1.47E-03			5.48E-03	1.76E-03
o-Xylene [H]	95-47-6	3.43E-03		1.10E-03			2.33E-03		7.53E-04			2.41E-03		7.71E-04			2.72E-03	8.75E-04
Styrene [H]	100-42-5		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
Acetone	67-64-1	9.74E-03		3.13E-03		bb	7.93E-03		2.56E-03		bb	7.74E-03		2.48E-03		bb	8.47E-03	2.72E-03
Carbon Disulfide [H]	75-15-0		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		5.36E-03		1.72E-03	ND		5.83E-03		1.88E-03	ND		5.46E-03		1.75E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		5.36E-03		1.72E-03	ND		5.83E-03		1.88E-03	ND		5.46E-03		1.75E-03	ND	ND	ND
Bromodichloromethane	75-27-4		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		5.36E-03		1.72E-03	ND		5.83E-03		1.88E-03	ND		5.46E-03		1.75E-03	ND	ND	ND
2-Hexanone	591-78-6		5.36E-03		1.72E-03	ND		5.83E-03		1.88E-03	ND		5.46E-03		1.75E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
Bromoform [H]	75-25-2		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.07E-03		3.44E-04	ND		1.17E-03		3.76E-04	ND		1.09E-03		3.50E-04	ND	ND	ND
HAP Total		**4.97E-02**		**1.60E-02**			**9.37E-02**		**3.02E-02**			**4.58E-02**		**1.47E-02**			**6.46E-02**	**2.08E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-156
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F404-GE-F1D2/400 (F-117A & F/A-18C/D)
Intermediate
Flow by Tracer

		Run Number													
		1				2				3				Average	
Flow Rate, dscfm		892460				897875				884511					
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	3.32E-03		5.05E-04		3.53E-03		5.54E-04		2.50E-03		3.89E-04		3.12E-03	4.83E-04
Vinyl Chloride [H]	75-01-4		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Bromomethane [H]	74-83-9		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Chloroethane [H]	75-00-3		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	3.84E-02		5.85E-03		4.04E-02		6.33E-03		5.37E-02		8.34E-03		4.42E-02	6.84E-03
1,1-Dichloroethene [H]	75-35-4		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Methylene Chloride [H]	75-09-2	8.56E-02		1.30E-02		5.99E-02		9.39E-03		7.52E-02		1.17E-02		7.36E-02	1.14E-02
1,1-Dichloroethane [H]	75-34-3		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Chloroform [H]	67-66-3		1.75E-03		2.66E-04 ND	3.17E-03		4.97E-04	bb	2.50E-03		3.89E-04	bb	2.47E-03	3.84E-04
1,1,1-Trichloroethane [H]	71-55-6		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Carbon Tetrachloride [H]	56-23-5	1.92E-03		2.92E-04			1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	1.82E-03	2.82E-04
Benzene [H]	71-43-2	6.12E-03		9.30E-04		3.53E-03		5.54E-04		2.86E-03		4.45E-04		4.17E-03	6.43E-04
1,2-Dichloroethane [H]	107-06-2		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Trichloroethene [H]	79-01-6		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Toluene [H]	108-88-3	1.14E-02		1.73E-03		6.69E-03		1.05E-03		2.68E-03		4.17E-04		6.91E-03	1.06E-03
cis-1,3-Dichloropropene [H]	10061-01-5		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Tetrachloroethene [H]	127-18-4		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Chlorobenzene [H]	108-90-7		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Ethyl Benzene [H]	100-41-4	3.32E-03		5.05E-04		2.64E-03		4.14E-04			1.79E-03		2.78E-04 ND	2.58E-03	3.99E-04
m,p-Xylene [H]	1330-20-7	1.29E-02		1.97E-03		9.15E-03		1.43E-03		4.64E-03		7.20E-04		8.91E-03	1.37E-03
o-Xylene [H]	95-47-6	5.42E-03		8.23E-04		3.87E-03		6.07E-04		2.15E-03		3.33E-04		3.81E-03	5.88E-04
Styrene [H]	100-42-5		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Acetone	67-64-1	4.55E-01		6.91E-02	J	1.23E-02		1.93E-03	bb	1.22E-02		1.89E-03	bb	1.60E-01	2.43E-02
Carbon Disulfide [H]	75-15-0		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Vinyl Acetate [H]	108-05-4		8.73E-03		1.33E-03 ND		8.81E-03		1.38E-03 ND		8.95E-03		1.39E-03 ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		8.73E-03		1.33E-03 ND		8.81E-03		1.38E-03 ND		8.95E-03		1.39E-03 ND	ND	ND
Bromodichloromethane	75-27-4		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		8.73E-03		1.33E-03 ND		8.81E-03		1.38E-03 ND		8.95E-03		1.39E-03 ND	ND	ND
2-Hexanone	591-78-6		8.73E-03		1.33E-03 ND		8.81E-03		1.38E-03 ND		8.95E-03		1.39E-03 ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
Bromoform [H]	75-25-2		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.75E-03		2.66E-04 ND		1.76E-03		2.76E-04 ND		1.79E-03		2.78E-04 ND	ND	ND
HAP Total		**1.30E-01**		**1.98E-02**		**9.25E-02**		**1.45E-02**		**9.26E-02**		**1.44E-02**		**1.07E-01**	**1.66E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-157
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F404-GE-F1D2/400 (F-117A & F/A-18C/D)
Military
Flow by Tracer

		Run Number															
		1					2					3					
Flow Rate, dscfm		987066					985084					986075					Average
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr / lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	4.73E-03		6.11E-04				1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	2.89E-03 / 3.74E-04
Vinyl Chloride [H]	75-01-4		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Bromomethane [H]	74-83-9		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Chloroethane [H]	75-00-3		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Freon 11 (Trichlorofluoromethane)	75-69-4	1.21E-01		1.57E-02			9.30E-02		1.20E-02			7.50E-02		9.71E-03			9.64E-02 / 1.25E-02
1,1-Dichloroethene [H]	75-35-4		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Methylene Chloride [H]	75-09-2	5.51E-02		7.12E-03			9.23E-03		1.19E-03			7.39E-03		9.57E-04			2.39E-02 / 3.09E-03
1,1-Dichloroethane [H]	75-34-3		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Chloroform [H]	67-66-3		3.22E-03		4.16E-04	ND	3.95E-03		5.09E-04		bb	3.36E-03		4.35E-04		bb	3.51E-03 / 4.54E-04
1,1,1-Trichloroethane [H]	71-55-6		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Carbon Tetrachloride [H]	56-23-5		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Benzene [H]	71-43-2	1.16E-02		1.49E-03			3.36E-03		4.33E-04			2.18E-03		2.82E-04			5.70E-03 / 7.37E-04
1,2-Dichloroethane [H]	107-06-2		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Trichloroethene [H]	79-01-6		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
1,2-Dichloropropane [H]	78-87-5		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
trans-1,3-Dichloropropene [H]	10061-02-6		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Toluene [H]	108-88-3	1.02E-02		1.32E-03			2.57E-03		3.31E-04			2.57E-03		3.33E-04			5.13E-03 / 6.62E-04
cis-1,3-Dichloropropene [H]	10061-01-5		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
1,1,2-Trichloroethane [H]	79-00-5		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Tetrachloroethene [H]	127-18-4		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Chlorobenzene [H]	108-90-7		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Ethyl Benzene [H]	100-41-4		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
m,p-Xylene [H]	1330-20-7	7.21E-03		9.31E-04			4.72E-03		6.09E-04			5.36E-03		6.94E-04			5.76E-03 / 7.45E-04
o-Xylene [H]	95-47-6		3.22E-03		4.16E-04	ND	2.17E-03		2.80E-04			2.38E-03		3.08E-04			2.59E-03 / 3.35E-04
Styrene [H]	100-42-5		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Acetone	67-64-1	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00 / 0.00E+00
Carbon Disulfide [H]	75-15-0		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
trans-1,2-Dichloroethene	156-60-5		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Vinyl Acetate [H]	108-05-4		1.61E-02		2.08E-03	ND		9.89E-03		1.28E-03	ND		9.90E-03		1.28E-03	ND	ND / ND
2-Butanone (MEK) [H]	78-93-3		1.61E-02		2.08E-03	ND		9.89E-03		1.28E-03	ND		9.90E-03		1.28E-03	ND	ND / ND
Bromodichloromethane	75-27-4		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.61E-02		2.08E-03	ND		9.89E-03		1.28E-03	ND		9.90E-03		1.28E-03	ND	ND / ND
2-Hexanone	591-78-6		1.61E-02		2.08E-03	ND		9.89E-03		1.28E-03	ND		9.90E-03		1.28E-03	ND	ND / ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
Bromoform [H]	75-25-2		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
cis-1,2-Dichloroethene	156-59-2		3.22E-03		4.16E-04	ND		1.97E-03		2.55E-04	ND		1.98E-03		2.56E-04	ND	ND / ND
HAP Total		**8.89E-02**		**1.15E-02**			**2.60E-02**		**3.35E-03**			**2.32E-02**		**3.01E-03**			**4.95E-02 / 6.39E-03**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-158
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
F404-GE-F1D2/400 (F-117A & F/A-18C/D)
Afterburner (Zone 3)
Flow by Tracer

		Run Number													
		1				2				3				Average	
Flow Rate, dscfm		1007868				1028865				1027830					
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Vinyl Chloride [H]	75-01-4	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Bromomethane [H]	74-83-9	8.16E-03		5.14E-04	J		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.49E-02	4.09E-03
Chloroethane [H]	75-00-3	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Freon 11 (Trichlorofluoromethane)	75-69-4	1.67E-02		1.05E-03	J		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.77E-02	4.27E-03
1,1-Dichloroethene [H]	75-35-4	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Methylene Chloride [H]	75-09-2	1.94E-03		1.23E-04	UJ	1.96E-01		1.24E-02		2.01E-01		1.27E-02		1.33E-01	8.38E-03
1,1-Dichloroethane [H]	75-34-3	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Chloroform [H]	67-66-3	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
1,1,1-Trichloroethane [H]	71-55-6	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Carbon Tetrachloride [H]	56-23-5	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Benzene [H]	71-43-2	2.75E-01		1.74E-02	J	8.37E+00		5.27E-01		8.93E+00		5.64E-01		5.86E+00	3.69E-01
1,2-Dichloroethane [H]	107-06-2	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Trichloroethene [H]	79-01-6	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
1,2-Dichloropropane [H]	78-87-5	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
trans-1,3-Dichloropropene [H]	10061-02-6	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Toluene [H]	108-88-3	9.54E-01		6.01E-02	J	3.58E+00		2.26E-01		3.95E+00		2.49E-01		2.83E+00	1.78E-01
cis-1,3-Dichloropropene [H]	10061-01-5	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
1,1,2-Trichloroethane [H]	79-00-5	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Tetrachloroethene [H]	127-18-4	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Chlorobenzene [H]	108-90-7	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Ethyl Benzene [H]	100-41-4	8.76E-01		5.52E-02	J	6.82E-01		4.30E-02		7.51E-01		4.74E-02		7.70E-01	4.85E-02
m,p-Xylene [H]	1330-20-7	1.15E+00		7.24E-02	J	1.56E+00		9.83E-02		1.71E+00		1.08E-01		1.47E+00	9.30E-02
o-Xylene [H]	95-47-6	8.57E-01		5.40E-02	J	6.82E-01		4.30E-02		7.74E-01		4.89E-02		7.71E-01	4.86E-02
Styrene [H]	100-42-5	8.57E-02		5.40E-03	J		9.02E-02		5.68E-03 ND	1.02E-01		6.47E-03		9.28E-02	5.85E-03
1,1,2,2-Tetrachloroethane [H]	79-34-5	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Acetone	67-64-1	1.56E+00		9.85E-02	J	1.63E+00		1.02E-01		1.87E+00		1.18E-01		1.68E+00	1.06E-01
Carbon Disulfide [H]	75-15-0	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
trans-1,2-Dichloroethene	156-60-5	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Vinyl Acetate [H]	108-05-4	9.74E-03		6.14E-04	UJ		4.62E-01		2.91E-02 ND		4.81E-01		3.04E-02 ND	3.18E-01	2.00E-02
2-Butanone (MEK) [H]	78-93-3	4.87E-01		3.07E-02	J	6.01E-01		3.79E-02		5.62E-01		3.55E-02		5.50E-01	3.47E-02
Bromodichloromethane	75-27-4	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	9.74E-03		6.14E-04	UJ		4.62E-01		2.91E-02 ND		4.81E-01		3.04E-02 ND	3.18E-01	2.00E-02
2-Hexanone	591-78-6	9.74E-03		6.14E-04	UJ		4.62E-01		2.91E-02 ND		4.81E-01		3.04E-02 ND	3.18E-01	2.00E-02
Dibromochloromethane (Chlorodibromomethane)	124-48-1	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
Bromoform [H]	75-25-2	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
cis-1,2-Dichloroethene	156-59-2	1.94E-03		1.23E-04	UJ		9.02E-02		5.68E-03 ND		9.63E-02		6.08E-03 ND	6.28E-02	3.96E-03
HAP Total		**4.75E+00**		**3.00E-01**		**1.57E+01**		**9.87E-01**		**1.70E+01**		**1.07E+00**		**1.41E+01**	**8.86E-01**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-159
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
F404-GE-F1D2/400 (F-117A & F/A-18C/D)

Flow by Tracer

		Engine Mode																					
		Idle					Approach					Intermediate					Military					Afterburner (Zone 3)				
Flow Rate, dscfm		147980					559692					891587					986075					1021427				
		lb/hr	Detection	lbs/1,000 lbs fuel	Detection		lb/hr	Detection	lbs/1,000 lbs fuel	Detection		lb/hr	Detection	lbs/1,000 lbs fuel	Detection		lb/hr	Detection	lbs/1,000 lbs fuel	Detection		lb/hr	Detection	lbs/1,000 lbs fuel	Detection	
Analyte	CAS Number	Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit	
Phenol [H]	108-95-2	7.91E-02		1.16E-01				2.56E-03		8.22E-04	ND		4.81E-03		7.44E-04	ND		5.17E-03		6.68E-04	ND	1.06E+00		6.68E-02		
Dichloroethyl ether [H]	111-44-4		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
2-Chlorophenol	95-57-8		5.93E-03		8.68E-03	ND		2.56E-03		8.22E-04	ND		4.81E-03		7.44E-04	ND		5.17E-03		6.68E-04	ND		1.27E-01		8.01E-03	ND
1,3-Dichlorobenzene	541-73-1		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
1,4-Dichlorobenzene [H]	106-46-7		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
1,2-Dichlorobenzene	95-50-1		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
o-Cresol [H]	95-48-7		5.93E-03		8.68E-03	ND		2.56E-03		8.22E-04	ND		4.81E-03		7.44E-04	ND		5.17E-03		6.68E-04	ND		1.27E-01		8.01E-03	ND
bis(2-Chloroisopropyl) Ether	39638-32-9		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
N-Nitroso-di-n-propylamine	621-64-7		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
p-Cresol [H]	106-44-5	1.77E-02		2.59E-02				2.56E-03		8.22E-04	ND		4.81E-03		7.44E-04	ND		5.17E-03		6.68E-04	ND	3.07E-01		1.94E-02		
Hexachloroethane [H]	67-72-1		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Nitrobenzene [H]	98-95-3		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Isophorone [H]	78-59-1		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
2-Nitrophenol	88-75-5		5.93E-03		8.68E-03	ND		2.56E-03		8.22E-04	ND		4.81E-03		7.44E-04	ND		5.17E-03		6.68E-04	ND	3.89E-01		2.45E-02		
2,4-Dimethylphenol	105-67-9		5.93E-03		8.68E-03	ND		2.56E-03		8.22E-04	ND		4.81E-03		7.44E-04	ND		5.17E-03		6.68E-04	ND		1.27E-01		8.01E-03	ND
Benzoic Acid	65-85-0		2.37E-02		3.47E-02	ND	4.96E-02		1.60E-02			1.05E-01		1.62E-02			5.85E-02		7.56E-03			2.24E+00		1.41E-01		
bis(2-Chloroethoxy) Methane	111-91-1		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
2,4-Dichlorophenol	120-83-2		5.93E-03		8.68E-03	ND		2.56E-03		8.22E-04	ND		4.81E-03		7.44E-04	ND		5.17E-03		6.68E-04	ND		1.27E-01		8.01E-03	ND
1,2,4-Trichlorobenzene [H]	120-82-1		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Naphthalene [H]	91-20-3	8.95E-02		1.31E-01			9.65E-04		3.10E-04			4.55E-04		7.03E-05			7.99E-04		1.03E-04			1.16E+00		7.32E-02		
4-Chloroaniline	106-47-8		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Hexachlorobutadiene [H]	87-68-3		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
4-Chloro-3-methylphenol	59-50-7		5.93E-03		8.68E-03	ND		2.56E-03		8.22E-04	ND		4.81E-03		7.44E-04	ND		5.17E-03		6.68E-04	ND		1.27E-01		8.01E-03	ND
2-Methylnaphthalene	91-57-6	7.56E-02		1.11E-01			5.51E-04		1.77E-04			1.15E-04		1.77E-05			8.11E-05		1.05E-05			1.06E+00		6.70E-02		
Hexachlorocyclopentadiene [H]	77-47-4		1.18E-02		1.73E-02	ND		5.12E-03		1.64E-03	ND		9.62E-03		1.49E-03	ND		1.03E-02		1.33E-03	ND		2.44E-01		1.54E-02	ND
2,4,6-Trichlorophenol [H]	88-06-2		5.93E-03		8.68E-03	ND		2.56E-03		8.22E-04	ND		4.81E-03		7.44E-04	ND		5.17E-03		6.68E-04	ND		1.27E-01		8.01E-03	ND
2,4,5-Trichlorophenol [H]	95-95-4		5.93E-03		8.68E-03	ND		2.56E-03		8.22E-04	ND		4.81E-03		7.44E-04	ND		5.17E-03		6.68E-04	ND		1.27E-01		8.01E-03	ND
2-Chloronaphthalene	91-58-7		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
2-Nitroaniline	88-74-4		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Dimethylphthalate [H]	131-11-3		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Acenaphthylene	208-96-8	6.25E-03		9.15E-03				5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
2,6-Dinitrotoluene	606-20-2		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
3-Nitroaniline	99-09-2		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Acenaphthene	83-32-9		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
2,4-Dinitrophenol [H]	51-28-5		2.37E-02		3.47E-02	ND		1.02E-02		3.29E-03	ND		1.93E-02		2.98E-03	ND		2.06E-02		2.67E-03	ND		4.90E-01		3.09E-02	ND
4-Nitrophenol [H]	100-02-7		2.37E-02		3.47E-02	ND		1.02E-02		3.29E-03	ND		1.93E-02		2.98E-03	ND		2.06E-02		2.67E-03	ND		4.90E-01		3.09E-02	ND
2,4-Dinitrotoluene [H]	121-14-2		1.18E-02		1.73E-02	ND		5.12E-03		1.64E-03	ND		9.62E-03		1.49E-03	ND		1.03E-02		1.33E-03	ND		2.44E-01		1.54E-02	ND
Dibenzofuran [H]	132-64-9		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Diethylphthalate	84-66-2		1.18E-03		1.73E-03	ND	0.00E+00		0.00E+00			7.40E-04		1.15E-04		bb	0.00E+00		0.00E+00		bb		2.44E-02		1.54E-03	ND
Fluorene	86-73-7	1.76E-03		2.58E-03				5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
4-Chlorophenyl-phenyl Ether	7005-72-3		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
4-Nitroaniline	100-01-6		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
4,6-Dinitro-2-methylphenol	534-52-1		2.37E-02		3.47E-02	ND		1.02E-02		3.29E-03	ND		1.93E-02		2.98E-03	ND		2.06E-02		2.67E-03	ND		4.90E-01		3.09E-02	ND
N-Nitrosodiphenylamine	86-30-6		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
4-Bromophenyl-phenyl Ether	101-55-3		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Hexachlorobenzene [H]	118-74-1		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Pentachlorophenol [H]	87-86-5		1.18E-02		1.73E-02	ND		5.12E-03		1.64E-03	ND		9.62E-03		1.49E-03	ND		1.03E-02		1.33E-03	ND		2.44E-01		1.54E-02	ND
Phenanthrene	85-01-8	1.76E-03		2.58E-03				5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Anthracene	120-12-7		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
di-n-Butylphthalate [H]	84-74-2		1.18E-03		1.73E-03	ND	3.32E-04		1.07E-04		bb	1.22E-02		1.89E-03			1.24E-03		1.60E-04				2.44E-02		1.54E-03	ND
Fluoranthene	206-44-0		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Pyrene	129-00-0		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Butylbenzylphthalate	85-68-7		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
3,3'-Dichlorobenzidine [H]	91-94-1		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Chrysene	218-01-9		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Benzo(a)anthracene	56-55-3		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
bis(2-Ethylhexyl)phthalate [H]	117-81-7	1.74E-03		2.55E-03		B	1.59E-03		5.11E-04		B,bb	1.42E-02		2.19E-03		B	6.72E-03		8.69E-04		B		2.44E-02		1.54E-03	ND
Di-n-Octylphthalate	117-84-0		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Benzo(b)fluoranthene	205-99-2		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Benzo(k)fluoranthene	207-08-9		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Benzo(a)pyrene	50-32-8		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Indeno(1,2,3-c,d)pyrene	193-39-5		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Benzo(g,h,i)perylene	191-24-2		1.18E-03		1.73E-03	ND		5.12E-04		1.64E-04	ND		9.62E-04		1.49E-04	ND		1.03E-03		1.33E-04	ND		2.44E-02		1.54E-03	ND
Benzyl alcohol	100-51-6	2.36E-02		3.46E-02				2.56E-03		8.22E-04	ND		4.81E-03		7.44E-04	ND		5.17E-03		6.68E-04	ND	4.50E-01		2.84E-02		
HAP Total		**1.88E-01**		**2.75E-01**			**2.89E-03**		**9.28E-04**			**2.68E-02**		**4.15E-03**			**8.76E-03**		**1.13E-03**			**2.53E+00**		**1.59E-01**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.

B - Compound present in the laboratory blank greater than reporting limit.

bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.

H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-160
Emissions Factor Summary
Aldehyde/Ketones
F404-GE-F1D2/400 (F-117A & F/A-18C/D)

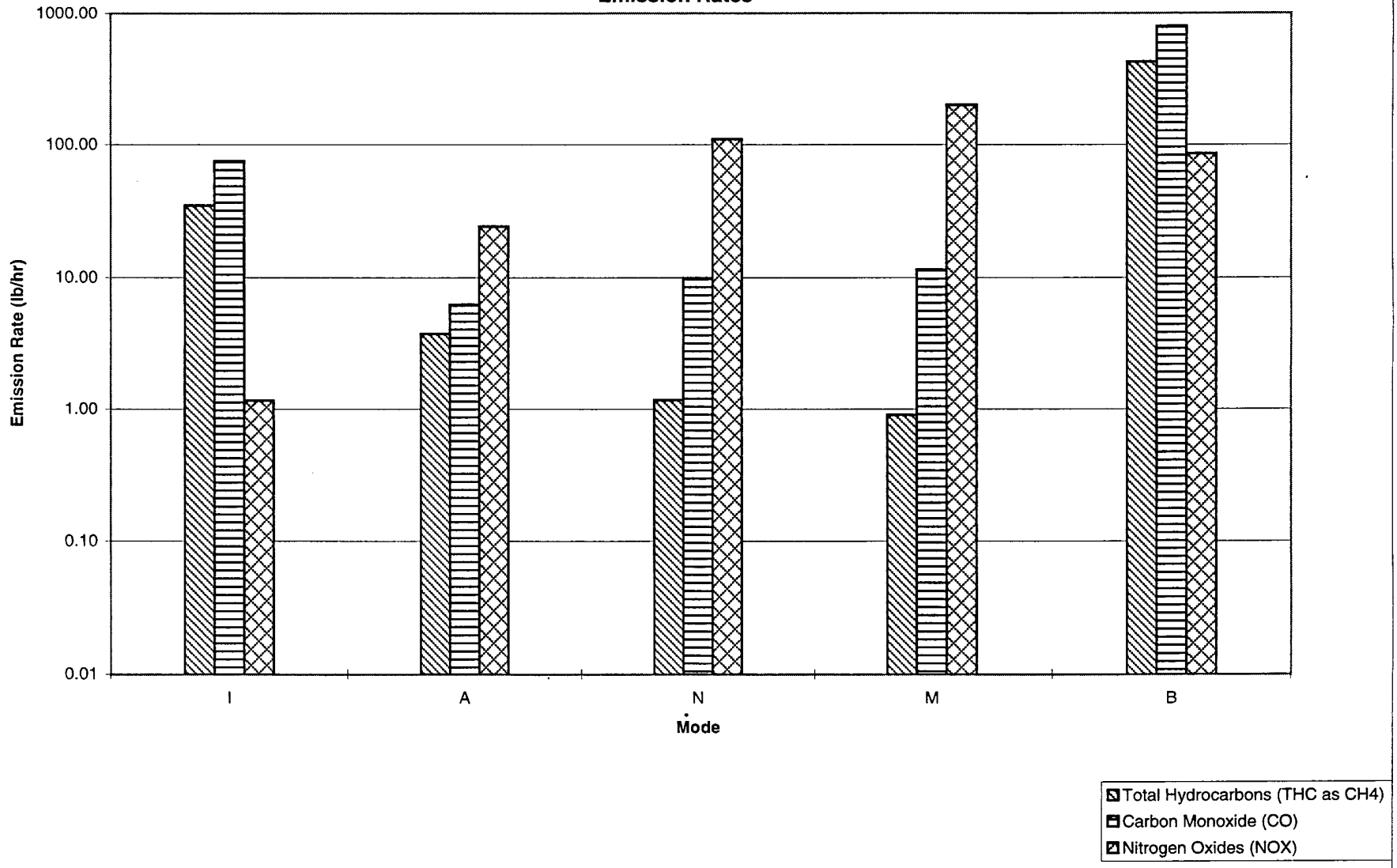
Flow by Tracer

		Engine Mode																	
		Idle				Approach				Intermediate				Military				Afterburner (Zone 3)			
Flow Rate, dscfm		147980				559692				891587				986075				1021427			
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel	
			Detection		Detection		Detection		Detection		Detection		Detection		Detection		Detection		Detection		Detection
Analyte	**CAS Number**	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit
Formaldehyde [H]	50-00-0	7.82E-01		1.14E+00		5.20E-02		1.67E-02	bb	1.46E-01		2.26E-02		6.98E-02		9.02E-03	bb	5.93E-01		3.74E-02	
Acetaldehyde [H]	75-07-0	3.90E-02		5.71E-02			2.85E-03		9.17E-04 ND		8.68E-03		1.34E-03 ND		7.54E-03		9.74E-04 ND	5.36E-01		3.38E-02	
Acrolein [H]	107-02-8	1.17E-01		1.71E-01			2.85E-03		9.17E-04 ND		8.68E-03		1.34E-03 ND		7.54E-03		9.74E-04 ND	2.29E+00		1.45E-01	
Acetone	67-64-1		3.38E-02		4.95E-02 ND	9.88E-02		3.17E-02	B	2.19E-01		3.39E-02	B	2.55E-01		3.29E-02	B		6.70E-02		4.22E-03 ND
Crotonaldehyde	4170-30-3	6.26E-02		9.17E-02			2.85E-03		9.17E-04 ND		8.68E-03		1.34E-03 ND		7.54E-03		9.74E-04 ND	1.34E+00		8.44E-02	
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3		3.38E-02		4.95E-02 ND		2.85E-03		9.17E-04 ND		8.68E-03		1.34E-03 ND		7.54E-03		9.74E-04 ND	3.44E-01		2.17E-02	
Benzaldehyde	100-52-7	8.98E-02		1.31E-01			2.85E-03		9.17E-04 ND	1.10E-02		1.70E-03			7.54E-03		9.74E-04 ND	2.10E+00		1.32E-01	
Isopentanal (Isovaleraldehyde)	590-86-3		3.38E-02		4.95E-02 ND	3.54E-03		1.14E-03	bb	1.19E-02		1.84E-03	bb		7.54E-03		9.74E-04 ND	2.10E-01		1.32E-02	
Pentanal (Valeraldehyde)	110-62-3		3.38E-02		4.95E-02 ND		2.85E-03		9.17E-04 ND		8.68E-03		1.34E-03 ND		7.54E-03		9.74E-04 ND		6.70E-02		4.22E-03 ND
o-Tolualdehyde	529-20-4		3.38E-02		4.95E-02 ND		2.85E-03		9.17E-04 ND		8.68E-03		1.34E-03 ND		7.54E-03		9.74E-04 ND	6.89E-01		4.34E-02	
m-Tolualdehyde	620-23-5	4.68E-02		6.86E-02			2.85E-03		9.17E-04 ND		8.68E-03		1.34E-03 ND		7.54E-03		9.74E-04 ND	1.53E+00		9.63E-02	
p-Tolualdehyde	104-87-0		3.38E-02		4.95E-02 ND		2.85E-03		9.17E-04 ND		8.68E-03		1.34E-03 ND		7.54E-03		9.74E-04 ND		6.70E-02		4.22E-03 ND
Hexanal (Hexaldehyde)	66-25-1		3.38E-02		4.95E-02 ND		2.85E-03		9.17E-04 ND		8.68E-03		1.34E-03 ND		7.54E-03		9.74E-04 ND	2.00E-01		1.26E-02	
HAP Total		**9.38E-01**		**1.37E+00**		**5.20E-02**		**1.67E-02**		**1.46E-01**		**2.26E-02**		**6.98E-02**		**9.02E-03**		**3.76E+00**		**2.37E-01**	

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-15
F404-GE-F1D2/400 (F-117A & F/A-18C/D)
Emission Rates



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Table 4-161
Engine Operating Parameter Summary
F404-GE-F1D2/400 (F-117A & F/A-18C/D)

Parameter	Idle	Approach	Intermediate	Military	Afterburner (Zone 3)
Barometric pressure, in. Hg	26.81	27.77	26.92	27.76	27.35
Fuel flow, lbs/hr	685	3,111	6,464	7,739	15,851
Fan speed, rpm	5,159	10,492	12,486	13,167	13,109
Core speed, rpm	10,960	14,176	15,414	15,994	15,876
Average thrust, lbs	632	4,057	8,305	9,608	12,034
Percent maximum thrust	6	38	79	91	114

4.3.16 Engine F110-GE-129

Tracer gas was used to determine the flow rate at each power setting. Testing involved only gaseous (NO_x, THC, CO_2, and CO) parameters. Sampling was conducted for approximately one hour at each engine power setting.

Table 4-162 presents engine results for the F110-GE-129 engine. Table 4-163 summarizes the engine operating data collected during testing.

Table 4-162
Emissions Factor Summary
Gaseous Parameters
F110-GE-129

Flow by Tracer

	Engine Mode														
	Idle			Approach			Intermediate			Military			Afterburner		
Flow Rate, dscfm	234595			973234			1158612			1258492			1327138		
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel	
Nitrogen Oxide (NO)	1.53	1.60		41.84	8.66		79.58	11.47		113.15	16.31		68.75	4.42	
Nitrogen Dioxide (NO_2)	0.17	0.17		0.70	0.14		0.83	0.12		1.66	0.24		4.98	0.32	
Nitrogen Oxides (NO_X)	2.52	2.62		64.84	13.42		123.67	17.82		175.13	25.24		110.39	7.09	
Carbon Monoxide (CO)	43.28	45.01		9.34	1.93		10.61	1.53		10.11	1.46		984.82	63.27	
Total Hydrocarbons (THC as CH_4)	4.09	4.25	ND	1.96	0.41	ND	2.34	0.34		7.00	1.01		723.51	46.48	
Carbon Dioxide (CO_2)	4823	5016		26676	5522		31757	4577		31757	4577		39697	2550	
Sulfur Dioxide (SO_2)	0.37	0.39		1.88	0.39		2.71	0.39		3.36	0.39		6.07	0.39	

Table 4-163
Engine Operating Parameter Summary
F110-GE-129 (F-16C/D)

Parameter	Idle	Approach	Intermediate	Military	Afterburner (Zone 1)
Barometric pressure, in. Hg	27.79	27.80	27.79	27.72	27.71
Throttle position (PLA), degrees	17	52	66	75	92
Fuel flow, lbs/hr	961	4,832	6,939	8,611	15,564
Fan speed, rpm	3,115	7,042	7,626	7,854	8,160
Core speed, rpm	10,192	13,228	13,863	14,289	14,610
Average thrust, lbs	809	8,034	11,431	13,489	17,467
Percent maximum thrust	4	45	65	76	99

4.3.17 Engine F100-PW-100

Tracer gas was used to determine the flow rate at each power setting. Testing involved only gaseous (NO_x, THC, CO_2, and CO) parameters. Sampling was conducted for approximately one hour at each engine power setting.

Table 4-164 presents engine results for the F100-PW-100 engine. Table 4-165 summarizes the engine operating data collected during testing.

Table 4-164
Emissions Factor Summary
Gaseous Parameters
F100-PW-100

Flow by Tracer

	Engine Mode									
	Idle		Approach		Intermediate		Military		Afterburner	
Flow Rate, dscfm	279280		670271		1053284		1092294		1108720	
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	2.87	2.69	21.30	7.81	167.83	22.23	212.12	28.10	177.18	14.53
Nitrogen Dioxide (NO_2)	0.20	0.19	0.48	0.18	3.02	0.40	3.77	0.50	4.53	0.37
Nitrogen Oxides (NO_X)	4.40	4.12	33.13	12.15	261.83	34.69	331.25	43.88	279.19	22.89
Carbon Monoxide (CO)	22.41	21.00	8.18	3.00	8.27	1.10	8.27	1.10	262.30	21.50
Total Hydrocarbons (THC as CH_4)	3.60	3.37	0.52	0.19	ND 2.13	0.28	2.78	0.37	48.41	3.97
Carbon Dioxide (CO_2)	3828	3587	9186	3370	28870	3825	28870	3825	36088	2959
Sulfur Dioxide (SO_2)	0.41	0.39	1.04	0.39	2.87	0.39	3.50	0.39	4.64	0.38

Table 4-165
Engine Operating Parameter Summary
F100-PW-100 (F-15)

Parameter	Idle	Approach	Intermediate	Military	Afterburner (Zone 1)
Barometric pressure, in. Hg	27.68	27.69	27.69	27.69	27.68
Throttle position (PLA), degrees	28	40	76	87	94
Fuel flow, lbs/hr	1,067	2,726	7,549	9,211	12,198
Fan speed, rpm	5,447	7,994	9,577	10,060	10,118
Core speed, rpm	9,620	10,853	12,376	12,698	12,757
Average thrust, lbs	1,174	3,963	10,992	12,827	13,909
Percent maximum thrust	8	27	75	87	95

4.3.18 Engine F100-PW-229

Tracer gas was used to determine the flow rate at each power setting. Testing involved only gaseous (NO_x, THC, CO_2, and CO) parameters. Sampling was conducted for approximately one hour at each engine power setting.

Table 4-166 presents engine results for the F100-PW-229 engine. Table 4-167 summarizes the engine operating data collected during testing.

Table 4-166
Emissions Factor Summary
Gaseous Parameters
F100-PW-229

Flow by Tracer

	Engine Mode									
	Idle		Approach		Intermediate		Military		Afterburner	
Flow Rate, dscfm	205949		639276		978715		1239157		1271205	
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	2.69	2.48	29.87	9.64	65.85	11.28	216.31	37.05	188.87	9.08
Nitrogen Dioxide (NO_2)	0.00	0.00	0.46	0.15	1.40	0.24	3.51	0.60	6.31	0.30
Nitrogen Oxides (NO_X)	4.13	3.80	46.71	15.08	102.37	17.53	336.55	57.65	297.28	14.30
Carbon Monoxide (CO)	11.05	10.16	3.62	1.17	0.85	0.15	3.84	0.66	447.33	21.51
Total Hydrocarbons (THC as CH_4)	0.42	0.38	0.65	0.21	1.74	0.30	3.14	0.54	94.95	4.57
Carbon Dioxide (CO_2)	2823	2597	13142	4242	20120	3446	26826	4595	46946	2258
Sulfur Dioxide (SO_2)	0.41	0.39	1.18	0.39	2.22	0.39	4.37	0.39	7.90	0.38

Table 4-167
Engine Operating Parameter Summary
F100-PW-229 (F-15 & F-16)

Parameter	Idle	Approach	Intermediate	Military	Afterburner (Zone 1)
Barometric pressure, in. Hg	27.55	27.56	27.56	27.55	27.55
Throttle position (PLA), degrees	16	41	56	86	100
Fuel flow, lbs/hr	1,087	3,098	5,838	11,490	20,793
Fan speed, rpm	4,102	7,579	8,355	9,751	10,053
Core speed, rpm	9,995	11,432	11,990	13,150	13,147
Average thrust, lbs	806	3,768	8,771	15,382	18,218
Percent maximum thrust	5	21	49	86	102

4.3.19 Engine T64-GE-100

Actual flows were measured following EPA Method 2 procedures because emissions were exhausted through a single stack. Measured flows were consistent between the particulate, semivolatile, and formaldehyde sampling trains.

Due to severe weather conditions during testing at the ground idle engine setting, testing was terminated after two hours. This limited both aldehyde and semivolatile tests to two hours instead of three hours (resulting in lower sample volumes) and eliminated the third particulate matter sample test.

Tables 4-168 through 4-181 present engine results for the T64-GE-100 engine. Figure 4-16 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-182 summarizes the engine operating data collected during testing.

Table 4-168
Emissions Factor Summary
Gaseous Parameters
T64-GE-100 (MH53J)
Ground Idle

Flow as Measured

	Run Number					
	1		2		Average	
Flow Rate, dscfm	9655		10213			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	0.23	0.76	0.19	0.62	0.21	0.69
Nitrogen Dioxide (NO_2)	0.01	0.05	0.01	0.05	0.01	0.05
Nitrogen Oxides (NO_X)	0.36	1.21	0.30	1.01	0.33	1.11
Carbon Monoxide (CO)	23.85	80.30	21.72	72.90	22.79	76.60
Total Hydrocarbons (THC as CH_4)	8.42	28.36	8.06	27.04	8.24	27.70
Carbon Dioxide (CO_2)	967	3257	1023	3434	995	3346

Refer to Section 4.4.19 for discussion of Run 3.

Table 4-169
Emissions Factor Summary
Gaseous Parameters
T64-GE-100 (MH53J)
75% Normal

Flow as Measured

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	25138		24707		25701			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	4.21	4.48	3.99	4.24	4.18	4.44	4.13	4.39
Nitrogen Dioxide (NO_2)	0.05	0.06	0.05	0.06	0.06	0.06	0.05	0.06
Nitrogen Oxides (NO_X)	6.56	6.98	6.23	6.61	6.54	6.94	6.44	6.84
Carbon Monoxide (CO)	7.25	7.72	7.47	7.93	7.44	7.90	7.39	7.85
Total Hydrocarbons (THC as CH_4)	0.19	0.21	0.21	0.23	0.23	0.25	0.21	0.23
Carbon Dioxide (CO_2)	3206	3414	3151	3345	3278	3480	3212	3413

Table 4-170
Emissions Factor Summary
Gaseous Parameters
T64-GE-100 (MH53J)
Normal

Flow as Measured

	Run Number									
	1			2			3		Average	
Flow Rate, dscfm	27932			28054			28099			
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	10.42	6.09		10.29	6.08		10.45	6.17	10.39	6.12
Nitrogen Dioxide (NO_2)	0.26	0.15		0.28	0.17		0.26	0.15	0.27	0.16
Nitrogen Oxides (NO_X)	16.11	9.43		15.92	9.40		16.16	9.55	16.06	9.46
Carbon Monoxide (CO)	3.76	2.20		3.78	2.23		3.70	2.19	3.75	2.21
Total Hydrocarbons (THC as CH_4)	0.08	0.04		0.06	0.03	ND	0.01	0.01	0.05	0.03
Carbon Dioxide (CO_2)	5091	2979		5114	3021		5123	3026	5109	3009

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.

Table 4-171
Emissions Factor Summary
Gaseous Parameters
T64-GE-100 (MH53J)
Military

Flow as Measured

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	29597		28655		27495			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	14.42	7.81	13.60	7.36	12.92	6.98	13.65	7.39
Nitrogen Dioxide (NO2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Oxides (NOX)	22.05	11.95	20.79	11.25	19.78	10.68	20.87	11.29
Carbon Monoxide (CO)	4.18	2.27	3.97	2.15	3.86	2.09	4.01	2.17
Total Hydrocarbons (THC as CH4)	0.01	0.01	0.13	0.07	0.00	0.00	0.05	0.03
Carbon Dioxide (CO2)	6210	3364	6013	3254	5770	3117	5998	3245

Table 4-172
Emissions Factor Summary
Particulates
T64-GE-100 (MH53J)
Ground Idle

Flow as Measured

	Run Number					
	1		2		Average	
Flow Rate, dscfm	9655		10213			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Particulate (filterable)	0.077	0.259	0.051	0.170	0.064	0.215
Particulate (condensable)	0.602	2.026	0.675	2.264	0.638	2.145
Particulate (total)	0.679	2.285	0.725	2.434	0.702	2.360

Refer to Section 4.4.19 for discussion of Run 3.

Table 4-173
Emissions Factor Summary
Particulates
T64-GE-100 (MH53J)
75% Normal

Flow as Measured

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	25138		24707		25701			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Particulate (filterable)	1.346	1.433	1.439	1.528	1.503	1.596	1.429	1.519
Particulate (condensable)	0.512	0.545	0.605	0.642	0.141	0.150	0.419	0.446
Particulate (total)	1.858	1.978	2.044	2.170	1.645	1.746	1.849	1.965

Table 4-174
Emissions Factor Summary
Particulates
T64-GE-100 (MH53J)
Normal

Flow as Measured

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	27932		28054		28099			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Particulate (filterable)	1.029	0.602	1.430	0.845	1.257	0.742	1.239	0.730
Particulate (condensable)	3.414	1.998	0.439	0.259	0.625	0.369	1.492	0.875
Particulate (total)	4.442	2.599	1.869	1.104	1.882	1.111	2.731	1.605

Table 4-175
Emissions Factor Summary
Particulates
T64-GE-100 (MH53J)
Military

Flow as Measured

	Run Number							
	1		2		3		Average	
Flow Rate, dscfm	29597		28655		27495			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Particulate (filterable)	1.517	0.822	1.751	0.947	1.318	0.712	1.529	0.827
Particulate (condensable)	0.149	0.081	0.065	0.035	0.273	0.147	0.162	0.088
Particulate (total)	1.666	0.902	1.816	0.983	1.591	0.860	1.691	0.915

Table 4-176
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
T64-GE-100 (MH53J)
Ground Idle
Flow as Measured

		Run Number											
		1				2					Average	
Flow Rate, dscfm		9655				10213						
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel				
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	6.51E-05		2.19E-04	J		1.31E-03		4.40E-03	ND	6.89E-04	2.31E-03
Vinyl Chloride [H]	75-01-4	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Bromomethane [H]	74-83-9	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Chloroethane [H]	75-00-3	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Freon 11 (Trichlorofluoromethane)	75-69-4	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
1,1-Dichloroethene [H]	75-35-4	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Methylene Chloride [H]	75-09-2	0.00E+00		0.00E+00	UJ	1.58E-03		5.29E-03			7.88E-04	2.65E-03
1,1-Dichloroethane [H]	75-34-3	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Chloroform [H]	67-66-3	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
1,1,1-Trichloroethane [H]	71-55-6	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Carbon Tetrachloride [H]	56-23-5	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Benzene [H]	71-43-2	8.79E-03		2.96E-02	J	1.20E-01		4.02E-01			6.43E-02	2.16E-01
1,2-Dichloroethane [H]	107-06-2	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Trichloroethene [H]	79-01-6	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
1,2-Dichloropropane [H]	78-87-5	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
trans-1,3-Dichloropropene [H]	10061-02-6	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Toluene [H]	108-88-3	1.63E-02		5.50E-02	J	4.44E-02		1.49E-01			3.04E-02	1.02E-01
cis-1,3-Dichloropropene [H]	10061-01-5	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
1,1,2-Trichloroethane [H]	79-00-5	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Tetrachloroethene [H]	127-18-4	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Chlorobenzene [H]	108-90-7	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Ethyl Benzene [H]	100-41-4	7.20E-03		2.42E-02	J	6.16E-03		2.07E-02			6.68E-03	2.25E-02
m,p-Xylene [H]	1330-20-7	1.30E-02		4.38E-02	J	1.31E-02		4.40E-02			1.31E-02	4.39E-02
o-Xylene [H]	95-47-6	5.79E-03		1.95E-02	J	6.54E-03		2.20E-02			6.16E-03	2.07E-02
Styrene [H]	100-42-5	1.27E-02		4.26E-02	J	1.18E-02		3.95E-02			1.22E-02	4.11E-02
1,1,2,2-Tetrachloroethane [H]	79-34-5	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Acetone	67-64-1	3.06E-02		1.03E-01	J	7.96E-03		2.67E-02			1.93E-02	6.49E-02
Carbon Disulfide [H]	75-15-0	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
trans-1,2-Dichloroethene	156-60-5	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Vinyl Acetate [H]	108-05-4	8.79E-05		2.96E-04	UJ		6.54E-03		2.20E-02	ND	3.31E-03	1.11E-02
2-Butanone (MEK) [H]	78-93-3	1.49E-02		5.03E-02	J	8.88E-03		2.98E-02			1.19E-02	4.00E-02
Bromodichloromethane	75-27-4	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
4-Methyl-2-pentanone (MIBK) [H]	108-10-1	8.79E-05		2.96E-04	UJ		6.54E-03		2.20E-02	ND	3.31E-03	1.11E-02
2-Hexanone	591-78-6	8.79E-05		2.96E-04	UJ		6.54E-03		2.20E-02	ND	3.31E-03	1.11E-02
Dibromochloromethane (Chlorodibromomethane)	124-48-1	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
Bromoform [H]	75-25-2	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
cis-1,2-Dichloroethene	156-59-2	1.76E-05		5.92E-05	UJ		1.31E-03		4.40E-03	ND	6.65E-04	2.23E-03
HAP Total		**7.93E-02**		**2.67E-01**		**2.12E-01**		**7.12E-01**			**1.62E-01**	**5.45E-01**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-177
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
T64-GE-100 (MH53J)
75% Normal
Flow as Measured

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		25138					24707					25701					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr / lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Vinyl Chloride [H]	75-01-4		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Bromomethane [H]	74-83-9		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Chloroethane [H]	75-00-3		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Freon 11 (Trichlorofluoromethane)	75-69-4	3.47E-03		3.70E-03			1.41E-02		1.49E-02		J	2.97E-03		3.16E-03			6.84E-03 / 7.26E-03
1,1-Dichloroethene [H]	75-35-4		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Methylene Chloride [H]	75-09-2	1.98E-04		2.11E-04			8.02E-03		8.52E-03		J	0.00E+00		0.00E+00			2.74E-03 / 2.91E-03
1,1-Dichloroethane [H]	75-34-3		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Chloroform [H]	67-66-3		4.82E-05		5.13E-05	ND	1.00E-04		1.06E-04		bb	8.63E-05		9.16E-05		bb	7.81E-05 / 8.30E-05
1,1,1-Trichloroethane [H]	71-55-6		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Carbon Tetrachloride [H]	56-23-5		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Benzene [H]	71-43-2	1.11E-02		1.18E-02		J	1.22E-02		1.30E-02		J	1.24E-02		1.32E-02		J	1.19E-02 / 1.27E-02
1,2-Dichloroethane [H]	107-06-2		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Trichloroethene [H]	79-01-6		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
1,2-Dichloropropane [H]	78-87-5		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
trans-1,3-Dichloropropene [H]	10061-02-6		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Toluene [H]	108-88-3	2.50E-03		2.67E-03			2.80E-03		2.98E-03			2.83E-03		3.00E-03			2.71E-03 / 2.88E-03
cis-1,3-Dichloropropene [H]	10061-01-5		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
1,1,2-Trichloroethane [H]	79-00-5		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Tetrachloroethene [H]	127-18-4		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Chlorobenzene [H]	108-90-7		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Ethyl Benzene [H]	100-41-4	2.80E-04		2.98E-04			3.04E-04		3.22E-04			2.83E-04		3.00E-04			2.89E-04 / 3.07E-04
m,p-Xylene [H]	1330-20-7	6.27E-04		6.68E-04			6.79E-04		7.21E-04			6.23E-04		6.61E-04			6.43E-04 / 6.83E-04
o-Xylene [H]	95-47-6	2.70E-04		2.88E-04			2.85E-04		3.03E-04			2.49E-04		2.65E-04			2.68E-04 / 2.85E-04
Styrene [H]	100-42-5	4.44E-04		4.72E-04			4.26E-04		4.52E-04			5.75E-04		6.10E-04			4.81E-04 / 5.11E-04
1,1,2,2-Tetrachloroethane [H]	79-34-5		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Acetone	67-64-1	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00 / 0.00E+00
Carbon Disulfide [H]	75-15-0		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
trans-1,2-Dichloroethene	156-60-5		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Vinyl Acetate [H]	108-05-4		2.41E-04		2.57E-04	ND		2.27E-04		2.41E-04	ND		2.40E-04		2.54E-04	ND	ND / ND
2-Butanone (MEK) [H]	78-93-3	5.30E-04		5.65E-04			4.30E-04		4.57E-04			2.49E-04		2.65E-04			4.03E-04 / 4.29E-04
Bromodichloromethane	75-27-4		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		2.41E-04		2.57E-04	ND		2.27E-04		2.41E-04	ND		2.40E-04		2.54E-04	ND	ND / ND
2-Hexanone	591-78-6		2.41E-04		2.57E-04	ND		2.27E-04		2.41E-04	ND		2.40E-04		2.54E-04	ND	ND / ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
Bromoform [H]	75-25-2		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
cis-1,2-Dichloroethene	156-59-2		4.82E-05		5.13E-05	ND		4.53E-05		4.80E-05	ND		4.79E-05		5.09E-05	ND	ND / ND
HAP Total		**1.60E-02**		**1.70E-02**			**2.53E-02**		**2.68E-02**			**1.73E-02**		**1.84E-02**			**1.95E-02 / 2.08E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-178
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
T64-GE-100 (MH53J)
Normal

Flow as Measured

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		27932					28054					28099					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Vinyl Chloride [H]	75-01-4		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Bromomethane [H]	74-83-9		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Chloroethane [H]	75-00-3		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	6.72E-03		3.93E-03		J	5.81E-03		3.43E-03		J	1.29E-02		7.65E-03		J	8.49E-03	5.00E-03
1,1-Dichloroethene [H]	75-35-4		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Methylene Chloride [H]	75-09-2	3.57E-03		2.09E-03			3.98E-03		2.35E-03		J	8.38E-03		4.95E-03		J	5.31E-03	3.13E-03
1,1-Dichloroethane [H]	75-34-3		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Chloroform [H]	67-66-3		5.60E-05		3.28E-05	ND	7.40E-05		4.37E-05			1.02E-04		6.04E-05		bb	7.74E-05	4.56E-05
1,1,1-Trichloroethane [H]	71-55-6		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Benzene [H]	71-43-2	1.79E-02		1.05E-02		J	1.95E-03		1.15E-03			5.33E-04		3.15E-04			6.79E-03	3.98E-03
1,2-Dichloroethane [H]	107-06-2		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Trichloroethene [H]	79-01-6		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Toluene [H]	108-88-3	4.03E-04		2.36E-04			1.59E-04		9.37E-05			1.18E-04		6.96E-05			2.26E-04	1.33E-04
cis-1,3-Dichloropropene [H]	10061-01-5		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Tetrachloroethene [H]	127-18-4		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Chlorobenzene [H]	108-90-7		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Ethyl Benzene [H]	100-41-4		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
m,p-Xylene [H]	1330-20-7		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
o-Xylene [H]	95-47-6		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Styrene [H]	100-42-5		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Acetone	67-64-1	0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00			0.00E+00		0.00E+00		bb	0.00E+00	0.00E+00
Carbon Disulfide [H]	75-15-0		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Vinyl Acetate [H]	108-05-4		2.79E-04		1.63E-04	ND		2.65E-04		1.56E-04	ND		2.69E-04		1.59E-04	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		2.79E-04		1.63E-04	ND		2.65E-04		1.56E-04	ND		2.69E-04		1.59E-04	ND	ND	ND
Bromodichloromethane	75-27-4		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		2.79E-04		1.63E-04	ND		2.65E-04		1.56E-04	ND		2.69E-04		1.59E-04	ND	ND	ND
2-Hexanone	591-78-6		2.79E-04		1.63E-04	ND		2.65E-04		1.56E-04	ND		2.69E-04		1.59E-04	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
Bromoform [H]	75-25-2		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		5.60E-05		3.28E-05	ND		5.29E-05		3.12E-05	ND		5.38E-05		3.18E-05	ND	ND	ND
HAP Total		**2.19E-02**		**1.28E-02**			**6.17E-03**		**3.64E-03**			**9.13E-03**		**5.39E-03**			**1.24E-02**	**7.29E-03**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-179
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
T64-GE-100 (MH53J)
Military
Flow as Measured

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		29597					28655					27495					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr / lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Vinyl Chloride [H]	75-01-4		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Bromomethane [H]	74-83-9		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Chloroethane [H]	75-00-3		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Freon 11 (Trichlorofluoromethane)	75-69-4	7.12E-03		3.86E-03		J	5.94E-03		3.21E-03		J	1.27E-02		6.84E-03		J	8.57E-03 / 4.64E-03
1,1-Dichloroethene [H]	75-35-4		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Methylene Chloride [H]	75-09-2	1.91E-03		1.03E-03			2.25E-03		1.22E-03		J	6.46E-03		3.49E-03		J	3.54E-03 / 1.91E-03
1,1-Dichloroethane [H]	75-34-3		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Chloroform [H]	67-66-3		5.93E-05		3.21E-05	ND	7.56E-05		4.09E-05		bb	1.00E-04		5.40E-05		bb	7.83E-05 / 4.24E-05
1,1,1-Trichloroethane [H]	71-55-6		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Carbon Tetrachloride [H]	56-23-5		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Benzene [H]	71-43-2	1.90E-02		1.03E-02		J	2.00E-03		1.08E-03			5.21E-04		2.82E-04			7.16E-03 / 3.88E-03
1,2-Dichloroethane [H]	107-06-2		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Trichloroethene [H]	79-01-6		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
1,2-Dichloropropane [H]	78-87-5		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
trans-1,3-Dichloropropene [H]	10061-02-6		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Toluene [H]	108-88-3	4.27E-04		2.31E-04			1.62E-04		8.77E-05			1.15E-04		6.23E-05			2.35E-04 / 1.27E-04
cis-1,3-Dichloropropene [H]	10061-01-5		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
1,1,2-Trichloroethane [H]	79-00-5		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Tetrachloroethene [H]	127-18-4		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Chlorobenzene [H]	108-90-7		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Ethyl Benzene [H]	100-41-4		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
m,p-Xylene [H]	1330-20-7		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
o-Xylene [H]	95-47-6		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Styrene [H]	100-42-5		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Acetone	67-64-1	0.00E+00		0.00E+00		bb	0.00E+00		0.00E+00		bb		2.64E-04		1.42E-04	ND	8.79E-05 / 4.75E-05
Carbon Disulfide [H]	75-15-0		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
trans-1,2-Dichloroethene	156-60-5		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Vinyl Acetate [H]	108-05-4		2.96E-04		1.60E-04	ND		2.71E-04		1.46E-04	ND		2.64E-04		1.42E-04	ND	ND / ND
2-Butanone (MEK) [H]	78-93-3		2.96E-04		1.60E-04	ND		2.71E-04		1.46E-04	ND		2.64E-04		1.42E-04	ND	ND / ND
Bromodichloromethane	75-27-4		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		2.96E-04		1.60E-04	ND		2.71E-04		1.46E-04	ND		2.64E-04		1.42E-04	ND	ND / ND
2-Hexanone	591-78-6		2.96E-04		1.60E-04	ND		2.71E-04		1.46E-04	ND		2.64E-04		1.42E-04	ND	ND / ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
Bromoform [H]	75-25-2		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
cis-1,2-Dichloroethene	156-59-2		5.93E-05		3.21E-05	ND		5.40E-05		2.92E-05	ND		5.26E-05		2.84E-05	ND	ND / ND
HAP Total		**2.13E-02**		**1.15E-02**			**4.49E-03**		**2.43E-03**			**7.19E-03**		**3.89E-03**			**1.10E-02 / 5.96E-03**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-180
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
T64-GE-100 (MH53J)
Flow as Measured

		Engine Mode																			
		Ground Idle					75% Normal					Normal					Military				
Flow Rate, dscfm		10149					24692					29585					31135				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
			Detection		Detection			Detection		Detection			Detection		Detection			Detection		Detection	
Analyte	CAS Number	Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit	
Phenol [H]	108-95-2	2.46E-03		8.28E-03		J		7.00E-04		7.44E-04	ND		1.83E-04		1.08E-04	ND		1.78E-03		9.65E-04	ND
Dichloroethyl ether [H]	111-44-4	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
2-Chlorophenol	95-57-8	7.38E-04		2.48E-03		UJ		7.00E-04		7.44E-04	ND		1.83E-04		1.08E-04	ND		1.78E-03		9.65E-04	ND
1,3-Dichlorobenzene	541-73-1	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
1,4-Dichlorobenzene [H]	106-46-7	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
1,2-Dichlorobenzene	95-50-1	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
o-Cresol [H]	95-48-7	7.01E-04		2.36E-03		UJ		7.00E-04		7.44E-04	ND		1.83E-04		1.08E-04	ND		1.78E-03		9.65E-04	ND
bis(2-Chloroisopropyl) Ether	39638-32-9	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
N-Nitroso-di-n-propylamine	621-64-7	1.48E-04		4.96E-04		UJ	1.40E-04		1.48E-04		UJ	3.67E-05		2.16E-05		UJ	3.57E-04		1.93E-04		UJ
p-Cresol [H]	106-44-5	7.94E-04		2.67E-03		J		7.00E-04		7.44E-04	ND		1.83E-04		1.08E-04	ND		1.78E-03		9.65E-04	ND
Hexachloroethane [H]	67-72-1	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Nitrobenzene [H]	98-95-3	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Isophorone [H]	78-59-1	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
2-Nitrophenol	88-75-5	7.38E-04		2.48E-03		UJ		7.00E-04		7.44E-04	ND		1.83E-04		1.08E-04	ND		1.78E-03		9.65E-04	ND
2,4-Dimethylphenol	105-67-9	7.38E-04		2.48E-03		UJ		7.00E-04		7.44E-04	ND		1.83E-04		1.08E-04	ND		1.78E-03		9.65E-04	ND
Benzoic Acid	65-85-0	1.47E-02		4.93E-02		J	6.72E-03		7.15E-03			5.46E-03		3.22E-03				7.15E-03		3.87E-03	ND
bis(2-Chloroethoxy) Methane	111-91-1	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
2,4-Dichlorophenol	120-83-2	7.38E-04		2.48E-03		UJ		7.00E-04		7.44E-04	ND		1.83E-04		1.08E-04	ND		1.78E-03		9.65E-04	ND
1,2,4-Trichlorobenzene [H]	120-82-1	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Naphthalene [H]	91-20-3	1.62E-02		5.44E-02		J	1.43E-03		1.52E-03			8.42E-06		4.96E-06			4.62E-03		2.50E-03		
4-Chloroaniline	106-47-8	1.48E-03		4.96E-03		UJ		1.40E-03		1.48E-03	ND		3.67E-04		2.16E-04	ND		3.57E-03		1.93E-03	ND
Hexachlorobutadiene [H]	87-68-3	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
4-Chloro-3-methylphenol	59-50-7	7.38E-04		2.48E-03		UJ		7.00E-04		7.44E-04	ND		1.83E-04		1.08E-04	ND		1.78E-03		9.65E-04	ND
2-Methylnaphthalene	91-57-6	1.91E-02		6.42E-02		J	3.39E-04		3.60E-04				3.67E-05		2.16E-05	ND	1.26E-03		6.80E-04		
Hexachlorocyclopentadiene [H]	77-47-4	1.48E-03		4.96E-03		UJ		1.40E-03		1.48E-03	ND		3.67E-04		2.16E-04	ND		3.57E-03		1.93E-03	ND
2,4,6-Trichlorophenol [H]	88-06-2	7.38E-04		2.48E-03		UJ		7.00E-04		7.44E-04	ND		1.83E-04		1.08E-04	ND		1.78E-03		9.65E-04	ND
2,4,5-Trichlorophenol [H]	95-95-4	7.38E-04		2.48E-03		UJ		7.00E-04		7.44E-04	ND		1.83E-04		1.08E-04	ND		1.78E-03		9.65E-04	ND
2-Chloronaphthalene	91-58-7	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
2-Nitroaniline	88-74-4	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Dimethylphthalate [H]	131-11-3	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Acenaphthylene	208-96-8	1.07E-03		3.59E-03		J		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND	3.93E-04		2.13E-04		
2,6-Dinitrotoluene	606-20-2	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
3-Nitroaniline	99-09-2	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Acenaphthene	83-32-9	2.36E-04		7.94E-04		J		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
2,4-Dinitrophenol [H]	51-28-5	2.95E-03		9.92E-03		UJ		2.80E-03		2.98E-03	ND		7.33E-04		4.31E-04	ND		7.15E-03		3.87E-03	ND
4-Nitrophenol [H]	100-02-7	1.77E-03		5.96E-03		J		2.80E-03		2.98E-03	ND		7.33E-04		4.31E-04	ND		7.15E-03		3.87E-03	ND
2,4-Dinitrotoluene [H]	121-14-2	1.48E-03		4.96E-03		UJ		1.40E-03		1.48E-03	ND		3.67E-04		2.16E-04	ND		3.57E-03		1.93E-03	ND
Dibenzofuran [H]	132-64-9	5.53E-04		1.86E-03		J		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Diethylphthalate	84-66-2	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND	4.29E-04		2.32E-04		
Fluorene	86-73-7	7.28E-04		2.45E-03		J		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND	5.35E-04		2.90E-04		
4-Chlorophenyl-phenyl Ether	7005-72-3	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
4-Nitroaniline	100-01-6	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
4,6-Dinitro-2-methylphenol	534-52-1	2.95E-03		9.92E-03		UJ		2.80E-03		2.98E-03	ND		7.33E-04		4.31E-04	ND		7.15E-03		3.87E-03	ND
N-Nitrosodiphenylamine	86-30-6	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
4-Bromophenyl-phenyl Ether	101-55-3	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Hexachlorobenzene [H]	118-74-1	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Pentachlorophenol [H]	87-86-5	1.48E-03		4.96E-03		UJ		1.40E-03		1.48E-03	ND		3.67E-04		2.16E-04	ND		3.57E-03		1.93E-03	ND
Phenanthrene	85-01-8	8.39E-04		2.82E-03		J		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND	8.22E-04		4.45E-04		
Anthracene	120-12-7	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
di-n-Butylphthalate [H]	84-74-2	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND	4.77E-05		2.81E-05			3.93E-04		2.13E-04		
Fluoranthene	206-44-0	2.44E-04		8.20E-04		J		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Pyrene	129-00-0	3.00E-04		1.01E-03		J		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Butylbenzylphthalate	85-68-7	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
3,3'-Dichlorobenzidine [H]	91-94-1	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Chrysene	218-01-9	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Benzo(a)anthracene	56-55-3	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
bis(2-Ethylhexyl)phthalate [H]	117-81-7	1.48E-04		4.96E-04		UJ	6.72E-04		7.15E-04			1.80E-04		1.06E-04			3.93E-04		2.13E-04		
Di-n-Octylphthalate	117-84-0	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Benzo(b)fluoranthene	205-99-2	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Benzo(k)fluoranthene	207-08-9	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Benzo(a)pyrene	50-32-8	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Indeno(1,2,3-c,d)pyrene	193-39-5	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Benzo(g,h,i)perylene	191-24-2	1.48E-04		4.96E-04		UJ		1.40E-04		1.48E-04	ND		3.67E-05		2.16E-05	ND		3.57E-04		1.93E-04	ND
Benzyl alcohol	100-51-6	7.38E-04		2.48E-03		UJ		7.00E-04		7.44E-04	ND		1.83E-04		1.08E-04	ND		1.78E-03		9.65E-04	ND
HAP Total		**3.13E-02**		**1.05E-01**			**2.10E-03**		**2.23E-03**			**2.36E-04**		**1.39E-04**			**5.41E-03**		**2.92E-03**		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.

J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.

UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.

H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-181
Emissions Factor Summary
Aldehyde/Ketones
T64-GE-100 (MH53J)
Flow as Measured

		Engine Mode															
		Ground Idle				75% Normal				Normal				Military			
Flow Rate, dscfm		10149				24692				29585				31135			
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel	
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit
Formaldehyde [H]	50-00-0	2.13E-02		7.16E-02	J	1.10E-02		1.17E-02	J	5.40E-04		3.18E-04	J,bb	3.39E-04		1.84E-04	bb
Acetaldehyde [H]	75-07-0	1.51E-02		5.05E-02	J	1.13E-03		1.20E-03	J		2.02E-04		1.19E-04 ND		2.38E-04		1.29E-04 ND
Acrolein [H]	107-02-8	3.39E-02		1.14E-01	J	1.29E-03		1.37E-03	J		2.02E-04		1.19E-04 ND		2.38E-04		1.29E-04 ND
Acetone	67-64-1	4.37E-04		1.47E-03	UJ	4.37E-04		4.64E-04	B,bb		2.02E-04		1.19E-04 ND		2.38E-04		1.29E-04 ND
Crotonaldehyde	4170-30-3	1.51E-02		5.05E-02	J	9.53E-04		1.01E-03	J		2.02E-04		1.19E-04 ND		2.38E-04		1.29E-04 ND
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3	5.78E-03		1.94E-02	J	3.60E-05		3.82E-05	UJ		2.02E-04		1.19E-04 ND		2.38E-04		1.29E-04 ND
Benzaldehyde	100-52-7	1.76E-02		5.89E-02	J	1.75E-03		1.86E-03	J		2.02E-04		1.19E-04 ND		2.38E-04		1.29E-04 ND
Isopentanal (Isovaleraldehyde)	590-86-3	2.13E-03		7.16E-03	J	3.60E-05		3.82E-05	UJ		2.02E-04		1.19E-04 ND		2.38E-04		1.29E-04 ND
Pentanal (Valeraldehyde)	110-62-3	6.27E-03		2.11E-02	J	3.60E-05		3.82E-05	UJ		2.02E-04		1.19E-04 ND		2.38E-04		1.29E-04 ND
o-Tolualdehyde	529-20-4	4.75E-03		1.59E-02	J	1.65E-04		1.75E-04	J		2.02E-04		1.19E-04 ND		2.38E-04		1.29E-04 ND
m-Tolualdehyde	620-23-5	7.26E-03		2.44E-02	J	3.60E-05		3.82E-05	UJ		2.02E-04		1.19E-04 ND		2.38E-04		1.29E-04 ND
p-Tolualdehyde	104-87-0	4.37E-04		1.47E-03	UJ	4.88E-04		5.19E-04	J		2.02E-04		1.19E-04 ND		2.38E-04		1.29E-04 ND
Hexanal (Hexaldehyde)	66-25-1	5.40E-03		1.81E-02	J	3.60E-05		3.82E-05	UJ		2.02E-04		1.19E-04 ND		2.38E-04		1.29E-04 ND
HAP Total		**7.60E-02**		**2.55E-01**		**1.35E-02**		**1.43E-02**		**5.40E-04**		**3.18E-04**		**3.39E-04**		**1.84E-04**	

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-16
T64-GE-100 (MH53J)
Emission Rates

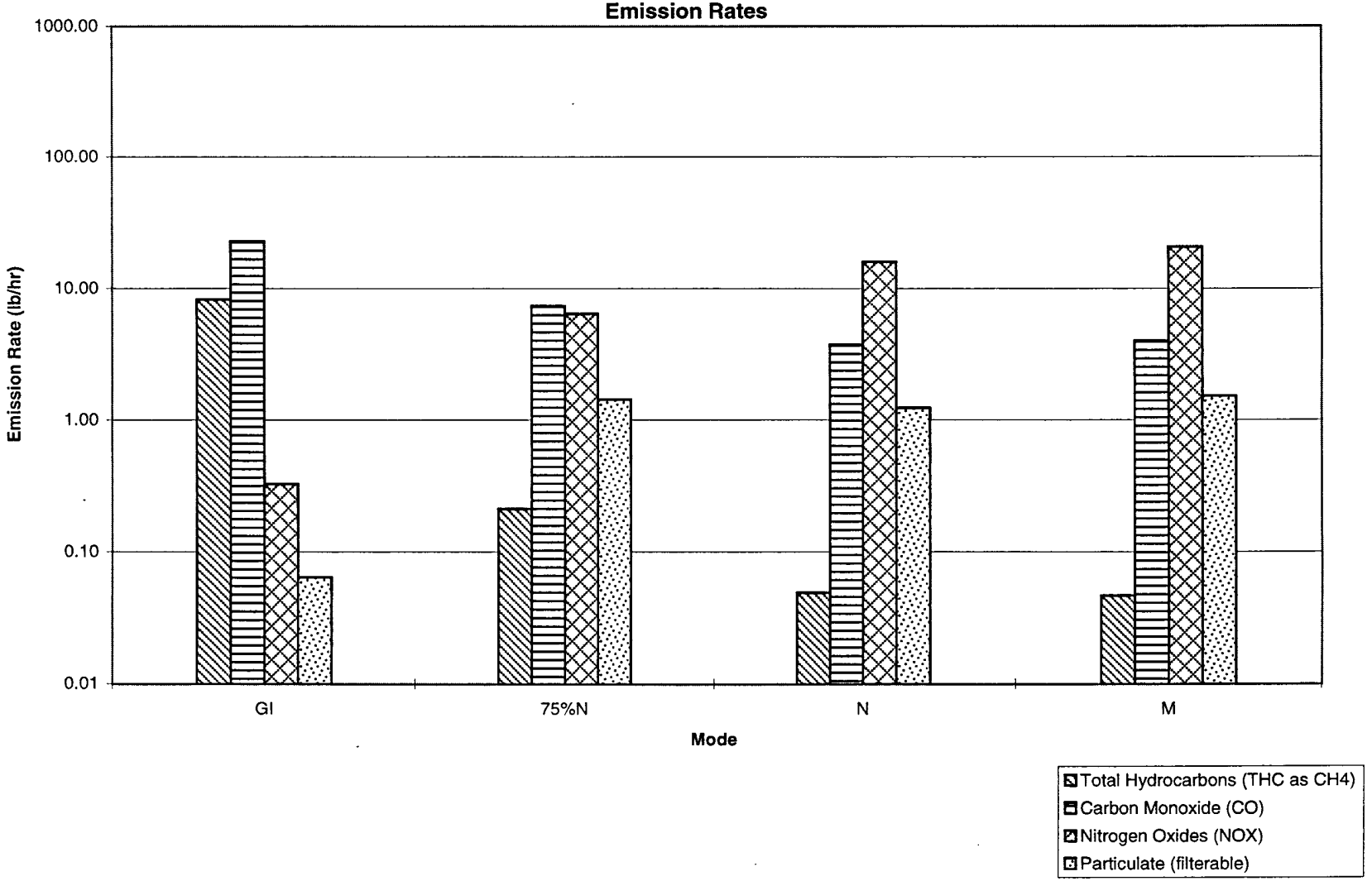


Table 4-182
Engine Operating Parameter Summary
T64-GE-100 (MH53J)

Parameter	Ground Idle	75% Normal	Normal	Military
Barometric pressure, in. Hg	29.73	29.36	29.93	29.82
Fuel flow, lbs/hr	298	941	1,698	1,848
Engine speed, rpm	12,259	16,008	17,462	17,704
Torque, ft-lbs	107	547	1,318	1,465
Shaft horsepower, SHP	85	1,458	3,521	3,873
Percent maximum SHP	2	34	81	90

4.3.20 Engine TF34-GE-100A

Tracer gas was used to determine the flow rate at each power setting. The combination of the high by-pass design of the TF34-GE-100A and large amount of dilution air (as the result of induced draft in the hush house configuration) resulted in very low pollutant concentrations. The measured concentrations were very low and concentrations showed little change between various engine operating conditions. NO_x concentrations ranged from 0.1 ppm at the Idle power setting to 2.8 ppm at the Military power setting. Because of the low NO_x concentrations, possible chemistry considerations in a hush house environment relating to NO_2 formation, and engine design, no NO_2 was measured during any of the test runs. Also noted during testing was stratification of the engine exhaust in the augmenter tube. This was probably the result of the upward angle of the engine directing exhaust towards the top of the augmenter tube. Sampling for all pollutant parameters was not affected by the stratification because samples were collected in the upper half of the augmenter tube where the central part of the exhaust plume was located.

Note that in Run 3 for the intermediate setting a THC non-detect value of 1.19 lbs/1,000 lbs fuel is greater than the result reported for Runs 1 and 2. This is also evident in Runs 1 and 2 for the military power setting.

For Run 3 the actual, analyzed data showed that the ambient concentration was greater than the exhaust concentration. Therefore, a negative result would have been reported. An instrument detection limit of 0.8 ppm was reported as opposed to a zero or negative value. The 0.8 ppm was input to the database with the exhaust flow rate for a result shown in Table 4-185. For Run 2 the exhaust concentration was greater than the ambient concentration, but the net difference is less than the detection limit (0.8 ppm) reported for Run 3. The difference in the exhaust and ambient concentration and the calculated flow rate provided a resulting emission rate and factor which is less than the "non-detect" value provided for Run 3. This scenario is the same for Runs 1 and 2 at the military setting.

Tables 4-183 through 4-192 present engine results for the TF34-GE-100A engine. Figure 4-17 presents a comparison of THC, CO, and NO_x at each engine setting. Table 4-193 summarizes the engine operating data collected during testing.

Table 4-183
Emissions Factor Summary
Gaseous Parameters
TF34-GE-100A (A-10)
Idle

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	227691		222238		225157			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	0.11	0.19	0.10	0.20	0.11	0.25	0.11	0.21
Nitrogen Dioxide (NO_2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Oxides (NO_X)	0.16	0.29	0.16	0.31	0.16	0.38	0.16	0.33
Carbon Monoxide (CO)	33.46	59.97	32.57	63.36	32.01	76.04	32.68	66.46
Total Hydrocarbons (THC as CH_4)	8.11	14.53	8.03	15.61	7.73	18.35	7.95	16.17
Carbon Dioxide (CO_2)	961	1722	934	1817	943	2240	946	1926

Table 4-184
Emissions Factor Summary
Gaseous Parameters
TF34-GE-100A (A-10)
Approach

Flow by Tracer

	Run Number						Average	
	1		2		3			
Flow Rate, dscfm	675472		661413		676883			
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	1.58	1.71	1.85	1.98	1.90	2.02	1.78	1.90
Nitrogen Dioxide (NO_2)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Oxides (NO_X)	2.90	3.14	2.84	3.04	2.91	3.10	2.89	3.09
Carbon Monoxide (CO)	27.10	29.33	25.96	27.74	25.09	26.72	26.05	27.93
Total Hydrocarbons (THC as CH_4)	1.35	1.46	0.01	0.01	0.04	0.04	0.47	0.51
Carbon Dioxide (CO_2)	2790	3019	2732	2919	2790	2971	2771	2970

Table 4-185
Emissions Factor Summary
Gaseous Parameters
TF34-GE-100A (A-10)
Intermediate

Flow by Tracer

	Run Number									
	1		2		3			Average	
Flow Rate, dscfm	889798		881785		893404				
Analyte	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	5.82	3.85	5.36	3.55	5.84	3.85		5.67	3.75
Nitrogen Dioxide (NO_2)	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
Nitrogen Oxides (NO_X)	8.29	5.48	8.21	5.45	8.96	5.91		8.49	5.61
Carbon Monoxide (CO)	13.58	8.98	13.46	8.93	13.25	8.73		13.43	8.88
Total Hydrocarbons (THC as CH_4) 1	0.01	0.005	0.01	0.01	1.80	1.19	ND	0.61	0.40
Carbon Dioxide (CO_2)	3795	2508	3747	2486	3727	2457		3756	2484

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.
1 - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 4 of this volume.

Table 4-186
Emissions Factor Summary
Gaseous Parameters
TF34-GE-100A (A-10)
Military

Flow by Tracer

	Run Number										Average	
	1			2			3					
Flow Rate, dscfm	1175846			1175846			1146190					
Analyte	lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel		lb/hr	lbs/1,000 lbs fuel			lb/hr	lbs/1,000 lbs fuel
Nitrogen Oxide (NO)	15.38	5.83		15.38	5.85		15.53	5.94			15.43	5.87
Nitrogen Dioxide (NO_2)	0.00	0.00		0.00	0.00		0.00	0.00			0.00	0.00
Nitrogen Oxides (NO_X)	23.59	8.93		23.59	8.97		24.63	9.42			23.94	9.11
Carbon Monoxide (CO)	10.77	4.08		10.77	4.10		9.50	3.63			10.35	3.94
Total Hydrocarbons (THC as CH_4) 1	2.30	0.87	ND	2.36	0.90	ND	0.02	0.33			1.56	0.70
Carbon Dioxide (CO_2)	12846	4866		12884	4903		12628	4827			12786	4865

ND - Value represents method detection limit. Compound may be present at a value less than the detection limit.
Refer to Section 4.4.20 for discussion of NO_2 values.
1 - Data outliers that can be explained by process, sampling or analytical phenomena are described in Section 4 of this volume.

Table 4-187
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF34-GE-100A (A-10)
Idle
Flow by Tracer

		Run Number															
		1					2					3					Average
Flow Rate, dscfm		227691					222238					225157					
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND	0.00E+00		0.00E+00			8.88E-04	1.61E-03
Vinyl Chloride [H]	75-01-4		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Bromomethane [H]	74-83-9		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Chloroethane [H]	75-00-3		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	6.35E-03		1.14E-02			6.31E-03		1.23E-02			5.41E-03		1.28E-02			6.02E-03	1.22E-02
1,1-Dichloroethene [H]	75-35-4		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
1,1-Dichloroethane [H]	75-34-3		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Chloroform [H]	67-66-3		2.24E-03		4.02E-03	ND	1.17E-03		2.28E-03		bb	1.08E-03		2.56E-03		bb	1.50E-03	2.96E-03
1,1,1-Trichloroethane [H]	71-55-6		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		2.24E-03		4.02E-03	ND	5.89E-04		1.15E-03			4.99E-04		1.19E-03			1.11E-03	2.12E-03
Benzene [H]	71-43-2	1.31E-01		2.35E-01			1.47E-01		2.87E-01		J	1.42E-01		3.37E-01		J	1.40E-01	2.86E-01
1,2-Dichloroethane [H]	107-06-2		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Trichloroethene [H]	79-01-6		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
1,2-Dichloropropane [H]	78-87-5		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Toluene [H]	108-88-3	5.08E-02		9.11E-02			5.89E-02		1.15E-01		J	5.82E-02		1.38E-01		J	5.60E-02	1.15E-01
cis-1,3-Dichloropropene [H]	10061-01-5		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Chlorobenzene [H]	108-90-7		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4	1.14E-02		2.05E-02			1.35E-02		2.62E-02			1.42E-02		3.37E-02			1.30E-02	2.68E-02
m,p-Xylene [H]	1330-20-7	2.37E-02		4.25E-02			2.86E-02		5.57E-02			2.99E-02		7.11E-02			2.74E-02	5.64E-02
o-Xylene [H]	95-47-6	1.14E-02		2.05E-02			1.35E-02		2.62E-02			1.50E-02		3.57E-02			1.33E-02	2.75E-02
Styrene [H]	100-42-5	1.57E-02		2.81E-02			2.48E-02		4.83E-02			2.54E-02		6.03E-02			2.20E-02	4.56E-02
1,1,2,2-Tetrachloroethane [H]	79-34-5		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Acetone	67-64-1	1.87E-02		3.35E-02			0.00E+00		0.00E+00			0.00E+00		0.00E+00			6.23E-03	1.12E-02
Carbon Disulfide [H]	75-15-0		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.14E-02		2.05E-02	ND		2.11E-03		4.10E-03	ND		2.08E-03		4.95E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		1.14E-02		2.05E-02	ND	4.63E-03		9.01E-03			4.07E-03		9.68E-03			6.71E-03	1.31E-02
Bromodichloromethane	75-27-4		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.14E-02		2.05E-02	ND		2.11E-03		4.10E-03	ND		2.08E-03		4.95E-03	ND	ND	ND
2-Hexanone	591-78-6		1.14E-02		2.05E-02	ND		2.11E-03		4.10E-03	ND		2.08E-03		4.95E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
Bromoform [H]	75-25-2		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		2.24E-03		4.02E-03	ND		4.20E-04		8.18E-04	ND		4.16E-04		9.88E-04	ND	ND	ND
HAP Total		**2.44E-01**		**4.38E-01**			**2.93E-01**		**5.70E-01**			**2.90E-01**		**6.89E-01**			**2.82E-01**	**5.77E-01**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-188
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF34-GE-100A (A-10)
Approach
Flow by Tracer

		Run Number															
		1					2					3					
Flow Rate, dscfm		675472					661413					676883				Average	
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		
Chloromethane [H]	74-87-3	1.62E-02		1.76E-02			2.03E-03		2.17E-03			1.50E-03		1.60E-03		6.58E-03	7.11E-03
Vinyl Chloride [H]	75-01-4		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
Bromomethane [H]	74-83-9	1.07E-02		1.16E-02				1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	4.39E-03	4.74E-03
Chloroethane [H]	75-00-3		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	2.61E-02		2.82E-02			2.27E-02		2.42E-02			3.37E-02		3.59E-02			2.75E-02	2.94E-02
1,1-Dichloroethene [H]	75-35-4		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
Methylene Chloride [H]	75-09-2	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
1,1-Dichloroethane [H]	75-34-3		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
Chloroform [H]	67-66-3		1.25E-03		1.35E-03	ND	2.03E-03		2.17E-03		bb		1.25E-03		1.33E-03	ND	1.51E-03	1.62E-03
1,1,1-Trichloroethane [H]	71-55-6		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5		1.25E-03		1.35E-03	ND	1.31E-03		1.40E-03			1.25E-03		1.33E-03			1.27E-03	1.36E-03
Benzene [H]	71-43-2	6.73E-02		7.28E-02			5.85E-02		6.25E-02			5.25E-02		5.59E-02			5.94E-02	6.37E-02
1,2-Dichloroethane [H]	107-06-2		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
Trichloroethene [H]	79-01-6		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND	2.50E-03		2.67E-03			1.65E-03	1.76E-03
1,2-Dichloropropane [H]	78-87-5		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
Toluene [H]	108-88-3	1.37E-02		1.48E-02			1.41E-02		1.51E-02			1.13E-02		1.20E-02			1.30E-02	1.40E-02
cis-1,3-Dichloropropene [H]	10061-01-5		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
Tetrachloroethene [H]	127-18-4	1.37E-03		1.48E-03				1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	1.27E-03	1.36E-03
Chlorobenzene [H]	108-90-7		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
Ethyl Benzene [H]	100-41-4	3.49E-03		3.78E-03			3.22E-03		3.44E-03			3.12E-03		3.32E-03			3.28E-03	3.51E-03
m,p-Xylene [H]	1330-20-7	7.84E-03		8.49E-03			7.28E-03		7.78E-03			7.13E-03		7.59E-03			7.42E-03	7.95E-03
o-Xylene [H]	95-47-6	3.74E-03		4.05E-03			3.22E-03		3.44E-03			3.25E-03		3.46E-03			3.40E-03	3.65E-03
Styrene [H]	100-42-5	6.73E-03		7.28E-03			6.57E-03		7.01E-03			5.50E-03		5.86E-03			6.27E-03	6.72E-03
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
Acetone	67-64-1	7.45E-01		8.06E-01		J	1.25E-01		1.34E-01		J	5.96E-02		6.35E-02		J	3.10E-01	3.35E-01
Carbon Disulfide [H]	75-15-0		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
Vinyl Acetate [H]	108-05-4		6.22E-03		6.74E-03	ND		5.97E-03		6.38E-03	ND		6.26E-03		6.67E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3	8.10E-03		8.76E-03				5.97E-03		6.38E-03	ND		6.26E-03		6.67E-03	ND	6.78E-03	7.27E-03
Bromodichloromethane	75-27-4		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		6.22E-03		6.74E-03	ND		5.97E-03		6.38E-03	ND		6.26E-03		6.67E-03	ND	ND	ND
2-Hexanone	591-78-6		6.22E-03		6.74E-03	ND		5.97E-03		6.38E-03	ND		6.26E-03		6.67E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
Bromoform [H]	75-25-2		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.25E-03		1.35E-03	ND		1.19E-03		1.28E-03	ND		1.25E-03		1.33E-03	ND	ND	ND
HAP Total		**1.39E-01**		**1.51E-01**			**9.83E-02**		**1.05E-01**			**8.80E-02**		**9.37E-02**			**1.16E-01**	**1.25E-01**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-189
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF34-GE-100A (A-10)
Intermediate
Flow by Tracer

		Run Number													
		1					2				3				Average
Flow Rate, dscfm		889798					881785				893404				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	Detected	Detection Limit	lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	2.20E-03		1.46E-03			2.32E-03		1.54E-03		1.73E-03		1.14E-03		2.09E-03	1.38E-03
Vinyl Chloride [H]	75-01-4		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Bromomethane [H]	74-83-9		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Chloroethane [H]	75-00-3		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	7.10E-02		4.69E-02			5.98E-02		3.97E-02		8.20E-02		5.41E-02				7.09E-02	4.69E-02
1,1-Dichloroethene [H]	75-35-4		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Methylene Chloride [H]	75-09-2	0.00E+00		0.00E+00			0.00E+00		0.00E+00		0.00E+00		0.00E+00				0.00E+00	0.00E+00
1,1-Dichloroethane [H]	75-34-3		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Chloroform [H]	67-66-3		1.69E-03		1.12E-03	ND	2.32E-03		1.54E-03		bb	3.31E-03		2.18E-03		bb	2.44E-03	1.61E-03
1,1,1-Trichloroethane [H]	71-55-6		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5	2.03E-03		1.34E-03				1.66E-03		1.10E-03	ND	2.05E-03		1.35E-03			1.91E-03	1.27E-03
Benzene [H]	71-43-2	1.66E-02		1.10E-02			1.13E-02		7.47E-03			1.55E-02		1.02E-02			1.44E-02	9.55E-03
1,2-Dichloroethane [H]	107-06-2		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Trichloroethene [H]	79-01-6		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND	3.31E-03		2.18E-03			2.22E-03	1.47E-03
1,2-Dichloropropane [H]	78-87-5		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Toluene [H]	108-88-3	4.57E-03		3.02E-03			4.62E-03		3.07E-03			5.35E-03		3.53E-03			4.85E-03	3.21E-03
cis-1,3-Dichloropropene [H]	10061-01-5		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Tetrachloroethene [H]	127-18-4		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Chlorobenzene [H]	108-90-7		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Ethyl Benzene [H]	100-41-4		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
m,p-Xylene [H]	1330-20-7	2.37E-03		1.57E-03			2.15E-03		1.43E-03			2.37E-03		1.56E-03			2.30E-03	1.52E-03
o-Xylene [H]	95-47-6		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Styrene [H]	100-42-5		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Acetone	67-64-1	0.00E+00		0.00E+00		J	0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00	0.00E+00
Carbon Disulfide [H]	75-15-0		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Vinyl Acetate [H]	108-05-4		8.47E-03		5.60E-03	ND		8.29E-03		5.50E-03	ND		7.90E-03		5.21E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		8.47E-03		5.60E-03	ND		8.29E-03		5.50E-03	ND		7.90E-03		5.21E-03	ND	ND	ND
Bromodichloromethane	75-27-4		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		8.47E-03		5.60E-03	ND		8.29E-03		5.50E-03	ND		7.90E-03		5.21E-03	ND	ND	ND
2-Hexanone	591-78-6		8.47E-03		5.60E-03	ND		8.29E-03		5.50E-03	ND		7.90E-03		5.21E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
Bromoform [H]	75-25-2		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		1.69E-03		1.12E-03	ND		1.66E-03		1.10E-03	ND		1.58E-03		1.04E-03	ND	ND	ND
HAP Total		**2.78E-02**		**1.84E-02**			**2.27E-02**		**1.50E-02**			**3.36E-02**		**2.21E-02**			**3.02E-02**	**2.00E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-190
Emissions Factor Summary
Volatile Organic Compounds (VOCs)
TF34-GE-100A (A-10)
Military
Flow by Tracer

		Run Number															
		1					2					3					
Flow Rate, dscfm		1175846					1175846					1146190					Average
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			
Analyte	CAS Number	Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		Detected	Detection Limit	Detected	Detection Limit		lb/hr	lbs/1,000 lbs fuel
Chloromethane [H]	74-87-3	5.33E-03		2.02E-03			5.33E-03		2.03E-03			2.54E-03		9.70E-04			4.40E-03	1.67E-03
Vinyl Chloride [H]	75-01-4		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
Bromomethane [H]	74-83-9		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
Chloroethane [H]	75-00-3		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
Freon 11 (Trichlorofluoromethane)	75-69-4	3.84E-02		1.45E-02			5.81E-02		2.21E-02			1.31E-01		5.02E-02			7.60E-02	2.90E-02
1,1-Dichloroethene [H]	75-35-4		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
Methylene Chloride [H]	75-09-2	7.88E-02		2.99E-02			1.03E-01		3.91E-02			2.33E-01		8.90E-02		J	1.38E-01	5.26E-02
1,1-Dichloroethane [H]	75-34-3		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
Chloroform [H]	67-66-3		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND	3.60E-03		1.38E-03		bb	2.65E-03	1.01E-03
1,1,1-Trichloroethane [H]	71-55-6		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
Carbon Tetrachloride [H]	56-23-5	2.34E-03		8.88E-04				2.23E-03		8.48E-04	ND	2.12E-03		8.09E-04			2.23E-03	8.48E-04
Benzene [H]	71-43-2	1.37E-02		5.17E-03			9.34E-03		3.55E-03			1.06E-02		4.04E-03			1.12E-02	4.25E-03
1,2-Dichloroethane [H]	107-06-2		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
Trichloroethene [H]	79-01-6	3.62E-03		1.37E-03				2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	2.66E-03	1.01E-03
1,2-Dichloropropane [H]	78-87-5		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
trans-1,3-Dichloropropene [H]	10061-02-6		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
Toluene [H]	108-88-3	1.06E-03		4.00E-04			0.00E+00		0.00E+00			0.00E+00		0.00E+00			3.52E-04	1.33E-04
cis-1,3-Dichloropropene [H]	10061-01-5		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
1,1,2-Trichloroethane [H]	79-00-5		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
Tetrachloroethene [H]	127-18-4		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND	2.33E-03		8.90E-04			2.23E-03	8.48E-04
Chlorobenzene [H]	108-90-7		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
Ethyl Benzene [H]	100-41-4	3.20E-03		1.21E-03				2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	2.51E-03	9.56E-04
m,p-Xylene [H]	1330-20-7	9.38E-03		3.55E-03			5.81E-03		2.21E-03			3.81E-03		1.46E-03			6.33E-03	2.41E-03
o-Xylene [H]	95-47-6	3.62E-03		1.37E-03				2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	2.66E-03	1.01E-03
Styrene [H]	100-42-5		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
1,1,2,2-Tetrachloroethane [H]	79-34-5		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
Acetone	67-64-1	9.37E-01		3.55E-01		J	0.00E+00		0.00E+00			4.50E-01		1.72E-01		J	4.62E-01	1.76E-01
Carbon Disulfide [H]	75-15-0		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
trans-1,2-Dichloroethene	156-60-5		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
Vinyl Acetate [H]	108-05-4		1.07E-02		4.04E-03	ND		1.11E-02		4.24E-03	ND		1.06E-02		4.04E-03	ND	ND	ND
2-Butanone (MEK) [H]	78-93-3		1.07E-02		4.04E-03	ND		1.11E-02		4.24E-03	ND		1.06E-02		4.04E-03	ND	ND	ND
Bromodichloromethane	75-27-4		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
4-Methyl-2-pentanone (MIBK) [H]	108-10-1		1.07E-02		4.04E-03	ND		1.11E-02		4.24E-03	ND		1.06E-02		4.04E-03	ND	ND	ND
2-Hexanone	591-78-6		1.07E-02		4.04E-03	ND		1.11E-02		4.24E-03	ND		1.06E-02		4.04E-03	ND	ND	ND
Dibromochloromethane (Chlorodibromomethane)	124-48-1		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
Bromoform [H]	75-25-2		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
cis-1,2-Dichloroethene	156-59-2		2.13E-03		8.08E-04	ND		2.23E-03		8.48E-04	ND		2.12E-03		8.09E-04	ND	ND	ND
HAP Total		**1.21E-01**		**4.59E-02**			**1.23E-01**		**4.68E-02**			**2.58E-01**		**9.85E-02**			**1.75E-01**	**6.68E-02**

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-191
Emissions Factor Summary
Polynuclear Aromatic Hydrocarbons (PAHs)
TF34-GE-100A (A-10)
Flow by Tracer

		Engine Mode																	
		Idle					Approach					Intermediate					Military				
Flow Rate, dscfm		225007					671179					888311					1165805				
		lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel			lb/hr		lbs/1,000 lbs fuel		
			Detection		Detection			Detection		Detection			Detection		Detection			Detection		Detection	
Analyte	CAS Number	Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit		Detected	Limit	Detected	Limit	
Phenol [H]	108-95-2	1.36E-02		2.74E-02			6.07E-03		6.50E-03				4.49E-03		2.97E-03	ND		4.93E-03		1.88E-03	ND
Dichloroethyl ether [H]	111-44-4		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
2-Chlorophenol	95-57-8		1.23E-03		2.47E-03	ND		3.19E-03		3.42E-03	ND		4.49E-03		2.97E-03	ND		4.93E-03		1.88E-03	ND
1,3-Dichlorobenzene	541-73-1		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
1,4-Dichlorobenzene [H]	106-46-7		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
1,2-Dichlorobenzene	95-50-1		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
o-Cresol [H]	95-48-7		1.23E-03		2.47E-03	ND		3.19E-03		3.42E-03	ND		4.49E-03		2.97E-03	ND		4.93E-03		1.88E-03	ND
bis(2-Chloroisopropyl) Ether	39638-32-9		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
N-Nitroso-di-n-propylamine	621-64-7		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
p-Cresol [H]	106-44-5	2.62E-03		5.26E-03				3.19E-03		3.42E-03	ND		4.49E-03		2.97E-03	ND		4.93E-03		1.88E-03	ND
Hexachloroethane [H]	67-72-1		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Nitrobenzene [H]	98-95-3		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Isophorone [H]	78-59-1		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
2-Nitrophenol	88-75-5		1.23E-03		2.47E-03	ND		3.19E-03		3.42E-03	ND		4.49E-03		2.97E-03	ND		4.93E-03		1.88E-03	ND
2,4-Dimethylphenol	105-67-9		1.23E-03		2.47E-03	ND		3.19E-03		3.42E-03	ND		4.49E-03		2.97E-03	ND		4.93E-03		1.88E-03	ND
Benzoic Acid	65-85-0	1.81E-02		3.63E-02			2.82E-02		3.02E-02			2.77E-02		1.83E-02			3.89E-02		1.48E-02		
bis(2-Chloroethoxy) Methane	111-91-1		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
2,4-Dichlorophenol	120-83-2		1.23E-03		2.47E-03	ND		3.19E-03		3.42E-03	ND		4.49E-03		2.97E-03	ND		4.93E-03		1.88E-03	ND
1,2,4-Trichlorobenzene [H]	120-82-1		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Naphthalene [H]	91-20-3	2.23E-02		4.47E-02			7.94E-03		8.51E-03			2.41E-03		1.59E-03			8.42E-05		3.20E-05		
4-Chloroaniline	106-47-8		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Hexachlorobutadiene [H]	87-68-3		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
4-Chloro-3-methylphenol	59-50-7		1.23E-03		2.47E-03	ND		3.19E-03		3.42E-03	ND		4.49E-03		2.97E-03	ND		4.93E-03		1.88E-03	ND
2-Methylnaphthalene	91-57-6	1.39E-02		2.80E-02			3.34E-03		3.58E-03				8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Hexachlorocyclopentadiene [H]	77-47-4		2.45E-03		4.93E-03	ND		6.36E-03		6.82E-03	ND		8.98E-03		5.94E-03	ND		9.91E-03		3.77E-03	ND
2,4,6-Trichlorophenol [H]	88-06-2		1.23E-03		2.47E-03	ND		3.19E-03		3.42E-03	ND		4.49E-03		2.97E-03	ND		4.93E-03		1.88E-03	ND
2,4,5-Trichlorophenol [H]	95-95-4		1.23E-03		2.47E-03	ND		3.19E-03		3.42E-03	ND		4.49E-03		2.97E-03	ND		4.93E-03		1.88E-03	ND
2-Chloronaphthalene	91-58-7		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
2-Nitroaniline	88-74-4		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Dimethylphthalate [H]	131-11-3		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Acenaphthylene	208-96-8	2.12E-03		4.27E-03				6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
2,6-Dinitrotoluene	606-20-2		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
3-Nitroaniline	99-09-2		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Acenaphthene	83-32-9		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
2,4-Dinitrophenol [H]	51-28-5		1.23E-03		2.47E-03	ND		3.19E-03		3.42E-03	ND		4.49E-03		2.97E-03	ND		4.93E-03		1.88E-03	ND
4-Nitrophenol [H]	100-02-7		1.23E-03		2.47E-03	ND	3.73E-03		4.00E-03				4.49E-03		2.97E-03	ND		4.93E-03		1.88E-03	ND
2,4-Dinitrotoluene [H]	121-14-2		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Dibenzofuran [H]	132-64-9		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Diethylphthalate	84-66-2	1.06E-05		2.14E-05			0.00E+00		0.00E+00			0.00E+00		0.00E+00			0.00E+00		0.00E+00		
Fluorene [H]	86-73-7	7.44E-04		1.50E-03				6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
4-Chlorophenyl-phenyl Ether	7005-72-3		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
4-Nitroaniline	100-01-6		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
4,6-Dinitro-2-methylphenol	534-52-1		1.23E-03		2.47E-03	ND		3.19E-03		3.42E-03	ND		4.49E-03		2.97E-03	ND		4.93E-03		1.88E-03	ND
N-Nitrosodiphenylamine	86-30-6		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
4-Bromophenyl-phenyl Ether	101-55-3		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Hexachlorobenzene [H]	118-74-1		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Pentachlorophenol [H]	87-86-5		2.45E-03		4.93E-03	ND		6.36E-03		6.82E-03	ND		8.98E-03		5.94E-03	ND		9.91E-03		3.77E-03	ND
Phenanthrene	85-01-8	1.21E-03		2.44E-03				6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Anthracene	120-12-7		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
di-n-Butylphthalate [H]	84-74-2	1.23E-03		2.48E-03			4.92E-04		5.28E-04				8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Fluoranthene	206-44-0	3.26E-04		6.55E-04				6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Pyrene	129-00-0	2.77E-04		5.57E-04				6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Butylbenzylphthalate	85-68-7		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
3,3'-Dichlorobenzidine [H]	91-94-1		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Chrysene	218-01-9		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Benzo(a)anthracene	56-55-3		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
bis(2-Ethylhexyl)phthalate [H]	117-81-7	1.12E-03		2.26E-03		B	2.99E-03		3.21E-03		B	2.18E-03		1.44E-03		B	4.55E-03		1.73E-03		B
Di-n-Octylphthalate	117-84-0		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Benzo(b)fluoranthene	205-99-2		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Benzo(k)fluoranthene	207-08-9		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Benzo(a)pyrene	50-32-8		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Indeno(1,2,3-c,d)pyrene	193-39-5		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Benzo(g,h,i)perylene	191-24-2		2.45E-04		4.93E-04	ND		6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
Benzyl alcohol	100-51-6	3.91E-03		7.86E-03				6.36E-04		6.82E-04	ND		8.98E-04		5.94E-04	ND		9.91E-04		3.77E-04	ND
HAP Total		4.09E-02		8.21E-02			1.75E-02		1.87E-02			4.59E-03		3.03E-03			4.63E-03		1.76E-03		

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
H - This compound is listed as a hazardous air pollutant (HAP).

Results reported as 0.00 indicate a detected ambient pollutant concentration greater than the detected pollutant concentration in the exhaust stream.
Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Table 4-192
Emissions Factor Summary
Aldehyde/Ketones
TF34-GE-100A (A-10)
Flow by Tracer

		Engine Mode															
		Idle				Approach				Intermediate				Military			
Flow Rate, dscfm		225007				671179				888311				1165805			
		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel		lb/hr		lbs/1,000 lbs fuel	
			Detection		Detection		Detection		Detection		Detection		Detection		Detection		Detection
Analyte	**CAS Number**	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit	Detected	Limit
Formaldehyde [H]	50-00-0	6.09E-01		1.22E+00		4.95E-01		5.31E-01		1.00E-01		6.62E-02		7.42E-02		2.82E-02	bb
Acetaldehyde [H]	75-07-0	6.34E-02		1.27E-01		2.87E-02		3.07E-02			8.19E-03		5.41E-03 ND		7.77E-03		2.96E-03 ND
Acrolein [H]	107-02-8	3.04E-02		6.11E-02	J	1.27E-02		1.36E-02	UJ	8.19E-03		5.41E-03	UJ	7.77E-03		2.96E-03	UJ
Acetone	67-64-1	1.83E-01		3.68E-01	B,bb	5.15E-01		5.52E-01	B,bb	2.73E-01		1.80E-01	B,bb	1.46E-01		5.57E-02	B,bb
Crotonaldehyde	4170-30-3	2.54E-02		5.10E-02			1.27E-02		1.36E-02 ND		8.19E-03		5.41E-03 ND		7.77E-03		2.96E-03 ND
Isobutyraldehyde / Methyl Ethyl Ketone [H]	78-93-3		2.03E-02		4.08E-02 ND		1.27E-02		1.36E-02 ND		8.19E-03		5.41E-03 ND		7.77E-03		2.96E-03 ND
Benzaldehyde	100-52-7	2.54E-02		5.10E-02		1.89E-02		2.03E-02		1.18E-02		7.81E-03		1.56E-02		5.93E-03	
Isopentanal (Isovaleraldehyde)	590-86-3		2.03E-02		4.08E-02 ND	1.37E-02		1.47E-02	bb		8.19E-03		5.41E-03 ND		7.77E-03		2.96E-03 ND
Pentanal (Valeraldehyde)	110-62-3		2.03E-02		4.08E-02 ND		1.27E-02		1.36E-02 ND		8.19E-03		5.41E-03 ND		7.77E-03		2.96E-03 ND
o-Tolualdehyde	529-20-4		2.03E-02		4.08E-02 ND		1.27E-02		1.36E-02 ND		8.19E-03		5.41E-03 ND		7.77E-03		2.96E-03 ND
m-Tolualdehyde	620-23-5		2.03E-02		4.08E-02 ND		1.27E-02		1.36E-02 ND	1.82E-02		1.20E-02	bb	2.05E-02		7.79E-03	bb
p-Tolualdehyde	104-87-0		2.03E-02		4.08E-02 ND		1.27E-02		1.36E-02 ND		8.19E-03		5.41E-03 ND		7.77E-03		2.96E-03 ND
Hexanal (Hexaldehyde)	66-25-1		2.03E-02		4.08E-02 ND		1.27E-02		1.36E-02 ND		8.19E-03		5.41E-03 ND		7.77E-03		2.96E-03 ND
HAP Total		**7.02E-01**		**1.41E+00**		**5.37E-01**		**5.75E-01**		**1.08E-01**		**7.16E-02**		**8.20E-02**		**3.12E-02**	

ND - Compound not detected at this detection limit. Compound may be present at a value less than the detection limit.
B - Compound present in the laboratory blank greater than reporting limit.
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
UJ - The analyte was not detected above the reported sample quantitation limit (reporting limit for the analytical method). However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. This is due to the quality criteria not being met.
bb - The sample media blank and/or sample field blank value with two times the sample value. Sample result should be considered suspect due to contamination.
H - This compound is listed as a hazardous air pollutant (HAP).

Note: Compounds analyzed in this pollutant group are a standard compound target list for the analytical method and are not necessarily combustion by-products from this engine.

Figure 4-17
TF34-GE-100A (A-10)
Emission Rates

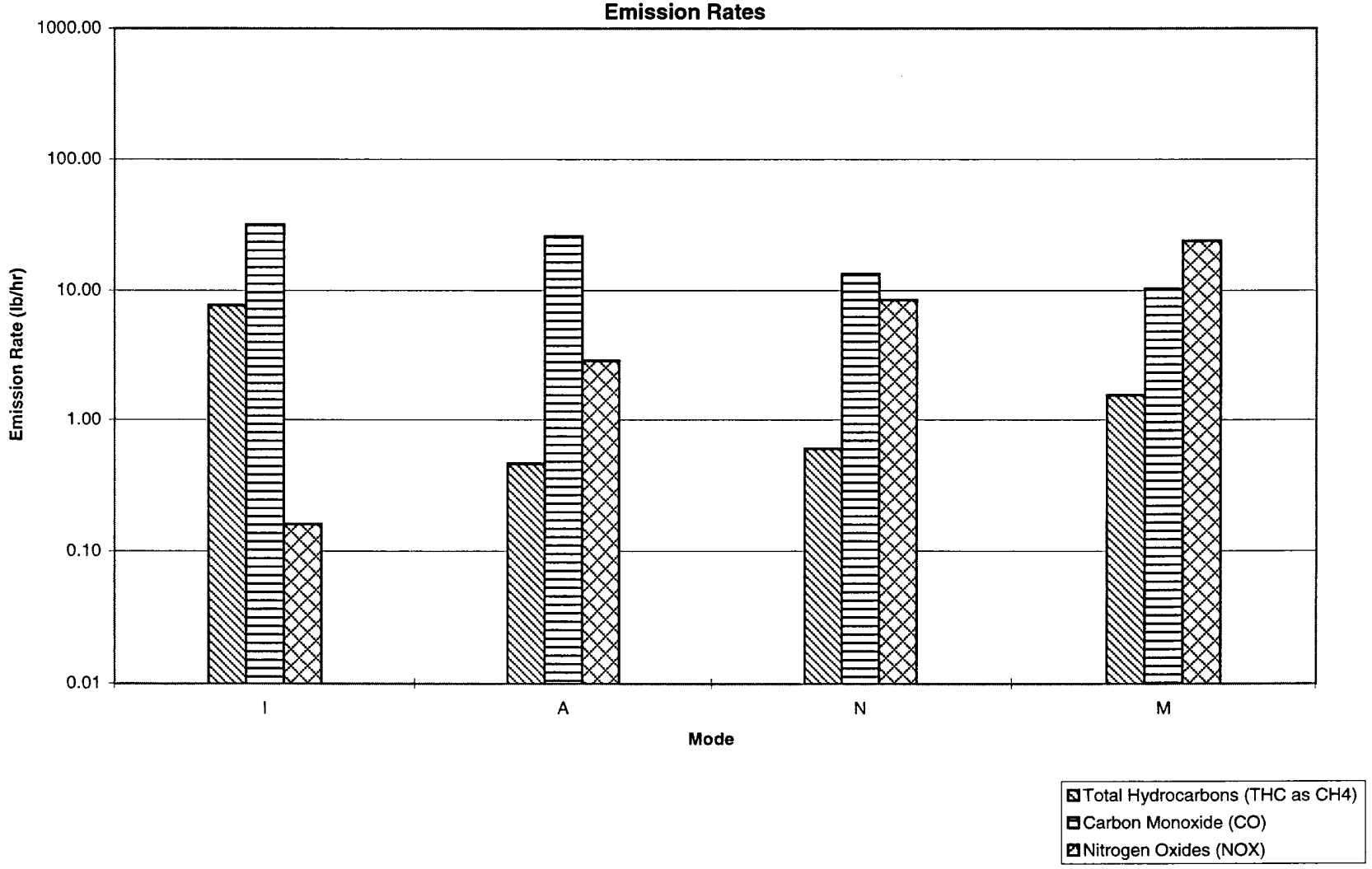


Table 4-193
Engine Operating Parameter Summary
TF34-GE-100A (A-10)

Parameter	Idle	Approach	Intermediate	Military
Barometric pressure, in. Hg	30.16	30.16	30.16	30.16
Fuel flow, lbs/hr	498	933	1,512	2,628
Percent of maximum engine speed, %	64	79	83	88
Average thrust, lbs	665	2,550	4,200	7,100
Percent maximum thrust	7	28	46	78

4.4 CARBON DIOXIDE VARIABILITY

The majority (approximately 65%) of CO_2 emission factors calculated from this data fall within 10% of the ideal value of 3,200 lbs CO_2/1,000 lbs fuel. The remaining CO_2 emission factors (approximately 35%) differ by more than 10% from the ideal value, which resulted from a deviation of less than 0.2 percent CO_2, as measured. Many of these differ from the ideal value by less than 500 ppm CO_2, as measured.

The CO_2 analyzer calibration errors were generally within method limits, and often instrument errors were less than one percent. All results were corrected for instrument drift based on calibration gas standards. The stated precision of the CO_2 measurement method is +/- 0.2% CO_2 which accounts for analyzer precision and accuracy of the EPA protocol calibration gas standard (EPA Protocol calibration gases must meet accuracy requirements of +/- 2%).

The combination of low measured concentrations (generally less than 2 percent) due to significant dilution of the exhaust gas, the precision of the method (+/- 0.2% CO_2), and the CO_2 analyzer operating within 10% of its operation range (0-25%) results in the potential of 0.2% differences between actual and measured concentrations. As was demonstrated in the results, differences as small as 0.2 can have a significant effect on CO_2 emission factors. As an example, a measured value of 0.3% CO_2 yielded a result of 2,500 lbs CO_2/1,000 lbs fuel and a measured result of 0.5% CO_2 yielded 4,300 lbs CO_2/1,000 lbs fuel. Both these results were greater than 10% of the ideal value. For future engine testing programs, it would be beneficial to use a CO_2 analyzer capable of measuring 0-5 percent CO_2. This may allow for better instrument precision and better accuracy.

4.5 NO/NO_2 VARIABILITY

The focus of the sampling program was to determine the emission rate of NO_x. The NO/NO_2 ratio was noted during the report preparation process after review of sampling results.

The NO/NO_2 ratio varied due to the sampling system used. Each system was constructed to comply with EPA Reference Method 7E to determine the concentration of NO_x. During the first phase of the emission testing project (Kelly AFB, CCAD, Laughlin AFB, and Tinker AFB), a pressurized sampling system was used in the sampling trailer. The sample was pressurized after the sampling pump but prior to the analyzer. The pressurized atmosphere promoted the reaction of NO with O_2 to form NO_2. Therefore, the NO/NO_2 ratio was relatively low (high NO_2). During the second phase of the project (Charleston AFB, Edwards AFB, NADEP, Barnes ANGB), a different sampling trailer and system were used. This system consisted of a sampling line at atmospheric pressure. The conversion of NO to NO_2 was not as great at atmospheric pressure as opposed to a pressurized system. The NO/NO_2 ratio was higher during this phase since more NO was present.

Based on a review of published emissions data, the variation is in line with historical data which presents NO/NO_2 ratios varying from 0.9 to 19.

SECTION 5

TRACER GAS METHODOLOGY

The use of tracer gas in conjunction with emission sampling provided two benefits to the program:

1) Determination of exhaust gas homogeneity and the justification of single point sampling at specific test locations.

2) A method for exhaust flow rate determination.

The determination of a homogeneous exhaust stream was important in this test program. Sampling had to be conducted at a single point because many engine test locations could not be traversed with the emission sampling equipment due to the physical configuration (discussed in Section 2) of the test cell. The distribution and measurement of the tracer gas allowed for the determination that the single sampling point was representative of the entire exhaust stream.

5.1 TRACER GAS INJECTION AND SAMPLING

Sulfur hexafluoride (SF_6) was selected as the tracer gas because of its excellent infrared radiation absorption characteristics and the lack of interference from water vapor or carbon dioxide. The tracer gas was released at a rate of 0.4 - 3.5 liters per minute (using a mass flow meter) into the engine exhaust stream near the rear of the engine. Tracer gas was metered by a mass flow controller calibrated for SF_6 and distributed through a manifold system to release points within the augmenter tube. The manifold consisted of four to six release points around the engine exhaust opening or augmenter tube. More elaborate (6-8 points directly in the exhaust flow) release

systems were utilized at the first test cell locations. The simpler 4- to 6-point release systems used during the majority of the test program provided similar results to the more sophisticated release systems, but required less material and less labor costs to install.

Integrated one-hour exhaust samples were collected at up to eight locations at the exhaust stack(s). These sample points were independent from the other sampling equipment. These samples were collected and analyzed by FTIR in the field for determination of the concentration of SF_6. The sample points from multiple exhaust stacks were selected on a random basis. The locations of these points are detailed in Section 2. The tracer gas sampling system was improved over the course of testing. During Phase I of emission testing (Kelly AFB, Laughlin AFB, and Tinker AFB), samples were collected by drawing exhaust directly from each stack at a constant rate, through a sample pump and into a Tedlar bag. At the completion of the one-hour test, samples were analyzed by FTIR to note the concentration of SF_6. This system provided representative results, but at times there were physical downfalls. In certain instances the Tedlar bag leaked or simply blew off the roof, thus losing a sample. The sampling system was improved based upon the lessons learned.

A simplified tracer gas collection system was used during Phase II of the test program conducted at Charleston AFB, Edwards AFB, and Barnes ANG Base. This system consisted of eight sample points placed across the test cell/hush house exhaust. Samples from each point were drawn through a heated sample line directly to the FTIR for analysis. Each point was sampled individually, and one sample from each point was collected during a one-hour period. Integrated sampling was not necessary because of the consistent nature of emissions from the engines; concentrations at each tracer gas sample point did not vary over time. Also during the second phase of the monitoring program, a standardized approach was adopted on how tracer gas could be uniformly distributed with the engine exhaust. The new approach adopted during the second phase of the monitoring program significantly reduced the operational biases

encountered from tracer gas distribution and sample collection that occurred during the initial stages of Phase I.

Exhaust gas analysis for the SF_6 tracer was performed using a MIDAC Series 2000 FTIR with a 10-meter multipass gas cell. Reference spectra for SF_6 were generated using a reference cylinder of 103 ppb SF_6 in air for temperature and pressure consistent with analytical conditions. Background spectra were generated using zero gas to establish a baseline for the instrument. The establishment of a baseline and reference spectra allowed for a quantitative and qualitative analysis. The result was then corrected for instrument response versus response from the reference cylinder.

5.2 TRACER GAS INTERFERENCE

Ethylene was present in the exhaust stream as a product of incomplete combustion at all engine settings with the highest levels occurring in the afterburner mode. Ethylene concentrations were negligible when they were in the same range as the SF_6. In the afterburner, ethylene concentrations were several orders of magnitude (as much as 100 times) greater than the SF_6 infrared signature. The SF_6 peak had to be removed from the ethylene peak, which tended to reduce the total SF_6 response and result in a high biased calculated flow rate. This was noted during the first four sample runs and corrected by CO analysis of ethylene with the SF_6.

5.3 TRACER GAS UNIFORMITY IN THE ENGINE EXHAUST

Figures 5-1 through 5-8 present the typical concentrations of SF_6 collected across each exhaust face. As can be seen from the results, the tracer gas was uniformly distributed in the exhaust. Therefore, sampling at a single point within the exhaust provided a representative result.

It was noted at Charleston AFB that one corner of the test cell showed consistently lower concentrations of SF_6 at idle and approach settings. At the intermediate setting, the exhaust flow had increased significantly to provide enough turbulence to thoroughly mix the exhaust gases. The non-uniformity was not noted at the intermediate setting.

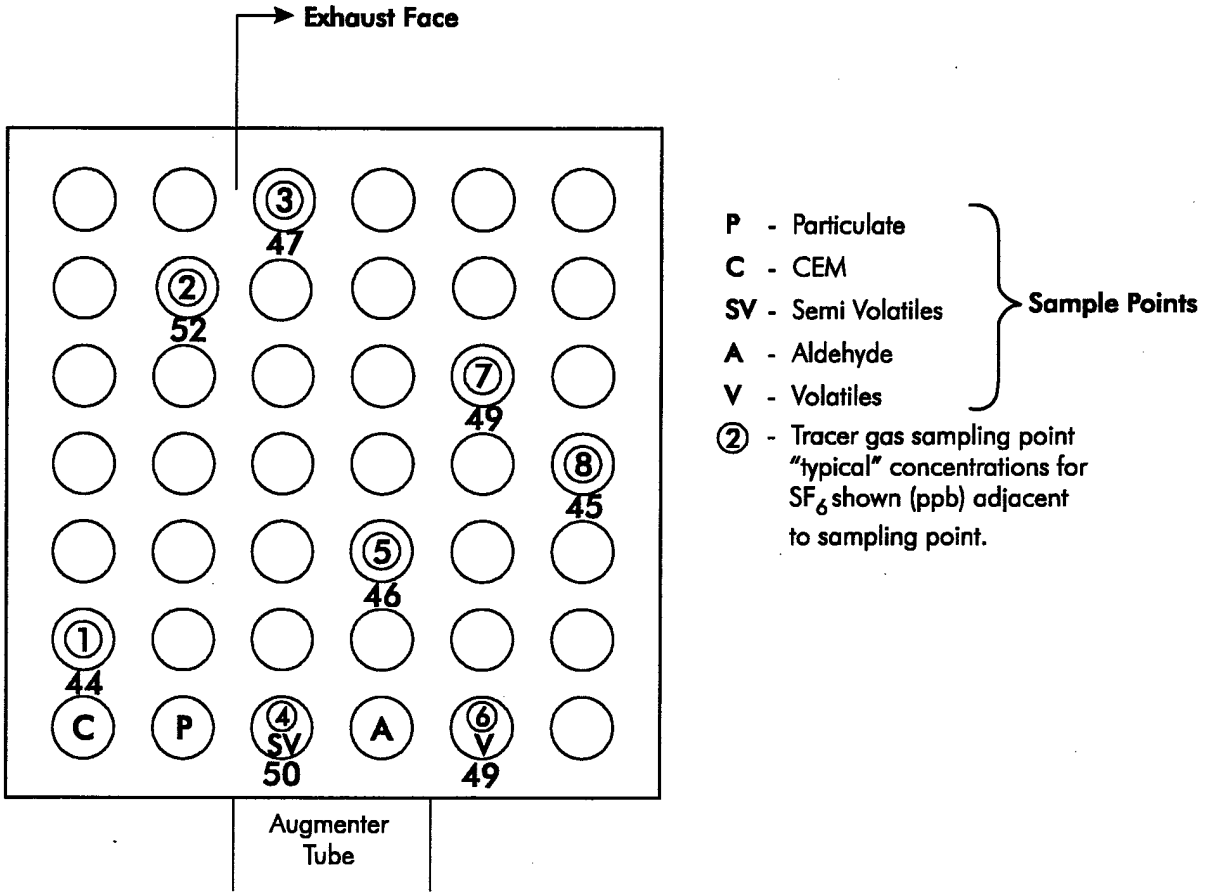


Figure 5-1. Kelly AFB Test Cell 58

Tracer Gas Sampling Points and Typical SF_6 Concentrations at Idle for the TF39 Engine

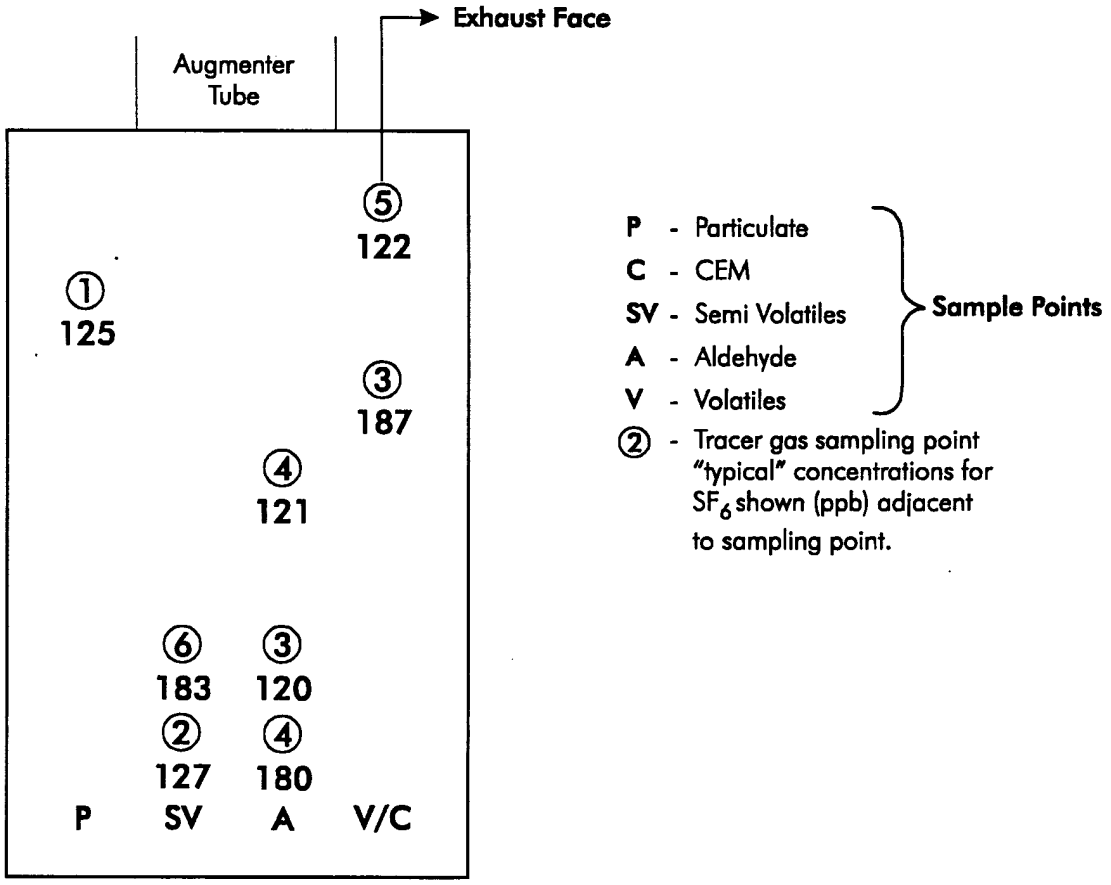


Figure 5-2. Kelly AFB Test Cell 54A

Tracer Gas Sampling Points and Typical SF_6 Concentrations at Idle for the T56 Engine

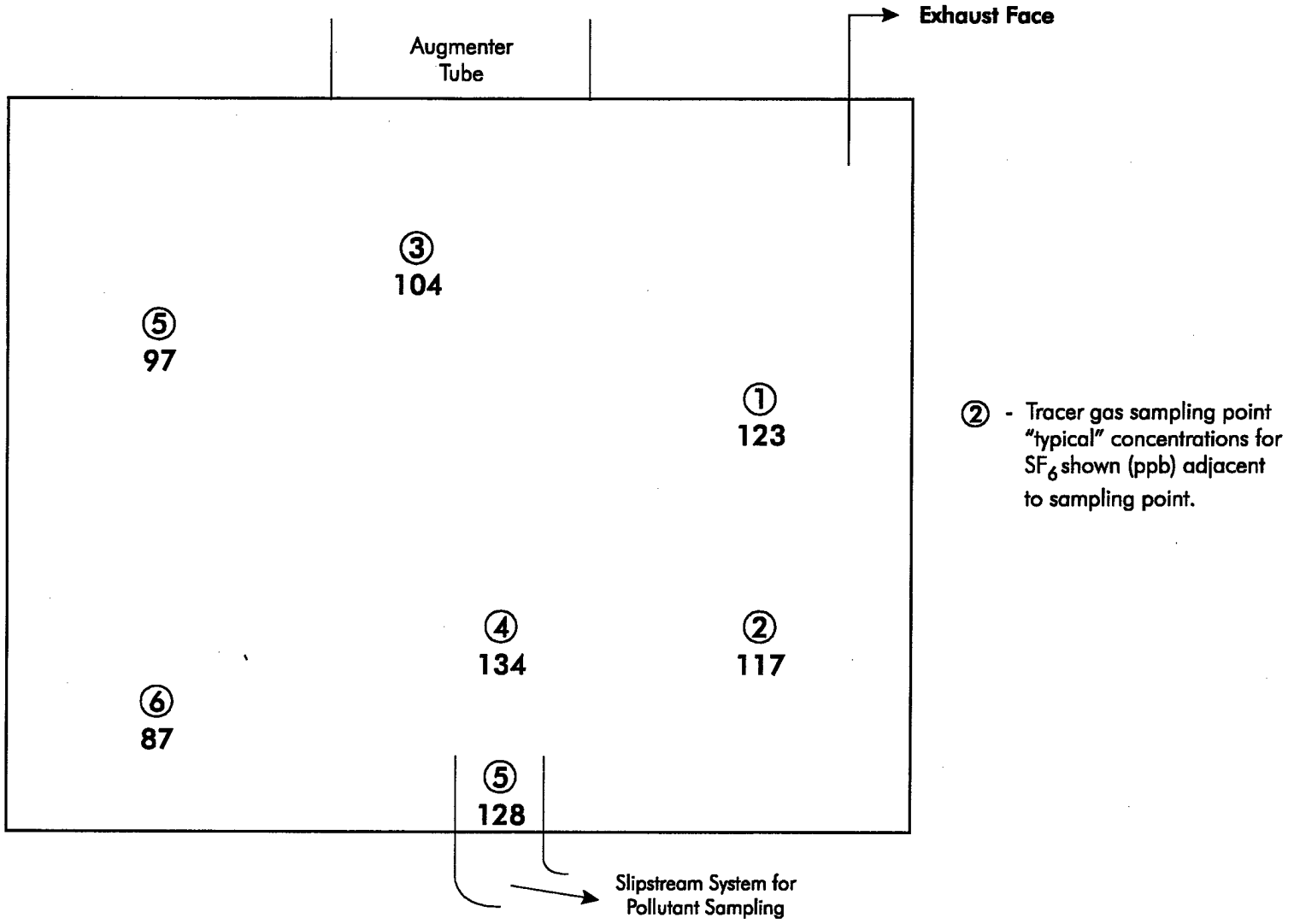


Figure 5-3. Laughlin AFB Test Cell 18

Tracer Gas Sampling Points and Typical SF_6 Concentrations at Military for the J85 Engine

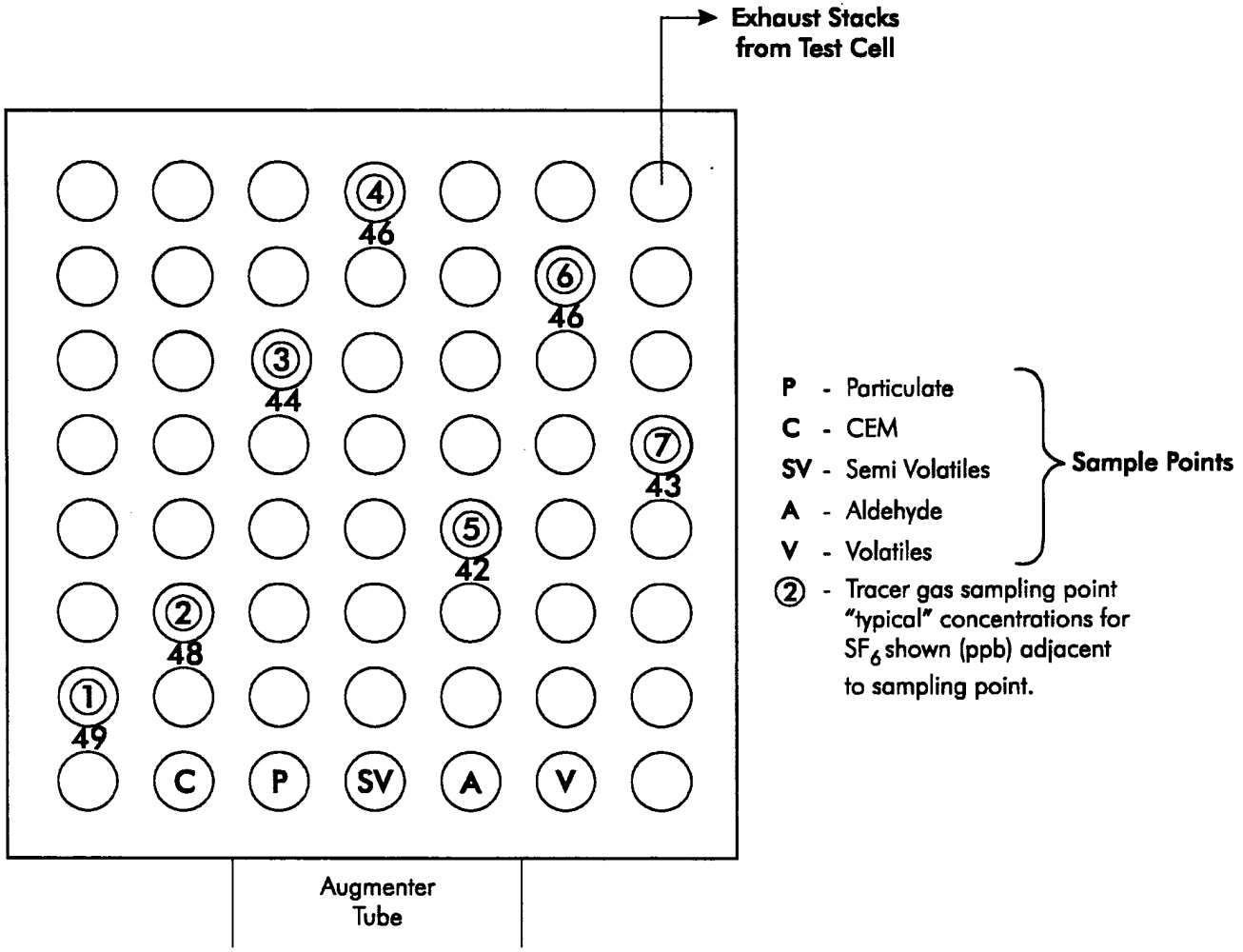


Figure 5-4. Tinker AFB Test Cell 9

Tracer Gas Sampling Points and Typical SF_6 Concentrations at Military Power for the F110 Engine

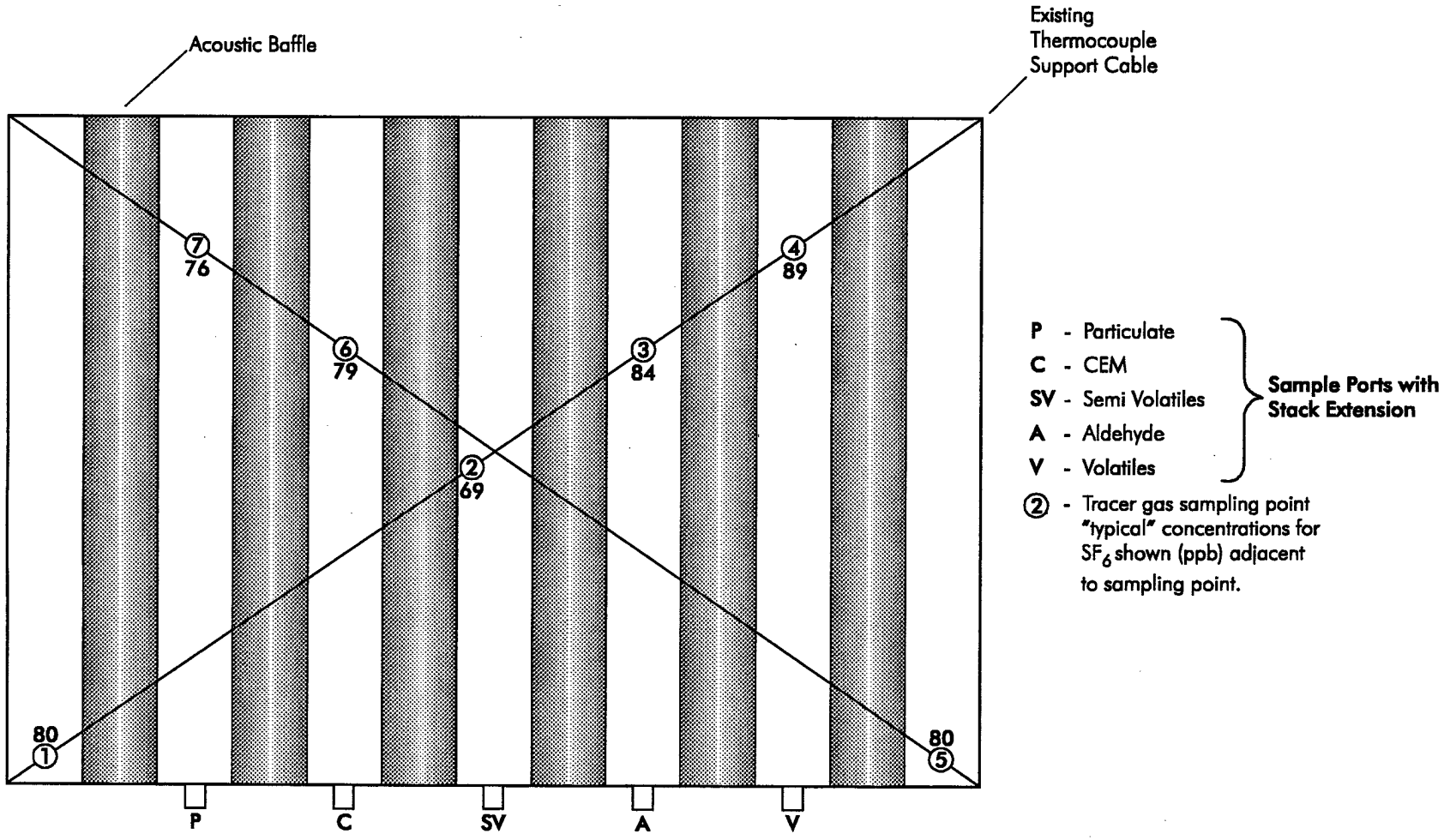


Figure 5-5. Charleston AFB Engine Test Cell

Tracer Gas Sampling Points and Typical SF_6 Concentrations (ppb) at Approach for the F117

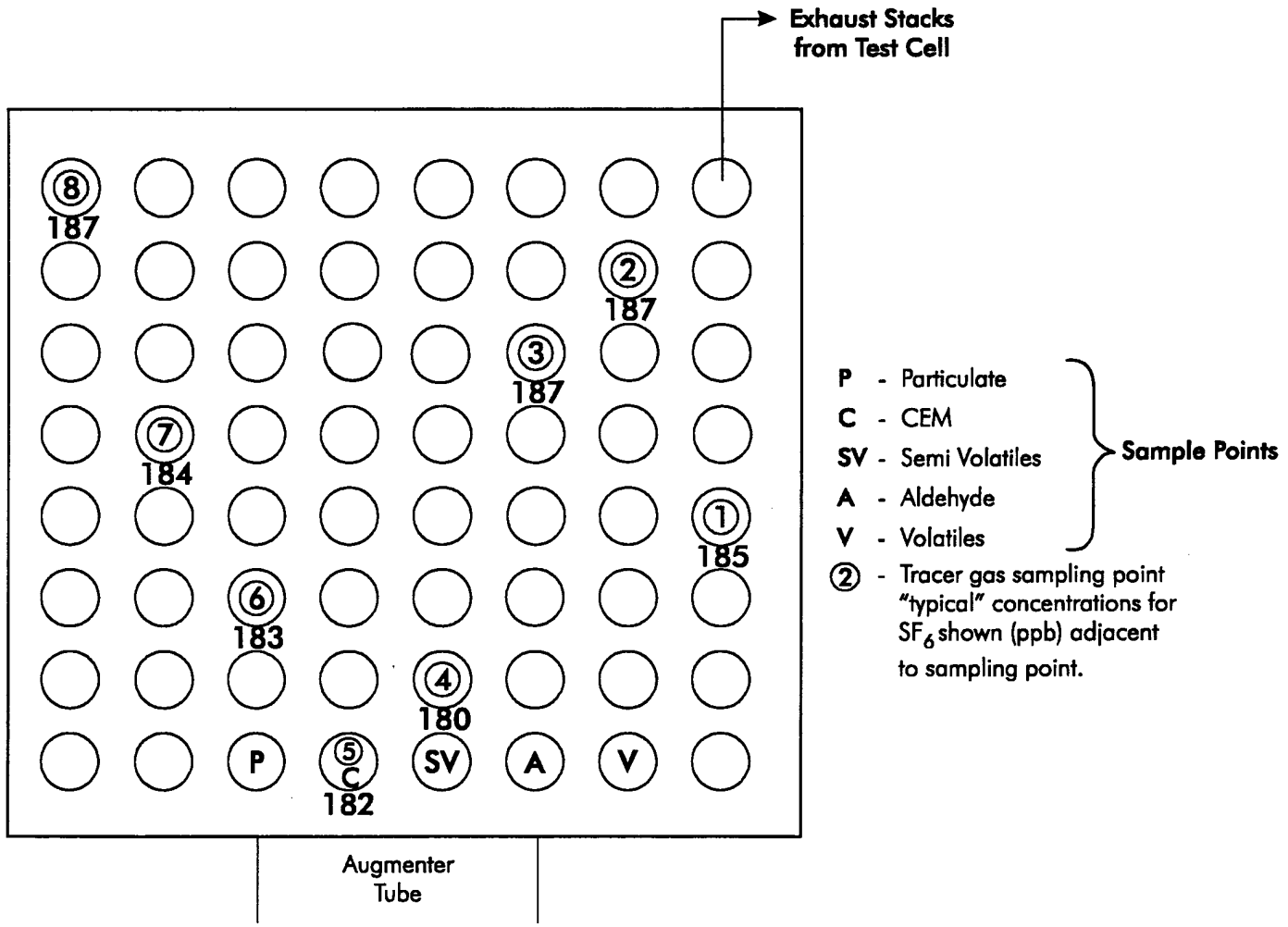


Figure 5-6. Edwards AFB Test Cell 4

Tracer Gas Sampling Points and Typical SF_6 Concentrations at Idle for the F118 Engine

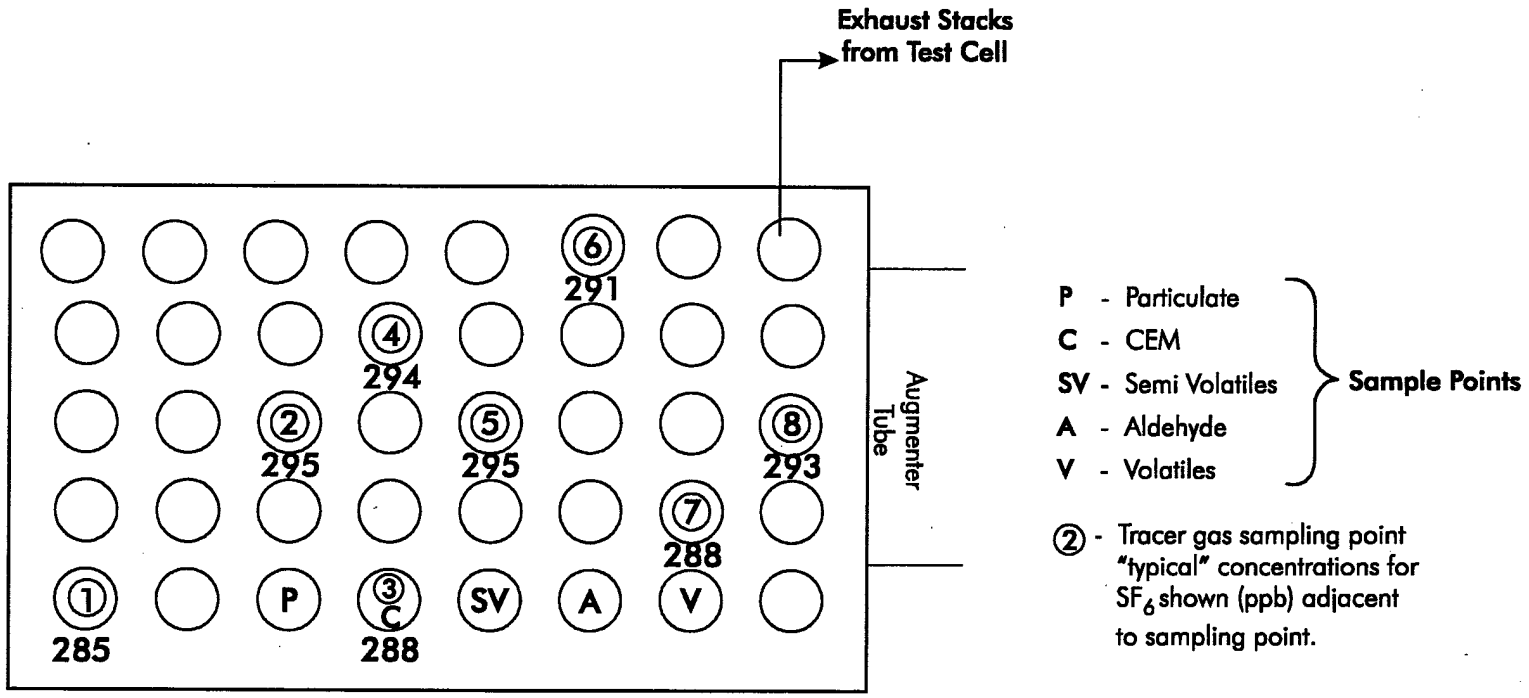
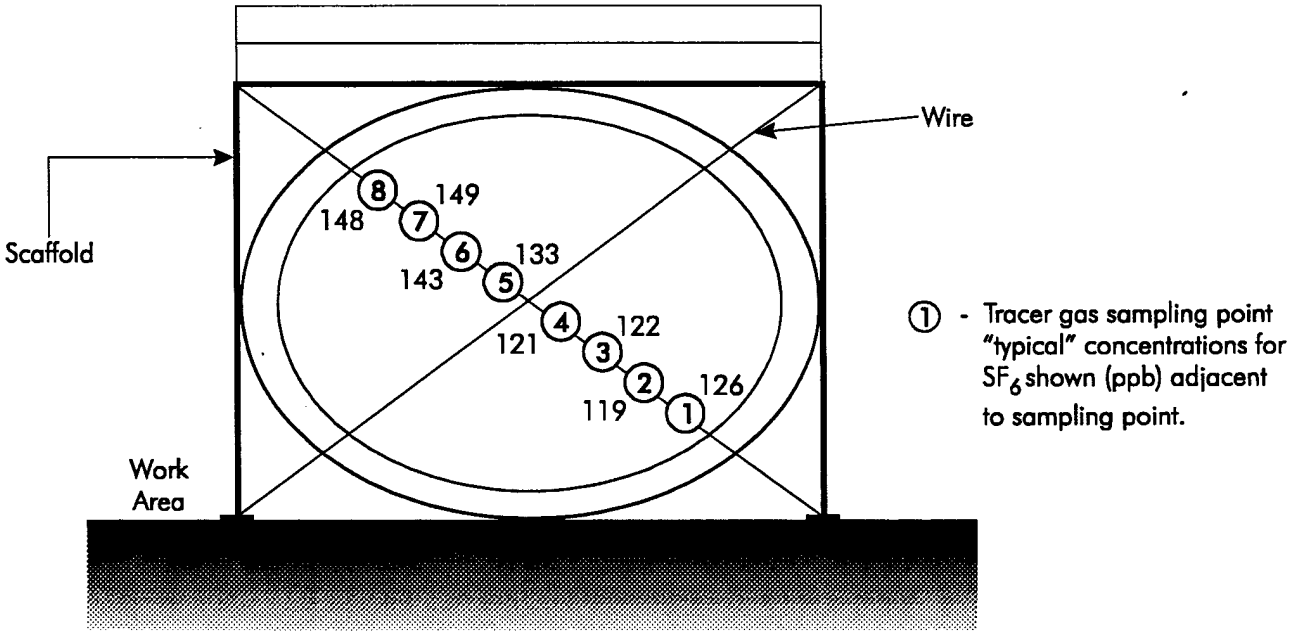


Figure 5-7. Edwards AFB Test Cell 2

Tracer Gas Sampling Points and Typical SF_6 Concentrations at Idle for the F404 Engine



View looking from Blast Box into Augmenter Tube

Figure 5-8. Barnes Air National Guard Base Hush House

Tracer Gas Sampling Points and Typical SF_6 Concentrations at Military for the TF34 Engine

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SECTION 6

COMPARISON OF RESULTS BETWEEN SIMILAR ENGINES

Engines tested during this program were compared to other engines tested during the program and to other test programs where JP-8 fuel was used. A total of ten engines in three engine families were compared for gaseous pollutant parameters. In addition, a comparison of the emissions of formaldehyde and benzene and their relative contribution to the total HAP emission rate is tabulated for the engines tested during this program. presented for each similar engine group for each engine power setting. Each graph depicts NO_x, CO, CO_2, and THC as lbs/1000 lbs fuel and fuel usage as lbs/hr. Factors that should be considered when comparing the data are:

- Fuel Usage - Differences in fuel usage may indicate that engines are not operating at the same power level. Though an engine setting may be classified as "Idle," power level classifications should be viewed as a general range. The greatest difference in emissions would occur at Idle and Afterburner, where the range in engine combustion efficiency is the greatest.

- Test Location – The potential exists for the stratification of the exhaust. Depending on the engine setting and test cell or hush house configuration, there could be some minor stratification (0.1 – 0.5 ppm) which can appear as a difference in the emission factors. This is important when dealing with results that are near 1 ppm +/- 0.5 ppm. The specific sample location within the test cell or hush house also affects the measured concentration of pollutants. The engine exhaust will be diluted with entrained air to varying degrees depending on the sample location and test cell/hush house configuration. Samples collected inside the center augmenter tube (front or rear) will generally be of a higher concentration than those measured at the exhaust of a test cell. All data presented in these comparisons that were collected by the test team were collected at the exhaust of test cells. Other data were collected from hush house augmenter tubes. The lower the pollutant concentration, the greater the effect of method variability and thus a greater potential for differences in emission factors.

For example, a 0.1 percent difference in CO_2 measurements, when the measured concentration is 1.0 percent or less, can result in a 20 percent difference in emission factors.

- Method Variability - Slight differences in emissions can also attribute to normal method variability. This variability can be caused by several factors including analyzer variability, analyzer resolution, instrument operator, and accuracy of EPA protocol calibration gases.

- Engine Differences – The comparisons made are only between similar engine families and not a head-to-head comparison between the same engine type (except for the F100-PW-100). Some of the differences noted in emission factors may be attributable to differences in operation of individual engine types.

The following reviews are only able to provide a general comparison between the data sets of each engine. In order to conduct a more rigorous analysis of engine variability, a statistically significant number of test results must be available.

6.1 ENGINE TF33-P-102 AND TF33A-P-7

Both TF33-P-102 and TF33A-P-7 engines were in engine test cells at Tinker AFB. Figures 6-1 though 6-4 depict the results from each engine at each power setting. The results are generally similar, but slightly higher pollutant concentrations are noted for the TF33A-P-7 at the idle and approach engine settings. One reason for the excellent comparison is that both engines were tested in the same test cell with exhaust samples collected at the same location. This limited the number of variables that could affect the emission factor comparison. For the TF33A-P-7 at the military setting the CO value is reported as a nondetect since the instrument indication was at zero. The instrument operation was verified with calibration gas before and after the test run.

Figure 6-1
TF33-P-102 and TF33A-P-7
Idle Emission Factors

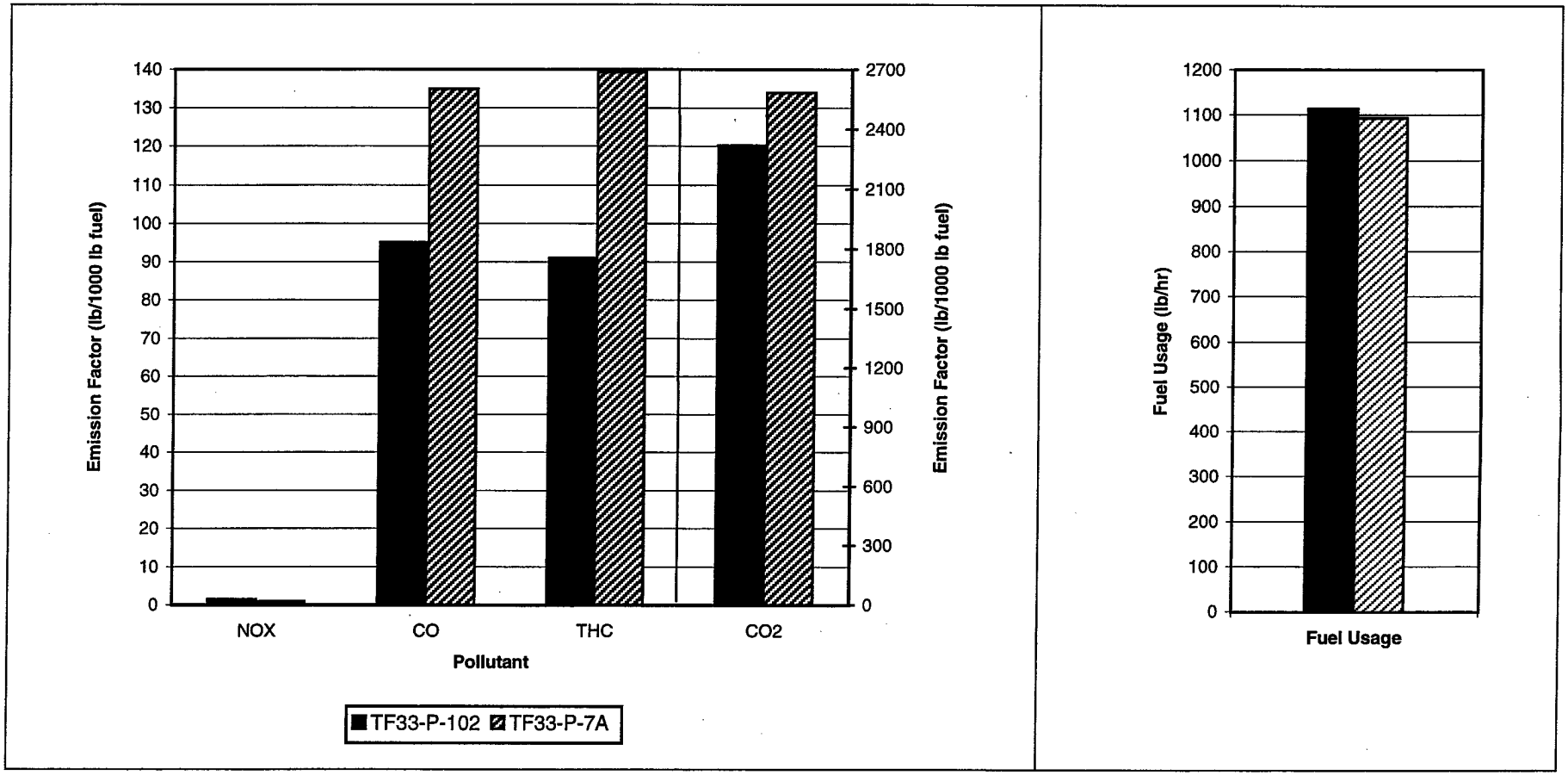


Figure 6-2
TF33-P-102 and TF33A-P-7
Approach Emission Factors

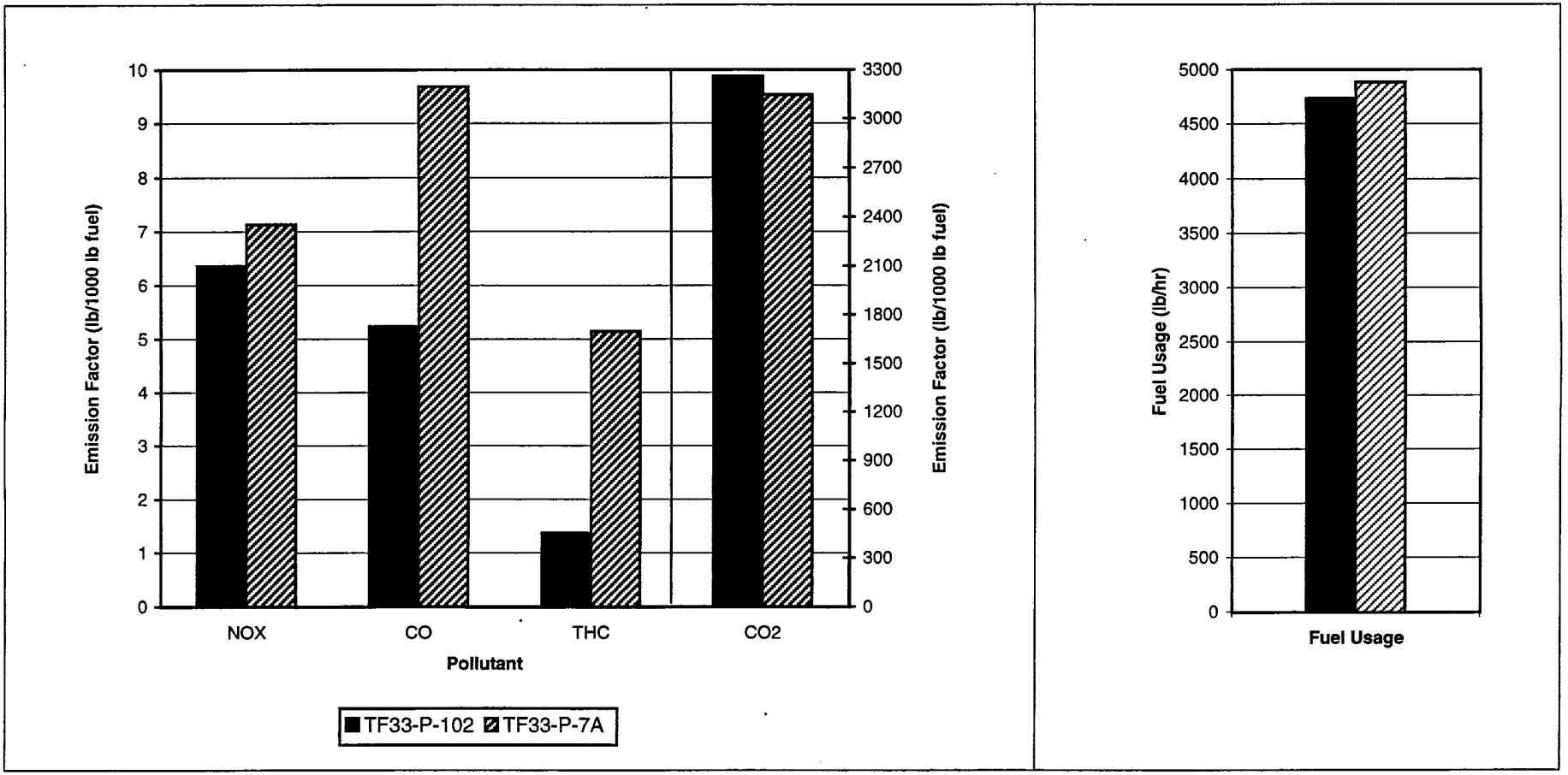


Figure 6-3
TF33-P-102 and TF33A-P-7
Intermediate Emission Factors

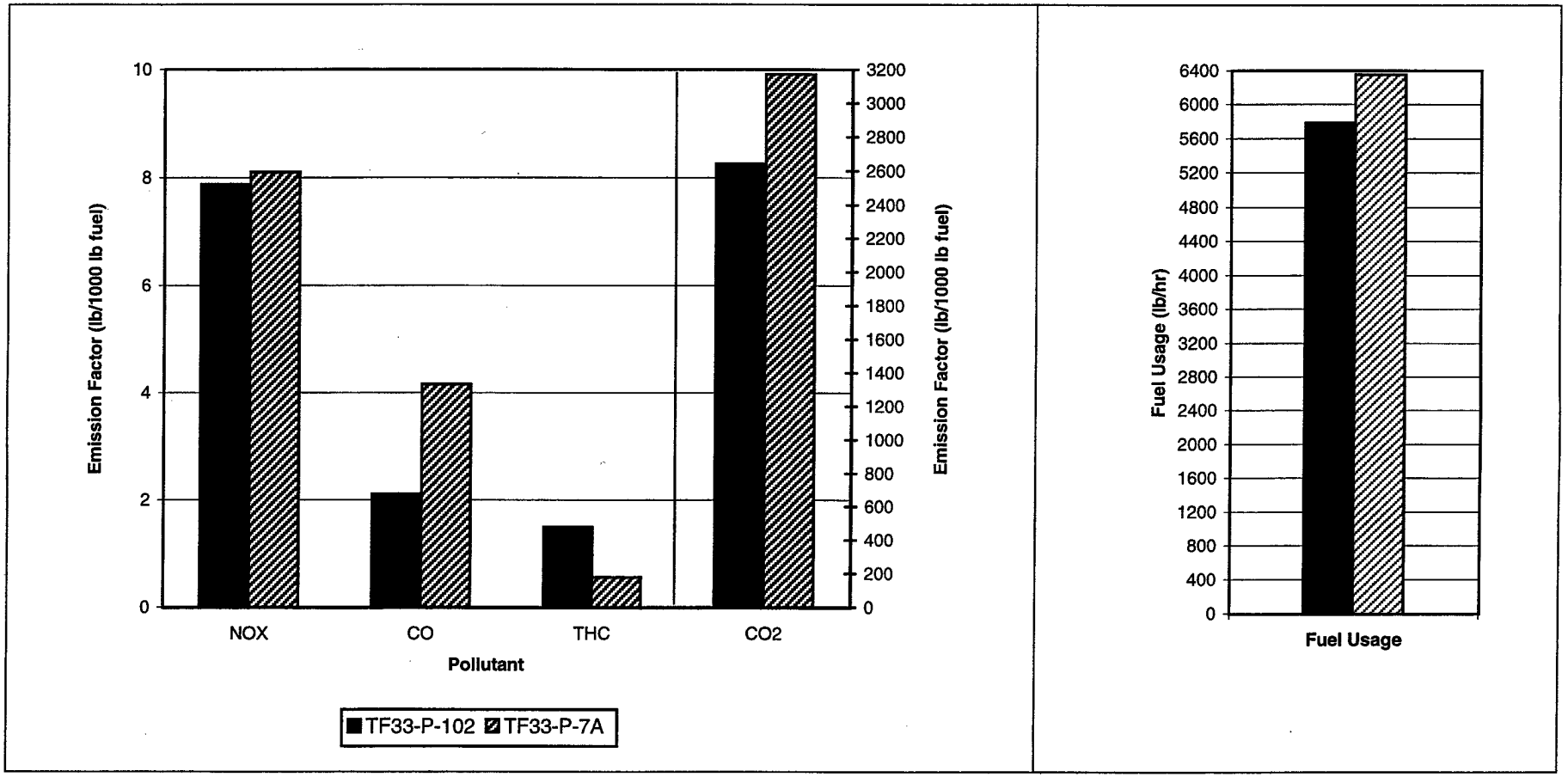
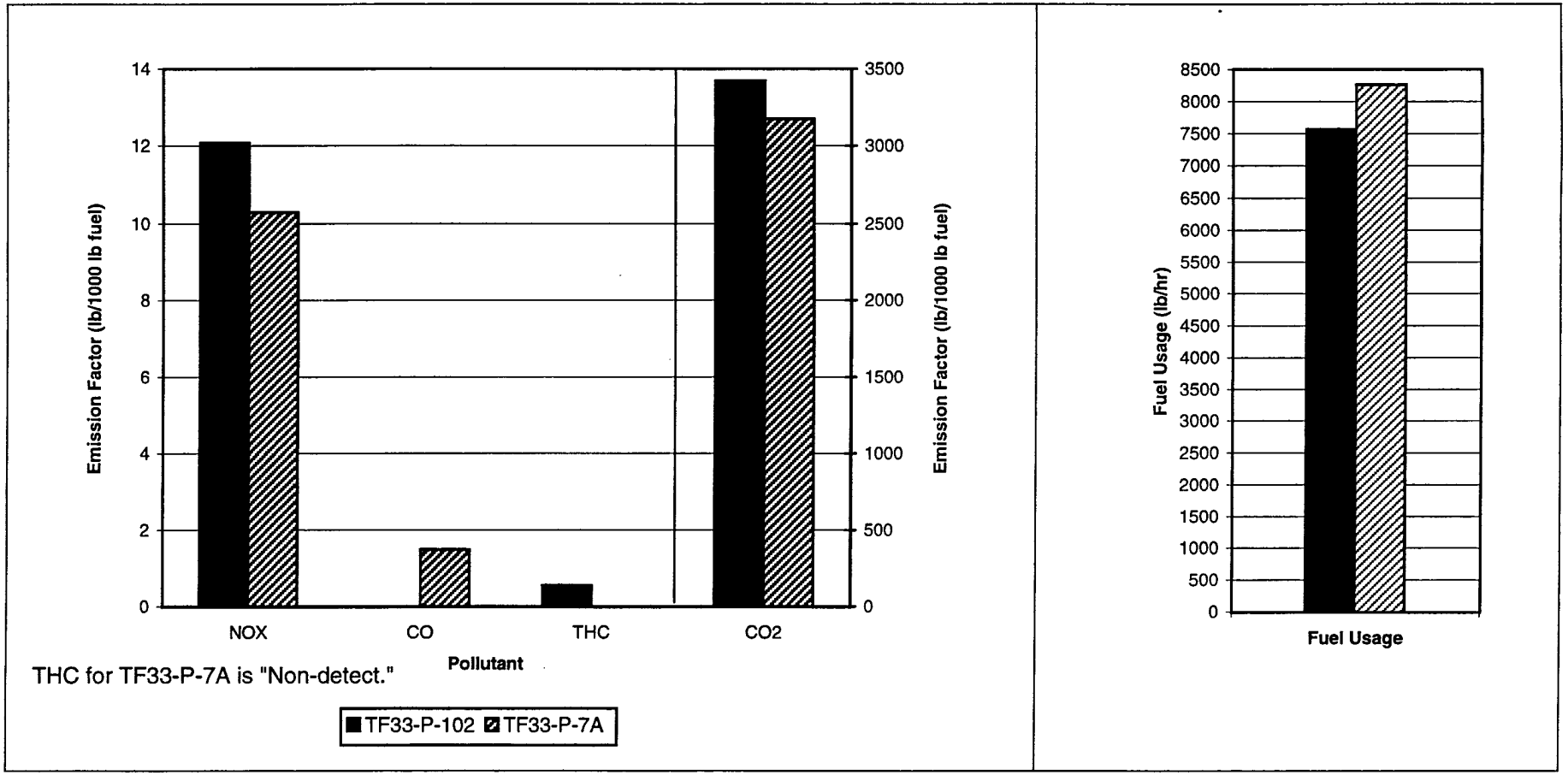


Figure 6-4
TF33-P-102 and TF33A-P-7
Military Emission Factors



6.2 ENGINES F118-GE-100, F108-CF-100, F110-GE-100, F101-GE-102, AND F110-GE-129

All engines were tested by the test team in the engine test cells at Tinker AFB and Edwards AFB. Figures 6-5 though 6-9 depict the results from each engine at each power setting. During this sampling program the F110-GE-100, F101-GE-102, and F110-GE-129 engines were tested in zone one of the afterburner power setting. The results are generally similar, but where differences occur they correlate to differences in fuel usage. The differences resulting from fuel usage are particularly evident at Idle, Approach, and Afterburner conditions. At these power settings, it appears that the increased fuel rate improved combustion efficiency. The similarity in emission trends between the F108-CF-100 and F101-GE-102 are expected since these engines use the same combuster.

6.3 ENGINE F100-GE-100 VS. F100-PW-100, F100-PW-220

The F100-GE-100 engine was tested by the test team in engine test cells at Edwards AFB. The F100-PW-100 was tested by Radian in a hush house at Langley AFB. The F100-PW-220 was tested by the test team in a hush house at Edwards AFB. Figures 6-10 though 6-14 depict the results from each engine at each power setting. The results are generally similar for Approach, Intermediate, and Military power settings with the exception of THC for F100-PW-220 at Approach. At Idle and Afterburner, it appears that differences in fuel usage are affecting combustion efficiency which are reflected in varying emission factors.

6.4 Hazardous Air Pollutant Emission Comparison

Table 6-1 provides a summary of the HAP emissions for the engines collected during this test program as well as a comparison with data collected in a previous

Figure 6-5
F118-GE-100, F108-CF-100, F110-GE-100, F101-GE-102, and F110-GE-129
Idle Emission Factors

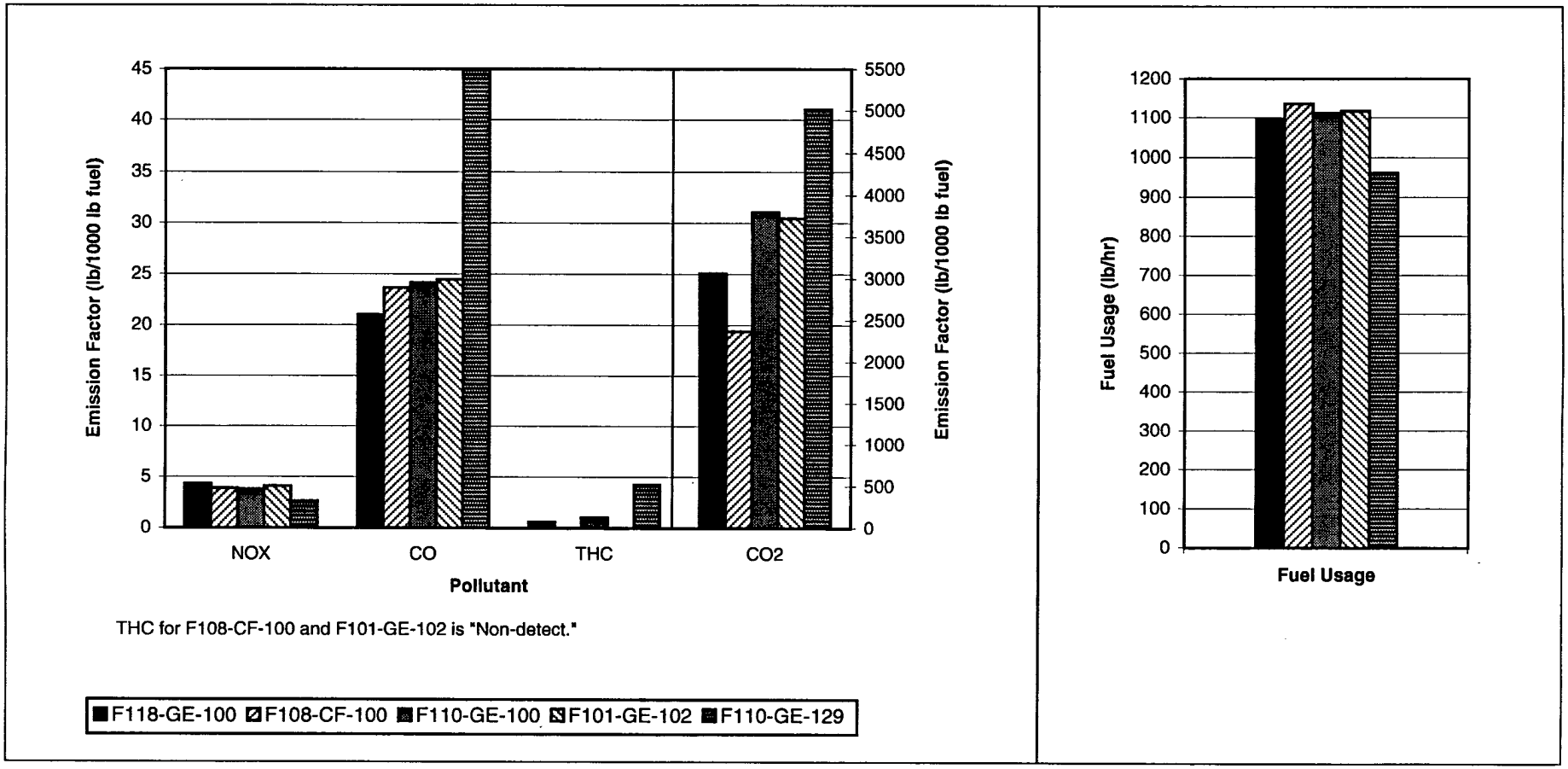


Figure 6-6
F118-GE-100, F108-CF-100, F110-GE-100, F101-GE-102, and F110-GE-129
Approach Emission Factors

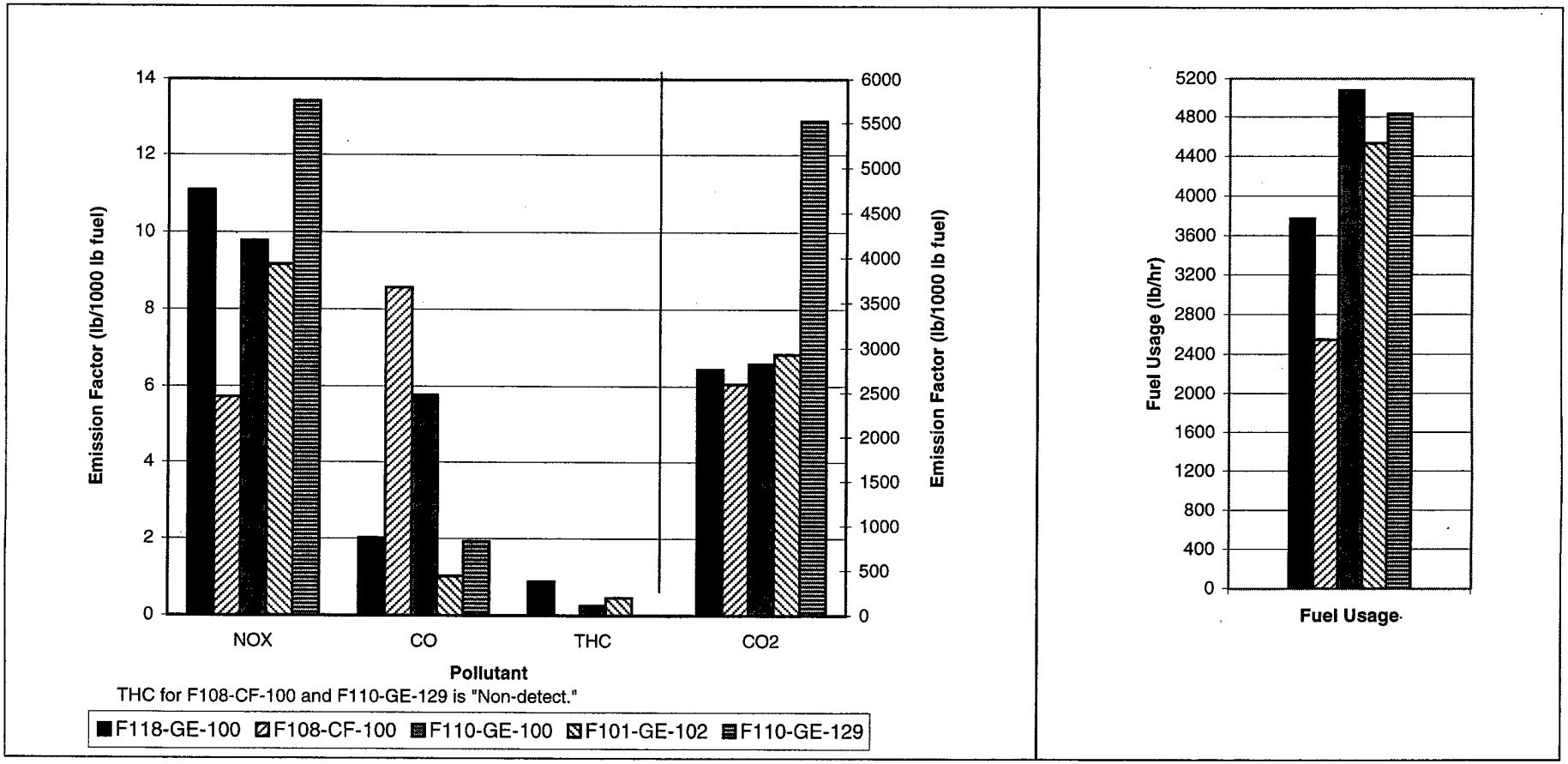


Figure 6-7
F118-GE-100, F108-CF-100, F110-GE-100, F101-GE-102, and F110-GE-129
Intermediate Emission Factors

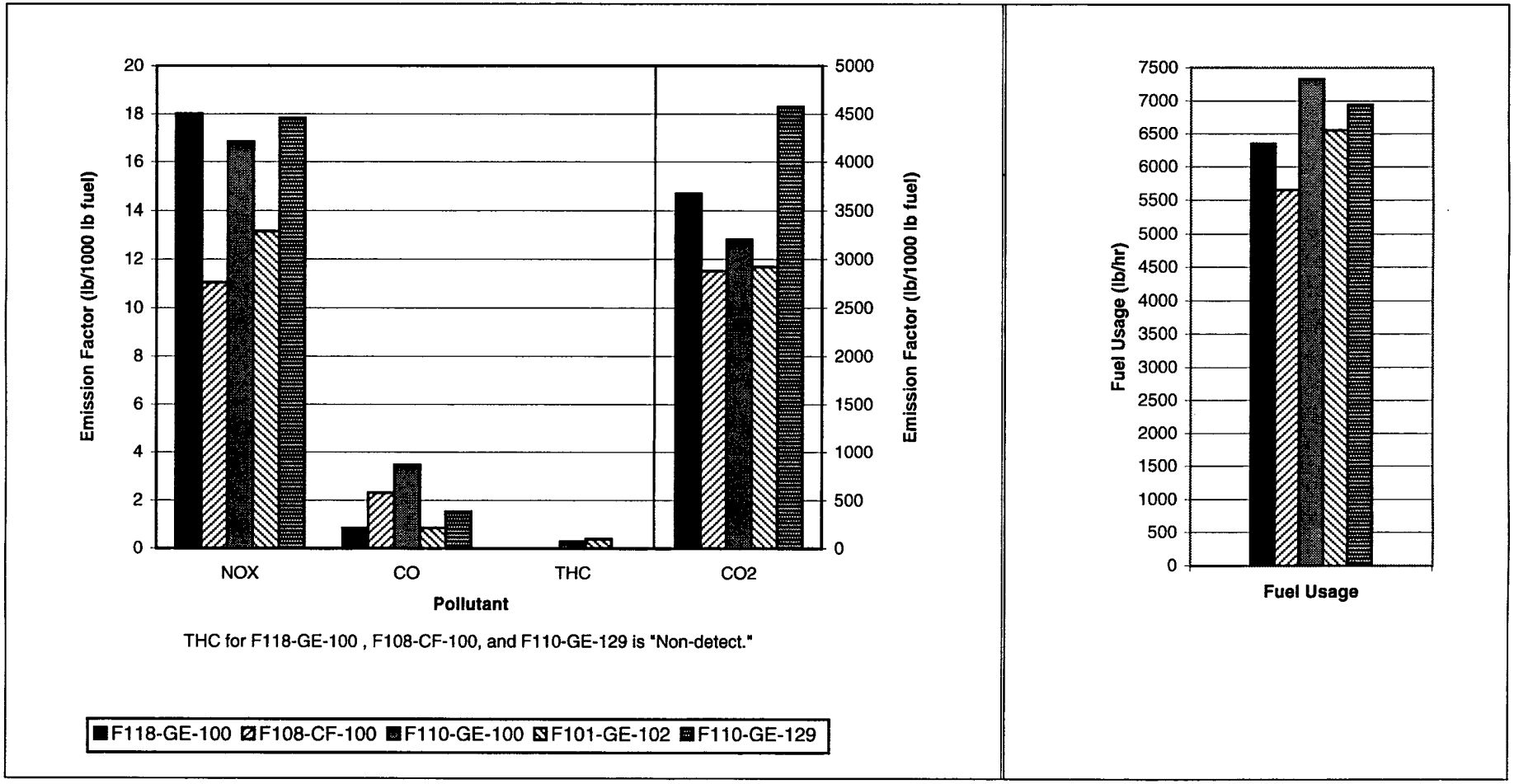


Figure 6-8
F118-GE-100, F108-CF-100, F110-GE-100, F101-GE-102, and F110-GE-129
Military Emission Factors

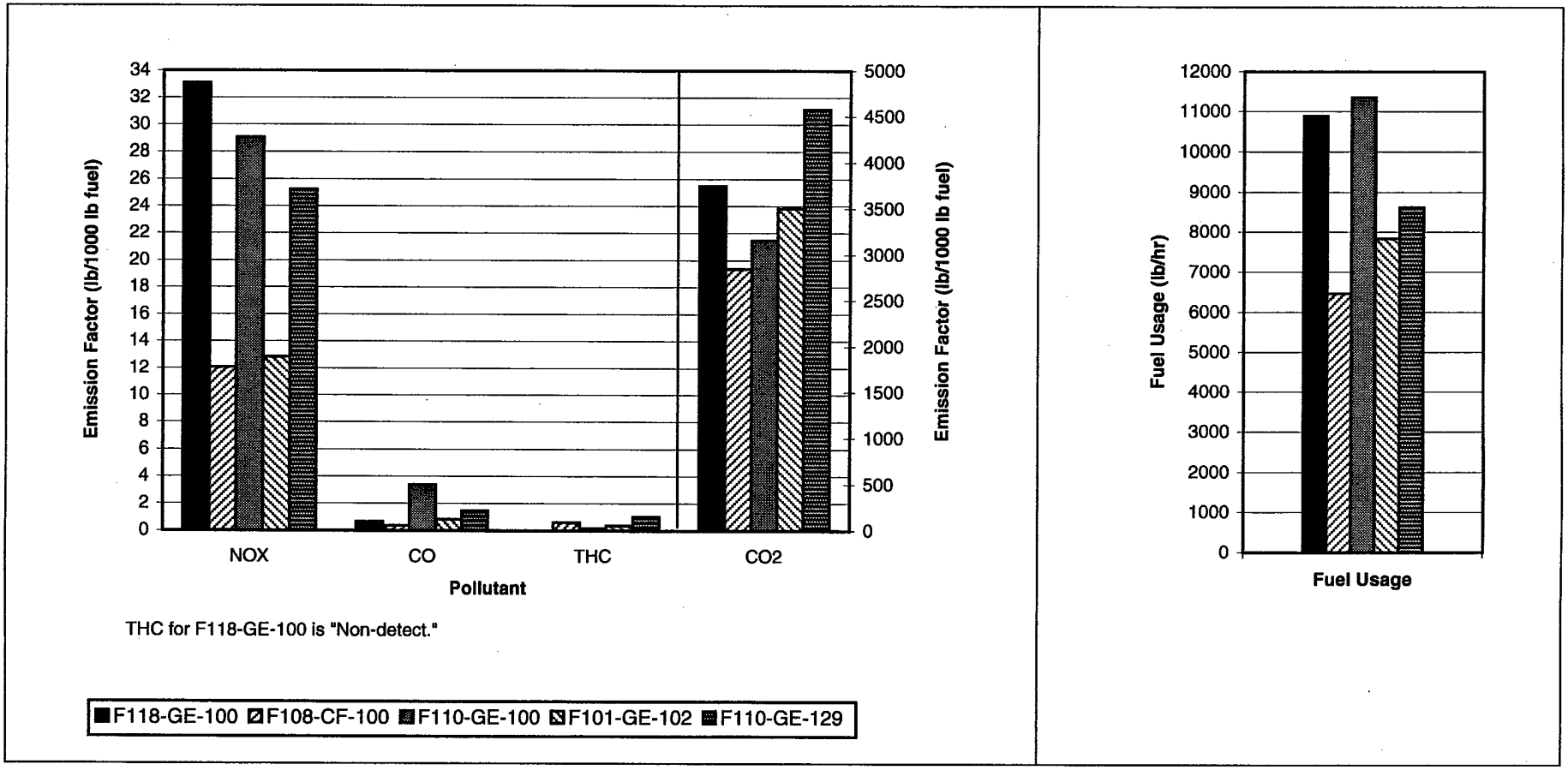
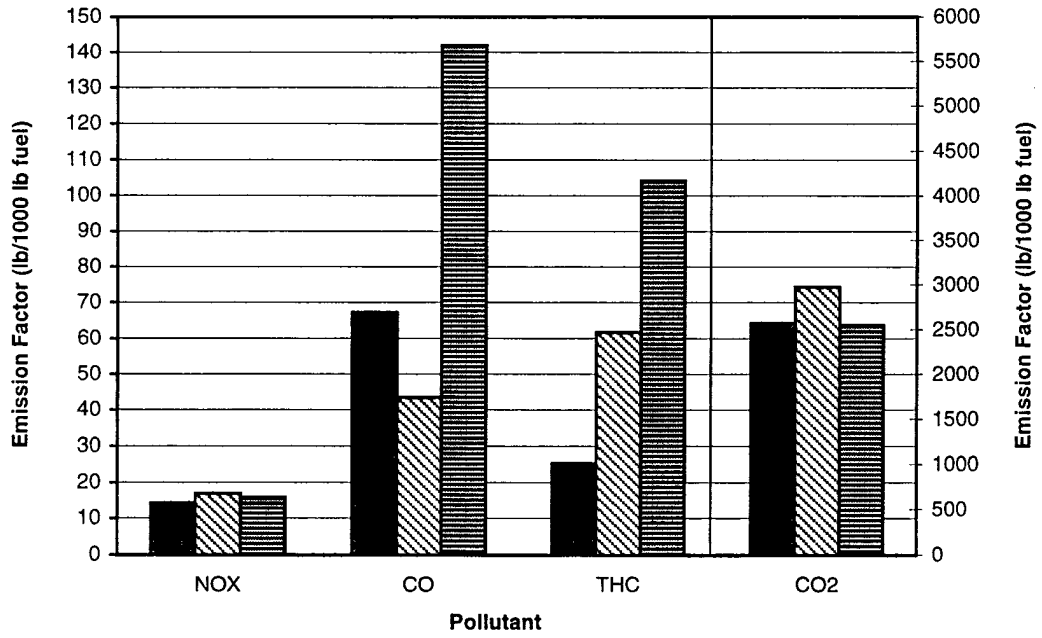
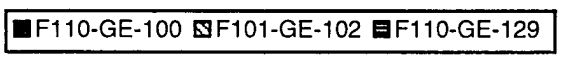


Figure 6-9
F110-GE-100, F101-GE-102, and F110-GE-129
Afterburner Emission Factors



Note: Emission factors and fuel usage were not available for F118-GE 100 and F108-CF-100 because the engines were not tested in afterburner mode.



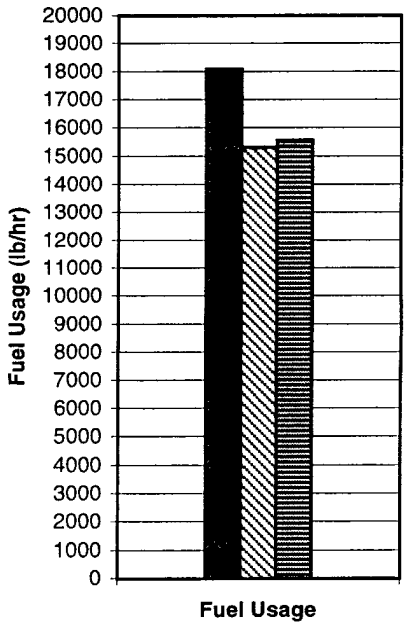


Figure 6-10
F100-PW-100 (Weston/EQ), F100-PW-100 (Radian), and F100-PW-220 (EQ) Idle Emission Factors

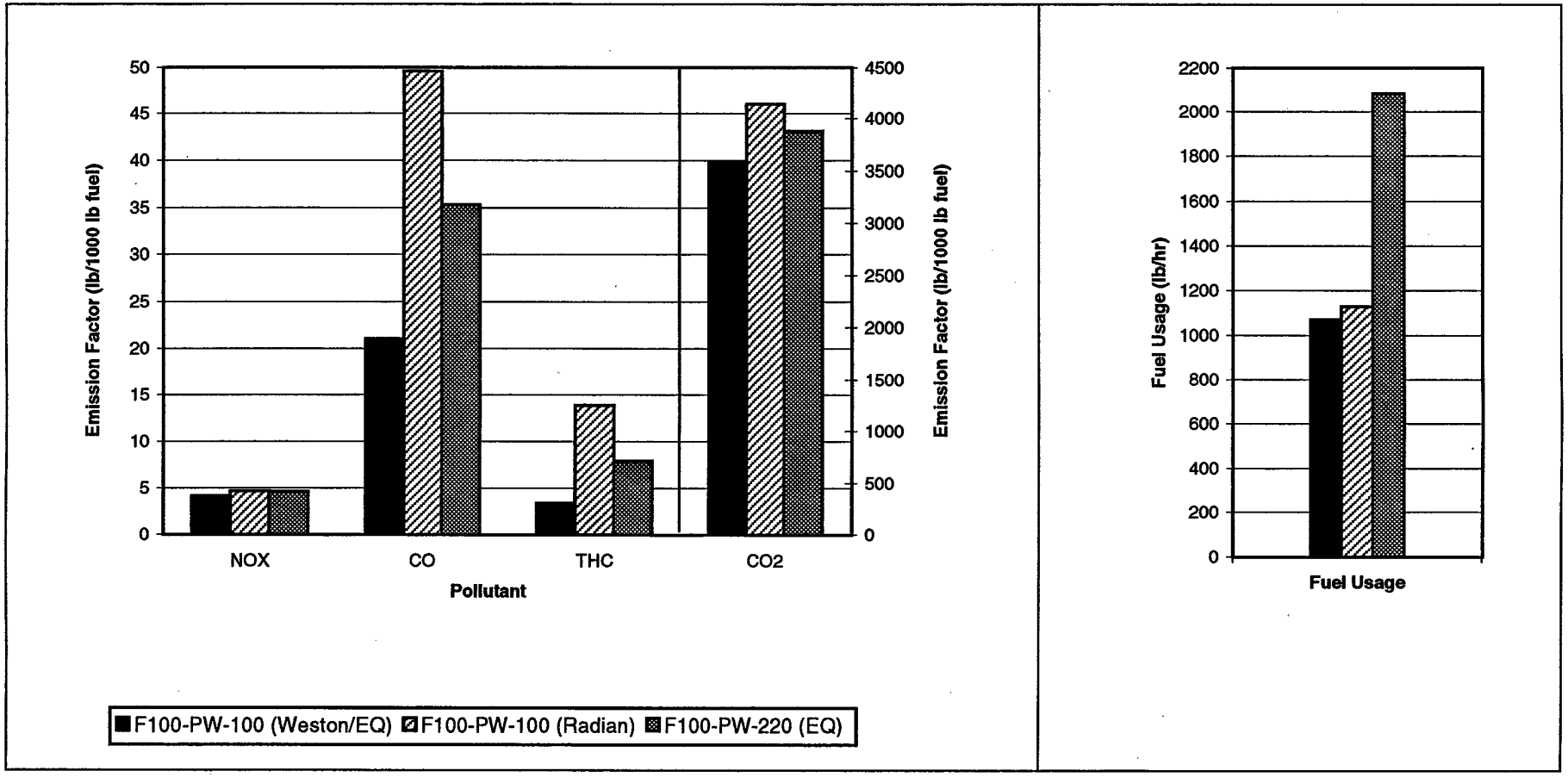


Figure 6-11
F100-PW-100 (Weston/EQ), F100-PW-100 (Radian), and F100-PW-220 (EQ) Approach Emission Factors

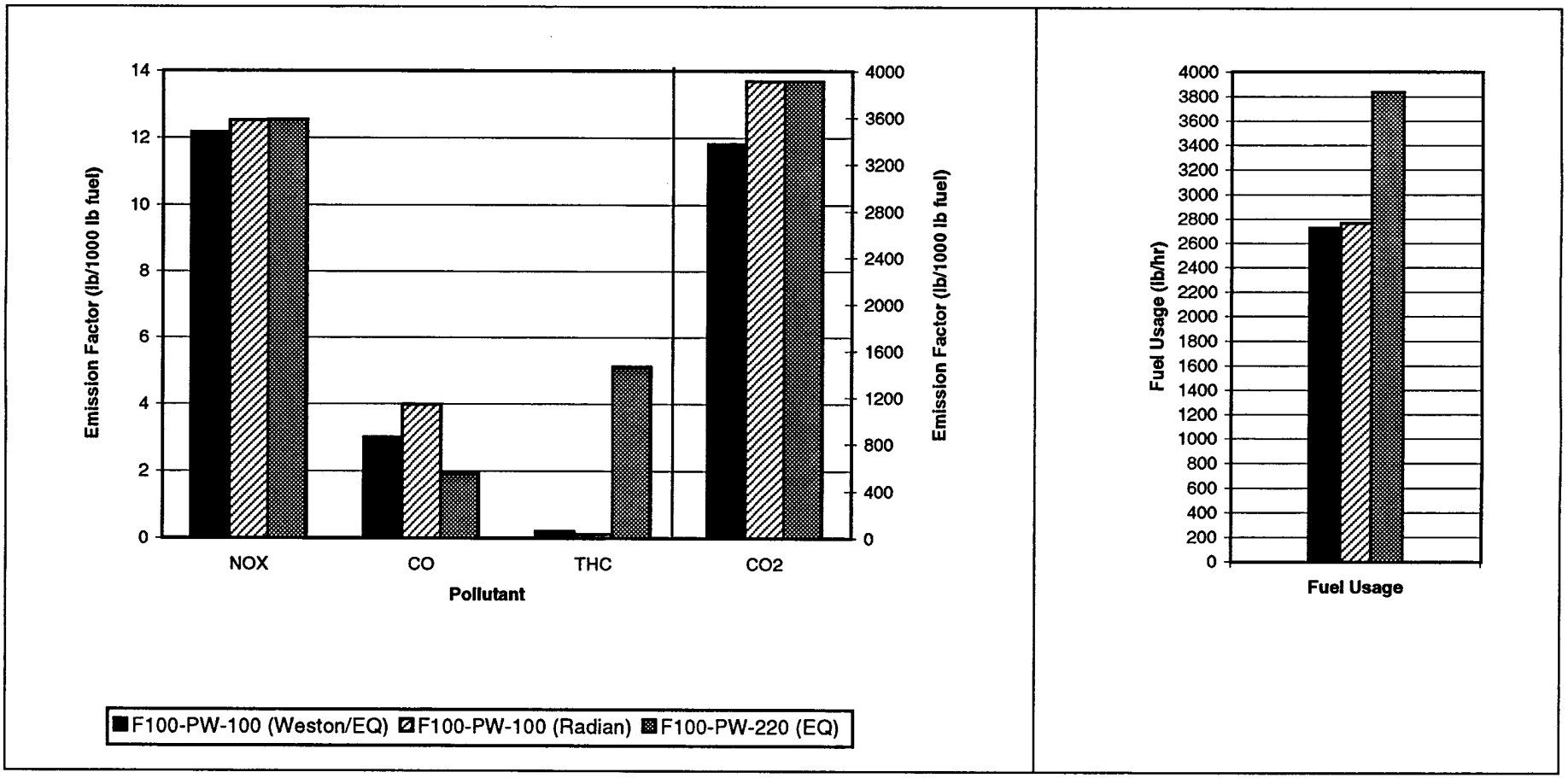


Figure 6-12
F100-PW-100 (Weston/EQ), F100-PW-100 (Radian), and F100-PW-220 (EQ) Intermediate Emission Factors

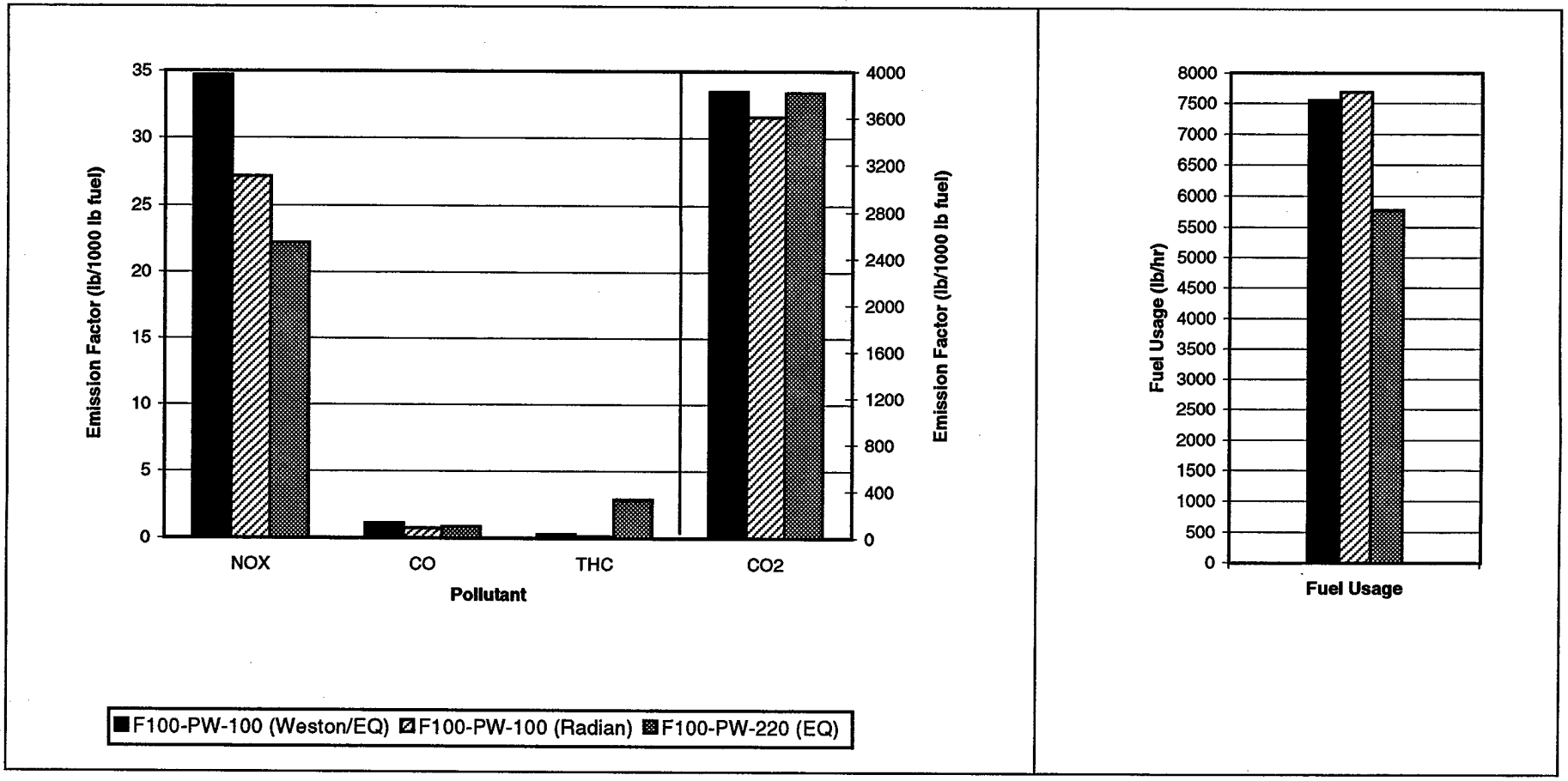


Figure 6-13
F100-PW-100 (Weston/EQ), F100-PW-100 (Radian), and F100-PW-220 (EQ)
Military Emission Factors

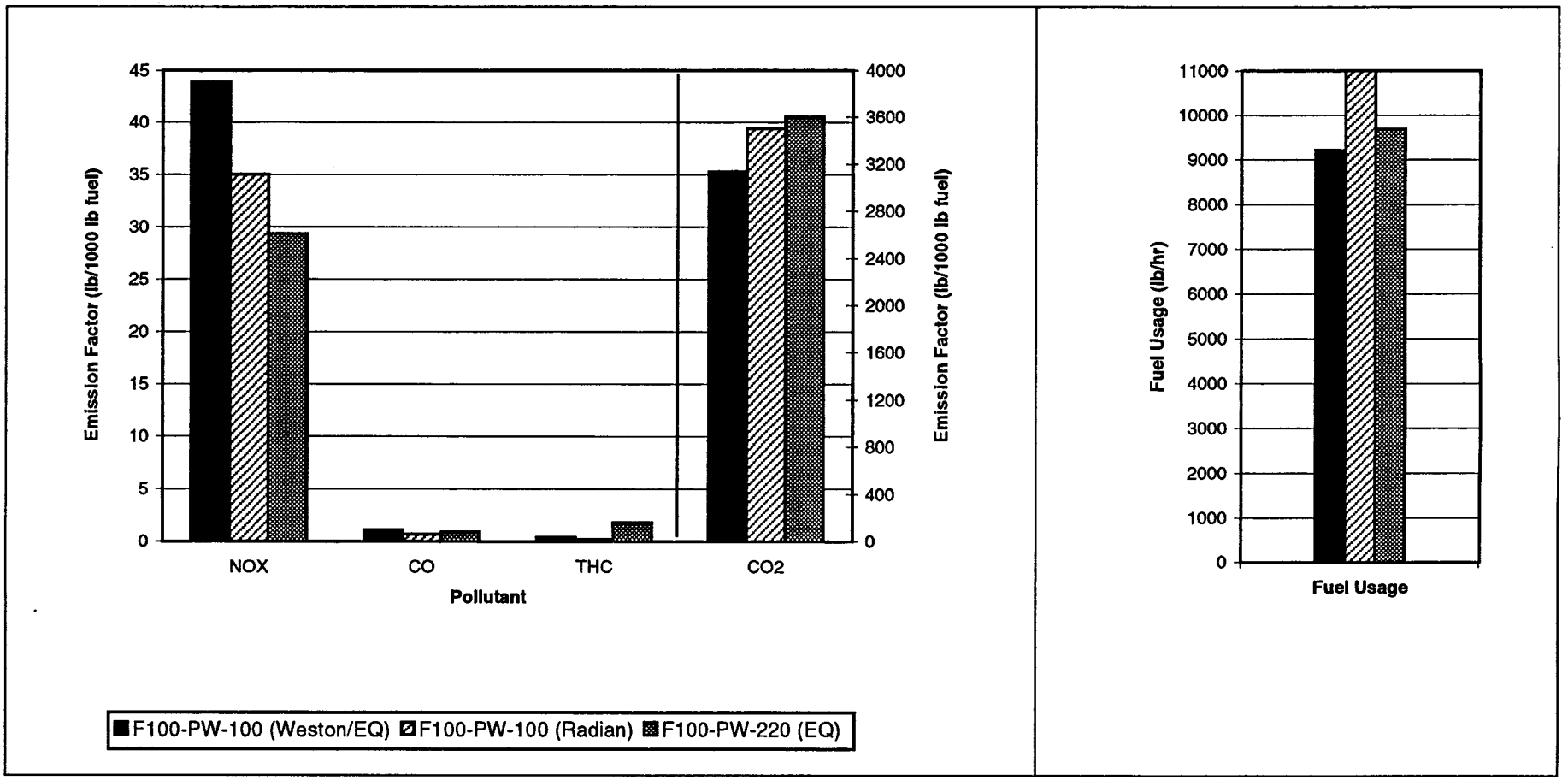


Figure 6-14
F100-PW-100 (Weston/EQ), F100-PW-100 (Radian), and F100-PW-220 (EQ) Afterburner Emission Factors

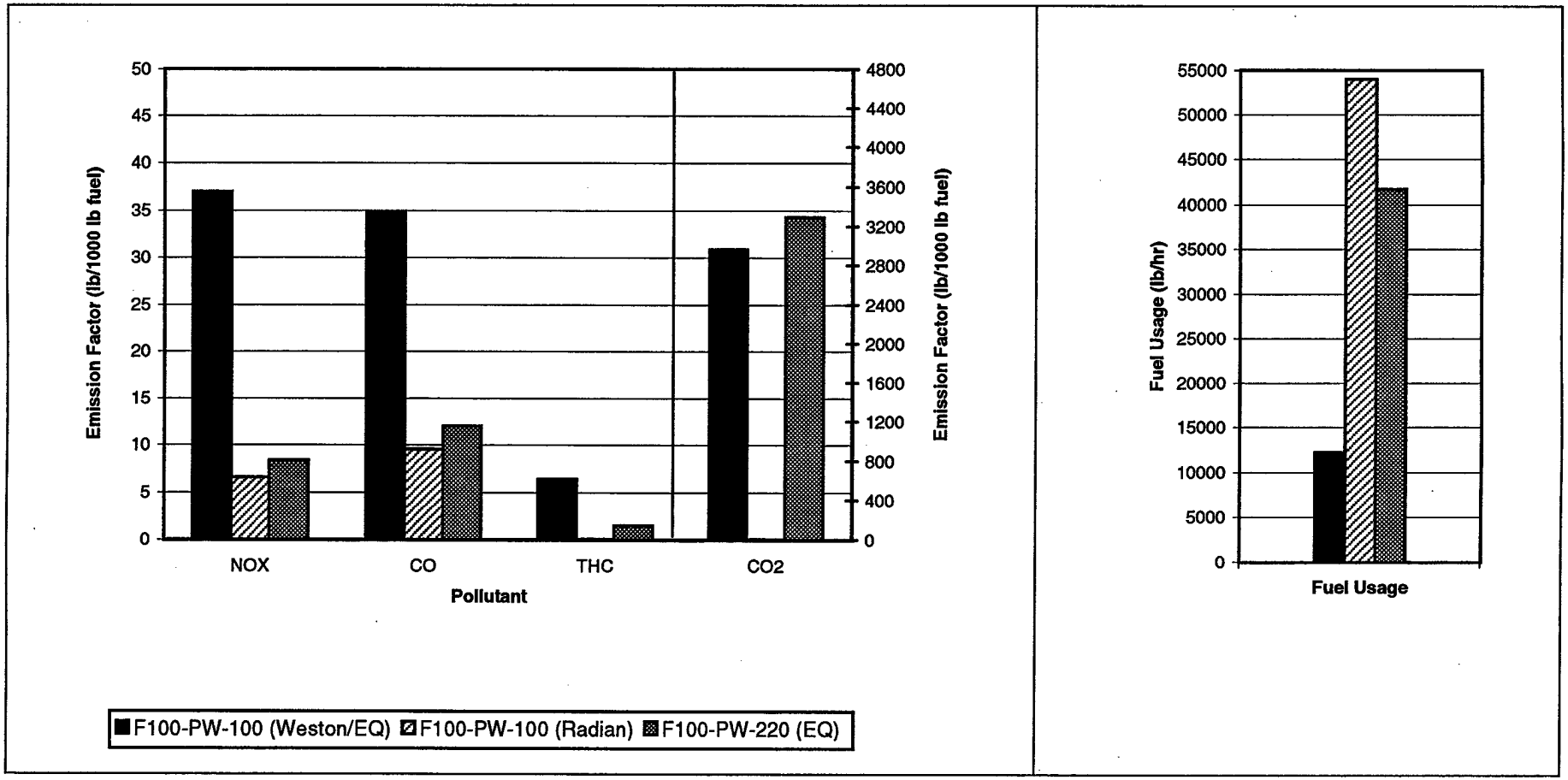


Table 6-1. Aircraft Engine HAP Emissions in Pounds per 1,000 Pounds of Fuel Burned

Engine	Idle			Approach			Intermediate			Military			Afterburner			
	Total HAPs	Portion of Total HAPs		Total HAPs	Portion of Total HAPs		Total HAPs	Portion of Total HAPs		Total HAPs	Portion of Total HAPs		Total HAPs	Portion of Total HAPs		
		Formaldehyde	Benzene		Formaldehyde	Benzene		Formaldehyde	Benzene		Formaldehyde	Benzene		Formaldehyde	Benzene	
T56-A-7	0.06	68%	8%	0.43	77%	10%	0.01	70%	10%	0.00	15%	30%				
TF39-GE-1C	2.58	55%	14%	0.02	50%	10%	0.01	50%	14%	0.01	73%	0%				
J69-T-25	1.72	53%	11%				0.04	74%	10%	0.02	77%	12%				
J85-GE-5A	1.05	18%	12%				0.95	68%	17%	0.01	80%	12%	0.04	64%	19%	Zone 1
T700-GE-700	0.33	67%	15%	0.01	64%	5%	0.00		35%	0.00	19%	12%				
TF33-P-102	2.53	37%	28%	0.09	77%	28%	0.03	69%	12%	0.00		29%				
TF33-P-7/7A	4.48	51%	12%	0.19	67%	15%	0.04	70%	16%	0.00	47%	13%				
F108-CF-100	0.13	72%	11%	0.03	54%	12%	0.01	66%	10%	0.01	76%	6%				
F101-GE-102	0.13	83%	18%	0.01	64%	12%	0.01	52%	6%	0.01	31%	8%	1.22	6%	26%	Zone 1
F110-GE-100	0.16	63%	8%	0.02	65%	12%	0.03	76%	6%	0.02	79%	8%	0.74	3%	26%	Zone 1
F117-PW-100	0.28	82%	8%	0.02	85%	5%	0.01	80%	5%							
F404-GE-F1D2/400	2.69	42%	19%	0.02	77%	3%	0.03	85%	2%	0.01	78%	6%	1.13	3%	33%	Zone 3
F118-GE-100	0.22	77%	12%	0.02	72%	5%	0.01	92%	3%	0.01	87%	5%				
T64-GE-100*	0.76	9%	29%	0.03	35%	38%	0.00	7%	89%	0.01	3%	58%				
TF34-GE-100	2.01	61%	14%	0.09	66%	9%	0.09	76%	11%	0.04	71%	11%				
AVERAGE	1.28	56%	14%	0.08	68%	11%	0.10	67%	16%	0.01	61%	12%	0.78	19%	26%	

High bypass engines average 1.99 lbs of HAPs of which 59.66% is formaldehyde.

Non-high bypass engines average 0.794 lbs of HAPs of which 58.88% is formaldehyde.

* Not included in average

study conducted by Radian Corporation. The HAP comparison provides the total HAP emission rate as well as the contribution of benzene and formaldehyde to the total HAP emission rate. The comparison provides reasonable correlation between similar engine types. In general, formaldehyde contributes approximately 60-70%^ (depending on engine setting) to the total HAP emission rate. Benzene typically makes up approximately 10-15% (depending on engine setting) of the total HAP emission rate. The comparison of HAP data indicates that the total emission rate of HAP for all engines is less than 1 lb/hr at engine settings higher than idle. At idle, the total HAP missions are less than 5 lbs/hr. These data show consistency in the general contribution of formaldehyde and benzene to the total HAP emission rate.

As was discussed previously in this report, comparisons made using individual data points do not provide a representative result. Comparisons made using the entire data set and a review of emission trends provide a more reasonable representation of the data. As Table 6-1 presents, there are data outliers within the entire data set. This is expected considering the number of sample runs performed, but in general, the results correlate well.

SECTION 7

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

7.1 QUALITY CONTROL PROCEDURES

As part of the engine testing program, a quality assurance (QA) and quality control (QC) program was implemented. QA/QC is defined as follows:

- Quality Control - The overall system of activities whose purpose is to provide a quality product or service (e.g., the routine application of procedures for obtaining prescribed standards of performance in the monitoring and measurement process).

- Quality Assurance - A system of activities whose purpose is to provide assurance that the overall QC is being conducted effectively.

The Field Team Leaders for stack sampling were responsible for implementation of field QA/QC procedures. Individual laboratory managers were responsible for implementation of analytical QA/QC procedures. The overall Project Manager oversaw all QA/QC procedures to ensure that sampling and analyses met the QA/QC requirements and that accurate data results from the test program were obtained.

7.1.1 Field QC Sample Collection/Preparation Procedures

Table 7-1 provides a summary of the numbers and types of field and analytical QA/QC samples by parameter. General field QC procedures are the following:

- Collect only the number of blank samples needed to represent the media being sampled.

Table 7-1. Summary Of Analytical QA/QC Samples

SAMPLE LOCATION	PARAMETER	NUMBER OF SAMPLES	TYPES AND NUMBERS OF QA/QC SAMPLES		
			FB	RB	MS
STACK ENGINE EXHAUST GAS[a]:					
	Particulate	96	--	3	--
	Volatile organics[b]	96	3 pair	3 pair	93 pair
	Semivolatiles	32	3	3	--
	Organics				
	Aldehydes and Ketones	32	3	3	--
AMBIENT (BACKGROUND)					
	Particulate	32	3	--	--
	Volatile organics	32	3	--	--
	Semivolatiles	32	3	--	--
	Organics				
	Aldehydes and Ketones	32	3	--	--

[a] Trip blanks for engine exhaust gas samples consisted of reagent blanks. See Subsection 7.1.2 for a description of engine exhaust gas blank samples.

[b] Four pairs of VOST tubes per test run.

FB = Field Blank or blank trains
RB = Reagent Blank
MB = Method Blank or Preparation Blank
MS = Matrix Spike

- To the extent possible, determine the quantities and types of samples and sample locations prior to the actual fieldwork.
- As few people as possible should handle samples.
- The field sampler is personally responsible for the care and control of the samples collected until they are properly transferred or dispatched.
- To ensure the legibility and integrity of sample identification, black waterproof ink or other measures must be used to complete the sample records for each sample.
- The Field Team Leader ensures that proper preservation, storage, and security procedures are followed during the fieldwork and decides if additional samples are needed.
- Storage conditions of samples must be documented on the sample forms or project records.

7.1.1.1 QC Procedures for Exhaust Gas Sample Collection

This subsection provides a list of QC procedures employed during the field sampling effort. Method-specific QC procedures are detailed in the method descriptions contained in Appendix B. General QC checks that applied to all methods include the following:

- Leak checks.
- Use of standardized forms, labels, and checklists.
- Procedures to ensure sample traceability.
- Collection of appropriate blanks.
- Use of calibrated instrumentation.
- Use of Protocol 1 and/or NIST-traceable calibration gases.
- Review of data sheets in the field to verify completeness.
- Use of validated spreadsheets for calculating results.

7.1.1.2 Velocity/Volumetric Flow Rate QC Procedures

Volumetric flow rates using EPA Method 1 and 2 procedures were determined during the isokinetic engine exhaust gas tests. The following QC procedures were followed during these tests:

- The S-type pitot tube was inspected visually before sampling.
- Both legs of the pitot tube were leak-checked before sampling.
- Proper orientation of the S-type pitot tube was maintained while making measurements. The yaw and pitch axes of the S-type pitot tube were maintained at 90° to the flow.
- The manometer oil was leveled and zeroed before each run.
- Cyclonic or turbulent flow checks were performed prior to testing the source.
- Pitot tube coefficients were determined based on physical measurement techniques as delineated in EPA Method 2.

7.1.1.3 Moisture Content and Sample Volume QC Procedures

Gas stream moisture was determined by EPA Method 4 as part of the isokinetic engine exhaust gas tests. The following QC procedures were followed in determining the volume of moisture collected:

- The balance zero was checked and re-zeroed if necessary before each weighing.
- The balance was leveled and placed in a clean, motionless environment for weighing.
- The indicating silica gel was fresh for each run and was inspected periodically and replaced during runs, if needed.

The following QC procedures were used to ensure accurate sample gas volumes:

- The dry gas meter was fully calibrated annually using an EPA-approved intermediate standard device.
- Pretest, port-change, and posttest leak checks were completed (must be less than 0.02 cfm or 4 % of the average sample rate).
- The gas meter was read to the thousandth of a cubic foot for all initial and final readings.
- Readings of the dry gas meter, meter orifice pressure (Delta H), and meter temperatures were taken at every sampling point.
- Accurate barometric pressures were recorded at least once per day.
- Pre- and posttest program dry gas meter checks were completed to verify the accuracy of the meter calibration constant (Y).

The most critical operating parameter for ambient air-sampling equipment is the airflow rate during sampling, which determines the total volume of air sampled. Calibrations of the ambient air-sampling equipment were performed to accurately determine the operating flow rates of the samplers, and to verify that all method-based flow-rate requirements were met.

All ambient air samplers were calibrated upon installation to establish the means for determining operating flow rates, and as required throughout the monitoring program whenever field calibration checks or repairs required re-calibration. All calibrations were conducted according to standard operating procedures (SOP), using materials traceable to NIST reference materials. Calibrations were conducted by qualified personnel thoroughly familiar with the sampling equipment. All calibration and audit results were recorded in a field logbook and/or the calibration/audit data sheets. Appendix B contains other specific QA/QC for particulate, semi-volatile, VOST, aldehydes and ketones, and CEMS.

7.1.2 Engine Exhaust Gas and Ambient Blank Samples

Engine exhaust gas blank samples consisted primarily of reagent blanks collected in the on-site sample recovery area during the test program. Reagent blanks included solvents used to recover stack samples, absorbing solutions, filters, and resins (XAD, Tenax, Tenax/charcoal). All reagent blanks were collected by transferring them directly from storage containers to sample jars, or labeling filters and resins as blank samples. These samples were referred to as "Site Blanks."

For the VOST Method 0030, Semivolatiles Method 0010, and Aldehydes and Ketones Method 0011 sampling trains, additional field blank samples, referred to as "Blank Trains," were taken in the field according to the following procedures.

VOST Method 0030

> Blank Tenax and Tenax/charcoal cartridges were taken to the sampling location and the end caps removed for a period of time equal to the time required to exchange one pair of VOST tubes on the VOST train. After this time period, the end caps were replaced on the blank tubes and these tubes were handled in a manner similar to the other VOST tube samples. This procedure is consistent with the EPA Quality Assurance/Quality Control (QA/QC) Procedures for Hazardous Waste Incineration (January 1990).

Semivolatiles Method 0010 and Aldehydes and Ketones Method 0011

> A blank sample train for each method was taken to the stack sample location, leak checked, and then recovered in the same manner as a regular sample. One field blank sample was collected at each test facility.

A blank sample for ambient sampling consists of a complete set of sampling media (e.g., a PUF cartridge and a glass fiber filter, or a complete ADS sampling train) that has had no air drawn through it by the sampling equipment. These samples are referred to as "Field Blanks." The field blanks were used to identify contamination resulting from field sample handling procedures. A field blank was handled in the same manner as the actual

samples, undergoing the same preparation, installation in the sampler module, and recovery procedures.

The sampling media normally contains small amounts of the target compounds emitted from naturally occurring or anthropogenic emission sources. Contamination may have been introduced to the sampling media during handling of the media in the laboratory, in the field, or during shipping. Blank samples were used to quantify these sources of contamination. Samples are not normally corrected for blank contamination unless specified by the method or unless sufficient justification can be made to perform a correction.

Stack sample blank corrections were performed for particulate by using acetone, water, and methylene chloride site blanks.

7.2 SAMPLING CONTAINERS, PRESERVATIVES, AND VOLUME REQUIREMENTS

Table 7-2 lists the holding times, storage containers, and preservation requirements that were followed for routine storage and handling of samples.

7.3 DECONTAMINATION PROCEDURES

Stack-gas sampling equipment was precleaned following standard source test method procedures. All stack-gas sampling equipment was cleaned on site as part of individual sample recovery procedures.

Table 7-2. Recommended Sample Containers, Preservation Techniques, And Holding Times

SAMPLE LOCATION	ANALYTE	MATRIX	CONTAINER TYPE AND SIZE	PRESERVATION	HOLDING TIME
ENGINE EXHAUST GAS	Particulate	Liquids, filters, and resins	AG/500 mL AG/1.0 L	NA NA	NA NA
	Volatile organics		G/40 mL	=4 °C	14 days
	Semivolatiles		AG/1L	=4 °C	14 days to extract 40 days to analysis
	Aldehydes and Ketones	Liquid	AG/1.0 L	=4 °C	14 days
AMBIENT	Particulate	Filter	E	NA	NA
	Volatile organics	Whole air	S	NA	30 days
	Semivolatiles	Filter/PUF	G/A	4 ± 2°C	7 days to extract 40 days to analysis
	Aldehydes and Ketones	Sorbent coating	D	NA	7 days to extract 14 days to analysis

Key:

A= Aluminum Foil AG = Amberglass D = Denuder Tube E = Envelope/Folder
G = Glass NA = Not Applicable P = Plastic S = Stainless Steel Canister.

Sample containers were purchased from a vendor with a certificate indicating that each lot of bottles is free of contaminants.

All personnel associated with sample collection used designated personal protective equipment (PPE). Personnel followed standard PPE decontamination procedures for each level of PPE required.

All personnel have received the proper hazardous materials training as specified in 29 CFR 1910.

7.4 SAMPLE PACKAGING AND SHIPPING

All samples were packaged and shipped according to the specifications detailed in the Hazardous Materials Transportation Regulations published by the U.S. Department of Transportation (DOT) (49 CFR 171-180) for ground transportation and the International Air Transport Association (IATA) regulations for air shipment. These regulations contain detailed instructions on how hazardous materials must be identified, packaged, marked, labeled, documented, and placarded. All personnel involved with sample shipment are trained and certified for shipment of hazardous materials.

When transferring possession of samples, the individuals relinquishing and receiving those samples signed, dated, and noted the time on the sample chain-of-custody record. This record documents sample transfer from the sampler, often through another person or commercial carrier, to the sample custodian or analyst.

The procedure for shipping samples was as follows:

- A complete sample inventory form (chain-of-custody) was enclosed with the samples being shipped, and a copy retained by the Field Team Leader.

- DOT and IATA regulations were followed for shipping container requirements. The regulations require that the shipper make a reasonable determination whether the sample is classified as a hazardous material and, if so, that it is appropriately identified.

- Each package was designed and constructed, and its contents limited, so that under normal transportation conditions there would be no significant

release of materials to the environment and result in no potentially hazardous conditions.

- Samples were placed inside a shipping container for transport back to the laboratory.

- Sample preservation (e.g., refrigerant packs, ice, chemical preservatives, etc.) was performed as required by the test plan or analytical requirements and documented on the sample inventory record.

All freight bills and shipping records were retained as part of the permanent records by the Project Manager.

7.5 CUSTODY PROCEDURES

An overriding consideration for environmental measurement data is the ability to demonstrate that samples have been obtained from the locations stated using the prescribed methods and that they have reached the laboratory without alteration. Evidence of collection, shipment, laboratory receipt, and laboratory custody until disposal was documented to accomplish this objective. Documentation was accomplished through a chain-of-custody record that documented each sample and the individuals responsible for sample collection, shipment, and receipt. A sample was considered "in custody " under the following conditions:

- It was in a person's actual possession.

- It was in view after being in physical possession.

- It was secured in a locked compartment so that no one could tamper with it after it had been in physical custody.

- It was in a secured area, restricted to authorized personnel.

7.5.1 Field Custody Procedures

Sample custody was initiated by the test team during sample collection. Preformatted labels were used at the time of collection. Documents prepared specifically for monitoring field sample collection and recovery were used for recording pertinent information about the types and numbers of samples collected and shipped for analysis. The samples collected first were assembled at an on-site location for batching and paperwork checks. This task included matching similar sample types (e.g., solids, liquids) from all sampling locations. Sample packaging procedures complied with all DOT and IATA requirements for shipment of environmental samples. Establishing or maintaining sample integrity involves numerous steps or considerations in addition to custody documentation. For example, major concerns in programs of this nature are contamination, cross-contamination, and/or degradation of sample containers; absorbing and filtration media; recovery materials; and actual samples, as applicable. These problems were avoided at all times by using the following procedure:

- Individual sample jars were sealed in plastic bags and placed in appropriate shipping containers.
- Volatile materials were stored, handled, and transported apart from sorbent materials (e.g., store, handle, and ship VOST tubes apart from solvents [methylene chloride, acetone, toluene, etc.] used to recover the other sample trains).
- Volatile organic, and aldehyde and ketone samples were sealed and kept away from sources of solvents, gasoline, etc., during recovery, transportation, storage, and analysis (e.g., recovery of particulate samples where acetone is used was performed remote from preparation, recovery, and storage of VOST and aldehyde and ketone samples).
- Vermiculite was placed around the bags in the shipping container for protection from damage. Ice was placed in the shipping container, when required.
- One chain-of-custody form was completed and placed in a large plastic bag in one of the shipping containers.

- The container was taped closed with tape and sealed with custody tape on two sides such that opening the container would break the custody tape.

Collected samples were kept under lock and key or within sight at all times until their shipment to the laboratory. The field sampler acted as the sample custodian and the document control officer in order to monitor the location of collected samples and to record vital sample information in field logbooks.

A unique system for individual sample identification was used. Table 7-3 provides a legend of the identification system for engine exhaust samples with some examples. The identification code was included on each sample label.

A uniform sample identification system was used in the ambient air-monitoring program. All samples were identified using the following format:

AF- m – lll – ppp – n - qq, where

AF	= Indicates United States Air Force
M	= Mode (see Table 7-3)
lll	= Sample location (see Table 7-3)
ppp	= Pollutant / identification code
VOC	= Volatile Organic Compounds
PM	= Particulate Matter
PAH	= Polynuclear Aromatic Hydrocarbon
DNPH	= DNPH-coated annular denuder (aldehydes and ketones)
n	= Sequence number, only used for multimedia sampling trains
qq	= Quality assurance sample identifier (one or two characters)
FB	= Field blank

Table 7-3. Legend For Sample Identification System

PROJECT NAME	MODE	SAMPLE LOCATION	RUN NUMBER	SAMPLE TYPE STACK SAMPLES	
				METHOD	FRACTION
AF (United States Air Force)	I (idle)	TF110 (Tinker F110-GE-100)	1	M5 (particulate)	FHA (front half acetone)
	A (approach)	TF101 (Tinker F110-GE-102)	2	M0010 (semivolatiles)	Filt (filter)
	N (intermediate)	TF108 (Tinker F108-GE-100)	3	M0030 (volatiles)	BHW (back half water)
	M (military)	TTF33 (Tinker TF33-GE-102)	BT Blank Train	M0011 (aldehydes and ketones)	BH $MeCl_2$ (back half $MeCl_2$)
	B (afterburner)	KT56 (Kelly T56-A-7)	SB Site Blank		FHS (front half solvent)
	C (constant)	KTF39 (Kelly TF39-GE-1A/-1C)			BHS (back half solvent)
	01 (other power setting 1)	CT700 (Corpus Christi T700-GE-700)			XAD (XAD resin)
	02 (other power setting 2)	KP165 (Kelly GTCP165-1)			BHC (back half condensate)
	03 (other power setting 3)	KP85 (Kelly GTCP85-180)			TP (tube pair)
					COND (VOST condensate)
					FB Field Blank

EXAMPLES: AF-A-KT56-1-M5-FHA = United States Air Force, Approach, Kelly AFB, T56-A-7, Run 1, Method 5, Front Half Acetone

For example, a sample identified as AF-N-KT56-DNP-1-FB indicates the first DNPH-coated denuder tube in the field blank sample train at Kelly AFB, collected during the intermediate run of engine T56-A-7.

This naming convention allowed every sample to be completely and consistently identified on field data sheets, sample media labels, chain-of-custody forms, and laboratory reports. The naming convention was designed to provide redundant information that can be used in conjunction with laboratory media identification numbers to verify sample identity.

The final evidence file includes the following:

- Field logbooks
- Field data and data deliverables
- Photographs
- Drawings
- Laboratory data deliverables
- Data validation reports
- Data assessment reports
- Progress reports, QA reports, interim project reports, etc.
- All custody documentation (i.e., tags, forms, airbills, etc.).

7.6 CALIBRATION PROCEDURES AND FREQUENCY

This subsection describes the calibration procedures and the frequency at which these procedures were performed for both field and laboratory instruments.

7.6.1 Field Instrument Calibration

The following equipment items were calibrated before and after field usage:

- Velocity measurement devices
- Gas flow rate metering systems
- Gas volume metering equipment
- Gas composition measuring apparatus (CEM).

The calibration records included device numbers, calibration dates, methods, and data and results, and are maintained on file at the Weston offices. Copies of applicable calibration records also were available at the job site for review.

Acceptance limits are shown for each equipment item in Table 7-4.

7.7 DATA REDUCTION, VALIDATION, AND REPORTING

Data was produced primarily from three sources, specifically the following:

- Engine operations during the test program.
- Field measurements data, including sampling records (volumes and duration), and observations.
- Sample analysis and characterization data.

All data generated by field activities or by the laboratory were reduced and validated prior to reporting. Specific data reduction, validation, and reporting procedures are described in the following subsections:

7.7.1 Data Reduction

7.7.1.1 Field Data Reduction Procedures

The stages of data confirmation began with an initial series of calculations completed on the same day as the sampling effort to establish that the pretest assumptions were correct and that the test procedures completed to that point were performed in an acceptable manner. This enabled the on-site test team to correct any faulty procedures, and provides a greater understanding of any immediate problems. The on-site data reduction and confirmation activities were performed by an experienced data management specialist.

Table 7-4. Activity Matrix For Calibration Of Equipment[1]

APPARATUS	ACCEPTANCE LIMITS	FREQUENCY AND METHOD OF MEASUREMENT	ACTION IF REQUIREMENTS ARE NOT MET
Wet test meter	Capacity 3.4 m^3/hr (120 ft/hr); accuracy within ±1.0%	Calibrate initially, and then yearly by liquid displacement.	Adjust until specifications are met, or return to manufacturer.
Dry gas meter	$Y_1 = Y \pm 0.02\ Y$	Calibrate vs. wet test meter initially, and when posttest check exceeds Y ±0.05 Y	Repair, or replace and then recalibrate.
Thermometers	Impinger thermometer ±1°C (2°F); dry gas meter thermometer ±3°C (5.4°F) over range; stack temperature sensor ±1.5% of absolute temperature	Calibrate each initially as a separate component against a mercury-in-glass thermometer. Then before each field trip compare each as part of the train with the mercury-in-glass thermometer.	Adjust to determine a constant correction factor, or reject.
Probe heating system	Capable of maintaining 120° ± 14°C (248° ± 25°F) at a flow rate of 20 l/min (0.71 ft^3/ min)	Calibrate component initially by APTD-0576(11) if constructed by APTD-0581(10), or use published calibration curves.	Repair or replace and then reverify the calibration.
Barometer	±2.5 mm (0.1 in.) Hg of mercury-in-glass barometer	Calibrate initially vs. mercury-in-glass barometer; check before and after each field test.	Adjust to agree with a certified barometer.
Probe nozzle	Average of three ID measurements of nozzle; difference between high and low 0.1 mm (0.004 in.)	Use a micrometer to measure to nearest 0.025 mm (0.001 in.); check before field test.	Recalibrate, reshape, and sharpen when nozzle becomes nicked, dented, or corroded.
Type S pitot tube and/or probe assembly	All dimension specifications met, or calibrate according to Subsection 3.1.2, and mount in an interference-free manner	When purchased, use method in Subsections 3.1.1 and 3.1.2; visually inspect after each field test.	Do not use pitot tubes that do not meet face opening specifications; repair or replace as required.
Engine exhaust gas temperature measurement system	Capable of measuring within 1.5% of minimum absolute stack temperature	When purchased and after each field test, calibrate against ASTM thermometer.	Adjust to agree with Hg bulb thermometer, or construct a calibration curve to correct the readings.
Analytical balance	±1 mg of Class-S weights	Check with Class-S weights upon receipt.	Adjust or repair.

[1] EPA-600/9-76-005, Quality Assurance Handbook for Air Pollution Measurement Systems - Volume III, U. S. EPA, Office of Research and Development, Environmental Monitoring and Support Laboratory, Research Triangle Park, NC, January 1976, as revised.

7.7.1.2 Office Calculations

All data averages were "double-checked" to verify numerical accuracy by an experienced technician. Prior to utilization of the analytical data for calculation of test results, a check was applied to ascertain any obvious "out-of-line" results for reanalysis.

All results of calculations were examined by another individual as assigned by the Field Team Leader. Depending on the complexity of the work, this person either spot-checked certain calculations or repeated the entire effort as assigned by the Field Team Leader. When all data were summarized, a check was made for test result correctness by the Field Team Leader and by the EQ Program Manager. The sample team QA Manager conducted routine audits to document that the checks were being performed and documented (with checker's initials and date).

The initial field test data and resulting calculations were performed on a portable PC at the end of each test day. In the office, final results and result tables were developed on a microcomputer. Standard EPA method programs have been developed and validated for the computational systems to ensure that correct equations are utilized to generate results. The programs list all entry items (for proofing purposes) and produce calculated results in hard copy form. Reference method equations were used to calculate the concentration and/or mass rate of each measured parameter.

7.7.2 Analytical Data Validation Evaluation

Analyses of all ambient air and emission samples of specific engines were completed by Air Toxics Limited of Folsom, California. All analyses were performed according to the Data Quality Assurance Plan, dated December 1996.

All final data packages were received and evaluated to determine if all data met the Data Quality Objectives (DQOs). All data evaluated for this project to date has the following characteristics:

- Was appropriately accurate for the DQOs.

- Was the appropriate precision for the DQOs.
- Met the completeness goals.
- Was representative of the overall population.

As part of the evaluation component of the Quality Assurance Program, analytical results were compared with certain data quality objectives. These objectives, in terms of precision, accuracy, representativeness, completeness, and comparability, are defined as follows:

- Precision - Reproducibility of degree of agreement among replicate measurements of the similar values. This was determined by evaluating sample duplicate results.

- Accuracy - Degree of the difference between the measured or calculated values and the true quantity. This was determined by evaluating the percent recovery from the laboratory control sample.

- Representativeness - Degree to which the data accurately represents a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Representativeness is achieved through careful, informed selection of sampling sites.

- Completeness - The adequacy in quality of valid measurements to prevent misinterpretation, expressed as the percentage of valid data obtained from a measurement system. This was measured by validation of final data packages.

- Comparability - The confidence with which one data set can be compared to another.

These objectives are evaluated during the data assessment and validation process.

The validation procedures were conducted as specified in the "Laboratory Data Validation Functional Guidelines for Evaluation of Organic Analysis" (EPA/540/R/94/083), as well as specific method requirements. A minimum of 10 percent of samples in each laboratory data package were evaluated for all elements. Of the remaining samples, holding times, blank contamination, precision, accuracy, error determination, detection limits, and confirmed identification of data were reviewed.

A data validation checklist, validation report, and analyte summary report that included validation qualifiers were completed for each data package. The specific procedure for data validation began with a preliminary review conducted upon receipt of a final data package. The data package is checked to confirm that all information is present to conduct the validation.

The validation includes review of the following items:

- Initial and continuing calibrations (proper levels and frequency, acceptable linearity, and drift).
- Instrument blanks (proper frequency, results within limits).
- Method blanks (proper frequency, results within limits).
- Quality Control samples (proper frequency, results within limits).
- Manual data entry (correct weights, volumes, and moistures).
- Surrogate recoveries (within limits or out for legitimate reasons).
- Completeness (necessary forms and raw data present).

In the event that any of the above items did not meet specific project DQOs, they were evaluated to determine the impact on the data points reported. Specific data qualifiers were then applied to any analytes and samples impacted. A detailed explanation is provided for each of the data qualifiers to allow each user to make their own interpretation of data acceptability for their specific application. The presence of a flag does not indicate that the data is invalid but allows the user to determine the potential bias the data may have for their specific application. The following data validation qualifiers were used:

J

The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met. The detection limit for a specific instrument is developed by establishing a level above the instrument noise (zero) where you can definitively qualify and quantify a given compound. This detection limit is not a hard line where a compound below the detection limit can neither be qualified nor qualified, but a sliding scale where confidence in your result erodes as the instrument signal response approaches zero. Since the analyst was able to make a relative determination that the compounds were present, outside the quality control boundaries of the detection limit, the value is flagged to indicate the potential bias.

RND

Recovery not determined. As part of routine quality control procedures, a known quantity of a surrogate compound is added to the sample prior to sample extraction and analysis. The surrogate is used as a reference to determine effectiveness of the sample extraction and analysis procedure.

"<"

Compound not detected. Value is the method detection limit. The detection limit is the smallest amount of a compound that the analytical method can reliably determine both qualitatively and quantitatively. The detection limit is present to allow the user to make his/her own determination on how the non-detect value is used for his/her specific application. Some applications require that the detection limit is used as reported, others use half the detection limit or use zero for non-detect values. This program used the reported detection limit.

B

Compound present in the laboratory blank greater than reporting limit. The data is flagged regardless of the amount of a given compound that is found in the laboratory blank sample. If a compound is detected, it is often at very low levels near the detection limit. The flag indicates that the sample is potentially biased high. The degree of bias depends on the concentration of the sample. Generally, the bias may be greater for sample results near the detection limit, while the bias may be insignificant for higher concentrations.

E

Results are estimated; value reported is outside linear working range. Prior to sample analysis, the instrument is calibrated around a range in which the sample results are expected. If the sample result is outside the instrument calibration range, the result must be reported as estimated. Generally this flag is used for

samples that exhibit high values and exceed the calibration range. The reported value can be biased either high or low.

Q

Exceeded quality control limits. There are several quality control limits that are used to assess the quality of the sample result. An example is the percent recovery of the spike sample. The flag does not invalidate the sample but alerts the user that a potential bias in the sample result may exist.

UJ

The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may, or may not, represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. Based on quality control criteria not being met, the detection limit normally flagged as "<" is an estimated value and flagged as "UJ." This does not invalidate the data but advises the user that the detection limit is estimated.

bb

Sample media blank and/or sample field blank value are within two times the sample value. Sample result should be considered suspect due to contamination. A "bb" qualifier identifies samples where the sample media blank and/or sample field blank had a concentration indicated that was two times the sample value. These qualifiers are associated with only a small percentage (approximately <1%) of the samples where the results were near the detection limit. These data should be considered suspect and biased high, but not invalid. The user must consider the significant high bias, relative concentration to the detection limit and other sample results, and the specific application before accepting the data.

S

Saturated peak concentration is estimated. The instrument signal response from the sample exceeded the instrument's upper limits. The signal response was estimated at some level above the instrument's maximum signal response. Therefore, the concentration is also estimated and may be either biased high or low.

In the event that method blanks were found to contain analytes of interest above the detection limits, the associated sample results were qualified. Any sample result detected for the analyte found in the method blank was considered a laboratory artifact

if the result was less than 10 times the level detected in the method blank. The sample result was qualified as not detected, with the detection level of the sample changed to the level quantitated in the sample. For example, if acetone was found in the method blank at 10 mg/l, and the sample was found to contain 50 mg/l, the sample result would be qualified as not detected at 50 mg/l in the sample.

Many of the analytes quantitated in the samples were qualified as estimated due to failure to meet all data quality criteria. All qualified results have been identified in the validation reports and in the analyte summary reports presented. All data that has not met all quality assurance criteria is still useful to the data quality objectives of this project. All data is appropriately qualified in this scientific and technical report.

7.7.2.1 Procedures Used To Evaluate Field Data

Procedures used to evaluate field data include posttest field instrument calibration checks, acceptable isokinetic sampling rates, and demonstration of acceptable posttest leak checks.

7.7.3 Field Data Reporting

Field data reporting was conducted principally through the generation of test data tables containing tabulated results of all measurements made in the field, and documentation of all field calibration activities.

7.7.3.1 Field Audit

System and performance audits were used to determine compliance with the quality assurance/quality control (QA/QC) requirements established for this assignment. These audits also serve to assess the data quality during the execution of the program. Audits are also useful for measuring performance during the actual sampling and analysis to detect problems at the time of occurrence so that prompt corrective actions can be applied. System audits and performance audits were completed during this

program. The audits were performed by internal WESTON auditors. The audits have proven to be useful mechanisms for documenting performance of all technical staff and their commitment to meeting all of the program objectives in a manner consistent with the procedures identified in the SAP.

System audits verify that the SAP was followed by inspection and observation of project performance and comparing findings to expectations. The field effort featured an internal audit by WESTON senior technical staff. WESTON auditors were on site for several days of data collection during the field tasks. All components of the field effort were audited at least once during the three replicate runs. A series of technical system audit checklists were prepared and completed for many of the sampling runs. WESTON also completed internal audits of the dry gas meters and temperature measurements devices used during the field effort. All audits were within stated objectives specified in the applicable EPA Reference Methods. All components of the field sampling were judged acceptable. Any deviations from standard field protocols were based on sound technical judgment with careful consideration of program data quality objectives. No significant deviations were noted during the assignment.

Internal performance audits were completed on systems associated with the manual emission testing and the continuous emission monitoring system (CEMS) used to characterize stack emissions. The data acquisition and reduction process was also reviewed.

Internal audits for the manual methods included dry gas meter correction factor verification and an Omega Thermocouple simulator. Audits of the CEMS were limited to procedural reviews and documentation of calibration gas accuracy. All field equipment was also visually inspected for reliable and consistent operation. Discussions were also completed with Field Team Personnel to assess the knowledge of the individual Team Members with respect to program goals and objectives.

Manual Method Audit

A summary of the dry gas meter audit is presented in Table 7-5. All units checked during the audit were found to be operating within the allowable range cited in EPA Reference Method 5, Section 4.4 Quality Control Procedures. The audits of the dry gas meters were limited to calibration factor check and thermocouple readout verifications.

Table 7-5. Summary Of Dry Gas Meter Calibration Check

ID	Initial Gamma	Gamma Check[1]	pass/fail
Box 16	1.006	1.0168 ; 1.0164	pass
Box 15	1.003	1.0124 ; 1.0126	pass
Box 8	0.998	0.9957 ; 0.9916	pass
Box 6	0.993	0.9678	pass

[1] Must be ± 5%.

Random checks of thermocouple readouts were completed with an Omega thermocouple simulator. All findings were within manufacturer specifications for response and accuracy. All readings were within 1 degree of the known value.

Specific items reviewed during the manual emission testing using isokinetic sample trains include the following:

- Properly calibrated sample nozzles.
- Correct probe configuration and orientation.
- Properly marked traverse points.
- Sample train temperatures with appropriate operational ranges.
- Properly cleaned sample train glassware and containers.
- Sample train leak checks performed before and after each run.
- Accurate collection and recording of sample train operational parameters.
- Fully completed and initialed field data sheets.
- Sample recovery completed in an area of low contamination potential.
- Samples appropriately labeled and chain of custody/traceability maintained.
- Samples packed in accordance with D.O.T. and analytical specifications.

CEMS Audit

Continuous emission monitoring instrumentation was inspected for proper calibration procedures and daily operation. All system parameters were within methodology requirements. Checks completed on the CEMS included:

- Verification of calibration gas concentrations, cylinder IDs, and values used in the data acquisition program.
- Full direct calibrations and linearity checks performed each morning.
- System bias corrections applied.
- All pre-test and post-test calibrations performed within method requirements.

Data Acquisition and Data Reduction

All field data sheets were inspected for completeness and reasonableness at the conclusion of each run. Data was then submitted to the Field team Leader for final review prior to input to a validated spreadsheet/database system.

SECTION 8

CONCLUSIONS AND RECOMMENDATIONS

8.1 ALTERNATIVE PARTICULATE SAMPLING METHOD

Many of the filterable particulate samples collected isokinetically yielded very low concentrations of particulates. Low concentrations in the exhaust were the result of a large amount of dilution air in the sampled gases. Sampling volumes for a typical one-hour particulate test were in the range of 60-70 cubic feet. The greater the sample volume, the more particulate that possibly could have been captured, thus increasing the chance of collecting enough particulate to meet detectable levels. Alternate particulate samples were collected using an ambient high volume sampler capable of drawing 40 cubic feet per minute. The high volume sampler was placed directly in the exhaust. Since particulate in the stack is less then 10 microns and therefore is more likely to behave as a gas, sampling isokinetically was not a requirement. The results of this experiment were mixed. Sample results were not comparable to those collected by the isokinetic particulate sample train, and the results followed no trend. Unless further experimentation is done to understand the significance of these results, the in-stack high-volume method is considered unreliable.

As discussed in Section 4.1.5, it appears the variability in the results between individual sample runs was due to method variability rather than engine variability. The PM weights were at or near the 0.5-mg detection limit. Small fluctuations in particulate mass (+/- 0.1 mg) on the filter, in the probe rinse, or in the impinger water had a large impact on the emission rate. The three-run average for the particulate samples presents the most representative value accounting for method variability. It is recommended that the sample period be increased, which will reduce the effects of

method variability by increasing the sample size. Based on CEM data, there were no indications that particulate emissions would vary over an extended sample period.

Recently, the EPA has developed and validated Draft Method 5I for determination of low-level particulate matter emissions from facilities performing calibrations or calibration audits of continuous particulate matter monitoring systems. This method may be applicable for aircraft engine testing in the future.

There are other innovative methods of particulate measurement for low particulate sources that are being conducted in research and non-regulatory applications. These methods may provide more representative results, but they may not be acceptable for regulatory applications. Alternative methods must be validated or have approval of the regulatory agency where the data is to be used to ensure acceptance.

8.2 INLET MASS FLOW METER MEASUREMENTS

Due to the uncertainty in measuring flow from such a unique source as a jet engine test cell, several flow measurement methods were developed. One method involved placing 12 mass flow meters at the inlet of the engine test cell to measure flow rate. The data from these measurements did not compare favorably to those measurements taken using tracer gas or carbon balance. The flows measured by the mass flow meters were 20 to 40 percent greater than those measured by the other methods. One possible reason is that the cowl that was placed around the flow meter to act as a support caused turbulence around the sensor, thus elevating the flow readings. Inlet flows were not measured during the second phase (Charleston AFB, Edwards AFB and Barnes ANG Base) of the engine test program.

8.3 TRACER GAS FLOW DETERMINATION ISSUES

The original tracer gas measurement design assumed that flow through the augmenter tube was laminar, mixing in the blast room was variable and uneven, and temperatures in the augmenter tube would disassociate the SF_6. These assumptions required that the tracer gas be evenly distributed in the augmenter tube to ensure better mixing. It also necessitated that samples be collected at several locations from the exhaust stacks to account for variable tracer gas concentrations. Subsequent testing during Phase II of the program confirmed the following: 1) turbulent flow from the engine exhaust, combined with mixing in the blast room, yielded a uniform concentration (+/- 10 percent) of tracer gas across all stacks; and 2) placement of three to four tracer gas release points along the outside lip, and 1 to 2 feet into the augmenter tube, provided an adequate distribution system. Temperatures measured inside the augmenter tube directly in line with the engine during Phase I confirm that temperatures 25 to 30 feet inside the augmenter tube are below 500° F in non-afterburner engine power settings. Therefore, the dissociation of the tracer gas was not an issue.

During Phase I of the emission measurement program, progressively simplified approaches were adopted and the tracer gas release points were moved toward the front of the augmenter tube. Integrated samples were collected in Tedlar bags during each test run during the first phase of this program. Collecting as many as eight integrated samples in Tedlar bags during each one-hour sample run was difficult, especially during windy weather conditions. Some of the Tedlar bags may have leaked or had ambient air inadvertently introduced during sampling and transport. This may account for some of the variability of the tracer gas flow measurement results.

Tracer gas flow measurement methodology used during Phase II of the program was simplified. Sampling was conducted periodically at eight points during a one-hour period through the use of an electronically controlled manifold system. The results show no significant difference from point-to-point or run-to-run. This validates the

premise that engine test cell facilities that have an augmenter tube and blast room leading to multiple stacks do not stratify the exhaust gases.

Testing conducted at the Barnes ANG Base's hush house did indicate that some stratification of exhaust gases was present. This may have been the result of two factors: 1) the exhaust from the engine was directed upward toward the top of the augmenter tube; and 2) the augmenter tube was not long enough to ensure proper mixing. Because of low exhaust pollutant concentrations (near the lower operating range of the instruments) at the exit of the hush house, testing for stratification by using only pollutant concentrations may not show the level of stratification. The use of tracer gas allows the user to establish the desired SF_6 concentration at the exhaust to ensure an adequate instrument response and determine the degree of stratification.

8.4 LIMITATIONS IN ENGINE RUN TIME

Engine run time was limited due to high fuel costs, engine availability, and availability and cost of the test cell and engine operators. There was limited schedule flexibility to repeat low-confidence tests. This is evidenced by data gaps. Likely, similar data gaps will occur in future programs. These data gaps can be reduced by simplifying the program and developing alternate methods. This was achieved during this program by conducting single-point sampling, developing the tracer gas flow method (and improving upon it), and maintaining duplicate equipment to reduce turnaround time between sample runs. These steps also reduced fuel requirements and improved the quality of the collected data.

8.5 DATA APPLICABILITY

The data gathered during this test program has many potential end uses. Because there are many uses for this data for which we may not know the required inputs, no attempt was made to compress or edit the data. This report presents as

much information as possible to allow the user to interpret the data for their specific need. Potential uses for the data are as follows:

- Air Permit Emissions / Emission Determination
- Risk Assessment
- Dispersion Modeling
- Worker Health and Safety

The application and the level of conservatism that needs to be applied to the analysis will dictate what data will be used. Different states or local jurisdiction have many different requirements on what and how data are to be used. As an example, individual jurisdiction may require that zero, one half, or the detection limit be used for non-detect values for a Title V air permit. The user must understand what data will be required for their application and use the information in this database to select the appropriate data.

8.5.1 Products Of Incomplete Combustion (PICs)

During the program, many compounds were sampled, but some of those compounds may not be products of incomplete combustion (PICs). In addition, those compounds that were not detected may be a PIC, but these compounds are found at a level that may be below the detection limit. It is up to the user to choose which compound(s) and data fit the intended application and the level of conservatism needed. Because there are many potential uses for this data, no attempt was made to compress the data or to determine which compounds were PICs.

The user needs to evaluate each compound based on the following factors:

- Are those compounds frequently flagged for blank contamination from the site blank or blank trains? If the compounds are frequently flagged, this may indicate that the positive result is due to contamination and is not a PIC (e.g., methylene chloride and acetone are common laboratory contaminants).

- Does the detected compound show a trend? Idle conditions generally showed the most PICs with emissions decreasing as the engine power setting was increased (those engines with afterburner capability show a marked increase in emissions at afterburner). If a compound was detected at idle with reduced emissions at the other power settings, the compound may be a PIC.

- PIC concentrations can vary significantly between engines. Because less-efficient engines generally produce higher concentrations of PICs, more PICs above the detection limit will be present. Engines that are more efficient may have many more non-detect values; this does not indicate that efficient engines have fewer PICs, however, just that some PICs may be below the detection limit.

A review of available PIC data from other turbine engines (electrical generation and industrial turbines) may be useful in determining potential PICs from aircraft engines. It is reasonable to conclude that some PICs may be similar since the combustion principles are similar. The EPA has established a list of emission rates based on available data and summarized them in the AP-42 FIRE Database. The EPA reviewed available data to determine acceptability prior to inclusion in the database. It is not known how comprehensive the original data may have been. Therefore, the list of PICs present by AP-42 may be limited.

Table 8-1 presents PICs for VOCs and Semi-volatile compounds for turbine engines using keronaphtha jet fuel and distilled oil/diesel (SCC Codes 2-01-009-1, 2-02-001, and 2-02-009-01).

8.6 FUTURE HAP EMISSION TESTING

Based on the emission test results for HAPs, there were a few compounds which consistently stood out in the data sets. Concentrating on sampling methods for these compounds would provide a good indication of the presence and/or magnitude of additional HAPs. Benzene (predominantly), toluene, and xylene typically represent more than 90% of the total VOCs present. Formaldehyde is the dominant compound

Table 8-1. Compounds Listed in AP-42 Fire Database

Volatile Organic Compounds	
Acetylene	Isomers of Ethyltoluene
Benzene[1]	Isomers of Xylene[1]
Butene	Methane
C8 Aldehyde	N-nonane
C8 Olefins	Propylene
Ethane	Tert-Butylbenzene
Ethylene	Tri/Tetraalkyl Benzene
1,3 Butadiene	
Semi-Volatile Organic Compounds	
Benzo(a)pyrene[1]	
Chrysene[1]	
Fluoranthane[1]	

[1] Compounds sampled during this program.

in the aldehyde/ketone family. Targeting these pollutants or only benzene and formaldehyde would provide a reasonable estimate of the total HAPs present since they typically make up >75% of the total HAPs detected.

8.7 EMISSION RESULTS CORRELATION

Based on the results of comparing similar engines (Section 6.6), there are several factors that can affect any comparison of data. This does not indicate that emissions data is incorrect, but factors including emissions measurement location and engine operation conditions have an effect on the resultant data. To allow proper comparison of engine data sets, emissions data should be collected and engines should be operated in the same manner as the engine that it is to be compared against. The primary influence on emissions is engine fuel usage, and secondary considerations are test location (hush house or test cell), sample location (directly behind the engine or

at some location/distance downstream), test methods, and engine engineering differences.

Differences in the fuel usage may indicate that engines are not operating at the same power level. Though an engine setting may be classified as "Idle," power level classifications should be viewed as a general range. The greatest difference in emissions would occur at Idle and Afterburner, where the range in engine combustion efficiency is the greatest. The potential exists for the stratification of the exhaust. Depending on the engine setting and test cell or hush house configuration, there could be some minor stratification (0.1 – 0.5 ppm) which can appear as a difference in the emission factors. This is important when dealing with engine emission results that are near 1 ppm +/- 0.5 ppm. The specific sample location within the test cell or hush house also affects the measured concentration of pollutants. The engine exhaust will be diluted with entrained air to varying degrees depending on the sample location and test cell/hush house configuration. Samples collected inside the center augmenter tube (front or rear of the augmenter tube or directly behind the engine) will generally be of a higher concentration than those measured at the exhaust of a test cell. All data collected by the test team for this report were collected at the exhaust of the test cells or hush house. The lower the pollutant concentration, the greater the effect of method variability and thus a greater potential for differences in emission factors. For example, a 0.1 percent difference in CO_2 measurements, when the measured concentration is 1.0 percent or less, can result in a 20 percent difference in emission factors.

Slight differences in emissions can also attribute to normal method variability. This variability can be caused by several factors including analyzer variability, analyzer resolution, instrument operator, and accuracy of EPA protocol calibration gases.

8.8 EMISSION RESULTS IN AFTERBURNER

The F110-GE-100, F101-GE-102, J85-GE-5A, and F404-GE-F102/400 engines were sampled at afterburner during this test program. Due to engine and test cell limitations, the fuel load at afterburner had to be maintained at a safe operating level to keep the augementer tube temperature below the recommended limit. Due to the operational limitations, the afterburner setting was typically in Zone 1. Zone 1 Afterburner is the point where there is adequate fuel flow to light the afterburner and maintain the flame. The throttle position was not increased past this point in order to prevent cell and/or engine damage. The F404 engine was able to operate safely in Zone 3 (mid) afterburner without damage at Edwards AFB. At the minimum afterburner setting (Zone 1), the engine was passing through some unburned fuel since the engine was not maintaining a large flame (poor fuel combustion). The unburned fuel results in detectable quantities of VOC, SVOC, and aldehyde/ketone compounds. At Zone 3 afterburner, during testing of the F404 engine, the levels of SVOC, VOC, and aldehyde/ketone dropped due to the improved fuel combustion and higher heat flame.

When comparing emission data at afterburner, the zone of operation is important since there are many stages of afterburner. Data comparisons must be made using the fuel flow rate as a point of reference. The engine setting name (e.g., idle, approach, intermediate, etc.) should not be used as the point of reference since the fuel flow rate can vary greatly within the same engine setting. Afterburner (Zone 1) for the F110-100 may have a significantly different emission fingerprint at afterburner (Zone 5). The fuel flow rate must be noted when comparing emissions.

APPENDIX A

EXAMPLE CALCULATIONS

ALDEHYDE
CONCENTRATION AND MASS EMISSION RATE
EXAMPLE CALCULATIONS

Client: USAF-TINKER AIR FORCE BASE
Test Number: Run 1
Engine Type: ENGINE F101-GE-102 (B-1B)
Test Condition: AFTERBURNER

Location: OKLAHOMA CITY, OK
Test Date: 5/1/97
Test Period: 0754-1055

Engine emission Formaldehyde concentration, ug/dscm.

$$C1(Formaldehyde) = 35.316 \times \frac{W}{Vm_{(std)}}$$

$$C1(Formaldehyde) = 35.316 \times \frac{370}{136.270}$$

$$C1(Formaldehyde) = 95.89$$

Where:

C1(Formaldehyde) = Engine emission Formaldehyde concentration, ug/dscm.

W = Weight of Formaldehyde collected in sample in ug.

35.316 = Conversion factor from cubic feet to cubic meters.

Ambient corrected Formaldehyde concentration, ug/dscm.

C2(Formaldehyde) = C1(Formaldehyde) - C(ambient)

C2(Formaldehyde) = 95.89 - 0.481

C2(Formaldehyde) = 95.409

Where:

C2(Formaldehyde) = Formaldehyde concentration corrected for ambient air, ug/dscm

C(ambient) = Formaldehyde concentration in ambient air, ug/dscm

Formaldehyde mass emission rate, lbs/hr.

$$MR1(Formaldehyde) = \frac{C2(Formaldehyde)}{1.602\ E10} \times Q(std) \times 60$$

$$MR1(Formaldehyde) = \frac{95.409}{1.602\ E10} \times 1667881 \times 60$$

MR1(Formaldehyde) = 5.96E-01

Where:

MR1(Formaldehyde) = Formaldehyde mass emission rate, lbs/hr.

60 = Conversion factor from minutes to hours.

1.602 E10 = Conversion factor from cubic meters to cubic feet and ug to lbs.

Qs(std) = Volumetric flowrate of dry stack gas at standard conditions, dscf/m.
(Volumetric flowrate used for this calc was a three run average from the Tracer flow method.)

Formaldehyde mass emission rate, lbs/1000 lbs fuel.

$$MR2(Formaldehyde) = \frac{MR1(Formaldehyde)}{(FR/1000)}$$

$$MR2(Formaldehyde) = \frac{0.596}{15314 / 1000}$$

= 3.89E-02

Where:

MR2(Formaldehyde) = Formaldehyde mass emission rate, lbs/1000 lbs fuel.

FR = Fuel rate, lbs/hr.

MEASURED FLOWRATE (EPA METHODS 1-4)
EXAMPLE CALCULATIONS

Client: USAF- CORPUS CHRISTI ARMY DEPOT
Test Number: Particulate Run 1
Engine Type: ENGINE T700-GE-700
Test Condition: MILITARY

Location: CORPUS CHRISTI, TEXAS
Test Date: 3/5/97
Test Period: 0830-0950

Volume of dry gas sampled at standard conditions (68 deg F, 29.92 in. Hg), dscf.

$$Vm(std) = \frac{17.64 \times Y \times Vm \times \left(Pb + \frac{\text{delta H}}{13.6} \right)}{(Tm + 460)}$$

$$Vm(std) = \frac{17.64 \times 0.9942 \times 62.647 \times \left(30.13 + \frac{3.254}{13.6} \right)}{87.90 + 460} = 60.898$$

Where:

Vm(std) =	Volume of gas sample measured by the dry gas meter, corrected to standard conditions, dscf.
Vm =	Volume of gas sample measured by the dry gas meter at meter conditions, dcf.
Pb =	a!barometric Pressure, in Hg.
delt H =	Average pressure drop across the orifice meter, in H_2O
Tm =	Average dry gas meter temperature , deg F.
Y =	Dry gas meter calia!bration factor.
17.64 =	Factor that includes ratio of standard temperature (528 deg R) to standard pressure (29.92 in. Hg), deg R/in. Hg.
13.6 =	Specific gravity of mercury.

Volume of water vapor in the gas sample corrected to standard conditions, scf.

Vw(std) = (0.04707 x Vwc) + (0.04715 x Wwsg)

Vw(std) = (0.04707 x 30.0) + (0.04715 x 15.8) = 2.157

Where:

Vw(std) = Volume of water vapor in the gas sample corrected to standard conditions, scf.

Vwc = Volume of liquid condensed in impingers, ml.

Wwsg = Weight of water vapor collected in silica gel, g.

0.04707 = Factor which includes the density of water (0.002201 lb/ml), the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant 21.85 (in. Hg) (ft^3)/lb-mole)(deg R); aa!bsolute temperature at standard conditions (528 deg R), aa!bsolute pressure at standard conditions (29.92 in. Hg), ft^3/ml.

0.04715 = Factor which includes the molecular weight of water (18.0 lb/lb-mole), the ideal gas constant 21.85 (in. Hg) (ft^3)/lb-mole)(deg R); absolute temperature at standard conditions (528 deg R), absolute pressure at standard conditions (29.92 in. Hg), and 453.6 g/lb, ft^3/g.

Moisture content

$$bws = \frac{Vw(std)}{Vw(std) + Vm(std)}$$

$$bws = \frac{2.157}{2.157 + 60.898} = 0.034$$

Where:

bws = Proportion of water vapor, by volume, in the gas stream, dimensionless.

Mole fraction of dry gas.

$Md = 1 - bws$

$Md = 1 - 0.034 = 0.966$

Where:

Md = Mole fraction of dry gas, dimensionless.

Dry molecular weight of gas stream, lb/lb-mole.

$MWd = (0.440 \times \% CO_2) + (0.320 \times \% O_2) + (0.280 \times (\% N_2 + \% CO))$

$MWd = (0.440 \times 1.1) + (0.320 \times 19.4) + (0.280 \times (79.5 + 0.00))$

$= 28.96$

Where:

MWd =	Dry molecular weight , lb/lb-mole.
% CO2 =	Percent cara!bon dioxide by volume, dry basis.
$\% O_2$ =	Percent oxygen by volume, dry basis.
$\% N_2$ =	Percent nitrogen by volume, dry basis.
% CO =	Percent cara!bon monoxide by volume, dry basis.
0.440 =	Molecular weight of cara!bon dioxide, divided by 100.
0.320 =	Molecular weight of oxygen, divided by 100.
0.280 =	Molecular weight of nitrogen or cara!bon monoxide, divided by 100.

Actual molecular weight of gas stream (wet basis), lb/lb-mole.

$MWs = (MWd \times Md) + (18 \times (1 - Md))$

$MWs = (28.96 \times 0.966) + (18 (1 - 0.966)) = 28.58$

Where:

MWs =	Molecular weight of wet gas, lb/lb-mole.
18 =	Molecular weight of water, lb/lb-mole.

Average velocity of gas stream at actual conditions, ft/sec.

$$Vs = 85.49 \times Cp \times ((\text{delt } p)^{1/2})avg \times \left(\frac{Ts\ (avg)}{Ps \times MWs} \right)^{1/2}$$

$$Vs = 85.49 \times 0.84 \times 0.936157 \times \left(\frac{807}{30.09 \times 28.58} \right)^{1/2} = 65.1$$

Where:

Vs = Average gas stream velocity, ft/sec.

85.49 = Pitot tube constant, $\frac{\text{ft/sec} \times (\text{lb/lb-mole})(\text{in. Hg})^{1/2}}{(\text{deg R})(\text{in } H_2O)}$

Cp = Pitot tube coefficient, dimensionless.

Ts = Absolute gas stream temperature, deg R = Ts, deg F + 460.

Ps = Absolute gas stack pressure, in. Hg. = $Pb + \frac{P(\text{static})}{13.6}$

delt p = Velocity head of stack, in. H_2O

Average gas stream volumetric flowrate at actual conditions, wacf/min.

$$Qs(act) = 60 \times Vs \times As$$

$$Qs(act) = 60 \times 65.10 \times 12.57 = 49101$$

Where:

Qs(act) = Volumetric flowrate of wet stack gas at actual conditions, wacf/min.

As = Cross-sectional area of stack, ft^2.

60 = Conversion factor from seconds to minutes.

Average gas stream dry volumetric flowrate at standard conditions, dscf/min.

$$Qs(std) = 17.64 \times Md \times \frac{Ps}{Ts} \times Qs(act)$$

$$Qs(std) = 17.64 \times 0.966 \times \frac{30.09}{807} \times 49101$$

$$= 31206$$

Where:

Qs(std) = Volumetric flowrate of dry stack gas at standard conditions, dscf/min.

Facility Name	USAF-_CORPUS CHRISTI ARMY DEPOT
Location	CORPUS CHRISTI , TEXAS
Test Data	
Run number	1
Location	ENGINE T700-GE-700
Date	3/5/97
Time period	0830-0950
Test condition	MILITARY
Operator	NM
Inputs For Calcs.	
Sq. rt. delta P	0.9362
Delta H	3.2538
Stack temp. (deg.F)	346.50
Meter temp. (deg.F)	87.90
Sample volume (act.)	62.647
Barometric press. (in.Hg)	30.13
Volume H2O imp. (ml)	30.0
Weight chnge sil. gel (g)	15.8
% CO2	1.1
% O2	19.4
% N	79.5
Area of stack (sq.ft.)	12.57
Sample time (min.)	60
Static pressure (in.H2O)	-0.6
Nozzle dia. (in.)	0.275
Meter box cal.	0.9942
Cp of pitot tube	0.84
Standard temp. (deg.F)	68

SAMPLING DATA:	
Sampling duration, min.	60.0
Nozzle diameter, in.	0.275
Cross sectional nozzle area, sq.ft.	0.000412
Barometric pressure, in. Hg	30.13
Avg. orifice press. diff., in H2O	3.25
Avg. dry gas meter temp., deg F	88
Avg. abs. dry gas meter temp., deg. R	548
Total liquid collected by train, ml	45.8
Std. vol. of H2O vapor coll., cu.ft.	2.2
Dry gas meter calibration factor	0.994
Sample vol. at meter cond., dcf	62.647
Sample vol. at std. cond., dscf (1)	60.898
Percent of isokinetic sampling	99.1
GAS STREAM COMPOSITION DATA:	
CO2, % by volume, dry basis	1.1
O2, % by volume, dry basis	19.4
N2, % by volume, dry basis	79.5
Molecular wt. of dry gas, lb/lb mole	28.96
H2O vapor in gas stream, prop. by vol.	0.034
Mole fraction of dry gas	0.966
Molecular wt. of wet gas, lb/lb mole	28.6
GAS STREAM VELOCITY AND VOLUMETRIC FLOW DATA:	
Static pressure, in. H2O	-0.60
Static pressure, in. Hg	-0.044
Absolute pressure, in. Hg	30.09
Avg. temperature, deg. F	347
Avg. absolute temperature, deg.R	807
Pitot tube coefficient	0.84
Total number of traverse points	16
Avg. gas stream velocity, ft./sec.	65.1
Stack/duct cross sectional area, sq.ft.	12.57
Avg. gas stream volumetric flow, wacf/min.	49101
Avg. gas stream volumetric flow, dscf/min.	31206

Facility Name	USAF-TINKER AIR FORCE BASE
TEST ENGINE	F101-GE-102 (B-1B)
Location	OKLAHOMA CITY, OK.
TEST CONDITION	AFTERBURNER
Test Data	
Run number	1
Date	5/1/97
Time period	0754-0854
Polluant (chemical name)	Oxides of Nitrogen
Polluant (full name)	NO_x
Pollunat Mol. Wt.	46.01
Inputs For Calcs.	
AVERAGE	20.40
AVERAGE BIAS ZERO	-0.05
AVERAGE BIAS VALUE	53.15
BIAS STANDARD VALUE	54.60
PERCENT MOISTURE	0.0
Volumetric flow rate, dscf/min	[redacted]
CORRECTED AVERAGE	20.99
Mass emission rate, lbs/hr	249.57
OXYGEN CORRECTED VALUE	14.0
Fuel rate, lbs/hr	15232
Mass emission rate, lbs/1000 LBS FUEL	16.3849

NITROGEN OXIDES
BIAS CORRECTION AND MASS EMISSION RATE
EXAMPLE CALCULATIONS

Client:	USAF-TINKER AIR FORCE BASE	**Plant:**	OKLAHOMA CITY, OK.
Test Run No.:	1	**Test Date:**	5/1/97
Engine Type:	F101-GE-102 (B-1B)	**Test Period:**	0754-0854
Test Condition:	AFTERBURNER		

Bias corrected value of Oxides of Nitrogen (ppm/v)

$$C(corr) = \frac{(AVG - Zbias)}{(Sbias - Zbias)} \times SPAN\ GAS$$

$$C(corr) = \frac{20.40 - -0.05}{53.15 - -0.05} \times 54.6$$

$$C(corr) = 21.0$$

Where:

C(corr) = Oxides of Nitrogen concentration measured on a dry basis (ppm/v), bias corrected.

AVG = Average Oxides of Nitrogen concentration for the test run.

Zbias = The average of pre and post test zero bias checks.

Sbias = The average of pre and post test span bias check.

SPAN GAS = The calibration gas closest to the gas stream concentration, which was used for the BIAS check.

Nitrogen Oxides mass emission rate (lbs/hr)

$$MR1 = \frac{C(corr) \times Qs(std) \times MW \times 60\ min/hr}{385.35 \times 10^{6}}$$

$$MR1 = \frac{21.0 \times 1{,}659{,}885 \times 46.01 \times 60\ min/hr}{385.35 \times 10^{6}}$$

$$MR1 = 249.6$$

Where:

MR1 = Oxides of Nitrogen mass emission rate, lbs/hr.

C(corr) = NOx concentration measured on dry basis (ppm/v), bias corrected

Qs(std) = Average volumetric gas stream flow rate at standard conditions, dscf/min. (Volumetric flowrate used for this calc was derived from the Tracer flow method.)

MW = Molecular weight of Oxides of Nitrogen as N02

385.35×10^{6} = Conversion factor from ppm to lbs.

Nitrogen oxides mass emission rate, lbs/1000 lbs fuel.

$$MR2 = \frac{MR1}{(FR/1000)}$$

$$MR2 = \frac{249.6}{15232 / 1000}$$

$$MR2 = 16.38$$

Where:

MR2 = Nitrogen oxides mass emission rate, lbs/1000 lbs fuel.

FR = Fuel rate, lbs/hr.

EXAMPLE CALCULATION
FOR TOTAL SUSPENDED PARTICLES (TSP)
AMBIENT AIR MONITORING

CLIENT: USAF -TINKER AIR FORCE BASE
TEST NUMBER: RUN 1
ENGINE TYPE: ENGINE F101-GE-102 (B-1B)
TEST CONDITION: AFTERBURNER

LOCATION: Oklahoma City, OK
TEST DATE: 5/1/97
TEST PERIOD: 0755-1055

Particle Concentration, mg/m^3

C_1 = PL/Vol,

where:

C_1= Concentration.
PL= Analytical particle loading, mg.
Vol= Sample volume, m^3.

Thus, given:

PL= 7.9 mg
Vol= 437.27 m^3[1]

C1= 0.02 mg/m^3

[1] Sample Volume, Vol.

Vol=T[Cal(Press/29.92)(298.15/Temp)x0.028317

where:

T= Total sample time, minutes.
Cal= Sample calibrated flow, actual cubic feet/minute, acfm[2].
Press= Station sampling pressure, inches Hg.
29.92= Standard pressure, inches Hg.
298.15= Standard temperature, °K.
0.028317= Conversion from ft^3 to m^3.

Given:

T= 438.7 minutes
Cal= 41.45 acfm^2
Press= 28.63 inches Hg
Temp= 336 °K

Vol= 437.27 m^3

[2] Sampler Calibrated Flow, Cal, acfm

EXAMPLE CALCULATION
FOR TOTAL SUSPENDED PARTICLES (TSP)
AMBIENT AIR MONITORING

Cal_{scfm}= $(((H(Press_1/29.92x536.58/Temp_1))^{1/2}-b/m)x35.31$

Cal_{acfm}= $Cal_{scfm}(29.92/Press_1)(Temp_1/536.58)$

where:

H= Water deflection, inches water.
$Press_1$= Calibration pressure, inches Hg.
$Temp_1$= Calibration temperature,°R.
29.92= Standard pressure, inches Hg.
536.58= Standard temperature, °R.
b= Orifice intercept, = 0.004595.
m= Orifice slope, = 1.6.
35.31= Conversion from m^3 to ft^3.

Given:

$Press_1$= 28.63 inches Hg.
$Temp_1$= 535.58 °R.
H= 3.4 inches water

Cal_{scfm}= 39.74 scfm.

Cal_{acfm}= 41.45 acfm.

EXAMPLE CALCULATION
FOR SEMI-VOLATILE ORGANIC COMPOUNDS
(POLYCYCLIC AROMATIC HYDROCARBONS, PAH's)
AMBIENT AIR MONITORING

CLIENT: USAF -TINKER AIR FORCE BASE
TEST NUMBER: RUN 1
ENGINE TYPE: ENGINE F101-GE-102 (B-1B)
TEST CONDITION: AFTERBURNER

LOCATION: Oklahoma City, OK
TEST DATE: 5/1/97
TEST PERIOD: 0755-1055

Compound Concentration, ng/m^3

C_2=AR/Vol$_1$x1000

where:

C_2= Compound concentration, ng/m^3.
AR= Analytical result, µg/sample.
Vol$_1$= Sample volume, m^3, dry.
1000= Conversion from µg to ng.

Thus given:

AR= 57 µg
Vol1= 55.40 m^3 [1]

$C_{2\ for\ phenol}$= 1028.88 ng/m^3

[1] Sample Volume, Vol$_1$

Vol$_1$=(MFL)(T)(DBF)/1000

where:

MFL= Mean flow rate, standard liters/minute, slpm [2].
T= Total sample time, minutes.
DBF= Dry basis correction factor.
1000= Conversion from l^3 to m^3.

Given:

MFL= 218.7 slpm
T= 253.2 minutes
DBF= 1

Vol$_1$= 55.37 m^3

[2] Mean Flow Rate, MFL, slpm

EXAMPLE CALCULATION
FOR SEMI-VOLATILE ORGANIC COMPOUNDS
(POLYCYCLIC AROMATIC HYDROCARBONS, PAH's)
AMBIENT AIR MONITORING

$MFL=1000(0.5((MAG_1)^{1/2}+(MAG_2)^{1/2})-b)/m$

where:

1000= Conversion to liters.
Mag_1= Initial magnahelic gauge reading, inches water.
Mag_2= Final magnahelic gauge reading, inches water.
b= Calibration intercept.
m= Calibration slope.

Given:

MAG_1=	41 inches
MAG_2=	35 inches
b=	-0.01093
m=	28.2186
MFL=	218.7 slpm

Note: The calibration, intercept and slope were obtained by performing a multiunit check on the sampler's magnahelic gauge. Calibration points included 70,60,50,40,30, and 20 inches water. Ambient temperature and pressure were obtained to correct all measurements to standard conditions. The intercept and slope are based upon a comparison of standard flow conditions to the mangahelic gauge, which has been corrected to a seasonal temperature and pressure. An example calculation is presented below.

SFL=H-b/m

where:

SRF= Standard flow, m^3.
H= Water deflection, corrected to standard conditions.
b= Calibration orifice intercept.
m= Calibration orifice slope.

For example, given:

H=	2.946 inches
b=	-0.01676
m=	9.64

EXAMPLE CALCULATION
FOR SEMI-VOLATILE ORGANIC COMPOUNDS
(POLYCYCLIC AROMATIC HYDROCARBONS, PAH's)
AMBIENT AIR MONITORING

SLF= 0.307 m^3/min

Likewise,

$DGC_{season}=(DGx(Press_1/Press_2)(Temp_1/Temp_2))^{1/2}$

where:

DCG_{season}= Dial gauge, corrected to season.
DG= Dial gauge.
$Press_1$= Calibration pressure, inches Hg.
$Press_2$= Season pressure, inches Hg.
$Temp_1$= Seasonal temperature, °R.
$Temp_2$= Seasonal temperature, °R.

Thus given:

DG=	70	inches water
$Press_1$=	29.6	inches Hg
$Press_2$=	29.74	inches Hg
$Temp_1$=	497.88	°R
$Temp_2$=	507.58	°R

DGC_{season}= 8.27

EXAMPLE CALCULATION
FOR VOLATILE ORGANIC COMPOUNDS, VOC's
AMBIENT AIR MONITORING

CLIENT: USAF -TINKER AIR FORCE BASE
TEST NUMBER: RUN 1
ENGINE TYPE: ENGINE F101-GE-102 (B-1B)
TEST CONDITION: AFTERBURNER

LOCATION: Oklahoma City, OK
TEST DATE: 5/1/97
TEST PERIOD: 0755-1055

VOC Concentration, $\mu g/m^3$

C_4=ARxCF

where:

C_4= VOC concentration, $\mu g/m^3$.
AR= Analytical result, parts per billion, ppb.
CF= Conversion factor.

Thus, given for chloromethane:

AR< 6.7 ppb
CF= Molecular weight/24.5
2.1

Therefore,

C_4< 14.1 $\mu g/m^3$

Note: "<" denotes values that were quantified below the analytical detection limit.

EXAMPLE CALCULATION
FOR ALDEHYDES
AMBIENT AIR MONITORING

CLIENT: USAF -TINKER AIR FORCE BASE
TEST NUMBER: RUN 1
ENGINE TYPE: ENGINE F101-GE-102 (B-1B)
TEST CONDITION: AFTERBURNER

LOCATION: Oklahoma City, OK
TEST DATE: 5/1/97
TEST PERIOD: 0755-1055

Aldehyde Concentration, ng/m^3

C_3=AR/Vol

where:

C_3= Aldehyde concentration, µg/m^3.
AR= Analytical result, µg/sample.
Vol= Sample volume, m^3, dry.

Thus, given for formaldehyde:

AR= 0.83 µg
Vol= Final flow totalizer-initial flow totalizer
Final flow 992.4 m^3
Initial flow 990.7 m^3

Therefore,

C_3= 0.48 µg/m^3

TRACER GAS METHOD
EXAMPLE CALCULATIONS

Client:	USAF-TINKER AIR FORCE BASE	**Plant:**	OKLAHOMA CITY, OK.
Test Run No.:	1 PARTICULATE	**Test Date:**	5/1/97
Engine Type:	F101-GE-102 (B-1B)	**Test Period:**	0754-0854
Test Condition:	AFTERBURNER		

Inputs

Meter Tracer Gas Injection Rate, l/min	T	2.3
Avg Tracer Gas Conc, ppb	Cs	50.6
Outlet Moisture, percent	BWE	2
Calc Constant, l/min to lb/hr SF6	K_1	0.847458
Calc Constant,	KQS	4.397E+07

Calculations

Meter Tracer Gas Injection Rate, lb/hr

$Sm = T * K_1$

$Sm = 0.847458 * 2.3$

$Sm = 1.95$

Wet STD Vol Flow, wscF/min

$QS_{1w} = KQS * (Sm / Cs)$

$QS_{1w} = 43970000 * (1.95 / 50.6)$

$QS_{1w} = 1,693,760$

Dry STD Vol Flow, dscF/min

$QS_1 = (1 - (BWE / 100)) * QS_1$

$QS_1 = (1 - (2 / 100)) * 1,693,760$

$QS_1 = 1,659,885$

F - FACTOR METHOD
EXAMPLE CALCULATIONS

Client:	USAF-TINKER AIR FORCE BASE	**Plant:**	OKLAHOMA CITY, OK.
Test Run No.:	1 PARTICULATE	**Test Date:**	5/1/97
Engine Type:	F101-GE-102 (B-1B)	**Test Period:**	0754-0854
Test Condition:	AFTERBURNER		

Inputs

Outlet Conc. THC, wet ppm	TCE	220
Outlet Conc. O2, dry percent	O2D	20.4
Outlet Conc. CO2, dry percent	C2D	0.44
Outlet Conc. CO, dry ppm	COD	95
Outlet Moisture, percent	BWE	2
Carbon Content of Fuel, wt fraction	FC	0.8649
Hydrogen Content of fuel, % by wt	FH	13.27
Sulfur Content of Fuel, % by wt	FS	0.018
Nitrogen Content of Fuel, % by wt	FN	0.0021
Oxygen Content of Fuel, % by wt	FO	0.2199
Conversion Constant, % / ppm	KC_1	0.0001
Calc. Constant min/hour	KC_2	0.016667
Mass rate Fuel Burn, LB / HR	MF	15232
Inlet Moisture, percent	BWI	0.6335

Calculations

F FACTOR FOR FUEL, scf/lb FUEL

FMD= (3.64 * FH) + (1.53 * FC * 100) + (0.57 * FS) + (0.14 * FN) - (0.46 * FO)
FMD= (3.64 * 13.27) + (1.53 * 0.8649 * 100) + (0.57 * 0.018) + (0.14 * 0.0021) - (0.46 * 0.2199)
FMD= 180.54

ESS AIR IN EXHAUST, dimensionless fraction

EAF= (O2D - (0.00005 * COD)) / (20.9 - (O2D - (0.00005 * COD)))
EAF= (20.4 - (0.00005 * 95)) / (20.9 - (20.4 - (0.00005 * 95)))
EAF= 40.41

STOICHIOMETRIC AIR REQUIRED, scf/min

QS= MF * FMD * KC_2
QS= 15232 * 180.54 * 0.016667
QS= 45,834

EXHAUST DRY STANDARD FLOWRATE, dscf/min

QFE_1= QS * (1 + EAF)
QFE_1= 45,834 * (1 + 40.41)
QFE_1= 1,897,852

EXHAUST WET STANDARD FLOWRATE, wscf/min

QWE_1= QFE_1 / (1 - BWE / 100)
QWE_1= 1,897,852 / (1 - 2 / 100)
QWE_1= 1,936,584

NITROGEN IN EXHAUST, % dry basis

ND= 100 - (O2D + C2D + (COD * KC1) + (TCE * KC1 * (1 - (BWE / 100))))
ND= 100 - (20.4 + 0.44 + (95 * 0.0001) + (220 * 0.0001 * (1 - (2 / 100))))
ND= 79.13

INLET DRY STANDARD VOLUMETRIC FLOW, dscf/min

QFI_1= QFE_1 * ((ND / 100) / (1- (20.9/100)))
QFI_1= 1,897,852 * ((79.13 / 100) / (1- (20.9/100)))
QFI_1= 1,898,546

INLET WET STANDARD VOLUMETRIC FLOW, wscf/min

QWI_1= QFI_1 / (1 - BWI / 100)
QWI_1= 1,898,546 / (1 - 0.6335 / 100)
QWI_1= 1,910,650

CARBON BALANCE FLOW METHOD
EXAMPLE CALCULATIONS

Client:	USAF-TINKER AIR FORCE BASE	**Plant:**	OKLAHOMA CITY, OK.
Test Run No.:	1 PARTICULATE	**Test Date:**	5/1/97
Engine Type:	F101-GE-102 (B-1B)	**Test Period:**	0754-0854
Test Condition:	AFTERBURNER		

Inputs

Inlet Conc. CO2, ppm	C2I	0
Inlet Conc. CO, ppm	CO1	458
Inlet Conc. THC, ppm	TC1	2.5
Outlet Conc. THC, wet ppm	TCE	220
Outlet Conc. O2, dry percent	O2D	20.4
Outlet Conc. CO2, dry percent	C2D	0.44
Outlet Conc. CO, dry ppm	COD	95
Outlet Moisture, percent	BWE	2
Carbon Content of Fuel, wt fraction	FC	0.8649
Conversion Constant, %/ppm	KC_1	0.0001
Calc. Constant min/hour	KC_2	0.016667
Conversion Constant, dscm/dscf	KQM	0.02831
Mass rate Fuel Burn, LB/HR	MF	15232
Inlet Moisture, percent	BWI	0.6335

Calculations

Wet Mole. Weight Exhaust, lb/lbmole

MWE = ((28) + (0.16*C2D) + (0.04*O2D)) * (1 - (BWE/100)) +0.18*BWE
MWE = ((28) + (0.16 * 0.44) + (0.04 * 20.4)) * (1 - (2 / 100)) +0.18 * 2
MWE = 28.67

Wet Mole. Weight Inlet (Ambient), lb/lbmole

MWI= (28.84 * (1 - (BWI/100))) + (0.18*BWI)
MWI= (28.84 * (1 - (0.63 / 100))) + (0.18* 0.63)
MWI= 28.77

Wet Conc.CO2 in Exhaust, wet %

C2E= C2D * (1 - (BWE/100))
C2E= 0.44 * (1 - (2 / 100))
C2E= 0.4312

Wet Conc.CO in Exhaust, wet %

COE= KC_1 * COD * (1 - (BWE/100))
COE= 0.0001 * 95 * (1 - (2 / 100))
COE= 0.00931

Weight Fraction Carbon in Exhaust

CE= (C2E + COE + (KC_1 * TCE)) * 12.01 / MWE / 100
CE= (0.00931 + 0.4312 + (0.0001 * 220)) * 12.01 / 28.67 / 100
CE= 0.001938

Weight Fraction Carbon in Inlet

CI= KC_1 * (C2I + COI + TCI)) * 12.01 / MWI / 100
CI= 0.0001 * (0 + 458 + 2.5)) * 12.01 / 28.77 / 100
CI= 0.000192

Mass rate Exhaust, lb/hr

ME= MF * (FC - CI)/ (CE - CI)
ME= 15232 * (0.8649 - 0.000192)/ (0.001938 - 0.000192)
ME= 7,546,512

Exhaust Wet Standard Flowrate, wscf/min

QCE_{1w}= KC_2 * ME * 385.35 / MWE
QCE_{1w}= 0.016667 * 7,546,512 * 385.35 / 28.67
QCE_{1w}= 1,690,641

Exhaust Dry Standard Flowrate, dscf/min

QCE_{1d}= ((100 - BWE) / 100) * QCE_{1w}
QCE_{1d}= ((100 - 2) / 100) * 1,690,641
QCE_{1d}= 1,656,829

Mass Rate Inlet, lb/hr

MI= MF * (FC - CE) / (CE - CI)
MI= 15232 * (0.8649 - 0.001938)/ (0.001938 - 0.000192)
MI= 7,531,280

Inlet Wet Std. Vol. Flow, wscf/min

QCI_{1w}= KC_2 * MI * 385.35 / MWI
QCI_{1w}= 0.016667 * 7,531,280 * 385.35 / 28.77
QCI_{1w}= 1,681,209

Inlet dry Std. Vol. Flow, dscf/min

QCI_{1d}= ((100 - BWI) / 100) * QCI_{1w}
QCI_{1d}= ((100 - 0.6335) / 100) * 1,681,209
QCI_{1d}= 1,670,558

APPENDIX B

EMISSION SAMPLING METHODS

EPA METHOD 5 AND EPA METHOD 202

Particulate

The test train utilized to perform the particulate and condensable particulate sampling will conform to U.S. EPA Methods 5 and 202 (M5/M202).

The impingers will be charged as indicated below (Figure 1):

- Impingers 1 through 3: 100 ml deionized water.
- Impinger 4: 300 g of silica gel.

The particulate train will consist of the following compounds:

- A borosilicate or stainless-steel nozzle with an inside diameter sized to sample the amount of exhaust specified in Method 5.
- A heated, borosilicate-lined probe equipped with a calibrated thermocouple to measure flue gas temperature and an S-type pitot tube to measure the flue gas velocity pressure.
- A heated oven containing a borosilicate connector and filter holder with a Soxhlet-extracted glass-fiber filter.
- A rigid borosilicate connector to join the outlet of the filter holder to the inlet of the impinger train.
- Greenburg-Smith impingers plus a thermocouple to detect sample gas exit temperature.
- A vacuum line (umbilical cord) with adapter to connect the outlet of the impinger train to a control module.
- A control module containing a 3-cfm carbon-vane vacuum pump (sample gas mover), a calibrated dry gas meter (sample gas volume measurement device), a calibrated orifice (sample gas flow rate monitor), and inclined manometers (orifice and gas stream pressure indicators).

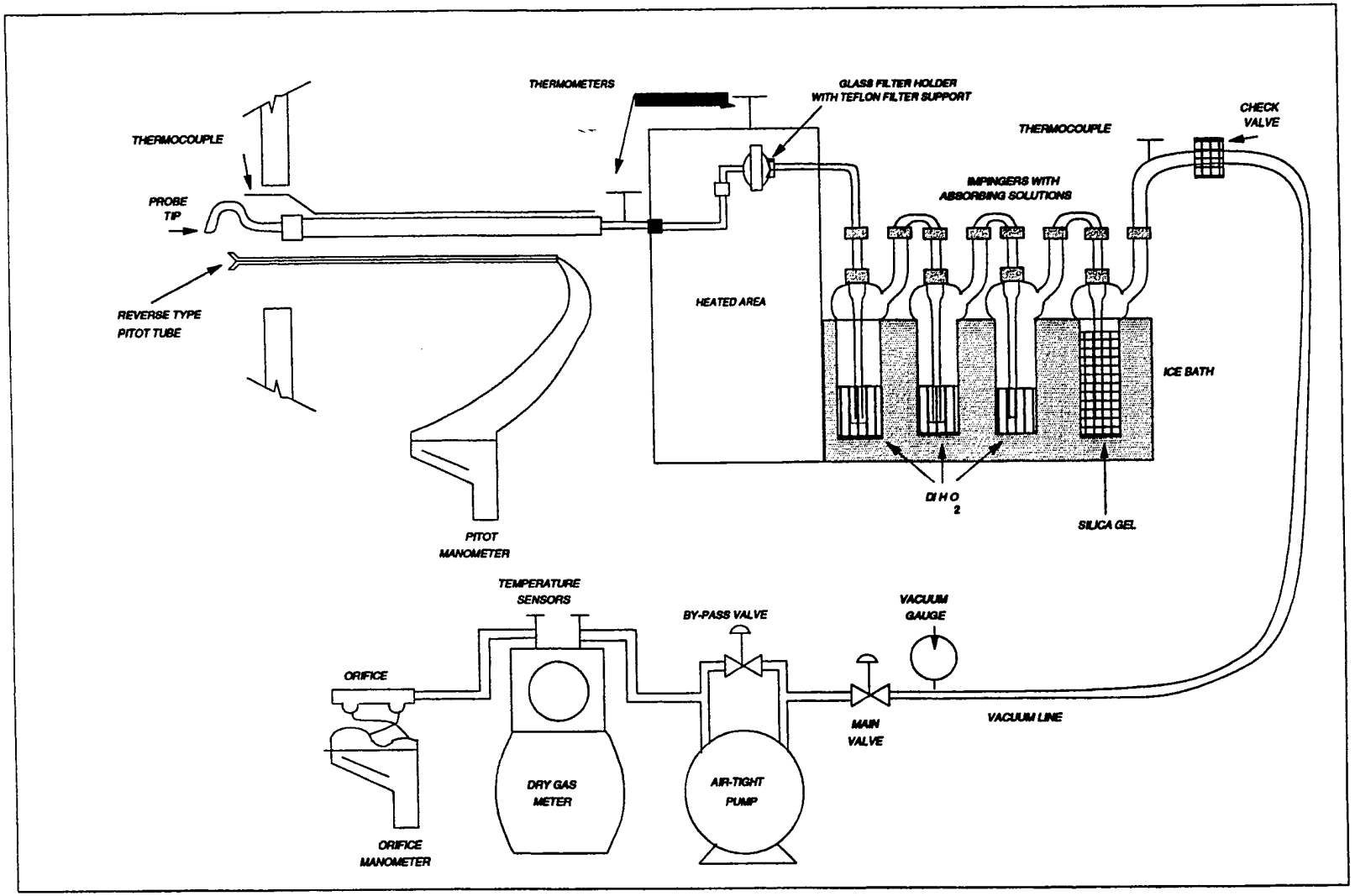


FIGURE 1
PARTICULATE (front and backhalf) SAMPLING TRAIN
EPA METHOD 5 AND METHOD 202

- A switchable, calibrated, digital pyrometer to monitor flue and sample gas temperatures.

The M5/M202 train will be calibrated to satisfy U.S. EPA requirements. Sample collection will follow U.S. EPA M5/M202 procedures. Prior to sampling, the number of traverse points and their locations will be calculated using U.S. EPA Method 1.

Figures 2, 3, and 4 illustrate the procedures that will be used to prepare the particulate sampling trains prior to each test, the procedures used to sample the stack flue gases, and the procedures used to recover the samples from the train, respectively. Each test will be $\geq$ 60 minutes in length, $\geq$ 50 ft^3 in sample volume, and isokinetic ± 10%.

Particulate Matter Analysis (M5/M202)

The M5 probe/front-half acetone wash and filter fractions and back-half condensate from all test runs will be analyzed gravimetrically for particulates according to U.S. EPA M5/M202. The front-half particulate analysis will be performed according to the procedures established in U.S. EPA Reference Method 5 (40 CFR 60, Appendix A). As specified by the method, quartz filters exhibiting >99.5 % efficiency on 0.3-micron dioctyl phthalate smoke particles will be used. Particulate analysis of the filter will be performed by oven-drying the filter. The filter will be oven-dried for 2 to 3 hours at 105°C (220°F) and cooled in a desiccator. The filter will be weighed to a constant weight.

Constant weight means a difference of no more than 0.5 mg or 1% of total weight less tare weight, whichever is greater, between two consecutive weighings.

The acetone probe rinse will be checked for any leakage during transport. The liquid will be measured volumetrically to the nearest ±1 ml. The contents will be transferred to a tared 250-ml beaker. The probe rinse will be evaporated to dryness at ambient temperature and pressure. The beaker will be weighed to a constant weight and the results reported to the nearest 0.1 mg.

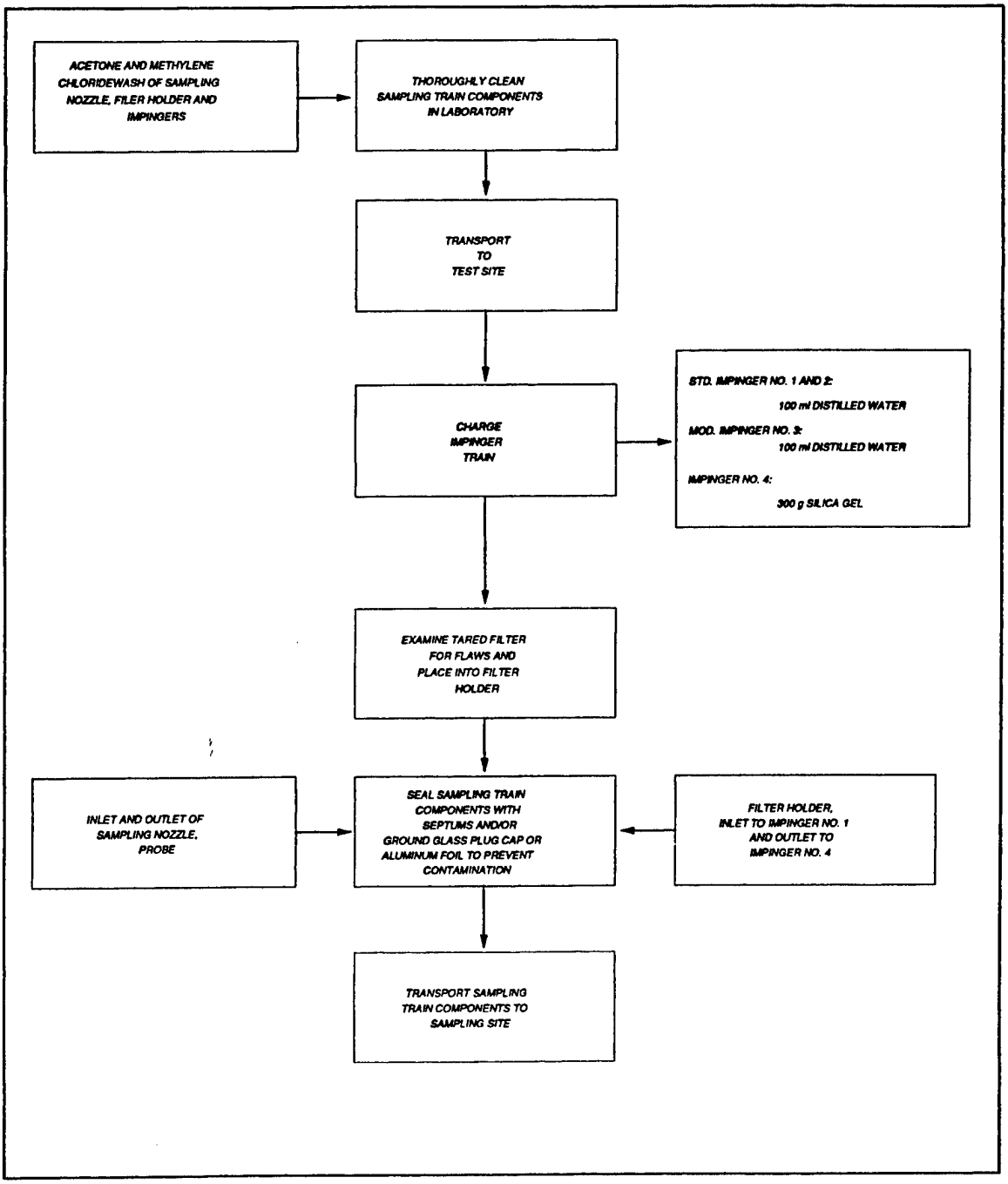


FIGURE 2
PREPARATION PROCEDURES FOR PARTICULATE (M5/M202) SAMPLING TRAIN

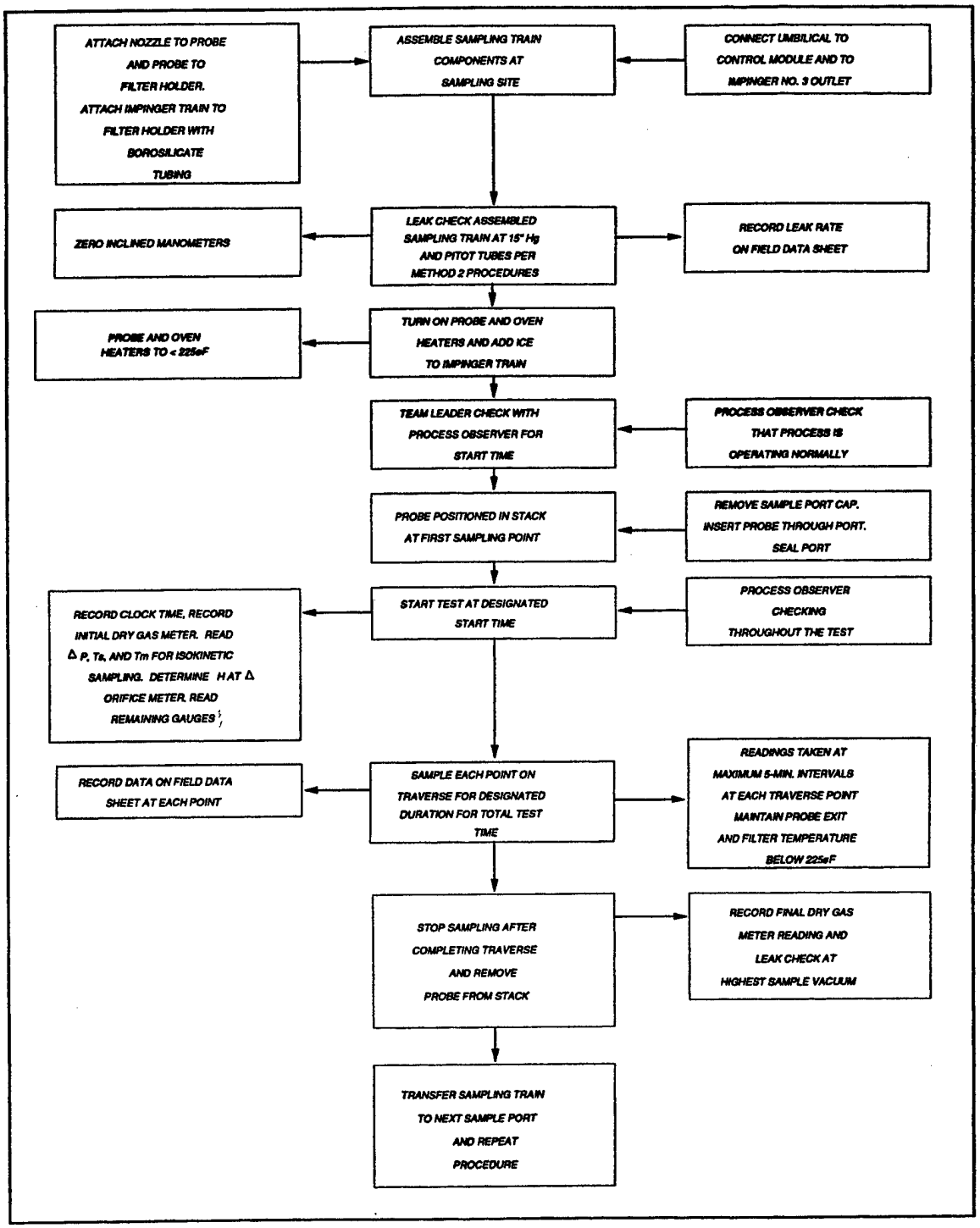


FIGURE 3
TEST PROCEDURES FOR PARTICULATES (M5/M202)

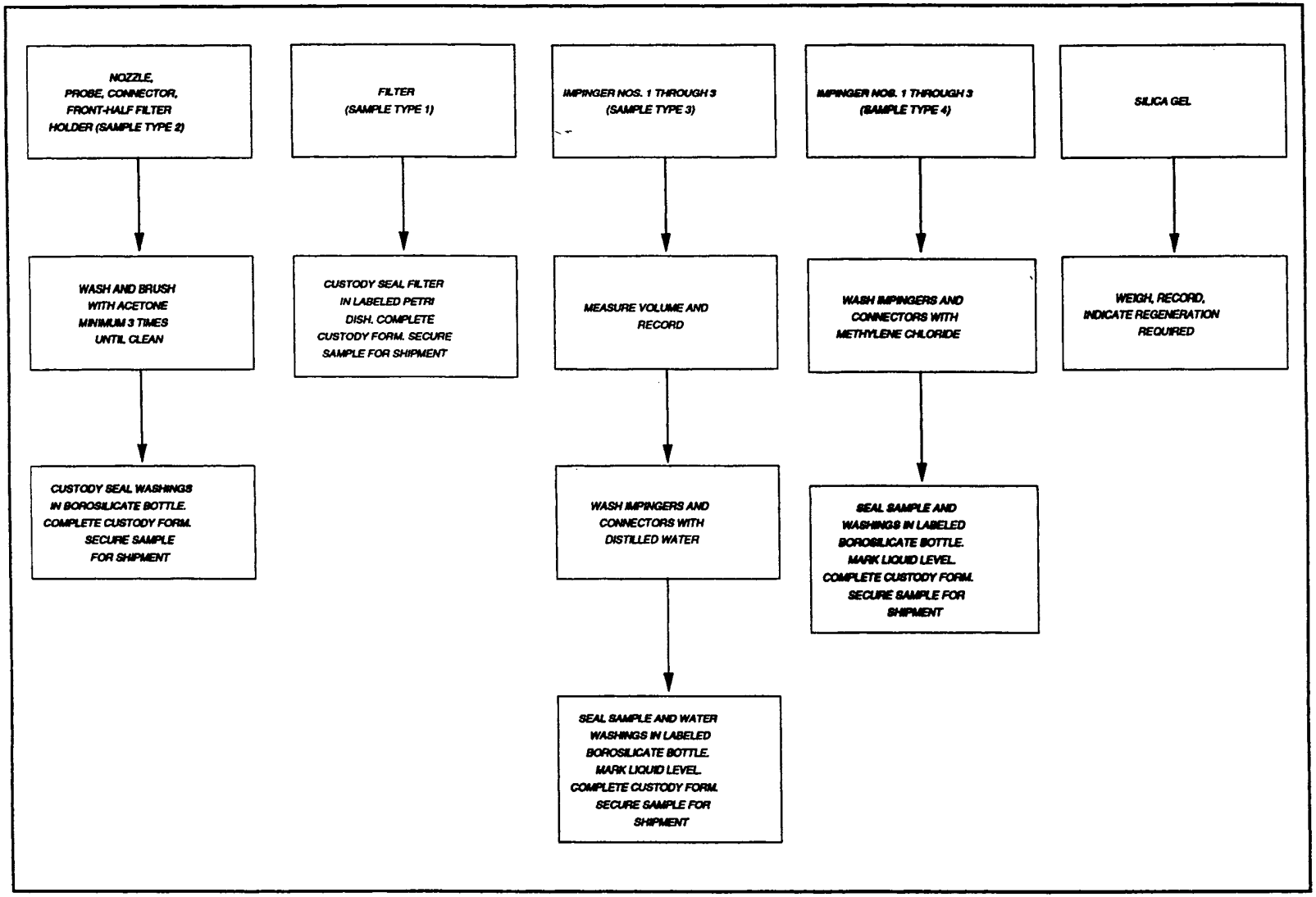


FIGURE 4
SAMPLE RECOVERY PROCEDURES FOR PARTICULATE (M5/M202) SAMPLING TRAIN

The back-half condensable particulate fraction analysis will be performed according to procedures established in U.S. EPA Reference Method 202 (40 CFR 60, Appendix A). The back-half water and wash samples will be combined in a separator funnel to separate aqueous and organic phases. The organic-phase extract will be placed in a tared beaker and evaporated to dryness at ambient temperature and pressure, then desiccated to a constant 0.1-mg weight. A methylene chloride extraction will be performed on the distilled water blank sampling to obtain a blank correction value.

The extracted water sample and extracted distilled water sample blank will be poured into tared beakers, evaporated to dryness at 220 to 230°F, then desiccated at ambient temperature and pressure to a constant 0.1-mg weight. The residue weight of the dried distilled water samples will be adjusted based on the water blank sample correction factor.

Particulate QC Sampling Procedures

The sampling QC procedures that will be used to ensure representative measurements of particulates are the following:

- The sample rate must be within 10 % of the true isokinetic (100 %) rate.
- All sampling nozzles will be manufactured and calibrated according to U.S. EPA standards.
- Particulate filters will be pre-test and post-test weighed (following 24 hours of desiccation) to the nearest 0.1 mg to a constant (± 0.5 mg) value.
- Recovery procedures will be completed in a clean environment.
- Sample containers for liquids will be constructed of borosilicate with Teflon®-lined lids. Filters will be stored in plastic or borosilicate petri dishes.

EPA METHOD 0010 — SEMIVOLATILE ORGANICS

The test train utilized to perform the semivolatile and semivolatile products of incomplete combustion (PICs) sampling will conform to U.S. EPA Method 0010 (see Figure 1). The Method 0010 train will consist of the following components:

- A borosilicate or stainless-steel nozzle with an inside diameter sized to sample isokinetically.
- A heated, borosilicate-lined probe equipped with a calibrated thermocouple to measure flue gas temperature and an S-type pitot tube to measure the flue gas velocity pressure.
- A heated oven containing a borosilicate connector and filter holder with a Soxhlet-extracted glass-fiber filter.
- A rigid borosilicate connector to join the outlet of the filter holder to the inlet of the impinger train.
- An impinger train which consists of the following: Grahm (spiral) -type ice-water-cooled condenser; a temperature sensor (thermocouple); an ice-water-jacketed sorbent module containing approximately 40 grams of XAD-2 resin (pre-extracted); a 1-liter condensate trap; one standard and one modified Greenburg-Smith impinger each containing 100-ml high-purity liquid chromatograph (HPLC) -grade water; and a final impinger containing 300 grams of dry preweighed silica gel, plus a thermocouple to detect sample gas exit temperature.
- A vacuum line (umbilical cord) with adapter to connect the outlet of the impinger train to a control module.
- A control module containing a 3-cfm carbon-vane vacuum pump (sample gas mover), a calibrated dry gas meter (sample gas volume measurement device), a calibrated orifice (sample gas flow rate monitor), and inclined manometers (orifice and gas stream pressure indicators).

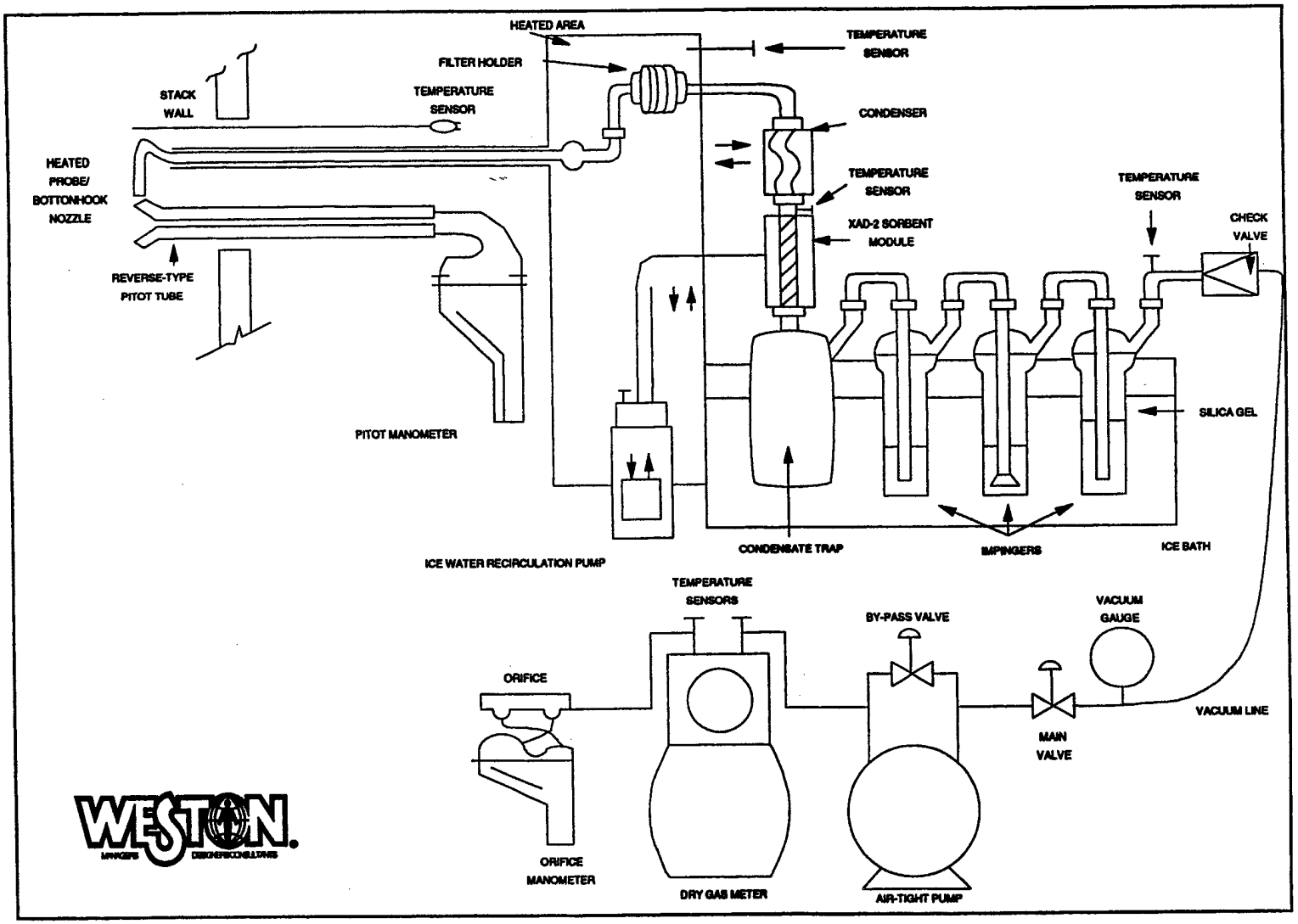


FIGURE 1
EPA METHOD 0010 - SAMPLING TRAIN FOR SEMIVOLATILE ORGANICS

- A switchable, calibrated, digital pyrometer to monitor flue and sample gas temperatures.

Figures 2, 3, and 4 depict the preparation, sampling, and recovery procedures that will be used for the semi-volatile sampling train, respectively. The sampling rate during each typical 180- to 240-minute test will be isokinetic ± 10% and will never exceed the maximum rate of 0.75 cfm specified by the test method. A total of [3] 106 dscf (3 m^3) sample volume will be collected.

Semivolatile Organic Compounds (SVOCs)

A summary of the general analysis procedure for the semivolatiles for stack gas samples follows. These compounds will be collected from a U.S. EPA Method 0010 sampling train. Refer to U.S. EPA Method 8270 for detailed specifications of this analysis procedure.

First, each front-half wash sample will be concentrated to 1 to 5 ml using a rotary evaporator apparatus. The sample container will be rinsed three times with methylene chloride, added to concentrated solution, and concentrated further to near dryness.

The above concentrate will be added to the filter and XAD-2 resin in a Soxhlet apparatus that contains a precleaned glass extraction thimble and silica gel. Semivolatile internal standard will be added, covered with a plug of precleaned glass wool, and refluxed with toluene for 16 hours. The extract will be transferred using three 10-ml rinses of toluene to a rotary evaporator, concentrated to approximately 8 ml, and reduced to 1 ml under a nitrogen stream. The sample will be split in half; one split will be analyzed, and the second will be archived.

The back-half impinger solvent rinse will be concentrated to 2 ml using a rotary evaporator, then added to the impinger water/condensate sample. Following solvent addition, the sample will be spiked with the appropriate semivolatile internal standards. A liquid extraction will be conducted using methylene chloride. The extract will be combined with the front-half Soxhlet extract for cleanup and analysis. The remaining extract will be

analyzed for the volatile compounds utilizing U.S. EPA Method 8270 procedures for high-resolution gas chromatography (GC) with low-resolution mass spectrometry (MS).

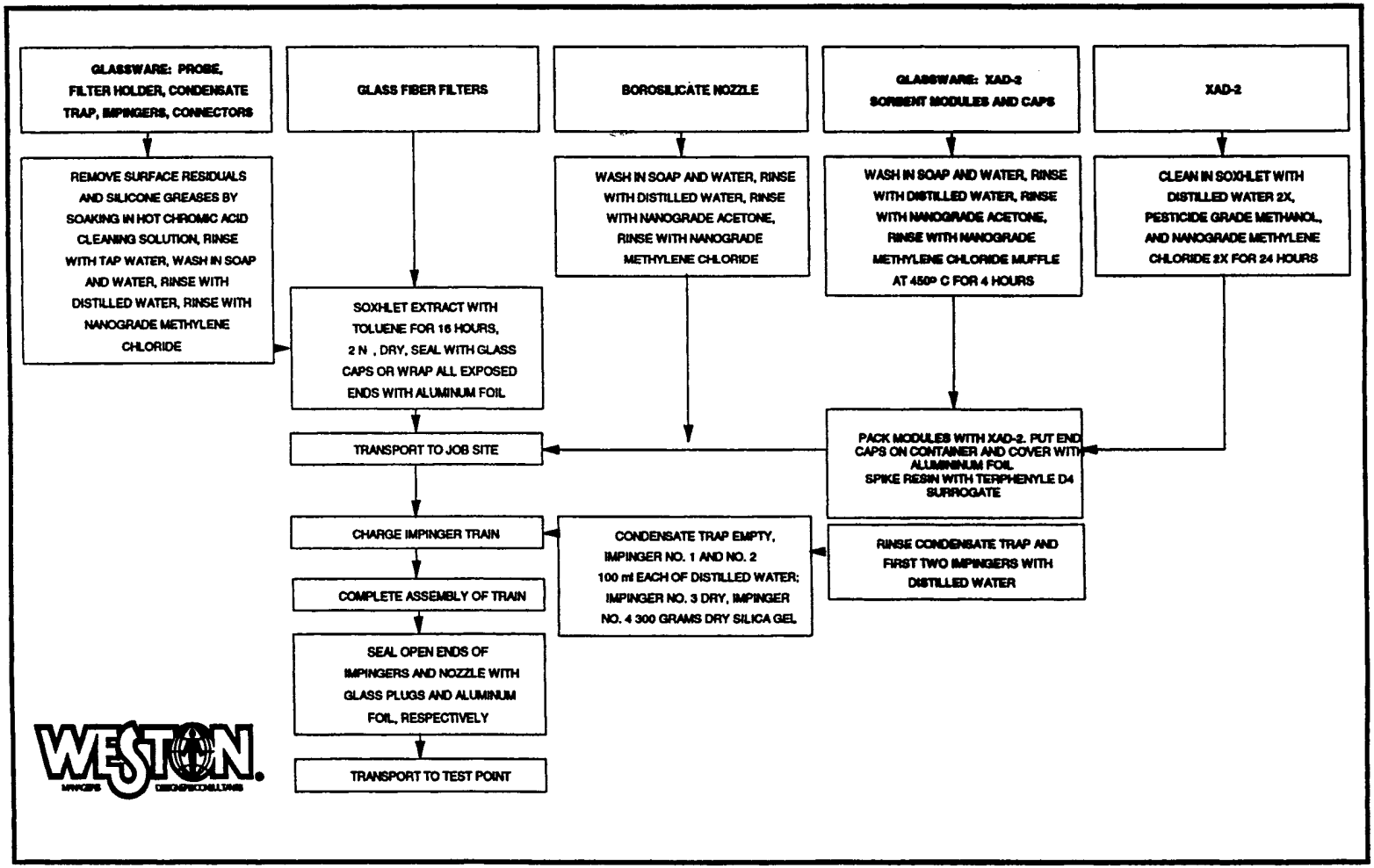


FIGURE 2

PREPARATION PROCEDURES SEMIVOLATILE ORGANICS SAMPLING

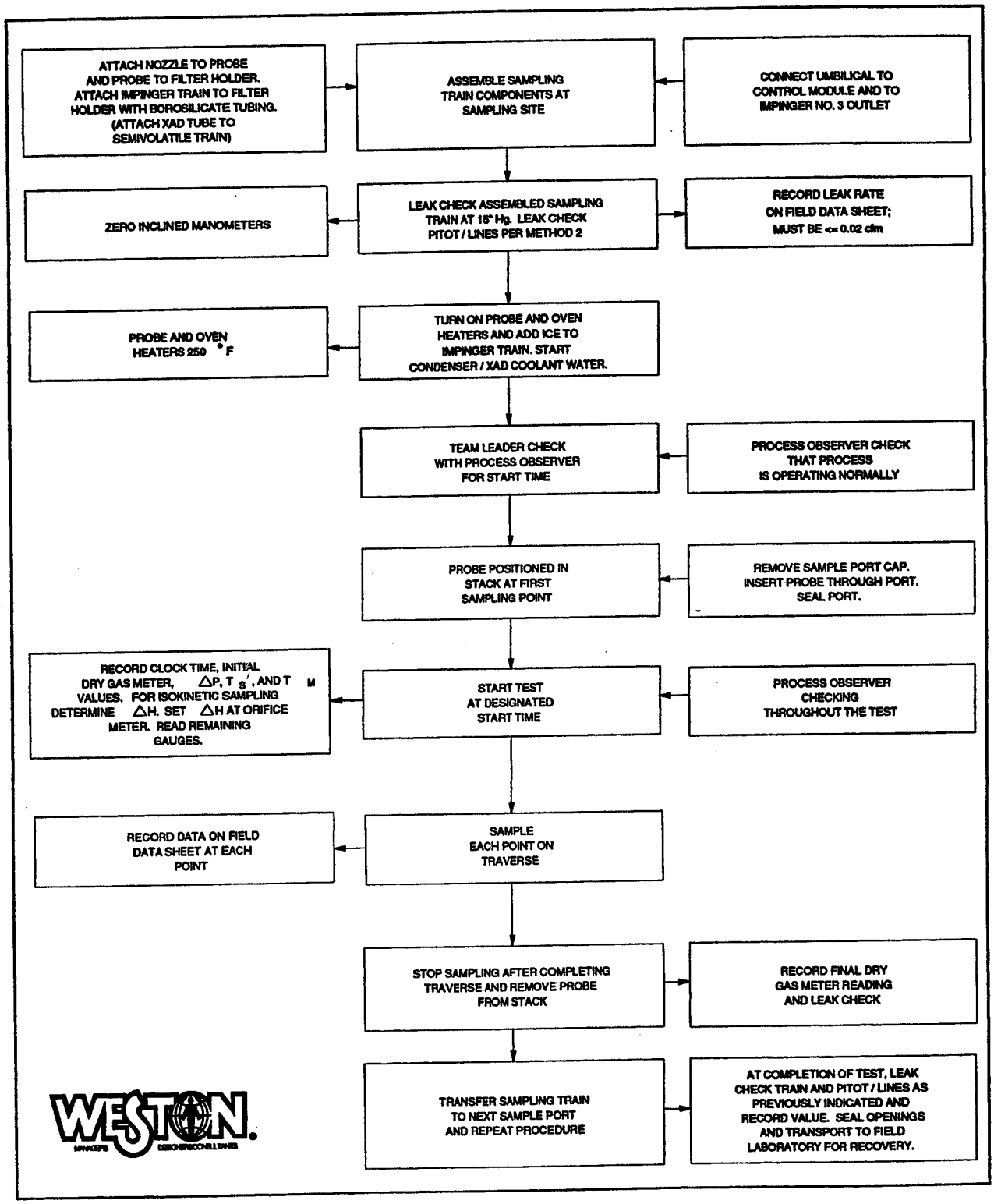


FIGURE 3
SAMPLING PROCEDURES FOR SEMIVOLATILE ORGANICS

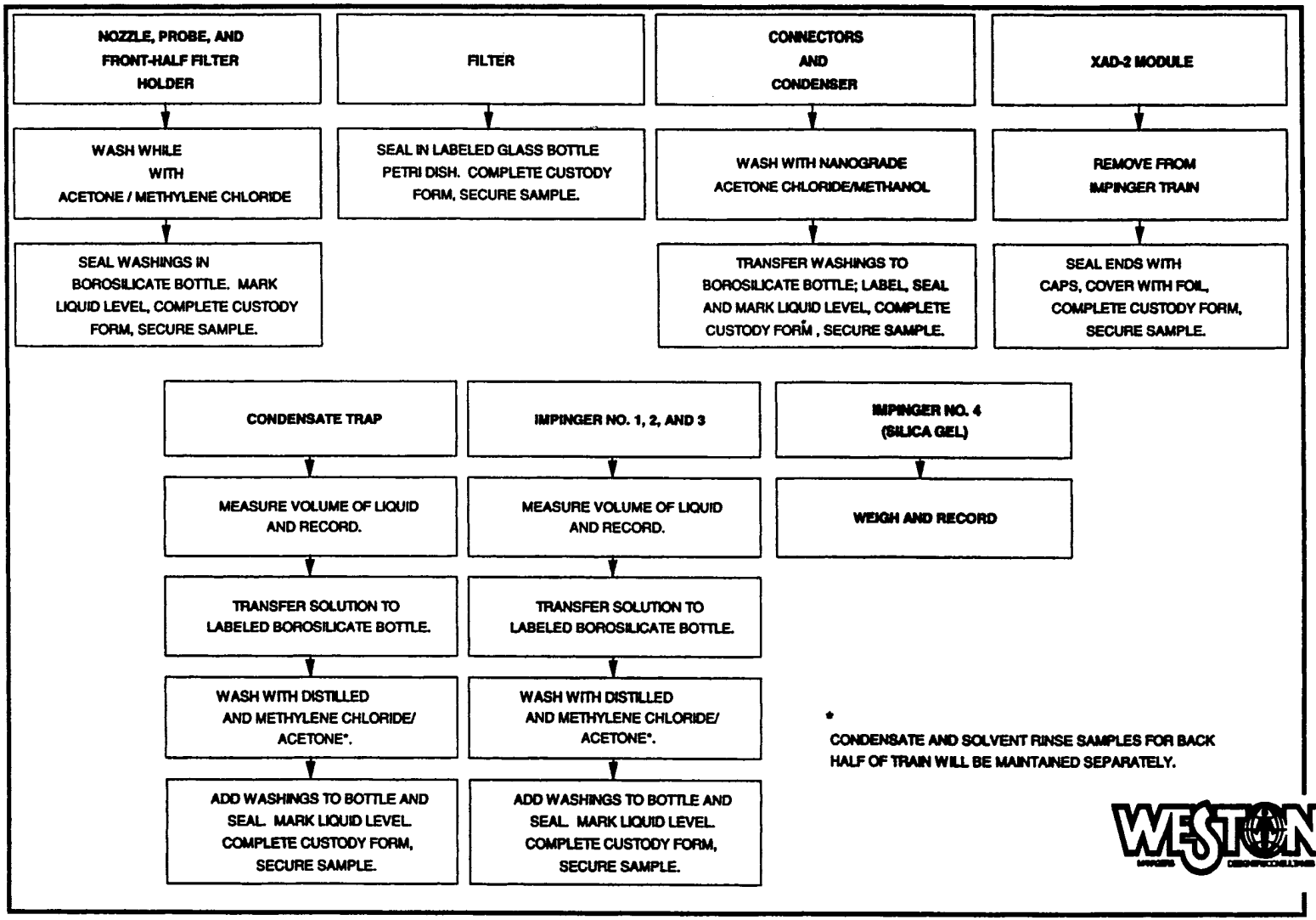


FIGURE 4
SAMPLE RECOVERY PROCEDURES
SEMIVOLATILE ORGANICS

Blank train, field, and laboratory blanks will be analyzed with each group of source samples using the above procedure as QC, contamination, or performance checks, as appropriate. All GC/MS analyses will include analysis of a method blank, a method blank spike (semivolatiles), a matrix spike, and a laboratory sample. The semivolatiles and matrix spike solution will contain the compounds and will be used for both matrix spikes and blank spikes. In addition, appropriate surrogate compounds for the semivolatiles will be spiked into each sample. Recoveries from method spikes and surrogate compounds will be calculated and recorded on control charts to maintain a history of system performance.

Semivolatile QC Sampling Procedures

The following specific QC sampling procedures will ensure representative collection of semivolatile data:

- All sample and recovery glassware will be precleaned as described in Section 3A of the *Manual of Analytical Methods for Analysis of Pesticides in Human and Environmental Samples*. This procedure is recommended in U.S. EPA Method 23 for glassware preparation.

- Each lot of XAD resin will be prescreened prior to packing and spiking the XAD resin trap in preparation for sampling. All screening, packing, and spiking will be performed at the laboratory prior to shipment to the field.

- Only nanograde or equivalent solvents will be used for test train preparation and recovery. Distilled water will be high purity liquid chromatography (HPLC)-grade.

- The XAD-2 resin gas stream inlet temperature will be maintained below 68°F during testing.

- Recovery procedures will be completed in a clean environment.

EPA METHOD 0011-FORMALDEHYDE SAMPLING TRAIN

The formaldehyde in the stack gas emission stream will be determined by U.S. EPA Method 0011. The sampling train (see Figure 1) will consist of the following components connected in a series:

- A calibrated borosilicate nozzle attached to a heated borosilicate probe.
- A rigid borosilicate connector to join the outlet of the sampling probe to the inlet of the impinger train.
- An impinger train consisting of four impingers. The first, second, and third impingers will each contain 100 ml of cleaned 2,4-dinitrophenylhydrazine (DNPH) solution. The fourth impinger will contain 300 grams of dry preweighed silica gel. The second impinger will be a Greenburg-Smith type; all other impingers will be of a modified design. All impingers will be maintained in a crushed ice bath.
- A vacuum line (umbilical cord with adapter) to connect the outlet of the fourth impinger train to a control module.
- A control module containing a 3-cfm carbon-vane vacuum pump (sample gas mover), a calibrated dry gas meter (sample gas volume measurement device), a calibrated orifice (sample gas flow rate monitor), and inclined manometers (orifice and gas stream pressure indicators).

Figures 2, 3, and 4 outline the preparation, sampling, and recovery procedures that will be used to determine the formaldehyde at the stack location.

Formaldehyde Analysis Procedures

The analytical procedures for the quantification of formaldehyde will be performed as specified in U.S. EPA Methods 0011 and 0011A utilizing high-performance liquid chromatography (HPLC).

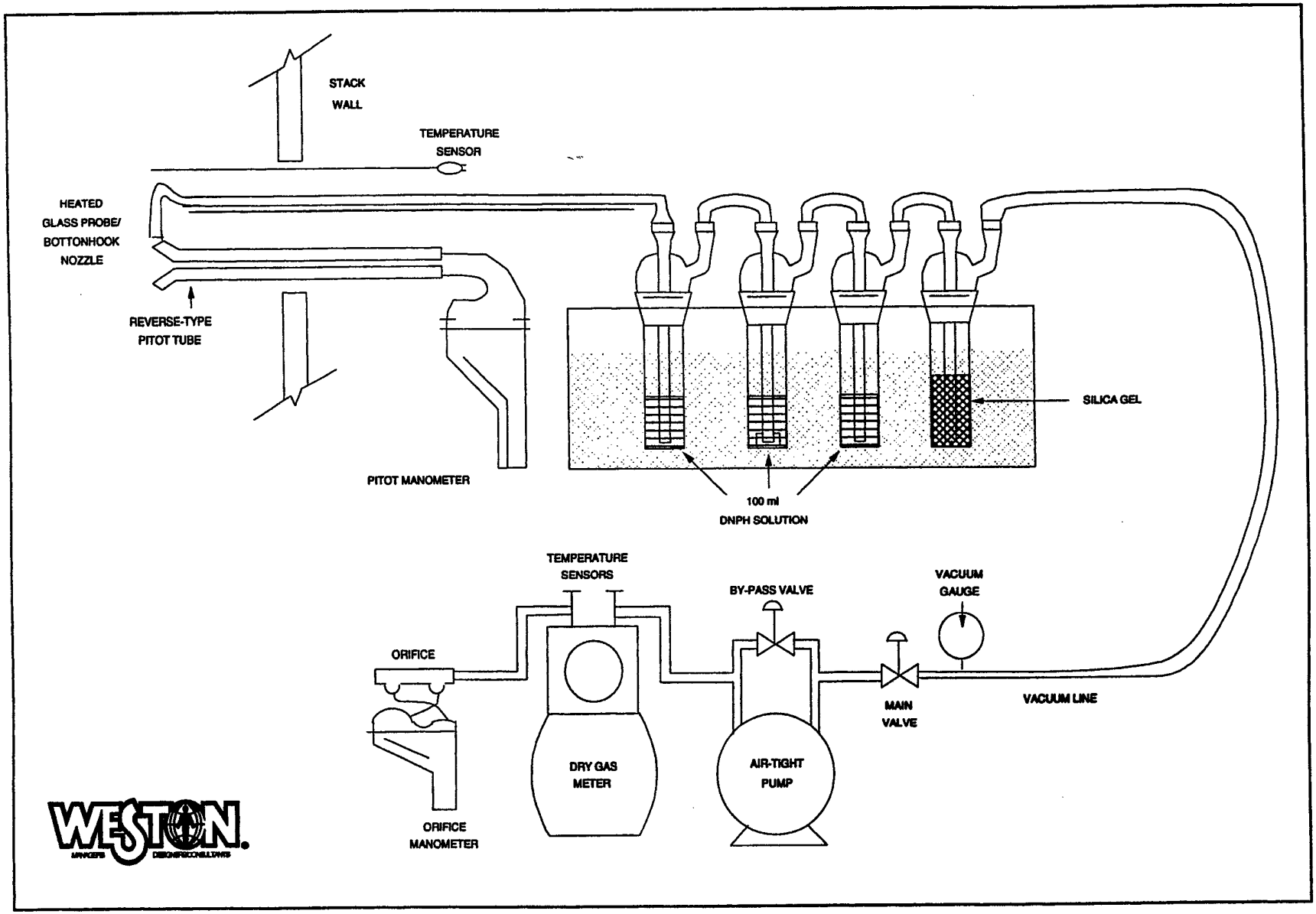


FIGURE 1
EPA METHOD 0011 - FORMALDEHYDE SAMPLING TRAIN

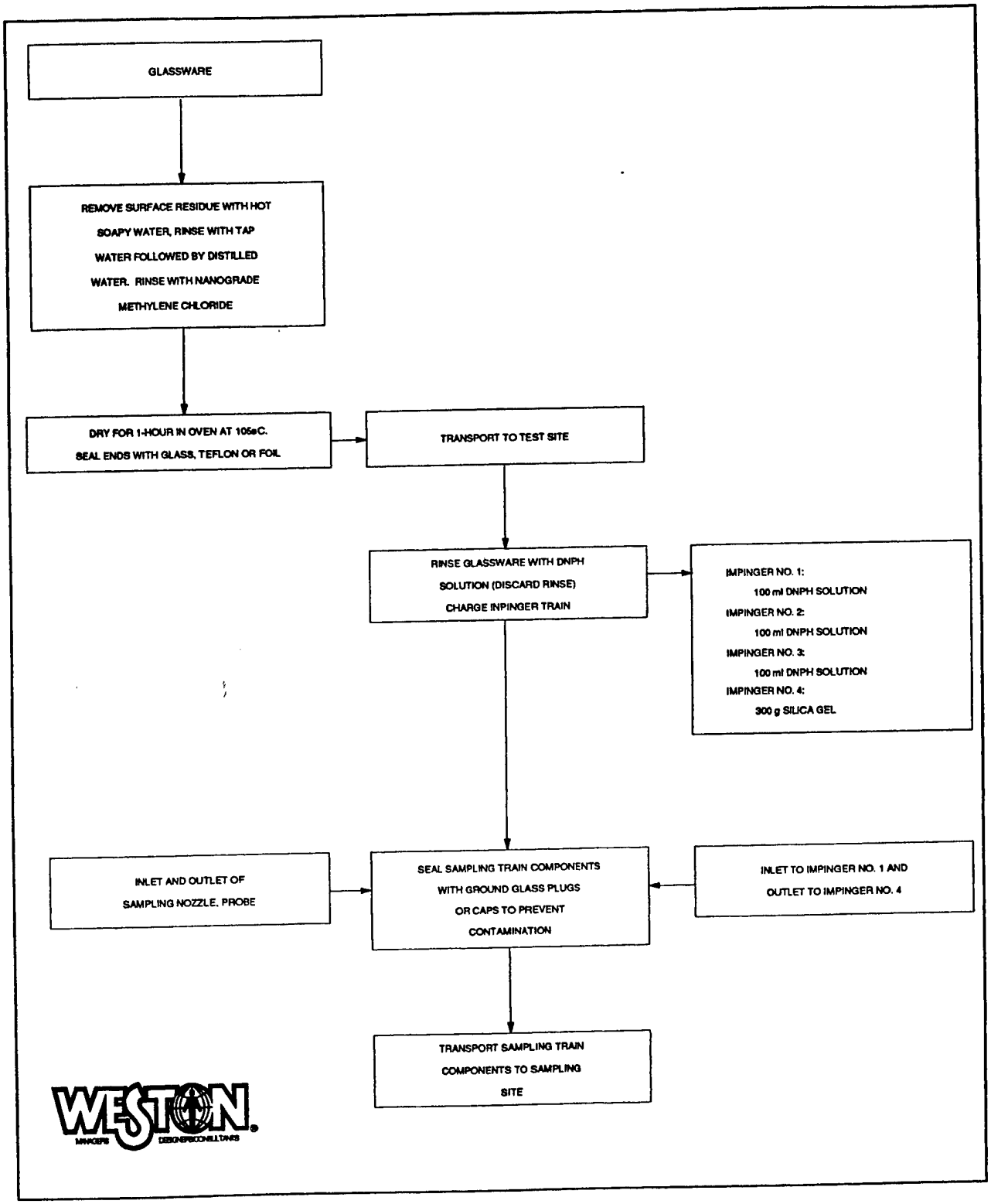


FIGURE 2
PREPARATION PROCEDURES FOR FORMALDEHYDE SAMPLING TRAIN

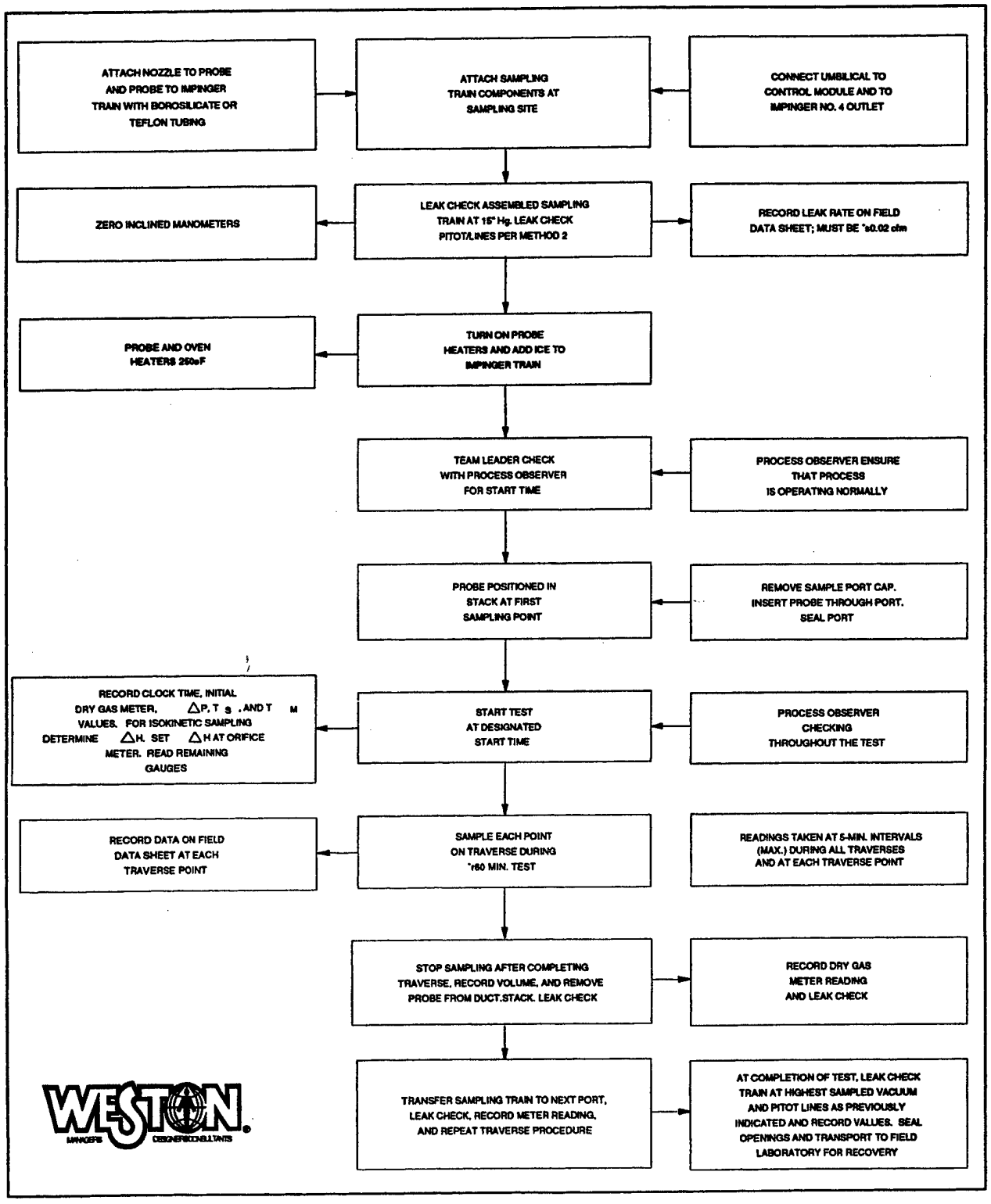


FIGURE 3
SAMPLING PROCEDURES FOR FORMALDEHYDE

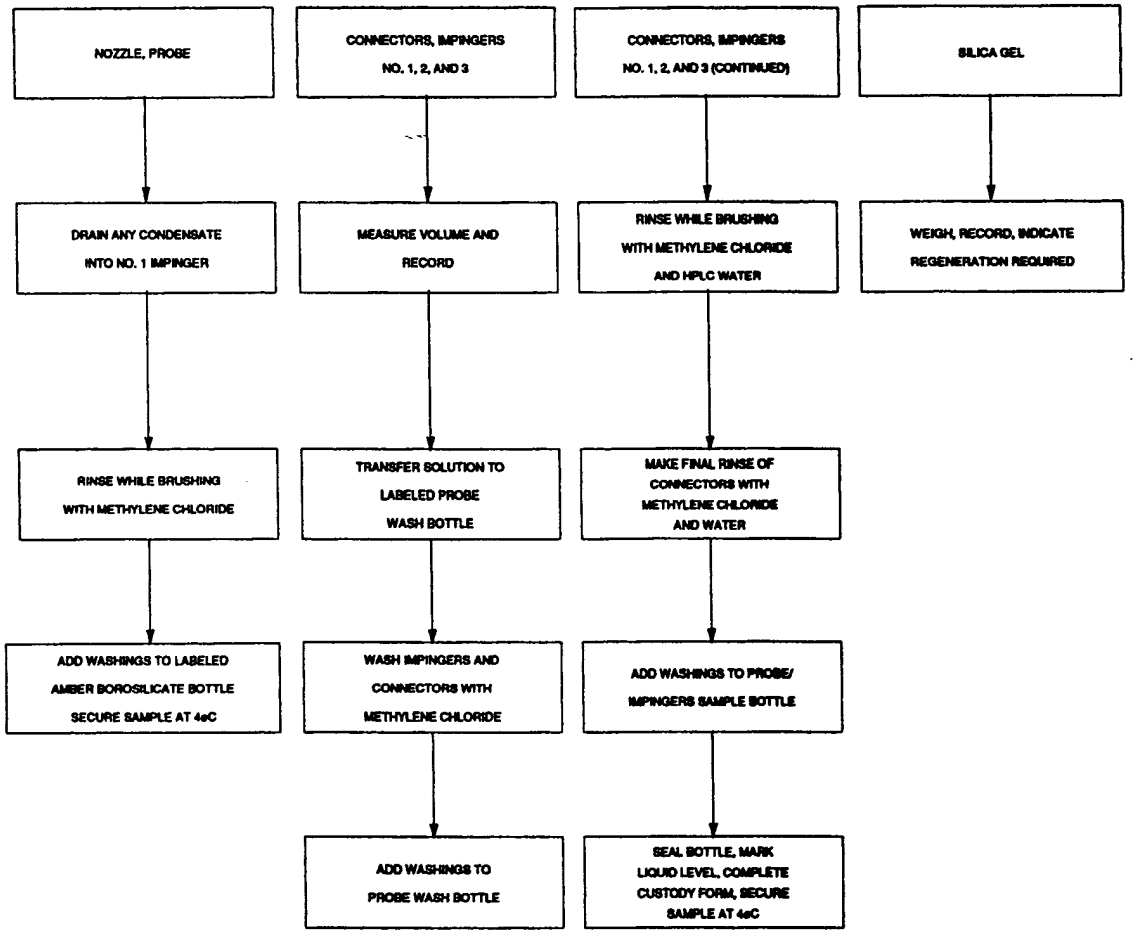


FIGURE 4
SAMPLE RECOVERY PROCEDURES FOR FORMALDEHYDE SAMPLING TRAIN

Each of the three DNPH impingers will be recovered, composited, and analyzed as one sample. The samples must be chilled immediately to stabilize the DNPH-carbonyl derivatives.

The HPLC will be calibrated prior to use each day. Calibration standard mixtures will be prepared from appropriate reference materials and will contain analytes appropriate for the method of analysis.

If a correlation of 0.996 cannot be obtained, additional standards must be analyzed to define the calibration curve. A midpoint calibration check standard will be analyzed each shift to confirm the validity of the initial calibration curve. The check standard must be within 20% of the initial response curve to demonstrate that the initial calibration curve is still valid.

Calibration data, including the correlation coefficient, will be retained in laboratory notebooks to maintain a permanent record of instrument performance.

At least one method blank and two method spikes will be included in each laboratory lot of samples. The method spikes and blanks will be in aqueous media. Method spikes will be examined to determine if contamination is being introduced in the laboratory.

The spikes will be examined to determine both precision and accuracy. Accuracy will be measured by the percent recovery of the spikes; precision will be measured by the reproducibility of both method spikes.

Formaldehyde QC Sampling Procedures

The following QC procedures will ensure representative formaldehyde data are taken:

- Reagents will be used that meet method criteria. A supply of the DNPH reagent will be extracted the day before shipping to the test site. Two aliquots from each lot of DNPH prepared will be reserved for blank analysis per U.S. EPA Method 0011.

- The formaldehyde trains will be assembled and recovered in an environment free from uncontrolled dust and contaminated organics, and

will be performed in an area away from other test train recovery activities to minimize contamination. The train will be prerinsed with DNPH to eliminate any acetone residue prior to charging.

- DNPH will be stored in a cool environment and away from other solvents.

EPA METHOD 0030 (VOST)

Volatile Organic Compounds

The volatile organics in the stack gas emission stream will be determined by U.S. EPA Method 0030 (VOST). This sampling train (see Figure 1) will consist of the following components connected in series:

- A heated borosilicate or quartz probe containing a glass wool particulate filter.
- An ice-water-cooled condenser connected to the probe, followed by a temperature sensor, an adsorption cartridge containing 1.6 grams of Tenax, and a condensate trap.
- A section of Teflon tubing used to connect the outlet of the condensate trap to a second condenser, which will be followed by a backup sorbent trap containing 1 gram of Tenax and 1 gram of activated charcoal, a second condensate collector, and a borosilicate tube containing an unweighed amount of dry silica gel.
- A tube of silica gel connected via an umbilical cable to a control console containing flow controllers, a calibrated 1-liter-per-minute dry gas meter, a sample pump, a temperature indicator, and other components.

A total of one VOST tube pairs will be collected during each test period. The volatile organics will be determined by analyzing the tube pairs by purge-trap-desorb GC/MS.

Figures 2, 3 and 4 outline the preparation, sampling, and recovery procedures that will be used to determine the volatile organics at the stack location.

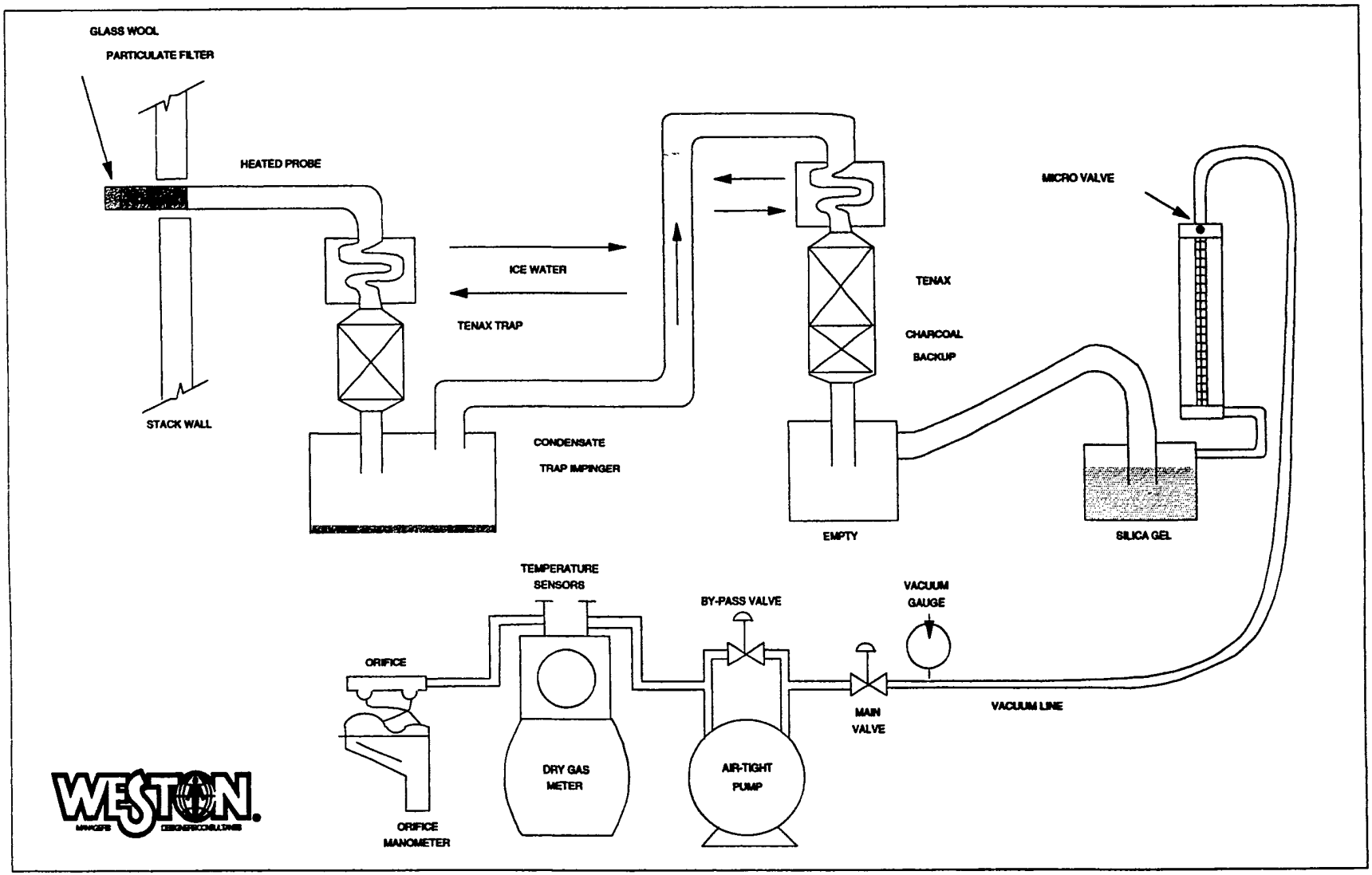


FIGURE 1
EPA METHOD 0030 - VOLATILE ORGANIC SAMPLING TRAIN (VOST)

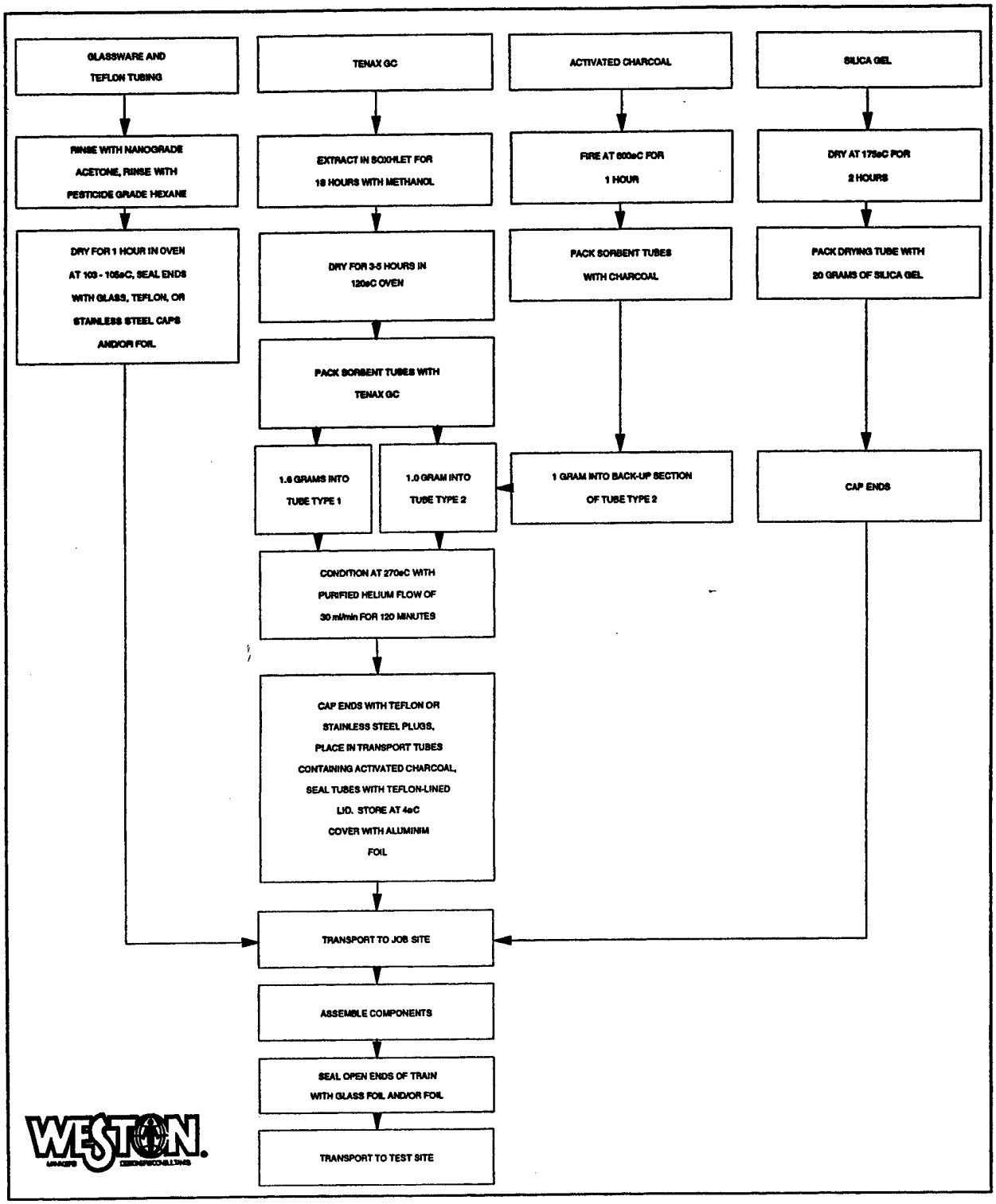


FIGURE 2
PREPARATION PROCEDURES FOR VOLATILE ORGANICS SAMPLING TRAIN

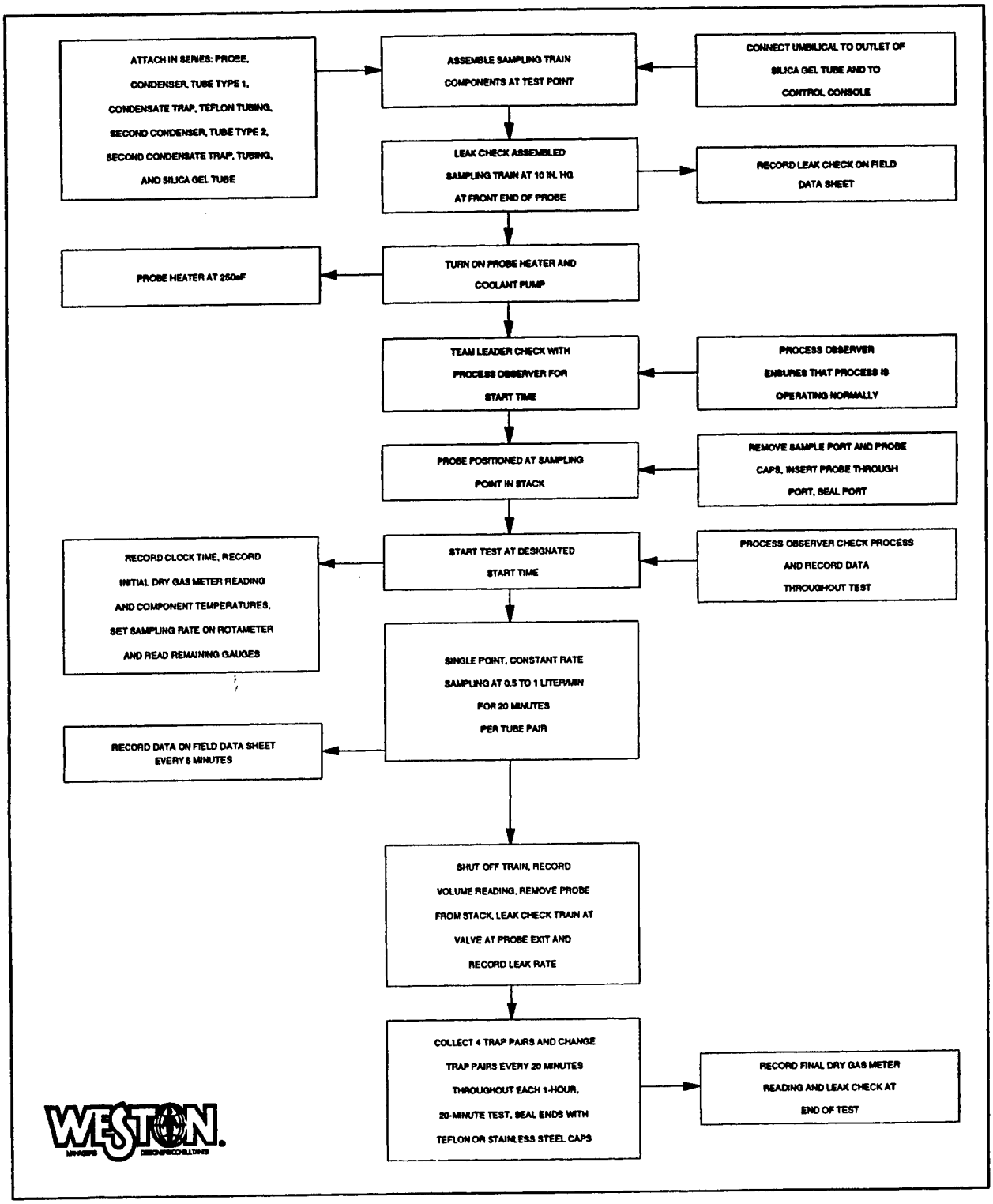


FIGURE 3
SAMPLING PROCEDURES FOR VOLATILE ORGANICS

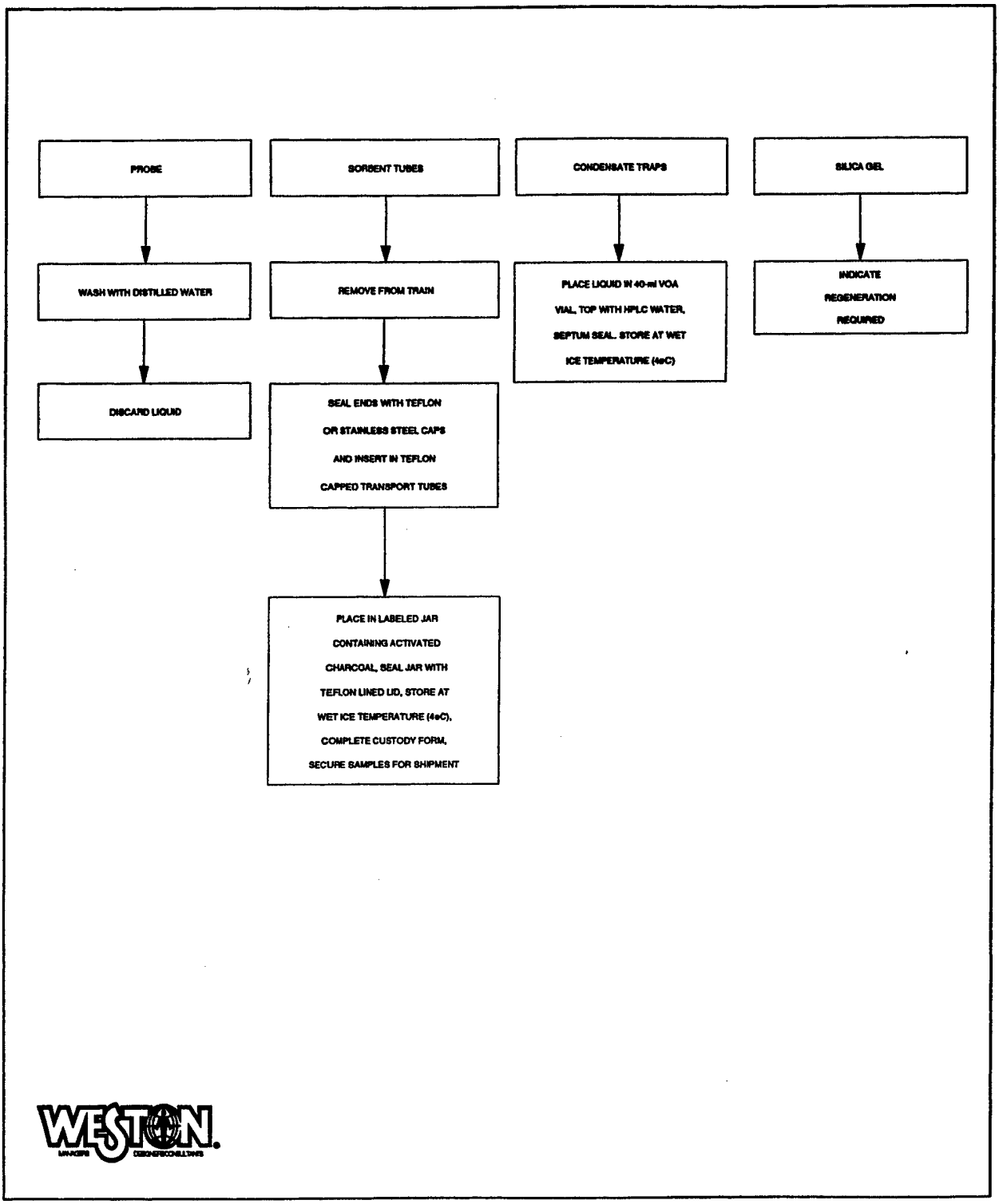


FIGURE 4
RECOVERY PROCEDURES FOR VOLATILE ORGANICS

Volatile Organics Analysis

The VOST samples will be placed in cold storage (<4°C) upon receipt in the laboratory. The samples have a recommended 14-day holding time from collection to analysis. The samples will require no additional preparation for analysis, except additions of the internal standard and the surrogate (D_8-toluene).

Volatile organics present in stack gases will be collected on Tenax and Tenax/charcoal sorbent cartridges using a VOST. Method 5040 (SW-846, third edition) describes in detail the procedural steps required to desorb VOST cartridges and analyze the effluent gas stream for VOCs. Additionally, if peaks of other compounds appear in the total ionization chromatogram (up to 10), they will be tentatively identified using a forward library search against the U.S. EPA/National Institutes of Health (NIH) mass spectral library and semiquantified relative to an internal standard spiked into the traps prior to analysis.

Methanolic solutions of internal standards compounds will be spiked onto each set of tubes prior to thermal desorption and analysis.

After spiking, the contents of the sorbent cartridges will be desorbed thermally for approximately 10 minutes at 180°C with organic-free nitrogen or helium gas, and bubbled through a tower to impinge water desorbed from the cartridges. Target analytes will be trapped on an analytical adsorbent trap. After the 10-minute desorption, the analytical adsorbent trap will be heated rapidly to 180°C with the carrier gas flow reversed. VOCs will be desorbed from the analytical trap and vented directly to a megabore column in the GC. The VOCs will be separated by temperature-programmed GC and detected by low-resolution MS. Concentrations of VOCs will be calculated using the internal standard technique.

VOST QC

The QC procedures that will ensure representative volatile organics data are the following:

- All sample and recovery glassware will be precleaned as per the procedure outlined in U.S. EPA Method 0030.
- The distilled water used for recovery of the condensate sample will be HPLC grade.
- Blanks of distilled water and unused tube pairs will be retained for blank analysis.
- All condensate and tube pair samples will be maintained at 4°C following collection and prior to analysis.
- VOST train preparation and recovery will be conducted in an area away from other test train recovery activities to avoid solvent contamination.

CONTINUOUS EMISSION MONITORING METHODS

The continuous emission monitoring system (CEMS) will be utilized to monitor gaseous emissions from stationary sources. The CEMS will monitor one or more of the following analytes: oxygen (O_2), carbon dioxide (CO_2), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxides (NO_x), and total hydrocarbons (THCs). These measurements will satisfy the requirements of the following U.S. EPA Reference Methods:

- Method 3A — Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources.
- Method 6C — Determination of Sulfur Dioxide Emissions from Stationary Sources.
- Method 7E — Determination of Nitrogen Oxide Emissions from Stationary Sources.
- Method 10 — Determination of Carbon Monoxide Emissions from Stationary Sources.
- Method 25A — Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer.

The CEMS consists of the sampling interface, the analyzers, and the data collection system. The sample interface will begin at the sample probe and extract the sample from the source, transport the samples to the analyzers, and filter the samples. For most of the analytes the moisture in the sample will be removed in the sample interface prior to analysis. Only the flame ionization analyzer sample will be analyzed on a wet basis. The sample interface will allow calibration gas to be introduced at the analyzer and at the sample probe. The analyzers will provide the next component of the CEMS. The analyzers must meet specific calibration requirements. The data collection system will record the raw voltage signal output from the analyzers, convert the signal to

represent the analyte concentration, and store these concentrations as discrete averages (usually 1-minute averages). At the end of any test run, the data collection system will correct the test results for calibration drift and bias as required in the EPA methods.

The CEMS can be operated to monitor one or all of the analytes. The sampling interface will be modified to suit the source characteristics and the desired analytes.

Sample Interface

The hot, wet sample interface (see Figure 1) must be used if THCs are being measured. The sample will be extracted through a heated probe, filter, and sample line to prevent condensation. The sample interface components that are outside the stack will be maintained at or above 250 °F. The hot, wet sample interface will consist of the following components:

- An unheated inner stainless-steel probe extension, which will be maintained at stack temperature.
- A heated probe section (at least 250 °F) which penetrates the stack wall and connects the inner probe to the heated filter box.
- A heated filter box (at least 250 °F) which contains calibration gas injection ports and an in-line stainless-steel filter.
- A heated sample line (at least 250 °F) to transport the sample from the filter box to the analyzer manifold.
- A heated manifold, which will split the sample between the heated and unheated analyzers.
- A VIA MAK II low contact refrigerated condenser to remove water.
- A flow distribution manifold to maintain the required sample flow to each analyzer.

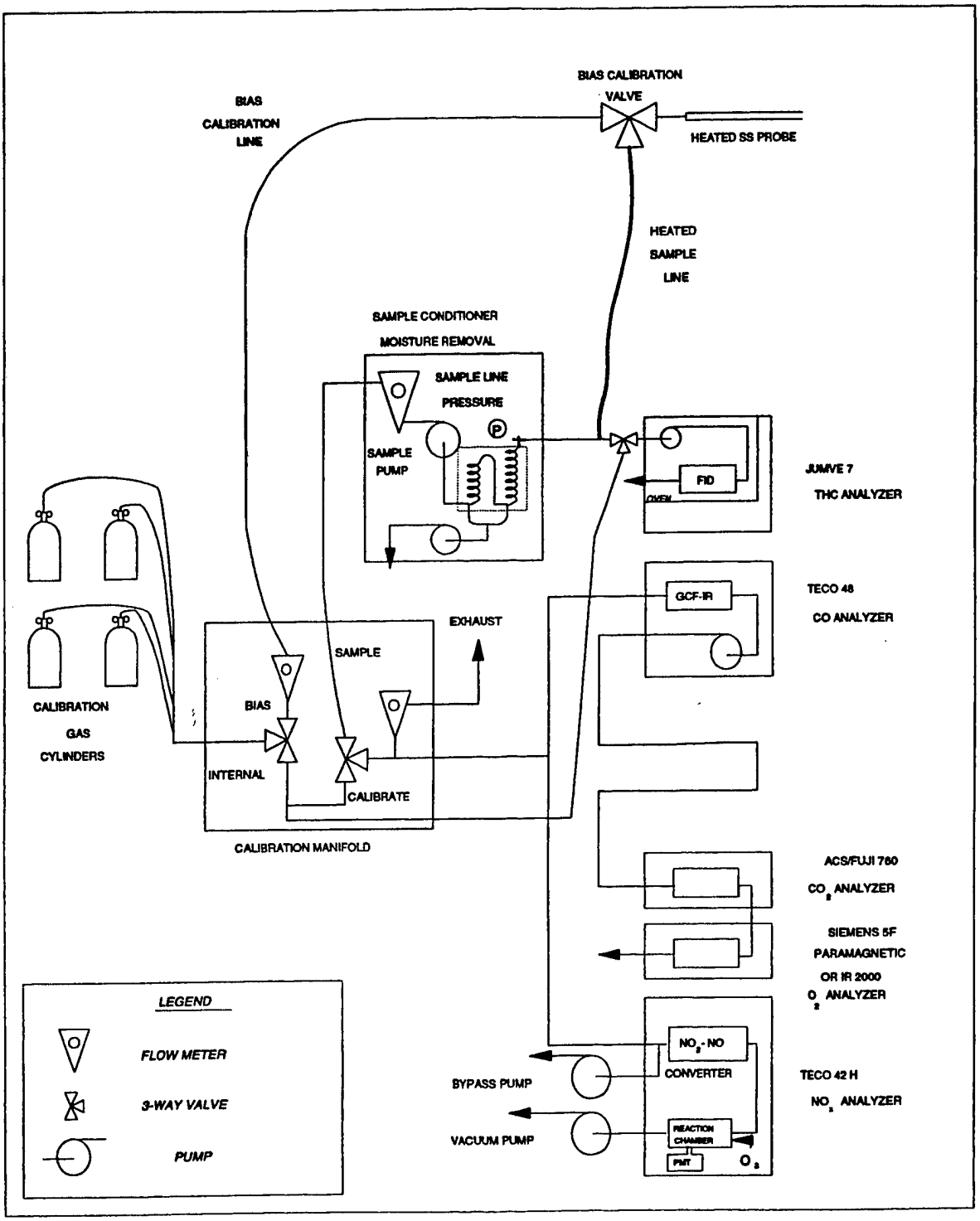


Figure 1

Continuous Emissions Monitoring System

One fraction of the sample will be transported by a short heated line to the hydrocarbon analyzer. The remaining sample will be sent to a VIA MAK II low-contact refrigerated condenser to remove water. The condenser will be maintained at 38 °F, and condensed moisture will be removed continuously from the bottom of the condenser through a peristaltic pump. The dried sample will pass through a pump and control valve, and will be distributed to the various analyzers by a distribution manifold. The critical flow parameter for each analyzer will be monitored with a rotameter as described below. The sample control valve will be adjusted to ensure that the sample gas always will be provided in excess, and that the excess sample will be released to the atmosphere.

Calibration

Calibration of the CEMS is always conducted in two steps: internal (direct to the instrument) and bias (direct to the probe end in the heated filter box). The internal calibration always is conducted first to verify instrument response. The internal calibration is conducted by introducing a calibration standard through the flow distribution manifold.

The instrument response will be adjusted initially by observing the front display of the analyzer. All final calibration response data **must be collected from the datalogger display.** Typically, there will be a slight difference between the analyzer front panel display and the data logger display, and the calibration data must be consistent with the recorded test data.

The bias calibration will be conducted prior to the start of the test run. This calibration will be conducted by introducing the calibration gas standard to a tee on the end of the probe in the heated filter box. The calibration gas will be supplied in excess and the surplus gas will flow out of the open end of the probe into the stack. This will ensure that bias calibrations are conducted at stack pressure.

The calibration drift will be measured at the end of the test run by repeating the bias calibration for zero and one or more calibration standards. The difference between the pretest and posttest CEMS response will be the calibration drift.

Analyzers

The following analyzers may be used in the CEMS:

- Total hydrocarbons:

  JUM Model VE- 7
  Flame ionization analyzer
  Range: 0 to 100, 0 to 10,000 ppm as carbon equivalent.

- Sulfur dioxide:

  Bovar Corporation Model 721, version AT or M
  Nondispersive infrared adsorption
  Range: 0 to 500, 0 to 5000 ppm as SO_2.

- Nitrogen oxides:

  Thermo Environmental Company (TECO) Model 42H
  Chemiluminescence
  Range: Between 0 to 25 and 0 to 5000 ppm as NO or as NO_x ; NO_2 by difference.

  API Model 200
  Chemiluminescence
  Range: Between 0 to 100 and 0 to 10,000 ppm as NO or NO_x; NO_2 by difference.

- Carbon monoxide:

  TECO Model 48 or 48H
  Gas correlation nondispersive infrared
  Range: 0 to 10 and 0 to 1,000 ppm (Model 48) and 0 to 10,000 ppm (Model 48H).

  API Model 100
  Gas correlation nondispersive infrared
  Range: 0 to 100 and 0 to 1,000 ppm.

- Carbon dioxide:

  Fugi/ACS Model 760
  Nondispersive infrared
  Range: 0 to 20 %.

- Oxygen:

  Siemens Oxymat 5E
  Paramagnetic
  Range: 0 to 25 %.

  Servomex 1400
  Paramagnetic
  Range: 0 to 25 %.

EPA Reference Methods

The performance parameters for the EPA Reference Methods are presented in Table 1.

The universal WESTON calibration performance requirements, applicable to all parameters, are the following:

- Calibration error: ± 2%
- Calibration bias: ± 2%
- Calibration drift: ± 3%

All parameters will be calibrated using zero plus three upscale gas standards. All sample data will be corrected using the EPA method 6C bias correction.

$$C_{corrected} = \frac{(C_{raw} - Z_b)}{(S_b - Z_b)} \times S_{std}$$

Where:

$C_{corrected}$ = Run average concentration corrected for instrument bias and drift.
C_{raw} = Raw run average concentration before correction.
Z_b = Average pre- and posttest zero bias response.
S_b = Average pre and posttest upscale bias response.
S_{std} = True value of upscale bias standard.

TABLE 1. PERFORMANCE PARAMETERS FOR EPA REFERENCE METHODS

Parameter	Method	Calibration Gas (% F_s)[a]	Calibration Error (% F_s)[b]	Calibration Bias (% F_s)[c]	Calibration Drift (% F_s)	Interference Check	Calibration Bias Drift Correction	Other Requirements
O_2	3A	Zero - 0 Low - N/R Mid - 40 to 60 High - 80 to 100	± 2 % F_s	± 5 % F_s	± 3 % F_s/run	Per Method 20[d]	Per Method 6C	
CO_2	3A	Zero - 0 Low - N/R Mid - 40 to 60 High - 80 to 100	± 2 % F_s	± 5 % F_s	± 3 % F_s/run	Per Method 20[d]	Per Method 6C	
SO_2	6C	Zero - 0 Low - N/R Mid - 40 to 60 High - 80 to 100	± 2 % F_s	± 5 % F_s	± 3 % F_s/run	7% of Method 6C[e]	Linear correction for average bias response	
CO	10	Zero - 0 Low - N/R Mid - Approx. 30 High - Approx. 60	± 2 % F_s[f]	± 2 % F_s[f]	± 10 % F_s/8 hrs	For CO_2 and H_2O	Per Method 6C[g]	
NO_X	7E	Zero - 0 Low - N/R Mid - 40 to 60 High - 80 to 100	± 2 % F_s	± 5 % F_s	± 3 % F_s/run	Per Method 20	Per Method 6C	NO_2/NO converter efficiency 98% minimum.
THC	25A	Zero - 0 Low 25 to 35 Mid - 40 to 60 High - 80 to 90	± 5 % C_g[g]	± 5 % C_g[h]	± 3 % F_s/run	N/R	Per Method 6C[g]	Pretest calibration required within 2 hours of start of test run.

N/R = Not required by method.
F_s = Instrument full scale or span value.
C_g = Calibration gas value
a % F_s = Percent full scale of calibration range.
b Calibration error = difference between known calibration value and instrument response when injected directly into instrument.
c Calibration bias = difference between instrument response when calibration gas is injected directly into the instrument and when calibration gas is injected at the sample probe.
d Substitute 500-ppm NO for oxygen or carbon dioxide during interference check.
e Required for first use at a source category only.
f Difference between calibration error and calibration bias is not specified in method; CO accuracy requirement is applied to both.
g Not specific method, but required as WESTON basic operating procedure.
h According to method, all calibrations are conducted from probe.

Stack CEM QC Sampling Procedures

The following QC procedures will be applied to ensure collection of representative CEM data.

- CEMs (probe to sample conditioner) will be leak-checked prior to the testing.
- All CEMs will be calibrated prior to testing to ensure precise and accurate data. Cylinder gases with a certified accuracy of ±2 % or Protocol One standards will be used to calibrate each of the analyzers. Each analyzer will be calibrated at four points (zero, low, mid, and high range). Nitrogen or hydrocarbon-free air will be used to set the instrument zero. The three calibration standards will be approximately 20 to 30, 45 to 55, and 80 to 100 % of span.
- Pre- and posttest calibration bias tests will be performed for each test run. The bias check will be performed with the calibration standard that is closest to the observed concentration in the sample gas. The average pretest/posttest bias drift will not exceed 3 % of full scale.
- A permanent data record of CEM analyzer responses will be made on a strip chart data logger and on the sampling data sheets.

APPENDIX C

ANALYTICAL QUALITY ASSURANCE/QUALITY CONTROL PACKAGE

DATA VALIDATION CHECKLIST

COC # ATL WO# 9712088A

PN / Site Name: 3314-08B-060 / Armstrong Laboratory Reviewer Name: J Doan

Laboratory: Air Toxics Limited Review Date: 3/5/98

Total # of samples / matrix: 6 / air

Sample ID	Laboratory ID	Sample Matrix	Date Sampled	Date Received	Analysis Performed
AF-A-EF117-PAH	9712088A-01A	AIR	12/3/97	12/6/97	TO-13
AF-I-EF117-PAH	9712088A-02A	"	"	"	"
AF-M-EF404-PAH	9712088A-03A	"	12/4/97	"	"
AF-N-EF404-PAH	9712088A-04A	"	"	"	"
AF-B-EF404-PAH-FB	9712088A-05A	"	12/5/97	"	"
AF-B-EF404-PAH	9712088A-06A	"	"	"	"

Was narrative included in data package? YES / NO

Was QC Sign-off sheet included in data package? YES / NO

EQ

SVOAs TO-13 2/97

QC Level II Data Review Check List for Semivolatile Analysis (SVOAs) by EPA Method TO-13

PN / Site Name: 3314-6RB-1160/Armstrong C.O.C#(s) ATL 97129SA
Laboratory: ATL Matrix: air
Reviewer / Date: JDeem 3/25/98

Review Item / Criteria	Y	N	Flag	Comments
General Information				
1. Was a descriptive Case Narrative provided?	✓			
2. What date were samples received?				Sample Receipt Date - 12/6/97
3. Was sample condition upon receipt noted with no associated problems?	✓			
4. Were samples prepared within required holding times?	✓			Preparation Dates - 12/8/97
5. Was the correct methodology used for sample preparation?	✓			
6. Was the required cleanup method(s) used?	✓			
7. Were samples analyzed within required holding times?	✓			Dates of analysis - 1/10, 1/15, 1/16
GC/MS Tuning				
1. Was the GC/MS system tuned with decaflorotriphenylphosphine?	✓			1/8 1/15 1/10
2. Was the criteria met during each 12 hour shift?	✓			
Initial Calibration Curve				
1. Does the initial calibration curve consist of 5 concentration levels, with the low standard near but above the MDL?	✓			1/8
2. Did all compounds have an average response factor of at least 0.05?	✓			
3. Did all compounds have an relative standard deviation (%RSD) of <20 for PAHs and <30 for all others?	✓	✓	no action taken on 2,4-DNP and 2,4-Dinitrophenol	2,4-Dinitrophenol = 30.109 CC 57.3 (for RSD)
4. Was all raw data provided?	✓			

Review Item / Criteria	Y	N	Flag	Comments
Continuing Calibration				
1. Was a CCV run at the beginning of the analytical sequence, after every 12 hours of analysis?	✓			1/10 1/15-1/16
2. Was the CCV a mid-level standard from the initial calibration curve?	✓			
3. Was the percent difference (% D) for the compounds in the CCV ≤ 30?	✓			000 RCC's < 30 PAHs < 20
4. Was all raw data provided?	✓			
Method Blank(s)				
1. Was a method blank(s) run for every extraction batch (up to 20 samples) and evaluated to be ≤ the method detection limit of any target analyte?	✓	✓	all sample results for Blank are ND @ MDL concentration	1/10 di-n-Butylphthalate = 1.4 1/15 " " = 1.3 Sample 01 < 6.02 04 < 4.7 02 < 5.9 05 < 3.5 03 < 6
Compound Identification				Sample 03 check all
1. Were positive results within 0.06 RRT units of the associated standard?	✓			
2. Were all ions present in the standard mass spectrum at an relative intensity > 10% also present in the sample mass spectrum?	✓	✓		1,4-Dichlorobenzene ion 146
3. Were all ions present in the sample mass spectrum but not in the standard, accounted for?	✓	✓		1,4-Dichlorobenzene 10.71 SU
4. Did the relative intensities of the ions specified as present in the sample differ by less than 20% of the standard spectra?	✓			
Compound Quantitation				
1. Were all reported values correctly adjusted to reflect dilutions, percent dry weight or other adjustments?	✓			

Review Item / Criteria	Y	N	Flag	Comments
Surrogate Standards				
1. Were Nitrobenzene-d_5, 2-Fluoro-biphenyl, p-Terphenyl-d_{14}, Phenol-d_6, 2-Fluorophenol, and 2,4,6-Tribromophenol spiked into all calibration standards, blanks, QC samples as well as field samples?	\			
2. Were at least 5 of the 6 surrogates within established limits?	\			
3. Were laboratory control charted limits used or the established limits of EQ (80-120)?	\			
Internal Standards (IS)				
1. Were 1,4-Dichlorobenzene-d_4, Naphthalene-d_8, Acenaphthene-d_{10}, Phenanthrene-d_{10}, Chrysene-d_{12}, and Perylene-d_{12} added to every standard, blank, and sample extracts?	\			
2. Did the retention times for all IS compounds vary by no more than 30 seconds?	\			
3. Did the areas of all IS compounds vary by no more than -50% to +100%?	\			

Additional Comments:

@AIR TOXICS LTD.
AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 9712088A

Work Order Summary

CLIENT:	Ms. Jackie Doan Environmental Quality Management, Inc. 1310 Kemper Meadows Drive Cincinnati, OH 45240	**BILL TO:** Same	
PHONE:	800-500-0575	**P.O. #** 5768	
FAX:	513-825-9728	**PROJECT #** 3214-008-040 USAF/EQM	
DATE RECEIVED:	12/6/97		
DATE COMPLETED:	1/30/98		

FRACTION #	NAME	TEST
01A	AF - A - EF117 PAH	TO-13
01AA	AF - A - EF117 PAH-DUP	TO-13
02A	AF - I - EF117 PAH	TO-13
03A	AF - M - EF404 - PAH	TO-13
04A	AF - N - EF404 - PAH	TO-13
05A	AF - B - EF404 - PAH - FB	TO-13
06A	AF - B - EF404 - PAH	TO-13
07A	Method Blank	TO-13
07B	Method Blank	TO-13
08A	Method Spike	TO-13

CERTIFIED BY: Linda D. Truman
Laboratory Director

DATE: 2/2/98

Certification numbers: CA ELAP - 1149, NY ELAP - 11291, UT ELAP - E-217
180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA 95630
(916) 985-1000 • (800) 985-5955 • FAX (916) 985-1020

Table 1

Client Sample ID	Lab Sample ID	Lab File ID	Date Collected	Date Received	Date Extracted	Date Analyzed
AF - A - EF117 PAH	9712088A-01A	H011014	12/3/97	12/6/97	12/8/97	1/10/98
AF - A - EF117 PAH-DUP	9712088A-01AA	H011015	12/3/97	12/6/97	12/8/97	1/10/98
AF - I - EF117 PAH	9712088A-02A	H011016	12/3/97	12/6/97	12/8/97	1/10/98
AF - M - EF404 - PAH	9712088A-03A	H011506	12/4/97	12/6/97	12/8/97	1/15/98
AF - N - EF404 - PAH	9712088A-04A	H011507	12/4/97	12/6/97	12/8/97	1/15/98
AF - B - EF404 - PAH - FB	9712088A-05A	H011508	12/5/97	12/6/97	12/8/97	1/16/98
AF - B - EF404 - PAH	9712088A-06A	H011509	12/5/97	12/6/97	12/8/97	1/16/98

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.

AF - A - EF117 PAH

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-01A
Lab File ID: H011014
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/10/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	2.5	
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	17	
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	25	
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	51	

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

AF - A - EF117 PAH

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-01A
Matrix:	AMBIENT AIR	Lab File ID:	H011014
Sample Vol:	1.0uL	Date Received:	12/6/97
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/10/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	6.2	B
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	11	
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	5.5	
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.

AF - A - EF117 PAH-DUP

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-01AA
Matrix:	AMBIENT AIR	Lab File ID:	H011015
Sample Vol:	1.0uL	Date Received:	12/6/97
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/10/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	2.7	
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	16	
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	26	
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	51	

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

AF - A - EF117 PAH-DUP

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-01AA
Matrix:	AMBIENT AIR	Lab File ID:	H011015
Sample Vol:	1.0uL	Date Received:	12/6/97
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/10/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	6.6	B
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	11	
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	5.6	
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.

AF - I - EF117 PAH

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-02A
Lab File ID: H011016
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/10/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	19	
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	2.4	
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	29	
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	28	
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.3	
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	53	

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

AF - I - EF117 PAH

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-02A
Matrix:	AMBIENT AIR	Lab File ID:	H011016
Sample Vol:	1.0uL	Date Received:	12/6/97
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/10/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	5.9	B
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	6.0	
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	2.8	
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.

AF - M - EF404 - PAH

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-03A
Matrix:	AMBIENT AIR	Lab File ID:	H011506
Sample Vol:	1.0uL	Date Received:	12/6/97
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/15/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	2.1	
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	17	
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	29	
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	55	

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

AF - M - EF404 - PAH

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-03A
Matrix:	AMBIENT AIR	Lab File ID:	H011506
Sample Vol:	1.0uL	Date Received:	12/6/97
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/15/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	6.0	B
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	3.3	
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	27	
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.

AF - N - EF404 - PAH

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-04A
Matrix:	AMBIENT AIR	Lab File ID:	H011507
Sample Vol:	1.0uL	Date Received:	12/6/97
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/15/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	3.0	
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	16	
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	21	
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	50	

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

AF - N - EF404 - PAH

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-04A
Matrix:	AMBIENT AIR	Lab File ID:	H011507
Sample Vol:	1.0uL	Date Received:	12/6/97
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/15/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	4.7	B
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	3.6	
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	4.5	
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.

AF - B - EF404 - PAH - FB

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-05A
Matrix:	AMBIENT AIR	Lab File ID:	H011508
Sample Vol:	1.0uL	Date Received:	12/6/97
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/16/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	1.0	U
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	1.0	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	52	

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

AF - B - EF404 - PAH - FB

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-05A
Matrix:	AMBIENT AIR	Lab File ID:	H011508
Sample Vol:	1.0uL	Date Received:	12/6/97
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/16/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	3.5	B
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	1.8	
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	9.4	
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.

AF - B - EF404 - PAH

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-06A
Lab File ID: H011509
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/16/98
Dilution Factor: 5.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	230	
111-44-4	bis(2-Chloroethyl) Ether	5.0	U
95-57-8	2-Chlorophenol	25	U
541-73-1	1,3-Dichlorobenzene	5.0	U
106-46-7	1,4-Dichlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	5.0	U
95-48-7	2-Methylphenol	25	U
108-60-1	bis(2-Chloroisopropyl) Ether	5.0	U
621-64-7	N-Nitroso-di-n-propylamine	5.0	U
106-44-5	4-Methylphenol	89	
67-72-1	Hexachloroethane	5.0	U
98-95-3	Nitrobenzene	5.0	U
78-59-1	Isophorone	5.0	U
88-75-5	2-Nitrophenol	25	U
105-67-9	2,4-Dimethylphenol	25	U
65-85-0	Benzoic Acid	200	
111-91-1	bis(2-Chloroethoxy) Methane	5.0	U
120-83-2	2,4-Dichlorophenol	25	U
120-82-1	1,2,4-Trichlorobenzene	5.0	U
91-20-3	Naphthalene	190	
106-47-8	4-Chloroaniline	5.0	U
87-68-3	Hexachlorobutadiene	5.0	U
59-50-7	4-Chloro-3-methylphenol	25	U
91-57-6	2-Methylnaphthalene	190	
77-47-4	Hexachlorocyclopentadiene	50	U
88-06-2	2,4,6-Trichlorophenol	25	U
95-95-4	2,4,5-Trichlorophenol	25	U
91-58-7	2-Chloronaphthalene	5.0	U
88-74-4	2-Nitroaniline	5.0	U
131-11-3	Dimethylphthalate	5.0	U
208-96-8	Acenaphthylene	5.0	U
606-20-2	2,6-Dinitrotoluene	5.0	U
99-09-2	3-Nitroaniline	5.0	U
83-32-9	Acenaphthene	5.0	U
51-28-5	2,4-Dinitrophenol	100	U
100-02-7	4-Nitrophenol	100	U
121-14-2	2,4-Dinitrotoluene	5.0	U
132-64-9	Dibenzofuran	5.0	U
84-66-2	Diethylphthalate	58	

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

AF - B - EF404 - PAH

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-06A
Matrix:	AMBIENT AIR	Lab File ID:	H011509
Sample Vol:	1.0uL	Date Received:	12/6/97
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/16/98
		Dilution Factor:	5.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	5.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	5.0	U
100-01-6	4-Nitroaniline	5.0	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-Nitrosodiphenylamine	5.0	U
101-55-3	4-Bromophenyl-phenyl Ether	5.0	U
118-74-1	Hexachlorobenzene	5.0	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	5.0	U
120-12-7	Anthracene	5.0	U
84-74-2	di-n-Butylphthalate	5.0	U
206-44-0	Fluoranthene	5.0	U
129-00-0	Pyrene	5.0	U
85-68-7	Butylbenzylphthalate	5.0	U
91-94-1	3,3'-Dichlorobenzidine	5.0	U
218-01-9	Chrysene	5.0	U
56-55-3	Benzo(a)anthracene	5.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	7.1	
117-84-0	Di-n-Octylphthalate	5.0	U
205-99-2	Benzo(b)fluoranthene	5.0	U
207-08-9	Benzo(k)fluoranthene	5.0	U
50-32-8	Benzo(a)pyrene	5.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	5.0	U
191-24-2	Benzo(g,h,i)perylene	5.0	U
100-51-6	Benzyl alcohol	25	U

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.

SVBLK01

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-07A
Matrix:	AMBIENT AIR	Lab File ID:	H011012
Sample Vol:	1.0uL	Date Received:	NA
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/10/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	1.0	U
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	1.0	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	1.0	U

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

SVBLK01

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-07A
Matrix:	AMBIENT AIR	Lab File ID:	H011012
Sample Vol:	1.0uL	Date Received:	NA
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/10/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	1.4	
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	1.0	U
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	1.0	U
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.

SVBLK02

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-07B
Lab File ID: H011503
Date Received: NA
Date Extracted: NA
Date Analyzed: 1/15/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	1.0	U
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	1.0	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	1.0	U

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

SVBLK02

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-07B
Matrix:	AMBIENT AIR	Lab File ID:	H011503
Sample Vol:	1.0uL	Date Received:	NA
% Moisture:	NA	Date Extracted:	NA
Instrument ID:	MSD-H	Date Analyzed:	1/15/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	1.3	
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	1.0	U
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	1.0	U
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

LEVEL-IV VALIDATABLE

SEMI-VOLATILE ORGANICS ANALYSIS

EPA Method TO-13

SURROGATE RECOVERY

Lab Name: AIR TOXICS LTD. SDG No:

Lab Code: Contract:

		SURROGATE % RECOVERY					
	CLIENT SAMPLE NO.	2-Fluorophenol	#	Phenol-d5	#	Nitrobenzene-d5	#
01	AF - A - EF117 PAH	62		69		66	
02	AF - A - EF117 PAH-DUP	58		68		68	
03	AF - I - EF117 PAH	62		68		67	
04	AF - M - EF404 - PAH	55		57		69	
05	AF - N - EF404 - PAH	55		53		58	
06	AF - B - EF404 - PAH - FB	45		51		52	
07	AF - B - EF404 - PAH	63		63		78	
08	SVBLK01	59		63		64	
09	SVBLK02	55		60		60	
10	SVBLK01MBS	51		56		56	
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

Column used to flag values outside QC limits with an asterisk

Surrogate Recovery Limits

2-Fluorophenyl: 25-121%

Phenol-d5: 24-113%

Nitrobenzene-d5: 23-120%

LEVEL-IV VALIDATABLE

SEMI-VOLATILE ORGANICS ANALYSIS

EPA Method TO-13

SURROGATE RECOVERY (Cont.)

Lab Name: AIR TOXICS LTD. SDG No:

Lab Code: Contract:

	CLIENT SAMPLE NO.	SURROGATE % RECOVERY						
		2-Fluorobiphenyl	#	2,4,6-Tribromophenol	#	Terphenyl-d14	#	TOTAL OUT
01	AF - A - EF117 PAH	67		105		112		0
02	AF - A - EF117 PAH-DUP	70		106		112		0
03	AF - I - EF117 PAH	68		106		105		0
04	AF - M - EF404 - PAH	70		89		99		0
05	AF - N - EF404 - PAH	62		79		98		0
06	AF - B - EF404 - PAH - FB	55		84		103		0
07	AF - B - EF404 - PAH	73		77		89		0
08	SVBLK01	58		78		100		0
09	SVBLK02	66		71		94		0
10	SVBLK01MBS	58		78		97		0
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								

Column used to flag values outside QC limits with an asterisk

Surrogate Recovery Limits

2-Fluorobiphenyl: 30-115%

2,4,6-Tribromophenol: 19-121%

Terphenyl-d14: 18-137%

LEVEL-IV VALIDATABLE

SEMI-VOLATILE ORGANICS ANALYSIS

EPA Method TO-13

METHOD BLANK SPIKE DATA SHEET

CLIENT SAMPLE NO.

SVBLK01MBS

Lab Name: AIR TOXICS LTD.	SDG No:	
Lab Code:	Contract:	
Lab Sample ID: 9712088A-08A	Instrument ID: MSD-H	Date Extracted: NA
Lab File ID: H011013	Dil.: 1.0	Date Analyzed: 1/10/98

CAS #	COMPOUND	AMT. SPIKED (ug)	AMT. FOUND (ug)	% RECOVERY	#	% Rec. Limits
108-95-2	Phenol	100	58	58		26-90
95-57-8	2-Chlorophenol	100	59	59		25-102
106-46-7	1,4-Dichlorobenzene	100	57	57		28-104
621-64-7	N-Nitroso-di-n-propylamine	100	57	57		41-126
120-82-1	1,2,4-Trichlorobenzene	100	55	55		38-107
59-50-7	4-Chloro-3-methylphenol	100	67	67		26-103
83-32-9	Acenaphthene	100	65	65		31-137
100-02-7	4-Nitrophenol	100	93	93		11-114
121-14-2	2,4-Dinitrotoluene	100	87	87		28-89
87-86-5	Pentachlorophenol	100	86	86		17-109
129-00-0	Pyrene	100	99	99		35-142

Column to be used to flag % recovery values with an asterisk.

* Values outside of QC Limits.

%Rec:___0___ out of ___11___ outside limits

COMMENTS: _____

_____

9712088

Lab Tracking Number

Chain-of-Custody Record/Lab Work Request

Page ___ of ___

Client	USAF/EQM	**Phone Number**	513-825-7500
Work Order Number	3214-008-040	**Turn Around Time**	10 Day
Contact Person	Tom Gerstel		

Lab ID	Sample ID	Sample Date	Analysis	Sample Type	Canister / Filter / No.		Method	Sample Check-off
			Analyses Requested/Other Info					
01	AF - A - EF117 PAH	12/3/97	PAH	PUF/filter			PAH	
	AF - A - EF117 VOC	12/3/97	VOC	Canister	12654		VOC	

Notes:

Canister Inital Vacuum 27.5 "Hg

Canister Final Vacuum 10 "Hg

Relinquished By	Received By	Date	Time	Lab Use Only	
	Fed X	12/5		Shipper	Air Bill #
	Melissa Stroppel	12/4/97	1400	Opened By	Date/Time
				Temp °C	Condition
				Custody Seals: Yes No None N/A	

Laboratory Comments:

Boxes - Ambient Condition when received good

Custody Seal intact? Y N None — Temp. Cooler ice

9712088/

Lab Tracking Number

Chain-of-Custody Record/Lab Work Request

Client	USAF/EQM	Phone Number	513-825-7500
Work Order Number	3214-008-040	Turn Around Time	10 Day
Contact Person	Tom Gerstel		

			Analyses Requested/Other Info					
Lab ID	Sample ID	Sample Date	Analysis	Sample Type	Canister / Filter / No.		Method	Sample Check-off
02	AF - I - EF117 PAH	12/3/97	PAH	PUF/filter			PAH	
	AF - I - EF117 VOC	12/3/97	VOC	Canister	12540		VOC	

Notes:

Canister Inital Vacuum 27.5 "Hg
Canister Final Vacuum 7.5 "Hg

Relinquished By	Received By	Date	Time	Lab Use Only	
	Fed	12/5		Shipper	Air Bill #
	[illegible]	12/16/97	1400	Opened By	Date/Time
				Temp °C	Condition
				Custody Seals: Yes No None N/A	

Laboratory Comments:

Custody Seal intact: (Y) N None Boxes Amber
Temp. Cooler-on-ice
Condition when received good

9712088A

Lab Tracking Number

Chain-of-Custody Record/Lab Work Request

WESTON

Page____of____

Client	USAF/EQM	Phone Number	513-825-7500
Work Order Number	3214-008-040	Turn Around Time	10 Day
Contact Person	Tom Gerstel		

			Analyses Requested/Other Info					
Lab ID	ample ID	Sample Date	Analysis	Sample Type	Canister / Filter / No.		Method	Sample Check-off
OAV	AF - M - EF404 - PAH	12/4/97	PAH	PUF/filter			PAH	
	AF - M - EF404 - VOC	12/4/97	VOC	Canister	427		VOC	

Notes:

Canister Inital Vacuum 27.5 "Hg

Canister Final Vacuum 1.5 "Hg

Relinquished By	Received By	Date	Time	Lab Use Only	
	Fed X	12/5		Shipper	Air Bill #
	Theresa Stregolski	12/6/97	1401	Opened By	Date/Time
				Temp °C	Condition
				Custody Seals: Yes No None N/A	

Laboratory Comments:

Custody Seal intact (Y) N None Temp. Boxes-Ambient Coolers-on ice Condition when received good

9712088

Lab Tracking Number

Chain-of-Custody Record/Lab Work Request

Page ___ of ___

Client	USAF/EQM	**Phone Number**	513-825-7500
Work Order Number	3214-008-040	**Turn Around Time**	10 Day
Contact Person	Tom Gerstel		

Lab ID	Sample ID	Sample Date	Analysis	Sample Type	Canister / Filter / No.		Method	Sample Check-off
			Analyses Requested/Other Info					
0317	AF - N - EF404 - PAH	12/4/97	PAH	PUF/filter			PAH	
0417								
	AF - N - EF404 - VOC	12/4/97	VOC	Canister	1009		VOC	

Notes:

Canister Inital Vacuum 27.5 "Hg

Canister Final Vacuum 0 "Hg

Relinquished By	Received By	Date	Time	Lab Use Only	
	FedEx	12/5		Shipper	Air Bill #
	Theresa Arapoke 12/6/97		1450	Opened By	Date/Time
				Temp °C	Condition
				Custody Seals: Yes No None N/A	

Laboratory Comments:

Custody Seal intact (Y) N None — Temp Boxes-Ambient Coolers-ice — Condition when receive good

9712088/N

Lab Tracking Number

Chain-of-Custody Record/Lab Work Request

Client	USAF/EQM	**Phone Number**	513-825-7500
Work Order Number	3214-008-040	**Turn Around Time**	10 Day
Contact Person	Tom Gerstel		

				Analyses Requested/Other Info					
Lab ID	**Sample ID**	**Sample Date**	**Analysis**	**Sample Type**	**Canister / Filter / No.**		**Method**	**Sample Check-off**
DAN	AF - B - EF404 - PAH - FB	12/5/97	PAH	PUF/filter			PAH - FB	
OSM								
	AF - B - EF404 - VOC - FB	12/5/97	VOC	Canister	21015		VOC - FB	

Notes:

Canister Inital Vacuum 27 "Hg
Canister Final Vacuum 27 "Hg

Relinquished By	Received By	Date	Time	Lab Use Only	
	FedEx	12/5		Shipper	Air Bill #
	Theresa Stapleton	12/6/97	1400	Opened By	Date/Time
				Temp °C	Condition
				Custody Seals: Yes No None N/A	

Laboratory Comments:

Custody Seal Intact? (Y) N None Temp. Boxes-Ambient Coolers-on-ice Condition when received - good

9712088A

Lab Tracking Number

Chain-of-Custody Record/Lab Work Request

WESTON

Page ___ of ___

Client	USAF/EQM	**Phone Number**	513-825-7500
Work Order Number	3214-008-040	**Turn Around Time**	10 Day
Contact Person	Tom Gerstel		

Lab ID	Sample ID	Sample Date	Analysis	Sample Type	Canister / Filter / No.		Method	Sample Check-off
			Analyses Requested/Other Info					
01N	AF - B - EF404 - PAH	12/5/97	PAH	PUF/filter			PAH	
	AF - B - EF404 - VOC	12/5/97	VOC	Canister	1278		VOC	

Notes:

Canister Inital Vacuum 27.5 "Hg

Canister Final Vacuum 7.1 "Hg

Relinquished By	Received By	Date	Time	Lab Use Only	
	FedEx	12/5		Shipper	Air Bill #
	Theresa Stepleton	12/6/97	1400	Opened By	Date/Time
				Temp °C	Condition
				Custody Seals: Yes No None N/A	

Laboratory Comments:

Custody Seal intact? Y N None Temp. Boxes - Ambient Cooler - Ice Condition when received Good

LEVEL-IV VALIDATABLE

Semi-Volatile Organics Analysis
EPA Method TO-13

COMPLETE SDG FILE (CSF) DOCUMENT
INVENTORY SHEET

Lab Name: Air Toxics Ltd.
City/State: Folsom, CA
Lab Code:

Contract:
SDG:
Work Order: 9712088A

	Page Nos. From	Page Nos. To	(Please Check:) Lab	(Please Check:) Region
1. Inventory Sheet (ATL-2) (Do Not Number)			√	
2. Cover Page & Laboratory Narrative (Do Not Number)			√	
3. QC Summary				
a. Surrogate Recovery (FORM II-ATL)	1	2	√	
b. Sample Results/Sample Results Duplicate (FORM III-DUP-ATL)	–	–	–	
c. Method Blank Spike Data Sheet (FORM III B-ATL)	3	3	√	
d. Method Blank Summary (FORM IV-ATL)	–	–	–	
e. GC/MS Instrument Performance Check (DFTPP Tune) (FORM V-ATL)	4	11	√	
f. Internal Standard Area and Retention Time Summary (FORM VIII-ATL)	–	–	–	
4. Sample Results (FORM I-ATL/FORM I-TIC-ATL + Raw Data)	227	–	√	
5. Standards & Raw QC Data				
a. Initial Calibration Data (Summary Sheet + Raw Data)	228	443	√	
b. Continuing Calibration Data (Summary Sheet + Raw Data)	444	641	√	
c. DFTPP Tune (Raw Data)	642	665	√	
d. Method Blank Data (FORM I-ATL + Raw Data)	666	698	√	
e. Method Blank Spike Data (Raw Data)	697	720	√	
6. Shipping/Receiving Documents:				
a. Airbill (No. of Shipments ____)	–	–	–	
b. Chain-of-Custody Records	721	726	√	
c. Sample Tags	–	–	–	
d. Sample Log-In Sheet	727	727	√	
e. Misc. Shipping/Receiving Records (list individual records)				
Sample Receipt Discrepancy Report	728	728	√	
	–	–	–	
7. Internal Lab Sample Transfer Records & Tracking Sheets	–	–	–	
8. Internal Original Sample Preparation & Analysis Records (describe or list):				
a. Preparation Records — Extraction Log	729	729	√	
b. Analysis Records — Run Logs	–	–	–	
9. Other Records (decribe or list)				
a. Telephone Communication Log	–	–	–	
Corrective Action Report	730	731	√	
Data Review Sheet	732	732	√	

Comments:

Completed by:

Julie R. Bellendir (Signature) / Julie R. Bellendir / Document Control (Print Name & Title) / 2/2/98 (Date)

FORM ATL-2

LEVEL-IV VALIDATABLE

SEMI-VOLATILE ORGANICS ANALYSIS

EPA Method TO-13

SURROGATE RECOVERY

Lab Name: AIR TOXICS LTD. SDG No:

Lab Code: Contract:

	CLIENT SAMPLE NO.	SURROGATE % RECOVERY 2-Fluorophenol	#	Phenol-d5	#	Nitrobenzene-d5	#
01	AF - A - EF117 PAH	62		69		66	
02	AF - A - EF117 PAH-DUP	58		68		68	
03	AF - I - EF117 PAH	62		68		67	
04	AF - M - EF404 - PAH	55		57		69	
05	AF - N - EF404 - PAH	55		53		58	
06	AF - B - EF404 - PAH - FB	45		51		52	
07	AF - B - EF404 - PAH	63		63		78	
08	SVBLK01	59		63		64	
09	SVBLK02	55		60		60	
10	SVBLK01MBS	51		56		56	
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							

Column used to flag values outside QC limits with an asterisk

Surrogate Recovery Limits

2-Fluorophenyl: 25-121%

Phenol-d5: 24-113%

Nitrobenzene-d5: 23-120%

LEVEL-IV VALIDATABLE

SEMI-VOLATILE ORGANICS ANALYSIS

EPA Method TO-13

SURROGATE RECOVERY (Cont.)

Lab Name: AIR TOXICS LTD. SDG No:

Lab Code: Contract:

	CLIENT SAMPLE NO.	SURROGATE % RECOVERY						
		2-Fluorobiphenyl	#	2,4,6-Tribromophenol	#	Terphenyl-d14	#	TOTAL OUT
01	AF - A - EF117 PAH	67		105		112		0
02	AF - A - EF117 PAH-DUP	70		106		112		0
03	AF - I - EF117 PAH	68		106		105		0
04	AF - M - EF404 - PAH	70		89		99		0
05	AF - N - EF404 - PAH	62		79		98		0
06	AF - B - EF404 - PAH - FB	55		84		103		0
07	AF - B - EF404 - PAH	73		77		89		0
08	SVBLK01	58		78		100		0
09	SVBLK02	66		71		94		0
10	SVBLK01MBS	58		78		97		0
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								

Column used to flag values outside QC limits with an asterisk

Surrogate Recovery Limits

2-Fluorobiphenyl: 30-115%

2,4,6-Tribromophenol: 19-121%

Terphenyl-d14: 18-137%

LEVEL-IV VALIDATABLE

SEMI-VOLATILE ORGANICS ANALYSIS

EPA Method TO-13

METHOD BLANK SPIKE DATA SHEET

CLIENT SAMPLE NO.
SVBLK01MBS

Lab Name: AIR TOXICS LTD. SDG No:
Lab Code: Contract:
Lab Sample ID: 9712088A-08A Instrument ID: MSD-H Date Extracted: NA
Lab File ID: H011013 Dil.: 1.0 Date Analyzed: 1/10/98

CAS #	COMPOUND	AMT. SPIKED (ug)	AMT. FOUND (ug)	% RECOVERY	#	% Rec. Limits
108-95-2	Phenol	100	58	58		26-90
95-57-8	2-Chlorophenol	100	59	59		25-102
106-46-7	1,4-Dichlorobenzene	100	57	57		28-104
621-64-7	N-Nitroso-di-n-propylamine	100	57	57		41-126
120-82-1	1,2,4-Trichlorobenzene	100	55	55		38-107
59-50-7	4-Chloro-3-methylphenol	100	67	67		26-103
83-32-9	Acenaphthene	100	65	65		31-137
100-02-7	4-Nitrophenol	100	93	93		11-114
121-14-2	2,4-Dinitrotoluene	100	87	87		28-89
87-86-5	Pentachlorophenol	100	86	86		17-109
129-00-0	Pyrene	100	99	99		35-142

Column to be used to flag % recovery values with an asterisk.
* Values outside of QC Limits.

%Rec:___0___ out of ___11___ outside limits

COMMENTS: _____

004

@ Air Tox[illegible] Ltd.

GC/MS TUNING AND MASS CALIBRATION

Decafluorotriphenylphosphine (DFTPP)

Laboratory Name: Air Toxics Ltd.
Lab File ID: h0108Q101001
Instrument ID: MSD-II
Matrix: AIR

SDG No.: _____
Contract: _____
DFTPP Injection Date: 1-8-98
DFTPP Injection Time: 22:48

Log Book #: 393

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	50.74
68	Less than 2.0% of mass 69	(0.00) 1
69	Mass 69 relative abundance	65.18
70	Less than 2.0% of mass 69	(0.17) 1
127	25.0 - 75.0% of mass 198	41.88
197	Less than 1.0% of mass 198	0.00
198	Base peak, 100.0% relative abundance	100.00
199	5.0 - 9.0% of mass 198	6.50
275	10.0 - 30.0% of mass 198	18.31
365	Greater than 0.75% of mass 198	2.07
441	Present, but less than mass 443	77.87
442	40.0 - 110.0% of mass 198	58.09
443	15.0 - 24.0% of mass 442	(19.29) 2

1 - value in parenthesis is % mass 69
2 - value in parenthesis is % mass 442

#	I.S.	Area cts.
	1,4-Dichlorobenzene-d4:	7272118
	Naphthalene-d8:	13821622
	Acenaphthene-d10:	8116937
	Phenanthrene-d10:	14791818
	Chrysene-d12:	11581767
	Perylene-d12:	8146005

THIS TUNE CHECK APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

	use	File #	Sample Name/Client	STD. I.D.	Amount	Dil. Fac.	Date Analyzed	Time Analyzed	Int.	Comments
1	/	h0109Q101001	solvent		1.0 ul	1.0	1-9-98	23:10		
2	/	h0109Q101002	solvent		1.0 ul	↓	↓	23:24	↓	
3	/	h0109Q101101	conditioning shot		1.0 ul	↓	↓	23:39	↓	
4	/	h0109Q101003	solvent		1.0 ul	↓	1-9-98	00:21	↓	

005

5	/	h0109211010	solvent		1.0 ul	1.0	1-9-98	0034	
6	/	h0109030107	1ug STD	396-4-1	1.0 ul			00:49	
7	/	h0109010108	10 ug STD	396-4-10	1.0 ul			01:30	
8	/	h0109050109	20 ug STD	396-4-20	1.0 ul			02:13	
9	/	h0109060110	40 ug STD	396-4-40	1.0 ul			02:56	
10	/	h0109070111	80 ug STD	396-4-80	1.0 ul			03:39	
11	/	h0109080112	120 ug STD	396-4-120	1.0 ul			04:21	
12	/	h0109090113	160 ug STD	396-4-160	1.0 ul			05:04	
13	/	h0109111014	solvent		1.0 ul			05:48	
14	/	h0109120115	solvent		1.0 ul			06:01	
15	/	h0109100116	solvent blank		1.0 ul			06:16	
16	/	h0109111017	solvent chak BQ344		1.0 ul			06:57	
17	R	h0109120118	second source	396-5-80	1.0 ul			07:40	FOR MANY COMPOUNDS USED WIDENT STD
18	/	h0109130119	xlea cmpd (1-Cl-3,4-DENTE-E)		1.0 ul			08:23	
19					1.0 ul				
20					1.0 ul				
21					1.0 ul				
22					1.0 ul				
23					1.0 ul				
24					1.0 ul				
25					1.0 ul				
26					1.0 ul				
27					1.0 ul				
28					1.0 ul				
29					1.0 ul				
30					1.0 ul				
31					1.0 ul				
32					1.0 ul				

Signed

1-11-99
Date

006

@ Air Toxicx Ltd.

GC/MS TUNING AND MASS CALIBRATION

Decafluorotriphenylphosphine (DFTPP)

Log Book #: 393

Laboratory Name Air Toxics Ltd.
Lab File ID h0110001
Instrument ID MSD-H
Matrix: AIR

SDG No.:
Contract:
DFTPP Injection Date: 1.10.98
DFTPP Injection Time: 11:42

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	55.47
68	Less than 2.0% of mass 69	(0.00)1
69	Mass 69 relative abundance	70.98
70	Less than 2.0% of mass 69	(0.24)1
127	25.0 - 75.0% of mass 198	43.47
197	Less than 1.0% of mass 198	0.00
198	Base peak, 100.0% relative abundance	100
199	5.0 - 9.0% of mass 198	6.54
275	10.0 - 30.0% of mass 198	18.38
365	Greater than 0.75% of mass 198	2.06
441	Present, but less than mass 443	38.16
442	40.0 - 110.0% of mass 198	49.54
443	15.0 - 24.0% of mass 442	(19.03)2

# I.S.	Area cts.
1,4-Dichlorobenzene-d4:	5433602
Naphthalene-d8:	10679247
Acenaphthene-d10:	6057945
Phenanthrene-d10:	11000079
Chrysene-d12:	8154182
Perylene-d12:	5122068

1 - value in parenthesis is % mass 69
2 - value in parenthesis is % mass 442

THIS TUNE CHECK APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

	use	File #	Sample Name/Client	STD. I.D. 396-4-80	Amount	Dil. Fac.	Date Analyzed	Time Analyzed	Int.	Comments
1	✓	h0110 001	80 ug Cal Check	~~396-5-80~~	1.0 ul	1.0	1.10.98	11:57		OK - 1 high
2	✓	h0110003	Solvent Blank		1.0 ul	↓	↓	12:51	↓	
3	/	h0110004	9712173-05A		1.0 ul			13:28		
4	/	h0110501005	9712173-06A		1.0 ul			14.11		

007

5	h0110060101006	9712173-07A		1.0 ul	1.0	1-10-98	14:54		
6	h0110070101007	9712087-BLK		1.0 ul	↓		15:37		1 HIGH SURR
7	h0110080101008	9712087-01A (1:10)		1.0 ul	10		16:20		
8	h0110090101009	9712087-05A		1.0 ul	1.0		17:03		
9	h0110100101010	9712087-05AA		1.0 ul	↓		17:45		
10	h0110110101011	9712087-06A (1:5 or 5mL FINAL VOL.)		1.0 ul	25.0		18:28		
11	h0110120101012	BLANK 12/8		1.0 ul	1.0		19:11		
12	h0110130101013	SPIKE 12/8		1.0 ul			19:54		
13	h0110140101014	9712088-01A		1.0 ul			20:37		
14	h0110150101015	9712088-01AA		1.0 ul	↓		21:19		
15	h0110160101016	9712088-02A		1.0 ul	↓	↓	22:02	↓	
16				~~1.0 ul~~					
17				1.0 ul					
18				1.0 ul					
19				1.0 ul					
20				1.0 ul					
21				1.0 ul					
22				1.0 ul					
23				1.0 ul					
24				1.0 ul					
25				1.0 ul					
26				1.0 ul					
27				1.0 ul					
28				1.0 ul					
29				1.0 ul					
30				1.0 ul					
31				1.0 ul					
32				1.0 ul					

1-11-98

Kristy Mayo 1.29.98

Signed

1-11-98
Date

008

@ Air [illegible]ics Ltd.

GC/MS TUNING AND MASS CALIBRATION

Decafluorotriphenylphosphine (DFTPP)

Laboratory Name: Air Toxics Ltd.
Lab File ID: h01150101001
Instrument ID: MSD-H
Matrix: AIR

SDG No.: _____
Contract: _____
DFTPP Injection Date: 1-15-98
DFTPP Injection Time: 08:43

Log Book #: 393

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	48.81
68	Less than 2.0% of mass 69	(0.00) 1
69	Mass 69 relative abundance	63.38
70	Less than 2.0% of mass 69	(0.45) 1
127	25.0 - 75.0% of mass 198	47.11
197	Less than 1.0% of mass 198	0.00
198	Base peak, 100.0% relative abundance	100.00
199	5.0 - 9.0% of mass 198	6.43
275	10.0 - 30.0% of mass 198	20.61
365	Greater than 0.75% of mass 198	2.49
441	Present, but less than mass 443	79.52
442	40.0 - 110.0% of mass 198	70.15
443	15.0 - 24.0% of mass 442	(18.95) 2

1 - value in parenthesis is % mass 69
2 - value in parenthesis is % mass 442

#	I.S.	Area cts.
	1,4-Dichlorobenzene-d4:	10654269
	Naphthalene-d8:	16919358
	Acenaphthene-d10:	12271905
	Phenanthrene-d10:	19162935
	Chrysene-d12:	16491019
	Perylene-d12:	9979847

THIS TUNE CHECK APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

	Use	File #	Sample Name/Client	STD. I.D.	Amount	Dil. Fac.	Date Analyzed	Time Analyzed	Int.	Comments
1	✓	h01150101002	Conditioning Shot		1.0 ul	1.0	1-15-98	09:45		
2	✓	h01150101003	solvent		1.0 ul	↓	↓	10:26		
3	✓	h01150101004	"		1.0 ul			10:39		
4	✓	h01150101005	Conditioning Shot		1.0 ul	↓	↓	11:05	↓	

009

5	/	h011521010006	solvent		1.0 ul	1.0	1-15-98	11:43		
6	/	h011521010071	solvent		1.0 ul			11:56		
7	/	h011503010081	1ng STD	396-4-1	1.0 ul			12:11		
8	/	h011504010091	10ng STD	396-4-10	1.0 ul			12:52		
9	/	h011505010101	20ng STD	396-4-20	1.0 ul			13:35		
10	/	h011506010111	40ng STD	396-4-40	1.0 ul			14:18		
11	/	h011507010121	80ng STD	396-4-80	1.0 ul			15:01		
12	/	h011508010131	120ng STD	396-4-120	1.0 ul			15:44		
13	/	h011509010141	160ng STD	396-4-160	1.0 ul			16:27		
14	/	h011510010151	solvent		1.0 ul			17:11		
15	/	h011511010161	solvent		1.0 ul			17:24		
16	/	h011512010171	solvent blank		1.0 ul			17:39		BENZO(GHI) HIT!
17					1.0 ul					
18					1.0 ul					
19					1.0 ul					
20					1.0 ul					
21					1.0 ul					
22					1.0 ul					
23					1.0 ul					
24					1.0 ul					
25					1.0 ul					
26					1.0 ul					
27					1.0 ul					
28					1.0 ul					
29					1.0 ul					
30					1.0 ul					
31					1.0 ul					
32					1.0 ul					

1-17-98
Signed Date

010

@ Air Toxicx Ltd.

GC/MS TUNING AND MASS CALIBRATION

Decafluorotriphenylphosphine (DFTPP)

Laboratory Name: Air Toxics Ltd.
Lab File ID: ho115010101B
Instrument ID: MSD-H
Matrix: AIR

SDG No.: _____
Contract: _____
DFTPP Injection Date: 1-15-98
DFTPP Injection Time: 18:23

Log Book #: 393

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	52.89
68	Less than 2.0% of mass 69	(0.00) 1
69	Mass 69 relative abundance	68.85
70	Less than 2.0% of mass 69	(0.19) 1
127	25.0 - 75.0% of mass 198	49.63
197	Less than 1.0% of mass 198	0.00
198	Base peak, 100.0% relative abundance	100.00
199	5.0 - 9.0% of mass 198	6.69
275	10.0 - 30.0% of mass 198	20.63
365	Greater than 0.75% of mass 198	2.34
441	Present, but less than mass 443	81.88
442	40.0 - 110.0% of mass 198	62.60
443	15.0 - 24.0% of mass 442	(18.93) 2

# I.S.	Area cts.
1,4-Dichlorobenzene-d4:	1270581
Naphthalene-d8:	1745391
Acenaphthene-d10:	1249791
Phenanthrene-d10:	1793787O
Chrysene-d12:	1530180l
Perylene-d12:	995493Z

1 - value in parenthesis is % mass 69
2 - value in parenthesis is % mass 442

THIS TUNE CHECK APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS

	use	File #	Sample Name/Client	STD. .I.D.	Amount	Dil. Fac.	Date Analyzed	Time Analyzed	Int.	Comments
1	/	ho115020101B	80 ng STD	396-4-80	1.0 ul	1.0	1-15-98	18:36	*	2 cmpds out
2	/	ho115020101C	80 ng STD (2nd source)	396-5-80	1.0 ul	↓	↓	19:25	↓	1 cmpd out
3	/	ho115210101A	solvent		1.0 ul	↓	↓	20:03	↓	
4	/	ho115210202A	↓		1.0 ul	↓	↓	20:16	↓	

5		h011S0301023	12/8 Method Blank		1.0 ul	1.0	1-15-98	20:31	
6	/	h011S0401024	9712257B - BLK		1.0 ul			21:12	
7		h011S0501025	9712257B - SPK		1.0 ul			21:55	
8		h011S0601026	9712088A - 03A		1.0 ul			22:38	
9		h011S0701027	9712088A - 04A		1.0 ul		1-16-98	23:20	
10		h011S0801028	9712088A - 05A		1.0 ul			00:03	
11		h011S0901029	9712088A - 06A (1:5)		1.0 ul	5.0		00:45	
12		h011S1001030	9712088A - 06A		1.0 ul	1.0		01:28	
13	/	h011S1101031	Solvent		1.0 ul	↓		02:12	
14	/	h011S1201032	9712259 - 03A (1:2)		1.0 ul	2.0		02:26	
15	/	h011S1301033	9712259 - 04A (1:2)		1.0 ul	2.0		03:07	
16	/	h011S1401034	9712259 - 05A (1:10)		1.0 ul	10.0		03:50	
17	/	h011S1501035	9712257B - 01A		1.0 ul	1.0		04:32	
18	/	h011S1601036	Solvent		1.0 ul	↓		05:15	
19					1.0 ul				
20					1.0 ul				
21					1.0 ul				
22					1.0 ul				
23					1.0 ul				
24					1.0 ul				
25					1.0 ul				
26					1.0 ul				
27					1.0 ul				
28					1.0 ul				
29					1.0 ul				
30					1.0 ul				
31					1.0 ul				
32					1.0 ul				

1-16-98

Signed

1-19-98

Date

1.29.98

Revised 12/97

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.
AF - A - EF117 PAH

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-01A
Lab File ID: H011014
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/10/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	2.5	
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	17	
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	25	
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	51	

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.
AF - A - EF117 PAH

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-01A
Lab File ID: H011014
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/10/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	6.2	B
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	11	
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	5.5	
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-10Jan98.b/h01101401014.d
Lab Smp Id: 9712088A-01A Client Smp ID: AF-A-EF117 PAH
Inj Date : 10-JAN-1998 20:37
Operator : hch Inst ID: msdh.i
Smp Info : 1.0ul 9712088A-01A
Misc Info : 80 ng ISTD #267-91-1
Comment :
Method : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Meth Date : 29-Jan-1998 16:36 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 14
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8270.sub
Target Version: 3.40
Processing Host: frodo

1-30-98
1.30.98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
$	1 2-Fluorophenol	112	5.407	5.389	(0.685)	3043736	61.6580	61.6
$	2 Phenol-d5	99	7.108	7.107	(0.663)	4158309	69.4304	69.4(M)
*	7 1,4-Dichlorobenzene-d4	150	7.893	7.892	(1.000)	4898557	80.0000	
	8 1,4-Dichlorobenzene	146	7.926	7.925	(1.004)	124843	2.53909	2.5
$	15 Nitrobenzene-d5	82	9.087	9.086	(0.609)	3684076	65.6115	65.6
*	24 Naphthalene-d8	136	10.723	10.722	(1.000)	9975791	80.0000	
	25 Naphthalene	128	10.772	10.771	(1.005)	2067252	17.0283	17.0
	29 2-Methylnaphthalene	142	12.391	12.407	(1.156)	1945674	25.3298	25.3
$	33 2-Fluorobiphenyl	172	13.291	13.306	(0.717)	6801488	67.2712	67.3
*	40 Acenaphthene-d10	164	14.910	14.926	(1.000)	6314793	80.0000	
	46 Diethylphthalate	149	16.022	16.038	(1.075)	4960702	51.3501	51.4
$	52 2,4,6-Tribromophenol	330	16.840	16.839	(0.674)	1712504	105.112	105
*	56 Phenanthrene-d10	188	18.525	18.541	(1.000)	11765127	80.0000	
	59 Di-n-butylphthalate	149	20.030	20.062	(1.081)	978037	6.22189	6.2

"B"

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
$ 62 Terphenyl-d14	244	22.467	22.483	(0.900)	8822864	111.987	112
64 Butyl benzyl phthalate	149	23.677	23.709	(0.948)	718110	10.8442	10.8
65 bis(2-ethylhexyl)Phthalate	149	25.100	25.132	(1.005)	507115	5.51658	5.5
* 67 Chrysene-d12	240	24.970	25.002	(1.000)	7913088	80.0000	
* 72 Perylene-d12	264	28.323	28.338	(1.000)	4831247	80.0000	

QC Flag Legend

M - Compound response manually integrated.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-10Jan98.b/h01101401014.d
Lab Smp Id:
Inj Date : 10-JAN-1998 20:37
Operator : hch Inst ID: msdh.i
Smp Info : 9712088-01a
Misc Info :
Comment :
Method : /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Meth Date : 10-Jan-1998 11:38 Quant Type: ISTD
Cal Date : 09-JAN-1998 00:49 Cal File: h01080301007.d
Als bottle: 14
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8270.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
$ 1 2-Fluorophenol	112	5.407	5.389	(0.685)	3043736	61.6580	61.6
	112	5.194	5.389	(0.658)	83243	1.68628	1.7(R)
	112	5.276	5.389	(0.668)	67440	1.36616	1.4(R)
	112	5.717	5.389	(0.724)	27482	0.55671	0.56(R)
$ 2 Phenol-d5	99	6.960	7.107	(0.649)	346902	5.79215	5.8(R)
	99	6.781	7.107	(0.632)	60899	1.01682	1.0(R)
	99	6.895	7.107	(0.643)	179722	3.00078	3.0(R)
3 Phenol	94	7.124	7.123	(0.903)	263770	4.55797	4.6
	94	7.255	7.123	(0.919)	37819	0.65352	0.65(a)
4 bis(2-Chloroethyl)ether	93	7.386	7.336	(0.936)	35598	0.73082	0.73(a)
	93	6.977	7.336	(0.884)	30070	0.61733	0.62(a)
	93	7.026	7.336	(0.890)	38906	0.79873	0.80(a)
	93	7.255	7.336	(0.919)	62374	1.28052	1.3
	93	7.549	7.336	(0.956)	55467	1.13872	1.1

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
6 1,3-Dichlorobenzene	146	7.926	7.778	(1.004)	124843	2.55229	2.6
* 7 1,4-Dichlorobenzene-d4	150	7.893	7.892	(1.000)	4898557	80.0000	
	150	7.680	7.892	(1.000)	365	80.0000	
	150	8.171	7.892	(1.000)	868	80.0000	
	150	8.220	7.892	(1.000)	3392	80.0000	
8 1,4-Dichlorobenzene	146	7.926	7.925	(1.004)	124843	2.55146	2.6
9 1,2-Dichlorobenzene	146	7.926	8.252	(1.004)	124843	2.70528	2.7
10 2-Methylphenol	108	8.400	8.399	(1.064)	26966	0.68146	0.68(a)
	108	8.138	8.399	(1.031)	107879	2.72624	2.7
	108	8.727	8.399	(1.106)	61193	1.54642	1.5
11 bis(2-Chloroisopropyl)ether	45	8.220	8.465	(1.041)	77281	0.91998	0.92(a)
12 4-Methylphenol	108	8.727	8.743	(1.106)	61193	1.49504	1.5
	108	8.400	8.743	(1.064)	26966	0.65882	0.66(a)
13 N-Nitrosodipropylamine	70	8.711	8.775	(1.104)	188014	5.62755	5.6
	70	8.367	8.775	(1.060)	112837	3.37739	3.4
	70	8.465	8.775	(1.073)	572360	17.1316	17.1
	70	8.547	8.775	(1.083)	594891	17.8060	17.8
	70	8.613	8.775	(1.091)	358619	10.7340	10.7
	70	8.923	8.775	(1.131)	41223	1.23387	1.2
	70	9.005	8.775	(1.141)	388461	11.6272	11.6
	70	9.087	8.775	(1.151)	749965	22.4476	22.4
	70	9.136	8.775	(1.157)	130847	3.91646	3.9
	70	9.201	8.775	(1.166)	666459	19.9482	19.9
14 Hexachloroethane	117	8.940	8.972	(1.133)	124257	6.03700	6.0
$ 15 Nitrobenzene-d5	82	9.087	9.086	(0.609)	3684076	65.6084	65.6
	82	8.662	9.086	(0.581)	140829	2.50797	2.5(R)
	82	8.727	9.086	(0.585)	770920	13.7290	13.7(R)
	82	8.891	9.086	(0.596)	226747	4.03806	4.0(R)
	82	9.185	9.086	(0.616)	99743	1.77629	1.8(R)
	82	9.250	9.086	(0.620)	436370	7.77116	7.8(R)
	82	9.365	9.086	(0.628)	231153	4.11652	4.1(R)
	82	9.463	9.086	(0.635)	301204	5.36403	5.4(R)
16 Nitrobenzene	77	9.103	9.135	(0.849)	172202	3.25896	3.2
	77	8.727	9.135	(0.814)	393581	7.44860	7.4
	77	8.891	9.135	(0.829)	141861	2.68475	2.7
	77	8.940	9.135	(0.834)	177741	3.36379	3.4
	77	9.038	9.135	(0.843)	322646	6.10614	6.1
	77	9.283	9.135	(0.866)	247649	4.68681	4.7
	77	9.365	9.135	(0.873)	92700	1.75437	1.8
	77	9.447	9.135	(0.881)	92098	1.74297	1.7
	77	9.561	9.135	(0.892)	60754	1.14978	1.1
17 Isophorone	82	9.643	9.675	(0.899)	892573	8.15311	8.2
	82	9.250	9.675	(0.863)	434548	3.96933	4.0
	82	9.365	9.675	(0.873)	231153	2.11144	2.1
	82	9.463	9.675	(0.883)	301204	2.75132	2.8
	82	9.512	9.675	(0.887)	160635	1.46730	1.5
	82	9.758	9.675	(0.910)	106054	0.96874	0.97(a)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
	82	9.856	9.675	(0.919)	1813738	16.5674	16.6
	82	10.003	9.675	(0.933)	302097	2.75947	2.8
	82	10.068	9.675	(0.939)	100872	0.92140	0.92(a)
18 2,4-Dimethylphenol	122	9.921	9.937	(0.925)	40316	1.19032	1.2
	122	9.823	9.937	(0.916)	17865	0.52746	0.53(a)
	122	10.117	9.937	(0.944)	278500	8.22263	8.2
	122	10.232	9.937	(0.954)	45892	1.35495	1.4
19 2-Nitrophenol	139	9.872	9.839	(0.921)	46244	1.60523	1.6
	139	9.414	9.839	(0.878)	25985	0.90200	0.90(a)
	139	9.463	9.839	(0.883)	18534	0.64336	0.64(a)
	139	9.561	9.839	(0.892)	17004	0.59025	0.59(a)
	139	9.610	9.839	(0.896)	28401	0.98586	0.98(a)
	139	9.970	9.839	(0.930)	69031	2.39622	2.4
	139	10.085	9.839	(0.941)	56536	1.96249	2.0
	139	10.199	9.839	(0.951)	79191	2.74889	2.7
20 Benzoic Acid	122	10.232	10.231	(0.954)	47824	1.93955	1.9
	122	9.823	10.231	(0.916)	17865	0.72453	0.72(a)
	122	9.921	10.231	(0.925)	41045	1.66462	1.7
	122	10.117	10.231	(0.944)	278500	11.2949	11.3
	122	10.526	10.231	(0.982)	27734	1.12478	1.1
21 bis(2-Chloroethoxy)methane	93	10.183	10.166	(0.950)	53111	0.90148	0.90(a)
	93	9.888	10.166	(0.922)	147678	2.50661	2.5
	93	10.232	10.166	(0.954)	29780	0.50547	0.50(a)
	93	10.330	10.166	(0.963)	40052	0.67982	0.68(a)
	93	10.494	10.166	(0.979)	49662	0.84294	0.84(a)
22 2,4-Dichlorophenol	162	10.395	10.378	(0.969)	20646	0.54472	0.54(a)
	162	10.526	10.378	(0.982)	20527	0.54158	0.54(a)
	162	10.575	10.378	(0.986)	20333	0.53646	0.54(a)
	162	10.657	10.378	(0.994)	103103	2.72022	2.7
* 24 Naphthalene-d8	136	10.723	10.722	(1.000)	9975791	80.0000	
	136	10.314	10.722	(1.000)	9824	80.0000	
	136	10.363	10.722	(1.000)	2706	80.0000	
	136	10.428	10.722	(1.000)	6452	80.0000	
	136	10.526	10.722	(1.000)	2948	80.0000	
	136	10.575	10.722	(1.000)	10395	80.0000	
	136	10.624	10.722	(1.000)	16223	80.0000	
	136	11.082	10.722	(1.000)	2014	80.0000	
25 Naphthalene	128	10.772	10.771	(1.005)	2067252	18.0073	18.0
	128	10.346	10.771	(0.965)	77772	0.67745	0.68
	128	10.657	10.771	(0.994)	85009	0.74049	0.74
	128	10.706	10.771	(0.998)	159509	1.38944	1.4
	128	10.837	10.771	(1.011)	160666	1.39952	1.4
	128	11.181	10.771	(1.043)	80932	0.70498	0.70
26 4-Chloroaniline	127	10.755	10.885	(1.003)	342548	11.9327	11.9
	127	10.657	10.885	(0.994)	25949	0.90394	0.90(a)
	127	10.706	10.885	(0.998)	59296	2.06559	2.1
	127	10.837	10.885	(1.011)	65692	2.28839	2.3

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
		127	10.935	10.885	(1.020)	22050	0.76812	0.77(a)
		127	11.050	10.885	(1.030)	40220	1.40107	1.4
		127	11.181	10.885	(1.043)	52429	1.82638	1.8
	28 4-Chloro-3-Methylphenol	107	11.998	12.047	(1.119)	23990	0.65708	0.66(a)
		107	11.753	12.047	(1.096)	38185	1.04588	1.0
		107	11.819	12.047	(1.102)	131554	3.60325	3.6
		107	12.097	12.047	(1.128)	24148	0.66141	0.66(a)
		107	12.227	12.047	(1.140)	49120	1.34539	1.3
		107	12.326	12.047	(1.149)	38708	1.06021	1.1
	29 2-Methylnaphthalene	142	12.391	12.407	(1.156)	1945674	25.3298	25.3
		142	12.636	12.407	(1.178)	1216879	15.8420	15.8
	31 2,4,6-Trichlorophenol	196	12.685	13.077	(0.851)	14896	0.52822	0.53(a)
$	33 2-Fluorobiphenyl	172	13.291	13.306	(0.717)	6801488	67.2712	67.3
	35 2-Nitroaniline	65	13.912	13.830	(0.933)	23106	0.92941	0.93(a)
		65	13.520	13.830	(0.907)	15098	0.60730	0.61(a)
		65	13.569	13.830	(0.910)	24650	0.99151	0.99(a)
		65	13.634	13.830	(0.914)	75429	3.03403	3.0
		65	13.716	13.830	(0.920)	25251	1.01569	1.0
		65	14.043	13.830	(0.942)	20422	0.82145	0.82(a)
		65	14.092	13.830	(0.945)	14896	0.59917	0.60(a)
		65	14.141	13.830	(0.948)	16042	0.64527	0.64(a)
	37 2,6-Dinitrotoluene	165	14.387	14.451	(0.965)	152186	6.73384	6.7
		165	14.190	14.451	(0.952)	15375	0.68030	0.68(a)
*	40 Acenaphthene-d10	164	14.910	14.926	(1.000)	6314793	80.0000	
		164	14.517	14.926	(1.000)	4358	80.0000	
		164	14.583	14.926	(1.000)	3315	80.0000	
		164	14.648	14.926	(1.000)	3763	80.0000	
		164	14.779	14.926	(1.000)	543	80.0000	
	43 4-Nitrophenol	109	15.482	15.269	(1.038)	12459	1.39186	1.4
		109	14.910	15.269	(1.000)	59305	6.62529	6.6
	44 2,4-Dinitrotoluene	165	15.025	15.416	(1.008)	15539	0.58012	0.58(a)
	46 Diethylphthalate	149	16.022	16.038	(1.075)	4960702	51.3501	51.4
	51 N-nitrosodiphenylamine	169	16.824	16.578	(0.908)	61005	1.09310	1.1
$	52 2,4,6-Tribromophenol	330	16.840	16.839	(0.674)	1712504	105.112	105
*	56 Phenanthrene-d10	188	18.525	18.541	(1.000)	11765127	80.0000	
		188	18.165	18.541	(1.000)	466	80.0000	
		188	18.214	18.541	(1.000)	1245	80.0000	
	59 Di-n-butylphthalate	149	20.030	20.062	(1.081)	978037	6.22189	6.2
$	62 Terphenyl-d14	244	22.467	22.483	(0.900)	8822864	111.987	112
	64 Butyl benzyl phthalate	149	23.677	23.709	(0.948)	718110	10.8441	10.8
	65 bis(2-ethylhexyl)Phthalate	149	25.100	25.132	(1.005)	507115	5.51658	5.5
*	67 Chrysene-d12	240	24.970	25.002	(1.000)	7913088	80.0000	
		240	24.610	25.002	(1.000)	728	80.0000	
		240	24.708	25.002	(1.000)	1606	80.0000	
		240	24.757	25.002	(1.000)	1211	80.0000	
		240	24.855	25.002	(1.000)	6500	80.0000	
*	72 Perylene-d12	264	28.323	28.338	(1.000)	4831247	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)	
	264	27.996	28.338	(1.000)	293	80.0000		
	264	28.061	28.338	(1.000)	855	80.0000		
	264	28.126	28.338	(1.000)	477	80.0000		
	264	28.176	28.338	(1.000)	1858	80.0000		
$ 123 Benzo(e)pyrene-d12	264	27.996	27.995	(0.988)	293			(aR)
	264	27.570	27.995	(0.973)	214			(aR)
	264	27.619	27.995	(0.975)	480			(aR)
	264	27.783	27.995	(0.981)	386			(aR)
	264	27.897	27.995	(0.985)	468			(aR)
	264	28.061	27.995	(0.991)	858			(aR)
	264	28.126	27.995	(0.993)	477			(aR)
	264	28.176	27.995	(0.995)	1858			(aR)
	264	28.323	27.995	(1.000)	4831247			(aR)
124 Benzyl Alcohol	108	8.138	8.170	(1.031)	107879	3.79409	3.8	
	108	8.400	8.170	(1.064)	28327	0.99626	1.00	

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01101401014.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: hch
Method File: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Misc Info:

Calibration Date: JAN/10/98
Calibration Time: 1157

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	5433602	2716801	10867204	4898557	-9.85
24 Naphthalene-d8	10679247	5339624	21358494	9975791	-6.59
40 Acenaphthene-d10	6057945	3028972	12115890	6314793	4.24
56 Phenanthrene-d10	11000079	5500040	22000158	11765127	6.95
67 Chrysene-d12	8154182	4077091	16308364	7913088	-2.96
72 Perylene-d12	5122068	2561034	10244136	4831247	-5.68

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.89	7.39	8.39	7.89	0.01
24 Naphthalene-d8	10.72	10.22	11.22	10.72	0.01
40 Acenaphthene-d10	14.93	14.43	15.43	14.91	-0.10
56 Phenanthrene-d10	18.54	18.04	19.04	18.52	-0.08
67 Chrysene-d12	25.00	24.50	25.50	24.97	-0.13
72 Perylene-d12	28.34	27.84	28.84	28.32	-0.06

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

1.29.98

022

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: 9712088A-01A
Level: LOW
Data Type: MS DATA
SpikeList File: 8270.spk
Sublist File: 8270.sub
Method File: /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Misc Info: 80 ng ISTD #267-91-1

Client SDG: h-10Jan98
Fraction: SV
Client Smp ID: AF-A-EF117 PAH
Operator: hch
SampleType: SAMPLE
Quant Type: ISTD

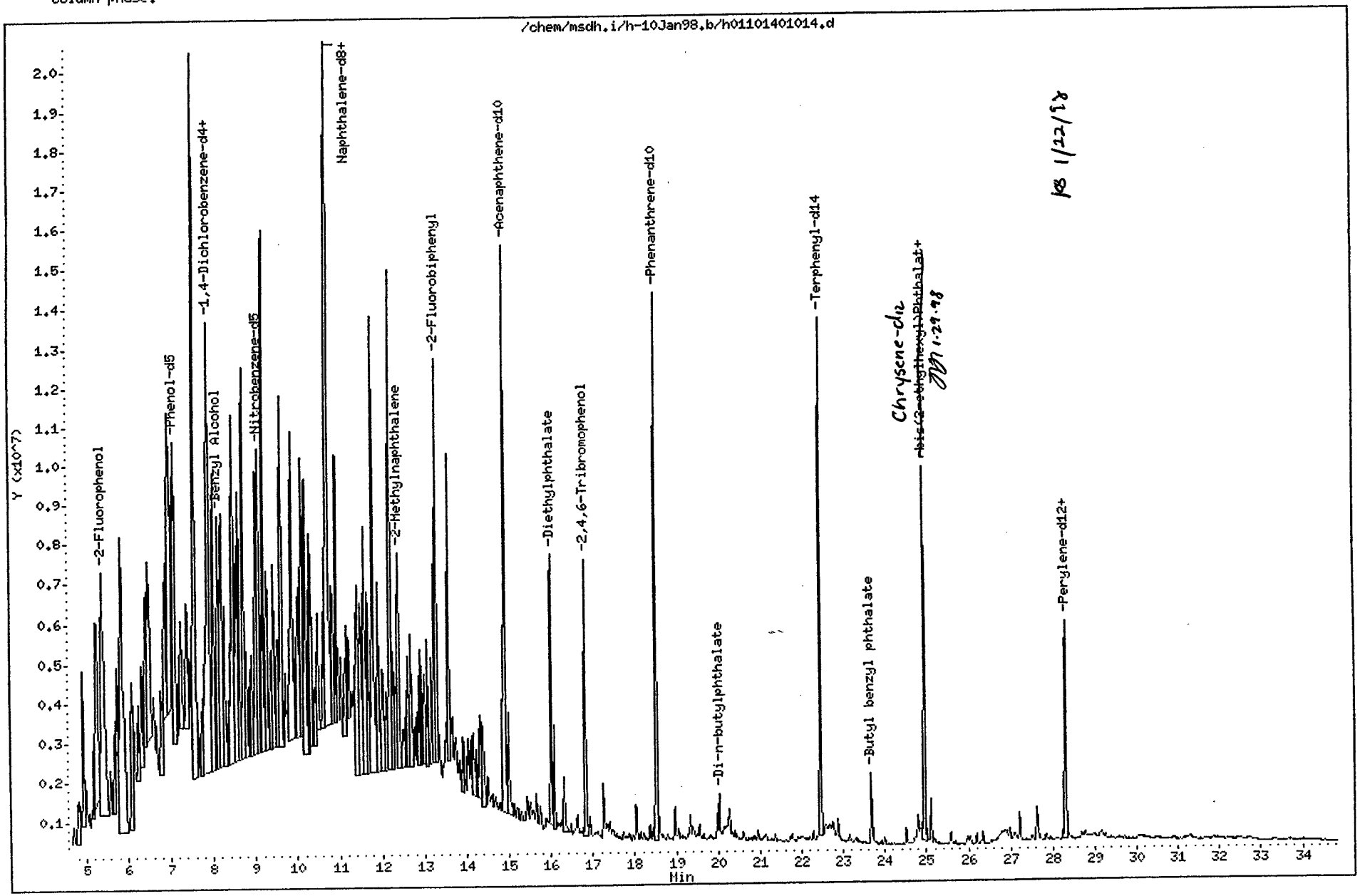
SURROGATE COMPOUND	CONC ADDED ug	CONC RECOVERED ug	% RECOVERED	LIMITS
$ 1 2-Fluorophenol	100	61.6	61.66	25-121
$ 2 Phenol-d5	100	69.4	69.43	24-113
$ 15 Nitrobenzene-d5	100	65.6	65.61	23-120
$ 33 2-Fluorobiphenyl	100	67.3	67.27	30-115
$ 52 2,4,6-Tribromophen	100	105	105.11	19-122
$ 62 Terphenyl-d14	100	112	111.99	18-137
~~$ 123 Benzo(e)pyrene-d12~~	~~2.5~~	~~0.0~~	~~*~~	~~50-150~~
			JM 1.30.98	

023

Data File: /chem/msdh.i/h-10Jan98.b/h01101401014.d
Date : 10-JAN-1998 20:37
Client ID: AF-A-EF117 PAH
Sample Info: 9712088A-01A
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i

Operator: hch
Column diameter: 2.00



Data File: /chem/msdh.i/h-10Jan98.b/h01101401014.d

Date : 10-JAN-1998 20:37

Client ID: AF-A-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-01A

Volume Injected (uL): 1.0

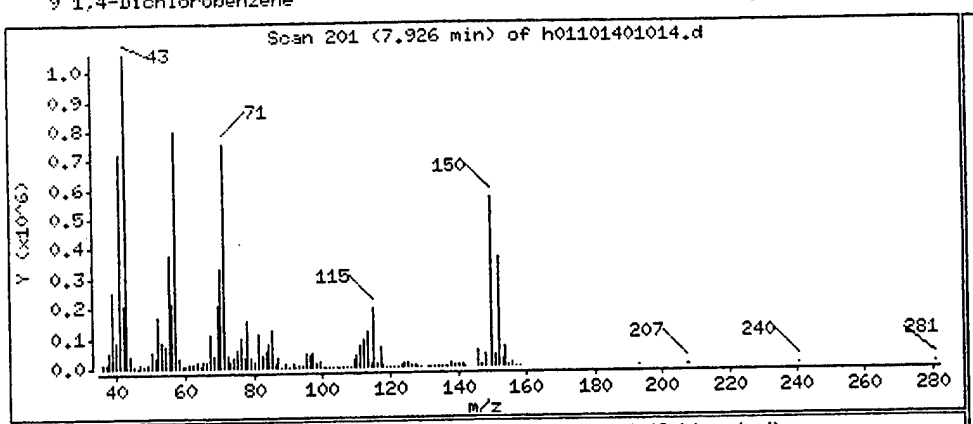
Operator: hch

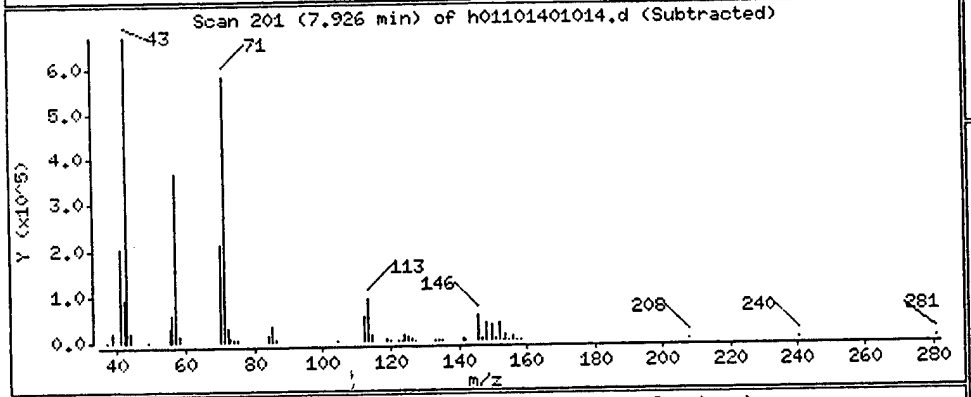
Column phase:

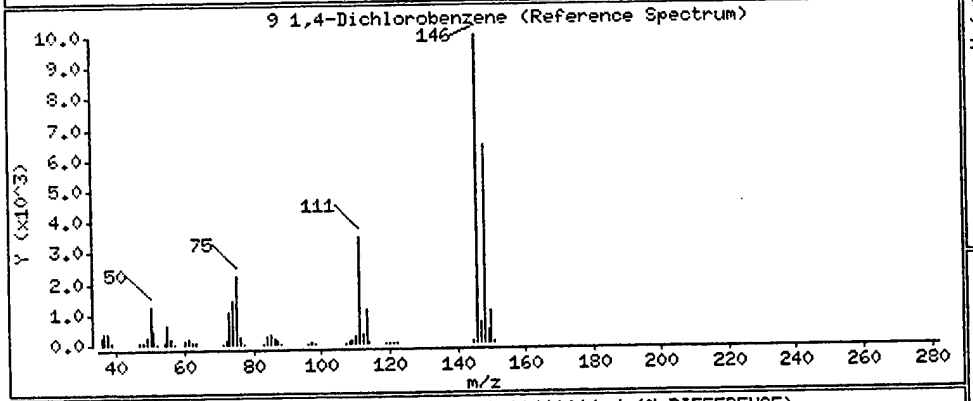
Column diameter: 2.00

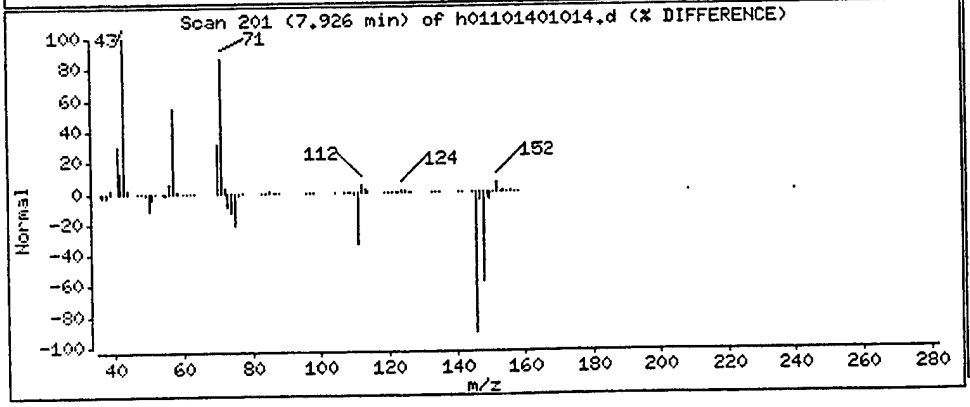
9 1,4-Dichlorobenzene

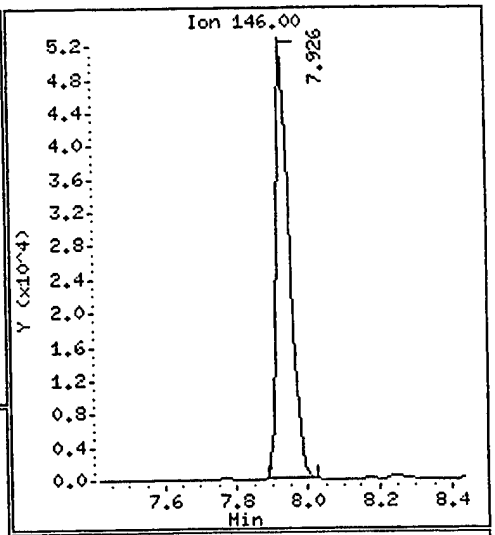
Concentration: 2.6 ug

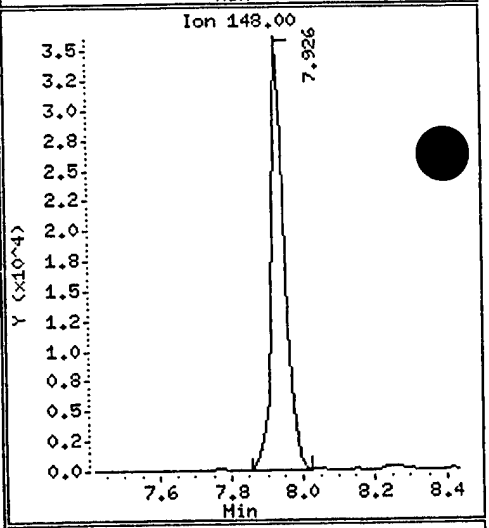


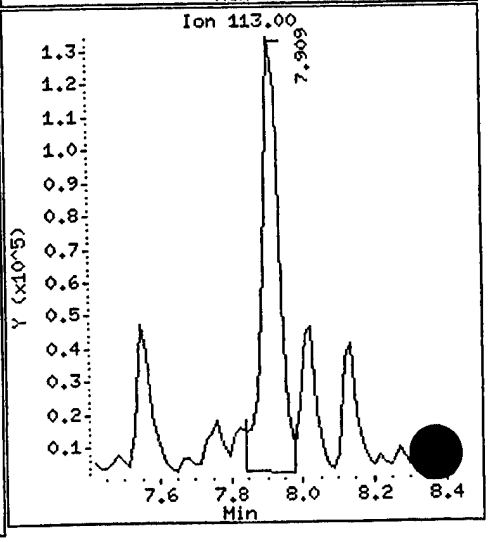












Data File: /chem/msdh.i/h-10Jan98.b/h01101401014.d

Date : 10-JAN-1998 20:37

Client ID: AF-A-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-01A

Volume Injected (uL): 1.0

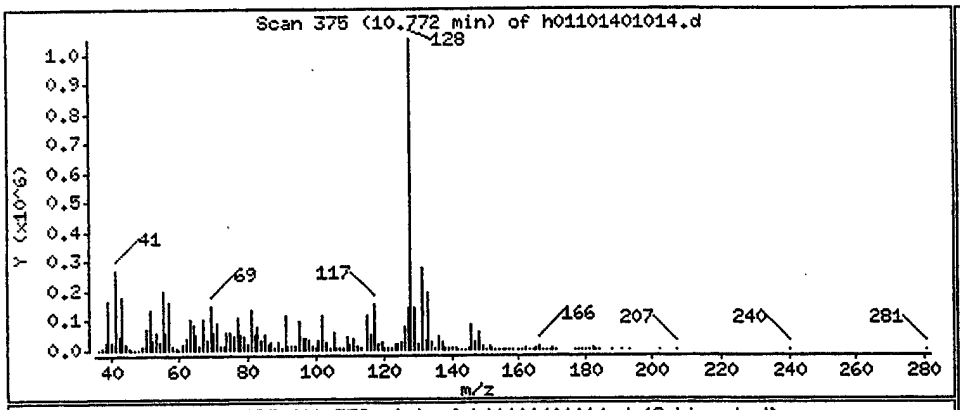
Operator: hch

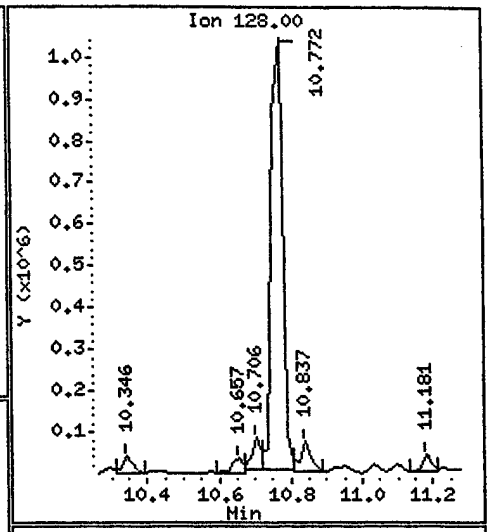
Column phase:

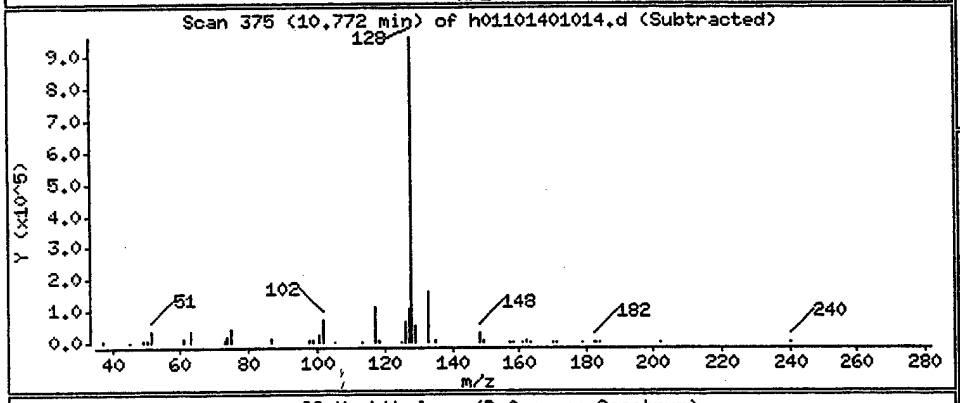
Column diameter: 2.00

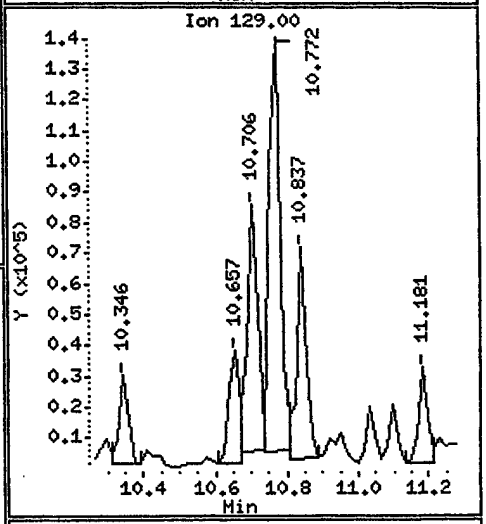
28 Naphthalene

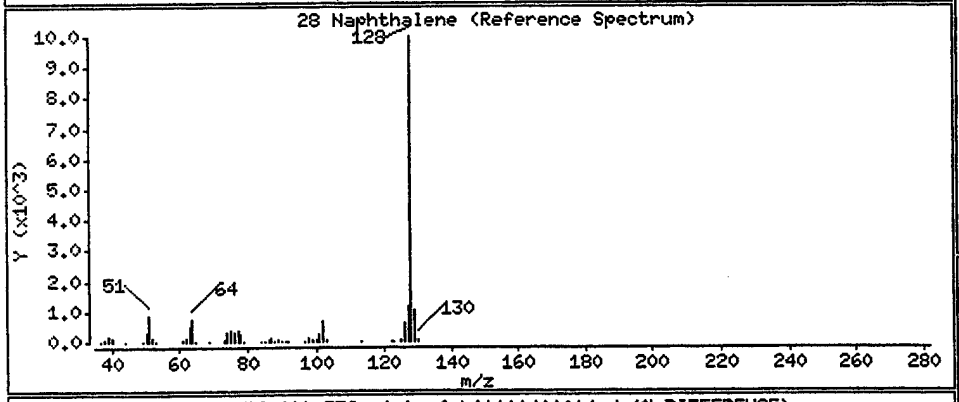
Concentration: 18.0 ug

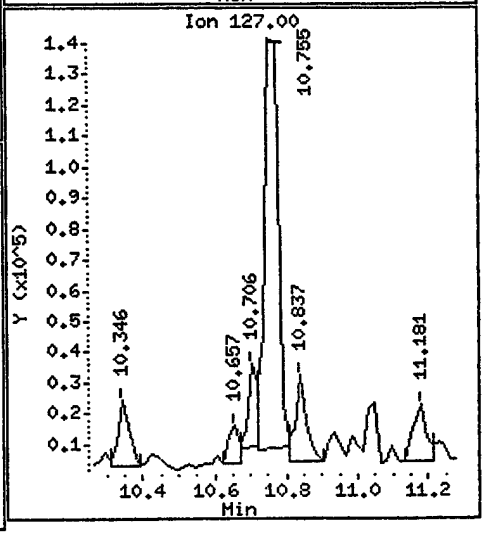


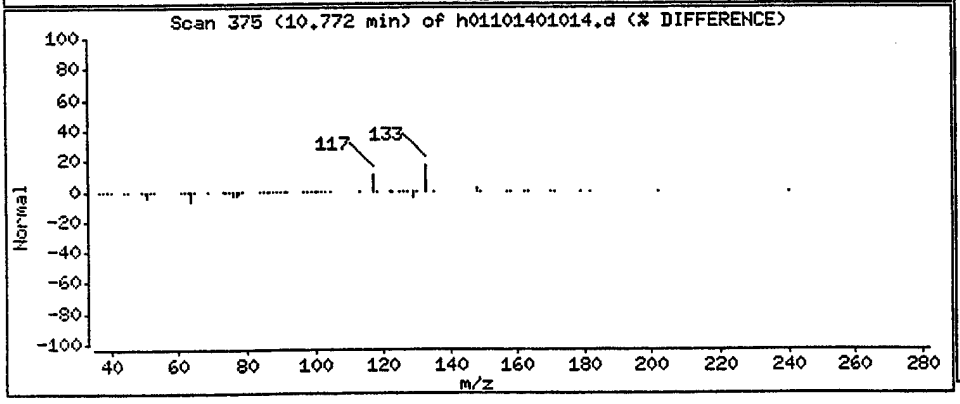












Data File: /chem/msdh.i/h-10Jan98.b/h01101401014.d

Date : 10-JAN-1998 20:37

Client ID: AF-A-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-01A

Volume Injected (uL): 1.0

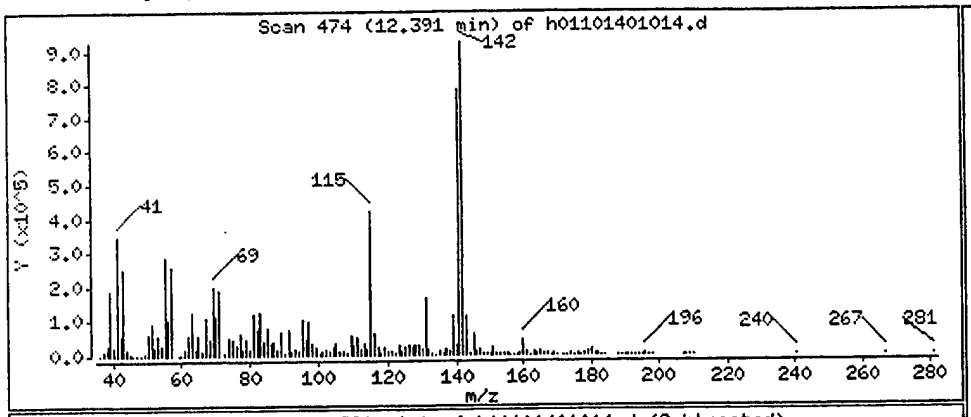
Operator: hch

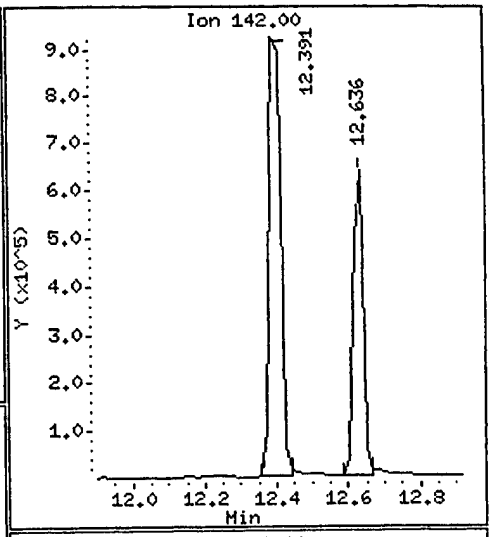
Column phase:

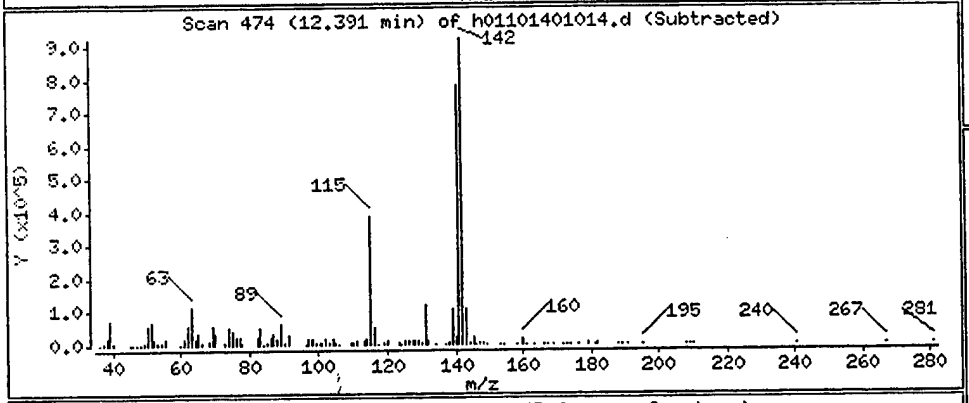
Column diameter: 2.00

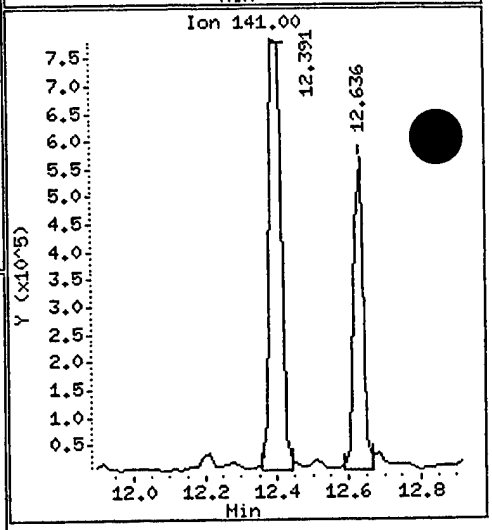
33 2-Methylnaphthalene

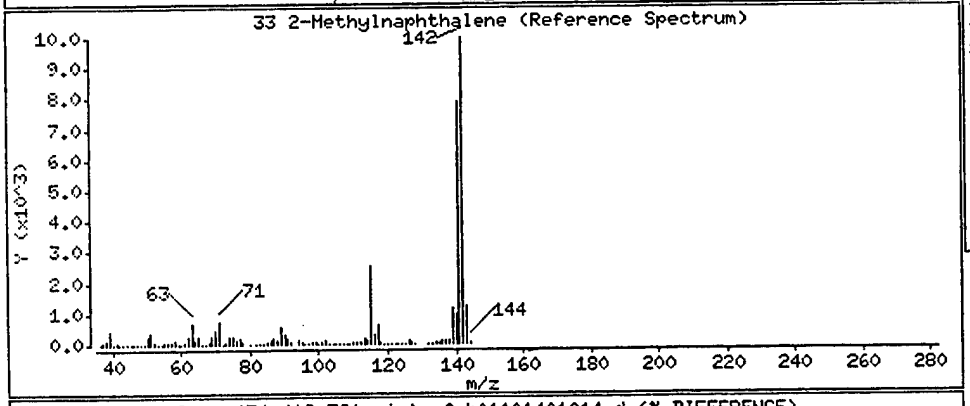
Concentration: 25.3 ug

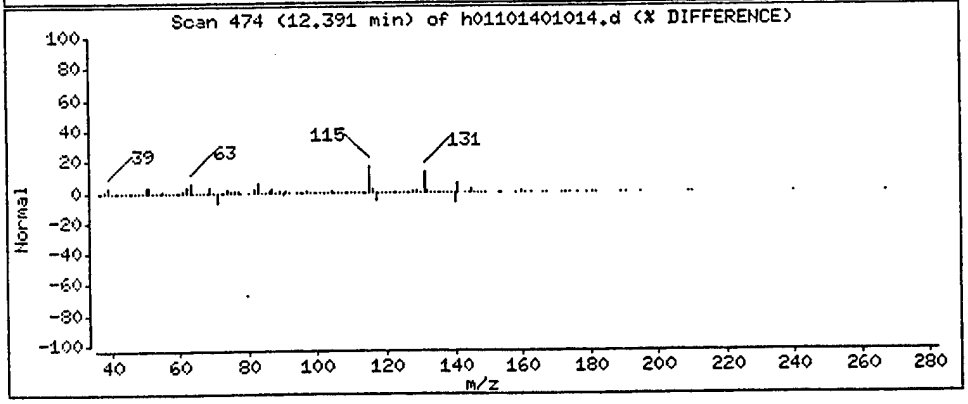












Data File: /chem/msdh.i/h-10Jan98.b/h01101401014.d

Date : 10-JAN-1998 20:37

Client ID: AF-A-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-01A

Volume Injected (uL): 1.0

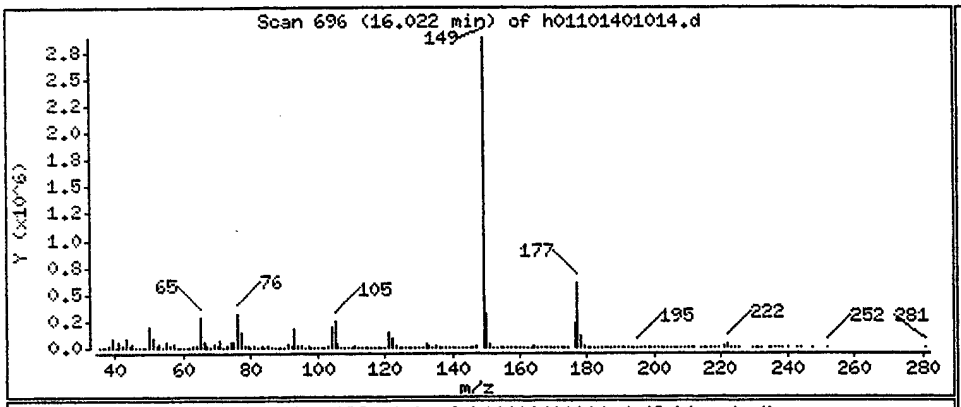
Operator: hch

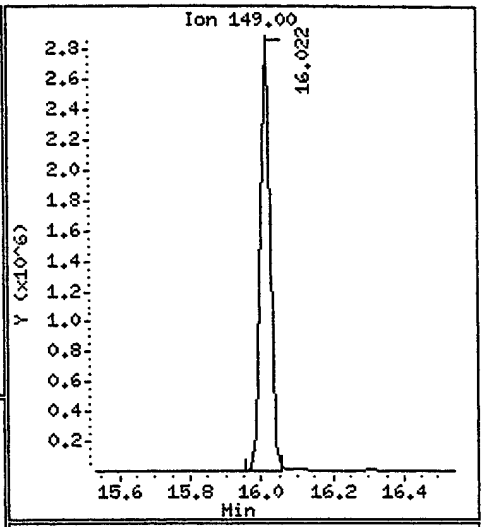
Column phase:

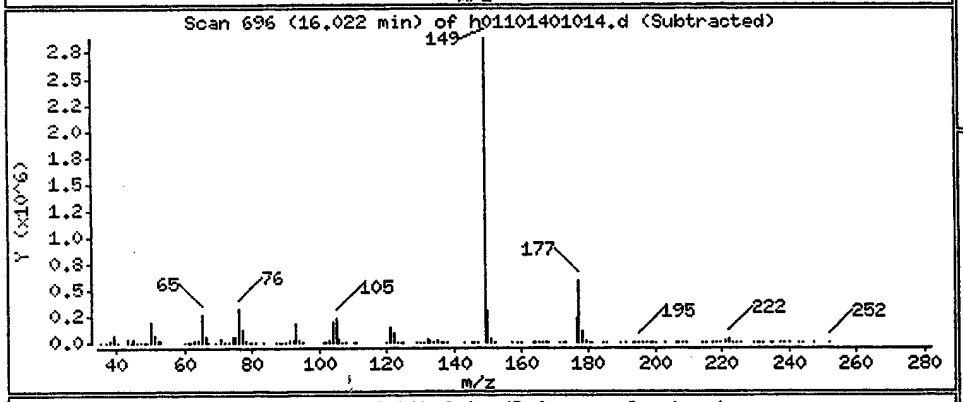
Column diameter: 2.00

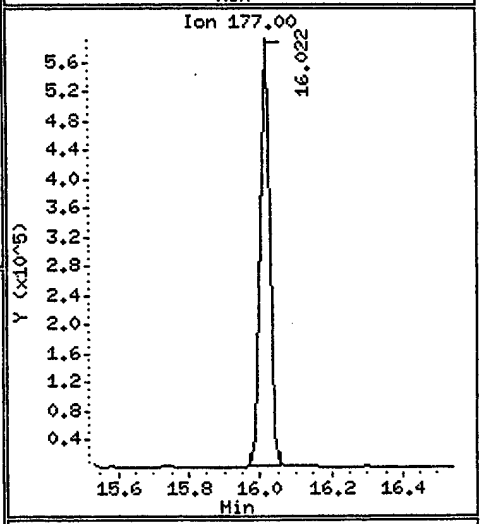
56 Diethylphthalate

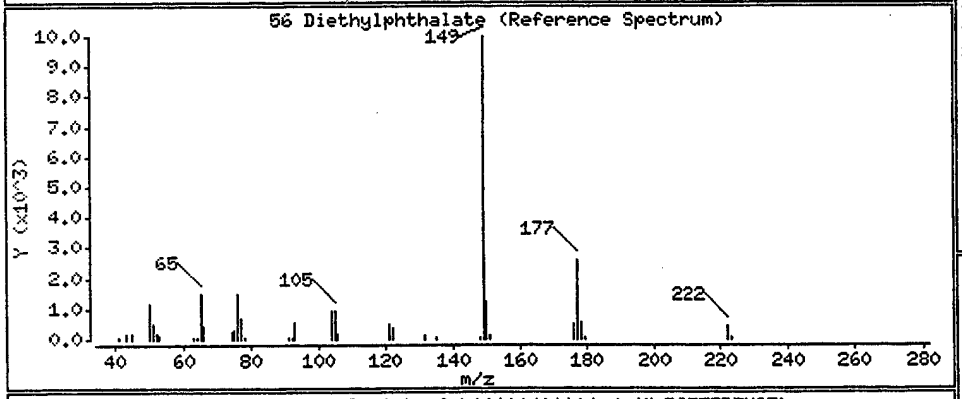
Concentration: 51.4 ug

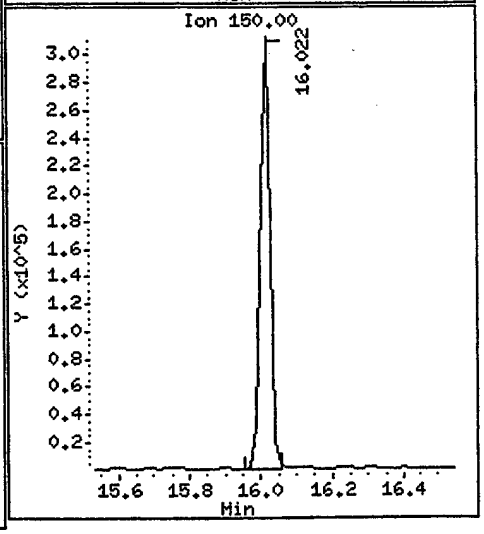


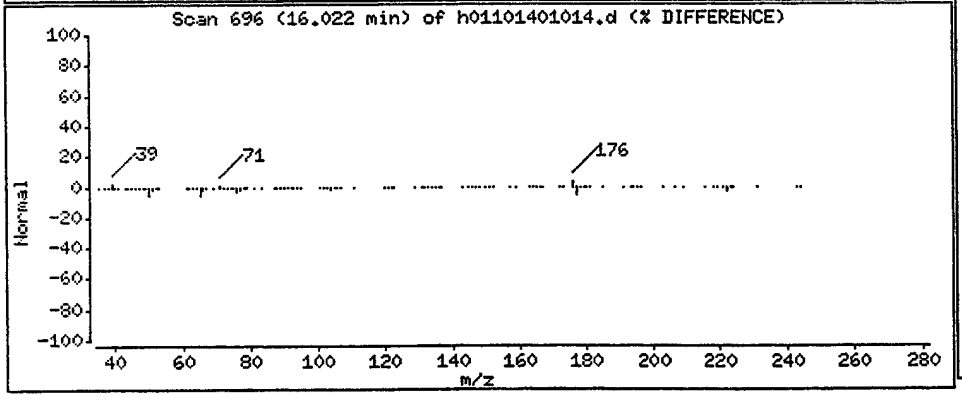












Data File: /chem/msdh.i/h-10Jan98.b/h01101401014.d

Date : 10-JAN-1998 20:37

Client ID: AF-A-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-01A

Volume Injected (uL): 1.0

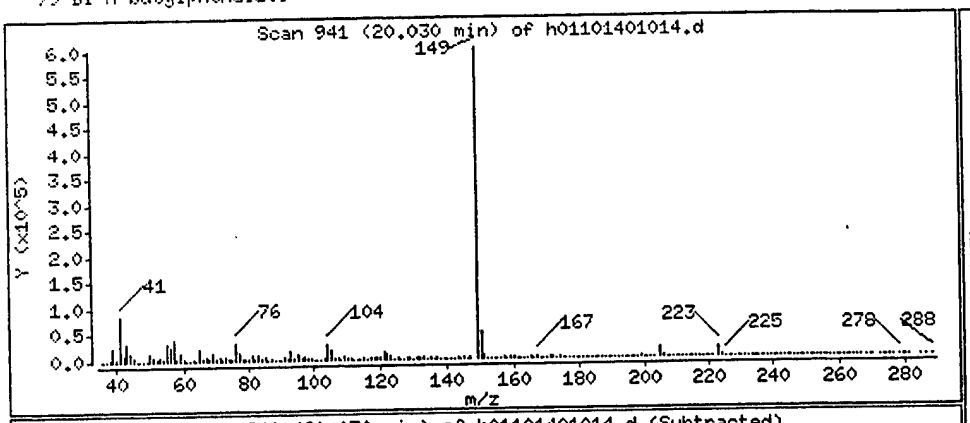
Operator: hch

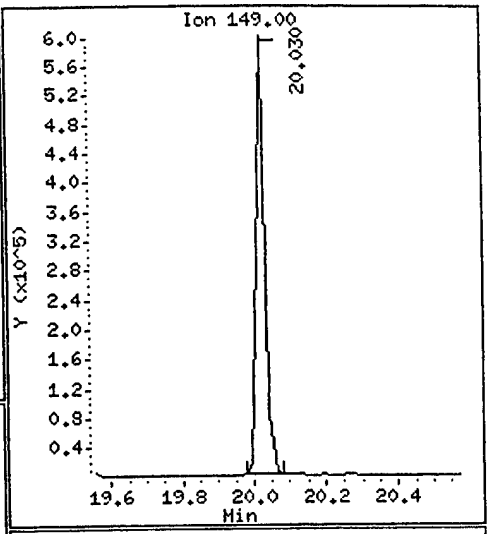
Column phase:

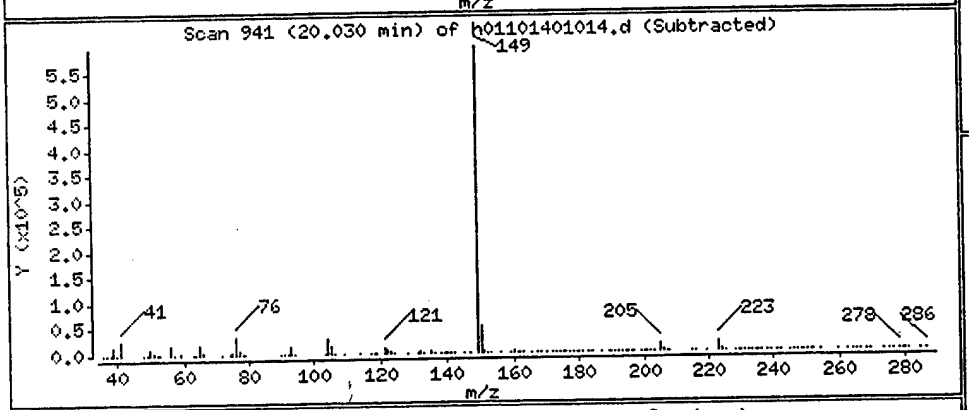
Column diameter: 2.00

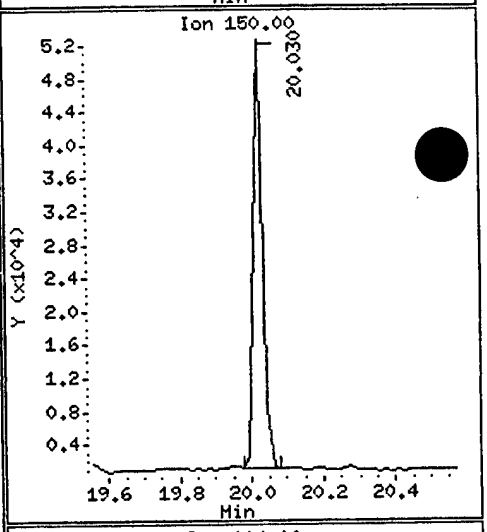
79 Di-n-butylphthalate

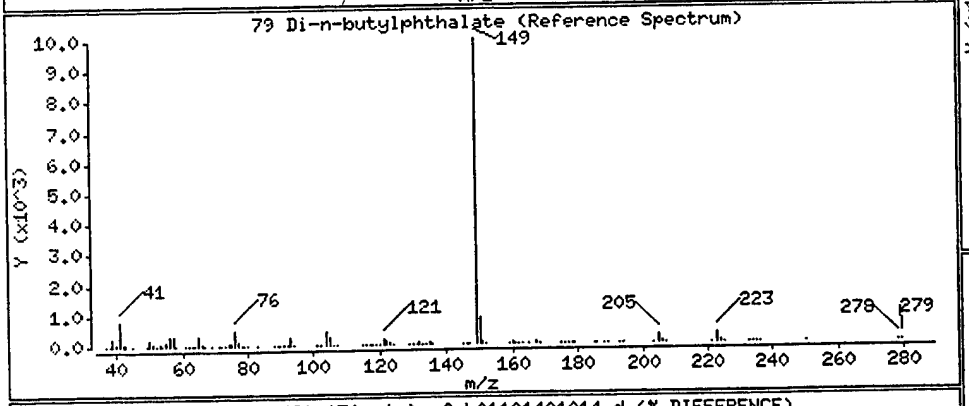
Concentration: 6.2 ug

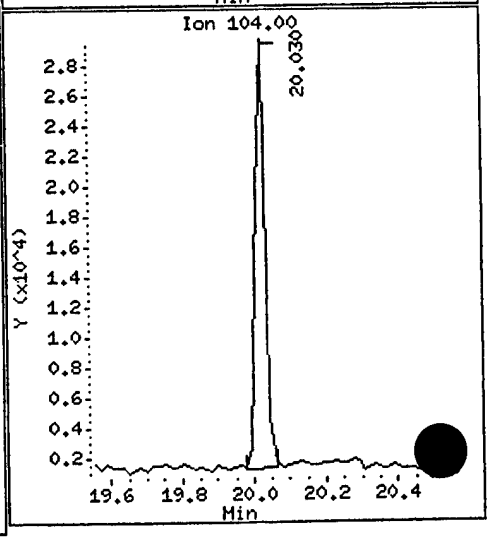


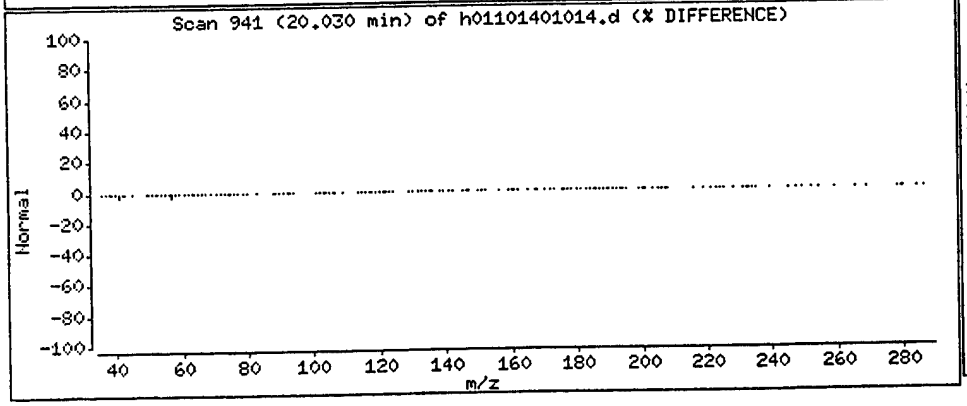












Data File: /chem/msdh.i/h-10Jan98.b/h01101401014.d

Date : 10-JAN-1998 20:37

Client ID: AF-A-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-01A

Volume Injected (uL): 1.0

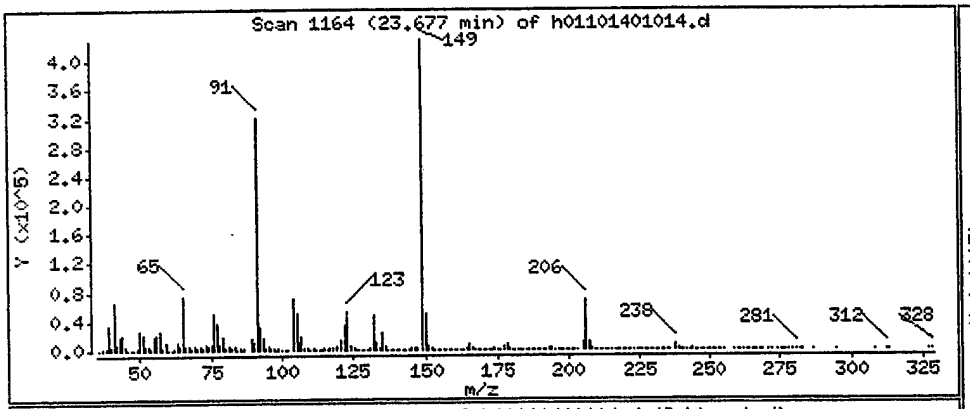
Operator: hch

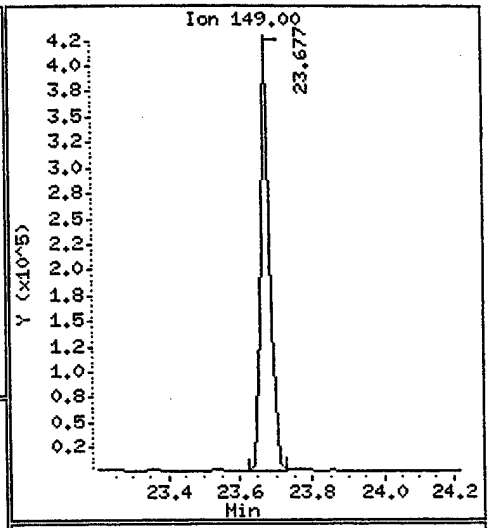
Column phase:

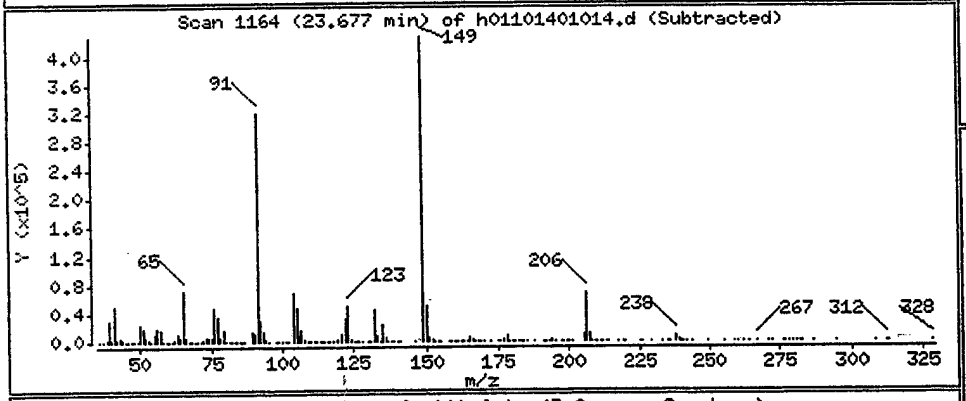
Column diameter: 2.00

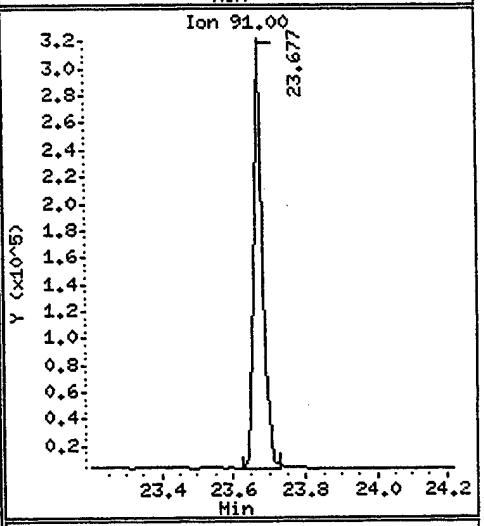
87 Butyl benzyl phthalate

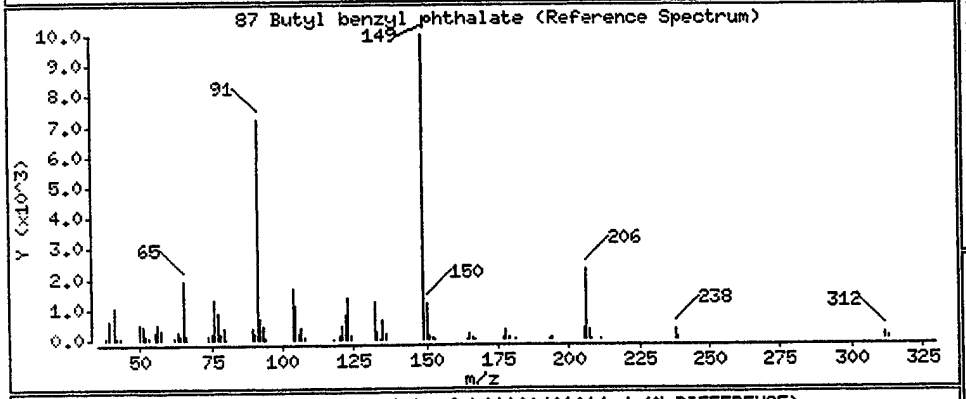
Concentration: 10.8 ug

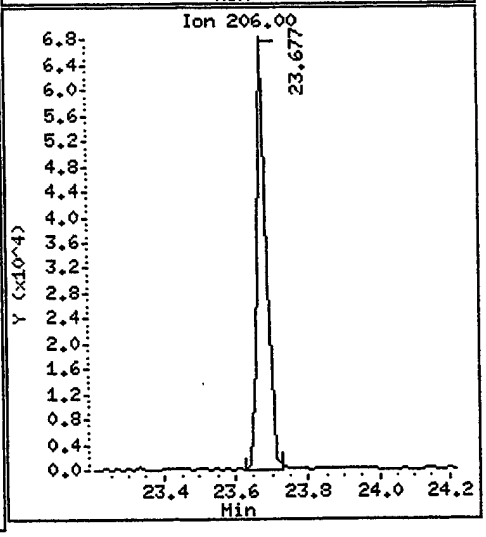


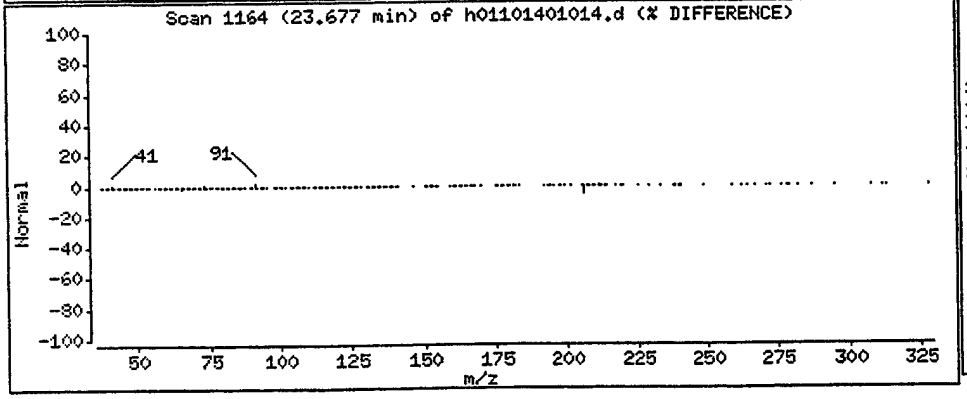












030

Data File: /chem/msdh.i/h-10Jan98.b/h01101401014.d

Date : 10-JAN-1998 20:37

Client ID: AF-A-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-01A

Volume Injected (uL): 1.0

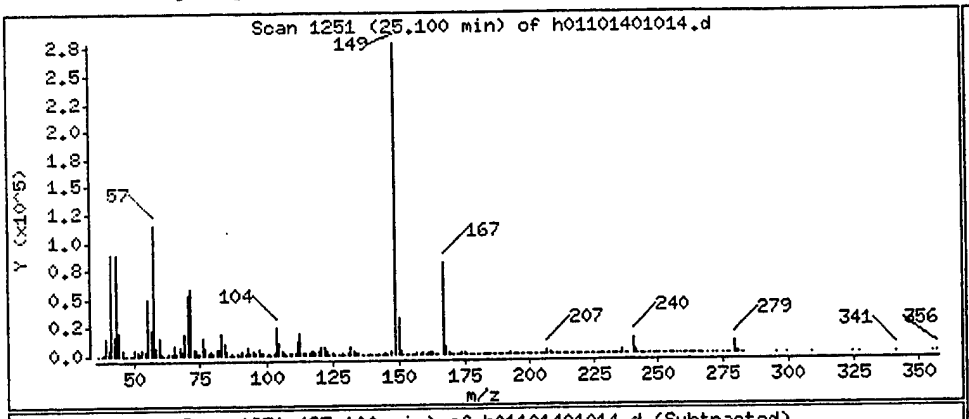
Operator: hch

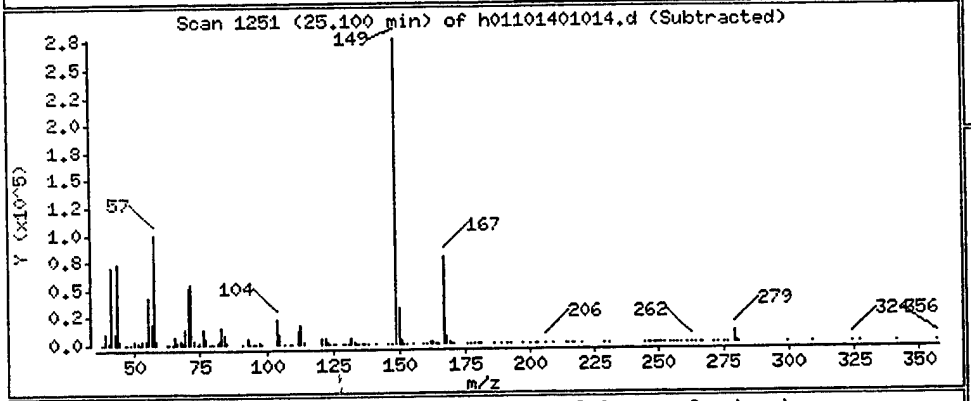
Column phase:

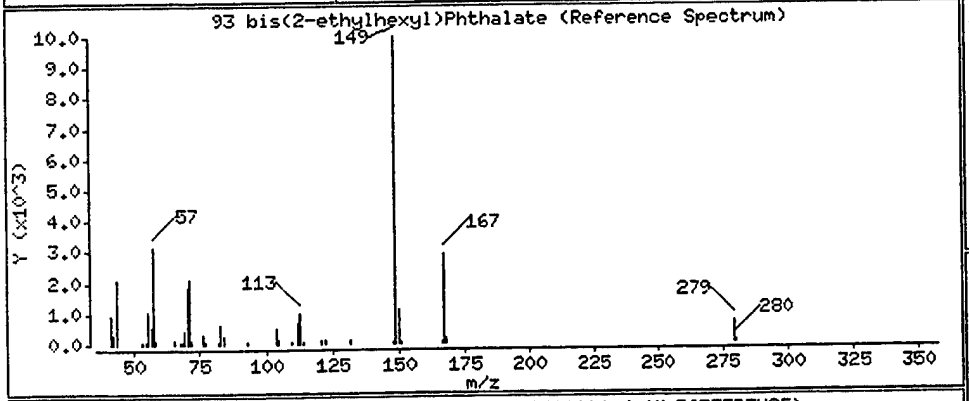
Column diameter: 2.00

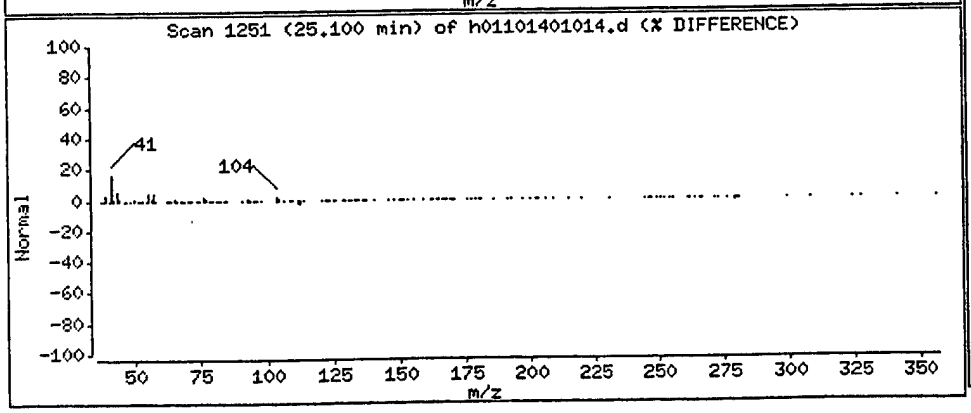
93 bis(2-ethylhexyl)Phthalate

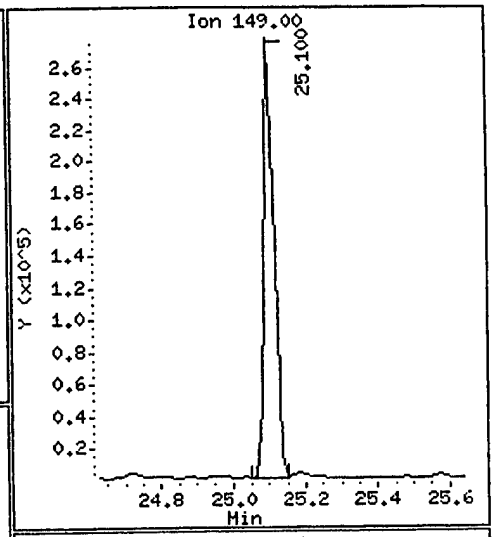
Concentration: 5.5 ug

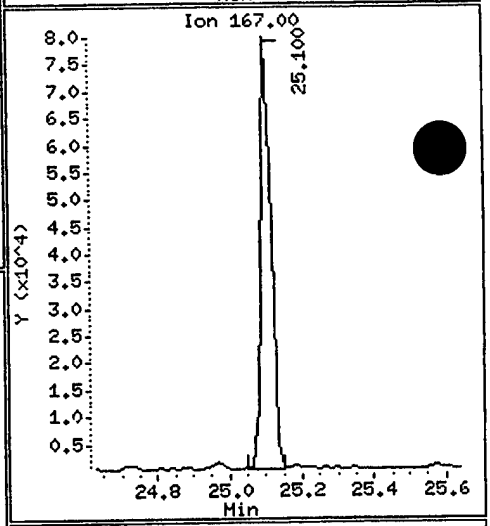


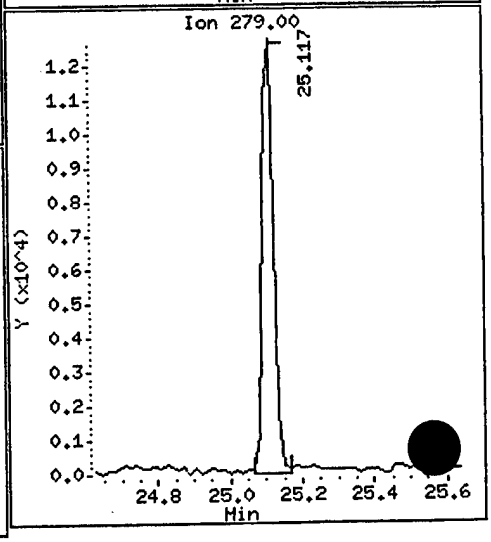






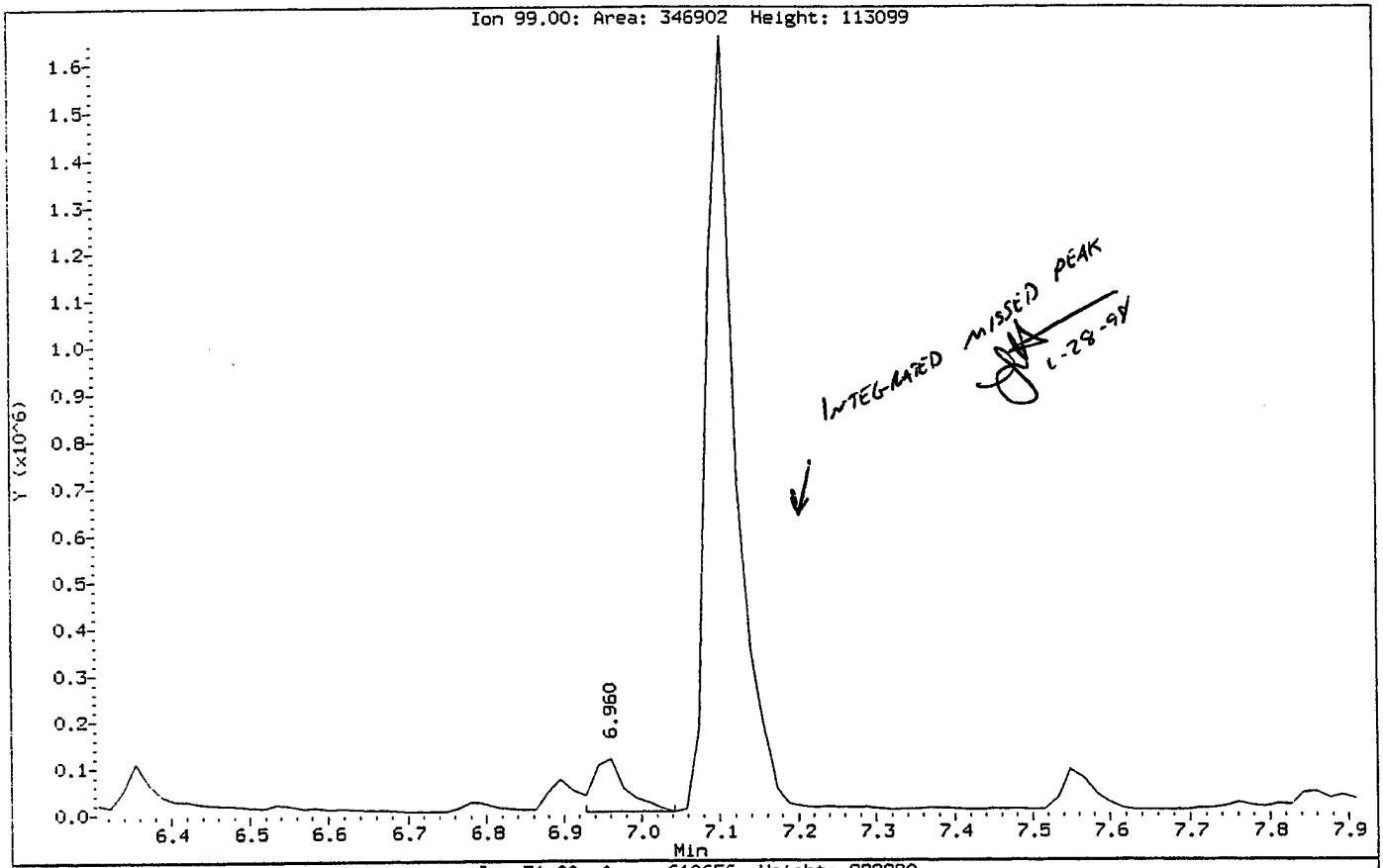


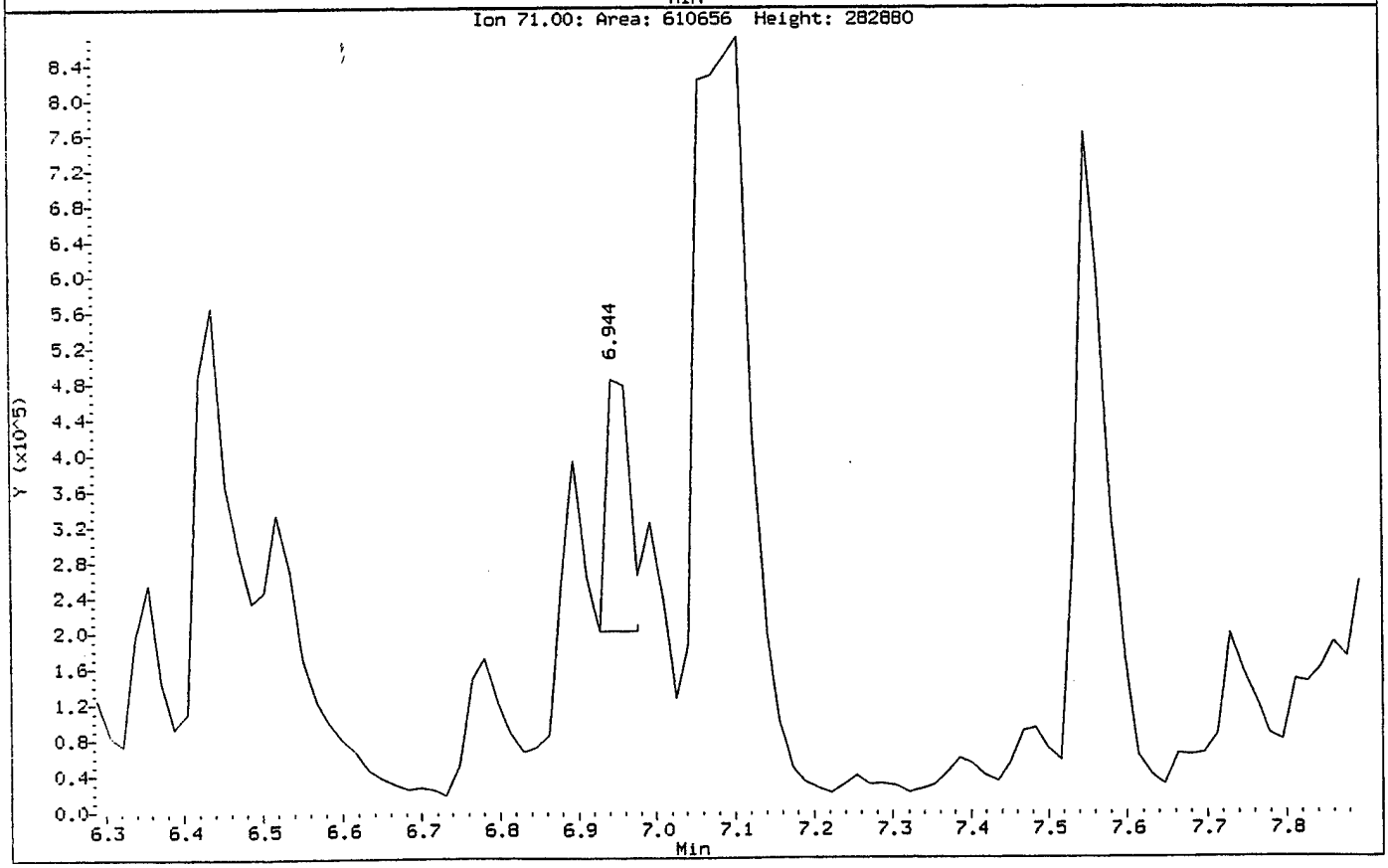




Data File: /chem/msdh.i/h-10Jan98.b/h01101401014.d
Injection Date: 10-JAN-1998 20:37
Instrument: msdh.i
Client Sample ID: AF-A-EF117 PAH

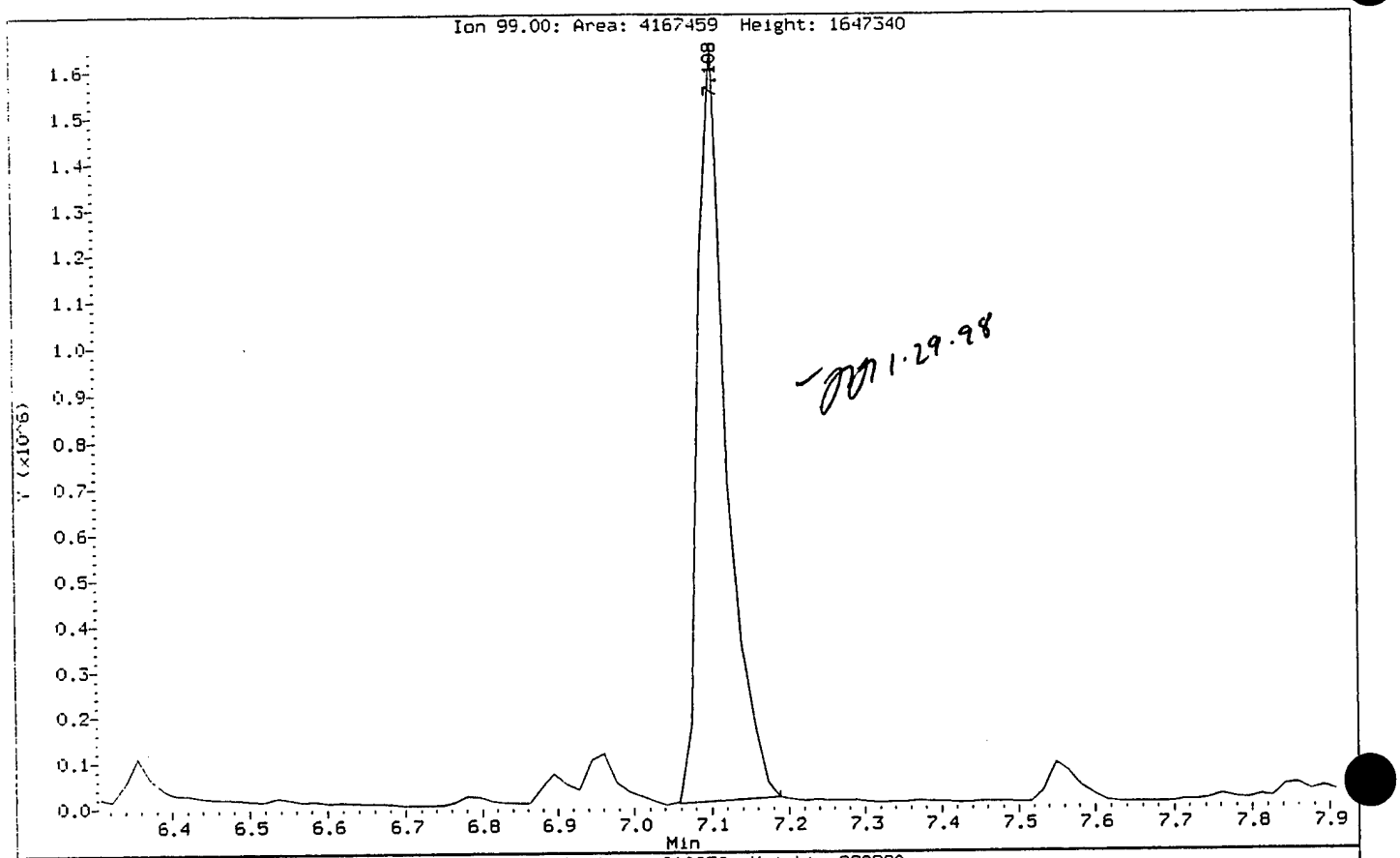
Compound: Phenol-d5
CAS Number: 4165-62-2



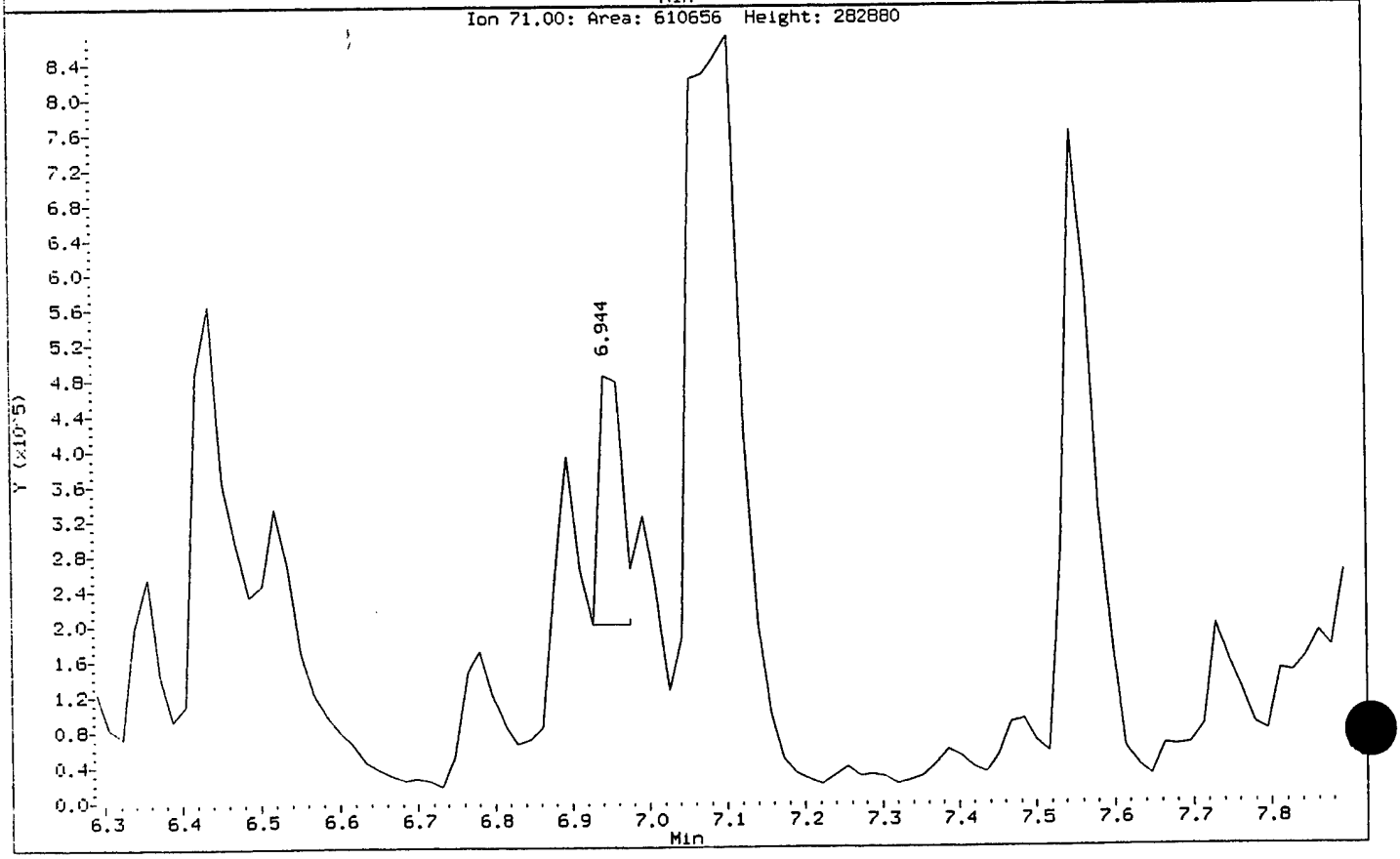


Data File: /chem/msdh.i/h-10Jan98.b/h01101401014.d
Injection Date: 10-JAN-1998 20:37
Instrument: msdh.i
Client Sample ID: AF-A-EF117 PAH

Compound: Phenol-d5
CAS Number: 4165-62-2



1.29.98



Audit History For: /chem/msdh.i/h-10Jan98.b/h01101401014.d

Change Date: 10-Jan-1998 21:26
Change Made by: Automation

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Complete Target Compound Processing

Change Date: 11-Jan-1998 11:35
Change Made by: jheffel

Parameter: Manual reintegration of Phenol-d5 (Signal 1)
Old Value: Old Area/Time: 346902 / 6.96
New Value: New Area/Time: 4167459 / 7.11
Reason For Change: N/A

Change Date: 22-Jan-1998 09:33
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: 8270.sub
New Value: MM5.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:36
Change Made by: kbadal

Parameter: Lab ID
Old Value:
New Value: 9712088-01A
Reason For Change: N/A

Change Date: 22-Jan-1998 09:36
Change Made by: kbadal

Parameter: Client ID
Old Value:
New Value: AF-A-EF117 PAH
Reason For Change: N/A

Change Date: 22-Jan-1998 09:39
Change Made by: kbadal

Parameter: Sample Info
Old Value: 9712088-01a
New Value: 9712088A-01a
Reason For Change: N/A

Change Date: 22-Jan-1998 09:39
Change Made by: kbadal

Parameter: Lab ID
Old Value: 9712088-01A
New Value: 9712088A-01A
Reason For Change: N/A

Change Date: 22-Jan-1998 09:40
Change Made by: kbadal

Parameter: Misc Information
Old Value:
New Value: 80 ng ISTD #267-91-1
Reason For Change: N/A

Change Date: 22-Jan-1998 09:41
Change Made by: kbadal

Parameter: Sample Prep. Date
Old Value:
New Value: 08-DEC-1997 17:30
Reason For Change: N/A

Change Date: 22-Jan-1998 09:42
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 09:59
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: MM5.sub
New Value: 8270.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:59
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 13:33
Change Made by: kbadal

Parameter: Sample Info
Old Value: 9712088A-01a
New Value: 9712088A-01A
Reason For Change: N/A

Change Date: 22-Jan-1998 13:34
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 13:37
Change Made by: kbadal

Parameter: Best Hit for Phenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:37
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:38
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethyl)ether changed
Old Value: Old Hit #4
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:38
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:38
Change Made by: kbadal

Parameter: Best Hit for 1,3-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:38
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:38
Change Made by: kbadal

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:38
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:38
Change Made by: kbadal

Parameter: Best Hit for 2-Methylphenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:38
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:38
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroisopropyl)ether changed

Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:38
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:39
Change Made by: kbadal

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Compound Undetected
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 13:39
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:39
Change Made by: kbadal

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:39
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:39
Change Made by: kbadal

Parameter: Best Hit for 2-Methylphenol changed
Old Value: Compound Undetected
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 13:39
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:39
Change Made by: kbadal

Parameter: Best Hit for 2-Methylphenol changed
Old Value: Old Hit #1
New Value: New Hit #2

Reason For Change: N/A

Change Date: 22-Jan-1998 13:39
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:39
Change Made by: kbadal

Parameter: Best Hit for 2-Methylphenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:39
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Best Hit for 4-Methylphenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Best Hit for N-Nitrosodipropylamine changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Best Hit for Hexachloroethane changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Best Hit for Nitrobenzene changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Best Hit for Isophorone changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Best Hit for 2-Nitrophenol changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dimethylphenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:40
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:41
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethoxy)methane changed
Old Value: Old Hit #1
New Value: New Hit #4
Reason For Change: N/A

Change Date: 22-Jan-1998 13:41
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:41
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethoxy)methane changed
Old Value: Old Hit #4
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:41
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:41
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dichlorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:41
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:41
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #4
New Value: New Hit #3
Reason For Change: N/A

Change Date: 22-Jan-1998 13:41
Change Made by: kbadal

Parameter: Requantitate all compounds

Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Best Hit for 4-Chloroaniline changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Best Hit for 4-Chloro-3-Methylphenol changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Best Hit for 2,4,6-Trichlorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Best Hit for 2-Nitroaniline changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:

Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Best Hit for 2,6-Dinitrotoluene changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Best Hit for 4-Nitrophenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dinitrotoluene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:42
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:43
Change Made by: kbadal

Parameter: Best Hit for N-nitrosodiphenylamine changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:43
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:53
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:53
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 11:23
Change Made by: jheffel

Parameter: Sample Info
Old Value: 9712088A-01A
New Value: 1.0ul 9712088A-01A
Reason For Change: N/A

Change Date: 28-Jan-1998 11:23
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 28-Jan-1998 11:33
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 5.243 min. changed.
Old Value: Old match: 2-Pentanol, 5-(2-propynyloxy)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.786 min. changed.
Old Value: Old match: Nonane, 3-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 12.195 min. changed.
Old Value: Old match: Tridecane
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.590 min. changed.
Old Value: Old match: Benzene, (1,2,2-trimethylpropyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.671 min. changed.
Old Value: Old match: Undecane, 2,10-dimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.491 min. changed.
Old Value: Old match: Dodecane, 6-methyl-
New Value: New match: Unknown
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.491 min. changed.
Old Value: Old match: Undecane, 3,5-dimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.442 min. changed.
Old Value: Old match: Cyclohexane, (4-methylpentyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 10.919 min. changed.
Old Value: Old match: Dodecane, 6-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 10.117 min. changed.
Old Value: Old match: 1H-Indene, 2,3-dihydro-2-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 10.036 min. changed.
Old Value: Old match: Undecane, 5-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.447 min. changed.
Old Value: Old match: Unknown
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.283 min. changed.

Old Value: Old match: Cyclohexane, 1,2,4,5-tetraethyl-, (1.alp
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.201 min. changed.
Old Value: Old match: Undecane
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.038 min. changed.
Old Value: Old match: Benzene, 1-methyl-3-(1-methylethyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.613 min. changed.
Old Value: Old match: Heptadecane, 2,6-dimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.563 min. changed.
Old Value: Old match: Benzene, 1-methyl-3-(1-methylethyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.024 min. changed.
Old Value: Old match: Benzene, (1-methylethyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 7.549 min. changed.
Old Value: Old match: Benzene, 1,2,3-trimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:34
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 6.486 min. changed.
Old Value: Old match: Cyclopentane, 1-methyl-2-(2-propenyl)-,
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 11:35
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 5.848 min. changed.
Old Value: Old match: Nonane
New Value: New match: Unknown Compound Deleted

Reason For Change: N/A

Change Date: 28-Jan-1998 11:36
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Complete Target Compound Processing

Change Date: 28-Jan-1998 12:08
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 12.195 min. changed.
Old Value: Old match: Tridecane
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:08
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 5.243 min. changed.
Old Value: Old match: 2-Pentanol, 5-(2-propynyloxy)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:08
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 5.848 min. changed.
Old Value: Old match: Nonane
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:08
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 6.486 min. changed.
Old Value: Old match: Cyclopentane, 1-methyl-2-(2-propenyl)-,
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:08
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 7.549 min. changed.
Old Value: Old match: Benzene, 1,2,3-trimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:08
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.024 min. changed.
Old Value: Old match: Benzene, (1-methylethyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:08
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.138 min. changed.
Old Value: Old match: Bicyclo[2.2.1]hept-2-ene, 1,7,7-trimethy
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:09
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.563 min. changed.
Old Value: Old match: Benzene, 1-methyl-3-(1-methylethyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:09
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.613 min. changed.
Old Value: Old match: Heptadecane, 2,6-dimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:09
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.038 min. changed.
Old Value: Old match: Benzene, 1-methyl-3-(1-methylethyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:09
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.201 min. changed.
Old Value: Old match: Undecane
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:09
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.283 min. changed.
Old Value: Old match: Cyclohexane, 1,2,4,5-tetraethyl-, (1.alp
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:09
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 10.036 min. changed.
Old Value: Old match: Undecane, 5-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:09
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 10.117 min. changed.
Old Value: Old match: 1H-Indene, 2,3-dihydro-2-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:09
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 10.919 min. changed.
Old Value: Old match: Dodecane, 6-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:09
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.442 min. changed.
Old Value: Old match: Cyclohexane, (4-methylpentyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:09
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.491 min. changed.
Old Value: Old match: Dodecane, 6-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:09
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.590 min. changed.
Old Value: Old match: Benzene, (1,2,2-trimethylpropyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:09
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.671 min. changed.
Old Value: Old match: Undecane, 2,10-dimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:09
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.786 min. changed.
Old Value: Old match: Nonane, 3-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:22
Change Made by: jheffel

Parameter: Manual reintegration of Phenol-d5 (Signal 1)
Old Value: Old Area/Time: 346902 / 6.96
New Value: New Area/Time: 4158309 / 7.11
Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Best Hit for Phenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Best Hit for bis(2-Chloroethyl)ether changed

Old Value: Old Hit #4
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Best Hit for 1,3-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Best Hit for 2-Methylphenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Best Hit for bis(2-Chloroisopropyl)ether changed
Old Value: Old Hit #1
New Value: Compound Undetected

Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Best Hit for 4-Methylphenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:23
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:24
Change Made by: jheffel

Parameter: Best Hit for N-Nitrosodipropylamine changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:24
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:24
Change Made by: jheffel

Parameter: Best Hit for Hexachloroethane changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:24
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:24
Change Made by: jheffel

Parameter: Best Hit for Nitrobenzene changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:24
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Best Hit for Isophorone changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Best Hit for 2-Nitrophenol changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Best Hit for 2,4-Dimethylphenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Best Hit for bis(2-Chloroethoxy)methane changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Best Hit for 2,4-Dichlorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #4
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Best Hit for 4-Chloroaniline changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Best Hit for 4-Chloro-3-Methylphenol changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:25
Change Made by: jheffel

Parameter: Requantitate all compounds

Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:26
Change Made by: jheffel

Parameter: Best Hit for 2,4,6-Trichlorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:26
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:26
Change Made by: jheffel

Parameter: Best Hit for 2-Nitroaniline changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:26
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:26
Change Made by: jheffel

Parameter: Best Hit for 2,6-Dinitrotoluene changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:26
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:26
Change Made by: jheffel

Parameter: Best Hit for 4-Nitrophenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:26
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:

Reason For Change: N/A

Change Date: 28-Jan-1998 12:26
Change Made by: jheffel

Parameter: Best Hit for 2,4-Dinitrotoluene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:26
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:26
Change Made by: jheffel

Parameter: Best Hit for N-nitrosodiphenylamine changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 12:26
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 12:27
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 30-Jan-1998 08:58
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Reason For Change: Quantitation

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.

AF - A - EF117 PAH-DUP

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-01AA
Lab File ID: H011015
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/10/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	2.7	
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	16	
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	26	
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	51	

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

AF - A - EF117 PAH-DUP

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-01AA
Lab File ID: H011015
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/10/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	6.6	B
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	11	
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	5.6	
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

Data File: /chem/msdh.i/h-10Jan98.b/h01101501015.d
Report Date: 30-Jan-1998 09:07

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-10Jan98.b/h01101501015.d
Lab Smp Id: 9712088A-01AA Client Smp ID: AF-A-EF117 PAH Dup
Inj Date : 10-JAN-1998 21:19
Operator : hch Inst ID: msdh.i
Smp Info : 1.0ul 9712088A-01AA
Misc Info : 80 ng ISTD #267-91-1
Comment :
Method : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Meth Date : 29-Jan-1998 16:36 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 15
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8270.sub
Target Version: 3.40
Processing Host: frodo

1-30-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
$	1 2-Fluorophenol	112	5.408	5.389	(0.685)	3070758	58.3766	58.4
$	2 Phenol-d5	99	7.109	7.107	(0.663)	4275287	67.5502	67.6
*	7 1,4-Dichlorobenzene-d4	150	7.894	7.892	(1.000)	5219846	80.0000	
	8 1,4-Dichlorobenzene	146	7.927	7.925	(1.004)	139627	2.66498	2.7(H)
$	15 Nitrobenzene-d5	82	9.088	9.086	(0.609)	4032847	67.8164	67.8
*	24 Naphthalene-d8	136	10.724	10.722	(1.000)	10541888	80.0000	
	25 Naphthalene	128	10.773	10.771	(1.005)	2054169	16.0119	16.0
	29 2-Methylnaphthalene	142	12.392	12.407	(1.156)	2078021	25.6001	25.6
$	33 2-Fluorobiphenyl	172	13.292	13.306	(0.717)	7235751	69.5253	69.5
*	40 Acenaphthene-d10	164	14.911	14.926	(1.000)	6687864	80.0000	
	46 Diethylphthalate	149	16.024	16.038	(1.075)	5227184	51.0902	51.1
$	52 2,4,6-Tribromophenol	330	16.825	16.839	(0.674)	1822892	105.496	105
*	56 Phenanthrene-d10	188	18.526	18.541	(1.000)	12110502	80.0000	
	59 Di-n-butylphthalate	149	20.031	20.062	(1.081)	1059929	6.55056	6.6 B

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)	
$ 62 Terphenyl-d14	244	22.468	22.483	(0.900)	9406888	112.580	112	
64 Butyl benzyl phthalate	149	23.679	23.709	(0.948)	753643	10.7307	10.7	
65 bis(2-ethylhexyl)Phthalate	149	25.102	25.132	(1.005)	542044	5.55974	5.6	
* 67 Chrysene-d12	240	24.971	25.002	(1.000)	8392464	80.0000		
* 72 Perylene-d12	264	28.324	28.338	(1.000)	5134920	80.0000		
$ 123 Benzo(e)pyrene-d12	264	28.030	28.027	(0.990)	780			(aR)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.
H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-10Jan98.b/h01101501015.d
Lab Smp Id:
Inj Date : 10-JAN-1998 21:19
Operator : hch Inst ID: msdh.i
Smp Info : 9712088-01aa
Misc Info :
Comment :
Method : /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Meth Date : 10-Jan-1998 11:38 Quant Type: ISTD
Cal Date : 09-JAN-1998 00:49 Cal File: h01080301007.d
Als bottle: 15
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8270.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
$ 1 2-Fluorophenol	112	5.408	5.389	(0.685)	3070758	58.3766	58.4
	112	5.179	5.389	(0.656)	86268	1.64000	1.6(R)
	112	5.261	5.389	(0.666)	60736	1.15462	1.2(R)
	112	5.719	5.389	(0.724)	26935	0.51205	0.51(R)
$ 2 Phenol-d5	99	7.109	7.107	(0.663)	4275287	67.5502	67.6
	99	6.782	7.107	(0.632)	64274	1.01554	1.0(R)
	99	6.896	7.107	(0.643)	194217	3.06866	3.1(R)
	99	6.945	7.107	(0.648)	352371	5.56752	5.6(R)
3 Phenol	94	7.125	7.123	(0.903)	267987	4.34580	4.3
4 bis(2-Chloroethyl)ether	93	7.256	7.336	(0.919)	49481	0.95331	0.95(a)
	93	6.978	7.336	(0.884)	41687	0.80315	0.80(a)
	93	7.027	7.336	(0.890)	28726	0.55344	0.55(a)
	93	7.551	7.336	(0.956)	55956	1.07806	1.1
6 1,3-Dichlorobenzene	146	7.927	7.778	(1.004)	139627	2.67883	2.7

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
* 7 1,4-Dichlorobenzene-d4	150	7.894	7.892	(1.000)	5219846	80.0000	
	150	7.567	7.892	(1.000)	117	80.0000	(Q)
	150	7.600	7.892	(1.000)	118	80.0000	(Q)
	150	8.221	7.892	(1.000)	2980	80.0000	
	150	8.303	7.892	(1.000)	164	80.0000	(Q)
8 1,4-Dichlorobenzene	146	7.927	7.925	(1.004)	139627	2.67797	2.7
9 1,2-Dichlorobenzene	146	7.927	8.252	(1.004)	139627	2.83941	2.8
10 2-Methylphenol	108	8.401	8.399	(1.064)	28626	0.67889	0.68(a)
	108	8.139	8.399	(1.031)	126737	3.00567	3.0
	108	8.728	8.399	(1.106)	66387	1.57442	1.6
11 bis(2-Chloroisopropyl)ether	45	8.221	8.465	(1.041)	68027	0.75997	0.76(a)
12 4-Methylphenol	108	8.728	8.743	(1.106)	66387	1.52210	1.5
	108	8.401	8.743	(1.064)	28366	0.65037	0.65(a)
13 N-Nitrosodipropylamine	70	8.826	8.775	(1.118)	262712	7.37938	7.4
	70	8.385	8.775	(1.062)	110623	3.10732	3.1
	70	8.467	8.775	(1.073)	590910	16.5982	16.6
	70	8.532	8.775	(1.081)	623519	17.5142	17.5
	70	8.614	8.775	(1.091)	351867	9.88368	9.9
	70	8.712	8.775	(1.104)	187008	5.25291	5.2
	70	8.925	8.775	(1.131)	42372	1.19020	1.2
	70	9.006	8.775	(1.141)	413204	11.6066	11.6
	70	9.088	8.775	(1.151)	673356	18.9141	18.9
	70	9.137	8.775	(1.157)	73678	2.06956	2.1
14 Hexachloroethane	117	8.941	8.972	(1.133)	127740	5.82422	5.8
	117	9.023	8.972	(1.143)	685084	31.2360	31.2
$ 15 Nitrobenzene-d5	82	9.088	9.086	(0.609)	4032847	67.8132	67.8
	82	8.663	9.086	(0.581)	129558	2.17855	2.2(R)
	82	8.728	9.086	(0.585)	861606	14.4881	14.5(R)
	82	8.892	9.086	(0.596)	227557	3.82642	3.8(R)
	82	9.186	9.086	(0.616)	118808	1.99778	2.0(R)
	82	9.252	9.086	(0.620)	457508	7.69310	7.7(R)
	82	9.366	9.086	(0.628)	235150	3.95410	4.0(R)
	82	9.448	9.086	(0.634)	299954	5.04379	5.0(R)
16 Nitrobenzene	77	9.104	9.135	(0.849)	180486	3.23231	3.2
	77	8.728	9.135	(0.814)	513908	9.20354	9.2
	77	8.892	9.135	(0.829)	163219	2.92308	2.9
	77	8.941	9.135	(0.834)	180996	3.24144	3.2
	77	9.039	9.135	(0.843)	334454	5.98971	6.0
	77	9.284	9.135	(0.866)	243213	4.35568	4.4
	77	9.366	9.135	(0.873)	95684	1.71360	1.7
	77	9.448	9.135	(0.881)	95796	1.71560	1.7
	77	9.513	9.135	(0.887)	62875	1.12602	1.1
17 Isophorone	82	9.644	9.675	(0.899)	918263	7.93735	7.9
	82	9.252	9.675	(0.863)	456445	3.94545	3.9
	82	9.366	9.675	(0.873)	235111	2.03227	2.0
	82	9.448	9.675	(0.881)	299954	2.59277	2.6
	82	9.513	9.675	(0.887)	132172	1.14248	1.1

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	82	9.857	9.675	(0.919)	1819024	15.7234	15.7
	82	10.004	9.675	(0.933)	305364	2.63953	2.6
	82	10.070	9.675	(0.939)	100529	0.86896	0.87(a)
18 2,4-Dimethylphenol	122	9.922	9.937	(0.925)	42472	1.18664	1.2
	122	9.824	9.937	(0.916)	17964	0.50190	0.50(a)
	122	10.135	9.937	(0.945)	300094	8.38440	8.4
	122	10.233	9.937	(0.954)	90043	2.51573	2.5
19 2-Nitrophenol	139	9.873	9.839	(0.921)	68165	2.23909	2.2
	139	9.415	9.839	(0.878)	30878	1.01428	1.0
	139	9.464	9.839	(0.883)	15622	0.51315	0.51(a)
	139	9.612	9.839	(0.896)	31352	1.02985	1.0
	139	9.971	9.839	(0.930)	64367	2.11434	2.1
	139	10.086	9.839	(0.941)	57143	1.87704	1.9
	139	10.200	9.839	(0.951)	66772	2.19334	2.2
20 Benzoic Acid	122	10.233	10.231	(0.954)	99867	3.83272	3.8
	122	9.824	10.231	(0.916)	17964	0.68943	0.69(a)
	122	9.922	10.231	(0.925)	43982	1.68795	1.7
	122	10.135	10.231	(0.945)	304386	11.6818	11.7
	122	10.528	10.231	(0.982)	24548	0.94211	0.94(a)
21 bis(2-Chloroethoxy)methane	93	10.184	10.166	(0.950)	54133	0.86948	0.87(a)
	93	9.890	10.166	(0.922)	146770	2.35742	2.4
	93	10.495	10.166	(0.979)	57460	0.92292	0.92(a)
22 2,4-Dichlorophenol	162	10.397	10.378	(0.969)	24381	0.60871	0.61(a)
	162	10.528	10.378	(0.982)	22977	0.57366	0.57(a)
	162	10.577	10.378	(0.986)	21656	0.54068	0.54(a)
	162	10.658	10.378	(0.994)	108683	2.71346	2.7
* 24 Naphthalene-d8	136	10.724	10.722	(1.000)	10541888	80.0000	
	136	10.315	10.722	(1.000)	12449	80.0000	
	136	10.364	10.722	(1.000)	3027	80.0000	
	136	10.429	10.722	(1.000)	8526	80.0000	
	136	10.528	10.722	(1.000)	2724	80.0000	
	136	10.626	10.722	(1.000)	26974	80.0000	
25 Naphthalene	128	10.773	10.771	(1.005)	2054169	16.9325	16.9
	128	10.348	10.771	(0.965)	82464	0.67975	0.68
	128	10.658	10.771	(0.994)	91345	0.75296	0.75
	128	10.707	10.771	(0.998)	118472	0.97656	0.98
	128	10.838	10.771	(1.011)	171507	1.41373	1.4
	128	11.182	10.771	(1.043)	80777	0.66584	0.66
26 4-Chloroaniline	127	10.757	10.885	(1.003)	349686	11.5272	11.5
	127	10.658	10.885	(0.994)	28344	0.93435	0.93(a)
	127	10.707	10.885	(0.998)	61264	2.01954	2.0
	127	10.838	10.885	(1.011)	69355	2.28626	2.3
	127	10.936	10.885	(1.020)	21297	0.70205	0.70(a)
	127	11.035	10.885	(1.029)	37723	1.24352	1.2
	127	11.182	10.885	(1.043)	55032	1.81411	1.8
	127	11.231	10.885	(1.047)	15393	0.50742	0.51(a)
28 4-Chloro-3-Methylphenol	107	12.098	12.047	(1.128)	31442	0.81495	0.81(a)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)	
		107	11.754	12.047	(1.096)	57874	1.50004	1.5	
		107	11.803	12.047	(1.101)	132347	3.43031	3.4	
		107	12.229	12.047	(1.140)	49893	1.29318	1.3	
		107	12.327	12.047	(1.149)	35700	0.92531	0.92(a)	
	29 2-Methylnaphthalene	142	12.392	12.407	(1.156)	2078021	25.6001	25.6	
		142	12.638	12.407	(1.178)	1240785	15.2858	15.3	
	31 2,4,6-Trichlorophenol	196	12.670	13.077	(0.850)	18376	0.61528	0.62(a)	
$	33 2-Fluorobiphenyl	172	13.292	13.306	(0.717)	7235751	69.5253	69.5	
	35 2-Nitroaniline	65	13.913	13.830	(0.933)	21881	0.83104	0.83(a)	
		65	13.570	13.830	(0.910)	18892	0.71752	0.72(a)	
		65	13.635	13.830	(0.914)	82280	3.12498	3.1	
		65	13.717	13.830	(0.920)	27168	1.03184	1.0	
		65	14.044	13.830	(0.942)	20042	0.76119	0.76(a)	
		65	14.142	13.830	(0.948)	16117	0.61212	0.61(a)	
	37 2,6-Dinitrotoluene	165	14.388	14.451	(0.965)	147687	6.17024	6.2	
*	40 Acenaphthene-d10	164	14.911	14.926	(1.000)	6687864	80.0000		
		164	14.519	14.926	(1.000)	4723	80.0000		
		164	14.584	14.926	(1.000)	4815	80.0000		
		164	14.650	14.926	(1.000)	3813	80.0000		
	43 4-Nitrophenol	109	15.484	15.269	(1.038)	16728	1.76453	1.8	
		109	14.911	15.269	(1.000)	48752	5.14254	5.1	
	44 2,4-Dinitrotoluene	165	15.500	15.416	(1.039)	14670	0.51713	0.52(a)	
		165	15.026	15.416	(1.008)	16013	0.56447	0.56(a)	
	46 Diethylphthalate	149	16.024	16.038	(1.075)	5227184	51.0902	51.1	
	51 N-nitrosodiphenylamine	169	16.825	16.578	(0.908)	63852	1.11148	1.1	
$	52 2,4,6-Tribromophenol	330	16.825	16.839	(0.674)	1822892	105.496	105	
*	56 Phenanthrene-d10	188	18.526	18.541	(1.000)	12110502	80.0000		
		188	18.215	18.541	(1.000)	1372	80.0000		
		188	18.248	18.541	(1.000)	364	80.0000		
	59 Di-n-butylphthalate	149	20.031	20.062	(1.081)	1059929	6.55056	6.6	
$	62 Terphenyl-d14	244	22.468	22.483	(0.900)	9406888	112.580	112	
	64 Butyl benzyl phthalate	149	23.679	23.709	(0.948)	753643	10.7306	10.7	
	65 bis(2-ethylhexyl)Phthalate	149	25.102	25.132	(1.005)	542044	5.55974	5.6	
*	67 Chrysene-d12	240	24.971	25.002	(1.000)	8392464	80.0000		
		240	24.627	25.002	(1.000)	2216	80.0000		
		240	24.742	25.002	(1.000)	2144	80.0000		
		240	24.873	25.002	(1.000)	4902	80.0000		
*	72 Perylene-d12	264	28.324	28.338	(1.000)	5134920	80.0000		
		264	27.899	28.338	(1.000)	954	80.0000		
		264	28.030	28.338	(1.000)	780	80.0000		
		264	28.079	28.338	(1.000)	458	80.0000		
$	123 Benzo(e)pyrene-d12	264	28.030	27.995	(0.990)	780			(aR)
		264	27.621	27.995	(0.975)	310			(aR)
		264	27.735	27.995	(0.979)	210			(aR)
		264	27.801	27.995	(0.982)	203			(aR)
		264	27.899	27.995	(0.985)	1068			(aR)
		264	28.079	27.995	(0.991)	458			(aR)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	264	28.177	27.995	(0.995)	1950		(aR)
	264	28.324	27.995	(1.000)	5134920		(aR)
32 2,4,5-Trichlorophenol	196	13.128	13.159	(0.880)	15904	0.52226	0.52(a)
124 Benzyl Alcohol	108	8.139	8.170	(1.031)	131267	4.33248	4.3
	108	7.894	8.170	(1.000)	18139	0.59868	0.60(a)
	108	7.943	8.170	(1.006)	15401	0.50831	0.51(a)
	108	8.401	8.170	(1.064)	32542	1.07405	1.1

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01101501015.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: hch
Method File: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Misc Info:

Calibration Date: JAN/10/98
Calibration Time: 1157

Level: LOW
Sample Type: WATER

		AREA LIMIT			
COMPOUND	STANDARD	LOWER	UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	5433602	2716801	10867204	5219846	-3.93
24 Naphthalene-d8	10679247	5339624	21358494	10541888	-1.29
40 Acenaphthene-d10	6057945	3028972	12115890	6687864	10.40
56 Phenanthrene-d10	11000079	5500040	22000158	12110502	10.09
67 Chrysene-d12	8154182	4077091	16308364	8392464	2.92
72 Perylene-d12	5122068	2561034	10244136	5134920	0.25

		RT LIMIT			
COMPOUND	STANDARD	LOWER	UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.89	7.39	8.39	7.89	0.02
24 Naphthalene-d8	10.72	10.22	11.22	10.72	0.02
40 Acenaphthene-d10	14.93	14.43	15.43	14.91	-0.10
56 Phenanthrene-d10	18.54	18.04	19.04	18.53	-0.08
67 Chrysene-d12	25.00	24.50	25.50	24.97	-0.12
72 Perylene-d12	28.34	27.84	28.84	28.32	-0.05

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

1-29-98

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: 9712088A-01AA
Level: LOW
Data Type: MS DATA
SpikeList File: 8270.spk
Sublist File: 8270.sub
Method File: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Misc Info: 80 ng ISTD #267-91-1

Client SDG: h-10Jan98
Fraction: SV
Client Smp ID: AF-A-EF117 PAH Dup
Operator: hch
SampleType: SAMPLE
Quant Type: ISTD

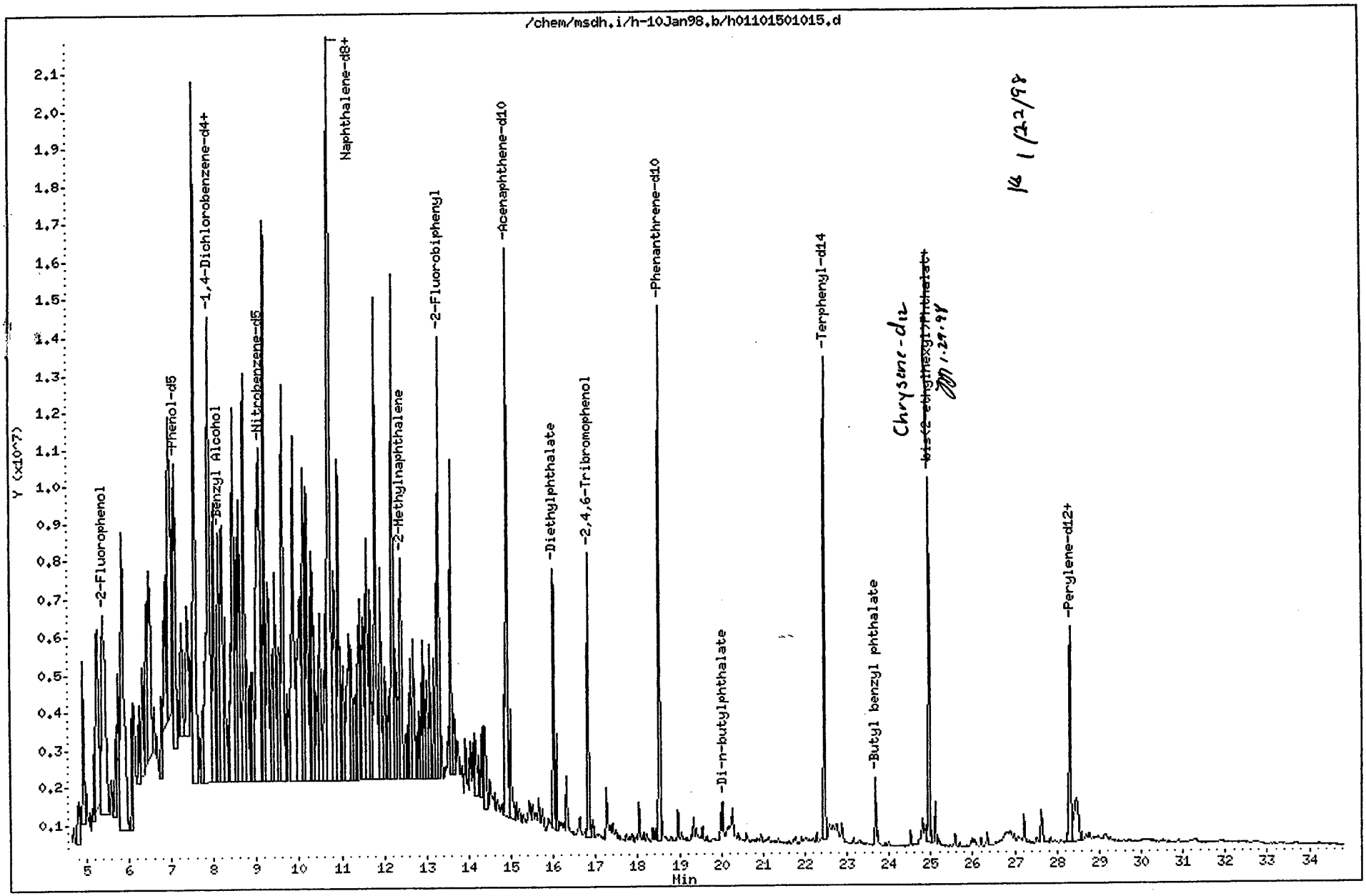
SURROGATE COMPOUND	CONC ADDED ug	CONC RECOVERED ug	% RECOVERED	LIMITS
$ 1 2-Fluorophenol	100	58.4	58.38	25-121
$ 3 Phenol-d5	100	67.6	67.55	24-113
$ 17 Nitrobenzene-d5	100	67.8	67.82	23-120
$ 38 2-Fluorobiphenyl	100	69.5	69.53	30-115
$ 65 2,4,6-Tribromophen	100	105	105.50	19-122
$ 84 Terphenyl-d14	100	112	112.58	18-137

1.29.98

Data File: /chem/msdh.i/h-10Jan98.b/h01101501015.d
Date : 10-JAN-1998 21:19
Client ID: AF-A-EF117 PAH Dup
Sample Info: 9712088A-01AA
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i

Operator: hch
Column diameter: 2.00



Data File: /chem/msdh.i/h-10Jan98.b/h01101501015.d

Date : 10-JAN-1998 21:19

Client ID: AF-A-EF117 PAH Dup

Instrument: msdh.i

Sample Info: 9712088A-01AA

Volume Injected (uL): 1.0

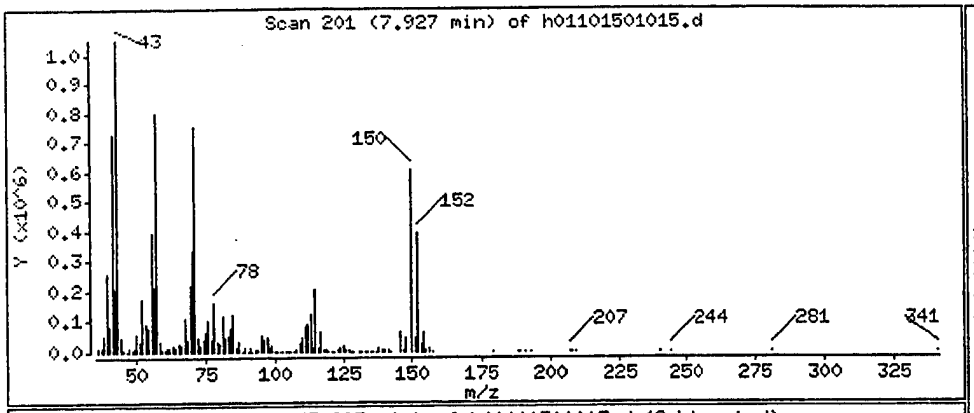
Operator: hch

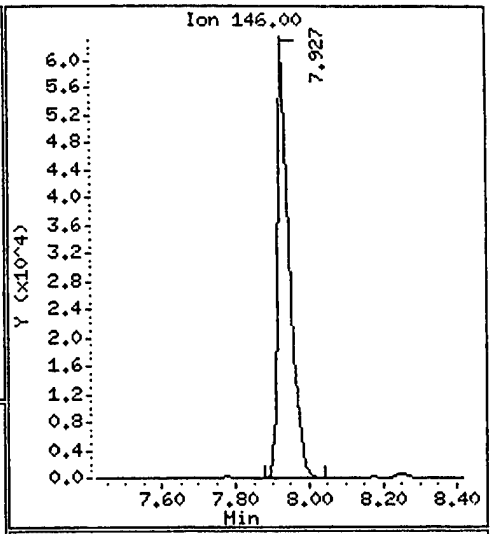
Column phase:

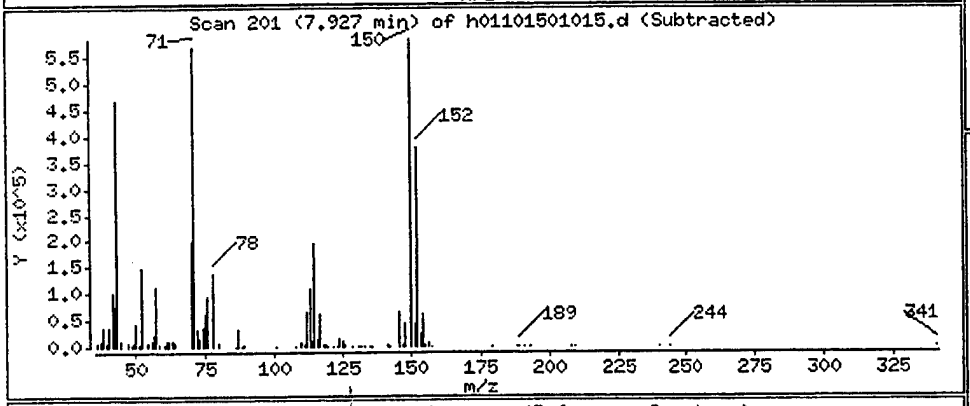
Column diameter: 2.00

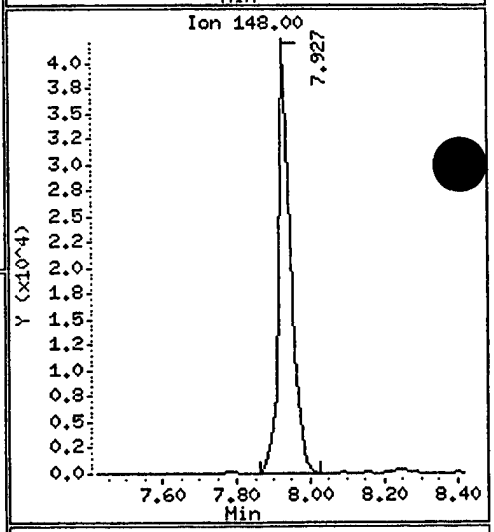
9 1,4-Dichlorobenzene

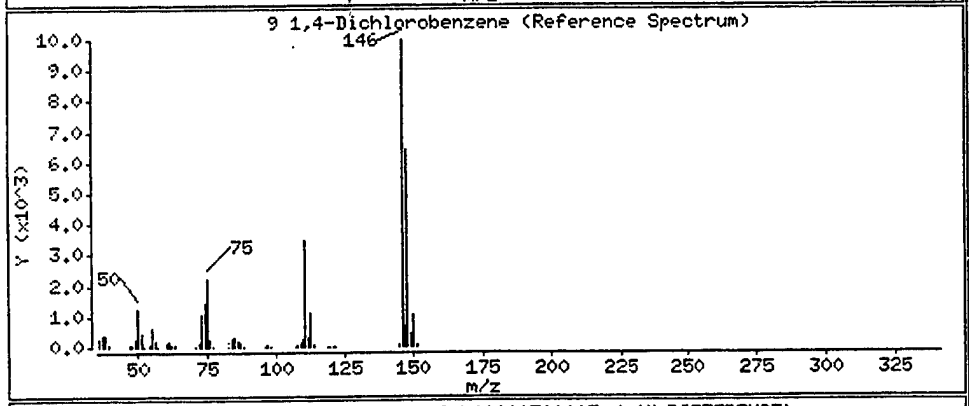
Concentration: 2.7 ug

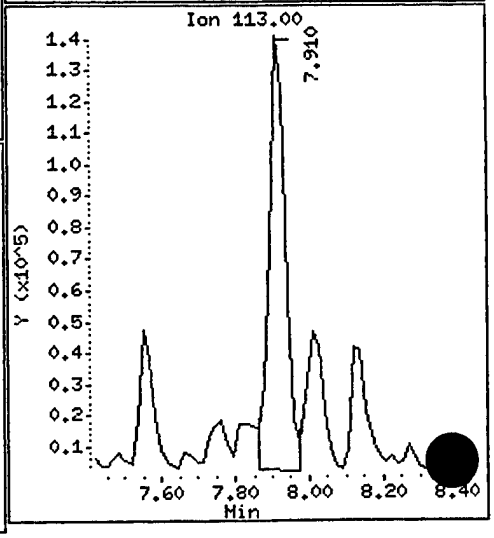


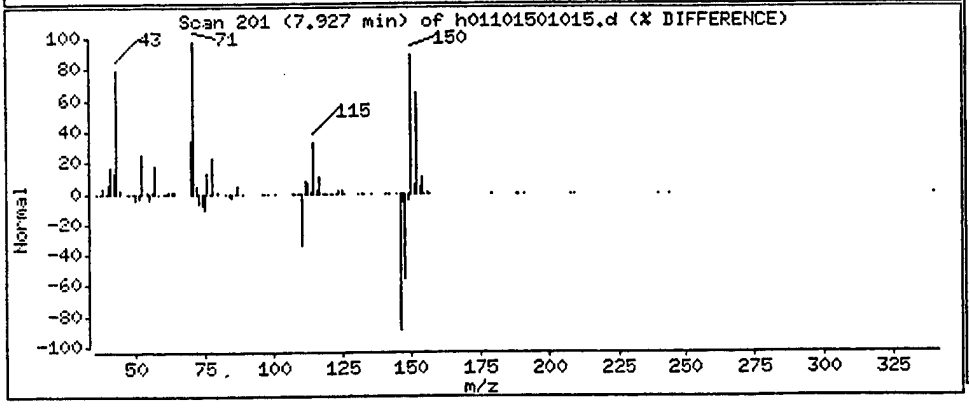












067

Data File: /chem/msdh.i/h-10Jan98.b/h01101501015.d

Date : 10-JAN-1998 21:19

Client ID: AF-A-EF117 PAH Dup

Instrument: msdh.i

Sample Info: 9712088A-01AA

Volume Injected (uL): 1.0

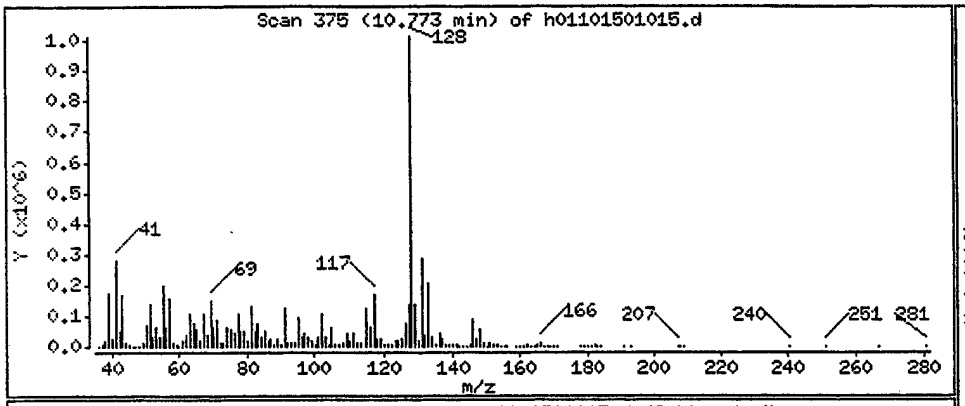
Operator: hch

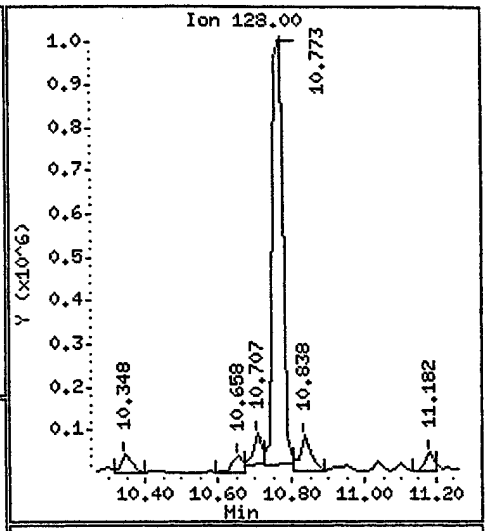
Column phase:

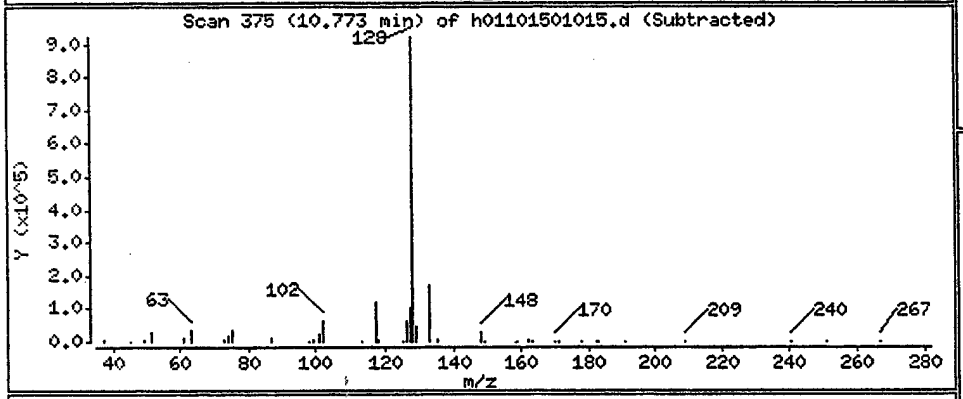
Column diameter: 2.00

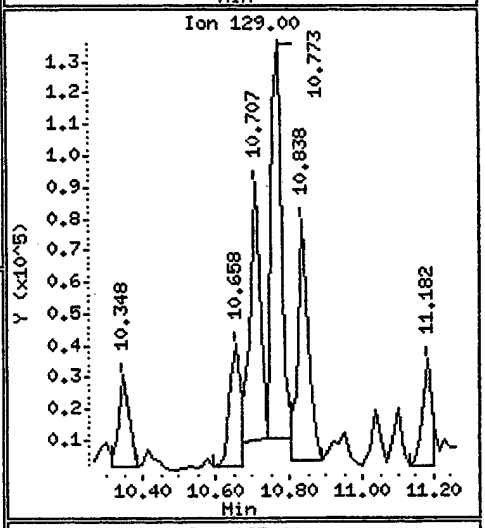
28 Naphthalene

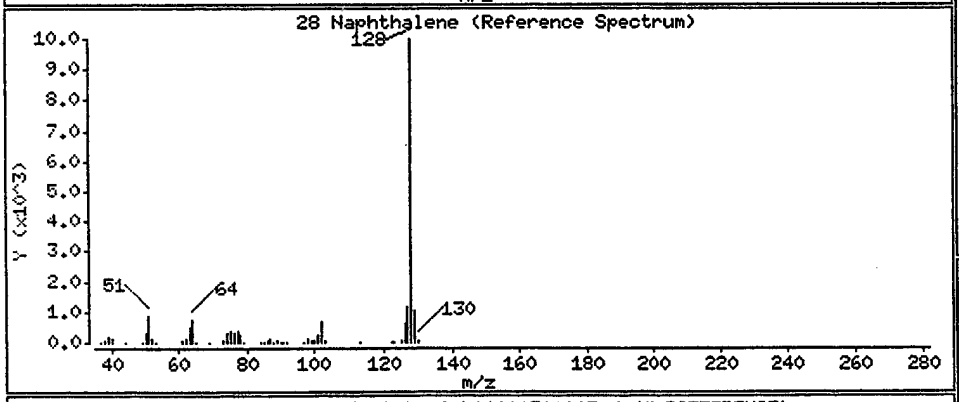
Concentration: 16.9 ug

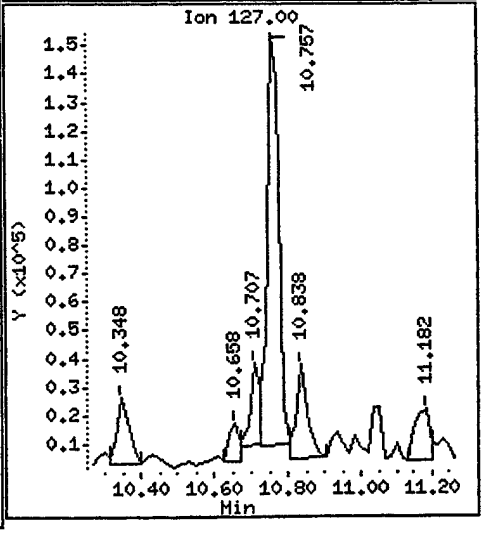


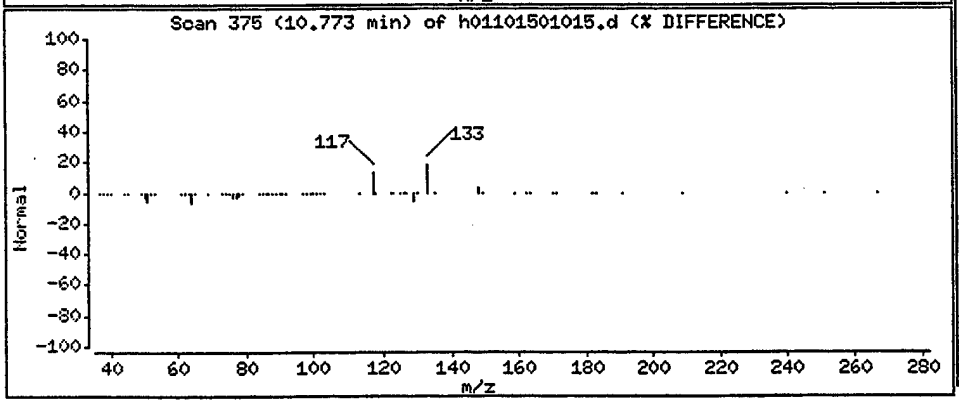












Data File: /chem/msdh.i/h-10Jan98.b/h01101501015.d

Date : 10-JAN-1998 21:19

Client ID: AF-A-EF117 PAH Dup

Instrument: msdh.i

Sample Info: 9712088A-01AA

Volume Injected (uL): 1.0

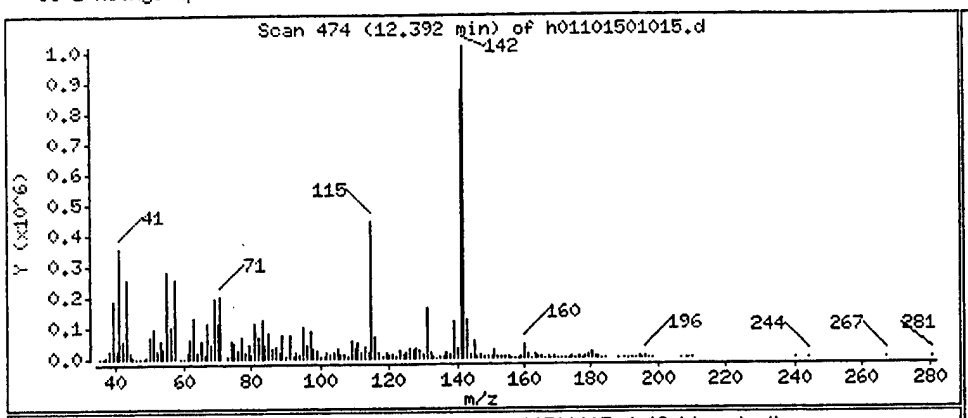
Operator: hch

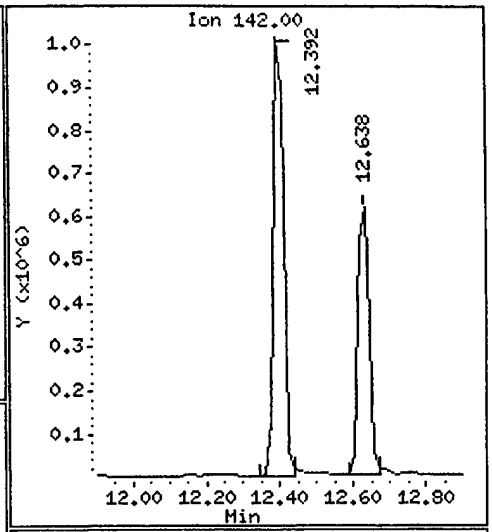
Column phase:

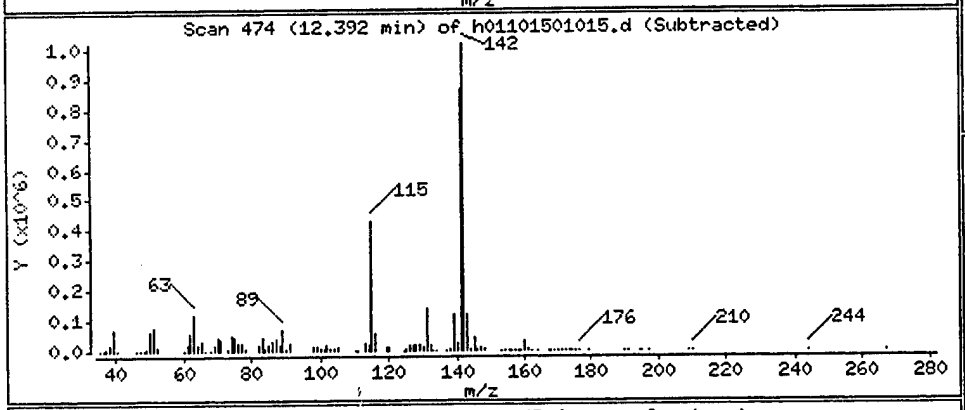
Column diameter: 2.00

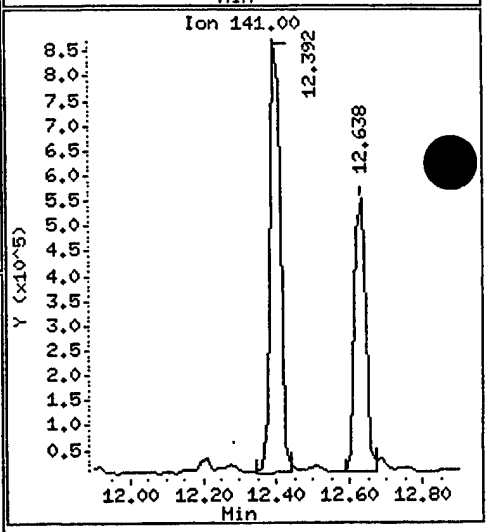
33 2-Methylnaphthalene

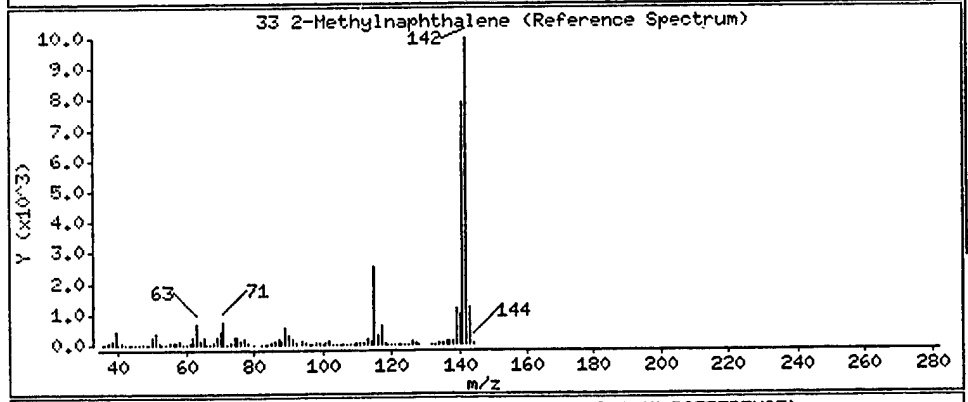
Concentration: 25.6 ug

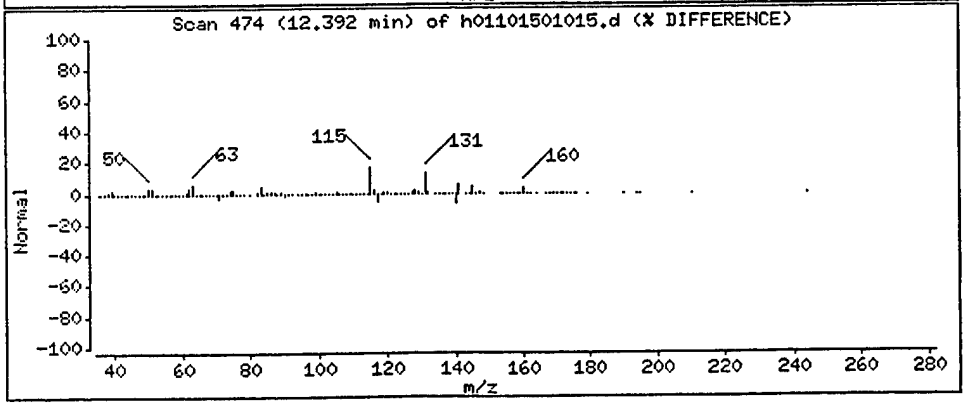












Data File: /chem/msdh.i/h-10Jan98.b/h01101501015.d

Date : 10-JAN-1998 21:19

Client ID: AF-A-EF117 PAH Dup

Instrument: msdh.i

Sample Info: 9712088A-01AA

Volume Injected (uL): 1.0

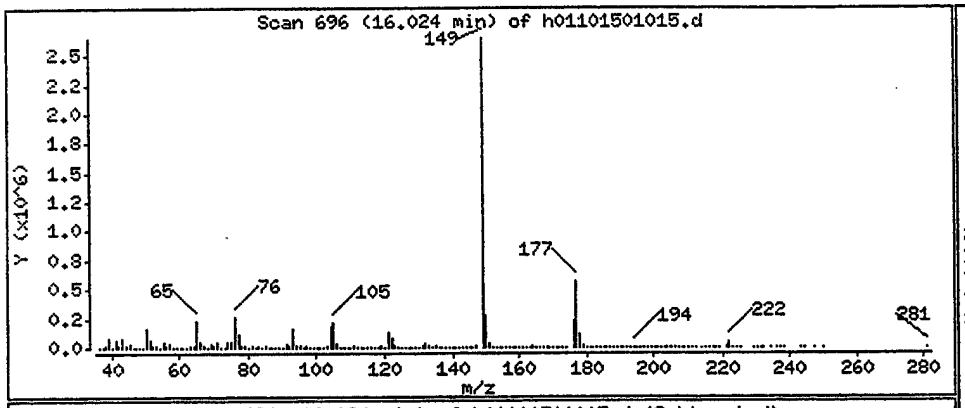
Operator: hch

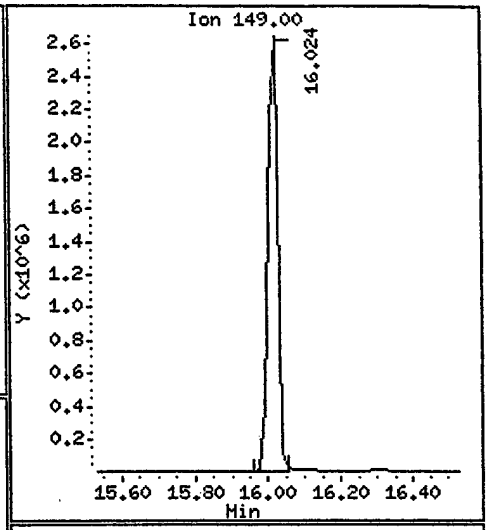
Column phase:

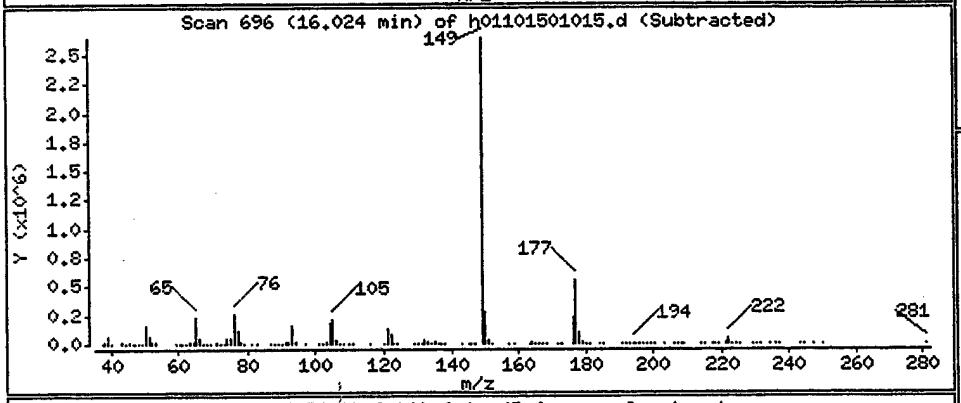
Column diameter: 2.00

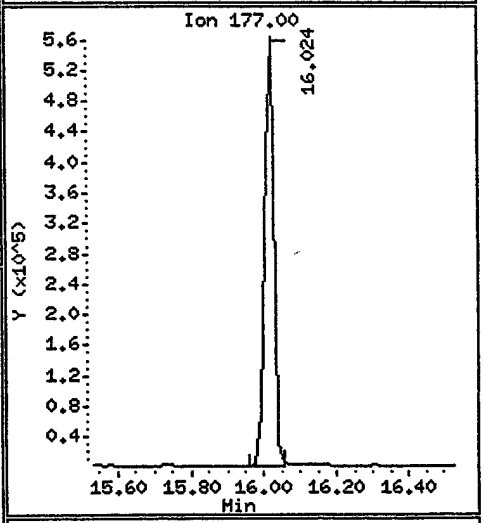
56 Diethylphthalate

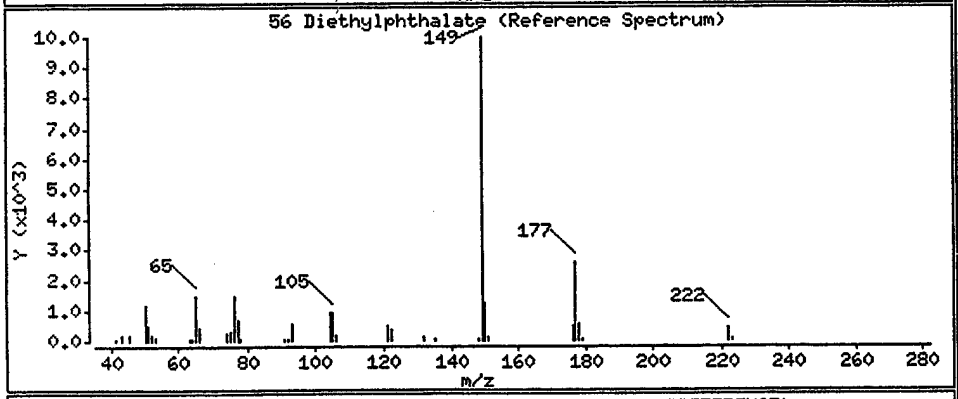
Concentration: 51.1 ug

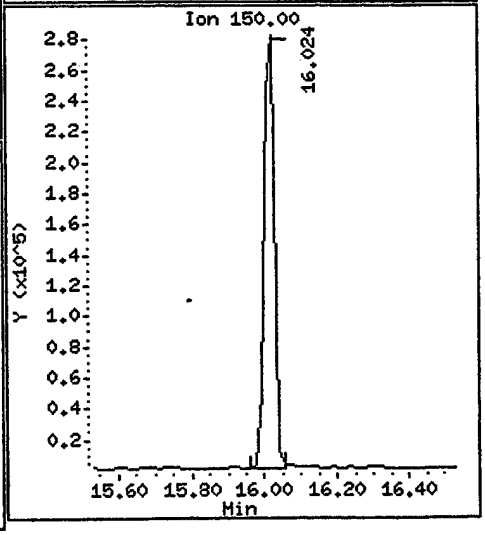


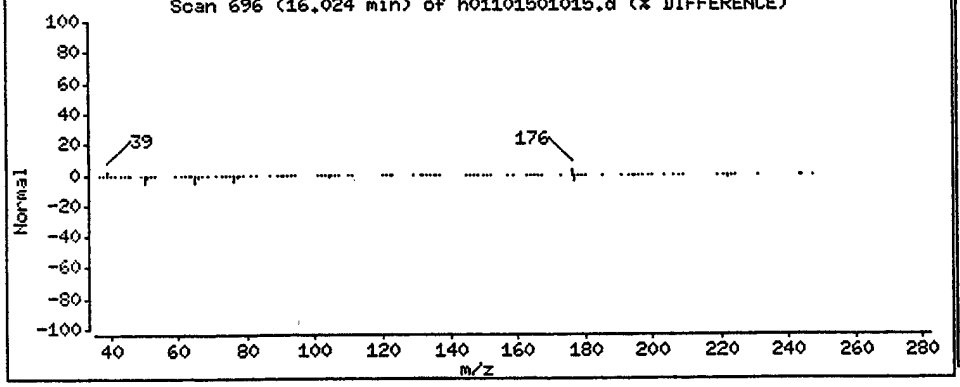












Data File: /chem/msdh.i/h-10Jan98.b/h01101501015.d

Date : 10-JAN-1998 21:19

Client ID: AF-A-EF117 PAH Dup

Instrument: msdh.i

Sample Info: 9712088A-01AA

Volume Injected (uL): 1.0

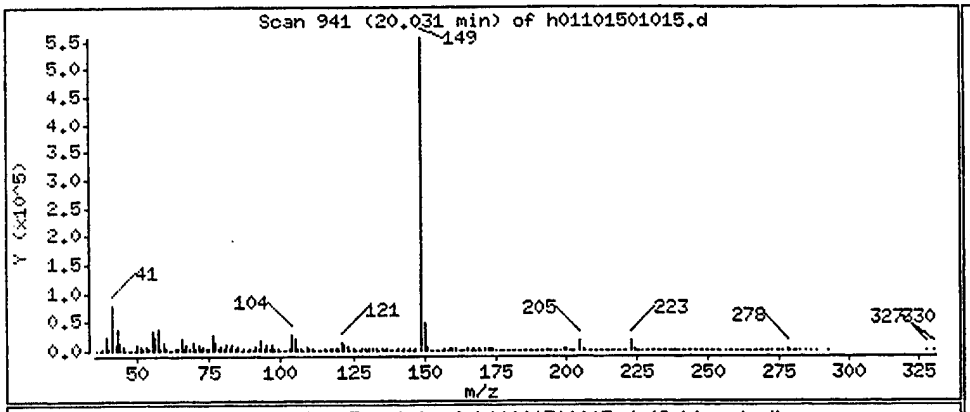
Operator: hch

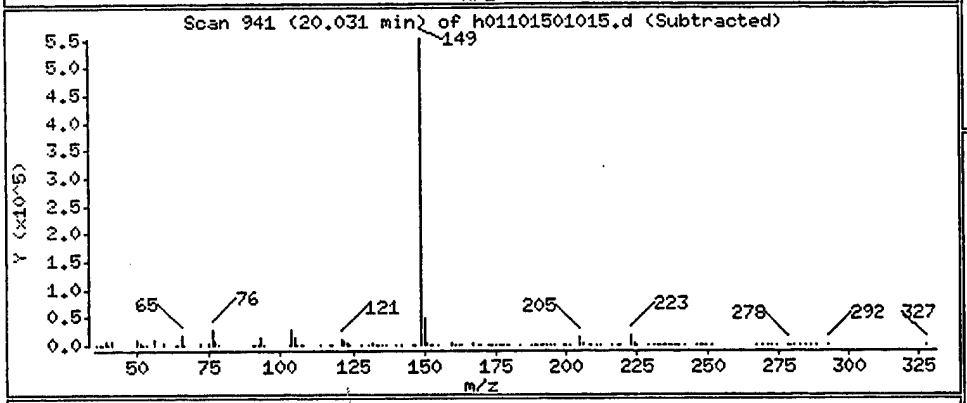
Column phase:

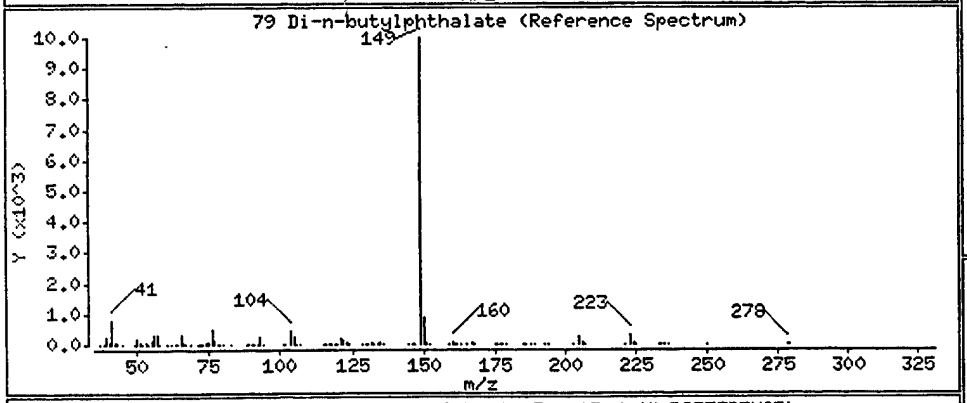
Column diameter: 2.00

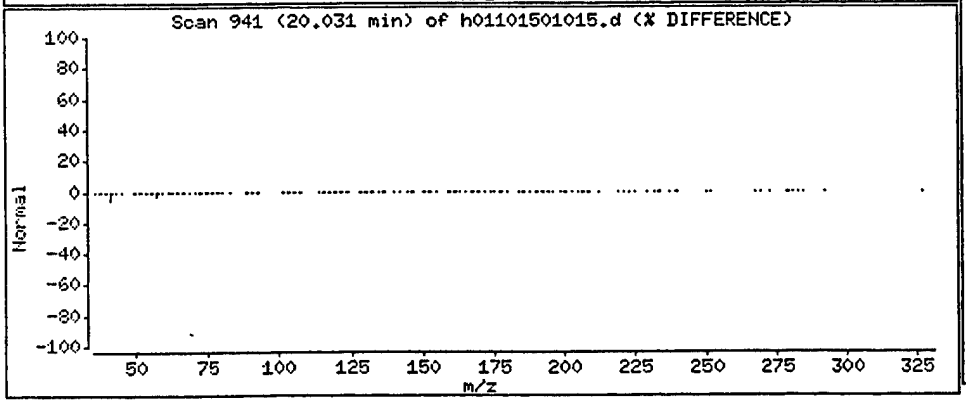
79 Di-n-butylphthalate

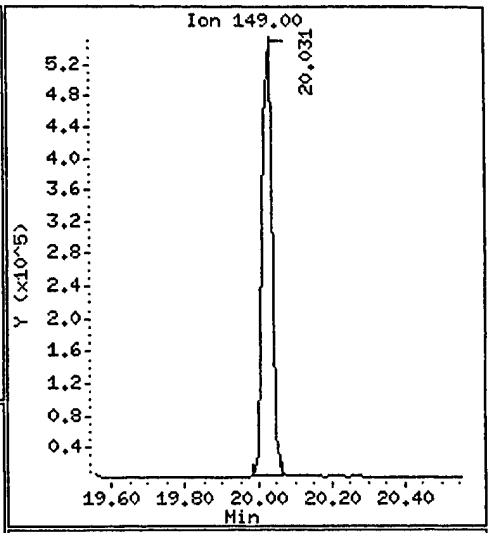
Concentration: 6.6 ug

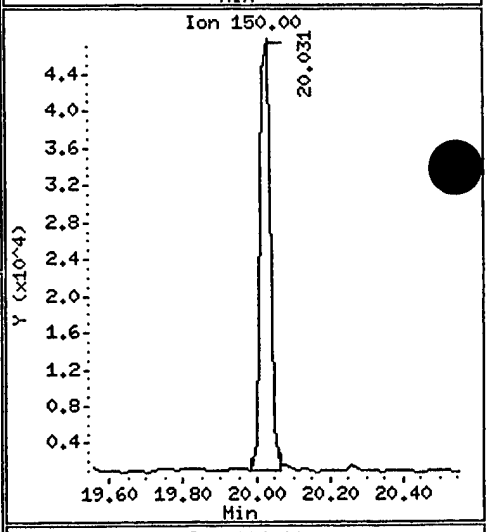


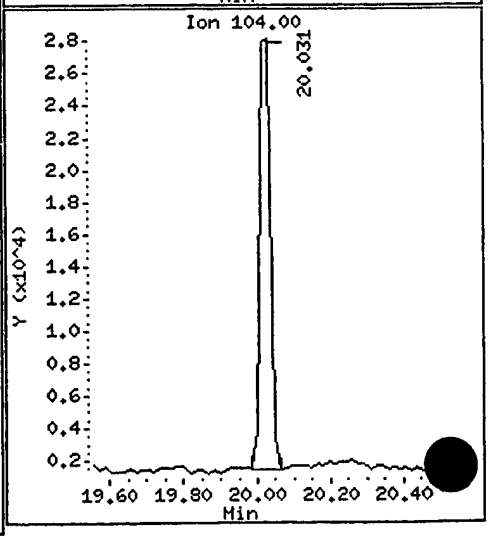












Data File: /chem/msdh.i/h-10Jan98.b/h01101501015.d

Date : 10-JAN-1998 21:19

Client ID: AF-A-EF117 PAH Dup

Instrument: msdh.i

Sample Info: 9712088A-01AA

Volume Injected (uL): 1.0

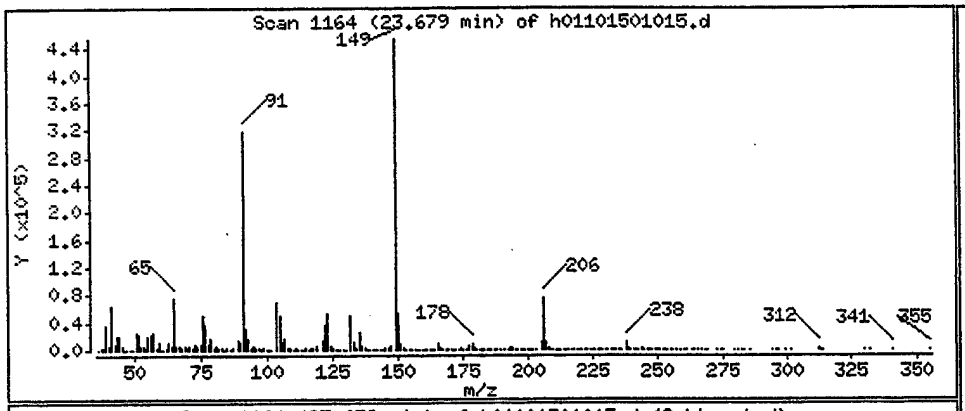
Operator: hch

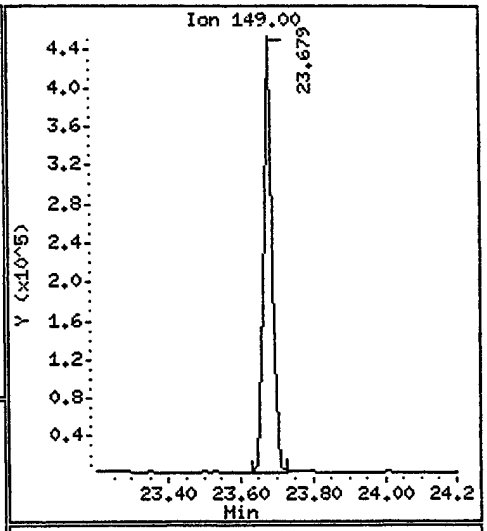
Column phase:

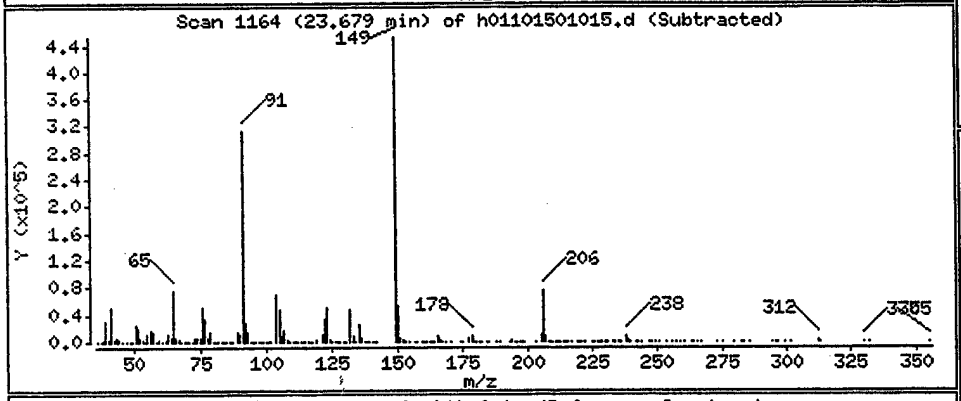
Column diameter: 2.00

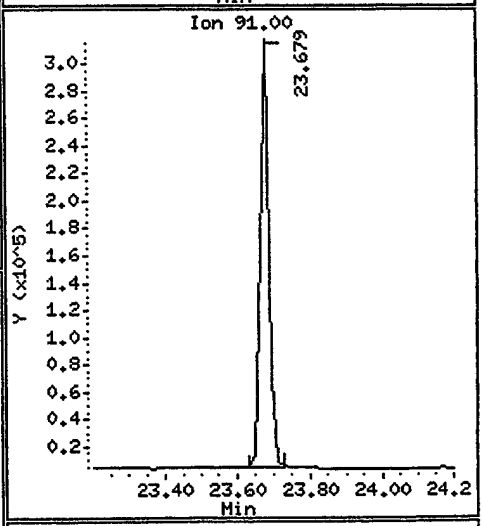
87 Butyl benzyl phthalate

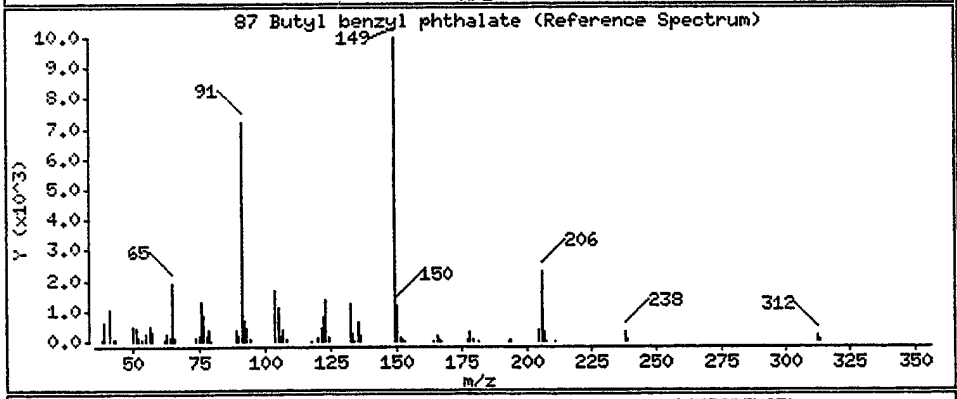
Concentration: 10.7 ug

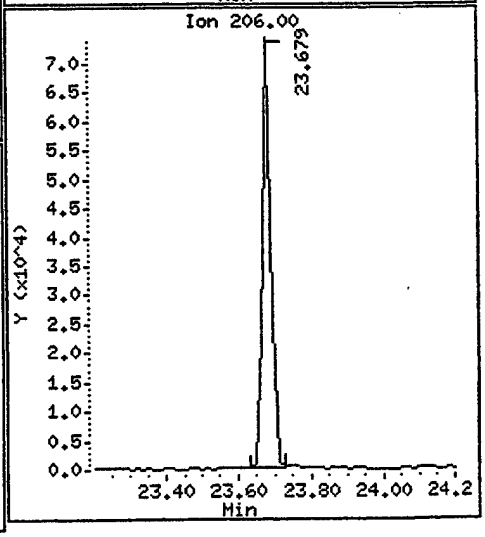


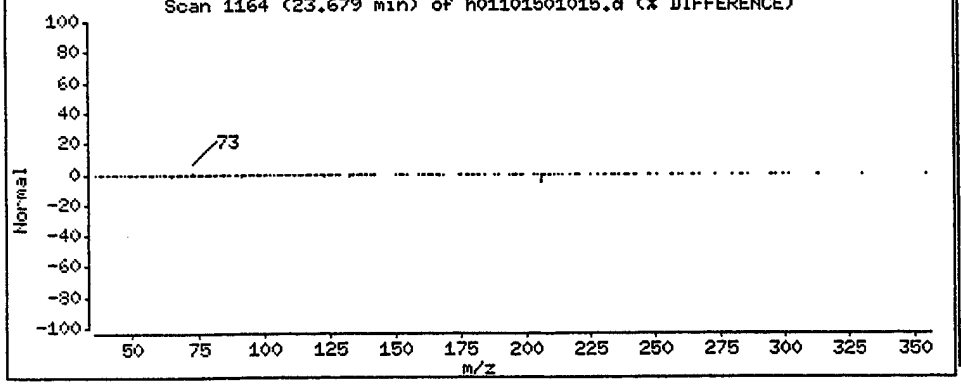












Data File: /chem/msdh.i/h-10Jan98.b/h01101501015.d

Date : 10-JAN-1998 21:19

Client ID: AF-A-EF117 PAH Dup

Instrument: msdh.i

Sample Info: 9712088A-01AA

Volume Injected (uL): 1.0

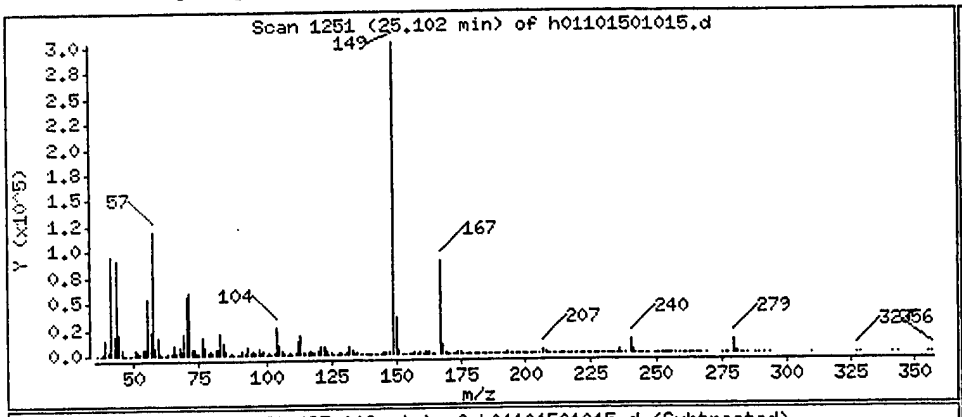
Operator: hch

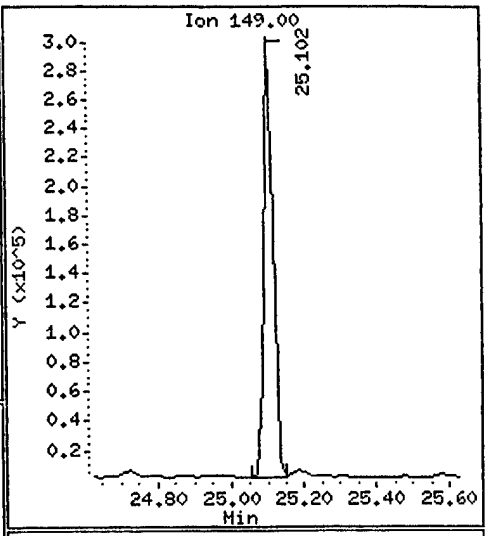
Column phase:

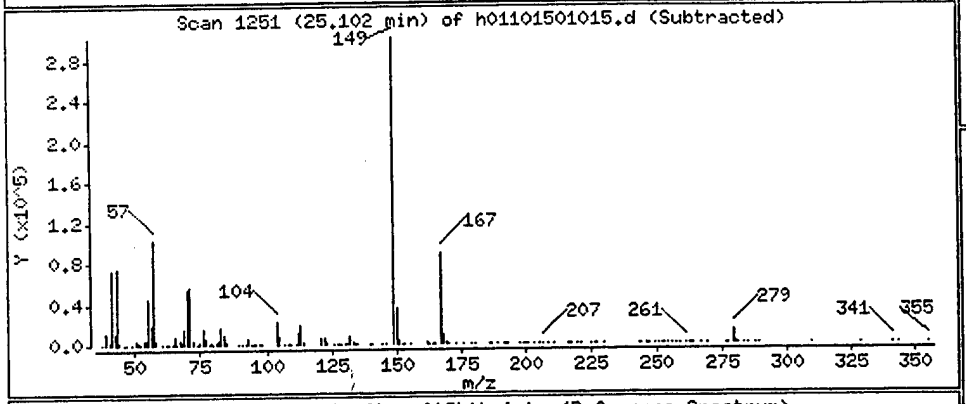
Column diameter: 2.00

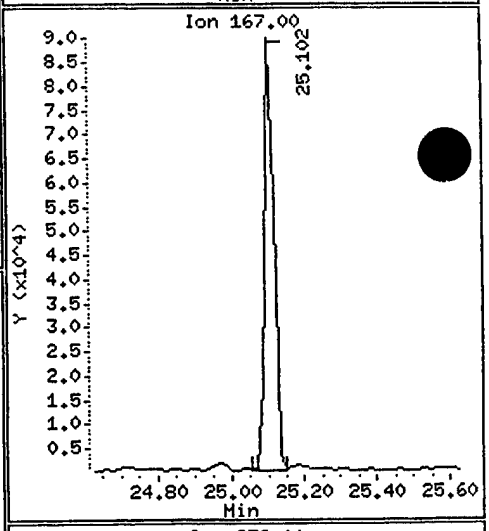
93 bis(2-ethylhexyl)Phthalate

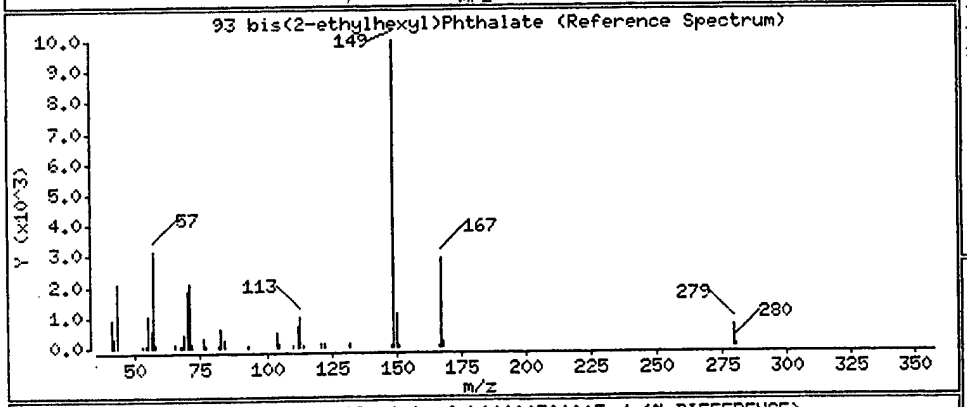
Concentration: 5.6 ug

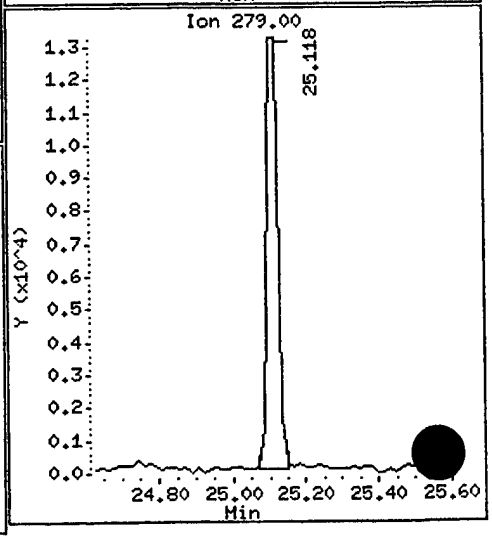


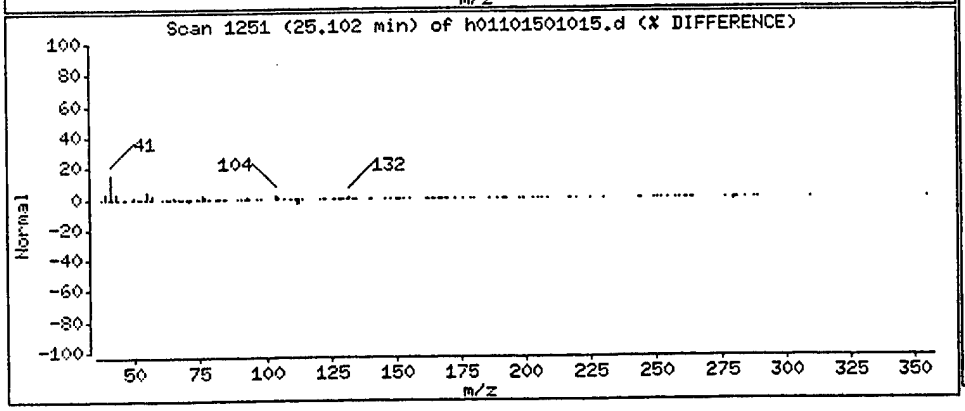












Audit History For: /chem/msdh.i/h-10Jan98.b/h01101501015.d

Change Date: 10-Jan-1998 22:08
Change Made by: Automation

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 09:34
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: 8270.sub
New Value: MM5.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:37
Change Made by: kbadal

Parameter: Misc Information
Old Value:
New Value: 80 ng ISTD #267-91-1
Reason For Change: N/A

Change Date: 22-Jan-1998 09:37
Change Made by: kbadal

Parameter: Lab ID
Old Value:
New Value: 9712088-01AA
Reason For Change: N/A

Change Date: 22-Jan-1998 09:37
Change Made by: kbadal

Parameter: Client ID
Old Value:
New Value: AF-A-EF117 PAH Dup
Reason For Change: N/A

Change Date: 22-Jan-1998 09:38
Change Made by: kbadal

Parameter: Sample Info
Old Value: 9712088-01aa
New Value: 9712088A-01aa
Reason For Change: N/A

Change Date: 22-Jan-1998 09:38
Change Made by: kbadal

Parameter: Lab ID
Old Value: 9712088-01AA
New Value: 9712088A-01AA
Reason For Change: N/A

Change Date: 22-Jan-1998 09:42
Change Made by: kbadal

Parameter: Sample Prep. Date
Old Value:
New Value: 08-DEC-1997 17:30
Reason For Change: N/A

Change Date: 22-Jan-1998 09:42
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 09:59
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: MM5.sub
New Value: 8270.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 10:00
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 13:34
Change Made by: kbadal

Parameter: Sample Info
Old Value: 9712088A-01aa
New Value: 9712088A-01AA
Reason For Change: N/A

Change Date: 22-Jan-1998 13:34
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 14:04
Change Made by: kbadal

Parameter: Best Hit for Phenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:04
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:04
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethyl)ether changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:04
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:04
Change Made by: kbadal

Parameter: Best Hit for 1,3-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:04
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Best Hit for 1,4-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Best Hit for 2-Methylphenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroisopropyl)ether changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Requantitate all compounds

Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Best Hit for 4-Methylphenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Best Hit for N-Nitrosodipropylamine changed
Old Value: Old Hit #6
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Best Hit for Hexachloroethane changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Best Hit for Nitrobenzene changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:

Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Best Hit for Isophorone changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Best Hit for 2-Nitrophenol changed
Old Value: Old Hit #4
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dimethylphenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:05
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethoxy)methane changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dichlorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #4
New Value: New Hit #3
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Best Hit for 4-Chloroaniline changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Best Hit for 4-Chloro-3-Methylphenol changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Best Hit for 2,4,6-Trichlorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Best Hit for 2,4,5-Trichlorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Best Hit for 2-Nitroaniline changed
Old Value: Old Hit #4
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:06
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:07
Change Made by: kbadal

Parameter: Best Hit for 2,6-Dinitrotoluene changed

Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:07
Change Made by: kbadal

Parameter: Best Hit for 4-Nitrophenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:07
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dinitrotoluene changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:07
Change Made by: kbadal

Parameter: Best Hit for N-nitrosodiphenylamine changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:22
Change Made by: kbadal

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected

Reason For Change: N/A

Change Date: 22-Jan-1998 14:22
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:22
Change Made by: kbadal

Parameter: Best Hit for 1,4-Dichlorobenzene changed
Old Value: Compound Undetected
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 14:22
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 11:45
Change Made by: jheffel

Parameter: Sample Info
Old Value: 9712088A-01AA
New Value: 1.0ul 9712088A-01AA
Reason For Change: N/A

Change Date: 28-Jan-1998 11:45
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 28-Jan-1998 12:15
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 5.261 min. changed.
Old Value: Old match: Octane, 2-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:15
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 5.849 min. changed.
Old Value: Old match: Nonane
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:15
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 6.487 min. changed.
Old Value: Old match: Cyclohexane, 1-propenyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:15
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 6.962 min. changed.
Old Value: Old match: Benzene, 1-ethyl-2-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:15
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 7.551 min. changed.
Old Value: Old match: Benzene, 1,2,3-trimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:15
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.025 min. changed.
Old Value: Old match: Benzene, (1-methylethyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.467 min. changed.
Old Value: Old match: Benzene, 1-methyl-3-propyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.565 min. changed.
Old Value: Old match: Benzene, methyl(1-methylethyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.614 min. changed.
Old Value: Old match: Undecane, 2,10-dimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.186 min. changed.
Old Value: Old match: Decane, 2,9-dimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 12.196 min. changed.
Old Value: Old match: Tridecane
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.787 min. changed.
Old Value: Old match: Octane, 3,6-dimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.591 min. changed.
Old Value: Old match: Diisoamylene
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.182 min. changed.
Old Value: Old match: Naphthalene, 1,2,3,4-tetrahydro-2-methyl
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 10.920 min. changed.
Old Value: Old match: Undecane, 2,6-dimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 10.838 min. changed.
Old Value: Old match: 1H-Indene, 2,3-dihydro-1,6-dimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 10.119 min. changed.
Old Value: Old match: Benzene, (1-methyl-1-propenyl)-, (E)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 10.037 min. changed.
Old Value: Old match: Undecane, 5-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.448 min. changed.
Old Value: Old match: Unknown
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:16
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.284 min. changed.

Old Value: Old match: Benzene, 1-methyl-4-(2-methylpropyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 30-Jan-1998 09:05
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Reason For Change: Quantitation

Change Date: 30-Jan-1998 09:07
Change Made by: kbadal

Parameter: Best Hit for Benzyl Alcohol changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 30-Jan-1998 09:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 30-Jan-1998 09:07
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Reason For Change: Quantitation

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-14

085

CLIENT SAMPLE NO.

AF - I - EF117 PAH

Lab Name:	AIR TOXICS LIMITED		
Lab Code:		SDG No:	
Contract:		Lab Sample ID:	9712088A-02A
Matrix:	AMBIENT AIR	Lab File ID:	H011016
Sample Vol:	1.0uL	Date Received:	12/6/97
% Moisture:	NA	Date Extracted:	12/8/97
Instrument ID:	MSD-H	Date Analyzed:	1/10/98
		Dilution Factor:	1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	19	
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	2.4	
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	29	
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	28	
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.3	
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	53	

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.
AF - I - EF117 PAH

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-02A
Lab File ID: H011016
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/10/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	5.9	B
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	6.0	
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	2.8	
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-10Jan98.b/h01101601016.d
Lab Smp Id: 9712088A-02A Client Smp ID: AF-I-EF117 PAH
Inj Date : 10-JAN-1998 22:02
Operator : hch Inst ID: msdh.i
Smp Info : 9712088A-02A
Misc Info : 80 ng ISTD #267-91-1
Comment :
Method : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Meth Date : 29-Jan-1998 16:36 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 16
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8270.sub
Target Version: 3.40
Processing Host: frodo

1-30-98

JJH 1.30.98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
$	1 2-Fluorophenol	112	5.406	5.389	(0.685)	3118366	61.6033	61.6
$	2 Phenol-d5	99	7.107	7.107	(0.663)	4192607	67.9019	67.9
	3 Phenol	94	7.140	7.123	(0.905)	1127255	19.1080	19.1
*	7 1,4-Dichlorobenzene-d4	150	7.892	7.892	(1.000)	5023121	80.0000	
	8 1,4-Dichlorobenzene	146	7.925	7.925	(1.004)	121231	2.40449	2.4(H)
$	15 Nitrobenzene-d5	82	9.086	9.086	(0.609)	3861471	67.4667	67.5
*	24 Naphthalene-d8	136	10.722	10.722	(1.000)	10284484	80.0000	
	25 Naphthalene	128	10.771	10.771	(1.005)	3652610	29.1841	29.2
	29 2-Methylnaphthalene	142	12.390	12.407	(1.156)	2236095	28.2369	28.2
$	33 2-Fluorobiphenyl	172	13.290	13.306	(0.717)	7005171	68.1297	68.1
	38 Acenaphthylene	152	14.549	14.566	(0.976)	154484	1.29214	1.3
*	40 Acenaphthene-d10	164	14.909	14.926	(1.000)	6436856	80.0000	
	46 Diethylphthalate	149	16.022	16.038	(1.075)	5195527	52.7611	52.8
$	52 2,4,6-Tribromophenol	330	16.839	16.839	(0.674)	1783062	105.892	106

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)	
* 56 Phenanthrene-d10	188	18.524	18.541	(1.000)	11964752	80.0000		
59 Di-n-butylphthalate	149	20.029	20.062	(1.081)	938748	5.87231	5.9	B
$ 62 Terphenyl-d14	244	22.466	22.483	(0.899)	8572827	105.283	105	
64 Butyl benzyl phthalate	149	23.677	23.709	(0.948)	410173	5.99311	6.0	
65 bis(2-ethylhexyl)Phthalate	149	25.100	25.132	(1.005)	266048	2.80028	2.8	
* 67 Chrysene-d12	240	24.985	25.002	(1.000)	8178385	80.0000		
* 72 Perylene-d12	264	28.322	28.338	(1.000)	4585756	80.0000		
$ 123 Benzo(e)pyrene-d12	264	27.995	28.027	(0.988)	268			(aR)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.
H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-10Jan98.b/h01101601016.d
Lab Smp Id:
Inj Date : 10-JAN-1998 22:02
Operator : hch Inst ID: msdh.i
Smp Info : 9712088-02a
Misc Info :
Comment :
Method : /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Meth Date : 10-Jan-1998 11:38 Quant Type: ISTD
Cal Date : 09-JAN-1998 00:49 Cal File: h01080301007.d
Als bottle: 16
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8270.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
$ 1 2-Fluorophenol	112	5.406	5.389	(0.685)	3118366	61.6033	61.6
	112	5.193	5.389	(0.658)	92599	1.82929	1.8(R)
	112	5.275	5.389	(0.668)	73407	1.45016	1.4(R)
$ 2 Phenol-d5	99	7.107	7.107	(0.663)	4192607	67.9019	67.9
	99	6.780	7.107	(0.632)	56588	0.91648	0.92(R)
	99	6.894	7.107	(0.643)	159392	2.58145	2.6(R)
	99	6.960	7.107	(0.649)	272490	4.41314	4.4(R)
3 Phenol	94	7.140	7.123	(0.905)	1127255	18.9960	19.0
	94	7.254	7.123	(0.919)	37928	0.63915	0.64(a)
4 bis(2-Chloroethyl)ether	93	7.303	7.336	(0.925)	81117	1.62402	1.6
	93	6.976	7.336	(0.884)	74401	1.48956	1.5
	93	7.140	7.336	(0.905)	32061	0.64188	0.64(a)
	93	7.549	7.336	(0.956)	51144	1.02394	1.0
6 1,3-Dichlorobenzene	146	7.925	7.778	(1.004)	121231	2.41698	2.4

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
* 7 1,4-Dichlorobenzene-d4	150	7.892	7.892	(1.000)	5023121	80.0000	
	150	7.532	7.892	(1.000)	281	80.0000	
	150	7.565	7.892	(1.000)	779	80.0000	(Q)
	150	7.696	7.892	(1.000)	1426	80.0000	
	150	7.761	7.892	(1.000)	250	80.0000	(Q)
	150	7.827	7.892	(1.000)	103	80.0000	(Q)
	150	8.056	7.892	(1.000)	1707	80.0000	(Q)
	150	8.219	7.892	(1.000)	3585	80.0000	
	150	8.317	7.892	(1.000)	439	80.0000	(Q)
8 1,4-Dichlorobenzene	146	7.925	7.925	(1.004)	121231	2.41620	2.4
9 1,2-Dichlorobenzene	146	7.925	8.252	(1.004)	121231	2.56187	2.6
10 2-Methylphenol	108	8.399	8.399	(1.064)	108161	2.66558	2.7
	108	8.170	8.399	(1.035)	165946	4.08967	4.1
	108	8.743	8.399	(1.108)	209883	5.17248	5.2
12 4-Methylphenol	108	8.743	8.743	(1.108)	209883	5.00061	5.0
	108	8.399	8.743	(1.064)	108161	2.57701	2.6
13 N-Nitrosodipropylamine	70	8.710	8.775	(1.104)	152764	4.45908	4.4
	70	8.366	8.775	(1.060)	107051	3.12475	3.1
	70	8.465	8.775	(1.073)	473797	13.8298	13.8
	70	8.530	8.775	(1.081)	464642	13.5626	13.6
	70	8.612	8.775	(1.091)	301109	8.78917	8.8
	70	9.004	8.775	(1.141)	332829	9.71505	9.7
	70	9.086	8.775	(1.151)	862458	25.1746	25.2
14 Hexachloroethane	117	8.939	8.972	(1.133)	133550	6.32760	6.3
$ 15 Nitrobenzene-d5	82	9.086	9.086	(0.609)	3861471	67.4635	67.5
	82	8.661	9.086	(0.581)	90038	1.57305	1.6(R)
	82	8.726	9.086	(0.585)	872187	15.2379	15.2(R)
	82	8.874	9.086	(0.595)	167879	2.93300	2.9(R)
	82	9.184	9.086	(0.616)	78873	1.37798	1.4(R)
	82	9.250	9.086	(0.620)	357229	6.24112	6.2(R)
	82	9.364	9.086	(0.628)	192799	3.36838	3.4(R)
	82	9.446	9.086	(0.634)	221928	3.87729	3.9(R)
16 Nitrobenzene	77	9.103	9.135	(0.849)	171422	3.14682	3.1
	77	8.726	9.135	(0.814)	558157	10.2462	10.2
	77	8.890	9.135	(0.829)	142977	2.62465	2.6
	77	8.939	9.135	(0.834)	159408	2.92628	2.9
	77	9.037	9.135	(0.843)	308923	5.67095	5.7
	77	9.282	9.135	(0.866)	192426	3.53239	3.5
	77	9.364	9.135	(0.873)	107255	1.96890	2.0
	77	9.446	9.135	(0.881)	93758	1.72113	1.7
	77	9.511	9.135	(0.887)	64453	1.18317	1.2
	77	9.561	9.135	(0.892)	78233	1.43614	1.4
17 Isophorone	82	9.626	9.675	(0.898)	735553	6.51716	6.5
	82	9.250	9.675	(0.863)	357229	3.16513	3.2
	82	9.364	9.675	(0.873)	192799	1.70824	1.7
	82	9.446	9.675	(0.881)	221928	1.96633	2.0
	82	9.511	9.675	(0.887)	129696	1.14914	1.1

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	82	9.855	9.675	(0.919)	1409246	12.4862	12.5
	82	10.002	9.675	(0.933)	235551	2.08703	2.1
	82	10.068	9.675	(0.939)	83381	0.73877	0.74(a)
18 2,4-Dimethylphenol	122	9.920	9.937	(0.925)	28662	0.82084	0.82(a)
	122	9.822	9.937	(0.916)	44879	1.28527	1.3
	122	10.149	9.937	(0.947)	368055	10.5405	10.5
	122	10.231	9.937	(0.954)	109215	3.12775	3.1
19 2-Nitrophenol	139	9.871	9.839	(0.921)	62882	2.11725	2.1
	139	9.397	9.839	(0.876)	18462	0.62162	0.62(a)
	139	9.610	9.839	(0.896)	26383	0.88832	0.89(a)
	139	9.969	9.839	(0.930)	54644	1.83988	1.8
	139	10.084	9.839	(0.941)	46805	1.57594	1.6
	139	10.198	9.839	(0.951)	57516	1.93658	1.9
20 Benzoic Acid	122	10.231	10.231	(0.954)	108785	4.27947	4.3
	122	9.822	10.231	(0.916)	44879	1.76549	1.8
	122	9.920	10.231	(0.925)	27828	1.09472	1.1
	122	9.969	10.231	(0.930)	13540	0.53265	0.53(a)
	122	10.149	10.231	(0.947)	364628	14.3440	14.3
	122	10.395	10.231	(0.969)	14582	0.57364	0.57(a)
	122	10.526	10.231	(0.982)	18034	0.70944	0.71(a)
	122	10.640	10.231	(0.992)	14987	0.58957	0.59(a)
21 bis(2-Chloroethoxy)methane	93	10.182	10.166	(0.950)	46418	0.76423	0.76(a)
	93	9.773	10.166	(0.912)	182907	3.01138	3.0
	93	9.888	10.166	(0.922)	110968	1.82698	1.8
	93	10.133	10.166	(0.945)	35559	0.58544	0.58(a)
	93	10.231	10.166	(0.954)	35632	0.58664	0.59(a)
	93	10.329	10.166	(0.963)	48855	0.80435	0.80(a)
	93	10.493	10.166	(0.979)	39326	0.64746	0.65(a)
22 2,4-Dichlorophenol	162	10.395	10.378	(0.969)	20106	0.51455	0.51(a)
	162	10.656	10.378	(0.994)	92714	2.37270	2.4
* 24 Naphthalene-d8	136	10.722	10.722	(1.000)	10284484	80.0000	
	136	10.313	10.722	(1.000)	24814	80.0000	
	136	10.427	10.722	(1.000)	6082	80.0000	
	136	10.509	10.722	(1.000)	1703	80.0000	
	136	10.575	10.722	(1.000)	9568	80.0000	
	136	10.624	10.722	(1.000)	12570	80.0000	
	136	11.082	10.722	(1.000)	5037	80.0000	
	136	11.131	10.722	(1.000)	6090	80.0000	
25 Naphthalene	128	10.771	10.771	(1.005)	3652610	30.8620	30.9
	128	10.346	10.771	(0.965)	76397	0.64550	0.64
	128	10.411	10.771	(0.971)	65025	0.54942	0.55
	128	10.656	10.771	(0.994)	78229	0.66098	0.66
	128	10.706	10.771	(0.998)	135883	1.14812	1.1
	128	10.836	10.771	(1.011)	169897	1.43551	1.4
	128	11.180	10.771	(1.043)	73285	0.61921	0.62
26 4-Chloroaniline	127	10.771	10.885	(1.005)	520467	17.5864	17.6
	127	10.656	10.885	(0.994)	24069	0.81328	0.81(a)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
		127	10.706	10.885	(0.998)	56321	1.90306	1.9
		127	10.836	10.885	(1.011)	60592	2.04738	2.0
		127	10.935	10.885	(1.020)	16289	0.55040	0.55(a)
		127	11.033	10.885	(1.029)	34043	1.15030	1.2
		127	11.180	10.885	(1.043)	42567	1.43832	1.4
	28 4-Chloro-3-Methylphenol	107	12.096	12.047	(1.128)	33747	0.89658	0.90(a)
		107	11.752	12.047	(1.096)	35832	0.95198	0.95(a)
		107	11.801	12.047	(1.101)	94015	2.49777	2.5
		107	12.227	12.047	(1.140)	38891	1.03325	1.0
	29 2-Methylnaphthalene	142	12.390	12.407	(1.156)	2236095	28.2369	28.2
		142	12.636	12.407	(1.178)	1374870	17.3616	17.4
$	33 2-Fluorobiphenyl	172	13.290	13.306	(0.717)	7005171	68.1297	68.1
	35 2-Nitroaniline	65	13.781	13.830	(0.924)	16592	0.65473	0.65(a)
		65	13.568	13.830	(0.910)	21563	0.85089	0.85(a)
		65	13.633	13.830	(0.914)	48835	1.92707	1.9
		65	13.715	13.830	(0.920)	24749	0.97662	0.98(a)
		65	13.912	13.830	(0.933)	19138	0.75520	0.76(a)
		65	14.042	13.830	(0.942)	13180	0.52009	0.52(a)
		65	14.091	13.830	(0.945)	18434	0.72742	0.73(a)
		65	14.141	13.830	(0.948)	17791	0.70205	0.70(a)
	37 2,6-Dinitrotoluene	165	14.386	14.451	(0.965)	147473	6.40156	6.4
		165	14.190	14.451	(0.952)	14165	0.61488	0.61(a)
	38 Acenaphthylene	152	14.549	14.566	(0.976)	154484	1.29214	1.3
*	40 Acenaphthene-d10	164	14.909	14.926	(1.000)	6436856	80.0000	
		164	14.517	14.926	(1.000)	7644	80.0000	
		164	14.566	14.926	(1.000)	3898	80.0000	
		164	14.648	14.926	(1.000)	4290	80.0000	
		164	14.746	14.926	(1.000)	773	80.0000	
	43 4-Nitrophenol	109	15.482	15.269	(1.038)	16541	1.81284	1.8
		109	14.909	15.269	(1.000)	18701	2.04957	2.0
		109	15.613	15.269	(1.047)	7191	0.78811	0.79(a)
	46 Diethylphthalate	149	16.022	16.038	(1.075)	5195527	52.7611	52.8
	51 N-nitrosodiphenylamine	169	16.823	16.578	(0.908)	64494	1.13633	1.1
$	52 2,4,6-Tribromophenol	330	16.839	16.839	(0.674)	1783062	105.892	106
*	56 Phenanthrene-d10	188	18.524	18.541	(1.000)	11964752	80.0000	
		188	18.213	18.541	(1.000)	2011	80.0000	
		188	18.312	18.541	(1.000)	193	80.0000	
	59 Di-n-butylphthalate	149	20.029	20.062	(1.081)	938748	5.87231	5.9
$	62 Terphenyl-d14	244	22.466	22.483	(0.899)	8572827	105.283	105
	64 Butyl benzyl phthalate	149	23.677	23.709	(0.948)	410173	5.99307	6.0
	65 bis(2-ethylhexyl)Phthalate	149	25.100	25.132	(1.005)	266048	2.80028	2.8
*	67 Chrysene-d12	240	24.985	25.002	(1.000)	8178385	80.0000	
		240	24.609	25.002	(1.000)	828	80.0000	
		240	24.723	25.002	(1.000)	1423	80.0000	
		240	24.773	25.002	(1.000)	1764	80.0000	
		240	24.871	25.002	(1.000)	5014	80.0000	
*	72 Perylene-d12	264	28.322	28.338	(1.000)	4585756	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)	
	264	27.929	28.338	(1.000)	370	80.0000		
	264	27.995	28.338	(1.000)	268	80.0000		
	264	28.126	28.338	(1.000)	246	80.0000		
	264	28.191	28.338	(1.000)	754	80.0000		
$ 123 Benzo(e)pyrene-d12	264	27.995	27.995	(0.988)	268			(aR)
	264	27.570	27.995	(0.973)	364			(aR)
	264	27.619	27.995	(0.975)	769			(aR)
	264	27.782	27.995	(0.981)	384			(aR)
	264	27.929	27.995	(0.986)	370			(aR)
	264	28.126	27.995	(0.993)	246			(aR)
	264	28.191	27.995	(0.995)	754			(aR)
	264	28.322	27.995	(1.000)	4585756			(aR)
124 Benzyl Alcohol	108	8.170	8.170	(1.035)	173903	5.96448	6.0	
	108	8.399	8.170	(1.064)	109736	3.76369	3.8	

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01101601016.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: hch
Method File: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Misc Info:

Calibration Date: JAN/10/98
Calibration Time: 1157

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	5433602	2716801	10867204	5023121	-7.55
24 Naphthalene-d8	10679247	5339624	21358494	10284484	-3.70
40 Acenaphthene-d10	6057945	3028972	12115890	6436856	6.25
56 Phenanthrene-d10	11000079	5500040	22000158	11964752	8.77
67 Chrysene-d12	8154182	4077091	16308364	8178385	0.30
72 Perylene-d12	5122068	2561034	10244136	4585756	-10.47

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIF
7 1,4-Dichlorobenze	7.89	7.39	8.39	7.89	0.00
24 Naphthalene-d8	10.72	10.22	11.22	10.72	0.00
40 Acenaphthene-d10	14.93	14.43	15.43	14.91	-0.11
56 Phenanthrene-d10	18.54	18.04	19.04	18.52	-0.09
67 Chrysene-d12	25.00	24.50	25.50	24.99	-0.07
72 Perylene-d12	28.34	27.84	28.84	28.32	-0.06

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

1.29.98

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: 9712088A-02A
Level: LOW
Data Type: MS DATA
SpikeList File: 8270.spk
Sublist File: 8270.sub
Method File: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Misc Info: 80 ng ISTD #267-91-1

Client SDG: h-10Jan98
Fraction: SV
Client Smp ID: AF-I-EF117 PAH
Operator: hch
SampleType: SAMPLE
Quant Type: ISTD

SURROGATE COMPOUND	CONC ADDED ug	CONC RECOVERED ug	% RECOVERED	LIMITS
$ 1 2-Fluorophenol	100	61.6	61.60	25-121
$ 3 Phenol-d5	100	67.9	67.90	24-113
$ 17 Nitrobenzene-d5	100	67.5	67.47	23-120
$ 38 2-Fluorobiphenyl	100	68.1	68.13	30-115
$ 65 2,4,6-Tribromophen	100	106	105.89	19-122
$ 84 Terphenyl-d14	100	105	105.28	18-137

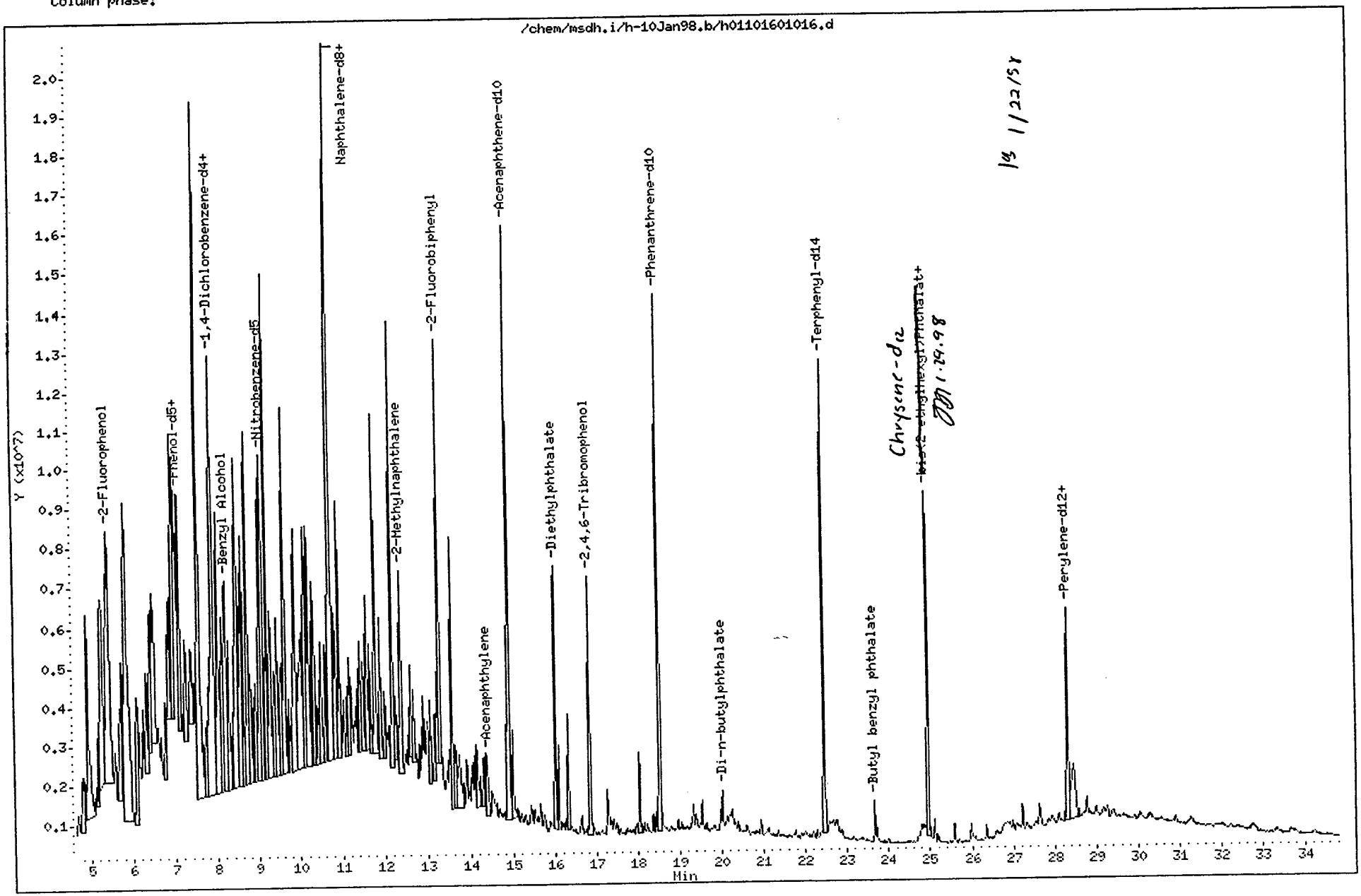
1.29.98

096

Data P /chem/msdh.i/h-10Jan98.b/h01101601016.d
Date : 10-JAN-1998 22:02
Client ID: AF-I-EF117 PAH
Sample Info: 9712088A-02A
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i

Operator: hch
Column diameter: 2.00



14 1/22/98

Data File: /chem/msdh.i/h-10Jan98.b/h01101601016.d

Date : 10-JAN-1998 22:02

Client ID: AF-I-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-02A

Volume Injected (uL): 1.0

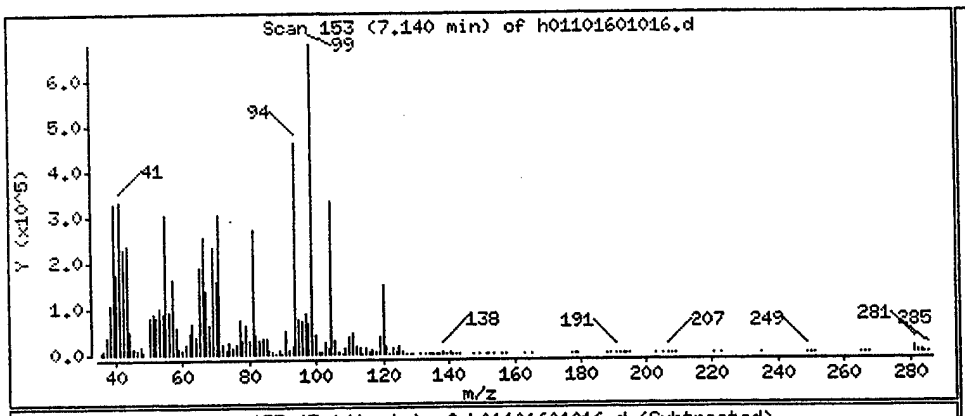
Operator: hch

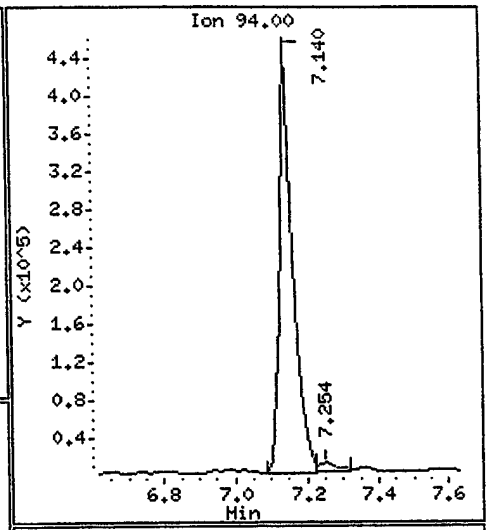
Column phase:

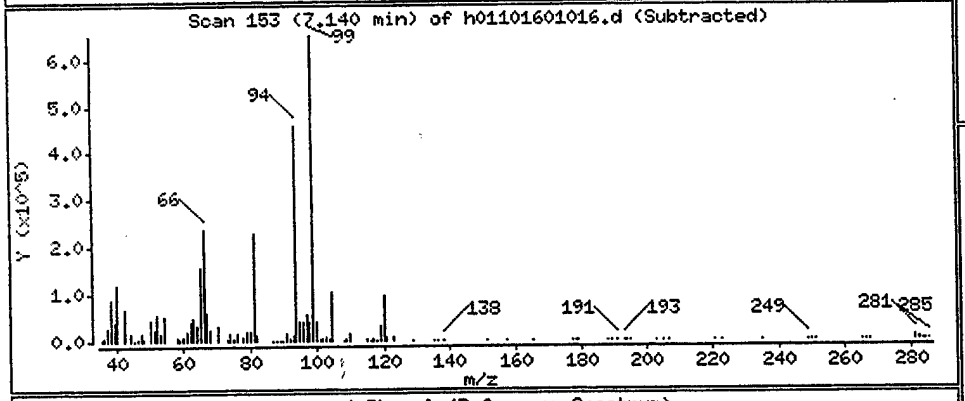
Column diameter: 2.00

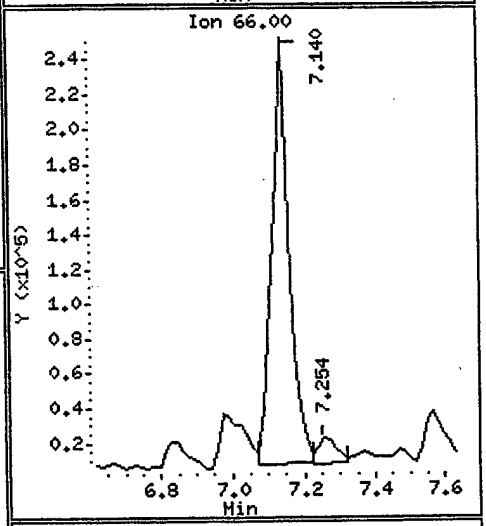
4 Phenol

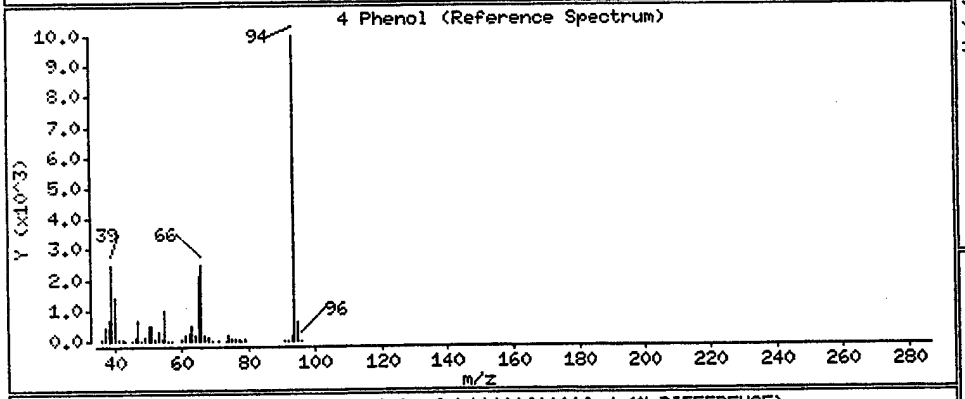
Concentration: 19.0 ug

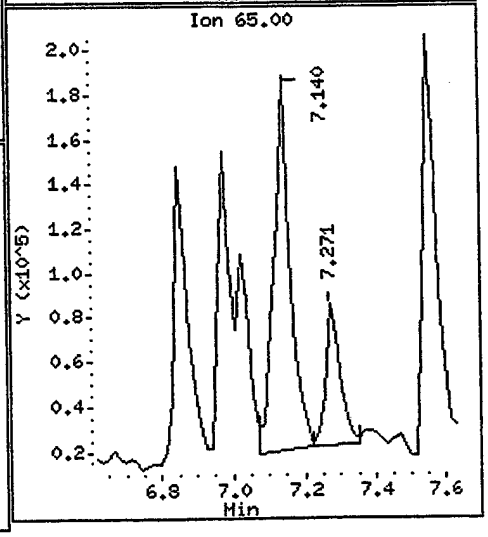


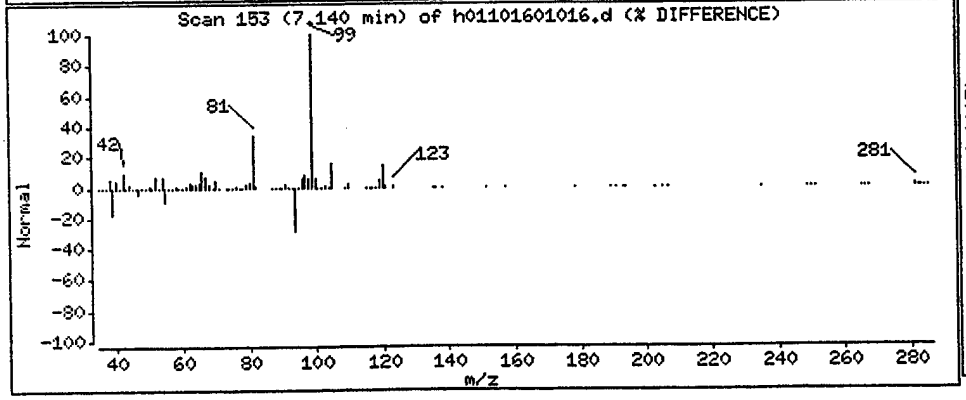












Data File: /chem/msdh.i/h-10Jan98.b/h01101601016.d

Date : 10-JAN-1998 22:02

Client ID: AF-I-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-02A

Volume Injected (uL): 1.0

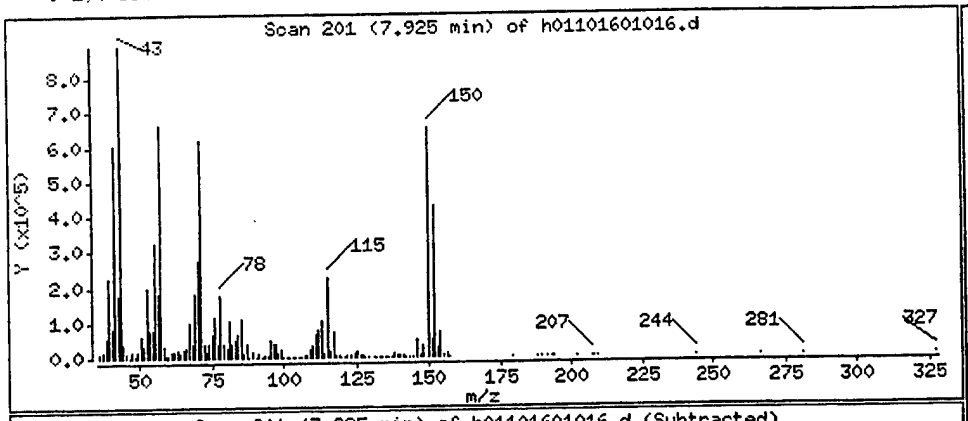
Operator: hch

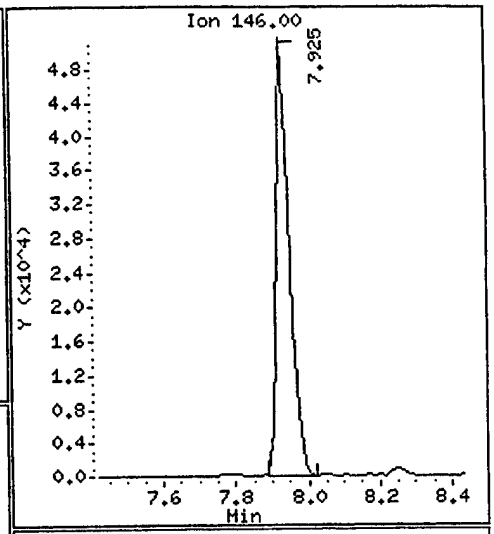
Column phase:

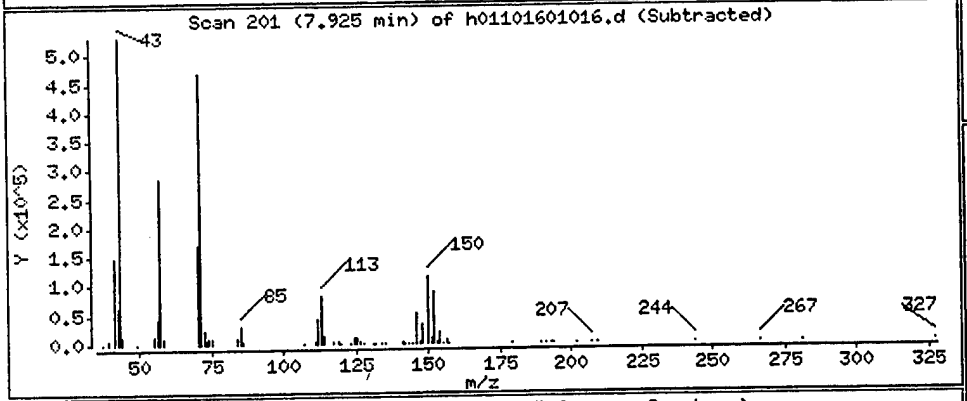
Column diameter: 2.00

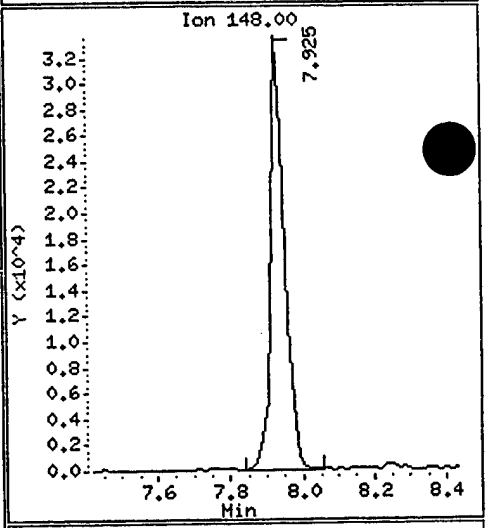
9 1,4-Dichlorobenzene

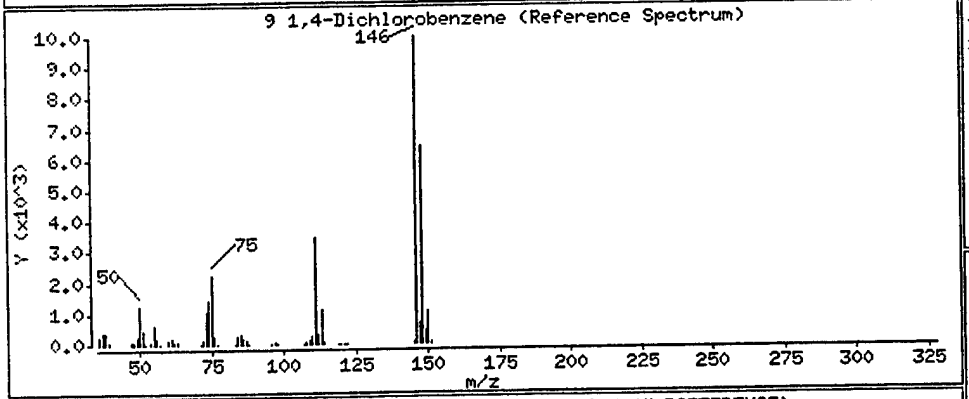
Concentration: 2.4 ug

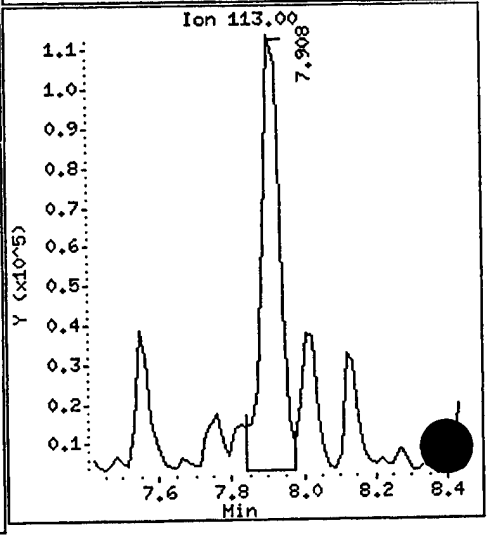


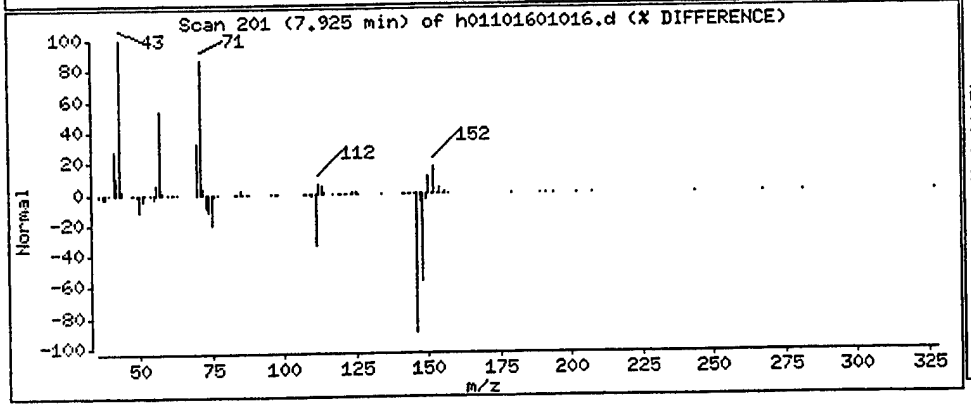












Data File: /chem/msdh.i/h-10Jan98.b/h01101601016.d

Date : 10-JAN-1998 22:02

Client ID: AF-I-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-02A

Volume Injected (uL): 1.0

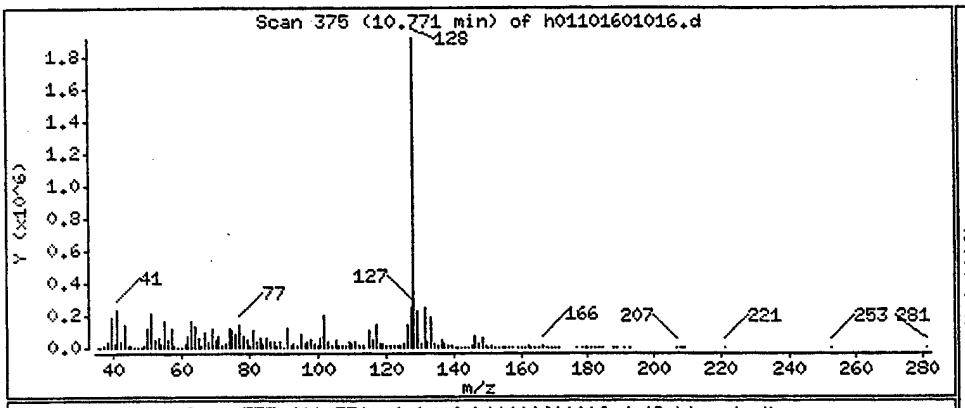
Operator: hch

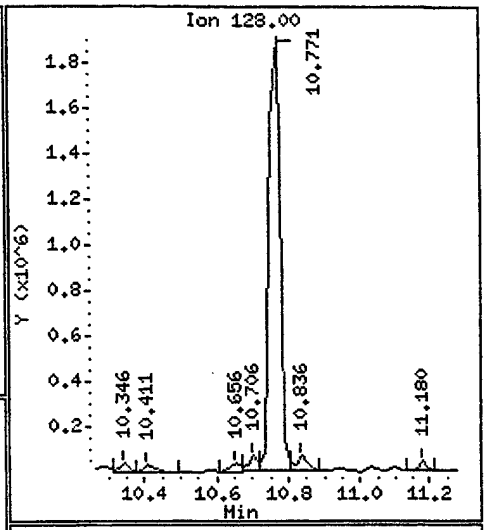
Column phase:

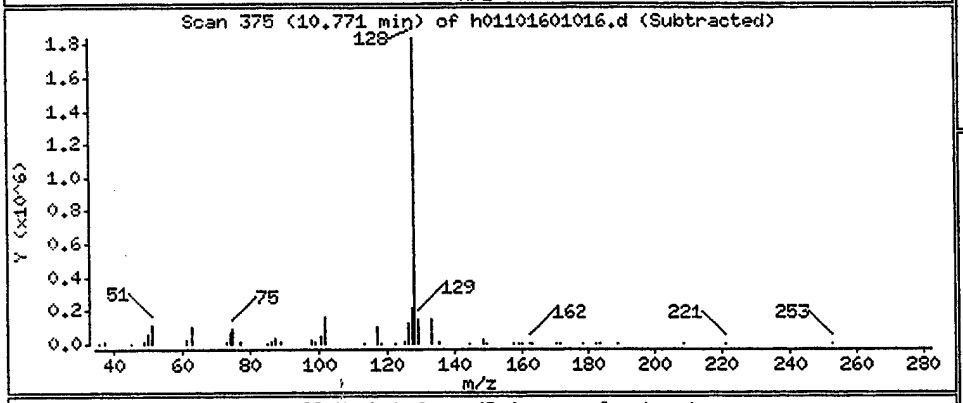
Column diameter: 2.00

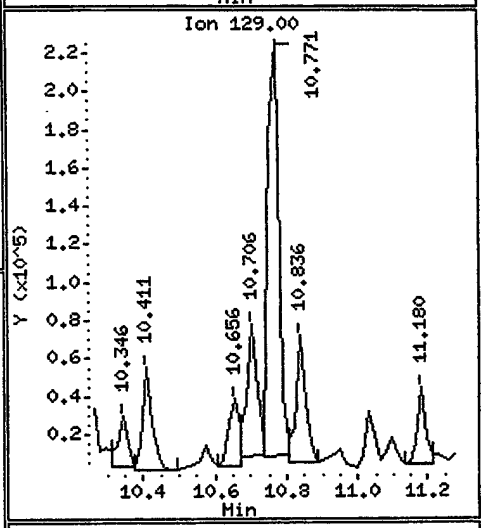
28 Naphthalene

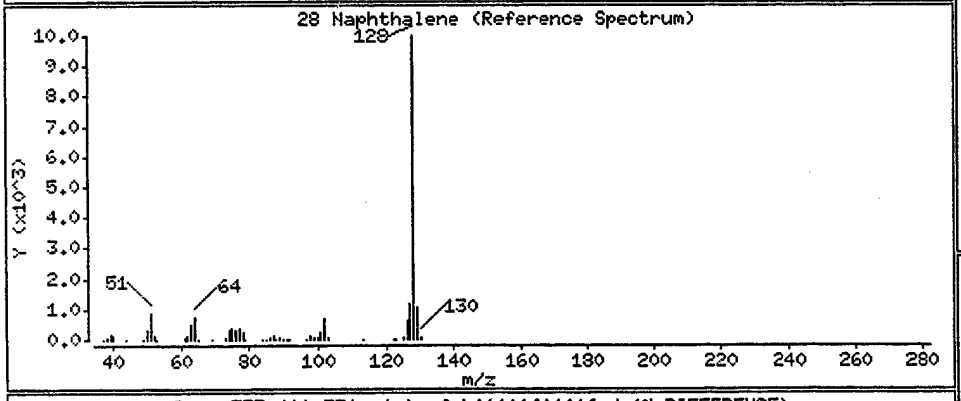
Concentration: 30.9 ug

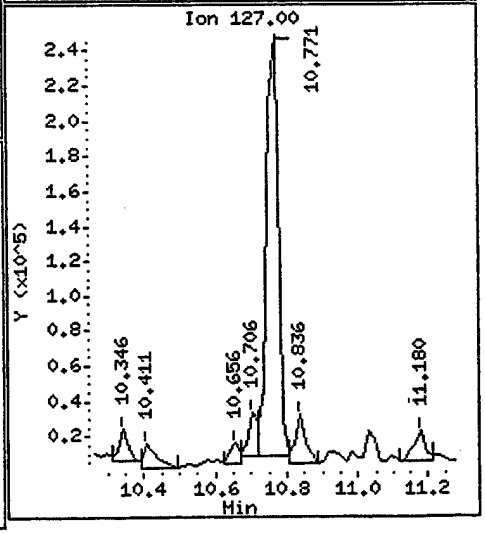


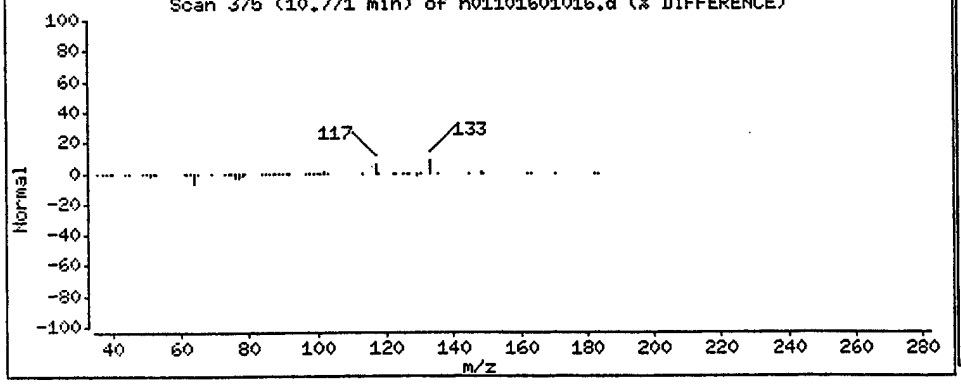












Data File: /chem/msdh.i/h-10Jan98.b/h01101601016.d

Date : 10-JAN-1998 22:02

Client ID: AF-I-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-02A

Volume Injected (uL): 1.0

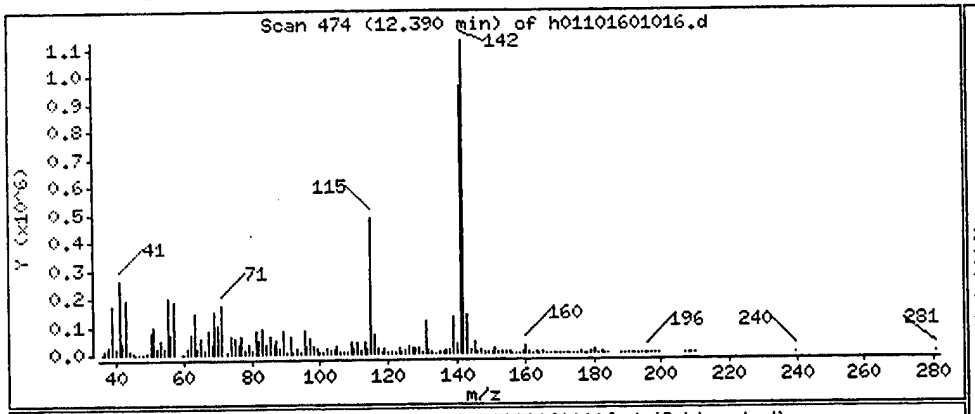
Operator: hch

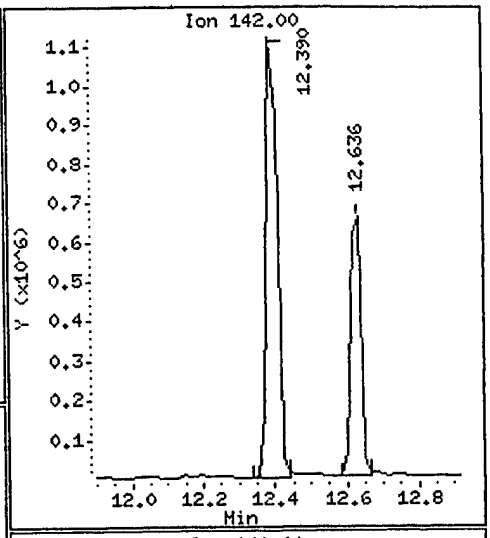
Column phase:

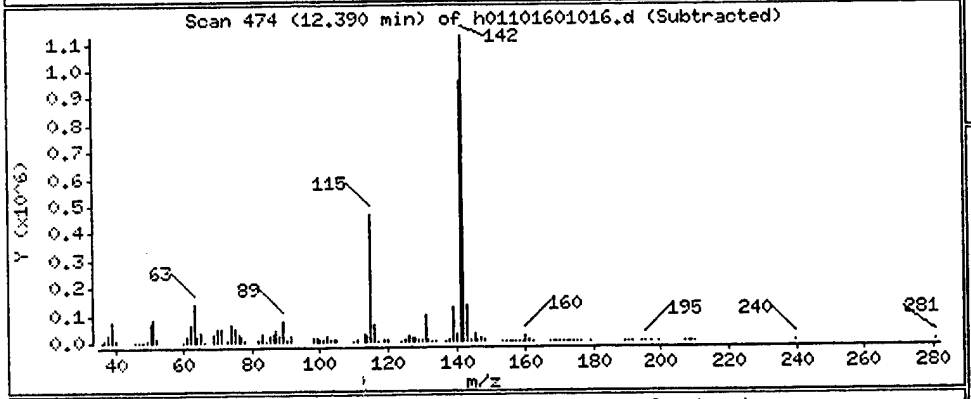
Column diameter: 2.00

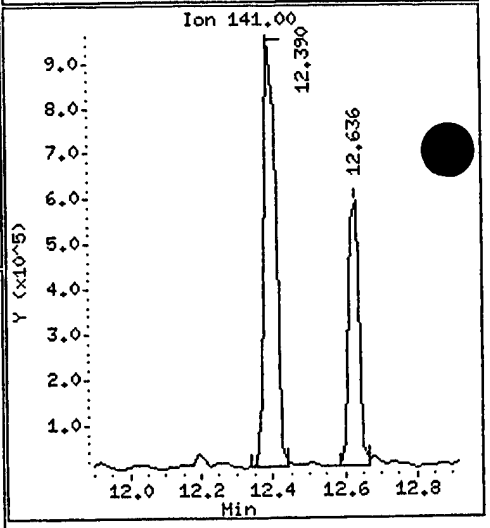
33 2-Methylnaphthalene

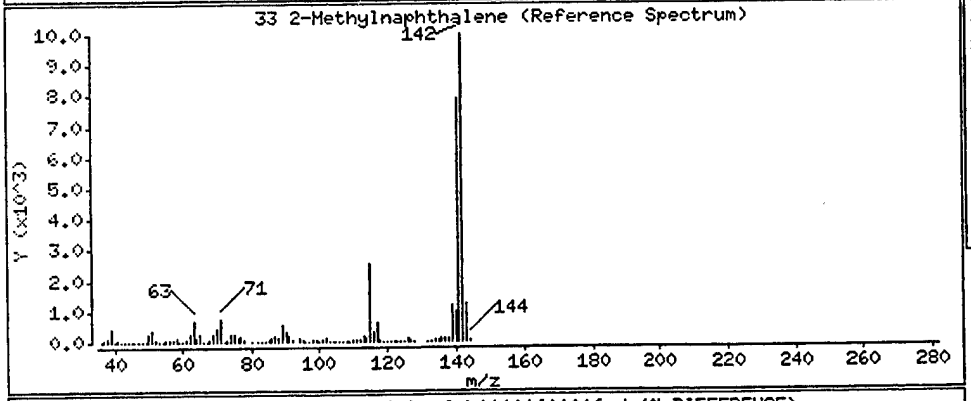
Concentration: 28.2 ug

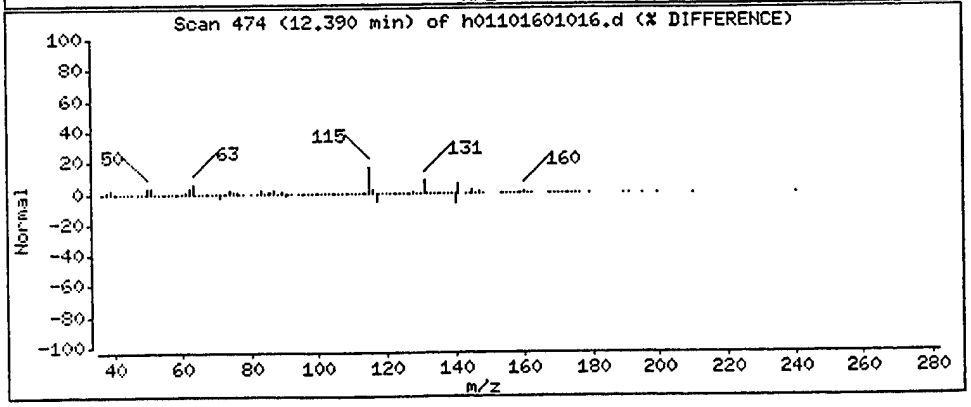












Data File: /chem/msdh.i/h-10Jan98.b/h01101601016.d

Date : 10-JAN-1998 22:02

Client ID: AF-I-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-02A

Volume Injected (uL): 1.0

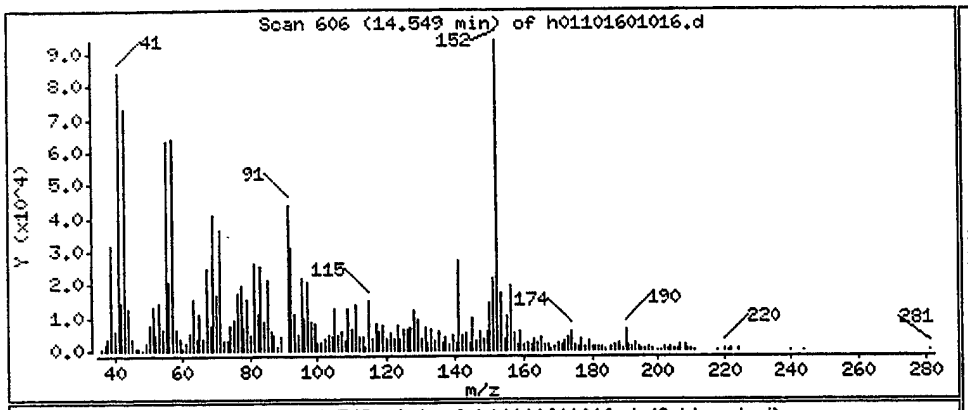
Operator: hch

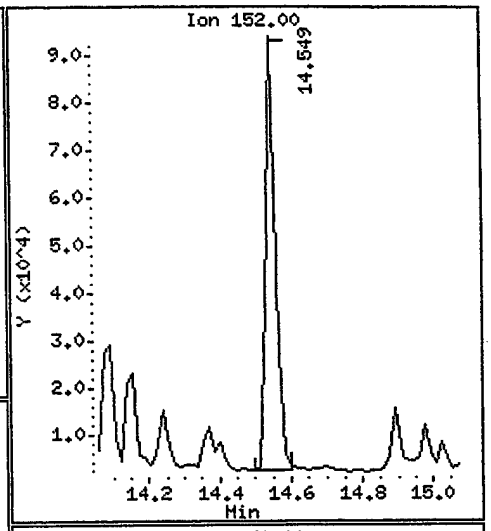
Column phase:

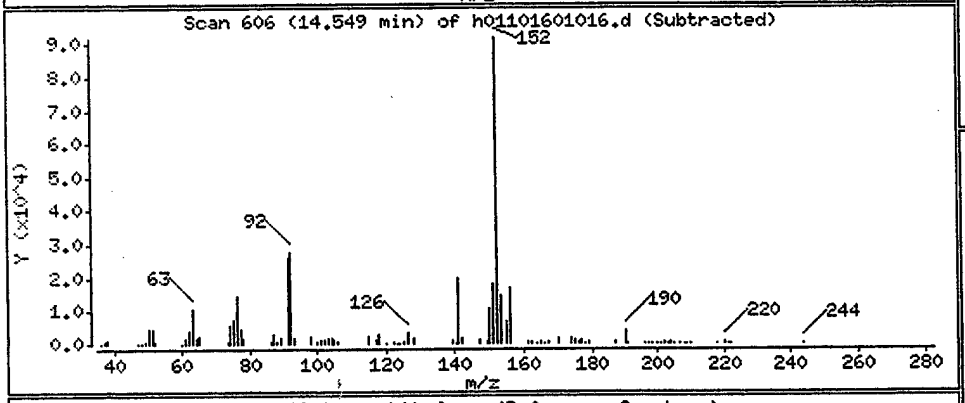
Column diameter: 2.00

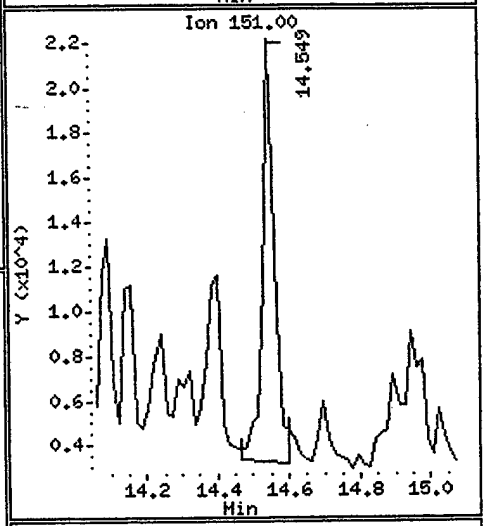
46 Acenaphthylene

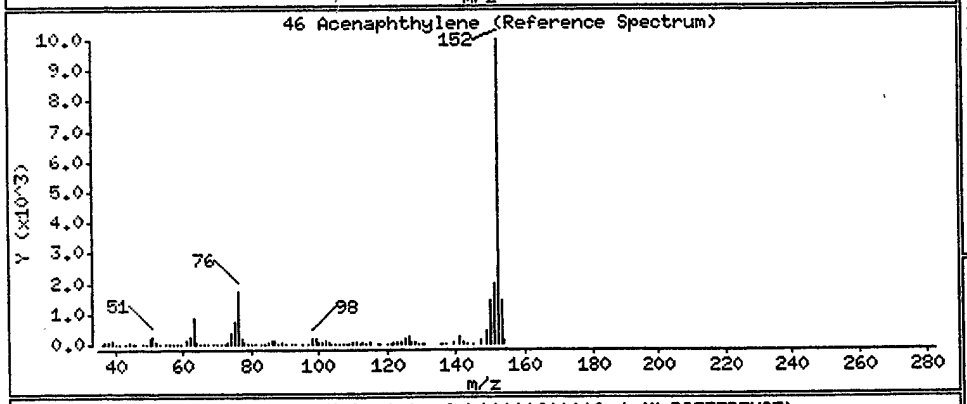
Concentration: 1.3 ug

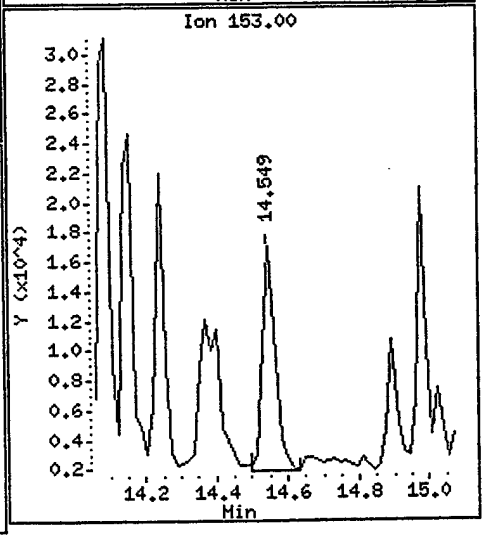


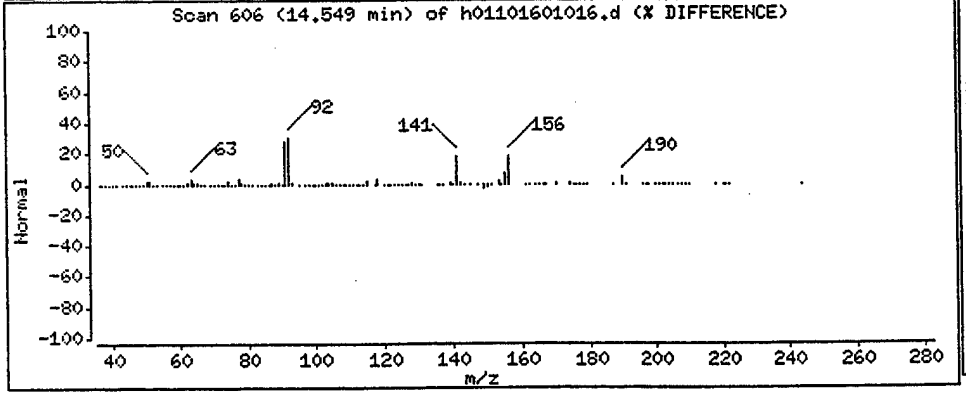












Data File: /chem/msdh.i/h-10Jan98.b/h01101601016.d

Date : 10-JAN-1998 22:02

Client ID: AF-I-EF117 PAH

Sample Info: 9712088A-02A

Volume Injected (uL): 1.0

Column phase:

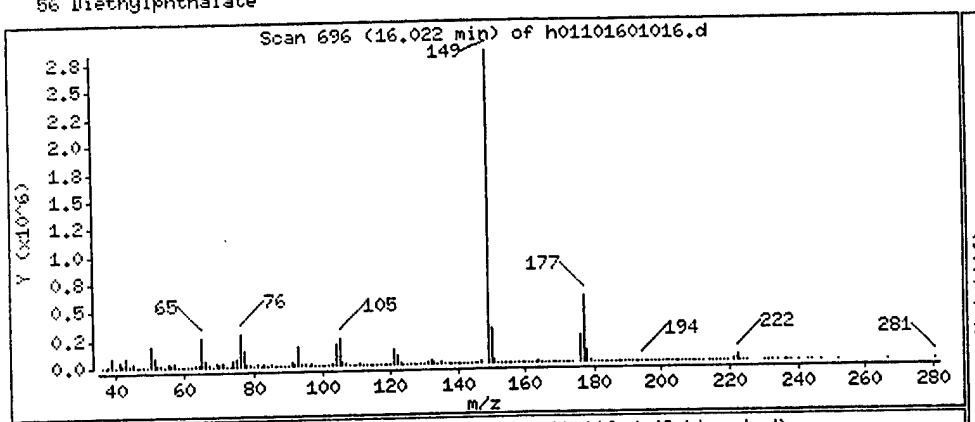
Instrument: msdh.i

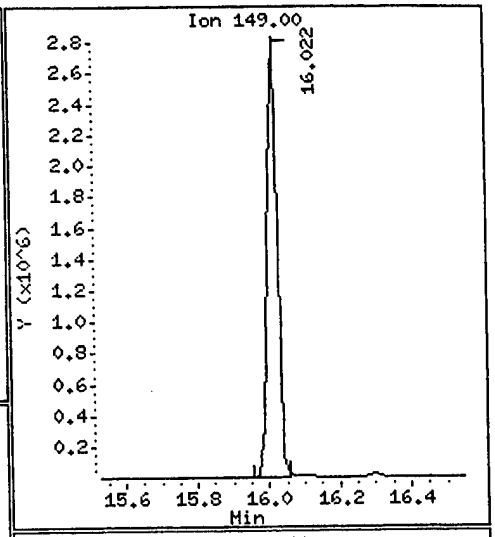
Operator: hch

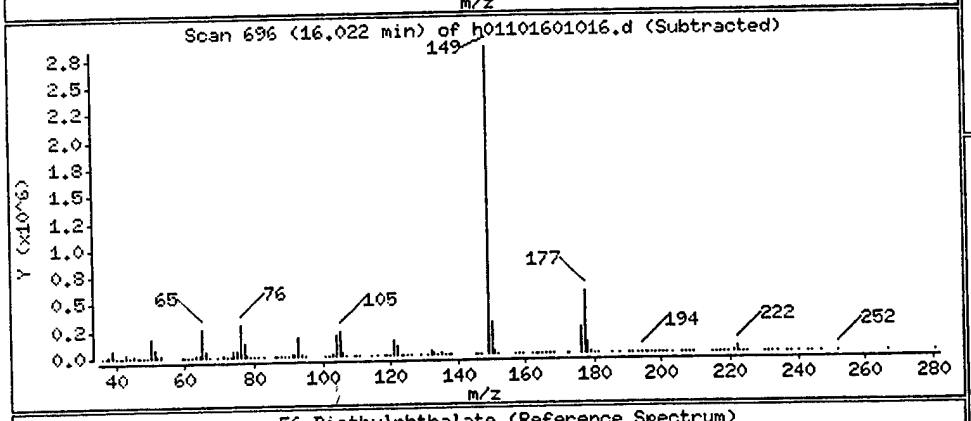
Column diameter: 2.00

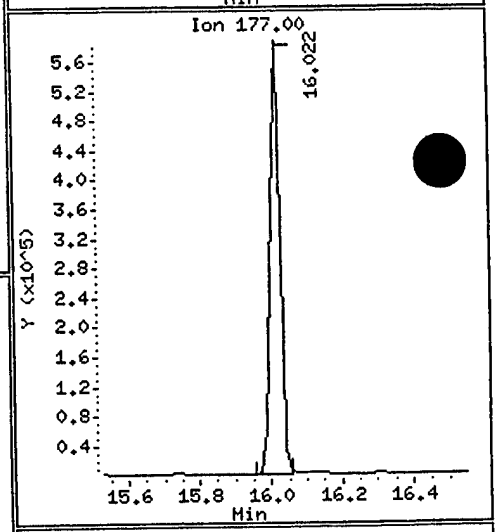
Concentration: 52.8 ug

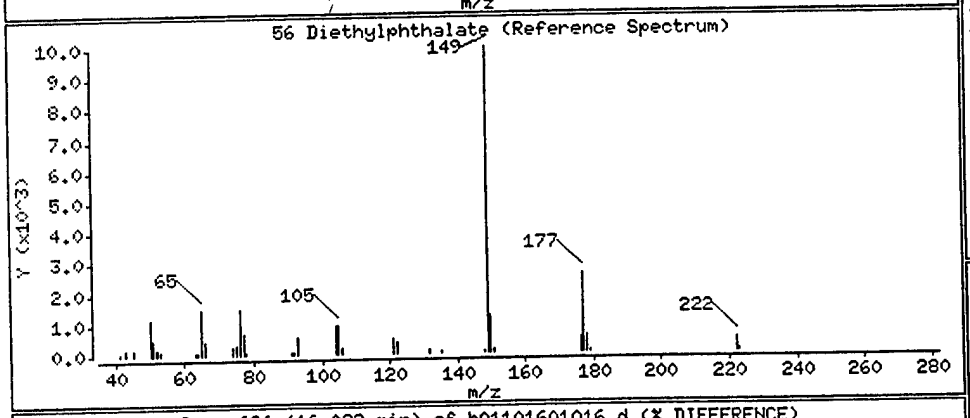
56 Diethylphthalate

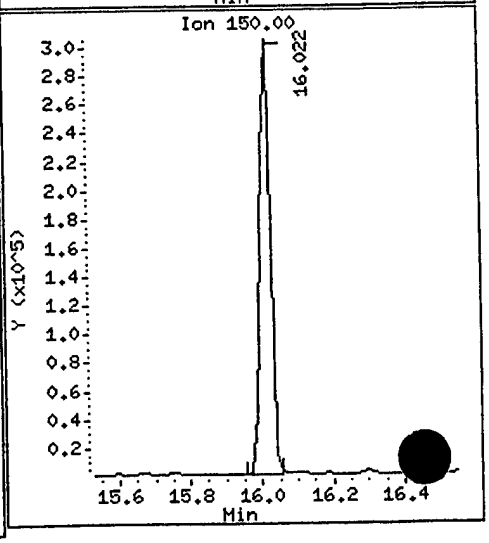


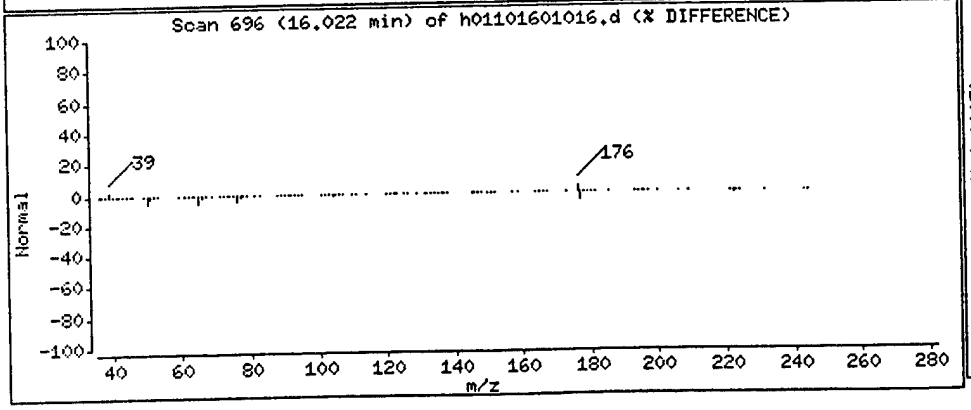












Data File: /chem/msdh.i/h-10Jan98.b/h01101601016.d

Date : 10-JAN-1998 22:02

Client ID: AF-I-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-02A

Volume Injected (uL): 1.0

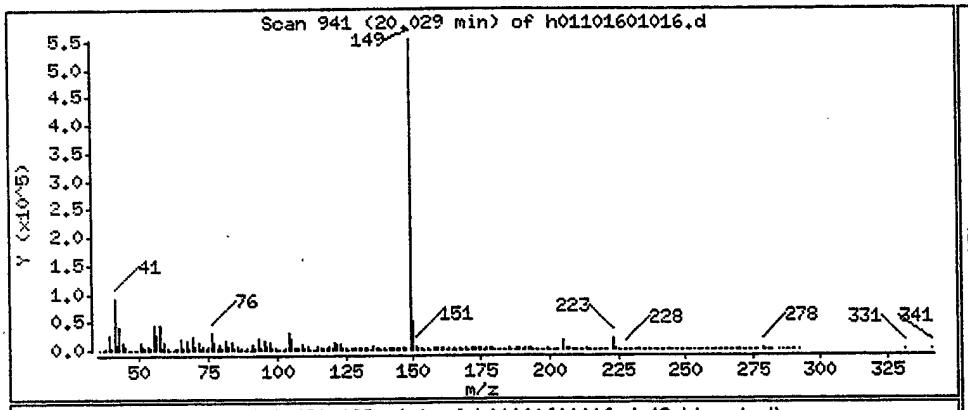
Operator: hch

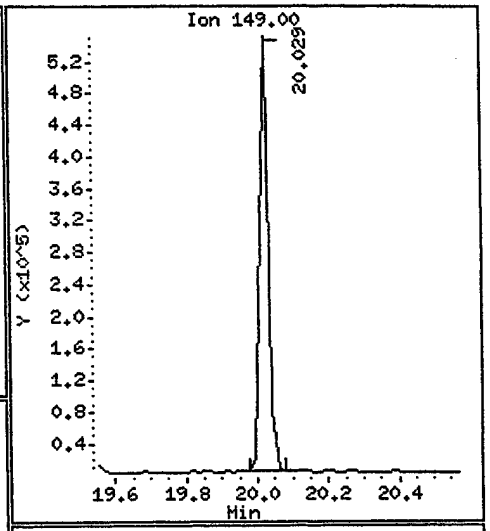
Column phase:

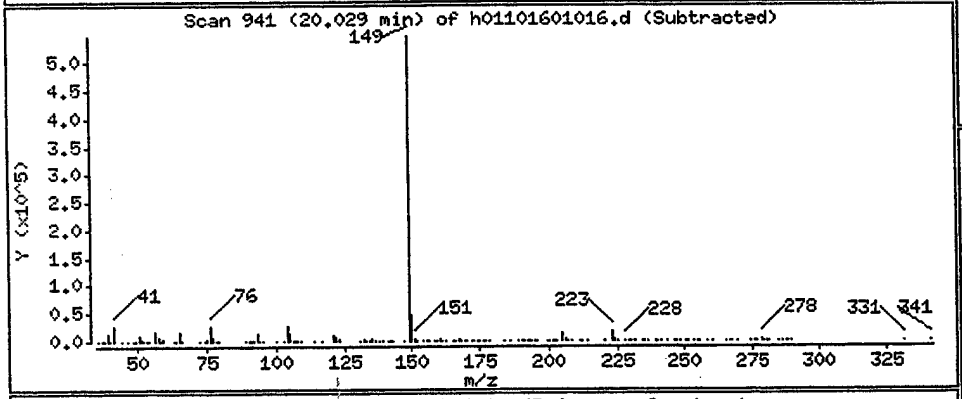
Column diameter: 2.00

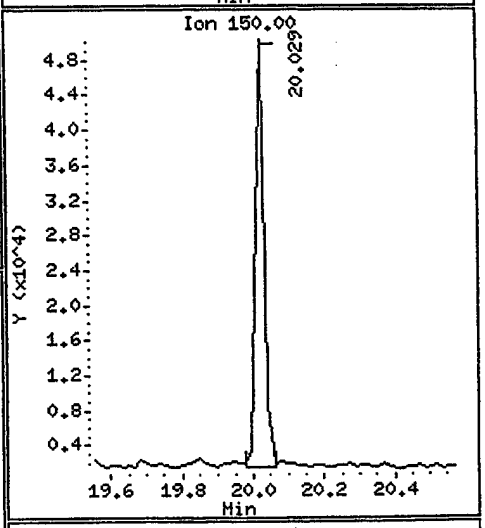
79 Di-n-butylphthalate

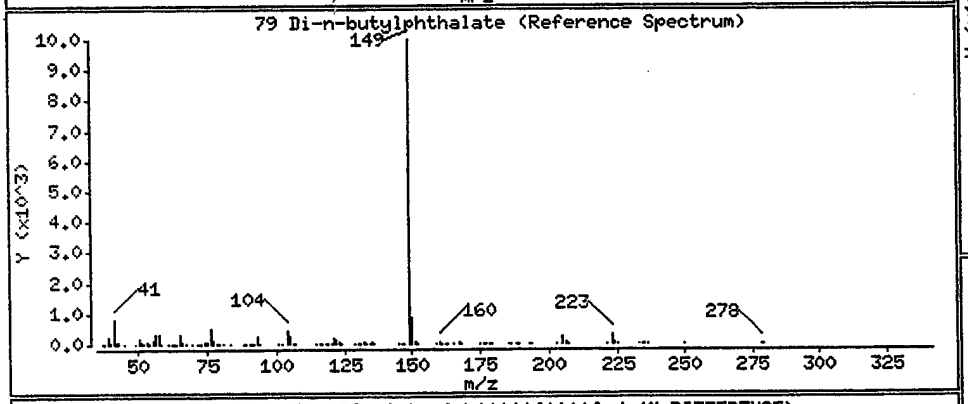
Concentration: 5.9 ug

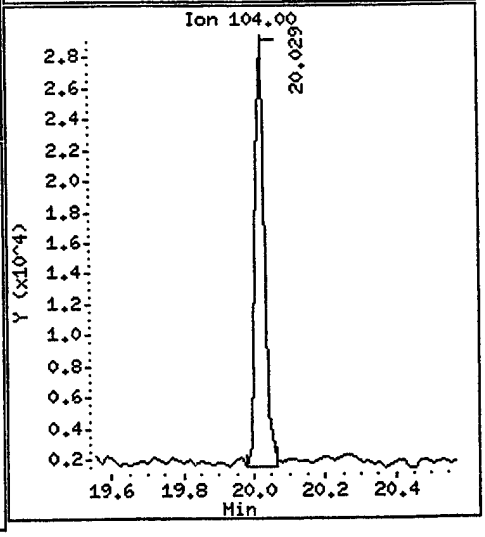


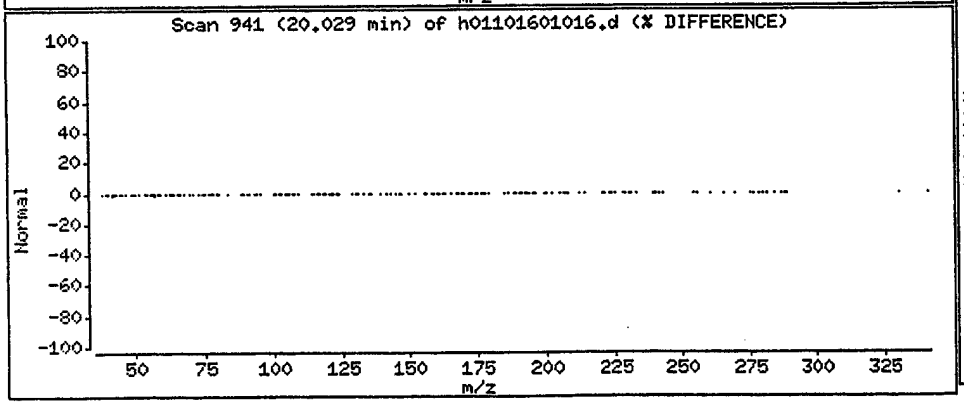












Data File: /chem/msdh.i/h-10Jan98.b/h01101601016.d

Date : 10-JAN-1998 22:02

Client ID: AF-I-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-02A

Volume Injected (uL): 1.0

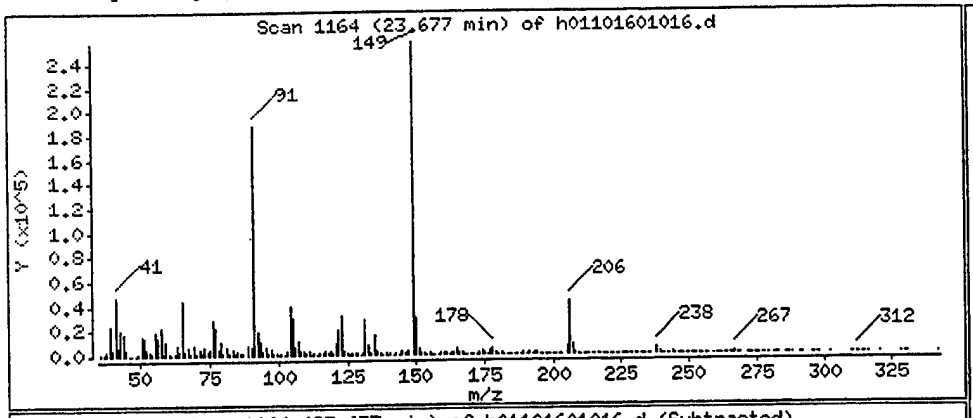
Operator: hch

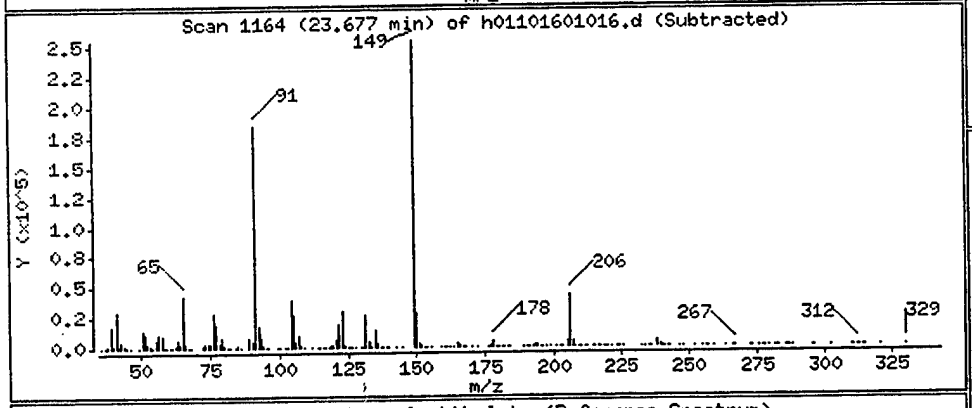
Column phase:

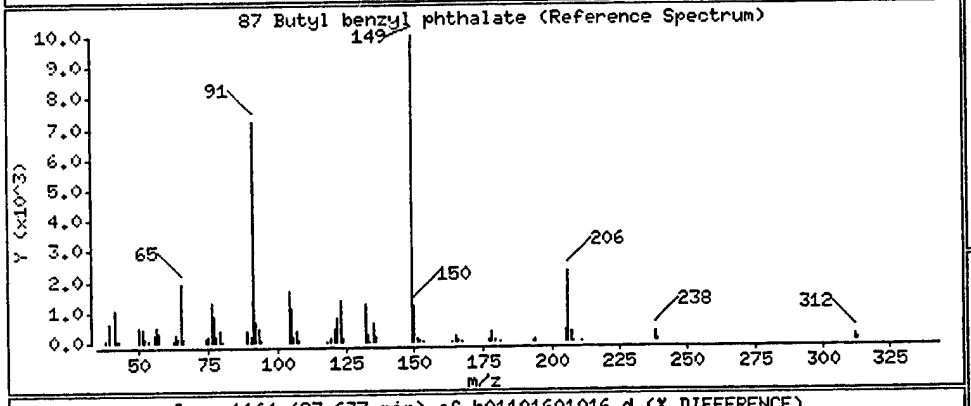
Column diameter: 2.00

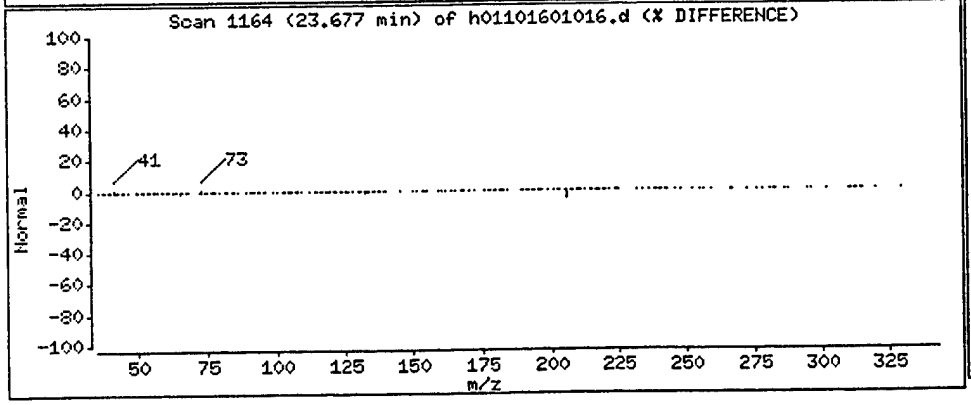
87 Butyl benzyl phthalate

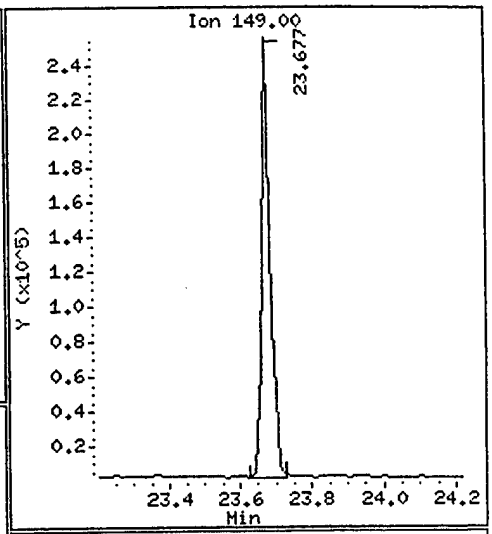
Concentration: 6.0 ug

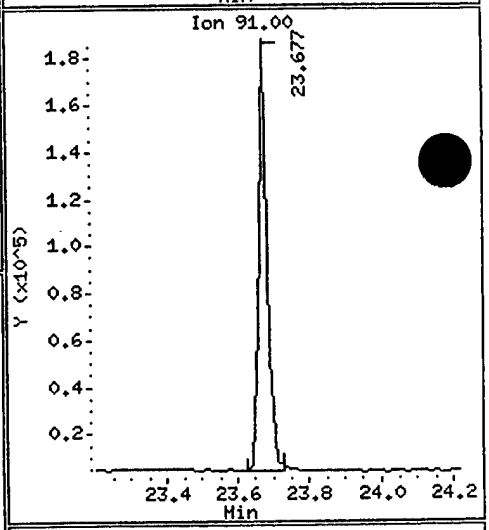


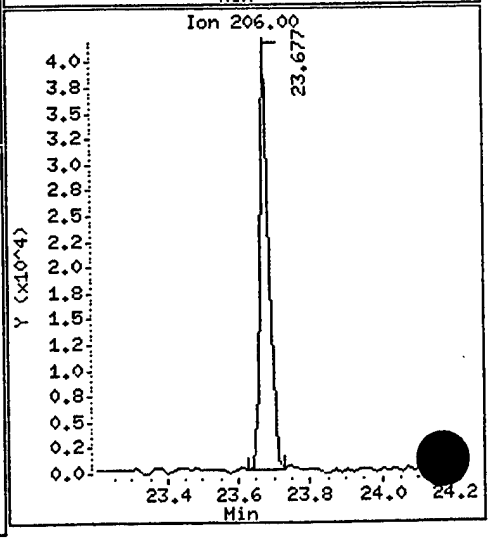












Data File: /chem/msdh.i/h-10Jan98.b/h01101601016.d

Date : 10-JAN-1998 22:02

Client ID: AF-I-EF117 PAH

Instrument: msdh.i

Sample Info: 9712088A-02A

Volume Injected (uL): 1.0

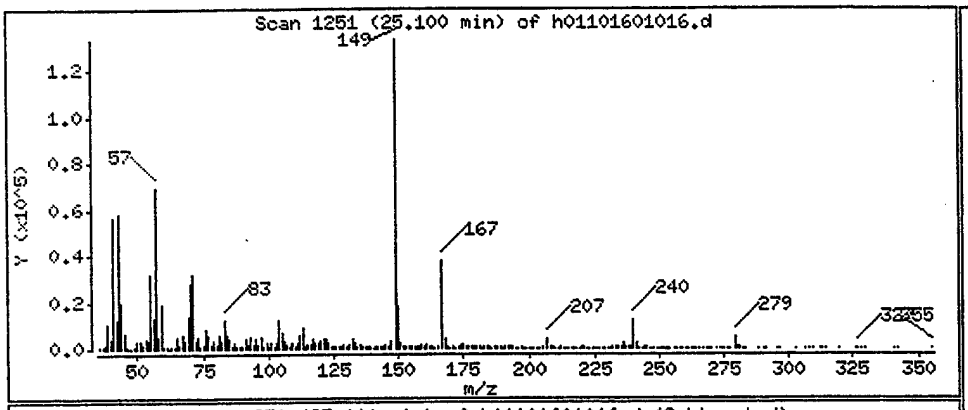
Operator: hch

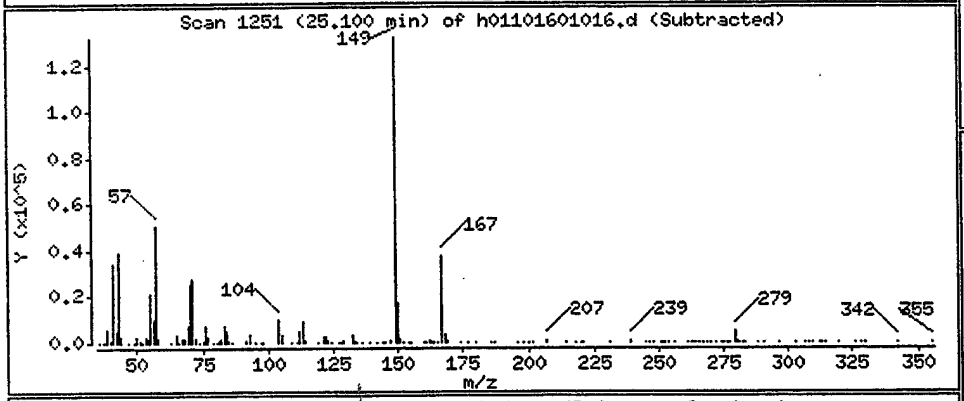
Column phase:

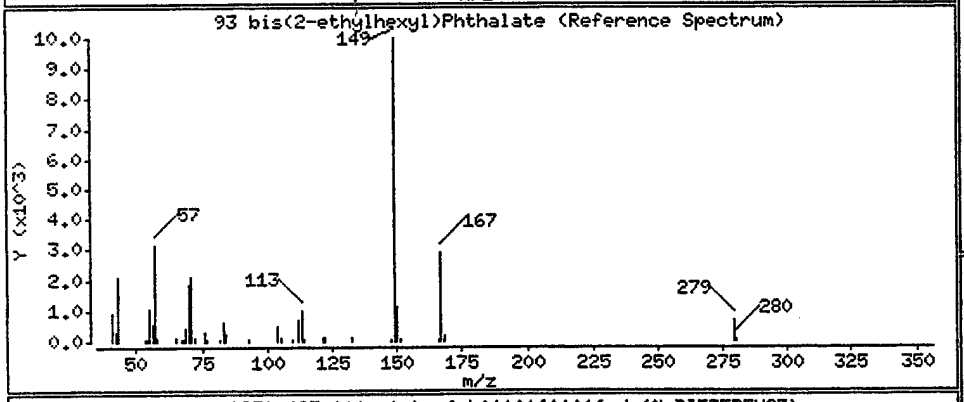
Column diameter: 2.00

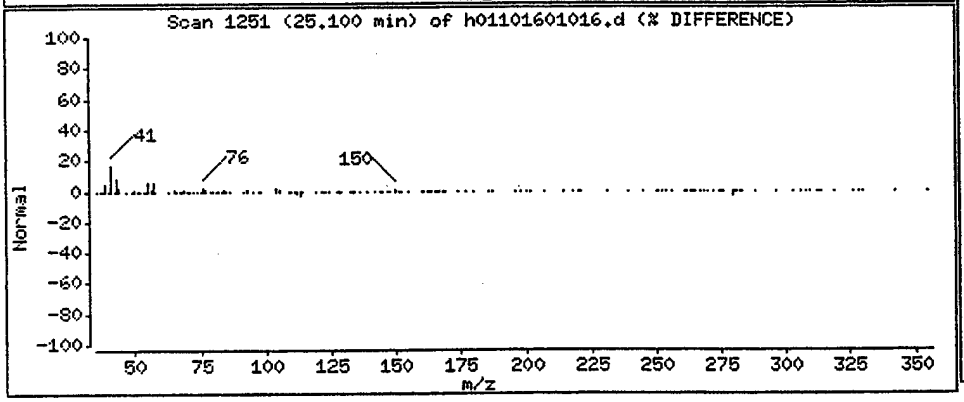
93 bis(2-ethylhexyl)Phthalate

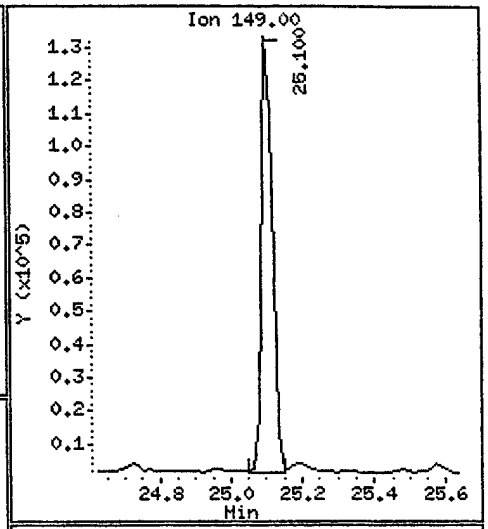
Concentration: 2.8 ug

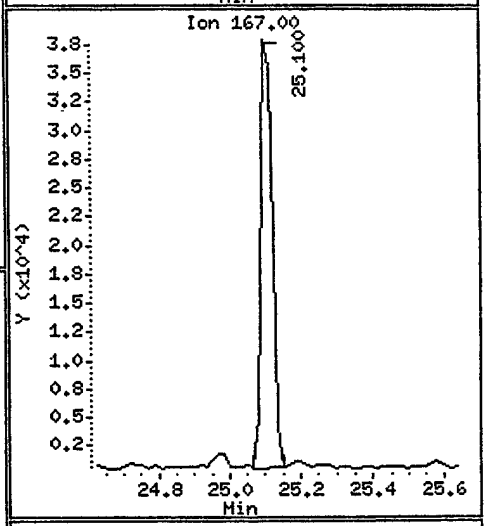


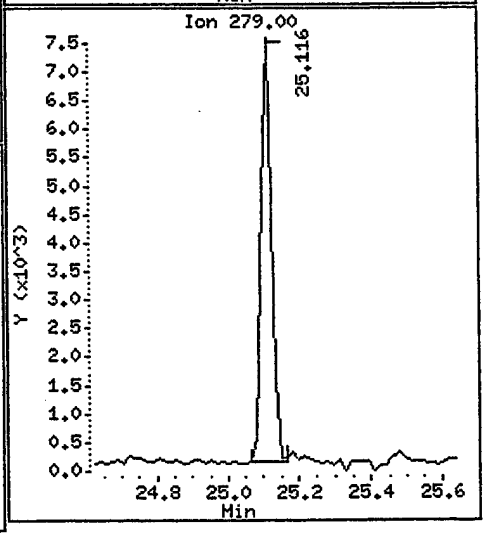












Audit History For: /chem/msdh.i/h-10Jan98.b/01101601016.d

Change Date: 10-Jan-1998 22:51
Change Made by: Automation

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 09:34
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: 8270.sub
New Value: MM5.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:38
Change Made by: kbadal

Parameter: Sample Info
Old Value: 9712088-02a
New Value: 9712088A-02a
Reason For Change: N/A

Change Date: 22-Jan-1998 09:38
Change Made by: kbadal

Parameter: Lab ID
Old Value:
New Value: 9712088A-02A
Reason For Change: N/A

Change Date: 22-Jan-1998 09:38
Change Made by: kbadal

Parameter: Client ID
Old Value:
New Value: AF-I-EF117 PAH
Reason For Change: N/A

Change Date: 22-Jan-1998 09:40
Change Made by: kbadal

Parameter: Misc Information
Old Value:
New Value: 80 ng ISTD #267-91-1
Reason For Change: N/A

Change Date: 22-Jan-1998 09:42
Change Made by: kbadal

Parameter: Sample Prep. Date
Old Value:
New Value: 08-DEC-1997 17:30
Reason For Change: N/A

Change Date: 22-Jan-1998 09:42
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 09:59
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: MM5.sub
New Value: 8270.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 10:00
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 13:34
Change Made by: kbadal

Parameter: Sample Info
Old Value: 9712088A-02a
New Value: 9712088A-02A
Reason For Change: N/A

Change Date: 22-Jan-1998 13:34
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 14:11
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethyl)ether changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:11
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:11
Change Made by: kbadal

Parameter: Best Hit for 1,3-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:11
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:11
Change Made by: kbadal

Parameter: Best Hit for 1,4-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:11
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:11
Change Made by: kbadal

Parameter: Best Hit for 2-Methylphenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:11
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Best Hit for N-Nitrosodipropylamine changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Best Hit for Hexachloroethane changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Best Hit for Nitrobenzene changed

Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Best Hit for Isophorone changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Best Hit for 2-Nitrophenol changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dimethylphenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dimethylphenol changed
Old Value: Compound Undetected
New Value: New Hit #3

Reason For Change: N/A

Change Date: 22-Jan-1998 14:12
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dimethylphenol changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethoxy)methane changed
Old Value: Old Hit #4
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dichlorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Best Hit for 4-Chloroaniline changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Best Hit for 4-Chloro-3-Methylphenol changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Best Hit for 2-Nitroaniline changed
Old Value: Old Hit #4
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Best Hit for 2,6-Dinitrotoluene changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:13
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:14
Change Made by: kbadal

Parameter: Best Hit for 4-Nitrophenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:14
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:14
Change Made by: kbadal

Parameter: Best Hit for N-nitrosodiphenylamine changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:14
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:20
Change Made by: kbadal

Parameter: Best Hit for 4-Methylphenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:20
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:20
Change Made by: kbadal

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:20
Change Made by: kbadal

Parameter: Requantitate all compounds

Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:20
Change Made by: kbadal

Parameter: Best Hit for 1,4-Dichlorobenzene changed
Old Value: Compound Undetected
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 14:20
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 11:45
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 13.568 min. changed.
Old Value: Old match: Tetradecane
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 12.194 min. changed.
Old Value: Old match: Tridecane
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 11.785 min. changed.
Old Value: Old match: Nonane, 3-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 10.918 min. changed.
Old Value: Old match: Undecane, 2,6-dimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 10.117 min. changed.
Old Value: Old match: Benzene, (2-methyl-1-propenyl)-
New Value: New match: Unknown Compound Deleted

Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 10.035 min. changed.
Old Value: Old match: Nonane, 4,5-dimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.446 min. changed.
Old Value: Old match: Unknown
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.282 min. changed.
Old Value: Old match: Benzene, 1-methyl-4-(2-methylpropyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.184 min. changed.
Old Value: Old match: Undecane
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 9.037 min. changed.
Old Value: Old match: Benzene, 1-methyl-3-(1-methylethyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.612 min. changed.
Old Value: Old match: Tridecane
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.563 min. changed.
Old Value: Old match: Benzene, methyl(1-methylethyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.465 min. changed.
Old Value: Old match: Benzene, (1-methylpropyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 8.023 min. changed.
Old Value: Old match: Benzene, (1-methylethyl)-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 7.549 min. changed.
Old Value: Old match: Benzene, 1,2,3-trimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 6.485 min. changed.
Old Value: Old match: Cyclohexane, propyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 6.976 min. changed.
Old Value: Old match: Benzene, 1-ethyl-2-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 5.848 min. changed.
Old Value: Old match: Benzene, 1,2-dimethyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:07
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 5.275 min. changed.
Old Value: Old match: Octane, 4-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 28-Jan-1998 12:08
Change Made by: jheffel

Parameter: Best Match for Unknown compound at 4.915 min. changed.
Old Value: Old match: 2-Pentanone, 4-hydroxy-4-methyl-
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 30-Jan-1998 10:26
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 30-Jan-1998 10:29
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Reason For Change: Quantitation

Change Date: 30-Jan-1998 10:32
Change Made by: kbadal

Parameter: Best Hit for 2-Methylphenol changed
Old Value: Compound Undetected
New Value: New Hit #3
Reason For Change: N/A

Change Date: 30-Jan-1998 10:32
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 30-Jan-1998 10:33
Change Made by: kbadal

Parameter: Best Hit for 2-Methylphenol changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 30-Jan-1998 10:33
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 30-Jan-1998 10:37
Change Made by: kbadal

Parameter: Best Hit for Benzyl Alcohol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 30-Jan-1998 10:37
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 30-Jan-1998 10:38
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Reason For Change: Quantitation

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.
AF - M - EF404 - PAH

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-03A
Lab File ID: H011506
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/15/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	2.1	
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	17	
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	29	
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	55	

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

AF - M - EF404 - PAH

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-03A
Lab File ID: H011506
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/15/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	6.0	B
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	3.3	
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	27	
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150601026.d
Lab Smp Id: 912088A-03A Client Smp ID: AF-M-EF404-PAH
Inj Date : 15-JAN-1998 22:38
Operator : jgh Inst ID: msdh.i
Smp Info : 9712088A-03A
Misc Info : 80 ng ISTD #267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 27-Jan-1998 15:24 jheffel Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8270.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

1-29-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

1.29.98

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

					CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
$ 1 2-Fluorophenol						CAS #: 367-12-4		
4.643	4.649 (0.662)	112	4466788	55.3924	55.4		80.00- 120.00	100.00
4.643	4.649 (0.662)	64	2098886				0.00-10046.11	46.99
4.643	4.649 (0.662)	92	1229527				0.00-10019.15	27.53
$ 2 Phenol-d5						CAS #: 4165-62-2		
6.312	6.317 (0.645)	99	6199036	56.6824	56.7		80.00- 120.00	100.00
6.312	6.317 (0.645)	71	2245010				0.00-10029.73	36.22
$ 17 Nitrobenzene-d5						CAS #: 4165-60-0		
8.176	8.182 (0.587)	82	5274847	69.0547	69.0		80.00- 120.00	100.00
8.176	8.182 (0.587)	54	2692372				0.00-10052.46	51.04
8.176	8.182 (0.587)	128	2332996				0.00-10049.58	44.23

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
$ 38 2-Fluorobiphenyl					CAS #: 321-60-8		
12.347	12.337 (0.706)	172	7887390	70.4668	70.5	80.00- 120.00	100.00
12.347	12.337 (0.706)	171	2697688			0.00-10033.81	34.20
$ 62 2,4,6-Tribromophenol					CAS #: 118-79-6		
15.815	15.804 (0.663)	330	2070841	88.6148	88.6	80.00- 120.00	100.00
15.815	15.804 (0.663)	332	1992118			0.00-10096.28	96.20
15.799	15.804 (0.662)	141	621288			0.00-10029.68	30.00
$ 82 Terphenyl-d14					CAS #: 98904-43-9		
21.409	21.415 (0.897)	244	10189606	99.3304	99.3	80.00- 120.00	100.00
21.409	21.415 (0.897)	122	1678603			0.00-10016.35	16.47
21.409	21.415 (0.897)	212	620977			0.00-10005.98	6.09
* 7 1,4-Dichlorobenzene-d4					CAS #: 3855-82-1		
7.015	7.021 (1.000)	150	8443227	80.0000		80.00- 120.00	100.00
7.015	7.021 (1.000)	152	5313560			0.00-10058.51	62.93
7.015	7.021 (1.000)	115	3510554			0.00-10037.59	41.58
* 27 Naphthalene-d8					CAS #: 1146-65-2		
9.779	9.769 (1.000)	136	15890572	80.0000		80.00- 120.00	100.00
9.779	9.769 (1.000)	68	1341043			0.00-10006.78	8.44
* 47 Acenaphthene-d10					CAS #: 15067-26-2		
13.918	13.907 (1.000)	164	9540198	80.0000		80.00- 120.00	100.00
13.918	13.907 (1.000)	162	9110499			0.00-10094.94	95.50
13.918	13.907 (1.000)	160	3910599			0.00-10041.02	40.99
* 71 Phenanthrene-d10					CAS #: 1517-22-2		
17.484	17.489 (1.000)	188	14686003	80.0000		80.00- 120.00	100.00
17.484	17.489 (1.000)	94	2023716			0.00-10014.44	13.78
17.484	17.489 (1.000)	80	1939057			0.00-10015.28	13.20
* 90 Chrysene-d12					CAS #: 1719-03-5		
23.863	23.885 (1.000)	240	11719251	80.0000		80.00- 120.00	100.00
23.863	23.885 (1.000)	236	2798866			0.00-10026.00	23.88
23.863	23.885 (1.000)	120	2092754			0.00-10018.11	17.86
* 99 Perylene-d12					CAS #: 1520-96-3		
27.036	27.058 (1.000)	264	8112974	80.0000		80.00- 120.00	100.00(H)
27.036	27.058 (1.000)	260	1776716			0.00-10021.95	21.90
27.036	27.058 (1.000)	265	1687163			0.00-10020.90	20.80
9 1,4-Dichlorobenzene					CAS #: 106-46-7		
7.048	7.053 (1.005)	146	150539	2.07333	2.1	80.00- 120.00	100.00(H)
7.048	7.053 (1.005)	148	110608			0.00-10063.27	73.47

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
9 1,4-Dichlorobenzene (continued)							
7.080	7.053 (1.009)	113	782993			0.00-10016.16	520.13
28 Naphthalene					CAS #: 91-20-3		
9.828	9.818 (1.005)	128	3630420	17.1476	17.1	80.00- 120.00	100.00
9.812	9.818 (1.003)	129	800161			0.00-10013.27	22.04
9.828	9.818 (1.005)	127	578618			0.00-10013.22	15.94
33 2-Methylnaphthalene					CAS #: 91-57-6		
11.448	11.437 (1.171)	142	3596723	28.9781	29.0	80.00- 120.00	100.00(H)
11.448	11.437 (1.171)	141	3164366			0.00-10090.11	87.98
56 Diethylphthalate					CAS #: 84-66-2		
15.063	15.085 (1.082)	149	6717700	54.9819	55.0	80.00- 120.00	100.00
15.063	15.085 (1.082)	177	1221754			0.00-10019.67	18.19
15.063	15.085 (1.082)	150	728744			0.00-10011.54	10.85
78 Di-n-butylphthalate					CAS #: 84-74-2		
19.037	19.059 (1.089)	149	1199998	6.03288	6.0	80.00- 120.00	100.00
19.037	19.059 (1.089)	150	108305			0.00-10011.22	9.03
19.037	19.059 (1.089)	104	74447			0.00-10006.82	6.20
85 Butyl benzyl phthalate					CAS #: 85-68-7		
22.652	22.674 (0.949)	149	282173	3.27344	3.3	80.00- 120.00	100.00
22.652	22.674 (0.949)	91	233310			0.00-10073.35	82.68
22.652	22.674 (0.949)	206	40679			0.00-10015.36	14.42
93 bis(2-ethylhexyl)Phthalate					CAS #: 117-81-7		
24.108	24.130 (1.010)	149	3029164	27.0816	27.1	80.00- 120.00	100.00
24.108	24.130 (1.010)	167	838149			0.00-10027.97	27.67
24.108	24.130 (1.010)	279	156815			0.00-10005.78	5.18

B

QC Flag Legend

H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150601026.d
Lab Smp Id: 912088A-03A Client Smp ID: AF-M-EF404-PAH
Inj Date : 15-JAN-1998 22:38
Operator : jgh Inst ID: msdh.i
Smp Info : 9712088a-03a
Misc Info : 80 ng ISTD #267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 22-Jan-1998 08:50 kbadal Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
* 7 1,4-Dichlorobenzene-d4					CAS #: 3855-82-1		
7.015	7.021 (1.000)	150	8443227	80.0000		80.00- 120.00	100.00
7.015	7.021 (1.000)	152	5313560			0.00-10058.51	62.93
7.015	7.021 (1.000)	115	3510554			0.00-10037.59	41.58
* 27 Naphthalene-d8					CAS #: 1146-65-2		
9.779	9.769 (1.000)	136	15890572	80.0000		80.00- 120.00	100.00
9.779	9.769 (1.000)	68	1341043			0.00-10006.78	8.44
* 47 Acenaphthene-d10					CAS #: 15067-26-2		
13.918	13.907 (1.000)	164	9540198	80.0000		80.00- 120.00	100.00
13.918	13.907 (1.000)	162	9110499			0.00-10094.94	95.50
13.918	13.907 (1.000)	160	3910599			0.00-10041.02	40.99

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
* 71 Phenanthrene-d10						CAS #: 1517-22-2	
17.484	17.489 (1.000)	188	14686003	80.0000		80.00- 120.00	100.00
17.484	17.489 (1.000)	94	2023716			0.00-10014.44	13.78
17.484	17.489 (1.000)	80	1939057			0.00-10015.28	13.20
* 90 Chrysene-d12						CAS #: 1719-03-5	
23.863	23.885 (1.000)	240	11719251	80.0000		80.00- 120.00	100.00
23.863	23.885 (1.000)	236	2798866			0.00-10026.00	23.88
23.863	23.885 (1.000)	120	2092754			0.00-10018.11	17.86
* 99 Perylene-d12						CAS #: 1520-96-3	
27.036	27.058 (1.000)	264	8112974	80.0000		80.00- 120.00	100.00
27.036	27.058 (1.000)	260	1776716			0.00-10021.95	21.90
27.036	27.058 (1.000)	265	1687163			0.00-10020.90	20.80
$ 1 2-Fluorophenol						CAS #: 367-12-4	
4.643	4.649 (0.662)	112	4466788	55.3924	55.4	80.00- 120.00	100.00
4.643	4.649 (0.662)	64	2098886			0.00-10046.11	46.99
4.643	4.649 (0.662)	92	1229527			0.00-10019.15	27.53
$ 2 Phenol-d5						CAS #: 4165-62-2	
6.312	6.317 (0.645)	99	6199036	56.6824	56.7	80.00- 120.00	100.00
6.312	6.317 (0.645)	71	2245010			0.00-10029.73	36.22
$ 17 Nitrobenzene-d5						CAS #: 4165-60-0	
8.176	8.182 (0.587)	82	5274847	69.0547	69.0	80.00- 120.00	100.00
8.176	8.182 (0.587)	54	2692372			0.00-10052.46	51.04
8.176	8.182 (0.587)	128	2332996			0.00-10049.58	44.23
$ 62 2,4,6-Tribromophenol						CAS #: 118-79-6	
15.815	15.804 (0.663)	330	2070841	88.6148	88.6	80.00- 120.00	100.00
15.815	15.804 (0.663)	332	1992118			0.00-10096.28	96.20
15.799	15.804 (0.662)	141	621288			0.00-10029.68	30.00
$ 82 Terphenyl-d14						CAS #: 98904-43-9	
21.409	21.415 (0.897)	244	10189606	99.3304	99.3	80.00- 120.00	100.00
21.409	21.415 (0.897)	122	1678603			0.00-10016.35	16.47
21.409	21.415 (0.897)	212	620977			0.00-10005.98	6.09
$ 38 2-Fluorobiphenyl						CAS #: 321-60-8	
12.347	12.337 (0.706)	172	7887390	70.4668	70.5	80.00- 120.00	100.00
12.347	12.337 (0.706)	171	2697688			0.00-10033.81	34.20
$ 34 1-Methylnaphthalene-d10						CAS #: 38072-94-5	
11.268	11.584 (1.152)	152	64656	0.61568	0.62	80.00- 120.00	100.00(R)
11.252	11.584 (1.151)	122	18678			0.00-10038.76	28.89

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
34 1-Methylnaphthalene-d10 (continued)								
11.268	11.584	(1.152)	150	35259			0.00-10084.36	54.53
3 Phenol						CAS #: 108-95-2		
6.328	6.350	(0.902)	94	322851	3.48172	3.5	80.00- 120.00	100.00(a)
6.312	6.350	(0.900)	66	434899			0.00-10037.29	134.71
6.328	6.350	(0.902)	65	122132			0.00-10025.14	37.83
4 bis(2-Chloroethyl)ether						CAS #: 111-44-4		
6.393	6.514	(0.911)	93	39607	0.52634	0.53	80.00- 120.00	100.00(a)
6.426	6.514	(0.916)	63	96287			0.00-10062.92	243.10
6.393	6.514	(0.911)	95	639790			0.00-10031.42	1615.31
6 1,3-Dichlorobenzene						CAS #: 541-73-1		
7.048	6.890	(1.005)	146	151273	2.15837	2.2	80.00- 120.00	100.00
7.048	6.890	(1.005)	148	109776			0.00-10063.34	72.57
7.015	6.890	(1.000)	113	218048			0.00-10013.88	144.14
9 1,4-Dichlorobenzene						CAS #: 106-46-7		
7.048	7.053	(1.005)	146	150539	2.07333	2.1	80.00- 120.00	100.00
7.048	7.053	(1.005)	148	110608			0.00-10063.27	73.47
7.080	7.053	(1.009)	113	782993			0.00-10016.16	520.12
10 Benzyl Alcohol						CAS #: 100-51-6		
7.260	7.315	(1.035)	108	53035	1.17624	1.2	80.00- 120.00	100.00(a)
7.260	7.315	(1.035)	79	226059			0.00-10116.61	426.24
7.260	7.315	(1.035)	77	54024			0.00-10078.86	101.87
11 1,2-Dichlorobenzene						CAS #: 95-50-1		
7.048	7.348	(1.005)	146	150537	2.29315	2.3	80.00- 120.00	100.00
7.048	7.348	(1.005)	148	110076			0.00-10063.46	73.12
7.015	7.348	(1.000)	113	224733			0.00-10014.38	149.29
12 2-Methylphenol						CAS #: 95-48-7		
7.260	7.560	(1.035)	108	53035	0.81040	0.81	80.00- 120.00	100.00(a)
7.260	7.560	(1.035)	107	97515			0.00-10086.18	183.87
7.260	7.560	(1.035)	79	203292			0.00-10041.55	383.31
14 4-Methylphenol						CAS #: 106-44-5		
7.898	7.904	(1.126)	108	115860	1.84719	1.8	80.00- 120.00	100.00(a)
7.898	7.904	(1.126)	107	128521			0.00-10122.08	110.93
7.833	7.904	(1.117)	79	722967			0.00-10025.12	624.00
15 N-Nitrosodipropylamine						CAS #: 621-64-7		
7.866	7.904	(1.121)	70	142160	3.52444	3.5	80.00- 120.00	100.00
7.833	7.904	(1.117)	130	1083			0.00-10026.33	0.76

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
15 N-Nitrosodipropylamine (continued)							
7.849	7.904 (1.119)	101	3103			0.00-10012.19	2.18
16 Hexachloroethane					CAS #: 67-72-1		
8.046	8.051 (1.147)	117	122265	3.94437	3.9	80.00- 120.00	100.00
8.062	8.051 (1.149)	201	1221			0.00-10068.38	1.00
8.062	8.051 (1.149)	199	517			0.00-10041.83	0.42
18 Nitrobenzene					CAS #: 98-95-3		
8.144	8.231 (0.833)	77	317707	3.98496	4.0	80.00- 120.00	100.00
8.111	8.231 (0.829)	123	338118			0.00-10053.45	106.42
8.144	8.231 (0.833)	65	192197			0.00-10013.89	60.50
19 Isophorone					CAS #: 78-59-1		
8.716	8.771 (0.891)	82	1270114	7.44893	7.4	80.00- 120.00	100.00
8.716	8.771 (0.891)	138	82862			0.00-10014.70	6.52
8.716	8.771 (0.891)	95	2296681			0.00-10005.51	180.82
20 2-Nitrophenol					CAS #: 88-75-5		
8.994	8.918 (0.920)	139	79723	1.85412	1.8	80.00- 120.00	100.00(a)
8.962	8.918 (0.916)	65	249326			0.00-10042.96	312.74
8.962	8.918 (0.916)	109	347447			0.00-10026.21	435.82
21 2,4-Dimethylphenol					CAS #: 105-67-9		
8.994	9.065 (0.920)	122	54333	0.92064	0.92	80.00- 120.00	100.00(a)
8.978	9.065 (0.918)	107	232823			0.00-10123.86	428.51
8.994	9.065 (0.920)	121	74777			0.00-10055.27	137.63
23 bis(2-Chloroethoxy)methane					CAS #: 111-91-1		
9.289	9.294 (0.950)	93	116939	1.14126	1.1	80.00- 120.00	100.00
9.305	9.294 (0.951)	123	280118			0.00-10010.88	239.54
9.305	9.294 (0.951)	95	459515			0.00-10031.15	392.95
24 Benzoic Acid					CAS #: 65-85-0		
9.338	9.441 (0.955)	122	115199	2.82164	2.8	80.00- 120.00	100.00(a)
9.305	9.441 (0.951)	105	1747869			0.00-10123.32	1517.25
9.305	9.441 (0.951)	77	672230			0.00-10081.55	583.53
25 2,4-Dichlorophenol					CAS #: 120-83-2		
9.501	9.474 (0.972)	162	29628	0.53039	0.53	80.00- 120.00	100.00(a)
9.452	9.474 (0.967)	164	2598			0.00-10063.52	8.77
9.550	9.474 (0.977)	98	43445			0.00-10039.12	146.63
28 Naphthalene					CAS #: 91-20-3		
9.828	9.818 (1.005)	128	3630420	18.5093	18.5	80.00- 120.00	100.00
9.812	9.818 (1.003)	129	800161			0.00-10013.27	22.04

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
28 Naphthalene (continued)							
9.828	9.818 (1.005)	127	578618			0.00-10013.22	15.94
29 4-Chloroaniline					CAS #: 106-47-8		
9.828	10.014 (1.005)	127	572589	11.7116	11.7	80.00- 120.00	100.00
9.812	10.014 (1.003)	129	769893			0.00-10010.39	134.46
32 4-Chloro-3-Methylphenol					CAS #: 59-50-7		
11.284	11.159 (1.154)	107	73416	1.15862	1.2	80.00- 120.00	100.00(a)
11.284	11.159 (1.154)	142	10876			0.00-10073.71	14.81
11.284	11.159 (1.154)	144	48788			0.00-10023.72	66.45
33 2-Methylnaphthalene					CAS #: 91-57-6		
11.448	11.437 (1.171)	142	3596723	28.9781	29.0	80.00- 120.00	100.00
11.448	11.437 (1.171)	141	3164366			0.00-10090.11	87.98
36 2,4,6-Trichlorophenol					CAS #: 88-06-2		
11.709	12.124 (0.841)	196	20433	0.63409	0.63	80.00- 120.00	100.00(a)
11.693	12.124 (0.840)	198	2059			0.00-10094.84	10.08
11.791	12.124 (0.847)	200	109			0.00-10030.07	0.54
37 2,4,5-Trichlorophenol					CAS #: 95-95-4		
12.560	12.206 (0.902)	196	20114	0.63048	0.63	80.00- 120.00	100.00(a)
12.576	12.206 (0.904)	198	133			0.00-10095.07	0.66
12.593	12.206 (0.905)	200	267			0.00-10030.67	1.33
40 2-Nitroaniline					CAS #: 88-74-4		
12.871	12.860 (0.925)	65	41238	1.37500	1.4	80.00- 120.00	100.00
12.871	12.860 (0.925)	138	5067			0.00-10127.72	12.29
12.887	12.860 (0.926)	92	114226			0.00-10073.86	276.99
46 3-Nitroaniline					CAS #: 99-09-2		
13.918	13.874 (1.000)	138	6437	0.61050	0.61	80.00- 120.00	100.00(a)
13.918	13.874 (1.000)	92	64557			0.00-10120.29	1002.75
13.918	13.874 (1.000)	108	249997			0.00-10080.06	3883.16
44 2,6-Dinitrotoluene					CAS #: 606-20-2		
13.476	13.498 (0.968)	165	222371	8.76383	8.8	80.00- 120.00	100.00
13.460	13.498 (0.967)	89	24120			0.00-10059.87	10.85
13.476	13.498 (0.968)	121	48219			0.00-10022.31	21.68
45 Acenaphthylene					CAS #: 208-96-8		
13.182	13.563 (0.947)	152	77021	0.52948	0.53	80.00- 120.00	100.00(a)
13.182	13.563 (0.947)	151	38921			0.00-10023.78	50.53
13.182	13.563 (0.947)	153	83384			0.00-10015.23	108.26

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
48 Acenaphthene					CAS #: 83-32-9		
13.967	13.989 (1.004)	154	64210	0.70574	0.70	80.00- 120.00	100.00(a)
13.983	13.989 (1.005)	152	30395			0.00-10049.54	47.34
13.983	13.989 (1.005)	153	34432			0.00-10106.26	53.62
50 4-Nitrophenol					CAS #: 100-02-7		
14.736	14.349 (1.059)	109	24333	1.75698	1.8	80.00- 120.00	100.00(a)
14.703	14.349 (1.056)	139	4620			0.00-10155.17	18.99
14.736	14.349 (1.059)	65	9288			0.00-10133.38	38.17
52 2,4-Dinitrotoluene					CAS #: 121-14-2		
14.408	14.447 (1.035)	165	25349	0.69607	0.70	80.00- 120.00	100.00(a)
14.425	14.447 (1.036)	63	31155			0.00-10063.54	122.91
14.408	14.447 (1.035)	182	11490			0.00-10004.86	45.33
56 Diethylphthalate					CAS #: 84-66-2		
15.063	15.085 (1.082)	149	6717700	54.9819	55.0	80.00- 120.00	100.00
15.063	15.085 (1.082)	177	1221754			0.00-10019.67	18.19
15.063	15.085 (1.082)	150	728744			0.00-10011.54	10.85
61 N-nitrosodiphenylamine					CAS #: 86-30-6		
15.684	15.575 (0.897)	169	41573	0.63720	0.64	80.00- 120.00	100.00(a)
15.701	15.575 (0.898)	168	11635			0.00-10066.04	27.99
15.652	15.575 (0.895)	167	9655			0.00-10035.43	23.22
78 Di-n-butylphthalate					CAS #: 84-74-2		
19.037	19.059 (1.089)	149	1199998	6.03288	6.0	80.00- 120.00	100.00
19.037	19.059 (1.089)	150	108305			0.00-10011.22	9.03
19.037	19.059 (1.089)	104	74447			0.00-10006.82	6.20
85 Butyl benzyl phthalate					CAS #: 85-68-7		
22.652	22.674 (0.949)	149	282173	3.27344	3.3	80.00- 120.00	100.00
22.652	22.674 (0.949)	91	233310			0.00-10073.35	82.68
22.652	22.674 (0.949)	206	40679			0.00-10015.36	14.42
93 bis(2-ethylhexyl)Phthalate					CAS #: 117-81-7		
24.108	24.130 (1.010)	149	3029164	27.0816	27.1	80.00- 120.00	100.00
24.108	24.130 (1.010)	167	838149			0.00-10027.97	27.67
24.108	24.130 (1.010)	279	156815			0.00-10005.78	5.18

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.

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Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01150601026.d
Lab Smp Id: 912088A-03A
Analysis Type: SV
Quant Type: ISTD
Operator: jgh
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80 ng ISTD #267-91-1

Calibration Date: JAN/15/98
Calibration Time: 1836
Client Smp ID: AF-M-EF404-PAH
Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	11270581	5635290	22541162	8443227	-25.09
27 Naphthalene-d8	17745391	8872696	35490782	15890572	-10.45
47 Acenaphthene-d10	12494791	6247396	24989582	9540198	-23.65
71 Phenanthrene-d10	17937870	8968935	35875740	14686003	-18.13
90 Chrysene-d12	15301801	7650900	30603602	11719251	-23.41
99 Perylene-d12	9954932	4977466	19909864	8112974	-18.50

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DI
7 1,4-Dichlorobenze	7.02	6.52	7.52	7.02	-0.08
27 Naphthalene-d8	9.77	9.27	10.27	9.78	0.11
47 Acenaphthene-d10	13.91	13.41	14.41	13.92	0.08
71 Phenanthrene-d10	17.49	16.99	17.99	17.48	-0.03
90 Chrysene-d12	23.88	23.38	24.38	23.86	-0.09
99 Perylene-d12	27.06	26.56	27.56	27.04	-0.08

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

KS 1/21/98

JM 1.29.98

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: 912088A-03A
Level: LOW
Data Type: MS DATA
SpikeList File: 8270.spk
Sublist File: 8270.sub
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80 ng ISTD #267-91-1

Client SDG: h-15Jan98
Fraction: SV
Client Smp ID: AF-M-EF404-PAH
Operator: jgh
SampleType: SAMPLE
Quant Type: ISTD

SURROGATE COMPOUND	CONC ADDED ug	CONC RECOVERED ug	% RECOVERED	LIMITS
$ 1 2-Fluorophenol	100	55.4	55.39	25-121
$ 2 Phenol-d5	100	56.7	56.68	24-113
$ 17 Nitrobenzene-d5	100	69.0	69.05	23-120
$ 38 2-Fluorobiphenyl	100	70.5	70.47	30-115
$ 62 2,4,6-Tribromophen	100	88.6	88.61	19-122
$ 82 Terphenyl-d14	100	99.3	99.33	18-137

KS 1/22/98

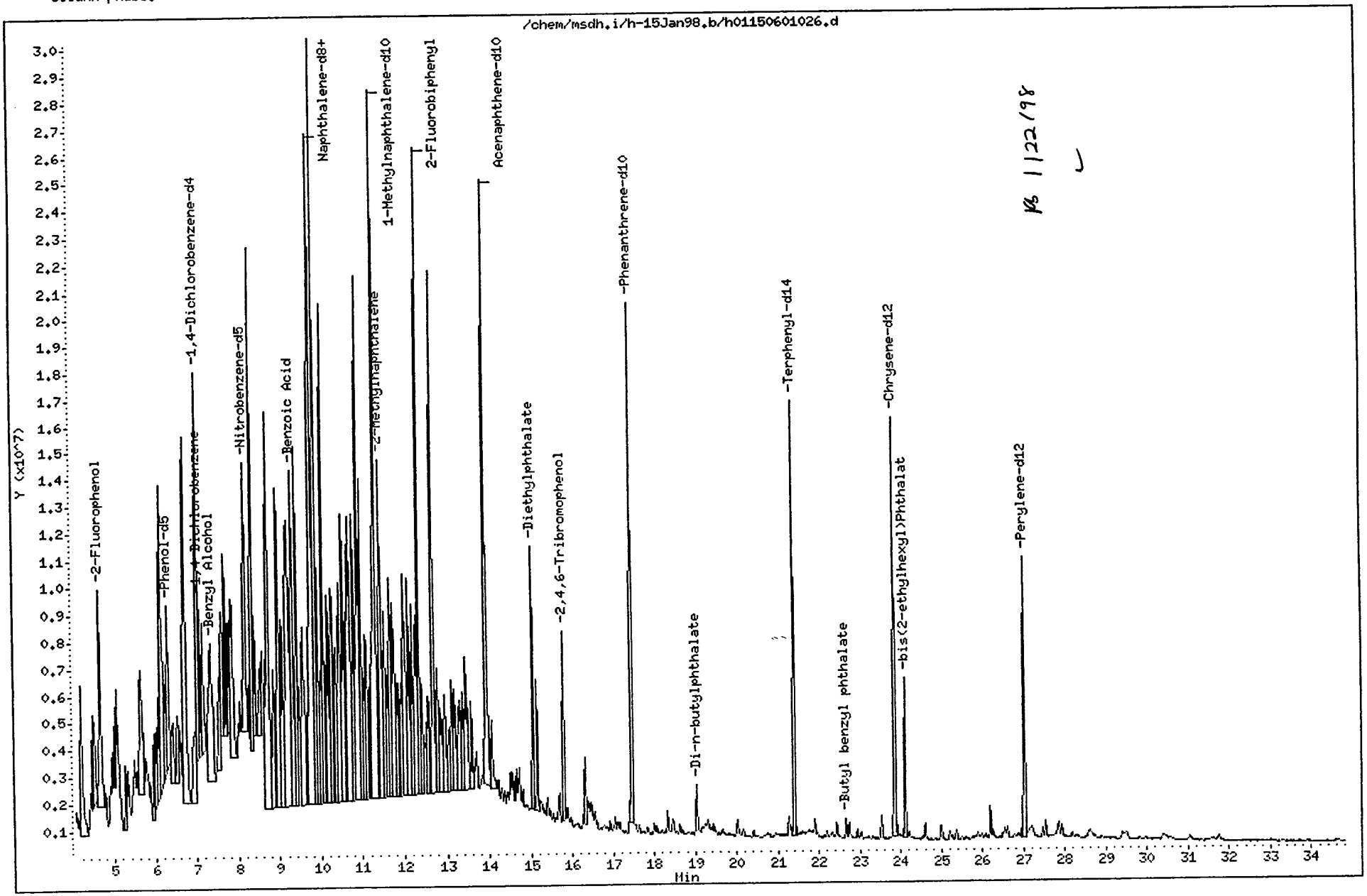
JGH 1.29.98

130

Data [redacted] /chem/msdh.i/h-15Jan98.b/h01150601026.d
Date : 15-JAN-1998 22:38
Client ID: AF-M-EF404-PAH
Sample Info: 9712088A-03A
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i

Operator: jgh
Column diameter: 2.00



KS 1/22/98

Data File: /chem/msdh.i/h-15Jan98.b/h01150601026.d

Date : 15-JAN-1998 22:38

Client ID: AF-M-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-03A

Volume Injected (uL): 1.0

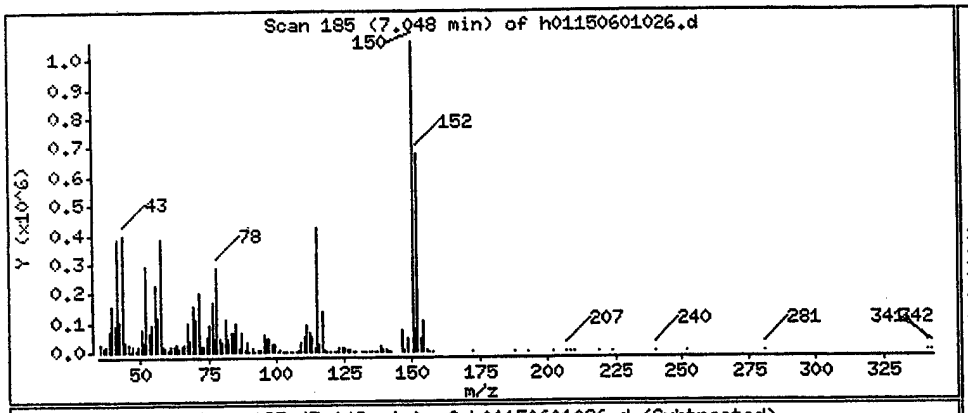
Operator: jgh

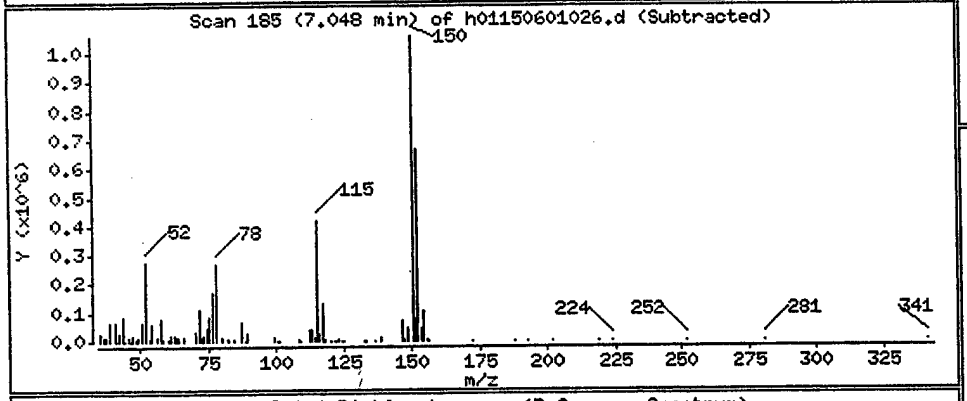
Column phase:

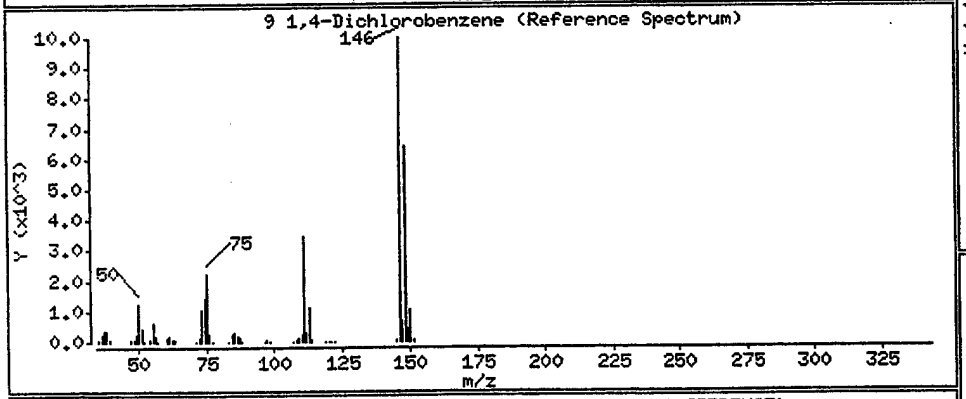
Column diameter: 2.00

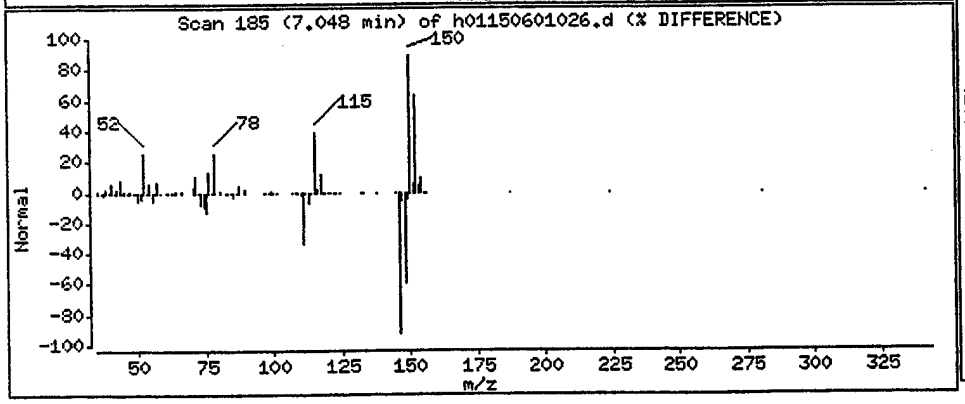
9 1,4-Dichlorobenzene

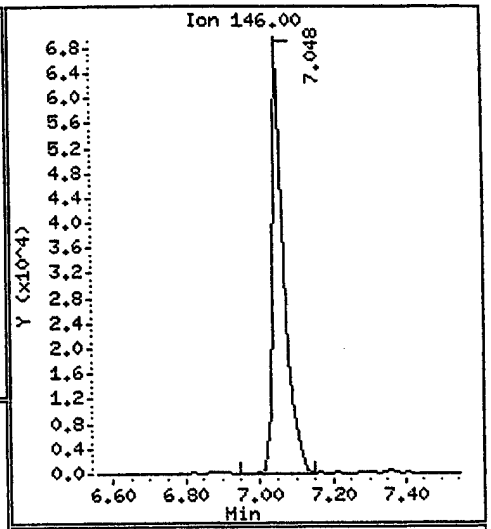
Concentration: 2.1 ug

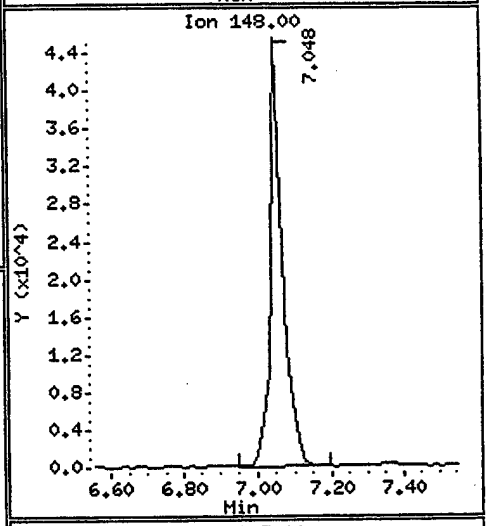


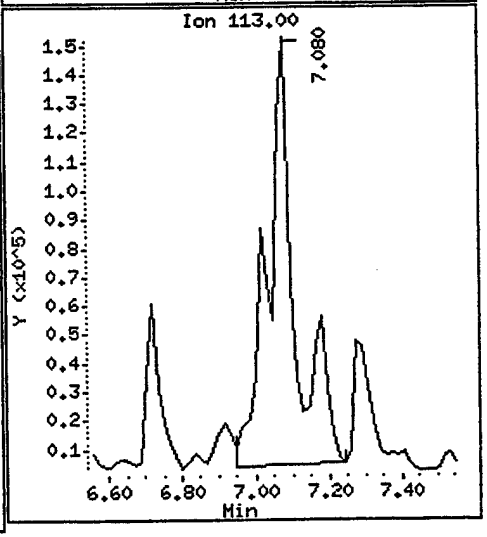












Data File: /chem/msdh.i/h-15Jan98.b/h01150601026.d

Date : 15-JAN-1998 22:38

Client ID: AF-M-EF404-PAH

Sample Info: 9712088A-03A

Volume Injected (uL): 1.0

Column phase:

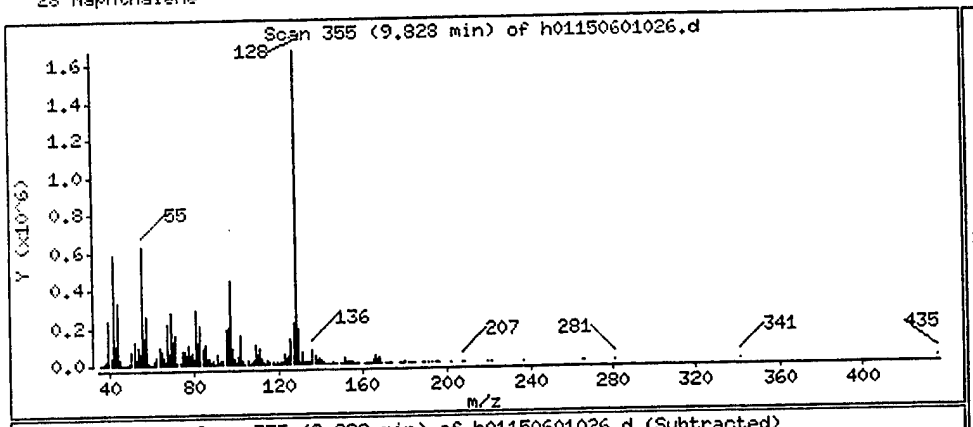
Instrument: msdh.i

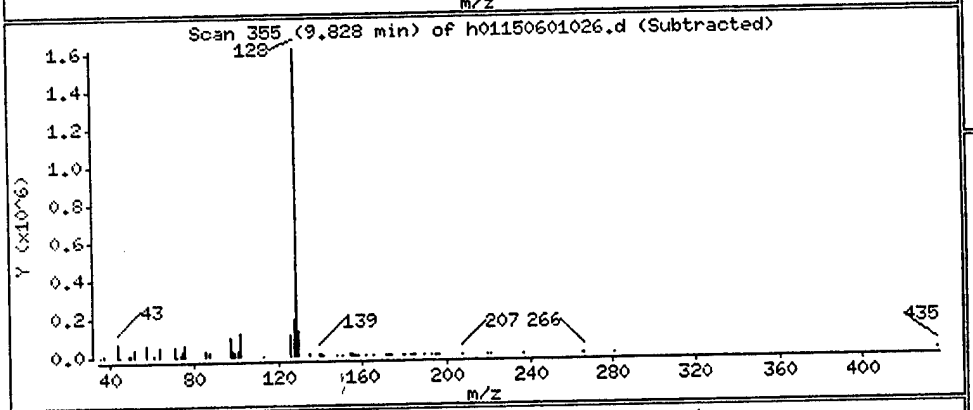
Operator: jgh

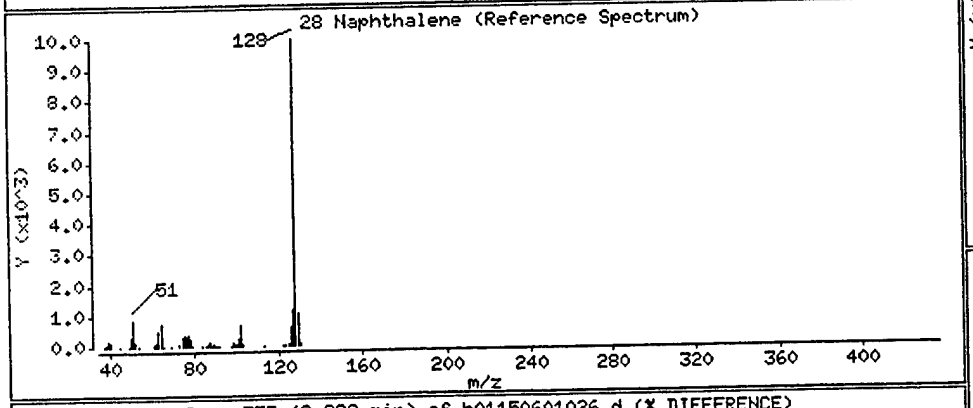
Column diameter: 2.00

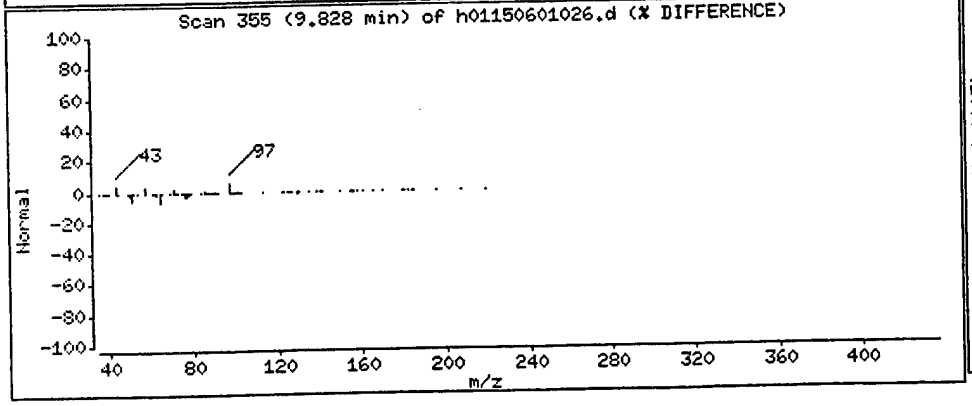
Concentration: 18.5 ug

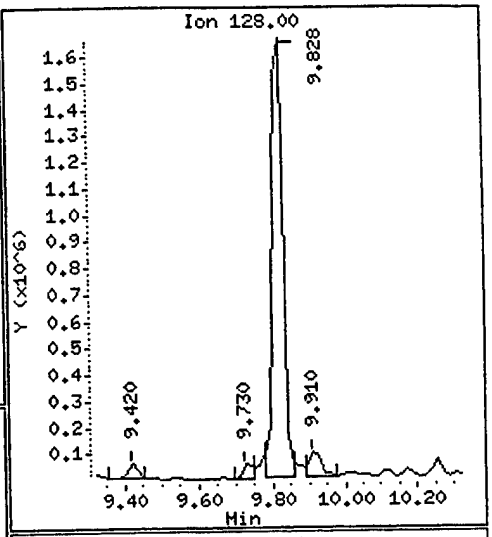
28 Naphthalene

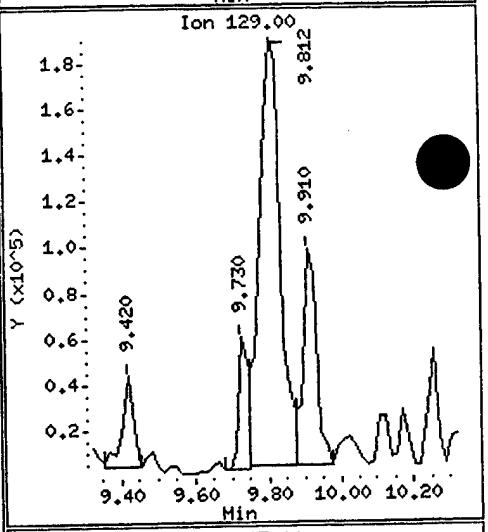


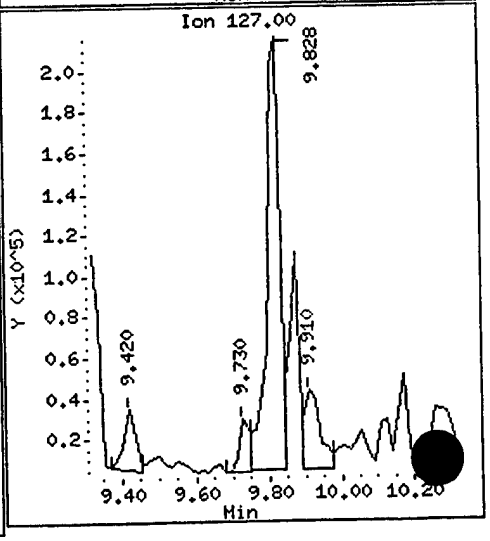












Data File: /chem/msdh.i/h-15Jan98.b/h01150601026.d

Date : 15-JAN-1998 22:38

Client ID: AF-M-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-03A

Volume Injected (uL): 1.0

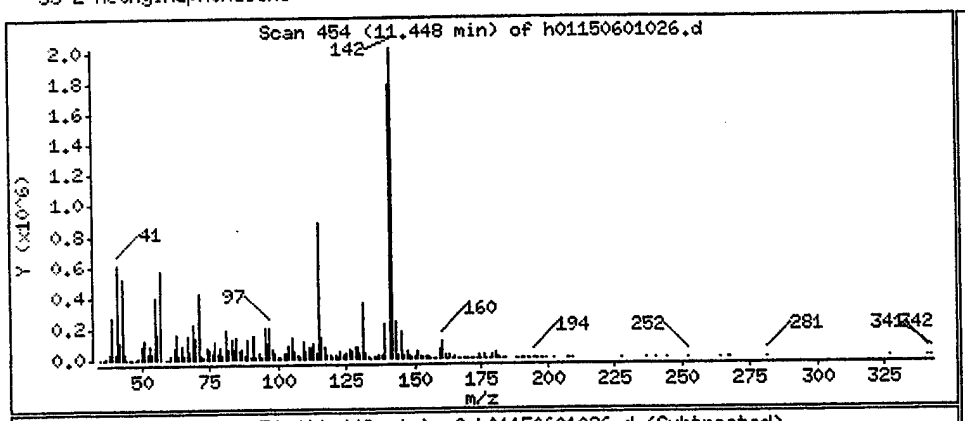
Operator: jgh

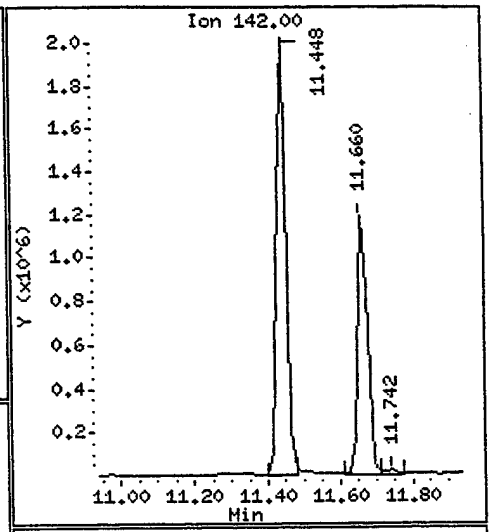
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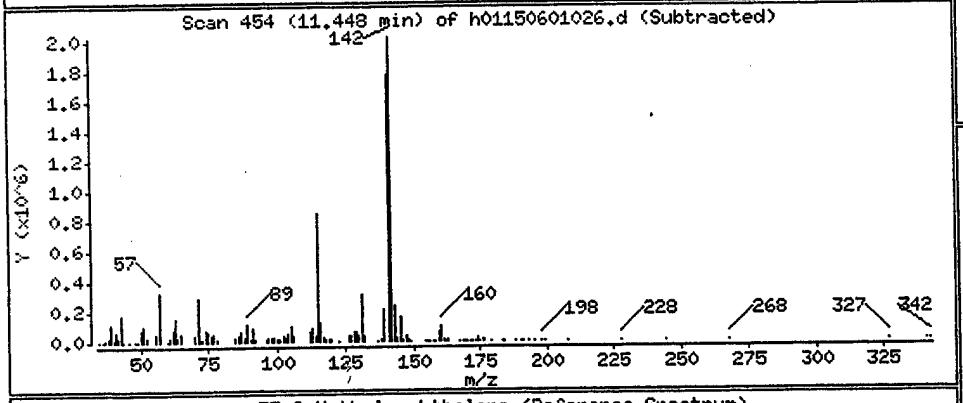
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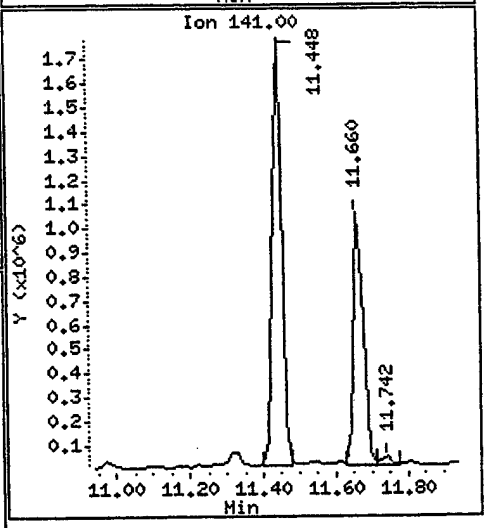
33 2-Methylnaphthalene

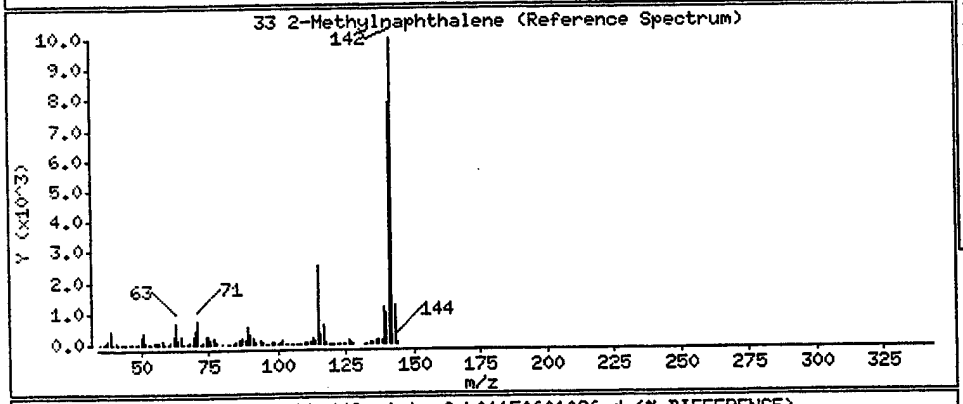
Concentration: 29.0 ug

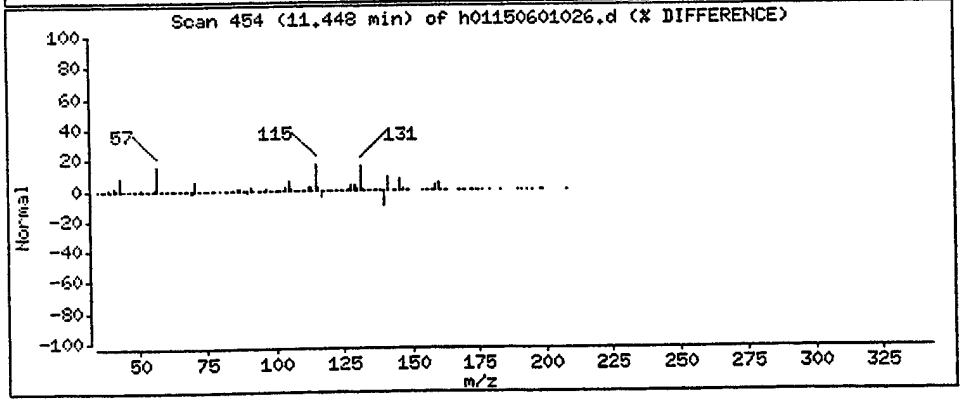












Data File: /chem/msdh.i/h-15Jan98.b/h01150601026.d

Date : 15-JAN-1998 22:38

Client ID: AF-M-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-03A

Volume Injected (uL): 1.0

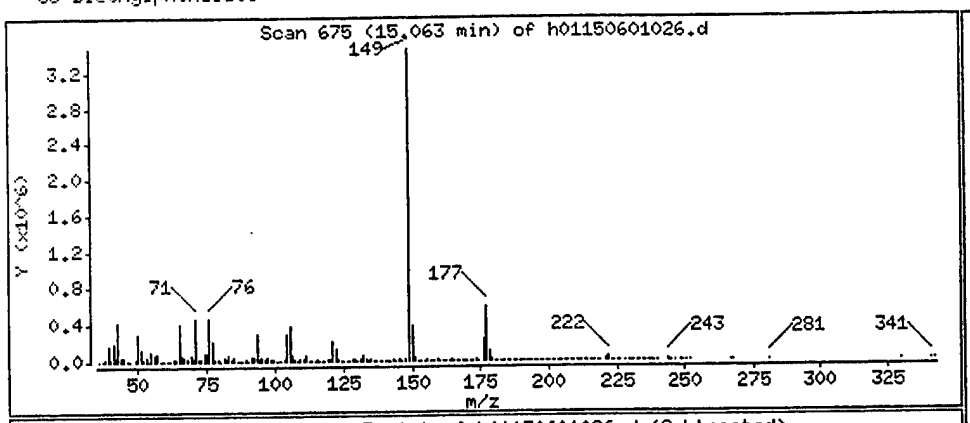
Operator: jgh

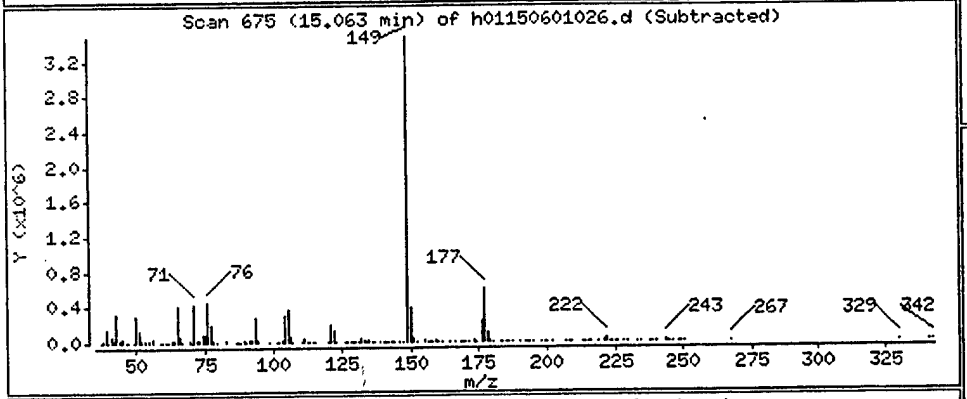
Column phase:

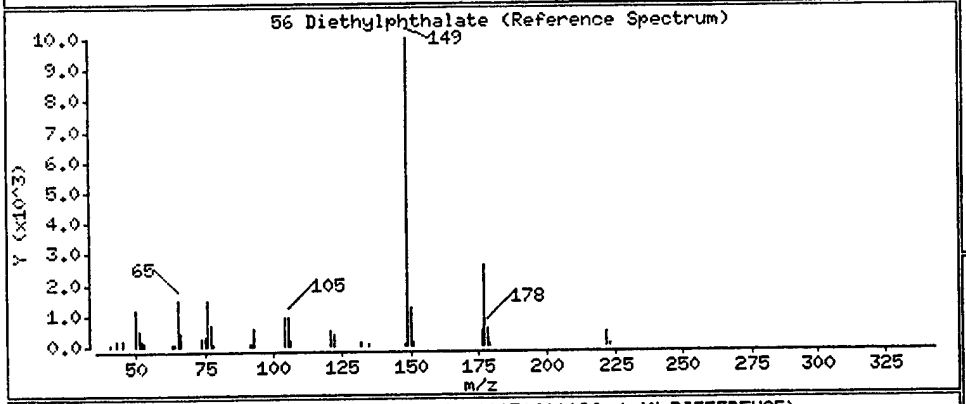
Column diameter: 2.00

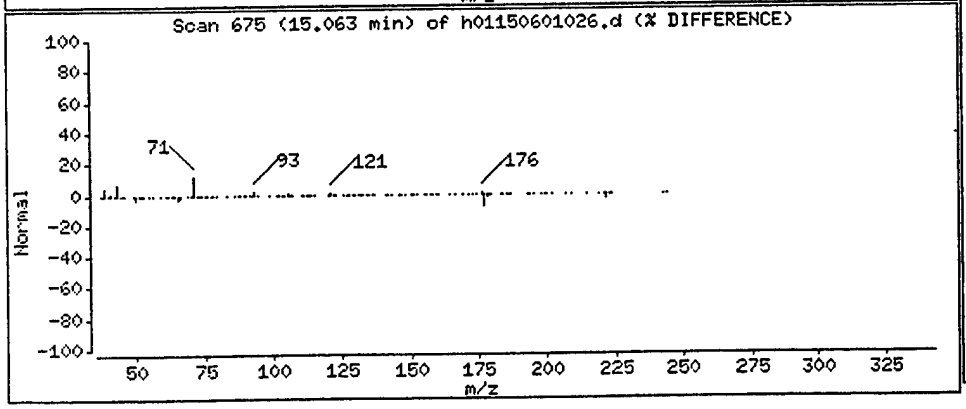
56 Diethylphthalate

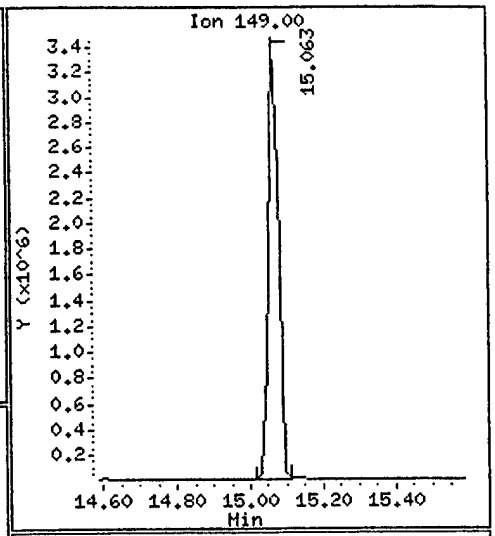
Concentration: 55.0 ug

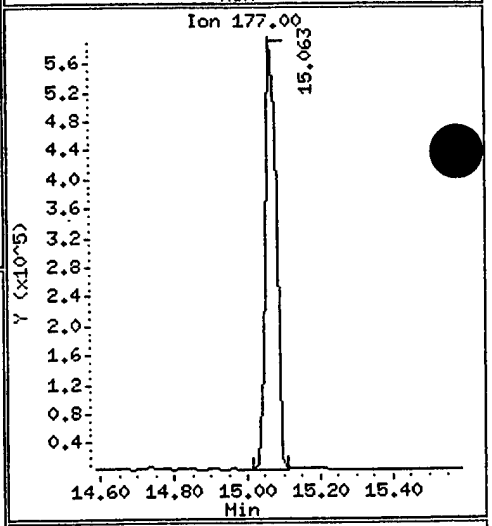


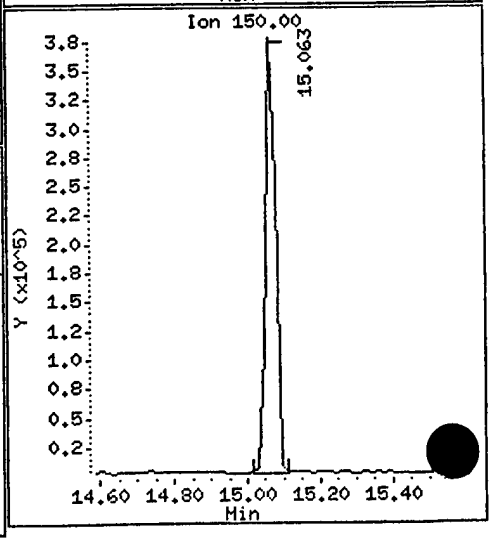












Data File: /chem/msdh.i/h-15Jan98.b/h01150601026.d

Date : 15-JAN-1998 22:38

Client ID: AF-M-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-03A

Volume Injected (uL): 1.0

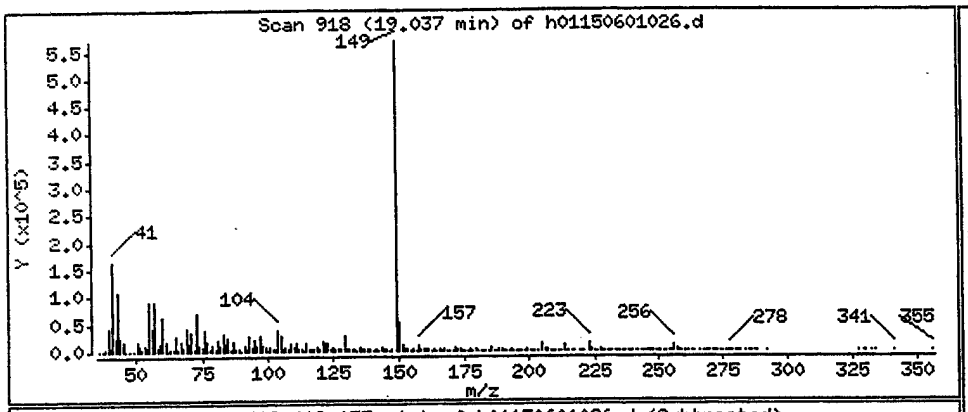
Operator: jgh

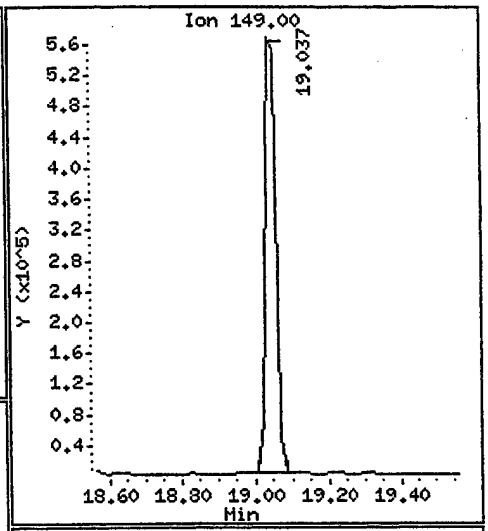
Column phase:

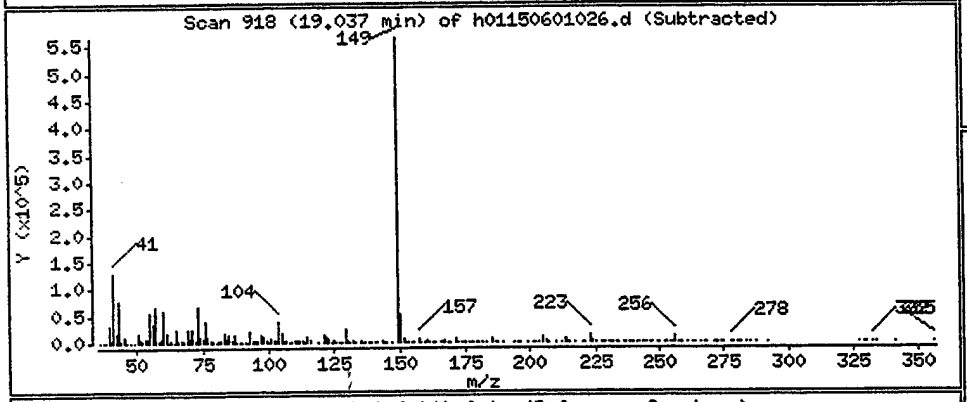
Column diameter: 2.00

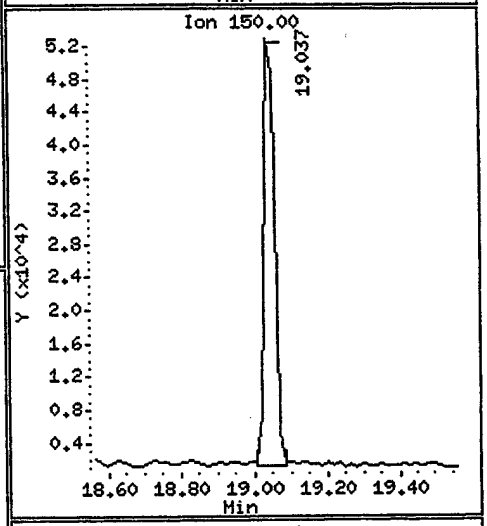
78 Di-n-butylphthalate

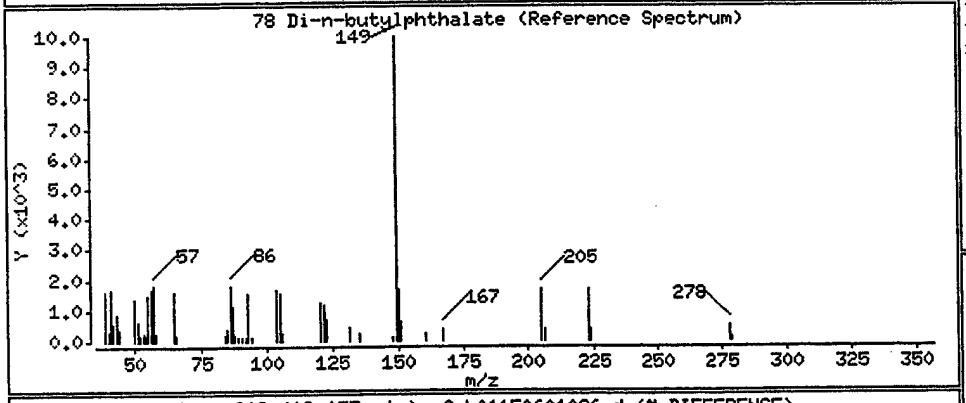
Concentration: 6.0 ug

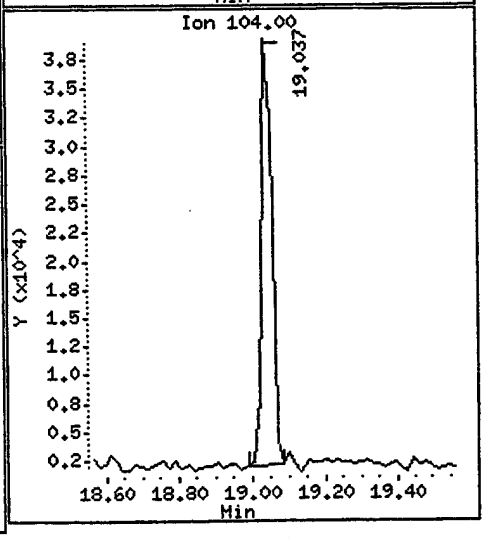


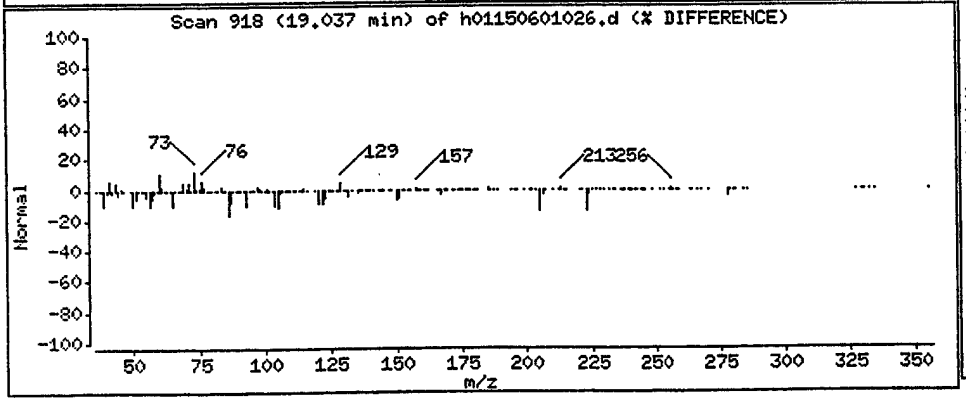












Data File: /chem/msdh.i/h-15Jan98.b/h01150601026.d

Date : 15-JAN-1998 22:38

Client ID: AF-M-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-03A

Volume Injected (uL): 1.0

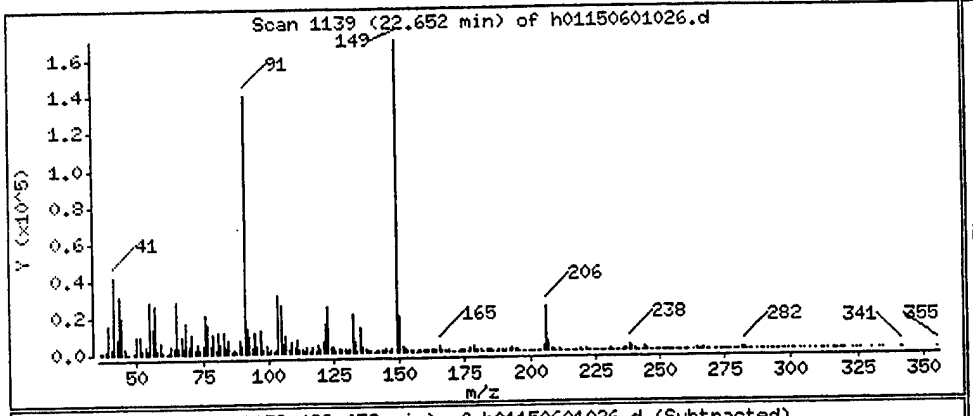
Operator: jgh

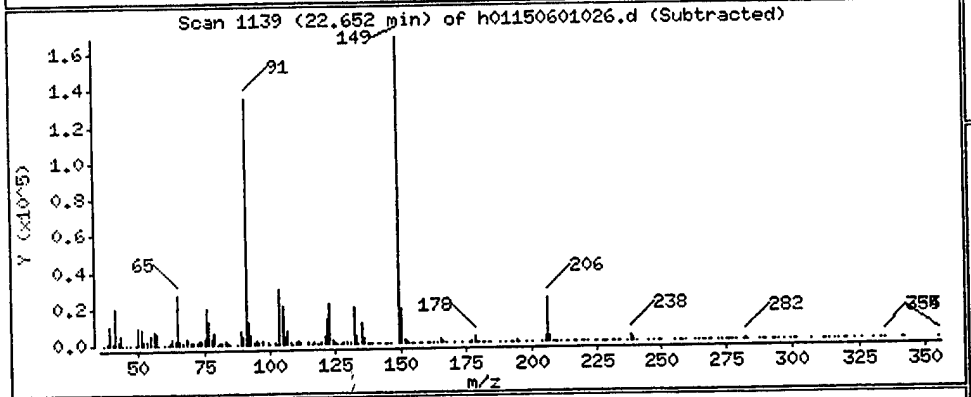
Column phase:

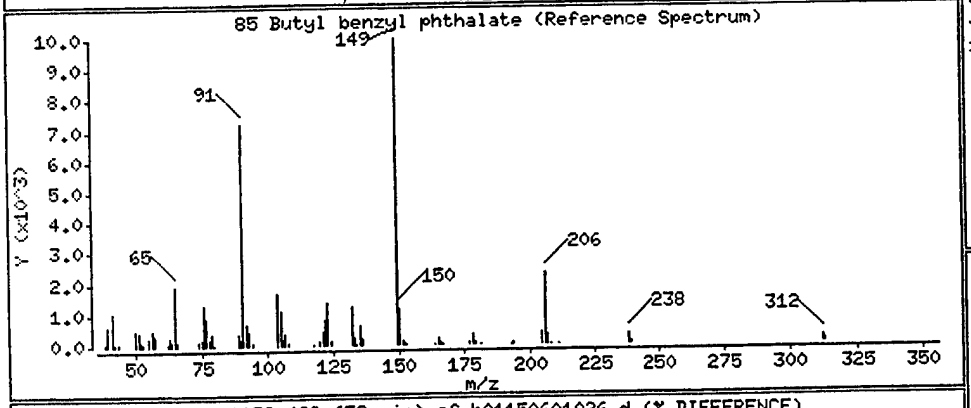
Column diameter: 2.00

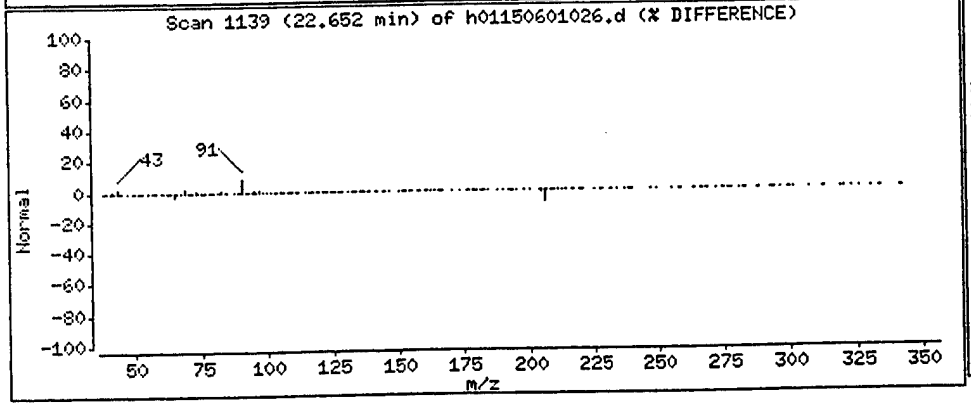
85 Butyl benzyl phthalate

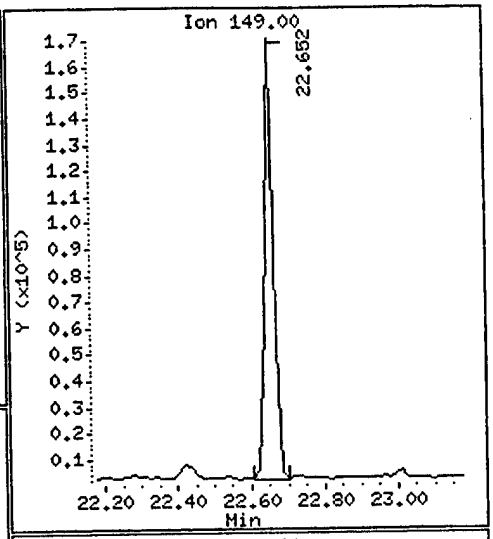
Concentration: 3.3 ug

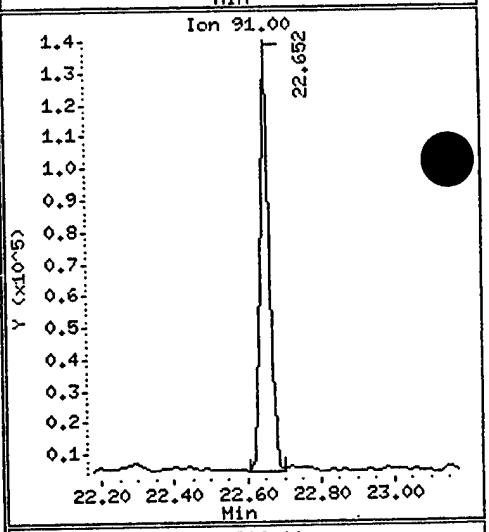


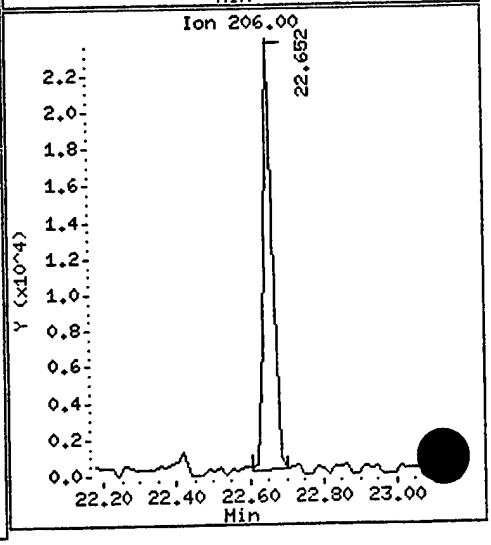












Data File: /chem/msdh.i/h-15Jan98.b/h01150601026.d

Date : 15-JAN-1998 22:38

Client ID: AF-M-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-03A

Volume Injected (uL): 1.0

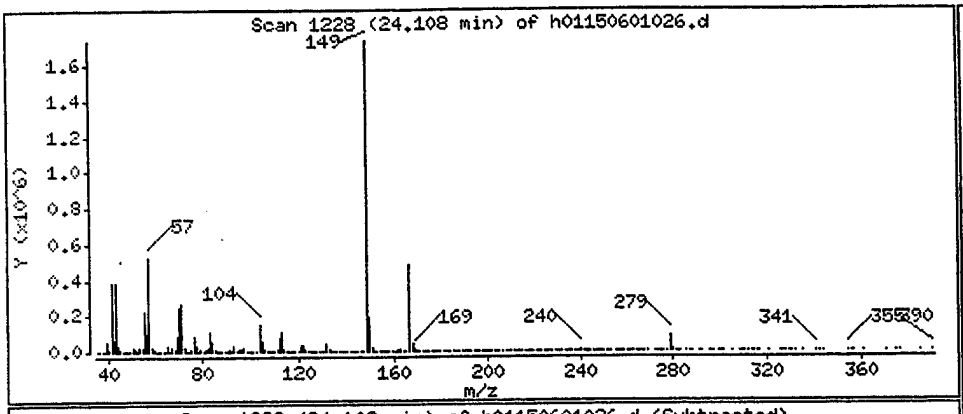
Operator: jgh

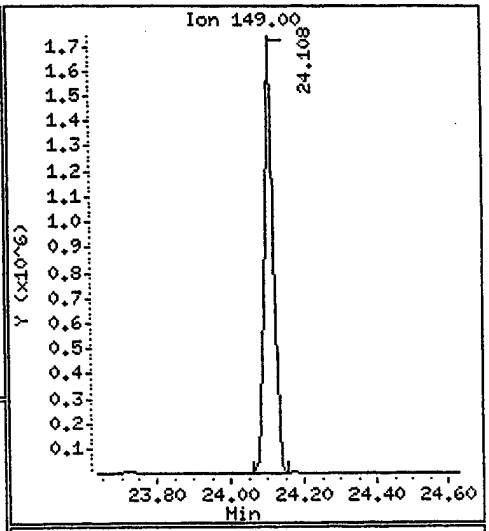
Column phase:

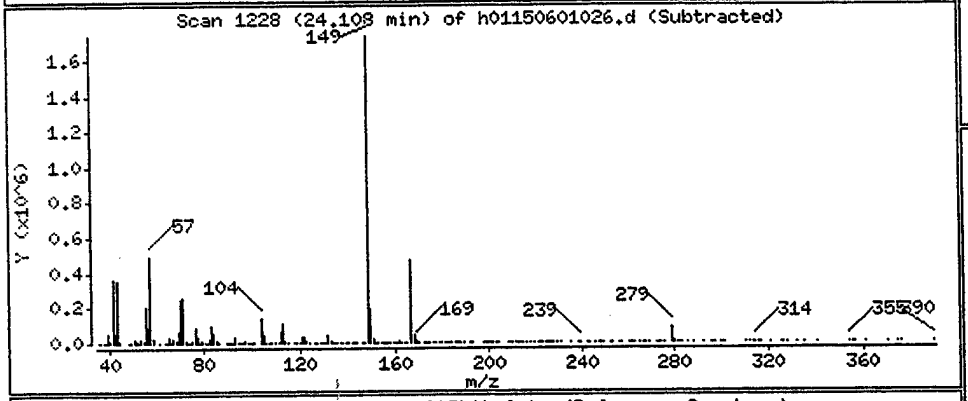
Column diameter: 2.00

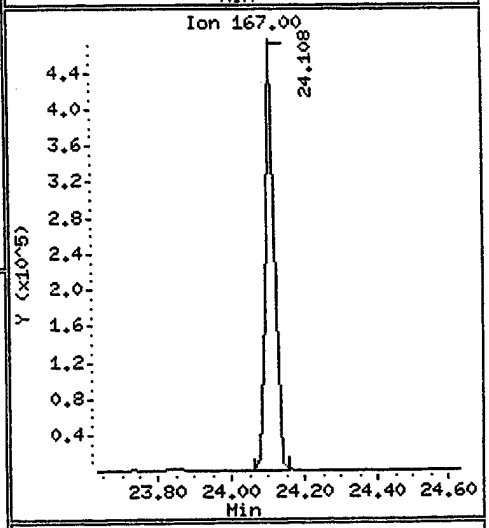
93 bis(2-ethylhexyl)Phthalate

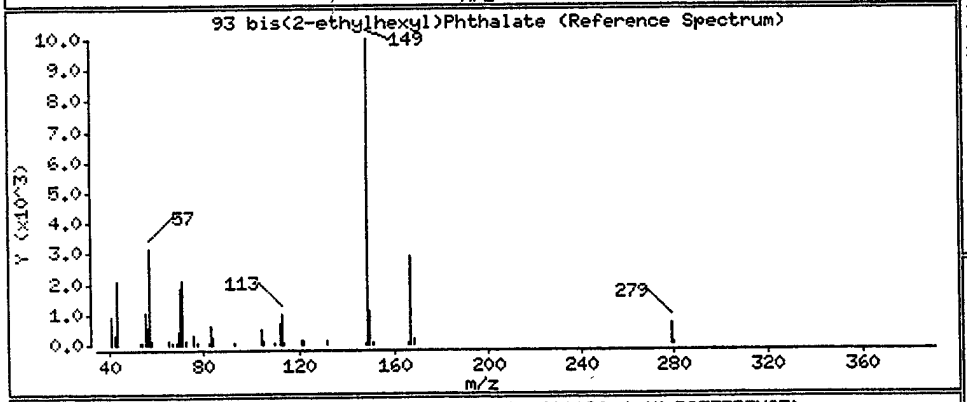
Concentration: 27.1 ug

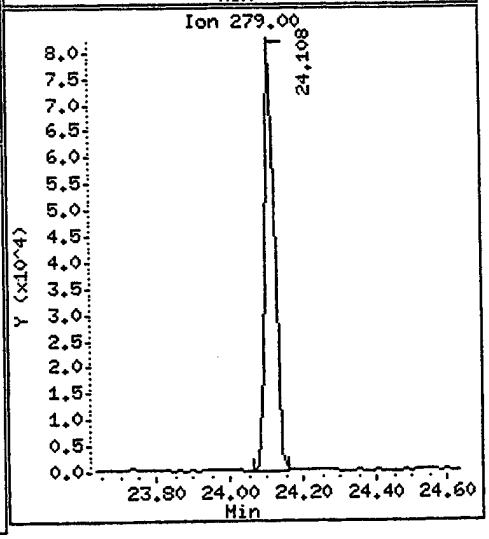


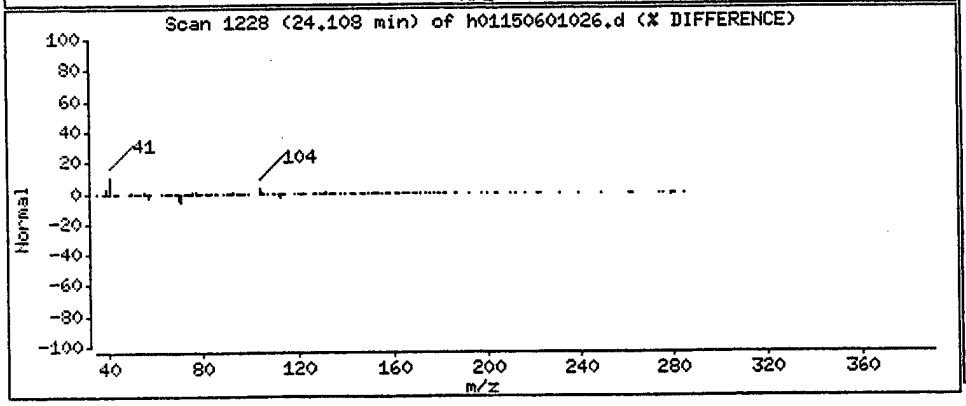












Audit History For: /chem/msdh.i/h-15Jan98.b/h01150601026.d

Change Date: 15-Jan-1998 23:26
Change Made by: Automation

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 09:09
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: 8270.sub
New Value: MM5.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:09
Change Made by: kbadal

Parameter: Lab ID
Old Value:
New Value: 912088A-03A
Reason For Change: N/A

Change Date: 22-Jan-1998 09:09
Change Made by: kbadal

Parameter: Client ID
Old Value:
New Value: AF-M-EF404-PAH
Reason For Change: N/A

Change Date: 22-Jan-1998 09:09
Change Made by: kbadal

Parameter: Sample Prep. Date
Old Value:
New Value: 08-DEC-1997 17:30
Reason For Change: N/A

Change Date: 22-Jan-1998 09:18
Change Made by: kbadal

Parameter: Misc Information
Old Value:
New Value: 80 ng ISTD #267-91-1
Reason For Change: N/A

Change Date: 22-Jan-1998 09:19
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 09:55
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: MM5.sub
New Value: 8270.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:55
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 10:05
Change Made by: kbadal

Parameter: Best Hit for Phenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:05
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:05
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethyl)ether changed
Old Value: Old Hit #1
New Value: New Hit #2
Reason For Change: N/A

Change Date: 22-Jan-1998 10:05
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:05
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethyl)ether changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:05
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:05
Change Made by: kbadal

Parameter: Best Hit for 1,3-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:05
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:06
Change Made by: kbadal

Parameter: Best Hit for 1,4-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:06
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:06
Change Made by: kbadal

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:06
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:07
Change Made by: kbadal

Parameter: Best Hit for 2-Methylphenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:07
Change Made by: kbadal

Parameter: Best Hit for 4-Methylphenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:07
Change Made by: kbadal

Parameter: Requantitate all compounds

Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:07
Change Made by: kbadal

Parameter: Best Hit for N-Nitrosodipropylamine changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:07
Change Made by: kbadal

Parameter: Best Hit for Hexachloroethane changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:08
Change Made by: kbadal

Parameter: Best Hit for Nitrobenzene changed
Old Value: Old Hit #4
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:08
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:09
Change Made by: kbadal

Parameter: Best Hit for Isophorone changed
Old Value: Old Hit #4
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:09
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:

Reason For Change: N/A

Change Date: 22-Jan-1998 10:09
Change Made by: kbadal

Parameter: Best Hit for 2-Nitrophenol changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:09
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:09
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dimethylphenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:09
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:10
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethoxy)methane changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:10
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:10
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dichlorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:10
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:10
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #2
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 10:10
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:10
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #1
New Value: New Hit #2
Reason For Change: N/A

Change Date: 22-Jan-1998 10:10
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:10
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #2
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 10:10
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:18
Change Made by: kbadal

Parameter: Best Hit for 4-Chloroaniline changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:18
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:18
Change Made by: kbadal

Parameter: Best Hit for 4-Chloro-3-Methylphenol changed
Old Value: Old Hit #4
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:18
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:19
Change Made by: kbadal

Parameter: Best Hit for 2-Methylnaphthalene changed
Old Value: Old Hit #1
New Value: New Hit #2
Reason For Change: N/A

Change Date: 22-Jan-1998 10:19
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:19
Change Made by: kbadal

Parameter: Best Hit for 2-Methylnaphthalene changed
Old Value: Old Hit #2
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 10:19
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:19
Change Made by: kbadal

Parameter: Best Hit for 2,4,6-Trichlorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:19
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:19
Change Made by: kbadal

Parameter: Best Hit for 2,4,5-Trichlorophenol changed

Old Value: Old Hit #4
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:19
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:20
Change Made by: kbadal

Parameter: Best Hit for 2-Nitroaniline changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:20
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:20
Change Made by: kbadal

Parameter: Best Hit for 3-Nitroaniline changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:20
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:21
Change Made by: kbadal

Parameter: Best Hit for 2,6-Dinitrotoluene changed
Old Value: Old Hit #1
New Value: New Hit #3
Reason For Change: N/A

Change Date: 22-Jan-1998 10:21
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:21
Change Made by: kbadal

Parameter: Best Hit for 2,6-Dinitrotoluene changed
Old Value: Old Hit #3
New Value: New Hit #1

Reason For Change: N/A

Change Date: 22-Jan-1998 10:21
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:24
Change Made by: kbadal

Parameter: Best Hit for 2,6-Dinitrotoluene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:24
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:24
Change Made by: kbadal

Parameter: Best Hit for Acenaphthylene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:24
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:24
Change Made by: kbadal

Parameter: Best Hit for Acenaphthene changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:24
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:25
Change Made by: kbadal

Parameter: Best Hit for Acenaphthene changed
Old Value: Compound Undetected
New Value: New Hit #2
Reason For Change: N/A

Change Date: 22-Jan-1998 10:25
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:25
Change Made by: kbadal

Parameter: Best Hit for Acenaphthene changed
Old Value: Old Hit #2
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 10:25
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:25
Change Made by: kbadal

Parameter: Best Hit for Acenaphthene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:25
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:25
Change Made by: kbadal

Parameter: Best Hit for 4-Nitrophenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:25
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:25
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dinitrotoluene changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:25
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:26
Change Made by: kbadal

Parameter: Best Hit for N-nitrosodiphenylamine changed
Old Value: Old Hit #1
New Value: New Hit #2
Reason For Change: N/A

Change Date: 22-Jan-1998 10:26
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:26
Change Made by: kbadal

Parameter: Best Hit for N-nitrosodiphenylamine changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:26
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:31
Change Made by: kbadal

Parameter: Sample Info
Old Value: 9712088a-03a
New Value: 9712088A-03A
Reason For Change: N/A

Change Date: 22-Jan-1998 10:31
Change Made by: kbadal

Parameter: Best Hit for Perylene-d12 changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:31
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:32
Change Made by: kbadal

Parameter: Best Hit for Perylene-d12 changed

Old Value: Compound Undetected
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 10:32
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:16
Change Made by: kbadal

Parameter: Best Hit for 1,4-Dichlorobenzene changed
Old Value: Compound Undetected
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 11:16
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:59
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:59
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 27-Jan-1998 15:52
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

Change Date: 28-Jan-1998 09:16
Change Made by: jheffel

Parameter: Sample Info
Old Value: 9712088A-03A
New Value: 1.0ul 9712088A-03A
Reason For Change: N/A

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.
AF - N - EF404 - PAH

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-04A
Lab File ID: H011507
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/15/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	3.0	
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	16	
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	21	
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	50	

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

AF - N - EF404 - PAH

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-04A
Lab File ID: H011507
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/15/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	4.7	B
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	3.6	
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	4.5	
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150701027.d
Lab Smp Id: 9712088A-04A Client Smp ID: AF-N-EF404-PAH
Inj Date : 15-JAN-1998 23:20
Operator : jgh Inst ID: msdh.i
Smp Info : 9712088A-04A
Misc Info : 80 ng ISTD #267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 27-Jan-1998 15:24 jheffel Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8270.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

1-27-98

1.29.98

	RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
$ 1	2-Fluorophenol					CAS #: 367-12-4		
	4.652	4.649 (0.662)	112	4302040	54.7226	54.7	80.00- 120.00	100.00
	4.636	4.649 (0.660)	64	2018090			0.00-10046.11	46.91
	4.652	4.649 (0.662)	92	1449060			0.00-10019.15	33.68
$ 2	Phenol-d5					CAS #: 4165-62-2		
	6.304	6.317 (0.645)	99	6111448	53.0521	53.0	80.00- 120.00	100.00
	6.304	6.317 (0.645)	71	2288664			0.00-10029.73	37.45
$ 17	Nitrobenzene-d5					CAS #: 4165-60-0		
	8.169	8.182 (0.587)	82	4695242	57.8159	57.8	80.00- 120.00	100.00
	8.169	8.182 (0.587)	54	2559364			0.00-10052.46	54.51
	8.185	8.182 (0.588)	128	2283459			0.00-10049.58	48.63

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
$ 38 2-Fluorobiphenyl					CAS #: 321-60-8		
12.340	12.337 (0.706)	172	7359118	61.7897	61.8	80.00- 120.00	100.00
12.340	12.337 (0.706)	171	2513317			0.00-10033.81	34.15
$ 62 2,4,6-Tribromophenol					CAS #: 118-79-6		
15.807	15.804 (0.663)	330	1904305	79.4491	79.4	80.00- 120.00	100.00
15.807	15.804 (0.663)	332	1838091			0.00-10096.28	96.52
15.807	15.804 (0.663)	141	614080			0.00-10029.68	32.25
$ 82 Terphenyl-d14					CAS #: 98904-43-9		
21.402	21.415 (0.897)	244	10368033	98.5404	98.5	80.00- 120.00	100.00
21.402	21.415 (0.897)	122	1622052			0.00-10016.35	15.64
21.402	21.415 (0.897)	212	624097			0.00-10005.98	6.02
* 7 1,4-Dichlorobenzene-d4					CAS #: 3855-82-1		
7.024	7.021 (1.000)	150	8231360	80.0000		80.00- 120.00	100.00
7.024	7.021 (1.000)	152	5141477			0.00-10058.51	62.46
7.024	7.021 (1.000)	115	3407891			0.00-10037.59	41.40
* 27 Naphthalene-d8					CAS #: 1146-65-2		
9.772	9.769 (1.000)	136	16738049	80.0000		80.00- 120.00	100.00
9.772	9.769 (1.000)	68	1164478			0.00-10006.78	6.96
* 47 Acenaphthene-d10					CAS #: 15067-26-2		
13.910	13.907 (1.000)	164	10142639	80.0000		80.00- 120.00	100.00
13.910	13.907 (1.000)	162	9659598			0.00-10094.94	95.24
13.910	13.907 (1.000)	160	4157008			0.00-10041.02	40.99
* 71 Phenanthrene-d10					CAS #: 1517-22-2		
17.476	17.489 (1.000)	188	15626607	80.0000		80.00- 120.00	100.00
17.476	17.489 (1.000)	94	1933362			0.00-10014.44	12.37
17.476	17.489 (1.000)	80	1841009			0.00-10015.28	11.78
* 90 Chrysene-d12					CAS #: 1719-03-5		
23.855	23.885 (1.000)	240	12020061	80.0000		80.00- 120.00	100.00
23.855	23.885 (1.000)	236	2845748			0.00-10026.00	23.67
23.855	23.885 (1.000)	120	2032475			0.00-10018.11	16.91
* 99 Perylene-d12					CAS #: 1520-96-3		
27.028	27.058 (1.000)	264	7583433	80.0000		80.00- 120.00	100.00
27.028	27.058 (1.000)	260	1672897			0.00-10021.95	22.06
27.028	27.058 (1.000)	265	1582154			0.00-10020.90	20.86
9 1,4-Dichlorobenzene					CAS #: 106-46-7		
7.040	7.053 (1.002)	146	211733	2.99119	3.0	80.00- 120.00	100.00
7.040	7.053 (1.002)	148	146139			0.00-10063.27	69.02

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
9 1,4-Dichlorobenzene (continued)							
7.073	7.053 (1.007)	113	885251			0.00-10016.16	418.10
28 Naphthalene					CAS #: 91-20-3		
9.821	9.818 (1.005)	128	3580083	16.0537	16.0	80.00- 120.00	100.00
9.821	9.818 (1.005)	129	709100			0.00-10013.27	19.81
9.821	9.818 (1.005)	127	520690			0.00-10013.22	14.54
33 2-Methylnaphthalene					CAS #: 91-57-6		
11.440	11.437 (1.171)	142	2726084	20.8514	20.8	80.00- 120.00	100.00
11.440	11.437 (1.171)	141	2386623			0.00-10090.11	87.55
56 Diethylphthalate					CAS #: 84-66-2		
15.071	15.085 (1.083)	149	6537180	50.3264	50.3	80.00- 120.00	100.00
15.071	15.085 (1.083)	177	1180101			0.00-10019.67	18.05
15.071	15.085 (1.083)	150	714841			0.00-10011.54	10.94
78 Di-n-butylphthalate					CAS #: 84-74-2		
19.046	19.059 (1.090)	149	998801	4.71913	4.7	80.00- 120.00	100.00
19.046	19.059 (1.090)	150	89322			0.00-10011.22	8.94
19.046	19.059 (1.090)	104	60141			0.00-10006.82	6.02
85 Butyl benzyl phthalate					CAS #: 85-68-7		
22.645	22.674 (0.949)	149	318854	3.60641	3.6	80.00- 120.00	100.00
22.645	22.674 (0.949)	91	263681			0.00-10073.35	82.70
22.645	22.674 (0.949)	206	52199			0.00-10015.36	16.37
93 bis(2-ethylhexyl)Phthalate					CAS #: 117-81-7		
24.100	24.130 (1.010)	149	516056	4.49823	4.5	80.00- 120.00	100.00
24.100	24.130 (1.010)	167	139660			0.00-10027.97	27.06
24.100	24.130 (1.010)	279	26986			0.00-10005.78	5.23

"B"

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150701027.d
Lab Smp Id: 9712088A-04A Client Smp ID: AF-N-EF404-PAH
Inj Date : 15-JAN-1998 23:20
Operator : jgh Inst ID: msdh.i
Smp Info : 9712088a-04a
Misc Info : 80 ng ISTD #267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 22-Jan-1998 08:50 kbadal Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

					CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
* 7 1,4-Dichlorobenzene-d4						CAS #: 3855-82-1		
7.024	7.021 (1.000)	150	8231360	80.0000			80.00- 120.00	100.00
7.024	7.021 (1.000)	152	5141477				0.00-10058.51	62.46
7.024	7.021 (1.000)	115	3407891				0.00-10037.59	41.40
* 27 Naphthalene-d8						CAS #: 1146-65-2		
9.772	9.769 (1.000)	136	16738049	80.0000			80.00- 120.00	100.00
9.772	9.769 (1.000)	68	1164478				0.00-10006.78	6.96
* 47 Acenaphthene-d10						CAS #: 15067-26-2		
13.910	13.907 (1.000)	164	10142639	80.0000			80.00- 120.00	100.00
13.910	13.907 (1.000)	162	9659598				0.00-10094.94	95.24
13.910	13.907 (1.000)	160	4157008				0.00-10041.02	40.99

				CONCENTRATIONS ON-COL	FINAL		
RT	EXP RT (REL RT)	MASS	RESPONSE	(NG)	(ug)	TARGET RANGE	RATIO
==	====== ========	====	========	=======	=======	==========	=====
* 71 Phenanthrene-d10						CAS #: 1517-22-2	
17.476	17.489 (1.000)	188	15626607	80.0000		80.00- 120.00	100.00
17.476	17.489 (1.000)	94	1933362			0.00-10014.44	12.37
17.476	17.489 (1.000)	80	1841009			0.00-10015.28	11.78
* 90 Chrysene-d12						CAS #: 1719-03-5	
23.855	23.885 (1.000)	240	12020061	80.0000		80.00- 120.00	100.00
23.855	23.885 (1.000)	236	2845748			0.00-10026.00	23.67
23.855	23.885 (1.000)	120	2032475			0.00-10018.11	16.91
* 99 Perylene-d12						CAS #: 1520-96-3	
27.028	27.058 (1.000)	264	7583433	80.0000		80.00- 120.00	100.00
27.028	27.058 (1.000)	260	1672897			0.00-10021.95	22.06
27.028	27.058 (1.000)	265	1582154			0.00-10020.90	20.86
$ 1 2-Fluorophenol						CAS #: 367-12-4	
4.652	4.649 (0.662)	112	4302040	54.7226	54.7	80.00- 120.00	100.00
4.636	4.649 (0.660)	64	2018090			0.00-10046.11	46.91
4.652	4.649 (0.662)	92	1449060			0.00-10019.15	33.68
$ 2 Phenol-d5						CAS #: 4165-62-2	
6.304	6.317 (0.645)	99	6111448	53.0521	53.0	80.00- 120.00	100.00
6.304	6.317 (0.645)	71	2288664			0.00-10029.73	37.45
$ 17 Nitrobenzene-d5						CAS #: 4165-60-0	
8.169	8.182 (0.587)	82	4695242	57.8159	57.8	80.00- 120.00	100.00
8.169	8.182 (0.587)	54	2559364			0.00-10052.46	54.51
8.185	8.182 (0.588)	128	2283459			0.00-10049.58	48.63
$ 62 2,4,6-Tribromophenol						CAS #: 118-79-6	
15.807	15.804 (0.663)	330	1904305	79.4491	79.4	80.00- 120.00	100.00
15.807	15.804 (0.663)	332	1838091			0.00-10096.28	96.52
15.807	15.804 (0.663)	141	614080			0.00-10029.68	32.25
$ 82 Terphenyl-d14						CAS #: 98904-43-9	
21.402	21.415 (0.897)	244	10368033	98.5404	98.5	80.00- 120.00	100.00
21.402	21.415 (0.897)	122	1622052			0.00-10016.35	15.64
21.402	21.415 (0.897)	212	624097			0.00-10005.98	6.02
$ 38 2-Fluorobiphenyl						CAS #: 321-60-8	
12.340	12.337 (0.706)	172	7359118	61.7897	61.8	80.00- 120.00	100.00
12.340	12.337 (0.706)	171	2513317			0.00-10033.81	34.15
3 Phenol						CAS #: 108-95-2	
6.320	6.350 (0.900)	94	309492	3.42356	3.4	80.00- 120.00	100.00(a)
6.304	6.350 (0.898)	66	442875			0.00-10037.29	143.10

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO	
3 Phenol (continued)								
6.320	6.350 (0.900)	65	129787			0.00-10025.14	41.94	
4 bis(2-Chloroethyl)ether					CAS #: 111-44-4			
6.680	6.514 (0.951)	93	63524	0.86590	0.86	80.00- 120.00	100.00(a)	
6.680	6.514 (0.951)	63	413085			0.00-10062.92	650.28	
6.729	6.514 (0.958)	95	373126			0.00-10031.42	587.38	
6 1,3-Dichlorobenzene					CAS #: 541-73-1			
7.040	6.890 (1.002)	146	212307	3.10718	3.1	80.00- 120.00	100.00	
7.040	6.890 (1.002)	148	147519			0.00-10063.34	69.48	
7.024	6.890 (1.000)	113	206108			0.00-10013.88	97.08	
9 1,4-Dichlorobenzene					CAS #: 106-46-7			
7.040	7.053 (1.002)	146	211733	2.99119	3.0	80.00- 120.00	100.00	} ratio matches std.
7.040	7.053 (1.002)	148	146139			0.00-10063.27	69.02	
7.073	7.053 (1.007)	113	885251			0.00-10016.16	418.10	→ interference, but present
10 Benzyl Alcohol					CAS #: 100-51-6			
7.253	7.315 (1.033)	108	51643	1.17485	1.2	80.00- 120.00	100.00(a)	
7.253	7.315 (1.033)	79	80602			0.00-10116.61	156.07	
7.253	7.315 (1.033)	77	39439			0.00-10078.86	76.37	
11 1,2-Dichlorobenzene					CAS #: 95-50-1			
7.040	7.348 (1.002)	146	212307	3.31734	3.3	80.00- 120.00	100.00	
7.040	7.348 (1.002)	148	147519			0.00-10063.46	69.48	
7.024	7.348 (1.000)	113	206108			0.00-10014.38	97.08	
12 2-Methylphenol					CAS #: 95-48-7			
7.253	7.560 (1.033)	108	51643	0.80944	0.81	80.00- 120.00	100.00(a)	
7.253	7.560 (1.033)	107	90469			0.00-10086.18	175.18	
7.253	7.560 (1.033)	79	87431			0.00-10041.55	169.30	
14 4-Methylphenol					CAS #: 106-44-5			
7.891	7.904 (1.123)	108	125539	2.05302	2.0	80.00- 120.00	100.00(a)	
7.891	7.904 (1.123)	107	110472			0.00-10122.08	88.00	
7.825	7.904 (1.114)	79	723493			0.00-10025.12	576.31	
15 N-Nitrosodipropylamine					CAS #: 621-64-7			
7.940	7.904 (1.130)	70	131450	3.34280	3.3	80.00- 120.00	100.00	
7.989	7.904 (1.137)	130	1761			0.00-10026.33	1.34	
7.907	7.904 (1.126)	101	735			0.00-10012.19	0.56	
16 Hexachloroethane					CAS #: 67-72-1			
8.054	8.051 (1.147)	117	136321	4.51102	4.5	80.00- 120.00	100.00	
8.054	8.051 (1.147)	201	766			0.00-10068.38	0.56	

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
16 Hexachloroethane (continued)							
8.054	8.051 (1.147)	199	267			0.00-10041.83	0.20
18 Nitrobenzene					CAS #: 98-95-3		
8.201	8.231 (0.839)	77	189594	2.25765	2.2	80.00- 120.00	100.00
8.201	8.231 (0.839)	123	36170			0.00-10053.45	19.08
8.201	8.231 (0.839)	65	151959			0.00-10013.89	80.15
19 Isophorone					CAS #: 78-59-1		
8.709	8.771 (0.891)	82	1113452	6.19951	6.2	80.00- 120.00	100.00
8.709	8.771 (0.891)	138	80053			0.00-10014.70	7.19
8.709	8.771 (0.891)	95	2086943			0.00-10005.51	187.43
20 2-Nitrophenol					CAS #: 88-75-5		
8.987	8.918 (0.920)	139	67594	1.49244	1.5	80.00- 120.00	100.00(a)
8.970	8.918 (0.918)	65	238680			0.00-10042.96	353.10
8.954	8.918 (0.916)	109	375655			0.00-10026.21	555.75
21 2,4-Dimethylphenol					CAS #: 105-67-9		
8.987	9.065 (0.920)	122	54812	0.88173	0.88	80.00- 120.00	100.00(a)
8.987	9.065 (0.920)	107	234056			0.00-10123.86	427.01
8.987	9.065 (0.920)	121	70740			0.00-10055.27	129.06
22 bis(2-Chloroethoxy)methane					CAS #: 111-91-1		
9.281	9.294 (0.950)	93	102217	0.94707	0.95	80.00- 120.00	100.00(a)
9.314	9.294 (0.953)	123	249982			0.00-10010.88	244.56
9.297	9.294 (0.951)	95	350926			0.00-10031.15	343.31
24 Benzoic Acid					CAS #: 65-85-0		
9.314	9.441 (0.953)	122	112977	2.62711	2.6	80.00- 120.00	100.00(a)
9.297	9.441 (0.951)	105	1353444			0.00-10123.32	1197.98
9.297	9.441 (0.951)	77	483778			0.00-10081.55	428.21
25 2,4-Dichlorophenol					CAS #: 120-83-2		
9.755	9.474 (0.998)	162	109970	1.86896	1.9	80.00- 120.00	100.00(a)
9.788	9.474 (1.002)	164	24378			0.00-10063.52	22.17
9.739	9.474 (0.997)	98	177252			0.00-10039.12	161.18
28 Naphthalene					CAS #: 91-20-3		
9.821	9.818 (1.005)	128	3580083	17.3285	17.3	80.00- 120.00	100.00
9.821	9.818 (1.005)	129	709100			0.00-10013.27	19.81
9.821	9.818 (1.005)	127	520690			0.00-10013.22	14.54
29 4-Chloroaniline					CAS #: 106-47-8		
9.821	10.014 (1.005)	127	516874	10.0368	10.0	80.00- 120.00	100.00
9.821	10.014 (1.005)	129	674760			0.00-10010.39	130.55

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
32 4-Chloro-3-Methylphenol					CAS #: 59-50-7		
11.277	11.159 (1.154)	107	64929	0.97280	0.97	80.00- 120.00	100.00(a)
11.277	11.159 (1.154)	142	8295			0.00-10073.71	12.78
11.277	11.159 (1.154)	144	34157			0.00-10023.72	52.61
33 2-Methylnaphthalene					CAS #: 91-57-6		
11.440	11.437 (1.171)	142	2726084	20.8514	20.8	80.00- 120.00	100.00
11.440	11.437 (1.171)	141	2386623			0.00-10090.11	87.55
40 2-Nitroaniline					CAS #: 88-74-4		
12.880	12.860 (0.926)	65	33965	1.06523	1.1	80.00- 120.00	100.00
12.863	12.860 (0.925)	138	2915			0.00-10127.72	8.58
12.880	12.860 (0.926)	92	82265			0.00-10073.86	242.20
46 3-Nitroaniline					CAS #: 99-09-2		
13.910	13.874 (1.000)	138	5636	0.50279	0.50	80.00- 120.00	100.00(a)
13.910	13.874 (1.000)	92	66931			0.00-10120.29	1187.50
13.910	13.874 (1.000)	108	251659			0.00-10080.06	4464.93
44 2,6-Dinitrotoluene					CAS #: 606-20-2		
13.468	13.498 (0.968)	165	171423	6.35465	6.4	80.00- 120.00	100.00
13.452	13.498 (0.967)	89	16068			0.00-10059.87	9.37
13.468	13.498 (0.968)	121	40145			0.00-10022.31	23.42
48 Acenaphthene					CAS #: 83-32-9		
13.910	13.989 (1.000)	154	50557	0.52267	0.52	80.00- 120.00	100.00(a)
13.926	13.989 (1.001)	152	32821			0.00-10049.54	64.92
13.926	13.989 (1.001)	153	17081			0.00-10106.26	33.79
50 4-Nitrophenol					CAS #: 100-02-7		
14.384	14.349 (1.034)	109	25279	1.71687	1.7	80.00- 120.00	100.00(a)
14.384	14.349 (1.034)	139	25089			0.00-10155.17	99.25
14.368	14.349 (1.033)	65	7281			0.00-10133.38	28.80
52 2,4-Dinitrotoluene					CAS #: 121-14-2		
14.532	14.447 (1.045)	165	21268	0.54932	0.55	80.00- 120.00	100.00(a)
14.532	14.447 (1.045)	63	8540			0.00-10063.54	40.16
14.499	14.447 (1.042)	182	2424			0.00-10004.86	11.40
56 Diethylphthalate					CAS #: 84-66-2		
15.071	15.085 (1.083)	149	6537180	50.3264	50.3	80.00- 120.00	100.00
15.071	15.085 (1.083)	177	1180101			0.00-10019.67	18.05
15.071	15.085 (1.083)	150	714841			0.00-10011.54	10.94
61 N-nitrosodiphenylamine					CAS #: 86-30-6		
15.807	15.575 (0.905)	169	58253	0.83912	0.84	80.00- 120.00	100.00(a)

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
61 N-nitrosodiphenylamine (continued)								
15.824	15.575	(0.905)	168	5001			0.00-10066.04	8.59
15.807	15.575	(0.905)	167	32129			0.00-10035.43	55.15
78 Di-n-butylphthalate						CAS #: 84-74-2		
19.046	19.059	(1.090)	149	998801	4.71913	4.7	80.00- 120.00	100.00
19.046	19.059	(1.090)	150	89322			0.00-10011.22	8.94
19.046	19.059	(1.090)	104	60141			0.00-10006.82	6.02
85 Butyl benzyl phthalate						CAS #: 85-68-7		
22.645	22.674	(0.949)	149	318854	3.60641	3.6	80.00- 120.00	100.00
22.645	22.674	(0.949)	91	263681			0.00-10073.35	82.70
22.645	22.674	(0.949)	206	52199			0.00-10015.36	16.37
93 bis(2-ethylhexyl)Phthalate						CAS #: 117-81-7		
24.100	24.130	(1.010)	149	516056	4.49823	4.5	80.00- 120.00	100.00
24.100	24.130	(1.010)	167	139660			0.00-10027.97	27.06
24.100	24.130	(1.010)	279	26986			0.00-10005.78	5.23

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Air Toxics Limited

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INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01150701027.d
Lab Smp Id: 9712088A-04A
Analysis Type: SV
Quant Type: ISTD
Operator: jgh
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80 ng ISTD #267-91-1

Calibration Date: JAN/15/98
Calibration Time: 1836
Client Smp ID: AF-N-EF404-PAH
Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	11270581	5635290	22541162	8231360	-26.97
27 Naphthalene-d8	17745391	8872696	35490782	16738049	-5.68
47 Acenaphthene-d10	12494791	6247396	24989582	10142639	-18.83
71 Phenanthrene-d10	17937870	8968935	35875740	15626607	-12.88
90 Chrysene-d12	15301801	7650900	30603602	12020061	-21.45
99 Perylene-d12	9954932	4977466	19909864	7583433	-23.82

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.02	6.52	7.52	7.02	0.04
27 Naphthalene-d8	9.77	9.27	10.27	9.77	0.03
47 Acenaphthene-d10	13.91	13.41	14.41	13.91	0.02
71 Phenanthrene-d10	17.49	16.99	17.99	17.48	-0.08
90 Chrysene-d12	23.88	23.38	24.38	23.86	-0.12
99 Perylene-d12	27.06	26.56	27.56	27.03	-0.11

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

JJH 1.29.98

Air Toxics Limited

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RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: 9712088A-04A
Level: LOW
Data Type: MS DATA
SpikeList File: 8270.spk
Sublist File: 8270.sub
Client SDG: h-15Jan98
Fraction: SV
Client Smp ID: AF-N-EF404-PAH
Operator: jgh
SampleType: SAMPLE
Quant Type: ISTD
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80 ng ISTD #267-91-1

SURROGATE COMPOUND	CONC ADDED ug	CONC RECOVERED ug	% RECOVERED	LIMITS
$ 1 2-Fluorophenol	100	54.7	54.72	25-121
$ 2 Phenol-d5	100	53.0	53.05	24-113
$ 17 Nitrobenzene-d5	100	57.8	57.82	23-120
$ 38 2-Fluorobiphenyl	100	61.8	61.79	30-115
$ 62 2,4,6-Tribromophen	100	79.4	79.45	19-122
$ 82 Terphenyl-d14	100	98.5	98.54	18-137

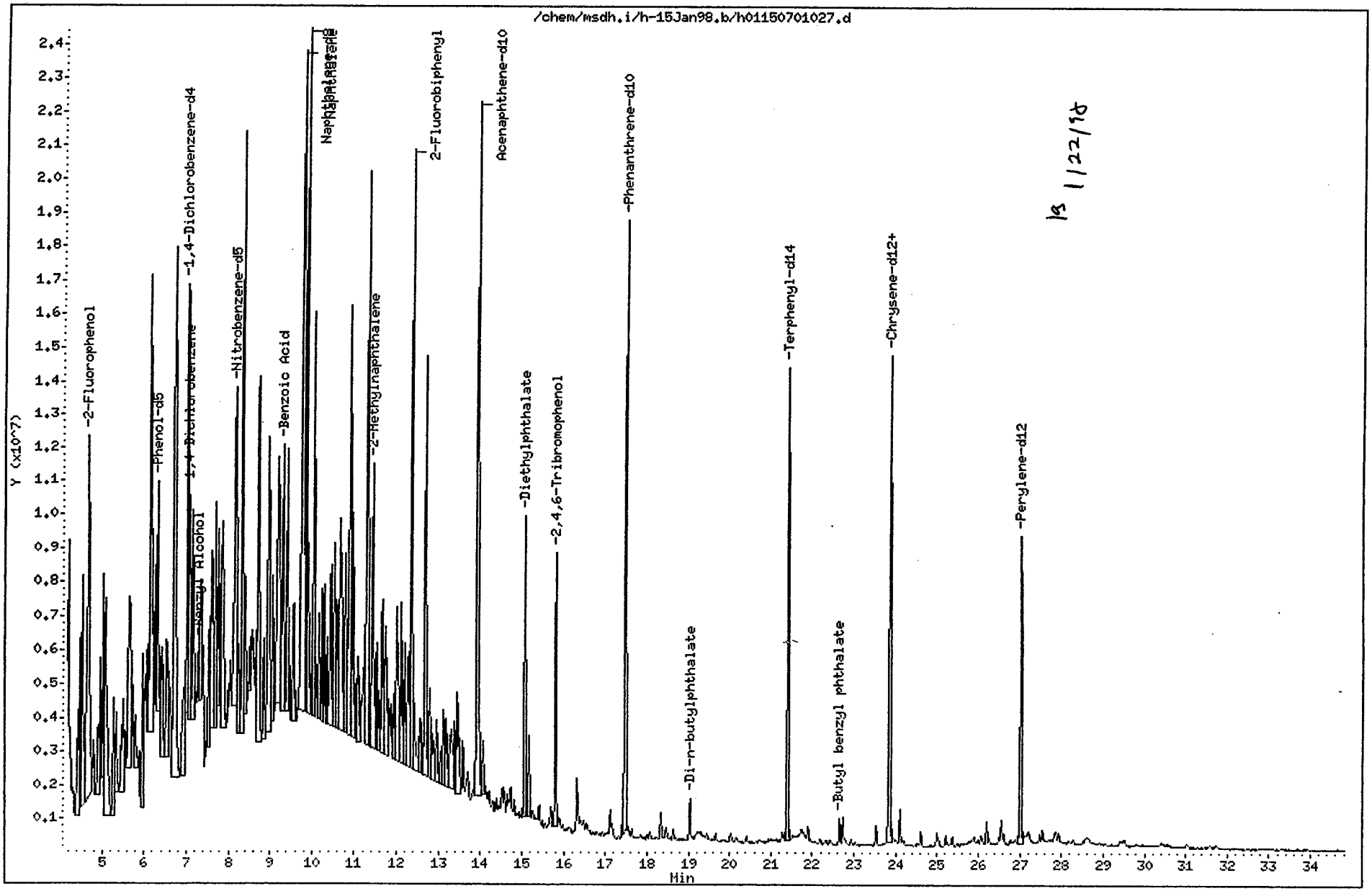
1.29.98

163

Data File: /chem/msdh.i/h-15Jan98.b/h01150701027.d
Date : 15-JAN-1998 23:20
Client ID: AF-N-EF404-PAH
Sample Info: 9712088A-04A
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i

Operator: jgh
Column diameter: 2.00



1/22/98

Data File: /chem/msdh.i/h-15Jan98.b/h01150701027.d

Date : 15-JAN-1998 23:20

Client ID: AF-N-EF404-PAH

Sample Info: 9712088A-04A

Volume Injected (uL): 1.0

Column phase:

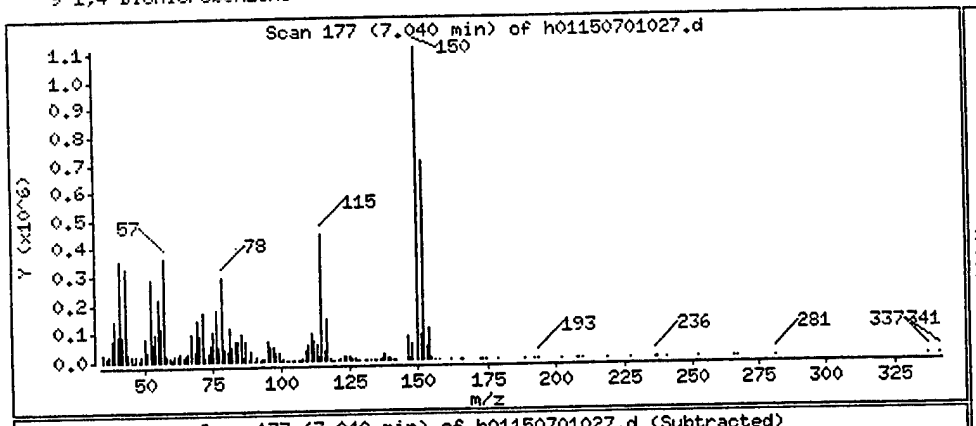
Instrument: msdh.i

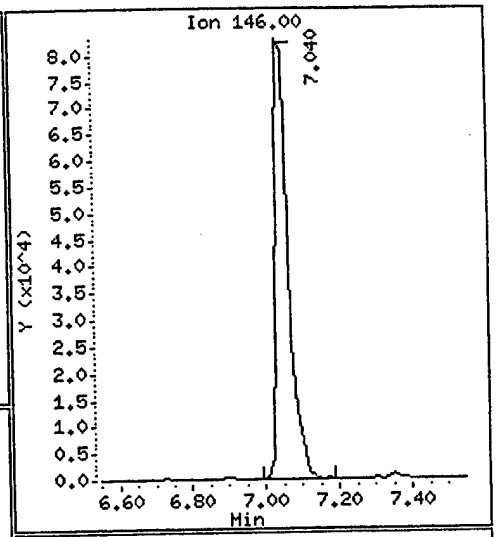
Operator: jgh

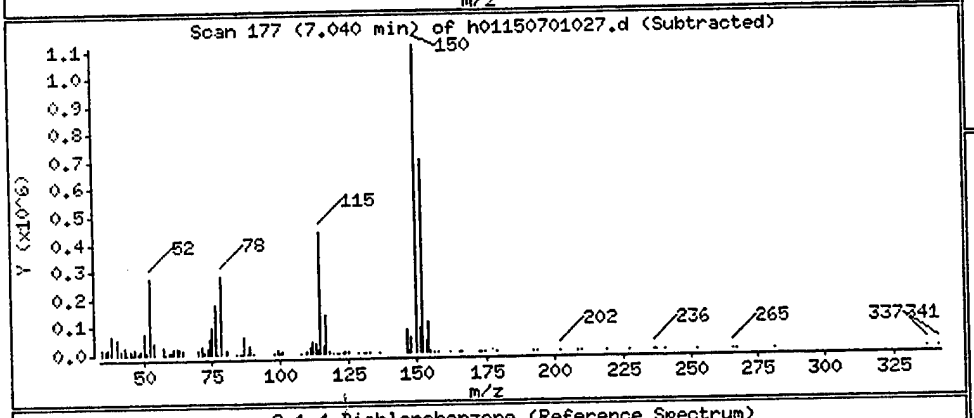
Column diameter: 2.00

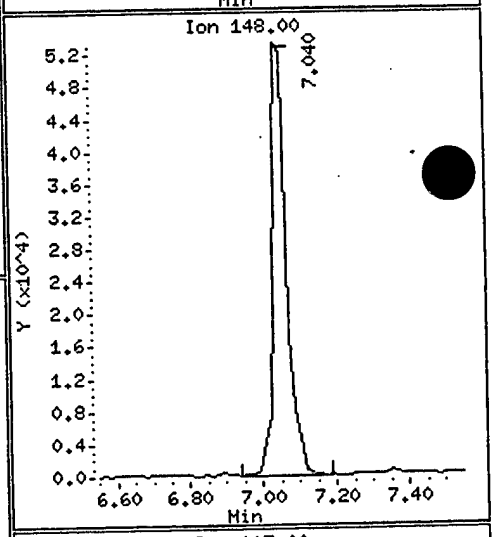
9 1,4-Dichlorobenzene

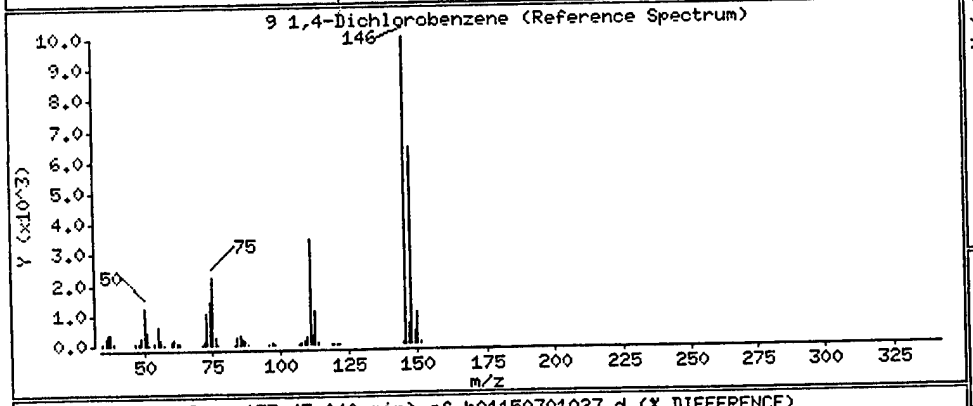
Concentration: 3.0 ug

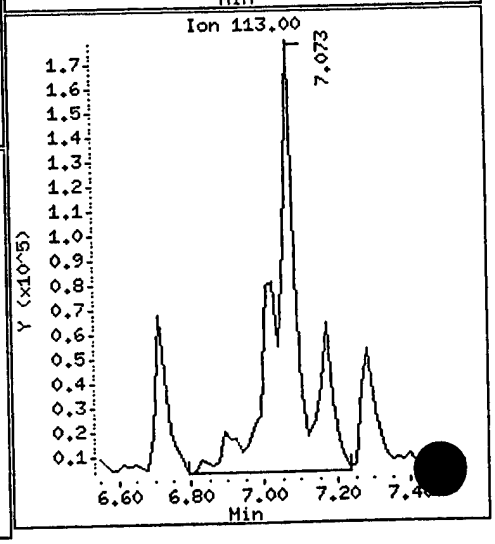


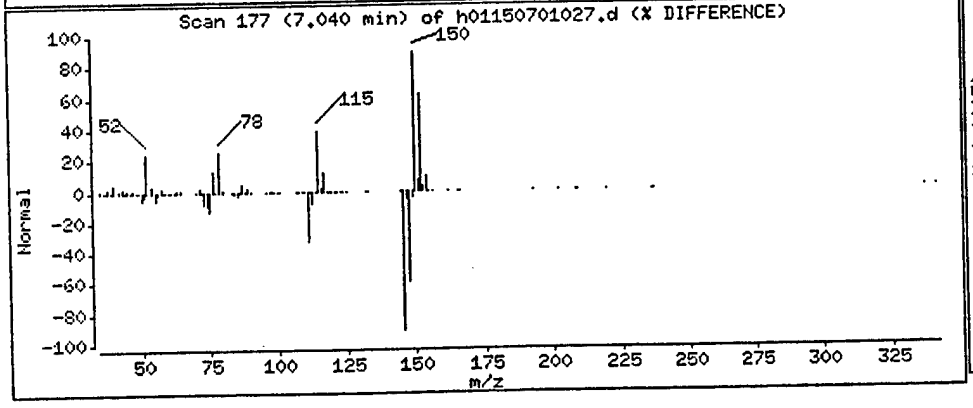












Data File: /chem/msdh.i/h-15Jan98.b/h01150701027.d

Date : 15-JAN-1998 23:20

Client ID: AF-N-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-04A

Volume Injected (uL): 1.0

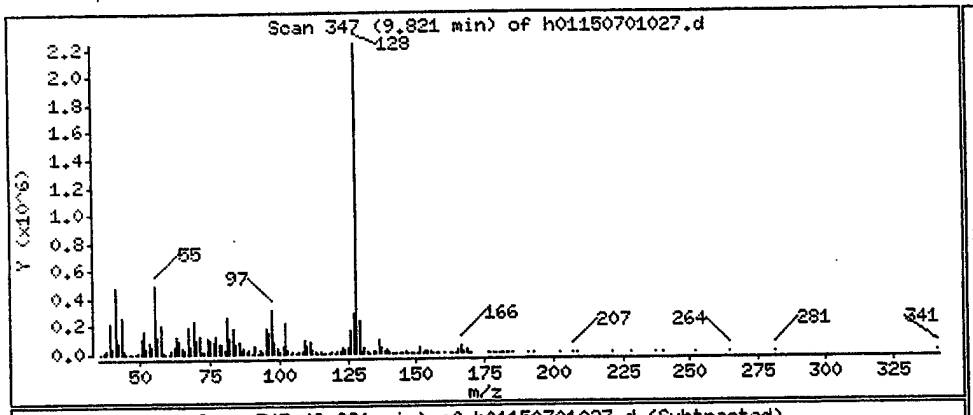
Operator: jgh

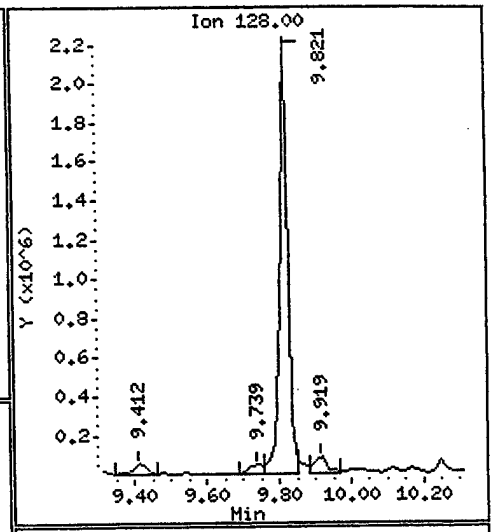
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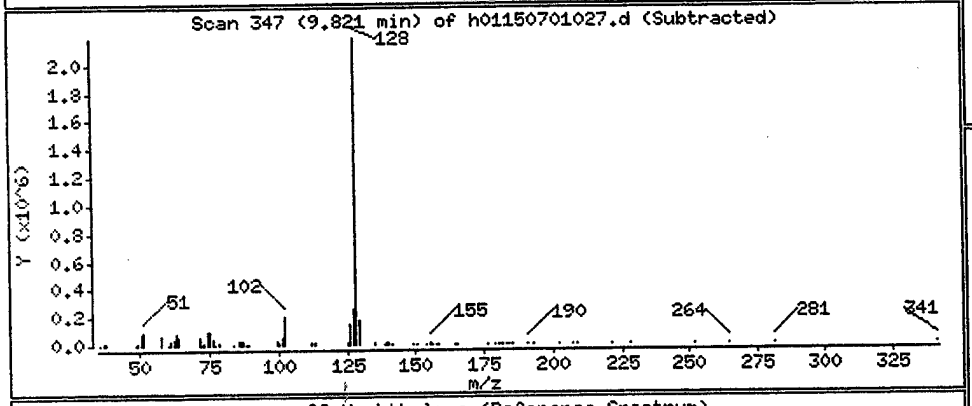
Column diameter: 2.00

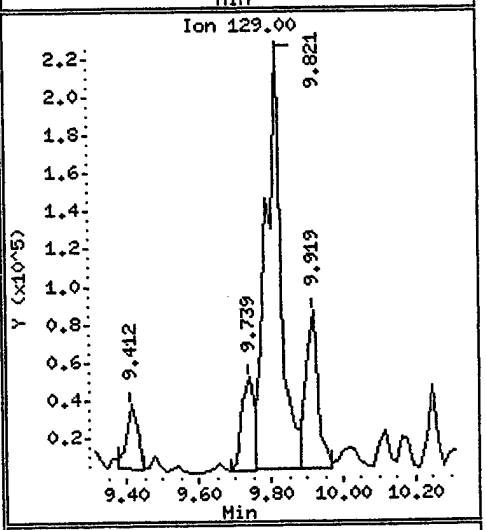
28 Naphthalene

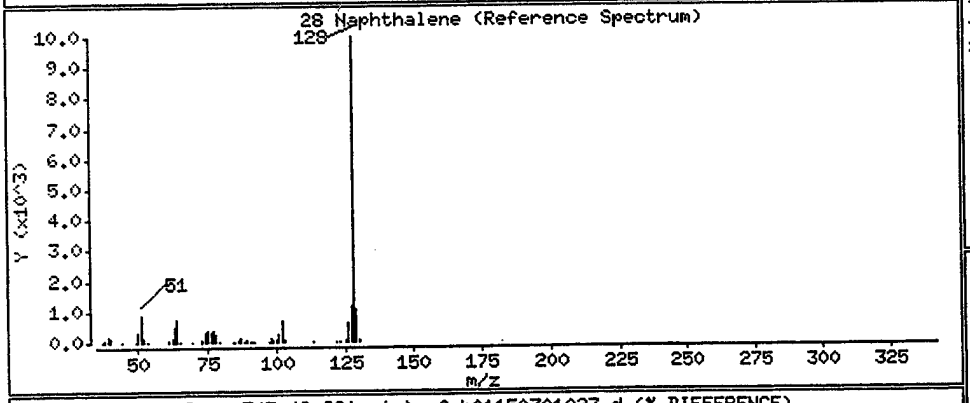
Concentration: 17.3 ug

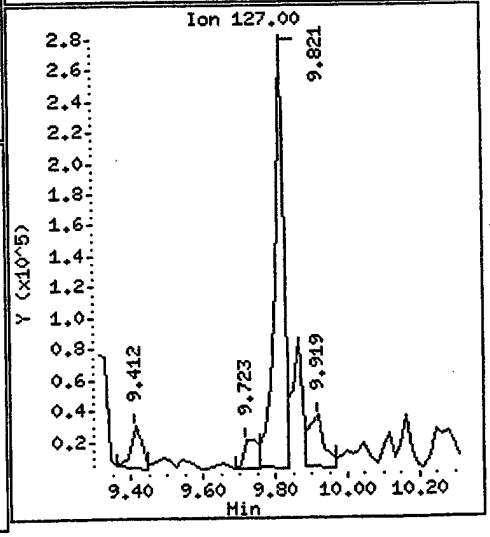


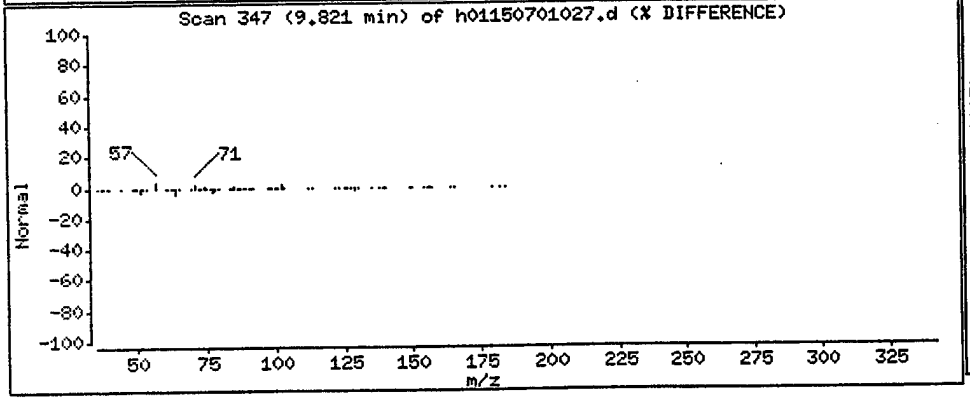












Data File: /chem/msdh.i/h-15Jan98.b/h0115070l027.d

Date : 15-JAN-1998 23:20

Client ID: AF-N-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-04A

Volume Injected (uL): 1.0

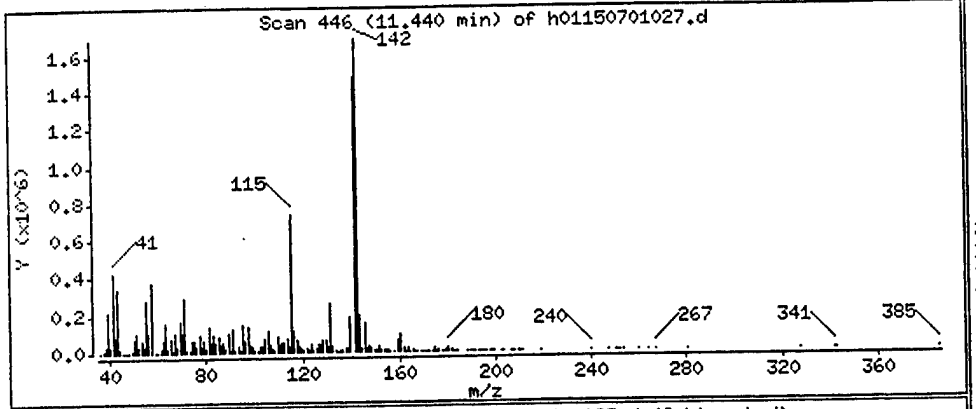
Operator: jgh

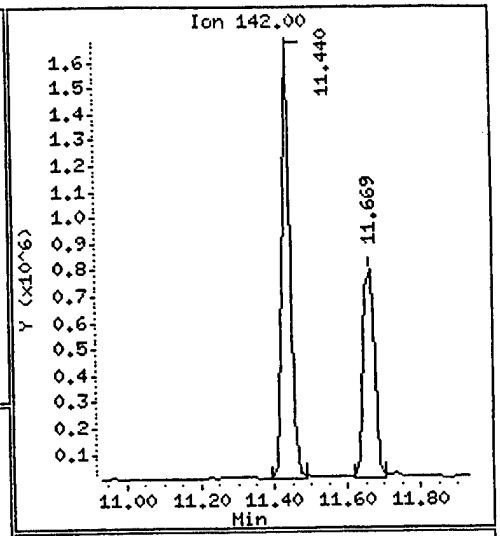
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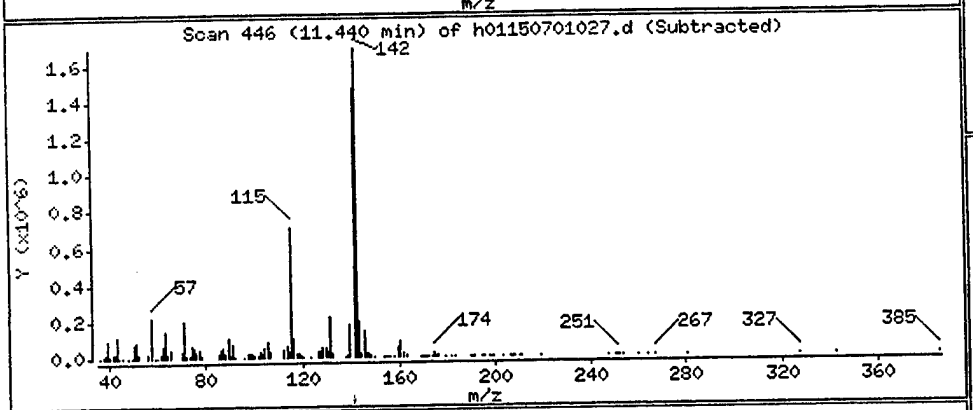
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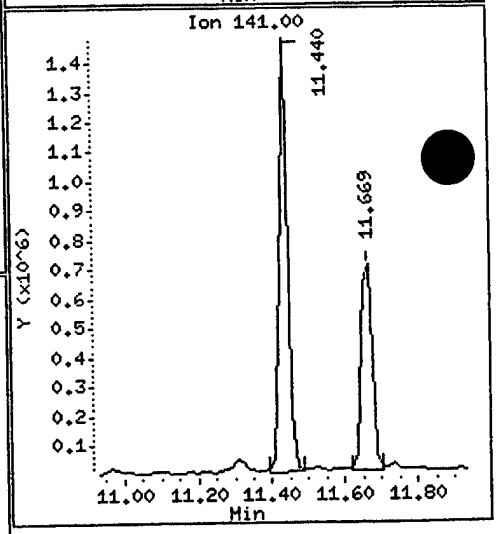
33 2-Methylnaphthalene

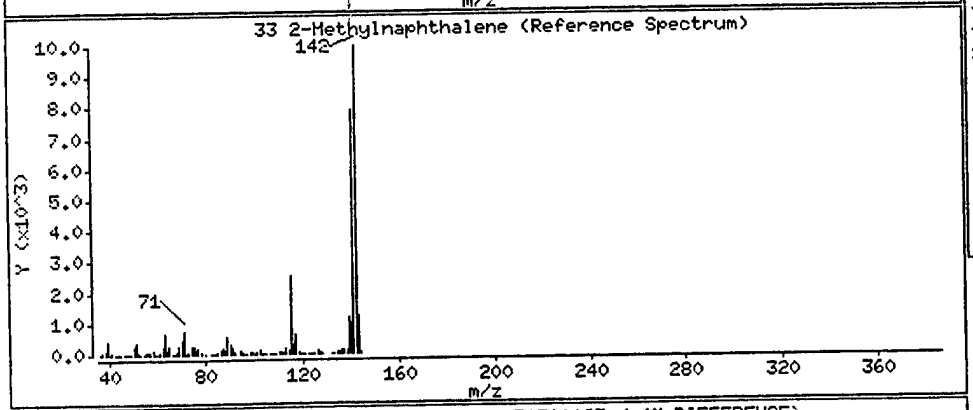
Concentration: 20.8 ug

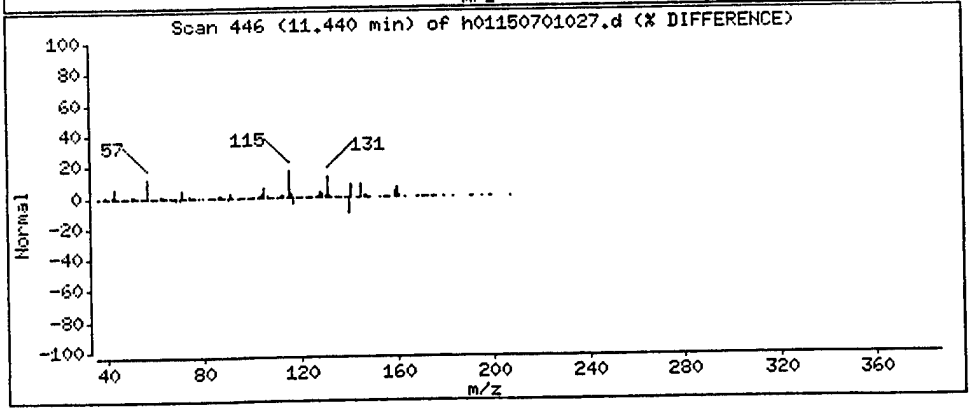












Data File: /chem/msdh.i/h-15Jan98.b/h01150701027.d

Date : 15-JAN-1998 23:20

Client ID: AF-N-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-04A

Volume Injected (uL): 1.0

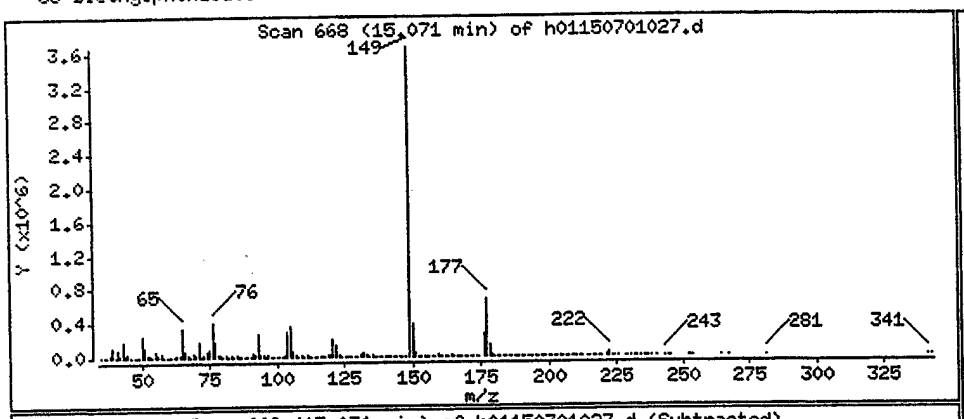
Operator: jgh

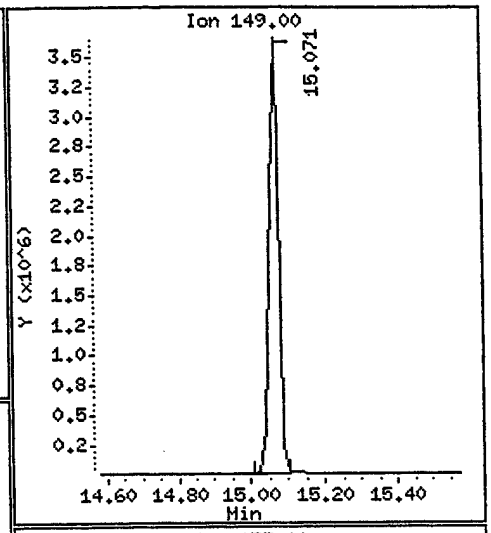
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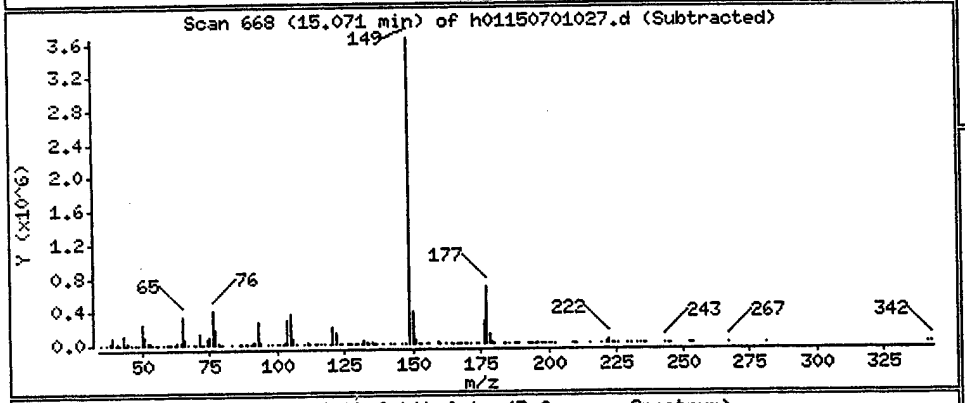
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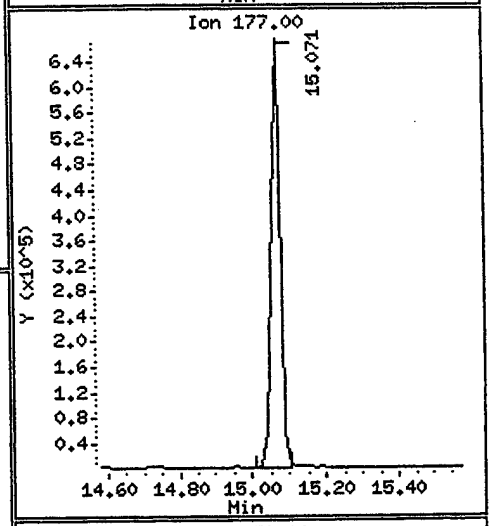
56 Diethylphthalate

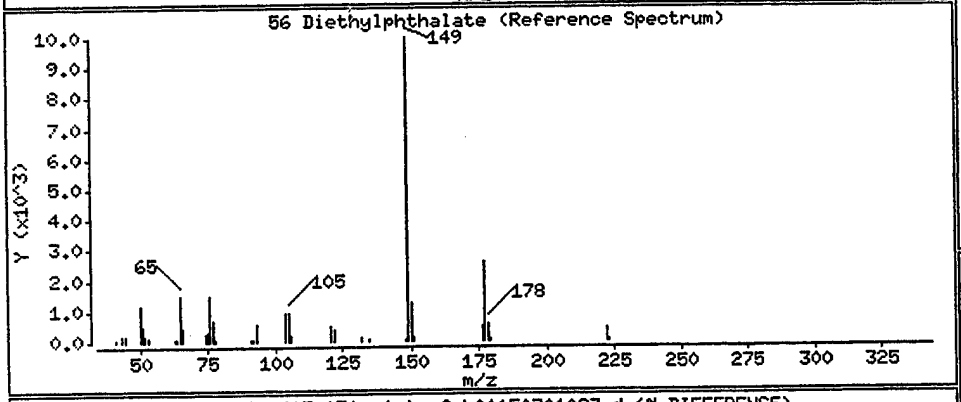
Concentration: 50.3 ug

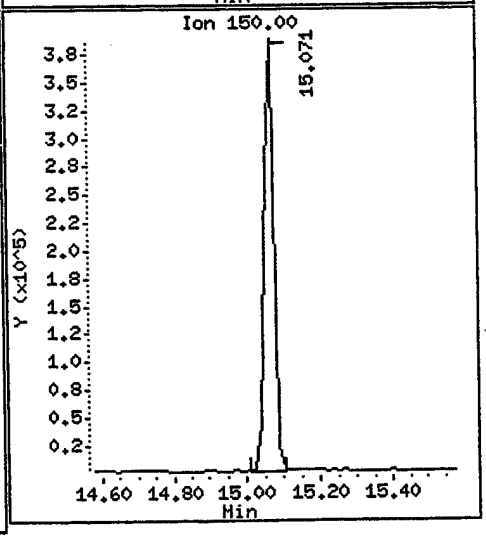


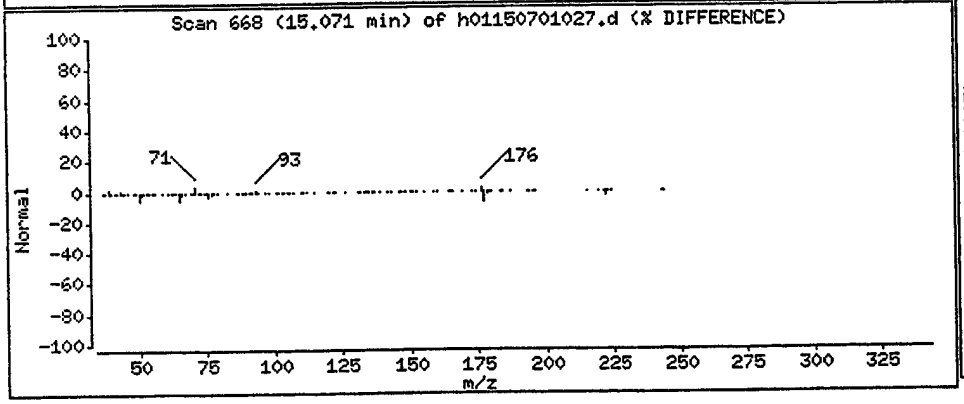












Data File: /chem/msdh.i/h-15Jan98.b/h01150701027.d

Date : 15-JAN-1998 23:20

Client ID: AF-N-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-04A

Volume Injected (uL): 1.0

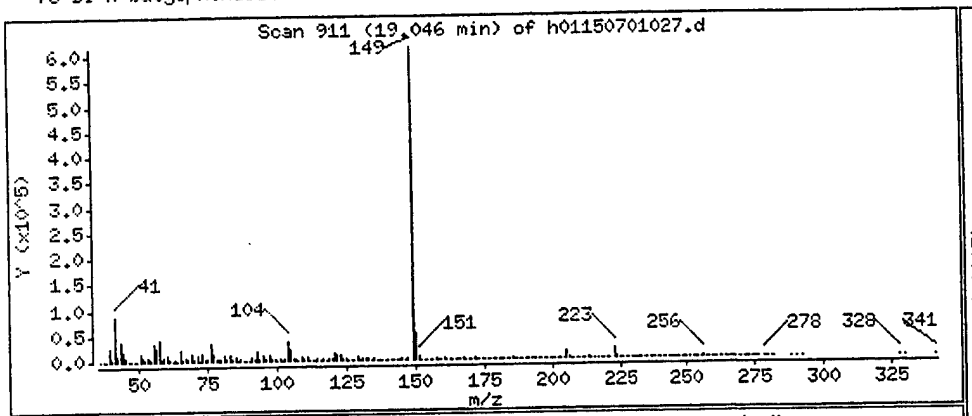
Operator: jgh

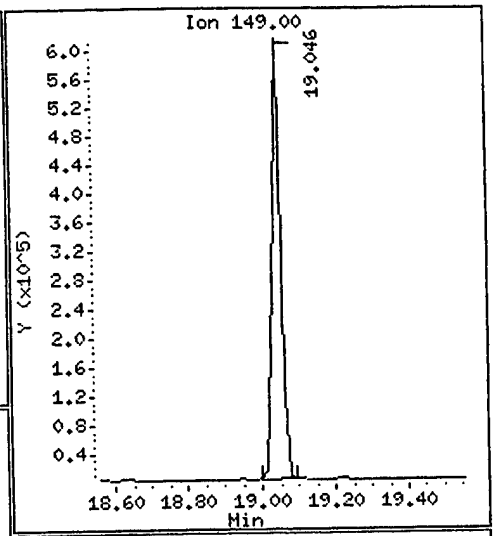
Column phase:

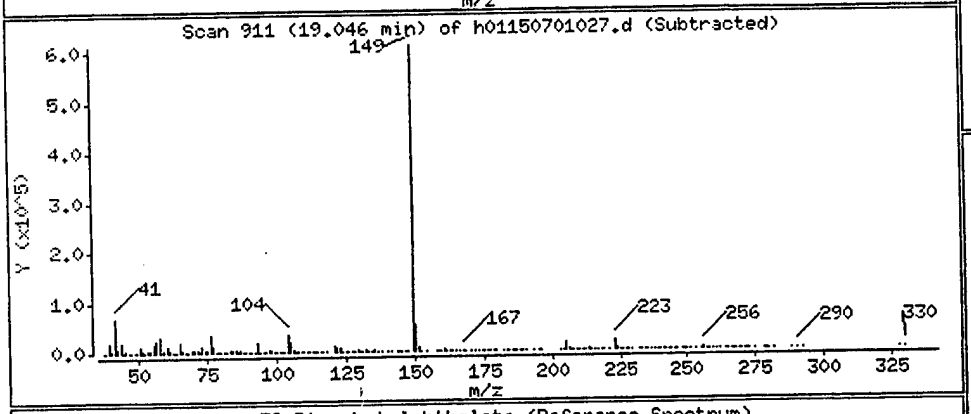
Column diameter: 2.00

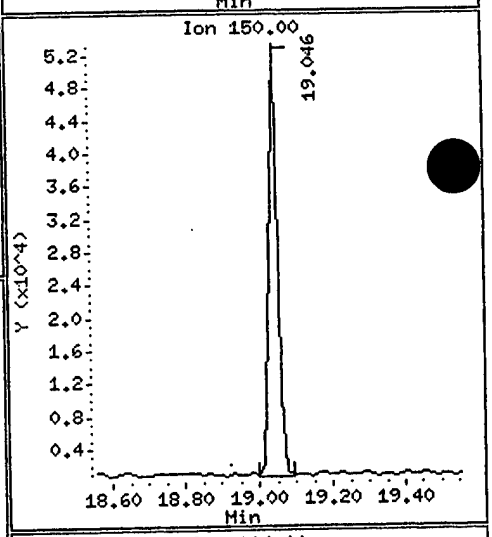
78 Di-n-butylphthalate

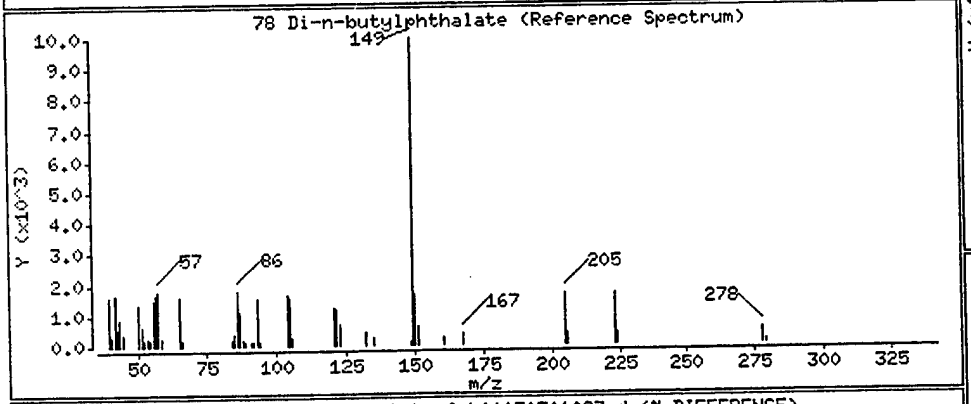
Concentration: 4.7 ug

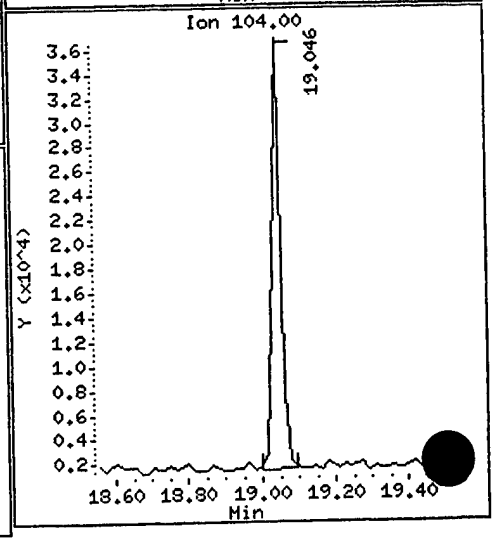


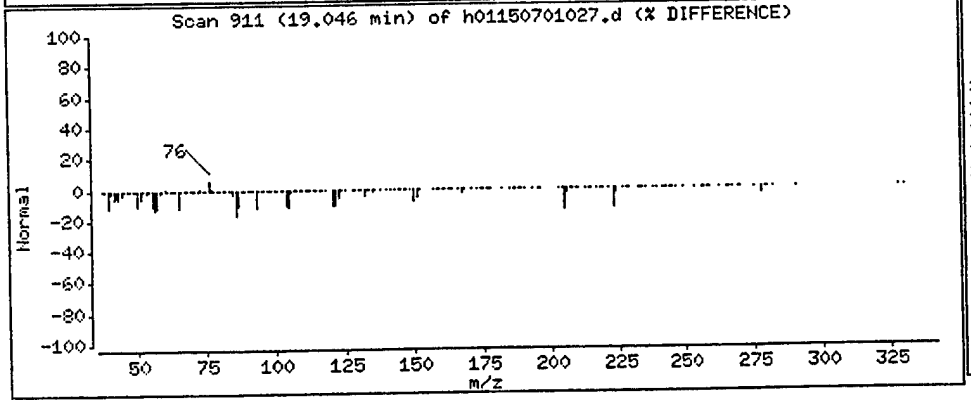












Data File: /chem/msdh.i/h-15Jan98.b/h01150701027.d

Date : 15-JAN-1998 23:20

Client ID: AF-N-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-04A

Volume Injected (uL): 1.0

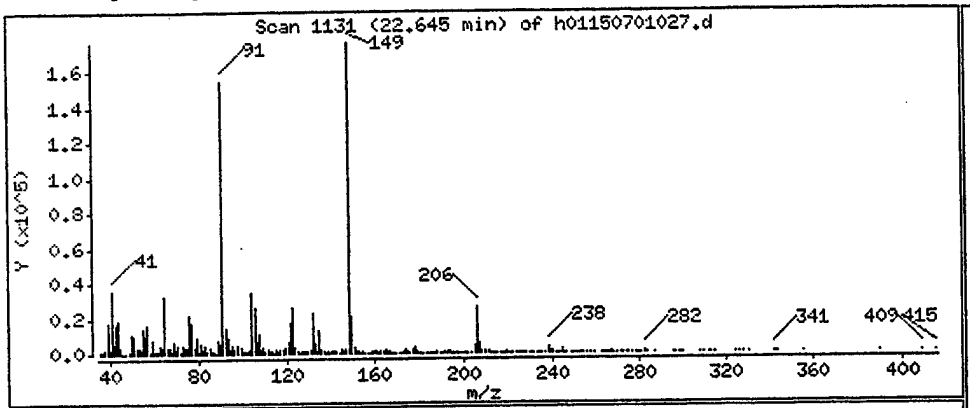
Operator: jgh

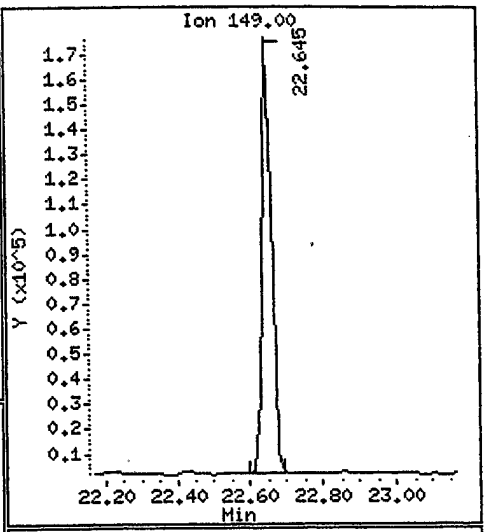
Column phase:

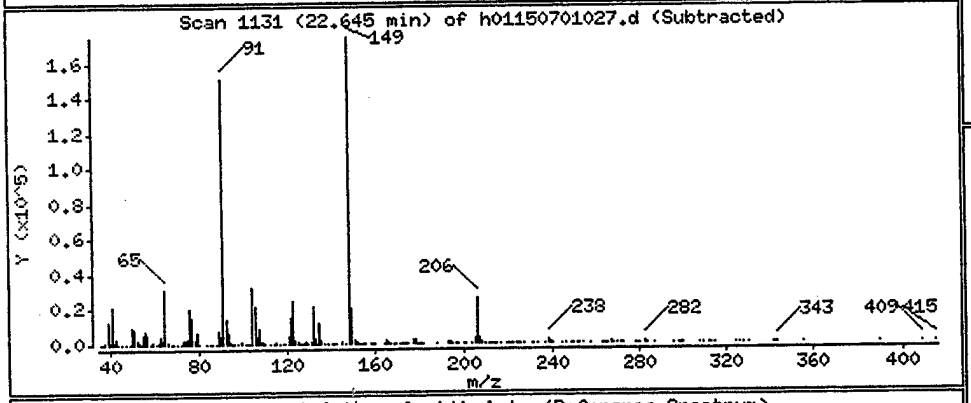
Column diameter: 2.00

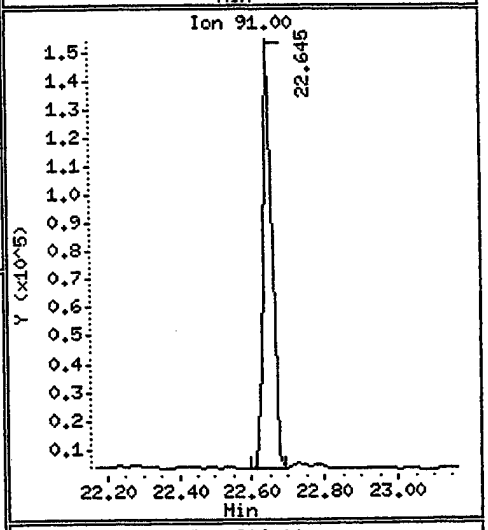
85 Butyl benzyl phthalate

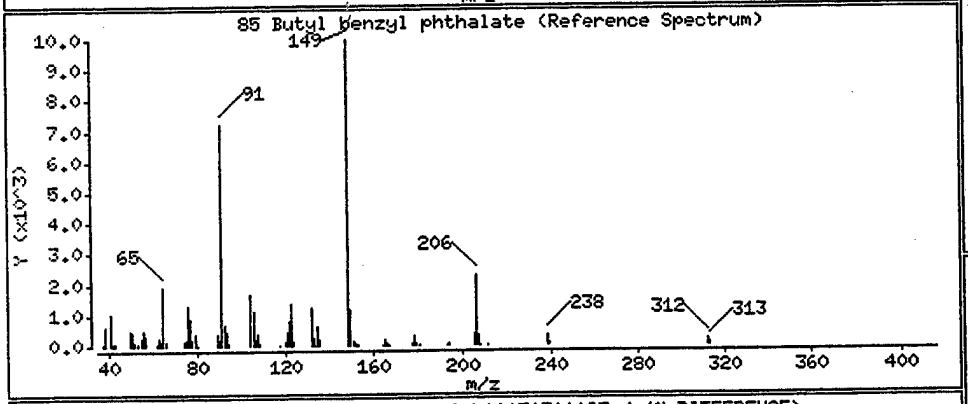
Concentration: 3.6 ug

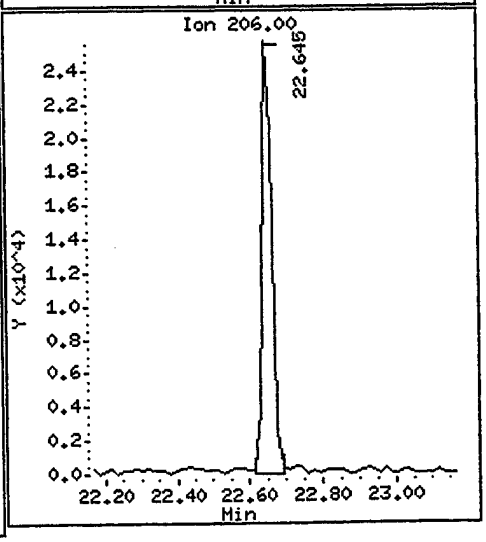


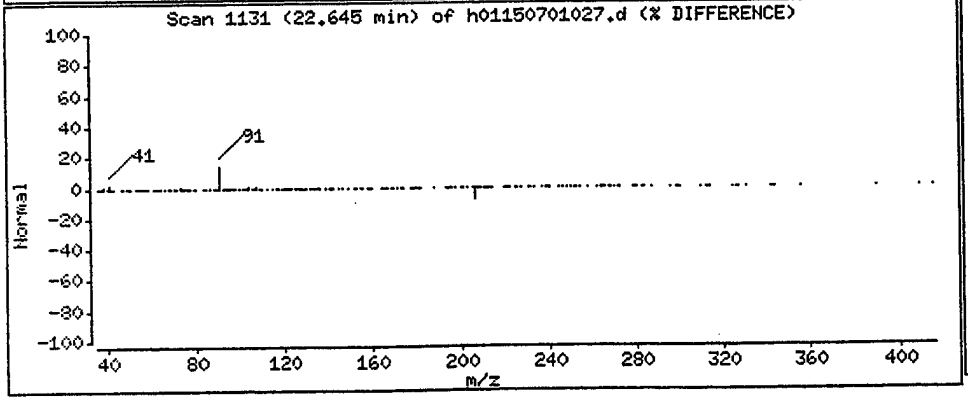












Data File: /chem/msdh.i/h-15Jan98.b/h01150701027.d

Date : 15-JAN-1998 23:20

Client ID: AF-N-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-04A

Volume Injected (uL): 1.0

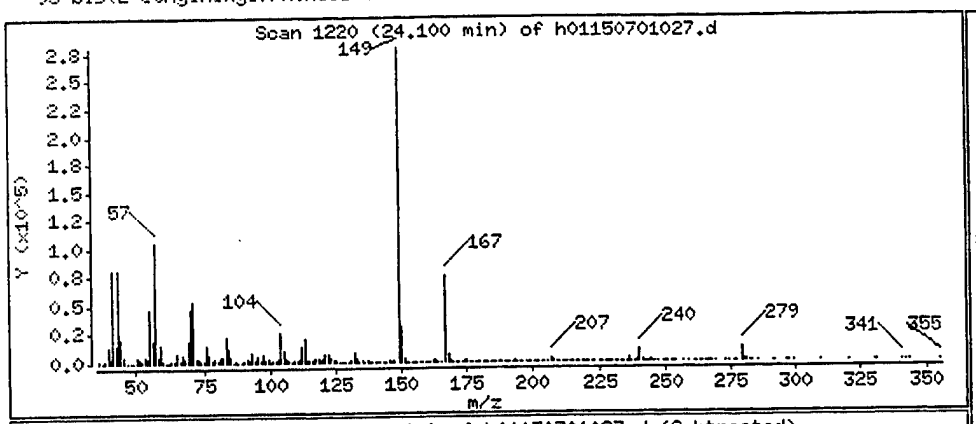
Operator: jgh

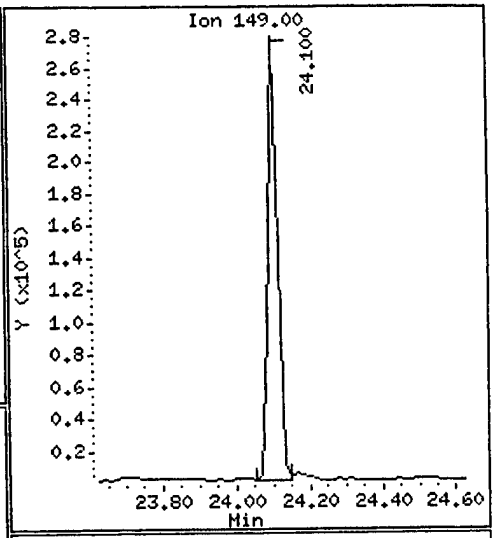
Column phase:

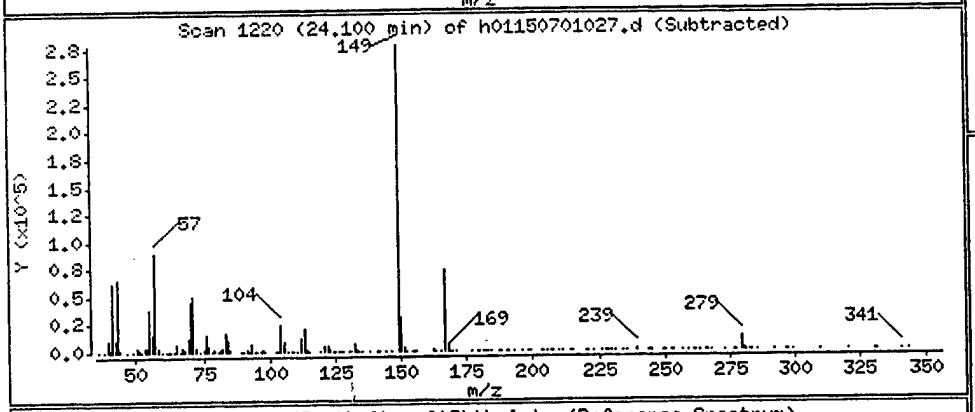
Column diameter: 2.00

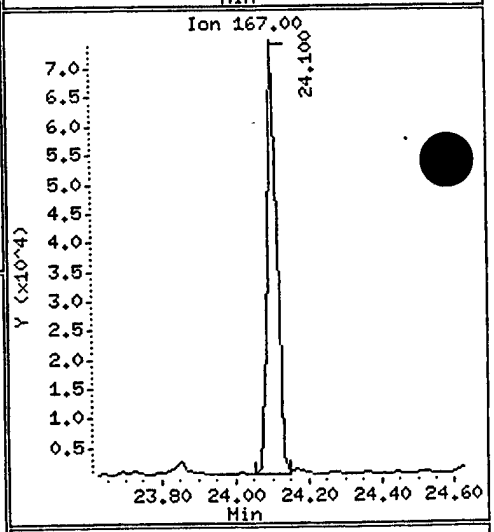
93 bis(2-ethylhexyl)Phthalate

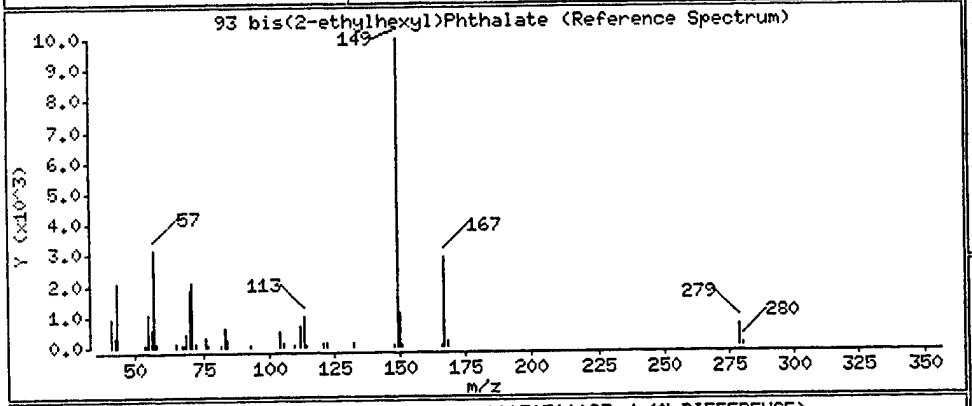
Concentration: 4.5 ug

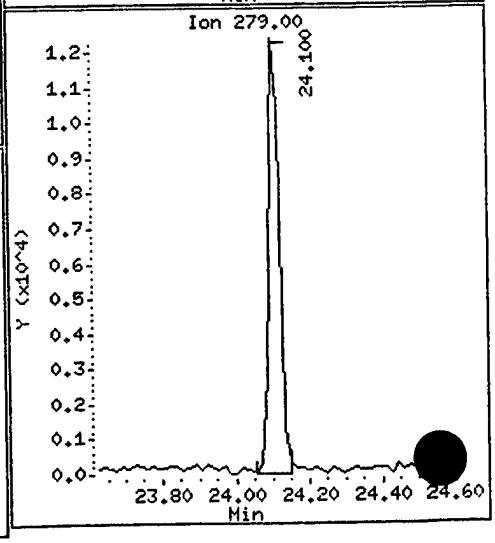


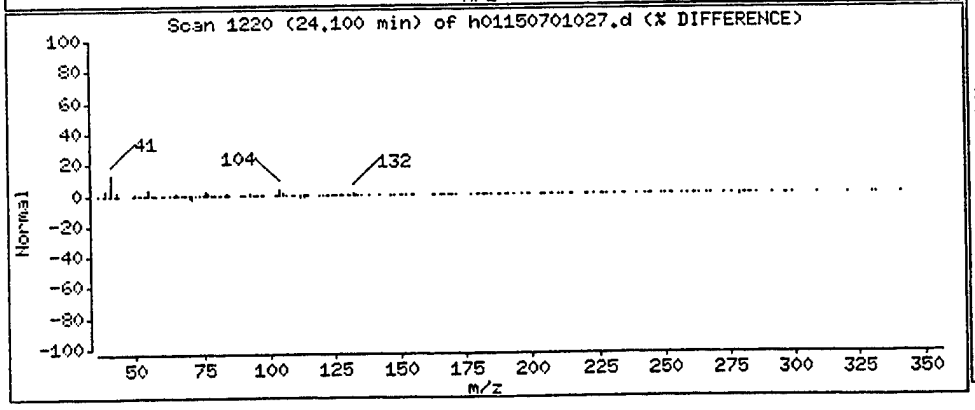












Audit History For: /chem/msdh.i/h-15Jan98.b/b1150701027.d

Change Date: 16-Jan-1998 00:09
Change Made by: Automation

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 09:10
Change Made by: kbadal

Parameter: Sample Prep. Date
Old Value:
New Value: 08-DEC-1997 17:30
Reason For Change: N/A

Change Date: 22-Jan-1998 09:11
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: 8270.sub
New Value: MM5.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:11
Change Made by: kbadal

Parameter: Lab ID
Old Value:
New Value: 9712088A-04A
Reason For Change: N/A

Change Date: 22-Jan-1998 09:11
Change Made by: kbadal

Parameter: Client ID
Old Value:
New Value: AF-N-EF404-PAH
Reason For Change: N/A

Change Date: 22-Jan-1998 09:17
Change Made by: kbadal

Parameter: Misc Information
Old Value:
New Value: 80 ng ISTD #267-91-1
Reason For Change: N/A

Change Date: 22-Jan-1998 09:19
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 09:55
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: MM5.sub
New Value: 8270.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:55
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 10:31
Change Made by: kbadal

Parameter: Sample Info
Old Value: 9712088a-04a
New Value: 9712088A-04A
Reason For Change: N/A

Change Date: 22-Jan-1998 10:57
Change Made by: kbadal

Parameter: Best Hit for Phenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:57
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:57
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethyl)ether changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:57
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 10:57
Change Made by: kbadal

Parameter: Best Hit for 1,3-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 10:57
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Best Hit for 2-Methylphenol changed
Old Value: Old Hit #1
New Value: New Hit #2
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Best Hit for 2-Methylphenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Best Hit for 4-Methylphenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Best Hit for N-Nitrosodipropylamine changed

Old Value: Old Hit #6
New Value: New Hit #7
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Best Hit for N-Nitrosodipropylamine changed
Old Value: Old Hit #7
New Value: New Hit #8
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Best Hit for N-Nitrosodipropylamine changed
Old Value: Old Hit #8
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:07
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:08
Change Made by: kbadal

Parameter: Manual reintegration of Hexachloroethane (Signal 1)
Old Value: Old Area/Time: 136321 / 8.05
New Value: New Area/Time: 791255 / 8.12
Reason For Change: N/A

Change Date: 22-Jan-1998 11:08
Change Made by: kbadal

Parameter: Manual reintegration of Hexachloroethane (Signal 1)
Old Value: Old Area/Time: 791255 / 8.12
New Value: New Area/Time: 1731571 / 8.20
Reason For Change: N/A

Change Date: 22-Jan-1998 11:08
Change Made by: kbadal

Parameter: Manual reintegration of Hexachloroethane (Signal 1)
Old Value: Old Area/Time: 1731571 / 8.20
New Value: New Area/Time: 2301556 / 8.20

Reason For Change: N/A

Change Date: 22-Jan-1998 11:08
Change Made by: kbadal

Parameter: Best Hit for Hexachloroethane changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:08
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:08
Change Made by: kbadal

Parameter: Best Hit for Nitrobenzene changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:08
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:09
Change Made by: kbadal

Parameter: Best Hit for Isophorone changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:09
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:09
Change Made by: kbadal

Parameter: Best Hit for 2-Nitrophenol changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:09
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:09
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dimethylphenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:09
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:10
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethoxy)methane changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:10
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:10
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dichlorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:10
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:10
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #2
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 11:10
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:11
Change Made by: kbadal

Parameter: Best Hit for 4-Chloroaniline changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:11
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:11
Change Made by: kbadal

Parameter: Best Hit for 4-Chloro-3-Methylphenol changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:11
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:11
Change Made by: kbadal

Parameter: Best Hit for 2-Nitroaniline changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:11
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:11
Change Made by: kbadal

Parameter: Best Hit for 3-Nitroaniline changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:11
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:13
Change Made by: kbadal

Parameter: Best Hit for 2,6-Dinitrotoluene changed

Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:13
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:13
Change Made by: kbadal

Parameter: Best Hit for Acenaphthene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:13
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:13
Change Made by: kbadal

Parameter: Best Hit for 4-Nitrophenol changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:13
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:13
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dinitrotoluene changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:13
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:14
Change Made by: kbadal

Parameter: Best Hit for N-nitrosodiphenylamine changed
Old Value: Old Hit #1
New Value: Compound Undetected

Reason For Change: N/A

Change Date: 22-Jan-1998 11:14
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:02
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 14:02
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 27-Jan-1998 15:52
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

180A

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.

AF - B - EF404 - PAH - FB

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-05A
Lab File ID: H011508
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/16/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	1.0	U
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	1.0	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	52	

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LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

AF - B - EF404 - PAH - FB

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-05A
Lab File ID: H011508
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/16/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	3.5	B
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	1.8	
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	9.4	
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150801028.d
Lab Smp Id: 9712088A-05A Client Smp ID: AF-B-EF404-PAH-FB
Inj Date : 16-JAN-1998 00:03
Operator : jgh Inst ID: msdh.i
Smp Info : 9712088A-05A
Misc Info : 80 ng ISTD #267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m ✓
Meth Date : 27-Jan-1998 15:24 jheffel Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8270.sub ✓
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

1-28-98

JJH 1.29.98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

					CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
$ 1 2-Fluorophenol						CAS #: 367-12-4		
4.635	4.649 (0.661)	112	3677984	45.4325		45.4	80.00- 120.00	100.00
4.635	4.649 (0.661)	64	1816767				0.00-10046.11	49.40
4.635	4.649 (0.661)	92	774930				0.00-10019.15	21.07

$ 2 Phenol-d5						CAS #: 4165-62-2		
6.303	6.317 (0.645)	99	5523567	50.8719		50.9	80.00- 120.00	100.00
6.303	6.317 (0.645)	71	1652040				0.00-10029.73	29.91

$ 17 Nitrobenzene-d5						CAS #: 4165-60-0		
8.168	8.182 (0.587)	82	4229145	51.7836		51.8	80.00- 120.00	100.00
8.168	8.182 (0.587)	54	2241894				0.00-10052.46	53.01
8.168	8.182 (0.587)	128	2008018				0.00-10049.58	47.48

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
$ 38 2-Fluorobiphenyl					CAS #: 321-60-8		
12.323	12.337 (0.705)	172	6441794	55.2410	55.2	80.00- 120.00	100.00
12.323	12.337 (0.705)	171	2197100			0.00-10033.81	34.11
$ 62 2,4,6-Tribromophenol					CAS #: 118-79-6		
15.807	15.804 (0.663)	330	2088433	84.4187	84.4	80.00- 120.00	100.00
15.807	15.804 (0.663)	332	2017873			0.00-10096.28	96.62
15.790	15.804 (0.662)	141	617525			0.00-10029.68	29.57
$ 82 Terphenyl-d14					CAS #: 98904-43-9		
21.401	21.415 (0.897)	244	11230518	103.415	103	80.00- 120.00	100.00
21.401	21.415 (0.897)	122	1789665			0.00-10016.35	15.94
21.401	21.415 (0.897)	212	680265			0.00-10005.98	6.06
* 7 1,4-Dichlorobenzene-d4					CAS #: 3855-82-1		
7.007	7.021 (1.000)	150	8476306	80.0000		80.00- 120.00	100.00
7.007	7.021 (1.000)	152	5326290			0.00-10058.51	62.84
7.007	7.021 (1.000)	115	3524443			0.00-10037.59	41.58
* 27 Naphthalene-d8					CAS #: 1146-65-2		
9.771	9.769 (1.000)	136	15776287	80.0000		80.00- 120.00	100.00
9.755	9.769 (1.000)	68	964439			0.00-10006.78	6.11
* 47 Acenaphthene-d10					CAS #: 15067-26-2		
13.909	13.907 (1.000)	164	10200018	80.0000		80.00- 120.00	100.00
13.909	13.907 (1.000)	162	9746795			0.00-10094.94	95.56
13.909	13.907 (1.000)	160	4222874			0.00-10041.02	41.40
* 71 Phenanthrene-d10					CAS #: 1517-22-2		
17.475	17.489 (1.000)	188	15300298	80.0000		80.00- 120.00	100.00
17.475	17.489 (1.000)	94	2036326			0.00-10014.44	13.31
17.475	17.489 (1.000)	80	1944516			0.00-10015.28	12.71
* 90 Chrysene-d12					CAS #: 1719-03-5		
23.855	23.885 (1.000)	240	12406264	80.0000		80.00- 120.00	100.00
23.855	23.885 (1.000)	236	2926387			0.00-10026.00	23.59
23.855	23.885 (1.000)	120	2113949			0.00-10018.11	17.04
* 99 Perylene-d12					CAS #: 1520-96-3		
27.044	27.058 (1.000)	264	7886636	80.0000		80.00- 120.00	100.00
27.044	27.058 (1.000)	260	1744895			0.00-10021.95	22.12
27.044	27.058 (1.000)	265	1662526			0.00-10020.90	21.08
56 Diethylphthalate					CAS #: 84-66-2		
15.071	15.085 (1.083)	149	6789199	51.9726	52.0	80.00- 120.00	100.00
15.071	15.085 (1.083)	177	1236208			0.00-10019.67	18.21

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
56 Diethylphthalate (continued)								
15.071	15.085	(1.083)	150	741245			0.00-10011.54	10.92
78 Di-n-butylphthalate						CAS #: 84-74-2		
19.046	19.059	(1.090)	149	730796	3.52650	3.5	80.00- 120.00	100.00
19.046	19.059	(1.090)	150	64574			0.00-10011.22	8.84
19.046	19.059	(1.090)	104	42454			0.00-10006.82	5.81
85 Butyl benzyl phthalate						CAS #: 85-68-7		
22.644	22.674	(0.949)	149	167509	1.83564	1.8	80.00- 120.00	100.00
22.644	22.674	(0.949)	91	142098			0.00-10073.35	84.83
22.660	22.674	(0.950)	206	27503			0.00-10015.36	16.42
93 bis(2-ethylhexyl)Phthalate						CAS #: 117-81-7		
24.100	24.130	(1.010)	149	1117292	9.43576	9.4	80.00- 120.00	100.00
24.100	24.130	(1.010)	167	312071			0.00-10027.97	27.93
24.116	24.130	(1.011)	279	58283			0.00-10005.78	5.22

"B"

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Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150801028.d
Lab Smp Id: 9712088A-05A Client Smp ID: AF-B-EF404-PAH-FB
Inj Date : 16-JAN-1998 00:03
Operator : jgh Inst ID: msdh.i
Smp Info : 9712088a-05a
Misc Info : 80 ng ISTD #267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 22-Jan-1998 08:50 kbadal Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

					CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
* 7 1,4-Dichlorobenzene-d4						CAS #: 3855-82-1		
7.007	7.021 (1.000)	150	8476306	80.0000			80.00- 120.00	100.00
7.007	7.021 (1.000)	152	5326290				0.00-10058.51	62.84
7.007	7.021 (1.000)	115	3524443				0.00-10037.59	41.58
* 27 Naphthalene-d8						CAS #: 1146-65-2		
9.771	9.769 (1.000)	136	15776287	80.0000			80.00- 120.00	100.00
9.755	9.769 (1.000)	68	964439				0.00-10006.78	6.11
* 47 Acenaphthene-d10						CAS #: 15067-26-2		
13.909	13.907 (1.000)	164	10200018	80.0000			80.00- 120.00	100.00
13.909	13.907 (1.000)	162	9746795				0.00-10094.94	95.56
13.909	13.907 (1.000)	160	4222874				0.00-10041.02	41.40

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
* 71 Phenanthrene-d10						CAS #: 1517-22-2	
17.475	17.489 (1.000)	188	15300298	80.0000		80.00- 120.00	100.00
17.475	17.489 (1.000)	94	2036326			0.00-10014.44	13.31
17.475	17.489 (1.000)	80	1944516			0.00-10015.28	12.71
* 90 Chrysene-d12						CAS #: 1719-03-5	
23.855	23.885 (1.000)	240	12406264	80.0000		80.00- 120.00	100.00
23.855	23.885 (1.000)	236	2926387			0.00-10026.00	23.59
23.855	23.885 (1.000)	120	2113949			0.00-10018.11	17.04
* 99 Perylene-d12						CAS #: 1520-96-3	
27.044	27.058 (1.000)	264	7886636	80.0000		80.00- 120.00	100.00
27.044	27.058 (1.000)	260	1744895			0.00-10021.95	22.12
27.044	27.058 (1.000)	265	1662526			0.00-10020.90	21.08
$ 1 2-Fluorophenol						CAS #: 367-12-4	
4.635	4.649 (0.661)	112	3677984	45.4325	45.4	80.00- 120.00	100.00
4.635	4.649 (0.661)	64	1816767			0.00-10046.11	49.40
4.635	4.649 (0.661)	92	774930			0.00-10019.15	21.07
$ 2 Phenol-d5						CAS #: 4165-62-2	
6.303	6.317 (0.645)	99	5523567	50.8719	50.9	80.00- 120.00	100.00
6.303	6.317 (0.645)	71	1652040			0.00-10029.73	29.91
$ 17 Nitrobenzene-d5						CAS #: 4165-60-0	
8.168	8.182 (0.587)	82	4229145	51.7836	51.8	80.00- 120.00	100.00
8.168	8.182 (0.587)	54	2241894			0.00-10052.46	53.01
8.168	8.182 (0.587)	128	2008018			0.00-10049.58	47.48
$ 62 2,4,6-Tribromophenol						CAS #: 118-79-6	
15.807	15.804 (0.663)	330	2088433	84.4187	84.4	80.00- 120.00	100.00
15.807	15.804 (0.663)	332	2017873			0.00-10096.28	96.62
15.790	15.804 (0.662)	141	617525			0.00-10029.68	29.57
$ 82 Terphenyl-d14						CAS #: 98904-43-9	
21.401	21.415 (0.897)	244	11230518	103.415	103	80.00- 120.00	100.00
21.401	21.415 (0.897)	122	1789665			0.00-10016.35	15.94
21.401	21.415 (0.897)	212	680265			0.00-10005.98	6.06
$ 38 2-Fluorobiphenyl						CAS #: 321-60-8	
12.323	12.337 (0.705)	172	6441794	55.2410	55.2	80.00- 120.00	100.00
12.323	12.337 (0.705)	171	2197100			0.00-10033.81	34.11
3 Phenol						CAS #: 108-95-2	
6.320	6.350 (0.902)	94	61435	0.65995	0.66	80.00- 120.00	100.00(a)
6.303	6.350 (0.900)	66	260435			0.00-10037.29	423.92

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
3 Phenol (continued)							
6.303	6.350 (0.900)	65	55576			0.00-10025.14	90.46
10 Benzyl Alcohol					CAS #: 100-51-6		
7.007	7.315 (1.000)	108	25478	0.56286	0.56	80.00- 120.00	100.00(a)
7.007	7.315 (1.000)	79	151700			0.00-10116.61	595.41
7.007	7.315 (1.000)	77	206336			0.00-10078.86	809.85
15 N-Nitrosodipropylamine					CAS #: 621-64-7		
7.923	7.904 (1.131)	70	43750	1.08042	1.1	80.00- 120.00	100.00
7.939	7.904 (1.133)	130	270			0.00-10026.33	0.62
7.906	7.904 (1.128)	101	231			0.00-10012.19	0.53
18 Nitrobenzene					CAS #: 98-95-3		
7.841	8.231 (0.802)	77	46393	0.58612	0.59	80.00- 120.00	100.00(a)
7.841	8.231 (0.802)	123	160			0.00-10053.45	0.35
7.841	8.231 (0.802)	65	1495			0.00-10013.89	3.22
21 2,4-Dimethylphenol					CAS #: 105-67-9		
9.329	9.065 (0.955)	122	29751	0.50777	0.51	80.00- 120.00	100.00(a)
9.329	9.065 (0.955)	107	42113			0.00-10123.86	141.55
9.346	9.065 (0.956)	121	5949			0.00-10055.27	20.00
24 Benzoic Acid					CAS #: 65-85-0		
9.329	9.441 (0.955)	122	30289	0.74726	0.75	80.00- 120.00	100.00(a)
9.379	9.441 (0.960)	105	78219			0.00-10123.32	258.24
9.379	9.441 (0.960)	77	48188			0.00-10081.55	159.09
40 2-Nitroaniline					CAS #: 88-74-4		
12.666	12.860 (0.911)	65	21191	0.66086	0.66	80.00- 120.00	100.00(a)
12.683	12.860 (0.912)	138	439			0.00-10127.72	2.07
12.666	12.860 (0.911)	92	17263			0.00-10073.86	81.47
46 3-Nitroaniline					CAS #: 99-09-2		
13.451	13.874 (0.967)	138	11375	1.00905	1.0	80.00- 120.00	100.00
13.451	13.874 (0.967)	92	5024			0.00-10120.29	44.17
13.451	13.874 (0.967)	108	2851			0.00-10080.06	25.06
44 2,6-Dinitrotoluene					CAS #: 606-20-2		
13.451	13.498 (0.967)	165	130245	4.80102	4.8	80.00- 120.00	100.00
13.451	13.498 (0.967)	89	3108			0.00-10059.87	2.39
13.451	13.498 (0.967)	121	14305			0.00-10022.31	10.98
50 4-Nitrophenol					CAS #: 100-02-7		
13.909	14.349 (1.000)	109	23376	1.57869	1.6	80.00- 120.00	100.00(a)
13.942	14.349 (1.002)	139	685			0.00-10155.17	2.93

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
50 4-Nitrophenol (continued)								
13.909	14.349	(1.000)	65	46956			0.00-10133.38	200.87
56 Diethylphthalate						CAS #: 84-66-2		
15.071	15.085	(1.083)	149	6789199	51.9726	52.0	80.00- 120.00	100.00
15.071	15.085	(1.083)	177	1236208			0.00-10019.67	18.21
15.071	15.085	(1.083)	150	741245			0.00-10011.54	10.92
61 N-nitrosodiphenylamine						CAS #: 86-30-6		
15.807	15.575	(0.905)	169	52458	0.77176	0.77	80.00- 120.00	100.00(a)
15.790	15.575	(0.904)	168	4096			0.00-10066.04	7.81
15.807	15.575	(0.905)	167	36371			0.00-10035.43	69.33
78 Di-n-butylphthalate						CAS #: 84-74-2		
19.046	19.059	(1.090)	149	730796	3.52650	3.5	80.00- 120.00	100.00
19.046	19.059	(1.090)	150	64574			0.00-10011.22	8.84
19.046	19.059	(1.090)	104	42454			0.00-10006.82	5.81
85 Butyl benzyl phthalate						CAS #: 85-68-7		
22.644	22.674	(0.949)	149	167509	1.83564	1.8	80.00- 120.00	100.00
22.644	22.674	(0.949)	91	142098			0.00-10073.35	84.83
22.660	22.674	(0.950)	206	27503			0.00-10015.36	16.42
93 bis(2-ethylhexyl)Phthalate						CAS #: 117-81-7		
24.100	24.130	(1.010)	149	1117292	9.43576	9.4	80.00- 120.00	100.00
24.100	24.130	(1.010)	167	312071			0.00-10027.97	27.93
24.116	24.130	(1.011)	279	58283			0.00-10005.78	5.22

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01150801028.d
Lab Smp Id: 9712088A-05A
Analysis Type: SV
Quant Type: ISTD
Operator: jgh
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80 ng ISTD #267-91-1

Calibration Date: JAN/15/98
Calibration Time: 1836
Client Smp ID: AF-B-EF404-PAH-
Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	11270581	5635290	22541162	8476306	-24.79
27 Naphthalene-d8	17745391	8872696	35490782	15776287	-11.10
47 Acenaphthene-d10	12494791	6247396	24989582	10200018	-18.37
71 Phenanthrene-d10	17937870	8968935	35875740	15300298	-14.70
90 Chrysene-d12	15301801	7650900	30603602	12406264	-18.92
99 Perylene-d12	9954932	4977466	19909864	7886636	-20.78

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.02	6.52	7.52	7.01	-0.20
27 Naphthalene-d8	9.77	9.27	10.27	9.77	0.03
47 Acenaphthene-d10	13.91	13.41	14.41	13.91	0.02
71 Phenanthrene-d10	17.49	16.99	17.99	17.48	-0.08
90 Chrysene-d12	23.88	23.38	24.38	23.85	-0.13
99 Perylene-d12	27.06	26.56	27.56	27.04	-0.05

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

JJH 1.29.98

Data File: /chem/msdh.i/h-15Jan98.b/h01150801028.d
Report Date: 22-Jan-1998 11:28

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Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: 9712088A-05A
Level: LOW
Data Type: MS DATA
SpikeList File: 8270.spk
Sublist File: 8270.sub
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80 ng ISTD #267-91-1

Client SDG: h-15Jan98
Fraction: SV
Client Smp ID: AF-B-EF404-PAH-FB
Operator: jgh
SampleType: SAMPLE
Quant Type: ISTD

SURROGATE COMPOUND	CONC ADDED ug	CONC RECOVERED ug	% RECOVERED	LIMITS
$ 1 2-Fluorophenol	100	45.4	45.43	25-121
$ 2 Phenol-d5	100	50.9	50.87	24-113
$ 17 Nitrobenzene-d5	100	51.8	51.78	23-120
$ 38 2-Fluorobiphenyl	100	55.2	55.24	30-115
$ 62 2,4,6-Tribromophen	100	84.4	84.42	19-122
$ 82 Terphenyl-d14	100	103	103.42	18-137

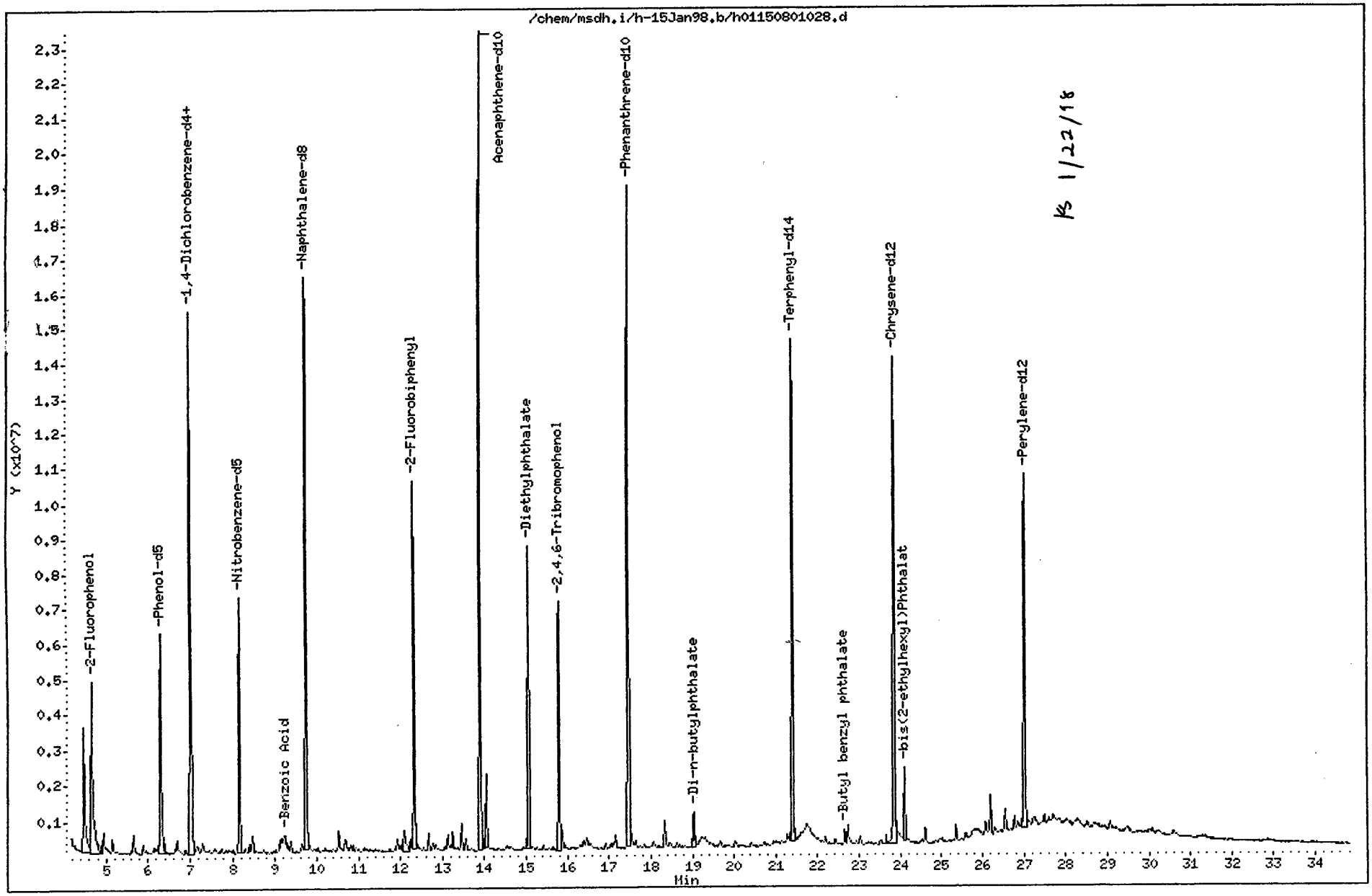
1.29.98

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Data File: /chem/msdh.i/h-15Jan98.b/h01150801028.d
Date : 16-JAN-1998 00:03
Client ID: AF-B-EF404-PAH-FB
Sample Info: 9712088A-05A
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i

Operator: jgh
Column diameter: 2.00



KS 1/22/98

Data File: /chem/msdh.i/h-15Jan98.b/h01150801028.d

Date : 16-JAN-1998 00:03

Client ID: AF-B-EF404-PAH-FB

Instrument: msdh.i

Sample Info: 9712088A-05A

Volume Injected (uL): 1.0

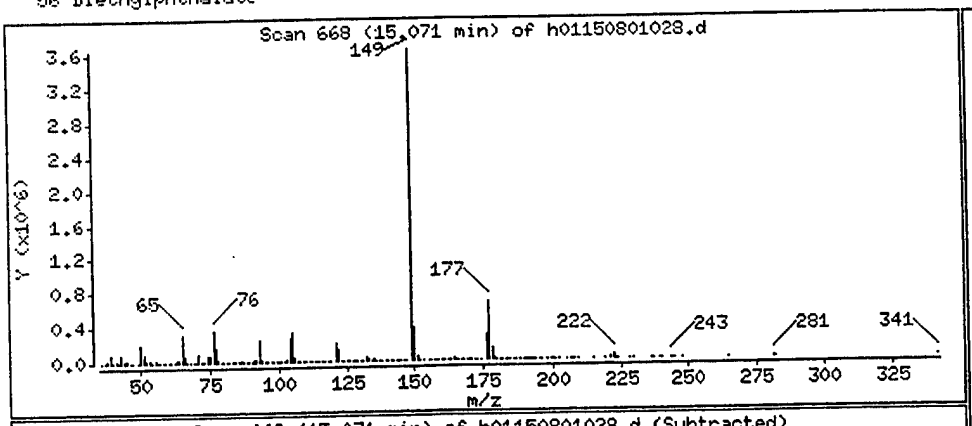
Operator: jgh

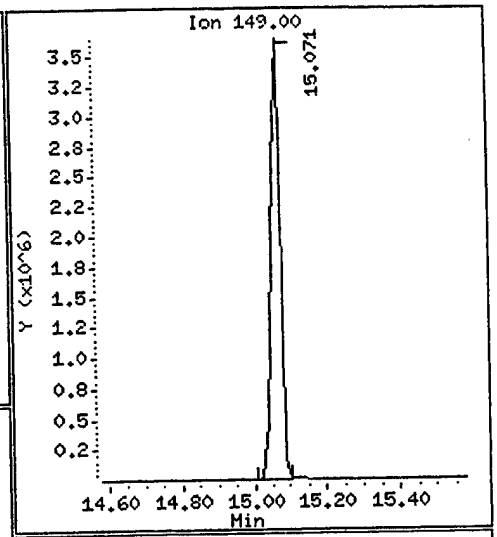
Column phase:

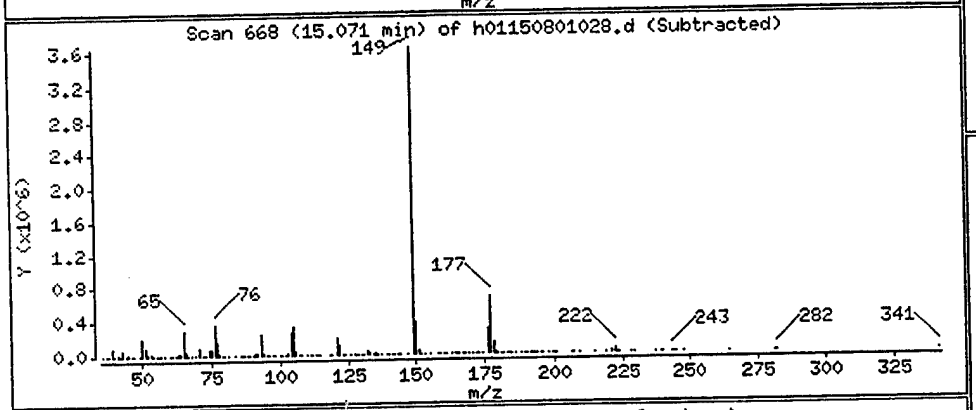
Column diameter: 2.00

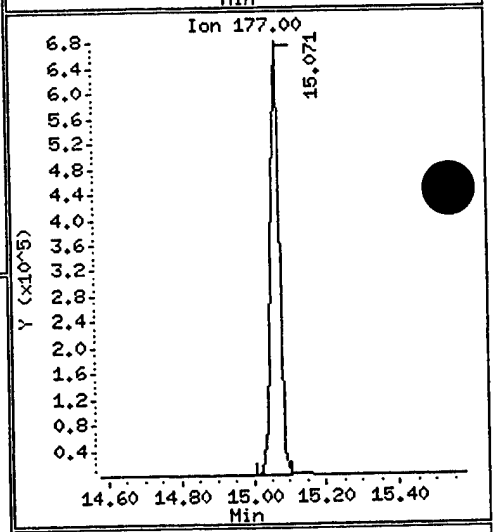
56 Diethylphthalate

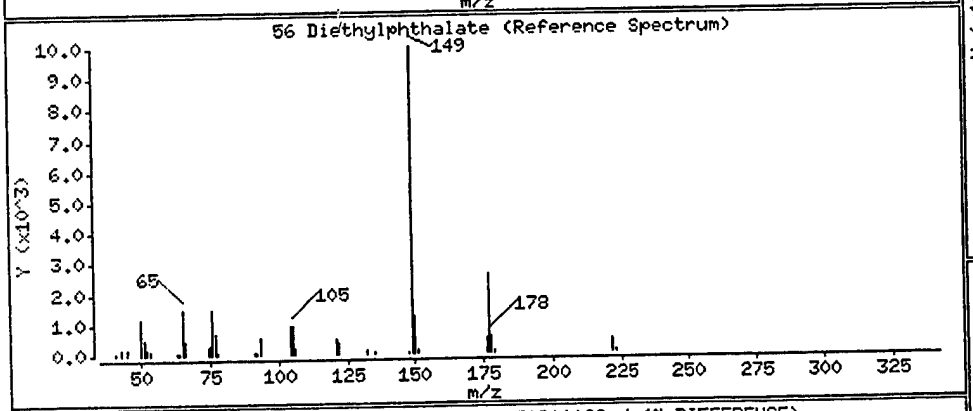
Concentration: 52.0 ug

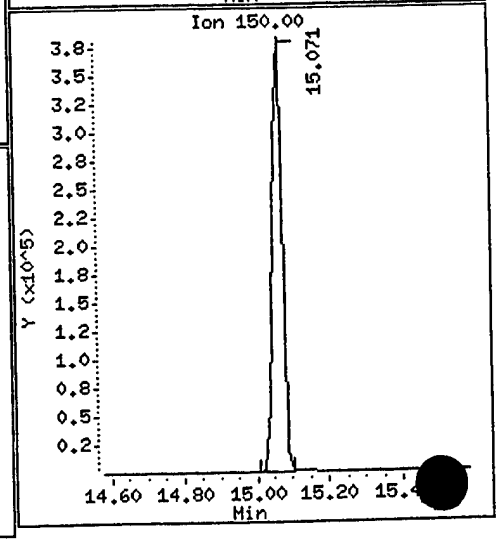


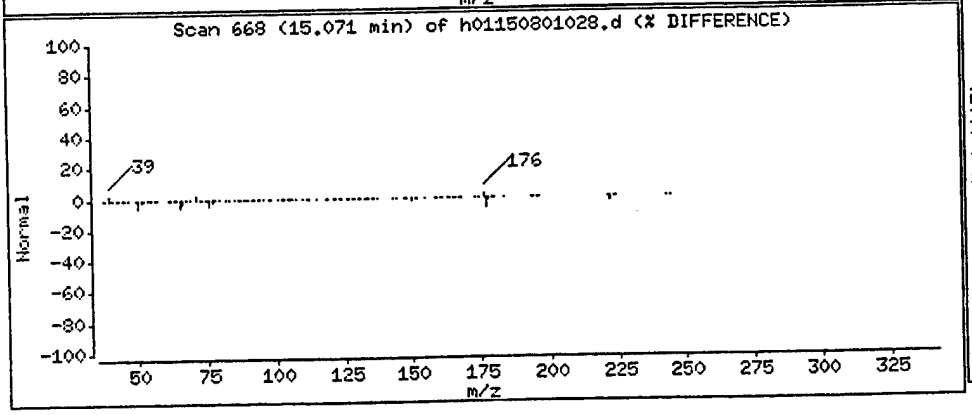












Data File: /chem/msdh.i/h-15Jan98.b/h01150801028.d

Date : 16-JAN-1998 00:03

Client ID: AF-B-EF404-PAH-FB

Instrument: msdh.i

Sample Info: 9712088A-05A

Volume Injected (uL): 1.0

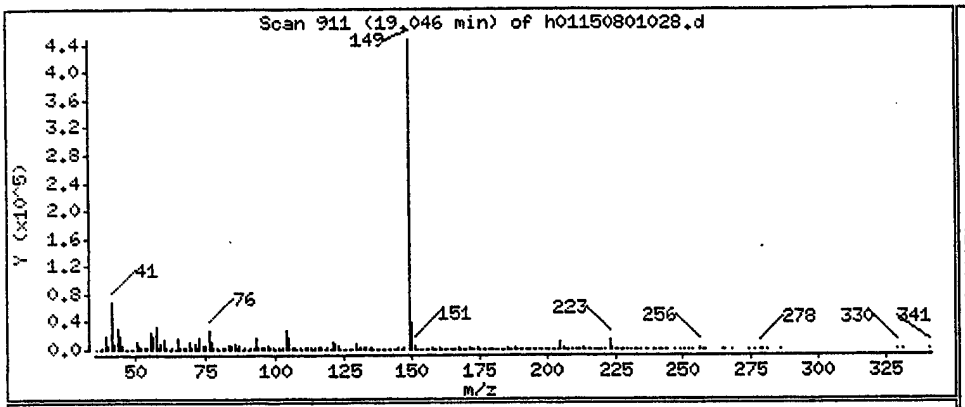
Operator: jgh

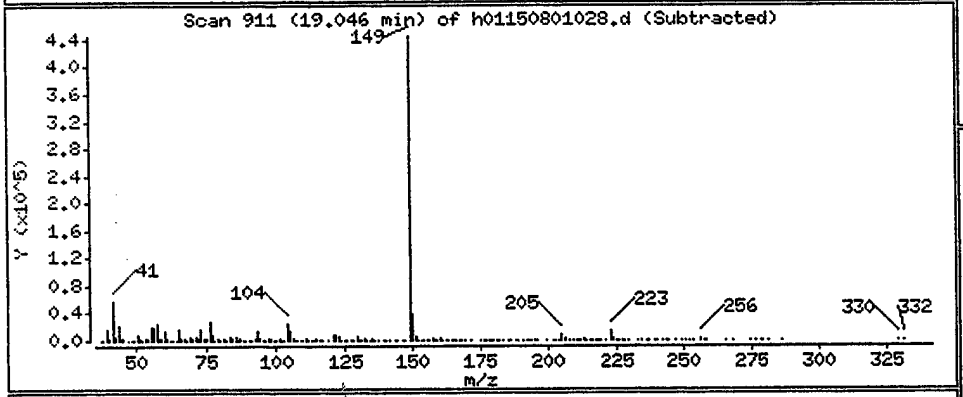
Column phase:

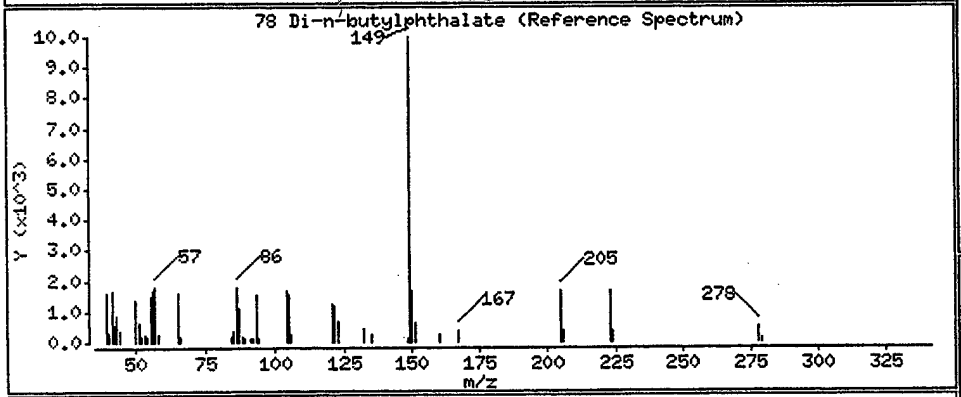
Column diameter: 2.00

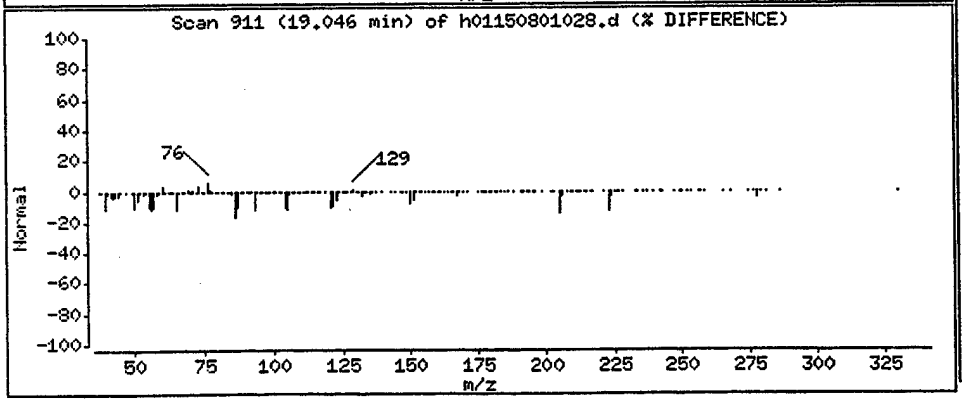
78 Di-n-butylphthalate

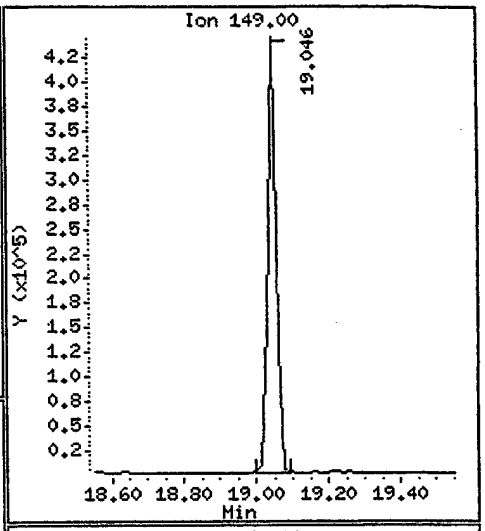
Concentration: 3.5 ug

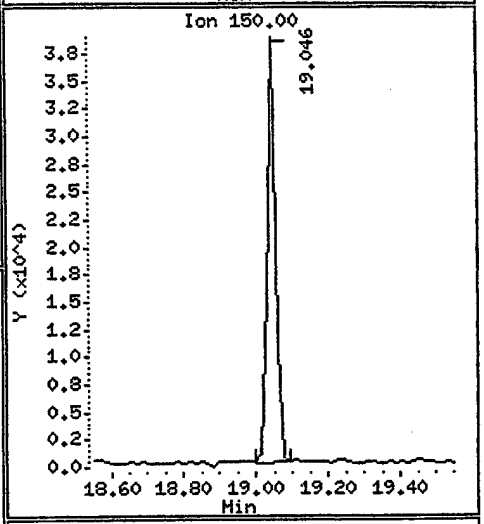


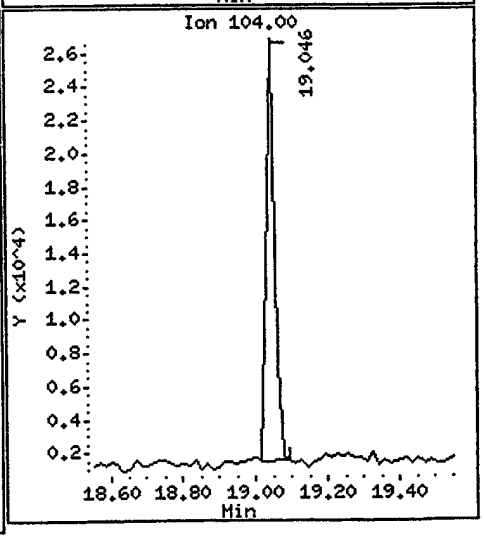












Data File: /chem/msdh.i/h-15Jan98.b/h01150801028.d

Date : 16-JAN-1998 00:03

Client ID: AF-B-EF404-PAH-FB

Instrument: msdh.i

Sample Info: 9712088A-05A

Volume Injected (uL): 1.0

Operator: jgh

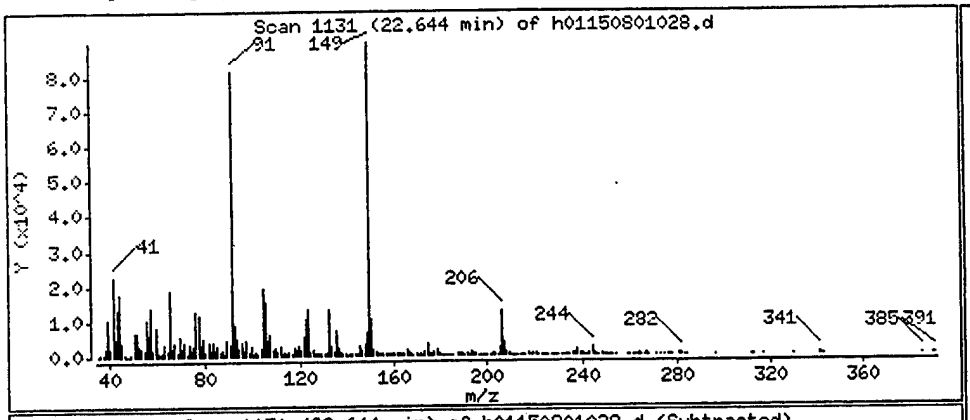
Column phase:

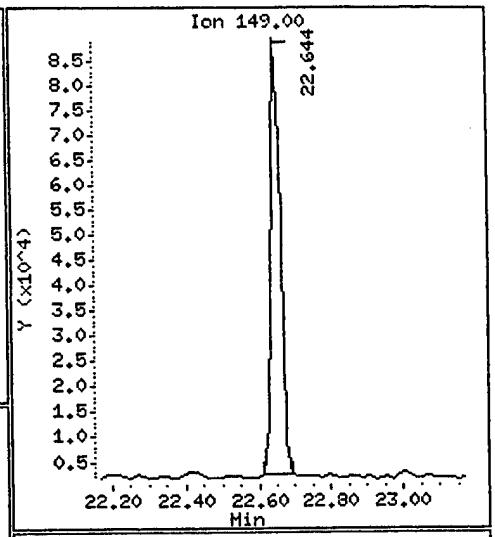
Column diameter: 2.00

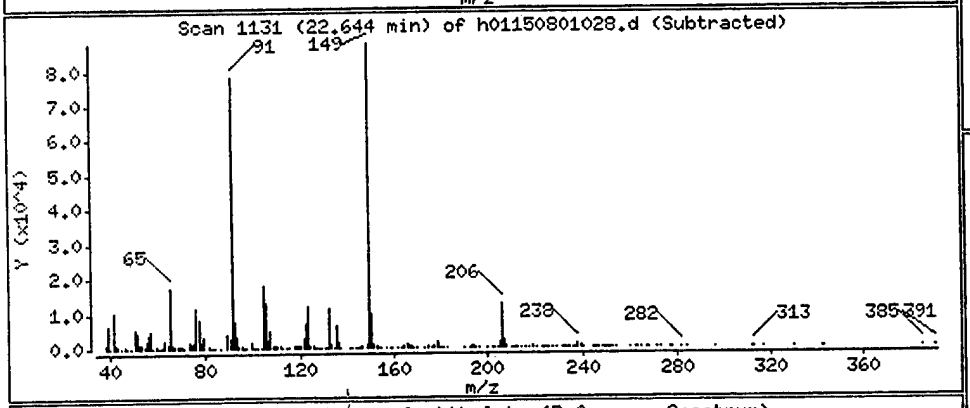
85 Butyl benzyl phthalate

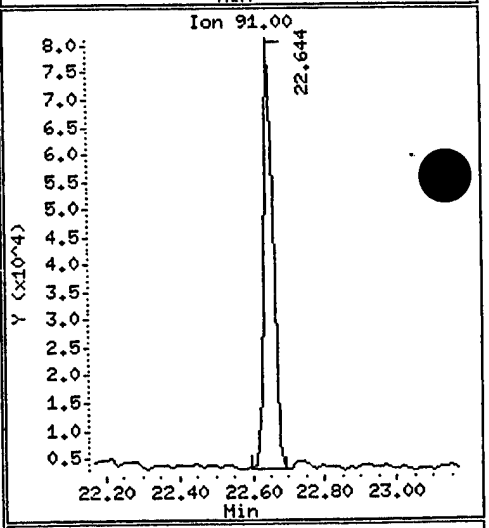
Concentration: 1.8 ug

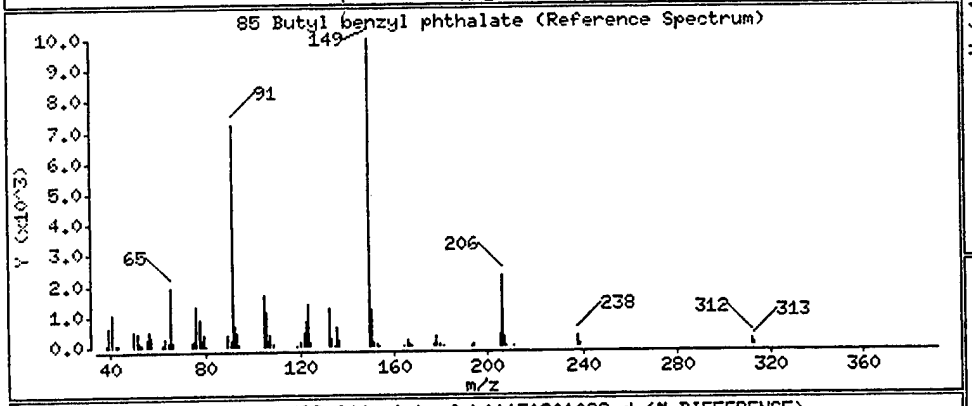
192

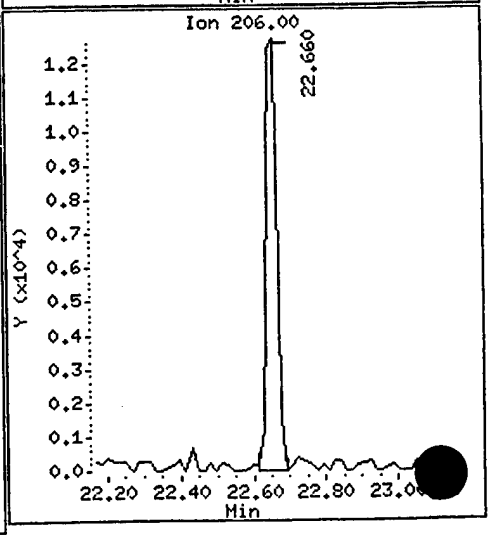


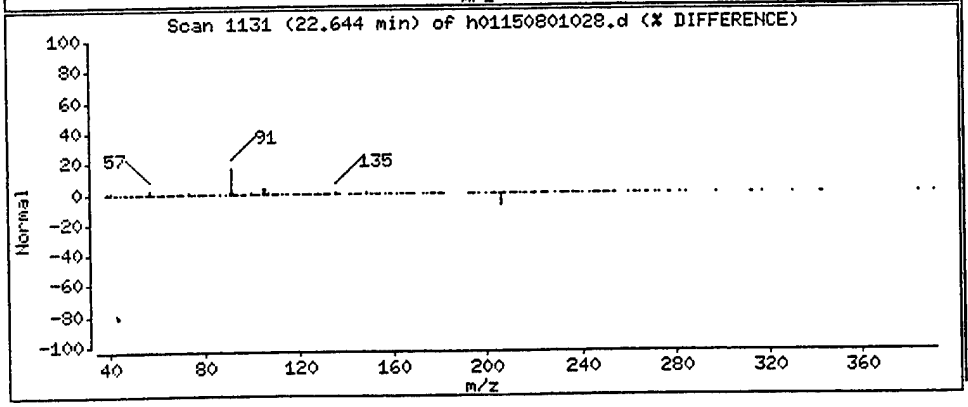












Data File: /chem/msdh.i/h-15Jan98.b/h01150801028.d

Date : 16-JAN-1998 00:03

Client ID: AF-B-EF404-PAH-FB

Instrument: msdh.i

Sample Info: 9712088A-05A

Volume Injected (uL): 1.0

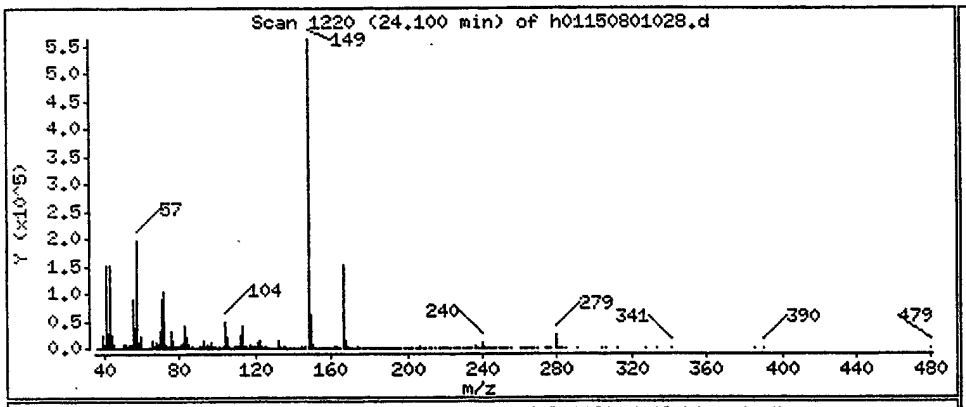
Operator: jgh

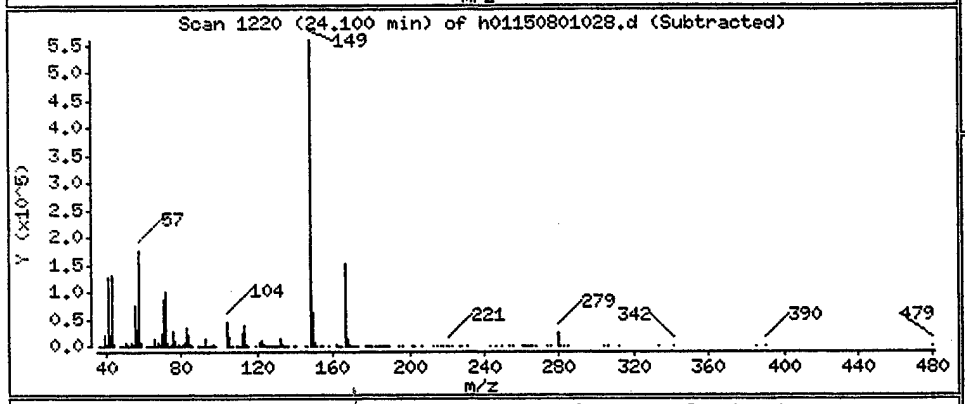
Column phase:

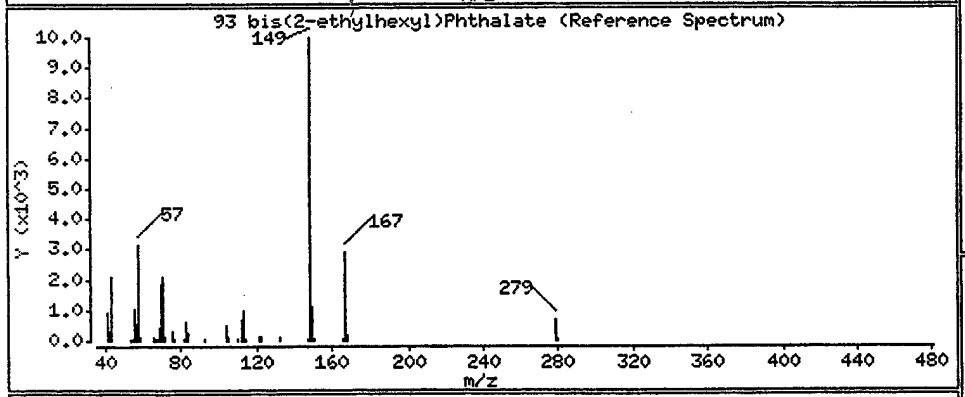
Column diameter: 2.00

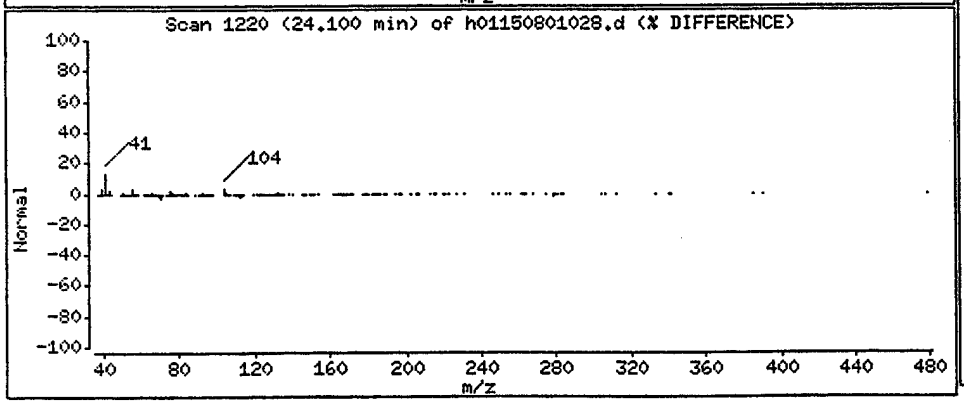
93 bis(2-ethylhexyl)Phthalate

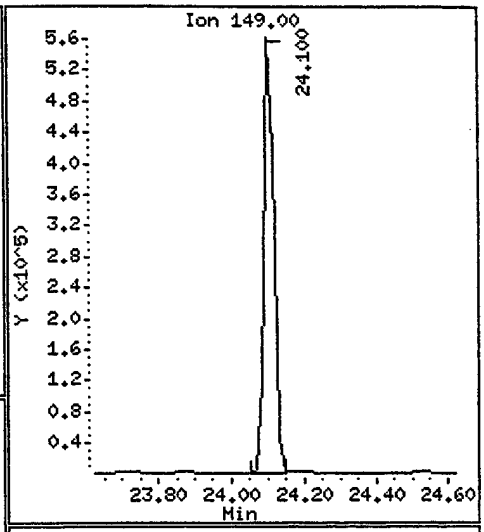
Concentration: 9.4 ug

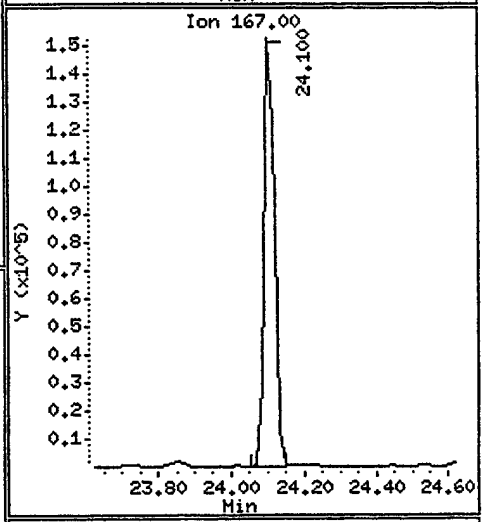


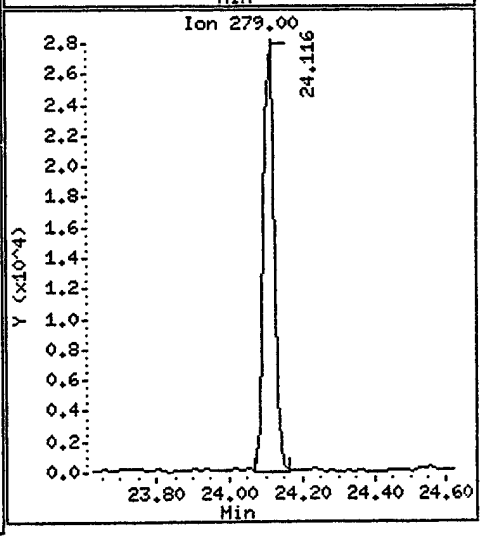












Audit History For: /chem/msdh.i/h-15Jan98.b/h01150801028.d

Change Date: 16-Jan-1998 00:52
Change Made by: Automation

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 09:10
Change Made by: kbadal

Parameter: Sample Prep. Date
Old Value:
New Value: 08-DEC-1997 17:30
Reason For Change: N/A

Change Date: 22-Jan-1998 09:14
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: 8270.sub
New Value: MM5.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:14
Change Made by: kbadal

Parameter: Lab ID
Old Value:
New Value: 9712088A-05A
Reason For Change: N/A

Change Date: 22-Jan-1998 09:14
Change Made by: kbadal

Parameter: Client ID
Old Value:
New Value: AF-B-EF404-PAH-FB
Reason For Change: N/A

Change Date: 22-Jan-1998 09:17
Change Made by: kbadal

Parameter: Misc Information
Old Value:
New Value: 80 ng ISTD #267-91-1
Reason For Change: N/A

Change Date: 22-Jan-1998 09:19
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 09:55
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: MM5.sub
New Value: 8270.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:56
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 11:26
Change Made by: kbadal

Parameter: Sample Info
Old Value: 9712088a-05a
New Value: 9712088A-05A
Reason For Change: N/A

Change Date: 22-Jan-1998 11:26
Change Made by: kbadal

Parameter: Best Hit for Phenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:26
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:26
Change Made by: kbadal

Parameter: Best Hit for N-Nitrosodipropylamine changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:26
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:26
Change Made by: kbadal

Parameter: Best Hit for Nitrobenzene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:26
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:26
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dimethylphenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:26
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:26
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #2
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 11:26
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:27
Change Made by: kbadal

Parameter: Best Hit for 2-Nitroaniline changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:27
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:27
Change Made by: kbadal

Parameter: Best Hit for 3-Nitroaniline changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:27
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:27
Change Made by: kbadal

Parameter: Best Hit for 2,6-Dinitrotoluene changed

Old Value: Old Hit #1
New Value: New Hit #2
Reason For Change: N/A

Change Date: 22-Jan-1998 11:27
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:27
Change Made by: kbadal

Parameter: Best Hit for 2,6-Dinitrotoluene changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:27
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:27
Change Made by: kbadal

Parameter: Best Hit for 4-Nitrophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:27
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 11:27
Change Made by: kbadal

Parameter: Best Hit for N-nitrosodiphenylamine changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 11:27
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 14:01
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #1
New Value: Compound Undetected

Reason For Change: N/A

Change Date: 22-Jan-1998 14:01
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 27-Jan-1998 15:52
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.
AF - B - EF404 - PAH

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-06A
Lab File ID: H011509
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/16/98
Dilution Factor: 5.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	230	
111-44-4	bis(2-Chloroethyl) Ether	5.0	U
95-57-8	2-Chlorophenol	25	U
541-73-1	1,3-Dichlorobenzene	5.0	U
106-46-7	1,4-Dichlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	5.0	U
95-48-7	2-Methylphenol	25	U
108-60-1	bis(2-Chloroisopropyl) Ether	5.0	U
621-64-7	N-Nitroso-di-n-propylamine	5.0	U
106-44-5	4-Methylphenol	89	
67-72-1	Hexachloroethane	5.0	U
98-95-3	Nitrobenzene	5.0	U
78-59-1	Isophorone	5.0	U
88-75-5	2-Nitrophenol	25	U
105-67-9	2,4-Dimethylphenol	25	U
65-85-0	Benzoic Acid	200	
111-91-1	bis(2-Chloroethoxy) Methane	5.0	U
120-83-2	2,4-Dichlorophenol	25	U
120-82-1	1,2,4-Trichlorobenzene	5.0	U
91-20-3	Naphthalene	190	
106-47-8	4-Chloroaniline	5.0	U
87-68-3	Hexachlorobutadiene	5.0	U
59-50-7	4-Chloro-3-methylphenol	25	U
91-57-6	2-Methylnaphthalene	190	
77-47-4	Hexachlorocyclopentadiene	50	U
88-06-2	2,4,6-Trichlorophenol	25	U
95-95-4	2,4,5-Trichlorophenol	25	U
91-58-7	2-Chloronaphthalene	5.0	U
88-74-4	2-Nitroaniline	5.0	U
131-11-3	Dimethylphthalate	5.0	U
208-96-8	Acenaphthylene	5.0	U
606-20-2	2,6-Dinitrotoluene	5.0	U
99-09-2	3-Nitroaniline	5.0	U
83-32-9	Acenaphthene	5.0	U
51-28-5	2,4-Dinitrophenol	100	U
100-02-7	4-Nitrophenol	100	U
121-14-2	2,4-Dinitrotoluene	5.0	U
132-64-9	Dibenzofuran	5.0	U
84-66-2	Diethylphthalate	58	

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.
AF - B - EF404 - PAH

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-06A
Lab File ID: H011509
Date Received: 12/6/97
Date Extracted: 12/8/97
Date Analyzed: 1/16/98
Dilution Factor: 5.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	5.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	5.0	U
100-01-6	4-Nitroaniline	5.0	U
534-52-1	4,6-Dinitro-2-methylphenol	25	U
86-30-6	N-Nitrosodiphenylamine	5.0	U
101-55-3	4-Bromophenyl-phenyl Ether	5.0	U
118-74-1	Hexachlorobenzene	5.0	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	5.0	U
120-12-7	Anthracene	5.0	U
84-74-2	di-n-Butylphthalate	5.0	U
206-44-0	Fluoranthene	5.0	U
129-00-0	Pyrene	5.0	U
85-68-7	Butylbenzylphthalate	5.0	U
91-94-1	3,3'-Dichlorobenzidine	5.0	U
218-01-9	Chrysene	5.0	U
56-55-3	Benzo(a)anthracene	5.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	7.1	
117-84-0	Di-n-Octylphthalate	5.0	U
205-99-2	Benzo(b)fluoranthene	5.0	U
207-08-9	Benzo(k)fluoranthene	5.0	U
50-32-8	Benzo(a)pyrene	5.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	5.0	U
191-24-2	Benzo(g,h,i)perylene	5.0	U
100-51-6	Benzyl alcohol	25	U

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150901029.d
Lab Smp Id: 9712008A-06A Client Smp ID: AF-B-EF404-PAH
Inj Date : 16-JAN-1998 00:45
Operator : jgh Inst ID: msdh.i
Smp Info : 9712088A-06A 1:5
Misc Info : 80 ng ISTD #267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 27-Jan-1998 15:24 jheffel Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 9
Dil Factor: 5.00000
Integrator: HP RTE Compound Sublist: 8270.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	5.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
$ 1	2-Fluorophenol					CAS #: 367-12-4		
	4.652	4.649 (0.662)	112	1105811	12.5937	63.0	80.00- 120.00	100.00(H)
	4.635	4.649 (0.660)	64	594166			0.00-10046.11	53.73
	4.652	4.649 (0.662)	92	645419			0.00-10019.15	58.37
$ 2	Phenol-d5					CAS #: 4165-62-2		
	6.320	6.317 (0.647)	99	1516496	12.6240	63.1	80.00- 120.00	100.00
	6.320	6.317 (0.647)	71	628320			0.00-10029.73	41.43
$ 17	Nitrobenzene-d5					CAS #: 4165-60-0		
	8.169	8.182 (0.587)	82	1319200	15.5439	77.7	80.00- 120.00	100.00
	8.169	8.182 (0.587)	54	708098			0.00-10052.46	53.68
	8.169	8.182 (0.587)	128	675804			0.00-10049.58	51.23

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
$ 38 2-Fluorobiphenyl					CAS #: 321-60-8		
12.340	12.337 (0.705)	172	1855556	14.6753	73.4	80.00- 120.00	100.00
12.340	12.337 (0.705)	171	630598			0.00-10033.81	33.98
$ 62 2,4,6-Tribromophenol					CAS #: 118-79-6		
15.807	15.804 (0.662)	330	422276	15.3933	77.0	80.00- 120.00	100.00
15.807	15.804 (0.662)	332	414316			0.00-10096.28	98.11
15.807	15.804 (0.662)	141	164842			0.00-10029.68	39.04
$ 82 Terphenyl-d14					CAS #: 98904-43-9		
21.385	21.415 (0.896)	244	2154375	17.8905	89.4	80.00- 120.00	100.00
21.385	21.415 (0.896)	122	403707			0.00-10016.35	18.74
21.385	21.415 (0.896)	212	129523			0.00-10005.98	6.01
* 7 1,4-Dichlorobenzene-d4					CAS #: 3855-82-1		
7.024	7.021 (1.000)	150	9193705	80.0000		80.00- 120.00	100.00
7.024	7.021 (1.000)	152	5734439			0.00-10058.51	62.37
7.024	7.021 (1.000)	115	3845161			0.00-10037.59	41.82
* 27 Naphthalene-d8					CAS #: 1146-65-2		
9.772	9.769 (1.000)	136	17454460	80.0000		80.00- 120.00	100.00
9.772	9.769 (1.000)	68	1103693			0.00-10006.78	6.32
* 47 Acenaphthene-d10					CAS #: 15067-26-2		
13.926	13.907 (1.000)	164	10599630	80.0000		80.00- 120.00	100.00
13.926	13.907 (1.000)	162	10118241			0.00-10094.94	95.46
13.926	13.907 (1.000)	160	4367239			0.00-10041.02	41.20
* 71 Phenanthrene-d10					CAS #: 1517-22-2		
17.492	17.489 (1.000)	188	16589835	80.0000		80.00- 120.00	100.00
17.476	17.489 (1.000)	94	2179470			0.00-10014.44	13.14
17.476	17.489 (1.000)	80	2033463			0.00-10015.28	12.26
* 90 Chrysene-d12					CAS #: 1719-03-5		
23.871	23.885 (1.000)	240	13756976	80.0000		80.00- 120.00	100.00
23.871	23.885 (1.000)	236	3253897			0.00-10026.00	23.65
23.855	23.885 (1.000)	120	2377736			0.00-10018.11	17.28
* 99 Perylene-d12					CAS #: 1520-96-3		
27.045	27.058 (1.000)	264	8447613	80.0000		80.00- 120.00	100.00
27.045	27.058 (1.000)	260	1863636			0.00-10021.95	22.06
27.045	27.058 (1.000)	265	1763092			0.00-10020.90	20.87
3 Phenol					CAS #: 108-95-2		
6.353	6.350 (0.904)	94	4675872	46.3098	232	80.00- 120.00	100.00
6.353	6.350 (0.904)	66	1666645			0.00-10037.29	35.64

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
3 Phenol (continued)							
6.353	6.350 (0.904)	65	1293744			0.00-10025.14	27.67
14 4-Methylphenol					CAS #: 106-44-5		
7.907	7.904 (1.126)	108	1214938	17.7890	88.9	80.00- 120.00	100.00
7.907	7.904 (1.126)	107	1289248			0.00-10122.08	106.12
7.907	7.904 (1.126)	79	933052			0.00-10025.12	76.80
24 Benzoic Acid					CAS #: 65-85-0		
9.395	9.441 (0.961)	122	1747920	38.9769	195	80.00- 120.00	100.00
9.395	9.441 (0.961)	105	2390423			0.00-10123.32	136.76
9.395	9.441 (0.961)	77	1339030			0.00-10081.55	76.61
28 Naphthalene					CAS #: 91-20-3		
9.821	9.818 (1.005)	128	8944769	38.4636	192	80.00- 120.00	100.00
9.821	9.818 (1.005)	129	1152408			0.00-10013.27	12.88
9.821	9.818 (1.005)	127	1193690			0.00-10013.22	13.35
33 2-Methylnaphthalene					CAS #: 91-57-6		
11.440	11.437 (1.171)	142	5079849	37.2603	186	80.00- 120.00	100.00
11.440	11.437 (1.171)	141	4397816			0.00-10090.11	86.57
56 Diethylphthalate					CAS #: 84-66-2		
15.071	15.085 (1.082)	149	1564178	11.5226	57.6	80.00- 120.00	100.00
15.071	15.085 (1.082)	177	291078			0.00-10019.67	18.61
15.071	15.085 (1.082)	150	180482			0.00-10011.54	11.54
93 bis(2-ethylhexyl)Phthalate					CAS #: 117-81-7		
24.100	24.130 (1.010)	149	187237	1.42600	7.1	80.00- 120.00	100.00
24.100	24.130 (1.010)	167	51116			0.00-10027.97	27.30
24.117	24.130 (1.010)	279	8998			0.00-10005.78	4.81

QC Flag Legend

H - Operator selected an alternate compound hit.

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Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150901029.d
Lab Smp Id: 9712008A-06A Client Smp ID: AF-B-EF404-PAH
Inj Date : 16-JAN-1998 00:45
Operator : jgh Inst ID: msdh.i
Smp Info : 9712088a-06a 1:5
Misc Info : 80 ng ISTD #267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 22-Jan-1998 08:50 kbadal Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 9
Dil Factor: 5.00000
Integrator: HP RTE Compound Sublist: MM5.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	5.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Ok to Use
kb 1/22/98

					CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
* 7 1,4-Dichlorobenzene-d4						CAS #: 3855-82-1		
7.024	7.021 (1.000)	150	9193705	80.0000			80.00- 120.00	100.00
7.024	7.021 (1.000)	152	5734439				0.00-10058.51	62.37
7.024	7.021 (1.000)	115	3845161				0.00-10037.59	41.82
* 27 Naphthalene-d8						CAS #: 1146-65-2		
9.772	9.769 (1.000)	136	17454460	80.0000			80.00- 120.00	100.00
9.772	9.769 (1.000)	68	1103693				0.00-10006.78	6.32
* 47 Acenaphthene-d10						CAS #: 15067-26-2		
13.926	13.907 (1.000)	164	10599630	80.0000			80.00- 120.00	100.00
13.926	13.907 (1.000)	162	10118241				0.00-10094.94	95.46
13.926	13.907 (1.000)	160	4367239				0.00-10041.02	41.20

				CONCENTRATIONS ON-COL	FINAL		
RT	EXP RT (REL RT)	MASS	RESPONSE	(NG)	(ug)	TARGET RANGE	RATIO
==	====== ========	====	========	=======	=======	==========	=====
* 71 Phenanthrene-d10						CAS #: 1517-22-2	
17.492	17.489 (1.000)	188	16589835	80.0000		80.00- 120.00	100.00
17.476	17.489 (1.000)	94	2179470			0.00-10014.44	13.14
17.476	17.489 (1.000)	80	2033463			0.00-10015.28	12.26
* 90 Chrysene-d12						CAS #: 1719-03-5	
23.871	23.885 (1.000)	240	13756976	80.0000		80.00- 120.00	100.00
23.871	23.885 (1.000)	236	3253897			0.00-10026.00	23.65
23.855	23.885 (1.000)	120	2377736			0.00-10018.11	17.28
* 99 Perylene-d12						CAS #: 1520-96-3	
27.045	27.058 (1.000)	264	8447613	80.0000		80.00- 120.00	100.00
27.045	27.058 (1.000)	260	1863636			0.00-10021.95	22.06
27.045	27.058 (1.000)	265	1763092			0.00-10020.90	20.87
$ 1 2-Fluorophenol						CAS #: 367-12-4	
4.652	4.649 (0.662)	112	1105811	12.5937	63.0	80.00- 120.00	100.00
4.635	4.649 (0.660)	64	594166			0.00-10046.11	53.73
4.652	4.649 (0.662)	92	645419			0.00-10019.15	58.37
$ 2 Phenol-d5						CAS #: 4165-62-2	
6.320	6.317 (0.647)	99	1516496	12.6240	63.1	80.00- 120.00	100.00
6.320	6.317 (0.647)	71	628320			0.00-10029.73	41.43
$ 17 Nitrobenzene-d5						CAS #: 4165-60-0	
8.169	8.182 (0.587)	82	1319200	15.5439	77.7	80.00- 120.00	100.00
8.169	8.182 (0.587)	54	708098			0.00-10052.46	53.68
8.169	8.182 (0.587)	128	675804			0.00-10049.58	51.23
$ 62 2,4,6-Tribromophenol						CAS #: 118-79-6	
15.807	15.804 (0.662)	330	422276	15.3933	77.0	80.00- 120.00	100.00
15.807	15.804 (0.662)	332	414316			0.00-10096.28	98.11
15.807	15.804 (0.662)	141	164842			0.00-10029.68	39.04
$ 82 Terphenyl-d14						CAS #: 98904-43-9	
21.385	21.415 (0.896)	244	2154375	17.8905	89.4	80.00- 120.00	100.00
21.385	21.415 (0.896)	122	403707			0.00-10016.35	18.74
21.385	21.415 (0.896)	212	129523			0.00-10005.98	6.01
$ 38 2-Fluorobiphenyl						CAS #: 321-60-8	
12.340	12.337 (0.705)	172	1855556	14.6753	73.4	80.00- 120.00	100.00
12.340	12.337 (0.705)	171	630598			0.00-10033.81	33.98
3 Phenol						CAS #: 108-95-2	
6.353	6.350 (0.904)	94	4675872	46.3098	232	80.00- 120.00	100.00
6.353	6.350 (0.904)	66	1666645			0.00-10037.29	35.64

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
3 Phenol (continued)							
6.353	6.350 (0.904)	65	1293744			0.00-10025.14	27.67
4 bis(2-Chloroethyl)ether					CAS #: 111-44-4		
6.353	6.514 (0.904)	93	119941	1.46379	7.3	80.00- 120.00	100.00
6.353	6.514 (0.904)	63	303975			0.00-10062.92	253.44
6.353	6.514 (0.904)	95	296138			0.00-10031.42	246.90
10 Benzyl Alcohol					CAS #: 100-51-6		
7.318	7.315 (1.042)	108	624820	12.7264	63.6	80.00- 120.00	100.00
7.318	7.315 (1.042)	79	724784			0.00-10116.61	116.00
7.318	7.315 (1.042)	77	502842			0.00-10078.86	80.48
12 2-Methylphenol					CAS #: 95-48-7		
7.563	7.560 (1.077)	108	345601	4.84989	24.2	80.00- 120.00	100.00(a)
7.563	7.560 (1.077)	107	314223			0.00-10086.18	90.92
7.596	7.560 (1.081)	79	424738			0.00-10041.55	122.90
13 bis(2-Chloroisopropyl)ether					CAS #: 108-60-1		
7.482	7.609 (1.065)	45	94581	0.88198	4.4	80.00- 120.00	100.00(a)
7.531	7.609 (1.072)	121	662550	32.4291	162	0.00-10020.26	700.51
14 4-Methylphenol					CAS #: 106-44-5		
7.907	7.904 (1.126)	108	1214938	17.7890	88.9	80.00- 120.00	100.00
7.907	7.904 (1.126)	107	1289248			0.00-10122.08	106.12
7.907	7.904 (1.126)	79	933052			0.00-10025.12	76.80
15 N-Nitrosodipropylamine					CAS #: 621-64-7		
7.858	7.904 (1.119)	70	112935	2.57134	12.8	80.00- 120.00	100.00
7.841	7.904 (1.116)	130	755			0.00-10026.33	0.67
7.825	7.904 (1.114)	101	13160			0.00-10012.19	11.65
18 Nitrobenzene					CAS #: 98-95-3		
8.152	8.231 (0.834)	77	248586	2.83862	14.2	80.00- 120.00	100.00
8.201	8.231 (0.839)	123	14222			0.00-10053.45	5.72
8.152	8.231 (0.834)	65	475870			0.00-10013.89	191.43
19 Isophorone					CAS #: 78-59-1		
8.708	8.771 (0.891)	82	510044	2.72328	13.6	80.00- 120.00	100.00
8.708	8.771 (0.891)	138	34156			0.00-10014.70	6.70
8.708	8.771 (0.891)	95	1082873			0.00-10005.51	212.31
20 2-Nitrophenol					CAS #: 88-75-5		
8.905	8.918 (0.911)	139	122311	2.58973	12.9	80.00- 120.00	100.00(a)
8.937	8.918 (0.915)	65	251591			0.00-10042.96	205.70
8.905	8.918 (0.911)	109	86636			0.00-10026.21	70.83

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
21 2,4-Dimethylphenol					CAS #: 105-67-9		
9.085	9.065 (0.930)	122	190939	2.94547	14.7	80.00- 120.00	100.00(a)
9.085	9.065 (0.930)	107	234047			0.00-10123.86	122.58
9.068	9.065 (0.928)	121	123530			0.00-10055.27	64.70
23 bis(2-Chloroethoxy)methane					CAS #: 111-91-1		
9.281	9.294 (0.950)	93	133586	1.18691	5.9	80.00- 120.00	100.00
9.297	9.294 (0.951)	123	219066			0.00-10010.88	163.99
9.297	9.294 (0.951)	95	217862			0.00-10031.15	163.09
24 Benzoic Acid					CAS #: 65-85-0		
9.395	9.441 (0.961)	122	1747920	38.9769	195	80.00- 120.00	100.00
9.395	9.441 (0.961)	105	2390423			0.00-10123.32	136.76
9.395	9.441 (0.961)	77	1339030			0.00-10081.55	76.61
25 2,4-Dichlorophenol					CAS #: 120-83-2		
9.755	9.474 (0.998)	162	87673	1.42887	7.1	80.00- 120.00	100.00(a)
9.788	9.474 (1.002)	164	13435			0.00-10063.52	15.32
9.739	9.474 (0.997)	98	121351			0.00-10039.12	138.41
28 Naphthalene					CAS #: 91-20-3		
9.821	9.818 (1.005)	128	8944769	41.5180	208	80.00- 120.00	100.00
9.821	9.818 (1.005)	129	1152408			0.00-10013.27	12.88
9.821	9.818 (1.005)	127	1193690			0.00-10013.22	13.35
29 4-Chloroaniline					CAS #: 106-47-8		
9.821	10.014 (1.005)	127	1203418	22.4091	112	80.00- 120.00	100.00
9.821	10.014 (1.005)	129	1171097			0.00-10010.39	97.31
32 4-Chloro-3-Methylphenol					CAS #: 59-50-7		
10.851	11.159 (1.110)	107	121398	1.74420	8.7	80.00- 120.00	100.00(a)
10.884	11.159 (1.114)	142	2966			0.00-10073.71	2.44
10.867	11.159 (1.112)	144	72034			0.00-10023.72	59.34
33 2-Methylnaphthalene					CAS #: 91-57-6		
11.440	11.437 (1.171)	142	5079849	37.2603	186	80.00- 120.00	100.00
11.440	11.437 (1.171)	141	4397816			0.00-10090.11	86.57
39 2-Chloronaphthalene					CAS #: 91-58-7		
12.716	12.582 (0.913)	162	61230	0.58713	2.9	80.00- 120.00	100.00(a)
12.699	12.582 (0.912)	164	7167			0.00-10031.20	11.71
12.667	12.582 (0.910)	127	100347			0.00-10038.71	163.88
40 2-Nitroaniline					CAS #: 88-74-4		
12.945	12.860 (0.930)	65	34211	1.02668	5.1	80.00- 120.00	100.00
12.961	12.860 (0.931)	138	16526			0.00-10127.72	48.31

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
40 2-Nitroaniline (continued)							
12.978	12.960 (0.932)	92	76947			0.00-10073.86	224.92
46 3-Nitroaniline					CAS #: 99-09-2		
14.073	13.874 (1.011)	138	13392	1.14319	5.7	80.00- 120.00	100.00
14.057	13.874 (1.009)	92	13903			0.00-10120.29	103.82
13.959	13.874 (1.002)	108	4168			0.00-10080.06	31.13
44 2,6-Dinitrotoluene					CAS #: 606-20-2		
13.468	13.498 (0.967)	165	49117	1.74227	8.7	80.00- 120.00	100.00
13.419	13.498 (0.964)	89	10904			0.00-10059.87	22.20
13.435	13.498 (0.965)	121	30984			0.00-10022.31	63.08
45 Acenaphthylene					CAS #: 208-96-8		
13.550	13.563 (0.973)	152	102397	0.63357	3.2	80.00- 120.00	100.00(a)
13.550	13.563 (0.973)	151	23082			0.00-10023.78	22.54
13.566	13.563 (0.974)	153	42704			0.00-10015.23	41.70
48 Acenaphthene					CAS #: 83-32-9		
13.975	13.989 (1.004)	154	57167	0.56553	2.8	80.00- 120.00	100.00(a)
13.975	13.989 (1.004)	152	31964			0.00-10049.54	55.91
13.975	13.989 (1.004)	153	49021			0.00-10106.26	85.75
50 4-Nitrophenol					CAS #: 100-02-7		
14.368	14.349 (1.032)	109	33925	2.20474	11.0	80.00- 120.00	100.00(a)
14.384	14.349 (1.033)	139	88738			0.00-10155.17	261.57
14.368	14.349 (1.032)	65	81499			0.00-10133.38	240.23
51 Dibenzofuran					CAS #: 132-64-9		
14.401	14.414 (1.034)	168	72496	0.51640	2.6	80.00- 120.00	100.00(a)
14.384	14.414 (1.033)	139	94780			0.00-10038.83	130.74
52 2,4-Dinitrotoluene					CAS #: 121-14-2		
14.531	14.447 (1.043)	165	23014	0.56879	2.8	80.00- 120.00	100.00(a)
14.515	14.447 (1.042)	63	11646			0.00-10063.54	50.60
14.499	14.447 (1.041)	182	4533			0.00-10004.86	19.70
56 Diethylphthalate					CAS #: 84-66-2		
15.071	15.085 (1.082)	149	1564178	11.5226	57.6	80.00- 120.00	100.00
15.071	15.085 (1.082)	177	291078			0.00-10019.67	18.61
15.071	15.085 (1.082)	150	180482			0.00-10011.54	11.54
61 N-nitrosodiphenylamine					CAS #: 86-30-6		
15.578	15.575 (0.891)	169	61971	0.84085	4.2	80.00- 120.00	100.00(a)
15.546	15.575 (0.889)	168	9168			0.00-10066.04	14.79
15.546	15.575 (0.889)	167	7334			0.00-10035.43	11.83

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
78 Di-n-butylphthalate						CAS #: 84-74-2		
19.046	19.059	(1.089)	149	158557	0.70565	3.5	80.00- 120.00	100.00(a)
19.046	19.059	(1.089)	150	15066			0.00-10011.22	9.50
19.046	19.059	(1.089)	104	10588			0.00-10006.82	6.68
93 bis(2-ethylhexyl)Phthalate						CAS #: 117-81-7		
24.100	24.130	(1.010)	149	187237	1.42600	7.1	80.00- 120.00	100.00
24.100	24.130	(1.010)	167	51116			0.00-10027.97	27.30
24.117	24.130	(1.010)	279	8998			0.00-10005.78	4.81

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01150901029.d
Lab Smp Id: 9712008A-06A
Analysis Type: SV
Quant Type: ISTD
Operator: jgh
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80 ng ISTD #267-91-1

Calibration Date: JAN/15/98
Calibration Time: 1836
Client Smp ID: AF-B-EF404-PAH
Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	11270581	5635290	22541162	9193705	-18.43
27 Naphthalene-d8	17745391	8872696	35490782	17454460	-1.64
47 Acenaphthene-d10	12494791	6247396	24989582	10599630	-15.17
71 Phenanthrene-d10	17937870	8968935	35875740	16589835	-7.52
90 Chrysene-d12	15301801	7650900	30603602	13756976	-10.10
99 Perylene-d12	9954932	4977466	19909864	8447613	-15.14

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.02	6.52	7.52	7.02	0.04
27 Naphthalene-d8	9.77	9.27	10.27	9.77	0.03
47 Acenaphthene-d10	13.91	13.41	14.41	13.93	0.14
71 Phenanthrene-d10	17.49	16.99	17.99	17.49	0.02
90 Chrysene-d12	23.88	23.38	24.38	23.87	-0.06
99 Perylene-d12	27.06	26.56	27.56	27.04	-0.05

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

1.29.98

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: 9712008A-06A
Level: LOW
Data Type: MS DATA
SpikeList File: 8270.spk
Sublist File: 8270.sub
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80 ng ISTD #267-91-1

Client SDG: h-15Jan98
Fraction: SV
Client Smp ID: AF-B-EF404-PAH
Operator: jgh
SampleType: SAMPLE
Quant Type: ISTD

SURROGATE COMPOUND	CONC ADDED ug	CONC RECOVERED ug	% RECOVERED	LIMITS
$ 1 2-Fluorophenol	100	63.0	62.97	25-121
$ 2 Phenol-d5	100	63.1	63.12	24-113
$ 17 Nitrobenzene-d5	100	77.7	77.72	23-120
$ 38 2-Fluorobiphenyl	100	73.4	73.38	30-115
$ 62 2,4,6-Tribromophen	100	77.0	76.97	19-122
$ 82 Terphenyl-d14	100	89.4	89.45	18-137

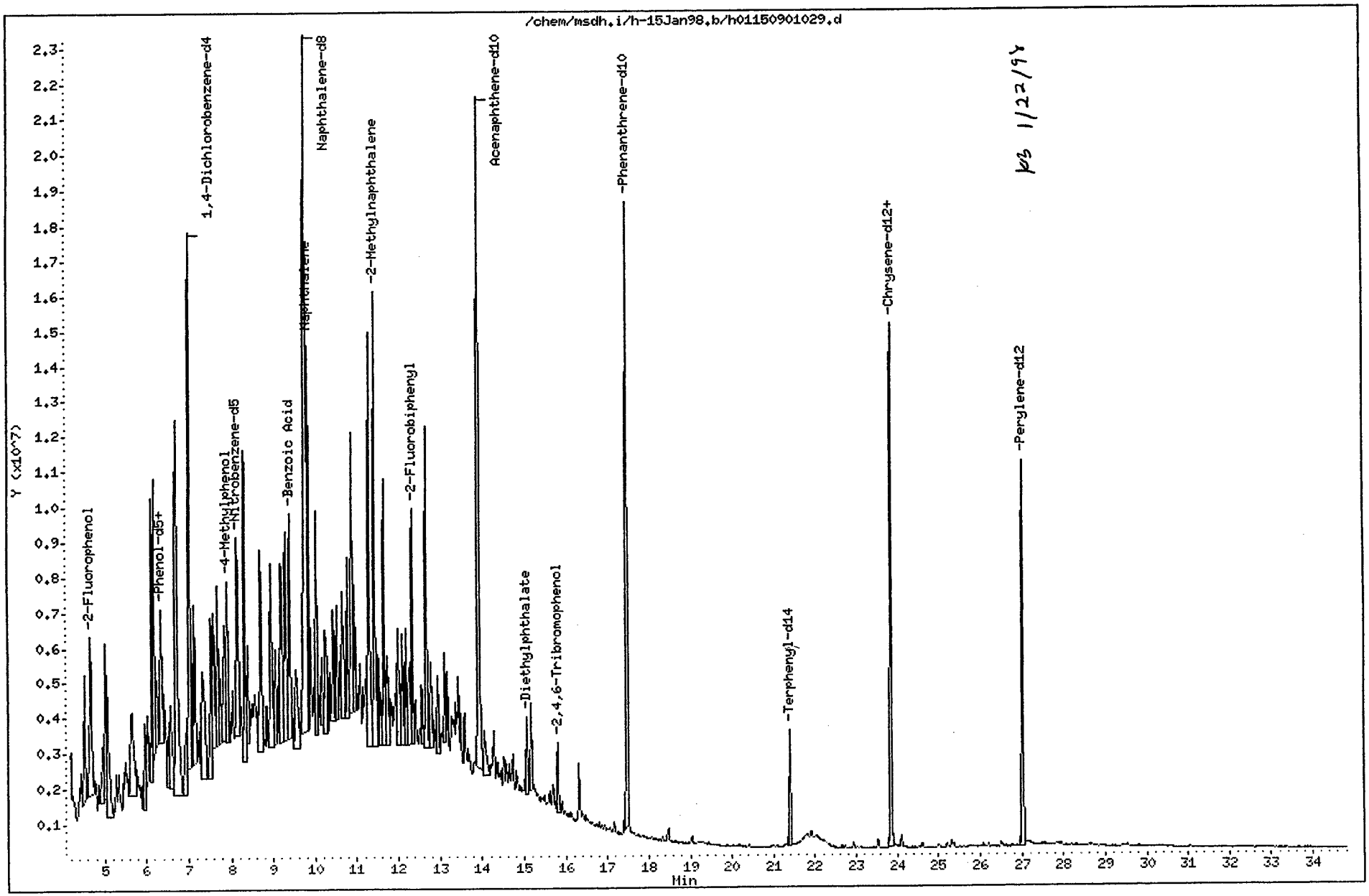
JGH 1.29.98

212

Data File: /chem/msdh.i/h-15Jan98.b/h01150901029.d
Date : 16-JAN-1998 00:45
Client ID: AF-B-EF404-PAH
Sample Info: 9712088A-06A 1:5
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i

Operator: jgh
Column diameter: 2.00



bs 1/22/98

Data File: /chem/msdh.i/h-15Jan98.b/h01150901029.d

Date : 16-JAN-1998 00:45

Client ID: AF-B-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-06A 1:5

Volume Injected (uL): 1.0

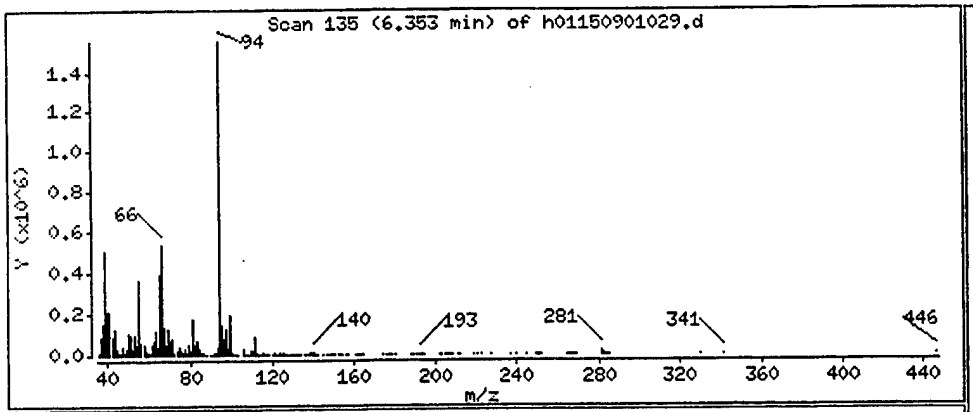
Operator: jgh

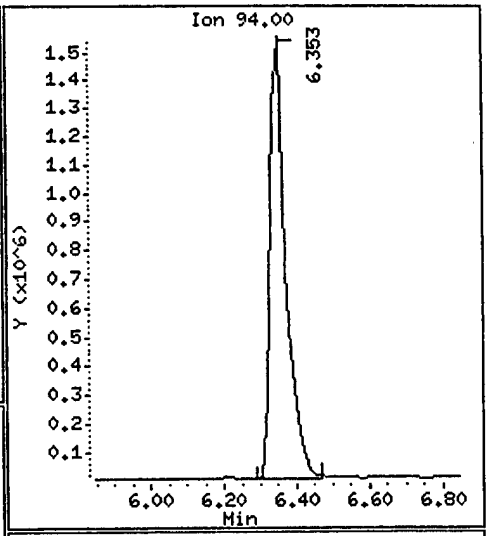
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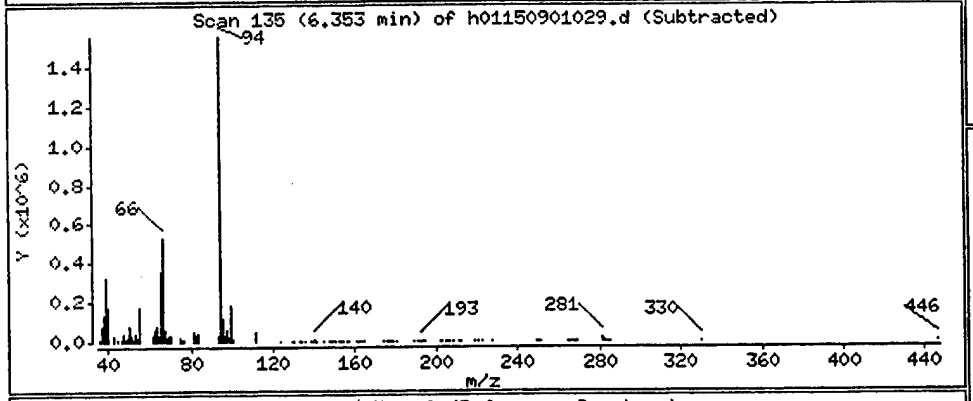
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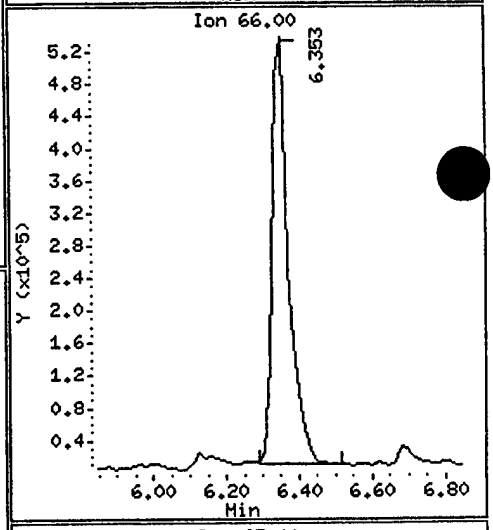
3 Phenol

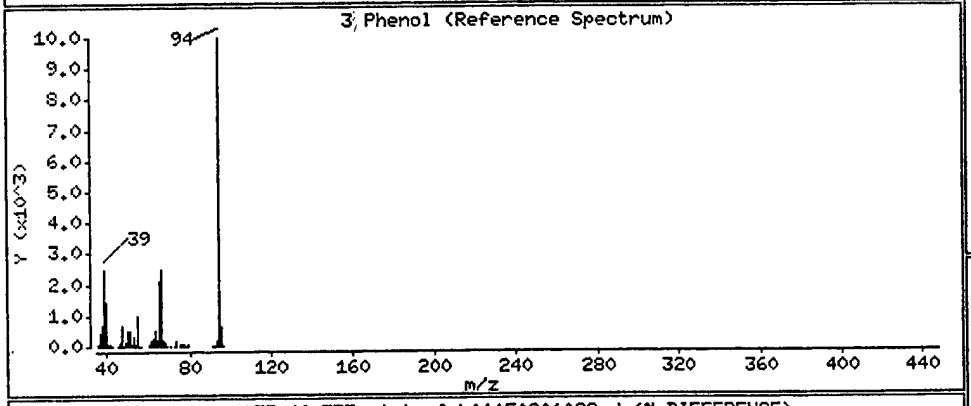
Concentration: 232 ug

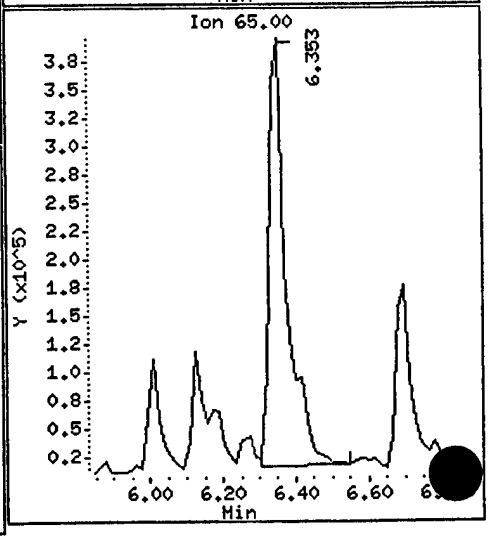


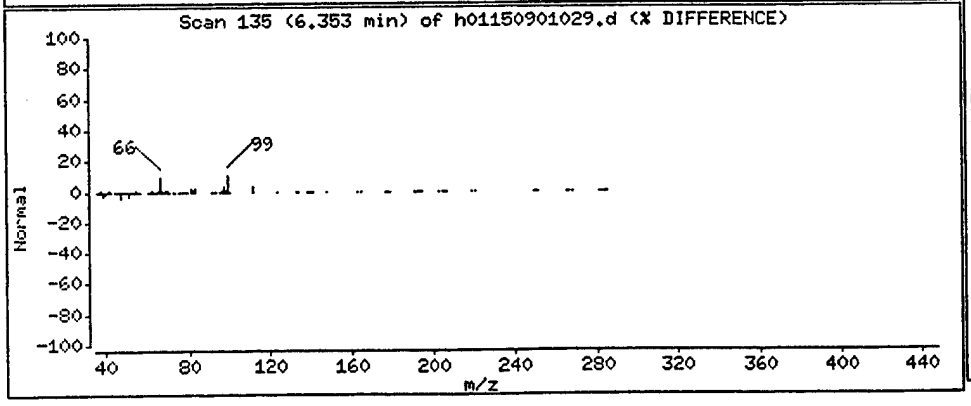












Data File: /chem/msdh.i/h-15Jan98.b/h01150901029.d

Date : 16-JAN-1998 00:45

Client ID: AF-B-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-06A 1:5

Operator: jgh

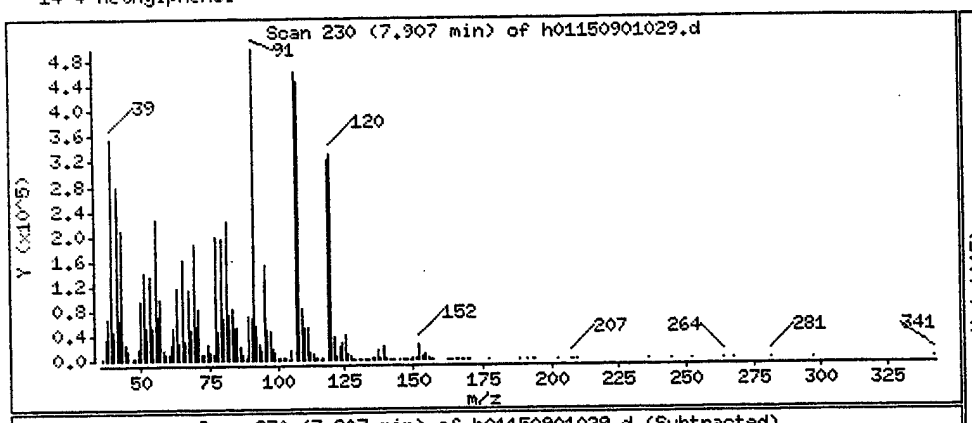
Volume Injected (uL): 1.0

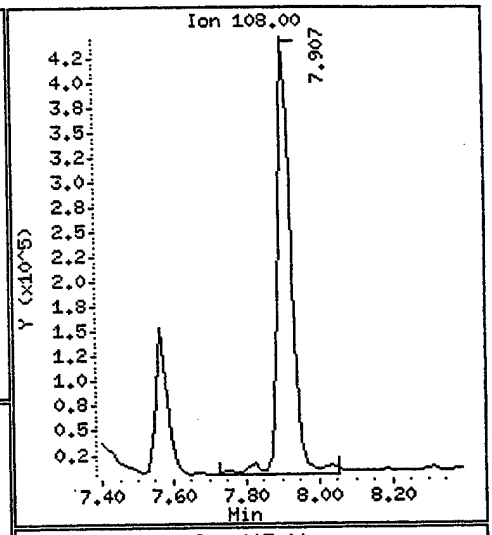
Column diameter: 2.00

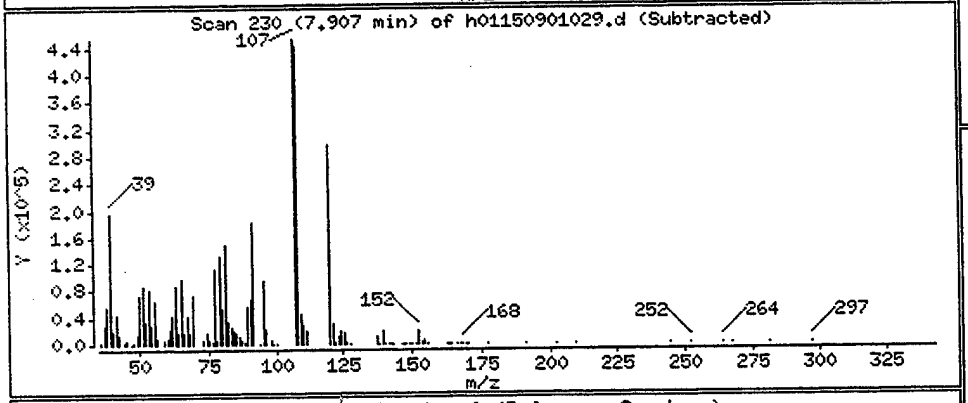
Column phase:

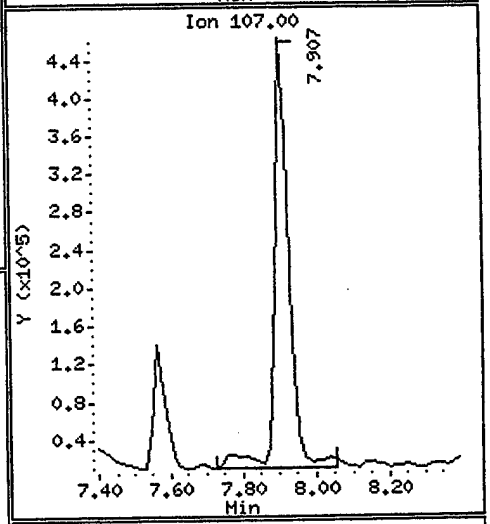
Concentration: 88.9 ug

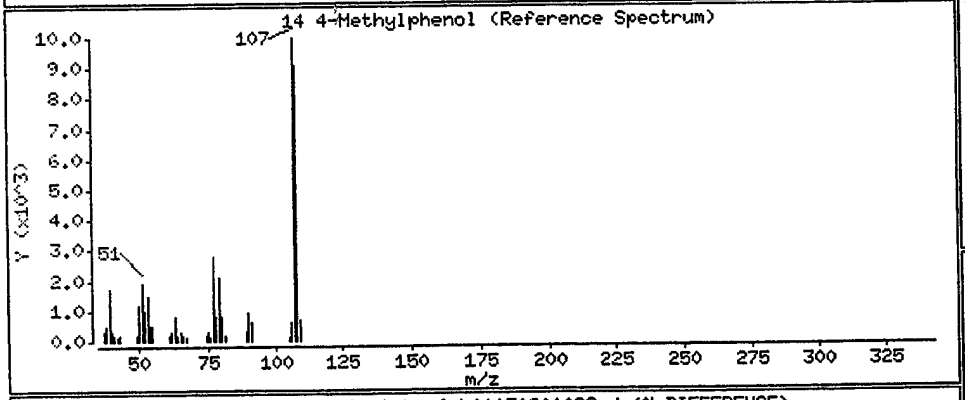
14 4-Methylphenol

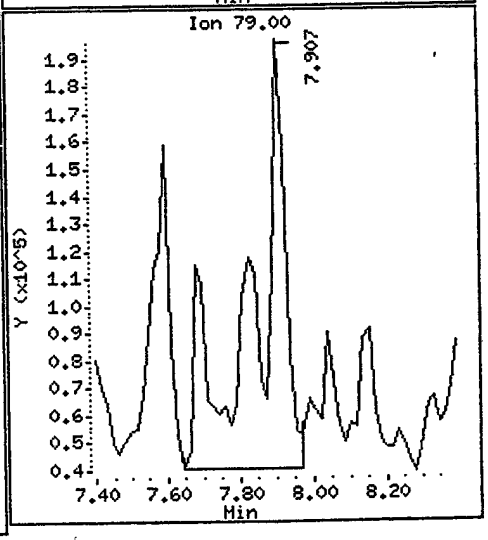


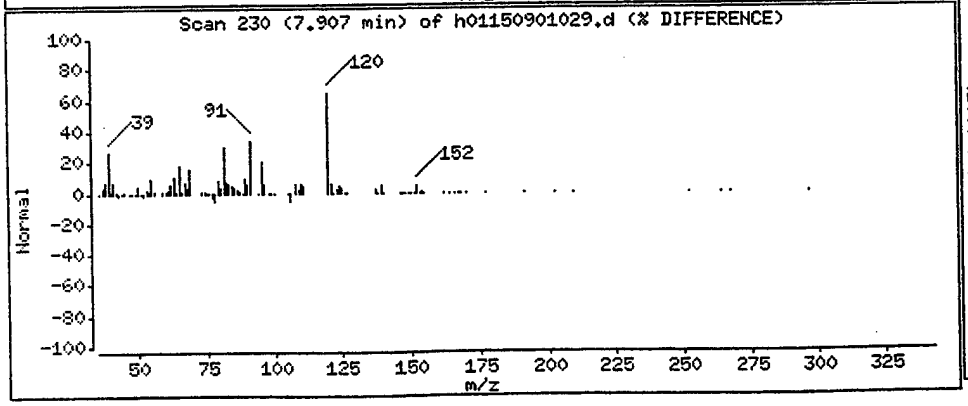












Data File: /chem/msdh.i/h-15Jan98.b/h01150901029.d

Date : 16-JAN-1998 00:45

Client ID: AF-B-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-06A 1:5

Volume Injected (uL): 1.0

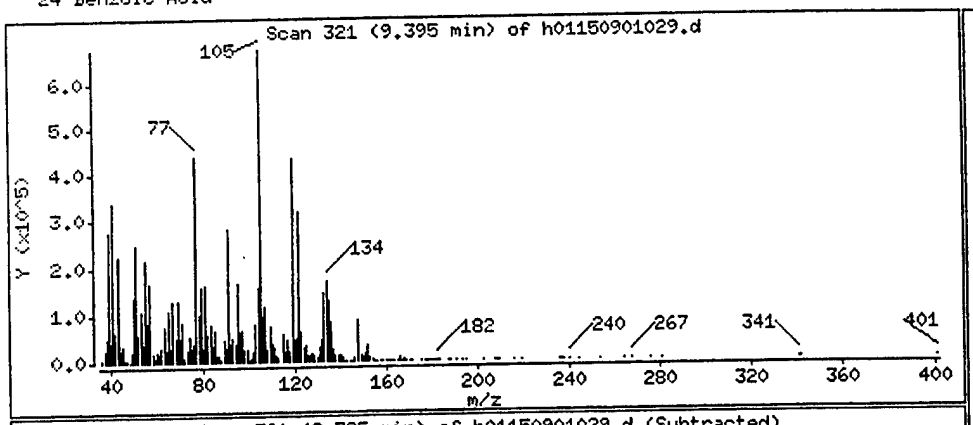
Operator: jgh

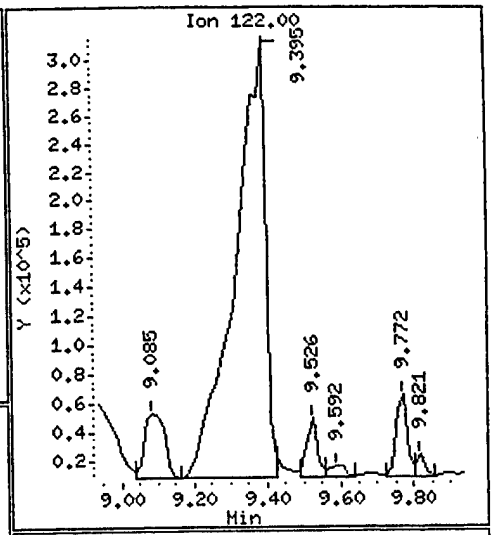
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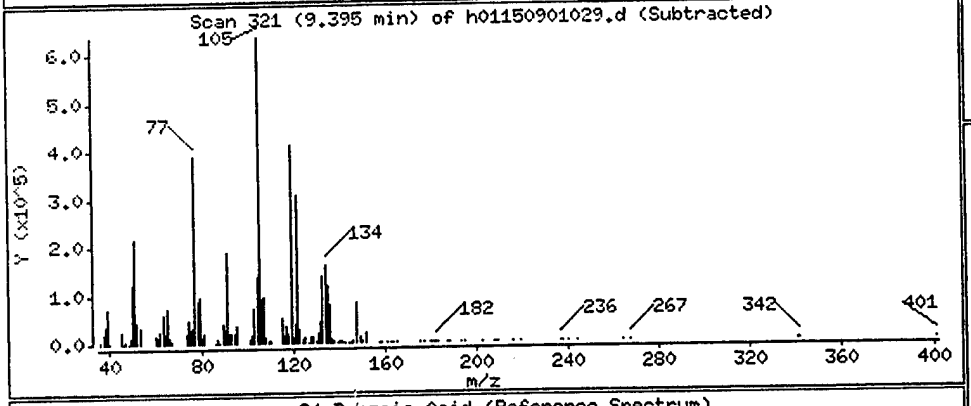
Column diameter: 2.00

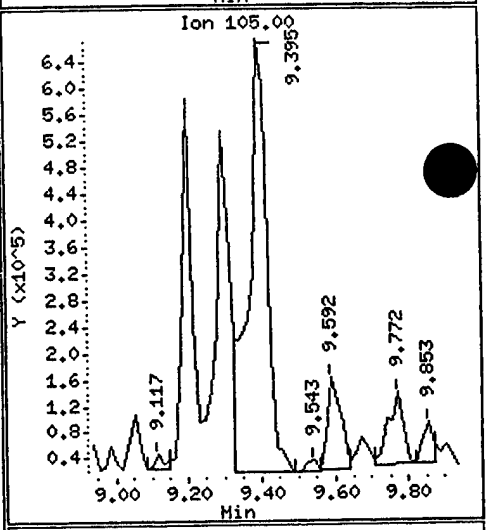
24 Benzoic Acid

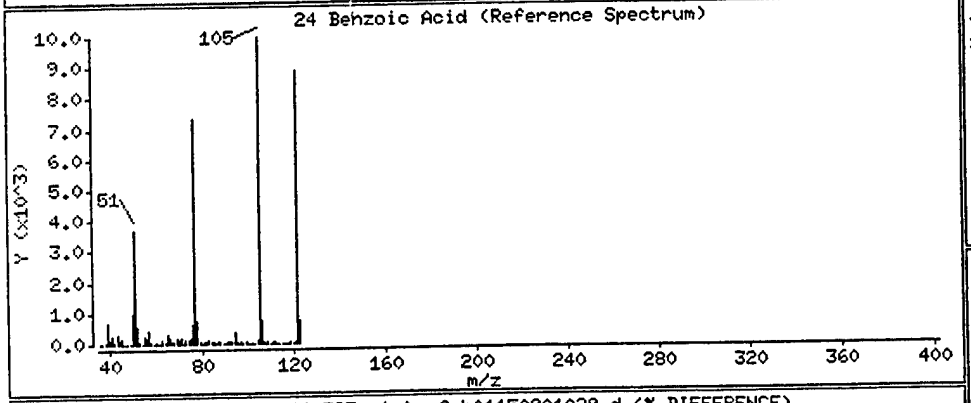
Concentration: 195 ug

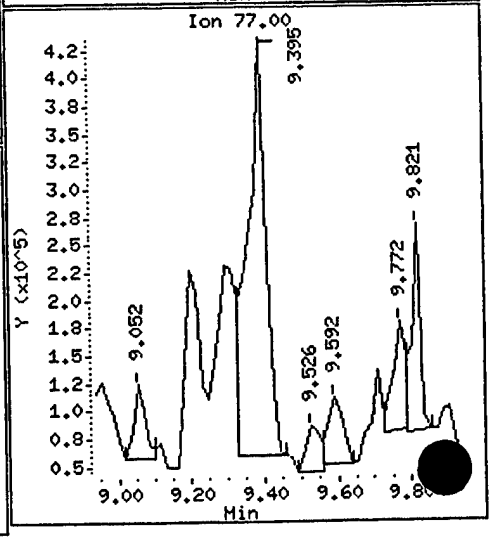


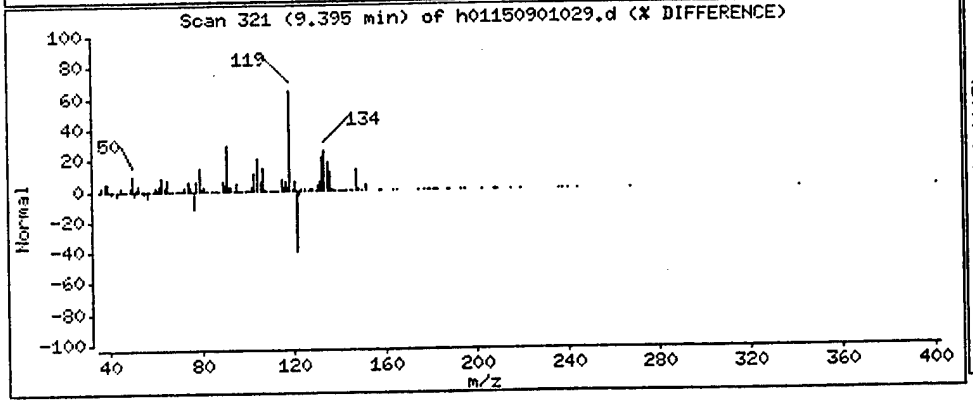












Data File: /chem/msdh.i/h-15Jan98.b/h01150901029.d

Date : 16-JAN-1998 00:45

Client ID: AF-B-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-06A 1:5

Volume Injected (uL): 1.0

Operator: jgh

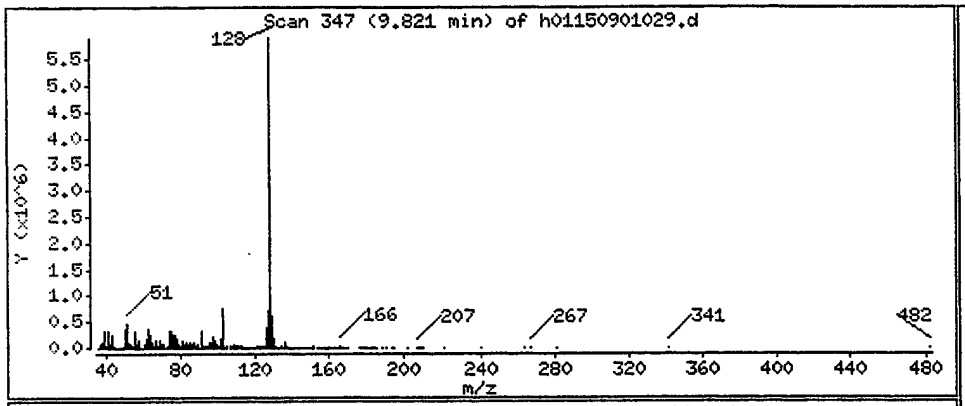
Column phase:

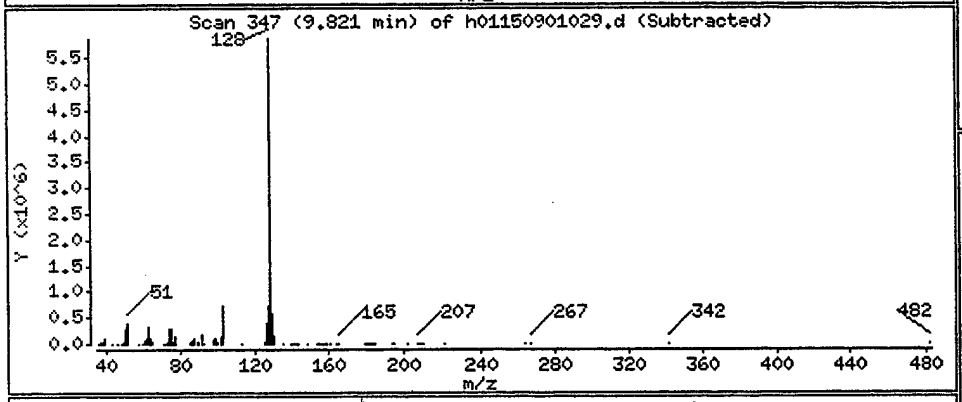
Column diameter: 2.00

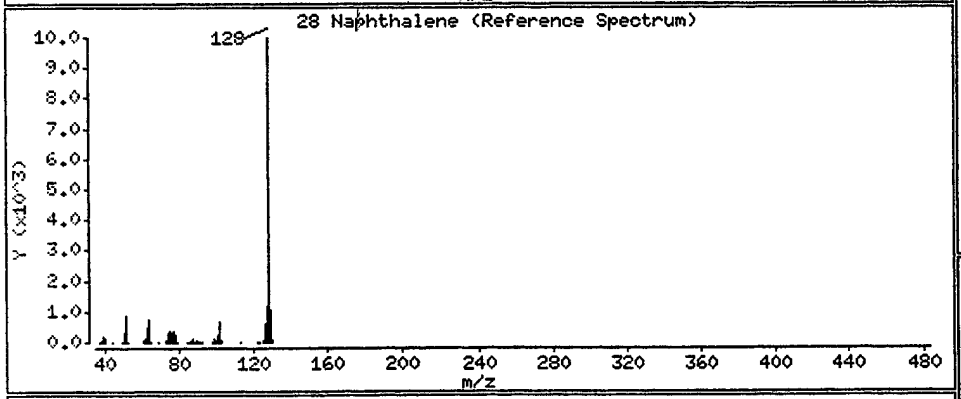
28 Naphthalene

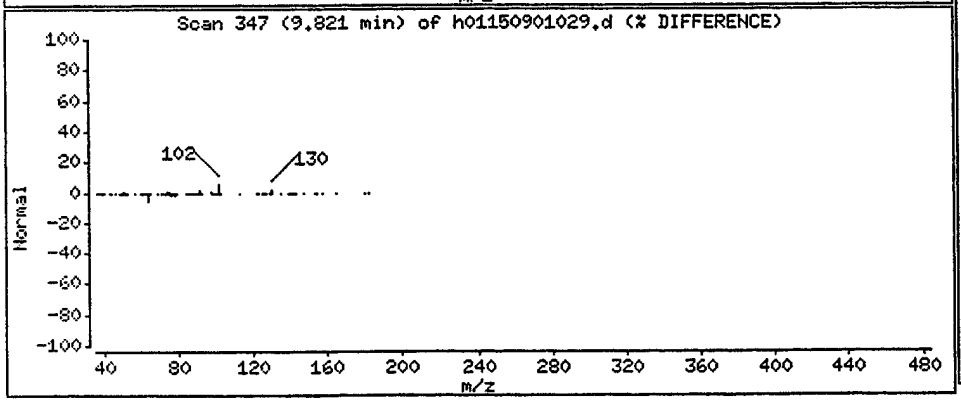
Concentration: 208 ug

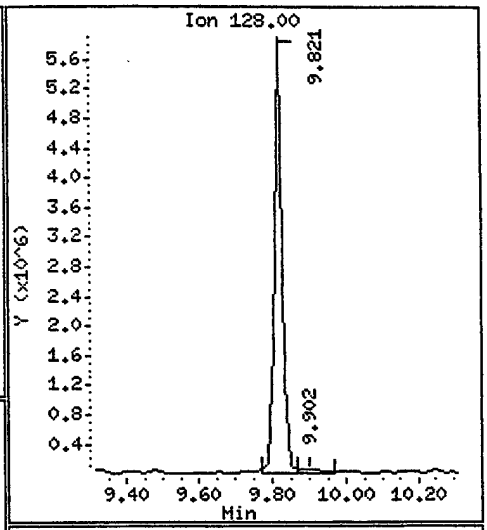
216

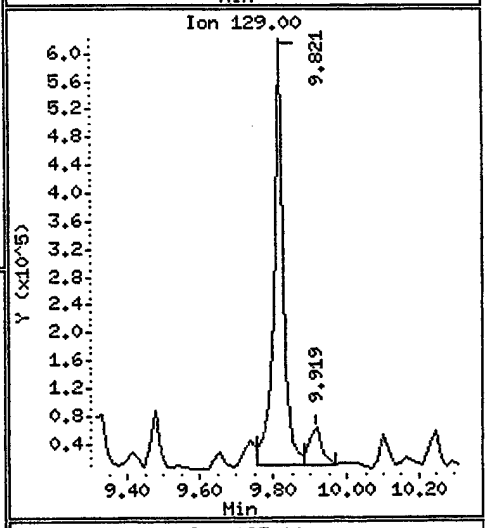


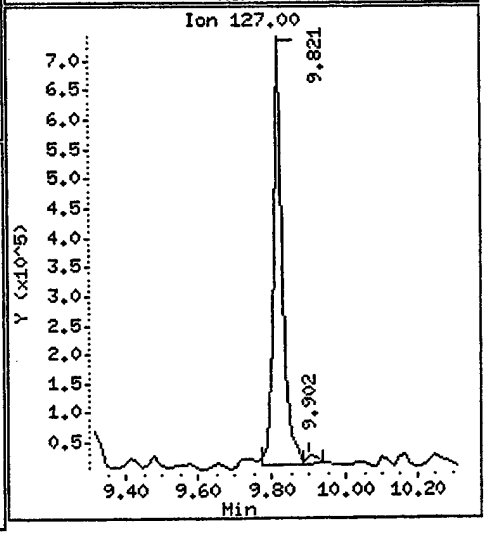












Data File: /chem/msdh.i/h-15Jan98.b/h01150901029.d

Date : 16-JAN-1998 00:45

Client ID: AF-B-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-06A 1:5

Volume Injected (uL): 1.0

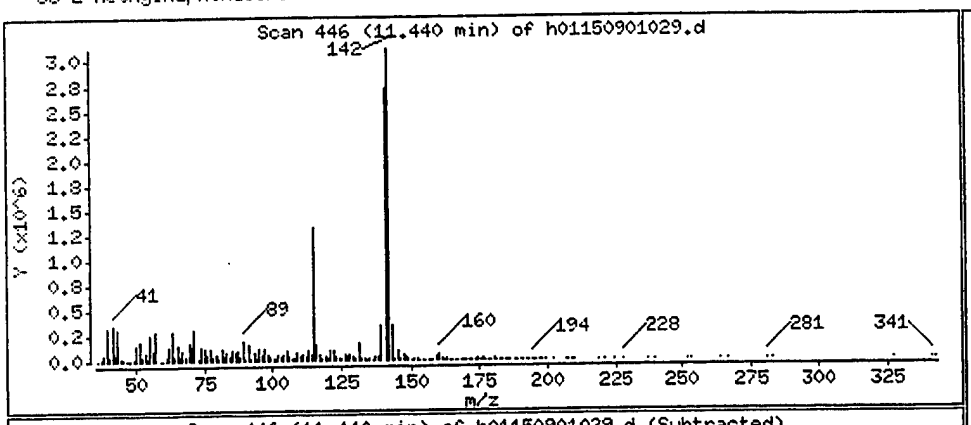
Operator: jgh

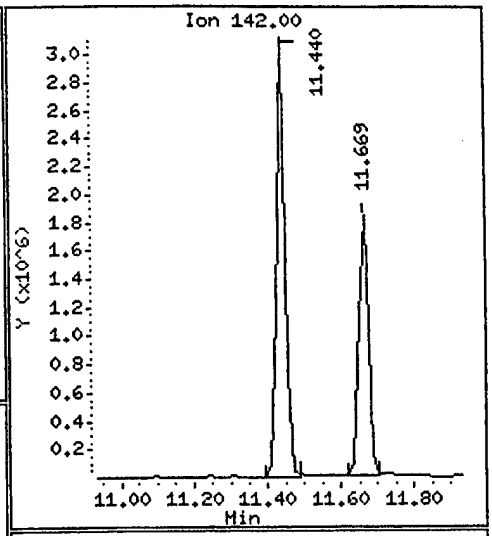
Column phase:

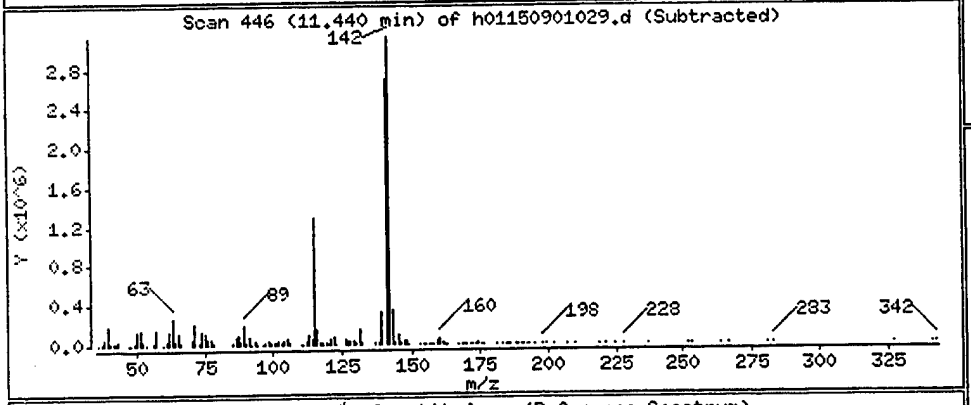
Column diameter: 2.00

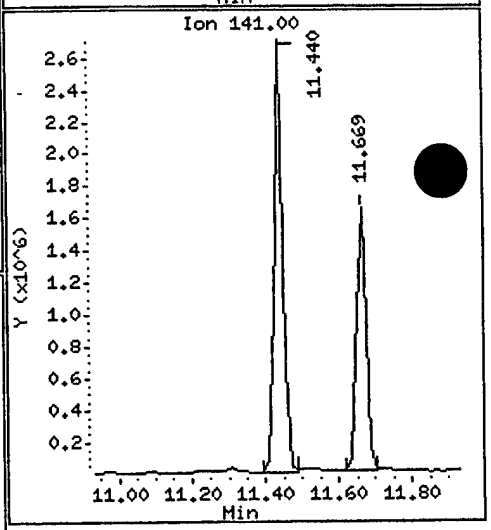
33 2-Methylnaphthalene

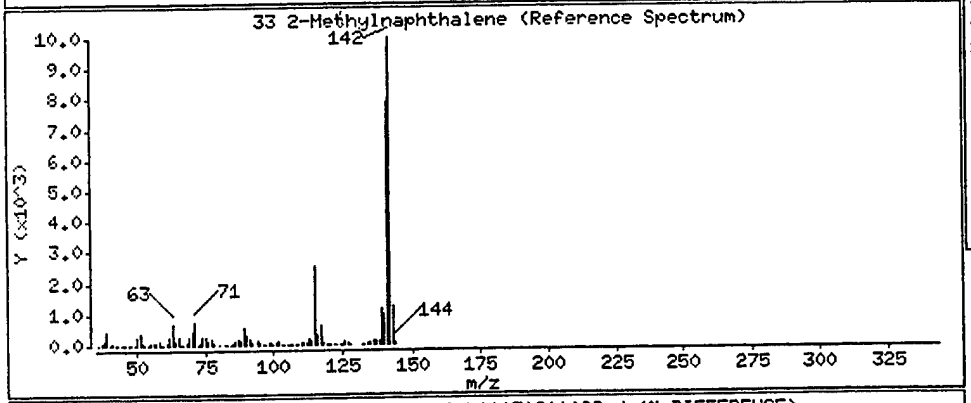
Concentration: 186 ug

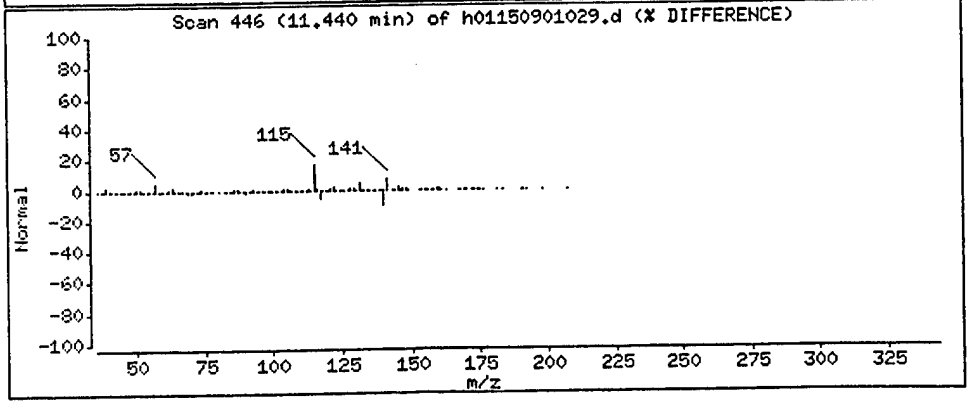












Data File: /chem/msdh.i/h-15Jan98.b/h01150901029.d

Date : 16-JAN-1998 00:45

Client ID: AF-B-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-06A 1:5

Volume Injected (uL): 1.0

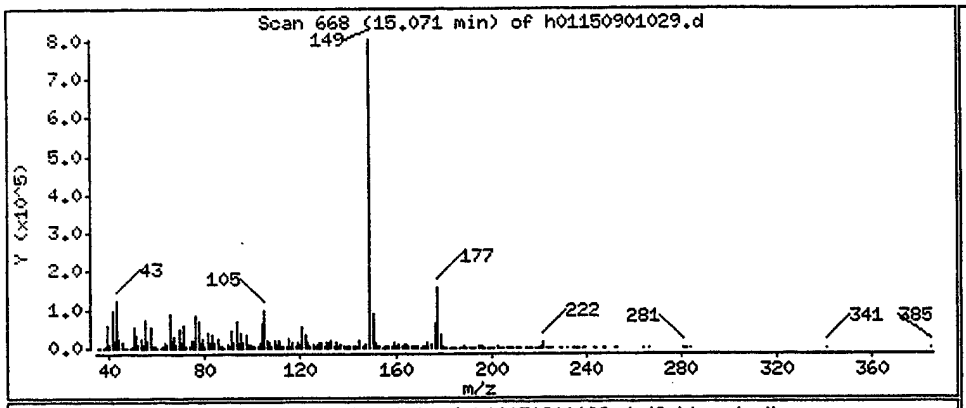
Operator: jgh

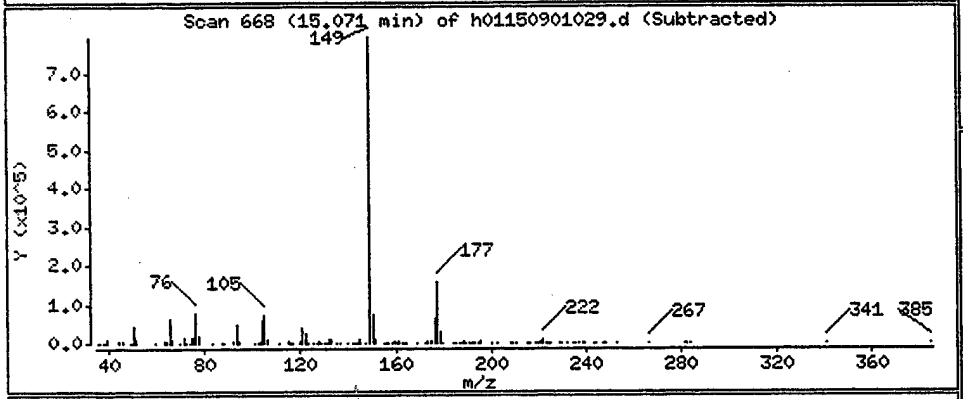
Column phase:

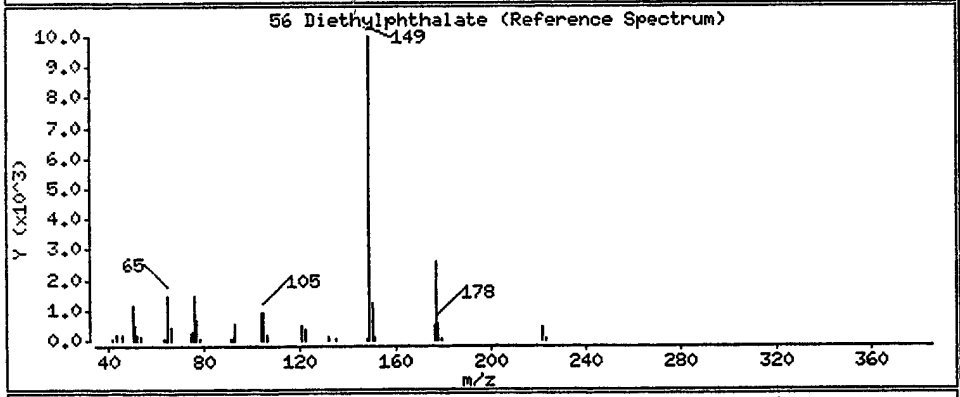
Column diameter: 2.00

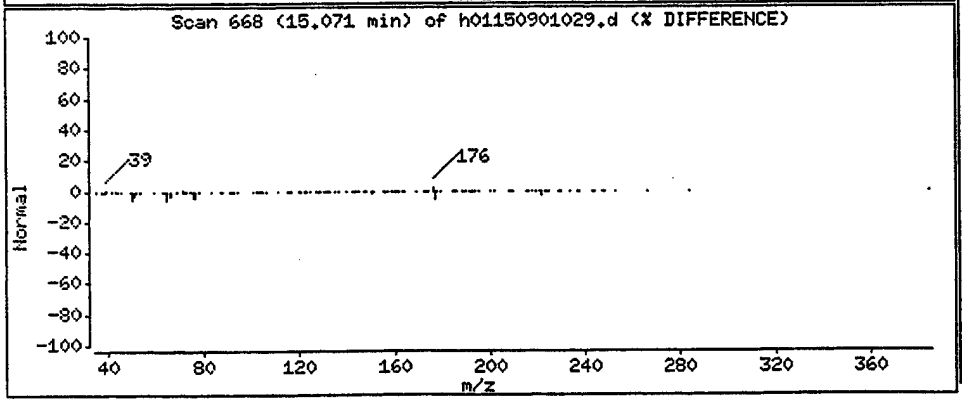
56 Diethylphthalate

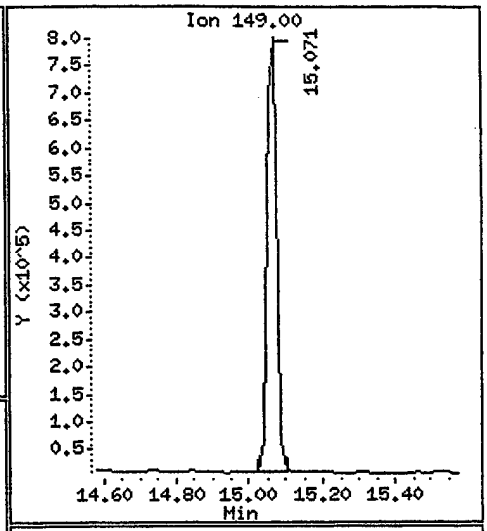
Concentration: 57.6 ug

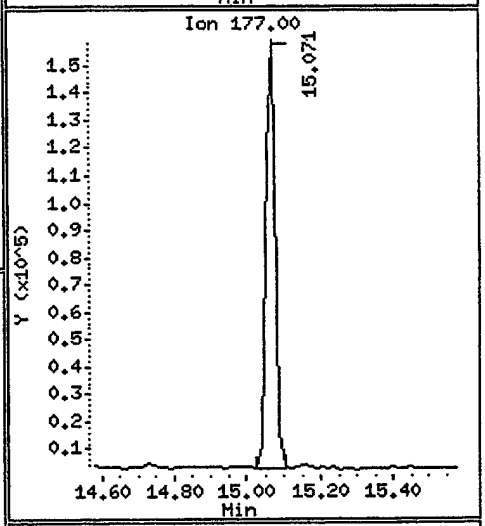


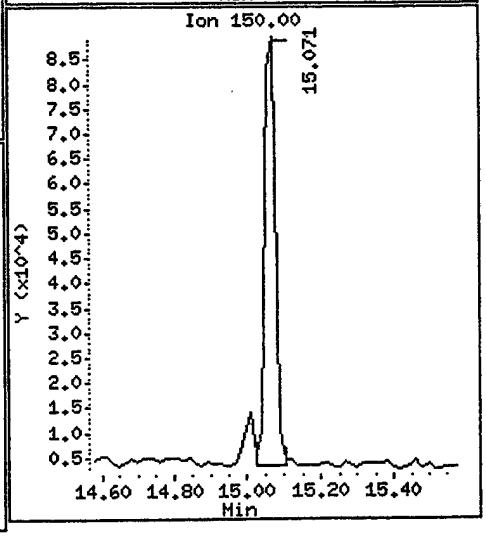












Data File: /chem/msdh.i/h-15Jan98.b/h01150901029.d

Date : 16-JAN-1998 00:45

Client ID: AF-B-EF404-PAH

Instrument: msdh.i

Sample Info: 9712088A-06A 1:5

Volume Injected (uL): 1.0

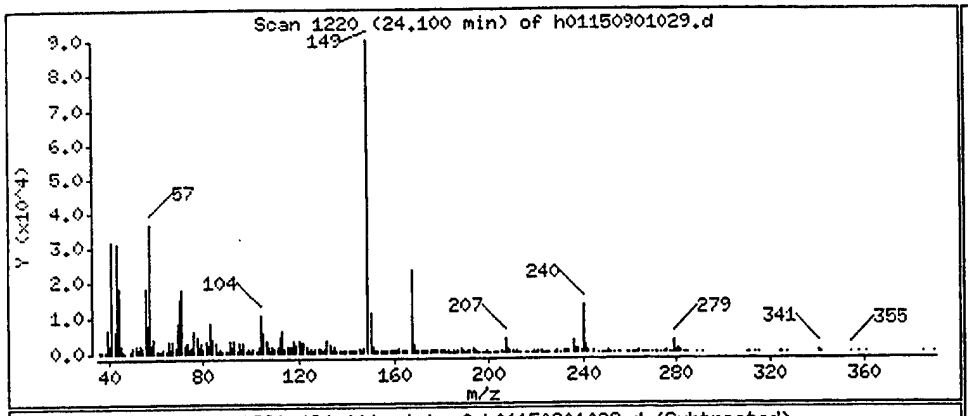
Operator: jgh

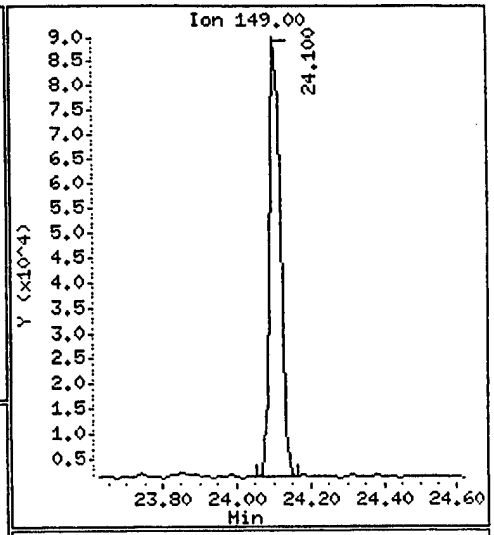
Column phase:

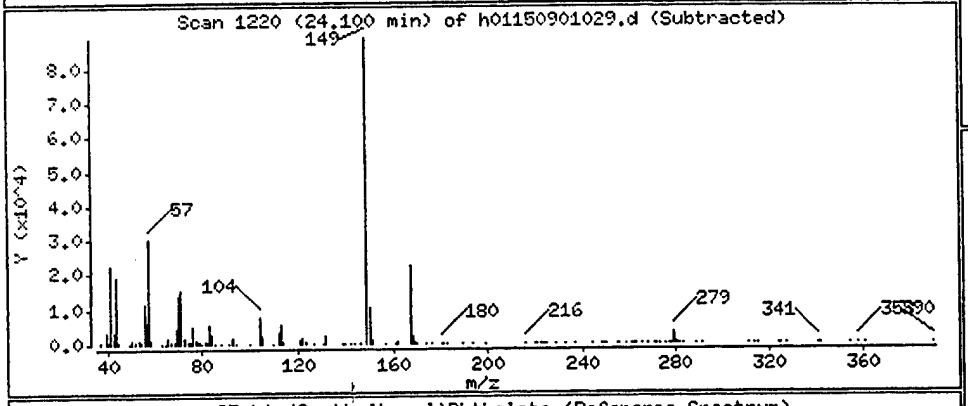
Column diameter: 2.00

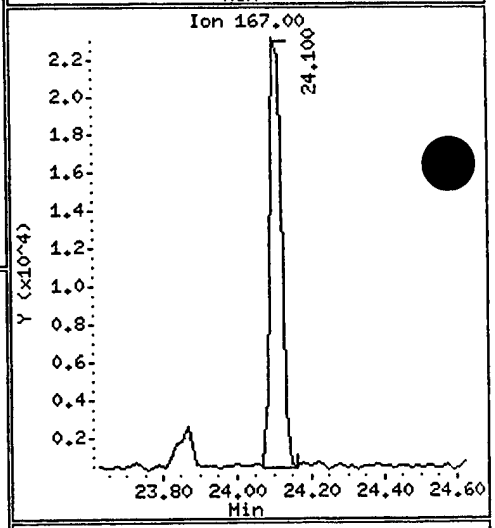
93 bis(2-ethylhexyl)Phthalate

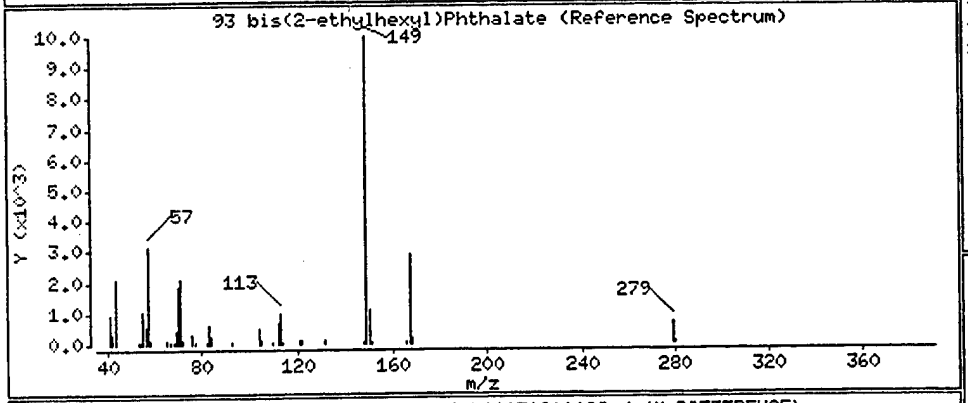
Concentration: 7.1 ug

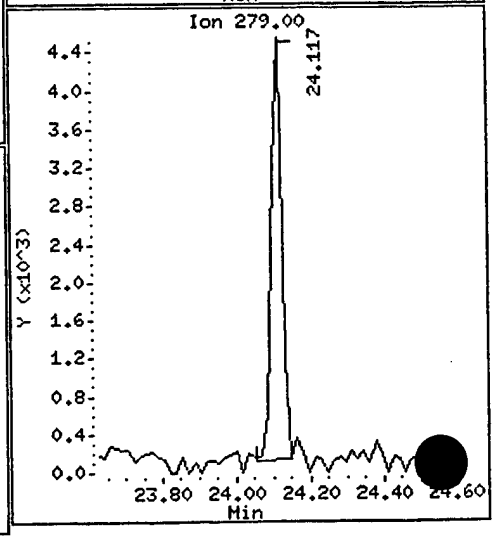


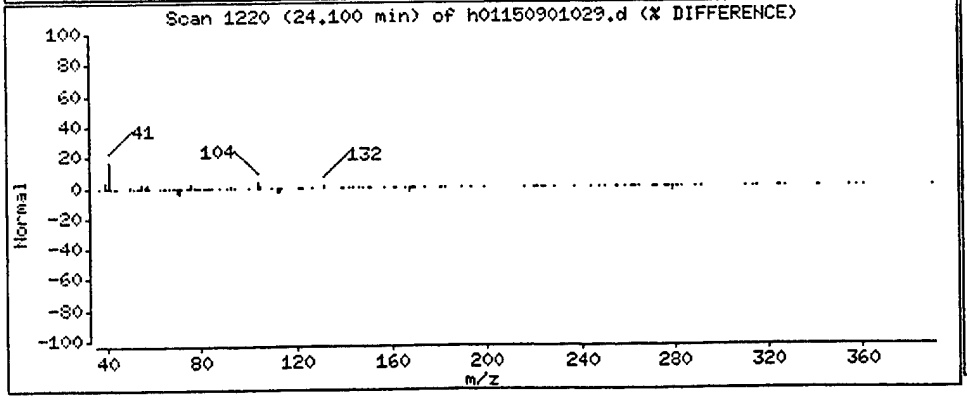












Audit History For: /chem/msdh.i/h-15Jan98.b/h01150901029.d

Change Date: 16-Jan-1998 01:34
Change Made by: Automation

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 09:10
Change Made by: kbadal

Parameter: Sample Prep. Date
Old Value:
New Value: 08-DEC-1997 17:30
Reason For Change: N/A

Change Date: 22-Jan-1998 09:15
Change Made by: kbadal

Parameter: Misc Information
Old Value:
New Value: 80 ng ISTD #267-91-1
Reason For Change: N/A

Change Date: 22-Jan-1998 09:15
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: 8270.sub
New Value: MM5.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:15
Change Made by: kbadal

Parameter: Lab ID
Old Value:
New Value: 9712008A-06A
Reason For Change: N/A

Change Date: 22-Jan-1998 09:15
Change Made by: kbadal

Parameter: Client ID
Old Value:
New Value: AF-B-EF404-PAH
Reason For Change: N/A

Change Date: 22-Jan-1998 09:20
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 13:02
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: MM5.sub
New Value: 8270.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 13:02
Change Made by: kbadal

Parameter: Sample Info
Old Value: 9712088a-06a 1:5
New Value: 9712088A-06A 1:5
Reason For Change: N/A

Change Date: 22-Jan-1998 12:56
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethyl)ether changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 12:56
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 12:56
Change Made by: kbadal

Parameter: Best Hit for Benzyl Alcohol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 12:56
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 12:57
Change Made by: kbadal

Parameter: Best Hit for 2-Methylphenol changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 12:57
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 12:57
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroisopropyl)ether changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 12:57
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 12:57
Change Made by: kbadal

Parameter: Best Hit for N-Nitrosodipropylamine changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 12:57
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 12:57
Change Made by: kbadal

Parameter: Best Hit for Nitrobenzene changed
Old Value: Old Hit #5
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 12:57
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 12:57
Change Made by: kbadal

Parameter: Best Hit for Isophorone changed
Old Value: Old Hit #4
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 12:57
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 12:58
Change Made by: kbadal

Parameter: Best Hit for 2-Nitrophenol changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 12:58
Change Made by: kbadal

Parameter: Requantitate all compounds

Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 12:58
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dimethylphenol changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 12:58
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 12:58
Change Made by: kbadal

Parameter: Best Hit for bis(2-Chloroethoxy)methane changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 12:58
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 12:59
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dichlorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 12:59
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:00
Change Made by: kbadal

Parameter: Best Hit for 4-Chloroaniline changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:00
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:

Reason For Change: N/A

Change Date: 22-Jan-1998 13:00
Change Made by: kbadal

Parameter: Best Hit for 4-Chloro-3-Methylphenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:00
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:00
Change Made by: kbadal

Parameter: Best Hit for 2-Chloronaphthalene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:00
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:00
Change Made by: kbadal

Parameter: Best Hit for 2-Nitroaniline changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:00
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:00
Change Made by: kbadal

Parameter: Best Hit for 3-Nitroaniline changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:00
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Best Hit for 2,6-Dinitrotoluene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Best Hit for Acenaphthylene changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Best Hit for Acenaphthene changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Best Hit for 4-Nitrophenol changed
Old Value: Old Hit #3
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Best Hit for Dibenzofuran changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dinitrotoluene changed
Old Value: Old Hit #2
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Best Hit for N-nitrosodiphenylamine changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Best Hit for Di-n-butylphthalate changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:01
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:02
Change Made by: kbadal

Parameter: Requantitate all compounds

Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:06
Change Made by: kbadal

Parameter: Best Hit for 2-Fluorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:06
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:21
Change Made by: kbadal

Parameter: Best Hit for 2-Fluorophenol changed
Old Value: Compound Undetected
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 13:21
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 27-Jan-1998 15:52
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

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Air Toxics Limited

INITIAL CALIBRATION DATA

Start Cal Date : 09-JAN-1998 00:49
End Cal Date : 09-JAN-1998 05:04
Quant Method : ISTD
Origin : Disabled
Target Version : 3.40
Integrator : HP RTE
Method file : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Cal Date : 29-Jan-1998 16:36 jheffel
Curve Type : Average

1-30-98
1.30.98

Calibration File Names:
Level 1: /chem/msdh.i/h-08Jan98.b/h01080301007.d
Level 2: /chem/msdh.i/h-08Jan98.b/h01080401008.d
Level 3: /chem/msdh.i/h-08Jan98.b/h01080501009.d
Level 4: /chem/msdh.i/h-08Jan98.b/h01080601010.d
Level 5: /chem/msdh.i/h-08Jan98.b/h01080701011.d
Level 6: /chem/msdh.i/h-08Jan98.b/h01080801012.d
Level 7: /chem/msdh.i/h-08Jan98.b/h01080901013.d

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD	
	160.000 Level 7								
136 1-Chloro-3,4-Dinitrobenzene	0.05479	0.10366	0.13211	0.12793	0.11731	0.12077			
	0.12249						0.11129	23.808	
133 4,4'-DDE	+++++	+++++	+++++	+++++	+++++	+++++			
	+++++						+++++	+++++	<-
3 Phenol	0.90643	1.02716	1.03407	1.01690	0.91213	0.88196			
	0.79824						0.93956	9.492	
4 bis(2-Chloroethyl)ether	0.80426	0.87773	0.90173	0.82522	0.77643	0.72135			
	0.66114						0.79541	10.633	
5 2-Chlorophenol	0.62682	0.74071	0.77163	0.75574	0.68419	0.66525			
	0.65005						0.69920	8.090	
6 1,3-Dichlorobenzene	0.81559	0.86692	0.88496	0.83119	0.76560	0.74286			
	0.68472						0.79883	8.946	
8 1,4-Dichlorobenzene	0.84116	0.89405	0.87695	0.82170	0.76248	0.73612			
	0.68843						0.80299	9.485	

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Air Toxics Limited

INITIAL CALIBRATION DATA

Start Cal Date : 09-JAN-1998 00:49
End Cal Date : 09-JAN-1998 05:04
Quant Method : ISTD
Origin : Disabled
Target Version : 3.40
Integrator : HP RTE
Method file : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Cal Date : 29-Jan-1998 16:36 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD
	160.000 Level 7							
9 1,2-Dichlorobenzene	0.74767	0.81419	0.85322	0.78816	0.74414	0.68264		
	0.64557						0.75366	9.632
10 2-Methylphenol	0.60061	0.70039	0.74167	0.66930	0.61701	0.59434		
	0.55441						0.63968	10.357
11 bis(2-Chloroisopropyl)ether(1)	1.38204	1.48762	1.54504	1.48352	1.32060	1.26792		
	1.16811						1.37926	9.840
(2)	0.19990	0.22172	0.22923	0.22174	0.19854	0.19192		
	0.17966						0.20610	8.900
12 4-Methylphenol	0.60948	0.69893	0.75089	0.66020	0.64594	0.63191		
	0.60701						0.65777	7.872
13 N-Nitrosodipropylamine	0.48866	0.59452	0.61897	0.56759	0.55316	0.51925		
	0.47720						0.54562	9.736
14 Hexachloroethane	0.31953	0.36646	0.38356	0.35150	0.33456	0.31076		
	0.28662						0.33614	10.000
16 Nitrobenzene	0.38508	0.43169	0.46536	0.45603	0.43207	0.41772		
	0.37824						0.42374	7.773
17 Isophorone	0.73323	0.88952	1.03591	0.93916	0.85348	0.85156		
	0.84268						0.87794	10.636
18 2,4-Dimethylphenol	0.25145	0.28337	0.31211	0.27992	0.26213	0.25050		
	0.24167						0.26874	9.151

Air Toxics Limited

INITIAL CALIBRATION DATA

Start Cal Date : 09-JAN-1998 00:49
End Cal Date : 09-JAN-1998 05:04
Quant Method : ISTD
Origin : Disabled
Target Version : 3.40
Integrator : HP RTE
Method file : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Cal Date : 29-Jan-1998 16:36 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD
	160.000 Level 7							
19 2-Nitrophenol	0.12726	0.19649	0.29541	0.23712	0.22386	0.21434		
	0.21893						0.21620	23.189
20 Benzoic Acid	+++++	+++++	0.14249	0.18205	0.20239	0.22091		
	0.22788						0.19514	17.624
21 bis(2-Chloroethoxy)methane	0.42827	0.51021	0.54814	0.50500	0.45455	0.43837		
	0.42273						0.47247	10.267
22 2,4-Dichlorophenol	0.24089	0.28141	0.33757	0.31379	0.30073	0.30110		
	0.28913						0.29495	10.155
23 1,2,4-Trichlorobenzene	0.33703	0.34441	0.39705	0.36884	0.34868	0.34823		
	0.31895						0.35188	7.069
25 Naphthalene	0.98666	1.04800	1.19159	1.06729	0.86776	0.68009		
	+++++						0.97357	18.337
26 4-Chloroaniline	0.25426	0.30269	0.27889	0.20682	0.17521	0.18633		
	0.20212						0.22947	21.412
27 Hexachlorobutadiene	0.16350	0.16815	0.19445	0.19113	0.17819	0.16592		
	0.15622						0.17394	8.314
28 4-Chloro-3-Methylphenol	0.22318	0.27554	0.33850	0.30515	0.28110	0.29597		
	0.26047						0.28284	12.816
29 2-Methylnaphthalene	0.59398	0.64928	0.71380	0.67660	0.60758	0.55722		
	0.51354						0.61600	11.257

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Air Toxics Limited

INITIAL CALIBRATION DATA

Start Cal Date : 09-JAN-1998 00:49
End Cal Date : 09-JAN-1998 05:04
Quant Method : ISTD
Origin : Disabled
Target Version : 3.40
Integrator : HP RTE
Method file : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Cal Date : 29-Jan-1998 16:36 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD
	160.000 Level 7							
30 Hexachlorocyclopentadiene	+++++	0.20433	0.25360	0.28406	0.31277	0.32025		
	0.29655						0.27860	15.560
31 2,4,6-Trichlorophenol	0.21933	0.31918	0.34445	0.36661	0.39248	0.36650		
	0.35433						0.33755	16.821
32 2,4,5-Trichlorophenol	0.21147	0.31464	0.34743	0.36939	0.39599	0.39936		
	0.35878						0.34244	18.870
34 2-Chloronaphthalene	0.83780	0.95082	1.04516	0.99744	1.04145	0.96549		
	0.87788						0.95943	8.193
35 2-Nitroaniline	0.15989	0.28118	0.33152	0.34069	0.35456	0.37177		
	0.36542						0.31501	23.709
36 Dimethylphthalate	1.01433	1.24274	1.32026	1.27935	1.31609	1.24707		
	1.17855						1.22834	8.640
37 2,6-Dinitrotoluene	0.16044	0.26939	0.30689	0.30545	0.33912	0.33181		
	0.29110						0.28631	21.054
38 Acenaphthylene	1.31444	1.67171	1.67846	1.65996	1.59385	1.38400		
	1.09893						1.48591	15.126
39 3-Nitroaniline	0.15894	0.29775	0.35170	0.37232	0.38765	0.38689		
	0.37945						0.33353	24.929
41 Acenaphthene	0.79456	0.91869	0.96760	0.88077	0.90860	0.88643		
	0.78096						0.87680	7.660

Air Toxics Limited

INITIAL CALIBRATION DATA

Start Cal Date : 09-JAN-1998 00:49
End Cal Date : 09-JAN-1998 05:04
Quant Method : ISTD
Origin : Disabled
Target Version : 3.40
Integrator : HP RTE
Method file : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Cal Date : 29-Jan-1998 16:36 jheffel
Curve Type : Average

Compound	1.000 Level 1 / 160.000 Level 7	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD	
42 2,4-Dinitrophenol	+++++ / 0.21417	+++++	0.07859	0.11989	0.17391	0.19958	0.15723	36.109	<-
43 4-Nitrophenol	+++++ / 0.13436	0.06779	0.08959	0.10365	0.11770	0.12171	0.10580	22.852	
44 2,4-Dinitrotoluene	0.16511 / 0.35188	0.32145	0.37801	0.38662	0.39182	0.38504	0.33999	23.836	
45 Dibenzofuran	1.25626 / 1.05595	1.35222	1.45446	1.47816	1.48063	1.28352	1.33732	11.542	
46 Diethylphthalate	1.04356 / 0.95960	1.26765	1.33282	1.33028	1.42120	1.21193	1.22386	13.613	
47 4-Chlorophenyl phenyl ether	0.43484 / 0.41742	0.51950	0.53914	0.56039	0.54342	0.51985	0.50494	11.066	
48 4-Nitroaniline	0.08792 / 0.08023	0.12364	0.11995	0.12765	0.10526	0.08907	0.10482	18.445	
49 Fluorene	0.92261 / 0.87450	1.07427	1.13566	1.11416	1.12407	1.04558	1.04155	9.922	
50 4,6-Dinitro-2-methylphenol	+++++ / 0.16406	0.06138	0.11433	0.14301	0.15534	0.15920	0.13289	29.586	
51 N-nitrosodiphenylamine	0.30900 / 0.32729	0.39323	0.47285	0.42682	0.37971	0.34754	0.37949	15.160	

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Air Toxics Limited

INITIAL CALIBRATION DATA

Start Cal Date : 09-JAN-1998 00:49
End Cal Date : 09-JAN-1998 05:04
Quant Method : ISTD
Origin : Disabled
Target Version : 3.40
Integrator : HP RTE
Method file : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Cal Date : 29-Jan-1998 16:36 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD
	160.000 Level 7							
53 4-Bromophenyl phenyl ether	0.13752	0.16861	0.19564	0.19335	0.17810	0.17146		
	0.15416						0.17126	12.077
54 Hexachlorobenzene	0.20733	0.22473	0.25725	0.25085	0.22447	0.20951		
	0.20091						0.22501	9.671
55 Pentachlorophenol	+++++	0.08515	0.12990	0.14594	0.14750	0.14527		
	0.14268						0.13274	18.209
57 Phenanthrene	0.80135	0.88743	1.06229	1.02134	0.83576	0.73801		
	0.58972						0.84798	19.176
58 Anthracene	0.68894	0.84280	1.00523	1.01506	0.86785	0.68920		
	0.62974						0.81983	19.005
59 Di-n-butylphthalate	0.92083	1.25889	1.46975	1.38811	1.06447	0.72282		
	0.65724						1.06887	29.827
60 Fluoranthene	0.64290	0.84724	1.00725	0.99791	0.86552	0.76992		
	0.66108						0.82740	17.672
61 Pyrene	1.07941	1.28536	1.22227	1.23174	1.22270	1.03117		
	0.95684						1.14707	10.787
63 3 3'-Dichlorobenzidine	0.21527	0.16622	0.12850	0.12837	0.17028	0.16229		
	0.14718						0.15973	18.714
64 Butyl benzyl phthalate	0.52234	0.70923	0.67327	0.70888	0.70193	0.70881		
	0.66190						0.66948	10.104

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Air Toxics Limited

INITIAL CALIBRATION DATA

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End Cal Date : 09-JAN-1998 05:04
Quant Method : ISTD
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Target Version : 3.40
Integrator : HP RTE
Method file : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Cal Date : 29-Jan-1998 16:36 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD
	160.000 Level 7							
65 bis(2-ethylhexyl)Phthalate	0.98118	1.03886	0.96382	0.98993	0.95592	0.86453		
	0.71123						0.92935	11.789
66 Benzo(a)Anthracene	0.97595	0.86662	0.86281	0.87782	0.93498	0.93787		
	0.87778						0.90483	4.890
68 Chrysene	0.73900	0.79859	0.79601	0.85145	0.89015	0.79538		
	0.76641						0.80528	6.305
69 Di-n-octyl phthalate	2.38129	2.09780	2.14726	2.11923	1.74784	1.29360		
	1.14079						1.84683	25.469
70 Benzo(b)fluoranthene	1.08115	0.95158	0.99704	1.05191	1.14008	1.17261		
	1.25708						1.09306	9.632
71 Benzo(k)fluoranthene	1.30792	0.91529	1.00148	0.98537	1.06045	1.14526		
	0.99226						1.05829	12.395
73 Indeno(1,2,3-cd)pyrene	0.74059	0.57913	0.60911	0.65122	0.70692	0.71920		
	0.67894						0.66930	8.873
74 Benzo(a)pyrene	0.97004	0.79917	0.80421	0.84549	0.90627	0.92875		
	0.88803						0.87742	7.307
75 Dibenzo(a,h)anthracene	0.59882	0.52940	0.53267	0.57093	0.61417	0.61921		
	0.58909						0.57918	6.312
76 Benzo(g,h,i)perylene	0.77256	0.64722	0.64021	0.65277	0.66563	0.67552		
	0.62003						0.66771	7.421

Air Toxics Limited

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Integrator : HP RTE
Method file : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Cal Date : 29-Jan-1998 16:36 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	160.000 Level 7	___ RRF	% RSD	
77 N-nitrosodimethylamine	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
78 3-Methylphenol	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
79 Cumene	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
80 3,3'-Dimethoxybenzidine	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
81 Bicyclo[2.2.1]hepta-2,5-diene	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
82 Dicyclopentadiene	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
84 Benzo(e)pyrene	1.06408	0.86350	0.89977	0.90587	0.97673	1.01534	0.98089	0.95802	7.437	
112 Biphenyl	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
118 Diethyl Ether	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
113 Aniline	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-

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Air Toxics Limited

INITIAL CALIBRATION DATA

Start Cal Date : 09-JAN-1998 00:49
End Cal Date : 09-JAN-1998 05:04
Quant Method : ISTD
Origin : Disabled
Target Version : 3.40
Integrator : HP RTE
Method file : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Cal Date : 29-Jan-1998 16:36 jheffel
Curve Type : Average

Compound	1.000 Level 1 / 160.000 Level 7	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD	
114 2-Methyl-benzenamine	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
115 N,N-Dimethyl-benzenamine	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
116 2,4-Dimethylbenzenamine	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
117 N,N,4-Trimethylbenzenamine	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
124 Benzyl Alcohol	0.41561 / 0.41600	0.48659	0.51457	0.48501	0.44728	0.43668	0.45739	8.408	
125 Lindane	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
126 Dieldrin	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
127 4,4'-DDD	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
128 4,4'-DDT	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
$ 1 2-Fluorophenol	0.76570 / 0.73549	0.84736	0.86289	0.86378	0.80512	0.76301	0.80619	6.550	

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Air Toxics Limited

INITIAL CALIBRATION DATA

Start Cal Date : 09-JAN-1998 00:49
End Cal Date : 09-JAN-1998 05:04
Quant Method : ISTD
Origin : Disabled
Target Version : 3.40
Integrator : HP RTE
Method file : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Cal Date : 29-Jan-1998 16:36 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD	
	160.000 Level 7								
$ 129 d4-2,4-dichlorophenol	+++++	+++++	+++++	+++++	+++++	+++++			
	+++++						+++++	+++++	<-
$ 135 13C-Phenol	+++++	+++++	+++++	+++++	+++++	+++++			
	+++++						+++++	+++++	<-
$ 2 Phenol-d5	0.43283	0.48670	0.56155	0.51301	0.45801	0.47320			
	0.43676						0.48030	9.468	
$ 15 Nitrobenzene-d5	0.59427	0.68376	0.73023	0.74141	0.75542	0.74172			
	0.73261						0.71134	7.920	
$ 33 2-Fluorobiphenyl	0.65948	0.73088	0.82564	0.79567	0.69450	0.59611			
	0.51018						0.68749	16.076	
$ 52 2,4,6-Tribromophenol	+++++	0.15474	0.15779	0.16168	0.17417	0.17177			
	0.16812						0.16471	4.762	
$ 62 Terphenyl-d14	0.67423	0.85042	0.81407	0.85979	0.84750	0.76647			
	0.76303						0.79650	8.390	
$ 83 1-Methylnaphthalene-d10	0.53374	0.55808	0.63138	0.58058	0.51829	0.48852			
	0.48732						0.54256	9.581	
$ 123 Benzo(e)pyrene-d12	+++++	+++++	+++++	+++++	+++++	+++++			
	+++++						+++++	+++++	<-
$ 119 Fluoranthene-d10	+++++	+++++	+++++	+++++	+++++	+++++			
	+++++						+++++	+++++	<-

Air Toxics Limited

INITIAL CALIBRATION DATA

Start Cal Date : 09-JAN-1998 00:49
End Cal Date : 09-JAN-1998 05:04
Quant Method : ISTD
Origin : Disabled
Target Version : 3.40
Integrator : HP RTE
Method file : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Cal Date : 29-Jan-1998 16:36 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	160.000 Level 7	___ RRF	% RSD	
$ 120 Benzo(a)pyrene-d12	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
$ 130 13c-Pentachlorophenol	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
$ 131 d10-Anthracene	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-
$ 132 d12-Benzo(a)pyrene	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	+++++	<-

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080301007.d
Lab Smp Id:
Inj Date : 09-JAN-1998 00:49
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 1ug STD 396-4-1
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

1-13-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
c	1 2-Fluorophenol	112	5.379	5.397	(0.681)	60838	0.94977	0.95(R)
c	2 Phenol-d5	99	7.064	7.114	(0.659)	67877	0.90117	0.90(R)
	3 Phenol	94	7.097	7.147	(0.899)	72020	0.96474	0.96(a)
	4 bis(2-Chloroethyl)ether	93	7.326	7.376	(0.928)	63902	1.01113	1.0
	5 2-Chlorophenol	128	7.440	7.474	(0.942)	49804	0.89649	0.90(a)
	6 1,3-Dichlorobenzene	146	7.767	7.785	(0.983)	64802	1.02097	1.0
*	7 1,4-Dichlorobenzene-d4	150	7.898	7.899	(1.000)	6356356	80.0000	
	8 1,4-Dichlorobenzene	146	7.931	7.948	(1.004)	66834	1.04754	1.0
	9 1,2-Dichlorobenzene	146	8.242	8.259	(1.043)	59406	0.99206	0.99(a)
	10 2-Methylphenol	108	8.373	8.406	(1.060)	47721	0.93893	0.94(a)
	11 bis(2-Chloroisopropyl)ether	45	8.471	8.488	(1.072)	109809	1.00201	1.0
	12 4-Methylphenol	108	8.700	8.783	(1.101)	48426	0.92659	0.93(a)
	13 N-Nitrosodipropylamine	70	8.732	8.832	(1.106)	38826	0.89560	0.90(a)
	14 Hexachloroethane	117	8.978	8.979	(1.137)	25388	0.95058	0.95(a)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
$	15 Nitrobenzene-d5	82	9.060	9.110	(0.608)	60940	0.83542	0.84(R)
	16 Nitrobenzene	77	9.109	9.159	(0.850)	60389	0.90877	0.91(a)
	17 Isophorone	82	9.648	9.715	(0.901)	114986	0.83518	0.84(a)
	18 2,4-Dimethylphenol	122	9.910	9.960	(0.925)	39432	0.93566	0.94(a)
	19 2-Nitrophenol	139	9.812	9.862	(0.916)	19957	0.58861	0.59(a)
	22 bis(2-Chloroethoxy)methane	93	10.156	10.189	(0.948)	67162	0.90646	0.91(a)
	22 2,4-Dichlorophenol	162	10.352	10.402	(0.966)	37776	0.81672	0.82(a)
	23 1,2,4-Trichlorobenzene	180	10.564	10.598	(0.986)	52854	0.95780	0.96(a)
*	24 Naphthalene-d8	136	10.712	10.729	(1.000)	12545673	80.0000	
	25 Naphthalene	128	10.744	10.794	(1.003)	154729	1.07172	1.1
	26 4-Chloroaniline	127	10.875	10.909	(1.015)	39874	1.10803	1.1
	27 Hexachlorobutadiene	225	11.055	11.073	(1.032)	25641	0.94002	0.94(a)
	28 4-Chloro-3-Methylphenol	107	12.020	12.054	(1.122)	35000	0.78907	0.79(a)
	29 2-Methylnaphthalene	142	12.380	12.414	(1.156)	93148	0.96425	0.96
	31 2,4,6-Trichlorophenol	196	13.067	13.084	(0.877)	22491	0.64975	0.65(a)
$	33 2-Fluorobiphenyl	172	13.280	13.313	(0.717)	110591	0.95925	0.96(R)
	34 2-Chloronaphthalene	162	13.541	13.592	(0.909)	85913	0.87323	0.87
	35 2-Nitroaniline	65	13.787	13.853	(0.925)	16396	0.50758	0.51(a)
	36 Dimethylphthalate	163	14.277	14.328	(0.958)	104015	0.82577	0.82(a)
	37 2,6-Dinitrotoluene	165	14.408	14.475	(0.967)	16452	0.56035	0.56(a)
	38 Acenaphthylene	152	14.539	14.589	(0.976)	134790	0.88461	0.88
*	40 Acenaphthene-d10	164	14.899	14.916	(1.000)	8203638	80.0000	
	41 Acenaphthene	154	14.964	15.015	(1.004)	81479	0.90621	0.91
	43 4-Nitrophenol	109	14.899	15.293	(1.000)	14500	1.33651	1.3
	45 Dibenzofuran	168	15.390	15.440	(1.033)	128824	0.93939	0.94(a)
	46 Diethylphthalate	149	16.011	16.061	(1.075)	107012	0.85268	0.85(a)
	47 4-Chlorophenyl phenyl ether	204	16.257	16.290	(1.091)	44591	0.86118	0.86(a)
	48 4-Nitroaniline	138	16.257	16.389	(1.091)	9016	0.83882	0.84(a)
	49 Fluorene	166	16.224	16.274	(1.089)	94609	0.88580	0.88
	51 N-nitrosodiphenylamine	169	16.535	16.585	(0.892)	51817	0.81424	0.81(a)
$	52 2,4,6-Tribromophenol	330	16.813	16.847	(0.673)	10258	0.58456	0.58(R)
	53 4-Bromophenyl phenyl ether	248	17.451	17.485	(0.942)	23062	0.80300	0.80(a)
	54 Hexachlorobenzene	284	17.565	17.599	(0.948)	34768	0.92144	0.92(a)
*	56 Phenanthrene-d10	188	18.530	18.548	(1.000)	13415526	80.0000	
	57 Phenanthrene	178	18.563	18.613	(1.002)	134381	0.94500	0.94
	58 Anthracene	178	18.694	18.744	(1.009)	115531	0.84034	0.84(H)
	59 Di-n-butylphthalate	149	20.035	20.053	(1.081)	154418	0.86150	0.86(a)
	60 Fluoranthene	202	21.458	21.508	(1.158)	107810	0.77701	0.78
	61 Pyrene	202	22.014	22.064	(0.881)	114999	0.94102	0.94
$	62 Terphenyl-d14	244	22.440	22.473	(0.898)	71831	0.84648	0.85(R)
	63 3 3'-Dichlorobenzidine	252	24.910	24.943	(0.997)	22935	1.34773	1.3
	64 Butyl benzyl phthalate	149	23.683	23.717	(0.948)	55649	0.78021	0.78(a)
	65 bis(2-ethylhexyl)Phthalate	149	25.106	25.140	(1.005)	104533	1.05576	1.0
	66 Benzo(a)Anthracene	228	24.942	24.976	(0.999)	103976	1.07860	1.1
*	67 Chrysene-d12	240	24.975	25.009	(1.000)	8523078	80.0000	
	68 Chrysene	228	25.024	25.091	(1.002)	78732	0.91769	0.92(H)
	69 Di-n-octyl phthalate	149	26.611	26.644	(0.939)	163487	1.28939	1.3

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
	70 Benzo(b)fluoranthene	252	27.379	27.446	(0.967)	74226	0.98910	0.99(H)
	71 Benzo(k)fluoranthene	252	27.445	27.511	(0.969)	89795	1.23588	1.2
*	72 Perylene-d12	264	28.328	28.362	(1.000)	5492380	80.0000	
	73 Indeno(1,2,3-cd)pyrene	276	31.469	31.552	(1.111)	50845	1.10651	1.1
	74 Benzo(a)pyrene	252	28.148	28.231	(0.994)	66598	1.10556	1.1
	75 Dibenzo(a,h)anthracene	278	31.550	31.650	(1.114)	41112	1.03391	1.0
	76 Benzo(g,h,i)perylene	276	32.417	32.549	(1.144)	53040	1.15704	1.2
	84 Benzo(e)pyrene	252	28.017	28.067	(0.989)	36527	0.55535	0.56(a)
	32 2,4,5-Trichlorophenol	196	13.133	13.166	(0.881)	21685	0.61753	0.62(aH)
	124 Benzyl Alcohol	108	8.144	8.210	(1.031)	33022	0.90865	0.91(a)
$	83 1-Methylnaphthalene-d10	152	12.527	12.561	(1.169)	83701	0.98374	0.98(aR)
	136 1-Chloro-3,4-Dinitrobenzene	63	15.373	15.718	(1.435)	16665	0.95485	0.95(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.
H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080301007.d
Lab Smp Id:
Inj Date : 09-JAN-1998 00:49
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 1ug STD 396-4-1
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
:	1 2-Fluorophenol	112	5.379	5.397	(0.681)	60838	0.94977	0.95(R)
:	2 Phenol-d5	99	7.064	7.114	(0.659)	67877	0.90117	0.90(R)
	3 Phenol	94	7.097	7.147	(0.899)	71799	0.96178	0.96(a)
	4 bis(2-Chloroethyl)ether	93	7.326	7.376	(0.928)	63902	1.01113	1.0
	5 2-Chlorophenol	128	7.440	7.474	(0.942)	49804	0.89649	0.90(a)
	6 1,3-Dichlorobenzene	146	7.767	7.785	(0.983)	64802	1.02097	1.0
		146	7.931	7.785	(1.004)	65784	1.03644	1.0
*	7 1,4-Dichlorobenzene-d4	150	7.898	7.899	(1.000)	6356356	80.0000	
		150	8.242	7.899	(1.000)	10723	80.0000	
	8 1,4-Dichlorobenzene	146	7.931	7.948	(1.004)	65834	1.03187	1.0
		146	7.767	7.948	(0.983)	65242	1.02259	1.0
	9 1,2-Dichlorobenzene	146	8.242	8.259	(1.043)	59406	0.99206	0.99(a)
		146	7.931	8.259	(1.004)	65546	1.09460	1.1
	10 2-Methylphenol	108	8.373	8.406	(1.060)	47721	0.93893	0.94(a)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
	108	8.144	8.406	(1.031)	33022	0.64972	0.65(a)
	108	8.700	8.406	(1.101)	46957	0.92389	0.92(a)
11 bis(2-Chloroisopropyl)ether	45	8.471	8.488	(1.072)	110733	1.01044	1.0
12 4-Methylphenol	108	8.700	8.783	(1.101)	47615	0.91107	0.91(a)
13 N-Nitrosodipropylamine	70	8.732	8.832	(1.106)	39032	0.90035	0.90(a)
14 Hexachloroethane	117	8.978	8.979	(1.137)	25388	0.95058	0.95(a)
◇ 15 Nitrobenzene-d5	82	9.060	9.110	(0.608)	61066	0.83715	0.84(R)
16 Nitrobenzene	77	9.109	9.159	(0.850)	60437	0.90949	0.91(a)
17 Isophorone	82	9.648	9.715	(0.901)	114986	0.83518	0.84(a)
18 2,4-Dimethylphenol	122	9.910	9.960	(0.925)	39432	0.93566	0.94(a)
19 2-Nitrophenol	139	9.812	9.862	(0.916)	19957	0.58861	0.59(a)
21 bis(2-Chloroethoxy)methane	93	10.156	10.189	(0.948)	67418	0.90991	0.91(a)
22 2,4-Dichlorophenol	162	10.352	10.402	(0.966)	37776	0.81672	0.82(a)
23 1,2,4-Trichlorobenzene	180	10.564	10.598	(0.986)	52854	0.95780	0.96(a)
• 24 Naphthalene-d8	136	10.712	10.729	(1.000)	12545673	80.0000	
	136	10.352	10.729	(1.000)	288	80.0000	
25 Naphthalene	128	10.744	10.794	(1.003)	154729	1.07172	1.1
26 4-Chloroaniline	127	10.875	10.909	(1.015)	39874	1.10803	1.1
	127	10.744	10.909	(1.003)	18098	0.50291	0.50(a)
27 Hexachlorobutadiene	225	11.055	11.073	(1.032)	25641	0.94002	0.94(a)
28 4-Chloro-3-Methylphenol	107	12.020	12.054	(1.122)	35000	0.78907	0.79(a)
29 2-Methylnaphthalene	142	12.380	12.414	(1.156)	93148	0.96425	0.96
31 2,4,6-Trichlorophenol	196	13.067	13.084	(0.877)	22491	0.64975	0.65(a)
	196	13.133	13.084	(0.881)	21685	0.62647	0.63(a)
◇ 33 2-Fluorobiphenyl	172	13.280	13.313	(0.717)	110591	0.95925	0.96(R)
34 2-Chloronaphthalene	162	13.541	13.592	(0.909)	85913	0.87323	0.87
35 2-Nitroaniline	65	13.787	13.853	(0.925)	16372	0.50684	0.51(a)
36 Dimethylphthalate	163	14.277	14.328	(0.958)	104015	0.82577	0.82(a)
37 2,6-Dinitrotoluene	165	14.408	14.475	(0.967)	16452	0.56035	0.56(a)
38 Acenaphthylene	152	14.539	14.589	(0.976)	134790	0.88461	0.88
• 40 Acenaphthene-d10	164	14.899	14.916	(1.000)	8203638	80.0000	
41 Acenaphthene	154	14.964	15.015	(1.004)	81479	0.90621	0.91
43 4-Nitrophenol	109	14.899	15.293	(1.000)	14500	1.33651	1.3
45 Dibenzofuran	168	15.390	15.440	(1.033)	129260	0.94257	0.94(a)
46 Diethylphthalate	149	16.011	16.061	(1.075)	107012	0.85268	0.85(a)
47 4-Chlorophenyl phenyl ether	204	16.257	16.290	(1.091)	44591	0.86118	0.86(a)
48 4-Nitroaniline	138	16.257	16.389	(1.091)	9016	0.83882	0.84(a)
49 Fluorene	166	16.224	16.274	(1.089)	94609	0.88580	0.88
51 N-nitrosodiphenylamine	169	16.535	16.585	(0.892)	51817	0.81424	0.81(a)
◇ 52 2,4,6-Tribromophenol	330	16.813	16.847	(0.673)	10258	0.58456	0.58(R)
53 4-Bromophenyl phenyl ether	248	17.451	17.485	(0.942)	23062	0.80300	0.80(a)
54 Hexachlorobenzene	284	17.565	17.599	(0.948)	34768	0.92144	0.92(a)
• 56 Phenanthrene-d10	188	18.530	18.548	(1.000)	13415526	80.0000	
	188	18.220	18.548	(1.000)	981	80.0000	
57 Phenanthrene	178	18.563	18.613	(1.002)	134652	0.94691	0.95
	178	18.694	18.613	(1.009)	115531	0.81244	0.81
58 Anthracene	178	18.694	18.744	(1.009)	115531	0.84034	0.84

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
		178	18.563	18.744	(1.002)	135061	0.98240	0.98
59	Di-n-butylphthalate	149	20.035	20.053	(1.081)	154418	0.86150	0.86(a)
60	Fluoranthene	202	21.458	21.508	(1.158)	107810	0.77701	0.78
61	Pyrene	202	22.014	22.064	(0.881)	114999	0.94102	0.94
: 62	Terphenyl-d14	244	22.440	22.473	(0.898)	71831	0.84648	0.85(R)
63	3 3'-Dichlorobenzidine	252	24.910	24.943	(0.997)	22935	1.34773	1.3
64	Butyl benzyl phthalate	149	23.683	23.717	(0.948)	55694	0.78085	0.78(a)
65	bis(2-ethylhexyl)Phthalate	149	25.106	25.140	(1.005)	104533	1.05576	1.0
66	Benzo(a)Anthracene	228	24.942	24.976	(0.999)	103976	1.07860	1.1
		228	25.024	24.976	(1.002)	78732	0.81673	0.82
* 67	Chrysene-d12	240	24.975	25.009	(1.000)	8523078	80.0000	
68	Chrysene	228	25.024	25.091	(1.002)	78732	0.91769	0.92
		228	24.942	25.091	(0.999)	103976	1.21193	1.2
69	Di-n-octyl phthalate	149	26.611	26.644	(0.939)	163487	1.28939	1.3
70	Benzo(b)fluoranthene	252	27.379	27.446	(0.967)	74226	0.98910	0.99
		252	27.445	27.446	(0.969)	89795	1.19657	1.2
71	Benzo(k)fluoranthene	252	27.445	27.511	(0.969)	90477	1.24527	1.2
		252	27.379	27.511	(0.967)	74803	1.02954	1.0
* 72	Perylene-d12	264	28.328	28.362	(1.000)	5492380	80.0000	
73	Indeno(1,2,3-cd)pyrene	276	31.469	31.552	(1.111)	51042	1.11080	1.1
74	Benzo(a)pyrene	252	28.148	28.231	(0.994)	66598	1.10556	1.1
		252	28.017	28.231	(0.989)	36487	0.60570	0.60
75	Dibenzo(a,h)anthracene	278	31.550	31.650	(1.114)	41627	1.04686	1.0
76	Benzo(g,h,i)perylene	276	32.417	32.549	(1.144)	53040	1.15704	1.2
84	Benzo(e)pyrene	252	28.017	28.067	(0.989)	36487	0.55474	0.55(a)
		252	28.148	28.067	(0.994)	66598	1.01254	1.0
32	2,4,5-Trichlorophenol	196	13.133	13.166	(0.881)	21685	0.61753	0.62(a)
		196	13.067	13.166	(0.877)	22491	0.64048	0.64(a)
124	Benzyl Alcohol	108	8.144	8.210	(1.031)	33022	0.90865	0.91(a)
		108	8.373	8.210	(1.060)	47721	1.31311	1.3
: 83	1-Methylnaphthalene-d10	152	12.527	12.561	(1.169)	83701	0.98374	0.98(aR)
136	1-Chloro-3,4-Dinitrobenzene	63	15.651	15.718	(1.461)	8918	0.51097	0.51(a)
		63	15.373	15.718	(1.435)	16728	0.95846	0.96(a)

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01080301007.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: JGH
Method File: /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/09/98
Calibration Time: 0339

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7272118	3636059	14544236	6356356	-12.59
24 Naphthalene-d8	13821622	6910811	27643244	12545673	-9.23
40 Acenaphthene-d10	8116937	4058468	16233874	8203638	1.07
56 Phenanthrene-d10	14791818	7395909	29583636	13415526	-9.30
67 Chrysene-d12	11581767	5790884	23163534	8523078	-26.41
72 Perylene-d12	8146005	4073002	16292010	5492380	-32.58

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIF
7 1,4-Dichlorobenze	7.90	7.40	8.40	7.90	0.04
24 Naphthalene-d8	10.72	10.22	11.22	10.71	-0.12
40 Acenaphthene-d10	14.91	14.41	15.41	14.90	-0.09
56 Phenanthrene-d10	18.53	18.03	19.03	18.53	0.02
67 Chrysene-d12	24.99	24.49	25.49	24.97	-0.05
72 Perylene-d12	28.34	27.84	28.84	28.33	-0.05

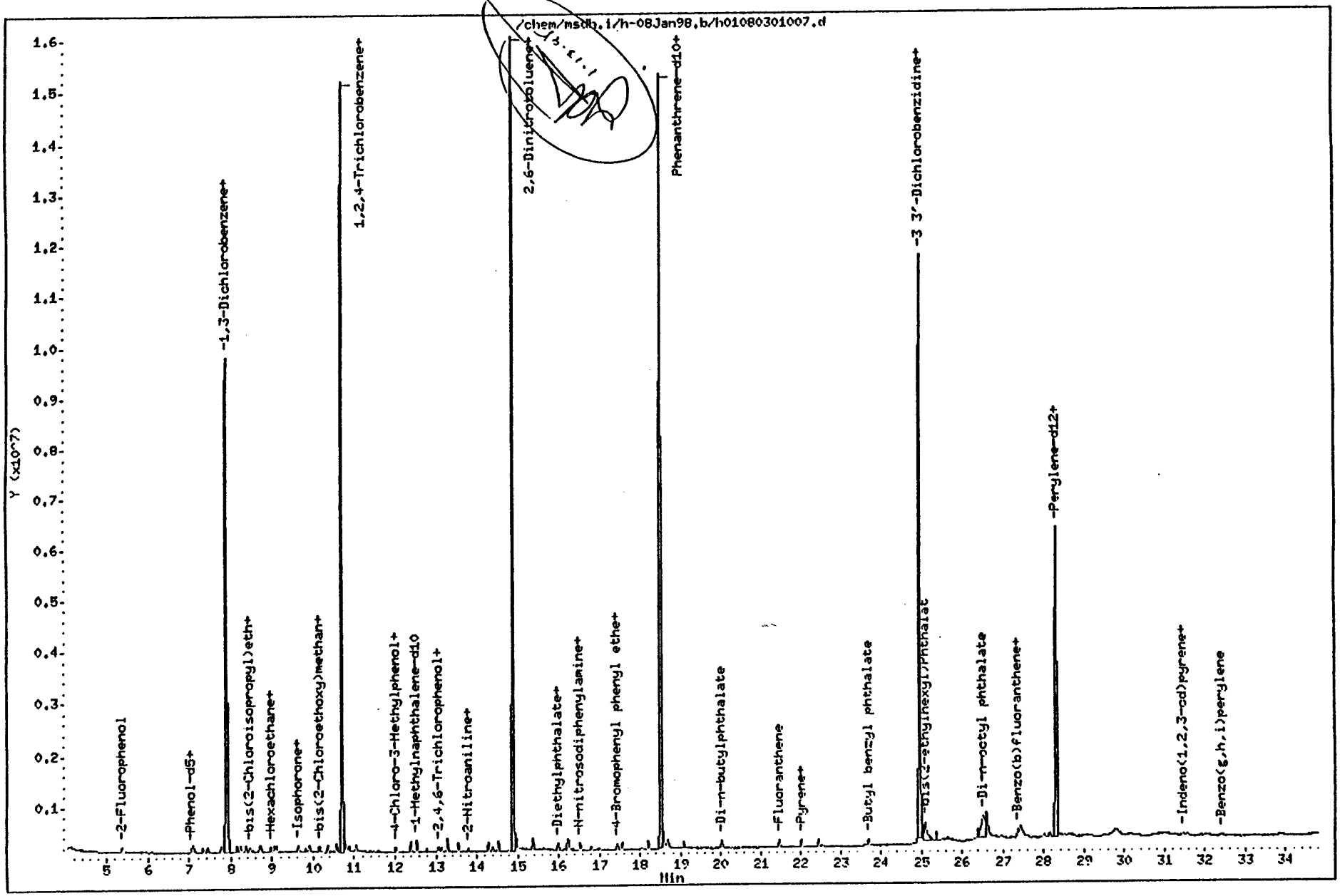
AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

246

Data File: /chem/msdh.i/h-08Jan98.b/h01080301007.d
Date : 09-JAN-1998 00:49
Client ID:
Sample Info: 1.0ul 1ug STD 396-4-1
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i

Operator: JCH
Column diameter: 2.00



Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080401008.d
Lab Smp Id:
Inj Date : 09-JAN-1998 01:30
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 10ug STD 396-4-10
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

1-13-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
1 2-Fluorophenol	112	5.381	5.297	(0.681)	704474	10.5106	10.5(R)
2 Phenol-d5	99	7.065	7.114	(0.659)	795188	10.1333	10.1(R)
3 Phenol	94	7.098	7.147	(0.899)	853951	10.9324	10.9
4 bis(2-Chloroethyl)ether	93	7.327	7.376	(0.928)	729718	11.0349	11.0
5 2-Chlorophenol	128	7.442	7.474	(0.942)	615808	10.5937	10.6
6 1,3-Dichlorobenzene	146	7.769	7.785	(0.983)	720733	10.8523	10.8
7 1,4-Dichlorobenzene-d4	150	7.900	7.899	(1.000)	6650987	80.0000	
8 1,4-Dichlorobenzene	146	7.932	7.948	(1.004)	743293	11.1341	11.1
9 1,2-Dichlorobenzene	146	8.243	8.259	(1.043)	676893	10.8032	10.8
10 2-Methylphenol	108	8.374	8.406	(1.060)	582286	10.9491	10.9
11 bis(2-Chloroisopropyl)ether	45	8.456	8.488	(1.070)	1236765	10.7856	10.8
12 4-Methylphenol	108	8.701	8.783	(1.101)	581071	10.6258	10.6
13 N-Nitrosodipropylamine	70	8.734	8.832	(1.106)	494266	10.8961	10.9
14 Hexachloroethane	117	8.963	8.979	(1.135)	304664	10.9019	10.9

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
$	15 Nitrobenzene-d5	82	9.061	9.110	(0.608)	699259	9.61216	9.6(R)
	16 Nitrobenzene	77	9.110	9.159	(0.850)	705312	10.1876	10.2
	17 Isophorone	82	9.650	9.715	(0.901)	1453330	10.1320	10.1
	18 2,4-Dimethylphenol	122	9.911	9.960	(0.925)	462986	10.5447	10.5
	19 2-Nitrophenol	139	9.813	9.862	(0.916)	321031	9.08822	9.1
	20 Benzoic Acid	122	10.026	10.353	(0.936)	126474	3.96677	4.0
	21 bis(2-Chloroethoxy)methane	93	10.157	10.189	(0.948)	833592	10.7987	10.8
	22 2,4-Dichlorophenol	162	10.353	10.402	(0.966)	459785	9.54126	9.5
	23 1,2,4-Trichlorobenzene	180	10.566	10.598	(0.986)	562707	9.78756	9.8
*	24 Naphthalene-d8	136	10.713	10.729	(1.000)	13070667	80.0000	
	25 Naphthalene	128	10.746	10.794	(1.003)	1712261	11.3835	11.4
	26 4-Chloroaniline	127	10.877	10.909	(1.015)	494549	13.1907	13.2
	27 Hexachlorobutadiene	225	11.056	11.073	(1.032)	274734	9.66743	9.7
	28 4-Chloro-3-Methylphenol	107	12.005	12.054	(1.121)	450182	9.74166	9.7
	29 2-Methylnaphthalene	142	12.381	12.414	(1.156)	1060809	10.5402	10.5
	30 Hexachlorocyclopentadiene	237	12.774	12.790	(0.857)	208963	7.33429	7.3
	31 2,4,6-Trichlorophenol	196	13.052	13.084	(0.876)	326413	9.45554	9.4
$	32 2-Fluorobiphenyl	172	13.281	13.313	(0.717)	1263823	10.6310	10.6(R)
	33 2-Chloronaphthalene	162	13.543	13.592	(0.909)	972379	9.91023	9.9
	34 2-Nitroaniline	65	13.788	13.853	(0.925)	287558	8.92626	8.9
	35 Dimethylphthalate	163	14.279	14.328	(0.958)	1270916	10.1172	10.1
	36 2,6-Dinitrotoluene	165	14.410	14.475	(0.967)	275499	9.40892	9.4
	37 Acenaphthylene	152	14.540	14.589	(0.976)	1709617	11.2505	11.2
	38 3-Nitroaniline	138	13.788	13.853	(0.925)	304505	8.92737	8.9
*	39 Acenaphthene-d10	164	14.900	14.916	(1.000)	8181393	80.0000	
	40 Acenaphthene	154	14.982	15.015	(1.005)	939516	10.4777	10.5
	41 2,4-Dinitrophenol	184	15.064	15.113	(1.011)	35485	2.20687	2.2
	42 4-Nitrophenol	109	15.195	15.293	(1.020)	69325	6.40727	6.4
	43 2,4-Dinitrotoluene	165	15.375	15.440	(1.032)	328728	9.45471	9.4
	44 Dibenzofuran	168	15.391	15.440	(1.033)	1382884	10.1115	10.1
	45 Diethylphthalate	149	16.013	16.061	(1.075)	1296391	10.3578	10.4
	46 4-Chlorophenyl phenyl ether	204	16.258	16.290	(1.091)	531282	10.2884	10.3
	47 4-Nitroaniline	138	16.258	16.389	(1.091)	126447	11.7962	11.8
	48 Fluorene	166	16.225	16.274	(1.089)	1098626	10.3141	10.3
	49 4,6-Dinitro-2-methylphenol	198	16.356	16.421	(0.883)	106139	4.61898	4.6
	50 N-nitrosodiphenylamine	169	16.536	16.585	(0.892)	679965	10.3620	10.4
$	51 2,4,6-Tribromophenol	330	16.814	16.847	(0.673)	180431	9.39440	9.4(R)
	52 4-Bromophenyl phenyl ether	248	17.452	17.485	(0.942)	291563	9.84519	9.8
	53 Hexachlorobenzene	284	17.567	17.599	(0.948)	388609	9.98795	10
	54 Pentachlorophenol	266	18.041	18.073	(0.974)	147237	6.41472	6.4
*	55 Phenanthrene-d10	188	18.532	18.548	(1.000)	13833526	80.0000	
	56 Phenanthrene	178	18.564	18.613	(1.002)	1534530	10.4651	10.5
	57 Anthracene	178	18.695	18.744	(1.009)	1457357	10.2802	10.3
	58 Di-n-butylphthalate	149	20.036	20.053	(1.081)	2176860	11.7777	11.8
	59 Fluoranthene	202	21.459	21.508	(1.158)	1465034	10.2397	10.2
	60 Pyrene	202	22.016	22.064	(0.881)	1498797	11.2056	11.2
$	61 Terphenyl-d14	244	22.441	22.473	(0.898)	991639	10.6770	10.7(R)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
63	3 3'-Dichlorobenzidine	252	24.911	24.943	(0.997)	193822	10.4063	10.4
64	Butyl benzyl phthalate	149	23.684	23.717	(0.948)	827000	10.5938	10.6
65	bis(2-ethylhexyl) Phthalate	149	25.123	25.140	(1.006)	1211369	11.1783	11.2
66	Benzo(a)Anthracene	228	24.944	24.976	(0.999)	1010530	9.57774	9.6
* 67	Chrysene-d12	240	24.976	25.009	(1.000)	9328424	80.0000	
68	Chrysene	228	25.025	25.091	(1.002)	931195	9.91685	9.9
69	Di-n-octyl phthalate	149	26.612	26.644	(0.939)	1636029	11.3589	11.4
70	Benzo(b)fluoranthene	252	27.381	27.446	(0.967)	742112	8.70559	8.7
71	Benzo(k)fluoranthene	252	27.446	27.511	(0.969)	713817	8.64880	8.6
* 72	Perylene-d12	264	28.329	28.362	(1.000)	6239016	80.0000	
73	Indeno(1,2,3-cd)pyrene	276	31.470	31.552	(1.111)	451650	8.65277	8.6
74	Benzo(a)pyrene	252	28.150	28.231	(0.994)	623254	9.10813	9.1
75	Dibenzo(a,h)anthracene	278	31.552	31.650	(1.114)	412868	9.14049	9.1
76	Benzo(g,h,i)perylene	276	32.419	32.549	(1.144)	504755	9.69322	9.7
84	Benzo(e)pyrene	252	28.019	28.067	(0.989)	336712	4.50667	4.5
32	2,4,5-Trichlorophenol	196	13.134	13.166	(0.881)	321777	9.18827	9.2
124	Benzyl Alcohol	108	8.145	8.210	(1.031)	404534	10.6383	10.6
: 82	1-Methylnaphthalene-d10	152	12.529	12.561	(1.169)	911809	10.2861	10.3(R)
136	1-Chloro-3,4-Dinitrobenzene	63	15.653	15.719	(1.461)	169358	9.31388	9.3

QC Flag Legend

R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080401008.d
Lab Smp Id:
Inj Date : 09-JAN-1998 01:30
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 10ug STD 396-4-10
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
C	1 2-Fluorophenol	112	5.381	5.397	(0.681)	704474	10.5106	10.5(R)
C	2 Phenol-d5	99	7.065	7.114	(0.659)	795188	10.1333	10.1(R)
	3 Phenol	94	7.098	7.147	(0.899)	853951	10.9324	10.9
	4 bis(2-Chloroethyl)ether	93	7.327	7.376	(0.928)	729871	11.0372	11.0
	5 2-Chlorophenol	128	7.442	7.474	(0.942)	615808	10.5937	10.6
	6 1,3-Dichlorobenzene	146	7.769	7.785	(0.983)	720733	10.8523	10.8
*	7 1,4-Dichlorobenzene-d4	150	7.900	7.899	(1.000)	6650987	80.0000	
		150	7.769	7.899	(1.000)	75787	80.0000	
		150	8.243	7.899	(1.000)	74127	80.0000	
	8 1,4-Dichlorobenzene	146	7.932	7.948	(1.004)	741654	11.1096	11.1
		146	7.769	7.948	(0.983)	720745	10.7964	10.8
	9 1,2-Dichlorobenzene	146	8.243	8.259	(1.043)	676893	10.8032	10.8
	10 2-Methylphenol	108	8.374	8.406	(1.060)	582286	10.9491	10.9
		108	8.145	8.406	(1.031)	404534	7.60674	7.6

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	108	8.701	8.406	(1.101)	585284	11.0055	11.0
11 bis(2-Chloroisopropyl)ether	45	8.456	8.488	(1.070)	1234632	10.7670	10.8
12 4-Methylphenol	108	8.701	8.783	(1.101)	581071	10.6258	10.6
13 N-Nitrosodipropylamine	70	8.734	8.832	(1.106)	494266	10.8961	10.9
14 Hexachloroethane	117	8.963	8.979	(1.135)	304664	10.9019	10.9
: 15 Nitrobenzene-d5	82	9.061	9.110	(0.608)	699259	9.61216	9.6(R)
16 Nitrobenzene	77	9.110	9.159	(0.850)	704955	10.1824	10.2
17 Isophorone	82	9.650	9.715	(0.901)	1453330	10.1320	10.1
18 2,4-Dimethylphenol	122	9.911	9.960	(0.925)	462986	10.5447	10.5
19 2-Nitrophenol	139	9.813	9.862	(0.916)	321031	9.08822	9.1
	139	9.650	9.862	(0.901)	20710	0.58629	0.59(a)
20 Benzoic Acid	122	10.026	10.353	(0.936)	130702	4.09938	4.1
	122	9.911	10.353	(0.925)	454291	14.2485	14.2
21 bis(2-Chloroethoxy)methane	93	10.157	10.189	(0.948)	833592	10.7987	10.8
22 2,4-Dichlorophenol	162	10.353	10.402	(0.966)	459785	9.54126	9.5
23 1,2,4-Trichlorobenzene	180	10.566	10.598	(0.986)	562707	9.78756	9.8
• 24 Naphthalene-d8	136	10.713	10.729	(1.000)	13070667	80.0000	
	136	10.304	10.729	(1.000)	236	80.0000	
	136	10.353	10.729	(1.000)	2940	80.0000	
	136	10.533	10.729	(1.000)	533	80.0000	
25 Naphthalene	128	10.746	10.794	(1.003)	1712261	11.3835	11.4
26 4-Chloroaniline	127	10.877	10.909	(1.015)	494549	13.1907	13.2
	127	10.746	10.909	(1.003)	208341	5.55692	5.6
27 Hexachlorobutadiene	225	11.056	11.073	(1.032)	274734	9.66743	9.7
28 4-Chloro-3-Methylphenol	107	12.005	12.054	(1.121)	450182	9.74166	9.7
29 2-Methylnaphthalene	142	12.381	12.414	(1.156)	1060809	10.5402	10.5
	142	12.021	12.414	(1.122)	375123	3.72722	3.7
30 Hexachlorocyclopentadiene	237	12.774	12.790	(0.857)	208963	7.33429	7.3
31 2,4,6-Trichlorophenol	196	13.052	13.084	(0.876)	326413	9.45554	9.4
	196	13.134	13.084	(0.881)	321777	9.32124	9.3
: 33 2-Fluorobiphenyl	172	13.281	13.313	(0.717)	1263823	10.6310	10.6(R)
34 2-Chloronaphthalene	162	13.543	13.592	(0.909)	972379	9.91023	9.9
35 2-Nitroaniline	65	13.788	13.853	(0.925)	287558	8.92626	8.9
36 Dimethylphthalate	163	14.279	14.328	(0.958)	1270916	10.1172	10.1
37 2,6-Dinitrotoluene	165	14.410	14.475	(0.967)	275499	9.40892	9.4
	165	14.900	14.475	(1.000)	1011794	34.5551	34.6
38 Acenaphthylene	152	14.540	14.589	(0.976)	1709617	11.2505	11.2
	152	14.982	14.589	(1.005)	462846	3.04584	3.0
39 3-Nitroaniline	138	13.788	13.853	(0.925)	304505	8.92737	8.9
• 40 Acenaphthene-d10	164	14.900	14.916	(1.000)	8181393	80.0000	
	164	14.524	14.916	(1.000)	153	80.0000	(Q)
41 Acenaphthene	154	14.982	15.015	(1.005)	939493	10.4774	10.5
42 2,4-Dinitrophenol	184	15.064	15.113	(1.011)	35485	2.20687	2.2
43 4-Nitrophenol	109	15.391	15.293	(1.033)	6197	0.57275	0.57(a)
	109	14.900	15.293	(1.000)	14982	1.38469	1.4
	109	15.195	15.293	(1.020)	69012	6.37834	6.4
	109	15.653	15.293	(1.050)	6229	0.57571	0.58(a)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	44 2,4-Dinitrotoluene	165	15.375	15.440	(1.032)	328738	9.45471	9.4
	45 Dibenzofuran	168	15.391	15.440	(1.033)	1382884	10.1115	10.1
	46 Diethylphthalate	149	16.013	16.061	(1.075)	1296391	10.3578	10.4
	47 4-Chlorophenyl phenyl ether	204	16.258	16.290	(1.091)	531282	10.2884	10.3
	48 4-Nitroaniline	138	16.258	16.389	(1.091)	126447	11.7962	11.8
	49 Fluorene	166	16.225	16.274	(1.089)	1098626	10.3141	10.3
	50 4,6-Dinitro-2-methylphenol	198	16.356	16.421	(0.883)	106139	4.61898	4.6
	51 N-nitrosodiphenylamine	169	16.536	16.585	(0.892)	679965	10.3620	10.4
		169	16.258	16.585	(0.877)	50713	0.77282	0.77(a)
C	52 2,4,6-Tribromophenol	330	16.814	16.847	(0.673)	180431	9.39440	9.4(R)
	53 4-Bromophenyl phenyl ether	248	17.452	17.485	(0.942)	291563	9.84519	9.8
	54 Hexachlorobenzene	284	17.567	17.599	(0.948)	388609	9.98795	10
	55 Pentachlorophenol	266	18.041	18.073	(0.974)	147237	6.41472	6.4
*	56 Phenanthrene-d10	188	18.532	18.548	(1.000)	13833526	80.0000	
		188	18.204	18.548	(1.000)	1973	80.0000	
		188	18.286	18.548	(1.000)	386	80.0000	
		188	18.352	18.548	(1.000)	529	80.0000	
	57 Phenanthrene	178	18.564	18.613	(1.002)	1534530	10.4651	10.5
		178	18.695	18.613	(1.009)	1457357	9.93883	9.9
	58 Anthracene	178	18.695	18.744	(1.009)	1457357	10.2802	10.3
		178	18.564	18.744	(1.002)	1534530	10.8245	10.8
	59 Di-n-butylphthalate	149	20.036	20.053	(1.081)	2176860	11.7777	11.8
	60 Fluoranthene	202	21.459	21.508	(1.158)	1465034	10.2397	10.2
	61 Pyrene	202	22.016	22.064	(0.881)	1498797	11.2056	11.2
C	62 Terphenyl-d14	244	22.441	22.473	(0.898)	991639	10.6770	10.7(R)
	63 3 3'-Dichlorobenzidine	252	24.911	24.943	(0.997)	193822	10.4063	10.4
	64 Butyl benzyl phthalate	149	23.684	23.717	(0.948)	827058	10.5945	10.6
	65 bis(2-ethylhexyl)Phthalate	149	25.123	25.140	(1.006)	1211369	11.1783	11.2
	66 Benzo(a)Anthracene	228	24.944	24.976	(0.999)	1010530	9.57774	9.6
		228	25.025	24.976	(1.002)	931195	8.82581	8.8
*	67 Chrysene-d12	240	24.976	25.009	(1.000)	9328424	80.0000	
		240	24.813	25.009	(1.000)	302	80.0000	
	68 Chrysene	228	25.025	25.091	(1.002)	931192	9.91681	9.9
		228	24.944	25.091	(0.999)	1010530	10.7617	10.8
	69 Di-n-octyl phthalate	149	26.612	26.644	(0.939)	1636029	11.3589	11.4
	70 Benzo(b)fluoranthene	252	27.381	27.446	(0.967)	742112	8.70559	8.7
		252	27.446	27.446	(0.969)	713817	8.37367	8.4
	71 Benzo(k)fluoranthene	252	27.446	27.511	(0.969)	713817	8.64880	8.6
		252	27.381	27.511	(0.967)	742112	8.99163	9.0
*	72 Perylene-d12	264	28.329	28.362	(1.000)	6239016	80.0000	
		264	28.166	28.362	(1.000)	751	80.0000	
	73 Indeno(1,2,3-cd)pyrene	276	31.470	31.552	(1.111)	451650	8.65277	8.6
		276	31.552	31.552	(1.114)	114958	2.20238	2.2
	74 Benzo(a)pyrene	252	28.150	28.231	(0.994)	623254	9.10813	9.1
		252	28.019	28.231	(0.989)	336712	4.92065	4.9
		252	28.329	28.231	(1.000)	35922	0.52496	0.52
	75 Dibenzo(a,h)anthracene	278	31.552	31.650	(1.114)	412868	9.14049	9.1

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
76 Benzo(g,h,i)perylene	276	32.419	32.549	(1.144)	504755	9.69322	9.7
84 Benzo(e)pyrene	252	28.019	28.067	(0.989)	336712	4.50667	4.5
	252	28.150	28.067	(0.994)	623254	8.34185	8.3
32 2,4,5-Trichlorophenol	196	13.134	13.166	(0.981)	321777	9.18827	9.2
	196	13.052	13.166	(0.876)	326413	9.32065	9.3
124 Benzyl Alcohol	108	8.145	8.210	(1.031)	404534	10.6383	10.6
	108	7.900	8.210	(1.000)	23610	0.62088	0.62(a)
	108	8.374	8.210	(1.060)	584155	15.3618	15.4
83 1-Methylnaphthalene-d10	152	12.529	12.561	(1.169)	911809	10.2861	10.3(R)
136 1-Chloro-3,4-Dinitrobenzene	63	15.653	15.718	(1.461)	170663	9.38565	9.4
	63	15.375	15.718	(1.435)	244597	13.4517	13.4
	63	15.996	15.718	(1.493)	10120	0.55655	0.56(a)

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01080401008.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: JGH
Method File: /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/09/98
Calibration Time: 0339

Level: LOW
Sample Type: WATER

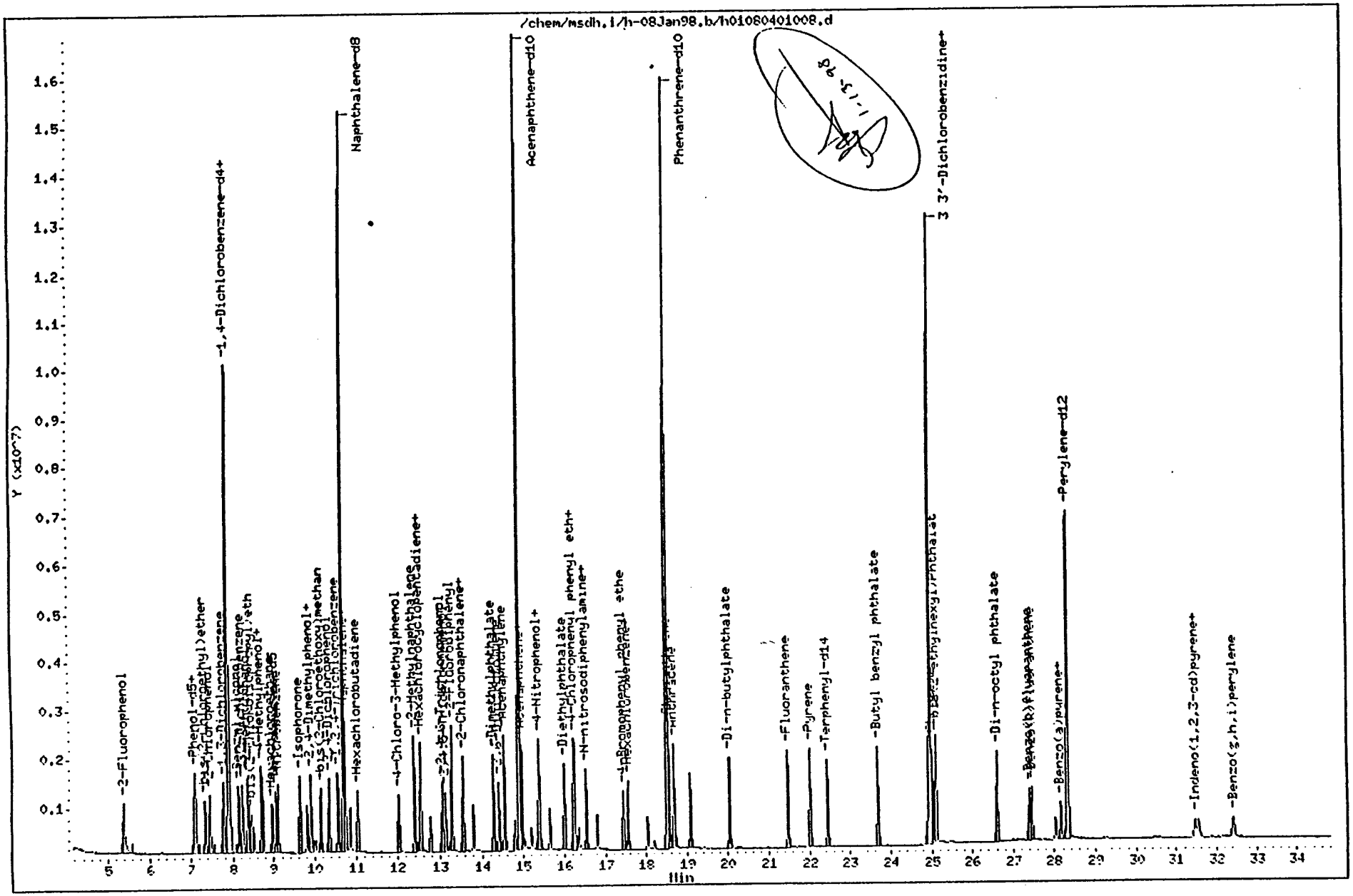
COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7272118	3636059	14544236	6650987	-8.54
24 Naphthalene-d8	13821622	6910811	27643244	13070667	-5.43
40 Acenaphthene-d10	8116937	4058468	16233874	8181393	0.79
56 Phenanthrene-d10	14791818	7395909	29583636	13833526	-6.48
67 Chrysene-d12	11581767	5790884	23163534	9328424	-19.46
72 Perylene-d12	8146005	4073002	16292010	6239016	-23.41

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.90	7.40	8.40	7.90	0.06
24 Naphthalene-d8	10.72	10.22	11.22	10.71	-0.11
40 Acenaphthene-d10	14.91	14.41	15.41	14.90	-0.08
56 Phenanthrene-d10	18.53	18.03	19.03	18.53	0.02
67 Chrysene-d12	24.99	24.49	25.49	24.98	-0.05
72 Perylene-d12	28.34	27.84	28.84	28.33	-0.04

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

Data File: /chem/msdh.i/h-08Jan98.b/h01080401008.d
Date : 09-JAN-1998 01:30
Client ID:
Sample Info: 1.0ul 10ug STD 396-4-10
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i
Operator: JGH
Column diameter: 2.00



Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080501009.d
Lab Smp Id:
Inj Date : 09-JAN-1998 02:13
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 20ug STD 396-4-20
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	1 2-Fluorophenol	112	5.376	5.397	(0.681)	1618191	21.4065	21.4(R)
	2 Phenol-d5	99	7.078	7.114	(0.661)	1914292	23.3834	23.4(R)
	3 Phenol	94	7.110	7.147	(0.901)	1939202	22.0118	22.0
	4 bis(2-Chloroethyl)ether	93	7.339	7.376	(0.930)	1691028	22.6733	22.7
	5 2-Chlorophenol	128	7.437	7.474	(0.942)	1447054	22.0719	22.1
	6 1,3-Dichlorobenzene	146	7.765	7.785	(0.983)	1659578	22.1563	22.2
*	7 1,4-Dichlorobenzene-d4	150	7.895	7.899	(1.000)	7501268	80.0000	
	8 1,4-Dichlorobenzene	146	7.928	7.948	(1.004)	1644559	21.8422	21.8
	9 1,2-Dichlorobenzene	146	8.239	8.259	(1.044)	1600055	22.6421	22.6
	10 2-Methylphenol	108	8.370	8.406	(1.060)	1390875	23.1891	23.2
	11 bis(2-Chloroisopropyl)ether	45	8.468	8.488	(1.073)	2897442	22.4039	22.4
	12 4-Methylphenol	108	8.713	8.783	(1.104)	1408156	22.8315	22.8
	13 N-Nitrosodipropylamine	70	8.746	8.832	(1.108)	1160774	22.6888	22.7
	14 Hexachloroethane	117	8.975	8.979	(1.137)	719297	22.8214	22.8

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
;	15 Nitrobenzene-d5	82	9.073	9.110	(0.608)	1721414	20.5309	20.5(R)
	16 Nitrobenzene	77	9.106	9.159	(0.850)	1586393	21.9644	22.0
	17 Isophorone	82	9.646	9.715	(0.901)	3531375	23.5989	23.6
	18 2,4-Dimethylphenol	122	9.907	9.960	(0.925)	1063961	23.2279	23.2
	19 2-Nitrophenol	139	9.826	9.862	(0.918)	1007052	27.3276	27.3
	20 Benzoic Acid	122	10.087	10.353	(0.942)	485756	14.6040	14.6
	21 bis(2-Chloroethoxy)methane	93	10.153	10.189	(0.948)	1868587	23.2034	23.2
	22 2,4-Dichlorophenol	162	10.365	10.402	(0.968)	1150745	22.8901	22.9
	23 1,2,4-Trichlorobenzene	180	10.578	10.598	(0.988)	1353526	22.5671	22.6
*	24 Naphthalene-d8	136	10.709	10.729	(1.000)	13635781	80.0000	
	25 Naphthalene	128	10.758	10.794	(1.005)	4062059	25.8863	25.9
	26 4-Chloroaniline	127	10.872	10.909	(1.015)	950712	24.3067	24.3
	27 Hexachlorobutadiene	225	11.052	11.073	(1.032)	662861	22.3583	22.4
	28 4-Chloro-3-Methylphenol	107	12.017	12.054	(1.122)	1153925	23.9354	23.9
	29 2-Methylnaphthalene	142	12.394	12.414	(1.157)	2433317	23.1755	23.2
	30 Hexachlorocyclopentadiene	237	12.770	12.790	(0.856)	597838	18.2059	18.2
	31 2,4,6-Trichlorophenol	196	13.064	13.084	(0.876)	812006	20.4088	20.4
;	32 2-Fluorobiphenyl	172	13.277	13.313	(0.717)	3051660	24.0189	24.0(R)
	34 2-Chloronaphthalene	162	13.555	13.592	(0.909)	2463824	21.7870	21.8
	35 2-Nitroaniline	65	13.800	13.853	(0.925)	781514	21.0485	21.0
	36 Dimethylphthalate	163	14.291	14.328	(0.958)	3112336	21.4966	21.5
	37 2,6-Dinitrotoluene	165	14.422	14.475	(0.967)	723447	21.4371	21.4
	38 Acenaphthylene	152	14.553	14.589	(0.976)	3956756	22.5917	22.6
	39 3-Nitroaniline	138	13.800	13.853	(0.925)	829086	21.0896	21.1
*	40 Acenaphthene-d10	164	14.913	14.916	(1.000)	9429486	80.0000	
	41 Acenaphthene	154	14.978	15.015	(1.004)	2280997	22.0711	22.1
	42 2,4-Dinitrophenol	184	15.060	15.113	(1.010)	185265	9.99689	10
	43 4-Nitrophenol	109	15.207	15.293	(1.020)	211193	16.9356	16.9
	44 2,4-Dinitrotoluene	165	15.387	15.440	(1.032)	891101	22.2364	22.2
	45 Dibenzofuran	168	15.403	15.440	(1.033)	3428710	21.7520	21.8
	46 Diethylphthalate	149	16.008	16.061	(1.073)	3141949	21.7805	21.8
	47 4-Chlorophenyl phenyl ether	204	16.254	16.290	(1.090)	1270961	21.3548	21.4
	48 4-Nitroaniline	138	16.287	16.389	(1.092)	282759	22.8870	22.9(H)
	49 Fluorene	166	16.237	16.274	(1.089)	2677184	21.8072	21.8
	50 4,6-Dinitro-2-methylphenol	198	16.368	16.421	(0.883)	422568	17.2066	17.2
	51 N-nitrosodiphenylamine	169	16.548	16.585	(0.893)	1747692	24.9201	24.9
;	52 2,4,6-Tribromophenol	330	16.810	16.847	(0.673)	503661	19.1597	19.2
	53 4-Bromophenyl phenyl ether	248	17.448	17.485	(0.942)	723112	22.8468	22.8
	54 Hexachlorobenzene	284	17.562	17.599	(0.948)	950813	22.8658	22.9
	55 Pentachlorophenol	266	18.053	18.073	(0.974)	480109	19.5717	19.6
*	56 Phenanthrene-d10	188	18.527	18.548	(1.000)	14784421	80.0000	
	57 Phenanthrene	178	18.577	18.613	(1.003)	3926339	25.0545	25.0
	58 Anthracene	178	18.691	18.744	(1.009)	3715433	24.5229	24.5
	59 Di-n-butylphthalate	149	20.032	20.053	(1.081)	5432359	27.5010	27.5
	60 Fluoranthene	202	21.472	21.508	(1.159)	3722898	24.3473	24.3
	61 Pyrene	202	22.012	22.064	(0.881)	3901402	21.3111	21.3
;	62 Terphenyl-d14	244	22.453	22.473	(0.899)	2598468	20.4411	20.4

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
63	3 3'-Dichlorobenzidine	252	24.907	24.943	(0.997)	410169	16.0898	16.1
64	Butyl benzyl phthalate	149	23.680	23.717	(0.948)	2149034	20.1132	20.1
65	bis(2-ethylhexyl)Phthalate	149	25.119	25.140	(1.006)	3076472	20.7418	20.7
66	Benzo(a)Anthracene	228	24.939	24.976	(0.999)	2754045	19.0712	19.1
* 67	Chrysene-d12	240	24.972	25.009	(1.000)	12767775	80.0000	
68	Chrysene	228	25.021	25.091	(1.002)	2540806	19.7696	19.8
69	Di-n-octyl phthalate	149	26.608	26.644	(0.939)	4500083	23.2534	23.2
70	Benzo(b)fluoranthene	252	27.377	27.446	(0.967)	2089536	18.2431	18.2
71	Benzo(k)fluoranthene	252	27.442	27.511	(0.969)	2098845	18.9264	18.9
* 72	Perylene-d12	264	28.325	28.362	(1.000)	8382942	80.0000	
73	Indeno(1,2,3-cd)pyrene	276	31.466	31.552	(1.111)	1276530	18.2013	18.2
74	Benzo(a)pyrene	252	28.162	28.231	(0.994)	1685404	18.3311	18.3
75	Dibenzo(a,h)anthracene	278	31.548	31.650	(1.114)	1116326	18.3937	18.4
76	Benzo(g,h,i)perylene	276	32.431	32.549	(1.145)	1341717	19.1764	19.2
84	Benzo(e)pyrene	252	28.031	28.067	(0.990)	942835	9.39188	9.4
32	2,4,5-Trichlorophenol	196	13.130	13.166	(0.880)	819028	20.2916	20.3
124	Benzyl Alcohol	108	8.157	8.210	(1.033)	964974	22.5000	22.5
3 82	1-Methylnaphthalene-d10	152	12.541	12.561	(1.171)	2152347	23.2743	23.3(R)
136	1-Chloro-3,4-Dinitrobenzene	63	15.649	15.718	(1.461)	450350	23.7407	23.7

QC Flag Legend

R - Spike/Surrogate failed recovery limits.
H - Operator selected an alternate compound hit.

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Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080501009.d
Lab Smp Id:
Inj Date : 09-JAN-1998 02:13
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 20ug STD 396-4-20
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
C	1 2-Fluorophenol	112	5.376	5.397	(0.681)	1618323	21.4083	21.4(R)
C	2 Phenol-d5	99	7.078	7.114	(0.661)	1914292	23.3834	23.4(R)
		99	7.437	7.114	(0.695)	80623	0.98482	0.98(R)
	3 Phenol	94	7.110	7.147	(0.901)	1939202	22.0118	22.0
		94	7.339	7.147	(0.930)	59146	0.67363	0.67(a)
	4 bis(2-Chloroethyl)ether	93	7.339	7.376	(0.930)	1691028	22.6733	22.7
	5 2-Chlorophenol	128	7.437	7.474	(0.942)	1447054	22.0719	22.1
	6 1,3-Dichlorobenzene	146	7.765	7.785	(0.983)	1659578	22.1563	22.2
		146	7.928	7.785	(1.004)	1643007	21.9350	21.9
*	7 1,4-Dichlorobenzene-d4	150	7.895	7.899	(1.000)	7501268	80.0000	
		150	8.239	7.899	(1.000)	166612	80.0000	
	8 1,4-Dichlorobenzene	146	7.928	7.948	(1.004)	1648904	21.8999	21.9
		146	7.765	7.948	(0.983)	1661298	22.0646	22.1
		146	8.239	7.948	(1.044)	1594938	21.1832	21.2

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
9	1,2-Dichlorobenzene	146	8.239	8.259	(1.044)	1600055	22.6421	22.6
		146	7.928	8.259	(1.004)	1643007	23.2499	23.2
10	2-Methylphenol	108	8.370	8.406	(1.060)	1390875	23.1891	23.2
		108	8.157	8.406	(1.033)	964974	16.0883	16.1
		108	8.713	8.406	(1.104)	1405109	23.4264	23.4
11	bis(2-Chloroisopropyl)ether	45	8.468	8.488	(1.073)	2894888	22.3841	22.4
12	4-Methylphenol	108	8.713	8.783	(1.104)	1408156	22.8315	22.8
13	N-Nitrosodipropylamine	70	8.746	8.832	(1.108)	1160774	22.6888	22.7
		70	9.073	8.832	(1.149)	243289	4.75538	4.8
14	Hexachloroethane	117	8.975	8.979	(1.137)	719297	22.8214	22.8
$ 15	Nitrobenzene-d5	82	9.073	9.110	(0.608)	1721414	20.5309	20.5(R)
16	Nitrobenzene	77	9.106	9.159	(0.850)	1586393	21.9644	22.0
17	Isophorone	82	9.646	9.715	(0.901)	3531375	23.5989	23.6
18	2,4-Dimethylphenol	122	9.907	9.960	(0.925)	1063961	23.2279	23.2
19	2-Nitrophenol	139	9.826	9.862	(0.918)	1007052	27.3276	27.3
		139	9.646	9.862	(0.901)	52281	1.41871	1.4
20	Benzoic Acid	122	10.087	10.353	(0.942)	485761	14.6041	14.6
		122	9.907	10.353	(0.925)	987690	29.6944	29.7
21	bis(2-Chloroethoxy)methane	93	10.153	10.189	(0.948)	1868587	23.2034	23.2
		93	9.826	10.189	(0.918)	76902	0.95494	0.95(a)
		93	9.907	10.189	(0.925)	40424	0.50197	0.50(a)
22	2,4-Dichlorophenol	162	10.365	10.402	(0.968)	1150745	22.8901	22.9
23	1,2,4-Trichlorobenzene	180	10.578	10.598	(0.988)	1353526	22.5671	22.6
* 24	Naphthalene-d8	136	10.709	10.729	(1.000)	13635781	80.0000	
		136	10.365	10.729	(1.000)	6751	80.0000	
		136	10.480	10.729	(1.000)	205	80.0000	
		136	10.513	10.729	(1.000)	159	80.0000	
		136	10.562	10.729	(1.000)	1039	80.0000	
25	Naphthalene	128	10.758	10.794	(1.005)	4062059	25.8863	25.9
		128	10.872	10.794	(1.015)	115046	0.73315	0.73
26	4-Chloroaniline	127	10.872	10.909	(1.015)	950712	24.3067	24.3
		127	10.758	10.909	(1.005)	487895	12.4739	12.5
27	Hexachlorobutadiene	225	11.052	11.073	(1.032)	662861	22.3583	22.4
28	4-Chloro-3-Methylphenol	107	12.017	12.054	(1.122)	1153925	23.9354	23.9
29	2-Methylnaphthalene	142	12.394	12.414	(1.157)	2433317	23.1755	23.2
		142	12.017	12.414	(1.122)	950772	9.05536	9.0
30	Hexachlorocyclopentadiene	237	12.770	12.790	(0.856)	597838	18.2059	18.2
31	2,4,6-Trichlorophenol	196	13.064	13.084	(0.876)	812006	20.4088	20.4
		196	13.130	13.084	(0.880)	819022	20.5851	20.6
$ 33	2-Fluorobiphenyl	172	13.277	13.313	(0.717)	3051660	24.0189	24.0(R)
34	2-Chloronaphthalene	162	13.555	13.592	(0.909)	2463824	21.7870	21.8
35	2-Nitroaniline	65	13.800	13.853	(0.925)	781514	21.0485	21.0
36	Dimethylphthalate	163	14.291	14.328	(0.958)	3112336	21.4966	21.5
37	2,6-Dinitrotoluene	165	14.422	14.475	(0.967)	723447	21.4371	21.4
		165	14.291	14.475	(0.958)	30800	0.91266	0.91(a)
38	Acenaphthylene	152	14.553	14.589	(0.976)	3956756	22.5917	22.6
		152	14.978	14.589	(1.004)	1125688	6.42730	6.4

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Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
39 3-Nitroaniline	138	13.800	13.353	(0.925)	829086	21.0896	21.1
* 40 Acenaphthene-d10	164	14.913	14.916	(1.000)	9429486	80.0000	
	164	14.504	14.916	(1.000)	324	80.0000	
41 Acenaphthene	154	14.978	15.015	(1.004)	2280997	22.0711	22.1
42 2,4-Dinitrophenol	184	15.060	15.113	(1.010)	185265	9.99689	10
43 4-Nitrophenol	109	15.207	15.293	(1.020)	211193	16.9356	16.9
	109	15.387	15.293	(1.032)	12553	1.00663	1.0
	109	15.665	15.293	(1.050)	14901	1.19492	1.2
44 2,4-Dinitrotoluene	165	15.387	15.440	(1.032)	891101	22.2364	22.2
45 Dibenzofuran	168	15.403	15.440	(1.033)	3428710	21.7520	21.8
46 Diethylphthalate	149	16.008	16.061	(1.073)	3141949	21.7805	21.8
47 4-Chlorophenyl phenyl ether	204	16.254	16.290	(1.090)	1270961	21.3548	21.4
48 4-Nitroaniline	138	16.287	16.389	(1.092)	285370	23.0983	23.1
	138	16.237	16.389	(1.089)	39795	3.22107	3.2
49 Fluorene	166	16.237	16.274	(1.089)	2677184	21.8072	21.8
	166	16.548	16.274	(1.110)	91309	0.74376	0.74
50 4,6-Dinitro-2-methylphenol	198	16.368	16.421	(0.883)	422568	17.2066	17.2
51 N-nitrosodiphenylamine	169	16.548	16.585	(0.893)	1747692	24.9201	24.9
	169	16.254	16.585	(0.877)	119368	1.70205	1.7
: 52 2,4,6-Tribromophenol	330	16.810	16.847	(0.673)	503661	19.1597	19.2
53 4-Bromophenyl phenyl ether	248	17.448	17.485	(0.942)	723112	22.8468	22.8
54 Hexachlorobenzene	284	17.562	17.599	(0.948)	950813	22.8658	22.9
55 Pentachlorophenol	266	18.053	18.073	(0.974)	480109	19.5717	19.6
* 56 Phenanthrene-d10	188	18.527	18.548	(1.000)	14784421	80.0000	
	188	18.217	18.548	(1.000)	1825	80.0000	
57 Phenanthrene	178	18.577	18.613	(1.003)	3926339	25.0545	25.0
	178	18.691	18.613	(1.009)	3715433	23.7087	23.7
58 Anthracene	178	18.691	18.744	(1.009)	3715433	24.5229	24.5
	178	18.577	18.744	(1.003)	3926339	25.9149	25.9
59 Di-n-butylphthalate	149	20.032	20.053	(1.081)	5432359	27.5010	27.5
60 Fluoranthene	202	21.472	21.508	(1.159)	3722898	24.3473	24.3
61 Pyrene	202	22.012	22.064	(0.881)	3901402	21.3111	21.3
: 62 Terphenyl-d14	244	22.453	22.473	(0.899)	2598468	20.4411	20.4
63 3 3'-Dichlorobenzidine	252	24.907	24.943	(0.997)	410169	16.0898	16.1
64 Butyl benzyl phthalate	149	23.680	23.717	(0.948)	2149034	20.1132	20.1
65 bis(2-ethylhexyl) Phthalate	149	25.119	25.140	(1.006)	3076472	20.7418	20.7
66 Benzo(a)Anthracene	228	24.939	24.976	(0.999)	2754045	19.0712	19.1
	228	25.021	24.976	(1.002)	2540276	17.5909	17.6
* 67 Chrysene-d12	240	24.972	25.009	(1.000)	12767775	80.0000	
	240	24.776	25.009	(1.000)	489	80.0000	
68 Chrysene	228	25.021	25.091	(1.002)	2542125	19.7798	19.8
	228	24.939	25.091	(0.999)	2754045	21.4288	21.4
69 Di-n-octyl phthalate	149	26.608	26.644	(0.939)	4500083	23.2534	23.2
70 Benzo(b)fluoranthene	252	27.377	27.446	(0.967)	2089536	18.2431	18.2
	252	27.442	27.446	(0.969)	2098845	18.3244	18.3
71 Benzo(k)fluoranthene	252	27.442	27.511	(0.969)	2100135	18.9381	18.9
	252	27.377	27.511	(0.967)	2089536	18.8425	18.8

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
* 72 Perylene-d12	264	28.325	28.362	(1.000)	8382942	80.0000	
	264	28.129	28.362	(1.000)	444	80.0000	
73 Indeno(1,2,3-cd)pyrene	276	31.466	31.552	(1.111)	1276530	18.2013	18.2
	276	31.548	31.552	(1.114)	317140	4.52193	4.5
74 Benzo(a)pyrene	252	28.162	28.231	(0.994)	1685404	18.3311	18.3
	252	28.031	28.231	(0.990)	942835	10.2546	10.2
	252	28.325	28.231	(1.000)	67776	0.73716	0.74
75 Dibenzo(a,h)anthracene	278	31.548	31.650	(1.114)	1116326	18.3937	18.4
76 Benzo(g,h,i)perylene	276	32.431	32.549	(1.145)	1341717	19.1764	19.2
84 Benzo(e)pyrene	252	28.031	28.067	(0.990)	942835	9.39188	9.4
	252	28.162	28.067	(0.994)	1685404	16.7888	16.8
	252	28.325	28.067	(1.000)	67776	0.67514	0.68(a)
32 2,4,5-Trichlorophenol	196	13.130	13.166	(0.880)	819022	20.2915	20.3
	196	13.064	13.166	(0.876)	812006	20.1176	20.1
124 Benzyl Alcohol	108	8.157	8.210	(1.033)	964974	22.5000	22.5
	108	7.895	8.210	(1.000)	32502	0.75784	0.76(a)
	108	8.370	8.210	(1.060)	1396783	32.5683	32.6
$ 83 1-Methylnaphthalene-d10	152	12.541	12.561	(1.171)	2152347	23.2743	23.3(R)
136 1-Chloro-3,4-Dinitrobenzene	63	15.649	15.718	(1.461)	450350	23.7407	23.7
	63	15.387	15.718	(1.437)	607559	32.0281	32.0
	63	15.469	15.718	(1.444)	12642	0.66644	0.67(a)
	63	15.943	15.718	(1.489)	23661	1.24731	1.2
	63	16.008	15.718	(1.495)	23523	1.24004	1.2

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01080501009.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: JGH
Method File: /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/09/98
Calibration Time: 0339

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7272118	3636059	14544236	7501268	3.15
24 Naphthalene-d8	13821622	6910811	27643244	13635781	-1.34
40 Acenaphthene-d10	8116937	4058468	16233874	9429486	16.17
56 Phenanthrene-d10	14791818	7395909	29583636	14784421	-0.05
67 Chrysene-d12	11581767	5790884	23163534	12767775	10.24
72 Perylene-d12	8146005	4073002	16292010	8382942	2.91

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.90	7.40	8.40	7.90	0.00
24 Naphthalene-d8	10.72	10.22	11.22	10.71	-0.15
40 Acenaphthene-d10	14.91	14.41	15.41	14.91	0.00
56 Phenanthrene-d10	18.53	18.03	19.03	18.53	0.00
67 Chrysene-d12	24.99	24.49	25.49	24.97	-0.06
72 Perylene-d12	28.34	27.84	28.84	28.33	-0.06

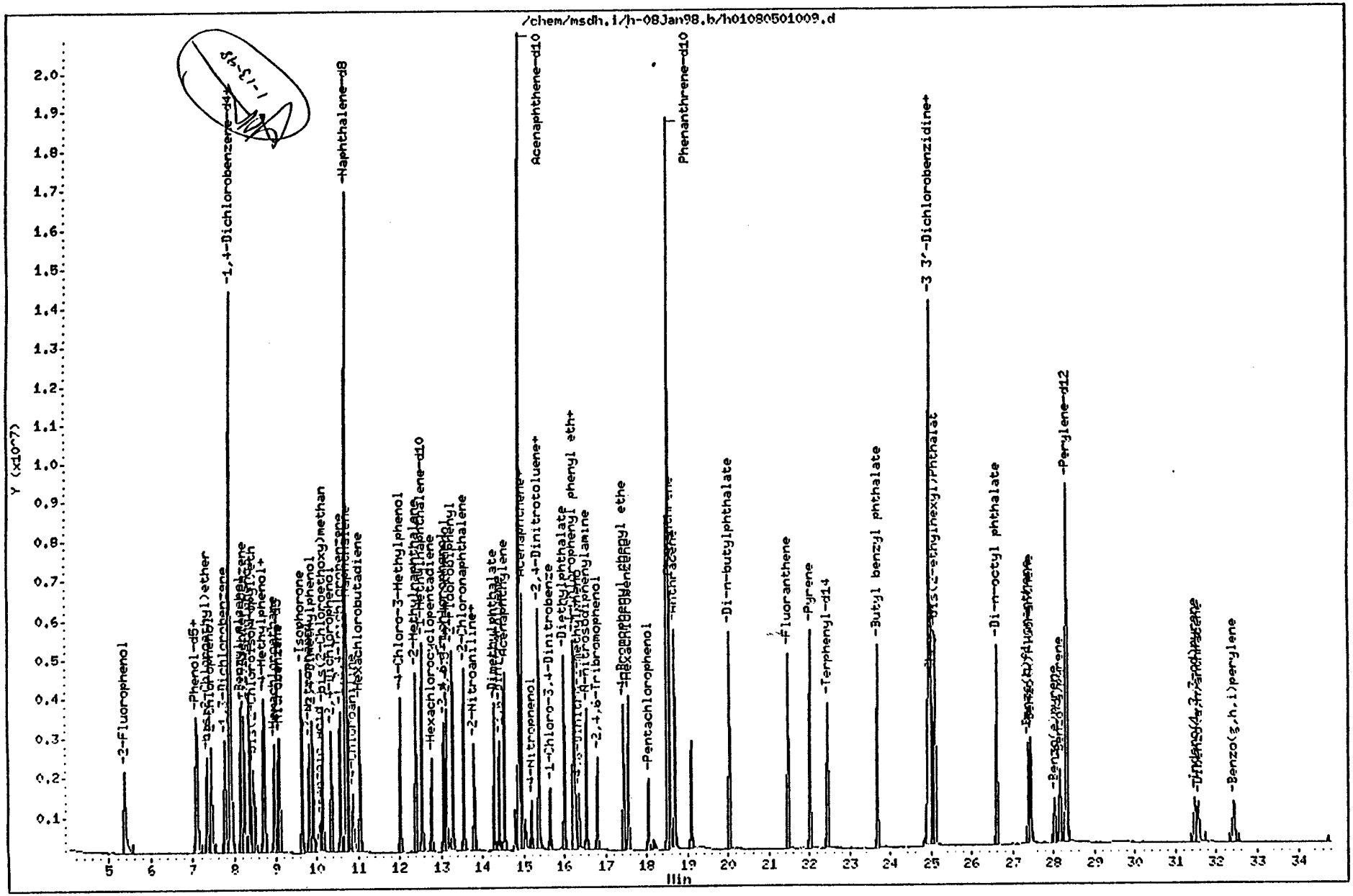
AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

Data File: /chem/msdh.i/h-08Jan98.b/h01080501009.d
Date : 09-JAN-1998 02:13
Client ID:
Sample Info: 1.0ul 20ug STD 396-4-20
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i

Operator: JGH
Column diameter: 2.00

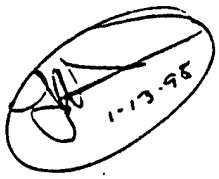
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Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080601010.d
Lab Smp Id:
Inj Date : 09-JAN-1998 02:56
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 40ug STD 396-4-40
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo



Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
S	1 2-Fluorophenol	112	5.379	5.397	(0.681)	3297560	42.8573	42.8
S	2 Phenol-d5	99	7.080	7.114	(0.661)	3636325	42.7248	42.7
	3 Phenol	94	7.113	7.147	(0.901)	3882105	43.2929	43.3
	4 bis(2-Chloroethyl)ether	93	7.342	7.376	(0.930)	3150356	41.4993	41.5
	5 2-Chlorophenol	128	7.440	7.474	(0.942)	2885093	43.2345	43.2
	6 1,3-Dichlorobenzene	146	7.767	7.785	(0.983)	3173148	41.6203	41.6
*	7 1,4-Dichlorobenzene-d4	150	7.898	7.899	(1.000)	7635166	80.0000	
	8 1,4-Dichlorobenzene	146	7.931	7.948	(1.004)	3136896	40.9321	40.9
	9 1,2-Dichlorobenzene	146	8.241	8.259	(1.043)	3008861	41.8312	41.8
	10 2-Methylphenol	108	8.372	8.406	(1.060)	2555108	41.8524	41.8
	11 bis(2-Chloroisopropyl)ether	45	8.470	8.488	(1.072)	5663468	43.0236	43.0
	12 4-Methylphenol	108	8.716	8.783	(1.104)	2520363	40.1479	40.1(M)
	13 N-Nitrosodipropylamine	70	8.765	8.832	(1.110)	2166825	41.6105	41.6
	14 Hexachloroethane	117	8.977	8.979	(1.137)	1341885	41.8279	41.8

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
‡	15 Nitrobenzene-d5	82	9.076	9.110	(0.608)	3408284	41.6908	41.7
	16 Nitrobenzene	77	9.125	9.159	(0.852)	3232406	43.0478	43.0
	17 Isophorone	82	9.664	9.715	(0.902)	6656943	42.7897	42.8
	18 2,4-Dimethylphenol	122	9.926	9.960	(0.927)	1984137	41.6652	41.7
	19 2-Nitrophenol	139	9.828	9.862	(0.918)	1680731	43.8697	43.9
	20 Benzoic Acid	122	10.155	10.353	(0.948)	1290393	37.3158	37.3
	21 bis(2-Chloroethoxy)methane	93	10.155	10.189	(0.948)	3579522	42.7543	42.8
	22 2,4-Dichlorophenol	162	10.368	10.402	(0.968)	2224207	42.5560	42.6
	23 1,2,4-Trichlorobenzene	180	10.580	10.598	(0.988)	2614422	41.9278	41.9
•	24 Naphthalene-d8	136	10.711	10.729	(1.000)	14176305	80.0000	
	25 Naphthalene	128	10.760	10.794	(1.005)	7565136	46.3721	46.4
	26 4-Chloroaniline	127	10.875	10.909	(1.015)	1465962	36.0510	36.0
	27 Hexachlorobutadiene	225	11.055	11.073	(1.032)	1354748	43.9533	44.0
	28 4-Chloro-3-Methylphenol	107	12.020	12.054	(1.122)	2162980	43.1551	43.2
	29 2-Methylnaphthalene	142	12.396	12.414	(1.157)	4795817	43.9348	43.9
	30 Hexachlorocyclopentadiene	237	12.772	12.790	(0.856)	1305840	40.7850	40.8
	31 2,4,6-Trichlorophenol	196	13.067	13.084	(0.876)	1685317	43.4432	43.4
‡	32 2-Fluorobiphenyl	172	13.296	13.313	(0.718)	5856480	46.2937	46.3
	34 2-Chloronaphthalene	162	13.557	13.592	(0.909)	4585228	41.5844	41.6
	35 2-Nitroaniline	65	13.803	13.853	(0.925)	1566155	43.2614	43.3
	36 Dimethylphthalate	163	14.293	14.328	(0.958)	5881184	41.6611	41.7
	37 2,6-Dinitrotoluene	165	14.424	14.475	(0.967)	1404143	42.6730	42.7
	38 Acenaphthylene	152	14.555	14.589	(0.976)	7630838	44.6853	44.7
	39 3-Nitroaniline	138	13.819	13.853	(0.927)	1711570	44.6525	44.6
•	40 Acenaphthene-d10	164	14.915	14.916	(1.000)	9194027	80.0000	
	41 Acenaphthene	154	14.980	15.015	(1.004)	4048929	40.1812	40.2
	42 2,4-Dinitrophenol	184	15.062	15.113	(1.010)	551124	30.5002	30.5
	43 4-Nitrophenol	109	15.209	15.293	(1.020)	476475	39.1872	39.2
	44 2,4-Dinitrotoluene	165	15.389	15.440	(1.032)	1777294	45.4861	45.5
	45 Dibenzofuran	168	15.406	15.440	(1.033)	6795113	44.2127	44.2
	46 Diethylphthalate	149	16.027	16.061	(1.075)	6115309	43.4781	43.5
	47 4-Chlorophenyl phenyl ether	204	16.256	16.290	(1.090)	2576133	44.3930	44.4
	48 4-Nitroaniline	138	16.289	16.389	(1.092)	586792	48.7123	48.7(H)
	49 Fluorene	166	16.240	16.274	(1.089)	5121807	42.7885	42.8
	50 4,6-Dinitro-2-methylphenol	198	16.371	16.421	(0.883)	1052658	43.0482	43.0
	51 N-nitrosodiphenylamine	169	16.551	16.585	(0.893)	3141585	44.9886	45.0
‡	52 2,4,6-Tribromophenol	330	16.812	16.847	(0.673)	1023377	39.2627	39.3
	53 4-Bromophenyl phenyl ether	248	17.450	17.485	(0.942)	1423121	45.1576	45.2
	54 Hexachlorobenzene	284	17.565	17.599	(0.948)	1846362	44.5941	44.6
	55 Pentachlorophenol	266	18.056	18.073	(0.974)	1074173	43.9777	44.0
•	56 Phenanthrene-d10	188	18.530	18.548	(1.000)	14720958	80.0000	
	57 Phenanthrene	178	18.579	18.613	(1.003)	7517518	48.1772	48.2
	58 Anthracene	178	18.710	18.744	(1.010)	7471335	49.5255	49.5
	59 Di-n-butylphthalate	149	20.035	20.053	(1.081)	10217133	51.9466	51.9
	60 Fluoranthene	202	21.474	21.508	(1.159)	7345083	48.2431	48.2
	61 Pyrene	202	22.014	22.064	(0.881)	7796674	42.9525	43.0
‡	62 Terphenyl-d14	244	22.456	22.473	(0.899)	5442331	43.1784	43.2

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
63 3 3'-Dichlorobenzidine	252	24.909	24.943	(0.997)	812580	32.1474	32.1
64 Butyl benzyl phthalate	149	23.682	23.717	(0.948)	4487107	42.3543	42.4
65 bis(2-ethylhexyl)Phthalate	149	25.122	25.140	(1.005)	6266076	42.6072	42.6
66 Benzo(a)Anthracene	228	24.942	24.976	(0.998)	5556439	38.8058	38.8
* 67 Chrysene-d12	240	24.991	25.009	(1.000)	12659652	80.0000	
68 Chrysene	228	25.040	25.091	(1.002)	5389526	42.2931	42.3
69 Di-n-octyl phthalate	149	26.610	26.644	(0.939)	9349814	45.8998	45.9
70 Benzo(b)fluoranthene	252	27.395	27.446	(0.967)	4640935	38.4942	38.5
71 Benzo(k)fluoranthene	252	27.461	27.511	(0.969)	4347339	37.2437	37.2
* 72 Perylene-d12	264	28.328	28.362	(1.000)	8823799	80.0000	
73 Indeno(1,2,3-cd)pyrene	276	31.485	31.552	(1.111)	2873108	38.9193	38.9
74 Benzo(a)pyrene	252	28.164	28.231	(0.994)	3730220	38.5442	38.5
75 Dibenzo(a,h)anthracene	278	31.566	31.650	(1.114)	2518898	39.4302	39.4
76 Benzo(g,h,i)perylene	276	32.450	32.549	(1.145)	2879966	39.1053	39.1
94 Benzo(e)pyrene	252	28.033	28.067	(0.990)	1998307	18.9112	18.9
32 2,4,5-Trichlorophenol	196	13.132	13.166	(0.880)	1698111	43.1485	43.1
124 Benzyl Alcohol	108	8.160	8.210	(1.033)	1851574	42.4154	42.4
33 1-Methylnaphthalene-d10	152	12.543	12.561	(1.171)	4115246	42.8032	42.8
136 1-Chloro-3,4-Dinitrobenzene	63	15.667	15.718	(1.463)	906769	45.9787	46.0

QC Flag Legend

M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080601010.d
Lab Smp Id:
Inj Date : 09-JAN-1998 02:56
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 40ug STD 396-4-40
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
C	1 2-Fluorophenol	112	5.379	5.397	(0.681)	3297560	42.8573	42.8
		112	5.068	5.397	(0.642)	63778	0.82890	0.83(R)
C	2 Phenol-d5	99	7.080	7.114	(0.661)	3636325	42.7248	42.7
		99	7.440	7.114	(0.695)	160232	1.88264	1.9(R)
	3 Phenol	94	7.113	7.147	(0.901)	3882561	43.2979	43.3
		94	7.342	7.147	(0.930)	114634	1.27839	1.3
	4 bis(2-Chloroethyl)ether	93	7.342	7.376	(0.930)	3150356	41.4993	41.5
		93	7.113	7.376	(0.901)	75288	0.99176	0.99(a)
		93	7.440	7.376	(0.942)	65564	0.86367	0.86(a)
	5 2-Chlorophenol	128	7.440	7.474	(0.942)	2885093	43.2345	43.2
	6 1,3-Dichlorobenzene	146	7.767	7.785	(0.983)	3173148	41.6203	41.6
		146	7.931	7.785	(1.004)	3124588	40.9834	41.0
*	7 1,4-Dichlorobenzene-d4	150	7.898	7.899	(1.000)	7635166	80.0000	
		150	7.783	7.899	(1.000)	324503	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
	150	8.241	7.899	(1.000)	306783	80.0000	
8 1,4-Dichlorobenzene	146	7.931	7.948	(1.004)	3134902	40.9061	40.9
	146	7.767	7.948	(0.983)	3178799	41.4789	41.5
	146	8.241	7.948	(1.043)	2997570	39.1141	39.1
9 1,2-Dichlorobenzene	146	8.241	8.259	(1.043)	3008861	41.8312	41.8
	146	7.931	8.259	(1.004)	3124588	43.4401	43.4
10 2-Methylphenol	108	8.372	8.406	(1.060)	2555108	41.8524	41.8
	108	8.160	8.406	(1.033)	1851574	30.3286	30.3
	108	8.241	8.406	(1.043)	38973	0.63837	0.64(a)
	108	8.716	8.406	(1.104)	2568463	42.0712	42.1
11 bis(2-Chloroisopropyl)ether	45	8.470	8.488	(1.072)	5658748	42.9877	43.0
12 4-Methylphenol	108	8.716	8.783	(1.104)	2562667	40.8218	40.8
13 N-Nitrosodipropylamine	70	8.765	8.832	(1.110)	2166825	41.6105	41.6
	70	9.076	8.832	(1.149)	481570	9.24780	9.2
14 Hexachloroethane	117	8.977	8.979	(1.137)	1341885	41.8279	41.8
S 15 Nitrobenzene-d5	82	9.076	9.110	(0.608)	3408284	41.6908	41.7
16 Nitrobenzene	77	9.125	9.159	(0.852)	3232406	43.0478	43.0
17 Isophorone	82	9.664	9.715	(0.902)	6656943	42.7897	42.8
18 2,4-Dimethylphenol	122	9.926	9.960	(0.927)	1984137	41.6652	41.7
	122	9.828	9.960	(0.918)	85796	1.80164	1.8
	122	10.155	9.960	(0.948)	1323211	27.7863	27.8
19 2-Nitrophenol	139	9.828	9.862	(0.918)	1680731	43.8697	43.9
	139	9.664	9.862	(0.902)	94137	2.45712	2.4
	139	9.926	9.862	(0.927)	699852	18.2672	18.3
20 Benzoic Acid	122	10.155	10.353	(0.948)	1290393	37.3158	37.3
	122	9.926	10.353	(0.927)	1889682	54.6461	54.6
21 bis(2-Chloroethoxy)methane	93	10.155	10.189	(0.948)	3579522	42.7543	42.8
	93	9.828	10.189	(0.918)	154962	1.85089	1.8
	93	9.926	10.189	(0.927)	79730	0.95231	0.95(a)
22 2,4-Dichlorophenol	162	10.368	10.402	(0.968)	2224207	42.5560	42.6
23 1,2,4-Trichlorobenzene	180	10.580	10.598	(0.988)	2614422	41.9278	41.9
* 24 Naphthalene-d8	136	10.711	10.729	(1.000)	14176305	80.0000	
	136	10.368	10.729	(1.000)	12636	80.0000	
	136	10.433	10.729	(1.000)	181	80.0000	
	136	10.482	10.729	(1.000)	360	80.0000	
	136	10.597	10.729	(1.000)	1441	80.0000	
25 Naphthalene	128	10.760	10.794	(1.005)	7565136	46.3721	46.4
	128	10.875	10.794	(1.015)	176101	1.07945	1.1
26 4-Chloroaniline	127	10.875	10.909	(1.015)	1469646	36.1416	36.1
	127	10.760	10.909	(1.005)	902539	22.1953	22.2
27 Hexachlorobutadiene	225	11.055	11.073	(1.032)	1354748	43.9533	44.0
	225	10.695	11.073	(0.998)	19346	0.62766	0.63(a)
28 4-Chloro-3-Methylphenol	107	12.020	12.054	(1.122)	2162980	43.1551	43.2
29 2-Methylnaphthalene	142	12.396	12.414	(1.157)	4795817	43.9348	43.9
	142	12.020	12.414	(1.122)	1814555	16.6233	16.6
	142	12.625	12.414	(1.179)	69726	0.63877	0.64
30 Hexachlorocyclopentadiene	237	12.772	12.790	(0.856)	1305840	40.7850	40.8

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	31 2,4,6-Trichlorophenol	196	13.067	13.084	(0.876)	1685317	43.4432	43.4
		196	13.132	13.084	(0.880)	1698111	43.7730	43.8
S	33 2-Fluorobiphenyl	172	13.296	13.313	(0.718)	5856480	46.2937	46.3
	34 2-Chloronaphthalene	162	13.557	13.592	(0.909)	4585228	41.5844	41.6
	35 2-Nitroaniline	65	13.803	13.853	(0.925)	1566155	43.2614	43.3
	36 Dimethylphthalate	163	14.293	14.328	(0.958)	5881184	41.6611	41.7
	37 2,6-Dinitrotoluene	165	14.424	14.475	(0.967)	1404143	42.6730	42.7
		165	14.293	14.475	(0.958)	60056	1.82515	1.8
	38 Acenaphthylene	152	14.555	14.589	(0.976)	7630838	44.6853	44.7
		152	14.980	14.589	(1.004)	1985954	11.6295	11.6
	39 3-Nitroaniline	138	13.819	13.853	(0.927)	1711570	44.6525	44.6
*	40 Acenaphthene-d10	164	14.915	14.916	(1.000)	9194027	80.0000	
		164	14.702	14.916	(1.000)	280	80.0000	
	41 Acenaphthene	154	14.980	15.015	(1.004)	4048929	40.1812	40.2
	42 2,4-Dinitrophenol	184	15.062	15.113	(1.010)	551124	30.5002	30.5
	43 4-Nitrophenol	109	15.209	15.293	(1.020)	476475	39.1872	39.2
		109	14.980	15.293	(1.004)	9182	0.75516	0.76(a)
		109	15.406	15.293	(1.033)	29577	2.43253	2.4
	44 2,4-Dinitrotoluene	165	15.389	15.440	(1.032)	1777294	45.4861	45.5
	45 Dibenzofuran	168	15.406	15.440	(1.033)	6795113	44.2127	44.2
	46 Diethylphthalate	149	16.027	16.061	(1.075)	6115309	43.4781	43.5
	47 4-Chlorophenyl phenyl ether	204	16.256	16.290	(1.090)	2576133	44.3930	44.4
	48 4-Nitroaniline	138	16.289	16.389	(1.092)	589628	48.9477	48.9
		138	16.240	16.389	(1.089)	62691	5.20426	5.2
	49 Fluorene	166	16.240	16.274	(1.089)	5121807	42.7885	42.8
		166	16.551	16.274	(1.110)	164101	1.37093	1.4
	50 4,6-Dinitro-2-methylphenol	198	16.371	16.421	(0.883)	1052658	43.0482	43.0
	51 N-nitrosodiphenylamine	169	16.551	16.585	(0.893)	3141585	44.9886	45.0
		169	16.256	16.585	(0.877)	236607	3.38830	3.4
S	52 2,4,6-Tribromophenol	330	16.812	16.847	(0.673)	1023377	39.2627	39.3
	53 4-Bromophenyl phenyl ether	248	17.450	17.485	(0.942)	1423121	45.1576	45.2
	54 Hexachlorobenzene	284	17.565	17.599	(0.948)	1846362	44.5941	44.6
	55 Pentachlorophenol	266	18.056	18.073	(0.974)	1074173	43.9777	44.0
*	56 Phenanthrene-d10	188	18.530	18.548	(1.000)	14720958	80.0000	
		188	18.219	18.548	(1.000)	993	80.0000	
		188	18.285	18.548	(1.000)	188	80.0000	
		188	18.334	18.548	(1.000)	60	80.0000	
	57 Phenanthrene	178	18.579	18.613	(1.003)	7517538	48.1772	48.2
		178	18.710	18.613	(1.010)	7471335	47.8811	47.9
	58 Anthracene	178	18.710	18.744	(1.010)	7471335	49.5255	49.5
		178	18.579	18.744	(1.003)	7517538	49.8317	49.8
	59 Di-n-butylphthalate	149	20.035	20.053	(1.081)	10217133	51.9466	51.9
	60 Fluoranthene	202	21.474	21.508	(1.159)	7345083	48.2431	48.2
	61 Pyrene	202	22.014	22.064	(0.881)	7796674	42.9525	43.0
S	62 Terphenyl-d14	244	22.456	22.473	(0.899)	5442331	43.1784	43.2
	63 3 3'-Dichlorobenzidine	252	24.909	24.943	(0.997)	812580	32.1474	32.1
	64 Butyl benzyl phthalate	149	23.682	23.717	(0.948)	4487107	42.3543	42.4

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
65	bis(2-ethylhexyl)Phthalate	149	25.122	25.140	(1.005)	6266076	42.6072	42.6
66	Benzo(a)Anthracene	228	24.942	24.976	(0.998)	5556439	38.8058	38.8
		228	25.040	24.976	(1.002)	5388246	37.6312	37.6
* 67	Chrysene-d12	240	24.991	25.009	(1.000)	12659652	80.0000	
		240	24.664	25.009	(1.000)	463	80.0000	
		240	24.762	25.009	(1.000)	1123	80.0000	
		240	24.860	25.009	(1.000)	2307	80.0000	
68	Chrysene	228	25.040	25.091	(1.002)	5392362	42.3154	42.3
		228	24.942	25.091	(0.998)	5556439	43.6030	43.6
69	Di-n-octyl phthalate	149	26.610	26.644	(0.939)	9349814	45.8998	45.9
70	Benzo(b)fluoranthene	252	27.395	27.446	(0.967)	4640935	38.4942	38.5
		252	27.461	27.446	(0.969)	4347342	36.0590	36.0
71	Benzo(k)fluoranthene	252	27.461	27.511	(0.969)	4347339	37.2437	37.2
		252	27.395	27.511	(0.967)	4640935	39.7590	39.8
* 72	Perylene-d12	264	28.328	28.362	(1.000)	9823799	80.0000	
		264	27.984	28.362	(1.000)	237	80.0000	
		264	28.181	28.362	(1.000)	2025	80.0000	
73	Indeno(1,2,3-cd)pyrene	276	31.485	31.552	(1.111)	2873108	38.9193	38.9
		276	31.566	31.552	(1.114)	565760	7.66383	7.7
74	Benzo(a)pyrene	252	28.164	28.231	(0.994)	3730220	38.5442	38.5
		252	28.033	28.231	(0.990)	1998307	20.6484	20.6
		252	28.328	28.231	(1.000)	100359	1.03701	1.0
75	Dibenzo(a,h)anthracene	278	31.566	31.650	(1.114)	2518898	39.4302	39.4
76	Benzo(g,h,i)perylene	276	32.450	32.549	(1.145)	2879966	39.1053	39.1
84	Benzo(e)pyrene	252	28.033	28.067	(0.990)	1998307	18.9112	18.9
		252	28.164	28.067	(0.994)	3730220	35.3014	35.3
		252	28.328	28.067	(1.000)	100359	0.94976	0.95(a)
32	2,4,5-Trichlorophenol	196	13.132	13.166	(0.880)	1698114	43.1486	43.1
		196	13.067	13.166	(0.876)	1685317	42.8235	42.8
124	Benzyl Alcohol	108	8.241	8.210	(1.043)	45476	1.04175	1.0
		108	7.767	8.210	(0.983)	23004	0.52697	0.53(a)
		108	7.931	8.210	(1.004)	41788	0.95727	0.96(a)
		108	8.160	8.210	(1.033)	1851574	42.4154	42.4
		108	8.372	8.210	(1.060)	2565640	58.7731	58.8
* 93	1-Methylnaphthalene-d10	152	12.543	12.561	(1.171)	4115246	42.8032	42.8
126	1-Chloro-3,4-Dinitrobenzene	63	15.667	15.718	(1.463)	906769	45.9787	46.0
		63	15.389	15.718	(1.437)	1234898	62.6168	62.6
		63	15.471	15.718	(1.444)	25091	1.27227	1.3
		63	15.946	15.718	(1.489)	50939	2.58291	2.6
		63	16.011	15.718	(1.495)	42046	2.13199	2.1

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.

272

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01080601010.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: JGH
Method File: /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/09/98
Calibration Time: 0339

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7272118	3636059	14544236	7635166	4.99
24 Naphthalene-d8	13821622	6910811	27643244	14176305	2.57
40 Acenaphthene-d10	8116937	4058468	16233874	9194027	13.27
56 Phenanthrene-d10	14791818	7395909	29583636	14720958	-0.48
67 Chrysene-d12	11581767	5790884	23163534	12659652	9.31
72 Perylene-d12	8146005	4073002	16292010	8823799	8.32

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.90	7.40	8.40	7.90	0.03
24 Naphthalene-d8	10.72	10.22	11.22	10.71	-0.13
40 Acenaphthene-d10	14.91	14.41	15.41	14.92	0.02
56 Phenanthrene-d10	18.53	18.03	19.03	18.53	0.01
67 Chrysene-d12	24.99	24.49	25.49	24.99	0.01
72 Perylene-d12	28.34	27.84	28.84	28.33	-0.05

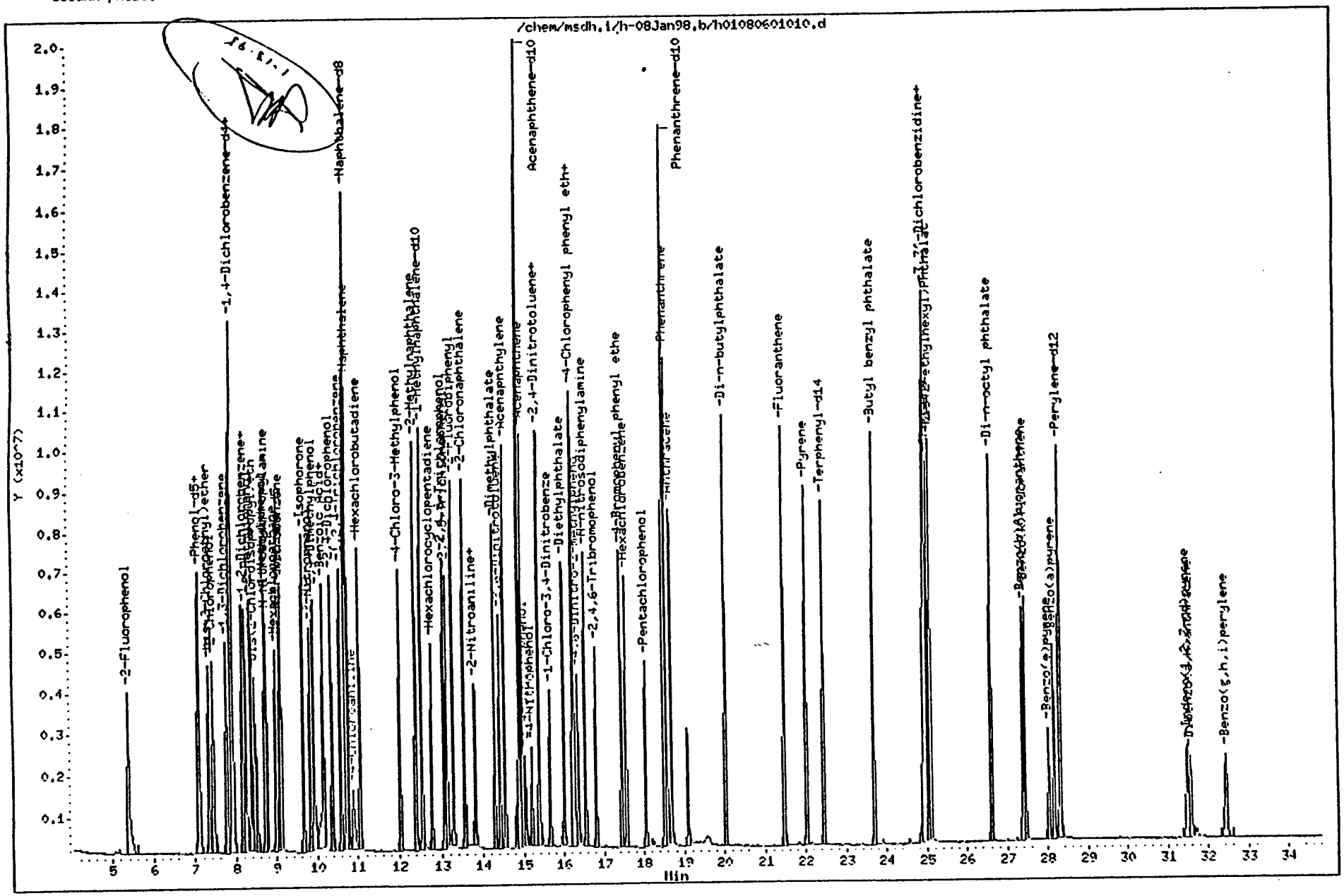
AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

273A

Data [redacted]: /chem/msdh.i/h-08Jan98.b/h01080601010.d
Date : 09-JAN-1998 02:56
Client ID:
Sample Info: 1.0ul 40ug STD 396-4-40
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i

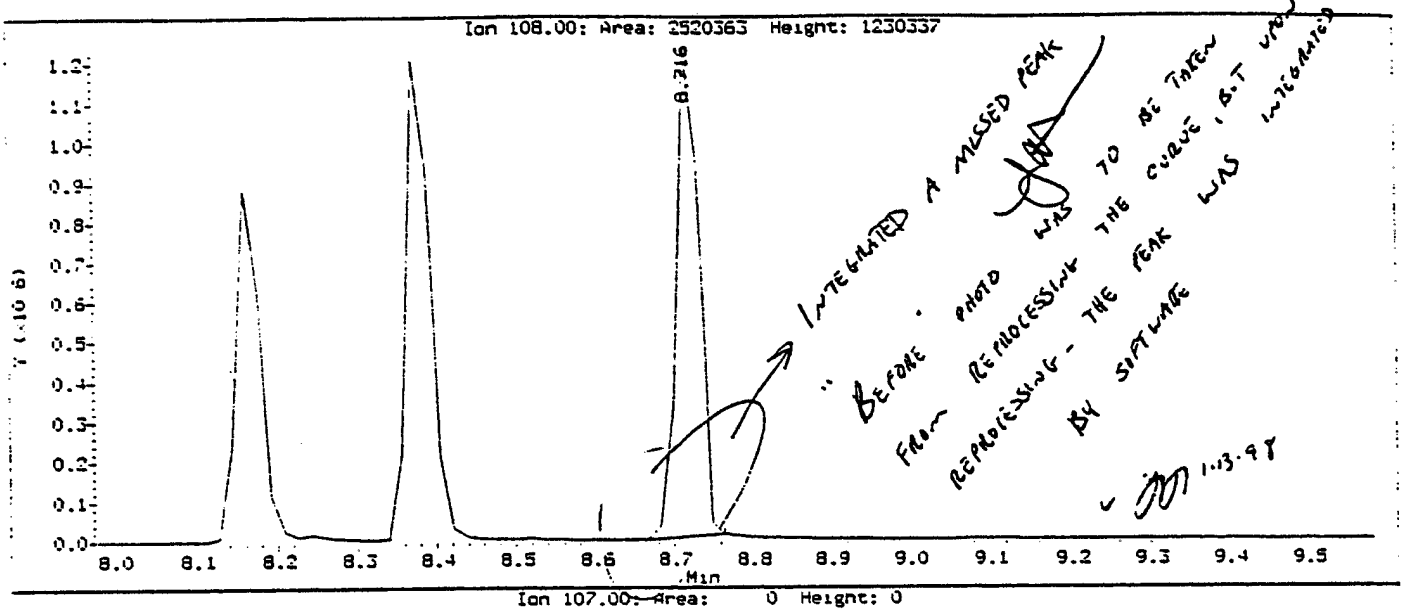
Operator: JCH
Column diameter: 2.00

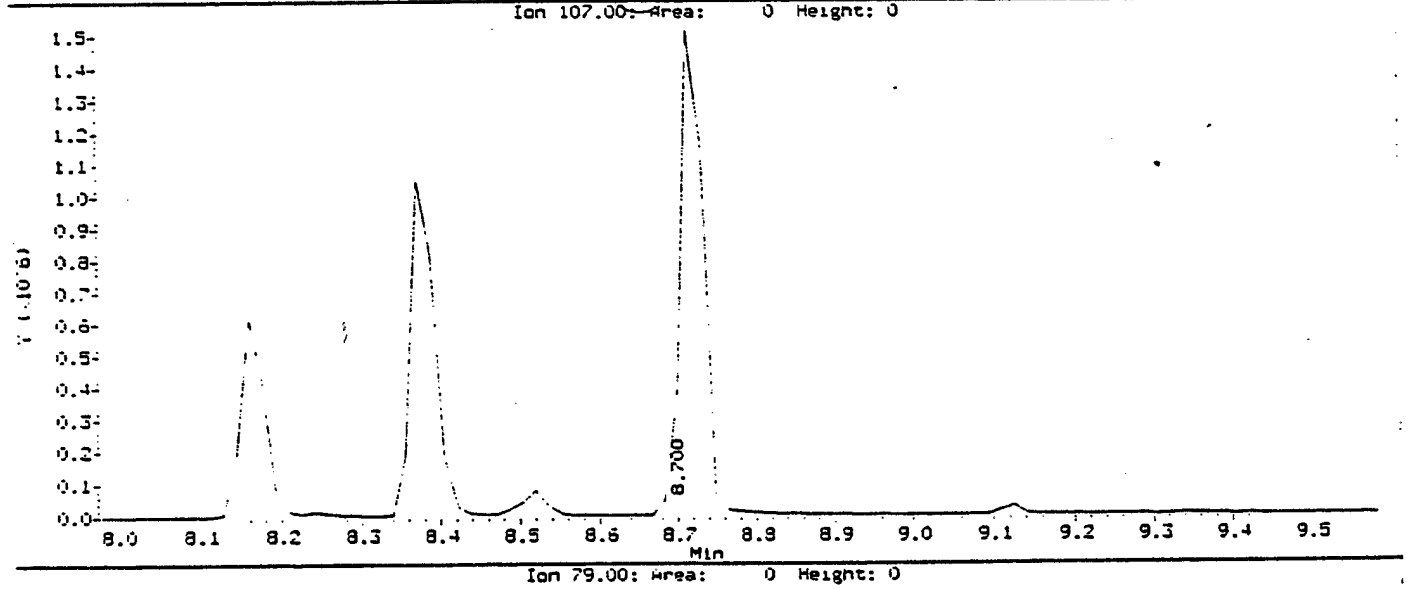


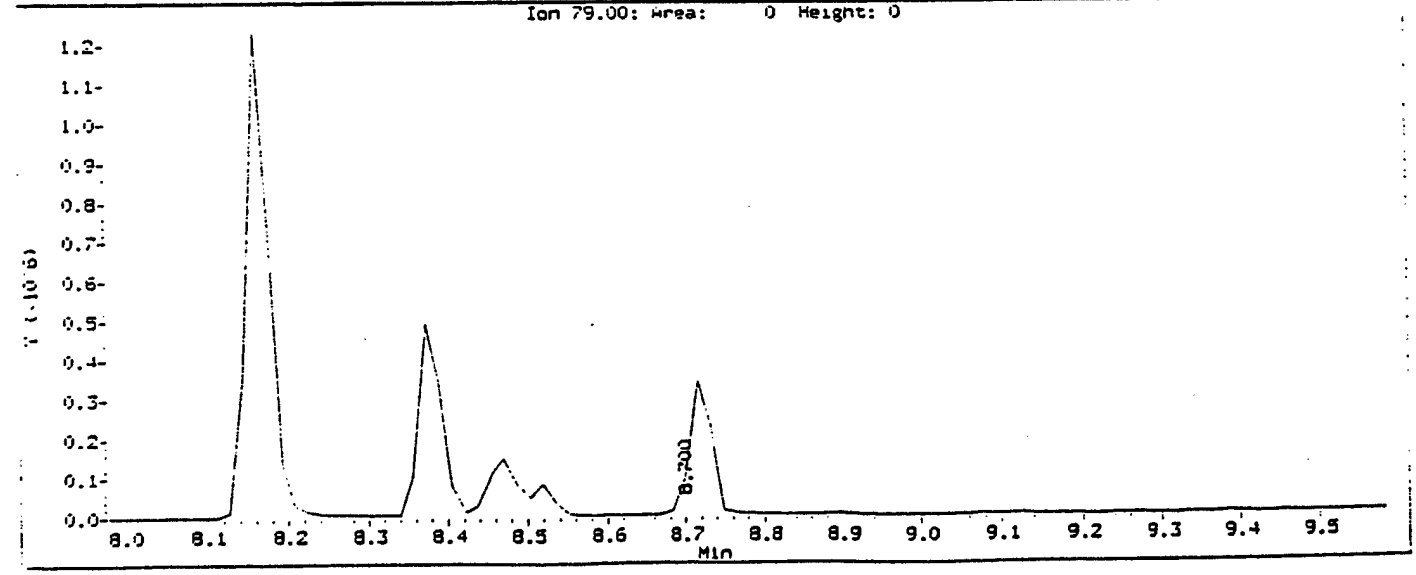
Data File: /chem/msdh.i/h-08Jan98.b/h01080601010.d
Injection Date: 09-JAN-1998 02:56
Instrument: msdh.i
Client Sample ID:

273B

Compound: 4-Methylphenol
CAS Number: 106-44-5







Data File: /chem/msdh.i/h-08Jan98.b/h01080701011.d
Report Date: 13-Jan-1998 10:44

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080701011.d
Lab Smp Id:
Inj Date : 09-JAN-1998 03:39
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 80ug STD 396-4-80
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

1-13-98

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
:	1 2-Fluorophenol	112	5.393	5.397	(0.683)	5854943	79.8937	79.9
:	2 Phenol-d5	99	7.094	7.114	(0.661)	5330504	76.2885	76.3
	3 Phenol	94	7.126	7.147	(0.903)	6633143	77.6651	77.7
	4 bis(2-Chloroethyl)ether	93	7.355	7.376	(0.932)	5646323	78.0916	78.1
	5 2-Chlorophenol	128	7.453	7.474	(0.944)	4975500	78.2826	78.3
	6 1,3-Dichlorobenzene	146	7.781	7.785	(0.985)	5567563	76.6721	76.7
•	7 1,4-Dichlorobenzene-d4	150	7.895	7.899	(1.000)	7272118	80.0000	
	8 1,4-Dichlorobenzene	146	7.928	7.948	(1.004)	5544860	75.9647	76.0
	9 1,2-Dichlorobenzene	146	8.255	8.259	(1.046)	5411484	78.9900	79.0
	10 2-Methylphenol	108	8.386	8.406	(1.062)	4486971	77.1653	77.2
	11 bis(2-Chloroisopropyl)ether	45	8.468	8.488	(1.073)	9603550	76.5973	76.6
	12 4-Methylphenol	108	8.746	8.783	(1.108)	4697364	78.5618	78.6
	13 N-Nitrosodipropylamine	70	8.778	8.832	(1.112)	4022678	81.1058	81.1
	14 Hexachloroethane	117	8.975	8.979	(1.137)	2432949	79.6234	79.6

Data File: /chem/msdh.i/h-08Jan98.b/h01080701011.d
Report Date: 13-Jan-1998 10:44

		Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
S	15	Nitrobenzene-d5	82	9.089	9.110	(0.610)	6131676	84.9566	85.0
	16	Nitrobenzene	77	9.138	9.159	(0.852)	5971911	81.5722	81.6
	17	Isophorone	82	9.678	9.715	(0.902)	11796500	77.7716	77.8
	18	2,4-Dimethylphenol	122	9.940	9.960	(0.927)	3623037	78.0331	78.0
	19	2-Nitrophenol	139	9.842	9.862	(0.918)	3094171	82.8352	82.8
	20	Benzoic Acid	122	10.234	10.353	(0.954)	2797338	82.9696	83.0
	21	bis(2-Chloroethoxy)methane	93	10.169	10.189	(0.948)	6282609	76.9659	77.0
	22	2,4-Dichlorophenol	162	10.381	10.402	(0.968)	4156510	81.5678	81.6
	23	1,2,4-Trichlorobenzene	180	10.578	10.598	(0.986)	4819274	79.2706	79.3
*	24	Naphthalene-d8	136	10.725	10.729	(1.000)	13821622	80.0000	
	25	Naphthalene	128	10.774	10.794	(1.005)	11993840	75.4054	75.4
	26	4-Chloroaniline	127	10.888	10.909	(1.015)	2421649	61.0815	61.1
	27	Hexachlorobutadiene	225	11.052	11.073	(1.030)	2462814	81.9538	82.0
	28	4-Chloro-3-Methylphenol	107	12.033	12.054	(1.122)	3885220	79.5059	79.5
	29	2-Methylnaphthalene	142	12.410	12.414	(1.157)	8397725	78.9064	78.9
	30	Hexachlorocyclopentadiene	237	12.770	12.790	(0.856)	2538736	89.8134	89.8
	31	2,4,6-Trichlorophenol	196	13.080	13.084	(0.877)	3185748	93.0176	93.0
S	33	2-Fluorobiphenyl	172	13.293	13.313	(0.717)	10272909	80.8153	80.8
	34	2-Chloronaphthalene	162	13.571	13.592	(0.910)	8453374	86.8387	86.8
	35	2-Nitroaniline	65	13.816	13.853	(0.926)	2877948	90.0455	90.0
	36	Dimethylphthalate	163	14.307	14.328	(0.959)	10682584	85.7148	85.7
	37	2,6-Dinitrotoluene	165	14.438	14.475	(0.968)	2752612	94.7545	94.8
	38	Acenaphthylene	152	14.569	14.589	(0.977)	12937194	85.8117	85.8
	39	3-Nitroaniline	138	13.833	13.853	(0.928)	3146508	92.9808	93.0
*	40	Acenaphthene-d10	164	14.912	14.916	(1.000)	8116937	80.0000	
	41	Acenaphthene	154	14.994	15.015	(1.005)	7375066	82.9014	82.9
	42	2,4-Dinitrophenol	184	15.076	15.113	(1.011)	1411619	88.4881	88.5
	43	4-Nitrophenol	109	15.239	15.293	(1.022)	955367	88.9996	89.0
	44	2,4-Dinitrotoluene	165	15.403	15.440	(1.033)	3180394	92.1965	92.2
	45	Dibenzofuran	168	15.419	15.440	(1.034)	12018206	88.5735	88.6
	46	Diethylphthalate	149	16.025	16.061	(1.075)	11525820	92.8996	92.9
	47	4-Chlorophenyl phenyl ether	204	16.270	16.290	(1.091)	4410913	86.0970	86.1
	48	4-Nitroaniline	138	16.319	16.389	(1.094)	854368	80.3365	80.3(H)
	49	Fluorene	166	16.254	16.274	(1.090)	9124044	86.3386	86.3
	50	4,6-Dinitro-2-methylphenol	198	16.384	16.421	(0.884)	2297814	93.5184	93.5
	51	N-nitrosodiphenylamine	169	16.564	16.585	(0.894)	5616547	80.0457	80.0
S	52	2,4,6-Tribromophenol	330	16.826	16.847	(0.673)	2017186	84.5935	84.6
	53	4-Bromophenyl phenyl ether	248	17.464	17.485	(0.943)	2634481	83.1952	83.2
	54	Hexachlorobenzene	284	17.578	17.599	(0.949)	3320288	79.8087	79.8
	55	Pentachlorophenol	266	18.053	18.073	(0.974)	2181785	88.8964	88.9
*	56	Phenanthrene-d10	188	18.527	18.548	(1.000)	14791818	80.0000	
	57	Phenanthrene	178	18.593	18.613	(1.004)	12362380	78.8466	78.8
	58	Anthracene	178	18.707	18.744	(1.010)	12837014	84.6855	84.7
	59	Di-n-butylphthalate	149	20.032	20.053	(1.081)	15745403	79.6702	79.7
	60	Fluoranthene	202	21.488	21.508	(1.160)	12802544	83.6853	83.7
	61	Pyrene	202	22.028	22.064	(0.882)	14161063	85.2749	85.3
S	62	Terphenyl-d14	244	22.453	22.473	(0.899)	9815539	85.1221	85.1

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
63	3 3'-Dichlorobenzidine	252	24.923	24.943	(0.997)	1972150	85.2839	85.3
64	Butyl benzyl phthalate	149	23.696	23.717	(0.948)	8129597	83.8778	83.9
65	bis(2-ethylhexyl)Phthalate	149	25.119	25.140	(1.005)	11071284	82.2873	82.3
66	Benzo(a)Anthracene	228	24.955	24.976	(0.999)	10828686	82.6653	82.7
* 67	Chrysene-d12	240	24.988	25.009	(1.000)	11581767	80.0000	
68	Chrysene	228	25.054	25.091	(1.003)	10309458	88.4305	88.4
69	Di-n-octyl phthalate	149	26.624	26.644	(0.939)	14237913	75.7120	75.7
70	Benzo(b)fluoranthene	252	27.409	27.446	(0.967)	9287076	83.4410	83.4
71	Benzo(k)fluoranthene	252	27.474	27.511	(0.969)	8638417	90.1631	80.2
* 72	Perylene-d12	264	28.341	28.362	(1.000)	8146005	80.0000	
73	Indeno(1,2,3-cd)pyrene	276	31.515	31.552	(1.112)	5758602	84.4970	84.5
74	Benzo(a)pyrene	252	28.194	28.231	(0.995)	7382510	82.6304	82.6
75	Dibenzo(a,h)anthracene	278	31.596	31.650	(1.115)	5002994	84.8320	84.8
76	Benzo(g,h,i)perylene	276	32.480	32.549	(1.146)	5422256	79.7515	79.8
84	Benzo(e)pyrene	252	28.047	28.067	(0.990)	3978234	40.7811	40.8
32	2,4,5-Trichlorophenol	196	13.146	13.166	(0.882)	3214264	92.5114	92.5
124	Benzyl Alcohol	108	8.173	8.210	(1.035)	3252704	78.2321	78.2
* 93	1-Methylnaphthalene-d10	152	12.557	12.561	(1.171)	7163542	76.4210	76.4
136	1-Chloro-3,4-Dinitrobenzene	63	15.681	15.718	(1.462)	1621422	84.3257	84.3

QC Flag Legend

H - Operator selected an alternate compound hit.

Data File: /chem/msdh.i/h-08Jan98.b/h01080701011.d
Report Date: 13-Jan-1998 11:07

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080701011.d
Lab Smp Id:
Inj Date : 09-JAN-1998 03:39
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 80ug STD 396-4-80
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
1 2-Fluorophenol	112	5.393	5.397	(0.683)	5854943	79.8937	79.9
	112	5.065	5.397	(0.642)	204638	2.79239	2.8(R)
2 Phenol-d5	99	7.094	7.114	(0.661)	6330504	76.2885	76.3
	99	7.453	7.114	(0.695)	283734	3.41926	3.4(R)
3 Phenol	94	7.126	7.147	(0.903)	6633143	77.6651	77.7
	94	7.339	7.147	(0.930)	200253	2.34469	2.3
4 bis(2-Chloroethyl)ether	93	7.355	7.376	(0.932)	5646496	78.0940	78.1
	93	7.126	7.376	(0.903)	126926	1.75545	1.8
	93	7.453	7.376	(0.944)	121682	1.68293	1.7
5 2-Chlorophenol	128	7.453	7.474	(0.944)	4975500	78.2826	78.3
6 1,3-Dichlorobenzene	146	7.781	7.785	(0.985)	5567563	76.6721	76.7
	146	7.928	7.785	(1.004)	5536705	76.2472	76.2
7 1,4-Dichlorobenzene-d4	150	7.895	7.899	(1.000)	7272118	80.0000	
	150	7.781	7.899	(1.000)	566457	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	150	8.255	7.899	(1.000)	549872	80.0000	
8 1,4-Dichlorobenzene	146	7.928	7.948	(1.004)	5534968	75.8292	75.8
	146	7.781	7.948	(0.985)	5576548	76.3989	76.4
	146	8.239	7.948	(1.044)	5377162	73.6673	73.7
9 1,2-Dichlorobenzene	146	8.255	8.259	(1.046)	5411484	78.9900	79.0
	146	7.928	8.259	(1.004)	5535066	80.7939	80.8
10 2-Methylphenol	108	8.386	8.406	(1.062)	4486971	77.1653	77.2
	108	8.173	8.406	(1.035)	3252704	55.9388	55.9
	108	8.746	8.406	(1.108)	4769688	82.0274	82.0
11 bis(2-Chloroisopropyl)ether	45	8.468	8.488	(1.073)	9611447	76.6603	76.7
12 4-Methylphenol	108	8.746	8.783	(1.108)	4697364	78.5618	78.6
13 N-Nitrosodipropylamine	70	8.778	8.832	(1.112)	4022678	81.1058	81.1
	70	8.975	8.832	(1.137)	34230	0.69015	0.69(a)
	70	9.089	8.832	(1.151)	860040	17.3402	17.3
14 Hexachloroethane	117	8.975	8.979	(1.137)	2432949	79.6234	79.6
15 Nitrobenzene-d5	82	9.089	9.110	(0.610)	6131676	84.9566	85.0
16 Nitrobenzene	77	9.138	9.159	(0.852)	5971911	81.5722	81.6
	77	8.746	9.159	(0.815)	1766691	24.1318	24.1
17 Isophorone	82	9.678	9.715	(0.902)	11796500	77.7716	77.8
	82	9.842	9.715	(0.918)	115393	0.76076	0.76(a)
18 2,4-Dimethylphenol	122	9.940	9.960	(0.927)	3623037	78.0331	78.0
	122	9.842	9.960	(0.918)	159910	3.44415	3.4
19 2-Nitrophenol	139	9.842	9.862	(0.918)	3094171	82.8352	82.8
	139	9.678	9.862	(0.902)	166908	4.46836	4.5
20 Benzoic Acid	122	10.234	10.353	(0.954)	2867290	85.0444	85.0
	122	9.940	10.353	(0.927)	3553277	105.391	105
	122	10.578	10.353	(0.986)	24656	0.73130	0.73(a)
	122	10.774	10.353	(1.005)	24913	0.73892	0.74(a)
21 bis(2-Chloroethoxy)methane	93	10.169	10.189	(0.948)	6282609	76.9659	77.0
	93	9.842	10.189	(0.918)	288489	3.53417	3.5
	93	9.940	10.189	(0.927)	146887	1.79946	1.8
22 2,4-Dichlorophenol	162	10.381	10.402	(0.968)	4156510	81.5678	81.6
23 1,2,4-Trichlorobenzene	180	10.578	10.598	(0.986)	4819274	79.2706	79.3
24 Naphthalene-d8	136	10.725	10.729	(1.000)	13821622	80.0000	
	136	10.300	10.729	(1.000)	37	80.0000	
	136	10.381	10.729	(1.000)	25184	80.0000	
	136	10.578	10.729	(1.000)	1451	80.0000	
25 Naphthalene	128	10.774	10.794	(1.005)	11993840	75.4054	75.4
	128	10.381	10.794	(0.968)	131142	0.82449	0.82
	128	10.888	10.794	(1.015)	278267	1.74947	1.7
26 4-Chloroaniline	127	10.888	10.909	(1.015)	2422562	61.1045	61.1
	127	10.774	10.909	(1.005)	1528486	38.5531	38.6
	127	11.101	10.909	(1.035)	49566	1.25021	1.2
27 Hexachlorobutadiene	225	11.052	11.073	(1.030)	2462814	81.9538	82.0
	225	10.692	11.073	(0.997)	33884	1.12754	1.1
28 4-Chloro-3-Methylphenol	107	12.033	12.054	(1.122)	3885220	79.5059	79.5
29 2-Methylnaphthalene	142	12.410	12.414	(1.157)	8397725	78.9064	78.9

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
		142	12.033	12.414	(1.122)	3187562	29.9509	30.0
		142	12.622	12.414	(1.177)	109734	1.03108	1.0
	30 Hexachlorocyclopentadiene	237	12.770	12.790	(0.856)	2538736	89.8134	89.8
	31 2,4,6-Trichlorophenol	196	13.080	13.084	(0.877)	3185748	93.0176	93.0
		196	13.146	13.084	(0.882)	3214264	93.8502	93.8
S	33 2-Fluorobiphenyl	172	13.293	13.313	(0.717)	10272909	80.8153	80.8
	34 2-Chloronaphthalene	162	13.571	13.592	(0.910)	8453374	86.8387	86.8
	35 2-Nitroaniline	65	13.816	13.853	(0.926)	2877948	90.0455	90.0
	36 Dimethylphthalate	163	14.307	14.328	(0.959)	10682584	85.7148	85.7
	37 2,6-Dinitrotoluene	165	14.438	14.475	(0.968)	2752612	94.7545	94.8
		165	14.307	14.475	(0.959)	109678	3.77550	3.8
	38 Acenaphthylene	152	14.569	14.589	(0.977)	12937194	85.8117	85.8
		152	14.994	14.589	(1.005)	3606564	23.9221	23.9
	39 3-Nitroaniline	138	13.833	13.853	(0.928)	3146508	92.9808	93.0
*	40 Acenaphthene-d10	164	14.912	14.916	(1.000)	8116937	80.0000	
		164	14.618	14.916	(1.000)	2610	80.0000	
	41 Acenaphthene	154	14.994	15.015	(1.005)	7375066	82.9014	82.9
	42 2,4-Dinitrophenol	184	15.076	15.113	(1.011)	1411619	88.4881	88.5
	43 4-Nitrophenol	109	15.239	15.293	(1.022)	955367	88.9996	89.0
		109	14.994	15.293	(1.005)	17977	1.67469	1.7
		109	15.076	15.293	(1.011)	7264	0.67670	0.68(a)
		109	15.403	15.293	(1.033)	50172	4.67390	4.7
		109	15.681	15.293	(1.052)	52504	4.89114	4.9
	44 2,4-Dinitrotoluene	165	15.403	15.440	(1.033)	3180394	92.1965	92.2
	45 Dibenzofuran	168	15.419	15.440	(1.034)	12018206	88.5735	88.6
	46 Diethylphthalate	149	16.025	16.061	(1.075)	11535820	92.8996	92.9
		149	16.270	16.061	(1.091)	69600	0.56050	0.56(a)
	47 4-Chlorophenyl phenyl ether	204	16.270	16.290	(1.091)	4410913	86.0970	86.1
	48 4-Nitroaniline	138	16.319	16.389	(1.094)	854368	80.3365	80.3
		138	16.254	16.389	(1.090)	116848	10.9873	11.0
	49 Fluorene	166	16.254	16.274	(1.090)	9124044	86.3386	86.3
		166	16.564	16.274	(1.111)	295122	2.79267	2.8
	50 4,6-Dinitro-2-methylphenol	198	16.384	16.421	(0.884)	2297814	93.5184	93.5
	51 N-nitrosodiphenylamine	169	16.564	16.585	(0.894)	5616547	80.0457	80.0
		169	16.270	16.585	(0.878)	416907	5.94166	5.9
		169	16.826	16.585	(0.908)	59081	0.84201	0.84(a)
S	52 2,4,6-Tribromophenol	330	16.826	16.847	(0.673)	2017186	84.5935	84.6
	53 4-Bromophenyl phenyl ether	248	17.464	17.485	(0.943)	2634481	83.1952	83.2
	54 Hexachlorobenzene	284	17.578	17.599	(0.949)	3320288	79.8087	79.8
	55 Pentachlorophenol	266	18.053	18.073	(0.974)	2131785	88.8964	88.9
*	56 Phenanthrene-d10	188	18.527	18.548	(1.000)	14791818	80.0000	
		188	18.151	18.548	(1.000)	180	80.0000	
		188	18.216	18.548	(1.000)	1403	80.0000	
		188	18.331	18.548	(1.000)	233	80.0000	
	57 Phenanthrene	178	18.593	18.613	(1.004)	12362380	78.8466	78.8
		178	18.707	18.613	(1.010)	12837014	81.8738	81.9
	58 Anthracene	178	18.707	18.744	(1.010)	12837014	84.6855	84.7

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	178	18.593	18.744	(1.004)	12362380	81.5543	81.6
59 Di-n-butylphthalate	149	20.032	20.053	(1.081)	15745403	79.6702	79.7
60 Fluoranthene	202	21.488	21.508	(1.160)	12802544	83.6853	83.7
61 Pyrene	202	22.028	22.064	(0.882)	14161063	85.2749	85.3
: 62 Terphenyl-d14	244	22.453	22.473	(0.899)	9815539	85.1221	85.1
63 3 3'-Dichlorobenzidine	252	24.923	24.943	(0.997)	1972150	85.2839	85.3
64 Butyl benzyl phthalate	149	23.696	23.717	(0.948)	8129597	83.8778	83.9
65 bis(2-ethylhexyl)Phthalate	149	25.119	25.140	(1.005)	11071280	82.2872	82.3
66 Benzo(a)Anthracene	228	24.955	24.976	(0.999)	10828686	82.6653	82.7
	228	25.054	24.976	(1.003)	10307927	78.6898	78.7
* 67 Chrysene-d12	240	24.988	25.009	(1.000)	11581767	80.0000	
	240	24.579	25.009	(1.000)	331	80.0000	
	240	24.661	25.009	(1.000)	143	80.0000	
	240	24.759	25.009	(1.000)	655	80.0000	
68 Chrysene	228	25.054	25.091	(1.003)	10313680	88.4667	88.5
	228	24.955	25.091	(0.999)	10828686	92.8843	92.9
69 Di-n-octyl phthalate	149	26.624	26.644	(0.939)	14237913	75.7120	75.7
70 Benzo(b)fluoranthene	252	27.409	27.446	(0.967)	9287076	83.4410	83.4
	252	27.474	27.446	(0.969)	8638417	77.6130	77.6
71 Benzo(k)fluoranthene	252	27.474	27.511	(0.969)	8638417	80.1631	80.2
	252	27.409	27.511	(0.967)	9287076	86.1826	86.2
* 72 Perylene-d12	264	28.341	28.362	(1.000)	8146005	80.0000	
	264	28.031	28.362	(1.000)	210	80.0000	
	264	28.080	28.362	(1.000)	164	80.0000	
73 Indeno(1,2,3-cd)pyrene	276	31.515	31.552	(1.112)	5758602	84.4970	84.5
	276	31.596	31.552	(1.115)	1015844	14.9057	14.9
74 Benzo(a)pyrene	252	28.194	28.231	(0.995)	7382510	82.6304	82.6
	252	28.047	28.231	(0.990)	3978234	44.5273	44.5
	252	28.325	28.231	(0.999)	93435	1.04579	1.0
75 Dibenzo(a,h)anthracene	278	31.596	31.650	(1.115)	5002994	84.8320	84.8
76 Benzo(g,h,i)perylene	276	32.480	32.549	(1.146)	5422256	79.7515	79.8
94 Benzo(e)pyrene	252	28.047	28.067	(0.990)	3978234	40.7811	40.8
	252	28.194	28.067	(0.995)	7382510	75.6785	75.7
	252	28.325	28.067	(0.999)	93435	0.95781	0.96(a)
32 2,4,5-Trichlorophenol	196	13.146	13.166	(0.882)	3214264	92.5114	92.5
	196	13.080	13.166	(0.877)	3185748	91.6907	91.7
124 Benzyl Alcohol	108	8.173	8.210	(1.035)	3252704	78.2321	78.2
	108	7.781	8.210	(0.985)	39980	0.96157	0.96(a)
	108	7.928	8.210	(1.004)	57406	1.38069	1.4
	108	8.386	8.210	(1.062)	4489331	107.975	108
	108	8.517	8.210	(1.079)	23851	0.57365	0.57(a)
: 83 1-Methylnaphthalene-d10	152	12.557	12.561	(1.171)	7163542	76.4210	76.4
136 1-Chloro-3,4-Dinitrobenzene	63	15.746	15.718	(1.468)	22329	1.16127	1.2
	63	15.403	15.718	(1.436)	2157744	112.218	112
	63	15.485	15.718	(1.444)	47486	2.46961	2.5
	63	15.681	15.718	(1.462)	1624484	84.4849	84.5
	63	15.959	15.718	(1.488)	105046	5.46315	5.5

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
	63	16.025	15.718	(1.494)	80135	4.16760	4.2

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01080701011.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: JGH
Method File: /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/09/98
Calibration Time: 0339

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7272118	3636059	14544236	7272118	0.00
24 Naphthalene-d8	13821622	6910811	27643244	13821622	0.00
40 Acenaphthene-d10	8116937	4058468	16233874	8116937	0.00
56 Phenanthrene-d10	14791818	7395909	29583636	14791818	0.00
67 Chrysene-d12	11581767	5790884	23163534	11581767	0.00
72 Perylene-d12	8146005	4073002	16292010	8146005	0.00

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIF
7 1,4-Dichlorobenze	7.90	7.40	8.40	7.90	0.00
24 Naphthalene-d8	10.72	10.22	11.22	10.72	0.00
40 Acenaphthene-d10	14.91	14.41	15.41	14.91	0.00
56 Phenanthrene-d10	18.53	18.03	19.03	18.53	0.00
67 Chrysene-d12	24.99	24.49	25.49	24.99	0.00
72 Perylene-d12	28.34	27.84	28.84	28.34	0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

Data File: /chem/msdh.i/h-08Jan98.b/h01080701011.d

Date : 09-JAN-1998 03:39

Client ID:

Sample Info: 1.0ul 80ug STD 396-4-80

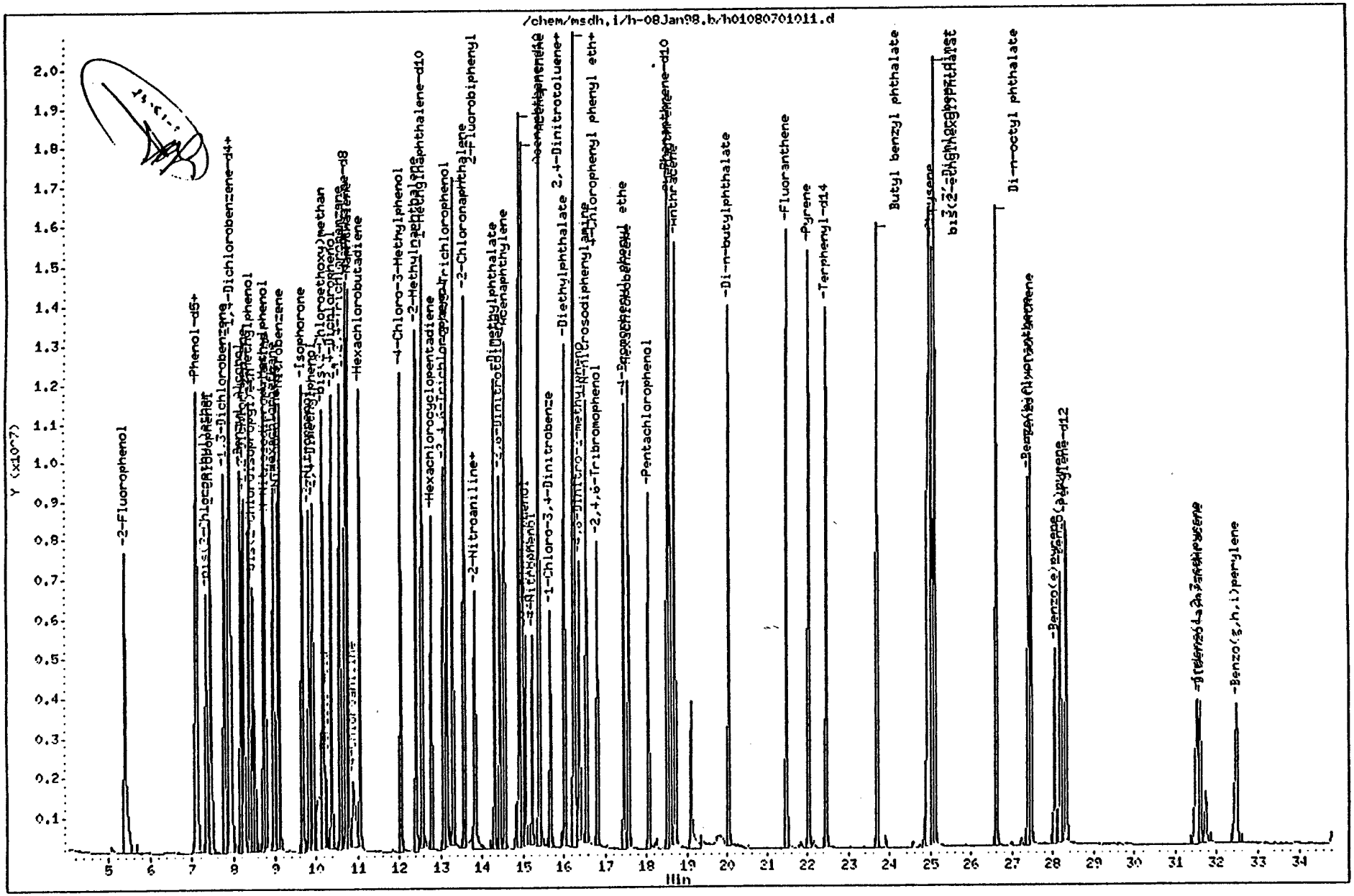
Volume Injected (uL): 1.0

Column phase:

Instrument: msdh.i

Operator: JCH

Column diameter: 2.00



Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080801012.d
Lab Smp Id:
Inj Date : 09-JAN-1998 04:21
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 120ug STD 396-5-120
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

1-13-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
C	1 2-Fluorophenol	112	5.394	5.397	(0.683)	8740231	113.572	114
C	2 Phenol-d5	99	7.111	7.114	(0.663)	9841052	118.228	118(R)
	3 Phenol	94	7.144	7.147	(0.905)	10102805	112.644	113
	4 bis(2-Chloroethyl)ether	93	7.357	7.376	(0.932)	8263064	108.827	109
	5 2-Chlorophenol	128	7.455	7.474	(0.944)	7620362	114.173	114
	6 1,3-Dichlorobenzene	146	7.782	7.785	(0.985)	8509477	111.592	112
*	7 1,4-Dichlorobenzene-d4	150	7.896	7.899	(1.000)	7636641	80.0000	
	8 1,4-Dichlorobenzene	146	7.946	7.948	(1.006)	8432226	110.007	110
	9 1,2-Dichlorobenzene	146	8.256	8.259	(1.046)	7819641	108.693	109
	10 2-Methylphenol	108	8.404	8.406	(1.064)	6808146	111.495	111
	11 bis(2-Chloroisopropyl)ether	45	8.485	8.488	(1.075)	14523948	110.313	110
	12 4-Methylphenol	108	8.763	8.783	(1.110)	7238520	115.283	115
	13 N-Nitrosodipropylamine	70	8.812	8.832	(1.116)	5948009	114.200	114
	14 Hexachloroethane	117	8.976	8.979	(1.137)	3559742	110.939	111

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	15 Nitrobenzene-d5	82	9.107	9.110	(0.611)	9243906	125.124	125(R)
	16 Nitrobenzene	77	9.140	9.159	(0.852)	8687233	118.295	118
	17 Isophorone	82	9.696	9.715	(0.904)	17709631	116.395	116
	18 2,4-Dimethylphenol	122	9.941	9.960	(0.927)	5209460	111.855	112
	19 2-Nitrophenol	139	9.843	9.862	(0.918)	4457548	118.966	119
	20 Benzoic Acid	122	10.317	10.353	(0.962)	4594249	135.846	136(M)
	21 bis(2-Chloroethoxy)methane	93	10.186	10.189	(0.950)	9116717	111.341	111
	22 2,4-Dichlorophenol	162	10.399	10.402	(0.970)	6261811	122.503	122
	23 1,2,4-Trichlorobenzene	180	10.595	10.598	(0.988)	7241925	118.752	119
*	24 Naphthalene-d8	136	10.726	10.729	(1.000)	13864412	80.0000	
	25 Naphthalene	128	10.775	10.794	(1.005)	14143523	88.6460	88.6
	26 4-Chloroaniline	127	10.890	10.909	(1.015)	3874939	97.4363	97.4(M)
	27 Hexachlorobutadiene	225	11.070	11.073	(1.032)	3450640	114.471	114
	28 4-Chloro-3-Methylphenol	107	12.051	12.054	(1.124)	6155110	125.567	126
	29 2-Methylnaphthalene	142	12.411	12.414	(1.157)	11588303	108.550	108
	30 Hexachlorocyclopentadiene	237	12.787	12.790	(0.857)	3991263	137.943	138
	31 2,4,6-Trichlorophenol	196	13.082	13.084	(0.877)	4567668	130.291	130
	32 2-Fluorobiphenyl	172	13.311	13.313	(0.718)	13876200	104.049	104
	34 2-Chloronaphthalene	162	13.572	13.592	(0.910)	12032763	120.758	121
	35 2-Nitroaniline	65	13.834	13.853	(0.928)	4633368	141.626	142
	36 Dimethylphthalate	163	14.325	14.328	(0.961)	15541989	121.829	122
	37 2,6-Dinitrotoluene	165	14.456	14.475	(0.969)	4135360	139.070	139
	38 Acenapnthylene	152	14.570	14.589	(0.977)	17248566	111.770	112
	39 3-Nitroaniline	138	13.834	13.853	(0.928)	4821717	139.198	139
*	40 Acenaphthene-d10	164	14.914	14.916	(1.000)	8308569	80.0000	
	41 Acenaphthene	154	14.995	15.015	(1.005)	11047489	121.318	121
	42 2,4-Dinitrophenol	184	15.094	15.113	(1.012)	2487363	152.325	152
	43 4-Nitrophenol	109	15.257	15.293	(1.022)	1516859	138.048	138
	44 2,4-Dinitrotoluene	165	15.421	15.440	(1.034)	4798657	135.900	136
	45 Dibenzofuran	168	15.421	15.440	(1.034)	15996335	115.173	115
	46 Diethylphthalate	149	16.042	16.061	(1.076)	15104075	118.830	119
	47 4-Chlorophenyl phenyl ether	204	16.288	16.290	(1.092)	6478791	123.543	124
	48 4-Nitroaniline	138	16.337	16.389	(1.095)	1110091	101.975	102(H)
	49 Fluorene	166	16.255	16.274	(1.090)	13030925	120.464	120
	50 4,6-Dinitro-2-methylphenol	198	16.418	16.421	(0.886)	3705899	143.762	144
	51 N-nitrosodiphenylamine	169	16.566	16.585	(0.894)	8090068	109.898	110
	52 2,4,6-Tribromophenol	330	16.827	16.847	(0.673)	3017593	125.145	125(R)
	53 4-Bromophenyl phenyl ether	248	17.465	17.485	(0.943)	3991186	120.136	120
	54 Hexachlorobenzene	284	17.596	17.599	(0.950)	4876900	111.734	112
	55 Pentachlorophenol	266	18.071	18.073	(0.975)	3381648	131.332	131
*	56 Phenanthrene-d10	188	18.529	18.548	(1.000)	15518617	80.0000	
	57 Phenanthrene	178	18.594	18.613	(1.004)	17179257	104.437	104
	58 Anthracene	178	18.725	18.744	(1.011)	16043083	100.879	101
	59 Di-n-butylphthalate	149	20.050	20.053	(1.082)	16825800	81.1496	81.1
	60 Fluoranthene	202	21.506	21.508	(1.161)	17922168	111.664	112
	61 Pyrene	202	22.045	22.064	(0.882)	18114940	107.875	108
	62 Terphenyl-d14	244	22.471	22.473	(0.899)	12464842	115.475	115

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
63	3 3'-Dichlorobenzidine	252	24.940	24.943	(0.997)	2850922	121.919	122
64	Butyl benzyl phthalate	149	23.697	23.717	(0.948)	12451873	127.049	127
65	bis(2-ethylhexyl)Phthalate	149	25.137	25.140	(1.005)	15187441	111.630	112
66	Benzo(a)Anthracene	228	24.973	24.976	(0.999)	16475841	124.381	124
* 67	Chrysene-d12	240	25.006	25.009	(1.000)	11711564	80.0000	
68	Chrysene	228	25.071	25.091	(1.003)	13972765	118.525	118
69	Di-n-octyl phthalate	149	26.642	26.644	(0.940)	16856222	84.0532	84.0
70	Benzo(b)fluoranthene	252	27.427	27.446	(0.968)	15279626	128.733	129
71	Benzo(k)fluoranthene	252	27.509	27.511	(0.971)	14923253	129.861	130
* 72	Perylene-d12	264	28.343	28.362	(1.000)	8686990	80.0000	
73	Indeno(1,2,3-cd)pyrene	276	31.532	31.552	(1.113)	9371476	128.946	129
74	Benzo(a)pyrene	252	28.212	28.231	(0.995)	12102106	127.020	127
75	Dibenzo(a,h)anthracene	278	31.631	31.650	(1.116)	8068549	128.292	128
76	Benzo(g,h,i)perylene	276	32.514	32.549	(1.147)	8802379	121.404	121
84	Benzo(e)pyrene	252	28.065	28.067	(0.990)	6615197	63.5897	63.6
32	2,4,5-Trichlorophenol	196	13.163	13.266	(0.883)	4977192	139.947	140
124	Benzyl Alcohol	108	8.191	8.210	(1.037)	5002199	114.567	114
83	1-Methylnaphthalene-d10	152	12.558	12.561	(1.171)	10159598	108.049	108
136	1-Chloro-3,4-Dinitrobenzene	63	15.699	15.718	(1.464)	2511511	130.214	130

QC Flag Legend

R - Spike/Surrogate failed recovery limits.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080801012.d
Lab Smp Id:
Inj Date : 09-JAN-1998 04:21
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 120ug STD 396-5-120
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
C	1 2-Fluorophenol	112	5.394	5.397	(0.683)	8740231	113.572	114
		112	5.067	5.397	(0.642)	196334	2.55120	2.6(R)
C	2 Phenol-d5	99	7.111	7.114	(0.663)	9841052	118.228	118(R)
		99	7.455	7.114	(0.695)	438974	5.27372	5.3(R)
	3 Phenol	94	7.144	7.147	(0.905)	10102805	112.644	113
		94	7.357	7.147	(0.932)	279654	3.11807	3.1
	4 bis(2-Chloroethyl)ether	93	7.357	7.376	(0.932)	9263064	108.827	109
		93	7.144	7.376	(0.905)	196145	2.58330	2.6
		93	7.455	7.376	(0.944)	177263	2.33461	2.3
	5 2-Chlorophenol	128	7.455	7.474	(0.944)	7620362	114.173	114
	6 1,3-Dichlorobenzene	146	7.782	7.785	(0.985)	8509477	111.592	112
		146	7.946	7.785	(1.006)	8421603	110.440	110
*	7 1,4-Dichlorobenzene-d4	150	7.896	7.899	(1.000)	7636641	80.0000	
		150	7.782	7.899	(1.000)	860921	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	150	8.256	7.899	(1.000)	789570	80.0000	
8 1,4-Dichlorobenzene	146	7.946	7.948	(1.006)	8420830	109.859	110
	146	7.782	7.948	(0.985)	8523930	111.204	111
	146	8.240	7.948	(1.044)	7727809	100.818	101
9 1,2-Dichlorobenzene	146	8.256	8.259	(1.046)	7819641	108.693	109
	146	7.946	8.259	(1.006)	8418546	117.018	117
10 2-Methylphenol	108	8.404	8.406	(1.064)	6808146	111.495	111
	108	8.191	8.406	(1.037)	5002199	81.9197	81.9
	108	8.534	8.406	(1.081)	46483	0.76124	0.76(a)
	108	8.763	8.406	(1.110)	7256388	118.836	119
11 bis(2-Chloroisopropyl)ether	45	8.485	8.488	(1.075)	14530438	110.362	110
12 4-Methylphenol	108	8.763	8.783	(1.110)	7238520	115.283	115
13 N-Nitrosodipropylamine	70	8.812	8.832	(1.116)	5948009	114.200	114
	70	8.976	8.832	(1.137)	46088	0.88488	0.88(a)
	70	9.107	8.832	(1.153)	1286327	24.6971	24.7
14 Hexachloroethane	117	8.976	8.979	(1.137)	3559742	110.939	111
15 Nitrobenzene-d5	82	9.107	9.110	(0.611)	9243906	125.124	125(R)
	82	8.763	9.110	(0.588)	43307	0.58620	0.59(R)
16 Nitrobenzene	77	9.140	9.159	(0.852)	8687233	118.295	118
	77	8.763	9.159	(0.817)	2755296	37.5193	37.5
17 Isophorone	82	9.696	9.715	(0.904)	17709631	116.395	116
	82	9.843	9.715	(0.918)	162996	1.07128	1.1
18 2,4-Dimethylphenol	122	9.941	9.960	(0.927)	5209460	111.855	112
	122	9.843	9.960	(0.918)	225083	4.83288	4.8
	122	10.154	9.960	(0.947)	1198521	25.7341	25.7
	122	10.317	9.960	(0.962)	3441147	73.8868	73.9
19 2-Nitrophenol	139	9.843	9.862	(0.918)	4457548	118.966	119
	139	9.696	9.862	(0.904)	249927	6.67024	6.7
	139	10.154	9.862	(0.947)	1453166	38.7832	38.8
20 Benzoic Acid	122	10.317	10.353	(0.962)	3530129	104.381	104
	122	9.941	10.353	(0.927)	5169067	152.842	153
	122	10.775	10.353	(1.005)	34224	1.01196	1.0
21 bis(2-Chloroethoxy)methane	93	10.186	10.189	(0.950)	9116717	121.341	121
	93	9.843	10.189	(0.918)	409917	5.00624	5.0
	93	9.941	10.189	(0.927)	208549	2.54697	2.5
22 2,4-Dichlorophenol	162	10.399	10.402	(0.970)	6261811	122.503	122
23 1,2,4-Trichlorobenzene	180	10.595	10.598	(0.988)	7241925	118.752	119
24 Naphthalene-d8	136	10.726	10.729	(1.000)	13864412	80.0000	
	136	10.301	10.729	(1.000)	467	80.0000	
	136	10.399	10.729	(1.000)	35036	80.0000	
	136	10.481	10.729	(1.000)	279	80.0000	
	136	10.579	10.729	(1.000)	1867	80.0000	
25 Naphthalene	128	10.775	10.794	(1.005)	14143523	88.6460	88.6
	128	10.399	10.794	(0.970)	196653	1.23254	1.2
	128	10.890	10.794	(1.015)	406973	2.55075	2.6
26 4-Chloroaniline	127	10.890	10.909	(1.015)	2307556	58.0241	58.0
	127	10.775	10.909	(1.005)	2109636	53.0473	53.0

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	27 Hexachlorobutadiene	225	11.070	11.073	(1.032)	3450640	114.471	114
		225	10.710	11.073	(0.998)	53482	1.77420	1.8
	28 4-Chloro-3-Methylphenol	107	12.051	12.054	(1.124)	6155110	125.567	126
	29 2-Methylnaphthalene	142	12.411	12.414	(1.157)	11588303	108.550	108
		142	12.051	12.414	(1.124)	5002823	46.8623	46.9
		142	12.624	12.414	(1.177)	179062	1.67730	1.7
	30 Hexachlorocyclopentadiene	237	12.787	12.790	(0.857)	3991263	137.943	138
	31 2,4,6-Trichlorophenol	196	13.082	13.084	(0.877)	4567668	130.291	130
		196	13.163	13.084	(0.883)	4977192	141.972	142
C	33 2-Fluorobiphenyl	172	13.311	13.313	(0.718)	13876200	104.049	104
	34 2-Chloronaphthalene	162	13.572	13.592	(0.910)	12032763	120.758	121
		162	13.163	13.592	(0.883)	134075	1.34554	1.3
	35 2-Nitroaniline	65	13.834	13.853	(0.928)	4633368	141.626	142
	36 Dimethylphthalate	163	14.325	14.328	(0.961)	15541989	121.829	122
	37 2,6-Dinitrotoluene	165	14.456	14.475	(0.969)	4135360	139.070	139
		165	14.325	14.475	(0.961)	162239	5.45602	5.4
	38 Acenaphthylene	152	14.570	14.589	(0.977)	17248566	111.770	112
		152	14.995	14.589	(1.005)	5412840	35.0750	35.1
	39 3-Nitroaniline	138	13.834	13.853	(0.928)	4821717	139.198	139
*	40 Acenaphthene-d10	164	14.914	14.916	(1.000)	8308569	80.0000	
	41 Acenaphthene	154	14.995	15.015	(1.005)	11047489	121.318	121
	42 2,4-Dinitrophenol	184	15.094	15.113	(1.012)	2487363	152.325	152
	43 4-Nitrophenol	109	15.257	15.293	(1.023)	1516859	138.048	138
		109	14.995	15.293	(1.005)	28399	2.58456	2.6
		109	15.094	15.293	(1.012)	11639	1.05925	1.0
		109	15.421	15.293	(1.034)	73237	6.66522	6.7
	44 2,4-Dinitrotoluene	165	15.421	15.440	(1.034)	4798657	135.900	136
	45 Dibenzofuran	168	15.421	15.440	(1.034)	15996335	115.173	115
		168	15.094	15.440	(1.012)	83310	0.59983	0.60(a)
	46 Diethylphthalate	149	16.042	16.061	(1.076)	15104075	118.830	119
		149	16.238	16.061	(1.092)	109693	0.86300	0.86(a)
	47 4-Chlorophenyl phenyl ether	204	16.288	16.290	(1.092)	6473791	123.543	124
		204	15.977	16.290	(1.071)	48114	0.91748	0.92(a)
	48 4-Nitroaniline	138	16.337	16.389	(1.095)	1118736	102.769	103
		138	16.189	16.389	(1.086)	32822	3.01508	3.0
	49 Fluorene	166	16.255	16.274	(1.090)	13030925	120.464	120
		166	16.566	16.274	(1.111)	428441	3.96072	4.0
	50 4,6-Dinitro-2-methylphenol	198	16.418	16.421	(0.886)	3705899	143.762	144
	51 N-nitrosodiphenylamine	169	16.566	16.585	(0.894)	8090068	109.898	110
		169	16.288	16.585	(0.879)	640456	8.70014	8.7
		169	16.402	16.585	(0.885)	36831	0.50032	0.50(a)
		169	16.827	16.585	(0.908)	84967	1.15422	1.2
C	52 2,4,6-Tribromophenol	330	16.827	16.847	(0.673)	3017593	125.145	125(R)
	53 4-Bromophenyl phenyl ether	248	17.465	17.485	(0.943)	3991186	120.136	120
	54 Hexachlorobenzene	284	17.596	17.599	(0.950)	4876900	111.734	112
	55 Pentachlorophenol	266	18.071	18.073	(0.975)	3281648	131.332	131
*	56 Phenanthrene-d10	188	18.529	18.548	(1.000)	15518617	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
	188	18.218	18.548	(1.000)	2155	80.0000	
	188	18.316	18.548	(1.000)	280	80.0000	
57 Phenanthrene	178	18.594	18.613	(1.004)	17179257	104.437	104
	178	18.725	18.613	(1.011)	16043083	97.5298	97.5
58 Anthracene	178	18.725	18.744	(1.011)	16043083	100.879	101
	178	18.594	18.744	(1.004)	17179257	108.023	108
59 Di-n-butylphthalate	149	20.050	20.053	(1.082)	16825800	81.1496	81.1
60 Fluoranthene	202	21.506	21.508	(1.161)	17922168	111.664	112
61 Pyrene	202	22.045	22.064	(0.882)	18114940	107.875	108
62 Terphenyl-d14	244	22.471	22.473	(0.899)	13464842	115.475	115
63 3 3'-Dichlorobenzidine	252	24.940	24.943	(0.997)	2850922	121.919	122
64 Butyl benzyl phthalate	149	23.697	23.717	(0.948)	12451873	127.049	127
65 bis(2-ethylhexyl)Phthalate	149	25.137	25.140	(1.005)	15187441	111.630	112
66 Benzo(a)Anthracene	228	24.973	24.976	(0.999)	16475841	124.381	124
	228	25.071	24.976	(1.003)	13972768	105.485	105
* 67 Chrysene-d12	240	25.006	25.009	(1.000)	11711564	80.0000	
	240	24.581	25.009	(1.000)	1245	80.0000	
	240	24.777	25.009	(1.000)	1099	80.0000	
	240	24.875	25.009	(1.000)	4588	80.0000	
68 Chrysene	228	25.071	25.091	(1.003)	13972765	118.525	118
	228	24.973	25.091	(0.999)	16475841	139.757	140
69 Di-n-octyl phthalate	149	26.642	26.644	(0.940)	16856222	84.0532	84.0
70 Benzo(b)fluoranthene	252	27.427	27.446	(0.968)	15279626	128.733	129
	252	27.509	27.446	(0.971)	14923253	125.730	126
71 Benzo(k)fluoranthene	252	27.509	27.511	(0.971)	14925549	129.881	130
	252	27.427	27.511	(0.968)	15279626	132.962	133
* 72 Perylene-d12	264	28.343	28.362	(1.000)	8686990	80.0000	
	264	27.999	28.362	(1.000)	297	80.0000	
	264	28.048	28.362	(1.000)	839	80.0000	
	264	28.163	28.362	(1.000)	1053	80.0000	
73 Indeno(1,2,3-cd)pyrene	276	31.532	31.552	(1.113)	9371476	128.946	129
	276	31.631	31.552	(1.116)	1594884	21.9447	21.9
	276	31.761	31.552	(1.121)	58372	0.80316	0.80
74 Benzo(a)pyrene	252	28.212	28.231	(0.995)	12102106	127.020	127
	252	28.065	28.231	(0.990)	6615197	69.4311	69.4
	252	28.343	28.231	(1.000)	153682	1.61300	1.6
75 Dibenzo(a,h)anthracene	278	31.631	31.650	(1.116)	8068549	128.292	128
	278	31.778	31.650	(1.121)	44425	0.70637	0.71
76 Benzo(g,h,i)perylene	276	32.514	32.549	(1.147)	8802379	121.404	121
34 Benzo(e)pyrene	252	28.065	28.067	(0.990)	6615197	63.5897	63.6
	252	28.212	28.067	(0.995)	12088591	116.204	116
	252	28.343	28.067	(1.000)	130351	1.25302	1.2
32 2,4,5-Trichlorophenol	196	13.163	13.166	(0.883)	4977192	139.947	140
	196	13.082	13.166	(0.877)	4567668	128.432	128
124 Benzyl Alcohol	108	8.191	8.210	(1.037)	5002199	114.567	114
	108	7.782	8.210	(0.985)	63546	1.45542	1.4
	108	7.929	8.210	(1.004)	79971	1.83160	1.8

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	108	8.404	8.210	(1.064)	6831512	156.464	156
	108	8.534	8.210	(1.081)	44964	1.02983	1.0
: 32 1-Methylnaphthalene-d10	152	12.558	12.561	(1.171)	10159598	108.049	108
136 1-Chloro-3,4-Dinitrobenzene	63	15.699	15.718	(1.464)	2510419	130.157	130
	63	15.421	15.718	(1.438)	3108750	161.178	161
	63	15.486	15.718	(1.444)	78065	4.04741	4.0
	63	15.748	15.718	(1.468)	31381	1.62700	1.6
	63	15.960	15.718	(1.488)	155018	8.03717	8.0
	63	16.042	15.718	(1.496)	106597	5.52670	5.5

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01080801012.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: JGH
Method File: /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/09/98
Calibration Time: 0339

Level: LOW
Sample Type: WATER

		AREA LIMIT			
COMPOUND	STANDARD	LOWER	UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7272118	3636059	14544236	7636641	5.01
24 Naphthalene-d8	13821622	6910811	27643244	13864412	0.31
40 Acenaphthene-d10	8116937	4058468	16233874	8308569	2.36
56 Phenanthrene-d10	14791818	7395909	29583636	15518617	4.91
67 Chrysene-d12	11581767	5790884	23163534	11711564	1.12
72 Perylene-d12	8146005	4073002	16292010	8686990	6.64

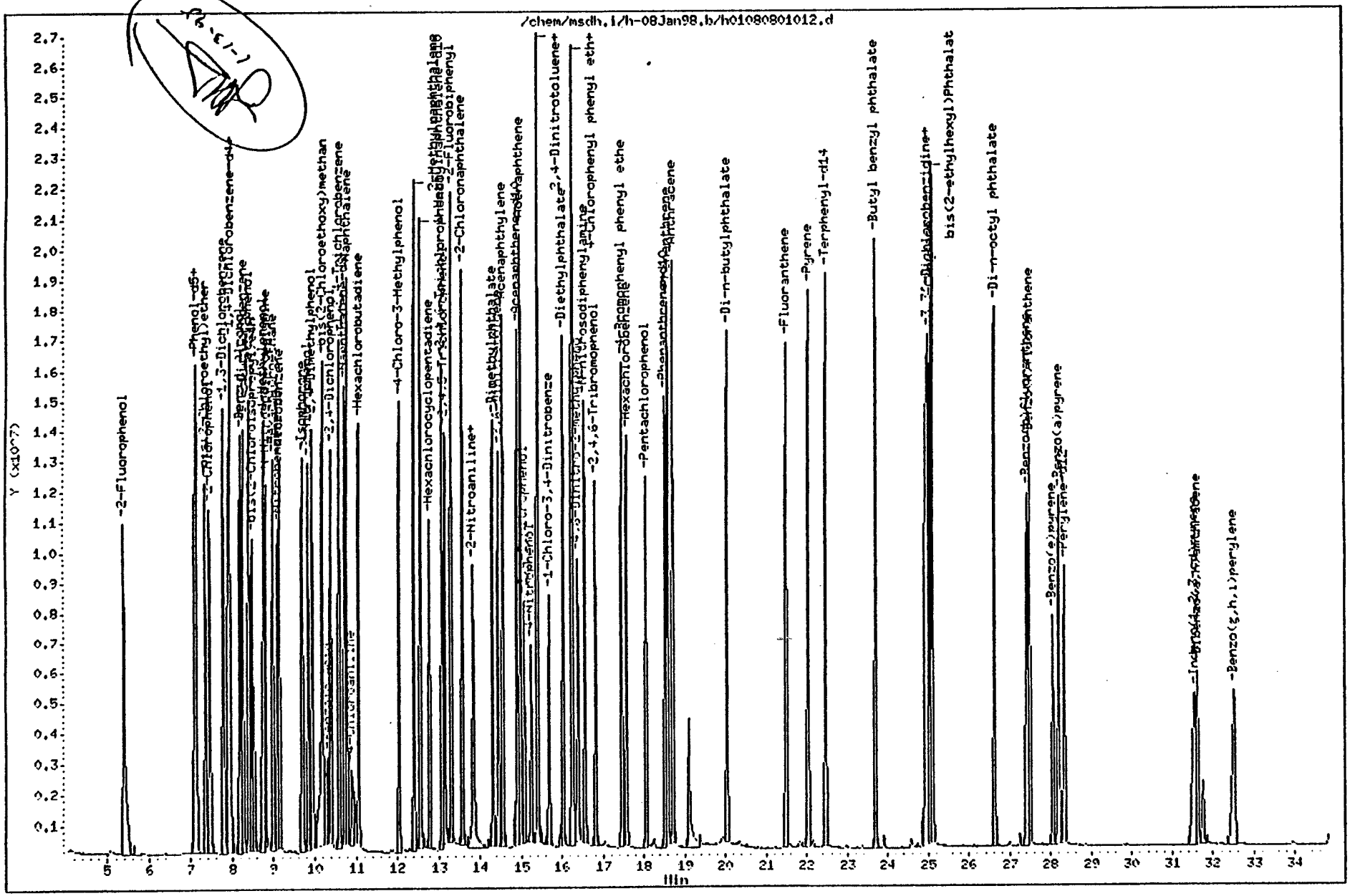
		RT LIMIT			
COMPOUND	STANDARD	LOWER	UPPER	SAMPLE	%DIF
7 1,4-Dichlorobenze	7.90	7.40	8.40	7.90	0.02
24 Naphthalene-d8	10.72	10.22	11.22	10.73	0.01
40 Acenaphthene-d10	14.91	14.41	15.41	14.91	0.01
56 Phenanthrene-d10	18.53	18.03	19.03	18.53	0.01
67 Chrysene-d12	24.99	24.49	25.49	25.01	0.07
72 Perylene-d12	28.34	27.84	28.84	28.34	0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

292

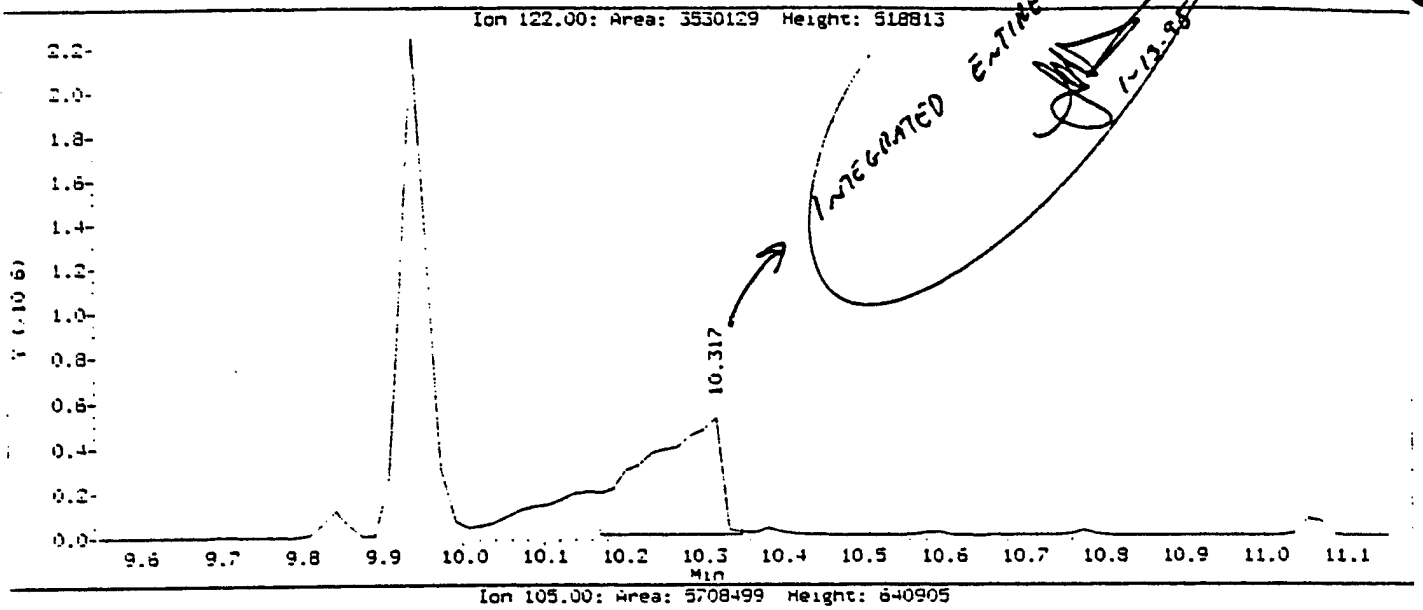
Data File: /chem/msdh.i/h-08Jan98.b/h01080801012.d
Date : 09-JAN-1998 04:21
Client ID:
Sample Info: 1.0ul 120ug STD 336-5-120
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i
Operator: JCH
Column diameter: 2.00

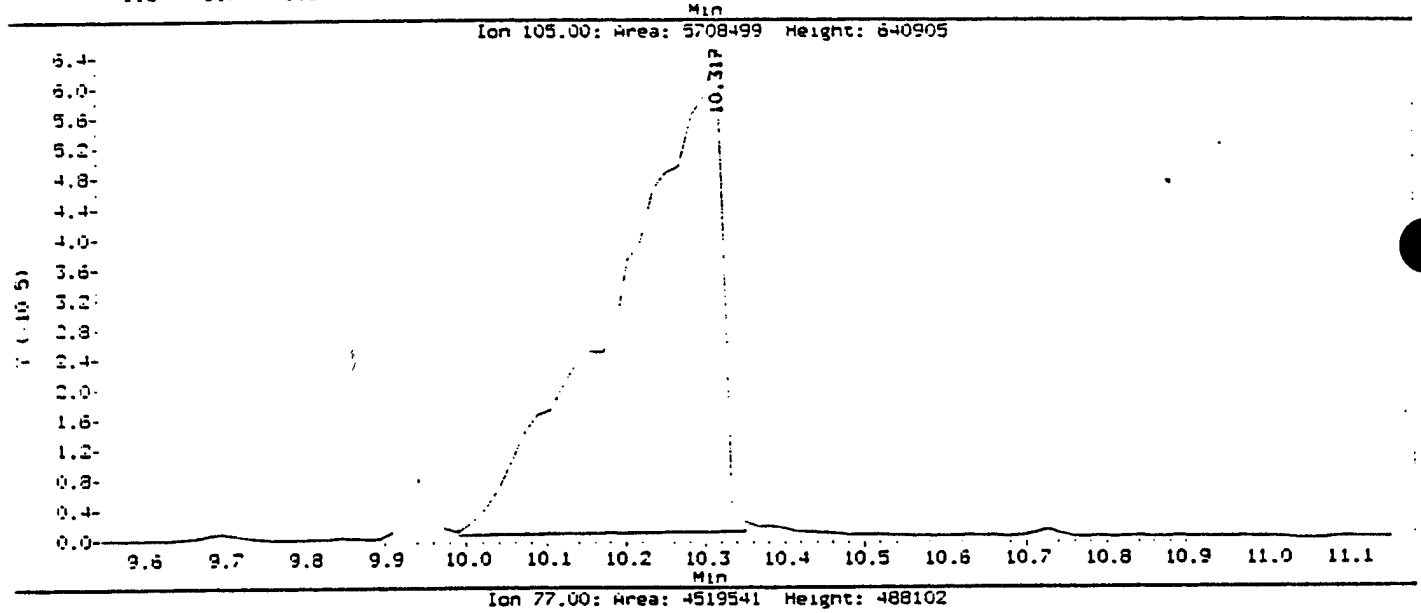


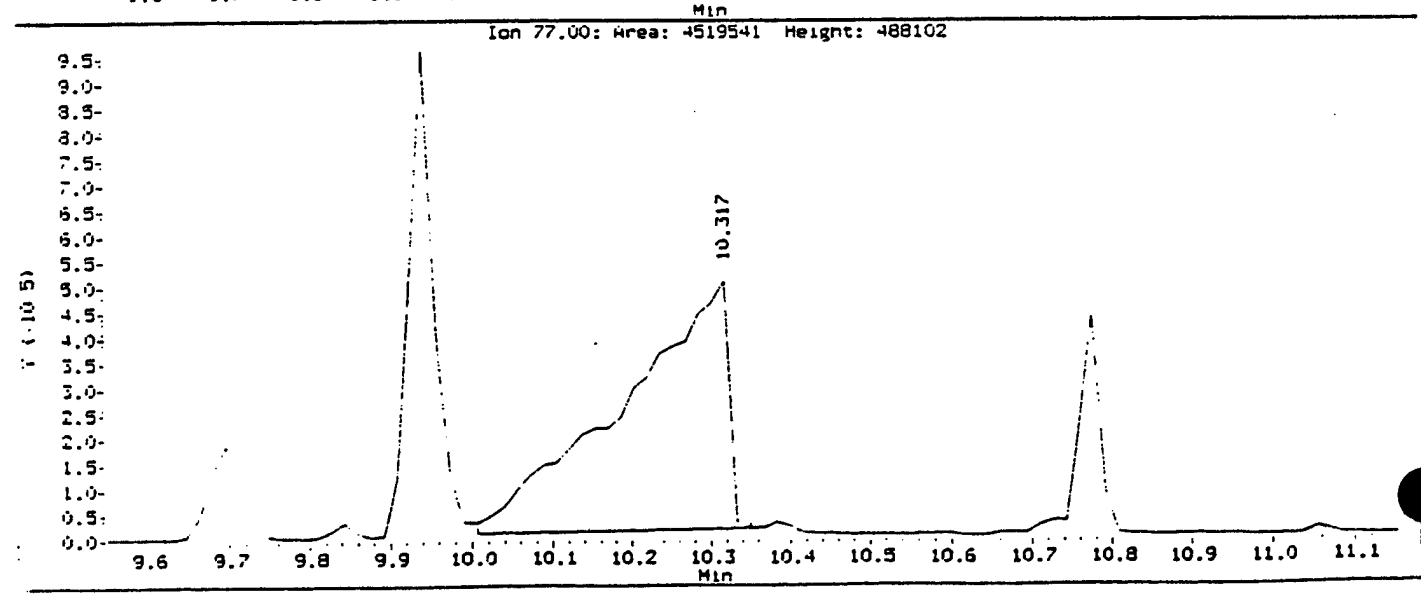
Data File: /chem/msdh.i/h-08Jan98.b/h01080801012.d
Injection Date: 09-JAN-1998 04:21
Instrument: msdh.i
Client Sample ID:

Compound: Benzoic Acid
CAS Number: 65-85-0



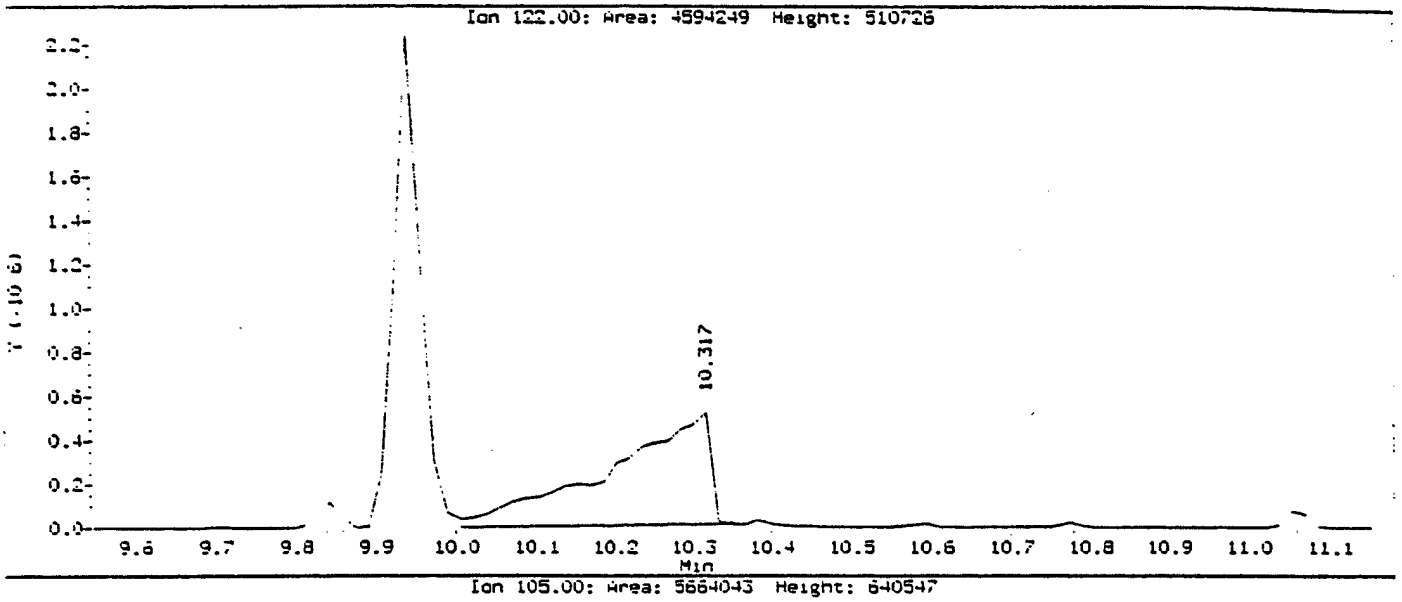
INTEGRATED ENTIRE CMPD
1-13-98

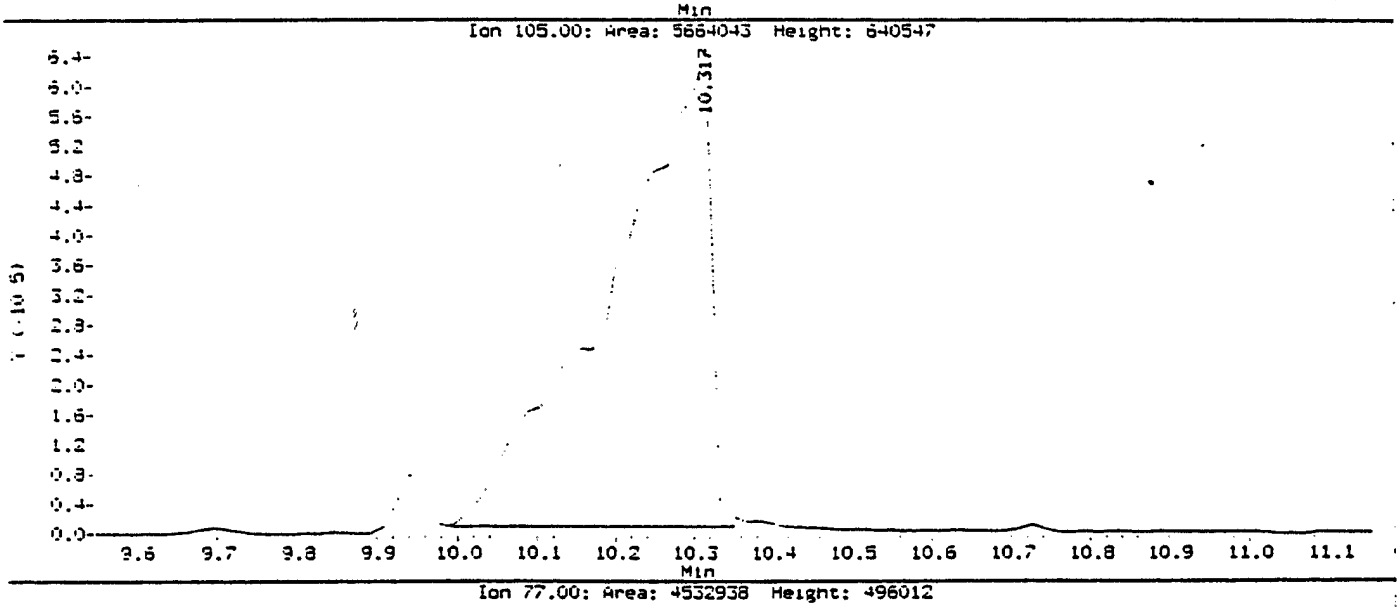


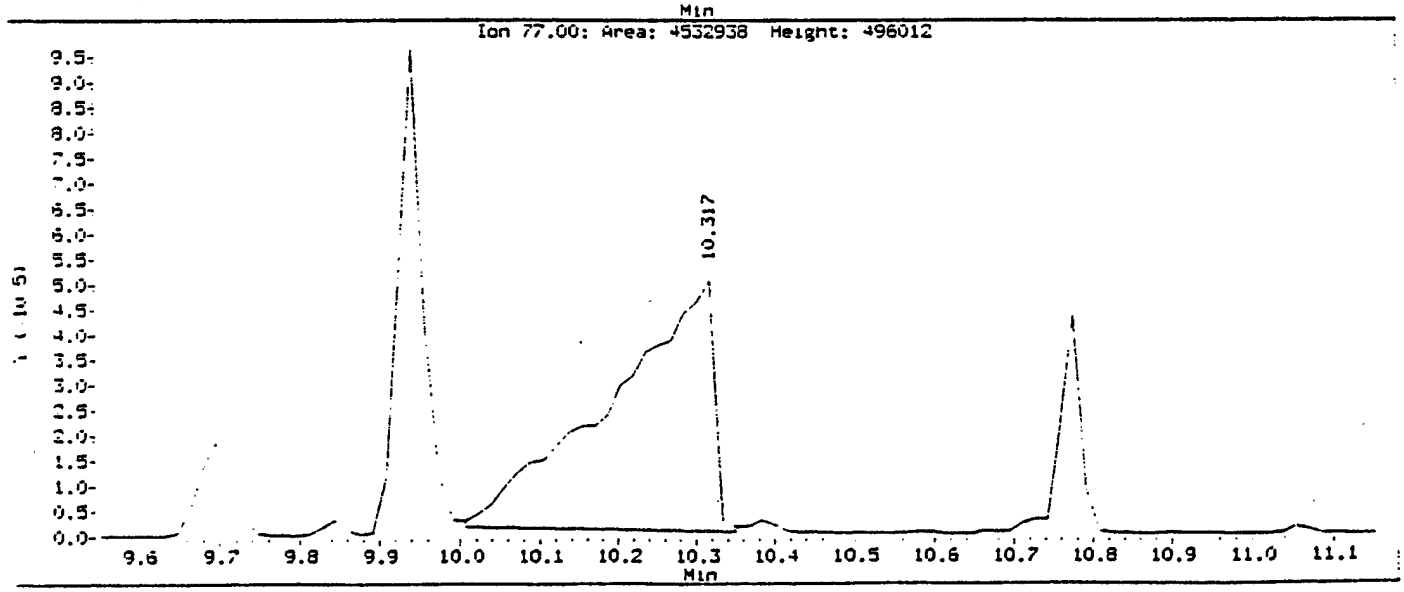


Data File: /chem/msdh.i/h-08Jan98.b/h01080801012.d
Injection Date: 09-JAN-1998 04:21
Instrument: msdh.i
Client Sample ID:

Compound: Benzoic Acid
CAS Number: 65-85-0



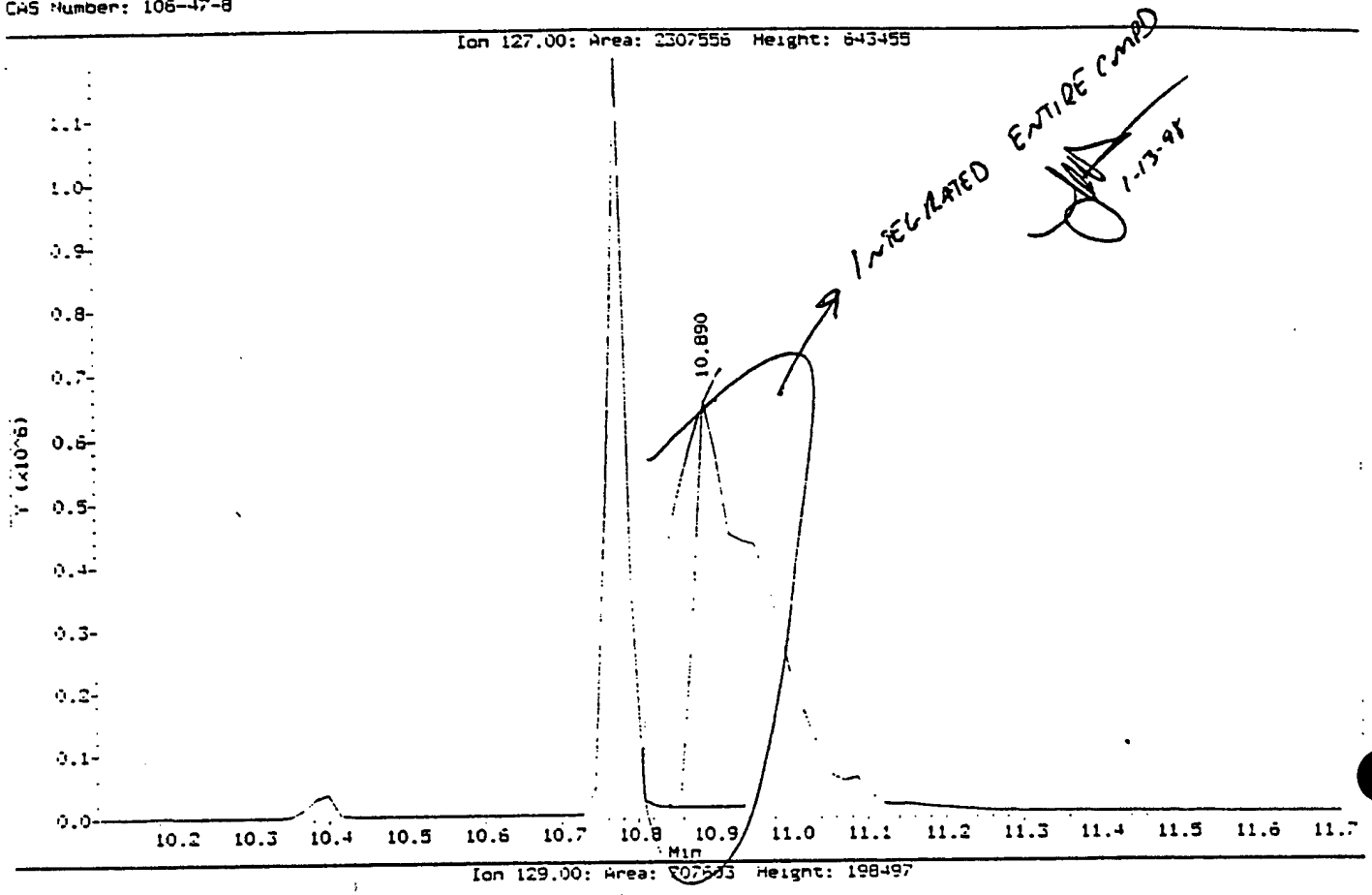




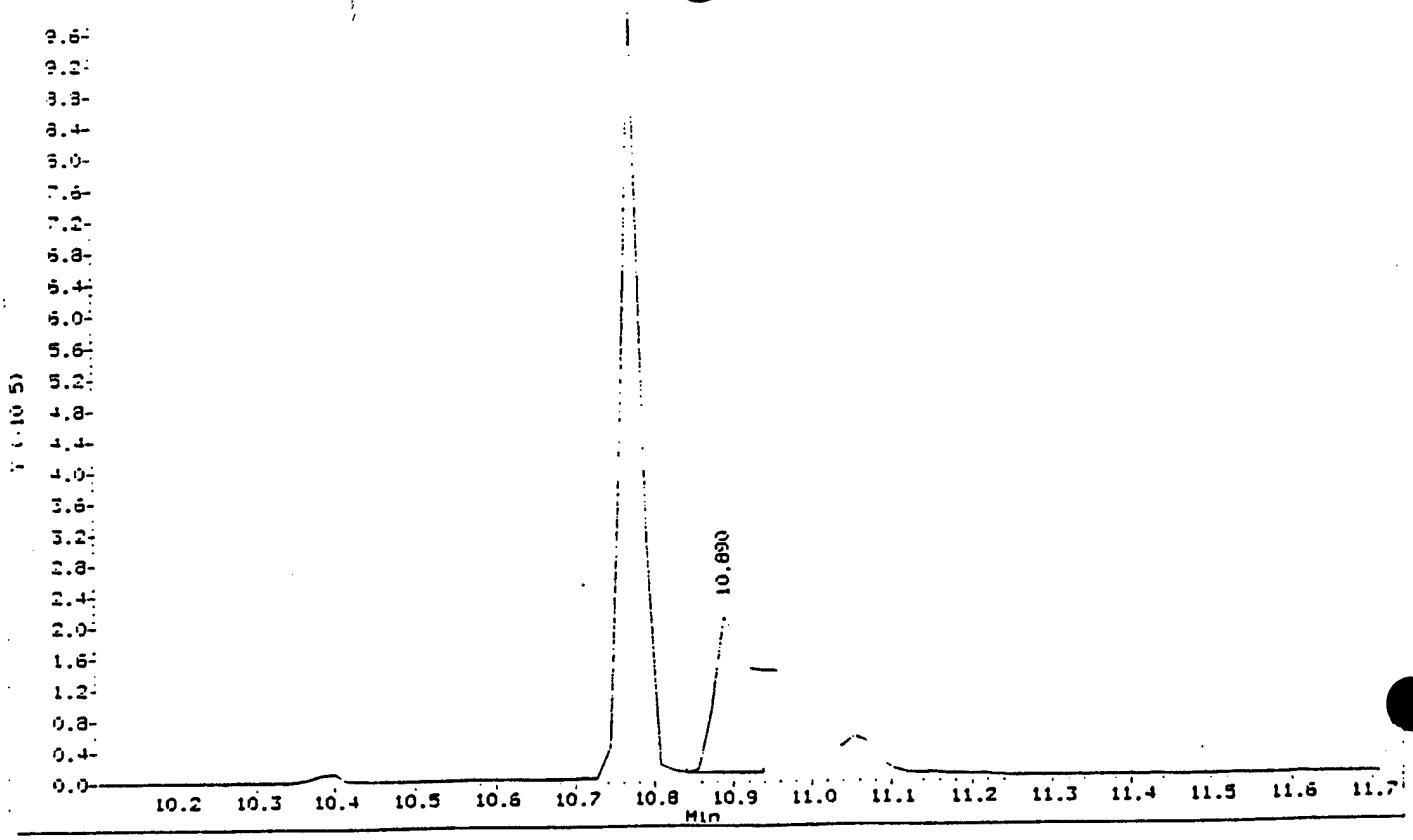
Data File: /chem/msdh.i/h-08Jan98.b/h01080801012.d
Injection Date: 09-JAN-1998 04:21
Instrument: msdh.i
Client Sample ID:

Compound: 4-Chloroaniline
CAS Number: 106-47-8

Ion 127.00: Area: 2307556 Height: 643455

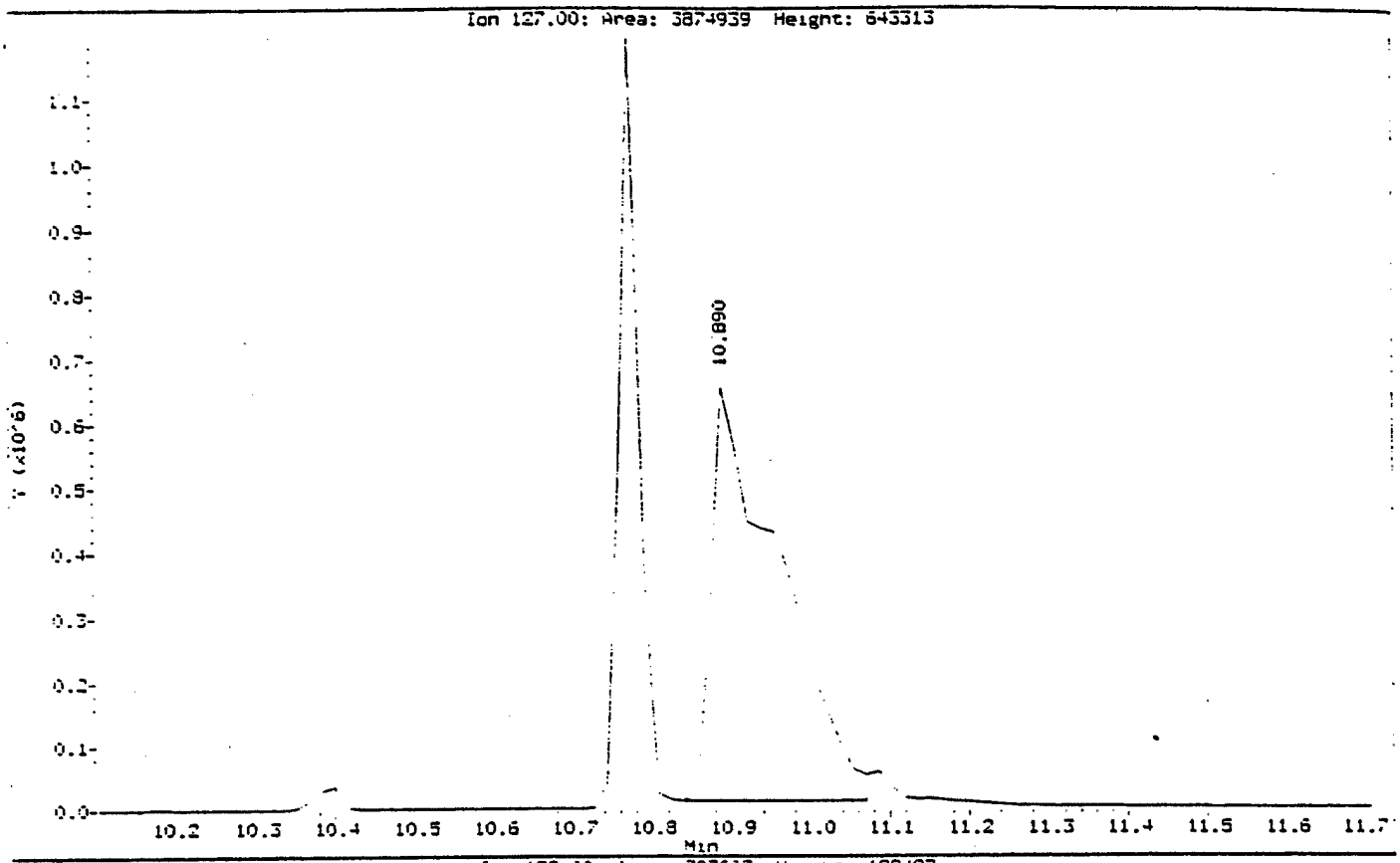


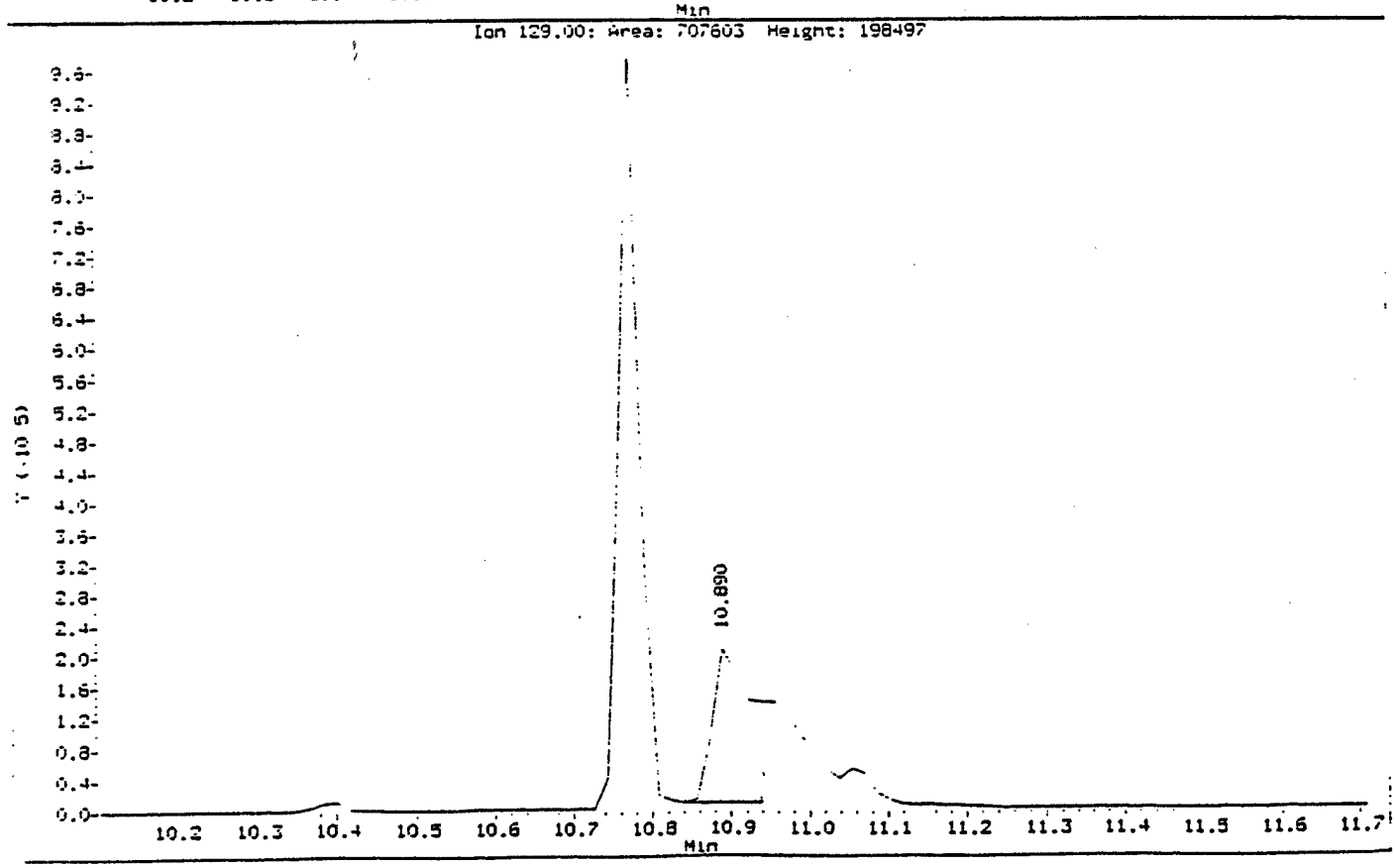
Ion 129.00: Area: 707603 Height: 198497



Data File: /chem/msdh.i/h-08Jan98.b/h01080801012.d
Injection Date: 09-JAN-1998 04:21
Instrument: msdh.i
Client Sample ID:

Compound: 4-Chloroaniline
CAS Number: 106-47-8





Data File: /chem/msdh.i/h-08Jan98.b/h01080901013.d
Report Date: 13-Jan-1998 10:45

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080901013.d
Lab Smp Id:
Inj Date : 09-JAN-1998 05:04
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 160ug STD 396-4-160
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

1-13-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
:	1 2-Fluorophenol	112	5.397	5.397	(0.683)	11545411	145.969	146(R)
:	2 Phenol-d5	99	7.114	7.114	(0.663)	12513632	145.498	145(R)
	3 Phenol	94	7.147	7.147	(0.905)	12530402	135.935	136
	4 bis(2-Chloroethyl)ether	93	7.376	7.376	(0.934)	10378229	132.991	133
	5 2-Chlorophenol	128	7.474	7.474	(0.946)	10204138	148.753	149
	6 1,3-Dichlorobenzene	146	7.785	7.785	(0.986)	10748303	137.143	137
*	7 1,4-Dichlorobenzene-d4	150	7.899	7.899	(1.000)	7848742	80.0000	
	8 1,4-Dichlorobenzene	146	7.948	7.948	(1.006)	10806659	137.175	137
	9 1,2-Dichlorobenzene	146	8.259	8.259	(1.046)	10133875	137.054	137
	10 2-Methylphenol	108	8.406	8.406	(1.064)	8702831	138.672	139
	11 bis(2-Chloroisopropyl)ether	45	8.488	8.488	(1.075)	18336401	135.505	136
	12 4-Methylphenol	108	8.783	8.783	(1.112)	9528574	147.654	148
	13 N-Nitrosodipropylamine	70	8.832	8.832	(1.118)	7490865	139.936	140
	14 Hexachloroethane	117	8.979	8.979	(1.137)	4499181	136.428	136

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
;	15 Nitrobenzene-d5	82	9.110	9.110	(0.611)	12807391	164.783	165(R)
	16 Nitrobenzene	77	9.159	9.159	(0.854)	10836821	142.818	143
	17 Isophorone	82	9.715	9.715	(0.905)	24143349	153.574	154
	18 2,4-Dimethylphenol	122	9.960	9.960	(0.928)	6924130	143.888	144(H)
	19 2-Nitrophenol	139	9.862	9.862	(0.919)	6272490	162.018	162
	20 Benzoic Acid	122	10.353	10.353	(0.965)	6528874	186.838	187(M)
	21 bis(2-Chloroethoxy)methane	93	10.189	10.189	(0.950)	12111565	143.157	143
	22 2,4-Dichlorophenol	162	10.402	10.402	(0.970)	8283899	156.847	157
	23 1,2,4-Trichlorobenzene	180	10.598	10.598	(0.988)	9138192	145.025	145
*	24 Naphthalene-d8	136	10.729	10.729	(1.000)	14325389	80.0000	
	25 Naphthalene	128	10.794	10.794	(1.006)	17277690	104.805	105
	26 4-Chloroaniline	127	10.909	10.909	(1.017)	5790865	140.927	141(M)
	27 Hexachlorobutadiene	225	11.073	11.073	(1.032)	4475839	143.703	144
	28 4-Chloro-3-Methylphenol	107	12.054	12.054	(1.123)	7462680	147.344	147
	29 2-Methylnaphthalene	142	12.414	12.414	(1.157)	14713458	133.388	133
	30 Hexachlorocyclopentadiene	237	12.790	12.790	(0.857)	5184328	170.313	170
	31 2,4,6-Trichlorophenol	196	13.084	13.084	(0.877)	6194372	167.951	168
;	32 2-Fluorobiphenyl	172	13.313	13.313	(0.728)	15952315	118.734	119(R)
	34 2-Chloronaphthalene	162	13.592	13.592	(0.911)	15346963	146.399	146
	35 2-Nitroaniline	65	13.853	13.853	(0.929)	6388325	185.609	186
	36 Dimethylphthalate	163	14.328	14.328	(0.961)	20603276	153.514	154
	37 2,6-Dinitrotoluene	165	14.475	14.475	(0.970)	5089061	162.677	163
	38 Acenaphthylene	152	14.589	14.589	(0.978)	19211406	118.331	118
	39 3-Nitroaniline	138	13.853	13.853	(0.929)	6633492	182.028	182
*	40 Acenaphthene-d10	164	14.916	14.916	(1.000)	8740969	80.0000	
	41 Acenaphthene	154	15.015	15.015	(1.007)	13652616	142.510	142
	42 2,4-Dinitrophenol	184	15.113	15.113	(1.013)	3744130	217.947	218
	43 4-Nitrophenol	109	15.293	15.293	(1.025)	2348796	203.187	203
	44 2,4-Dinitrotoluene	165	15.440	15.440	(1.035)	6151530	165.596	166
	45 Dibenzofuran	168	15.440	15.440	(1.035)	18459975	126.336	126
	46 Diethylphthalate	149	16.061	16.061	(1.077)	16775648	125.452	125
	47 4-Chlorophenyl phenyl ether	204	16.290	16.290	(1.092)	7297296	132.268	132
	48 4-Nitroaniline	138	16.389	16.389	(1.099)	1402545	122.466	122(H)
	49 Fluorene	166	16.274	16.274	(1.091)	15287906	134.338	134
	50 4,6-Dinitro-2-methylphenol	198	16.421	16.421	(0.885)	5129810	197.531	198
	51 N-nitrosodiphenylamine	169	16.585	16.585	(0.894)	10233720	137.992	138
;	52 2,4,6-Tribromophenol	330	16.847	16.847	(0.674)	4036974	163.315	163(R)
	53 4-Bromophenyl phenyl ether	248	17.485	17.485	(0.943)	4820257	144.021	144
	54 Hexachlorobenzene	284	17.599	17.599	(0.949)	6281923	142.863	143
	55 Pentachlorophenol	266	18.073	18.073	(0.974)	4461180	171.978	172
*	56 Phenanthrene-d10	188	18.548	18.548	(1.000)	15634015	80.0000	
	57 Phenanthrene	178	18.613	18.613	(1.004)	18439401	111.270	111
	58 Anthracene	178	18.744	18.744	(1.011)	19690660	122.901	123
	59 Di-n-butylphthalate	149	20.053	20.053	(1.081)	20550713	98.3830	98.4
	60 Fluoranthene	202	21.508	21.508	(1.160)	20670513	127.837	128
	61 Pyrene	202	22.064	22.064	(0.882)	22975493	133.465	133
;	62 Terphenyl-d14	244	22.473	22.473	(0.899)	18321906	152.277	153(R)

Data File: /chem/msdh.i/h-08Jan98.b/h01080901013.d
Report Date: 13-Jan-1998 10:45

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
63	3 3'-Dichlorobenzidine	252	24.943	24.943	(0.997)	3534055	147.427	147
64	Butyl benzyl phthalate	149	23.717	23.717	(0.948)	15893378	158.188	158
65	bis(2-ethylhexyl)Phthalate	149	25.140	25.140	(1.005)	17077929	122.447	122
66	Benzo(a)Anthracene	228	24.976	24.976	(0.999)	21077109	155.216	155
* 67	Chrysene-d12	240	25.009	25.009	(1.000)	12005956	80.0000	
68	Chrysene	228	25.091	25.091	(1.003)	18403044	152.277	152
69	Di-n-octyl phthalate	149	26.644	26.644	(0.939)	20378590	98.8322	98.8
70	Benzo(b)fluoranthene	252	27.446	27.446	(0.968)	22455873	184.008	184
71	Benzo(k)fluoranthene	252	27.511	27.511	(0.970)	17725325	150.017	150
* 72	Perylene-d12	264	28.362	28.362	(1.000)	8931794	80.0000	
73	Indeno(1,2,3-cd)pyrene	276	31.552	31.552	(1.112)	12128236	162.304	162
74	Benzo(a)pyrene	252	28.231	28.231	(0.995)	15863462	161.935	162
75	Dibenzo(a,h)anthracene	278	31.650	31.650	(1.116)	10523201	162.736	163
76	Benzo(g,h,i)perylene	276	32.549	32.549	(1.148)	11075894	148.574	148
84	Benzo(e)pyrene	252	28.067	28.067	(0.990)	8761064	81.9089	81.9
32	2,4,5-Trichlorophenol	196	13.166	13.166	(0.883)	6272238	167.637	168
124	Benzyl Alcohol	108	8.210	8.210	(1.039)	6530224	145.522	146
C 83	1-Methylnaphthalene-d10	152	12.561	12.561	(1.171)	13962086	143.710	144
136	1-Chloro-3,4-Dinitrobenzene	63	15.718	15.718	(1.465)	3509519	176.102	176

QC Flag Legend

R - Spike/Surrogate failed recovery limits.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

Data File: /chem/msdh.i/h-08Jan98.b/h01080901013.d
Report Date: 13-Jan-1998 11:07

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-08Jan98.b/h01080901013.d
Lab Smp Id:
Inj Date : 09-JAN-1998 05:04
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 160ug STD 396-4-160
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Meth Date : 13-Jan-1998 10:40 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
1 2-Fluorophenol	112	5.397	5.397	(0.683)	11545411	145.969	146(R)
	112	5.070	5.397	(0.642)	418457	5.29056	5.3(R)
2 Phenol-d5	99	7.114	7.114	(0.663)	12513632	145.498	145(R)
	99	7.474	7.114	(0.697)	582803	6.77634	6.8(R)
3 Phenol	94	7.147	7.147	(0.905)	12530402	135.935	136
	94	7.360	7.147	(0.932)	357555	3.87891	3.9
4 bis(2-Chloroethyl)ether	93	7.376	7.376	(0.934)	10378229	132.991	133
	93	7.147	7.376	(0.905)	250810	3.21399	3.2
	93	7.474	7.376	(0.946)	263090	3.37135	3.4
5 2-Chlorophenol	128	7.474	7.474	(0.946)	10204128	148.753	149
6 1,3-Dichlorobenzene	146	7.785	7.785	(0.986)	10748303	137.143	137
	146	7.948	7.785	(1.006)	10788461	137.655	138
7 1,4-Dichlorobenzene-d4	150	7.899	7.899	(1.000)	7848742	80.0000	
	150	7.605	7.899	(1.000)	326	80.0000	

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Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	150	7.785	7.899	(1.000)	1080787	80.0000	
	150	8.259	7.899	(1.000)	1007416	80.0000	
8 1,4-Dichlorobenzene	146	7.948	7.948	(1.006)	10810100	137.218	137
	146	7.785	7.948	(0.986)	10758314	136.561	136
9 1,2-Dichlorobenzene	146	8.259	8.259	(1.046)	10133875	137.054	137
	146	7.948	8.259	(1.006)	10782077	145.821	146
10 2-Methylphenol	108	8.406	8.406	(1.064)	8702831	138.672	139
	108	8.210	8.406	(1.039)	6530224	104.054	104
	108	8.537	8.406	(1.081)	90915	1.44866	1.4
	108	8.734	8.406	(1.106)	3877171	61.7795	61.8
	108	8.783	8.406	(1.112)	6434511	102.529	102
11 bis(2-Chloroisopropyl)ether	45	8.488	8.488	(1.075)	18329226	135.452	135
12 4-Methylphenol	108	8.783	8.783	(1.112)	9528574	147.654	148
13 N-Nitrosodipropylamine	70	8.832	8.832	(1.118)	7490865	139.936	140
	70	8.979	8.832	(1.137)	68931	1.28769	1.3
	70	9.110	8.832	(1.153)	1812933	33.8672	33.9
14 Hexachloroethane	117	8.979	8.979	(1.137)	4499181	136.428	136
15 Nitrobenzene-d5	82	9.110	9.110	(0.611)	12807391	164.783	165(R)
	82	8.783	9.110	(0.589)	41244	0.53065	0.53(R)
16 Nitrobenzene	77	9.159	9.159	(0.854)	10836821	142.818	143
	77	8.734	9.159	(0.814)	1487451	19.6031	19.6
	77	8.783	9.159	(0.819)	2560529	33.7451	33.7
17 Isophorone	82	9.715	9.715	(0.905)	24143349	153.574	154
	82	9.846	9.715	(0.918)	347657	2.21142	2.2
18 2,4-Dimethylphenol	122	9.960	9.960	(0.928)	6924130	143.888	144
	122	9.862	9.960	(0.919)	315776	6.56202	6.6
19 2-Nitrophenol	139	9.862	9.862	(0.919)	6272490	162.018	162
	139	9.715	9.862	(0.905)	338835	8.75209	8.8
	139	10.222	9.862	(0.953)	1031333	26.6393	26.6
20 Benzoic Acid	122	10.353	10.353	(0.965)	5148111	147.324	147
	122	9.960	10.353	(0.928)	6924130	198.149	198
21 bis(2-Chloroethoxy)methane	93	10.189	10.189	(0.950)	12111565	143.157	143
	93	9.862	10.189	(0.919)	572860	6.77111	6.8
	93	9.960	10.189	(0.928)	300742	3.55472	3.6
22 2,4-Dichlorophenol	162	10.402	10.402	(0.970)	8283899	156.847	157
23 1,2,4-Trichlorobenzene	180	10.598	10.598	(0.988)	9138192	145.025	145
24 Naphthalene-d8	136	10.729	10.729	(1.000)	14325389	80.0000	
	136	10.320	10.729	(1.000)	231	80.0000	
	136	10.402	10.729	(1.000)	47151	80.0000	
	136	10.484	10.729	(1.000)	385	80.0000	
	136	10.516	10.729	(1.000)	89	80.0000	
	136	10.582	10.729	(1.000)	1678	80.0000	
	136	11.089	10.729	(1.000)	3631	80.0000	
25 Naphthalene	128	10.794	10.794	(1.006)	17277690	104.805	105
	128	10.402	10.794	(0.970)	254950	1.54651	1.5
	128	10.893	10.794	(1.015)	700867	4.25140	4.2
26 4-Chloroaniline	127	10.909	10.909	(1.017)	3881447	94.4593	94.4

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	127	10.794	10.909	(1.006)	2883565	70.1747	70.2
	127	11.089	10.909	(1.034)	434415	10.5720	10.6
	127	11.203	10.909	(1.044)	45764	1.11372	1.1
	127	11.269	10.909	(1.050)	36002	0.87615	0.88(a)
27 Hexachlorobutadiene	225	11.073	11.073	(1.032)	4475839	143.703	144
	225	10.713	11.073	(0.998)	73928	2.37355	2.4
28 4-Chloro-3-Methylphenol	107	12.054	12.054	(1.123)	7462680	147.344	147
29 2-Methylnaphthalene	142	12.414	12.414	(1.157)	14713458	133.388	133
	142	12.054	12.414	(1.123)	6080914	55.1280	55.1
	142	12.626	12.414	(1.177)	229285	2.07864	2.1
30 Hexachlorocyclopentadiene	237	12.790	12.790	(0.857)	5184328	170.313	170
31 2,4,6-Trichlorophenol	196	13.084	13.084	(0.877)	6194372	167.951	168
	196	13.166	13.084	(0.883)	6272238	170.063	170
32 2-Fluorobiphenyl	172	13.313	13.313	(0.718)	15952315	118.734	119(R)
34 2-Chloronaphthalene	162	13.592	13.592	(0.911)	15346963	146.399	146
	162	13.166	13.592	(0.883)	176806	1.68660	1.7
35 2-Nitroaniline	65	13.853	13.853	(0.929)	6388325	185.609	186
36 Dimethylphthalate	163	14.328	14.328	(0.961)	20603276	153.514	154
37 2,6-Dinitrotoluene	165	14.475	14.475	(0.970)	5089061	162.677	163
	165	14.328	14.475	(0.961)	224671	7.18182	7.2
38 Acenaphthylene	152	14.589	14.589	(0.978)	19211406	118.331	118
	152	15.015	14.589	(1.007)	6966132	42.9072	42.9
39 3-Nitroaniline	138	13.853	13.853	(0.929)	6633492	182.028	182
* 40 Acenaphthene-d10	164	14.916	14.916	(1.000)	8740969	80.0000	
	164	14.622	14.916	(1.000)	6215	80.0000	
	164	14.802	14.916	(1.000)	501	80.0000	
41 Acenaphthene	154	15.015	15.015	(1.007)	13652616	142.510	142
	154	14.589	15.015	(0.978)	189214	1.97507	2.0
42 2,4-Dinitrophenol	184	15.113	15.113	(1.013)	3744130	217.947	218
43 4-Nitrophenol	109	15.293	15.293	(1.025)	3345722	202.921	203
	109	14.916	15.293	(1.000)	20809	1.80012	1.8
	109	15.015	15.293	(1.007)	38007	3.28787	3.3
	109	15.113	15.293	(1.013)	16660	1.44120	1.4
	109	15.440	15.293	(1.035)	88692	7.67247	7.7
44 2,4-Dinitrotoluene	165	15.440	15.440	(1.035)	6151530	165.596	166
45 Dibenzofuran	168	15.440	15.440	(1.035)	13459975	126.336	126
	168	15.113	15.440	(1.013)	125363	0.85796	0.86(a)
46 Diethylphthalate	149	16.061	16.061	(1.077)	16775648	125.452	125
	149	16.290	16.061	(1.092)	129541	0.96874	0.97(a)
47 4-Chlorophenyl phenyl ether	204	16.290	16.290	(1.092)	7297296	132.268	132
	204	15.980	16.290	(1.071)	63841	1.15716	1.2
48 4-Nitroaniline	138	16.389	16.389	(1.099)	1434181	125.229	125
	138	16.012	16.389	(1.073)	9448	0.82497	0.82(a)
	138	16.160	16.389	(1.083)	70682	6.17176	6.2
49 Fluorene	166	16.274	16.274	(1.091)	15287906	134.338	134
	166	16.585	16.274	(1.112)	522123	4.58800	4.6
50 4,6-Dinitro-2-methylphenol	198	16.421	16.421	(0.885)	5129810	197.531	198

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Report Date: 13-Jan-1998 11:07

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
51 N-nitrosodiphenylamine	169	16.585	16.585	(0.894)	10233720	137.992	138
	169	16.290	16.585	(0.878)	757494	10.2141	10.2
	169	16.421	16.585	(0.885)	51479	0.69414	0.69(a)
	169	16.830	16.585	(0.907)	119469	1.61092	1.6
52 2,4,6-Tribromophenol	330	16.847	16.847	(0.674)	4036974	163.315	163(R)
53 4-Bromophenyl phenyl ether	248	17.485	17.485	(0.943)	4820257	144.021	144
	248	17.043	17.485	(0.919)	18277	0.54608	0.55(a)
54 Hexachlorobenzene	284	17.599	17.599	(0.949)	6281923	142.863	143
55 Pentachlorophenol	266	18.073	18.073	(0.974)	4461180	171.978	172
* 56 Phenanthrene-d10	188	18.548	18.548	(1.000)	15634015	80.0000	
	188	18.221	18.548	(1.000)	1487	80.0000	
	188	18.270	18.548	(1.000)	161	80.0000	
57 Phenanthrene	178	18.613	18.613	(1.004)	18439401	111.270	111
	178	18.744	18.613	(1.011)	19690660	118.821	119
58 Anthracene	178	18.744	18.744	(1.011)	19690660	122.901	123
	178	18.613	18.744	(1.004)	18439401	115.091	115
59 Di-n-butylphthalate	149	20.053	20.053	(1.081)	20550713	98.3830	98.4
60 Fluoranthene	202	21.508	21.508	(1.160)	20670513	127.837	128
61 Pyrene	202	22.064	22.064	(0.882)	22975493	133.465	133
62 Terphenyl-d14	244	22.473	22.473	(0.899)	18321906	153.277	153(R)
63 3,3'-Dichlorobenzidine	252	24.943	24.943	(0.997)	3534055	147.427	147
64 Butyl benzyl phthalate	149	23.717	23.717	(0.948)	15893378	158.188	158
65 bis(2-ethylhexyl) Phthalate	149	25.140	25.140	(1.005)	17077929	122.447	122
	149	24.976	25.140	(0.999)	96023	0.68847	0.69(a)
66 Benzo(a)Anthracene	228	24.976	24.976	(0.999)	21077109	155.216	155
	228	25.091	24.976	(1.003)	18402466	135.519	136
* 67 Chrysene-d12	240	25.009	25.009	(1.000)	12005956	80.0000	
	240	24.616	25.009	(1.000)	2869	80.0000	
	240	24.714	25.009	(1.000)	641	80.0000	
	240	24.763	25.009	(1.000)	419	80.0000	
68 Chrysene	228	25.091	25.091	(1.003)	18410464	152.338	152
	228	24.976	25.091	(0.999)	21077109	174.404	174
69 Di-n-octyl phthalate	149	26.644	26.644	(0.939)	20378590	98.8322	98.8
70 Benzo(b)fluoranthene	252	27.446	27.446	(0.968)	22455873	184.008	184
	252	27.511	27.446	(0.970)	17725325	145.245	145
71 Benzo(k)fluoranthene	252	27.511	27.511	(0.970)	17725325	150.017	150
	252	27.446	27.511	(0.968)	22455873	190.054	190
* 72 Perylene-d12	264	28.362	28.362	(1.000)	8931794	80.0000	
	264	27.920	28.362	(1.000)	149	80.0000	
	264	27.986	28.362	(1.000)	203	80.0000	
	264	28.182	28.362	(1.000)	1077	80.0000	
73 Indeno(1,2,3-cd)pyrene	276	31.552	31.552	(1.112)	12128236	162.304	162
	276	31.650	31.552	(1.116)	2085604	27.9101	27.9
	276	31.781	31.552	(1.121)	84363	1.12897	1.1
74 Benzo(a)pyrene	252	28.231	28.231	(0.995)	15880588	162.109	162
	252	28.067	28.231	(0.990)	8762879	89.4517	89.4
	252	28.346	28.231	(0.999)	271848	2.77503	2.8

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
75	Dibenzo(a,h)anthracene	278	31.650	31.650	(1.116)	10523201	162.736	163
76	Benzo(g,h,i)perylene	276	32.549	32.549	(1.148)	11075894	148.574	148
84	Benzo(e)pyrene	252	28.067	28.067	(0.990)	8761064	81.9089	81.9
		252	28.231	28.067	(0.995)	15843328	148.122	148
		252	28.346	28.067	(0.999)	193871	1.81254	1.8
32	2,4,5-Trichlorophenol	196	13.526	13.166	(0.907)	24166	0.64588	0.64(a)
		196	13.084	13.166	(0.877)	6194372	165.555	166
		196	13.166	13.166	(0.883)	6272238	167.637	168
124	Benzyl Alcohol	108	8.210	8.210	(1.039)	6530224	145.522	146
		108	7.785	8.210	(0.986)	82495	1.83835	1.8
		108	7.948	8.210	(1.006)	99116	2.20874	2.2
		108	8.406	8.210	(1.064)	8749429	194.976	195
		108	8.537	8.210	(1.081)	81683	1.82026	1.8
83	1-Methylnaphthalene-d10	152	12.561	12.561	(1.171)	13962086	143.710	144
136	1-Chloro-3,4-Dinitrobenzene	63	15.718	15.718	(1.465)	3509001	176.076	176
		63	15.276	15.718	(1.424)	1047761	52.5749	52.6
		63	15.440	15.718	(1.439)	4181761	209.834	210
		63	15.505	15.718	(1.445)	116986	5.87016	5.9
		63	15.767	15.718	(1.470)	64234	3.22316	3.2
		63	15.980	15.718	(1.489)	208080	10.4411	10.4
		63	16.061	15.718	(1.497)	131540	6.60046	6.6

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.

Data File: /chem/msdh.i/h-08Jan98.b/h01080901013.d
Report Date: 13-Jan-1998 11:07

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01080901013.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: JGH
Method File: /chem/msdh.i/h-08Jan98.b/EBNA-010898.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/09/98
Calibration Time: 0339

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7272118	3636059	14544236	7848742	7.93
24 Naphthalene-d8	13821622	6910811	27643244	14325389	3.64
40 Acenaphthene-d10	8116937	4058468	16233874	8740969	7.69
56 Phenanthrene-d10	14791818	7395909	29583636	15634015	5.69
67 Chrysene-d12	11581767	5790884	23163534	12005956	3.66
72 Perylene-d12	8146005	4073002	16292010	8931794	9.65

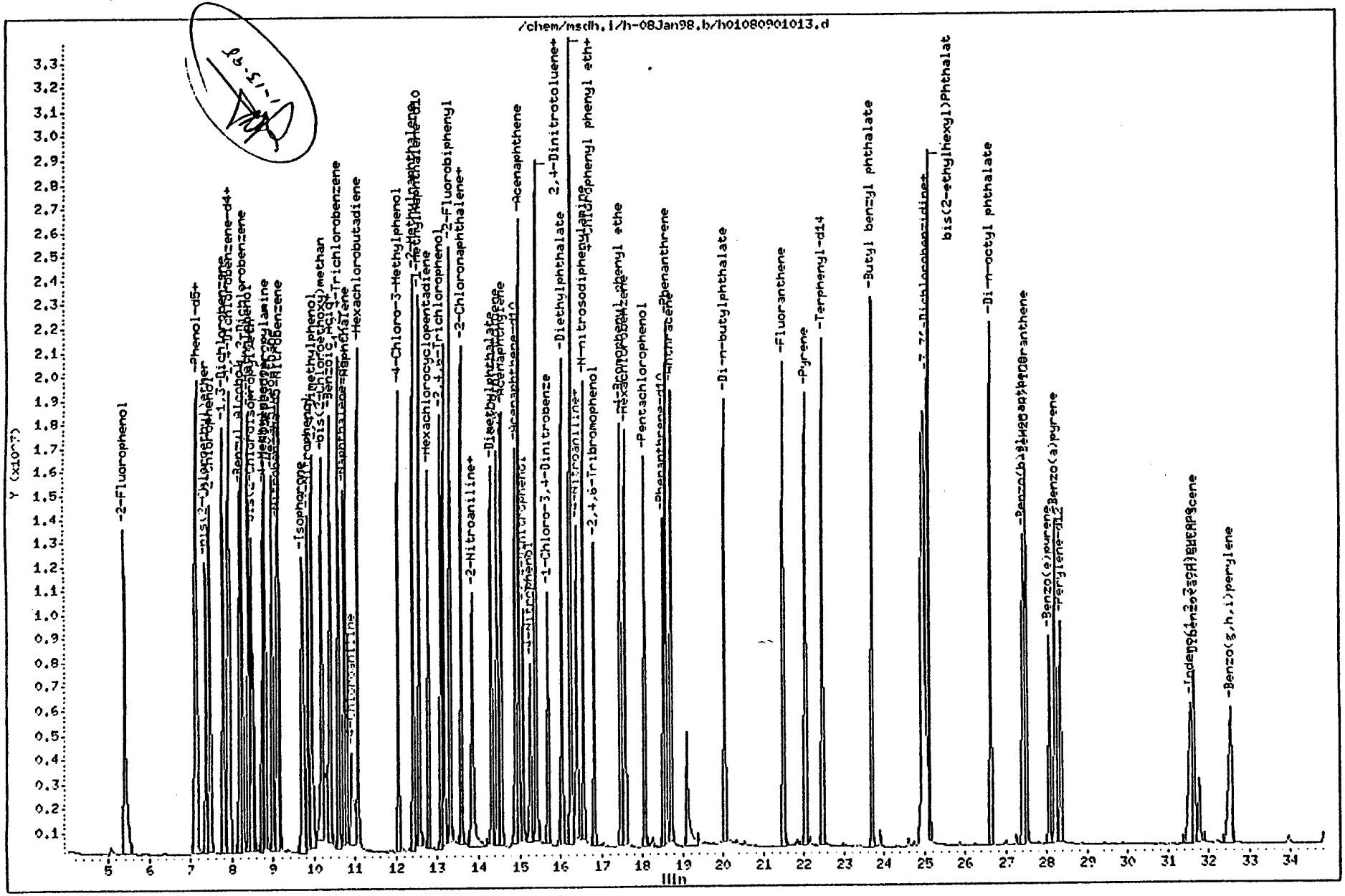
COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.90	7.40	8.40	7.90	0.05
24 Naphthalene-d8	10.72	10.22	11.22	10.73	0.04
40 Acenaphthene-d10	14.91	14.41	15.41	14.92	0.03
56 Phenanthrene-d10	18.53	18.03	19.03	18.55	0.11
67 Chrysene-d12	24.99	24.49	25.49	25.01	0.08
72 Perylene-d12	28.34	27.84	28.84	28.36	0.07

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

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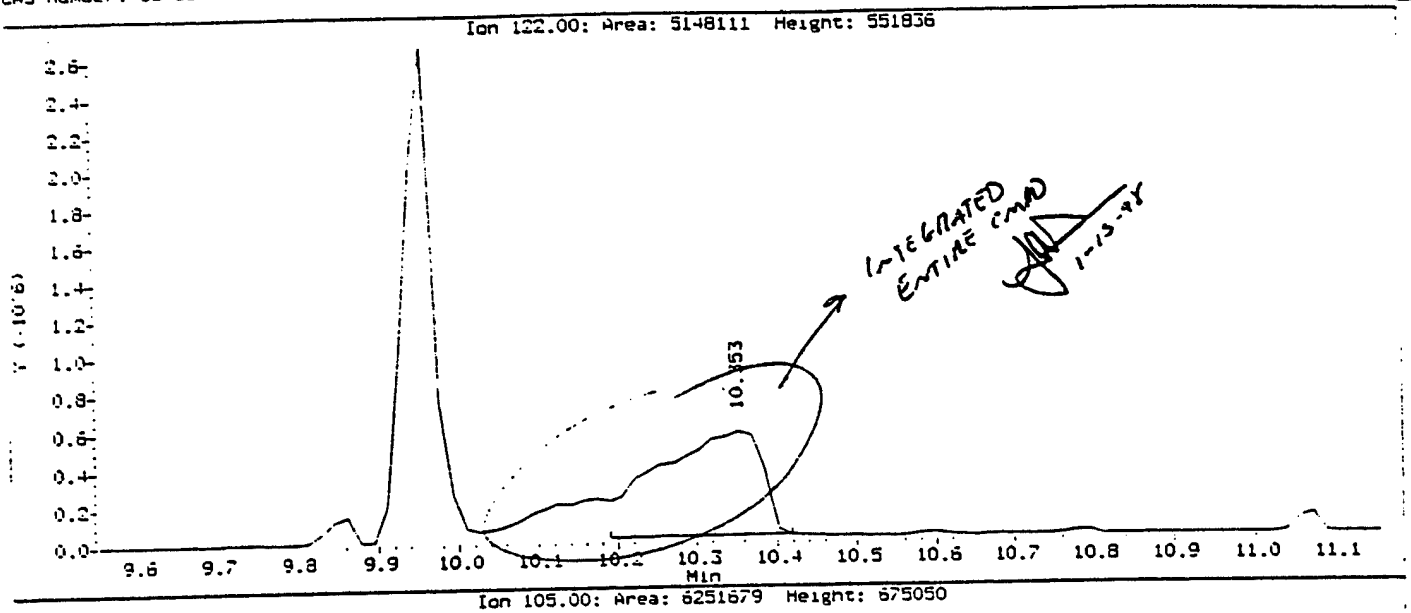
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Date : 09-JAN-1998 05:04
Client ID:
Sample Info: 1.0ul 160ug STD 396-4-160
Volume Injected (uL): 1.0
Column phase:

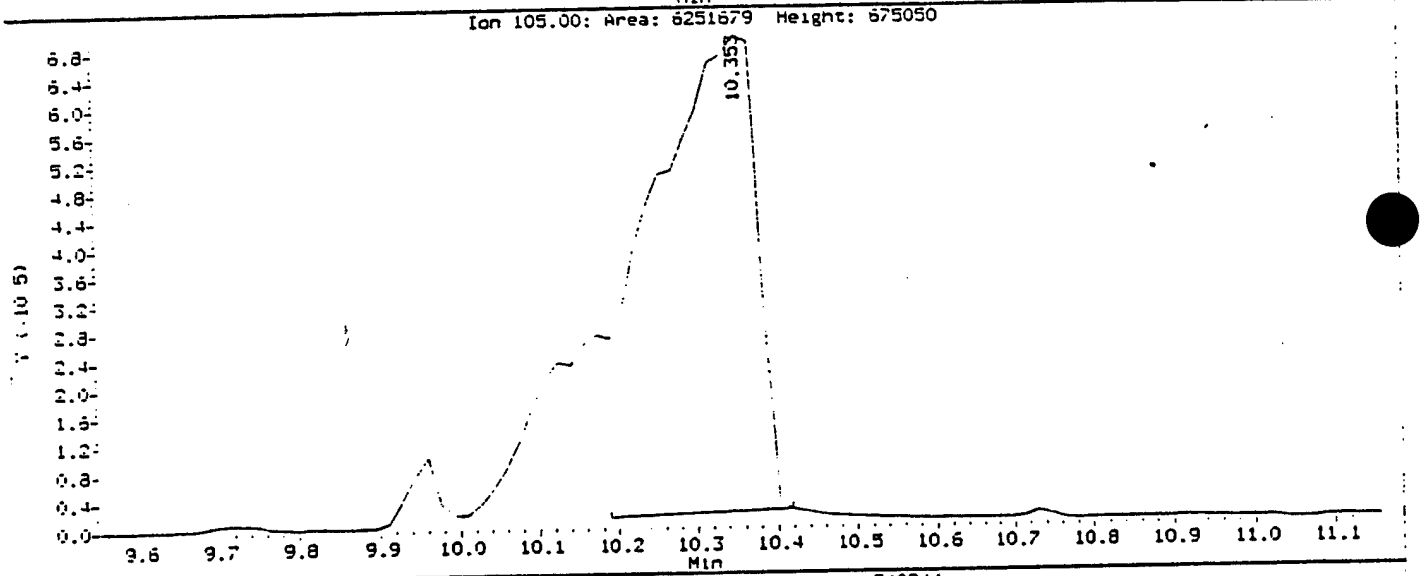
Instrument: msdh.i
Operator: JGH
Column diameter: 2.00

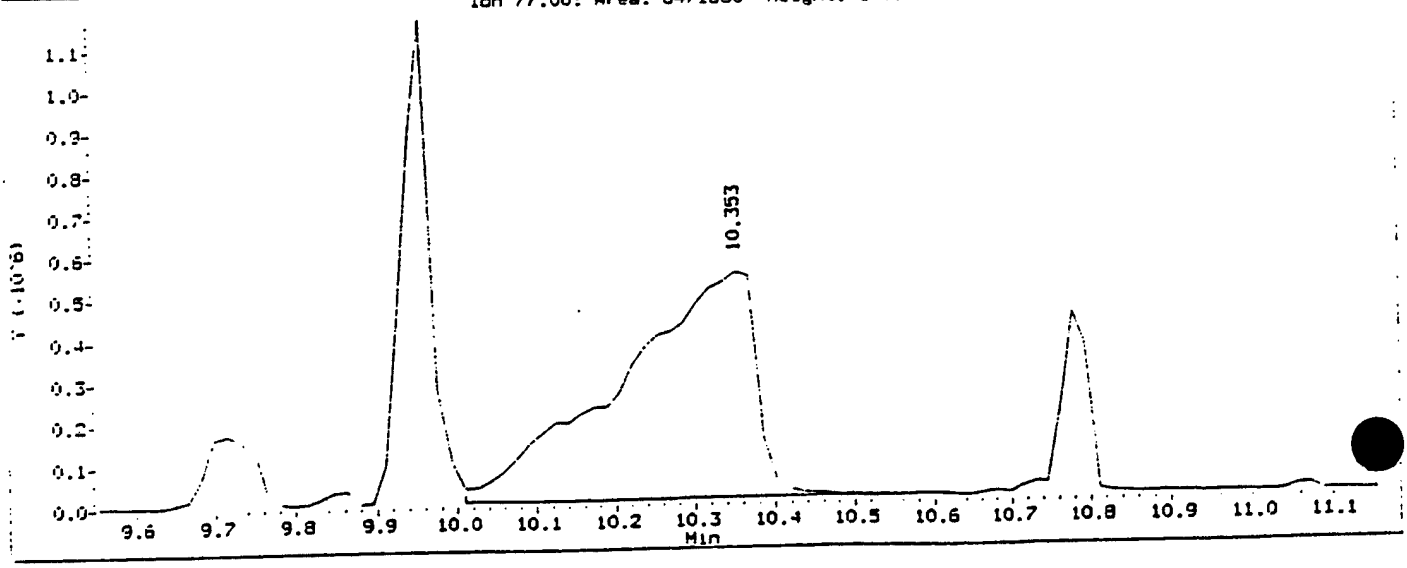


Data File: /chem/msdh.i/h-08Jan98.b/h01080901013.d
Injection Date: 09-JAN-1998 05:04
Instrument: msdh.i
Client Sample ID:

Compound: Benzoic Acid
CAS Number: 65-85-0

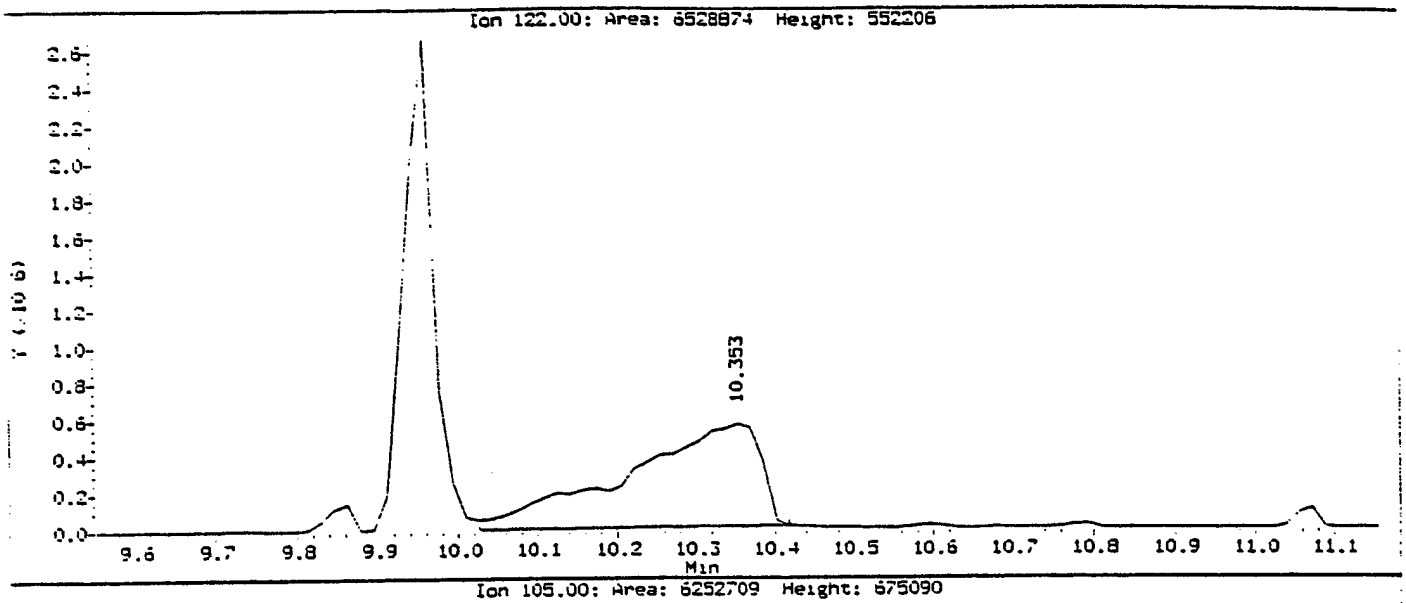


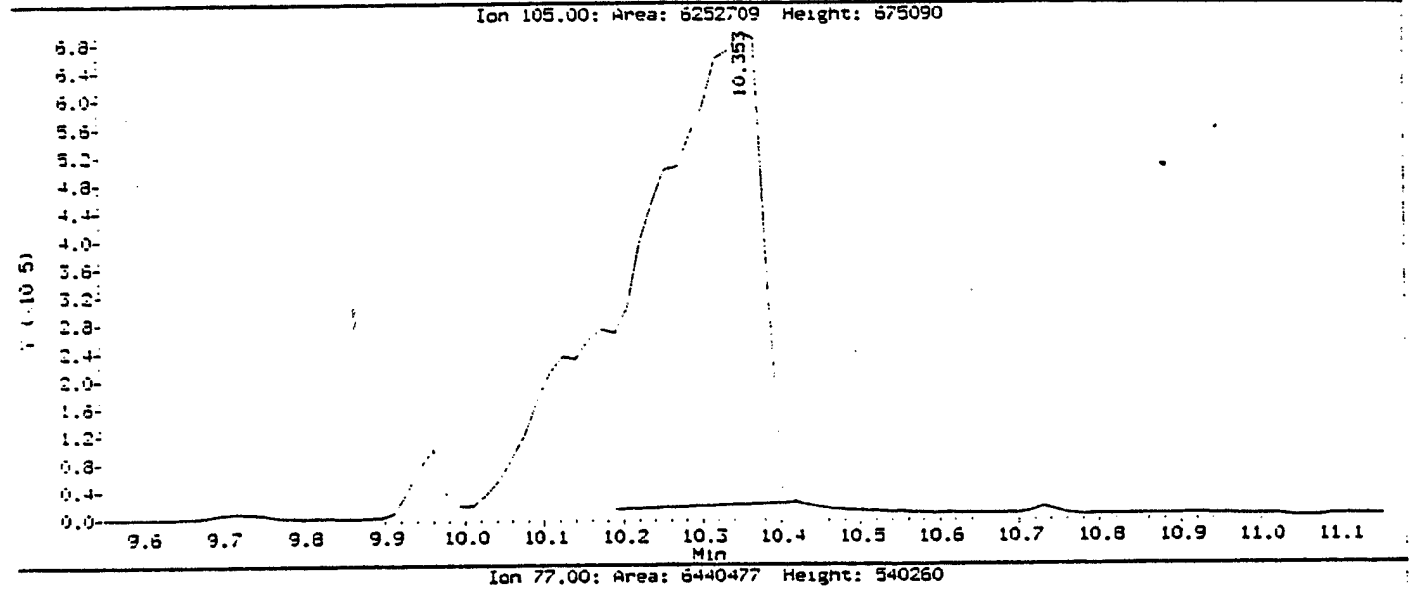


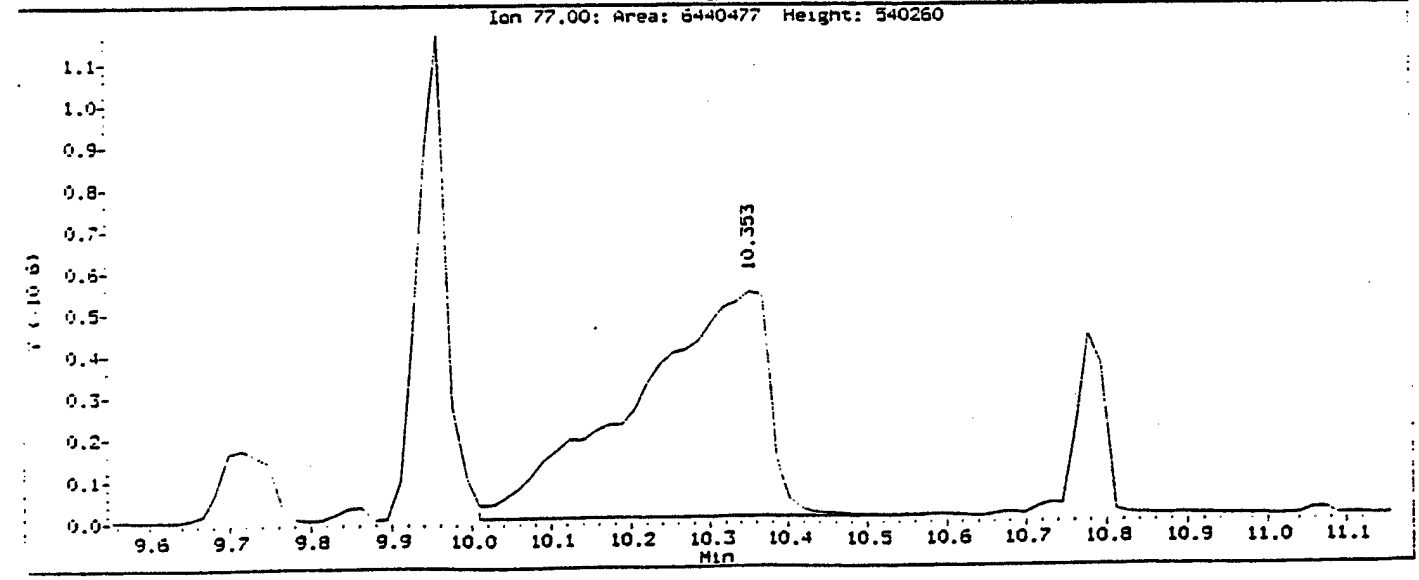


Data File: /chem/msdh.i/h-08Jan98.b/h01080901013.d
Injection Date: 09-JAN-1998 05:04
Instrument: msdh.i
Client Sample ID:

Compound: Benzoic Acid
CAS Number: 65-85-0

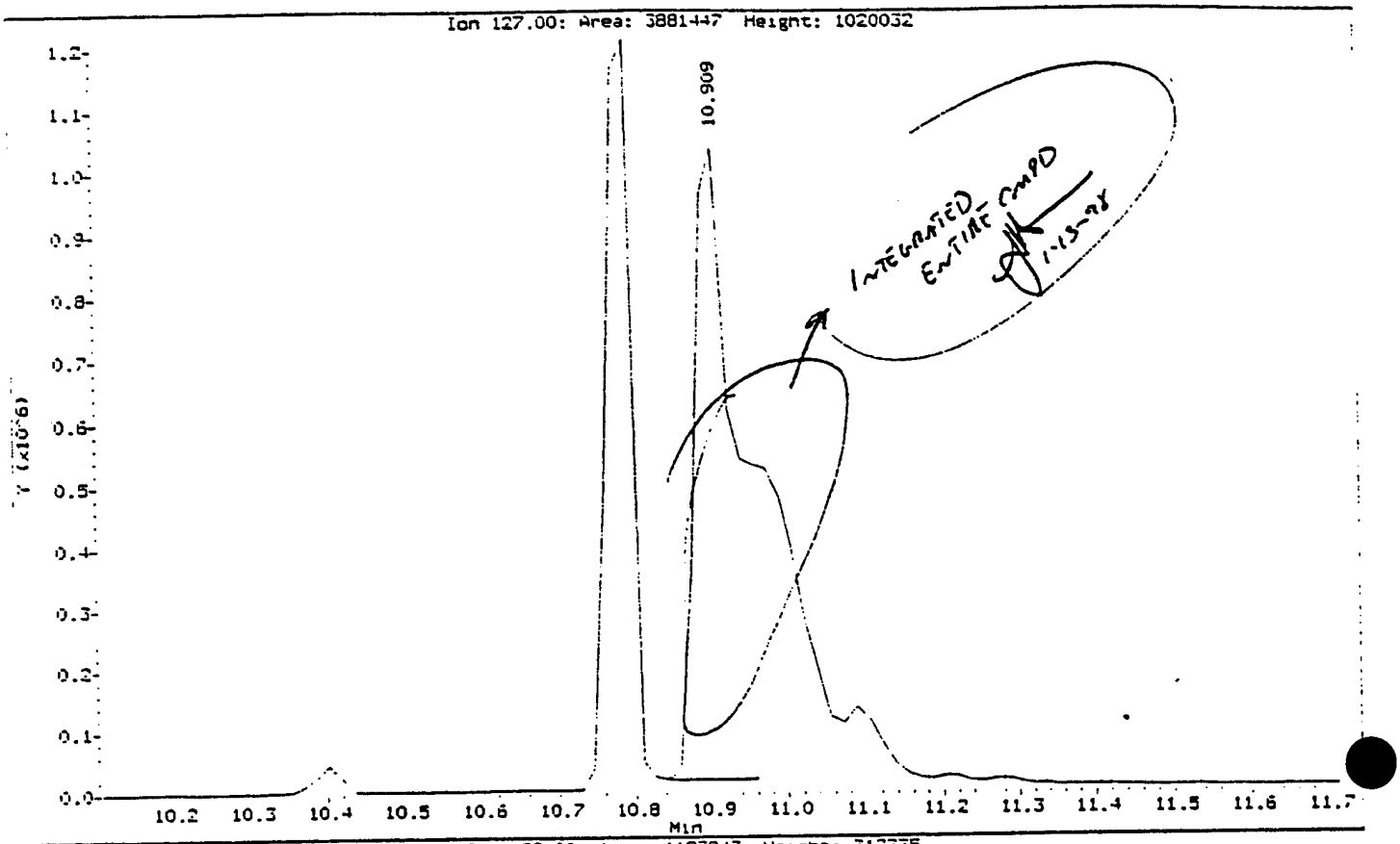


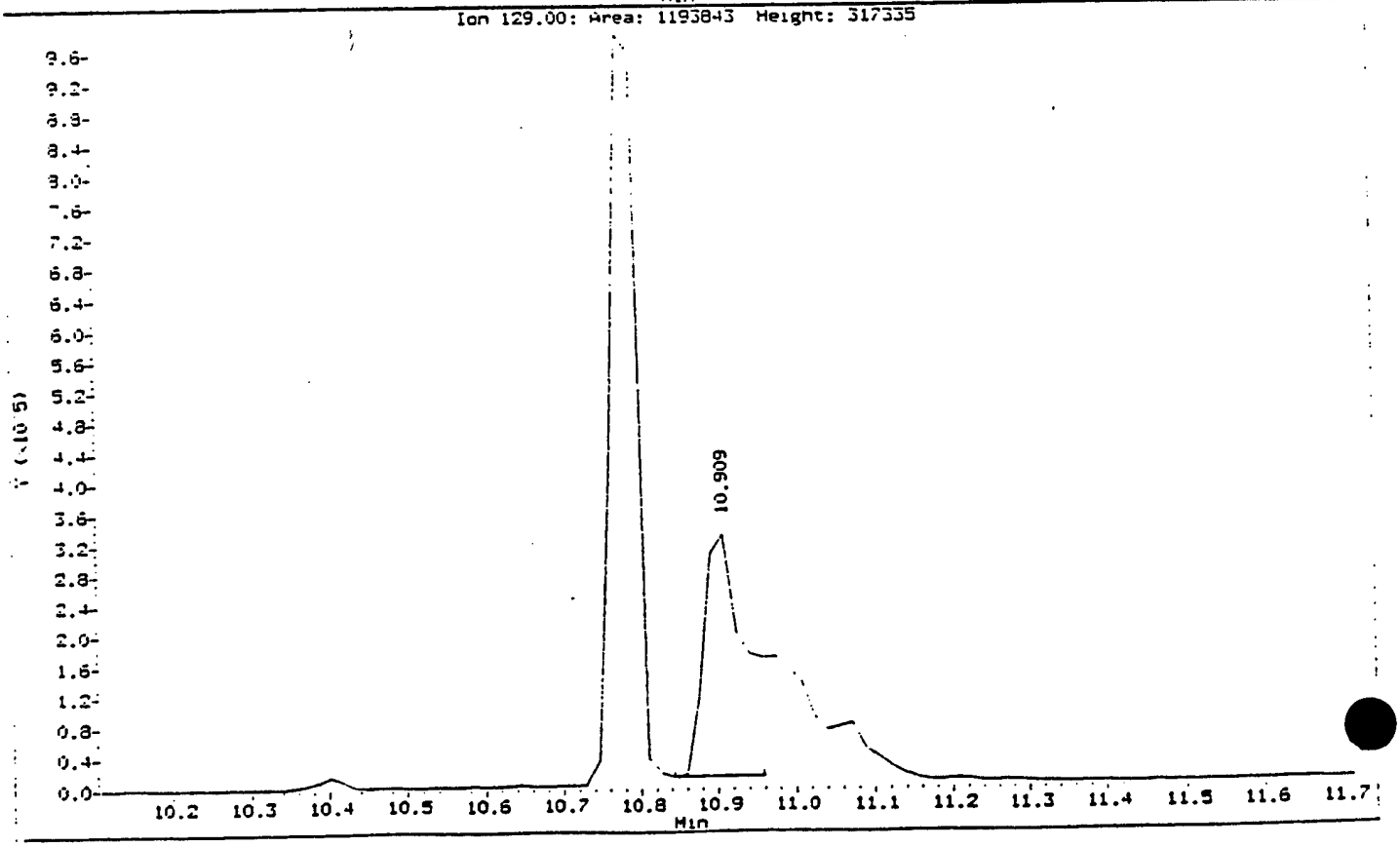




Data File: /chem/msdh.i/h-08Jan98.b/h01080901013.d
Injection Date: 09-JAN-1998 05:04
Instrument: msdh.i
Client Sample ID:

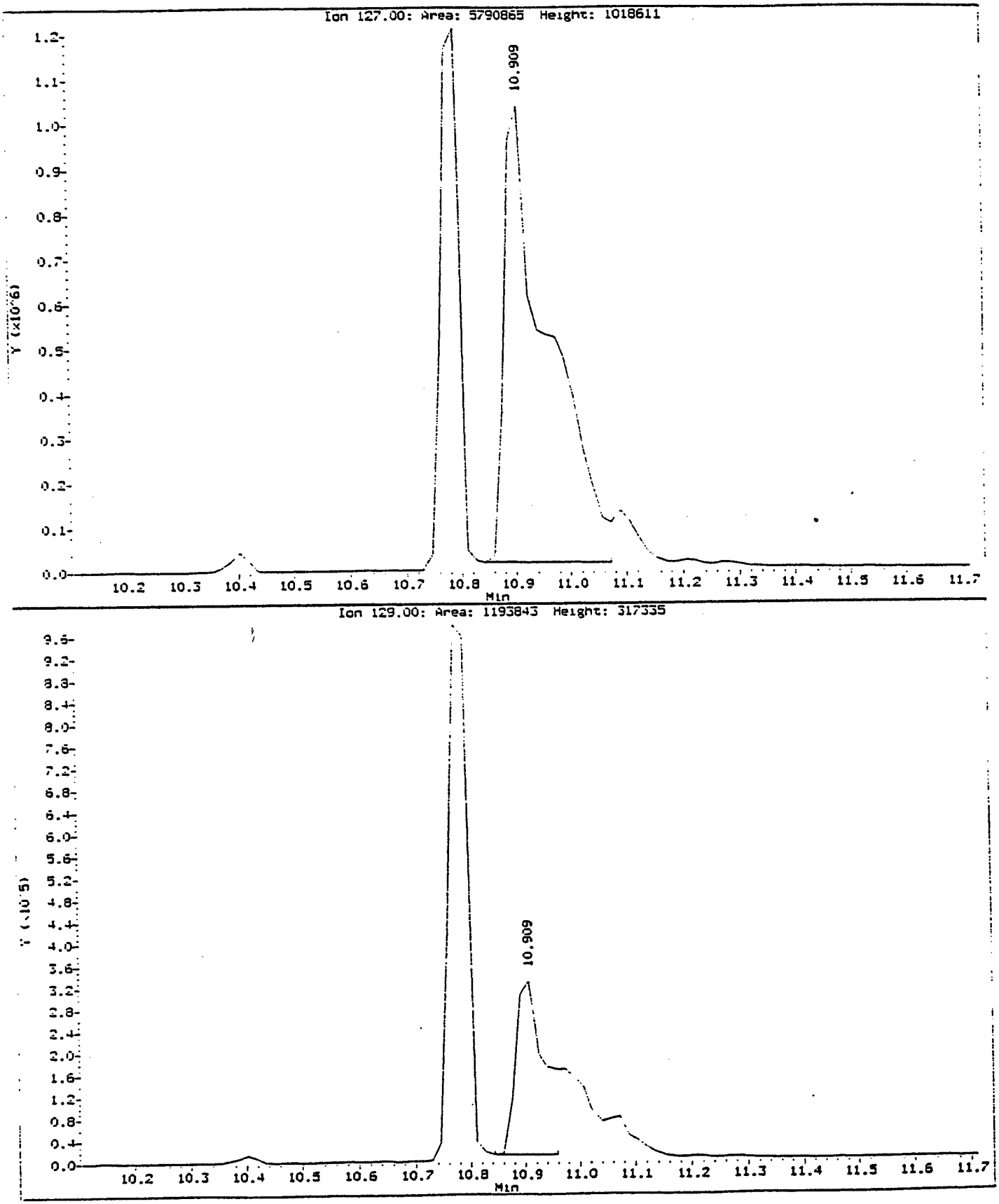
Compound: 4-Chloroaniline
CAS Number: 106-47-8





Data File: /chem/msdh.i/h-08Jan98.b/h01080901013.d
Injection Date: 09-JAN-1998 05:04
Instrument: msdh.i
Client Sample ID:

Compound: 4-Chloroaniline
CAS Number: 106-47-8



Air Toxics Limited

INITIAL CALIBRATION DATA

Start Cal Date : 15-JAN-1998 12:11
End Cal Date : 15-JAN-1998 16:27
Quant Method : ISTD
Origin : Disabled
Target Version : 3.40
Integrator : HP RTE
Method file : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Cal Date : 27-Jan-1998 15:14 jheffel
Curve Type : Average

1-27-98

1.27.98

Calibration File Names:
Level 1: /chem/msdh.i/h-15Jan98.b/h01150301008.d
Level 2: /chem/msdh.i/h-15Jan98.b/h01150401009.d
Level 3: /chem/msdh.i/h-15Jan98.b/h01150501010.d
Level 4: /chem/msdh.i/h-15Jan98.b/h01150601011.d
Level 5: /chem/msdh.i/h-15Jan98.b/h01150701012.d
Level 6: /chem/msdh.i/h-15Jan98.b/h01150801013.d
Level 7: /chem/msdh.i/h-15Jan98.b/h01150901014.d

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	160.000 Level 7	RRF	% RSD
3 Phenol	0.86620	0.94124	0.94854	0.93146	0.91898	0.86209	0.68166	0.87860	10.642
4 bis(2-Chloroethyl)ether	0.73029	0.77565	0.74153	0.76458	0.70967	0.69079	0.57848	0.71300	9.285
5 2-Chlorophenol	0.58711	0.69423	0.68297	0.69617	0.69495	0.66324	0.63436	0.66472	6.158
6 1,3-Dichlorobenzene	0.67527	0.68254	0.68345	0.67461	0.66889	0.64482	0.61893	0.66407	3.576
9 1,4-Dichlorobenzene	0.70109	0.74359	0.70516	0.70527	0.71541	0.66831	0.57687	0.68796	7.815
10 Benzyl Alcohol	0.36918	0.43975	0.45957	0.46388	0.46667	0.40536	0.38610	0.42722	9.383
11 1,2-Dichlorobenzene	0.61704	0.66454	0.65364	0.65560	0.62181	0.59906	0.54234	0.62200	6.833

Air Toxics Limited

INITIAL CALIBRATION DATA

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Integrator : HP RTE
Method file : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Cal Date : 27-Jan-1998 15:14 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD
	160.000 Level 7							
12 2-Methylphenol	0.59929	0.66474	0.64489	0.63680	0.63090	0.60590		
	0.55799						0.62007	5.700
13 bis(2-Chloroisopropyl)ether(1)	0.97702	1.03757	1.04579	0.97921	0.92616	0.82784		
	0.73834						0.93313	12.119
(2)	0.18131	0.18647	0.18546	0.18211	0.18045	0.16878		
	0.15987						0.17778	5.505
14 4-Methylphenol	0.55208	0.64544	0.64249	0.62573	0.59406	0.56742		
	0.53285						0.59430	7.590
15 N-Nitrosodipropylamine	0.39953	0.43370	0.41173	0.40534	0.36849	0.34510		
	0.31137						0.38218	11.173
16 Hexachloroethane	0.28882	0.30631	0.29711	0.30692	0.30142	0.28091		
	0.27442						0.29370	4.316
18 Nitrobenzene	0.38023	0.41966	0.44790	0.39522	0.41476	0.42076		
	0.33111						0.40138	9.364
19 Isophorone	0.82187	0.90087	0.92939	0.83627	0.88588	0.82561		
	0.80904						0.85842	5.409
20 2-Nitrophenol	0.14669	0.22114	0.23466	0.21200	0.23374	0.24311		
	0.22395						0.21647	14.977
21 2,4-Dimethylphenol	0.27607	0.31084	0.32480	0.27656	0.30698	0.29031		
	0.29423						0.29711	6.102

Air Toxics Limited

INITIAL CALIBRATION DATA

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Integrator : HP RTE
Method file : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Cal Date : 27-Jan-1998 15:14 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD
	160.000 Level 7							
22 N-nitrosodimethylamine	*****	*****	*****	*****	*****	*****	*****	***** <--
	*****							
23 bis(2-Chloroethoxy)methane	0.53664	0.55337	0.58130	0.49575	0.52169	0.47364	0.51585	8.978
	0.44857							
24 Benzoic Acid	*****	*****	0.15102	0.18354	0.22923	0.23760	0.20554	18.003
	0.22631							
25 2,4-Dichlorophenol	0.24475	0.27865	0.30051	0.27667	0.30528	0.29041	0.28123	7.217
	0.27232							
26 1,2,4-Trichlorobenzene	0.30979	0.33352	0.33741	0.29708	0.32906	0.31591	0.31823	4.837
	0.30486							
28 Naphthalene	1.08859	1.17480	1.18121	1.01187	0.87287	*****	1.06587	12.038
	*****							
29 4-Chloroaniline	0.32125	0.33220	0.29967	0.21250	0.13842	0.19011	0.24614	29.711
	0.22882							
30 Hexachlorobutadiene	0.16928	0.17557	0.18093	0.16695	0.17983	0.16661	0.17222	3.724
	0.16639							
32 4-Chloro-3-Methylphenol	0.25423	0.32033	0.35289	0.32005	0.35019	0.31677	0.31901	10.177
	0.31860							
33 2-Methylnaphthalene	0.66227	0.68401	0.67116	0.62938	0.63157	0.59510	0.62487	10.002
	0.50058							

Air Toxics Limited

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Integrator : HP RTE
Method file : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Cal Date : 27-Jan-1998 15:14 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD	
	160.000 Level 7								
35 Hexachlorocyclopentadiene	*****	0.15915	0.18538	0.19882	0.22674	0.23783			
	0.24605						0.20900	16.107	
36 2,4,6-Trichlorophenol	0.20402	0.26596	0.27908	0.26791	0.29194	0.30048			
	0.28215						0.27022	11.716	
37 2,4,5-Trichlorophenol	0.18451	0.25918	0.27062	0.26472	0.29313	0.31002			
	0.29047						0.26752	15.235	
39 2-Chloronaphthalene	0.76373	0.82880	0.85779	0.80551	0.81861	0.79901			
	0.63621						0.78709	9.209	
40 2-Nitroaniline	0.13755	0.23754	0.27226	0.27102	0.28179	0.28022			
	0.28010						0.25149	20.984	
41 Aniline	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
42 Dimethylphthalate	0.93646	0.99859	1.09515	1.00219	1.06096	0.94582			
	0.88279						0.98885	7.456	
43 Bicyclo[2.2.1]hepta-2,5-diene	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
44 2,6-Dinitrotoluene	0.11908	0.19138	0.22197	0.22172	0.23175	0.25462			
	0.24890						0.21277	21.723	
45 Acenaphthylene	1.25323	1.41978	1.49529	1.33369	1.15663	1.06952			
	0.81046						1.21980	19.054	

Air Toxics Limited

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Integrator : HP RTE
Method file : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Cal Date : 27-Jan-1998 15:14 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD	
	160.000 Level 7								
46 3-Nitroaniline	0.10206	0.16329	0.12411	0.06722	0.05479	0.04845			
	0.05900						0.08842	48.667	<-
48 Acenaphthene	0.77670	0.80836	0.80337	0.76000	0.80424	0.77562			
	0.61230						0.76294	9.026	
49 2,4-Dinitrophenol	*****	*****	0.04160	0.07021	0.11221	0.13417			
	0.14602						0.10084	43.590	<-
50 4-Nitrophenol	*****	*****	0.08775	0.09911	0.12603	0.13179			
	0.13600						0.11613	18.435	
51 Dibenzofuran	1.06331	1.23374	1.24149	1.12836	1.02164	0.93161			
	0.79686						1.05957	15.169	
52 2,4-Dinitrotoluene	*****	0.23999	0.28577	0.29539	0.32592	0.35033			
	0.33489						0.30538	13.158	
53 1-Chloro-3,4-Dinitrobenzene	0.04231	0.08007	0.11094	0.10956	0.12009	0.12255			
	0.11629						0.10026	29.118	<-
54 2-Methyl-benzenamine	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
55 N,N-Dimethyl-benzenamine	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
56 Diethylphthalate	1.04692	1.10991	1.16415	1.08890	1.15520	0.85771			
	0.74905						1.02455	15.546	

Air Toxics Limited

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Integrator : HP RTE
Method file : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Cal Date : 27-Jan-1998 15:14 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	160.000 Level 7	RRF	% RSD	
57 Fluorene	0.76668	0.91304	0.92471	0.92510	0.97830	0.82113	0.74094	0.86713	10.451	
58 4-Chlorophenyl phenyl ether	0.38379	0.43804	0.46059	0.42639	0.45583	0.44337	0.42809	0.43373	5.879	
59 4-Nitroaniline	0.08019	0.10353	0.12488	0.11314	0.09368	0.08017	0.05731	0.09327	24.510	
60 4,6-Dinitro-2-methylphenol	*****	*****	0.06855	0.10619	0.11783	0.12067	0.12070	0.10679	20.785	
61 N-nitrosodiphenylamine	0.34130	0.38310	0.38926	0.41393	0.32896	0.33304	0.29823	0.35540	11.491	
63 2,4-Dimethylbenzenamine	*****	*****	*****	*****	*****	*****	*****	*****	*****	<-
64 N,N,4-Trimethylbenzenamine	*****	*****	*****	*****	*****	*****	*****	*****	*****	<-
65 4-Bromophenyl phenyl ether	0.15958	0.17941	0.17939	0.20528	0.18474	0.17589	0.16700	0.17875	8.090	
66 Hexachlorobenzene	0.21818	0.22855	0.23021	0.25389	0.23641	0.20975	0.21696	0.22771	6.457	
67 Cumene	*****	*****	*****	*****	*****	*****	*****	*****	*****	<-

Air Toxics Limited

INITIAL CALIBRATION DATA

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End Cal Date : 15-JAN-1998 16:27
Quant Method : ISTD
Origin : Disabled
Target Version : 3.40
Integrator : HP RTE
Method file : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Cal Date : 27-Jan-1998 15:14 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD	
	160.000 Level 7								
68 Pentachlorophenol	*****	0.07784	0.10288	0.13436	0.13980	0.13769	0.12247	21.416	
	0.14222								
69 Biphenyl	*****	*****	*****	*****	*****	*****	*****	*****	<-
	*****								
70 Diethyl Ether	*****	*****	*****	*****	*****	*****	*****	*****	<-
	*****								
71 Phenanthrene	0.80896	0.87357	0.84660	0.96412	0.70619	0.55721	0.79277	18.019	
	*****								
72 Anthracene	0.73699	0.82750	0.81655	0.88598	0.74713	0.64911	0.73292	19.072	
	0.46717								
73 Dicyclopentadiene	*****	*****	*****	*****	*****	*****	*****	*****	<-
	*****								
74 3-Methylphenol	*****	*****	*****	*****	*****	*****	*****	*****	<-
	*****								
75 Di-n-butylphthalate	1.06862	1.30176	1.32523	1.30622	0.83414	0.66523	1.08353	25.875	
	*****								
79 Lindane	*****	*****	*****	*****	*****	*****	*****	*****	<-
	*****								
80 Fluoranthene	0.69688	0.81493	0.87093	0.99600	0.77921	0.63627	0.76768	18.638	
	0.57953								

Air Toxics Limited

INITIAL CALIBRATION DATA

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Integrator : HP RTE
Method file : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Cal Date : 27-Jan-1998 15:14 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD	
	160.000 Level 7								
81 Pyrene	0.91337	1.13084	1.12762	1.07111	1.00924	0.83011			
	0.76202						0.97776	14.943	
84 4,4'-DDE	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
85 Butyl benzyl phthalate	0.46296	0.59768	0.64184	0.63014	0.63241	0.60251			
	0.55153						0.58844	10.729	
86 4,4'-DDD	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
87 4,4'-DDT	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
88 Benzo(a)Anthracene	0.85281	0.70158	0.76406	0.74456	0.80999	0.77931			
	0.85500						0.78676	7.184	
89 3 3'-Dichlorobenzidine	0.16541	0.11020	0.09658	0.11047	0.13842	0.13459			
	0.15821						0.13055	19.852	
91 Chrysene	0.64052	0.65787	0.71920	0.73221	0.70438	0.65499			
	0.68441						0.68480	5.124	
92 Dieldrin	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
93 bis(2-ethylhexyl)Phthalate	0.67996	0.85298	0.89927	0.87066	0.78796	0.64504			
	0.60898						0.76355	15.442	

Air Toxics Limited

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Method file : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Cal Date : 27-Jan-1998 15:14 jheffel
Curve Type : Average

Compound	1.000 Level 1 / 160.000 Level 7	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD	
94 Di-n-octyl phthalate	1.23176 / 0.89199	1.90797	1.93241	2.08460	1.68824	1.35597	1.58471	27.539	
95 Benzo(b)fluoranthene	0.94209 / 1.10601	0.82900	0.85643	0.85611	1.09324	1.08429	0.96674	12.892	
96 Benzo(k)fluoranthene	0.93639 / 0.72302	0.81040	0.86445	0.85086	0.92830	0.86852	0.85456	8.505	
97 Benzo(e)pyrene	0.99050 / 0.81061	0.77355	0.75116	0.79555	0.90396	0.86073	0.84087	9.987	
98 Benzo(a)pyrene	0.79271 / 0.68427	0.67299	0.68404	0.68419	0.80624	0.76688	0.72748	8.035	
103 Indeno(1,2,3-cd)pyrene	0.65864 / 0.47645	0.41420	0.42331	0.43692	0.52237	0.51529	0.49245	17.246	
104 Dibenzo(a,h)anthracene	0.56448 / 0.42286	0.36619	0.36597	0.39684	0.45592	0.44204	0.43062	15.926	
105 Benzo(g,h,i)perylene	0.73105 / 0.45689	0.46948	0.45661	0.47798	0.52066	0.48338	0.51372	19.127	
106 3,3'-Dimethoxybenzidine	***** / *****	*****	*****	*****	*****	*****	*****	*****	<-
C 1 2-Fluorophenol	0.76151 / 0.69225	0.79705	0.77934	0.78058	0.77527	0.76240	0.76406	4.434	

Air Toxics Limited

INITIAL CALIBRATION DATA

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Integrator : HP RTE
Method file : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Cal Date : 27-Jan-1998 15:14 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD	
	160.000 Level 7								
2 Phenol-d5	0.54247	0.58501	0.58075	0.53620	0.56957	0.54320			
	0.49692						0.55059	5.580	
3 13C-Phenol	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
17 Nitrobenzene-d5	0.55436	0.64859	0.68744	0.62062	0.66524	0.66802			
	0.63954						0.64054	6.821	
31 d4-2,4-dichlorophenol	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
34 1-Methylnaphthalene-d10	0.51622	0.57158	0.58602	0.51602	0.53706	0.51522			
	0.45871						0.52869	7.947	
38 2-Fluorobiphenyl	0.63919	0.66345	0.65821	0.74582	0.66887	0.50008			
	0.39246						0.60973	19.789	
42 2,4,6-Tribromophenol	*****	0.14391	0.15335	0.15070	0.16945	0.16350			
	0.17624						0.15953	7.695	
75 13c-Pentachlorophenol	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
77 d10-Anthracene	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
82 Terphenyl-d14	0.60230	0.72932	0.78710	0.70526	0.78569	0.67324			
	0.61897						0.70027	10.533	

Air Toxics Limited

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Cal Date : 27-Jan-1998 15:14 jheffel
Curve Type : Average

Compound	1.000 Level 1	10.000 Level 2	20.000 Level 3	40.000 Level 4	80.000 Level 5	120.000 Level 6	RRF	% RSD	
	160.000 Level 7								
$ 33 Fluoranthene-d10	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
$ 100 Benzo(e)pyrene-d12	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
$ 101 Benzo(a)pyrene-d12	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-
$ 102 d12-Benzo(a)pyrene	*****	*****	*****	*****	*****	*****			
	*****						*****	*****	<-

Data File: /chem/msdh.i/h-15Jan98.b/h01150301008.d
Report Date: 19-Jan-1998 16:56

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150301008.d
Lab Smp Id:
Inj Date : 15-JAN-1998 12:11
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 1ug STD 396-4-1
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 16:39 m Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

1-19-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
**	******	********	****	********	*******	*******	**********	*****
* 7 1,4-Dichlorobenzene-d4						CAS #: 3855-82-1		
6.998	7.021	(1.000)	150	9799985	80.0000		80.00- 120.00	100.00
6.998	7.021	(1.000)	152	6110178			0.00-10058.51	62.35
6.998	7.021	(1.000)	115	3958834			0.00-10037.59	40.40
* 27 Naphthalene-d8						CAS #: 1146-65-2		
9.763	9.769	(1.000)	136	15475243	80.0000		80.00- 120.00	100.00
9.763	9.769	(1.000)	68	1192422			0.00-10006.78	7.71
* 47 Acenaphthene-d10						CAS #: 15067-26-2		
13.901	13.907	(1.000)	164	11354176	80.0000		80.00- 120.00	100.00
13.901	13.907	(1.000)	162	10990754			0.00-10094.94	96.80
13.901	13.907	(1.000)	160	4802823			0.00-10041.02	42.30

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
* 71 Phenanthrene-d10					CAS #: 1517-22-2		
17.467	17.489 (1.000)	188	16014287	80.0000		80.00- 120.00	100.00
17.467	17.489 (1.000)	94	2393037			0.00-10014.44	14.94
17.467	17.489 (1.000)	80	2306450			0.00-10015.28	14.40
* 90 Chrysene-d12					CAS #: 1719-03-5		
23.846	23.885 (1.000)	240	12187185	80.0000		80.00- 120.00	100.00
23.846	23.885 (1.000)	236	2851941			0.00-10026.00	23.40
23.846	23.885 (1.000)	120	2249899			0.00-10018.11	18.46
* 99 Perylene-d12					CAS #: 1520-96-3		
27.019	27.058 (1.000)	264	7661737	80.0000		80.00- 120.00	100.00
27.019	27.058 (1.000)	260	1671904			0.00-10021.95	21.82
27.019	27.058 (1.000)	265	1585671			0.00-10020.90	20.70
1 2-Fluorophenol					CAS #: 367-12-4		
4.626	4.649 (0.661)	112	93285	0.99667	1.00	80.00- 120.00	100.00(R)
4.626	4.649 (0.661)	64	49298			0.00-10046.11	52.85
4.626	4.649 (0.661)	92	20032			0.00-10019.15	21.47
2 Phenol-d5					CAS #: 4165-62-2		
6.278	6.317 (0.643)	99	104936	0.98526	0.98	80.00- 120.00	100.00(R)
6.278	6.317 (0.643)	71	32483			0.00-10029.73	30.96
17 Nitrobenzene-d5					CAS #: 4165-60-0		
8.143	8.182 (0.586)	82	78679	0.86545	0.86	80.00- 120.00	100.00(R)
8.143	8.182 (0.586)	54	39678			0.00-10052.46	50.43
8.143	8.182 (0.586)	128	35331			0.00-10049.58	44.91
62 2,4,6-Tribromophenol					CAS #: 118-79-6		
15.732	15.804 (0.662)	330	14211	0.58476	0.58	80.00- 120.00	100.00(R)
15.732	15.804 (0.662)	332	13768			0.00-10096.28	96.88
15.732	15.804 (0.662)	141	4463			0.00-10029.68	31.41
82 Terphenyl-d14					CAS #: 98904-43-9		
21.376	21.415 (0.896)	244	91754	0.86009	0.86	80.00- 120.00	100.00(R)
21.376	21.415 (0.896)	122	19699			0.00-10016.35	21.47
21.376	21.415 (0.896)	212	5943			0.00-10005.98	6.48
38 2-Fluorobiphenyl					CAS #: 321-60-8		
12.314	12.337 (0.705)	172	127953	1.04833	1.0	80.00- 120.00	100.00(R)
12.314	12.337 (0.705)	171	45687			0.00-10033.81	35.71
34 1-Methylnaphthalene-d10					CAS #: 38072-94-5		
11.562	11.584 (1.184)	152	99856	0.97640	0.98	80.00- 120.00	100.00(R)
11.562	11.584 (1.184)	122	40154			0.00-10038.76	40.21

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
34 1-Methylnaphthalene-d10 (continued)								
11.562	11.584	(1.184)	150	85394			0.00-10084.36	85.52
3 Phenol						CAS #: 108-95-2		
6.311	6.350	(0.902)	94	106109	0.98589	0.98	80.00- 120.00	100.00(a)
6.311	6.350	(0.902)	66	40694			0.00-10037.29	38.35
6.311	6.350	(0.902)	65	29354			0.00-10025.14	27.66
4 bis(2-Chloroethyl)ether						CAS #: 111-44-4		
6.491	6.514	(0.928)	93	89461	1.02426	1.0	80.00- 120.00	100.00
6.491	6.514	(0.928)	63	59601			0.00-10062.92	66.62
6.491	6.514	(0.928)	95	30589			0.00-10031.42	34.19
5 2-Chlorophenol						CAS #: 95-57-8		
6.573	6.595	(0.939)	128	71921	0.88325	0.88	80.00- 120.00	100.00(a)
6.573	6.595	(0.939)	130	24219			0.00-10030.89	33.67
6.573	6.595	(0.939)	64	33464			0.00-10041.15	46.53
6 1,3-Dichlorobenzene						CAS #: 541-73-1		
6.884	6.890	(0.984)	146	82720	1.01685	1.0	80.00- 120.00	100.00
6.884	6.890	(0.984)	148	49927			0.00-10063.34	60.36
6.884	6.890	(0.984)	113	11804			0.00-10013.98	14.27
9 1,4-Dichlorobenzene						CAS #: 106-46-7		
7.031	7.053	(1.005)	146	85884	1.01909	1.0	80.00- 120.00	100.00
7.031	7.053	(1.005)	148	61341			0.00-10063.27	71.42
6.998	7.053	(1.000)	113	202796			0.00-10016.16	236.13
10 Benzyl Alcohol						CAS #: 100-51-6		
7.293	7.315	(1.042)	108	45224	0.86414	0.86	80.00- 120.00	100.00(a)
7.293	7.315	(1.042)	79	55392			0.00-10116.61	122.48
7.293	7.315	(1.042)	77	40100			0.00-10078.86	88.67
11 1,2-Dichlorobenzene						CAS #: 95-50-1		
7.342	7.348	(1.049)	146	75587	0.99202	0.99	80.00- 120.00	100.00(a)
7.342	7.348	(1.049)	148	50460			0.00-10063.46	66.76
7.342	7.348	(1.049)	113	13343			0.00-10014.38	17.65
12 2-Methylphenol						CAS #: 95-48-7		
7.538	7.560	(1.077)	108	73413	0.96648	0.97	80.00- 120.00	100.00(a)
7.538	7.560	(1.077)	107	60254			0.00-10086.18	82.08
7.522	7.560	(1.075)	79	24644			0.00-10041.55	33.57
13 bis(2-Chloroisopropyl)ether						CAS #: 108-60-1		
7.587	7.609	(1.084)	45	119685	1.04704	1.0	80.00- 120.00	100.00
7.587	7.609	(1.084)	121	22210	1.01983	1.0	0.00-10020.26	18.56

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
14 4-Methylphenol					CAS #: 106-44-5		
7.865	7.904 (1.124)	108	67630	0.92897	0.93	80.00- 120.00	100.00(a)
7.865	7.904 (1.124)	107	81890			0.00-10122.08	121.09
7.865	7.904 (1.124)	79	20429			0.00-10025.12	30.21
15 N-Nitrosodipropylamine					CAS #: 621-64-7		
7.849	7.904 (1.122)	70	48942	1.04539	1.0	80.00- 120.00	100.00
7.849	7.904 (1.122)	130	11717			0.00-10026.33	23.94
7.849	7.904 (1.122)	101	6191			0.00-10012.19	12.65
16 Hexachloroethane					CAS #: 67-72-1		
8.045	8.051 (1.150)	117	35380	0.98337	0.98	80.00- 120.00	100.00(a)
8.045	8.051 (1.150)	201	23442			0.00-10068.38	66.26
8.045	8.051 (1.150)	199	14444			0.00-10041.83	40.83
18 Nitrobenzene					CAS #: 98-95-3		
8.192	8.231 (0.839)	77	73552	0.94731	0.95	80.00- 120.00	100.00(a)
8.192	8.231 (0.839)	123	37387			0.00-10053.45	50.83
8.192	8.231 (0.839)	65	10705			0.00-10013.89	14.55
19 Isophorone					CAS #: 78-59-1		
8.732	8.771 (0.894)	82	158983	0.95742	0.96	80.00- 120.00	100.00(a)
8.732	8.771 (0.894)	138	23905			0.00-10014.70	15.04
8.732	8.771 (0.894)	95	9297			0.00-10005.51	5.85
20 2-Nitrophenol					CAS #: 88-75-5		
8.896	8.918 (0.911)	139	28375	0.67763	0.68	80.00- 120.00	100.00(a)
8.896	8.918 (0.911)	65	12854			0.00-10042.96	45.30
8.896	8.918 (0.911)	109	7695			0.00-10026.21	27.12
21 2,4-Dimethylphenol					CAS #: 105-67-9		
9.043	9.065 (0.926)	122	53404	0.92919	0.93	80.00- 120.00	100.00(a)
9.043	9.065 (0.926)	107	64185			0.00-10123.86	120.19
9.043	9.065 (0.926)	121	31031			0.00-10055.27	58.11
22 bis(2-Chloroethoxy)methane					CAS #: 111-91-1		
9.255	9.294 (0.948)	93	103808	1.04030	1.0	80.00- 120.00	100.00
9.255	9.294 (0.948)	123	11123			0.00-10010.88	10.71
9.255	9.294 (0.948)	95	31823			0.00-10031.15	30.66
25 2,4-Dichlorophenol					CAS #: 120-83-2		
9.452	9.474 (0.968)	162	47345	0.87030	0.87	80.00- 120.00	100.00(a)
9.452	9.474 (0.968)	164	29540			0.00-10063.52	62.39
9.435	9.474 (0.966)	98	18697			0.00-10039.12	39.49
26 1,2,4-Trichlorobenzene					CAS #: 120-82-1		
9.632	9.654 (0.987)	180	59926	0.97347	0.97	80.00- 120.00	100.00(a)

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
26 1,2,4-Trichlorobenzene (continued)							
9.632	9.654 (0.987)	182	59694			0.00-10096.20	99.61
9.632	9.654 (0.987)	145	17732			0.00-10028.68	29.59
28 Naphthalene					CAS #: 91-20-3		
9.795	9.818 (1.003)	128	210577	1.10242	1.1	80.00- 120.00	100.00
9.795	9.818 (1.003)	129	23431			0.00-10013.27	11.13
9.795	9.818 (1.003)	127	27070			0.00-10013.22	12.86
29 4-Chloroaniline					CAS #: 106-47-8		
9.942	10.014 (1.018)	127	62142	1.30515	1.3	80.00- 120.00	100.00
9.942	9.965 (1.018)	129	19159			0.00-10010.59	30.83
30 Hexachlorobutadiene					CAS #: 87-68-3		
10.106	10.128 (1.035)	225	32745	0.98290	0.98	80.00- 120.00	100.00(a)
10.106	10.128 (1.035)	223	20114			0.00-10061.71	61.43
10.106	10.128 (1.035)	227	20708			0.00-10063.44	63.24
32 4-Chloro-3-Methylphenol					CAS #: 59-50-7		
11.120	11.159 (1.139)	107	49178	0.79694	0.80	80.00- 120.00	100.00(a)
11.120	11.159 (1.139)	142	37644			0.00-10073.71	76.55
11.120	11.159 (1.139)	144	12681			0.00-10023.72	25.79
33 2-Methylnaphthalene					CAS #: 91-57-6		
11.415	11.437 (1.169)	142	128109	1.05985	1.0	80.00- 120.00	100.00
11.415	11.437 (1.169)	141	110115			0.00-10090.11	85.95
35 Hexachlorocyclopentadiene					CAS #: 77-47-4		
11.791	11.813 (0.848)	237	15102	0.50913	0.51	80.00- 120.00	100.00(a)
11.807	11.813 (0.849)	272	2214			0.00-10014.73	14.66
11.791	11.813 (0.848)	235	8346			0.00-10061.71	55.26
36 2,4,6-Trichlorophenol					CAS #: 88-06-2		
12.102	12.124 (0.871)	196	28956	0.75502	0.76	80.00- 120.00	100.00(a)
12.102	12.124 (0.871)	198	26924			0.00-10094.84	92.98
12.102	12.124 (0.871)	200	8541			0.00-10030.07	29.50
37 2,4,5-Trichlorophenol					CAS #: 95-95-4		
12.183	12.206 (0.876)	196	26187	0.68970	0.69	80.00- 120.00	100.00(a)
12.183	12.206 (0.876)	198	28678			0.00-10095.07	109.51
12.183	12.206 (0.876)	200	7761			0.00-10030.67	29.64
39 2-Chloronaphthalene					CAS #: 91-58-7		
12.560	12.582 (0.903)	162	108394	0.97031	0.97	80.00- 120.00	100.00(a)
12.560	12.582 (0.903)	164	34772			0.00-10031.20	32.08
12.560	12.582 (0.903)	127	40627			0.00-10038.71	37.48

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
40 2-Nitroaniline						CAS #: 88-74-4		
12.821	12.860	(0.922)	65	19522	0.54693	0.55	80.00- 120.00	100.00(a)
12.821	12.876	(0.922)	138	24464			0.00-10127.72	125.32
12.821	12.860	(0.922)	92	17069			0.00-10073.86	87.43
41 3-Nitroaniline						CAS #: 99-09-2		
13.819	13.874	(0.994)	138	14485	1.15432	1.2	80.00- 120.00	100.00
13.819	13.874	(0.994)	92	16036			0.00-10120.29	110.71
13.819	13.907	(0.994)	108	4717			0.00-10080.06	32.56
43 Dimethylphthalate						CAS #: 131-11-3		
13.328	13.367	(0.959)	163	132909	0.94702	0.95	80.00- 120.00	100.00(a)
13.328	13.367	(0.959)	194	7474			0.00-10005.16	5.62
13.328	13.367	(0.959)	164	13110			0.00-10009.58	9.86
45 2,6-Dinitrotoluene						CAS #: 606-20-2		
13.443	13.498	(0.967)	165	16900	0.55963	0.56	80.00- 120.00	100.00(a)
13.443	13.498	(0.967)	89	10650			0.00-10059.87	63.02
13.443	13.498	(0.967)	121	4866			0.00-10022.31	28.79
46 Acenaphthylene						CAS #: 208-96-8		
13.525	13.563	(0.973)	152	177868	1.02741	1.0	80.00- 120.00	100.00
13.525	13.563	(0.973)	151	34148			0.00-10023.78	19.20
13.525	13.562	(0.973)	153	24063			0.00-10015.23	13.53
48 Acenaphthene						CAS #: 83-32-9		
13.966	13.989	(1.005)	154	110235	1.01803	1.0	80.00- 120.00	100.00
13.966	13.989	(1.005)	152	57183			0.00-10049.54	51.87
13.966	13.989	(1.005)	153	117296			0.00-10106.26	106.41
51 Dibenzofuran						CAS #: 132-64-9		
14.375	14.414	(1.034)	168	150913	1.00353	1.0	80.00- 120.00	100.00
14.375	14.414	(1.034)	139	51964			0.00-10038.83	34.43
56 Diethylphthalate						CAS #: 84-66-2		
15.046	15.085	(1.082)	149	148586	1.02183	1.0	80.00- 120.00	100.00
15.046	15.085	(1.082)	177	28238			0.00-10019.67	19.00
15.046	15.085	(1.082)	150	16235			0.00-10011.54	10.93
57 Fluorene						CAS #: 86-73-7		
15.193	15.232	(1.093)	166	108813	0.88416	0.88	80.00- 120.00	100.00(a)
15.193	15.232	(1.093)	165	99931			0.00-10093.28	91.84
15.193	15.232	(1.093)	167	13616			0.00-10012.75	12.51
58 4-Chlorophenyl phenyl ether						CAS #: 7005-72-3		
15.258	15.281	(1.098)	204	54470	0.88486	0.88	80.00- 120.00	100.00(a)

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
58 4-Chlorophenyl phenyl ether (continued)								
15.258	15.281	(1.098)	206	18557			0.00-10032.44	34.07
15.258	15.281	(1.098)	141	31263			0.00-10053.60	57.39
59 4-Nitroaniline						CAS #: 100-01-6		
15.258	15.330	(1.098)	138	11381	0.85974	0.86	80.00- 120.00	100.00(a)
15.258	15.330	(1.098)	92	7252			0.00-10032.69	63.72
15.275	15.330	(1.099)	108	9967			0.00-10073.68	87.58
61 N-nitrosodiphenylamine						CAS #: 86-30-6		
15.537	15.575	(0.889)	169	68320	0.96031	0.96	80.00- 120.00	100.00(a)
15.537	15.575	(0.889)	168	43050			0.00-10066.04	63.01
15.537	15.575	(0.889)	167	24086			0.00-10035.43	35.25
65 4-Bromophenyl phenyl ether						CAS #: 101-55-3		
16.436	16.459	(0.941)	248	31944	0.89272	0.89	80.00- 120.00	100.00(a)
16.436	16.459	(0.941)	250	30574			0.00-10096.59	95.71
16.420	16.459	(0.940)	141	22261			0.00-10065.11	69.69
66 Hexachlorobenzene						CAS #: 118-74-1		
16.518	16.540	(0.946)	284	43675	0.95816	0.96	80.00- 120.00	100.00(a)
16.502	16.540	(0.945)	142	16685			0.00-10033.27	38.20
16.518	16.540	(0.946)	249	10989			0.00-10024.51	25.16
72 Phenanthrene						CAS #: 85-01-8		
17.516	17.538	(1.003)	178	161936	1.07211	1.1	80.00- 120.00	100.00
17.516	17.538	(1.003)	176	30780			0.00-10020.36	19.01
17.516	17.538	(1.003)	179	31012			0.00-10016.57	19.15
73 Anthracene						CAS #: 120-12-7		
17.630	17.669	(1.009)	178	147530	1.00556	1.0	80.00- 120.00	100.00
17.630	17.669	(1.009)	176	27443			0.00-10019.61	18.60
17.630	17.669	(1.009)	179	24007			0.00-10016.26	16.27
78 Di-n-butylphthalate						CAS #: 84-74-2		
19.037	19.059	(1.090)	149	213915	0.98624	0.99	80.00- 120.00	100.00(a)
19.037	19.059	(1.090)	150	19204			0.00-10011.22	8.98
19.037	19.059	(1.090)	104	12248			0.00-10006.82	5.73
80 Fluoranthene						CAS #: 206-44-0		
20.362	20.401	(1.166)	202	139501	0.90778	0.91	80.00- 120.00	100.00(a)
20.362	20.401	(1.166)	101	30406			0.00-10017.87	21.80
20.362	20.401	(1.166)	100	24310			0.00-10013.24	17.43
81 Pyrene						CAS #: 129-00-0		
20.902	20.940	(0.877)	202	139143	0.93415	0.93	80.00- 120.00	100.00(a)

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
81 Pyrene (continued)								
20.885	20.940	(0.876)	101	37605			0.00-10022.30	27.03
20.902	20.940	(0.877)	100	30306			0.00-10017.69	21.78
85 Butyl benzyl phthalate						CAS #: 85-68-7		
22.635	22.674	(0.949)	149	70527	0.78676	0.79	80.00- 120.00	100.00(a)
22.635	22.674	(0.949)	91	56780			0.00-10073.35	80.51
22.652	22.674	(0.950)	206	10019			0.00-10015.36	14.21
89 Benzo(a)Anthracene						CAS #: 56-55-3		
23.813	23.836	(0.999)	228	129917	1.08395	1.1	80.00- 120.00	100.00
23.813	23.836	(0.999)	229	26671			0.00-10018.92	20.53
23.813	23.836	(0.999)	226	29315			0.00-10025.91	22.56
91 Chrysene						CAS #: 218-01-9		
23.895	23.950	(1.002)	228	97577	0.93535	0.94	80.00- 120.00	100.00(a)
23.895	23.950	(1.002)	226	31509			0.00-10028.14	32.29
23.895	23.950	(1.002)	229	20831			0.00-10018.65	21.35
93 bis(2-ethylhexyl)Phthalate						CAS #: 117-81-7		
24.091	24.130	(1.010)	149	103585	0.89052	0.89	80.00- 120.00	100.00(a)
24.091	24.130	(1.010)	167	29732			0.00-10027.97	28.70
24.108	24.130	(1.011)	279	7169			0.00-10005.78	6.92
94 Di-n-octyl phthalate						CAS #: 117-84-0		
25.596	25.619	(0.947)	149	117968	0.77728	0.78	80.00- 120.00	100.00(a)
25.596	25.619	(0.947)	150	12030			0.00-10011.28	10.20
95 Benzo(b)fluoranthene						CAS #: 205-99-2		
26.218	26.273	(0.970)	252	90226	0.97451	0.97	80.00- 120.00	100.00(a)
26.218	26.273	(0.970)	253	18606			0.00-10021.18	20.62
26.218	26.256	(0.970)	125	18740			0.00-10017.89	20.77
96 Benzo(k)fluoranthene						CAS #: 207-08-9		
26.283	26.322	(0.973)	252	99680	1.09576	1.1	80.00- 120.00	100.00(H)
26.267	26.322	(0.972)	253	19630			0.00-10020.93	21.89
26.267	26.322	(0.972)	125	16662			0.00-10016.09	18.58
97 Benzo(e)pyrene						CAS #:		
26.774	26.813	(0.991)	252	47431	0.58898	0.59	80.00- 120.00	100.00(aH)
26.774	26.813	(0.991)	125	13143			0.00-10027.28	27.71
26.774	26.813	(0.991)	250	12441			0.00-10027.55	26.23
98 Benzo(a)pyrene						CAS #: 50-32-8		
26.888	26.927	(0.995)	252	75919	1.08967	1.1	80.00- 120.00	100.00
26.888	26.927	(0.995)	253	17519			0.00-10021.09	23.08

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
98 Benzo(a)pyrene (continued)								
26.388	26.927	(0.995)	125	19247			0.00-10021.00	25.35
103 Indeno(1,2,3-cd)pyrene						CAS #: 193-39-5		
29.456	29.528	(1.090)	276	63079	1.33746	1.3	80.00- 120.00	100.00
29.456	29.528	(1.090)	138	23027			0.00-10035.87	36.51
29.391	29.528	(1.088)	227	251			0.00-10000.11	0.40
104 Dibenzo(a,h)anthracene						CAS #: 53-70-3		
29.538	29.593	(1.093)	278	54061	1.31086	1.3	80.00- 120.00	100.00
29.538	29.593	(1.093)	279	12895			0.00-10022.59	23.85
29.538	29.593	(1.093)	139	20877			0.00-10027.37	38.62
105 Benzo(g,h,i)perylene						CAS #: 191-24-2		
30.176	30.264	(1.117)	276	70014	1.42305	1.4	80.00- 120.00	100.00
30.176	30.264	(1.117)	138	28434			0.00-10038.50	40.61
30.176	30.264	(1.117)	277	18828			0.00-10023.39	26.89

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.
H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150301008.d
Lab Smp Id:
Inj Date : 15-JAN-1998 12:11 Inst ID: msdh.i
Operator : jgh
Smp Info : 1.0ul 1ug STD 396-4-1
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 17:51 jheffel Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
* 7 1,4-Dichlorobenzene-d4	150	6.998	7.017	(1.000)	9799985	80.0000	
	150	6.573	7.017	(1.000)	212	80.0000	
	150	6.704	7.017	(1.000)	291	80.0000	
	150	6.884	7.017	(1.000)	7206	80.0000	
	150	7.342	7.017	(1.000)	15789	80.0000	
* 27 Naphthalene-d8	136	9.763	9.782	(1.000)	15475243	80.0000	
	136	9.403	9.782	(1.000)	228	80.0000	
	136	9.452	9.782	(1.000)	469	80.0000	
	136	9.501	9.782	(1.000)	180	80.0000	
	136	9.534	9.782	(1.000)	105	80.0000	
	136	9.599	9.782	(1.000)	217	80.0000	
* 47 Acenaphthene-d10	164	13.901	13.920	(1.000)	11354176	80.0000	
* 71 Phenanthrene-d10	188	17.467	17.486	(1.000)	16014287	80.0000	
	188	17.090	17.486	(1.000)	202	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	188	17.140	17.486	(1.000)	1989	80.0000	
	188	17.221	17.486	(1.000)	568	80.0000	
* 90 Chrysene-d12	240	23.846	23.898	(1.000)	12187185	80.0000	
	240	23.568	23.898	(1.000)	296	80.0000	
	240	23.601	23.898	(1.000)	671	80.0000	
	240	23.650	23.898	(1.000)	187	80.0000	
	240	23.699	23.898	(1.000)	137	80.0000	
* 99 Perylene-d12	264	27.019	27.055	(1.000)	7661737	80.0000	
S 1 2-Fluorophenol	112	4.626	4.645	(0.661)	93285	0.99667	1.00(R)
S 2 Phenol-d5	99	6.278	6.314	(0.643)	104936	0.98526	0.98(R)
S 17 Nitrobenzene-d5	82	8.143	8.179	(0.586)	79001	0.86900	0.87(R)
S 62 2,4,6-Tribromophenol	330	15.782	15.817	(0.662)	14211	0.58476	0.58(R)
S 82 Terphenyl-d14	244	21.376	21.411	(0.896)	91754	0.86009	0.86(R)
S 38 2-Fluorobiphenyl	172	12.314	12.350	(0.705)	127953	1.04833	1.0(R)
S 24 1-Methylnaphthalene-d10	152	11.562	11.581	(1.184)	99856	0.97640	0.98(R)
3 Phenol	94	6.311	6.347	(0.902)	106109	0.98589	0.98(a)
4 bis(2-Chloroethyl)ether	93	6.491	6.510	(0.928)	89468	1.02434	1.0
5 2-Chlorophenol	128	6.573	6.592	(0.939)	72774	0.89373	0.89(a)
6 1,3-Dichlorobenzene	146	6.884	6.903	(0.984)	82720	1.01685	1.0
	146	7.031	6.903	(1.005)	86878	1.06797	1.1
9 1,4-Dichlorobenzene	146	7.031	7.050	(1.005)	85884	1.01909	1.0
	146	6.884	7.050	(0.984)	82721	0.98156	0.98(a)
	146	7.342	7.050	(1.049)	75040	0.89042	0.89(a)
10 Benzyl Alcohol	108	7.293	7.328	(1.042)	45224	0.86414	0.86(a)
	108	6.998	7.328	(1.000)	28152	0.53793	0.54(a)
	108	7.538	7.328	(1.077)	73434	1.40318	1.4(a)
11 1,2-Dichlorobenzene	146	7.342	7.344	(1.049)	75587	0.99202	0.99(a)
	146	7.031	7.344	(1.005)	85738	1.12524	1.1
12 2-Methylphenol	108	7.538	7.557	(1.077)	73420	0.96658	0.97(a)
	108	7.293	7.557	(1.042)	45087	0.59357	0.59(a)
	108	7.865	7.557	(1.124)	68018	0.89546	0.90(a)
13 bis(2-Chloroisopropyl)ether	45	7.587	7.606	(1.084)	119685	1.04704	1.0
14 4-Methylphenol	108	7.865	7.901	(1.124)	68684	0.94345	0.94(a)
15 N-Nitrosodipropylamine	70	7.849	7.901	(1.122)	49301	1.05306	1.0
16 Hexachloroethane	117	8.045	8.048	(1.150)	35380	0.98337	0.98(a)
18 Nitrobenzene	77	8.192	8.228	(0.839)	73548	0.94726	0.95(a)
19 Isophorone	82	8.732	8.767	(0.894)	158983	0.95742	0.96(a)
20 2-Nitrophenol	139	8.896	8.915	(0.911)	28375	0.67763	0.68(a)
21 2,4-Dimethylphenol	122	9.043	9.062	(0.926)	53302	0.92741	0.93(a)
23 bis(2-Chloroethoxy)methane	93	9.255	9.291	(0.948)	103808	1.04030	1.0
24 Benzoic Acid	122	9.043	9.454	(0.926)	53302	1.34060	1.3(a)
25 2,4-Dichlorophenol	162	9.452	9.471	(0.968)	47340	0.87021	0.87(a)
26 1,2,4-Trichlorobenzene	180	9.632	9.651	(0.987)	59926	0.97347	0.97(a)
28 Naphthalene	128	9.795	9.814	(1.003)	211473	1.10711	1.1
29 4-Chloroaniline	127	9.942	10.011	(1.018)	62245	1.30732	1.3
	127	9.795	10.011	(1.003)	27400	0.57548	0.58(a)
30 Hexachlorobutadiene	225	10.106	10.125	(1.035)	32745	0.98290	0.98(a)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
32 4-Chloro-3-Methylphenol	107	11.120	11.156	(1.139)	49060	0.79503	0.80(a)
33 2-Methylnaphthalene	142	11.415	11.434	(1.169)	128209	1.06068	1.1
35 Hexachlorocyclopentadiene	237	11.791	11.810	(0.848)	15102	0.50913	0.51(a)
36 2,4,6-Trichlorophenol	196	12.102	12.121	(0.871)	28956	0.75502	0.76(a)
	196	12.183	12.121	(0.876)	26376	0.68775	0.69(a)
37 2,4,5-Trichlorophenol	196	12.183	12.202	(0.876)	26922	0.70906	0.71(a)
	196	12.102	12.202	(0.871)	28956	0.76263	0.76(a)
39 2-Chloronaphthalene	162	12.560	12.579	(0.903)	108203	0.96861	0.97(a)
40 2-Nitroaniline	65	12.821	12.873	(0.922)	19522	0.54693	0.55(a)
41 3-Nitroaniline	138	13.819	13.871	(0.994)	14485	1.15432	1.2
43 Dimethylphthalate	163	13.328	13.380	(0.959)	132909	0.94702	0.95(a)
45 2,6-Dinitrotoluene	165	13.443	13.495	(0.967)	16900	0.55963	0.56(a)
	165	13.901	13.495	(1.000)	1448088	47.3527	48.0
46 Acenaphthylene	152	13.525	13.560	(0.973)	177868	1.02741	1.0
48 Acenaphthene	154	13.966	13.985	(1.005)	110235	1.01803	1.0
51 Dibenzofuran	168	14.375	14.411	(1.034)	150913	1.00353	1.0
53 1-Chloro-3,4-Dinitrobenzene	63	14.392	14.721	(1.474)	19223	0.99117	0.99(a)
56 Diethylphthalate	149	15.046	15.098	(1.082)	148586	1.02183	1.0
57 Fluorene	166	15.193	15.245	(1.093)	108813	0.88416	0.88(a)
58 4-Chlorophenyl phenyl ether	204	15.258	15.294	(1.098)	54470	0.88486	0.88(a)
59 4-Nitroaniline	138	15.258	15.343	(1.098)	12057	0.91081	0.91(a)
61 N-nitrosodiphenylamine	169	15.537	15.588	(0.889)	68320	0.96031	0.96(a)
65 4-Bromophenyl phenyl ether	248	16.436	16.455	(0.941)	31944	0.89272	0.89(a)
66 Hexachlorobenzene	284	16.518	16.553	(0.946)	43675	0.95816	0.96(a)
72 Phenanthrene	178	17.516	17.551	(1.003)	161936	1.07211	1.1
	178	17.630	17.551	(1.009)	148042	0.98012	0.98(a)
73 Anthracene	178	17.630	17.666	(1.009)	147530	1.00556	1.0
	178	17.516	17.666	(1.003)	161568	1.10124	1.1
78 Di-n-butylphthalate	149	19.037	19.072	(1.090)	213915	0.98624	0.99(a)
80 Fluoranthene	202	20.362	20.414	(1.166)	139501	0.90778	0.91(a)
81 Pyrene	202	20.902	20.937	(0.877)	139143	0.93415	0.93(a)
85 Butyl benzyl phthalate	149	22.635	22.687	(0.949)	70527	0.78676	0.79(a)
89 Benzo(a)Anthracene	228	23.813	23.849	(0.999)	129917	1.08395	1.1
	228	23.895	23.849	(1.002)	97345	0.81219	0.81(a)
91 Chrysene	228	23.895	23.947	(1.002)	97459	0.93421	0.93(a)
	228	23.813	23.947	(0.999)	129917	1.24535	1.2
93 bis(2-ethylhexyl)Phthalate	149	24.091	24.127	(1.010)	103540	0.89014	0.89(a)
94 Di-n-octyl phthalate	149	25.596	25.615	(0.947)	117968	0.77728	0.78(a)
95 Benzo(b)fluoranthene	252	26.218	26.269	(0.970)	90226	0.97451	0.97(a)
	252	26.283	26.269	(0.973)	89680	0.96861	0.97(a)
96 Benzo(k)fluoranthene	252	26.283	26.335	(0.973)	89680	1.09576	1.1
	252	26.218	26.335	(0.970)	90226	1.10243	1.1
97 Benzo(e)pyrene	252	26.774	26.826	(0.991)	47431	0.58898	0.59(a)
	252	26.888	26.826	(0.995)	75919	0.94273	0.94(a)
98 Benzo(a)pyrene	252	26.888	26.940	(0.995)	75919	1.08967	1.1
	252	26.774	26.940	(0.991)	47431	0.68078	0.68(a)
101 Indeno(1,2,3-cd)pyrene	276	29.456	29.524	(1.090)	63079	1.33746	1.3

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
104 Dibenzo(a,h)anthracene	278	29.538	29.590	(1.093)	53895	1.30684	1.3
105 Benzo(g,h,i)perylene	276	30.176	30.261	(1.117)	70014	1.42305	1.4

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01150301008.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: jgh
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/15/98
Calibration Time: 1501

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	10654771	5327386	21309542	9799985	-8.02
27 Naphthalene-d8	16919358	8459679	33838716	15475243	-8.54
47 Acenaphthene-d10	12271905	6135952	24543810	11354176	-7.48
71 Phenanthrene-d10	19162935	9581468	38325870	16014287	-16.43
90 Chrysene-d12	16491029	8245514	32982058	12187185	-26.10
99 Perylene-d12	9979847	4989924	19959694	7661737	-23.23

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.02	6.52	7.52	7.00	-0.27
27 Naphthalene-d8	9.78	9.28	10.28	9.76	-0.19
47 Acenaphthene-d10	13.92	13.42	14.42	13.90	-0.14
71 Phenanthrene-d10	17.49	16.99	17.99	17.47	-0.11
90 Chrysene-d12	23.90	23.40	24.40	23.85	-0.22
99 Perylene-d12	27.05	26.55	27.55	27.02	-0.13

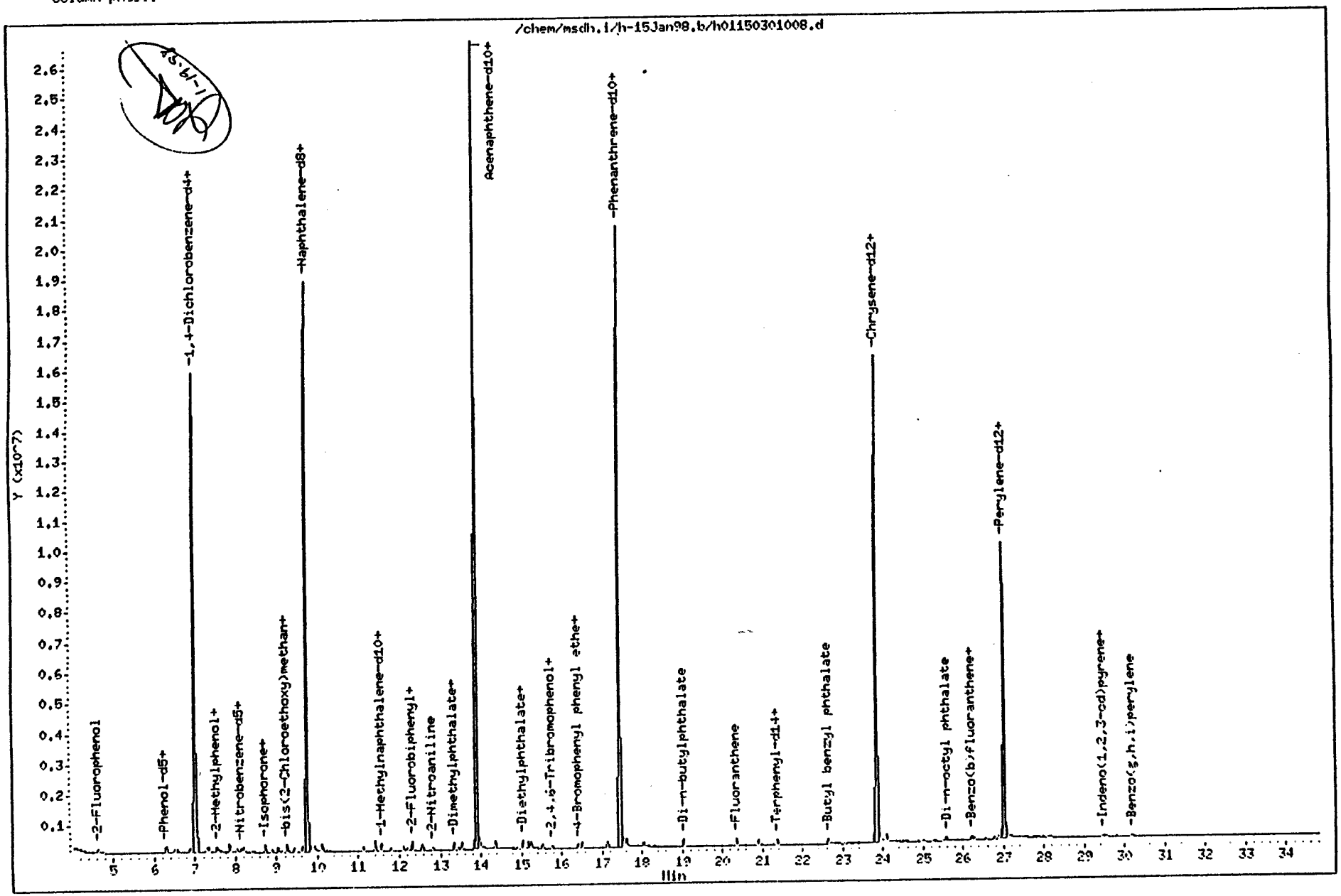
AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

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Data File: /chem/msdh.i/h-15Jan98.b/h01150301008.d
Date : 15-JAN-1998 12:11
Client ID:
Sample Info: 1.0ul 1ug STD 396-4-1
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i

Operator: jgh
Column diameter: 2.00



Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150401009.d
Lab Smp Id:
Inj Date : 15-JAN-1998 12:52
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 10ug STD 396-4-10
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 16:39 m Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

1-19-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
* 7 1,4-Dichlorobenzene-d4						CAS #: 3855-82-1		
7.015	7.021	(1.000)	150	9417962	80.0000		80.00- 120.00	100.00
7.015	7.021	(1.000)	152	5818711			0.00-10058.51	61.78
6.999	7.021	(1.000)	115	3749971			0.00-10037.59	39.82
* 27 Naphthalene-d8						CAS #: 1146-65-2		
9.763	9.769	(1.000)	136	15211529	80.0000		80.00- 120.00	100.00
9.763	9.769	(1.000)	68	1128309			0.00-10006.78	7.42
* 47 Acenaphthene-d10						CAS #: 15067-26-2		
13.902	13.907	(1.000)	164	11023645	80.0000		80.00- 120.00	100.00
13.902	13.907	(1.000)	162	10710220			0.00-10094.94	97.16
13.902	13.907	(1.000)	160	4649887			0.00-10041.02	42.18

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
* 71 Phenanthrene-d10						CAS #: 1517-22-2	
17.467	17.489 (1.000)	188	16483764	80.0000		80.00- 120.00	100.00
17.467	17.489 (1.000)	94	2401527			0.00-10014.44	14.57
17.467	17.489 (1.000)	80	2344043			0.00-10015.28	14.22
* 90 Chrysene-d12						CAS #: 1719-03-5	
23.847	23.885 (1.000)	240	12655036	80.0000		80.00- 120.00	100.00
23.847	23.885 (1.000)	236	2951447			0.00-10026.00	23.32
23.847	23.885 (1.000)	120	2275293			0.00-10018.11	17.98
* 99 Perylene-d12						CAS #: 1520-96-3	
27.020	27.058 (1.000)	264	7104935	80.0000		80.00- 120.00	100.00
27.020	27.058 (1.000)	260	1556191			0.00-10021.95	21.90
27.020	27.058 (1.000)	265	1483449			0.00-10020.90	20.88
$ 1 2-Fluorophenol						CAS #: 367-12-4	
4.627	4.649 (0.660)	112	938328	10.4318	10.4	80.00- 120.00	100.00(R)
4.627	4.649 (0.660)	64	477690			0.00-10046.11	50.91
4.627	4.649 (0.660)	92	196062			0.00-10019.15	20.89
$ 2 Phenol-d5						CAS #: 4165-62-2	
6.279	6.317 (0.643)	99	1112355	10.6251	10.6	80.00- 120.00	100.00(R)
6.279	6.317 (0.643)	71	324797			0.00-10029.73	29.20
$ 17 Nitrobenzene-d5						CAS #: 4165-60-0	
8.160	8.182 (0.587)	82	893727	10.1256	10.1	80.00- 120.00	100.00(R)
8.160	8.182 (0.587)	54	473596			0.00-10052.46	52.99
8.160	8.182 (0.587)	128	395351			0.00-10049.58	44.24
$ 62 2,4,6-Tribromophenol						CAS #: 118-79-6	
15.783	15.804 (0.662)	330	227652	9.02126	9.0	80.00- 120.00	100.00(R)
15.783	15.804 (0.662)	332	222688			0.00-10096.28	97.32
15.783	15.804 (0.662)	141	71119			0.00-10029.68	31.24
$ 82 Terphenyl-d14						CAS #: 98904-43-9	
21.377	21.415 (0.896)	244	1153703	10.4149	10.4	80.00- 120.00	100.00(R)
21.377	21.415 (0.896)	122	229957			0.00-10016.35	19.93
21.377	21.415 (0.896)	212	68985			0.00-10005.98	5.98
$ 38 2-Fluorobiphenyl						CAS #: 321-60-8	
12.315	12.337 (0.705)	172	1367015	10.8811	10.9	80.00- 120.00	100.00(R)
12.315	12.337 (0.705)	171	465970			0.00-10033.81	34.09
$ 34 1-Methylnaphthalene-d10						CAS #: 38072-94-5	
11.563	11.584 (1.184)	152	1086834	10.8113	10.8	80.00- 120.00	100.00(R)
11.563	11.584 (1.184)	122	418773			0.00-10038.76	38.53

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
11.563	11.584 (1.184)	150	918361			0.00-10084.36	84.50
	3 Phenol				CAS #: 108-95-2		
6.312	6.350 (0.900)	94	1108075	10.7130	10.7	80.00- 120.00	100.00
6.312	6.350 (0.900)	66	407246			0.00-10037.29	36.75
6.312	6.350 (0.900)	65	283139			0.00-10025.14	25.55
	4 bis(2-Chloroethyl)ether				CAS #: 111-44-4		
6.492	6.514 (0.925)	93	913130	10.8787	10.9	80.00- 120.00	100.00
6.492	6.514 (0.925)	63	612244			0.00-10062.92	67.05
6.492	6.514 (0.925)	95	280693			0.00-10031.42	30.74
	5 2-Chlorophenol				CAS #: 95-57-8		
6.574	6.595 (0.937)	128	817280	10.4440	10.4	80.00- 120.00	100.00
6.590	6.595 (0.939)	130	258862			0.00-10030.89	31.67
6.574	6.595 (0.937)	64	386124			0.00-10041.15	47.25
	6 1,3-Dichlorobenzene				CAS #: 541-73-1		
6.884	6.890 (0.981)	146	803519	10.2781	10.3	80.00- 120.00	100.00
6.884	6.890 (0.981)	148	510177			0.00-10063.34	63.49
6.884	6.890 (0.981)	113	115512			0.00-10013.88	14.38
	9 1,4-Dichlorobenzene				CAS #: 106-46-7		
7.032	7.053 (1.002)	146	875390	10.8087	10.8	80.00- 120.00	100.00
7.032	7.053 (1.002)	148	566192			0.00-10063.27	64.68
7.032	7.053 (1.002)	113	306501			0.00-10016.16	35.01
	10 Benzyl Alcohol				CAS #: 100-51-6		
7.293	7.315 (1.040)	108	517699	10.2935	10.3	80.00- 120.00	100.00
7.293	7.315 (1.040)	79	638731			0.00-10116.61	123.38
7.293	7.315 (1.040)	77	425706			0.00-10078.86	82.23
	11 1,2-Dichlorobenzene				CAS #: 95-50-1		
7.342	7.348 (1.047)	146	782326	10.6839	10.7	80.00- 120.00	100.00
7.342	7.348 (1.047)	148	494095			0.00-10063.46	63.16
7.342	7.348 (1.047)	113	119048			0.00-10014.38	15.22
	12 2-Methylphenol				CAS #: 95-48-7		
7.539	7.560 (1.075)	108	782567	10.7204	10.7	80.00- 120.00	100.00
7.539	7.560 (1.075)	107	680752			0.00-10086.18	86.99
7.539	7.560 (1.075)	79	310649			0.00-10041.55	39.70
	13 bis(2-Chloroisopropyl)ether				CAS #: 108-60-1		
7.588	7.609 (1.082)	45	1221473	11.1192	11.1	80.00- 120.00	100.00
7.588	7.609 (1.082)	121	219526	10.4890	10.5	0.00-10020.26	17.97

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
14 4-Methylphenol					CAS #: 106-44-5		
7.866	7.904 (1.121)	108	759845	10.8606	10.9	80.00- 120.00	100.00
7.866	7.904 (1.121)	107	911952			0.00-10122.08	120.02
7.866	7.904 (1.121)	79	188476			0.00-10025.12	24.80
15 N-Nitrosodipropylamine					CAS #: 621-64-7		
7.866	7.904 (1.121)	70	510571	11.3480	11.3	80.00- 120.00	100.00
7.866	7.904 (1.121)	130	118224			0.00-10026.33	23.16
7.866	7.904 (1.121)	101	57840			0.00-10012.19	11.33
16 Hexachloroethane					CAS #: 67-72-1		
8.046	8.051 (1.147)	117	360598	10.4292	10.4	80.00- 120.00	100.00
8.046	8.051 (1.147)	201	243091			0.00-10068.38	67.41
8.046	8.051 (1.147)	199	154413			0.00-10041.83	42.82
18 Nitrobenzene					CAS #: 98-95-3		
8.193	8.231 (0.839)	77	797966	10.4556	10.4	80.00- 120.00	100.00
8.193	8.231 (0.839)	123	398649			0.00-10053.45	49.96
8.193	8.231 (0.839)	65	114840			0.00-10013.89	14.39
19 Isophorone					CAS #: 78-59-1		
8.733	8.771 (0.894)	82	1712954	10.4945	10.5	80.00- 120.00	100.00
8.733	8.771 (0.894)	138	244701			0.00-10014.70	14.29
8.733	8.771 (0.894)	95	94937			0.00-10005.51	5.54
20 2-Nitrophenol					CAS #: 88-75-5		
8.896	8.918 (0.911)	139	420483	10.2158	10.2	80.00- 120.00	100.00
8.896	8.918 (0.911)	65	180338			0.00-10042.96	42.89
8.896	8.918 (0.911)	109	107842			0.00-10026.21	25.65
21 2,4-Dimethylphenol					CAS #: 105-67-9		
9.044	9.065 (0.926)	122	591041	10.4619	10.5	80.00- 120.00	100.00
9.044	9.065 (0.926)	107	717926			0.00-10123.86	121.47
9.044	9.065 (0.926)	121	328126			0.00-10055.27	55.52
23 bis(2-Chloroethoxy)methane					CAS #: 111-91-1		
9.256	9.294 (0.948)	93	1052191	10.7272	10.7	80.00- 120.00	100.00
9.256	9.294 (0.948)	123	102748			0.00-10010.88	9.77
9.256	9.294 (0.948)	95	336866			0.00-10031.15	32.02
24 Benzoic Acid					CAS #: 65-85-0		
9.207	9.441 (0.943)	122	172654	4.41770	4.4	80.00- 120.00	100.00(a)
9.207	9.441 (0.943)	105	240646			0.00-10123.32	139.38
9.207	9.441 (0.943)	77	179559			0.00-10081.55	104.00
25 2,4-Dichlorophenol					CAS #: 120-83-2		
9.453	9.474 (0.968)	162	529846	9.90851	9.9	80.00- 120.00	100.00

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
25 2,4-Dichlorophenol (continued)								
9.453	9.474	(0.968)	164	337031			0.00-10063.52	63.61
9.453	9.474	(0.968)	98	214836			0.00-10039.12	40.55
26 1,2,4-Trichlorobenzene						CAS #: 120-82-1		
9.632	9.654	(0.987)	180	634175	10.4805	10.5	80.00- 120.00	100.00
9.632	9.654	(0.987)	182	607459			0.00-10096.20	95.79
9.632	9.654	(0.987)	145	184073			0.00-10028.68	29.03
28 Naphthalene						CAS #: 91-20-3		
9.796	9.818	(1.003)	128	2233804	11.8972	11.9	80.00- 120.00	100.00
9.796	9.818	(1.003)	129	235422			0.00-10013.27	10.54
9.796	9.818	(1.003)	127	278003			0.00-10013.22	12.45
29 4-Chloroaniline						CAS #: 106-47-8		
9.943	10.014	(1.018)	127	631651	13.4964	13.5	80.00- 120.00	100.00
9.943	9.965	(1.018)	129	206007			0.00-10010.59	32.61
30 Hexachlorobutadiene						CAS #: 87-68-3		
10.107	10.128	(1.035)	225	333830	10.1942	10.2	80.00- 120.00	100.00
10.107	10.128	(1.035)	223	211636			0.00-10061.71	63.40
10.107	10.128	(1.035)	227	214623			0.00-10063.44	64.29
32 4-Chloro-3-Methylphenol						CAS #: 59-50-7		
11.121	11.159	(1.139)	107	609084	10.0414	10.0	80.00- 120.00	100.00
11.137	11.159	(1.141)	142	458386			0.00-10073.71	75.26
11.137	11.159	(1.141)	144	146086			0.00-10023.72	23.98
33 2-Methylnaphthalene						CAS #: 91-57-6		
11.415	11.437	(1.169)	142	1300607	10.9465	10.9	80.00- 120.00	100.00
11.415	11.437	(1.169)	141	1125899			0.00-10090.11	86.57
35 Hexachlorocyclopentadiene						CAS #: 77-47-4		
11.808	11.813	(0.849)	237	219298	7.61486	7.6	80.00- 120.00	100.00(a)
11.808	11.813	(0.849)	272	33532			0.00-10014.73	15.29
11.808	11.813	(0.849)	235	137112			0.00-10061.71	62.52
36 2,4,6-Trichlorophenol						CAS #: 88-06-2		
12.102	12.124	(0.871)	196	366486	9.84252	9.8	80.00- 120.00	100.00
12.102	12.124	(0.871)	198	342693			0.00-10094.84	93.51
12.102	12.124	(0.871)	200	109473			0.00-10030.07	29.87
37 2,4,5-Trichlorophenol						CAS #: 95-95-4		
12.184	12.206	(0.876)	196	357132	9.68802	9.7	80.00- 120.00	100.00
12.184	12.206	(0.876)	198	340541			0.00-10095.07	95.35
12.184	12.206	(0.876)	200	117325			0.00-10030.67	32.85

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
39 2-Chloronaphthalene					CAS #: 91-58-7		
12.560	12.582 (0.903)	162	1142053	10.5299	10.5	80.00- 120.00	100.00
12.560	12.582 (0.903)	164	372697			0.00-10031.20	32.63
12.560	12.582 (0.903)	127	438186			0.00-10038.71	38.37
40 2-Nitroaniline					CAS #: 88-74-4		
12.822	12.860 (0.922)	65	327316	9.44503	9.4	80.00- 120.00	100.00
12.822	12.876 (0.922)	138	387128			0.00-10127.72	118.27
12.822	12.860 (0.922)	92	233101			0.00-10073.86	71.22
41 3-Nitroaniline					CAS #: 99-09-2		
13.820	13.874 (0.994)	138	225007	18.4686	18.5	80.00- 120.00	100.00
13.820	13.874 (0.994)	92	252197			0.00-10120.29	112.08
13.820	13.907 (0.994)	108	41683			0.00-10080.06	18.53
43 Dimethylphthalate					CAS #: 131-11-3		
13.329	13.367 (0.959)	163	1376017	10.0985	10.1	80.00- 120.00	100.00
13.329	13.367 (0.959)	194	71019			0.00-10005.16	5.16
13.329	13.367 (0.959)	164	137621			0.00-10009.58	10.00
45 2,6-Dinitrotoluene					CAS #: 606-20-2		
13.460	13.498 (0.968)	165	263709	8.99442	9.0	80.00- 120.00	100.00
13.444	13.498 (0.967)	89	168242			0.00-10059.87	63.80
13.444	13.498 (0.967)	121	62485			0.00-10022.31	23.69
46 Acenaphthylene					CAS #: 208-96-8		
13.542	13.563 (0.974)	152	1956398	11.6395	11.6	80.00- 120.00	100.00
13.542	13.563 (0.974)	151	369876			0.00-10023.78	18.91
13.542	13.563 (0.974)	153	250009			0.00-10015.23	12.78
48 Acenaphthene					CAS #: 83-32-9		
13.967	13.989 (1.005)	154	1113885	10.5953	10.6	80.00- 120.00	100.00
13.967	13.989 (1.005)	152	559467			0.00-10049.54	50.23
13.967	13.989 (1.005)	153	1183073			0.00-10106.26	106.21
49 2,4-Dinitrophenol					CAS #: 51-28-5		
14.082	14.120 (1.013)	184	25357	1.82481	1.8	80.00- 120.00	100.00(a)
14.082	14.103 (1.013)	63	17570			0.00-10058.68	69.29
14.082	14.120 (1.013)	154	14142			0.00-10038.31	55.77
50 4-Nitrophenol					CAS #: 100-02-7		
14.294	14.349 (1.028)	109	79520	4.96911	5.0	80.00- 120.00	100.00(H)
14.294	14.349 (1.028)	139	119293			0.00-10155.17	150.02
14.294	14.349 (1.028)	65	106238			0.00-10133.38	133.60
51 Dibenzofuran					CAS #: 132-64-9		
14.276	14.414 (1.034)	168	1700036	11.6437	11.6	80.00- 120.00	100.00

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
51 Dibenzofuran (continued)							
14.376	14.414 (1.034)	139	568341			0.00-10038.83	33.43
52 2,4-Dinitrotoluene					CAS #: 121-14-2		
14.409	14.447 (1.036)	165	330698	7.85879	7.8	80.00- 120.00	100.00
14.392	14.430 (1.035)	63	279555			0.00-10063.54	84.53
14.409	14.447 (1.036)	182	16303			0.00-10004.86	4.93
53 1-Chloro-3,4-Dinitrobenzene					CAS #:		
14.670	14.708 (1.503)	63	152256	7.98670	8.0	80.00- 120.00	100.00
14.670	14.708 (1.503)	75	128543			0.00-10081.72	84.43
14.687	14.725 (1.504)	202	86544			0.00-10054.68	56.84
56 Diethylphthalate					CAS #: 84-66-2		
15.047	15.085 (1.082)	149	1529407	10.8331	10.8	80.00- 120.00	100.00
15.047	15.085 (1.082)	177	289009			0.00-10019.67	18.90
15.047	15.085 (1.082)	150	170601			0.00-10011.54	11.15
57 Fluorene					CAS #: 86-73-7		
15.210	15.232 (1.094)	166	1258130	10.5295	10.5	80.00- 120.00	100.00
15.210	15.232 (1.094)	165	1159167			0.00-10093.28	92.13
15.210	15.232 (1.094)	167	166248			0.00-10012.75	13.21
58 4-Chlorophenyl phenyl ether					CAS #: 7005-72-3		
15.259	15.281 (1.098)	204	603605	10.0995	10.1	80.00- 120.00	100.00
15.259	15.281 (1.098)	206	200028			0.00-10032.44	33.14
15.259	15.281 (1.098)	141	334685			0.00-10053.60	55.45
59 4-Nitroaniline					CAS #: 100-01-6		
15.276	15.330 (1.099)	138	142662	11.1001	11.1	80.00- 120.00	100.00
15.276	15.330 (1.099)	92	75881			0.00-10032.69	53.19
15.276	15.330 (1.099)	108	100953			0.00-10073.68	70.76
60 4,6-Dinitro-2-methylphenol					CAS #: 534-52-1		
15.374	15.412 (0.880)	198	79714	3.62277	3.6	80.00- 120.00	100.00(a)
15.374	15.412 (0.880)	121	28589			0.00-10036.17	35.86
15.357	15.412 (0.879)	51	42171			0.00-10054.03	52.90
61 N-nitrosodiphenylamine					CAS #: 86-30-6		
15.554	15.575 (0.890)	169	789363	10.7793	10.8	80.00- 120.00	100.00
15.554	15.575 (0.890)	168	512635			0.00-10066.04	64.94
15.554	15.575 (0.890)	167	272004			0.00-10035.43	34.46
65 4-Bromophenyl phenyl ether					CAS #: 101-55-3		
16.437	16.459 (0.941)	248	369667	10.0366	10.0	80.00- 120.00	100.00
16.437	16.459 (0.941)	250	356091			0.00-10096.59	96.33

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
65 4-Bromophenyl phenyl ether (continued)							
16.421	16.459 (0.940)	141	245712			0.00-10065.11	66.47
66 Hexachlorobenzene					CAS #: 118-74-1		
16.519	16.540 (0.946)	284	470923	10.0371	10.0	80.00- 120.00	100.00
16.519	16.540 (0.946)	142	172223			0.00-10033.27	36.57
16.519	16.540 (0.946)	249	118050			0.00-10024.51	25.07
68 Pentachlorophenol					CAS #: 87-86-5		
17.026	17.047 (0.975)	266	160385	6.35601	6.4	80.00- 120.00	100.00(a)
17.026	17.047 (0.975)	264	99473			0.00-10062.05	62.02
17.026	17.047 (0.975)	268	102159			0.00-10063.81	63.70
72 Phenanthrene					CAS #: 85-01-8		
17.517	17.538 (1.003)	178	1799967	11.5774	11.6	80.00- 120.00	100.00
17.517	17.538 (1.003)	176	326172			0.00-10020.36	18.12
17.517	17.538 (1.003)	179	277288			0.00-10016.57	15.41
73 Anthracene					CAS #: 120-12-7		
17.631	17.669 (1.009)	178	1705033	11.2904	11.3	80.00- 120.00	100.00
17.631	17.669 (1.009)	176	307650			0.00-10019.61	18.04
17.631	17.669 (1.009)	179	265243			0.00-10016.26	15.56
78 Di-n-butylphthalate					CAS #: 84-74-2		
19.038	19.059 (1.090)	149	2682242	12.0140	12.0	80.00- 120.00	100.00
19.038	19.059 (1.090)	150	239432			0.00-10011.22	8.93
19.038	19.059 (1.090)	104	145443			0.00-10006.82	5.42
80 Fluoranthene					CAS #: 206-44-0		
20.361	20.401 (1.166)	202	1679144	10.6155	10.6	80.00- 120.00	100.00
20.361	20.401 (1.166)	101	365192			0.00-10017.87	21.75
20.361	20.401 (1.166)	100	269070			0.00-10013.24	16.02
81 Pyrene					CAS #: 129-00-0		
20.902	20.940 (0.877)	202	1788848	11.5656	11.6	80.00- 120.00	100.00
20.902	20.940 (0.877)	101	448037			0.00-10022.30	25.05
20.902	20.940 (0.877)	100	359094			0.00-10017.69	20.07
85 Butyl benzyl phthalate					CAS #: 85-68-7		
22.653	22.674 (0.950)	149	945461	10.1571	10.2	80.00- 120.00	100.00
22.653	22.674 (0.950)	91	745606			0.00-10073.35	78.86
22.653	22.674 (0.950)	206	147701			0.00-10015.36	15.62
89 Benzo(a)Anthracene					CAS #: 56-55-3		
23.814	23.836 (0.999)	228	1109812	8.91731	8.9	80.00- 120.00	100.00
23.814	23.836 (0.999)	229	214379			0.00-10018.92	19.32

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
89 Benzo(a)Anthracene (continued)							
23.814	23.836 (0.999)	226	284079			0.00-10025.91	25.60
91 Chrysene					CAS #: 218-01-9		
23.896	23.950 (1.002)	228	1040676	9.60683	9.6	80.00- 120.00	100.00
23.896	23.950 (1.002)	226	291138			0.00-10028.14	27.98
23.896	23.950 (1.002)	229	203820			0.00-10018.65	19.59
93 bis(2-ethylhexyl)Phthalate					CAS #: 117-81-7		
24.092	24.130 (1.010)	149	1349316	11.1712	11.2	80.00- 120.00	100.00
24.108	24.130 (1.011)	167	385686			0.00-10027.97	28.58
24.108	24.130 (1.011)	279	72735			0.00-10005.78	5.39
94 Di-n-octyl phthalate					CAS #: 117-84-0		
25.597	25.619 (0.947)	149	1694503	12.0399	12.0	80.00- 120.00	100.00
25.597	25.619 (0.947)	150	159754			0.00-10011.28	9.43
95 Benzo(b)fluoranthene					CAS #: 205-99-2		
26.218	26.273 (0.970)	252	736245	8.57518	8.6	80.00- 120.00	100.00
26.218	26.273 (0.970)	253	160156			0.00-10021.18	21.75
26.218	26.256 (0.970)	125	144739			0.00-10017.89	19.66
96 Benzo(k)fluoranthene					CAS #: 207-08-9		
26.284	26.322 (0.973)	252	719730	9.48321	9.5	80.00- 120.00	100.00(H)
26.284	26.322 (0.973)	253	152538			0.00-10020.93	21.19
26.284	26.322 (0.973)	125	144736			0.00-10016.09	20.11
97 Benzo(e)pyrene					CAS #:		
26.775	26.813 (0.991)	252	343500	4.59971	4.6	80.00- 120.00	100.00(H)
26.775	26.813 (0.991)	125	95679			0.00-10027.28	27.85
26.775	26.813 (0.991)	250	95270			0.00-10027.55	27.74
98 Benzo(a)pyrene					CAS #: 50-32-8		
26.889	26.927 (0.995)	252	598584	9.26481	9.3	80.00- 120.00	100.00
26.889	26.927 (0.995)	253	125069			0.00-10021.09	20.89
26.889	26.927 (0.995)	125	133998			0.00-10021.00	22.39
103 Indeno(1,2,3-cd)pyrene					CAS #: 193-39-5		
29.457	29.528 (1.090)	276	367860	8.41097	8.4	80.00- 120.00	100.00
29.457	29.528 (1.090)	138	145248			0.00-10035.87	39.48
29.523	29.528 (1.093)	227	310			0.00-10000.11	0.08
104 Dibenzo(a,h)anthracene					CAS #: 53-70-3		
29.539	29.593 (1.093)	278	325222	8.50395	8.5	80.00- 120.00	100.00
29.539	29.593 (1.093)	279	81735			0.00-10022.59	25.13
29.539	29.593 (1.093)	139	99449			0.00-10027.37	30.58

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
105 Benzo(g,h,i)perylene						CAS #: 191-24-2		
30.193	30.264	(1.117)	276	416953	9.13879	9.1	80.00- 120.00	100.00
30.177	30.264	(1.117)	138	167201			0.00-10038.50	40.10
30.193	30.264	(1.117)	277	96515			0.00-10023.39	23.15

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.
H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150401009.d
Lab Smp Id:
Inj Date : 15-JAN-1998 12:52
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 10ug STD 396-4-10
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 17:51 jheffel Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
* 1,4-Dichlorobenzene-d4	150	7.015	7.017	(1.000)	9418571	80.0000	
	150	6.639	7.017	(1.000)	241	80.0000	
	150	6.688	7.017	(1.000)	104	80.0000	
	150	6.721	7.017	(1.000)	279	80.0000	
	150	6.786	7.017	(1.000)	261	80.0000	
	150	6.884	7.017	(1.000)	78679	80.0000	
	150	7.277	7.017	(1.000)	2066	80.0000	
	150	7.342	7.017	(1.000)	81562	80.0000	
* 27 Naphthalene-d8	136	9.763	9.782	(1.000)	15211529	80.0000	
	136	9.453	9.782	(1.000)	3475	80.0000	
	136	9.518	9.782	(1.000)	339	80.0000	
	136	9.549	9.782	(1.000)	869	80.0000	
* 47 Acenaphthene-d10	164	13.902	13.920	(1.000)	11023645	80.0000	
	164	13.575	13.920	(1.000)	554	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	164	13.656	13.920	(1.000)	143	80.0000	
	164	13.689	13.920	(1.000)	375	80.0000	
	164	13.754	13.920	(1.000)	170	80.0000	
• 71 Phenanthrene-d10	188	17.467	17.486	(1.000)	16483764	80.0000	
	188	17.157	17.486	(1.000)	1891	80.0000	
	188	17.222	17.486	(1.000)	443	80.0000	
	188	17.304	17.486	(1.000)	273	80.0000	
• 90 Chrysene-d12	240	23.847	23.898	(1.000)	12655036	80.0000	
	240	23.552	23.898	(1.000)	653	80.0000	
	240	23.618	23.898	(1.000)	345	80.0000	
	240	23.716	23.898	(1.000)	1985	80.0000	
• 99 Perylene-d12	264	27.020	27.055	(1.000)	7104935	80.0000	
	264	26.726	27.055	(1.000)	237	80.0000	
	264	26.791	27.055	(1.000)	201	80.0000	
S 1 2-Fluorophenol	112	4.627	4.645	(0.660)	937637	10.4235	10.4(R)
S 2 Phenol-d5	99	6.279	6.314	(0.643)	1111852	10.6203	10.6(R)
S 17 Nitrobenzene-d5	82	8.160	8.179	(0.587)	893727	10.1256	10.1(R)
	82	8.046	8.179	(0.579)	92395	1.04680	1.0(R)
S 62 2,4,6-Tribromophenol	330	15.783	15.817	(0.662)	227652	9.02126	9.0(R)
S 82 Terphenyl-d14	244	21.377	21.411	(0.896)	1153703	10.4149	10.4(R)
S 38 2-Fluorobiphenyl	172	12.315	12.350	(0.705)	1367015	10.8811	10.9(R)
S 34 1-Methylnaphthalene-d10	152	11.563	11.581	(1.184)	1086834	10.8113	10.8(R)
3 Phenol	94	6.312	6.347	(0.900)	1108075	10.7124	10.7
4 bis(2-Chloroethyl)ether	93	6.492	6.510	(0.925)	913437	10.8816	10.9
5 2-Chlorophenol	128	6.574	6.592	(0.937)	817280	10.4433	10.4
6 1,3-Dichlorobenzene	146	6.884	6.903	(0.981)	803519	10.2774	10.3
	146	7.032	6.903	(1.002)	872686	11.1621	11.2
9 1,4-Dichlorobenzene	146	7.032	7.050	(1.002)	875390	10.8080	10.8
	146	6.884	7.050	(0.981)	803532	9.92078	9.9
	146	7.342	7.050	(1.047)	777064	9.59399	9.6
10 Benzyl Alcohol	108	7.293	7.328	(1.040)	517699	10.2928	10.3
	108	6.999	7.328	(0.998)	31882	0.63387	0.63(a)
	108	7.539	7.328	(1.075)	780812	15.5240	15.5
11 1,2-Dichlorobenzene	146	7.342	7.344	(1.047)	782326	10.6832	10.7
	146	7.032	7.344	(1.002)	870964	11.8936	11.9
12 2-Methylphenol	108	7.539	7.557	(1.075)	782567	10.7197	10.7
	108	7.293	7.557	(1.040)	517699	7.09152	7.1
	108	7.866	7.557	(1.121)	769475	10.5404	10.5
13 bis(2-Chloroisopropyl)ether	45	7.588	7.606	(1.082)	1221473	11.1185	11.1
14 4-Methylphenol	108	7.866	7.901	(1.121)	773023	11.0483	11.0
15 N-Nitrosodipropylamine	70	7.866	7.901	(1.121)	509812	11.3304	11.3
	70	8.160	7.901	(1.163)	115967	2.57733	2.6
16 Hexachloroethane	117	8.046	8.048	(1.147)	360598	10.4285	10.4
18 Nitrobenzene	77	8.193	8.228	(0.839)	797966	10.4556	10.4
19 Isophorone	82	8.733	8.767	(0.894)	1712954	10.4945	10.5
20 2-Nitrophenol	139	8.896	8.915	(0.911)	420108	10.2066	10.2
	139	8.733	8.915	(0.894)	24766	0.60170	0.60(a)

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
21	2,4-Dimethylphenol	122	9.044	9.062	(0.926)	591041	10.4619	10.5
		122	9.207	9.062	(0.943)	177760	3.14650	3.1(a)
23	bis(2-Chloroethoxy)methane	93	9.256	9.291	(0.948)	1052191	10.7272	10.7
24	Benzoic Acid	122	9.207	9.454	(0.943)	183276	4.68948	4.7(a)
		122	9.044	9.454	(0.926)	591041	15.1230	15.1
25	2,4-Dichlorophenol	162	9.453	9.471	(0.968)	529846	9.90851	9.9
26	1,2,4-Trichlorobenzene	180	9.632	9.651	(0.987)	634175	10.4805	10.5
28	Naphthalene	128	9.796	9.814	(1.003)	2233804	11.8972	11.9
29	4-Chloroaniline	127	9.943	10.011	(1.018)	631651	13.4964	13.5
		127	9.796	10.011	(1.003)	278003	5.94006	5.9
30	Hexachlorobutadiene	225	10.107	10.125	(1.035)	333830	10.1942	10.2
32	4-Chloro-3-Methylphenol	107	11.121	11.156	(1.139)	609084	10.0414	10.0
33	2-Methylnaphthalene	142	11.415	11.434	(1.169)	1300607	10.9465	10.9
		142	11.137	11.434	(1.141)	458386	3.85798	3.8
35	Hexachlorocyclopentadiene	237	11.808	11.810	(0.849)	219298	7.61486	7.6(a)
36	2,4,6-Trichlorophenol	196	12.102	12.121	(0.871)	366486	9.84252	9.8
		196	12.184	12.121	(0.876)	357132	9.59131	9.6
37	2,4,5-Trichlorophenol	196	12.184	12.202	(0.876)	357132	9.68802	9.7
		196	12.102	12.202	(0.871)	366486	9.94176	9.9
39	2-Chloronaphthalene	162	12.560	12.579	(0.903)	1142053	10.5299	10.5
40	2-Nitroaniline	65	12.822	12.873	(0.922)	327316	9.44503	9.4
41	3-Nitroaniline	138	13.820	13.871	(0.994)	225007	18.4686	18.5
43	Dimethylphthalate	163	13.329	13.380	(0.959)	1376017	10.0985	10.1
45	2,6-Dinitrotoluene	165	13.460	13.495	(0.968)	263709	8.99442	9.0
		165	13.902	13.495	(1.000)	1404342	47.8984	47.9
46	Acenaphthylene	152	13.542	13.560	(0.974)	1956398	11.6395	11.6
		152	13.967	13.560	(1.005)	558395	3.32214	3.3
48	Acenaphthene	154	13.967	13.985	(1.005)	1213885	10.5953	10.6
49	2,4-Dinitrophenol	184	14.082	14.116	(1.013)	25357	1.82481	1.8(a)
50	4-Nitrophenol	109	14.376	14.362	(1.034)	17359	1.08474	1.1(a)
		109	14.294	14.362	(1.028)	79520	4.96911	5.0
51	Dibenzofuran	168	14.376	14.411	(1.034)	1700036	11.6437	11.6
52	2,4-Dinitrotoluene	165	14.409	14.443	(1.036)	120698	7.85879	7.8
53	1-Chloro-2,4-Dinitrobenzene	63	14.670	14.721	(1.503)	153637	8.05914	8.0
		63	14.294	14.721	(1.464)	35574	1.86606	1.9
		63	14.392	14.721	(1.474)	280555	14.7167	14.7
		63	15.047	14.721	(1.541)	11007	0.57738	0.58(a)
56	Diethylphthalate	149	15.047	15.098	(1.082)	1529407	10.8331	10.8
57	Fluorene	166	15.210	15.245	(1.094)	1258130	10.5295	10.5
58	4-Chlorophenyl phenyl ether	204	15.259	15.294	(1.098)	903605	10.0995	10.1
59	4-Nitroaniline	138	15.276	15.343	(1.099)	141201	10.9864	11.0
		138	15.210	15.343	(1.094)	13245	1.03055	1.0
60	4,6-Dinitro-2-methylphenol	198	15.374	15.408	(0.880)	79714	3.62277	3.6(a)
61	N-nitrosodiphenylamine	169	15.554	15.588	(0.890)	389363	10.7793	10.8
		169	15.259	15.588	(0.874)	54856	0.74910	0.75(a)
65	4-Bromophenyl phenyl ether	248	16.437	16.455	(0.941)	369667	10.0366	10.0
66	Hexachlorobenzene	284	16.519	16.553	(0.946)	470923	10.0371	10.0

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
68 Pentachlorophenol	266	17.026	17.044	(0.975)	160385	6.35601	6.4(a)
72 Phenanthrene	178	17.517	17.551	(1.003)	1799967	11.5774	11.6
	178	17.631	17.551	(1.009)	1705033	10.9668	11.0
73 Anthracene	178	17.631	17.666	(1.009)	1705033	11.2904	11.3
	178	17.517	17.666	(1.003)	1799967	11.9191	11.9
79 Di-n-butylphthalate	149	19.038	19.072	(1.090)	2682242	12.0140	12.0
80 Fluoranthene	202	20.363	20.414	(1.166)	1679144	10.6155	10.6
81 Pyrene	202	20.902	20.937	(0.877)	1788848	11.5656	11.6
85 Butyl benzyl phthalate	149	22.653	22.687	(0.950)	945461	10.1571	10.2
89 Benzo(a)Anthracene	228	23.814	23.849	(0.999)	1109812	8.91731	8.9
	228	23.896	23.849	(1.002)	1040676	8.36180	8.4
91 Chrysene	228	23.896	23.947	(1.002)	1040676	9.60683	9.6
	228	23.814	23.947	(0.999)	1109812	10.2450	10.2
93 bis(2-ethylhexyl) Phthalate	149	24.092	24.127	(1.010)	1349316	11.1712	11.2
94 Di-n-octyl phthalate	149	25.597	25.615	(0.947)	1694503	12.0399	12.0
95 Benzo(b)fluoranthene	252	26.218	26.269	(0.970)	736245	8.57518	8.6
	252	26.284	26.269	(0.973)	718431	8.36770	8.4
96 Benzo(k)fluoranthene	252	26.284	26.335	(0.973)	719730	9.48321	9.5
	252	26.218	26.335	(0.970)	736245	9.70081	9.7
97 Benzo(e)pyrene	252	26.775	26.826	(0.991)	343500	4.59971	4.6
	252	26.889	26.826	(0.995)	598588	8.01551	8.0
98 Benzo(a)pyrene	252	26.889	26.940	(0.995)	598584	9.26481	9.3
	252	26.775	26.940	(0.991)	343500	5.31665	5.3
	252	27.020	26.940	(1.000)	33639	0.52066	0.52(a)
102 Indeno(1,2,3-cd)pyrene	276	29.457	29.524	(1.090)	367860	8.41097	8.4
	276	29.539	29.524	(1.093)	104931	2.39921	2.4
104 Dibenzo(a,h)anthracene	278	29.539	29.590	(1.093)	324972	8.49741	8.5
105 Benzo(g,h,i)perylene	276	30.193	30.261	(1.117)	416953	9.13879	9.1

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01150401009.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: jgh
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/15/98
Calibration Time: 1501

Level: LOW
Sample Type: WATER

		AREA LIMIT			
COMPOUND	STANDARD	LOWER	UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	10654771	5327386	21309542	9418571	-11.60
27 Naphthalene-d8	16919358	8459679	33838716	15211529	-10.09
47 Acenaphthene-d10	12271905	6135952	24543810	11023645	-10.17
71 Phenanthrene-d10	19162935	9581468	38325870	16483764	-13.98
90 Chrysene-d12	16491029	8245514	32982058	12655036	-23.26
99 Perylene-d12	9979847	4989924	19959694	7104935	-28.81

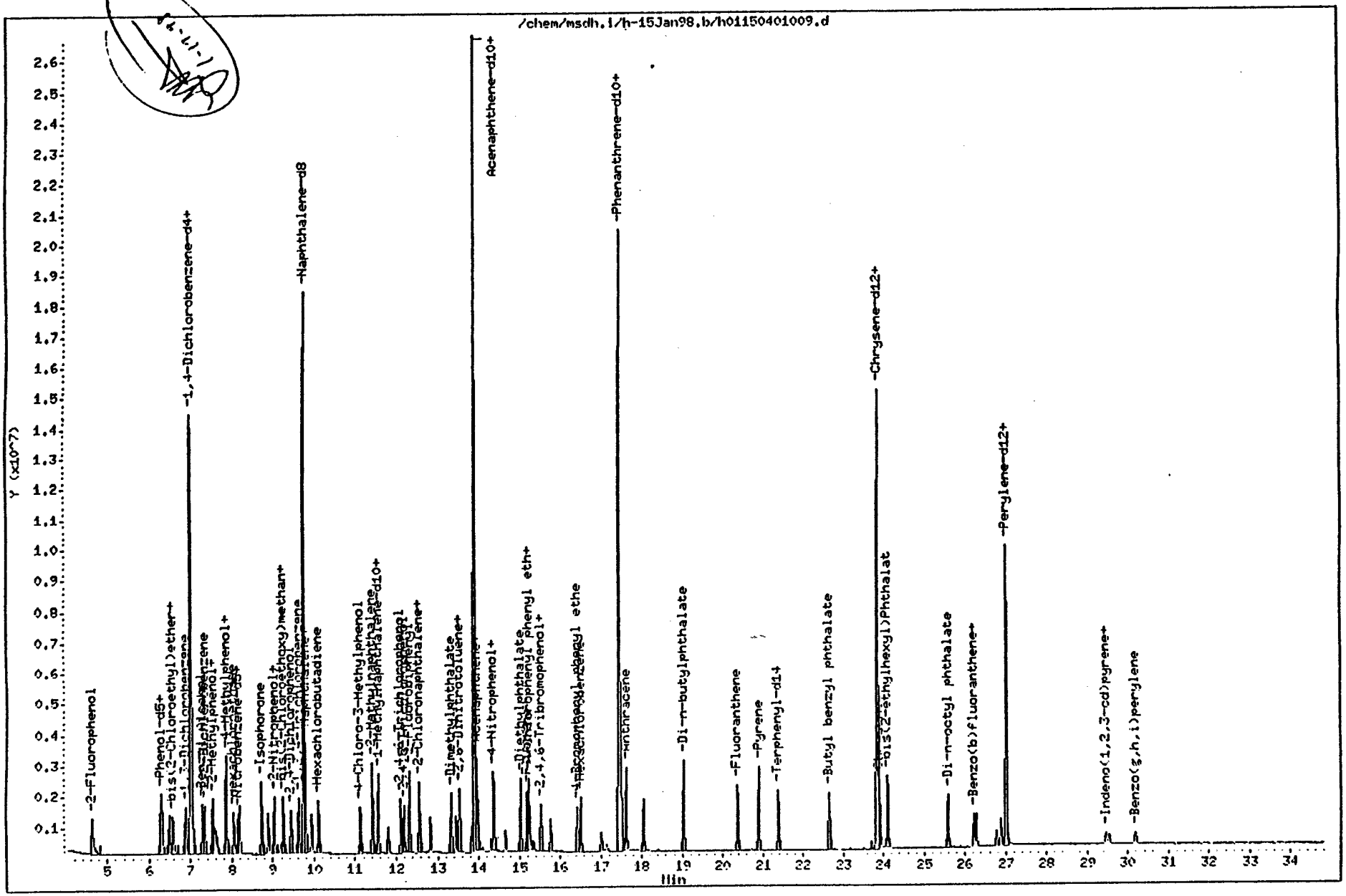
		RT LIMIT			
COMPOUND	STANDARD	LOWER	UPPER	SAMPLE	%DIF
7 1,4-Dichlorobenze	7.02	6.52	7.52	7.02	-0.03
27 Naphthalene-d8	9.78	9.28	10.28	9.76	-0.19
47 Acenaphthene-d10	13.92	13.42	14.42	13.90	-0.13
71 Phenanthrene-d10	17.49	16.99	17.99	17.47	-0.10
90 Chrysene-d12	23.90	23.40	24.40	23.85	-0.21
99 Perylene-d12	27.05	26.55	27.55	27.02	-0.13

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

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Data File: /chem/msdh.i/h-15Jan98.b/h01150401009.d
Date : 15-JAN-1998 12:52
Client ID:
Sample Info: 1.0ul 10ug STD 396-4-10
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i
Operator: jgh
Column diameter: 2.00



Data File: /chem/msdh.i/h-15Jan98.b/h01150501010.d
Report Date: 19-Jan-1998 16:56

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150501010.d
Lab Smp Id:
Inj Date : 15-JAN-1998 13:35
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 20ug STD 396-4-20
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 16:39 m Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ~~MM5X.sub~~
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

1-19-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
* 7 1,4-Dichlorobenzene-d4					CAS #: 3855-82-1		
7.016	7.021 (1.000)	150	10188599	80.0000		80.00- 120.00	100.00
7.016	7.021 (1.000)	152	6233143			0.00-10058.51	61.18
7.016	7.021 (1.000)	115	4041861			0.00-10037.59	39.67
* 27 Naphthalene-d8					CAS #: 1146-65-2		
9.763	9.769 (1.000)	136	16022723	80.0000		80.00- 120.00	100.00
9.763	9.769 (1.000)	68	1212435			0.00-10006.78	7.57
* 47 Acenaphthene-d10					CAS #: 15067-26-2		
13.902	13.907 (1.000)	164	11745176	80.0000		80.00- 120.00	100.00
13.902	13.907 (1.000)	162	11230721			0.00-10094.94	95.62
13.902	13.907 (1.000)	160	4807790			0.00-10041.02	40.93

Data File: /chem/msdh.i/h-15Jan98.b/h01150501010.d
Report Date: 19-Jan-1998 16:56

	RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO	
*	71 Phenanthrene-d10							CAS #: 1517-22-2		
	17.468	17.489	(1.000)	188	17900240	80.0000		80.00- 120.00	100.00	
	17.468	17.489	(1.000)	94	2612758			0.00-10014.44	14.60	
	17.468	17.489	(1.000)	80	2509652			0.00-10015.28	14.02	
*	90 Chrysene-d12							CAS #: 1719-03-5		
	23.863	23.885	(1.000)	240	14135867	80.0000		80.00- 120.00	100.00	
	23.863	23.885	(1.000)	236	3473617			0.00-10026.00	24.57	
	23.863	23.885	(1.000)	120	2657304			0.00-10018.11	18.80	
*	99 Perylene-d12							CAS #: 1520-96-3		
	27.036	27.058	(1.000)	264	8777860	80.0000		80.00- 120.00	100.00	
	27.036	27.058	(1.000)	260	1925216			0.00-10021.95	21.93	
	27.036	27.058	(1.000)	265	1827943			0.00-10020.90	20.82	
:	1 2-Fluorophenol							CAS #: 367-12-4		
	4.627	4.649	(0.660)	112	1985094	20.4000	20.4	80.00- 120.00	100.00(R)	
	4.627	4.649	(0.660)	64	985966			0.00-10046.11	49.67	
	4.627	4.649	(0.660)	92	402854			0.00-10019.15	20.29	
:	2 Phenol-d5							CAS #: 4165-62-2		
	6.296	6.317	(0.645)	99	2326296	21.0956	21.1	80.00- 120.00	100.00(R)	
	6.296	6.317	(0.645)	71	667400			0.00-10029.73	28.69	
:	17 Nitrobenzene-d5							CAS #: 4165-60-0		
	8.160	8.182	(0.587)	82	2018531	21.4643	21.5	80.00- 120.00	100.00(R)	
	8.160	8.182	(0.587)	54	1083404			0.00-10052.46	53.67	
	8.160	8.182	(0.587)	128	909364			0.00-10049.58	45.05	
:	62 2,4,6-Tribromophenol							CAS #: 118-79-6		
	15.783	15.804	(0.661)	330	541939	19.2259	19.2	80.00- 120.00	100.00	
	15.783	15.804	(0.661)	332	526740			0.00-10096.28	97.20	
	15.783	15.804	(0.661)	141	167037			0.00-10029.68	30.82	
:	82 Terphenyl-d14							CAS #: 98904-43-9		
	21.393	21.415	(0.896)	244	2781580	22.4799	22.5	80.00- 120.00	100.00	
	21.377	21.415	(0.896)	122	535613			0.00-10016.35	19.26	
	21.393	21.415	(0.896)	212	166202			0.00-10005.98	5.98	
:	38 2-Fluorobiphenyl							CAS #: 321-60-8		
	12.332	12.337	(0.706)	172	2945530	21.5903	21.6	80.00- 120.00	100.00(R)	
	12.332	12.337	(0.706)	171	1003952			0.00-10033.81	34.08	
:	34 1-Methylnaphthalene-d10							CAS #: 38072-94-5		
	11.563	11.584	(1.184)	152	2347419	22.1689	22.2	80.00- 120.00	100.00(R)	
	11.563	11.584	(1.184)	122	910541			0.00-10038.76	38.79	

Data File: /chem/msdh.i/h-15Jan98.b/h01150501010.d
Report Date: 19-Jan-1998 16:56

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
34 1-Methylnaphthalene-d10 (continued)								
11.563	11.584	(1.184)	150	1979256			0.00-10084.36	84.32
3 Phenol						CAS #: 108-95-2		
6.312	6.350	(0.900)	94	2416072	21.5922	21.6	80.00- 120.00	100.00
6.312	6.350	(0.900)	66	876831			0.00-10037.29	36.29
6.312	6.350	(0.900)	65	615652			0.00-10025.14	25.48
4 bis(2-Chloroethyl)ether						CAS #: 111-44-4		
6.492	6.514	(0.925)	93	1888795	20.8004	20.8	80.00- 120.00	100.00
6.492	6.514	(0.925)	63	1241017			0.00-10062.92	65.70
6.492	6.514	(0.925)	95	591121			0.00-10031.42	31.30
5 2-Chlorophenol						CAS #: 95-57-8		
6.590	6.595	(0.939)	128	1739622	20.5491	20.5	80.00- 120.00	100.00
6.590	6.595	(0.939)	130	552936			0.00-10030.89	31.78
6.590	6.595	(0.939)	64	795086			0.00-10041.15	45.70
6 1,3-Dichlorobenzene						CAS #: 541-73-1		
6.885	6.890	(0.981)	146	1740858	20.5836	20.6	80.00- 120.00	100.00
6.885	6.890	(0.981)	148	1114740			0.00-10063.34	64.03
6.885	6.890	(0.981)	113	246750			0.00-10013.88	14.17
9 1,4-Dichlorobenzene						CAS #: 106-46-7		
7.048	7.053	(1.005)	146	1796141	20.5000	20.5	80.00- 120.00	100.00
7.048	7.053	(1.005)	148	1151430			0.00-10063.27	64.11
7.032	7.053	(1.002)	113	446291			0.00-10016.16	24.85
10 Benzyl Alcohol						CAS #: 100-51-6		
7.294	7.315	(1.040)	108	1170584	21.5145	21.5	80.00- 120.00	100.00
7.294	7.315	(1.040)	79	1454659			0.00-10116.61	124.27
7.294	7.315	(1.040)	77	940823			0.00-10078.86	80.37
11 1,2-Dichlorobenzene						CAS #: 95-50-1		
7.343	7.348	(1.047)	146	1664915	21.0172	21.0	80.00- 120.00	100.00
7.343	7.348	(1.047)	148	1065593			0.00-10063.46	64.00
7.343	7.348	(1.047)	113	245602			0.00-10014.38	14.75
12 2-Methylphenol						CAS #: 95-48-7		
7.539	7.560	(1.075)	108	1642627	20.8004	20.8	80.00- 120.00	100.00
7.539	7.560	(1.075)	107	1421929			0.00-10086.18	86.56
7.539	7.560	(1.075)	79	636382			0.00-10041.55	38.74
13 bis(2-Chloroisopropyl)ether						CAS #: 108-60-1		
7.588	7.609	(1.082)	45	2663784	22.4146	22.4	80.00- 120.00	100.00
7.604	7.609	(1.084)	121	472403	20.8643	20.9	0.00-10020.26	17.73

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
14 4-Methylphenol					CAS #: 106-44-5		
7.866	7.904 (1.121)	108	1636526	21.6220	21.6	80.00- 120.00	100.00
7.866	7.904 (1.121)	107	1959169			0.00-10122.08	119.72
7.866	7.904 (1.121)	79	398869			0.00-10025.12	24.37
15 N-Nitrosodipropylamine					CAS #: 621-64-7		
7.866	7.904 (1.121)	70	1048747	21.5465	21.5	80.00- 120.00	100.00
7.866	7.904 (1.121)	130	259380			0.00-10026.33	24.73
7.866	7.904 (1.121)	101	126943			0.00-10012.19	12.10
16 Hexachloroethane					CAS #: 67-72-1		
8.046	8.051 (1.147)	117	756796	20.2324	20.2	80.00- 120.00	100.00
8.046	8.051 (1.147)	201	509126			0.00-10068.38	67.27
8.046	8.051 (1.147)	199	322226			0.00-10041.83	42.58
18 Nitrobenzene					CAS #: 98-95-3		
8.210	8.231 (0.841)	77	1794147	22.3182	22.3	80.00- 120.00	100.00
8.210	8.231 (0.841)	123	915221			0.00-10053.45	51.01
8.193	8.231 (0.839)	65	242630			0.00-10013.89	13.52
19 Isophorone					CAS #: 78-59-1		
8.733	8.771 (0.894)	82	3722828	21.6535	21.6	80.00- 120.00	100.00
8.749	8.771 (0.896)	138	522492			0.00-10014.70	14.03
8.733	8.771 (0.894)	95	207438			0.00-10005.51	5.57
20 2-Nitrophenol					CAS #: 88-75-5		
8.897	8.918 (0.911)	139	939976	21.6808	21.7	80.00- 120.00	100.00
8.897	8.918 (0.911)	65	407819			0.00-10042.96	43.39
8.897	8.918 (0.911)	109	234916			0.00-10026.21	24.99
21 2,4-Dimethylphenol					CAS #: 105-67-9		
9.044	9.065 (0.926)	122	1301044	21.8636	21.9	80.00- 120.00	100.00
9.044	9.065 (0.926)	107	1551574			0.00-10123.86	119.26
9.044	9.065 (0.926)	121	709689			0.00-10055.27	54.55
22 bis(2-Chloroethoxy)methane					CAS #: 111-91-1		
9.256	9.294 (0.948)	93	2328520	22.5376	22.5	80.00- 120.00	100.00
9.273	9.294 (0.950)	123	254215			0.00-10010.88	10.92
9.273	9.294 (0.950)	95	739346			0.00-10031.15	31.75
24 Benzoic Acid					CAS #: 65-85-0		
9.273	9.441 (0.950)	122	604936	14.6949	14.7	80.00- 120.00	100.00
9.273	9.441 (0.950)	105	831406			0.00-10123.32	137.44
9.273	9.441 (0.950)	77	584211			0.00-10081.55	96.57
25 2,4-Dichlorophenol					CAS #: 120-83-2		
9.453	9.474 (0.968)	162	1203753	21.3714	21.4	80.00- 120.00	100.00

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
25 2,4-Dichlorophenol (continued)								
9.453	9.474	(0.968)	164	754534			0.00-10063.52	62.68
9.453	9.474	(0.968)	98	485268			0.00-10039.12	40.31
26 1,2,4-Trichlorobenzene						CAS #: 120-82-1		
9.633	9.654	(0.987)	180	1351546	21.2051	21.2	80.00- 120.00	100.00
9.633	9.654	(0.987)	182	1294861			0.00-10096.20	95.81
9.633	9.654	(0.987)	145	400336			0.00-10028.68	29.62
28 Naphthalene						CAS #: 91-20-3		
9.796	9.818	(1.003)	128	4731541	23.9243	23.9	80.00- 120.00	100.00
9.796	9.818	(1.003)	129	495490			0.00-10013.27	10.47
9.796	9.818	(1.003)	127	575459			0.00-10013.22	12.16
29 4-Chloroaniline						CAS #: 106-47-8		
9.960	10.014	(1.020)	127	1200370	24.3497	24.3	80.00- 120.00	100.00
9.960	9.965	(1.020)	129	369036			0.00-10010.59	30.74
30 Hexachlorobutadiene						CAS #: 87-68-3		
10.107	10.128	(1.035)	225	724739	21.0110	21.0	80.00- 120.00	100.00
10.107	10.128	(1.035)	223	451214			0.00-10061.71	62.26
10.107	10.128	(1.035)	227	454717			0.00-10063.44	62.74
32 4-Chloro-3-Methylphenol						CAS #: 59-50-7		
11.137	11.159	(1.141)	107	1413557	22.1243	22.1	80.00- 120.00	100.00
11.137	11.159	(1.141)	142	1041652			0.00-10073.71	73.69
11.137	11.159	(1.141)	144	338139			0.00-10023.72	23.92
33 2-Methylnaphthalene						CAS #: 91-57-6		
11.416	11.437	(1.169)	142	2688463	21.4817	21.5	80.00- 120.00	100.00
11.416	11.437	(1.169)	141	2324084			0.00-10090.11	86.45
35 Hexachlorocyclopentadiene						CAS #: 77-47-4		
11.808	11.813	(0.849)	237	544320	17.7397	17.7	80.00- 120.00	100.00
11.808	11.813	(0.849)	272	80932			0.00-10014.73	14.87
11.808	11.813	(0.849)	235	332819			0.00-10061.71	61.14
36 2,4,6-Trichlorophenol						CAS #: 88-06-2		
12.103	12.124	(0.871)	196	819448	20.6555	20.6	80.00- 120.00	100.00
12.103	12.124	(0.871)	198	774701			0.00-10094.84	94.54
12.103	12.124	(0.871)	200	244259			0.00-10030.07	29.81
37 2,4,5-Trichlorophenol						CAS #: 95-95-4		
12.184	12.206	(0.876)	196	794634	20.2320	20.2	80.00- 120.00	100.00
12.184	12.206	(0.876)	198	756667			0.00-10095.07	95.22
12.184	12.206	(0.876)	200	240046			0.00-10030.67	30.21

Data File: /chem/msdh.i/h-15Jan98.b/h01150501010.d
Report Date: 19-Jan-1998 16:56

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
39 2-Chloronaphthalene						CAS #: 91-58-7		
12.561	12.582	(0.904)	162	2518736	21.7965	21.8	80.00- 120.00	100.00
12.561	12.582	(0.904)	164	807536			0.00-10031.20	32.06
12.561	12.582	(0.904)	127	982872			0.00-10038.71	39.02
40 2-Nitroaniline						CAS #: 88-74-4		
12.839	12.860	(0.924)	65	799427	21.6511	21.6	80.00- 120.00	100.00
12.839	12.876	(0.924)	138	953708			0.00-10127.72	119.30
12.839	12.860	(0.924)	92	564777			0.00-10073.86	70.65
41 3-Nitroaniline						CAS #: 99-09-2		
13.836	13.874	(0.995)	138	364412	28.0735	28.1	80.00- 120.00	100.00
13.836	13.874	(0.995)	92	389514			0.00-10120.29	106.89
13.836	13.907	(0.995)	108	50192			0.00-10080.06	13.77
43 Dimethylphthalate						CAS #: 131-11-3		
13.346	13.367	(0.960)	163	3215681	22.1499	22.1	80.00- 120.00	100.00
13.346	13.367	(0.960)	194	168377			0.00-10005.16	5.24
13.346	13.367	(0.960)	164	316138			0.00-10009.58	9.83
45 2,6-Dinitrotoluene						CAS #: 606-20-2		
13.460	13.498	(0.968)	165	651756	20.8641	20.9	80.00- 120.00	100.00
13.460	13.498	(0.968)	89	404172			0.00-10059.87	62.01
13.460	13.498	(0.968)	121	147316			0.00-10022.31	22.60
46 Acenaphthylene						CAS #: 208-96-8		
13.542	13.563	(0.974)	152	4390611	24.5169	24.5	80.00- 120.00	100.00
13.542	13.563	(0.974)	151	827113			0.00-10023.78	18.84
13.542	13.563	(0.974)	153	550740			0.00-10015.23	12.54
48 Acenaphthene						CAS #: 83-32-9		
13.967	13.989	(1.005)	154	2358928	21.0598	21.0	80.00- 120.00	100.00
13.967	13.989	(1.005)	152	1186339			0.00-10049.54	50.29
13.967	13.989	(1.005)	153	2534358			0.00-10106.26	107.44
49 2,4-Dinitrophenol						CAS #: 51-28-5		
14.082	14.120	(1.013)	184	122154	8.25076	8.2	80.00- 120.00	100.00
14.082	14.103	(1.013)	63	81934			0.00-10058.68	67.07
14.082	14.120	(1.013)	154	55944			0.00-10038.31	45.80
50 4-Nitrophenol						CAS #: 100-02-7		
14.211	14.349	(1.029)	109	257652	15.1113	15.1	80.00- 120.00	100.00(H)
14.211	14.349	(1.029)	139	372401			0.00-10155.17	144.54
14.211	14.349	(1.029)	65	339608			0.00-10133.38	131.81
51 Dibenzofuran						CAS #: 132-64-9		
14.393	14.414	(1.035)	168	3645391	23.4339	23.4	80.00- 120.00	100.00

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
51 Dibenzofuran (continued)							
14.376	14.414 (1.034)	139	1243624			0.00-10038.83	34.11
52 2,4-Dinitrotoluene					CAS #: 121-14-2		
14.409	14.447 (1.036)	165	839094	18.7154	18.7	80.00- 120.00	100.00
14.409	14.430 (1.036)	63	660106			0.00-10063.54	78.67
14.409	14.447 (1.036)	182	42952			0.00-10004.86	5.12
53 1-Chloro-3,4-Dinitrobenzene					CAS #:		
14.687	14.708 (1.504)	63	444395	22.1309	22.1	80.00- 120.00	100.00
14.687	14.708 (1.504)	75	357906			0.00-10081.72	80.54
14.687	14.725 (1.504)	202	235690			0.00-10054.68	53.04
56 Diethylphthalate					CAS #: 84-66-2		
15.063	15.085 (1.084)	149	3418290	22.7251	22.7	80.00- 120.00	100.00
15.063	15.085 (1.084)	177	635809			0.00-10019.67	18.60
15.063	15.085 (1.084)	150	370143			0.00-10011.54	10.83
57 Fluorene					CAS #: 86-73-7		
15.210	15.232 (1.094)	166	2715218	21.3281	21.3	80.00- 120.00	100.00
15.210	15.232 (1.094)	165	2483279			0.00-10093.28	91.46
15.210	15.232 (1.094)	167	351224			0.00-10012.75	12.94
58 4-Chlorophenyl phenyl ether					CAS #: 7005-72-3		
15.259	15.281 (1.098)	204	1352414	21.2384	21.2	80.00- 120.00	100.00
15.259	15.281 (1.098)	206	443572			0.00-10032.44	32.80
15.259	15.281 (1.098)	141	761152			0.00-10053.60	56.28
59 4-Nitroaniline					CAS #: 100-01-6		
15.292	15.330 (1.100)	138	366690	26.7732	26.8	80.00- 120.00	100.00
15.292	15.330 (1.100)	92	200901			0.00-10032.69	54.79
15.292	15.330 (1.100)	108	274299			0.00-10073.68	74.80
60 4,6-Dinitro-2-methylphenol					CAS #: 534-52-1		
15.374	15.412 (0.880)	198	306767	12.8384	12.8	80.00- 120.00	100.00
15.374	15.412 (0.880)	121	112738			0.00-10036.17	36.75
15.374	15.412 (0.880)	51	171321			0.00-10054.03	55.85
61 N-nitrosodiphenylamine					CAS #: 86-30-6		
15.554	15.575 (0.890)	169	1741973	21.9055	21.9	80.00- 120.00	100.00
15.554	15.575 (0.890)	168	1139847			0.00-10066.04	65.43
15.554	15.575 (0.890)	167	616895			0.00-10035.43	35.41
65 4-Bromophenyl phenyl ether					CAS #: 101-55-3		
16.437	16.459 (0.941)	248	802769	20.0708	20.1	80.00- 120.00	100.00
16.437	16.459 (0.941)	250	789601			0.00-10096.59	98.36

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Report Date: 19-Jan-1998 16:56

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
65 4-Bromophenyl phenyl ether (continued)								
16.437	16.459	(0.941)	141	541800			0.00-10065.11	67.49
66 Hexachlorobenzene						CAS #: 118-74-1		
16.519	16.540	(0.946)	284	1030190	20.2196	20.2	80.00- 120.00	100.00
16.519	16.540	(0.946)	142	370065			0.00-10033.27	35.92
16.519	16.540	(0.946)	249	251624			0.00-10024.51	24.43
68 Pentachlorophenol						CAS #: 87-86-5		
17.026	17.047	(0.975)	266	460374	16.8008	16.8	80.00- 120.00	100.00
17.026	17.047	(0.975)	264	283384			0.00-10062.05	61.56
17.026	17.047	(0.975)	268	299399			0.00-10063.81	65.03
72 Phenanthrene						CAS #: 85-01-8		
17.517	17.538	(1.003)	178	3738581	22.4399	22.4	80.00- 120.00	100.00
17.517	17.538	(1.003)	176	690047			0.00-10020.36	18.21
17.517	17.538	(1.003)	179	564608			0.00-10016.57	14.90
73 Anthracene						CAS #: 120-12-7		
17.631	17.669	(1.009)	178	3654130	22.2823	22.3	80.00- 120.00	100.00
17.631	17.669	(1.009)	176	644155			0.00-10019.61	17.63
17.631	17.669	(1.009)	179	549747			0.00-10016.26	15.04
78 Di-n-butylphthalate						CAS #: 84-74-2		
19.038	19.059	(1.090)	149	5930468	24.4612	24.5	80.00- 120.00	100.00
19.038	19.059	(1.090)	150	515920			0.00-10011.22	8.70
19.038	19.059	(1.090)	104	313868			0.00-10006.82	5.29
80 Fluoranthene						CAS #: 206-44-0		
20.379	20.401	(1.167)	202	3897486	22.6900	22.7	80.00- 120.00	100.00
20.379	20.401	(1.167)	101	790354			0.00-10017.87	20.28
20.379	20.401	(1.167)	100	592846			0.00-10013.24	15.21
81 Pyrene						CAS #: 129-00-0		
20.902	20.940	(0.876)	202	3984972	23.0654	23.1	80.00- 120.00	100.00
20.902	20.940	(0.876)	101	953131			0.00-10022.30	23.92
20.902	20.940	(0.876)	100	763810			0.00-10017.69	19.17
85 Butyl benzyl phthalate						CAS #: 85-68-7		
22.653	22.674	(0.949)	149	2268224	21.8149	21.8	80.00- 120.00	100.00
22.653	22.674	(0.949)	91	1771288			0.00-10073.35	78.09
22.653	22.674	(0.949)	206	348325			0.00-10015.36	15.36
89 Benzo(a)Anthracene						CAS #: 56-55-3		
23.814	23.836	(0.998)	228	2700163	19.4230	19.4	80.00- 120.00	100.00
23.814	23.836	(0.998)	229	525688			0.00-10018.92	19.47

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
89 Benzo(a)Anthracene (continued)								
23.814	23.836	(0.998)	226	676966			0.00-10025.91	25.07
91 Chrysene						CAS #: 218-01-9		
23.912	23.950	(1.002)	228	2541622	21.0047	21.0	80.00- 120.00	100.00
23.912	23.950	(1.002)	226	734868			0.00-10028.14	28.91
23.912	23.950	(1.002)	229	494574			0.00-10018.65	19.46
93 bis(2-ethylhexyl)Phthalate						CAS #: 117-81-7		
24.109	24.130	(1.010)	149	3178005	23.5550	23.6	80.00- 120.00	100.00
24.109	24.130	(1.010)	167	894458			0.00-10027.97	28.15
24.109	24.130	(1.010)	279	169744			0.00-10005.78	5.34
94 Di-n-octyl phthalate						CAS #: 117-84-0		
25.597	25.619	(0.947)	149	4240614	24.3883	24.4	80.00- 120.00	100.00
25.597	25.619	(0.947)	150	397286			0.00-10011.28	9.37
95 Benzo(b)fluoranthene						CAS #: 205-99-2		
26.225	26.273	(0.970)	252	1879398	17.7179	17.7	80.00- 120.00	100.00
26.225	26.273	(0.970)	253	402868			0.00-10021.18	21.44
26.219	26.256	(0.970)	125	364651			0.00-10017.89	19.40
96 Benzo(k)fluoranthene						CAS #: 207-08-9		
26.284	26.322	(0.972)	252	1897010	20.2314	20.2	80.00- 120.00	100.00(H)
26.284	26.322	(0.972)	253	412307			0.00-10020.93	21.73
26.284	26.322	(0.972)	125	358874			0.00-10016.09	18.92
97 Benzo(e)pyrene						CAS #:		
26.791	26.813	(0.991)	252	824197	8.93318	8.9	80.00- 120.00	100.00
26.791	26.813	(0.991)	125	227638			0.00-10027.28	27.62
26.791	26.813	(0.991)	250	228754			0.00-10027.55	27.75
98 Benzo(a)pyrene						CAS #: 50-32-8		
26.889	26.927	(0.995)	252	1501102	18.8059	18.8	80.00- 120.00	100.00
26.889	26.927	(0.995)	253	331197			0.00-10021.09	22.06
26.889	26.927	(0.995)	125	320849			0.00-10021.00	21.37
103 Indeno(1,2,3-cd)pyrene						CAS #: 193-39-5		
29.474	29.528	(1.090)	276	928929	17.1917	17.2	80.00- 120.00	100.00
29.474	29.528	(1.090)	138	346458			0.00-10035.87	37.30
29.474	29.528	(1.090)	227	1867			0.00-10000.11	0.20
104 Dibenzo(a,h)anthracene						CAS #: 53-70-3		
29.555	29.593	(1.093)	278	803114	16.9977	17.0	80.00- 120.00	100.00
29.555	29.593	(1.093)	279	194198			0.00-10022.59	24.18
29.539	29.593	(1.093)	139	242665			0.00-10027.17	30.22

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
105 Benzo(g,h,i)perylene						CAS #: 191-24-2		
30.193	30.264	(1.117)	276	1002009	17.7764	17.8	80.00- 120.00	100.00
30.193	30.264	(1.117)	138	408519			0.00-10038.50	40.77
30.193	30.264	(1.117)	277	233979			0.00-10023.39	23.35

QC Flag Legend

R - Spike/Surrogate failed recovery limits.
H - Operator selected an alternate compound hit.

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Report Date: 19-Jan-1998 18:10

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150501010.d
Lab Smp Id:
Inj Date : 15-JAN-1998 13:35
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 20ug STD 396-4-20
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 17:51 jheffel Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
* 1,4-Dichlorobenzene-d4	150	7.016	7.017	(1.000)	10188599	80.0000	
	150	6.639	7.017	(1.000)	220	80.0000	
	150	6.672	7.017	(1.000)	421	80.0000	
	150	6.737	7.017	(1.000)	130	80.0000	
	150	6.787	7.017	(1.000)	354	80.0000	
	150	6.885	7.017	(1.000)	178274	80.0000	
	150	7.343	7.017	(1.000)	171480	80.0000	
* 27 Naphthalene-d8	136	9.763	9.782	(1.000)	16022723	80.0000	
	136	9.371	9.782	(1.000)	516	80.0000	
	136	9.453	9.782	(1.000)	7691	80.0000	
	136	9.551	9.782	(1.000)	237	80.0000	
	136	9.616	9.782	(1.000)	542	80.0000	
* 47 Acenaphthene-d10	164	13.902	13.920	(1.000)	11745176	80.0000	
	164	13.477	13.920	(1.000)	3330	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)	
	164	13.542	13.920	(1.000)	504	80.0000		
	164	13.607	13.920	(1.000)	346	80.0000		
	164	13.689	13.920	(1.000)	294	80.0000		
* 71 Phenanthrene-d10	188	17.468	17.486	(1.000)	17900240	80.0000		
	188	17.108	17.486	(1.000)	87	80.0000		(Q)
	188	17.157	17.486	(1.000)	1673	80.0000		
	188	17.239	17.486	(1.000)	522	80.0000		
	188	17.304	17.486	(1.000)	887	80.0000		
	188	17.353	17.486	(1.000)	61	80.0000		
* 90 Chrysene-d12	240	23.863	23.898	(1.000)	14135867	80.0000		
	240	23.569	23.898	(1.000)	927	80.0000		
	240	23.618	23.898	(1.000)	256	80.0000		
	240	23.667	23.898	(1.000)	697	80.0000		
* 99 Perylene-d12	264	27.036	27.055	(1.000)	9777860	80.0000		
	264	26.709	27.055	(1.000)	261	80.0000		
	264	26.742	27.055	(1.000)	395	80.0000		
	264	26.791	27.055	(1.000)	375	80.0000		
	264	26.906	27.055	(1.000)	5058	80.0000		
S 1 2-Fluorophenol	112	4.627	4.645	(0.660)	1985094	20.4000		20.4(R)
S 2 Phenol-d5	99	6.296	6.314	(0.645)	2326296	21.0956		21.1(R)
	99	6.590	6.314	(0.675)	98843	0.89634		0.90(R)
S 17 Nitrobenzene-d5	82	8.160	8.179	(0.587)	2018531	21.4643		21.5(R)
	82	8.046	8.179	(0.579)	195094	2.07456		2.1(R)
S 62 2,4,6-Tribromophenol	330	15.783	15.817	(0.661)	541939	19.2259		19.2
S 82 Terphenyl-d14	244	21.393	21.411	(0.896)	2781580	22.4799		22.5
S 38 2-Fluorobiphenyl	172	12.332	12.350	(0.706)	2945530	21.5903		21.6(R)
S 34 1-Methylnaphthalene-d10	152	11.563	11.581	(1.184)	2347419	22.1689		22.2(R)
3 Phenol	94	6.312	6.347	(0.900)	2416030	21.5918		21.6
	94	6.492	6.347	(0.925)	80777	0.72189		0.72(a)
4 bis(2-Chloroethyl)ether	93	6.492	6.510	(0.925)	1888795	20.8004		20.8
	93	6.312	6.510	(0.900)	46032	0.50693		0.51(a)
5 2-Chlorophenol	128	6.590	6.592	(0.939)	1739622	20.5491		20.5
6 1,3-Dichlorobenzene	146	6.885	6.903	(0.981)	1740858	20.5836		20.6
	146	7.048	6.903	(1.005)	1796965	21.2470		21.2
9 1,4-Dichlorobenzene	146	7.048	7.050	(1.005)	1791671	20.4490		20.4
	146	6.885	7.050	(0.981)	1739562	19.8542		19.8
	146	7.343	7.050	(1.047)	1654778	18.8866		18.9
10 Benzyl Alcohol	108	7.294	7.328	(1.040)	1170584	21.5145		21.5
	108	7.016	7.328	(1.000)	40303	0.74074		0.74(a)
	108	7.539	7.328	(1.075)	1642621	30.1902		30.2
11 1,2-Dichlorobenzene	146	7.343	7.344	(1.047)	1664915	21.0172		21.0
	146	7.048	7.344	(1.005)	1790817	22.6066		22.6
12 2-Methylphenol	108	7.539	7.557	(1.075)	1642621	20.8003		20.8
	108	7.294	7.557	(1.040)	1170584	14.8230		14.8
	108	7.866	7.557	(1.121)	1652219	20.9219		20.9
13 bis(2-Chloroisopropyl)ether	45	7.588	7.606	(1.082)	2663784	22.4146		22.4
14 4-Methylphenol	108	7.866	7.901	(1.121)	1653995	21.8528		21.8

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
15 N-Nitrosodipropylamine	70	7.866	7.901	(1.121)	1047848	21.5281	21.5
16 Hexachloroethane	117	8.046	8.048	(1.147)	756796	20.2324	20.2
18 Nitrobenzene	77	8.210	8.228	(0.841)	1794439	22.3218	22.3
	77	7.866	8.228	(0.806)	565600	7.03574	7.0
19 Isophorone	82	8.733	8.767	(0.894)	3722828	21.6535	21.6
20 2-Nitrophenol	139	8.897	8.915	(0.911)	939976	21.6808	21.7
	139	8.749	8.915	(0.896)	51299	1.18323	1.2(a)
21 2,4-Dimethylphenol	122	9.044	9.062	(0.926)	1301044	21.8636	21.9
	122	8.897	9.062	(0.911)	46990	0.78965	0.79(a)
	122	9.273	9.062	(0.950)	604936	10.1658	10.2
23 bis(2-Chloroethoxy)methane	93	9.256	9.291	(0.948)	2328520	22.5376	22.5
	93	8.897	9.291	(0.911)	94423	0.91392	0.91(a)
24 Benzoic Acid	122	9.273	9.454	(0.950)	613839	14.9111	14.9
	122	9.044	9.454	(0.926)	1301044	31.6044	31.6
25 2,4-Dichlorophenol	162	9.453	9.471	(0.968)	1203753	21.3714	21.4
26 1,2,4-Trichlorobenzene	180	9.633	9.651	(0.987)	1351546	21.2051	21.2
28 Naphthalene	128	9.796	9.814	(1.003)	4731541	23.9243	23.9
	128	9.943	9.814	(1.019)	117626	0.59476	0.59(a)
29 4-Chloroaniline	127	9.960	10.011	(1.020)	1203047	24.4040	24.4
	127	9.796	10.011	(1.003)	575871	11.6816	11.7
30 Hexachlorobutadiene	225	10.107	10.125	(1.035)	724739	21.0110	21.0
32 4-Chloro-3-Methylphenol	107	11.137	11.156	(1.141)	1413557	22.1243	22.1
33 2-Methylnaphthalene	142	11.416	11.434	(1.169)	2688463	21.4817	21.5
	142	11.137	11.434	(1.141)	1041652	8.32316	8.3
35 Hexachlorocyclopentadiene	237	11.808	11.810	(0.849)	544320	17.7397	17.7
36 2,4,6-Trichlorophenol	196	12.103	12.121	(0.871)	819448	20.6555	20.6
	196	12.184	12.121	(0.876)	794634	20.0300	20.0
37 2,4,5-Trichlorophenol	196	12.184	12.202	(0.876)	794634	20.2320	20.2
	196	12.103	12.202	(0.871)	819448	20.8638	20.9
39 2-Chloronaphthalene	162	12.561	12.579	(0.904)	2518736	21.7965	21.8
40 2-Nitroaniline	65	12.839	12.873	(0.924)	799427	21.6511	21.6
41 3-Nitroaniline	138	13.836	13.871	(0.995)	364412	28.0735	28.1
43 Dimethylphthalate	163	13.346	13.380	(0.960)	3215681	22.1499	22.1
45 2,6-Dinitrotoluene	165	13.460	13.495	(0.968)	651756	20.8641	20.9
	165	13.346	13.495	(0.960)	32235	1.03191	1.0
	165	13.902	13.495	(1.000)	1447180	46.3272	46.3
46 Acenaphthylene	152	13.542	13.560	(0.974)	4390611	24.5169	24.5
	152	13.967	13.560	(1.005)	1182745	6.60439	6.6
48 Acenaphthene	154	13.967	13.985	(1.005)	2358928	21.0598	21.0
49 2,4-Dinitrophenol	184	14.082	14.116	(1.013)	122154	8.25076	8.2
50 4-Nitrophenol	109	14.376	14.362	(1.034)	28466	1.66953	1.7(a)
	109	14.311	14.362	(1.029)	257652	15.1113	15.1
	109	14.687	14.362	(1.056)	16639	0.97588	0.98(a)
51 Dibenzofuran	168	14.393	14.411	(1.035)	3645391	23.4339	23.4
52 2,4-Dinitrotoluene	165	14.409	14.443	(1.036)	839094	18.7154	18.7
53 1-Chloro-3,4-Dinitrobenzene	63	14.687	14.721	(1.504)	444395	22.1309	22.1
	63	14.311	14.721	(1.466)	108207	5.38871	5.4

Data File: /chem/msdh.i/h-15Jan98.b/h01150501010.d
Report Date: 19-Jan-1998 18:10

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	63	14.409	14.721	(1.476)	663187	33.0267	33.0
	63	14.491	14.721	(1.484)	15756	0.78465	0.78(a)
	63	14.949	14.721	(1.531)	22214	1.10626	1.1
	63	15.047	14.721	(1.541)	22876	1.13922	1.1
56 Diethylphthalate	149	15.063	15.098	(1.084)	3418290	22.7251	22.7
57 Fluorene	166	15.210	15.245	(1.094)	2715218	21.3281	21.3
	166	15.554	15.245	(1.119)	96573	0.75858	0.76(a)
58 4-Chlorophenyl phenyl ether	204	15.259	15.294	(1.098)	1352414	21.2384	21.2
59 4-Nitroaniline	138	15.292	15.343	(1.100)	366637	26.7744	26.8
	138	15.554	15.343	(1.119)	9484	0.69259	0.69(a)
60 4,6-Dinitro-2-methylphenol	198	15.374	15.408	(0.880)	306767	12.8384	12.8
61 N-nitrosodiphenylamine	169	15.554	15.588	(0.890)	1741973	21.9055	21.9
	169	15.259	15.588	(0.874)	123193	1.54916	1.5
65 4-Bromophenyl phenyl ether	248	16.437	16.455	(0.941)	802769	20.0708	20.1
66 Hexachlorobenzene	284	16.519	16.553	(0.946)	1030190	20.2196	20.2
68 Pentachlorophenol	266	17.026	17.044	(0.975)	460374	16.8008	16.8
72 Phenanthrene	178	17.517	17.551	(1.003)	3788581	22.4399	22.4
	178	17.631	17.551	(1.009)	3654130	21.6435	21.6
73 Anthracene	178	17.631	17.666	(1.009)	3654130	22.2823	22.3
	178	17.517	17.666	(1.003)	3788581	23.1021	23.1
78 Di-n-butylphthalate	149	19.038	19.072	(1.090)	5930468	24.4612	24.5
80 Fluoranthene	202	20.379	20.414	(1.167)	3897486	22.6900	22.7
81 Pyrene	202	20.903	20.937	(0.876)	3984972	23.0654	23.1
85 Butyl benzyl phthalate	149	22.653	22.687	(0.949)	2267926	21.8120	21.8
89 Benzo(a)Anthracene	228	23.814	23.849	(0.998)	2700163	19.4230	19.4
	228	23.912	23.849	(1.002)	2540348	18.2734	18.3
91 Chrysene	228	23.912	23.947	(1.002)	2541622	21.0047	21.0
	228	23.814	23.947	(0.998)	2700163	22.3149	22.3
91 bis(2-ethylhexyl)Phthalate	149	24.109	24.127	(1.010)	3178005	23.5550	23.6
94 Di-n-octyl phthalate	149	25.597	25.615	(0.947)	4240614	24.3883	24.4
95 Benzo(b)fluoranthene	252	26.235	26.269	(0.970)	1879398	17.7179	17.7
	252	26.284	26.269	(0.972)	1894595	17.8611	17.9
96 Benzo(k)fluoranthene	252	26.284	26.335	(0.972)	1897010	20.2314	20.2
	252	26.235	26.335	(0.970)	1879398	20.0436	20.0
97 Benzo(e)pyrene	252	26.791	26.826	(0.991)	824197	8.93318	8.9
	252	26.889	26.826	(0.995)	1501102	16.2699	16.3
	252	27.036	26.826	(1.000)	60326	0.65385	0.65(a)
98 Benzo(a)pyrene	252	26.889	26.940	(0.995)	1501102	18.8059	18.8
	252	26.791	26.940	(0.991)	824197	10.3256	10.3
	252	27.036	26.940	(1.000)	60326	0.75577	0.76(a)
103 Indeno(1,2,3-cd)pyrene	276	29.474	29.524	(1.090)	928929	17.1917	17.2
	276	29.555	29.524	(1.093)	216545	4.00759	4.0
104 Dibenzo(a,h)anthracene	278	29.555	29.590	(1.093)	902741	16.9898	17.0
	278	29.474	29.590	(1.090)	25901	0.54819	0.55(a)
105 Benzo(g,h,i)perylene	276	30.193	30.261	(1.117)	1002009	17.7764	17.8

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

Data File: /chem/msdh.i/h-15Jan98.b/h01150501010.d
Report Date: 19-Jan-1998 18:10

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01150501010.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: jgh
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80ng ISTD 267-91-1

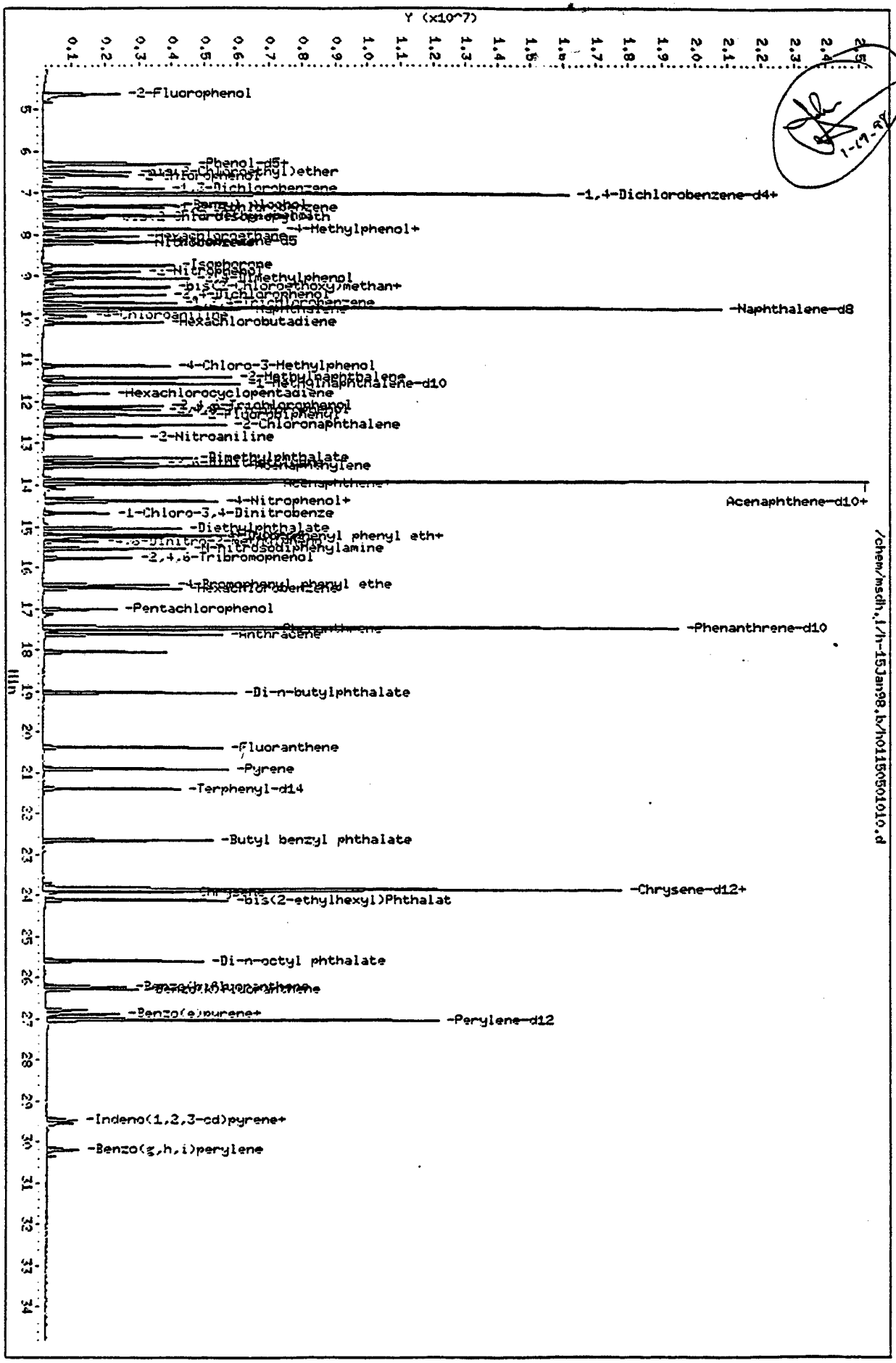
Calibration Date: JAN/15/98
Calibration Time: 1501

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	10654771	5327386	21309542	10188599	-4.38
27 Naphthalene-d8	16919358	8459679	33838716	16022723	-5.30
47 Acenaphthene-d10	12271905	6135952	24543810	11745176	-4.29
71 Phenanthrene-d10	19162935	9581468	38325870	17900240	-6.59
90 Chrysene-d12	16491029	8245514	32982058	14135867	-14.28
99 Perylene-d12	9979847	4989924	19959694	8777860	-12.04

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.02	6.52	7.52	7.02	-0.02
27 Naphthalene-d8	9.78	9.28	10.28	9.76	-0.18
47 Acenaphthene-d10	13.92	13.42	14.42	13.90	-0.13
71 Phenanthrene-d10	17.49	16.99	17.99	17.47	-0.10
90 Chrysene-d12	23.90	23.40	24.40	23.86	-0.14
99 Perylene-d12	27.05	26.55	27.55	27.04	-0.07

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.


Y (x10^7)
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0 2.1 2.2 2.3 2.4 2.5
5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34
min
-2-Fluorophenol
-Phenol-d5
-1,4-Dichlorobenzene-d4+
-1-Methylphenol+
-Isophorone
-Naphthalene-d8
-Hexachlorobutadiene
-4-Chloro-3-Methylphenol
-2-Methylnaphthalene
-1-Methylnaphthalene-d10
-Hexachlorocyclopentadiene
-2-Chloronaphthalene
-2-Nitroaniline
-Dimethylphthalate
-Acenaphthylene
-Acenaphthene-d10+
-4-Nitrophenol+
-1-Chloro-3,4-Dinitrobenze
-Diethylphthalate
-4-Chlorophenyl phenyl eth+
-N-nitrosodiphenylamine
-2,4,6-Tribromophenol
-4-Bromophenyl phenyl ethe
-Hexachlorobenzene
-Pentachlorophenol
-Phenanthrene-d10
-Anthracene
-Di-n-butylphthalate
-Fluoranthene
-Pyrene
-Terphenyl-d14
-Butyl benzyl phthalate
-Chrysene-d12+
-bis(2-ethylhexyl)Phthalat
-Di-n-octyl phthalate
-Benzo(b)fluoranthene
-Benzo(k)fluoranthene
-Benzo(e)pyrene+
-Perylene-d12
-Indeno(1,2,3-cd)pyrene+
-Benzo(g,h,i)perylene
1-17-97
/chem/msdh.i/h-15Jan98.b/h01150501010.d
Data File: /chem/msdh.i/h-15Jan98.b/h01150501010.d
Date : 15-JAN-1998 13:38
Client ID:
Sample Info: 1.0ul 20ug STD 396-4-20
Volume Injected (uL): 1.0
Column phase:
Instrument: msdh.i
Operator: jgh
Column diameter: 2.00
Page 1

Data File: /chem/msdh.i/h-15Jan98.b/h01150601011.d
Report Date: 19-Jan-1998 16:56

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150601011.d
Lab Smp Id:
Inj Date : 15-JAN-1998 14:18
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 40ug STD 396-4-40
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 16:39 m Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

1-19-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
*	7 1,4-Dichlorobenzene-d4					CAS #: 3855-82-1		
	7.015	7.021 (1.000)	150	10490610	80.0000		80.00- 120.00	100.00
	7.015	7.021 (1.000)	152	6320886			0.00-10058.51	60.25
	7.015	7.021 (1.000)	115	4086940			0.00-10037.59	38.96
*	27 Naphthalene-d8					CAS #: 1146-65-2		
	9.763	9.769 (1.000)	136	18216614	80.0000		80.00- 120.00	100.00
	9.763	9.769 (1.000)	68	1250480			0.00-10006.78	6.86
*	47 Acenaphthene-d10					CAS #: 15067-26-2		
	13.901	13.907 (1.000)	164	13211902	80.0000		80.00- 120.00	100.00
	13.901	13.907 (1.000)	162	12547671			0.00-10094.94	94.97
	13.901	13.907 (1.000)	160	5378322			0.00-10041.02	40.71

				CONCENTRATIONS ON-COL	FINAL		
RT	EXP RT (REL RT)	MASS	RESPONSE	(NG)	(ug)	TARGET RANGE	RATIO
**	****** ********	****	********	*******	*******	**********	*****
* 71 Phenanthrene-d10						CAS #: 1517-22-2	
17.484	17.489 (1.000)	188	17296004	80.0000		80.00- 120.00	100.00
17.484	17.489 (1.000)	94	2713673			0.00-10014.44	15.69
17.484	17.489 (1.000)	80	2643265			0.00-10015.28	15.28
* 90 Chrysene-d12						CAS #: 1719-03-5	
23.879	23.885 (1.000)	240	16439399	80.0000		80.00- 120.00	100.00
23.879	23.885 (1.000)	236	3971938			0.00-10026.00	24.16
23.863	23.885 (1.000)	120	2816543			0.00-10018.11	17.13
* 99 Perylene-d12						CAS #: 1520-96-3	
27.052	27.058 (1.000)	264	10216403	80.0000		80.00- 120.00	100.00
27.052	27.058 (1.000)	260	2250139			0.00-10021.95	22.02
27.052	27.058 (1.000)	265	2126832			0.00-10020.90	20.82
I 1 2-Fluorophenol						CAS #: 367-12-4	
4.643	4.649 (0.662)	112	4094370	40.8648	40.9	80.00- 120.00	100.00
4.643	4.649 (0.662)	64	1994404			0.00-10046.11	48.71
4.643	4.649 (0.662)	92	832853			0.00-10019.15	20.34
I 2 Phenol-d5						CAS #: 4165-62-2	
6.295	6.317 (0.645)	99	4883909	38.9550	39.0	80.00- 120.00	100.00
6.295	6.317 (0.645)	71	1443067			0.00-10029.73	29.55
I 17 Nitrobenzene-d5						CAS #: 4165-60-0	
8.160	8.182 (0.587)	82	4099794	38.7559	38.8	80.00- 120.00	100.00
8.160	8.182 (0.587)	54	2177609			0.00-10052.46	53.12
8.176	8.182 (0.588)	128	1908705			0.00-10049.58	46.56
I 62 2,4,6-Tribromophenol						CAS #: 118-79-6	
15.799	15.804 (0.662)	330	1238737	37.7879	37.8	80.00- 120.00	100.00
15.799	15.804 (0.662)	332	1201171			0.00-10096.28	96.97
15.782	15.804 (0.661)	141	367658			0.00-10029.68	29.68
I 82 Terphenyl-d14						CAS #: 98904-43-9	
21.393	21.415 (0.896)	244	5797051	40.2852	40.3	80.00- 120.00	100.00
21.393	21.415 (0.896)	122	1070655			0.00-10016.35	18.47
21.393	21.415 (0.896)	212	346387			0.00-10005.98	5.98
I 28 2-Fluorobiphenyl						CAS #: 321-60-8	
12.331	12.337 (0.705)	172	6449887	48.9284	48.9	80.00- 120.00	100.00
12.331	12.337 (0.705)	171	2180821			0.00-10033.81	33.81
I 34 1-Methylnaphthalene-d10						CAS #: 38072-94-5	
11.562	11.584 (1.184)	152	4700050	39.0413	39.0	80.00- 120.00	100.00(R)
11.562	11.584 (1.184)	122	1821859			0.00-10038.76	38.76

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
34 1-Methylnaphthalene-d10 (continued)							
11.562	11.584 (1.184)	150	3964917			0.00-10084.36	84.36
2 Phenol					CAS #: 108-95-2		
6.328	6.350 (0.902)	94	4885782	42.4067	42.4	80.00- 120.00	100.00
6.328	6.350 (0.902)	66	1790241			0.00-10037.29	36.64
6.328	6.350 (0.902)	65	1228222			0.00-10025.14	25.14
4 bis(2-Chloroethyl)ether					CAS #: 111-44-4		
6.508	6.514 (0.928)	93	4010438	42.8935	42.9	80.00- 120.00	100.00
6.508	6.514 (0.928)	63	2547772			0.00-10062.92	63.53
6.508	6.514 (0.928)	95	1260081			0.00-10031.42	31.42
5 2-Chlorophenol					CAS #: 95-57-8		
6.590	6.595 (0.939)	128	3651617	41.8927	41.9	80.00- 120.00	100.00
6.590	6.595 (0.939)	130	1148805			0.00-10030.89	31.46
6.590	6.595 (0.939)	64	1594532			0.00-10041.15	43.67
6 1,3-Dichlorobenzene					CAS #: 541-73-1		
6.884	6.890 (0.981)	146	3538528	40.6345	40.6	80.00- 120.00	100.00(H)
6.884	6.890 (0.981)	148	2222254			0.00-10063.34	62.80
6.884	6.890 (0.981)	113	502836			0.00-10013.88	14.21
9 1,4-Dichlorobenzene					CAS #: 106-46-7		
7.048	7.053 (1.005)	146	3699380	41.0068	41.0	80.00- 120.00	100.00
7.048	7.053 (1.005)	148	2362804			0.00-10063.27	63.87
7.048	7.053 (1.005)	113	702603			0.00-10016.16	18.99
10 Benzyl Alcohol					CAS #: 100-51-6		
7.310	7.315 (1.042)	108	2433212	43.4332	43.4	80.00- 120.00	100.00
7.310	7.315 (1.042)	79	2837394			0.00-10116.61	116.61
7.310	7.315 (1.042)	77	1918717			0.00-10078.86	78.86
11 1,2-Dichlorobenzene					CAS #: 95-50-1		
7.342	7.348 (1.047)	146	3438847	42.1609	42.2	80.00- 120.00	100.00(H)
7.342	7.348 (1.047)	148	2186636			0.00-10063.46	63.59
7.342	7.348 (1.047)	113	505674			0.00-10014.38	14.70
12 2-Methylphenol					CAS #: 95-48-7		
7.539	7.560 (1.075)	108	3340208	41.0790	41.1	80.00- 120.00	100.00
7.539	7.560 (1.075)	107	2898420			0.00-10086.18	86.77
7.539	7.560 (1.075)	79	1387928			0.00-10041.55	41.55
13 bis(2-Chloroisopropyl)ether					CAS #: 108-60-1		
7.604	7.609 (1.084)	45	5136238	41.9751	42.0	80.00- 120.00	100.00
7.604	7.609 (1.084)	121	955235	40.9747	41.0	0.00-10020.26	18.60

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
14 4-Methylphenol						CAS #: 106-44-5		
7.882	7.904	(1.124)	108	3282119	42.1154	42.1	80.00- 120.00	100.00
7.882	7.904	(1.124)	107	4038144			0.00-10122.08	123.03
7.882	7.904	(1.124)	79	824533			0.00-10025.12	25.12
15 N-Nitrosodipropylamine						CAS #: 621-64-7		
7.882	7.904	(1.124)	70	2126107	42.4234	42.4	80.00- 120.00	100.00
7.882	7.904	(1.124)	130	543036			0.00-10026.33	25.54
7.882	7.904	(1.124)	101	255500			0.00-10012.19	12.02
16 Hexachloroethane						CAS #: 67-72-1		
8.046	8.051	(1.147)	117	1609902	41.8006	41.8	80.00- 120.00	100.00
8.046	8.051	(1.147)	201	1112103			0.00-10068.38	69.08
8.046	8.051	(1.147)	199	692569			0.00-10041.83	43.02
18 Nitrobenzene						CAS #: 98-95-3		
8.209	8.231	(0.841)	77	3599825	39.3868	39.4	80.00- 120.00	100.00
8.209	8.231	(0.841)	123	1833280			0.00-10053.45	50.93
8.209	8.231	(0.841)	65	487768			0.00-10013.89	13.55
19 Isophorone						CAS #: 78-59-1		
8.749	8.771	(0.896)	82	7617015	38.9680	39.0	80.00- 120.00	100.00
8.749	8.771	(0.896)	138	1081608			0.00-10014.70	14.20
8.749	8.771	(0.896)	95	419987			0.00-10005.51	5.51
20 2-Nitrophenol						CAS #: 88-75-5		
8.913	8.918	(0.913)	139	1930926	39.1735	39.2	80.00- 120.00	100.00
8.896	8.918	(0.911)	65	844457			0.00-10042.96	43.73
8.913	8.918	(0.913)	109	504819			0.00-10026.21	26.14
21 2,4-Dimethylphenol						CAS #: 105-67-9		
9.060	9.065	(0.928)	122	2519004	37.2330	37.2	80.00- 120.00	100.00
9.060	9.065	(0.928)	107	3022483			0.00-10123.86	120.03
9.060	9.065	(0.928)	121	1382587			0.00-10055.27	54.89
23 bis(2-Chloroethoxy)methane						CAS #: 111-91-1		
9.272	9.294	(0.950)	93	4515477	38.4415	38.4	80.00- 120.00	100.00
9.272	9.294	(0.950)	123	467582			0.00-10010.88	10.36
9.272	9.294	(0.950)	95	1427755			0.00-10031.15	31.62
24 Benzoic Acid						CAS #: 65-85-0		
9.354	9.441	(0.958)	122	1671764	35.7190	35.7	80.00- 120.00	100.00(H)
9.354	9.441	(0.958)	105	2228081			0.00-10123.32	133.28
9.354	9.441	(0.958)	77	1559475			0.00-10081.55	93.28
25 2,4-Dichlorophenol						CAS #: 120-83-2		
9.469	9.474	(0.970)	162	2519992	39.3517	39.4	80.00- 120.00	100.00

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
25 2,4-Dichlorophenol (continued)								
9.469	9.474	(0.970)	164	1597084			0.00-10063.52	63.38
9.452	9.474	(0.968)	98	1018815			0.00-10039.12	40.43
26 1,2,4-Trichlorobenzene						CAS #: 120-82-1		
9.632	9.654	(0.987)	180	2705880	37.3410	37.3	80.00- 120.00	100.00
9.632	9.654	(0.987)	182	2584955			0.00-10096.20	95.53
9.632	9.654	(0.987)	145	792671			0.00-10028.68	29.29
28 Naphthalene						CAS #: 91-20-3		
9.812	9.818	(1.005)	128	9216447	40.9892	41.0	80.00- 120.00	100.00
9.812	9.818	(1.005)	129	1018782			0.00-10013.27	11.05
9.812	9.818	(1.005)	127	1218083			0.00-10013.22	13.22
29 4-Chloroaniline						CAS #: 106-47-8		
9.976	10.014	(1.022)	127	1935471	34.5329	34.5	80.00- 120.00	100.00
9.976	9.965	(1.022)	129	575697			0.00-10010.59	29.74
30 Hexachlorobutadiene						CAS #: 87-68-3		
10.123	10.128	(1.037)	225	1520665	38.7763	38.8	80.00- 120.00	100.00
10.123	10.128	(1.037)	223	952391			0.00-10061.71	62.63
10.123	10.128	(1.037)	227	964767			0.00-10063.44	63.44
32 4-Chloro-3-Methylphenol						CAS #: 59-50-7		
11.137	11.159	(1.141)	107	2915105	40.1208	40.1	80.00- 120.00	100.00
11.137	11.159	(1.141)	142	2154814			0.00-10073.71	73.92
11.137	11.159	(1.141)	144	691546			0.00-10023.72	23.72
33 2-Methylnaphthalene						CAS #: 91-57-6		
11.432	11.437	(1.171)	142	5732594	40.2889	40.3	80.00- 120.00	100.00
11.432	11.437	(1.171)	141	4966417			0.00-10090.11	86.63
35 Hexachlorocyclopentadiene						CAS #: 77-47-4		
11.808	11.813	(0.849)	237	1313419	38.0531	38.0	80.00- 120.00	100.00
11.808	11.813	(0.849)	272	190845			0.00-10014.73	14.53
11.808	11.813	(0.849)	235	813226			0.00-10061.71	61.92
36 2,4,6-Trichlorophenol						CAS #: 88-06-2		
12.118	12.124	(0.872)	196	1769789	39.6580	39.6	80.00- 120.00	100.00(H)
12.118	12.124	(0.872)	198	1669691			0.00-10094.84	94.34
12.118	12.124	(0.872)	200	532094			0.00-10030.07	30.07
37 2,4,5-Trichlorophenol						CAS #: 95-95-4		
12.184	12.206	(0.876)	196	1748716	39.5809	39.6	80.00- 120.00	100.00(H)
12.184	12.206	(0.876)	198	1676521			0.00-10095.07	95.87
12.200	12.206	(0.878)	200	536406			0.00-10030.67	30.67

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
39 2-Chloronaphthalene						CAS #: 91-58-7		
12.576	12.582	(0.905)	162	5321187	40.9361	40.9	80.00- 120.00	100.00
12.576	12.582	(0.905)	164	1689837			0.00-10031.20	31.76
12.576	12.582	(0.905)	127	2034866			0.00-10038.71	38.24
40 2-Nitroaniline						CAS #: 88-74-4		
12.855	12.860	(0.925)	65	1790348	43.1056	43.1	80.00- 120.00	100.00
12.855	12.876	(0.925)	138	2143156			0.00-10127.72	119.71
12.855	12.860	(0.925)	92	1255087			0.00-10073.86	70.10
41 3-Nitroaniline						CAS #: 99-09-2		
13.852	13.874	(0.996)	138	444021	30.4089	30.4	80.00- 120.00	100.00
13.852	13.874	(0.996)	92	559824			0.00-10120.29	126.08
13.901	13.907	(1.000)	108	355486			0.00-10080.06	80.06
43 Dimethylphthalate						CAS #: 131-11-3		
13.362	13.367	(0.961)	163	6620411	40.5395	40.5	80.00- 120.00	100.00
13.362	13.367	(0.961)	194	336635			0.00-10005.16	5.08
13.345	13.367	(0.960)	164	632255			0.00-10009.58	9.55
45 2,6-Dinitrotoluene						CAS #: 606-20-2		
13.476	13.498	(0.969)	165	1464660	41.6816	41.7	80.00- 120.00	100.00
13.476	13.498	(0.969)	89	893932			0.00-10059.87	61.03
13.476	13.498	(0.969)	121	327870			0.00-10022.31	22.39
46 Acenaphthylene						CAS #: 208-96-8		
13.542	13.563	(0.974)	152	8810271	43.7346	43.7	80.00- 120.00	100.00
13.542	13.563	(0.974)	151	1674781			0.00-10022.78	19.01
13.542	13.563	(0.974)	153	1094622			0.00-10015.23	12.42
48 Acenaphthene						CAS #: 83-32-9		
13.983	13.989	(1.006)	154	5020543	39.8459	39.8	80.00- 120.00	100.00
13.983	13.989	(1.006)	152	2491523			0.00-10049.54	49.63
13.983	13.989	(1.006)	153	5395599			0.00-10106.26	107.47
49 2,4-Dinitrophenol						CAS #: 51-28-5		
14.098	14.120	(1.014)	184	463790	27.8485	27.8	80.00- 120.00	100.00
14.098	14.103	(1.014)	63	286529			0.00-10058.68	61.78
14.098	14.120	(1.014)	154	232510			0.00-10038.31	50.13
50 4-Nitrophenol						CAS #: 100-02-7		
14.327	14.349	(1.031)	109	654683	34.1345	34.1	80.00- 120.00	100.00(H)
14.327	14.349	(1.031)	139	1043694			0.00-10155.17	159.42
14.327	14.349	(1.031)	65	876767			0.00-10133.38	133.92
51 Dibenzofuran						CAS #: 132-64-9		
14.392	14.414	(1.035)	168	7453876	42.5967	42.6	80.00- 120.00	100.00

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
51 Dibenzofuran (continued)								
14.392	14.414	(1.035)	139	2555547			0.00-10038.83	34.28
52 2,4-Dinitrotoluene						CAS #: 121-14-2		
14.425	14.447	(1.038)	165	1951311	38.6910	38.7	80.00- 120.00	100.00
14.425	14.430	(1.038)	63	1410461			0.00-10063.54	72.28
14.425	14.447	(1.038)	182	92995			0.00-10004.86	4.77
53 1-Chloro-3,4-Dinitrobenzene						CAS #:		
14.703	14.708	(1.506)	63	997938	43.7121	43.7	80.00- 120.00	100.00
14.703	14.708	(1.506)	75	815512			0.00-10081.72	81.72
14.703	14.725	(1.506)	202	545646			0.00-10054.68	54.68
56 Diethylphthalate						CAS #: 84-66-2		
15.063	15.085	(1.084)	149	7193251	42.5125	42.5	80.00- 120.00	100.00
15.063	15.085	(1.084)	177	1335012			0.00-10019.67	18.56
15.063	15.085	(1.084)	150	783021			0.00-10011.54	10.89
57 Fluorene						CAS #: 86-73-7		
15.226	15.232	(1.095)	166	6111162	42.6741	42.7	80.00- 120.00	100.00
15.226	15.232	(1.095)	165	5638232			0.00-10093.28	92.26
15.226	15.232	(1.095)	167	779423			0.00-10012.75	12.75
58 4-Chlorophenyl phenyl ether						CAS #: 7005-72-3		
15.275	15.281	(1.099)	204	2816717	39.3232	39.3	80.00- 120.00	100.00
15.275	15.281	(1.099)	206	911346			0.00-10032.44	32.35
15.275	15.281	(1.099)	141	1604834			0.00-10053.60	56.98
59 4-Nitroaniline						CAS #: 100-01-6		
15.308	15.330	(1.101)	138	747411	48.5218	48.5	80.00- 120.00	100.00
15.308	15.330	(1.101)	92	258534			0.00-10032.69	34.59
15.308	15.330	(1.101)	108	493063			0.00-10073.68	65.97
60 4,6-Dinitro-2-methylphenol						CAS #: 534-52-1		
15.390	15.412	(0.880)	198	918371	39.7773	39.8	80.00- 120.00	100.00
15.390	15.412	(0.880)	121	328678			0.00-10036.17	35.79
15.390	15.412	(0.880)	51	489419			0.00-10054.03	53.29
61 N-nitrosodiphenylamine						CAS #: 86-30-6		
15.570	15.575	(0.891)	169	3579678	46.5874	46.6	80.00- 120.00	100.00
15.570	15.575	(0.891)	168	2338572			0.00-10066.04	65.33
15.570	15.575	(0.891)	167	1274792			0.00-10035.43	35.61
65 4-Bromophenyl phenyl ether						CAS #: 101-55-3		
16.427	16.459	(0.940)	248	1775304	45.9367	45.9	80.00- 120.00	100.00
16.427	16.459	(0.940)	250	1724300			0.00-10096.59	97.13

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
65 4-Bromophenyl phenyl ether (continued)								
16.437	16.459	(0.940)	141	1156843			0.00-10065.11	65.16
66 Hexachlorobenzene						CAS #: 118-74-1		
16.535	16.540	(0.946)	284	2195636	44.5994	44.6	80.00- 120.00	100.00
16.535	16.540	(0.946)	142	757731			0.00-10033.27	34.51
16.535	16.540	(0.946)	249	538241			0.00-10024.51	24.51
68 Pentachlorophenol						CAS #: 87-86-5		
17.042	17.047	(0.975)	266	1161975	43.8862	43.9	80.00- 120.00	100.00
17.042	17.047	(0.975)	264	731445			0.00-10062.05	62.95
17.042	17.047	(0.975)	268	745057			0.00-10063.81	64.12
72 Phenanthrene						CAS #: 85-01-8		
17.533	17.538	(1.003)	178	8337692	51.1096	51.1	80.00- 120.00	100.00
17.533	17.538	(1.003)	176	1521826			0.00-10020.36	18.25
17.533	17.538	(1.003)	179	1234842			0.00-10016.57	14.81
73 Anthracene						CAS #: 120-12-7		
17.647	17.669	(1.009)	178	7661936	48.3534	48.4	80.00- 120.00	100.00
17.647	17.669	(1.009)	176	1360546			0.00-10019.61	17.76
17.647	17.669	(1.009)	179	1152603			0.00-10016.26	15.04
78 Di-n-butylphthalate						CAS #: 84-74-2		
19.054	19.059	(1.090)	149	11296199	48.2208	48.2	80.00- 120.00	100.00
19.054	19.059	(1.090)	150	1055048			0.00-10011.22	9.34
19.054	19.059	(1.090)	104	662589			0.00-10006.82	5.87
80 Fluoranthene						CAS #: 206-44-0		
20.395	20.401	(1.167)	202	8613371	51.8964	51.9	80.00- 120.00	100.00
20.379	20.401	(1.166)	101	1566023			0.00-10017.87	18.18
20.379	20.401	(1.166)	100	1179844			0.00-10013.24	13.70
81 Pyrene						CAS #: 129-00-0		
20.919	20.940	(0.876)	202	8804239	43.8192	43.8	80.00- 120.00	100.00
20.919	20.940	(0.876)	101	1867841			0.00-10022.30	21.22
20.919	20.940	(0.876)	100	1497335			0.00-10017.69	17.01
85 Butyl benzyl phthalate						CAS #: 85-68-7		
22.669	22.674	(0.949)	149	5179569	42.8348	42.8	80.00- 120.00	100.00
22.652	22.674	(0.949)	91	3966508			0.00-10073.35	76.58
22.669	22.674	(0.949)	206	809019			0.00-10015.36	15.62
89 Benzo(a)Anthracene						CAS #: 56-55-3		
23.830	23.836	(0.998)	228	6120070	37.8546	37.8	80.00- 120.00	100.00
23.830	23.836	(0.998)	229	1178043			0.00-10018.92	19.25

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
89 Benzo(a)Anthracene (continued)							
23.830	23.836 (0.998)	226	1599416			0.00-10025.91	26.13
91 Chrysene					CAS #: 218-01-9		
23.929	23.950 (1.002)	228	6018514	42.7692	42.8	80.00- 120.00	100.00
23.929	23.950 (1.002)	226	1698534			0.00-10028.14	28.22
23.929	23.950 (1.002)	229	1153789			0.00-10018.65	19.17
93 bis(2-ethylhexyl)Phthalate					CAS #: 117-81-7		
24.108	24.130 (1.010)	149	7156586	45.6112	45.6	80.00- 120.00	100.00
24.108	24.130 (1.010)	167	1987982			0.00-10027.97	27.78
24.108	24.130 (1.010)	279	381720			0.00-10005.78	5.33
94 Di-n-octyl phthalate					CAS #: 117-84-0		
25.613	25.619 (0.947)	149	10648582	52.6180	52.6	80.00- 120.00	100.00
25.613	25.619 (0.947)	150	969960			0.00-10011.28	9.11
95 Benzo(b)fluoranthene					CAS #: 205-99-2		
26.251	26.273 (0.970)	252	4373201	35.4228	35.4	80.00- 120.00	100.00(H)
26.251	26.273 (0.970)	253	934625			0.00-10021.18	21.37
26.235	26.256 (0.970)	125	848071			0.00-10017.89	19.39
96 Benzo(k)fluoranthene					CAS #: 207-08-9		
26.300	26.322 (0.972)	252	4346362	39.8266	39.8	80.00- 120.00	100.00
26.300	26.322 (0.972)	253	934176			0.00-10020.93	21.49
26.300	26.322 (0.972)	125	800469			0.00-10016.09	18.42
97 Benzo(e)pyrene					CAS #:		
26.807	26.813 (0.991)	252	2031914	18.9222	18.9	80.00- 120.00	100.00
26.791	26.813 (0.990)	125	554276			0.00-10027.28	27.28
26.807	26.813 (0.991)	250	559837			0.00-10027.55	27.55
98 Benzo(a)pyrene					CAS #: 50-32-8		
26.905	26.927 (0.995)	252	3494987	37.6200	37.6	80.00- 120.00	100.00
26.905	26.927 (0.995)	253	739547			0.00-10021.09	21.16
26.905	26.927 (0.995)	125	733816			0.00-10021.00	21.00
103 Indeno(1,2,3-cd)pyrene					CAS #: 193-39-5		
29.490	29.528 (1.090)	276	2231893	35.4894	35.5	80.00- 120.00	100.00
29.490	29.528 (1.090)	138	800648			0.00-10035.87	35.87
29.506	29.528 (1.091)	227	2436			0.00-10000.11	0.11
104 Dibenzo(a,h)anthracene					CAS #: 53-70-3		
29.571	29.593 (1.093)	278	2027151	36.8628	36.9	80.00- 120.00	100.00
29.571	29.593 (1.093)	279	428813			0.00-10022.59	21.15
29.571	29.593 (1.093)	139	577709			0.00-10027.17	28.50

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
**	*******	********	****	********	********	********	**********	******
135 Benzo(g,h,i)perylene						CAS #: 191-24-2		
30.226	30.264	(1.117)	276	2441610	37.2169	37.2	80.00- 120.00	100.00
30.226	30.264	(1.117)	138	970148			0.00-10038.50	39.73
30.226	30.264	(1.117)	277	567239			0.00-10023.39	23.23

QC Flag Legend

R - Spike/Surrogate failed recovery limits.
H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150601011.d
Lab Smp Id:
Inj Date : 15-JAN-1998 14:18
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 40ug STD 396-4-40
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 17:51 jheffel Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
* 7 1,4-Dichlorobenzene-d4	150	7.015	7.017	(1.000)	10490610	80.0000	
	150	6.639	7.017	(1.000)	343	80.0000	
	150	6.786	7.017	(1.000)	452	80.0000	
	150	7.342	7.017	(1.000)	351142	80.0000	
* 27 Naphthalene-d8	136	9.763	9.782	(1.000)	18216614	80.0000	
	136	9.452	9.782	(1.000)	14351	80.0000	
	136	9.550	9.782	(1.000)	390	80.0000	
* 47 Acenaphthene-d10	164	13.901	13.920	(1.000)	13211902	80.0000	
	164	13.525	13.920	(1.000)	5299	80.0000	
* 71 Phenanthrene-d10	188	17.484	17.486	(1.000)	17296004	80.0000	
	188	17.156	17.486	(1.000)	1668	80.0000	
	188	17.206	17.486	(1.000)	464	80.0000	
	188	17.336	17.486	(1.000)	435	80.0000	
* 90 Chrysene-d12	240	22.879	23.898	(1.000)	16439399	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	240	23.552	23.398	(1.000)	799	80.0000	
	240	23.765	23.398	(1.000)	618	80.0000	
* 99 Perylene-d12	264	27.052	27.055	(1.000)	10216403	80.0000	
	264	26.627	27.055	(1.000)	241	80.0000	
	264	26.660	27.055	(1.000)	373	80.0000	
	264	26.758	27.055	(1.000)	1217	80.0000	
	264	26.873	27.055	(1.000)	850	80.0000	
S 1 2-Fluorophenol	112	4.643	4.645	(0.662)	4094370	40.8648	40.9
	112	4.284	4.645	(0.611)	98825	0.98635	0.99(R)
S 2 Phenol-d5	99	6.295	6.314	(0.645)	4883909	38.9550	39.0
	99	6.590	6.314	(0.675)	210348	1.67778	1.7(R)
S 17 Nitrobenzene-d5	82	8.160	8.179	(0.587)	4099794	38.7559	38.8
	82	8.046	8.179	(0.579)	399918	3.78047	3.8(R)
S 62 2,4,6-Tribromophenol	330	15.799	15.817	(0.662)	1238737	37.7879	37.8
S 32 Terphenyl-d14	244	21.393	21.411	(0.896)	5797051	40.2852	40.3
S 38 2-Fluorobiphenyl	172	12.331	12.350	(0.705)	6449887	48.9284	48.9
S 34 1-Methylnaphthalene-d10	152	11.562	11.581	(1.184)	4700050	39.0413	39.0(R)
3 Phenol	94	6.328	6.347	(0.902)	4885782	42.4067	42.4
	94	6.508	6.347	(0.928)	136689	1.18641	1.2(a)
4 bis(2-Chloroethyl)ether	93	6.508	6.510	(0.928)	4010438	42.8935	42.9
	93	6.328	6.510	(0.902)	92612	0.99053	0.99(a)
5 2-Chlorophenol	128	6.590	6.592	(0.939)	3651617	41.8927	* 41.9
6 1,3-Dichlorobenzene	146	6.884	6.903	(0.981)	3538528	40.6345	40.6
	146	7.048	6.903	(1.005)	3693521	42.4144	42.4
9 1,4-Dichlorobenzene	146	7.048	7.050	(1.005)	3693031	40.9364	40.9
	146	6.884	7.050	(0.981)	3538528	39.2238	39.2
	146	7.342	7.050	(1.047)	3407155	37.7675	37.8
10 Benzyl Alcohol	108	7.310	7.328	(1.042)	2433212	43.4332	43.4
	108	7.048	7.328	(1.005)	59630	1.06440	1.1(a)
	108	7.539	7.328	(1.075)	3340208	59.6232	59.6
11 1,2-Dichlorobenzene	146	7.342	7.344	(1.047)	3438847	42.1609	42.2
	146	7.048	7.344	(1.005)	3688403	45.2205	45.2
12 2-Methylphenol	108	7.539	7.557	(1.075)	3340208	41.0790	41.1
	108	7.310	7.557	(1.042)	2433212	29.9245	29.9
	108	7.882	7.557	(1.124)	3289289	40.4528	40.4
13 bis(2-Chloroisopropyl)ether	45	7.604	7.606	(1.084)	5135414	41.9683	42.0
14 4-Methylphenol	108	7.882	7.901	(1.124)	3344705	42.9185	42.9
15 N-Nitrosodipropylamine	70	7.882	7.901	(1.124)	2126107	42.4234	42.4
	70	8.160	7.901	(1.163)	529266	10.5607	10.6
16 Hexachloroethane	117	8.046	8.048	(1.147)	1609902	41.8006	41.8
18 Nitrobenzene	77	8.209	8.228	(0.841)	3599825	39.3868	39.4
	77	7.882	8.228	(0.807)	1172406	12.8276	12.8
19 Isophorone	82	8.749	8.767	(0.896)	7617015	38.9680	39.0
20 2-Nitrophenol	139	8.913	8.915	(0.913)	1930926	39.1735	39.2
	139	8.749	8.915	(0.896)	109441	2.22028	2.2(a)
	139	9.060	8.915	(0.928)	693258	14.0644	14.1
21 2,4-Dimethylphenol	122	9.060	9.062	(0.928)	2519004	17.2330	17.2

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
	122	8.913	9.062	(0.913)	103452	1.52911	1.5(a)
23 bis(2-Chloroethoxy)methane	93	9.272	9.291	(0.950)	4515477	38.4415	38.4
	93	8.913	9.291	(0.913)	195433	1.66378	1.7
	93	9.060	9.291	(0.928)	98187	0.83589	0.84(a)
24 Benzoic Acid	122	9.501	9.454	(0.973)	42919	0.91701	0.92(a)
	122	9.060	9.454	(0.928)	2519004	53.8212	53.8
	122	9.354	9.454	(0.958)	1721401	36.7796	36.8
	122	9.812	9.454	(1.005)	31639	0.67600	0.68(a)
25 2,4-Dichlorophenol	162	9.469	9.471	(0.970)	2519992	39.3517	39.4
26 1,2,4-Trichlorobenzene	180	9.632	9.651	(0.987)	2705880	37.3410	37.3
28 Naphthalene	128	9.812	9.814	(1.005)	9216447	40.9892	41.0
	128	9.976	9.814	(1.022)	210024	0.93406	0.93(a)
29 4-Chloroaniline	127	9.976	10.011	(1.022)	1936244	34.5467	34.5
	127	9.812	10.011	(1.005)	1218604	21.7425	21.7
30 Hexachlorobutadiene	225	10.123	10.125	(1.037)	1520665	38.7763	38.8
	225	9.763	10.125	(1.000)	22434	0.57206	0.57(a)
32 4-Chloro-3-Methylphenol	107	11.137	11.156	(1.141)	2915105	40.1308	40.1
33 2-Methylnaphthalene	142	11.432	11.434	(1.171)	5732594	40.2889	40.3
	142	11.137	11.434	(1.141)	2154814	15.1441	15.1
35 Hexachlorocyclopentadiene	237	11.808	11.810	(0.849)	1313419	38.0531	38.0
36 2,4,6-Trichlorophenol	196	12.118	12.121	(0.872)	1769789	39.6580	39.6
	196	12.184	12.121	(0.876)	1748716	39.1858	39.2
37 2,4,5-Trichlorophenol	196	12.184	12.202	(0.876)	1748716	39.5809	39.6
	196	12.118	12.202	(0.872)	1769789	40.0578	40.0
39 2-Chloronaphthalene	162	12.576	12.579	(0.905)	5321187	40.9361	40.9
40 2-Nitroaniline	65	12.855	12.873	(0.925)	1789266	43.0795	43.1
41 3-Nitroaniline	138	13.852	13.871	(0.996)	450694	30.3659	30.9
	138	14.098	13.871	(1.014)	48447	3.31791	3.3
43 Dimethylphthalate	163	13.362	13.380	(0.961)	6620411	40.5395	40.5
45 2,6-Dinitrotoluene	165	13.476	13.495	(0.969)	1464660	41.6816	41.7
	165	13.345	13.495	(0.960)	69547	1.97919	2.0
	165	13.901	13.495	(1.000)	1607639	45.7506	45.8
46 Acenaphthylene	152	13.542	13.560	(0.974)	3810271	43.7346	43.7
	152	13.983	13.560	(1.006)	2483123	12.3263	12.3
48 Acenaphthene	154	13.983	13.985	(1.006)	5020543	39.8459	39.8
	154	13.542	13.985	(0.974)	64225	0.50973	0.51(aQ)
49 2,4-Dinitrophenol	184	14.098	14.116	(1.014)	463790	27.8485	27.8
50 4-Nitrophenol	109	14.392	14.362	(1.035)	68741	3.58408	3.6(a)
	109	13.983	14.362	(1.006)	12641	0.65909	0.66(a)
	109	14.327	14.362	(1.031)	654683	34.1345	34.1
	109	14.703	14.362	(1.058)	35702	1.86147	1.9(a)
51 Dibenzofuran	168	14.392	14.411	(1.035)	7453876	42.5967	42.6
52 2,4-Dinitrotoluene	165	14.425	14.443	(1.038)	1951311	38.6910	38.7
53 1-Chloro-3,4-Dinitrobenzene	63	14.703	14.721	(1.506)	997938	43.7121	43.7
	63	14.327	14.721	(1.467)	276873	12.1277	12.1
	63	14.425	14.721	(1.477)	1410461	61.7816	61.8
	63	14.507	14.721	(1.486)	30934	1.35498	1.4

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	63	14.948	14.721	(1.531)	52068	2.28070	2.3
	63	15.063	14.721	(1.543)	43829	1.91982	1.9
56 Diethylphthalate	149	15.063	15.098	(1.084)	7193251	42.5125	42.5
57 Fluorene	166	15.226	15.245	(1.095)	6111162	42.6741	42.7
	166	15.570	15.245	(1.120)	193555	1.35159	1.4
58 4-Chlorophenyl phenyl ether	204	15.275	15.294	(1.099)	2816717	39.3232	39.3
59 4-Nitroaniline	138	15.308	15.343	(1.101)	747411	48.5218	48.5
	138	15.226	15.343	(1.095)	115104	7.47253	7.5
60 4,6-Dinitro-2-methylphenol	198	15.390	15.408	(0.880)	918371	39.7773	39.8
61 N-nitrosodiphenylamine	169	15.570	15.588	(0.891)	3579678	46.5874	46.6
	169	15.275	15.588	(0.874)	260893	3.39537	3.4
	169	15.799	15.588	(0.904)	38987	0.50739	0.51(a)
65 4-Bromophenyl phenyl ether	248	16.437	16.455	(0.940)	1775304	45.9367	45.9
66 Hexachlorobenzene	284	16.535	16.553	(0.946)	2195636	44.5994	44.6
68 Pentachlorophenol	266	17.042	17.044	(0.975)	1161975	43.8862	43.9
72 Phenanthrene	178	17.533	17.551	(1.003)	8337692	51.1096	51.1
	178	17.647	17.551	(1.009)	7661936	46.9673	47.0
73 Anthracene	178	17.647	17.666	(1.009)	7661936	48.3534	48.4
	178	17.533	17.666	(1.003)	8337692	52.6180	52.6
78 Di-n-butylphthalate	149	19.054	19.072	(1.090)	11296199	48.2208	48.2
80 Fluoranthene	202	20.395	20.414	(1.167)	8613371	51.8964	51.9
81 Pyrene	202	20.919	20.937	(0.876)	8804239	43.8192	43.8
85 Butyl benzyl phthalate	149	22.669	22.687	(0.949)	5179569	42.8348	42.8
89 Benzo(a)Anthracene	228	23.830	23.849	(0.998)	6120070	37.8546	37.8
	228	23.928	23.849	(1.002)	6016701	37.2152	37.2
91 Chrysene	228	23.928	23.947	(1.002)	6020210	42.7813	42.8
	228	23.830	23.947	(0.998)	6120070	43.4909	43.5
91 bis(2-ethylhexyl)Phthalate	149	24.108	24.127	(1.010)	7156586	45.6112	45.6
94 Di-n-octyl phthalate	149	25.613	25.615	(0.947)	10648582	52.6180	52.6
95 Benzo(b)fluoranthene	252	26.251	26.269	(0.970)	4373201	35.4228	35.4
	252	26.300	26.269	(0.972)	4346362	35.2054	35.2
96 Benzo(k)fluoranthene	252	26.300	26.335	(0.972)	4348570	39.8469	39.8
	252	26.251	26.335	(0.970)	4373201	40.0726	40.1
97 Benzo(e)pyrene	252	26.807	26.826	(0.991)	2031914	18.9222	18.9
	252	26.905	26.826	(0.995)	3494987	32.5470	32.5
	252	27.052	26.826	(1.000)	139160	1.29593	1.3
98 Benzo(a)pyrene	252	26.905	26.940	(0.995)	3494987	37.6200	37.6
	252	26.807	26.940	(0.991)	2031914	21.8715	21.9
	252	27.052	26.940	(1.000)	139160	1.49792	1.5
103 Indeno(1,2,3-cd)pyrene	276	29.490	29.524	(1.090)	2231893	35.4894	35.5
	276	29.571	29.524	(1.093)	502489	7.99010	8.0
104 Dibenzo(a,h)anthracene	278	29.571	29.590	(1.093)	2027151	36.8628	36.9
105 Benzo(g,h,i)perylene	276	30.226	30.261	(1.117)	2441610	37.2169	37.2

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01150601011.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: jgh
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80ng ISTD 267-91-1

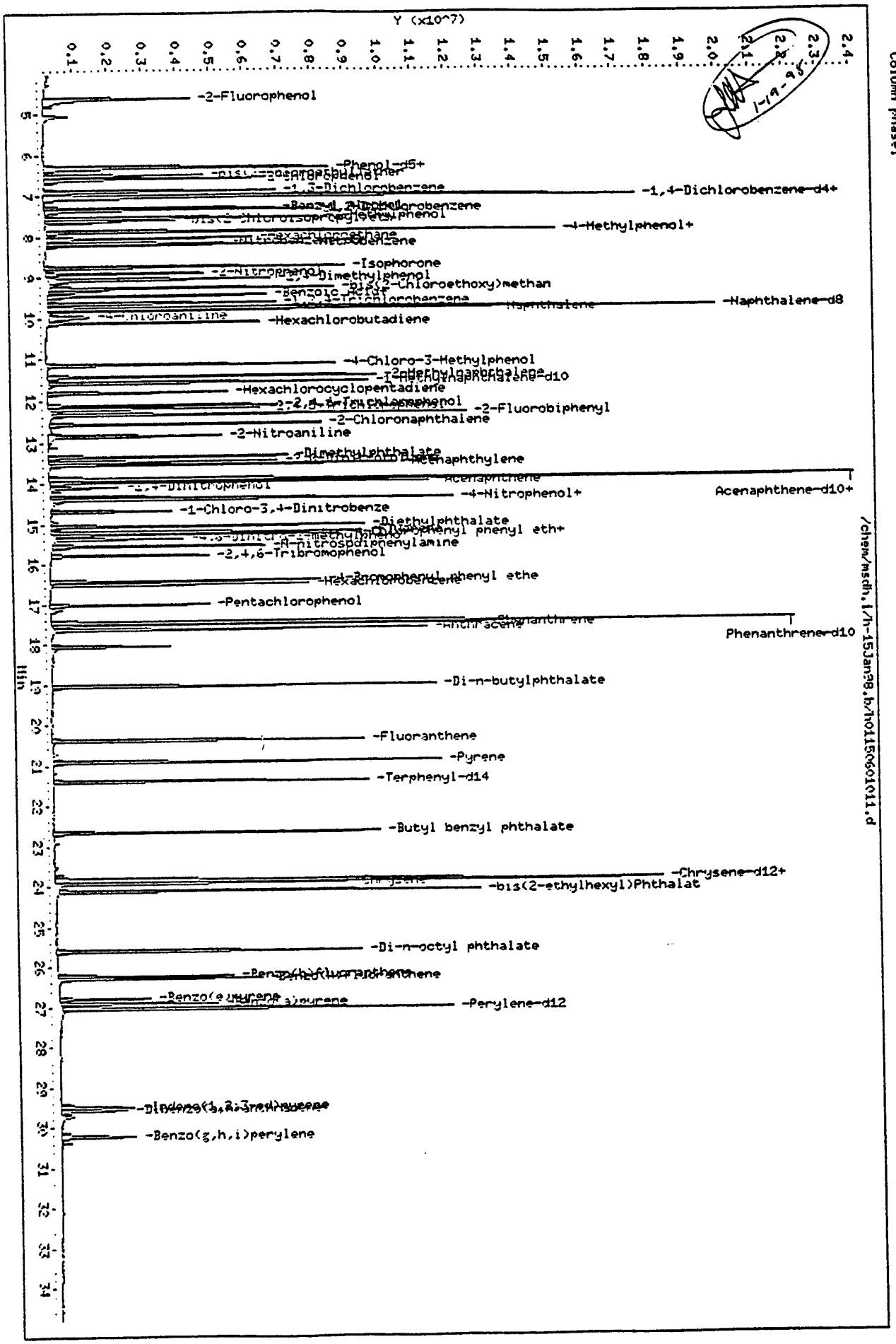
Calibration Date: JAN/15/98
Calibration Time: 1501

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	10654771	5327386	21309542	10490610	-1.54
27 Naphthalene-d8	16919358	8459679	33838716	18216614	7.67
47 Acenaphthene-d10	12271905	6135952	24543810	13211902	7.66
71 Phenanthrene-d10	19162935	9581468	38325870	17296004	-9.74
90 Chrysene-d12	16491029	8245514	32982058	16439399	-0.31
99 Perylene-d12	9979847	4989924	19959694	10216403	2.37

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.02	6.52	7.52	7.02	-0.03
27 Naphthalene-d8	9.78	9.28	10.28	9.76	-0.19
47 Acenaphthene-d10	13.92	13.42	14.42	13.90	-0.13
71 Phenanthrene-d10	17.49	16.99	17.99	17.48	-0.01
90 Chrysene-d12	23.90	23.40	24.40	23.88	-0.08
99 Perylene-d12	27.05	26.55	27.55	27.05	-0.01

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.



Date : 15-JAN-1998 14:18

Client ID:

Sample Info: 1.0ul 40ug SID 336-4-40

Volume Injected (uL): 1.0

Column phase:

Instrument: msdh.i

Operator: jeh

Column diameter: 2.00

385A

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150701012.d
Lab Smp Id:
Inj Date : 15-JAN-1998 15:01
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 80ug STD 396-4-80
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 16:39 m Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

1-14-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

					CONCENTRATIONS ON-COL (NG)	FINAL (ug)		
RT	EXP RT	(REL RT)	MASS	RESPONSE			TARGET RANGE	RATIO
7 1,4-Dichlorobenzene-d4						CAS #: 3855-82-1		
7.017	7.021	(1.000)	150	10654269	80.0000		80.00- 120.00	100.00
7.017	7.021	(1.000)	152	6184817			0.00-10058.51	58.05
7.017	7.021	(1.000)	115	4018534			0.00-10037.59	37.72
27 Naphthalene-d8						CAS #: 1146-65-2		
9.782	9.769	(1.000)	136	16919358	80.0000		80.00- 120.00	100.00
9.765	9.769	(1.000)	68	1191600			0.00-10006.78	7.04
47 Acenaphthene-d10						CAS #: 15067-26-2		
12.920	13.907	(1.000)	164	12271905	80.0000		80.00- 120.00	100.00
12.920	13.907	(1.000)	162	11733918			0.00-10094.94	95.62
12.920	13.907	(1.000)	160	5020942			0.00-10041.02	40.91

	RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
*	71 Phenanthrene-d10						CAS #: 1517-22-2	
	17.486	17.489 (1.000)	188	19162935	80.0000		80.00- 120.00	100.00
	17.486	17.489 (1.000)	94	2677925			0.00-10014.44	13.97
	17.486	17.489 (1.000)	80	2563539			0.00-10015.28	13.38
*	90 Chrysene-d12						CAS #: 1719-03-5	
	23.898	23.885 (1.000)	240	16491029	80.0000		80.00- 120.00	100.00
	23.898	23.885 (1.000)	236	4265299			0.00-10026.00	25.86
	23.881	23.885 (1.000)	120	2859741			0.00-10018.11	17.34
*	99 Perylene-d12						CAS #: 1520-96-3	
	27.055	27.058 (1.000)	264	9979847	80.0000		80.00- 120.00	100.00
	27.055	27.058 (1.000)	260	2204255			0.00-10021.95	22.09
	27.055	27.058 (1.000)	265	2081006			0.00-10020.90	20.85
:	1 2-Fluorophenol						CAS #: 367-12-4	
	4.645	4.649 (0.662)	112	8259940	81.1740	81.2	80.00- 120.00	100.00
	4.645	4.649 (0.662)	64	3846618			0.00-10046.11	46.57
	4.645	4.649 (0.662)	92	1613198			0.00-10019.15	19.53
:	2 Phenol-d5						CAS #: 4165-62-2	
	6.314	6.317 (0.645)	99	9636747	82.7580	82.8	80.00- 120.00	100.00
	6.314	6.317 (0.645)	71	2820045			0.00-10029.73	29.26
:	17 Nitrobenzene-d5						CAS #: 4165-60-0	
	8.179	8.182 (0.588)	82	8163772	83.0844	83.1	80.00- 120.00	100.00
	8.179	8.182 (0.588)	54	4271595			0.00-10052.46	52.32
	8.179	8.182 (0.588)	128	3880856			0.00-10049.58	47.54
:	62 2,4,6-Tribromophenol						CAS #: 118-79-6	
	15.817	15.804 (0.662)	330	2794366	84.9757	85.0	80.00- 120.00	100.00
	15.817	15.804 (0.662)	332	2703265			0.00-10096.28	96.74
	15.801	15.804 (0.661)	141	777721			0.00-10029.68	27.83
:	82 Terphenyl-d14						CAS #: 98904-43-9	
	21.411	21.415 (0.896)	244	12956839	89.7586	89.8	80.00- 120.00	100.00
	21.411	21.415 (0.896)	122	2073493			0.00-10016.35	16.00
	21.411	21.415 (0.896)	212	768333			0.00-10005.98	5.93
:	38 2-Fluorobiphenyl						CAS #: 321-60-8	
	12.350	12.337 (0.706)	172	12817569	87.7604	87.8	80.00- 120.00	100.00
	12.350	12.337 (0.706)	171	4404416			0.00-10033.81	34.36
:	34 1-Methylnaphthalene-d10						CAS #: 38072-94-5	
	11.581	11.584 (1.184)	152	9086711	81.2665	81.3	80.00- 120.00	100.00
	11.581	11.584 (1.184)	122	3645408			0.00-10038.76	40.12

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
11.581	11.584	(1.184)	150	7707065			0.00-10084.36	84.82
3 Phenol						CAS #: 108-95-2		
6.347	6.350	(0.904)	94	9791034	83.6769	83.7	80.00- 120.00	100.00
6.347	6.350	(0.904)	66	3604890			0.00-10037.29	36.82
6.347	6.350	(0.904)	65	2437137			0.00-10025.14	24.89
4 bis(2-Chloroethyl)ether						CAS #: 111-44-4		
6.510	6.514	(0.928)	93	7561007	79.6263	79.6	80.00- 120.00	100.00
6.510	6.514	(0.928)	63	4689562			0.00-10062.92	62.02
6.510	6.514	(0.928)	95	2359744			0.00-10031.42	31.21
5 2-Chlorophenol						CAS #: 95-57-8		
6.592	6.595	(0.939)	128	7404165	83.6384	83.6	80.00- 120.00	100.00
6.592	6.595	(0.939)	130	2329611			0.00-10030.89	31.46
6.592	6.595	(0.939)	64	3095826			0.00-10041.15	41.81
6 1,3-Dichlorobenzene						CAS #: 541-73-1		
6.903	6.890	(0.984)	146	7126563	80.5805	80.6	80.00- 120.00	100.00
6.903	6.890	(0.984)	148	4473830			0.00-10063.24	62.78
6.886	6.890	(0.981)	113	991025			0.00-10013.88	13.91
9 1,4-Dichlorobenzene						CAS #: 106-46-7		
7.050	7.053	(1.005)	146	7622195	83.1925	83.2	80.00- 120.00	100.00
7.050	7.053	(1.005)	148	4772045			0.00-10063.27	62.61
7.050	7.053	(1.005)	113	1246172			0.00-10016.16	16.35
10 Benzyl Alcohol						CAS #: 100-51-6		
7.328	7.315	(1.044)	108	4972004	87.3878	87.4	80.00- 120.00	100.00
7.328	7.315	(1.044)	79	5912826			0.00-10116.61	118.92
7.328	7.315	(1.044)	77	3787057			0.00-10078.86	75.17
11 1,2-Dichlorobenzene						CAS #: 95-50-1		
7.344	7.348	(1.047)	146	6624903	79.9749	80.0	80.00- 120.00	100.00
7.344	7.348	(1.047)	148	4144713			0.00-10063.46	62.56
7.344	7.348	(1.047)	113	940926			0.00-10014.38	14.20
12 2-Methylphenol						CAS #: 95-48-7		
7.557	7.560	(1.077)	108	6721727	81.3962	81.4	80.00- 120.00	100.00
7.557	7.560	(1.077)	107	5805621			0.00-10086.18	86.37
7.557	7.560	(1.077)	79	3572515			0.00-10041.55	53.15
13 bis(2-Chloroisopropyl)ether						CAS #: 108-60-1		
7.606	7.609	(1.084)	45	9867572	79.4024	79.4	80.00- 120.00	100.00
7.606	7.609	(1.084)	121	1922590	81.2025	81.2	0.00-10020.26	19.48

34 1-Methylnaphthalene-d10 (continued)

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
14 4-Methylphenol						CAS #: 106-44-5	
7.901	7.904 (1.126)	108	6329320	79.9688	80.0	80.00- 120.00	100.00
7.901	7.904 (1.126)	107	7708034			0.00-10122.08	121.78
7.901	7.904 (1.126)	79	1508533			0.00-10025.12	23.83
15 N-Nitrosodipropylamine						CAS #: 621-64-7	
7.901	7.904 (1.126)	70	3925996	77.1343	77.1	80.00- 120.00	100.00(H)
7.901	7.904 (1.126)	130	1014957			0.00-10026.33	25.85
7.901	7.904 (1.126)	101	479927			0.00-10012.19	12.22
16 Hexachloroethane						CAS #: 67-72-1	
8.048	8.051 (1.147)	117	3211361	82.1011	82.1	80.00- 120.00	100.00
8.048	8.051 (1.147)	201	2229666			0.00-10068.38	69.43
8.048	8.051 (1.147)	199	1385253			0.00-10041.83	43.14
18 Nitrobenzene						CAS #: 98-95-3	
8.228	8.231 (0.841)	77	7017465	82.6672	82.7	80.00- 120.00	100.00
8.228	8.231 (0.841)	123	3681102			0.00-10053.45	52.46
8.228	8.231 (0.841)	65	941014			0.00-10013.89	13.41
19 Isophorone						CAS #: 78-59-1	
8.767	8.771 (0.896)	82	14988604	82.5597	82.6	80.00- 120.00	100.00
8.784	8.771 (0.898)	138	2114779			0.00-10014.70	14.11
8.784	8.771 (0.898)	95	842890			0.00-10005.51	5.62
20 2-Nitrophenol						CAS #: 88-75-5	
8.915	8.918 (0.911)	139	3954787	86.3841	86.4	80.00- 120.00	100.00
8.915	8.918 (0.911)	65	1664093			0.00-10042.96	42.08
8.915	8.918 (0.911)	109	1031231			0.00-10026.21	26.08
21 2,4-Dimethylphenol						CAS #: 105-67-9	
9.062	9.065 (0.926)	122	5193962	82.6574	82.6	80.00- 120.00	100.00
9.062	9.065 (0.926)	107	6273693			0.00-10123.86	120.79
9.062	9.065 (0.926)	121	2854039			0.00-10055.27	54.95
23 bis(2-Chloroethoxy)methane						CAS #: 111-91-1	
9.291	9.294 (0.950)	93	8826732	80.9060	80.9	80.00- 120.00	100.00
9.291	9.294 (0.950)	123	893285			0.00-10010.88	10.12
9.291	9.294 (0.950)	95	2721076			0.00-10031.15	30.83
24 Benzoic Acid						CAS #: 65-85-0	
9.454	9.441 (0.967)	122	3878499	89.2220	89.2	80.00- 120.00	100.00(H)
9.454	9.441 (0.967)	105	5083607			0.00-10123.32	131.07
9.454	9.441 (0.967)	77	3355553			0.00-10081.55	86.52
25 2,4-Dichlorophenol						CAS #: 120-83-2	
9.471	9.474 (0.968)	162	5165136	86.8420	86.8	80.00- 120.00	100.00

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
25 2,4-Dichlorophenol (continued)							
9.471	9.474 (0.968)	164	3244136			0.00-10063.52	62.81
9.471	9.474 (0.968)	98	1965698			0.00-10039.12	38.06
26 1,2,4-Trichlorobenzene						CAS #: 120-82-1	
9.651	9.654 (0.987)	180	5567441	82.7212	82.7	80.00- 120.00	100.00
9.651	9.654 (0.987)	182	5330275			0.00-10096.20	95.74
9.651	9.654 (0.987)	145	1594842			0.00-10028.68	28.65
28 Naphthalene						CAS #: 91-20-3	
9.814	9.818 (1.003)	128	14768369	70.7167	70.7	80.00- 120.00	100.00
9.814	9.818 (1.003)	129	1950482			0.00-10013.27	13.21
9.814	9.818 (1.003)	127	2355191			0.00-10013.22	15.95
29 4-Chloroaniline						CAS #: 106-47-8	
10.011	10.014 (1.023)	127	2342013	44.9904	45.0	80.00- 120.00	100.00(H)
10.011	9.965 (1.023)	129	756245			0.00-10010.59	32.29
30 Hexachlorobutadiene						CAS #: 87-68-3	
10.125	10.128 (1.035)	225	3042636	83.5347	83.5	80.00- 120.00	100.00
10.125	10.128 (1.035)	223	1909453			0.00-10061.71	62.76
10.125	10.128 (1.035)	227	1912355			0.00-10063.44	62.85
32 4-Chloro-3-Methylphenol						CAS #: 59-50-7	
11.156	11.159 (1.140)	107	5924920	87.8194	87.8	80.00- 120.00	100.00
11.156	11.159 (1.140)	142	4353651			0.00-10073.71	73.48
11.156	11.159 (1.140)	144	1390344			0.00-10023.72	23.47
33 2-Methylnaphthalene						CAS #: 91-57-6	
11.434	11.437 (1.169)	142	10685708	80.8577	80.8	80.00- 120.00	100.00
11.434	11.437 (1.169)	141	9480903			0.00-10090.11	88.73
35 Hexachlorocyclopentadiene						CAS #: 77-47-4	
11.810	11.813 (0.848)	237	2782558	86.7930	86.8	80.00- 120.00	100.00
11.810	11.813 (0.848)	272	410190			0.00-10014.73	14.74
11.810	11.813 (0.848)	235	1713437			0.00-10061.71	61.58
36 2,4,6-Trichlorophenol						CAS #: 88-06-2	
12.121	12.124 (0.871)	196	3582679	86.4311	86.4	80.00- 120.00	100.00
12.121	12.124 (0.871)	198	3371805			0.00-10094.84	94.11
12.121	12.124 (0.871)	200	1054742			0.00-10030.07	29.44
37 2,4,5-Trichlorophenol						CAS #: 95-95-4	
12.202	12.206 (0.877)	196	3597240	87.6574	87.6	80.00- 120.00	100.00
12.202	12.206 (0.877)	198	2358781			0.00-10095.07	93.37
12.202	12.206 (0.877)	200	1065341			0.00-10030.67	29.62

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
39 2-Chloronaphthalene							CAS #: 91-58-7	
12.579	12.582	(0.904)	162	10045885	83.2031	83.2	80.00- 120.00	100.00
12.579	12.582	(0.904)	164	3150973			0.00-10031.20	31.37
12.579	12.582	(0.904)	127	3830491			0.00-10038.71	38.13
40 2-Nitroaniline							CAS #: 88-74-4	
12.873	12.860	(0.925)	65	3458050	89.6356	89.6	80.00- 120.00	100.00
12.873	12.876	(0.925)	138	4483821			0.00-10127.72	129.66
12.873	12.860	(0.925)	92	2534379			0.00-10073.86	73.29
41 3-Nitroaniline							CAS #: 99-09-2	
13.871	13.874	(0.996)	138	672324	49.5712	49.6	80.00- 120.00	100.00
13.871	13.874	(0.996)	92	778971			0.00-10120.29	115.86
13.920	13.907	(1.000)	108	375385			0.00-10080.06	55.83
43 Dimethylphthalate							CAS #: 131-11-3	
13.380	13.367	(0.961)	163	13020061	85.8341	85.8	80.00- 120.00	100.00
13.380	13.367	(0.961)	194	654054			0.00-10005.16	5.02
13.364	13.367	(0.960)	164	1223517			0.00-10009.58	9.40
45 2,6-Dinitrotoluene							CAS #: 606-20-2	
13.495	13.498	(0.969)	165	2844037	87.1358	87.1	80.00- 120.00	100.00
13.495	13.498	(0.969)	89	1757226			0.00-10059.87	61.79
13.495	13.498	(0.969)	121	633324			0.00-10022.31	22.27
46 Acenaphthylene							CAS #: 208-96-8	
13.560	13.563	(0.974)	152	14194114	75.8573	75.8	80.00- 120.00	100.00
13.560	13.563	(0.974)	151	3335125			0.00-10023.78	23.50
13.560	13.563	(0.974)	153	2123590			0.00-10015.23	14.96
48 Acenaphthene							CAS #: 83-32-9	
13.985	13.989	(1.005)	154	9869573	84.3305	84.3	80.00- 120.00	100.00
13.985	13.989	(1.005)	152	4909339			0.00-10049.54	49.74
13.985	13.989	(1.005)	153	10687065			0.00-10106.26	108.28
49 2,4-Dinitrophenol							CAS #: 51-28-5	
14.116	14.120	(1.014)	184	1377087	89.0215	89.0	80.00- 120.00	100.00
14.116	14.103	(1.014)	63	881323			0.00-10058.68	64.00
14.116	14.120	(1.014)	154	626365			0.00-10038.31	45.48
50 4-Nitrophenol							CAS #: 100-02-7	
14.362	14.349	(1.032)	109	1546628	86.8164	86.8	80.00- 120.00	100.00(H)
14.362	14.349	(1.032)	139	2736176			0.00-10155.17	176.91
14.345	14.349	(1.031)	65	1955068			0.00-10133.38	126.41
51 Dibenzofuran							CAS #: 132-64-9	
14.411	14.414	(1.035)	168	12537477	77.1360	77.1	80.00- 120.00	100.00

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
51 Dibenzofuran (continued)							
14.411	14.414 (1.035)	139	5020226			0.00-10038.83	40.34
52 2,4-Dinitrotoluene					CAS #: 121-14-2		
14.443	14.447 (1.038)	165	3999607	85.3797	85.4	80.00- 120.00	100.00
14.443	14.430 (1.038)	63	2841681			0.00-10063.54	71.05
14.443	14.447 (1.038)	182	188447			0.00-10004.86	4.71
53 1-Chloro-3,4-Dinitrobenzene					CAS #:		
14.721	14.708 (1.505)	63	2031837	95.8232	95.8	80.00- 120.00	100.00(H)
14.721	14.708 (1.505)	75	1628402			0.00-10081.72	80.14
14.721	14.725 (1.505)	202	1118960			0.00-10054.68	55.07
56 Diethylphthalate					CAS #: 84-66-2		
15.098	15.085 (1.085)	149	14176561	90.2019	90.2	80.00- 120.00	100.00
15.098	15.085 (1.085)	177	2726208			0.00-10019.67	19.23
15.098	15.085 (1.085)	150	1598191			0.00-10011.54	11.27
57 Fluorene					CAS #: 86-73-7		
15.245	15.232 (1.095)	166	12005658	90.2569	90.2	80.00- 120.00	100.00
15.245	15.232 (1.095)	165	11116755			0.00-10093.28	92.60
15.228	15.232 (1.094)	167	1522069			0.00-10012.75	12.68
58 4-Chlorophenyl phenyl ether					CAS #: 7005-72-3		
15.294	15.281 (1.099)	204	5593921	84.0766	84.1	80.00- 120.00	100.00
15.294	15.281 (1.099)	206	1801581			0.00-10032.44	32.21
15.278	15.281 (1.098)	141	3086417			0.00-10053.60	55.17
59 4-Nitroaniline					CAS #: 100-01-6		
15.343	15.330 (1.102)	138	1149593	80.3479	80.3	80.00- 120.00	100.00
15.343	15.330 (1.102)	92	390451			0.00-10032.69	33.96
15.343	15.330 (1.102)	108	778664			0.00-10073.68	67.73
60 4,6-Dinitro-2-methylphenol					CAS #: 534-52-1		
15.408	15.412 (0.881)	198	2257946	88.2702	88.3	80.00- 120.00	100.00
15.408	15.412 (0.881)	121	764295			0.00-10036.17	33.85
15.408	15.412 (0.881)	51	1123365			0.00-10054.03	49.75
61 N-nitrosodiphenylamine					CAS #: 86-30-6		
15.588	15.575 (0.891)	169	6303859	74.0482	74.0	80.00- 120.00	100.00
15.588	15.575 (0.891)	168	4138814			0.00-10066.04	65.66
15.588	15.575 (0.891)	167	2242319			0.00-10035.43	35.57
65 4-Bromophenyl phenyl ether					CAS #: 101-55-3		
16.455	16.459 (0.941)	248	3540127	82.6779	82.7	80.00- 120.00	100.00
16.455	16.459 (0.941)	250	3423275			0.00-10096.59	96.70

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
65 4-Bromophenyl phenyl ether (continued)								
16.455	16.459	(0.941)	141	2230747			0.00-10065.11	63.01
66 Hexachlorobenzene						CAS #: 118-74-1		
16.553	16.540	(0.947)	284	4530309	83.0578	83.0	80.00- 120.00	100.00
16.553	16.540	(0.947)	142	1503704			0.00-10033.27	33.19
16.553	16.540	(0.947)	249	1104049			0.00-10024.51	24.37
68 Pentachlorophenol						CAS #: 87-86-5		
17.044	17.047	(0.975)	266	2679035	91.3258	91.3	80.00- 120.00	100.00
17.044	17.047	(0.975)	264	1683758			0.00-10062.05	62.85
17.044	17.047	(0.975)	268	1694466			0.00-10063.81	63.25
72 Phenanthrene						CAS #: 85-01-8		
17.551	17.538	(1.004)	178	13532621	74.8725	74.9	80.00- 120.00	100.00
17.551	17.538	(1.004)	176	2994197			0.00-10020.36	22.13
17.551	17.538	(1.004)	179	2432245			0.00-10016.57	17.97
73 Anthracene						CAS #: 120-12-7		
17.666	17.669	(1.010)	178	14317138	81.5509	81.6	80.00- 120.00	100.00
17.666	17.669	(1.010)	176	2752530			0.00-10019.61	19.23
17.666	17.669	(1.010)	179	2354638			0.00-10016.26	16.45
78 Di-n-butylphthalate						CAS #: 84-74-2		
19.372	19.359	(1.091)	149	15984616	61.5868	61.6	80.00- 120.00	100.00
19.372	19.359	(1.091)	150	2094089			0.00-10011.22	13.10
19.372	19.359	(1.091)	104	1293894			0.00-10006.82	8.09
80 Fluoranthene						CAS #: 206-44-0		
20.414	20.401	(1.167)	202	14931957	81.2015	81.2	80.00- 120.00	100.00
20.414	20.401	(1.167)	101	2872850			0.00-10017.87	19.24
20.414	20.401	(1.167)	100	2174153			0.00-10013.24	14.56
81 Pyrene						CAS #: 129-00-0		
20.937	20.940	(0.876)	202	16643421	82.5759	82.6	80.00- 120.00	100.00
20.937	20.940	(0.876)	101	3478436			0.00-10022.30	20.90
20.937	20.940	(0.876)	100	2798405			0.00-10017.69	16.81
85 Butyl benzyl phthalate						CAS #: 85-68-7		
22.687	22.674	(0.949)	149	10429165	85.9787	86.0	80.00- 120.00	100.00
22.671	22.674	(0.949)	91	7588359			0.00-10073.35	72.76
22.687	22.674	(0.949)	206	1636235			0.00-10015.36	15.69
89 Benzo(a)Anthracene						CAS #: 56-55-3		
23.849	23.836	(0.998)	228	13357651	82.3626	82.4	80.00- 120.00	100.00
23.849	23.836	(0.998)	229	2526259			0.00-10018.92	18.91

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
89 Benzo(a)Anthracene (continued)							
23.849	23.836 (0.998)	226	3455275			0.00-10025.91	25.87
91 Chrysene					CAS #: 218-01-9		
23.947	23.950 (1.002)	228	11616017	82.2882	82.3	80.00- 120.00	100.00
23.947	23.950 (1.002)	226	3373626			0.00-10028.14	29.04
23.947	23.950 (1.002)	229	2270042			0.00-10018.65	19.54
93 bis(2-ethylhexyl)Phthalate					CAS #: 117-81-7		
24.127	24.130 (1.010)	149	12994297	82.5575	82.6	80.00- 120.00	100.00
24.127	24.130 (1.010)	167	3944161			0.00-10027.97	30.35
24.127	24.130 (1.010)	279	788114			0.00-10005.78	6.07
94 Di-n-octyl phthalate					CAS #: 117-84-0		
25.615	25.619 (0.947)	149	16848398	85.2267	85.2	80.00- 120.00	100.00
25.615	25.619 (0.947)	150	1960354			0.00-10011.28	11.64
95 Benzo(b)fluoranthene					CAS #: 205-99-2		
26.269	26.273 (0.971)	252	10910323	90.4679	90.5	80.00- 120.00	100.00
26.269	26.273 (0.971)	253	2323213			0.00-10021.18	21.29
26.269	26.256 (0.971)	125	1748868			0.00-10017.89	16.03
96 Benzo(k)fluoranthene					CAS #: 207-08-9		
26.335	26.322 (0.973)	252	9264281	86.9027	86.9	80.00- 120.00	100.00
26.335	26.322 (0.973)	253	1936312			0.00-10020.93	20.90
26.335	26.322 (0.973)	125	1731653			0.00-10016.09	18.69
97 Benzo(e)pyrene					CAS #:		
26.826	26.813 (0.992)	252	4510678	43.0013	43.0	80.00- 120.00	100.00
26.809	26.813 (0.991)	125	1171291			0.00-10027.28	25.97
26.826	26.813 (0.992)	250	1243696			0.00-10027.55	27.57
98 Benzo(a)pyrene					CAS #: 50-32-8		
26.940	26.927 (0.996)	252	8046172	88.6619	88.7	80.00- 120.00	100.00
26.940	26.927 (0.996)	253	1703498			0.00-10021.09	21.17
26.924	26.927 (0.995)	125	1542448			0.00-10021.00	19.17
103 Indeno(1,2,3-cd)pyrene					CAS #: 193-39-5		
29.524	29.528 (1.091)	276	5213130	84.8591	84.8	80.00- 120.00	100.00
29.524	29.528 (1.091)	138	1876286			0.00-10035.87	35.99
29.524	29.528 (1.091)	227	5063			0.00-10000.11	0.10
104 Dibenzo(a,h)anthracene					CAS #: 53-70-3		
29.590	29.593 (1.094)	278	4549998	84.7009	84.7	80.00- 120.00	100.00
29.590	29.593 (1.094)	279	1031227			0.00-10022.59	22.66
29.590	29.593 (1.094)	139	1185674			0.00-10027.37	26.06

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
105 Benzo(g,h,i)perylene						CAS #: 191-24-2		
30.261	30.264	(1.119)	276	5196130	81.0807	81.1	80.00- 120.00	100.00
30.261	30.264	(1.119)	138	2018576			0.00-10038.50	38.85
30.261	30.264	(1.119)	277	1177235			0.00-10023.39	22.66

QC Flag Legend

H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150701012.d
Lab Smp Id:
Inj Date : 15-JAN-1998 15:01
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 80ug STD 396-4-80
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 17:51 jheffel Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
* 7 1,4-Dichlorobenzene-d4	150	7.017	7.017	(1.000)	10654269	80.0000	
	150	6.576	7.017	(1.000)	193	80.0000	
	150	6.657	7.017	(1.000)	494	80.0000	
	150	6.755	7.017	(1.000)	882	80.0000	
	150	7.344	7.017	(1.000)	652490	80.0000	
* 27 Naphthalene-d8	136	9.782	9.782	(1.000)	16919358	80.0000	
	136	9.471	9.782	(1.000)	30236	80.0000	
	136	9.585	9.782	(1.000)	299	80.0000	
* 47 Acenaphthene-d10	164	13.920	13.920	(1.000)	12271905	80.0000	
	164	13.527	13.920	(1.000)	3647	80.0000	
* 71 Phenanthrene-d10	188	17.486	17.486	(1.000)	19162935	80.0000	
	188	17.044	17.486	(1.000)	1996	80.0000	
	188	17.209	17.486	(1.000)	776	80.0000	
	188	17.175	17.486	(1.000)	1697	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	188	17.355	17.486	(1.000)	406	80.0000	
* 90 Chrysene-d12	240	23.898	23.898	(1.000)	16491029	80.0000	
	240	23.472	23.898	(1.000)	1386	80.0000	
	240	23.521	23.898	(1.000)	784	80.0000	
	240	23.620	23.898	(1.000)	887	80.0000	
	240	23.718	23.898	(1.000)	1964	80.0000	
* 99 Perylene-d12	264	27.055	27.055	(1.000)	9979847	80.0000	
	264	26.629	27.055	(1.000)	1438	80.0000	
	264	26.760	27.055	(1.000)	1067	80.0000	
	264	26.826	27.055	(1.000)	634	80.0000	
S 1 2-Fluorophenol	112	4.645	4.645	(0.662)	8259940	81.1740	81.2
S 2 Phenol-d5	99	6.314	6.314	(0.645)	9636747	82.7580	82.8
	99	6.592	6.314	(0.674)	411887	3.53718	3.5(R)
S 17 Nitrobenzene-d5	82	8.179	8.179	(0.588)	8163772	83.0844	83.1
S 62 2,4,6-Tribromophenol	330	15.817	15.817	(0.662)	2794366	84.9757	85.0
S 32 Terphenyl-d14	244	21.411	21.411	(0.896)	12956839	89.7586	89.8
S 38 2-Fluorobiphenyl	172	12.350	12.350	(0.706)	12817569	87.7604	87.8
S 34 1-Methylnaphthalene-d10	152	11.581	11.581	(1.184)	9086711	81.2665	81.3
3 Phenol	94	6.347	6.347	(0.904)	9791034	83.6769	83.7
	94	6.510	6.347	(0.928)	294103	2.51349	2.5(a)
4 bis(2-Chloroethyl)ether	93	6.510	6.510	(0.928)	7561007	79.6263	79.6
	93	6.347	6.510	(0.904)	184388	1.94182	1.9
5 2-Chlorophenol	128	6.592	6.592	(0.939)	7404165	83.6384	* 83.6
6 1,3-Dichlorobenzene	146	6.903	6.903	(0.984)	7126563	80.5805	80.6
	146	7.050	6.903	(1.005)	7623240	86.1964	86.2
9 1,4-Dichlorobenzene	146	7.050	7.050	(1.005)	7633307	83.3137	83.3
	146	6.903	7.050	(0.984)	7122536	77.7389	77.7
10 Benzyl Alcohol	108	7.328	7.328	(1.044)	4972004	87.3878	87.4
	108	6.886	7.328	(0.981)	56864	0.99944	1.00(a)
	108	7.050	7.328	(1.005)	83245	1.46311	1.5(a)
	108	7.557	7.328	(1.077)	6721727	118.141	118
11 1,2-Dichlorobenzene	146	7.344	7.344	(1.047)	6624903	79.9749	80.0
	146	6.903	7.344	(0.984)	7089631	85.5850	85.6
	146	7.050	7.344	(1.005)	7617308	91.9550	92.0
12 2-Methylphenol	108	7.557	7.557	(1.077)	6721727	81.3962	81.4
	108	7.328	7.557	(1.044)	4972004	60.2081	60.2
	108	7.901	7.557	(1.126)	6209771	75.1967	75.2
13 bis(2-Chloroisopropyl)ether	45	7.606	7.606	(1.084)	9879652	79.4996	79.5
14 4-Methylphenol	108	7.901	7.901	(1.126)	6235357	78.7816	78.8
15 N-Nitrosodipropylamine	70	7.901	7.901	(1.126)	3925996	77.1343	77.1
	70	8.048	7.901	(1.147)	42090	0.82695	0.83(a)
	70	8.179	7.901	(1.165)	1042286	20.4779	20.5
16 Hexachloroethane	117	8.048	8.048	(1.147)	3211361	82.1011	82.1
18 Nitrobenzene	77	8.228	8.228	(0.841)	7017465	82.6672	82.7
	77	7.901	8.228	(0.808)	2114848	24.9133	24.9
19 Isophorone	82	8.767	8.767	(0.896)	14988604	82.5597	82.6
	82	8.915	8.767	(0.911)	154366	0.85027	0.85(a)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
20 2-Nitrophenol	139	8.915	8.915	(0.911)	3954787	86.3841	86.4
	139	8.784	8.915	(0.898)	206082	4.50144	4.5(a)
21 2,4-Dimethylphenol	122	9.062	9.062	(0.926)	5193962	82.6574	82.6
	122	8.915	9.062	(0.911)	209909	3.34052	3.3(a)
23 bis(2-Chloroethoxy)methane	93	9.291	9.291	(0.950)	8826732	80.9060	80.9
	93	8.915	9.291	(0.911)	380037	3.48343	3.5
	93	9.062	9.291	(0.926)	195440	1.79141	1.8
24 Benzoic Acid	122	9.454	9.454	(0.967)	4125310	94.8998	94.9
	122	9.062	9.454	(0.926)	5193962	119.483	119
	122	9.503	9.454	(0.972)	102422	2.35614	2.4(a)
	122	9.814	9.454	(1.003)	55879	1.28546	1.3(a)
25 2,4-Dichlorophenol	162	9.471	9.471	(0.968)	5165136	86.8420	86.8
26 1,2,4-Trichlorobenzene	180	9.651	9.651	(0.987)	5567441	82.7212	82.7
28 Naphthalene	128	9.814	9.814	(1.003)	14768369	70.7167	70.7
	128	9.471	9.814	(0.968)	192387	0.92122	0.92(a)
29 4-Chloroaniline	127	9.814	10.011	(1.003)	2355191	45.2435	45.2
	127	10.011	10.011	(1.023)	2342013	44.9904	45.0
30 Hexachlorobutadiene	225	10.125	10.125	(1.035)	3042636	83.5347	83.5
	225	9.765	10.125	(0.998)	40524	1.11257	1.1
32 4-Chloro-3-Methylphenol	107	11.156	11.156	(1.140)	5924920	87.8194	87.8
33 2-Methylnaphthalene	142	11.434	11.434	(1.169)	10685708	80.8577	80.8
	142	11.156	11.434	(1.140)	4353651	32.9436	32.9
	142	11.646	11.434	(1.191)	129474	0.97972	0.98(a)
35 Hexachlorocyclopentadiene	237	11.810	11.810	(0.848)	2782558	86.7930	86.8
36 2,4,6-Trichlorophenol	196	12.121	12.121	(0.871)	3582679	86.4311	86.4
	196	12.202	12.121	(0.877)	3597240	86.7824	86.8
37 2,4,5-Trichlorophenol	196	12.202	12.202	(0.877)	3597240	87.6574	87.6
	196	12.121	12.202	(0.871)	3582679	87.3026	87.3
39 2-Chloronaphthalene	162	12.579	12.579	(0.904)	10045885	83.2031	83.2
	162	12.202	12.579	(0.877)	95416	0.79026	0.79(a)
40 2-Nitroaniline	65	12.873	12.873	(0.925)	3458050	89.6356	89.6
41 3-Nitroaniline	138	13.871	13.871	(0.996)	672324	49.5712	49.6
	138	14.116	13.871	(1.014)	56001	4.12902	4.1
43 Dimethylphthalate	163	13.380	13.380	(0.961)	13020061	85.8341	85.8
45 2,6-Dinitrotoluene	165	13.495	13.495	(0.969)	2844037	87.1358	87.1
	165	13.364	13.495	(0.960)	131842	4.03938	4.0
	165	13.920	13.495	(1.000)	1512283	46.3334	46.3
46 Acenaphthylene	152	13.560	13.560	(0.974)	14194114	75.8573	75.8
	152	13.985	13.560	(1.005)	4862343	25.9857	26.0
48 Acenaphthene	154	13.985	13.985	(1.005)	9869573	84.3305	84.3
	154	13.560	13.985	(0.974)	128540	1.09831	1.1(Q)
49 2,4-Dinitrophenol	184	14.116	14.116	(1.014)	1377087	89.0215	89.0
50 4-Nitrophenol	109	14.362	14.362	(1.032)	1546628	86.8164	86.8
	109	13.985	14.362	(1.005)	19825	1.11283	1.1(a)
	109	14.116	14.362	(1.014)	11857	0.66557	0.66(a)
	109	14.411	14.362	(1.035)	131385	7.37499	7.4
	109	14.721	14.362	(1.058)	76575	4.29836	4.3(a)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
51 Dibenzofuran	168	14.411	14.411	(1.035)	12537477	77.1360	77.1
52 2,4-Dinitrotoluene	165	14.443	14.443	(1.038)	1999607	85.3797	85.4
53 1-Chloro-3,4-Dinitrobenzene	63	14.721	14.721	(1.505)	2031837	95.8232	95.8
	63	14.345	14.721	(1.467)	722789	34.0874	34.1
	63	14.443	14.721	(1.477)	2837771	133.832	134
	63	14.509	14.721	(1.483)	67680	3.19185	3.2
	63	14.770	14.721	(1.510)	28210	1.33041	1.3
	63	14.967	14.721	(1.530)	105291	4.96562	5.0
	63	15.081	14.721	(1.542)	85114	4.01405	4.0
56 Diethylphthalate	149	15.098	15.098	(1.085)	14176561	90.2019	90.2
	149	15.278	15.098	(1.098)	92262	0.58704	0.59(a)
57 Fluorene	166	15.245	15.245	(1.095)	12005658	90.2569	90.2
	166	15.588	15.245	(1.120)	341720	2.56900	2.6
58 4-Chlorophenyl phenyl ether	204	15.294	15.294	(1.099)	5593921	84.0766	84.1
	204	14.983	15.294	(1.076)	34472	0.51811	0.52(a)
59 4-Nitroaniline	138	15.343	15.343	(1.102)	1149593	80.3479	80.3
	138	15.228	15.343	(1.094)	257604	18.0046	18.0
60 4,6-Dinitro-2-methylphenol	198	15.408	15.408	(0.881)	2257946	88.2702	88.3
61 N-nitrosodiphenylamine	169	15.588	15.588	(0.891)	6303859	74.0482	74.0
	169	15.801	15.588	(0.904)	69299	0.81402	0.81(a)
65 4-Bromophenyl phenyl ether	248	16.455	16.455	(0.941)	3540127	82.6779	82.7
	248	16.521	16.455	(0.945)	23506	0.54897	0.55(a)
66 Hexachlorobenzene	284	16.553	16.553	(0.947)	4530309	83.0578	83.0
68 Pentachlorophenol	266	17.044	17.044	(0.975)	2679035	91.3258	91.3
72 Phenanthrene	178	17.551	17.551	(1.004)	13532621	74.8725	74.9
	178	17.666	17.551	(1.010)	14317138	79.2130	79.2
73 Anthracene	178	17.666	17.666	(1.010)	14317138	81.5509	81.6
	178	17.551	17.666	(1.004)	13532621	77.0822	77.1
78 Di-n-butylphthalate	149	19.072	19.072	(1.091)	15984616	61.5868	61.6
80 Fluoranthene	202	20.414	20.414	(1.167)	14931957	81.2015	81.2
81 Pyrene	202	20.937	20.937	(0.876)	16643421	82.5759	82.6
85 Butyl benzyl phthalate	149	22.687	22.687	(0.949)	10429165	85.9787	86.0
89 Benzo(a)Anthracene	228	23.849	23.849	(0.998)	13357651	82.3626	82.4
	228	23.947	23.849	(1.002)	11611146	71.5938	71.6
91 Chrysene	228	23.947	23.947	(1.002)	11615192	82.2823	82.3
	228	23.849	23.947	(0.998)	13357651	94.6260	94.6
93 bis(2-ethylhexyl)Phthalate	149	24.127	24.127	(1.010)	12994297	82.5575	82.6
94 Di-n-octyl phthalate	149	25.615	25.615	(0.947)	16848398	85.2267	85.2
95 Benzo(b)fluoranthene	252	26.269	26.269	(0.971)	10910323	90.4679	90.5
	252	26.335	26.269	(0.973)	9264281	76.8190	76.8
96 Benzo(k)fluoranthene	252	26.335	26.335	(0.973)	9264281	86.9027	86.9
	252	26.269	26.335	(0.971)	10910323	102.343	102
97 Benzo(e)pyrene	252	26.826	26.826	(0.992)	4510678	43.0013	43.0
	252	26.940	26.826	(0.996)	8046172	76.7059	76.7
	252	27.055	26.826	(1.000)	104116	0.99256	0.99(a)
98 Benzo(a)pyrene	252	26.940	26.940	(0.996)	8046172	88.6619	88.7
	252	26.826	26.940	(0.992)	4510678	49.7038	49.7

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	252	27.055	26.940	(1.000)	104116	1.14727	1.1
103 Indeno(1,2,3-cd)pyrene	276	29.524	29.524	(1.091)	5213130	84.8591	84.8
	276	29.590	29.524	(1.094)	962226	15.6631	15.7
104 Dibenzo(a,h)anthracene	278	29.590	29.590	(1.094)	4549998	84.7009	84.7
105 Benzo(g,h,i)perylene	276	30.261	30.261	(1.119)	5196130	81.0807	81.1

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01150701012.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: jgh
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/15/98
Calibration Time: 1501

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	10654771	5327386	21309542	10654269	0.00
27 Naphthalene-d8	16919358	8459679	33838716	16919358	0.00
47 Acenaphthene-d10	12271905	6135952	24543810	12271905	0.00
71 Phenanthrene-d10	19162935	9581468	38325870	19162935	0.00
90 Chrysene-d12	16491029	8245514	32982058	16491029	0.00
99 Perylene-d12	9979847	4989924	19959694	9979847	0.00

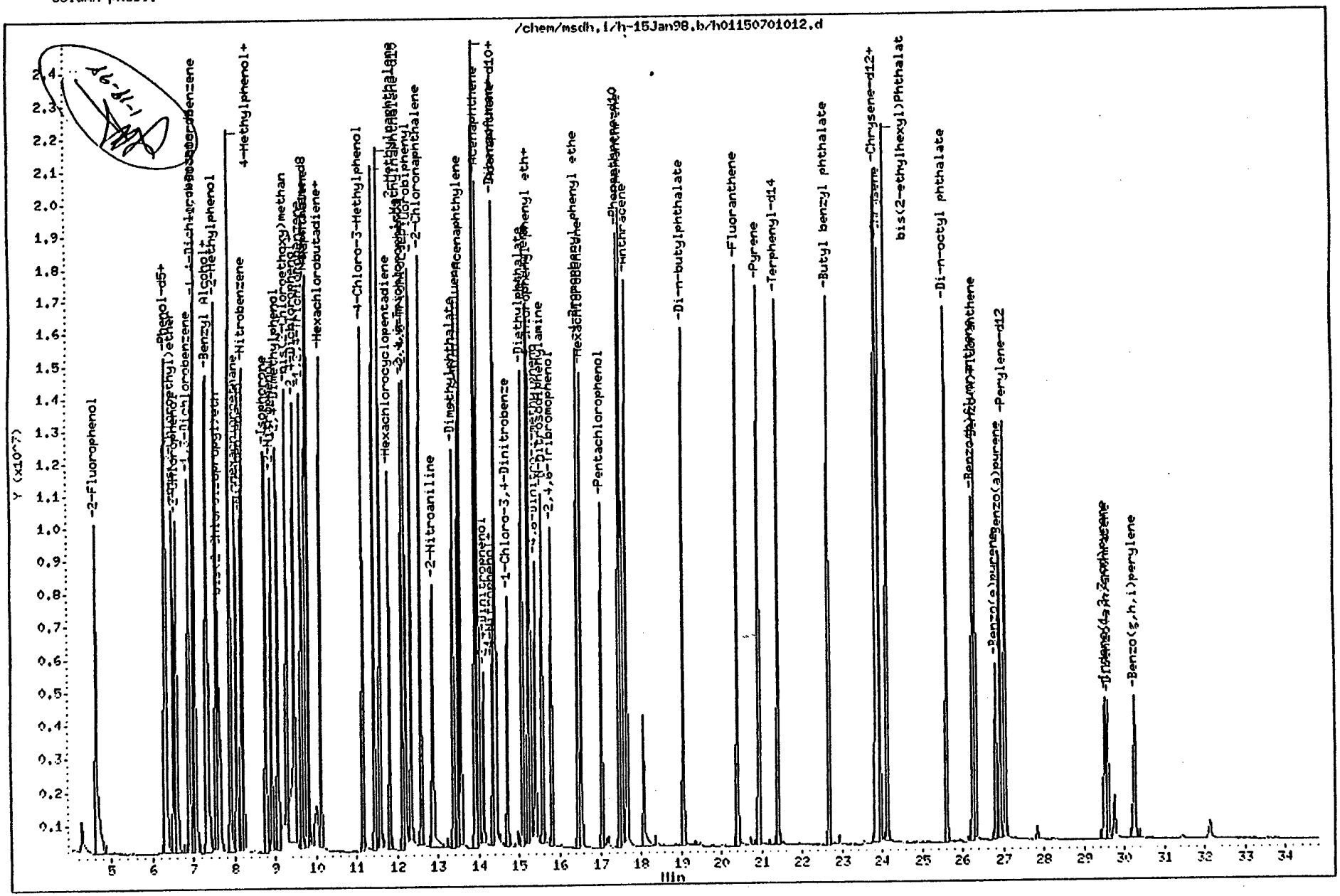
COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.02	6.52	7.52	7.02	0.00
27 Naphthalene-d8	9.78	9.28	10.28	9.78	0.00
47 Acenaphthene-d10	13.92	13.42	14.42	13.92	0.00
71 Phenanthrene-d10	17.49	16.99	17.99	17.49	0.00
90 Chrysene-d12	23.90	23.40	24.40	23.90	0.00
99 Perylene-d12	27.05	26.55	27.55	27.05	0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

400

Data File: /chem/msdh.i/h-15Jan98.b/h01150701012.d
Date : 15-JAN-1998 15:01
Client ID:
Sample Info: 1.0ul 80ug STD 396-4-80
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i
Operator: jgh
Column diameter: 2.00



401

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150801013.d
Lab Smp Id:
Inj Date : 15-JAN-1998 15:44
Operator : jgh
Inst ID: msdh.i
Smp Info : 1.0ul 120ug STD 396-4-120
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 16:39 m
Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27
Cal File: h01150901014.d
Als bottle: 8
Dil Factor: 1.00000
Integrator: HP RTE
Compound Sublist: MM5X.sub
Target Version: 3.40
Sample Matrix: WATER
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
**	****** ********	****	********	*******	*******	**********	*****
* 1,4-Dichlorobenzene-d4						CAS #: 3855-82-1	
7.022	7.021 (1.000)	150	11057447	80.0000		80.00- 120.00	100.00
7.022	7.021 (1.000)	152	6169544			0.00-10058.51	55.80
7.022	7.021 (1.000)	115	4039673			0.00-10037.59	36.53
* 27 Naphthalene-d8						CAS #: 1146-65-2	
9.787	9.769 (1.000)	136	17315437	80.0000		80.00- 120.00	100.00
9.770	9.769 (1.000)	68	1196022			0.00-10006.78	6.91
* 47 Acenaphthene-d10						CAS #: 15067-26-2	
13.925	13.907 (1.000)	164	12228609	80.0000		80.00- 120.00	100.00
13.925	13.907 (1.000)	162	11607522			0.00-10094.94	94.92
13.925	13.907 (1.000)	160	4997694			0.00-10041.02	40.87

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
* 71 Phenanthrene-d10						CAS #: 1517-22-2	
17.491	17.489 (1.000)	188	19461883	80.0000		80.00- 120.00	100.00
17.491	17.489 (1.000)	94	2678240			0.00-10014.44	13.76
17.491	17.489 (1.000)	80	2548596			0.00-10015.28	13.10
* 90 Chrysene-d12						CAS #: 1719-03-5	
23.887	23.885 (1.000)	240	16817859	80.0000		80.00- 120.00	100.00
23.887	23.885 (1.000)	236	4214161			0.00-10026.00	25.06
23.887	23.885 (1.000)	120	2786486			0.00-10018.11	16.57
* 99 Perylene-d12						CAS #: 1520-96-3	
27.060	27.058 (1.000)	264	9995032	80.0000		80.00- 120.00	100.00
27.060	27.058 (1.000)	260	2197699			0.00-10021.95	21.99
27.060	27.058 (1.000)	265	2082108			0.00-10020.90	20.83
1 2-Fluorophenol						CAS #: 367-12-4	
4.651	4.649 (0.662)	112	12645347	119.740	120	80.00- 120.00	100.00
4.651	4.649 (0.662)	64	5700963			0.00-10046.11	45.08
4.651	4.649 (0.662)	92	2421028			0.00-10019.15	19.15
2 Phenol-d5						CAS #: 4165-62-2	
6.335	6.317 (0.647)	99	14108568	118.389	118	80.00- 120.00	100.00(R)
6.335	6.317 (0.647)	71	4152428			0.00-10029.73	29.43
17 Nitrobenzene-d5						CAS #: 4165-60-0	
8.200	8.182 (0.589)	82	12253429	125.147	125	80.00- 120.00	100.00(R)
8.200	8.182 (0.589)	54	6392839			0.00-10052.46	52.17
8.200	8.182 (0.589)	128	5826284			0.00-10049.58	47.55
62 2,4,6-Tribromophenol						CAS #: 118-79-6	
15.823	15.804 (0.662)	330	4124501	122.987	123	80.00- 120.00	100.00(R)
15.823	15.804 (0.662)	332	3928567			0.00-10096.28	95.25
15.806	15.804 (0.662)	141	1115189			0.00-10029.68	27.04
32 Terphenyl-d14						CAS #: 98904-43-9	
21.417	21.415 (0.897)	244	16983701	115.368	115	80.00- 120.00	100.00
21.417	21.415 (0.897)	122	2812101			0.00-10016.35	16.56
21.417	21.415 (0.897)	212	1102268			0.00-10005.98	6.49
38 2-Fluorobiphenyl						CAS #: 321-60-8	
12.355	12.337 (0.706)	172	14598813	98.4209	98.4	80.00- 120.00	100.00
12.355	12.337 (0.706)	171	6249451			0.00-10033.81	42.81
34 1-Methylnaphthalene-d10						CAS #: 38072-94-5	
11.586	11.584 (1.184)	152	12381971	116.943	117	80.00- 120.00	100.00
11.586	11.584 (1.184)	122	5395697			0.00-10038.76	40.32

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
34 1-Methylnaphthalene-d10 (continued)								
11.586	11.584	(1.184)	150	11615927			0.00-10084.36	86.80
3 Phenol							CAS #: 108-95-2	
6.368	6.350	(0.907)	94	14298836	117.746	118	80.00- 120.00	100.00
6.368	6.350	(0.907)	66	5218583			0.00-10037.29	36.50
6.368	6.350	(0.907)	65	3469647			0.00-10025.14	24.27
4 bis(2-Chloroethyl)ether							CAS #: 111-44-4	
6.532	6.514	(0.930)	93	11457631	116.263	116	80.00- 120.00	100.00
6.532	6.514	(0.930)	63	7004527			0.00-10062.92	61.13
6.532	6.514	(0.930)	95	3506372			0.00-10031.42	30.60
5 2-Chlorophenol							CAS #: 95-57-8	
6.597	6.595	(0.939)	128	11000530	119.733	120	80.00- 120.00	100.00
6.597	6.595	(0.939)	130	3421918			0.00-10030.89	31.11
6.597	6.595	(0.939)	64	4409050			0.00-10041.15	40.08
6 1,3-Dichlorobenzene							CAS #: 541-73-1	
6.908	6.890	(0.984)	146	10695149	116.521	116	80.00- 120.00	100.00
6.908	6.890	(0.984)	148	6661262			0.00-10063.34	62.28
6.908	6.890	(0.984)	113	1449385			0.00-10013.38	13.55
9 1,4-Dichlorobenzene							CAS #: 106-46-7	
7.055	7.053	(1.005)	146	11084779	116.573	116	80.00- 120.00	100.00
7.055	7.053	(1.005)	148	6994179			0.00-10063.27	63.10
7.055	7.053	(1.005)	113	1706948			0.00-10016.16	15.40
10 Benzyl Alcohol							CAS #: 100-51-6	
7.333	7.315	(1.044)	108	6723408	113.862	114	80.00- 120.00	100.00
7.333	7.315	(1.044)	79	7978684			0.00-10116.61	118.67
7.333	7.315	(1.044)	77	5139144			0.00-10078.86	76.44
11 1,2-Dichlorobenzene							CAS #: 95-50-1	
7.350	7.348	(1.047)	146	9936069	115.573	116	80.00- 120.00	100.00
7.350	7.348	(1.047)	148	6177437			0.00-10063.46	62.17
7.350	7.348	(1.047)	113	1406139			0.00-10014.38	14.15
12 2-Methylphenol							CAS #: 95-48-7	
7.562	7.560	(1.077)	108	10049622	117.258	117	80.00- 120.00	100.00
7.562	7.560	(1.077)	107	8600344			0.00-10086.18	85.58
7.562	7.560	(1.077)	79	4090978			0.00-10041.55	40.71
13 bis(2-Chloroisopropyl)ether							CAS #: 108-60-1	
7.611	7.609	(1.084)	45	13730643	106.459	106	80.00- 120.00	100.00
7.611	7.609	(1.084)	121	2799473	113.927	114	0.00-10020.26	20.39

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
14 4-Methylphenol					CAS #: 106-44-5		
7.922	7.904 (1.128)	108	9411264	114.572	114	80.00- 120.00	100.00
7.922	7.904 (1.128)	107	11375980			0.00-10122.08	120.88
7.922	7.904 (1.128)	79	2229040			0.00-10025.12	23.68
15 N-Nitrosodipropylamine					CAS #: 621-64-7		
7.922	7.904 (1.128)	70	5723942	108.358	108	80.00- 120.00	100.00
7.922	7.904 (1.128)	130	1500976			0.00-10026.33	26.22
7.922	7.904 (1.128)	101	706896			0.00-10012.19	12.35
16 Hexachloroethane					CAS #: 67-72-1		
8.053	8.051 (1.147)	117	4659266	114.775	115	80.00- 120.00	100.00
8.053	8.051 (1.147)	201	3316338			0.00-10068.38	71.18
8.053	8.051 (1.147)	199	2045438			0.00-10041.83	43.90
18 Nitrobenzene					CAS #: 98-95-3		
8.249	8.231 (0.843)	77	10928350	125.793	126	80.00- 120.00	100.00
8.249	8.231 (0.843)	123	5867108			0.00-10053.45	53.69
8.249	8.231 (0.843)	65	1491618			0.00-10013.89	13.65
19 Isophorone					CAS #: 78-59-1		
8.789	8.771 (0.898)	82	21443683	115.414	115	80.00- 120.00	100.00
8.789	8.771 (0.898)	138	3205147			0.00-10014.70	14.95
8.789	8.771 (0.898)	95	1254450			0.00-10005.51	5.85
20 2-Nitrophenol					CAS #: 88-75-5		
8.936	8.918 (0.913)	139	6314302	134.768	135	80.00- 120.00	100.00
8.920	8.918 (0.911)	65	2634944			0.00-10042.96	41.73
8.936	8.918 (0.913)	109	1673266			0.00-10026.21	26.50
21 2,4-Dimethylphenol					CAS #: 105-67-9		
9.083	9.065 (0.928)	122	7540330	117.253	117	80.00- 120.00	100.00
9.083	9.065 (0.928)	107	9111507			0.00-10123.86	120.84
9.083	9.065 (0.928)	121	4102316			0.00-10055.27	54.40
22 bis(2-Chloroethoxy)methane					CAS #: 111-91-1		
9.296	9.294 (0.950)	93	12301860	110.180	110	80.00- 120.00	100.00
9.296	9.294 (0.950)	123	1346732			0.00-10010.88	10.95
9.296	9.294 (0.950)	95	3860112			0.00-10031.15	31.38
24 Benzoic Acid					CAS #: 65-85-0		
9.525	9.441 (0.973)	122	6171233	138.717	139	80.00- 120.00	100.00
9.525	9.441 (0.973)	105	8162462			0.00-10123.32	132.27
9.525	9.441 (0.973)	77	5481338			0.00-10081.55	88.82
25 2,4-Dichlorophenol					CAS #: 120-83-2		
9.492	9.474 (0.970)	162	7542744	123.916	124	80.00- 120.00	100.00

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
25 2,4-Dichlorophenol (continued)								
9.492	9.474	(0.970)	164	4681316			0.00-13063.52	62.06
9.492	9.474	(0.970)	98	2890586			0.00-13039.12	38.32
26 1,2,4-Trichlorobenzene							CAS #: 120-82-1	
9.656	9.654	(0.987)	180	8205208	119.125	119	80.00- 120.00	100.00
9.656	9.654	(0.987)	182	7772848			0.00-10096.20	94.73
9.656	9.654	(0.987)	145	2324562			0.00-10028.68	28.33
28 Naphthalene							CAS #: 91-20-3	
9.836	9.818	(1.005)	128	15464141	72.3545	72.4	80.00- 120.00	100.00
9.836	9.818	(1.005)	129	2990742			0.00-10013.27	19.34
9.836	9.818	(1.005)	127	3681878			0.00-10013.22	23.81
29 4-Chloroaniline							CAS #: 106-47-8	
9.983	10.014	(1.020)	127	4937653	92.6833	92.7	80.00- 120.00	100.00(M)
9.836	9.965	(1.005)	129	2990742			0.00-10010.59	60.57
30 Hexachlorobutadiene							CAS #: 87-68-3	
10.130	10.128	(1.035)	225	4327454	116.091	116	80.00- 120.00	100.00
10.130	10.128	(1.035)	223	2713428			0.00-10061.71	62.70
10.130	10.128	(1.035)	227	2775876			0.00-10063.44	64.15
32 4-Chloro-3-Methylphenol							CAS #: 59-50-7	
11.161	11.159	(1.140)	107	8227400	119.157	119	80.00- 120.00	100.00
11.161	11.159	(1.140)	142	6146059			0.00-10073.71	74.70
11.161	11.159	(1.140)	144	1970389			0.00-10023.72	23.95
33 2-Methylnaphthalene							CAS #: 91-57-6	
11.439	11.437	(1.169)	142	15456726	114.284	114	80.00- 120.00	100.00
11.439	11.437	(1.169)	141	14125565			0.00-10090.11	91.39
35 Hexachlorocyclopentadiene							CAS #: 77-47-4	
11.815	11.813	(0.848)	237	4362502	136.556	136	80.00- 120.00	100.00
11.815	11.813	(0.848)	272	646343			0.00-10014.73	14.82
11.815	11.813	(0.848)	235	2664640			0.00-10061.71	61.08
36 2,4,6-Trichlorophenol							CAS #: 88-06-2	
12.142	12.124	(0.872)	196	5511598	133.437	133	80.00- 120.00	100.00
12.142	12.124	(0.872)	198	5165842			0.00-10094.84	93.73
12.142	12.124	(0.872)	200	1616407			0.00-10030.07	29.33
37 2,4,5-Trichlorophenol							CAS #: 95-95-4	
12.208	12.206	(0.877)	196	5686684	139.064	139	80.00- 120.00	100.00
12.224	12.206	(0.878)	198	5311049			0.00-10095.07	93.39
12.224	12.206	(0.878)	200	1677750			0.00-10030.67	29.50

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
39 2-Chloronaphthalene						CAS #: 91-58-7	
12.600	12.582 (0.905)	162	14656125	121.816	122	80.00- 120.00	100.00
12.600	12.582 (0.905)	164	4939926			0.00-10031.20	33.71
12.584	12.582 (0.904)	127	5902162			0.00-10038.71	40.27
40 2-Nitroaniline						CAS #: 88-74-4	
12.878	12.860 (0.925)	65	5139993	133.705	134	80.00- 120.00	100.00
12.878	12.876 (0.925)	138	6489295			0.00-10127.72	126.25
12.878	12.860 (0.925)	92	3673405			0.00-10073.86	71.47
41 3-Nitroaniline						CAS #: 99-09-2	
13.892	13.874 (0.998)	138	888765	65.7617	65.8	80.00- 120.00	100.00
13.892	13.874 (0.998)	92	1003716			0.00-10120.29	112.93
13.909	13.907 (0.999)	108	369895			0.00-10080.06	41.62
43 Dimethylphthalate						CAS #: 131-11-3	
13.385	13.367 (0.961)	163	17349009	114.777	115	80.00- 120.00	100.00
13.385	13.367 (0.961)	194	921123			0.00-10005.16	5.31
13.385	13.367 (0.961)	164	1732214			0.00-10009.58	9.98
45 2,6-Dinitrotoluene						CAS #: 606-20-2	
13.516	13.498 (0.971)	165	4670476	143.601	144	80.00- 120.00	100.00
13.516	13.498 (0.971)	89	2768167			0.00-10059.87	59.27
13.516	13.498 (0.971)	121	1025448			0.00-10022.31	21.96
46 Acenaphthylene						CAS #: 208-96-8	
13.565	13.563 (0.974)	152	19618075	105.216	105	80.00- 120.00	100.00
13.565	13.563 (0.974)	151	4977452			0.00-10023.78	25.37
13.565	13.563 (0.974)	153	3204021			0.00-10015.23	16.33
48 Acenaphthene						CAS #: 83-32-9	
14.007	13.989 (1.006)	154	14227142	121.994	122	80.00- 120.00	100.00
14.007	13.989 (1.006)	152	7279250			0.00-10049.54	51.16
14.007	13.989 (1.006)	153	14741422			0.00-10106.26	103.61
49 2,4-Dinitrophenol						CAS #: 51-28-5	
14.121	14.120 (1.014)	184	2461150	159.664	160	80.00- 120.00	100.00
14.121	14.103 (1.014)	63	1420200			0.00-10058.68	57.70
14.121	14.120 (1.014)	154	959352			0.00-10038.31	38.98
50 4-Nitrophenol						CAS #: 100-02-7	
14.367	14.349 (1.032)	109	2417436	136.178	136	80.00- 120.00	100.00(H)
14.416	14.349 (1.035)	139	11120981			0.00-10155.17	460.03
14.367	14.349 (1.032)	65	2978938			0.00-10133.38	123.23
51 Dibenzofuran						CAS #: 132-64-9	
14.416	14.414 (1.035)	168	17088509	105.508	106	80.00- 120.00	100.00

RT	EXP RT	(RSL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
51 Dibenzofuran (continued)								
14.416	14.414	(1.035)	139	11120981			0.00-10038.83	65.38
52 2,4-Dinitrotoluene						CAS #: 121-14-2		
14.449	14.447	(1.038)	165	6426141	137.665	138	80.00- 120.00	100.00
14.449	14.430	(1.038)	63	4106791			0.00-10063.54	63.91
14.465	14.447	(1.039)	182	310636			0.00-10004.86	4.83
53 1-Chloro-3,4-Dinitrobenzene						CAS #:		
14.727	14.708	(1.505)	63	3183091	146.684	147	80.00- 120.00	100.00(H)
14.743	14.708	(1.506)	75	2633327			0.00-10081.72	82.73
14.743	14.725	(1.506)	202	1854772			0.00-10054.68	58.27
56 Diethylphthalate						CAS #: 84-66-2		
15.103	15.085	(1.085)	149	15732943	100.459	100	80.00- 120.00	100.00
15.103	15.085	(1.085)	177	3632513			0.00-10019.67	23.09
15.103	15.085	(1.085)	150	2127463			0.00-10011.54	13.59
57 Fluorene						CAS #: 86-73-7		
15.250	15.232	(1.095)	166	15061963	113.635	114	80.00- 120.00	100.00
15.250	15.232	(1.095)	165	14391381			0.00-10093.28	95.55
15.250	15.232	(1.095)	167	2152968			0.00-10012.75	14.29
58 4-Chlorophenyl phenyl ether						CAS #: 7005-72-3		
15.299	15.281	(1.099)	204	8132768	122.668	123	80.00- 120.00	100.00
15.299	15.281	(1.099)	206	2622546			0.00-10032.44	32.25
15.299	15.281	(1.099)	141	4616782			0.00-10053.60	56.77
59 4-Nitroaniline						CAS #: 100-01-6		
15.348	15.330	(1.102)	138	1470545	103.144	103	80.00- 120.00	100.00
15.348	15.330	(1.102)	92	481294			0.00-10032.69	32.73
15.365	15.330	(1.103)	108	1039635			0.00-10073.68	70.70
60 4,6-Dinitro-2-methylphenol						CAS #: 534-52-1		
15.430	15.412	(0.882)	198	3522756	135.600	136	80.00- 120.00	100.00
15.430	15.412	(0.882)	121	1303035			0.00-10036.17	36.99
15.430	15.412	(0.882)	51	1883349			0.00-10054.03	53.46
61 N-nitrosodiphenylamine						CAS #: 86-30-6		
15.594	15.575	(0.892)	169	9722250	112.448	112	80.00- 120.00	100.00
15.594	15.575	(0.892)	168	6384210			0.00-10066.04	65.67
15.594	15.575	(0.892)	167	3450114			0.00-10035.43	35.49
65 4-Bromophenyl phenyl ether						CAS #: 101-55-3		
16.460	16.459	(0.941)	248	5134647	118.075	118	80.00- 120.00	100.00
16.460	16.459	(0.941)	250	4973573			0.00-10096.59	96.86

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
65 4-Bromophenyl phenyl ether (continued)								
16.460	16.459	(0.941)	141	3240357			0.00-10065.11	63.11
66 Hexachlorobenzene						CAS #: 118-74-1		
16.559	16.540	(0.947)	284	6123141	110.536	110	80.00- 120.00	100.00
16.559	16.540	(0.947)	142	2061286			0.00-10033.27	33.66
16.559	16.540	(0.947)	249	1485754			0.00-10024.51	24.26
68 Pentachlorophenol						CAS #: 87-86-5		
17.049	17.047	(0.975)	266	4019675	134.922	135	80.00- 120.00	100.00
17.049	17.047	(0.975)	264	2545440			0.00-10062.05	63.32
17.049	17.047	(0.975)	268	2547603			0.00-10063.81	63.38
72 Phenanthrene						CAS #: 85-01-8		
17.556	17.538	(1.004)	178	16266628	88.6166	88.6	80.00- 120.00	100.00
17.556	17.538	(1.004)	176	4288960			0.00-10020.36	26.37
17.556	17.538	(1.004)	179	3487924			0.00-10016.57	21.44
73 Anthracene						CAS #: 120-12-7		
17.671	17.669	(1.010)	178	18949422	106.279	106	80.00- 120.00	100.00
17.671	17.669	(1.010)	176	4142010			0.00-10019.61	21.86
17.671	17.669	(1.010)	179	3522592			0.00-10016.26	18.59
78 Di-n-butylphthalate						CAS #: 84-74-2		
19.361	19.359	(1.090)	149	19419900	73.6732	73.7	80.00- 120.00	100.00
19.078	19.359	(1.091)	150	3047336			0.00-10011.22	15.69
19.078	19.359	(1.091)	104	1872032			0.00-10006.82	9.64
80 Fluoranthene						CAS #: 206-44-0		
20.419	20.401	(1.167)	202	18574651	99.4593	99.4	80.00- 120.00	100.00
20.419	20.401	(1.167)	101	4020551			0.00-10017.87	21.65
20.419	20.401	(1.167)	100	3069486			0.00-10013.24	16.53
81 Pyrene						CAS #: 129-00-0		
20.942	20.940	(0.877)	202	20940938	101.879	102	80.00- 120.00	100.00
20.942	20.940	(0.877)	101	4780814			0.00-10022.30	22.83
20.942	20.940	(0.877)	100	3850714			0.00-10017.69	18.39
85 Butyl benzyl phthalate						CAS #: 85-68-7		
22.676	22.674	(0.949)	149	15199312	122.869	123	80.00- 120.00	100.00
22.676	22.674	(0.949)	91	11005972			0.00-10073.35	72.41
22.692	22.674	(0.950)	206	2491543			0.00-10015.36	16.39
89 Benzo(a)Anthracene						CAS #: 56-55-3		
23.854	23.836	(0.999)	228	19659516	118.864	119	80.00- 120.00	100.00
23.854	23.836	(0.999)	229	3728204			0.00-10018.92	18.96

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
99 Benzo(a)Anthracene (continued)							
23.854	23.836 (0.999)	226	5093304			0.00-10025.91	25.91
91 Chrysene					CAS #: 218-01-9		
23.952	23.950 (1.003)	228	16523184	114.776	115	80.00- 120.00	100.00
23.952	23.950 (1.003)	226	5205336			0.00-10028.14	31.50
23.952	23.950 (1.003)	229	3440668			0.00-10018.65	20.82
93 bis(2-ethylhexyl)Phthalate					CAS #: 117-81-7		
24.132	24.130 (1.010)	149	16272360	101.375	101	80.00- 120.00	100.00
24.132	24.130 (1.010)	167	5573084			0.00-10027.97	34.25
24.132	24.130 (1.010)	279	1140285			0.00-10005.78	7.01
94 Di-n-octyl phthalate					CAS #: 117-84-0		
25.620	25.619 (0.947)	149	20329427	102.679	103	80.00- 120.00	100.00
25.620	25.619 (0.947)	150	2670603			0.00-10011.28	13.14
95 Benzo(b)fluoranthene					CAS #: 205-99-2		
26.275	26.273 (0.971)	252	16256257	134.591	134	80.00- 120.00	100.00
26.275	26.273 (0.971)	253	3435610			0.00-10021.18	21.13
26.275	26.256 (0.971)	125	2463899			0.00-10017.89	15.16
96 Benzo(k)fluoranthene					CAS #: 207-08-9		
26.340	26.322 (0.973)	252	13021357	121.960	122	80.00- 120.00	100.00
26.340	26.322 (0.973)	253	2848658			0.00-10020.93	21.88
26.340	26.322 (0.973)	125	2526703			0.00-10016.09	19.40
97 Benzo(e)pyrene					CAS #:		
26.831	26.813 (0.992)	252	6452276	61.4175	61.4	80.00- 120.00	100.00
26.814	26.813 (0.991)	125	1650670			0.00-10027.28	25.58
26.831	26.813 (0.992)	250	1784492			0.00-10027.55	27.66
98 Benzo(a)pyrene					CAS #: 50-32-8		
26.945	26.927 (0.996)	252	11497529	126.500	126	80.00- 120.00	100.00
26.945	26.927 (0.996)	253	2405406			0.00-10021.09	20.92
26.945	26.927 (0.996)	125	2159684			0.00-10021.00	18.78
103 Indeno(1,2,3-cd)pyrene					CAS #: 193-39-5		
29.530	29.528 (1.091)	276	7725533	125.565	126	80.00- 120.00	100.00
29.530	29.528 (1.091)	138	2699939			0.00-10035.87	34.95
29.530	29.528 (1.091)	227	7531			0.00-10000.11	0.10
104 Dibenzo(a,h)anthracene					CAS #: 53-70-3		
29.611	29.593 (1.094)	278	6627340	123.184	123	80.00- 120.00	100.00
29.611	29.593 (1.094)	279	1494390			0.00-10022.59	22.55
29.595	29.593 (1.094)	139	1735224			0.00-10027.37	26.18

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
105 Benzo(g,h,i)perylene						CAS #: 191-24-2		
30.282	30.264	(1.119)	276	7247133	112.913	113	80.00- 120.00	100.00
30.266	30.264	(1.118)	138	2756854			0.00-10038.50	38.04
30.282	30.264	(1.119)	277	1700814			0.00-10023.39	23.47

QC Flag Legend

R - Spike/Surrogate failed recovery limits.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150801013.d
Lab Smp Id:
Inj Date : 15-JAN-1998 15:44 Inst ID: msdh.i
Operator : jgh
Smp Info : 1.0ul 120ug STD 396-4-120
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 17:51 jheffel Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
* 7 1,4-Dichlorobenzene-d4	150	7.022	7.017	(1.000)	11057447	80.0000	
	150	6.614	7.017	(1.000)	1081	80.0000	
	150	6.663	7.017	(1.000)	604	80.0000	
	150	6.728	7.017	(1.000)	382	80.0000	
	150	6.810	7.017	(1.000)	718	80.0000	
	150	6.908	7.017	(1.000)	1040869	80.0000	
	150	7.350	7.017	(1.000)	960581	80.0000	
* 27 Naphchalene-d8	136	9.787	9.782	(1.000)	17315437	80.0000	
	136	9.345	9.782	(1.000)	1074	80.0000	
	136	9.394	9.782	(1.000)	181	80.0000	
	136	9.492	9.782	(1.000)	46441	80.0000	
	136	9.656	9.782	(1.000)	3228	80.0000	
* 47 Acenaphthene-d10	164	13.925	13.920	(1.000)	12228609	80.0000	
	164	13.533	13.920	(1.000)	5301	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)	
	164	13.614	13.920	(1.000)	3565	80.0000		
* 71 Phenanthrene-d10	188	17.491	17.486	(1.000)	19461883	80.0000		
	188	17.049	17.486	(1.000)	705	80.0000		(Q)
	188	17.082	17.486	(1.000)	251	80.0000		(Q)
	188	17.180	17.486	(1.000)	1275	80.0000		
	188	17.213	17.486	(1.000)	307	80.0000		
	188	17.295	17.486	(1.000)	500	80.0000		
	240	23.887	23.898	(1.000)	16817859	80.0000		
* 90 Chrysene-d12	240	23.461	23.898	(1.000)	499	80.0000		
	240	23.543	23.898	(1.000)	1018	80.0000		
	240	23.690	23.898	(1.000)	1300	80.0000		
	240	24.181	23.898	(1.000)	20532	80.0000		
	264	27.060	27.055	(1.000)	9995032	80.0000		
* 99 Perylene-d12	264	26.716	27.055	(1.000)	686	80.0000		
	264	26.782	27.055	(1.000)	412	80.0000		
	264	26.864	27.055	(1.000)	696	80.0000		
	264	26.962	27.055	(1.000)	2915	80.0000		
S 1 2-Fluorophenol	112	4.651	4.645	(0.662)	12645347	119.740		120
S 2 Phenol-d5	99	6.335	6.314	(0.647)	14108568	118.389		118(R)
	99	6.597	6.314	(0.674)	603774	5.06646		5.1(R)
S 17 Nitrobenzene-d5	82	8.200	8.179	(0.589)	12253429	125.147		125(R)
	82	8.053	8.179	(0.578)	1111932	11.3564		11.4(R)
S 62 2,4,6-Tribromophenol	330	15.823	15.817	(0.662)	4124501	122.987		123(R)
S 82 Terphenyl-d14	244	21.417	21.411	(0.897)	16983701	115.368		115
S 38 2-Fluorobiphenyl	172	12.355	12.350	(0.706)	14598813	98.4209		98.4
S 34 1-Methylnaphthalene-d10	152	11.586	11.581	(1.184)	13381971	116.943		117
3 Phenol	94	6.368	6.347	(0.907)	14298836	117.746		118
	94	6.532	6.347	(0.930)	488082	4.01919		4.0(a)
4 bis(2-Chloroethyl)ether	93	6.532	6.510	(0.930)	11457631	116.263		116
	93	6.368	6.510	(0.907)	277461	2.81545		2.8
5 2-Chlorophenol	128	6.597	6.592	(0.939)	11000530	119.733		120
6 1,3-Dichlorobenzene	146	6.908	6.903	(0.984)	10695149	116.521		116
	146	7.055	6.903	(1.005)	11086844	120.789		121
9 1,4-Dichlorobenzene	146	7.055	7.050	(1.005)	11101401	116.748		117
	146	6.908	7.050	(0.984)	10690781	112.430		112
10 Benzyl Alcohol	108	7.333	7.328	(1.044)	6723408	113.862		114
	108	6.908	7.328	(0.984)	83215	1.40925		1.4(a)
	108	7.055	7.328	(1.005)	107572	1.82174		1.8(a)
	108	7.562	7.328	(1.077)	10015447	169.613		170
11 1,2-Dichlorobenzene	146	7.350	7.344	(1.047)	9936069	115.573		116
	146	6.908	7.344	(0.984)	10643053	123.797		124
	146	7.055	7.344	(1.005)	11084278	128.929		129
12 2-Methylphenol	108	7.562	7.557	(1.077)	10049622	117.258		117
	108	7.333	7.557	(1.044)	6723408	78.4480		78.4
	108	7.922	7.557	(1.128)	9237031	107.777		108
13 bis(2-Chloroisopropyl)ether	45	7.611	7.606	(1.084)	13750339	106.612		107
14 4-Methylphenol	108	7.922	7.901	(1.128)	9290439	113.102		113

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
15 N-Nitrosodipropylamine	70	7.922	7.901	(1.128)	5723942	108.358	108
	70	8.200	7.901	(1.168)	1543817	29.2255	29.2
16 Hexachloroethane	117	8.053	8.048	(1.147)	4659266	114.775	115
18 Nitrobenzene	77	8.249	8.228	(0.843)	10928350	125.793	126
	77	7.922	8.228	(0.809)	3119110	35.9033	35.9
19 Isophorone	82	8.789	8.767	(0.898)	21443683	115.414	115
20 2-Nitrophenol	139	8.936	8.915	(0.913)	6314302	134.768	135
	139	8.805	8.915	(0.900)	315370	6.73103	6.7
	139	9.280	8.915	(0.948)	1147224	24.4855	24.5
21 2,4-Dimethylphenol	122	9.083	9.062	(0.928)	7540330	117.253	117
	122	8.936	9.062	(0.913)	339919	5.28578	5.3
23 bis(2-Chloroethoxy)methane	93	9.296	9.291	(0.950)	12301860	110.180	110
	93	8.936	9.291	(0.913)	601176	5.38434	5.4
	93	9.083	9.291	(0.928)	285247	2.55477	2.6
24 Benzoic Acid	122	9.525	9.454	(0.973)	6689433	150.366	150
	122	9.083	9.454	(0.928)	7540330	169.492	169
	122	9.836	9.454	(1.005)	71938	1.61703	1.6(a)
25 2,4-Dichlorophenol	162	9.492	9.471	(0.970)	7542744	123.916	124
26 1,2,4-Trichlorobenzene	180	9.656	9.651	(0.987)	8205208	119.125	119
28 Naphthalene	128	9.836	9.814	(1.005)	15464141	72.3545	72.4
	128	9.492	9.814	(0.970)	274774	1.28563	1.3
29 4-Chloroaniline	127	9.836	10.011	(1.005)	3681878	69.1115	69.1
	127	9.983	10.011	(1.020)	1840164	34.5412	34.5
	127	10.278	10.011	(1.050)	179407	3.36760	3.4
30 Hexachlorobutadiene	225	10.130	10.125	(1.035)	4327454	116.091	116
	225	9.770	10.125	(0.998)	62613	1.67970	1.7
32 4-Chloro-3-Methylphenol	107	11.161	11.156	(1.140)	8227400	119.157	119
33 2-Methylnaphthalene	142	11.439	11.434	(1.169)	15456726	114.284	114
	142	11.161	11.434	(1.140)	6146059	45.4428	45.4
	142	11.652	11.434	(1.191)	210882	1.55922	1.6
35 Hexachlorocyclopentadiene	237	11.815	11.810	(0.848)	4362502	136.556	136
36 2,4,6-Trichlorophenol	196	12.142	12.121	(0.872)	5511598	133.437	133
	196	12.208	12.121	(0.877)	5686684	137.675	138
37 2,4,5-Trichlorophenol	196	12.208	12.202	(0.877)	5686684	139.064	139
	196	12.142	12.202	(0.872)	5511598	134.782	135
39 2-Chloronaphthalene	162	12.600	12.579	(0.905)	14656125	121.816	122
	162	12.142	12.579	(0.872)	424388	3.52735	3.5
	162	12.208	12.579	(0.877)	146625	1.21869	1.2
40 2-Nitroaniline	65	12.878	12.873	(0.925)	5139993	133.705	134
	65	12.584	12.873	(0.904)	23899	0.62168	0.62(a)
41 3-Nitroaniline	138	13.892	13.871	(0.998)	888772	65.7622	65.8
	138	14.121	13.871	(1.014)	64646	4.78330	4.8
43 Dimethylphthalate	163	13.385	13.380	(0.961)	17349009	114.777	115
45 2,6-Dinitrotoluene	165	13.516	13.495	(0.971)	4670476	143.601	144
	165	13.385	13.495	(0.961)	183599	5.64503	5.6
46 Acenaphthylene	152	13.565	13.560	(0.974)	19618075	105.216	105
48 Acenaphthene	154	14.007	13.985	(1.006)	14227142	121.994	122

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	154	13.565	13.985	(0.974)	190578	1.63416	1.6(Q)
49 2,4-Dinitrophenol	184	14.121	14.116	(1.014)	2461150	159.664	160
50 4-Nitrophenol	109	14.367	14.362	(1.032)	2417436	136.178	136
	109	13.991	14.362	(1.005)	31453	1.77179	1.8(a)
	109	14.121	14.362	(1.014)	17708	0.99752	1.00(a)
	109	14.416	14.362	(1.035)	155180	8.74151	8.7
51 Dibenzofuran	168	14.416	14.411	(1.035)	17088509	105.508	106
	168	14.121	14.411	(1.014)	81545	0.50348	0.50(a)
52 2,4-Dinitrotoluene	165	14.449	14.443	(1.038)	6426141	137.665	138
53 1-Chloro-3,4-Dinitrobenzene	63	14.727	14.721	(1.505)	3183091	146.684	147
	63	14.367	14.721	(1.468)	1072694	49.4320	49.4
	63	14.449	14.721	(1.476)	4086154	188.299	188
	63	14.530	14.721	(1.485)	95902	4.41937	4.4
	63	14.776	14.721	(1.510)	56437	2.60074	2.6
	63	14.988	14.721	(1.531)	165100	7.60815	7.6
	63	15.103	14.721	(1.543)	128174	5.90653	5.9
56 Diethylphthalate	149	15.103	15.098	(1.085)	15732943	100.459	100
	149	15.299	15.098	(1.099)	138610	0.88506	0.88(a)
57 Fluorene	166	15.250	15.245	(1.095)	15061963	113.635	114
	166	15.594	15.245	(1.120)	523429	3.94900	3.9
58 4-Chlorophenyl phenyl ether	204	15.299	15.294	(1.099)	8132768	122.668	123
	204	14.988	15.294	(1.076)	49680	0.74933	0.75(a)
59 4-Nitroaniline	138	15.348	15.343	(1.102)	1470545	103.144	103
	138	15.168	15.343	(1.089)	169540	11.8915	11.9
60 4,6-Dinitro-2-methylphenol	198	15.430	15.408	(0.882)	3522756	135.600	136
61 N-nitrosodiphenylamine	169	15.594	15.588	(0.892)	9722250	112.448	112
	169	15.299	15.588	(0.875)	740485	8.56449	8.6
	169	15.430	15.588	(0.882)	43615	0.50445	0.50(a)
	169	15.806	15.588	(0.904)	110347	1.27628	1.3
65 4-Bromophenyl phenyl ether	248	16.460	16.455	(0.941)	5131579	118.005	118
66 Hexachlorobenzene	284	16.559	16.553	(0.947)	6123141	110.536	110
68 Pentachlorophenol	266	17.049	17.044	(0.975)	4019675	134.922	135
72 Phenanthrene	178	17.556	17.551	(1.004)	16266628	88.6166	88.6
	178	17.671	17.551	(1.010)	18949422	103.232	103
73 Anthracene	178	17.671	17.666	(1.010)	18949426	106.279	106
	178	17.556	17.666	(1.004)	16266628	91.2320	91.2
78 Di-n-butylphthalate	149	19.061	19.072	(1.090)	19419900	73.6732	73.7
80 Fluoranthene	202	20.419	20.414	(1.167)	18574651	99.4593	99.4
81 Pyrene	202	20.942	20.937	(0.877)	20940938	101.879	102
85 Butyl benzyl phthalate	149	22.676	22.687	(0.949)	15199312	122.869	123
89 Benzo(a)Anthracene	228	23.854	23.849	(0.999)	19659516	118.864	119
	228	23.952	23.849	(1.003)	16518159	99.8709	99.9
91 Chrysene	228	23.952	23.947	(1.003)	16523184	114.776	115
	228	23.854	23.947	(0.999)	19659516	136.562	136
93 bis(2-ethylhexyl)Phthalate	149	24.132	24.127	(1.010)	16272360	101.375	101
	149	23.854	24.127	(0.999)	81719	0.50910	0.51(a)
94 Di-n-octyl phthalate	149	25.620	25.615	(0.947)	20329427	102.679	103

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
95 Benzo(b)fluoranthene	252	26.275	26.269	(0.971)	16256257	134.591	134
	252	26.340	26.269	(0.973)	13016063	107.765	108
96 Benzo(k)fluoranthene	252	26.340	26.335	(0.973)	13019043	121.938	122
	252	26.275	26.335	(0.971)	16256257	152.259	152
97 Benzo(e)pyrene	252	26.831	26.826	(0.992)	6452276	61.4175	61.4
	252	26.945	26.826	(0.996)	11497529	109.442	109
98 Benzo(a)pyrene	252	26.945	26.940	(0.996)	11497529	126.500	126
	252	26.831	26.940	(0.992)	6452276	70.9905	71.0
103 Indeno(1,2,3-cd)pyrene	276	29.530	29.524	(1.091)	7725533	125.565	126
	276	29.611	29.524	(1.094)	1343796	21.8410	21.8
104 Dibenzo(a,h)anthracene	278	29.611	29.590	(1.094)	6627340	123.184	123
105 Benzo(g,h,i)perylene	276	30.282	30.261	(1.119)	7247133	112.913	113

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01150801013.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: jgh
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/15/98
Calibration Time: 1501

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	10654771	5327386	21309542	11057447	3.78
27 Naphthalene-d8	16919358	8459679	33838716	17315437	2.34
47 Acenaphthene-d10	12271905	6135952	24543810	12228609	-0.35
71 Phenanthrene-d10	19162935	9581468	38325870	19461883	1.56
90 Chrysene-d12	16491029	8245514	32982058	16817859	1.98
99 Perylene-d12	9979847	4989924	19959694	9995032	0.15

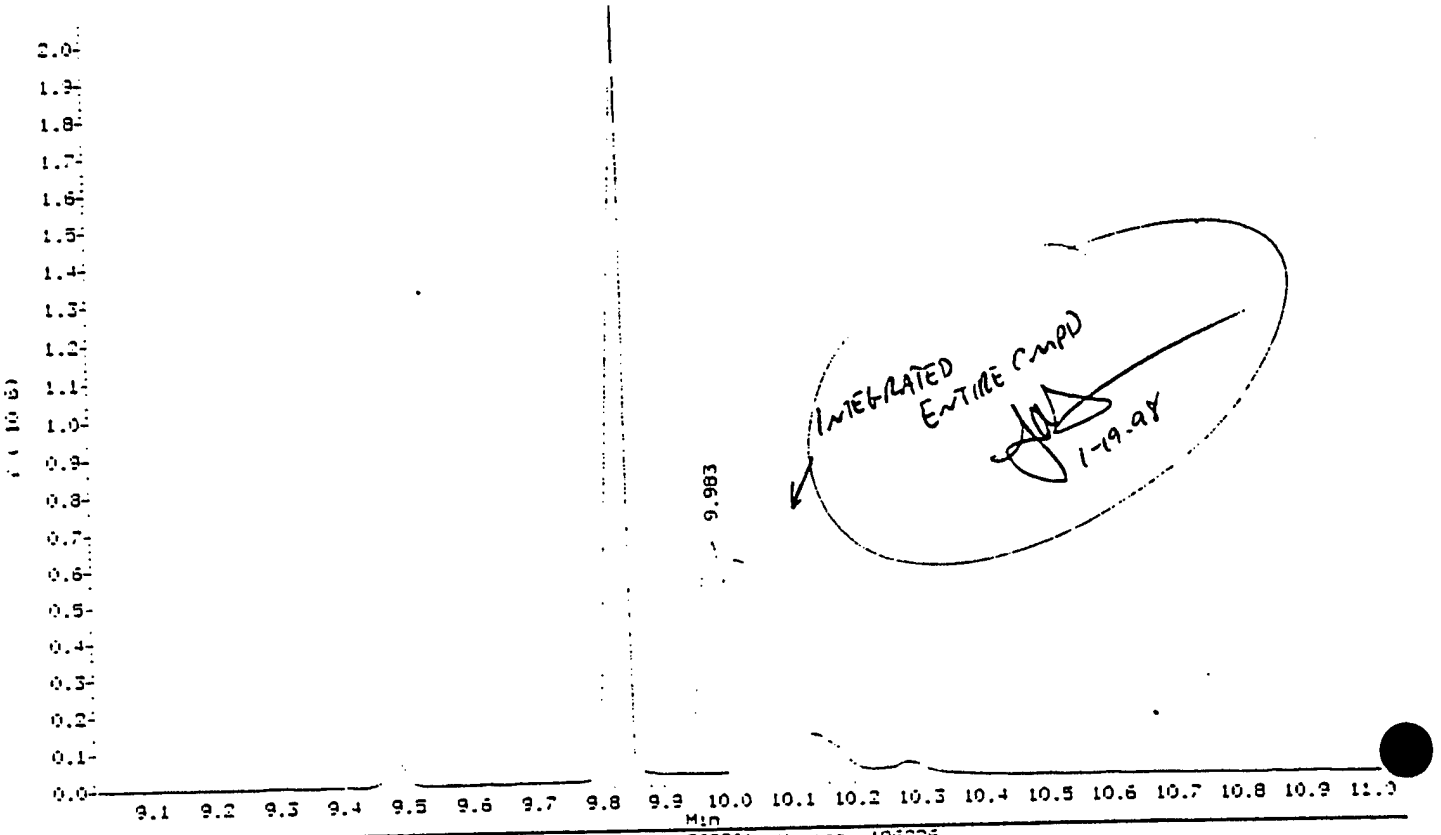
COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.02	6.52	7.52	7.02	0.08
27 Naphthalene-d8	9.78	9.28	10.28	9.79	0.05
47 Acenaphthene-d10	13.92	13.42	14.42	13.93	0.04
71 Phenanthrene-d10	17.49	16.99	17.99	17.49	0.03
90 Chrysene-d12	23.90	23.40	24.40	23.89	-0.05
99 Perylene-d12	27.05	26.55	27.55	27.06	0.02

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

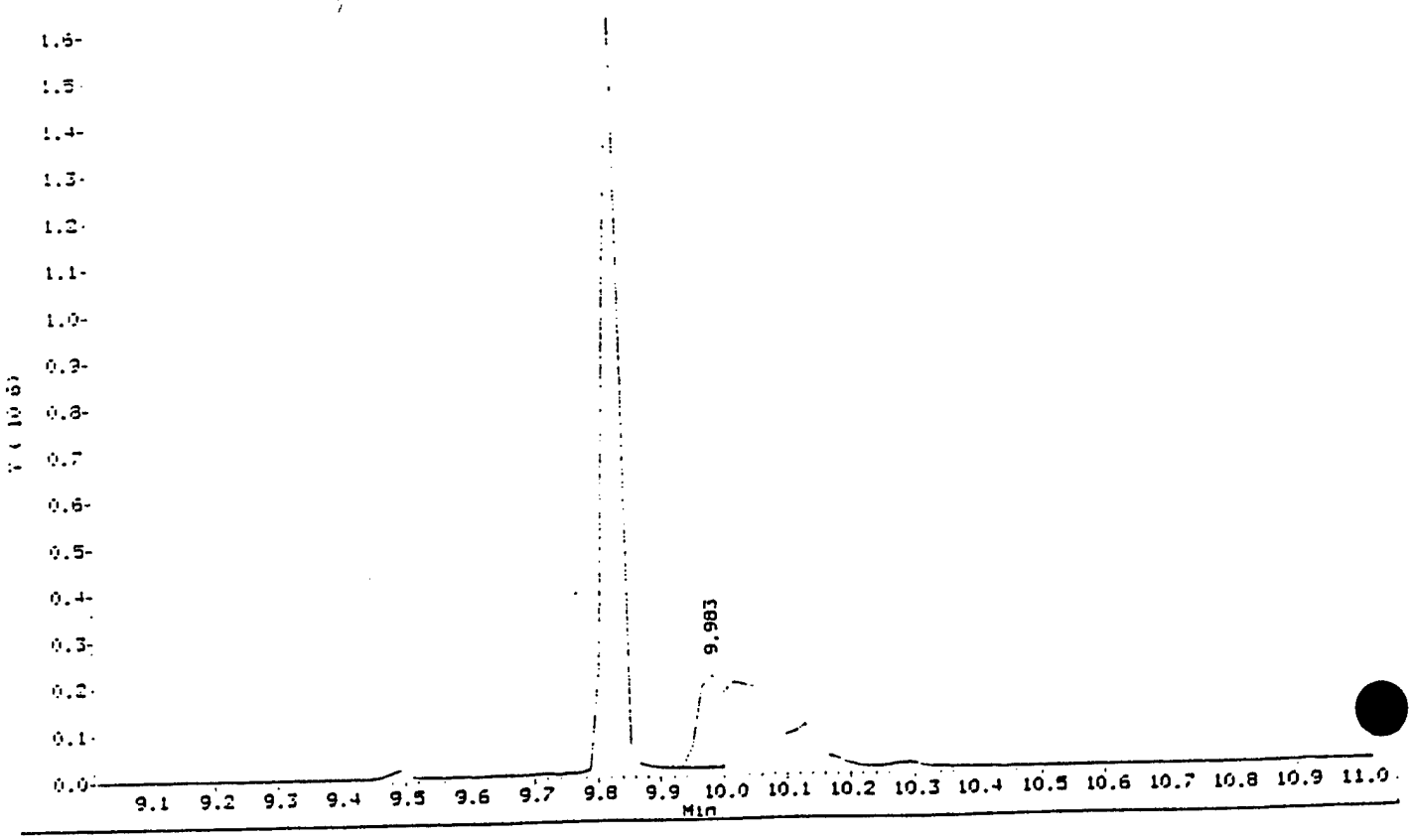
Data File: /chem/msdh.i/h-15Jan98.b/h01150801013.d
Injection Date: 15-JAN-1998 15:44
Instrument: msdh.i
Client Sample ID:

Compound: 4-Chloroaniline
CAS Number: 106-47-8

Ion 127.00: Area: 1840184 Height: 633360

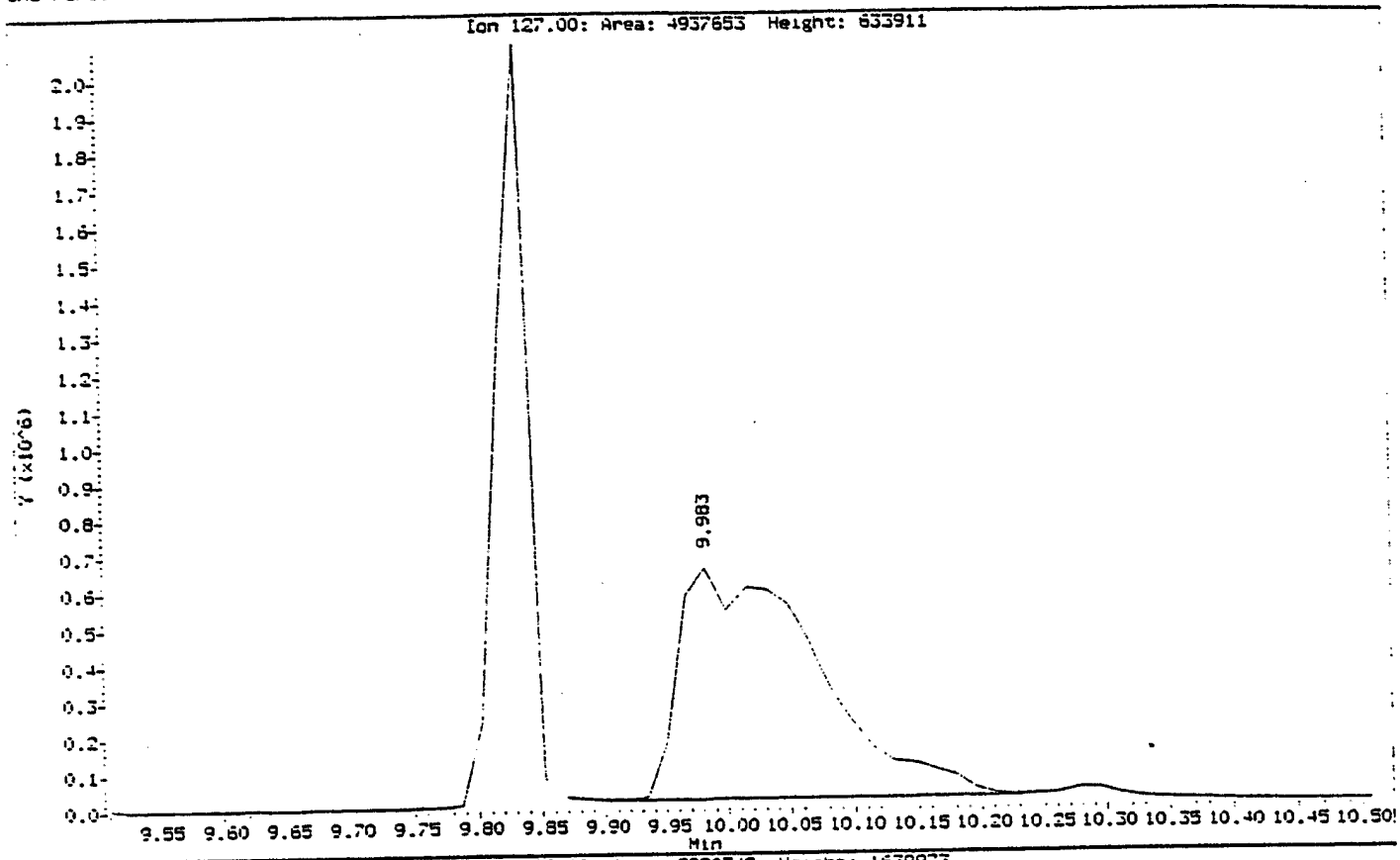


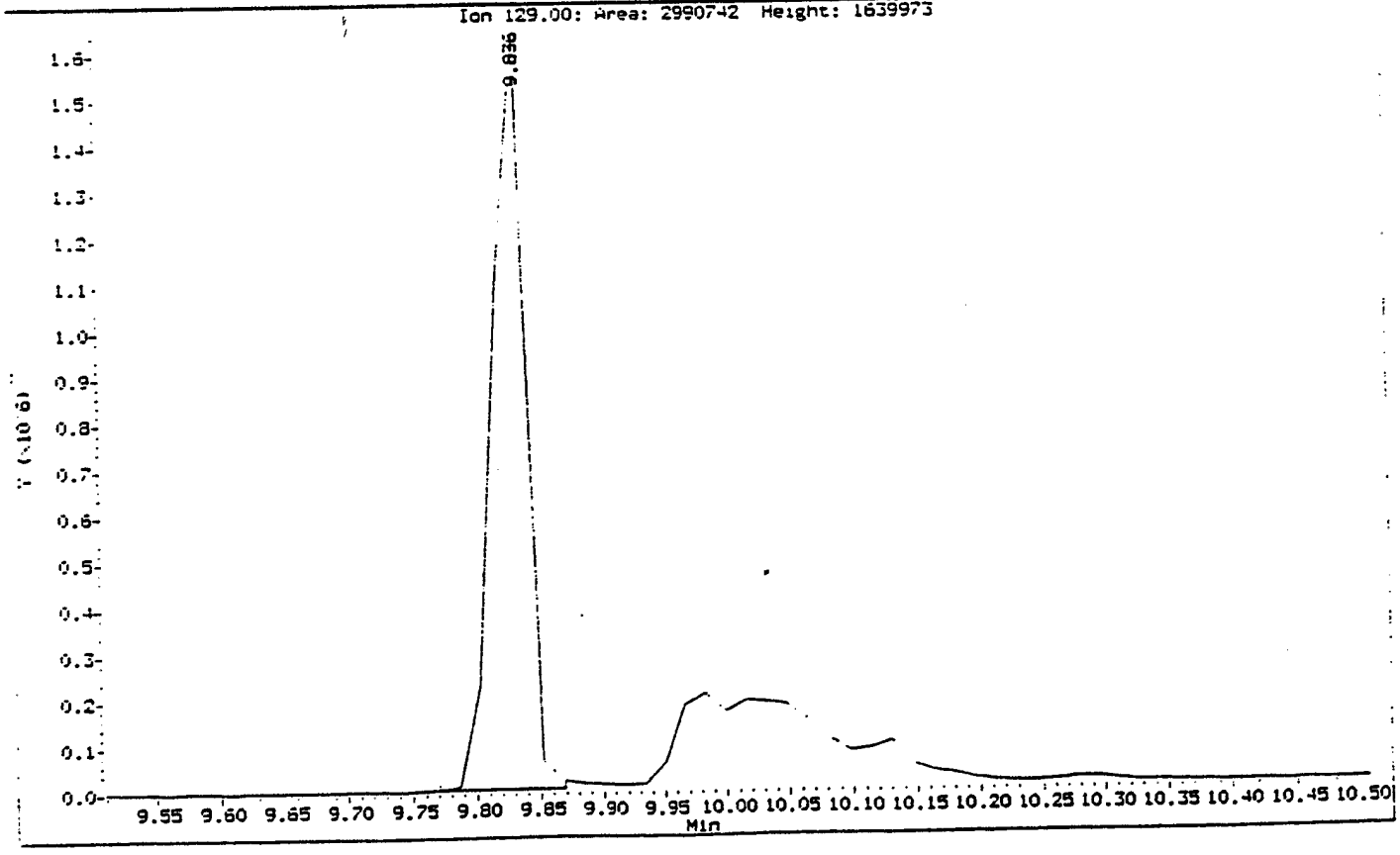
Ion 129.00: Area: 569201 Height: 196226



Data File: /chem/msdh.i/h-15Jan98.b/h01150801013.d
Injection Date: 15-JAN-1998 15:44
Instrument: msdh.i
Client Sample ID:

Compound: 4-Chloroaniline
CAS Number: 106-47-8





418

Data File: /chem/msdh.i/h-15Jan98.b/h01150801013.d

Date : 15-JAN-1998 15:44

Client ID:

Sample Info: 1.0ul 120ug SID 396-4-120

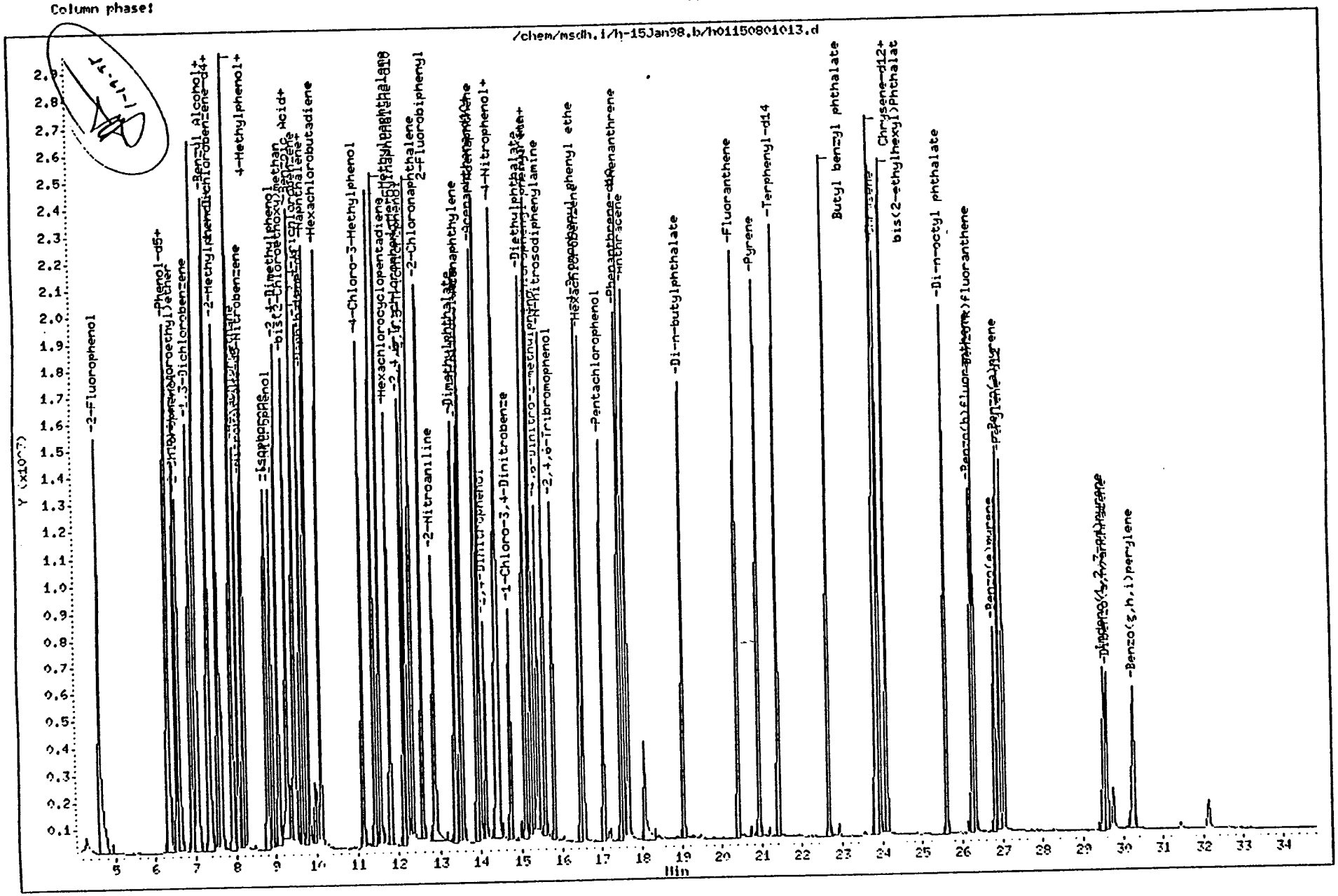
Volume Injected (uL): 1.0

Column phase:

Instrument: msdh.i

Operator: jgh

Column diameter: 2.00



Data File: /chem/msdh.i/h-15Jan98.b/h01150901014.d
Report Date: 19-Jan-1998 16:56

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150901014.d
Lab Smp Id:
Inj Date : 15-JAN-1998 16:27
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 160ug STD 396-4-160
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 16:39 m Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

1-19-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	RT	EXP RT	REL RT	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
*	7 1,4-Dichlorobenzene-d4						CAS #: 3855-82-1		
	7.015	7.021	(1.000)	150	12246509	80.0000		80.00- 120.00	100.00
	7.015	7.021	(1.000)	152	6670882			0.00-10058.51	54.47
	7.015	7.021	(1.000)	115	4339880			0.00-10037.59	35.44
*	27 Naphthalene-d8						CAS #: 1146-65-2		
	9.780	9.769	(1.000)	136	19429026	80.0000		80.00- 120.00	100.00
	9.780	9.769	(1.000)	68	1273229			0.00-10006.78	6.55
*	47 Acenaphthene-d10						CAS #: 15067-26-2		
	13.918	13.907	(1.000)	164	13407107	80.0000		80.00- 120.00	100.00
	13.918	13.907	(1.000)	162	12818052			0.00-10094.94	95.61
	13.918	13.907	(1.000)	160	5457086			0.00-10041.02	40.70

	RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
* 71 Phenanthrene-d10							CAS #: 1517-22-2		
	17.500	17.489	(1.000)	188	21902243	80.0000		80.00- 120.00	100.00
	17.500	17.489	(1.000)	94	2834812			0.00-10014.44	12.94
	17.500	17.489	(1.000)	80	2707992			0.00-10015.28	12.36
* 90 Chrysene-d12							CAS #: 1719-03-5		
	23.912	23.885	(1.000)	240	16320178	80.0000		80.00- 120.00	100.00
	23.912	23.885	(1.000)	236	4522298			0.00-10026.00	27.71
	23.912	23.885	(1.000)	120	3134492			0.00-10018.11	19.21
* 99 Perylene-d12							CAS #: 1520-96-3		
	27.069	27.058	(1.000)	264	12208572	80.0000		80.00- 120.00	100.00
	27.069	27.058	(1.000)	260	2689605			0.00-10021.95	22.03
	27.069	27.058	(1.000)	265	2525943			0.00-10020.90	20.69
S 1 2-Fluorophenol							CAS #: 367-12-4		
	4.660	4.649	(0.664)	112	16955326	144.963	145	80.00- 120.00	100.00(R)
	4.660	4.649	(0.664)	64	7847436			0.00-10046.11	46.28
	4.660	4.649	(0.664)	92	3407989			0.00-10019.15	20.10
S 2 Phenol-d5							CAS #: 4165-62-2		
	6.345	6.317	(0.649)	99	19309233	144.403	144	80.00- 120.00	100.00(R)
	6.345	6.317	(0.649)	71	5667274			0.00-10029.73	29.35
S 17 Nitrobenzene-d5							CAS #: 4165-60-0		
	9.210	9.182	(0.590)	82	17148714	159.749	160	80.00- 120.00	100.00(R)
	9.210	9.182	(0.590)	54	8974685			0.00-10052.46	52.33
	9.210	9.182	(0.590)	128	8285074			0.00-10049.58	48.31
S 62 2,4,6-Tribromophenol							CAS #: 118-79-6		
	15.832	15.804	(0.662)	330	5752614	176.766	177	80.00- 120.00	100.00(R)
	15.832	15.804	(0.662)	332	5516925			0.00-10096.28	95.90
	15.832	15.804	(0.662)	141	1635643			0.00-10029.68	28.43
S 82 Terphenyl-d14							CAS #: 98904-43-9		
	21.442	21.415	(0.897)	244	20203442	141.425	141	80.00- 120.00	100.00(R)
	21.442	21.415	(0.897)	122	4274160			0.00-10016.35	21.16
	21.442	21.415	(0.897)	212	1628064			0.00-10005.98	8.06
S 38 2-Fluorobiphenyl							CAS #: 321-60-8		
	12.364	12.337	(0.707)	172	17191318	102.985	103	80.00- 120.00	100.00
	12.364	12.337	(0.707)	171	8865618			0.00-10033.81	51.57
S 34 1-Methylnaphthalene-d10							CAS #: 38072-94-5		
	11.595	11.584	(1.186)	152	17824628	138.822	139	80.00- 120.00	100.00
	11.595	11.584	(1.186)	122	7699669			0.00-10038.76	43.20

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
34 1-Methylnaphthalene-d10 (continued)								
11.595	11.584	(1.186)	150	16115466			0.00-10084.36	90.41
1 Phenol							CAS #: 108-95-2	
6.378	6.350	(0.909)	94	16695989	124.137	124	80.00- 120.00	100.00
6.378	6.350	(0.909)	66	6582196			0.00-10037.29	39.42
6.378	6.350	(0.909)	65	4391242			0.00-10025.14	26.30
4 bis(2-Chloroethyl)ether							CAS #: 111-44-4	
6.541	6.514	(0.932)	93	14168698	129.813	130	80.00- 120.00	100.00
6.541	6.514	(0.932)	63	9395514			0.00-10062.92	66.31
6.541	6.514	(0.932)	95	4602002			0.00-10031.42	32.48
5 2-Chlorophenol							CAS #: 95-57-8	
6.607	6.595	(0.942)	128	15537272	152.692	153	80.00- 120.00	100.00
6.607	6.595	(0.942)	130	4772798			0.00-10030.89	30.72
6.607	6.595	(0.942)	64	5943438			0.00-10041.15	38.25
6 1,3-Dichlorobenzene							CAS #: 541-73-1	
6.901	6.890	(0.984)	146	15159576	149.124	149	80.00- 120.00	100.00
6.901	6.890	(0.984)	148	9515849			0.00-10063.34	62.77
6.901	6.890	(0.984)	113	2069851			0.00-10013.88	13.65
9 1,4-Dichlorobenzene							CAS #: 106-46-7	
7.065	7.053	(1.007)	146	14129199	134.163	134	80.00- 120.00	100.00
7.065	7.053	(1.007)	148	9825055			0.00-10063.27	69.54
7.065	7.053	(1.007)	113	2256814			0.00-10016.16	15.97
10 Benzyl Alcohol							CAS #: 100-51-6	
7.359	7.315	(1.049)	108	9456736	144.601	145	80.00- 120.00	100.00
7.359	7.315	(1.049)	79	11282641			0.00-10116.61	119.31
7.359	7.315	(1.049)	77	7304438			0.00-10078.86	77.24
11 1,2-Dichlorobenzene							CAS #: 95-50-1	
7.359	7.348	(1.049)	146	13283423	139.507	140	80.00- 120.00	100.00
7.359	7.348	(1.049)	148	8348667			0.00-10063.46	62.85
7.359	7.348	(1.049)	113	1864741			0.00-10014.38	14.04
12 2-Methylphenol							CAS #: 95-48-7	
7.588	7.560	(1.082)	108	13666857	143.980	144	80.00- 120.00	100.00
7.588	7.560	(1.082)	107	12067036			0.00-10086.18	88.29
7.588	7.560	(1.082)	79	5694496			0.00-10041.55	41.67
13 bis(2-Chloroisopropyl)ether							CAS #: 108-60-1	
7.621	7.609	(1.086)	45	18084093	126.599	126	80.00- 120.00	100.00
7.621	7.609	(1.086)	121	3915698	143.881	144	0.00-10020.26	21.65

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
14 4-Methylphenol					CAS #: 106-44-5		
7.948	7.904 (1.133)	108	13051064	143.457	143	80.00- 120.00	100.00
7.948	7.904 (1.133)	107	15096394			0.00-10122.08	115.67
7.948	7.904 (1.133)	79	3124585			0.00-10025.12	23.94
15 N-Nitrosodipropylamine					CAS #: 621-64-7		
7.981	7.904 (1.138)	70	7626493	130.357	130	80.00- 120.00	100.00(M)
7.948	7.904 (1.133)	130	1433027			0.00-10026.33	18.79
7.981	7.904 (1.138)	101	451523			0.00-10012.19	5.92
16 Hexachloroethane					CAS #: 67-72-1		
8.062	8.051 (1.149)	117	6721459	149.498	149	80.00- 120.00	100.00
8.062	8.051 (1.149)	201	4841876			0.00-10068.38	72.04
8.062	8.051 (1.149)	199	2995235			0.00-10041.83	44.56
18 Nitrobenzene					CAS #: 98-95-3		
8.259	8.231 (0.844)	77	12866293	131.989	132	80.00- 120.00	100.00
8.259	8.231 (0.844)	123	7446312			0.00-10053.45	57.87
8.259	8.231 (0.844)	65	1879502			0.00-10013.89	14.61
19 Isophorone					CAS #: 78-59-1		
8.815	8.771 (0.901)	82	31437643	150.796	151	80.00- 120.00	100.00(M)
8.815	8.771 (0.901)	138	2856880			0.00-10014.70	9.09
8.815	8.771 (0.901)	95	1166365			0.00-10005.51	3.71
20 2-Nitrophenol					CAS #: 88-75-5		
8.946	8.918 (0.915)	139	8702150	165.528	166	80.00- 120.00	100.00
8.946	8.918 (0.915)	65	3644156			0.00-10042.96	41.88
8.946	8.918 (0.915)	109	2390760			0.00-10026.21	27.47
22 2,4-Dimethylphenol					CAS #: 105-67-9		
9.109	9.065 (0.931)	122	11433132	158.446	158	80.00- 120.00	100.00
9.109	9.065 (0.931)	107	13813465			0.00-10123.86	120.82
9.109	9.065 (0.931)	121	6244212			0.00-10055.27	54.62
23 bis(2-Chloroethoxy)methane					CAS #: 111-91-1		
9.305	9.294 (0.951)	93	17430618	139.132	139	80.00- 120.00	100.00
9.322	9.294 (0.953)	123	1974052			0.00-10010.88	11.33
9.305	9.294 (0.951)	95	5800103			0.00-10031.15	33.28
24 Benzoic Acid					CAS #: 65-85-0		
9.600	9.441 (0.982)	122	8793804	176.164	176	80.00- 120.00	100.00(M)
9.600	9.441 (0.982)	105	5629716			0.00-10123.32	64.02
9.600	9.441 (0.982)	77	3889477			0.00-10081.55	44.23
25 2,4-Dichlorophenol					CAS #: 120-83-2		
9.502	9.474 (0.972)	162	10581871	154.933	155	80.00- 120.00	100.00

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
25 2,4-Dichlorophenol (continued)							
9.502	9.474 (0.972)	164	6607050			0.00-10063.52	62.44
9.502	9.474 (0.972)	98	3856256			0.00-10039.12	36.44
26 1,2,4-Trichlorobenzene						CAS #: 120-82-1	
9.665	9.654 (0.988)	180	11846285	153.277	153	80.00- 120.00	100.00
9.665	9.654 (0.988)	182	11226203			0.00-10096.20	94.77
9.665	9.654 (0.988)	145	3370551			0.00-10028.68	28.45
28 Naphthalene						CAS #: 91-20-3	
9.829	9.818 (1.005)	128	18477279	77.0478	77.0	80.00- 120.00	100.00
9.845	9.818 (1.007)	129	4042723			0.00-10013.27	21.88
9.845	9.818 (1.007)	127	5065266			0.00-10013.22	27.41
29 4-Chloroaniline						CAS #: 106-47-8	
9.976	10.014 (1.020)	127	8891574	148.745	149	80.00- 120.00	100.00(MH)
9.976	9.965 (1.020)	129	1376031			0.00-10010.59	15.48
30 Hexachlorobutadiene						CAS #: 87-68-3	
10.140	10.128 (1.037)	225	6465439	154.578	154	80.00- 120.00	100.00
10.140	10.128 (1.037)	223	4014191			0.00-10061.71	62.09
10.140	10.128 (1.037)	227	4116920			0.00-10063.44	63.68
32 4-Chloro-3-Methylphenol						CAS #: 59-50-7	
11.170	11.159 (1.142)	107	12379997	159.794	160	80.00- 120.00	100.00
11.187	11.159 (1.144)	142	9324021			0.00-10073.71	75.32
11.187	11.159 (1.144)	144	2933509			0.00-10023.72	23.70
33 2-Methylnaphthalene						CAS #: 91-57-6	
11.448	11.437 (1.171)	142	19451731	128.177	128	80.00- 120.00	100.00
11.448	11.437 (1.171)	141	18422867			0.00-10090.11	94.71
35 Hexachlorocyclopentadiene						CAS #: 77-47-4	
11.824	11.813 (0.850)	237	6597765	188.371	188	80.00- 120.00	100.00
11.824	11.813 (0.850)	272	983897			0.00-10014.73	14.91
11.824	11.813 (0.850)	235	4048316			0.00-10061.71	61.36
36 2,4,6-Trichlorophenol						CAS #: 88-06-2	
12.152	12.124 (0.873)	196	7565565	167.063	167	80.00- 120.00	100.00
12.152	12.124 (0.873)	198	7075903			0.00-10094.84	93.53
12.152	12.124 (0.873)	200	2209056			0.00-10030.07	29.20
37 2,4,5-Trichlorophenol						CAS #: 95-95-4	
12.233	12.206 (0.879)	196	7788814	173.727	174	80.00- 120.00	100.00
12.233	12.206 (0.879)	198	7282853			0.00-10095.07	94.79
12.233	12.206 (0.879)	200	2293299			0.00-10030.67	29.44

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
39 2-Chloronaphthalene					CAS #: 91-58-7		
13.610	13.582 (0.906)	162	17059341	129.327	129	80.00- 120.00	100.00
13.610	13.582 (0.906)	164	7138312			0.00-10031.20	41.84
13.610	13.582 (0.906)	127	8856201			0.00-10038.71	51.91
40 2-Nitroaniline					CAS #: 88-74-4		
13.888	13.860 (0.926)	65	7510537	178.196	178	80.00- 120.00	100.00
13.904	13.876 (0.927)	138	9720982			0.00-10127.72	129.43
13.888	13.860 (0.926)	92	5381759			0.00-10073.86	71.66
41 3-Nitroaniline					CAS #: 99-09-2		
13.934	13.874 (1.001)	138	1581951	106.763	107	80.00- 120.00	100.00(H)
13.934	13.874 (1.001)	92	1676443			0.00-10120.29	105.97
13.918	13.907 (1.000)	108	517678			0.00-10080.06	32.72
43 Dimethylphthalate					CAS #: 131-11-3		
13.395	13.367 (0.962)	163	23671406	142.839	143	80.00- 120.00	100.00
13.395	13.367 (0.962)	194	1345620			0.00-10005.16	5.68
13.395	13.367 (0.962)	164	2536958			0.00-10009.58	10.72
45 2,6-Dinitrotoluene					CAS #: 606-20-2		
13.526	13.498 (0.972)	165	6674150	187.169	187	80.00- 120.00	100.00
13.526	13.498 (0.972)	89	3676763			0.00-10059.87	55.09
13.526	13.498 (0.972)	121	1420910			0.00-10022.31	21.29
46 Acenaphthylene					CAS #: 208-96-8		
13.575	13.563 (0.975)	152	21731850	106.307	106	80.00- 120.00	100.00
13.591	13.563 (0.976)	151	7359548			0.00-10023.78	33.87
13.591	13.563 (0.976)	153	4690367			0.00-10015.23	21.58
48 Acenaphthene					CAS #: 83-32-9		
14.016	13.989 (1.007)	154	16418317	128.408	128	80.00- 120.00	100.00
14.016	13.989 (1.007)	152	10063262			0.00-10049.54	61.29
14.016	13.989 (1.007)	153	16918234			0.00-10106.26	103.04
49 2,4-Dinitrophenol					CAS #: 51-28-5		
14.147	14.120 (1.016)	184	3915278	231.672	232	80.00- 120.00	100.00
14.147	14.103 (1.016)	63	2304439			0.00-10058.68	58.86
14.147	14.120 (1.016)	154	1581277			0.00-10038.31	40.39
50 4-Nitrophenol					CAS #: 100-02-7		
14.409	14.349 (1.035)	109	3646740	187.369	187	80.00- 120.00	100.00
14.409	14.349 (1.035)	139	16522457			0.00-10155.17	453.07
14.409	14.349 (1.035)	65	4583402			0.00-10133.38	125.68
51 Dibenzofuran					CAS #: 132-64-9		
14.425	14.414 (1.036)	168	21367046	120.328	120	80.00- 120.00	100.00

RT	EXP RT	(RSL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
51 Dibenzofuran (continued)								
14.409	14.414	(1.035)	139	16522457			0.00-10038.83	77.33
52 2,4-Dinitrotoluene							CAS #: 121-14-2	
14.474	14.447	(1.040)	165	8979718	175.459		175 80.00- 120.00	100.00
14.474	14.430	(1.040)	63	3786361			0.00-10063.54	42.17
14.474	14.447	(1.040)	182	432263			0.00-10004.36	4.81
53 1-Chloro-3,4-Dinitrobenzene							CAS #:	
14.769	14.708	(1.510)	63	4518633	185.576		186 80.00- 120.00	100.00
14.769	14.708	(1.510)	75	3734431			0.00-10081.72	82.65
14.769	14.725	(1.510)	202	2579635			0.00-10054.68	57.09
56 Diethylphthalate							CAS #: 84-66-2	
15.229	15.085	(1.087)	149	20085198	116.976		117 80.00- 120.00	100.00
15.229	15.085	(1.087)	177	5266530			0.00-10019.67	26.22
15.229	15.085	(1.087)	150	3086608			0.00-10011.54	15.37
57 Fluorene							CAS #: 86-73-7	
15.259	15.232	(1.096)	166	19867591	136.715		137 80.00- 120.00	100.00
15.259	15.232	(1.096)	165	18987981			0.00-10093.28	95.57
15.259	15.232	(1.096)	167	2961101			0.00-10012.75	14.90
58 4-Chlorophenyl phenyl ether							CAS #: 7005-72-3	
15.308	15.281	(1.100)	204	11478999	157.921		158 80.00- 120.00	100.00
15.308	15.281	(1.100)	206	3702339			0.00-10032.44	32.25
15.308	15.281	(1.100)	141	6702809			0.00-10053.60	58.39
59 4-Nitroaniline							CAS #: 100-01-6	
15.390	15.330	(1.106)	138	1536653	98.3067		98.3 80.00- 120.00	100.00
15.139	15.330	(1.109)	92	805555			0.00-10032.69	52.42
15.390	15.330	(1.106)	108	1263120			0.00-10073.68	82.20
60 4,6-Dinitro-2-methylphenol							CAS #: 534-52-1	
15.456	15.412	(0.883)	198	5287219	180.843		181 80.00- 120.00	100.00
15.456	15.412	(0.883)	121	1880808			0.00-10036.17	35.57
15.456	15.412	(0.883)	51	2705272			0.00-10054.03	51.17
61 N-nitrosodiphenylamine							CAS #: 86-30-6	
15.602	15.575	(0.892)	169	13063791	134.261		134 80.00- 120.00	100.00
15.603	15.575	(0.892)	168	8597658			0.00-10066.04	65.81
15.603	15.575	(0.892)	167	4674094			0.00-10035.43	35.78
65 4-Bromophenyl phenyl ether							CAS #: 101-55-3	
16.486	16.459	(0.942)	248	7315272	149.477		149 80.00- 120.00	100.00
16.486	16.459	(0.942)	250	7105476			0.00-10096.59	97.13

RT	EXP RT	(RSL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
65 4-Bromophenyl phenyl ether (continued)								
16.486	16.459	(0.942)	141	4851002			0.00-10065.11	66.31
66 Hexachlorobenzene						CAS #: 118-74-1		
16.568	16.540	(0.947)	284	9503832	152.449	152	80.00- 120.00	100.00
16.568	16.540	(0.947)	142	2933980			0.00-10033.27	30.87
16.568	16.540	(0.947)	249	2309894			0.00-10024.51	24.30
68 Pentachlorophenol						CAS #: 87-86-5		
17.059	17.047	(0.975)	266	6229718	185.805	186	80.00- 120.00	100.00
17.059	17.047	(0.975)	264	3912695			0.00-10062.05	62.81
17.059	17.047	(0.975)	268	3923819			0.00-10063.81	62.99
72 Phenanthrene						CAS #: 85-01-8		
17.566	17.538	(1.004)	178	23006044	111.367	111	80.00- 120.00	100.00
17.566	17.538	(1.004)	176	6096113			0.00-10020.36	26.50
17.566	17.538	(1.004)	179	4973534			0.00-10016.57	21.62
73 Anthracene						CAS #: 120-12-7		
17.680	17.669	(1.010)	178	20464025	101.985	102	80.00- 120.00	100.00
17.697	17.669	(1.011)	176	5930835			0.00-10019.61	28.98
17.697	17.669	(1.011)	179	5085020			0.00-10016.26	24.85
78 Di-n-butylphthalate						CAS #: 84-74-2		
19.071	19.059	(1.090)	149	22120428	74.5680	74.6	80.00- 120.00	100.00
19.087	19.059	(1.091)	150	4167336			0.00-10011.22	18.84
19.087	19.059	(1.091)	104	2546603			0.00-10006.82	11.51
80 Fluoranthene						CAS #: 206-44-0		
20.428	20.401	(1.167)	202	25386122	120.786	121	80.00- 120.00	100.00
20.428	20.401	(1.167)	101	5344435			0.00-10017.87	21.05
20.428	20.401	(1.167)	100	4063928			0.00-10013.24	16.01
81 Pyrene						CAS #: 129-00-0		
20.968	20.940	(0.877)	202	24872463	124.696	125	80.00- 120.00	100.00
20.968	20.940	(0.877)	101	6451629			0.00-10022.30	25.94
20.968	20.940	(0.877)	100	5228267			0.00-10017.69	21.02
85 Butyl benzyl phthalate						CAS #: 85-68-7		
22.702	22.674	(0.949)	149	18002069	149.964	150	80.00- 120.00	100.00
22.702	22.674	(0.949)	91	15373586			0.00-10073.35	85.40
22.702	22.674	(0.949)	206	3245898			0.00-10015.36	18.03
89 Benzo(a)Anthracene						CAS #: 56-55-3		
22.880	22.836	(0.999)	228	27907572	173.878	174	80.00- 120.00	100.00
22.863	22.836	(0.998)	229	5704937			0.00-10018.92	20.44

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
99 Benzo(a)Anthracene (continued)								
23.880	23.836	(0.999)	226	7740972			0.00-10025.91	27.74
91 Chrysene							CAS #: 218-01-9	
23.978	23.950	(1.003)	228	22339456	159.910	160	80.00- 120.00	100.00
23.978	23.950	(1.003)	226	8010351			0.00-10028.14	35.86
23.978	23.950	(1.003)	229	5291051			0.00-10019.65	23.68
92 bis(2-ethylhexyl)Phthalate							CAS #: 117-81-7	
24.141	24.130	(1.010)	149	19877296	127.610	128	80.00- 120.00	100.00
24.141	24.130	(1.010)	167	7915435			0.00-10027.97	39.82
24.141	24.130	(1.010)	279	1716662			0.00-10005.78	8.64
94 Di-n-octyl phthalate							CAS #: 117-84-0	
25.630	25.619	(0.947)	149	21779757	90.0594	90.0	80.00- 120.00	100.00
25.646	25.619	(0.947)	150	4223952			0.00-10011.28	19.39
95 Benzo(b)fluoranthene							CAS #: 205-99-2	
26.300	26.273	(0.972)	252	27005717	183.051	183	80.00- 120.00	100.00
26.300	26.273	(0.972)	253	5703099			0.00-10021.18	21.12
26.300	26.256	(0.972)	125	4540120			0.00-10017.89	16.81
96 Benzo(k)fluoranthene							CAS #: 207-08-9	
26.366	26.322	(0.974)	252	17654035	135.371	135	80.00- 120.00	100.00
26.366	26.322	(0.974)	253	4267296			0.00-10020.93	24.17
26.366	26.322	(0.974)	125	3028785			0.00-10016.09	17.16
97 Benzo(e)pyrene							CAS #:	
26.840	26.813	(0.992)	252	9896416	77.1217	77.1	80.00- 120.00	100.00
26.840	26.813	(0.992)	125	2438924			0.00-10027.28	24.64
26.840	26.813	(0.992)	250	2744911			0.00-10027.55	27.74
98 Benzo(a)pyrene							CAS #: 50-32-8	
26.971	26.927	(0.996)	252	16707963	150.498	150	80.00- 120.00	100.00
26.971	26.927	(0.996)	253	3757867			0.00-10021.09	22.49
26.971	26.927	(0.996)	125	3174001			0.00-10021.00	19.00
101 Indeno(1,2,3-cd)pyrene							CAS #: 193-39-5	
29.555	29.528	(1.092)	276	11633665	154.802	155	80.00- 120.00	100.00
29.555	29.528	(1.092)	138	3949579			0.00-10035.87	33.95
29.572	29.528	(1.092)	227	11174			0.00-10000.11	0.10
104 Dibenzo(a,h)anthracene							CAS #: 53-70-3	
29.637	29.593	(1.095)	278	10325016	157.118	157	80.00- 120.00	100.00
29.637	29.593	(1.095)	279	2325742			0.00-10022.59	22.53
29.637	29.593	(1.095)	139	2630974			0.00-10027.37	25.48

RT	EXP RT	(RSL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
105 Benzo(g,h,i)perylene						CAS #: 191-24-2		
30.308	30.264	(1.120)	276	11156060	142.301	142	80.00- 120.00	100.00
30.308	30.264	(1.120)	138	4224064			0.00-10038.50	37.86
30.308	30.264	(1.120)	277	2605480			0.00-10023.39	23.35

QC Flag Legend

R - Spike/Surrogate failed recovery limits.
M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150901014.d
Lab Smp Id:
Inj Date : 15-JAN-1998 16:27 Inst ID: msdh.i
Operator : jgh
Smp Info : 1.0ul 160ug STD 396-4-160
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 17:51 jheffel Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 9
Dil Factor: 1.00000 Compound Sublist: MM5X.sub
Integrator: HP RTE
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)	
* 7 1,4-Dichlorobenzene-d4	150	7.015	7.017	(1.000)	12246509	80.0000		
	150	6.574	7.017	(1.000)	480	80.0000		
	150	6.639	7.017	(1.000)	243	80.0000		
	150	6.688	7.017	(1.000)	420	80.0000		
	150	6.721	7.017	(1.000)	307	80.0000		
	150	6.901	7.017	(1.000)	1495039	80.0000		
	150	7.359	7.017	(1.000)	1295235	80.0000		
* 27 Naphthalene-d8	136	9.780	9.782	(1.000)	19429026	80.0000		
	136	9.502	9.782	(1.000)	63954	80.0000		
* 47 Acenaphthene-d10	164	13.918	13.920	(1.000)	13407107	80.0000		
* 71 Phenanthrene-d10	188	17.500	17.486	(1.000)	21902243	80.0000		
	188	17.059	17.486	(1.000)	1988	80.0000		
	188	17.124	17.486	(1.000)	75	80.0000		(Q)
	188	17.173	17.486	(1.000)	1620	80.0000		

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	188	17.222	17.486	(1.000)	508	80.0000	
* 90 Chrysene-d12	240	23.912	23.898	(1.000)	16320178	80.0000	
	240	23.503	23.898	(1.000)	287	80.0000	
	240	23.585	23.898	(1.000)	840	80.0000	
	240	23.634	23.898	(1.000)	480	80.0000	
	240	24.272	23.898	(1.000)	3969	80.0000	
* 99 Perylene-d12	264	27.069	27.055	(1.000)	12208572	80.0000	
	264	26.677	27.055	(1.000)	315	80.0000	
	264	26.775	27.055	(1.000)	1386	80.0000	
	264	26.857	27.055	(1.000)	1063	80.0000	
S 1 2-Fluorophenol	112	4.660	4.645	(0.664)	16955326	144.963	145(R)
	112	4.284	4.645	(0.611)	761126	6.50740	6.5(R)
S 2 Phenol-d5	99	6.345	6.314	(0.649)	19309233	144.403	144(R)
	99	6.607	6.314	(0.676)	846098	6.32751	6.3(R)
S 17 Nitrobenzene-d5	82	8.210	8.179	(0.590)	17148714	159.749	160(R)
	82	7.948	8.179	(0.571)	71801	0.66886	0.67(R)
S 62 2,4,6-Tribromophenol	330	15.832	15.817	(0.662)	5752614	176.766	177(R)
S 82 Terphenyl-d14	244	21.442	21.411	(0.897)	20203442	141.425	141(R)
S 12 2-Fluorobiphenyl	172	12.364	12.350	(0.707)	17191318	102.985	103
S 34 1-Methylnaphthalene-d10	152	11.595	11.581	(1.186)	17824628	138.822	139
3 Phenol	94	6.378	6.347	(0.909)	16695989	124.137	124
	94	6.541	6.347	(0.932)	512877	3.81331	3.8(a)
4 bis(2-Chloroethyl)ether	93	6.541	6.510	(0.932)	14168698	129.813	130
	93	6.361	6.510	(0.907)	144122	1.32044	1.3
	93	6.394	6.510	(0.911)	70489	0.64582	0.64(a)
5 2-Chlorophenol	128	6.607	6.592	(0.942)	15537272	152.692	153
6 1,3-Dichlorobenzene	146	6.901	6.903	(0.984)	15159576	149.124	149
	146	7.065	6.903	(1.007)	14085321	138.557	138
9 1,4-Dichlorobenzene	146	7.065	7.050	(1.007)	14129199	124.163	134
	146	6.901	7.050	(0.984)	15149922	143.855	144
	146	7.343	7.050	(1.047)	12731402	120.890	121
10 Benzyl Alcohol	108	7.359	7.328	(1.049)	9456736	144.601	145
	108	6.901	7.328	(0.984)	116901	1.78751	1.8(a)
	108	7.065	7.328	(1.007)	142000	2.17129	2.2(a)
	108	7.588	7.328	(1.082)	13666857	208.977	209
11 1,2-Dichlorobenzene	146	7.359	7.344	(1.049)	12283423	139.507	140
	146	6.901	7.344	(0.984)	14935512	156.858	157
	146	7.065	7.344	(1.007)	14064229	147.707	148
12 2-Methylphenol	108	7.588	7.557	(1.082)	13666857	143.980	144
	108	7.359	7.557	(1.049)	9456736	99.6268	99.6
	108	7.948	7.557	(1.133)	12881310	135.705	136
13 bis(2-Chloroisopropyl)ether	45	7.621	7.606	(1.086)	18084093	126.599	126
14 4-Methylphenol	108	7.948	7.901	(1.133)	12929342	142.119	142
15 N-Nitrosodipropylamine	70	7.948	7.901	(1.133)	5440058	92.9850	93.0
	70	7.981	7.901	(1.138)	3570653	61.0319	61.0
	70	8.210	7.901	(1.170)	2144400	36.6535	36.6
16 Hexachloroethane	117	8.062	8.048	(1.149)	6721459	149.498	149

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
18 Nitrobenzene	77	8.259	8.228	(0.844)	12866293	131.989	132
	77	7.948	8.228	(0.813)	4495033	46.1125	46.1
19 Isophorone	82	8.815	8.767	(0.901)	19793514	94.9429	94.9
	82	8.929	8.767	(0.913)	412984	1.98095	2.0
20 2-Nitrophenol	139	8.946	8.915	(0.915)	9699951	165.486	165
	139	8.815	8.915	(0.901)	290849	5.53237	5.5
21 2,4-Dimethylphenol	122	9.109	9.062	(0.931)	11433132	158.446	158
	122	8.946	9.062	(0.915)	466610	6.46651	6.5
22 bis(2-Chloroethoxy)methane	93	9.305	9.291	(0.951)	17430618	139.132	139
	93	8.946	9.291	(0.915)	817673	6.52669	6.5
	93	9.109	9.291	(0.931)	425037	3.39266	3.4
24 Benzoic Acid	122	9.469	9.454	(0.968)	5071560	101.597	102
	122	9.109	9.454	(0.931)	11433132	229.037	229
	122	9.600	9.454	(0.982)	5295707	106.088	106
	122	9.845	9.454	(1.007)	105204	2.10753	2.1(a)
25 2,4-Dichlorophenol	162	9.502	9.471	(0.972)	10581871	154.933	155
26 1,2,4-Trichlorobenzene	180	9.665	9.651	(0.988)	11846285	153.277	153
28 Naphthalene	128	9.829	9.814	(1.005)	18477279	77.0478	77.0
	128	9.502	9.814	(0.972)	383667	1.59984	1.6
	128	9.976	9.814	(1.020)	233354	0.97306	0.97(a)
29 4-Chloroaniline	127	9.845	10.011	(1.007)	5065266	84.7355	84.7
	127	9.976	10.011	(1.020)	4444859	74.3569	74.4
	127	10.352	10.011	(1.059)	130886	2.18956	2.2
30 Hexachlorobutadiene	225	10.140	10.125	(1.037)	9465439	154.578	154
	225	9.780	10.125	(1.000)	89967	2.15096	2.2
32 4-Chloro-3-Methylphenol	107	11.170	11.156	(1.142)	12379997	159.794	160
33 2-Methylnaphthalene	142	11.448	11.434	(1.171)	19451731	128.177	128
	142	11.287	11.434	(1.144)	9324021	61.4404	61.4
	142	11.661	11.434	(1.192)	313960	2.06883	2.1
35 Hexachlorocyclopentadiene	237	11.824	11.810	(0.850)	6597765	188.371	188
36 2,4,6-Trichlorophenol	196	12.152	12.121	(0.873)	7565565	167.063	167
	196	12.233	12.121	(0.879)	7782157	171.846	172
37 2,4,5-Trichlorophenol	196	12.233	12.202	(0.879)	7888814	173.727	174
	196	12.152	12.202	(0.873)	7565565	168.748	169
39 2-Chloronaphthalene	162	12.610	12.579	(0.906)	17059341	129.327	129
	162	12.152	12.579	(0.873)	541811	4.10748	4.1
	162	12.233	12.579	(0.879)	210806	1.59813	1.6
40 2-Nitroaniline	65	12.888	12.873	(0.926)	7510537	178.196	178
41 3-Nitroaniline	138	13.853	13.871	(0.995)	171695	11.5874	11.6
	138	13.934	13.871	(1.001)	1562172	105.428	105
	138	14.147	13.871	(1.016)	95195	6.42454	6.4
43 Dimethylphthalate	163	13.395	13.380	(0.962)	23671406	142.839	143
45 2,6-Dinitrotoluene	165	13.526	13.495	(0.972)	6673726	187.157	187
	165	13.395	13.495	(0.962)	282933	7.93454	7.9
46 Acenaphthylene	152	13.575	13.560	(0.975)	21731850	106.307	106
48 Acenaphthene	154	14.016	13.985	(1.007)	16418317	128.408	128
	154	13.591	13.985	(0.976)	271806	2.12580	2.1

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
49	2,4-Dinitrophenol	184	14.147	14.116	(1.016)	3915278	231.672	232
50	4-Nitrophenol	109	14.409	14.362	(1.035)	3637087	186.873	187
		109	13.918	14.362	(1.000)	27729	1.42471	1.4(a)
		109	14.147	14.362	(1.016)	28178	1.44778	1.4(a)
51	Dibenzofuran	168	14.425	14.411	(1.036)	21367046	120.328	120
		168	14.147	14.411	(1.016)	125890	0.70895	0.7(a)
52	2,4-Dinitrotoluene	165	14.474	14.443	(1.040)	8979718	175.459	175
53	1-Chloro-3,4-Dinitrobenzene	63	14.769	14.721	(1.510)	4518633	185.576	186
		63	14.409	14.721	(1.473)	3988274	163.795	164
		63	14.474	14.721	(1.480)	3775540	155.058	155
		63	14.540	14.721	(1.487)	133034	5.46358	5.5
		63	14.801	14.721	(1.513)	77094	3.16618	3.2
		63	14.998	14.721	(1.534)	245762	10.0932	10.1
		63	15.129	14.721	(1.547)	178289	7.32216	7.3
56	Diethylphthalate	149	15.129	15.098	(1.087)	20085198	116.976	117
		149	15.308	15.098	(1.100)	203157	1.18319	1.2
57	Fluorene	166	15.259	15.245	(1.096)	19867591	136.715	137
		166	15.603	15.245	(1.121)	699712	4.81494	4.8
58	4-Chlorophenyl phenyl ether	204	15.308	15.294	(1.100)	11478999	157.921	158
		204	15.014	15.294	(1.079)	73846	1.01593	1.0
59	4-Nitroaniline	138	15.390	15.343	(1.106)	1536653	98.3067	98.3
		138	15.145	15.343	(1.088)	342873	21.9351	21.9
		138	15.259	15.343	(1.096)	247850	15.8561	15.8
60	4,6-Dinitro-2-methylphenol	198	15.456	15.408	(0.883)	5287219	180.843	181
61	N-nitrosodiphenylamine	169	15.603	15.588	(0.892)	13063791	134.261	134
		169	15.308	15.588	(0.875)	1052238	10.8142	10.8
		169	15.822	15.588	(0.905)	148717	1.52842	1.5
65	4-Bromophenyl phenyl ether	248	16.486	16.455	(0.942)	7315272	149.477	149
		248	16.601	16.455	(0.949)	29681	0.60649	0.61(a)
66	Hexachlorobenzene	284	16.568	16.553	(0.947)	9503832	152.449	152
68	Pentachlorophenol	266	17.059	17.044	(0.975)	6229718	185.805	186
72	Phenanthrene	178	17.566	17.551	(1.004)	23006044	111.367	111
		178	17.680	17.551	(1.010)	20464025	99.0615	99.1
73	Anthracene	178	17.680	17.666	(1.010)	20464025	101.985	102
		178	17.566	17.666	(1.004)	23006044	114.654	115
78	Di-n-butylphthalate	149	19.071	19.072	(1.090)	22120428	74.5680	74.6
80	Fluoranthene	202	20.428	20.414	(1.167)	25386122	120.786	121
81	Pyrene	202	20.968	20.937	(0.877)	24872463	124.696	125
85	Butyl benzyl phthalate	149	22.702	22.687	(0.949)	18002069	149.964	150
89	Benzo(a)Anthracene	228	23.880	23.849	(0.999)	27907573	173.878	174
		228	23.978	23.849	(1.003)	22333655	139.150	139
91	Chrysene	228	23.978	23.947	(1.003)	22339459	159.910	160
		228	23.880	23.947	(0.999)	27907573	199.768	200
93	bis(2-ethylhexyl)Phthalate	149	24.141	24.127	(1.010)	19877296	127.610	128
		149	23.880	24.127	(0.999)	129199	0.82944	0.83(a)
94	Di-n-octyl phthalate	149	25.630	25.615	(0.947)	21779757	90.0594	90.0
95	Benzo(b)fluoranthene	252	26.300	26.269	(0.972)	27005717	183.051	183

Data File: /chem/msdh.i/h-15Jan98.b/h01150901014.d
Report Date: 19-Jan-1998 17:53

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Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
	252	26.366	26.269	(0.974)	17643557	119.592	120
96 Benzo(k)fluoranthene	252	26.366	26.335	(0.974)	17654035	135.371	135
	252	26.300	26.335	(0.972)	27005717	207.079	207
97 Benzo(e)pyrene	252	26.840	26.826	(0.992)	9896416	77.1217	77.1
	252	26.971	26.826	(0.996)	16707963	130.203	130
98 Benzo(a)pyrene	252	26.971	26.940	(0.996)	16707963	150.498	150
	252	26.840	26.940	(0.992)	9896416	89.1425	89.1
103 Indeno(1,2,3-cd)pyrene	276	29.555	29.524	(1.092)	11633665	154.802	155
	276	29.637	29.524	(1.095)	2281475	30.3581	30.4
104 Dibenzo(a,h)anthracene	278	29.637	29.590	(1.095)	10325016	157.118	157
105 Benzo(g,h,i)perylene	276	30.308	30.261	(1.120)	11156060	142.301	142

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.
R - Spike/Surrogate failed recovery limits.

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01150901014.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: jgh
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/15/98
Calibration Time: 1501

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	10654771	5327386	21309542	12246509	14.94
27 Naphthalene-d8	16919358	8459679	33838716	19429026	14.83
47 Acenaphthene-d10	12271905	6135952	24543810	13407107	9.25
71 Phenanthrene-d10	19162935	9581468	38325870	21902243	14.29
90 Chrysene-d12	16491029	8245514	32982058	16320178	-1.04
99 Perylene-d12	9979847	4989924	19959694	12208572	22.33

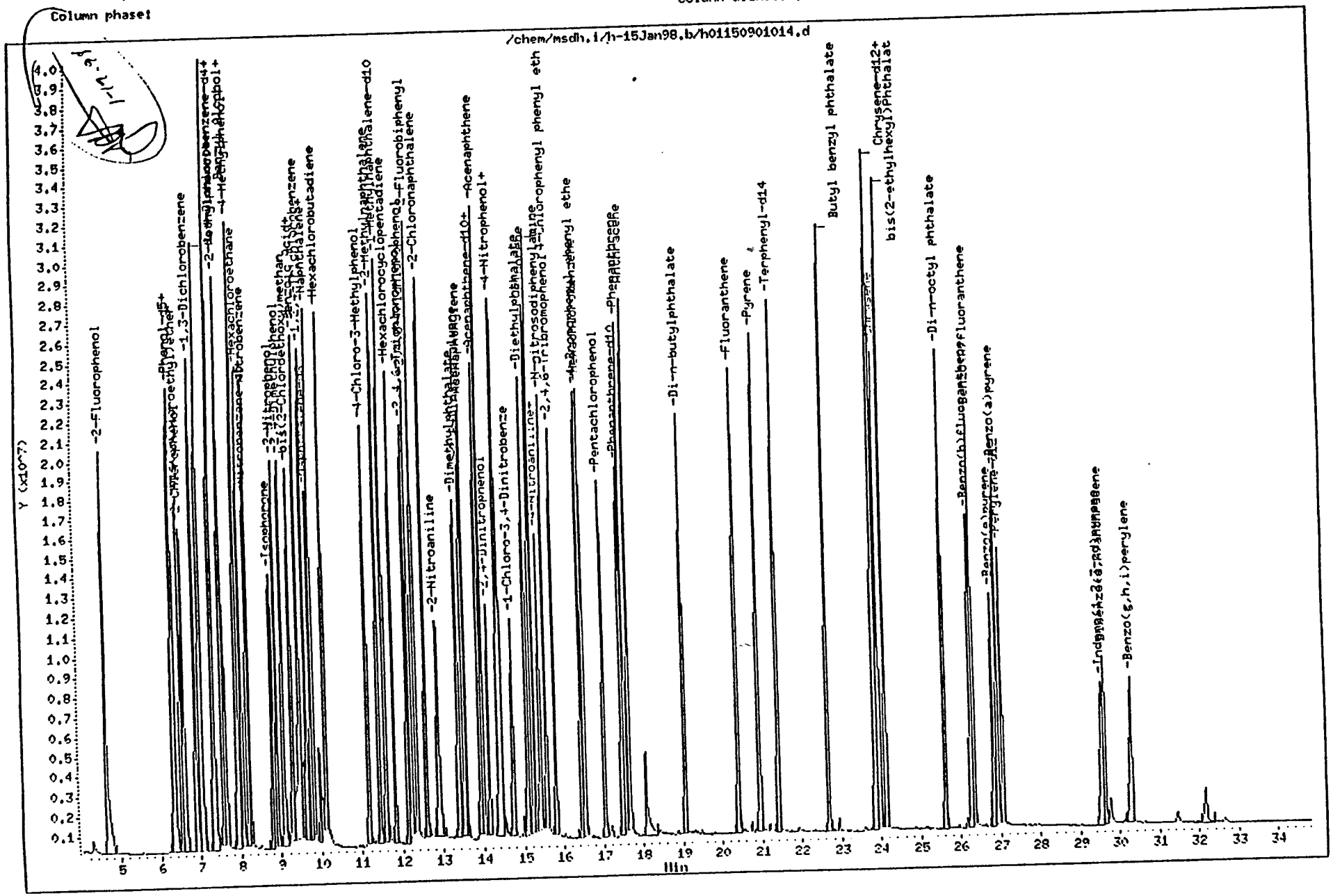
COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.02	6.52	7.52	7.02	-0.02
27 Naphthalene-d8	9.78	9.28	10.28	9.78	-0.02
47 Acenaphthene-d10	13.92	13.42	14.42	13.92	-0.01
71 Phenanthrene-d10	17.49	16.99	17.99	17.50	0.08
90 Chrysene-d12	23.90	23.40	24.40	23.91	0.06
99 Perylene-d12	27.05	26.55	27.55	27.07	0.05

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

435

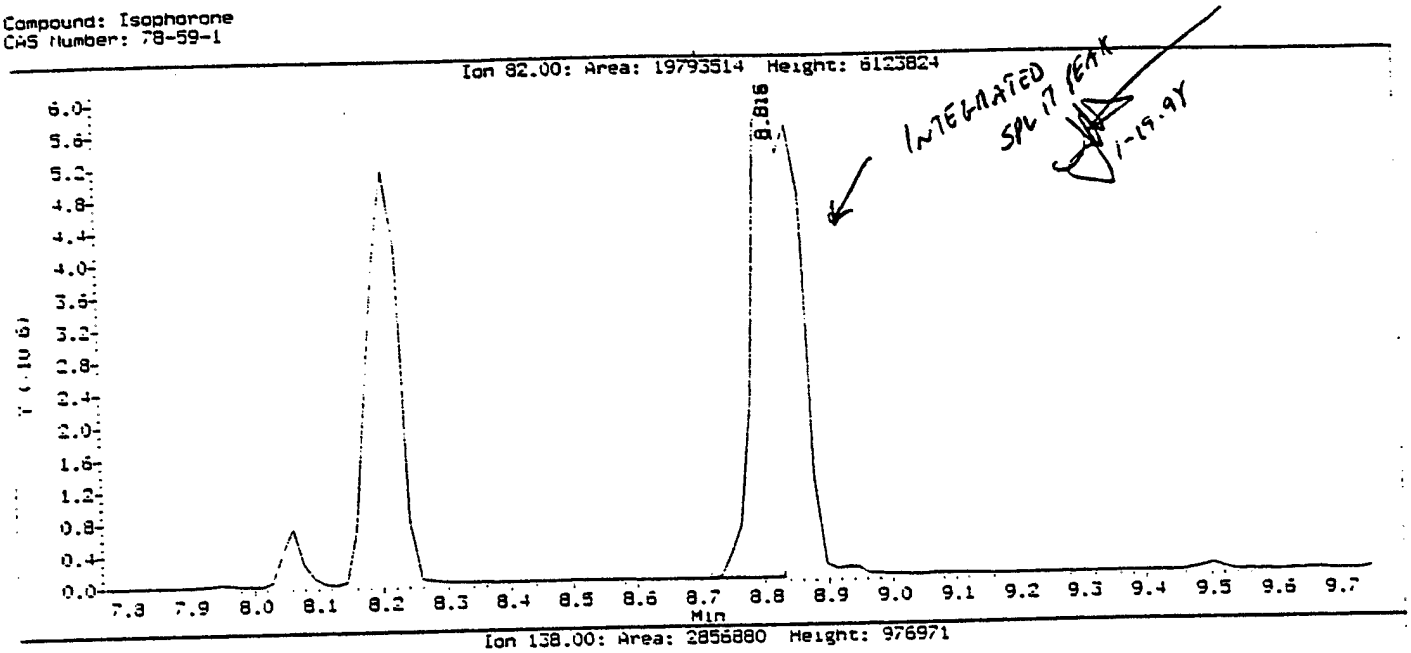
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Date: 15-JAN-1998 16:27
Client ID:
Sample Info: 1.0ul 160ug SID 396-4-160
Volume Injected (uL): 1.0
Column phase:

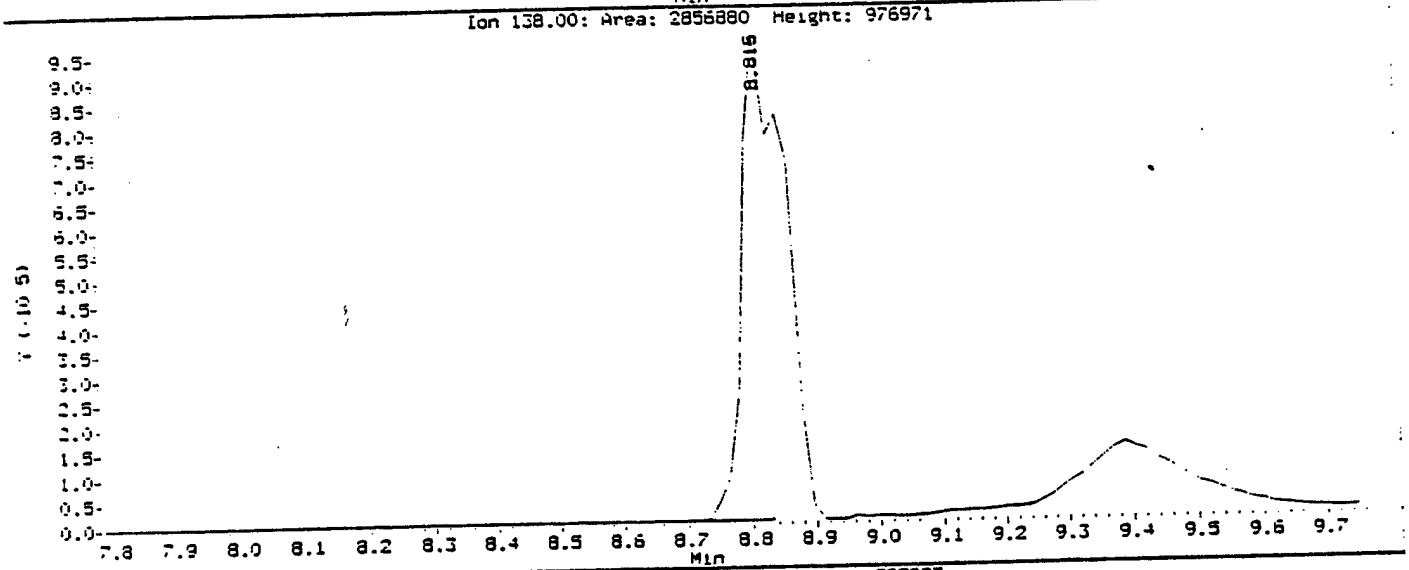
Instrument: msdh.i
Operator: jgh
Column diameter: 2.00

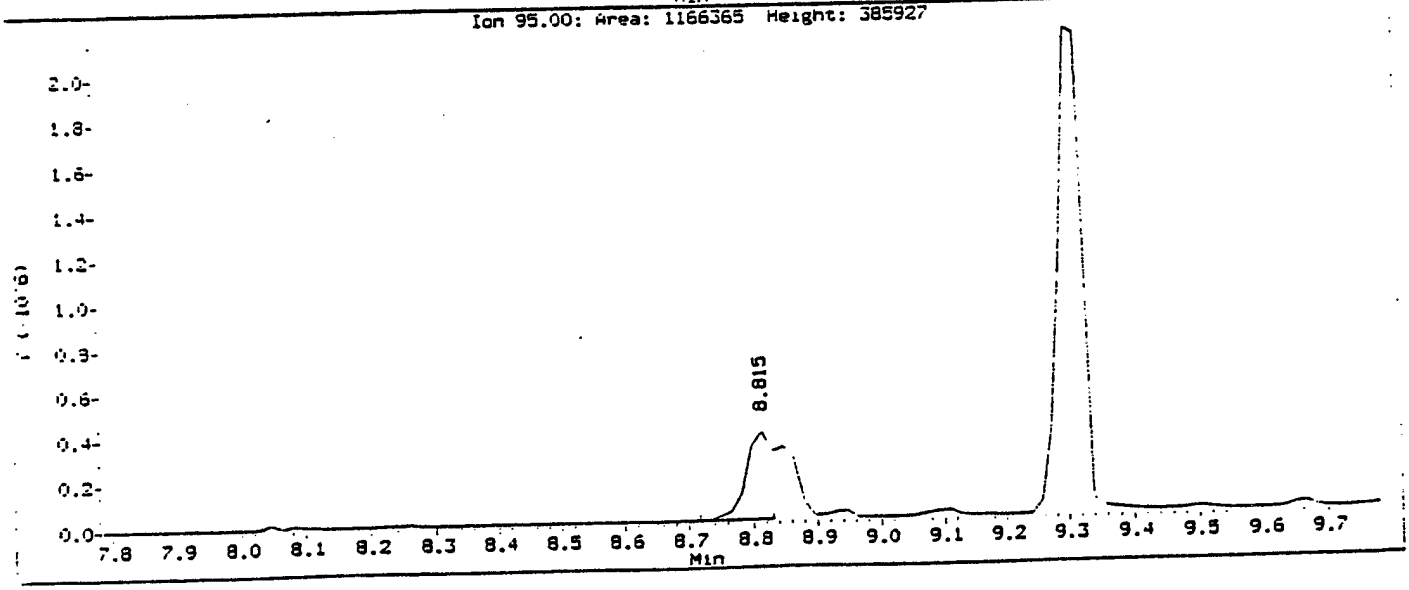


Data File: /chem/msdh.i/h-15Jan98.b/h0115090101d.d
Injection Date: 15-JAN-1998 16:27
Instrument: msdh.i
Client Sample ID:

Compound: Isophorone
CAS Number: 78-59-1





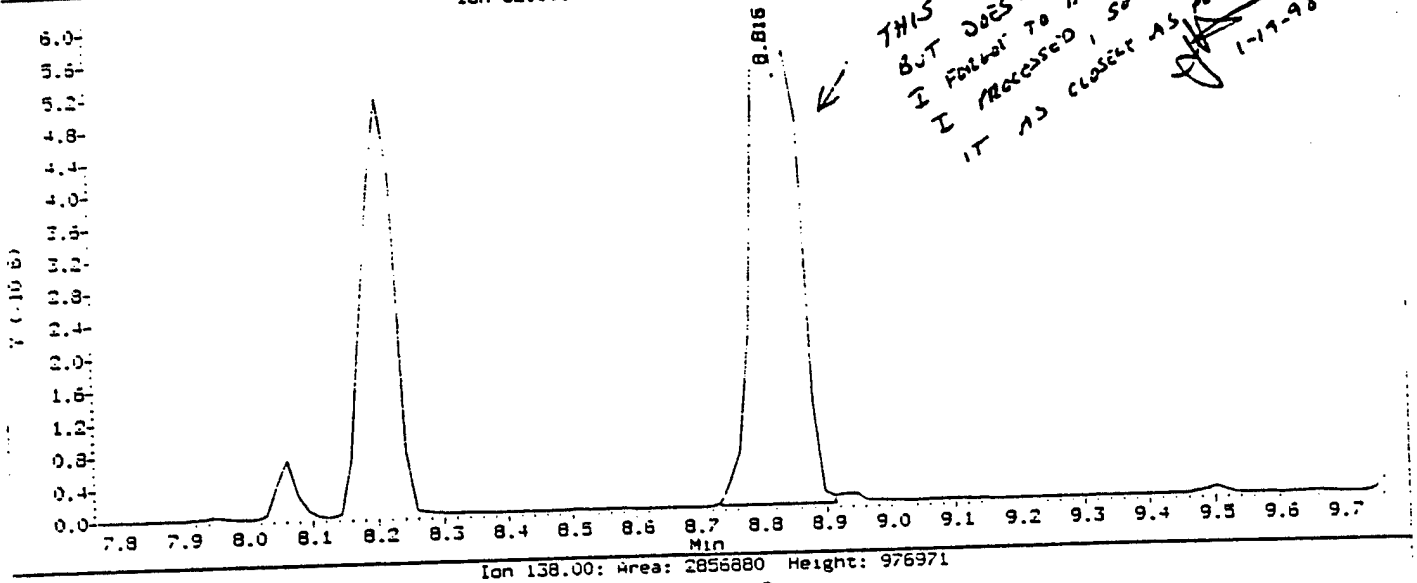


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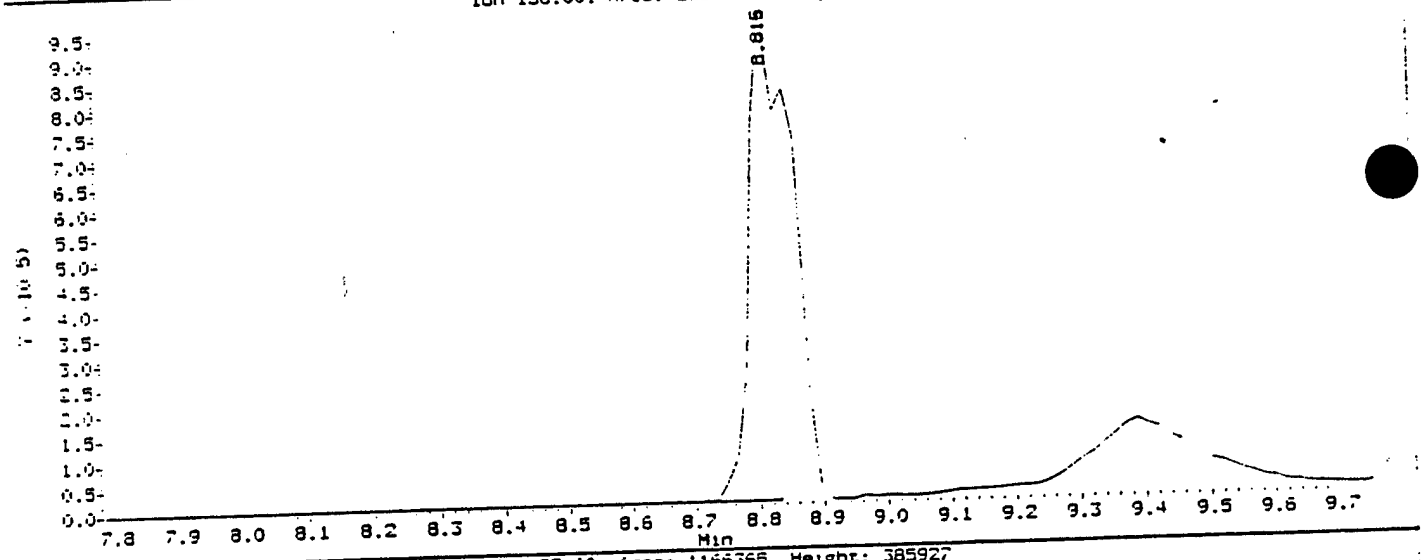
Compound: Isophorone
CAS Number: 78-59-1

THIS IS AFTER PHOTO
BUT DOES NOT EXACTLY MATCH,
I FORGOT TO TAKE PHOTO BEFORE
I PROCESSED, SO I MATCHED
IT AS CLOSELY AS POSSIBLE
1-19-98

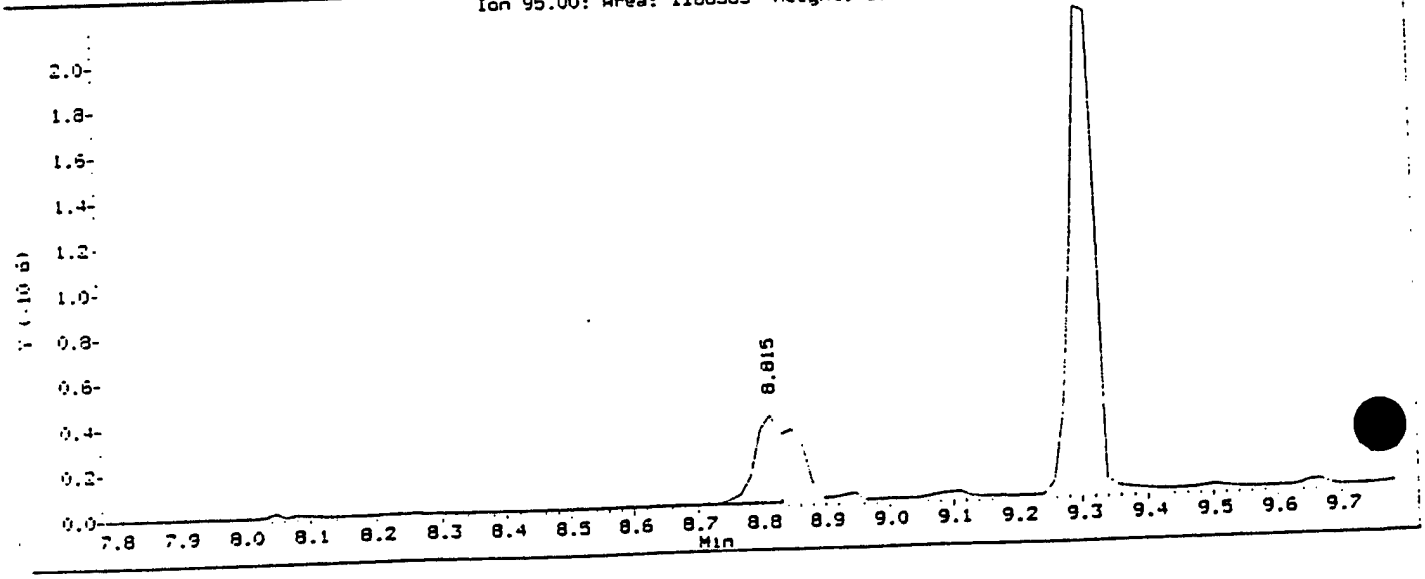
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Ion 138.00: Area: 2856880 Height: 976971

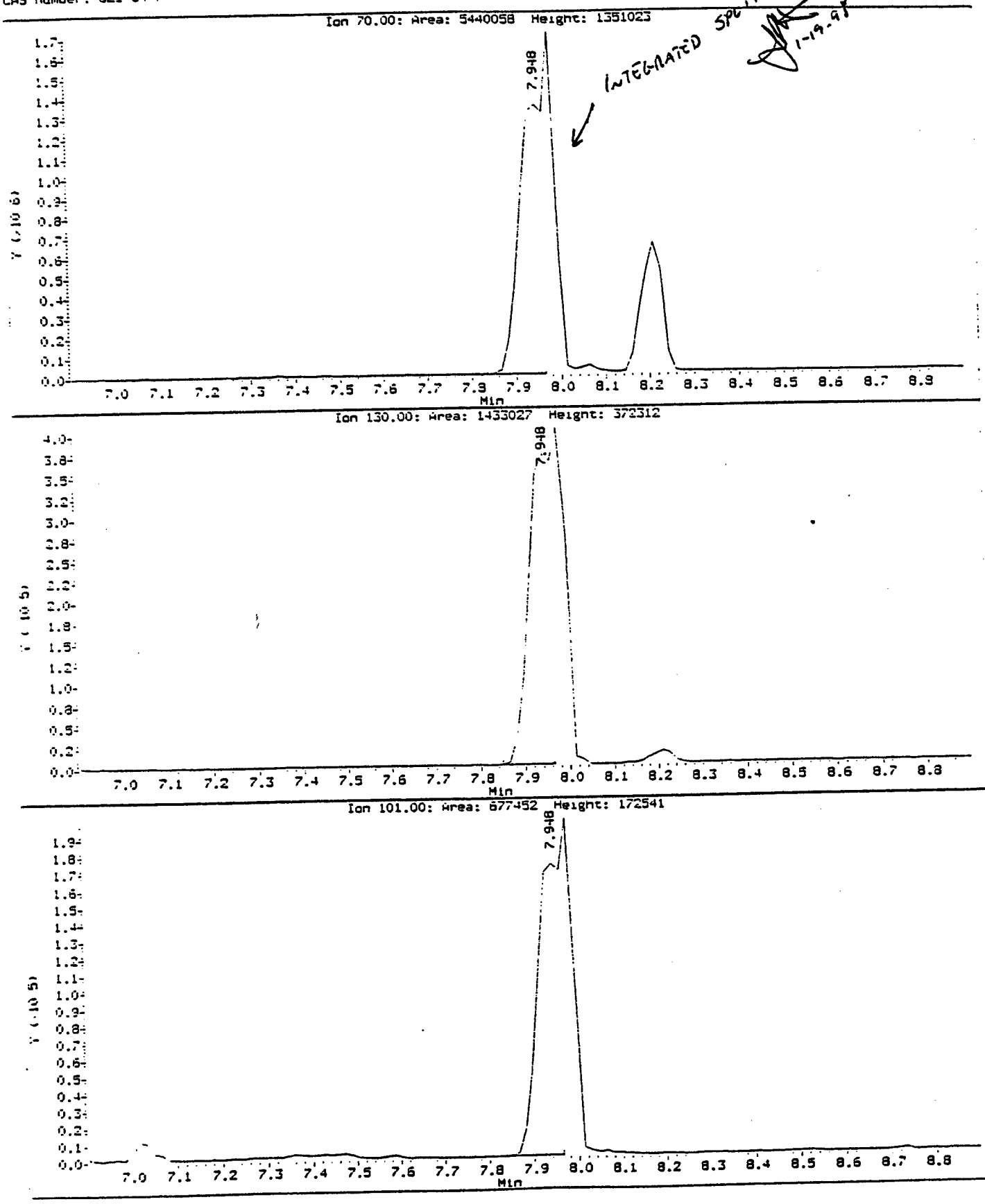


Ion 95.00: Area: 1166365 Height: 385927



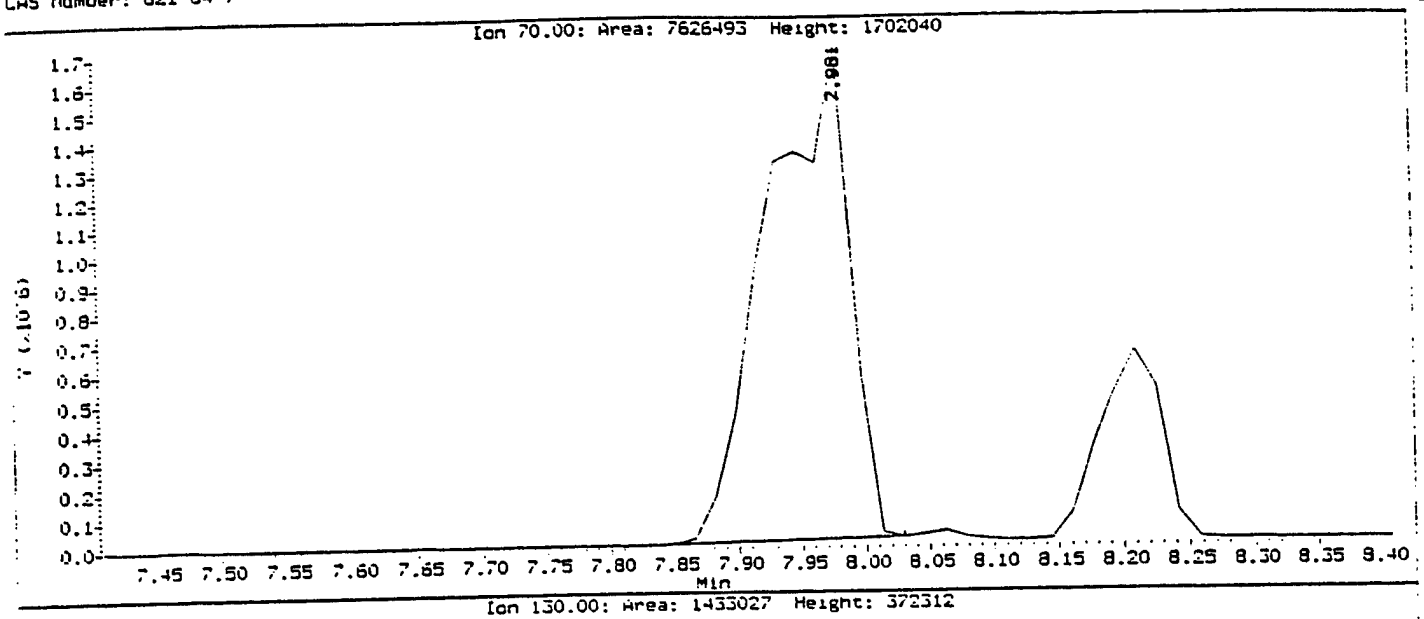
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Instrument: msdh.i
Client Sample ID:

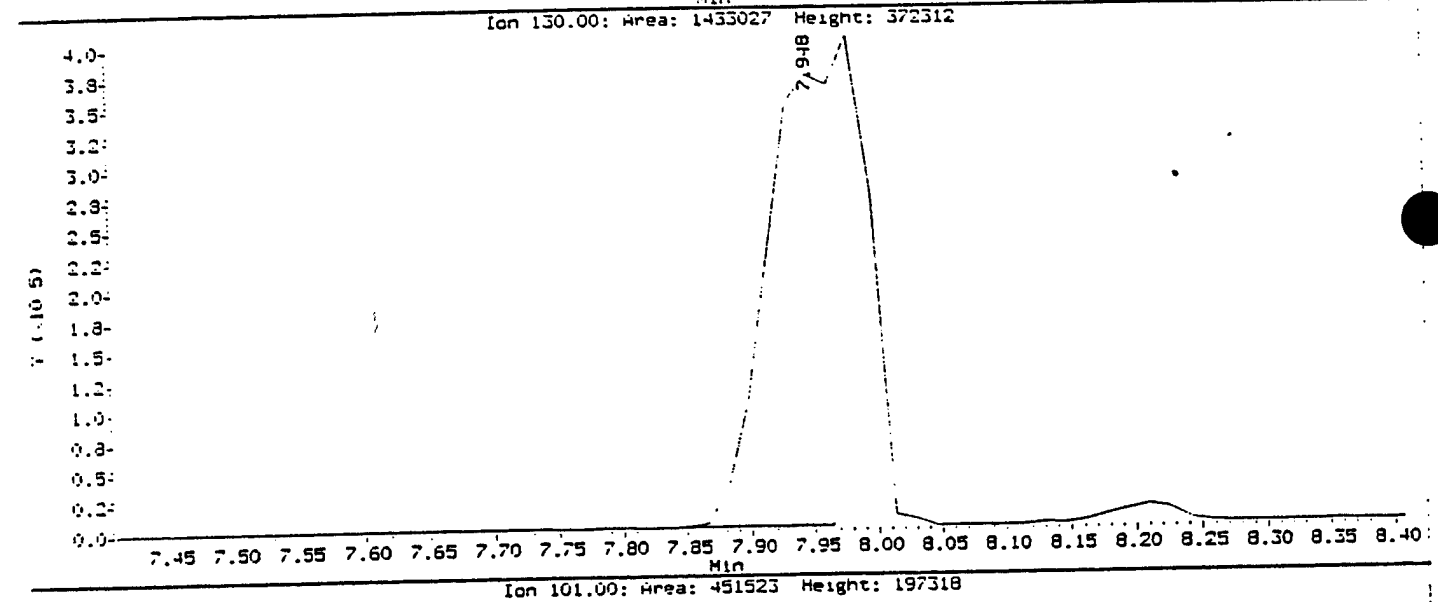
Compound: N-Nitrosodipropylamine
CAS Number: 621-64-7

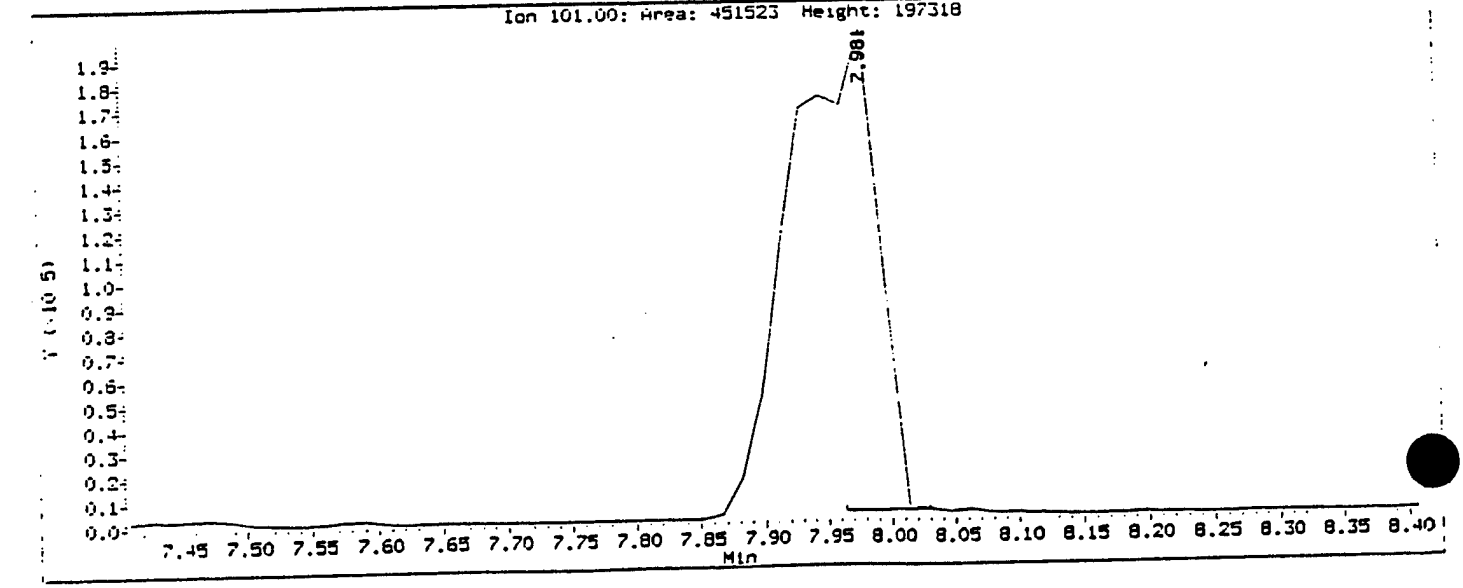


Data File: /chem/msdh.i/h-15Jan98.b/h01150901014.d
Injection Date: 15-JAN-1998 16:27
Instrument: msdh.i
Client Sample ID:

Compound: N-Nitrosodipropylamine
CAS Number: 621-64-7



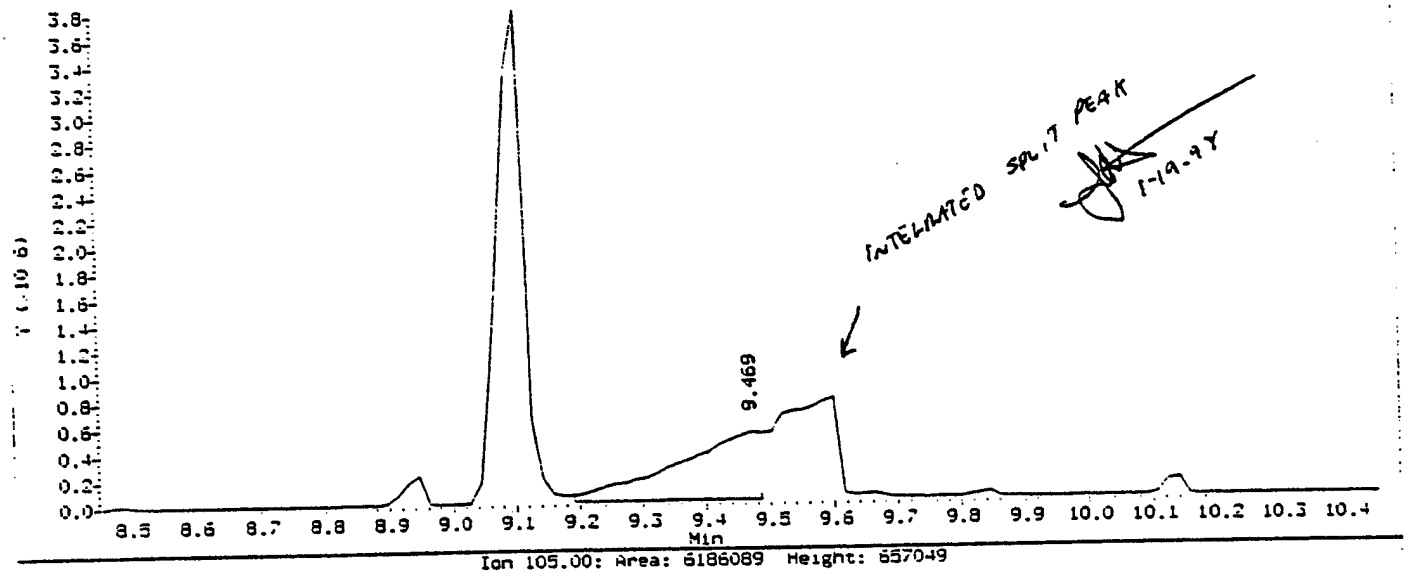




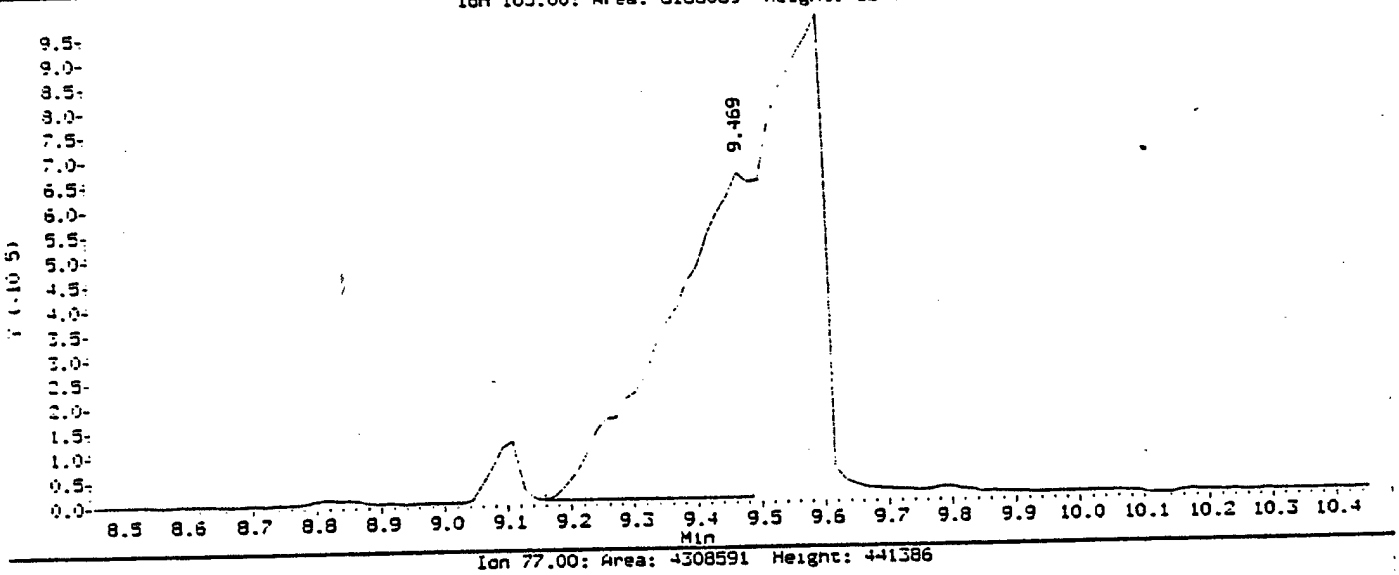
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Injection Date: 15-JAN-1998 16:27
Instrument: msdh.i
Client Sample ID:

Compound: Benzoic Acid
CAS Number: 65-85-0

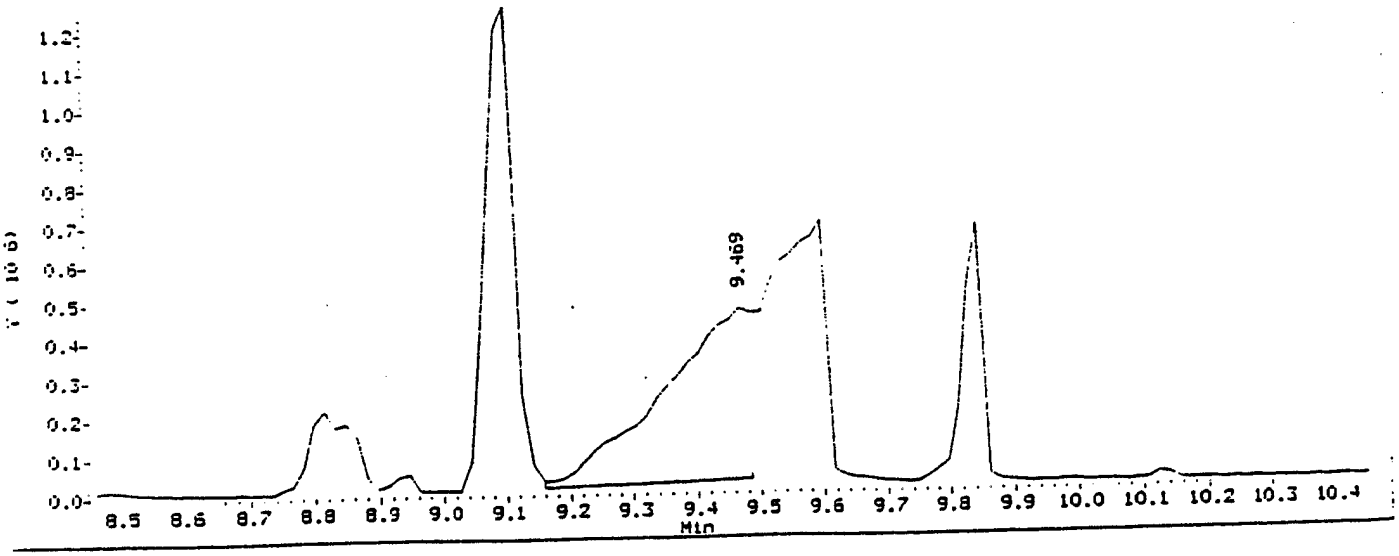
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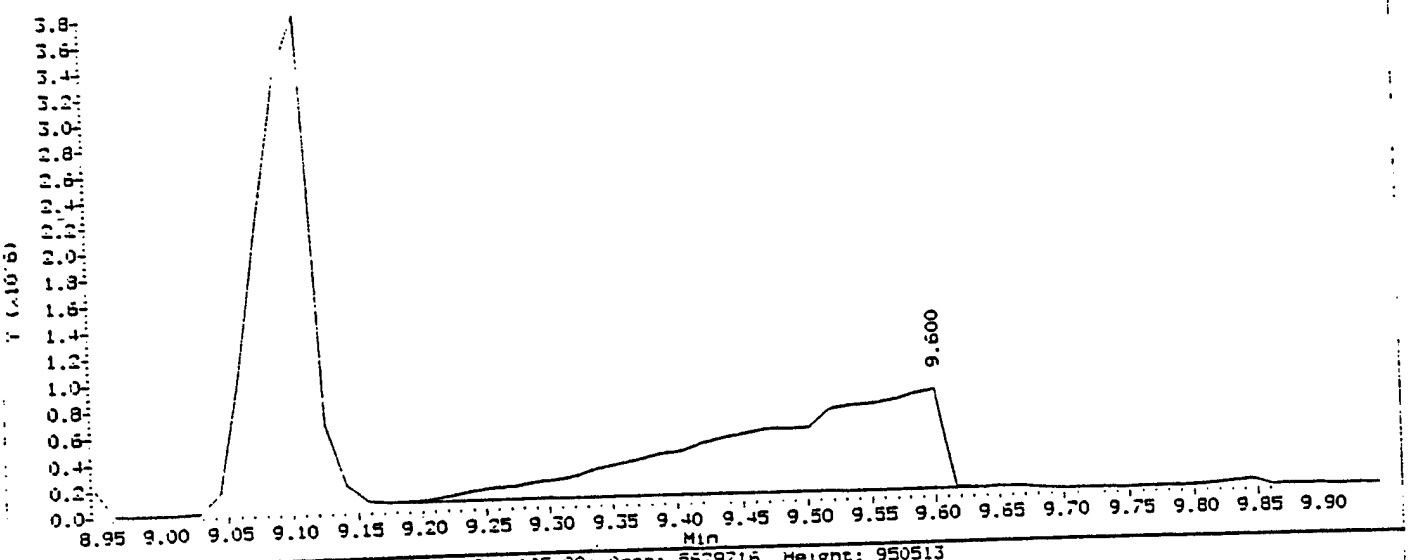
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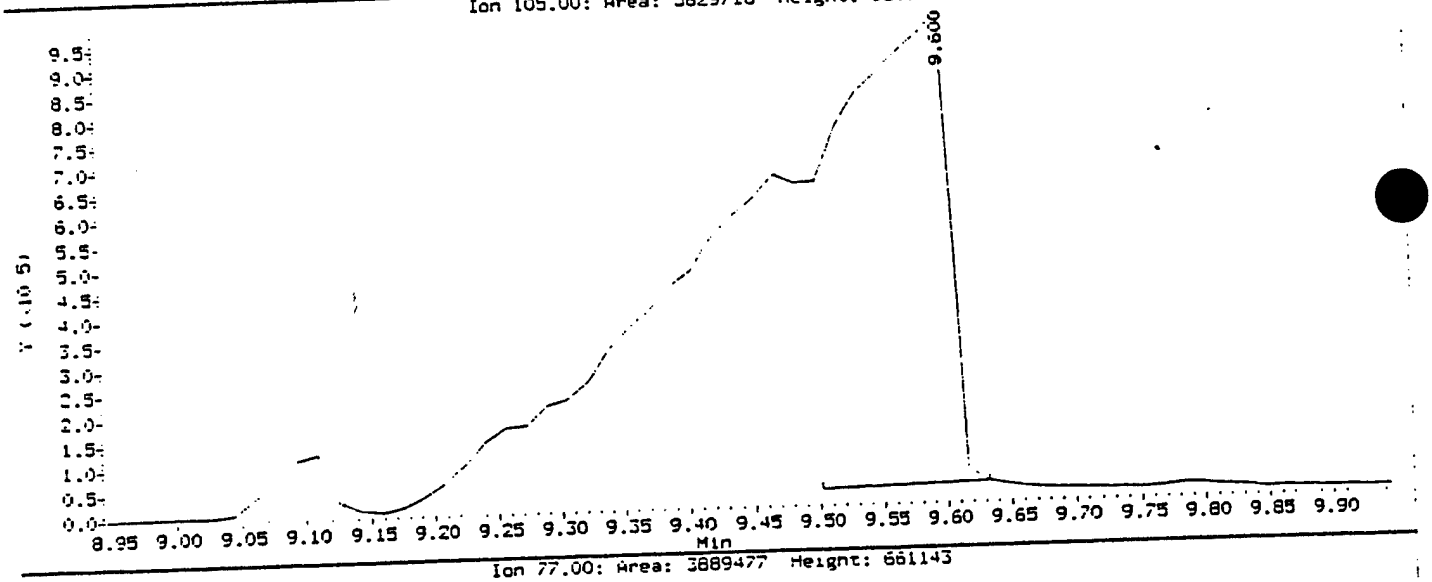
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Injection Date: 15-JAN-1998 16:27
Instrument: msdh.i
Client Sample ID:

Compound: Benzoic Acid
CAS Number: 65-85-0

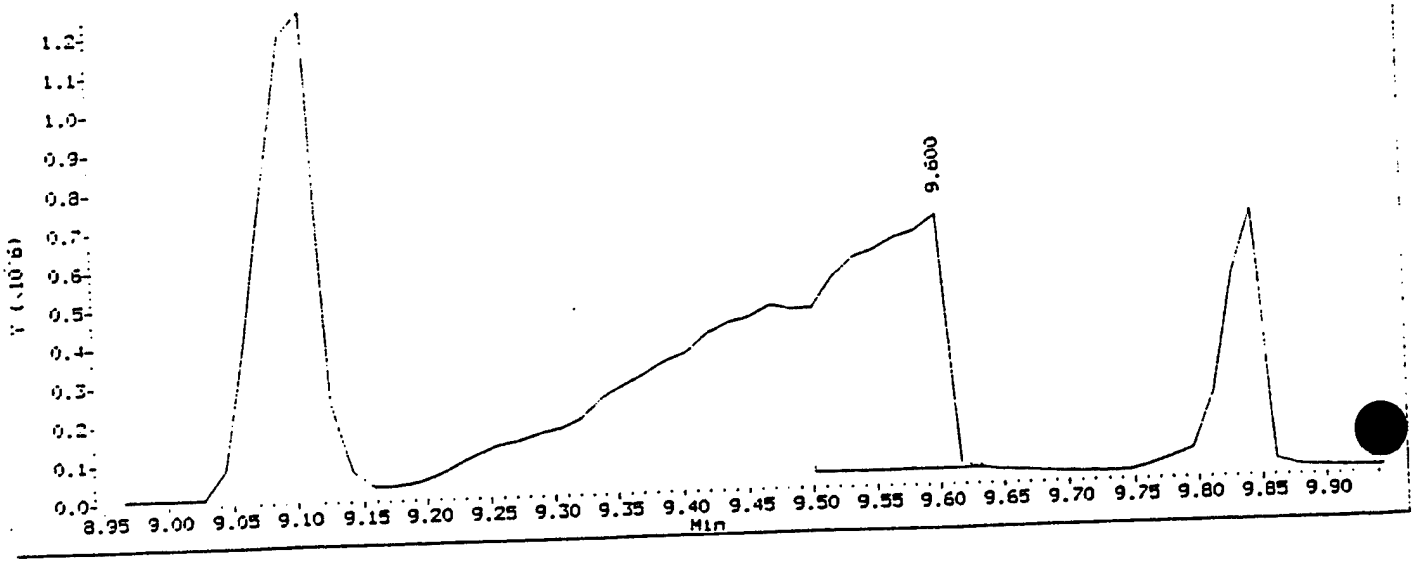
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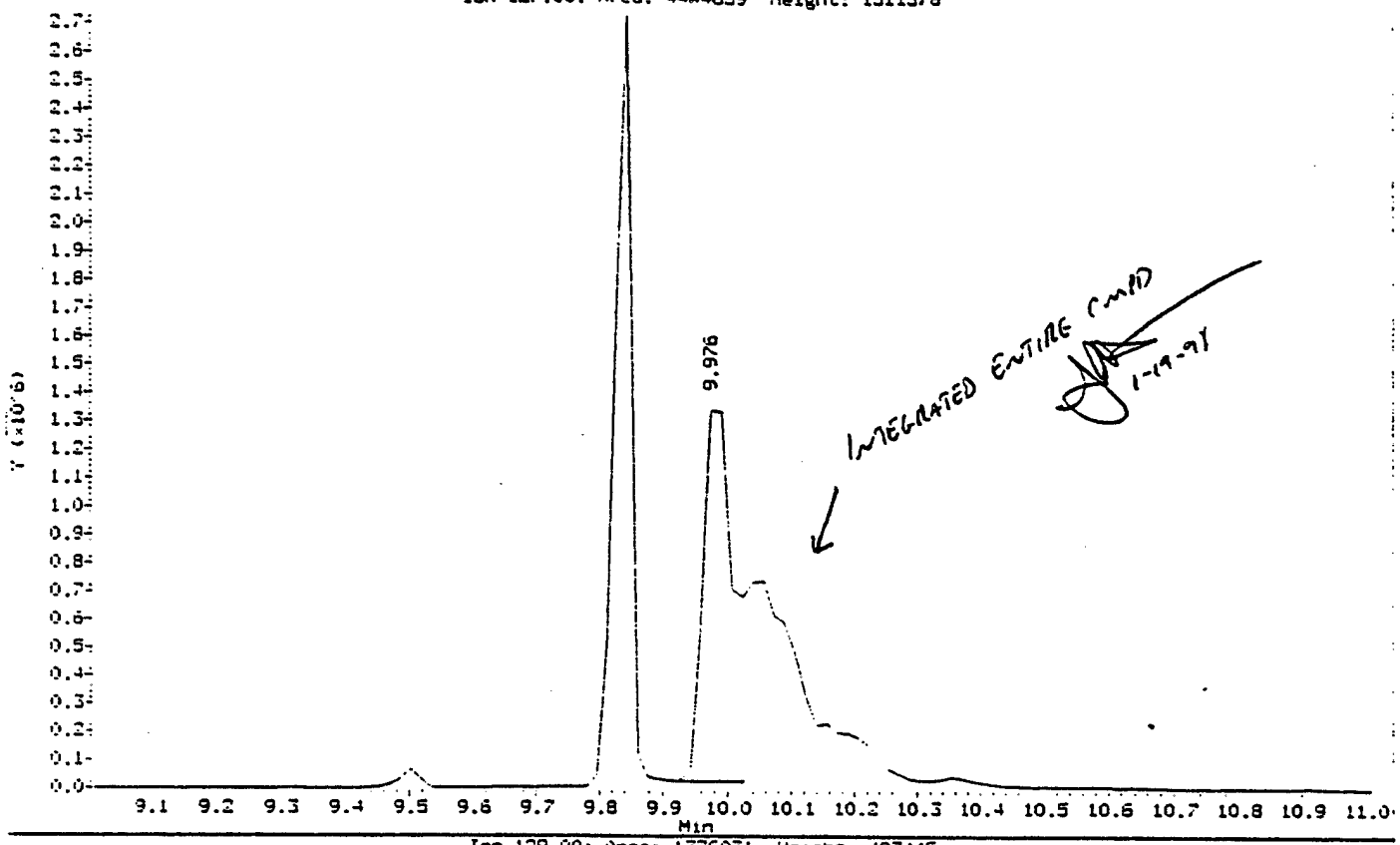
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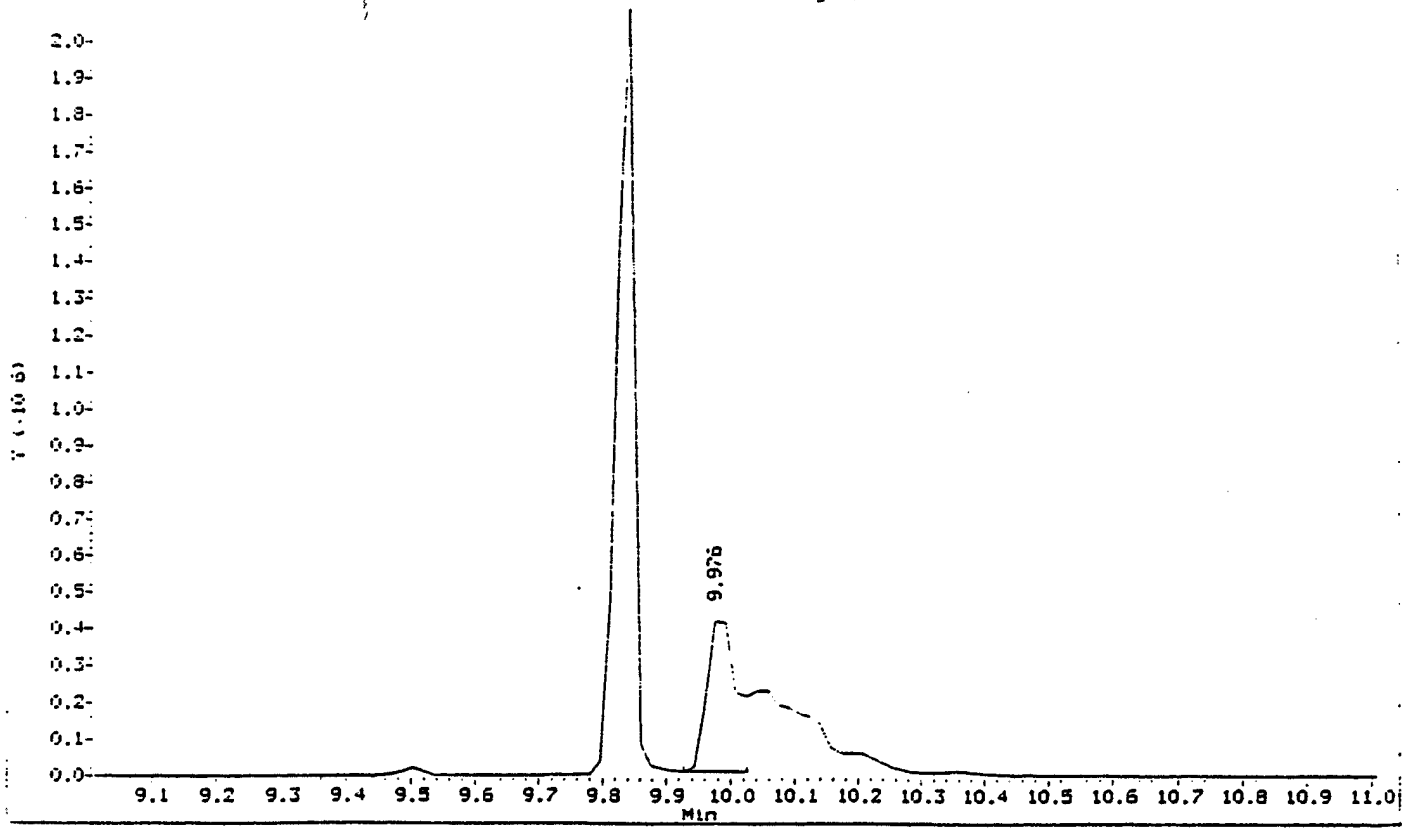
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Injection Date: 15-JAN-1998 16:27
Instrument: msdh.i
Client Sample ID:

Compound: 4-Chloroaniline
CAS Number: 106-47-8

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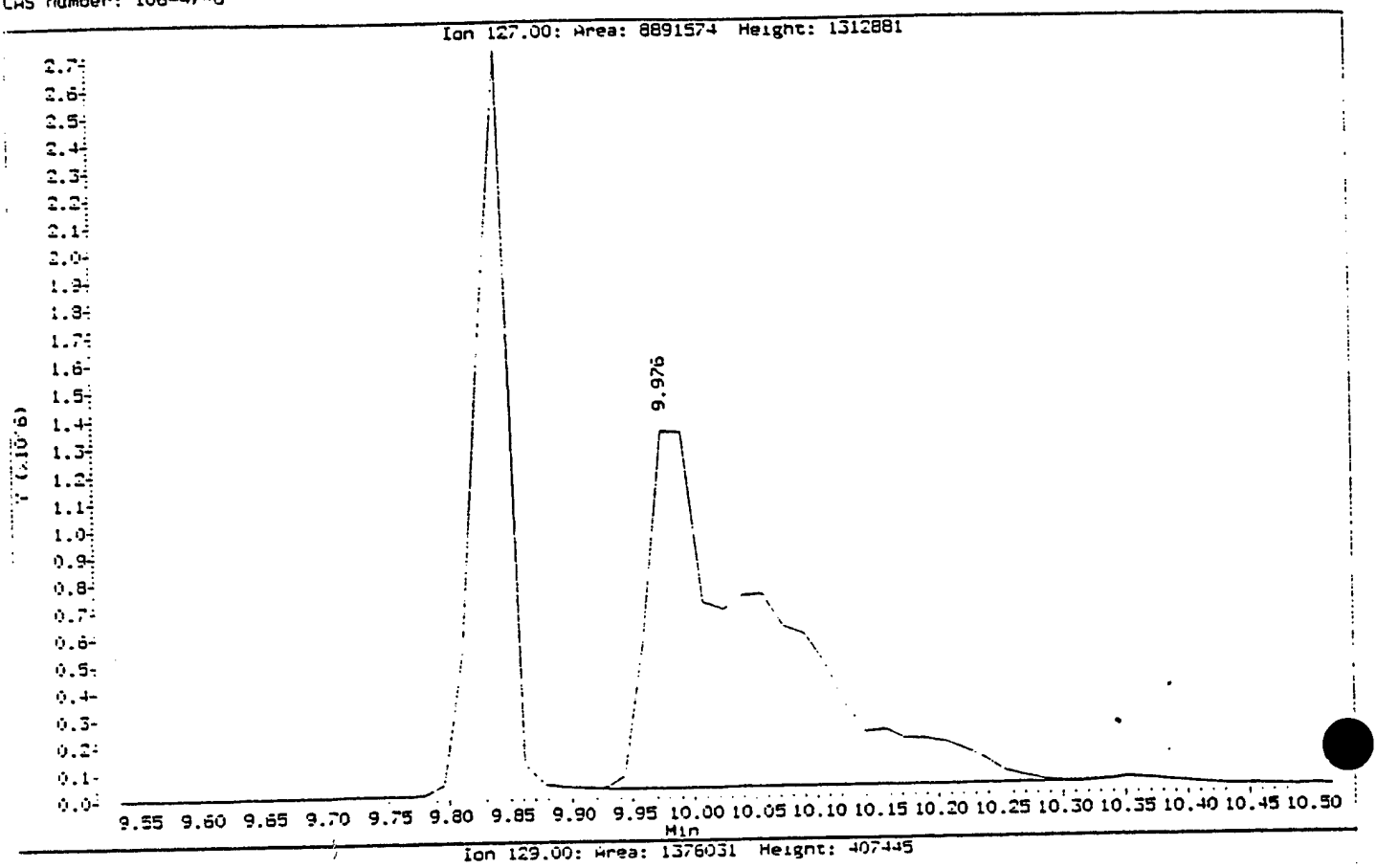


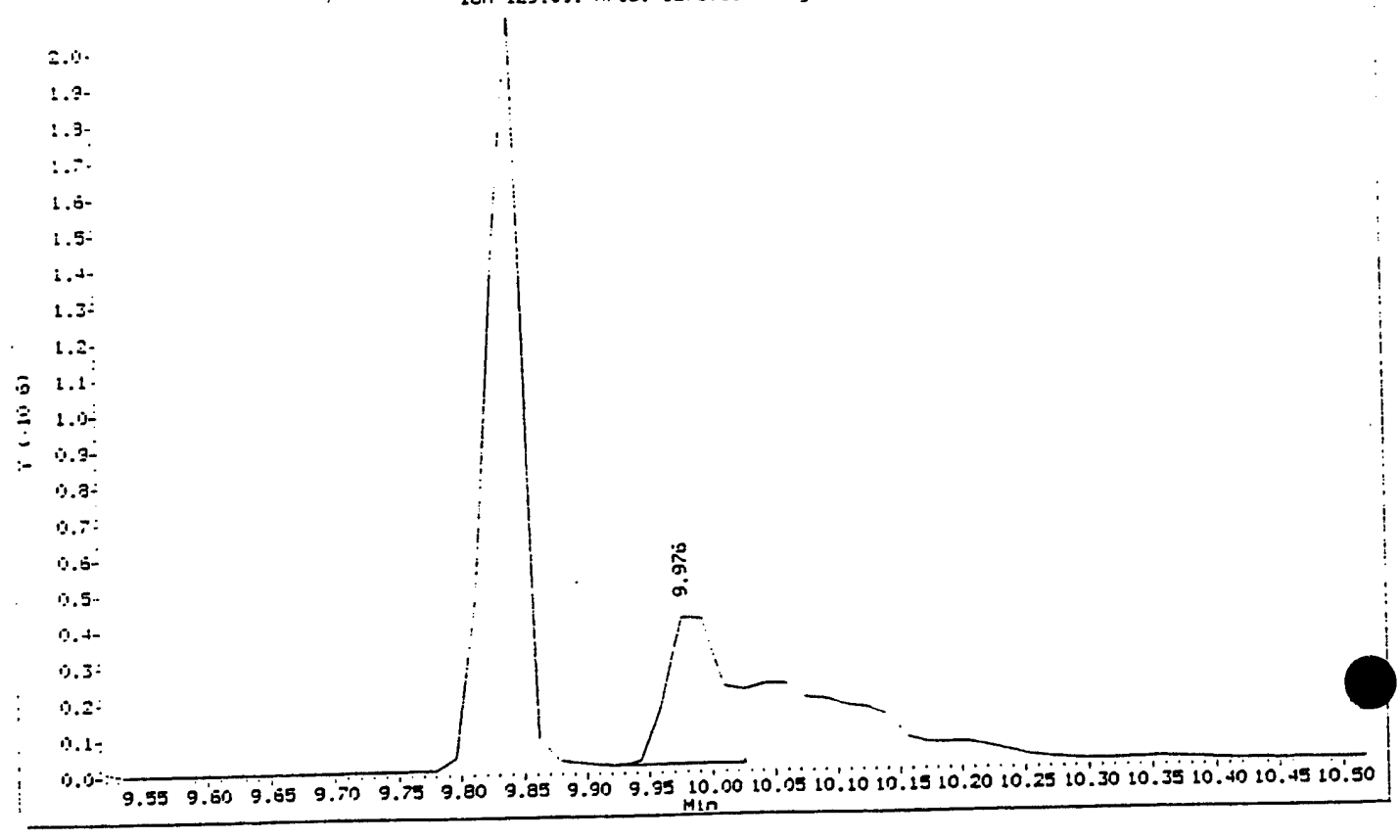
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Data File: /chem/msdh.i/h-15Jan98.b/h01150901014.d
Injection Date: 15-JAN-1998 16:27
Instrument: msdh.i
Client Sample ID:

Compound: 4-Chloroaniline
CAS Number: 106-47-8





Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d
Report Date: 30-Jan-1998 10:51

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Air Toxics Limited

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: msdh.i
Lab File ID: h01100201002.d
Analysis Type: WATER
Lab Sample ID: Method Spike
Quant Type: ISTD

Injection Date: 10-JAN-1998 11:57
Init. Calibration Date(s): JAN/09/98 JAN/09/98
Init. Calibration Times: 00:49 05:04
Method File: /chem/msdh.i/h-10Jan98.b/EBNA-01089

	COMPOUND	RRF	RF80	MIN RRF	%D	MAX %D
$	1 2-Fluorophenol	0.806	0.839	0.050	-4.1	30.0
$	2 Phenol-d5	0.480	0.449	0.050	6.5	30.0
	3 Phenol	0.940	0.929	0.050	1.1	30.0
	4 bis(2-Chloroethyl)ether	0.795	0.772	0.050	3.0	30.0
	5 2-Chlorophenol	0.699	0.737	0.050	-5.4	30.0
	6 1,3-Dichlorobenzene	0.799	0.799	0.050	-0.1	30.0
	8 1,4-Dichlorobenzene	0.803	0.822	0.050	-2.4	30.0
	9 1,2-Dichlorobenzene	0.754	0.773	0.050	-2.6	30.0
	10 2-Methylphenol	0.640	0.629	0.050	1.6	30.0
	11 bis(2-Chloroisopropyl)ether	1.379	1.337	0.050	3.1	30.0
	12 4-Methylphenol	0.658	0.612	0.050	6.9	30.0
	13 N-Nitrosodipropylamine	0.546	0.533	0.050	2.3	30.0
	14 Hexachloroethane	0.336	0.345	0.050	-2.6	30.0
$	15 Nitrobenzene-d5	0.711	0.758	0.050	-6.5	30.0
	16 Nitrobenzene	0.424	0.434	0.050	-2.3	30.0
	17 Isophorone	0.878	0.864	0.050	1.6	30.0
	18 2,4-Dimethylphenol	0.269	0.263	0.050	2.1	30.0
	19 2-Nitrophenol	0.216	0.212	0.050	1.8	30.0
	20 Benzoic Acid	0.195	0.209	0.050	-7.0	30.0
	21 bis(2-Chloroethoxy)methane	0.472	0.438	0.050	7.2	30.0
	22 2,4-Dichlorophenol	0.295	0.301	0.050	-2.1	30.0
	23 1,2,4-Trichlorobenzene	0.352	0.337	0.050	4.3	30.0
	25 Naphthalene	0.974	0.915	0.050	6.0	30.0
	26 4-Chloroaniline	0.229	0.199	0.050	13.3	30.0
	27 Hexachlorobutadiene	0.174	0.179	0.050	-2.6	30.0
	28 4-Chloro-3-Methylphenol	0.283	0.281	0.050	0.8	30.0
	29 2-Methylnaphthalene	0.616	0.574	0.050	6.8	30.0
	30 Hexachlorocyclopentadiene	0.279	0.297	0.050	-6.6	30.0
	31 2,4,6-Trichlorophenol	0.338	0.376	0.050	-11.5	30.0
$	33 2-Fluorobiphenyl	0.687	0.705	0.050	-2.6	30.0
	34 2-Chloronaphthalene	0.959	0.969	0.050	-1.0	30.0
	35 2-Nitroaniline	0.315	0.371	0.050	-17.7	30.0
	36 Dimethylphthalate	1.228	1.381	0.050	-12.4	30.0
	37 2,6-Dinitrotoluene	0.286	0.330	0.050	-15.4	30.0
	38 Acenaphthylene	1.486	1.631	0.050	-9.8	30.0

1-30-98
CCC's & SPCC's OK
PAH's 20 %D
1 cmpd out!
1.30.98

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d
Report Date: 30-Jan-1998 10:51

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Air Toxics Limited

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: msdh.i
Lab File ID: h01100201002.d
Analysis Type: WATER
Lab Sample ID: Method Spike
Quant Type: ISTD

Injection Date: 10-JAN-1998 11:57
Init. Calibration Date(s): JAN/09/98 JAN/09/98
Init. Calibration Times: 00:49 05:04
Method File: /chem/msdh.i/h-10Jan98.b/EBNA-01089

	COMPOUND	RRF	RF80	MIN RRF	%D	MAX %D	
	39 3-Nitroaniline	0.334	0.396	0.050	-18.7	30.0	
	41 Acenaphthene	0.877	0.939	0.050	-7.1	30.0	
	42 2,4-Dinitrophenol	0.157	0.156	0.050	0.7	30.0	
	43 4-Nitrophenol	0.106	0.125	0.050	-18.5	30.0	
	44 2,4-Dinitrotoluene	0.340	0.399	0.050	-17.4	30.0	
	45 Dibenzofuran	1.337	1.477	0.050	-10.4	30.0	
	46 Diethylphthalate	1.224	1.305	0.050	-6.6	30.0	
	47 4-Chlorophenyl phenyl ether	0.505	0.552	0.050	-9.3	30.0	
	48 4-Nitroaniline	0.105	0.146	0.050	-39.0	30.0	<-
	49 Fluorene	1.042	1.095	0.050	-5.2	30.0	
	50 4,6-Dinitro-2-methylphenol	0.133	0.144	0.050	-8.7	30.0	
	51 N-nitrosodiphenylamine	0.379	0.389	0.050	-2.5	30.0	
$	52 2,4,6-Tribromophenol	0.165	0.178	0.050	-8.3	30.0	
	53 4-Bromophenyl phenyl ether	0.171	0.175	0.050	-2.3	30.0	
	54 Hexachlorobenzene	0.225	0.231	0.050	-2.6	30.0	
	55 Pentachlorophenol	0.133	0.136	0.050	-2.2	30.0	
	57 Phenanthrene	0.848	0.881	0.050	-3.9	30.0	
	58 Anthracene	0.820	0.949	0.050	-15.7	30.0	
	59 Di-n-butylphthalate	1.069	1.175	0.050	-10.0	30.0	
	60 Fluoranthene	0.827	0.897	0.050	-8.4	30.0	
	61 Pyrene	1.147	1.324	0.050	-15.4	30.0	
$	62 Terphenyl-d14	0.797	0.935	0.050	-17.3	30.0	
	63 3 3'-Dichlorobenzidine	0.160	0.168	0.050	-5.4	30.0	
	64 Butyl benzyl phthalate	0.669	0.703	0.050	-5.0	30.0	
	65 bis(2-ethylhexyl)Phthalate	0.929	0.986	0.050	-6.1	30.0	
	66 Benzo(a)Anthracene	0.905	0.983	0.050	-8.7	30.0	
	68 Chrysene	0.805	0.884	0.050	-9.8	30.0	
	69 Di-n-octyl phthalate	1.847	2.329	0.050	-26.1	30.0	
	70 Benzo(b)fluoranthene	1.093	1.215	0.050	-11.1	30.0	
	71 Benzo(k)fluoranthene	1.058	1.138	0.050	-7.5	30.0	
	73 Indeno(1,2,3-cd)pyrene	0.669	0.604	0.050	9.8	30.0	
	74 Benzo(a)pyrene	0.877	0.931	0.050	-6.1	30.0	
	75 Dibenzo(a,h)anthracene	0.579	0.545	0.050	6.0	30.0	
	76 Benzo(g,h,i)perylene	0.668	0.597	0.050	10.5	30.0	
	84 Benzo(e)pyrene	0.958	0.951	0.050	0.8	30.0	

446A

Air Toxics Limited

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: msdh.i
Lab File ID: h01100201002.d
Analysis Type: WATER
Lab Sample ID: Method Spike
Quant Type: ISTD

Injection Date: 10-JAN-1998 11:57
Init. Calibration Date(s): JAN/09/98 JAN/09/98
Init. Calibration Times: 00:49 05:04
Method File: /chem/msdh.i/h-10Jan98.b/EBNA-01089

	COMPOUND	RRF	RF80	MIN RRF	%D	MAX %D
	32 2,4,5-Trichlorophenol	0.342	0.389	0.050	-13.5	30.0
	124 Benzyl Alcohol	0.457	0.458	0.050	-0.1	30.0
$	83 1-Methylnaphthalene-d10	0.543	0.499	0.050	8.0	30.0
	136 1-Chloro-3,4-Dinitrobenzene	0.111	0.124	0.050	-11.0	30.0

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d
Report Date: 30-Jan-1998 10:51

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Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-10Jan98.b/h01100201002.d
Lab Smp Id: Method Spike Client Smp ID: Method Spike
Inj Date : 10-JAN-1998 11:57 Inst ID: msdh.i
Operator : hch
Smp Info : 80 ug Method Spike 396-4-80
Misc Info : 80 ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Meth Date : 30-Jan-1998 10:51 kbadal Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 2 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

1-30-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)
$	1 2-Fluorophenol	112	5.389	5.389	(0.683)	4559064	80.0000	83.3
$	2 Phenol-d5	99	7.107	7.107	(0.663)	4794168	80.0000	74.8
	3 Phenol	94	7.123	7.123	(0.903)	5049033	80.0000	79.1
	4 bis(2-Chloroethyl)ether	93	7.336	7.336	(0.930)	4192665	80.0000	77.6
	5 2-Chlorophenol	128	7.450	7.450	(0.944)	4004472	80.0000	84.3
	6 1,3-Dichlorobenzene	146	7.778	7.778	(0.985)	4342974	80.0000	80.0
*	7 1,4-Dichlorobenzene-d4	150	7.892	7.892	(1.000)	5433602	80.0000	
	8 1,4-Dichlorobenzene	146	7.925	7.925	(1.004)	4469012	80.0000	81.9
	9 1,2-Dichlorobenzene	146	8.252	8.252	(1.046)	4201123	80.0000	82.1(H)
	10 2-Methylphenol	108	8.399	8.399	(1.064)	3419138	80.0000	78.7
	11 bis(2-Chloroisopropyl)ether	45	8.465	8.465	(1.073)	7262686	80.0000	77.5(M)
	12 4-Methylphenol	108	8.743	8.743	(1.108)	3327151	80.0000	74.5
	13 N-Nitrosodipropylamine	70	8.775	8.775	(1.112)	2895590	80.0000	78.1
	14 Hexachloroethane	117	8.972	8.972	(1.137)	1873576	80.0000	82.1

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)
$ 15 Nitrobenzene-d5	82	9.086	9.086	(0.609)	4590282	80.0000	85.2
16 Nitrobenzene	77	9.135	9.135	(0.852)	4630474	80.0000	81.9
17 Isophorone	82	9.675	9.675	(0.902)	9225535	80.0000	78.7
18 2,4-Dimethylphenol	122	9.937	9.937	(0.927)	2808514	80.0000	78.3
19 2-Nitrophenol	139	9.839	9.839	(0.918)	2267713	80.0000	78.6
20 Benzoic Acid	122	10.231	10.231	(0.954)	2230481	80.0000	85.6
21 bis(2-Chloroethoxy)methane	93	10.166	10.166	(0.948)	4679970	80.0000	74.2
22 2,4-Dichlorophenol	162	10.378	10.378	(0.968)	3214523	80.0000	81.6
23 1,2,4-Trichlorobenzene	180	10.591	10.591	(0.988)	3595873	80.0000	76.6
* 24 Naphthalene-d8	136	10.722	10.722	(1.000)	10679247	80.0000	
25 Naphthalene	128	10.771	10.771	(1.005)	9774846	80.0000	75.2
26 4-Chloroaniline	127	10.885	10.885	(1.015)	2123829	80.0000	69.3
27 Hexachlorobutadiene	225	11.065	11.065	(1.032)	1906522	80.0000	82.1
28 4-Chloro-3-Methylphenol	107	12.047	12.047	(1.124)	2996988	80.0000	79.4
29 2-Methylnaphthalene	142	12.407	12.407	(1.157)	6132882	80.0000	74.6
30 Hexachlorocyclopentadiene	237	12.783	12.783	(0.856)	1798456	80.0000	85.2
31 2,4,6-Trichlorophenol	196	13.077	13.077	(0.876)	2279313	80.0000	89.2
$ 33 2-Fluorobiphenyl	172	13.306	13.306	(0.718)	7757000	80.0000	82.0
34 2-Chloronaphthalene	162	13.568	13.568	(0.909)	5868482	80.0000	80.8
35 2-Nitroaniline	65	13.830	13.830	(0.927)	2246120	80.0000	94.2
36 Dimethylphthalate	163	14.320	14.320	(0.959)	8364297	80.0000	89.9
37 2,6-Dinitrotoluene	165	14.451	14.451	(0.968)	2000756	80.0000	92.3
38 Acenaphthylene	152	14.566	14.566	(0.976)	9882493	80.0000	87.8
39 3-Nitroaniline	138	13.830	13.830	(0.927)	2398280	80.0000	95.0
* 40 Acenaphthene-d10	164	14.926	14.926	(1.000)	6057945	80.0000	
41 Acenaphthene	154	15.007	15.007	(1.005)	5690045	80.0000	85.7
42 2,4-Dinitrophenol	184	15.089	15.089	(1.011)	945694	80.0000	79.4
43 4-Nitrophenol	109	15.269	15.269	(1.023)	759728	80.0000	94.8
44 2,4-Dinitrotoluene	165	15.416	15.416	(1.033)	2418443	80.0000	93.9
45 Dibenzofuran	168	15.416	15.416	(1.033)	8947369	80.0000	88.4
46 Diethylphthalate	149	16.038	16.038	(1.075)	7906367	80.0000	85.3
47 4-Chlorophenyl phenyl ether	204	16.283	16.283	(1.091)	3343347	80.0000	87.4
48 4-Nitroaniline	138	16.332	16.332	(1.094)	882496	80.0000	111
49 Fluorene	166	16.267	16.267	(1.090)	6635167	80.0000	84.1
50 4,6-Dinitro-2-methylphenol	198	16.398	16.398	(0.884)	1588784	80.0000	87.0
51 N-nitrosodiphenylamine	169	16.578	16.578	(0.894)	4277606	80.0000	82.0
$ 52 2,4,6-Tribromophenol	330	16.839	16.839	(0.674)	1455137	80.0000	86.7
53 4-Bromophenyl phenyl ether	248	17.477	17.477	(0.943)	1927332	80.0000	81.8
54 Hexachlorobenzene	284	17.592	17.592	(0.949)	2540366	80.0000	82.1
55 Pentachlorophenol	266	18.083	18.083	(0.975)	1492614	80.0000	81.8
* 56 Phenanthrene-d10	188	18.541	18.541	(1.000)	11000079	80.0000	
57 Phenanthrene	178	18.606	18.606	(1.004)	9695486	80.0000	83.2
58 Anthracene	178	18.737	18.737	(1.011)	10437869	80.0000	92.6
59 Di-n-butylphthalate	149	20.062	20.062	(1.082)	12929250	80.0000	88.0
60 Fluoranthene	202	21.501	21.501	(1.160)	9865462	80.0000	86.7
61 Pyrene	202	22.057	22.057	(0.882)	10794171	80.0000	92.3
$ 62 Terphenyl-d14	244	22.483	22.483	(0.899)	7621226	80.0000	93.9

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d
Report Date: 30-Jan-1998 10:51

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	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)
	63 3 3'-Dichlorobenzidine	252	24.936	24.936	(0.997)	1373277	80.0000	84.3
	64 Butyl benzyl phthalate	149	23.709	23.709	(0.948)	5734353	80.0000	84.0
	65 bis(2-ethylhexyl)Phthalate	149	25.132	25.132	(1.005)	8037530	80.0000	84.8
	66 Benzo(a)Anthracene	228	24.969	24.969	(0.999)	8016919	80.0000	86.9(H)
*	67 Chrysene-d12	240	25.002	25.002	(1.000)	8154182	80.0000	
	68 Chrysene	228	25.067	25.067	(1.003)	7209409	80.0000	87.8
	69 Di-n-octyl phthalate	149	26.637	26.637	(0.940)	11930221	80.0000	101
	70 Benzo(b)fluoranthene	252	27.422	27.422	(0.968)	6221785	80.0000	88.9(H)
	71 Benzo(k)fluoranthene	252	27.488	27.488	(0.970)	5826915	80.0000	86.0
*	72 Perylene-d12	264	28.338	28.338	(1.000)	5122068	80.0000	
	73 Indeno(1,2,3-cd)pyrene	276	31.528	31.528	(1.113)	3093738	80.0000	72.2
	74 Benzo(a)pyrene	252	28.208	28.208	(0.995)	4766677	80.0000	84.8
	75 Dibenzo(a,h)anthracene	278	31.610	31.610	(1.115)	2789262	80.0000	75.2
	76 Benzo(g,h,i)perylene	276	32.493	32.493	(1.147)	3059608	80.0000	71.6
	84 Benzo(e)pyrene	252	28.060	28.060	(0.990)	2434529	40.0000	39.7
	32 2,4,5-Trichlorophenol	196	13.159	13.159	(0.882)	2353713	80.0000	90.8(H)
	124 Benzyl Alcohol	108	8.170	8.170	(1.035)	2487585	80.0000	80.1
*	83 1-Methylnaphthalene-d10	152	12.554	12.554	(1.171)	5331211	80.0000	73.6
	136 1-Chloro-3,4-Dinitrobenzene	63	15.694	15.694	(1.464)	1319441	80.0000	88.8

QC Flag Legend

M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-10Jan98.b/h01100201002.d
Lab Smp Id: Method Spike
Client Smp ID: Method Spike
Inj Date : 10-JAN-1998 11:57
Operator : hch
Inst ID: msdh.i
Smp Info : 80 ug Method Spike 396-4-80
Misc Info : 80 ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Meth Date : 28-Jan-1998 10:45 jheffel
Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04
Cal File: h01080901013.d
Als bottle: 2
Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE
Compound Sublist: MM5X.sub
Target Version: 3.40
Sample Matrix: WATER
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
$	1 2-Fluorophenol					CAS #: 367-12-4		
	5.389	5.389 (0.683)	112	4559064	80.0000	83.3	80.00- 120.00	100.00
	5.389	5.389 (0.683)	64	2758132			0.00-10060.50	60.50
	5.389	5.389 (0.683)	92	990742			0.00-10021.73	21.73
$	3 Phenol-d5					CAS #: 4165-62-2		
	7.107	7.107 (0.663)	99	4794168	80.0000	74.8	80.00- 120.00	100.00
	7.091	7.091 (0.661)	71	1762049			0.00-10036.75	36.75
	4 Phenol					CAS #: 108-95-2		
	7.123	7.123 (0.903)	94	5049033	80.0000	78.6	80.00- 120.00	100.00
	7.123	7.123 (0.903)	66	2269767			0.00-10044.95	44.95
	7.123	7.123 (0.903)	65	1557977			0.00-10030.19	30.86

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d
Report Date: 28-Jan-1998 10:45

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				AMOUNTS CAL-AMT	ON-COL		
RT	EXP RT (REL RT)	MASS	RESPONSE	(NG)	(NG)	TARGET RANGE	RATIO
==	====== ========	====	========	=======	=======	==========	=====
5 bis(2-Chloroethyl)ether						CAS #: 111-44-4	
7.336	7.336 (0.930)	93	4192665	80.0000	77.6	80.00- 120.00	100.00
7.336	7.336 (0.930)	63	3244783			0.00-10077.39	77.39
7.336	7.336 (0.930)	95	1319746			0.00-10031.51	31.48
6 2-Chlorophenol						CAS #: 95-57-8	
7.450	7.450 (0.944)	128	4004472	80.0000	82.9	80.00- 120.00	100.00
7.450	7.450 (0.944)	130	1270116			0.00-10031.72	31.72
7.450	7.450 (0.944)	64	2175654			0.00-10054.33	54.33
7 1,3-Dichlorobenzene						CAS #: 541-73-1	
7.778	7.778 (0.985)	146	4342974	80.0000	80.0	80.00- 120.00	100.00
7.778	7.778 (0.985)	148	2765981			0.00-10063.69	63.69
7.778	7.778 (0.985)	113	537973			0.00-10012.39	12.39
* 8 1,4-Dichlorobenzene-d4						CAS #: 3855-82-1	
7.892	7.892 (1.000)	150	5433602	80.0000		80.00- 120.00	100.00
7.892	7.892 (1.000)	152	3190567			0.00-10058.72	58.72
7.892	7.892 (1.000)	115	1791977			0.00-10032.98	32.98
9 1,4-Dichlorobenzene						CAS #: 106-46-7	
7.925	7.925 (1.004)	146	4469012	80.0000	82.3	80.00- 120.00	100.00
7.925	7.925 (1.004)	148	2837434			0.00-10063.49	63.49
7.925	7.925 (1.004)	113	620095			0.00-10013.88	13.88
11 1,2-Dichlorobenzene						CAS #: 95-50-1	
8.252	8.252 (1.046)	146	4201123	80.0000	82.1	80.00- 120.00	100.00(H)
8.252	8.252 (1.046)	148	2657579			0.00-10063.26	63.26
8.252	8.252 (1.046)	113	543441			0.00-10012.94	12.94
12 2-Methylphenol						CAS #: 95-48-7	
8.399	8.399 (1.064)	108	3419138	80.0000	77.9	80.00- 120.00	100.00
8.399	8.399 (1.064)	107	2963957			0.00-10086.69	86.69
8.399	8.399 (1.064)	79	1426235			0.00-10041.41	41.71
13 bis(2-Chloroisopropyl)ether						CAS #: 108-60-1	
8.465	8.465 (1.073)	45	7262686	80.0000	78.2	80.00- 120.00	100.00(M)
8.481	8.481 (1.075)	121	849019	80.0000	75.0	0.00-10011.69	11.69
14 4-Methylphenol						CAS #: 106-44-5	
8.743	8.743 (1.108)	108	3327151	80.0000	73.3	80.00- 120.00	100.00
8.743	8.743 (1.108)	107	4041420			0.00-10121.47	121.47
8.743	8.743 (1.108)	79	960622			0.00-10011.11	28.87
15 N-Nitrosodipropylamine						CAS #: 621-64-7	
8.775	8.775 (1.112)	70	2895590	80.0000	78.1	80.00- 120.00	100.00

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
15 N-Nitrosodipropylamine (continued)							
8.775	8.775 (1.112)	130	601150			0.00-10020.76	20.76
8.775	8.775 (1.112)	101	289317			0.00-10009.99	9.99
16 Hexachloroethane					CAS #: 67-72-1		
8.972	8.972 (1.137)	117	1873576	80.0000	82.1	80.00- 120.00	100.00
8.972	8.972 (1.137)	201	1643426			0.00-10087.72	87.72
8.972	8.972 (1.137)	199	1015885			0.00-10054.22	54.22
$ 17 Nitrobenzene-d5					CAS #: 4165-60-0		
9.086	9.086 (0.609)	82	4590282	80.0000	85.2	80.00- 120.00	100.00
9.086	9.086 (0.609)	54	2695733			0.00-10058.73	58.73
9.086	9.086 (0.609)	128	2008704			0.00-10043.76	43.76
18 Nitrobenzene					CAS #: 98-95-3		
9.135	9.135 (0.852)	77	4630474	80.0000	81.9	80.00- 120.00	100.00
9.135	9.135 (0.852)	123	2101804			0.00-10045.39	45.39
9.135	9.135 (0.852)	65	678070			0.00-10014.64	14.64
20 Isophorone					CAS #: 78-59-1		
9.675	9.675 (0.902)	82	9225535	80.0000	78.7	80.00- 120.00	100.00
9.675	9.675 (0.902)	138	1264998			0.00-10013.71	13.71
9.675	9.675 (0.902)	95	498188			0.00-10005.28	5.40
22 2,4-Dimethylphenol					CAS #: 105-67-9		
9.937	9.937 (0.927)	122	2808514	80.0000	77.4	80.00- 120.00	100.00
9.937	9.937 (0.927)	107	3460436			0.00-10123.21	123.21
9.937	9.937 (0.927)	121	1534019			0.00-10054.62	54.62
21 2-Nitrophenol					CAS #: 88-75-5		
9.839	9.839 (0.918)	139	2267713	80.0000	73.5	80.00- 120.00	100.00
9.839	9.839 (0.918)	65	1154813			0.00-10050.92	50.92
9.839	9.839 (0.918)	109	586774			0.00-10025.88	25.88
24 Benzoic Acid					CAS #: 65-85-0		
10.231	10.231 (0.954)	122	2230481	80.0000	83.7	80.00- 120.00	100.00
10.231	10.231 (0.954)	105	2635618			0.00-10118.16	118.16
10.231	10.231 (0.954)	77	2185938			0.00-10098.00	98.00
23 bis(2-Chloroethoxy)methane					CAS #: 111-91-1		
10.166	10.166 (0.948)	93	4679970	80.0000	74.2	80.00- 120.00	100.00
10.166	10.166 (0.948)	123	532112			0.00-10011.37	11.37
10.166	10.166 (0.948)	95	1457166			0.00-10031.14	31.14
25 2,4-Dichlorophenol					CAS #: 120-83-2		
10.378	10.378 (0.968)	162	3214523	80.0000	79.2	80.00- 120.00	100.00

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
25 2,4-Dichlorophenol (continued)							
10.378	10.378 (0.968)	164	2073085			0.00-10064.49	64.49
10.378	10.378 (0.968)	98	1060437			0.00-10032.99	32.99
26 1,2,4-Trichlorobenzene						CAS #: 120-82-1	
10.591	10.591 (0.988)	180	3595873	80.0000		76.6 80.00- 120.00	100.00
10.591	10.591 (0.988)	182	3418908			0.00-10095.08	95.08
10.575	10.575 (0.986)	145	946978			0.00-10026.34	26.34
* 27 Naphthalene-d8						CAS #: 1146-65-2	
10.722	10.722 (1.000)	136	10679247	80.0000		80.00- 120.00	100.00
10.722	10.722 (1.000)	68	781732			0.00-10007.32	7.32
28 Naphthalene						CAS #: 91-20-3	
10.771	10.771 (1.005)	128	9774846	80.0000		75.2 80.00- 120.00	100.00
10.771	10.771 (1.005)	129	997358			0.00-10010.20	10.20
10.771	10.771 (1.005)	127	1184239			0.00-10016.69	12.12
30 4-Chloroaniline						CAS #: 106-47-8	
10.885	10.885 (1.015)	127	2123829	80.0000		69.3 80.00- 120.00	100.00
10.885	10.885 (1.015)	129	684785			0.00-10032.24	32.24
31 Hexachlorobutadiene						CAS #: 87-68-3	
11.065	11.065 (1.032)	225	1906522	80.0000		82.1 80.00- 120.00	100.00
11.065	11.065 (1.032)	223	1191505			0.00-10062.50	62.50
11.065	11.065 (1.032)	227	1220797			0.00-10063.60	64.03
32 4-Chloro-3-Methylphenol						CAS #: 59-50-7	
12.047	12.047 (1.124)	107	2996988	80.0000		76.7 80.00- 120.00	100.00
12.047	12.047 (1.124)	142	2446320			0.00-10081.63	81.63
12.047	12.047 (1.124)	144	784851			0.00-10026.07	26.19
33 2-Methylnaphthalene						CAS #: 91-57-6	
12.407	12.407 (1.157)	142	6132882	80.0000		74.6 80.00- 120.00	100.00
12.407	12.407 (1.157)	141	5198088			0.00-10084.76	84.76
35 Hexachlorocyclopentadiene						CAS #: 77-47-4	
12.783	12.783 (0.856)	237	1798456	80.0000		85.2 80.00- 120.00	100.00
12.783	12.783 (0.856)	272	269460			0.00-10014.98	14.98
12.783	12.783 (0.856)	235	1120471			0.00-10062.30	62.30
36 2,4,6-Trichlorophenol						CAS #: 88-06-2	
13.077	13.077 (0.876)	196	2279313	80.0000		84.2 80.00- 120.00	100.00
13.077	13.077 (0.876)	198	2178886			0.00-10095.59	95.59
13.077	13.077 (0.876)	200	699029			0.00-10030.07	30.67

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
$ 38 2-Fluorobiphenyl					CAS #: 321-60-8		
13.306	13.306 (0.718)	172	7757000 80.0000		82.0	80.00- 120.00	100.00
13.306	13.306 (0.718)	171	2592405			0.00-10033.42	33.42
41 2-Chloronaphthalene					CAS #: 91-58-7		
13.568	13.568 (0.909)	162	5868482 80.0000		80.8	80.00- 120.00	100.00
13.568	13.568 (0.909)	164	1871139			0.00-10031.88	31.88
13.568	13.568 (0.909)	127	1949339			0.00-10033.22	33.22
42 2-Nitroaniline					CAS #: 88-74-4		
13.830	13.830 (0.927)	65	2246120 80.0000		94.2	80.00- 120.00	100.00
13.830	13.830 (0.927)	138	2398280			0.00-10106.77	106.77
13.830	13.830 (0.927)	92	1357007			0.00-10060.42	60.42
44 Dimethylphthalate					CAS #: 131-11-3		
14.320	14.320 (0.959)	163	8364297 80.0000		89.9	80.00- 120.00	100.00
14.320	14.320 (0.959)	194	462805			0.00-10005.53	5.53
14.320	14.320 (0.959)	164	806224			0.00-10009.64	9.64
45 2,6-Dinitrotoluene					CAS #: 606-20-2		
14.451	14.451 (0.968)	165	2000756 80.0000		92.3	80.00- 120.00	100.00
14.451	14.451 (0.968)	89	1029924			0.00-10051.48	51.48
14.451	14.451 (0.968)	121	364584			0.00-10018.22	18.22
46 Acenaphthylene					CAS #: 208-96-8		
14.566	14.566 (0.976)	152	9882493 80.0000		87.8	80.00- 120.00	100.00
14.566	14.566 (0.976)	151	1832305			0.00-10018.54	18.54
14.566	14.566 (0.976)	153	1232150			0.00-10012.47	12.47
43 3-Nitroaniline					CAS #: 99-09-2		
13.830	13.830 (0.927)	138	2398280 80.0000		94.8	80.00- 120.00	100.00
13.830	13.830 (0.927)	92	1357007			0.00-10056.58	56.58
13.830	13.830 (0.927)	108	387357			0.00-10015.96	16.15
* 48 Acenaphthene-d10					CAS #: 15067-26-2		
14.926	14.926 (1.000)	164	6057945 80.0000			80.00- 120.00	100.00
14.926	14.926 (1.000)	162	5622017			0.00-10092.80	92.80
14.926	14.926 (1.000)	160	2471439			0.00-10040.80	40.80
49 Acenaphthene					CAS #: 83-32-9		
15.007	15.007 (1.005)	154	5690045 80.0000		85.7	80.00- 120.00	100.00
15.007	15.007 (1.005)	152	2777664			0.00-10048.82	48.82
15.007	15.007 (1.005)	153	6077604			0.00-10106.81	106.81
51 2,4-Dinitrophenol					CAS #: 51-28-5		
15.089	15.089 (1.011)	184	945694 80.0000		79.4	80.00- 120.00	100.00

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)	TARGET RANGE	RATIO
51 2,4-Dinitrophenol (continued)							
15.089	15.089 (1.011)	63	598803			0.00-10063.32	63.32
15.089	15.089 (1.011)	154	404456			0.00-10042.77	42.77
52 4-Nitrophenol						CAS #: 100-02-7	
15.269	15.269 (1.023)	109	759728	80.0000	88.5	80.00- 120.00	100.00
15.269	15.269 (1.023)	139	1187012			0.00-10156.24	156.24
15.269	15.269 (1.023)	65	1158986			0.00-10152.55	152.55
53 2,4-Dinitrotoluene						CAS #: 121-14-2	
15.416	15.416 (1.033)	165	2418443	80.0000	94.1	80.00- 120.00	100.00
15.416	15.416 (1.033)	63	1743690			0.00-10072.10	72.10
15.416	15.416 (1.033)	182	126820			0.00-10005.24	5.24
54 Dibenzofuran						CAS #: 132-64-9	
15.416	15.416 (1.033)	168	8947369	80.0000	88.4	80.00- 120.00	100.00
15.416	15.416 (1.033)	139	2888627			0.00-10032.28	32.28
56 Diethylphthalate						CAS #: 84-66-2	
16.038	16.038 (1.075)	149	7906367	80.0000	85.3	80.00- 120.00	100.00
16.038	16.038 (1.075)	177	1614274			0.00-10020.42	20.42
16.038	16.038 (1.075)	150	861470			0.00-10010.90	10.90
59 4-Chlorophenyl phenyl ether						CAS #: 7005-72-3	
16.283	16.283 (1.091)	204	3343347	80.0000	87.4	80.00- 120.00	100.00
16.283	16.283 (1.091)	206	1075305			0.00-10032.16	32.16
16.283	16.283 (1.091)	141	1761850			0.00-10052.70	52.70
61 4-Nitroaniline						CAS #: 100-01-6	
16.332	16.332 (1.094)	138	882496	80.0000	111	80.00- 120.00	100.00
16.332	16.332 (1.094)	92	443571			0.00-10050.26	50.26
16.332	16.332 (1.094)	108	647396			0.00-10073.36	73.36
58 Fluorene						CAS #: 86-73-7	
16.267	16.267 (1.090)	166	6635167	80.0000	84.1	80.00- 120.00	100.00
16.267	16.267 (1.090)	165	6080857			0.00-10091.65	91.65
16.267	16.267 (1.090)	167	868545			0.00-10013.28	13.09
62 4,6-Dinitro-2-methylphenol						CAS #: 534-52-1	
16.398	16.398 (0.884)	198	1588784	80.0000	87.0	80.00- 120.00	100.00
16.398	16.398 (0.884)	121	485086			0.00-10030.53	30.53
16.398	16.398 (0.884)	51	754533			0.00-10047.49	47.49
63 N-nitrosodiphenylamine						CAS #: 86-30-6	
16.578	16.578 (0.894)	169	4277606	80.0000	82.0	80.00- 120.00	100.00
16.578	16.578 (0.894)	168	2722569			0.00-10063.65	63.65

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)	TARGET RANGE	RATIO
63 N-nitrosodiphenylamine (continued)							
16.578	16.578 (0.894)	167	1468289			0.00-10034.33	34.33
$ 65 2,4,6-Tribromophenol						CAS #: 118-79-6	
16.839	16.839 (0.674)	330	1455137 80.0000		86.7	80.00- 120.00	100.00
16.839	16.839 (0.674)	332	1399214			0.00-10096.16	96.16
16.839	16.839 (0.674)	141	477050			0.00-10031.37	32.78
68 4-Bromophenyl phenyl ether						CAS #: 101-55-3	
17.477	17.477 (0.943)	248	1927332 80.0000		81.8	80.00- 120.00	100.00
17.477	17.477 (0.943)	250	1876818			0.00-10097.38	97.38
17.477	17.477 (0.943)	141	1359288			0.00-10070.53	70.53
69 Hexachlorobenzene						CAS #: 118-74-1	
17.592	17.592 (0.949)	284	2540366 80.0000		82.1	80.00- 120.00	100.00
17.592	17.592 (0.949)	142	862099			0.00-10033.94	33.94
17.592	17.592 (0.949)	249	644973			0.00-10025.13	25.39
70 Pentachlorophenol						CAS #: 87-86-5	
18.083	18.083 (0.975)	266	1492614 80.0000		81.8	80.00- 120.00	100.00
18.083	18.083 (0.975)	264	931060			0.00-10062.38	62.38
18.083	18.083 (0.975)	268	955954			0.00-10064.05	64.05
* 73 Phenanthrene-d10						CAS #: 1517-22-2	
18.541	18.541 (1.000)	188	11000079 80.0000			80.00- 120.00	100.00
18.541	18.541 (1.000)	94	1119884			0.00-10010.18	10.18
18.541	18.541 (1.000)	80	1268096			0.00-10012.01	11.53
74 Phenanthrene						CAS #: 85-01-8	
18.606	18.606 (1.004)	178	9695486 80.0000		83.2	80.00- 120.00	100.00
18.606	18.606 (1.004)	176	1742208			0.00-10017.97	17.97
18.606	18.606 (1.004)	179	1418411			0.00-10014.63	14.63
75 Anthracene						CAS #: 120-12-7	
18.737	18.737 (1.011)	178	10437869 80.0000		92.6	80.00- 120.00	100.00
18.737	18.737 (1.011)	176	1824070			0.00-10017.48	17.48
18.737	18.737 (1.011)	179	1532943			0.00-10014.69	14.69
79 Di-n-butylphthalate						CAS #: 84-74-2	
20.062	20.062 (1.082)	149	12929250 80.0000		88.0	80.00- 120.00	100.00
20.062	20.062 (1.082)	150	1185393			0.00-10009.17	9.17
20.062	20.062 (1.082)	104	722914			0.00-10005.59	5.59
81 Fluoranthene						CAS #: 206-44-0	
21.501	21.501 (1.160)	202	9865462 80.0000		86.7	80.00- 120.00	100.00
21.501	21.501 (1.160)	101	1336795			0.00-10013.55	13.55

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
81 Fluoranthene (continued)							
21.501	21.501 (1.160)	100	992208			0.00-10010.06	10.06
83 Pyrene					CAS #: 129-00-0		
22.057	22.057 (0.882)	202	10794171	80.0000	92.3	80.00- 120.00	100.00
22.041	22.041 (0.882)	101	1685130			0.00-10015.61	15.61
22.041	22.041 (0.882)	100	1337359			0.00-10012.39	12.39
$ 84 Terphenyl-d14					CAS #: 98904-43-9		
22.483	22.483 (0.899)	244	7621226	80.0000	93.9	80.00- 120.00	100.00
22.466	22.466 (0.899)	122	976587			0.00-10012.81	12.81
22.483	22.483 (0.899)	212	473039			0.00-10006.58	6.21
89 3 3'-Dichlorobenzidine					CAS #: 91-94-1		
24.936	24.936 (0.997)	252	1373277	80.0000	84.3	80.00- 120.00	100.00
24.936	24.936 (0.997)	254	872074			0.00-10063.50	63.50
24.936	24.936 (0.997)	126	248333			0.00-10016.07	18.08
87 Butyl benzyl phthalate					CAS #: 85-68-7		
23.709	23.709 (0.948)	149	5734353	80.0000	84.0	80.00- 120.00	100.00
23.709	23.709 (0.948)	91	4073020			0.00-10071.03	71.03
23.709	23.709 (0.948)	206	1025581			0.00-10017.88	17.88
93 bis(2-ethylhexyl)Phthalate					CAS #: 117-81-7		
25.132	25.132 (1.005)	149	8037530	80.0000	84.8	80.00- 120.00	100.00
25.132	25.132 (1.005)	167	2473238			0.00-10030.77	30.77
25.132	25.132 (1.005)	279	530328			0.00-10006.60	6.60
90 Benzo(a)Anthracene					CAS #: 56-55-3		
24.969	24.969 (0.999)	228	8016919	80.0000	86.9	80.00- 120.00	100.00(H)
24.969	24.969 (0.999)	229	1533251			0.00-10019.13	19.13
24.969	24.969 (0.999)	226	2096022			0.00-10026.14	26.14
* 91 Chrysene-d12					CAS #: 1719-03-5		
25.002	25.002 (1.000)	240	8154182	80.0000		80.00- 120.00	100.00
25.002	25.002 (1.000)	236	1930514			0.00-10023.68	23.68
25.002	25.002 (1.000)	120	985613			0.00-10012.09	12.09
92 Chrysene					CAS #: 218-01-9		
25.067	25.067 (1.003)	228	7209409	80.0000	87.8	80.00- 120.00	100.00
25.067	25.067 (1.003)	226	2069367			0.00-10028.70	28.70
25.067	25.067 (1.003)	229	1369084			0.00-10018.99	18.99
94 Di-n-octyl phthalate					CAS #: 117-84-0		
26.637	26.637 (0.940)	149	11930221	80.0000	101	80.00- 120.00	100.00
26.637	26.637 (0.940)	150	1140565			0.00-10009.56	9.56

RT	EXP RT	(REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
95 Benzo(b)fluoranthene						CAS #: 205-99-2		
27.422	27.422	(0.968)	252	6221785 80.0000		88.9	80.00- 120.00	100.00(H)
27.422	27.422	(0.968)	253	1343534			0.00-10021.59	21.59
27.422	27.422	(0.968)	125	912950			0.00-10014.67	14.67
96 Benzo(k)fluoranthene						CAS #: 207-08-9		
27.488	27.488	(0.970)	252	5826915 80.0000		86.0	80.00- 120.00	100.00
27.488	27.488	(0.970)	253	1251935			0.00-10021.49	21.49
27.488	27.488	(0.970)	125	791480			0.00-10013.58	13.58
* 100 Perylene-d12						CAS #: 1520-96-3		
28.338	28.338	(1.000)	264	5122068 80.0000			80.00- 120.00	100.00
28.338	28.338	(1.000)	260	1139180			0.00-10022.24	22.24
28.338	28.338	(1.000)	265	1078535			0.00-10021.06	21.06
103 Indeno(1,2,3-cd)pyrene						CAS #: 193-39-5		
31.528	31.528	(1.113)	276	3093738 80.0000		72.2	80.00- 120.00	100.00
31.528	31.528	(1.113)	138	1052135			0.00-10032.52	34.01
31.528	31.528	(1.113)	227	3778			0.00-10000.10	0.12
99 Benzo(a)pyrene						CAS #: 50-32-8		
28.208	28.208	(0.995)	252	4766677 80.0000		84.8	80.00- 120.00	100.00
28.208	28.208	(0.995)	253	1034473			0.00-10021.70	21.70
28.191	28.191	(0.995)	125	773881			0.00-10014.29	16.24
104 Dibenzo(a,h)anthracene						CAS #: 53-70-3		
31.610	31.610	(1.115)	278	2789262 80.0000		75.2	80.00- 120.00	100.00
31.610	31.610	(1.115)	279	653111			0.00-10023.42	23.42
31.610	31.610	(1.115)	139	734819			0.00-10026.34	26.34
105 Benzo(g,h,i)perylene						CAS #: 191-24-2		
32.493	32.493	(1.147)	276	3059608 80.0000		71.6	80.00- 120.00	100.00
32.493	32.493	(1.147)	138	1144903			0.00-10037.42	37.42
32.493	32.493	(1.147)	277	708625			0.00-10023.16	23.16
98 Benzo(e)pyrene						CAS #:		
28.060	28.060	(0.990)	252	2434529 40.0000		39.7	80.00- 120.00	100.00
28.060	28.060	(0.990)	125	568846			0.00-10020.49	23.37
28.060	28.060	(0.990)	250	680194			0.00-10028.29	27.94
37 2,4,5-Trichlorophenol						CAS #: 95-95-4		
13.159	13.159	(0.882)	196	2353713 80.0000		85.3	80.00- 120.00	100.00(H)
13.159	13.159	(0.882)	198	2252018			0.00-10095.68	95.68
13.159	13.159	(0.882)	200	712302			0.00-10030.22	30.26
10 Benzyl Alcohol						CAS #: 100-51-6		
8.170	8.170	(1.035)	108	2487585 80.0000		78.9	80.00- 120.00	100.00

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)	TARGET RANGE	RATIO
10 Benzyl Alcohol (continued)							
8.170	8.170 (1.035)	79	3521977			0.00-10138.60	141.58
8.170	8.170 (1.035)	77	2300152			0.00-10089.92	92.47
$ 34 1-Methylnaphthalene-d10					CAS #: 38072-94-5		
12.554	12.554 (1.171)	152	5331211	80.0000	73.6	80.00- 120.00	100.00
12.554	12.554 (1.171)	122	2054282			0.00-10038.69	38.53
12.554	12.554 (1.171)	150	4384342			0.00-10083.35	82.24
55 1-Chloro-3,4-Dinitrobenzene					CAS #:		
15.694	15.694 (1.464)	63	1319441	80.0000	89.0	80.00- 120.00	100.00
15.694	15.694 (1.464)	75	1056150			0.00-10078.85	80.05
15.694	15.694 (1.464)	202	760058			0.00-10062.18	57.60

QC Flag Legend

M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-10Jan98.b/h01100201002.d
Lab Smp Id: Method Spike Client Smp ID: Method Spike
Inj Date : 10-JAN-1998 11:57
Operator : hch Inst ID: msdh.i
Smp Info : 80 ug Method Spike 396-5-80
Misc Info : 80 ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Meth Date : 15-Jan-1998 15:06 m Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 2 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)
1 2-Fluorophenol	112	5.389	5.389	(0.683)	4559064	80.0000	83.3
2 Phenol-d5	99	7.107	7.107	(0.663)	4794168	80.0000	74.8
	99	7.450	7.107	(0.695)	230628	80.0000	3.6
3 Phenol	94	7.123	7.123	(0.903)	5049033	80.0000	78.6
	94	6.845	7.123	(0.867)	128	80.0000	0.0020(a)
	94	6.927	7.123	(0.878)	267	80.0000	0.0042(a)
	94	6.976	7.123	(0.884)	503	80.0000	0.0078(a)
	94	7.336	7.123	(0.930)	152149	80.0000	2.4
	94	7.450	7.123	(0.944)	11416	80.0000	0.18(a)
4 bis(2-Chloroethyl)ether	93	7.336	7.336	(0.930)	4192665	80.0000	77.6
	93	6.911	7.336	(0.876)	363	80.0000	0.0067(a)
	93	6.943	7.336	(0.880)	115	80.0000	0.0021(a)
	93	7.091	7.336	(0.898)	1518	80.0000	0.028(aQ)
	93	7.123	7.336	(0.903)	89518	80.0000	1.6

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d
Report Date: 15-Jan-1998 15:06

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Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)
	93	7.450	7.336	(0.944)	94850	80.0000	1.8
5 2-Chlorophenol	128	7.450	7.450	(0.944)	4004472	80.0000	82.9
6 1,3-Dichlorobenzene	146	7.778	7.778	(0.985)	4342974	80.0000	80.0
	146	7.925	7.778	(1.004)	4469012	80.0000	82.4
* 1,4-Dichlorobenzene-d4	150	7.892	7.892	(1.000)	5433602	80.0000	
	150	7.778	7.892	(1.000)	440562	80.0000	
	150	8.252	7.892	(1.000)	426234	80.0000	
8 1,4-Dichlorobenzene	146	7.925	7.925	(1.004)	4469012	80.0000	82.3
	146	7.778	7.925	(0.985)	4342974	80.0000	80.0
	146	8.252	7.925	(1.046)	4201123	80.0000	77.4
9 1,2-Dichlorobenzene	146	8.677	8.677	(1.099)	169	80.0000	0.0033(a)
	146	7.925	8.677	(1.004)	4468182	80.0000	87.3
	146	8.252	8.677	(1.046)	4201123	80.0000	82.1
10 2-Methylphenol	108	8.399	8.399	(1.064)	3419138	80.0000	77.9
	108	8.170	8.399	(1.035)	2487585	80.0000	56.7
	108	8.743	8.399	(1.108)	3327151	80.0000	75.8
11 bis(2-Chloroisopropyl)ether	45	8.465	8.465	(1.073)	5945885	80.0000	64.0
	45	8.072	8.465	(1.023)	514	80.0000	0.0055(a)
	45	8.170	8.465	(1.035)	7321	80.0000	0.079(a)
	45	8.268	8.465	(1.048)	979	80.0000	0.010(a)
	45	8.514	8.465	(1.079)	1907278	80.0000	20.5
	45	8.759	8.465	(1.110)	35105	80.0000	0.38(a)
	45	8.890	8.465	(1.126)	467	80.0000	0.0050(a)
12 4-Methylphenol	108	8.743	8.743	(1.108)	3327151	80.0000	73.3
	108	8.399	8.743	(1.064)	3419138	80.0000	75.3
	108	9.135	8.743	(1.157)	6481	80.0000	0.14(a)
13 N-Nitrosodipropylamine	70	8.775	8.775	(1.112)	2895590	80.0000	78.1
	70	8.383	8.775	(1.062)	213	80.0000	0.0057(a)
	70	8.972	8.775	(1.137)	28072	80.0000	0.76(a)
	70	9.086	8.775	(1.151)	658457	80.0000	17.8
14 Hexachloroethane	117	8.972	8.972	(1.137)	1873576	80.0000	82.1
	117	9.135	8.972	(1.157)	1705	80.0000	0.075(a)
	117	9.201	8.972	(1.166)	773	80.0000	0.034(a)
	117	9.250	8.972	(1.172)	966	80.0000	0.042(a)
	117	9.299	8.972	(1.178)	722	80.0000	0.032(a)
* 15 Nitrobenzene-d5	82	9.086	9.086	(0.609)	4590282	80.0000	85.2
	82	8.743	9.086	(0.586)	23193	80.0000	0.43
	82	8.890	9.086	(0.596)	848	80.0000	0.016
16 Nitrobenzene	77	9.135	9.135	(0.852)	4630474	80.0000	81.9
	77	8.743	9.135	(0.815)	1401679	80.0000	24.8
	77	9.348	9.135	(0.872)	7979	80.0000	0.14(a)
17 Isophorone	82	9.675	9.675	(0.902)	9225535	80.0000	78.7
	82	9.839	9.675	(0.918)	88636	80.0000	0.76(a)
18 2,4-Dimethylphenol	122	9.937	9.937	(0.927)	2808514	80.0000	77.4
	122	9.659	9.937	(0.901)	1082	80.0000	0.030(a)
	122	9.691	9.937	(0.904)	1207	80.0000	0.033(a)
	122	10.231	9.937	(0.954)	2112166	80.0000	58.2

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)
19 2-Nitrophenol	139	9.839	9.839	(0.918)	2267713	80.0000	73.5
	139	9.675	9.839	(0.902)	125537	80.0000	4.1
20 Benzoic Acid	122	10.231	10.231	(0.954)	2230481	80.0000	83.7
	122	9.839	10.231	(0.918)	116245	80.0000	4.4
	122	9.937	10.231	(0.927)	2808514	80.0000	105
	122	10.378	10.231	(0.968)	45326	80.0000	1.7
21 bis(2-Chloroethoxy)methane	93	10.166	10.166	(0.948)	4679970	80.0000	74.2
	93	9.839	10.166	(0.918)	219223	80.0000	3.5
	93	9.937	10.166	(0.927)	118494	80.0000	1.9
	93	10.575	10.166	(0.986)	4442	80.0000	0.070(a)
22 2,4-Dichlorophenol	162	10.378	10.378	(0.968)	3214523	80.0000	79.2
	162	10.755	10.378	(1.003)	1075	80.0000	0.026(aQ)
23 1,2,4-Trichlorobenzene	180	10.591	10.591	(0.988)	3595873	80.0000	76.6
* 24 Naphthalene-d8	136	10.722	10.722	(1.000)	10679247	80.0000	
	136	10.378	10.722	(1.000)	19582	80.0000	
25 Naphthalene	128	10.771	10.771	(1.005)	9774846	80.0000	79.5
	128	10.378	10.771	(0.968)	102125	80.0000	0.83
	128	10.640	10.771	(0.992)	5399	80.0000	0.044
	128	10.885	10.771	(1.015)	219792	80.0000	1.8
26 4-Chloroaniline	127	10.885	10.885	(1.015)	2123829	80.0000	69.3
	127	10.526	10.885	(0.982)	349	80.0000	0.011(a)
	127	10.640	10.885	(0.992)	1803	80.0000	0.059(a)
	127	10.771	10.885	(1.005)	1184239	80.0000	38.6
	127	11.082	10.885	(1.034)	95392	80.0000	3.1
27 Hexachlorobutadiene	225	11.065	11.065	(1.032)	1906522	80.0000	82.1
	225	10.706	11.065	(0.998)	25190	80.0000	1.1
28 4-Chloro-3-Methylphenol	107	12.047	12.047	(1.124)	2996988	80.0000	76.7
	107	11.883	12.047	(1.108)	4105	80.0000	0.10(a)
29 2-Methylnaphthalene	142	12.407	12.407	(1.157)	6132882	80.0000	74.6
	142	12.047	12.407	(1.124)	2446320	80.0000	29.7
	142	12.636	12.407	(1.178)	73137	80.0000	0.89
	142	12.799	12.407	(1.194)	14333	80.0000	0.17
30 Hexachlorocyclopentadiene	237	12.783	12.783	(0.856)	1798456	80.0000	85.2
31 2,4,6-Trichlorophenol	196	13.077	13.077	(0.876)	2279313	80.0000	84.2
	196	13.159	13.077	(0.882)	2353713	80.0000	87.0
33 2-Fluorobiphenyl	172	13.306	13.306	(0.718)	7757000	80.0000	82.0
	172	13.077	13.306	(0.705)	2421	80.0000	0.026
	172	13.159	13.306	(0.710)	4492	80.0000	0.048
34 2-Chloronaphthalene	162	13.568	13.568	(0.909)	5868482	80.0000	80.8
	162	13.159	13.568	(0.882)	61845	80.0000	0.85
	162	13.225	13.568	(0.886)	3576	80.0000	0.049
	162	13.306	13.568	(0.891)	632	80.0000	0.0087
	162	13.437	13.568	(0.900)	158	80.0000	0.0022
35 2-Nitroaniline	65	13.830	13.830	(0.927)	2246120	80.0000	94.2
	65	13.568	13.830	(0.909)	6367	80.0000	0.27(a)
	65	13.699	13.830	(0.918)	9960	80.0000	0.42(a)
36 Dimethylphthalate	163	14.320	14.320	(0.959)	8364297	80.0000	89.9

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)
37 2,6-Dinitrotoluene	165	14.451	14.451	(0.968)	2000756	80.0000	92.3
	165	14.075	14.451	(0.943)	610	80.0000	0.028(a)
	165	14.108	14.451	(0.945)	540	80.0000	0.025(a)
	165	14.190	14.451	(0.951)	147	80.0000	0.0068(a)
	165	14.304	14.451	(0.958)	85620	80.0000	3.9
	165	14.713	14.451	(0.986)	616	80.0000	0.028(a)
38 Acenaphthylene	152	14.566	14.566	(0.976)	9882493	80.0000	87.8
	152	14.140	14.566	(0.947)	164	80.0000	0.0014
	152	14.173	14.566	(0.950)	622	80.0000	0.0055
	152	14.271	14.566	(0.956)	603	80.0000	0.0054
39 3-Nitroaniline	138	13.830	13.830	(0.927)	2398280	80.0000	94.8
	138	13.486	13.830	(0.904)	239	80.0000	0.0094(a)
	138	13.568	13.830	(0.909)	11070	80.0000	0.44(a)
	138	13.748	13.830	(0.921)	100	80.0000	0.0040(aQ)
* 40 Acenaphthene-d10	164	14.926	14.926	(1.000)	6057945	80.0000	
41 Acenaphthene	154	15.007	15.007	(1.005)	5690045	80.0000	85.7
	154	14.566	15.007	(0.976)	70778	80.0000	1.1(Q)
42 2,4-Dinitrophenol	184	15.089	15.089	(1.011)	945694	80.0000	79.4
	184	14.991	15.089	(1.004)	433	80.0000	0.036(aQ)
43 4-Nitrophenol	109	15.269	15.269	(1.023)	759728	80.0000	88.5
	109	14.860	15.269	(0.996)	2013	80.0000	0.23(aQ)
	109	14.991	15.269	(1.004)	15022	80.0000	1.7
	109	15.089	15.269	(1.011)	4988	80.0000	0.58(a)
	109	15.416	15.269	(1.033)	39115	80.0000	4.6
44 2,4-Dinitrotoluene	165	15.416	15.416	(1.033)	2418443	80.0000	94.1
	165	15.253	15.416	(1.022)	2529	80.0000	0.098(aQ)
45 Dibenzofuran	168	15.416	15.416	(1.033)	8947369	80.0000	88.4
	168	15.089	15.416	(1.011)	34725	80.0000	0.34(a)
	168	15.187	15.416	(1.018)	256	80.0000	0.0025(a)
	168	15.220	15.416	(1.020)	364	80.0000	0.0036(a)
46 Diethylphthalate	149	16.038	16.038	(1.075)	7906367	80.0000	85.3
	149	16.283	16.038	(1.091)	55478	80.0000	0.60(a)
	149	16.414	16.038	(1.100)	2139	80.0000	0.023(a)
47 4-Chlorophenyl phenyl ether	204	16.283	16.283	(1.091)	3343347	80.0000	97.4
	204	15.972	16.283	(1.070)	17197	80.0000	0.45(a)
	204	16.545	16.283	(1.108)	419	80.0000	0.011(aQ)
48 4-Nitroaniline	138	16.332	16.332	(1.094)	882496	80.0000	111
	138	15.956	16.332	(1.069)	846	80.0000	0.11(a)
	138	16.087	16.332	(1.078)	2612	80.0000	0.33(a)
	138	16.267	16.332	(1.090)	84966	80.0000	10.7
49 Fluorene	166	16.267	16.267	(1.090)	6635167	80.0000	84.1
	166	15.956	16.267	(1.069)	654	80.0000	0.0083
	166	16.038	16.267	(1.075)	6046	80.0000	0.077
	166	16.103	16.267	(1.079)	557	80.0000	0.0071
	166	16.169	16.267	(1.083)	723	80.0000	0.0092
	166	16.578	16.267	(1.111)	223027	80.0000	2.8
	166	16.627	16.267	(1.114)	9486	80.0000	0.12(Q)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)
50 4,6-Dinitro-2-methylphenol	198	16.398	16.398	(0.884)	1588784	80.0000	87.0
	198	16.005	16.398	(0.863)	255	80.0000	0.014(aQ)
	198	16.087	16.398	(0.868)	496	80.0000	0.027(aQ)
	198	16.300	16.398	(0.879)	341	80.0000	0.019(aQ)
51 N-nitrosodiphenylamine	169	16.578	16.578	(0.894)	4277606	80.0000	82.0
	169	16.283	16.578	(0.878)	310254	80.0000	5.9
	169	16.398	16.578	(0.884)	15198	80.0000	0.29(a)
	169	16.839	16.578	(0.908)	47936	80.0000	0.92(a)
52 2,4,6-Tribromophenol	330	16.839	16.839	(0.674)	1455137	80.0000	86.7
53 4-Bromophenyl phenyl ether	248	17.477	17.477	(0.943)	1927332	80.0000	81.8
	248	17.052	17.477	(0.920)	6152	80.0000	0.26(a)
	248	17.625	17.477	(0.951)	8643	80.0000	0.37(a)
54 Hexachlorobenzene	284	17.592	17.592	(0.949)	2540366	80.0000	82.1
	284	17.821	17.592	(0.961)	2122	80.0000	0.068(a)
	284	17.984	17.592	(0.970)	966	80.0000	0.031(a)
55 Pentachlorophenol	266	18.083	18.083	(0.975)	1492614	80.0000	81.8
56 Phenanthrene-d10	188	18.541	18.541	(1.000)	11000079	80.0000	
	188	18.230	18.541	(1.000)	850	80.0000	
	188	18.279	18.541	(1.000)	105	80.0000	
57 Phenanthrene	178	18.606	18.606	(1.004)	9695486	80.0000	83.2
	178	18.344	18.606	(0.989)	405	80.0000	0.0035
	178	18.737	18.606	(1.011)	10437869	80.0000	89.5
58 Anthracene	178	18.737	18.737	(1.011)	10437869	80.0000	92.6
	178	18.344	18.737	(0.989)	405	80.0000	0.0036
	178	18.606	18.737	(1.004)	9695486	80.0000	86.0
59 Di-n-butylphthalate	149	20.062	20.062	(1.082)	12929250	80.0000	88.0
	149	19.669	20.062	(1.061)	572	80.0000	0.0039(a)
	149	19.735	20.062	(1.064)	209	80.0000	0.0014(a)
	149	19.833	20.062	(1.070)	748	80.0000	0.0051(a)
60 Fluoranthene	202	21.501	21.501	(1.160)	9865462	80.0000	86.7
	202	21.060	21.501	(1.136)	526	80.0000	0.0046
	202	21.141	21.501	(1.140)	525	80.0000	0.0046
	202	21.190	21.501	(1.143)	337	80.0000	0.0030
	202	21.305	21.501	(1.149)	860	80.0000	0.0076
	202	21.354	21.501	(1.152)	358	80.0000	0.0031
	202	21.403	21.501	(1.154)	2192	80.0000	0.019
61 Pyrene	202	22.057	22.057	(0.882)	10794171	80.0000	92.3
	202	22.466	22.057	(0.899)	21509	80.0000	0.18
62 Terphenyl-d14	244	22.483	22.483	(0.899)	7621226	80.0000	93.9
	244	22.090	22.483	(0.884)	1284	80.0000	0.016
	244	22.155	22.483	(0.886)	380	80.0000	0.0047
	244	22.254	22.483	(0.890)	826	80.0000	0.010
63 3 3'-Dichlorobenzidine	252	24.936	24.936	(0.997)	1373277	80.0000	84.3
	252	24.609	24.936	(0.984)	694	80.0000	0.043(a)
	252	24.658	24.936	(0.986)	374	80.0000	0.023(a)
64 Butyl benzyl phthalate	149	23.709	23.709	(0.948)	5734353	80.0000	84.0
	149	23.251	23.709	(0.930)	3029	80.0000	0.044(a)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)
	149	23.382	23.709	(0.935)	409	80.0000	0.0060(a)
	149	23.431	23.709	(0.937)	270	80.0000	0.0040(a)
	149	23.497	23.709	(0.940)	675	80.0000	0.0099(a)
	149	24.135	23.709	(0.965)	532	80.0000	0.0078(a)
65 bis(2-ethylhexyl)Phthalate	149	25.132	25.132	(1.005)	8037530	80.0000	84.8
	149	24.756	25.132	(0.990)	18170	80.0000	0.19(a)
	149	24.871	25.132	(0.995)	4634	80.0000	0.049(a)
	149	24.969	25.132	(0.999)	36410	80.0000	0.38(a)
66 Benzo(a)Anthracene	228	24.511	24.511	(0.980)	174	80.0000	0.0019
	228	24.609	24.511	(0.984)	527	80.0000	0.0057
	228	24.642	24.511	(0.986)	477	80.0000	0.0052
	228	24.969	24.511	(0.999)	8016919	80.0000	86.9
	228	25.067	24.511	(1.003)	7209409	80.0000	78.2
* 67 Chrysene-d12	240	25.002	25.002	(1.000)	8154182	80.0000	
68 Chrysene	228	25.067	25.067	(1.003)	7209409	80.0000	87.9
	228	24.642	25.067	(0.986)	477	80.0000	0.0058
	228	24.969	25.067	(0.999)	8016919	80.0000	97.7
69 Di-n-octyl phthalate	149	26.637	26.637	(0.940)	11930221	80.0000	101
	149	26.376	26.637	(0.931)	2355	80.0000	0.020(a)
	149	26.948	26.637	(0.951)	482	80.0000	0.0041(a)
	149	27.013	26.637	(0.953)	15088	80.0000	0.13(a)
70 Benzo(b)fluoranthene	252	27.161	27.161	(0.958)	454	80.0000	0.0065
	252	27.210	27.161	(0.960)	210	80.0000	0.0030
	252	27.422	27.161	(0.968)	6221785	80.0000	88.9
	252	27.488	27.161	(0.970)	5826912	80.0000	83.3
71 Benzo(k)fluoranthene	252	27.488	27.488	(0.970)	5826915	80.0000	86.0
	252	27.161	27.488	(0.958)	454	80.0000	0.0067
	252	27.210	27.488	(0.960)	224	80.0000	0.0033
	252	27.422	27.488	(0.968)	6221785	80.0000	91.8
* 72 Perylene-d12	264	28.338	28.338	(1.000)	5122068	80.0000	
	264	27.897	28.338	(1.000)	216	80.0000	
	264	27.995	28.338	(1.000)	196	80.0000	
73 Indeno(1,2,3-cd)pyrene	276	31.528	31.528	(1.113)	3093738	80.0000	72.2
	276	31.152	31.528	(1.099)	1114	80.0000	0.026
	276	31.266	31.528	(1.103)	101	80.0000	0.0024
	276	31.348	31.528	(1.106)	321	80.0000	0.0075
	276	31.610	31.528	(1.115)	639362	80.0000	14.9
74 Benzo(a)pyrene	252	28.208	28.208	(0.995)	4766677	80.0000	84.8
	252	28.060	28.208	(0.990)	2434529	80.0000	43.3
	252	28.338	28.208	(1.000)	63976	80.0000	1.1
75 Dibenzo(a,h)anthracene	278	31.610	31.610	(1.115)	2789262	80.0000	75.2
	278	31.364	31.610	(1.107)	150	80.0000	0.0040
76 Benzo(g,h,i)perylene	276	32.493	32.493	(1.147)	3059608	80.0000	71.6
84 Benzo(e)pyrene	252	28.060	28.060	(0.990)	2434529	40.0000	39.7
	252	28.208	28.060	(0.995)	4766677	40.0000	77.7
	252	28.338	28.060	(1.000)	63976	40.0000	1.0
32 2,4,5-Trichlorophenol	196	13.519	13.519	(0.906)	7033	80.0000	0.25(a)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)
	196	13.077	13.519	(0.876)	2279313	80.0000	82.6
	196	13.159	13.519	(0.882)	2353713	80.0000	85.3
124 Benzyl Alcohol	108	8.170	8.170	(1.035)	2487585	80.0000	78.9
	108	7.778	8.170	(0.985)	34060	80.0000	1.1
	108	7.925	8.170	(1.004)	48559	80.0000	1.5
	108	8.399	8.170	(1.064)	3425493	80.0000	109
	108	8.514	8.170	(1.079)	21444	80.0000	0.68(a)
83 1-Methylnaphthalene-d10	152	12.554	12.554	(1.171)	5331211	80.0000	73.6
	152	12.309	12.554	(1.148)	6148	80.0000	0.085(a)
136 1-Chloro-3,4-Dinitrobenzene	63	15.694	15.694	(1.464)	1319441	80.0000	89.0
	63	15.269	15.694	(1.424)	366971	80.0000	24.8
	63	15.416	15.694	(1.438)	1742410	80.0000	118
	63	15.482	15.694	(1.444)	35712	80.0000	2.4
	63	15.760	15.694	(1.470)	19387	80.0000	1.3
	63	15.972	15.694	(1.490)	78566	80.0000	5.3
	63	16.038	15.694	(1.496)	56525	80.0000	3.8

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d
Report Date: 15-Jan-1998 15:06

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Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01100201002.d
Lab Smp Id: Method Spike
Analysis Type: SV
Quant Type: ISTD
Operator: hch
Method File: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Misc Info: 80 ng ISTD 267-91-1

Calibration Date: JAN/10/98
Calibration Time: 1157
Client Smp ID: Method Spike
Level: LOW
Sample Type: WATER

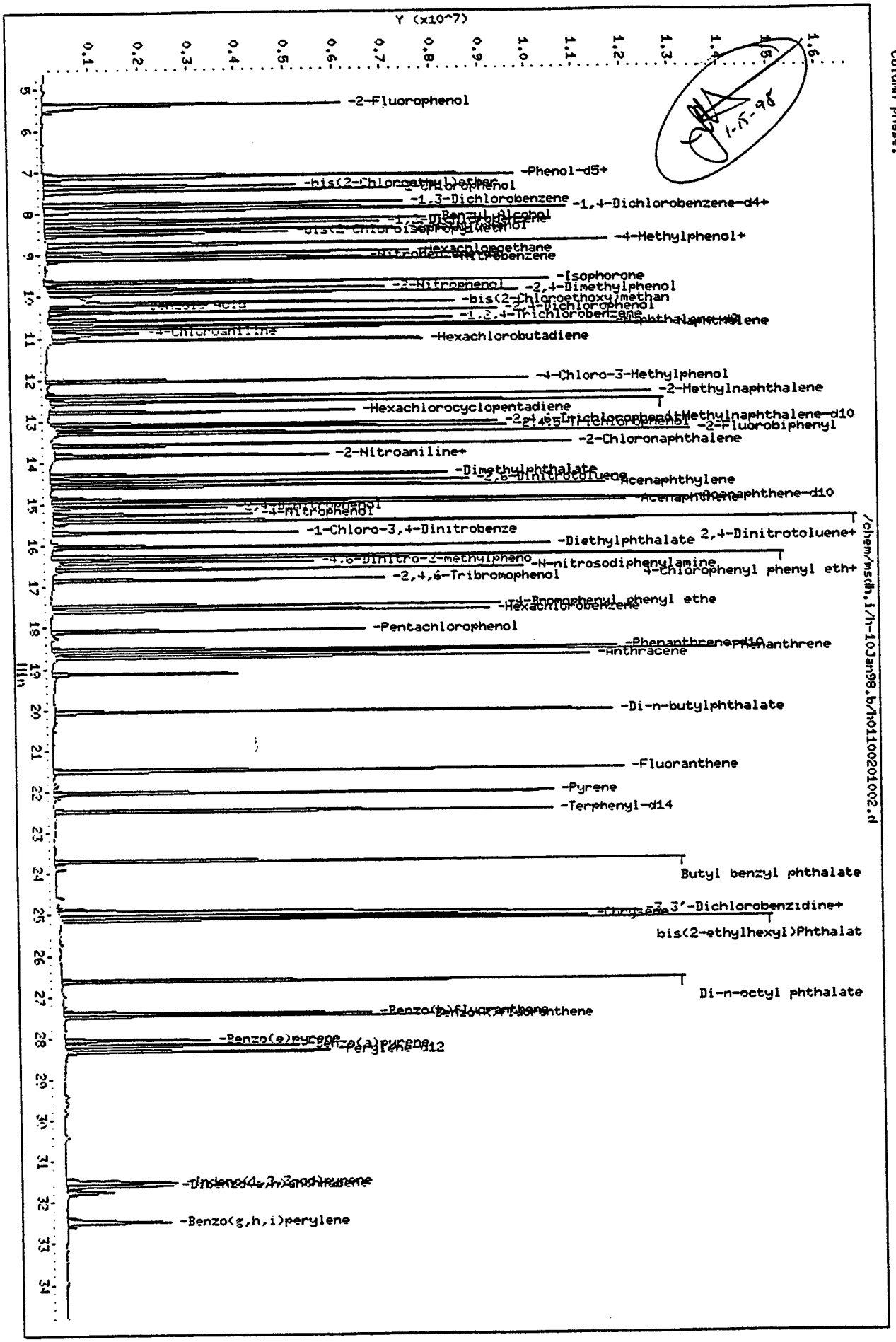
COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	5433602	2716801	10867204	5433602	0.00
24 Naphthalene-d8	10679247	5339624	21358494	10679247	0.00
40 Acenaphthene-d10	6057945	3028972	12115890	6057945	0.00
56 Phenanthrene-d10	11000079	5500040	22000158	11000079	0.00
67 Chrysene-d12	8154182	4077091	16308364	8154182	0.00
72 Perylene-d12	5122068	2561034	10244136	5122068	0.00

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.89	7.39	8.39	7.89	0.00
24 Naphthalene-d8	10.72	10.22	11.22	10.72	0.00
40 Acenaphthene-d10	14.93	14.43	15.43	14.93	0.00
56 Phenanthrene-d10	18.54	18.04	19.04	18.54	0.00
67 Chrysene-d12	25.00	24.50	25.50	25.00	0.00
72 Perylene-d12	28.34	27.84	28.84	28.34	0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

Data File: /chem/msdh.i/h-10Jan98.b/h011002O1002.d
Date : 10-JAN-1998 11:57
Client ID: Method Spike
Sample Info: 80 ug Method Spike 396-5-80
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i
Operator: hch
Column diameter: 2.00



Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

Column phase:

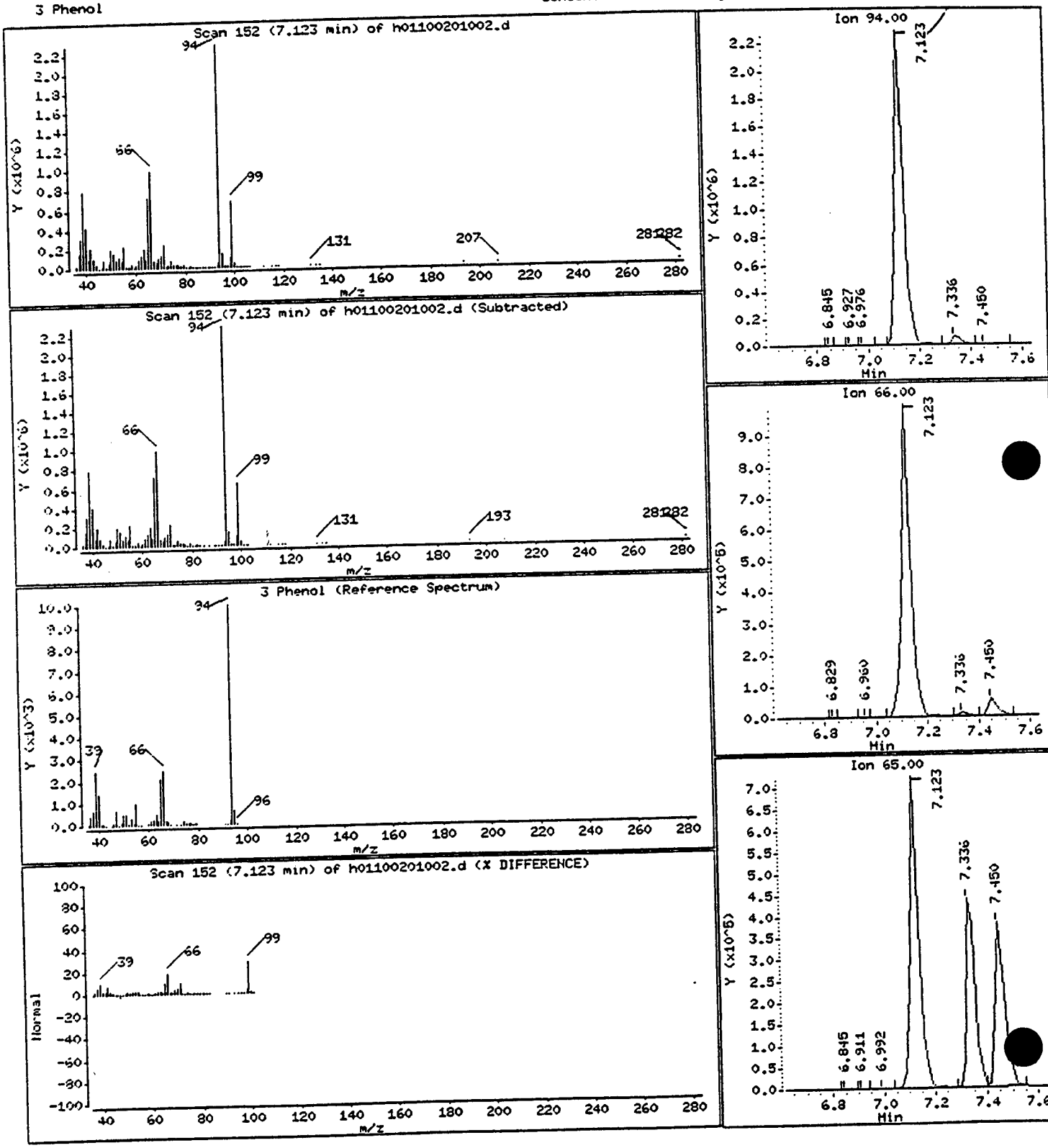
Instrument: msdh.i

Operator: hch

Column diameter: 2.00

Concentration: 78.6 ug

3 Phenol



Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

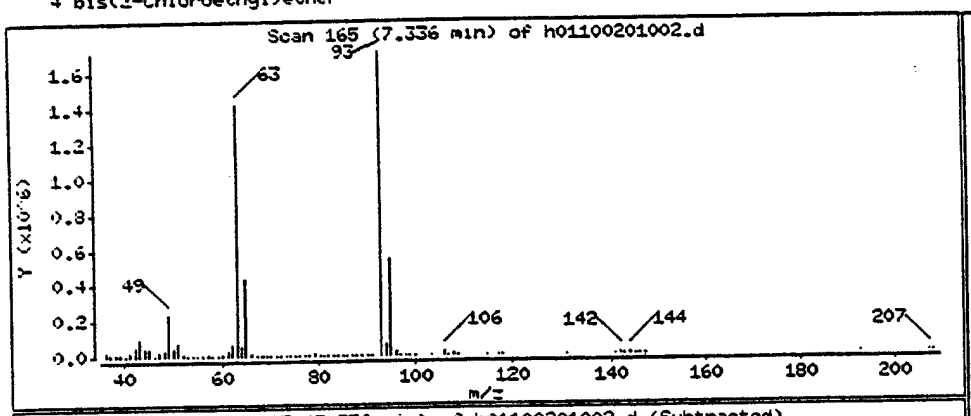
Operator: hch

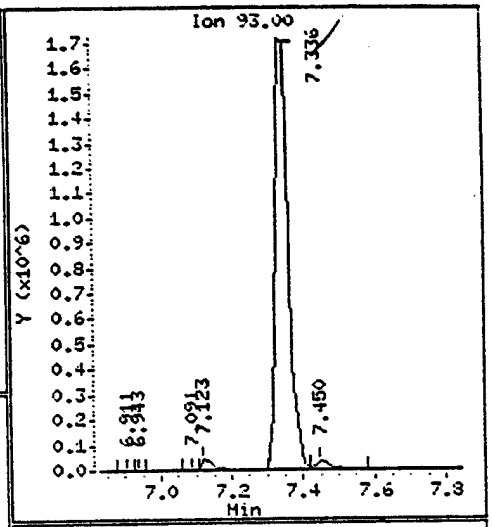
Column phase:

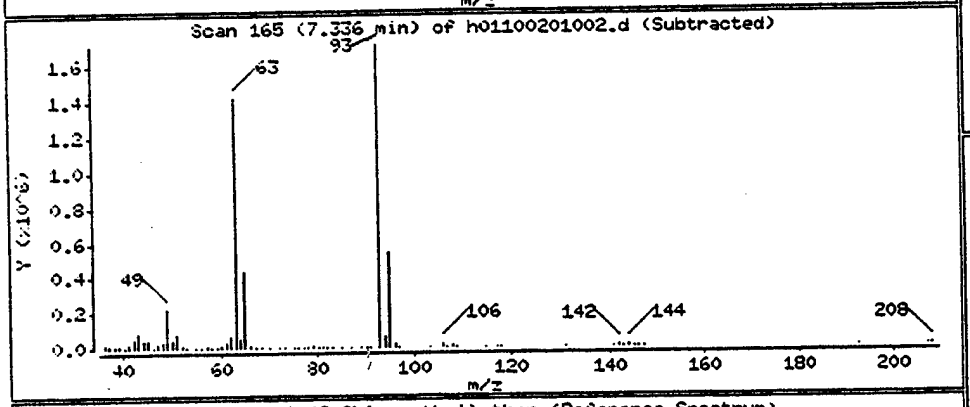
Column diameter: 2.00

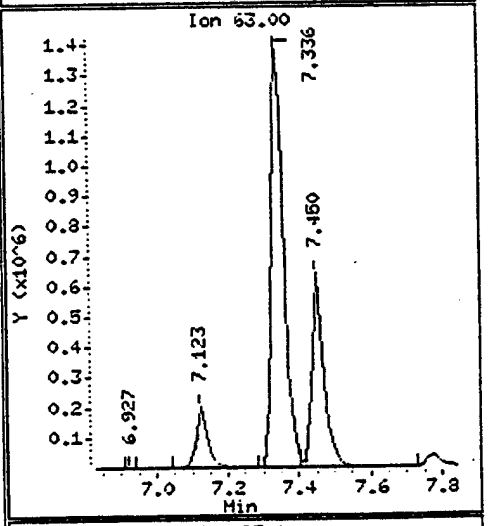
4 bis(2-Chloroethyl)ether

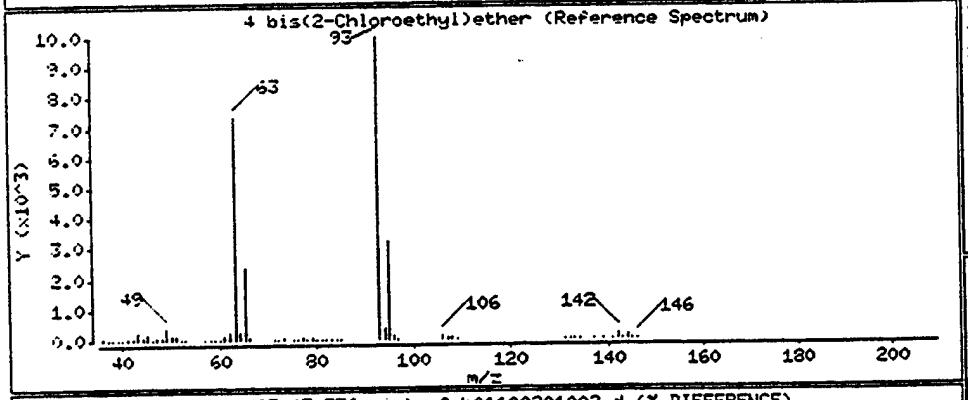
Concentration: 77.6 ug

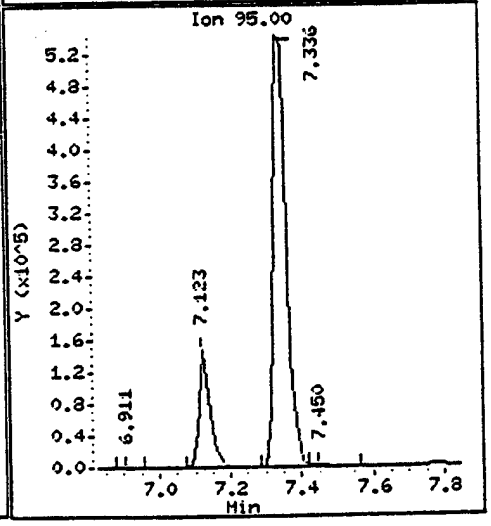


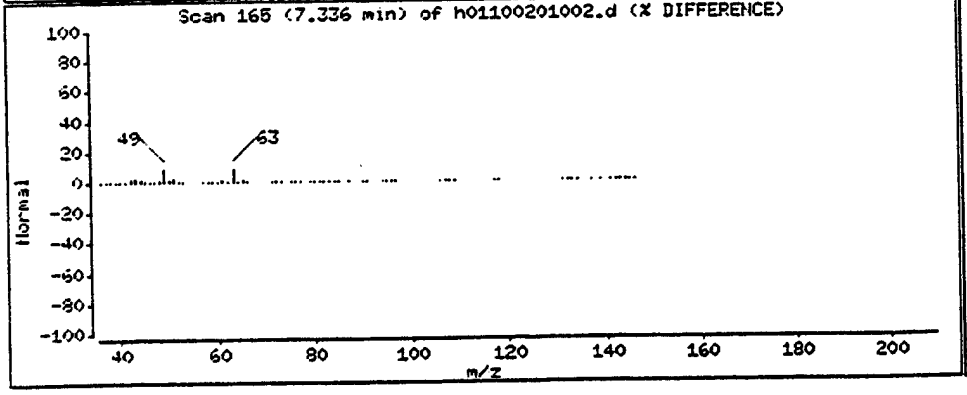












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

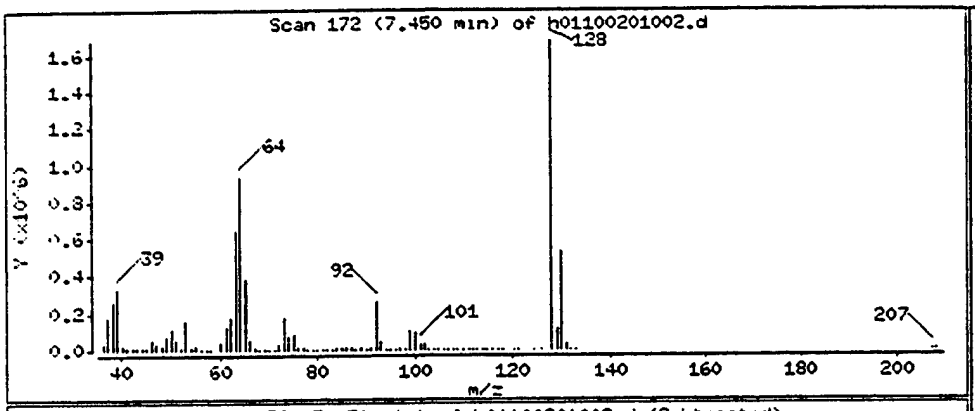
Operator: hch

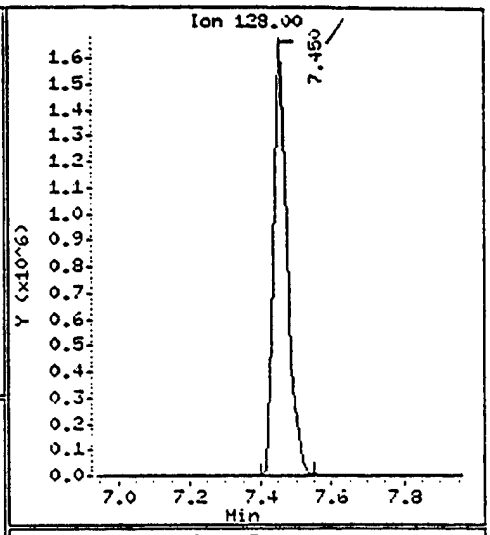
Column phase:

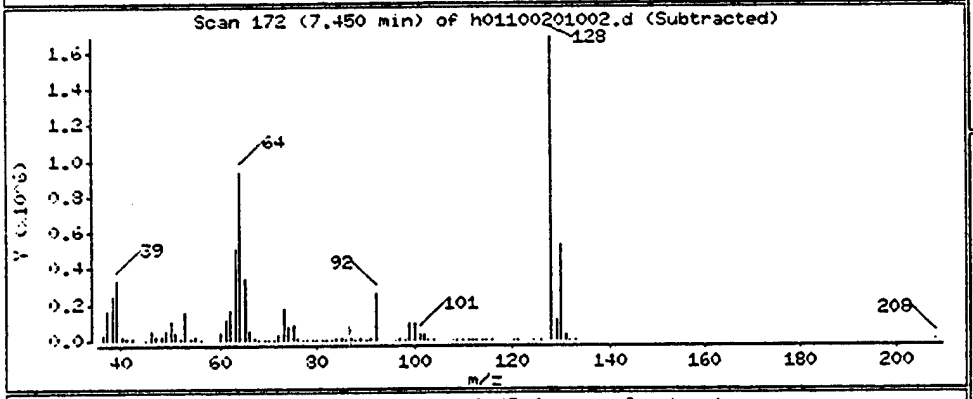
Column diameter: 2.00

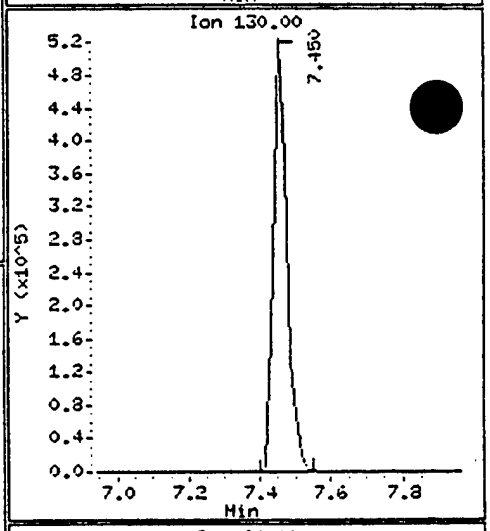
5 2-Chlorophenol

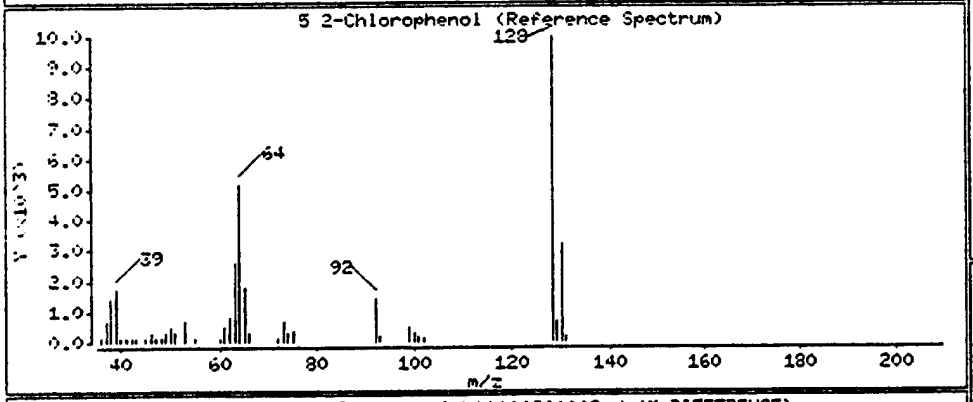
Concentration: 82.9 ug

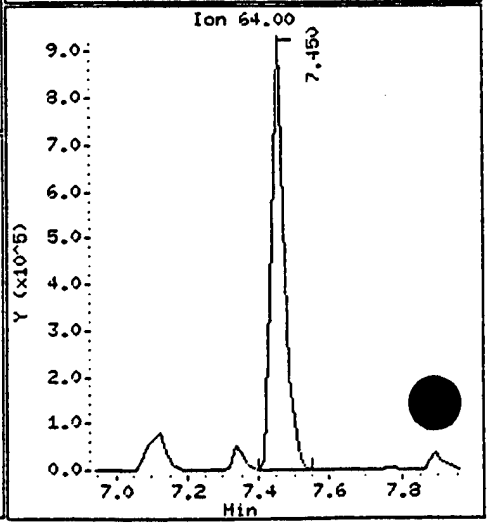


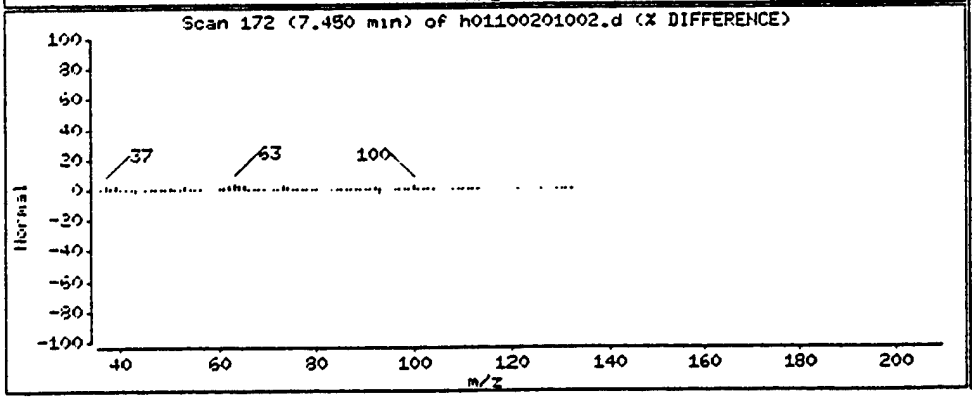












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

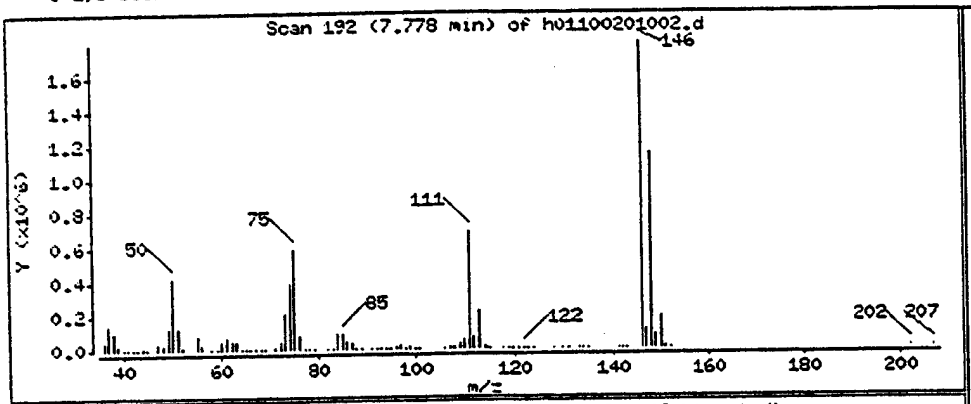
Operator: hch

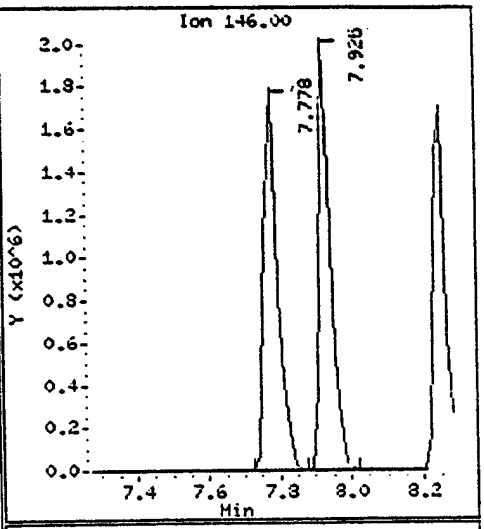
Column phase:

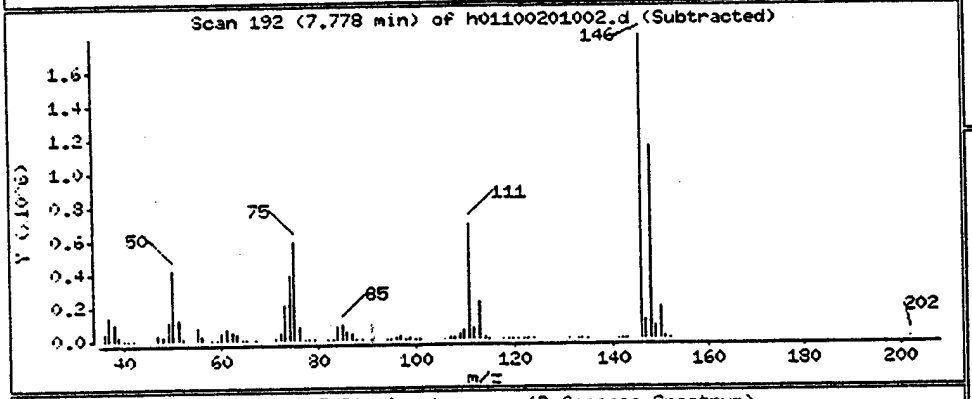
Column diameter: 2.00

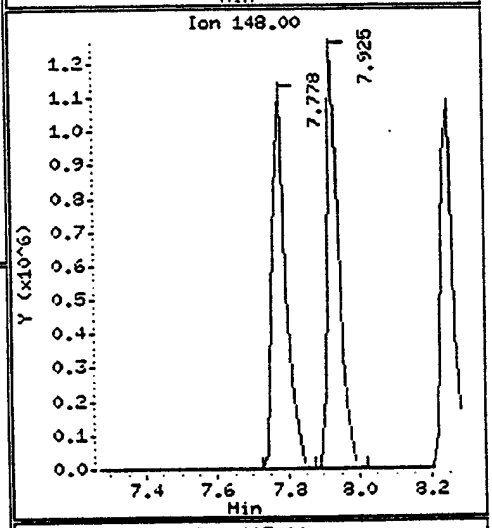
6 1,3-Dichlorobenzene

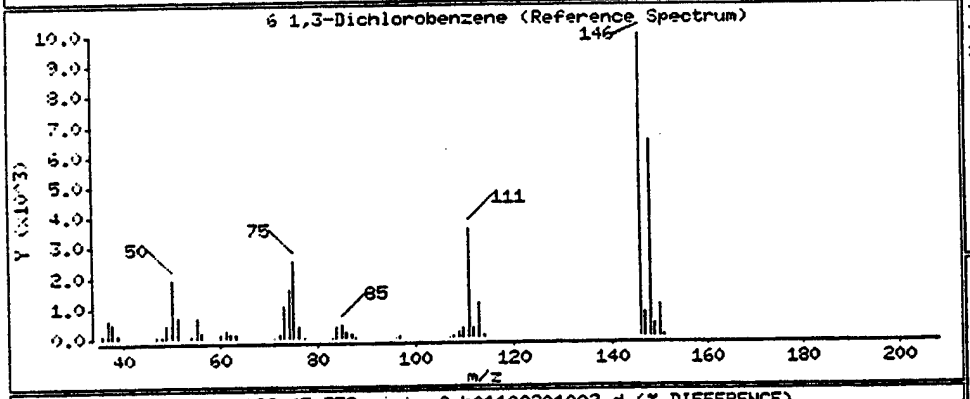
Concentration: 80.0 ug

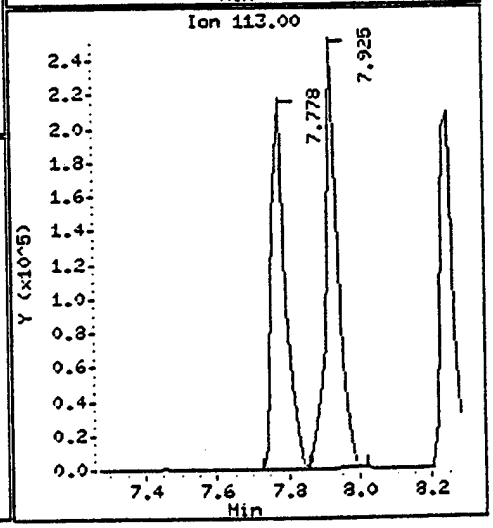


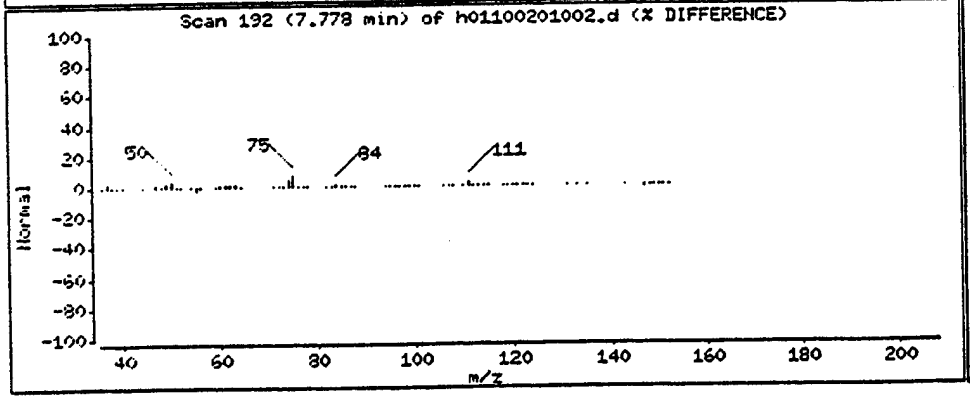












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Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

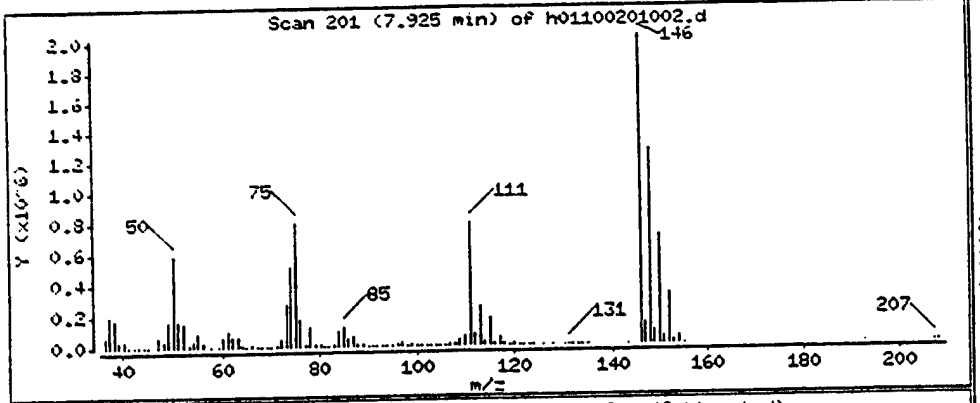
Operator: hch

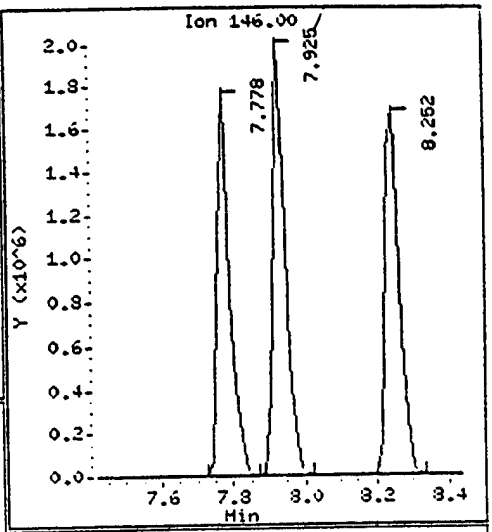
Column phase:

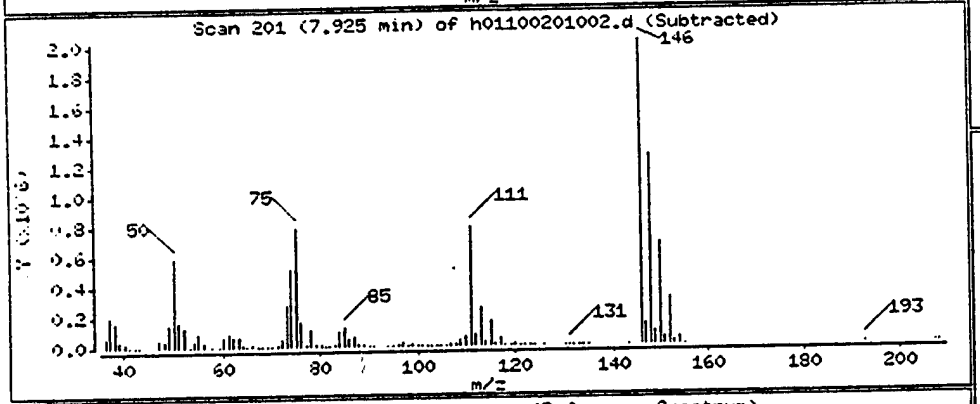
Column diameter: 2.00

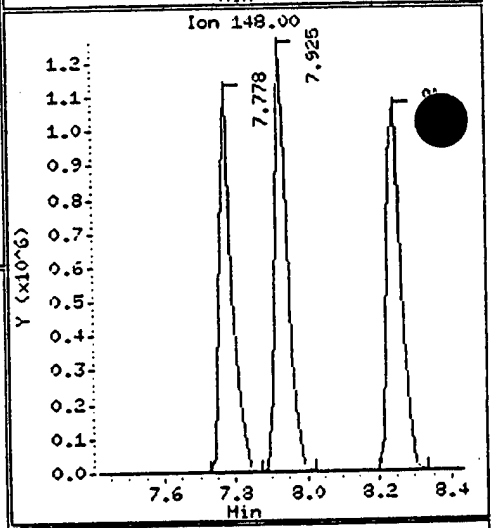
8 1,4-Dichlorobenzene

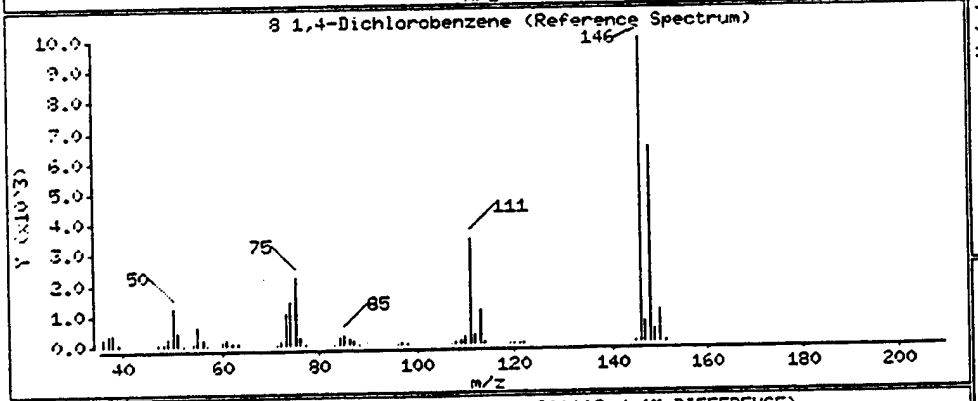
Concentration: 82.3 ug

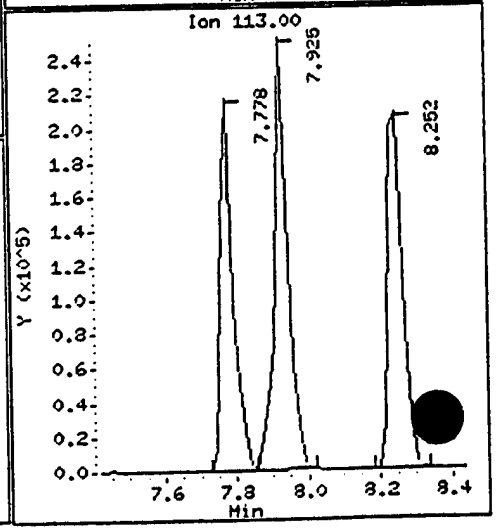


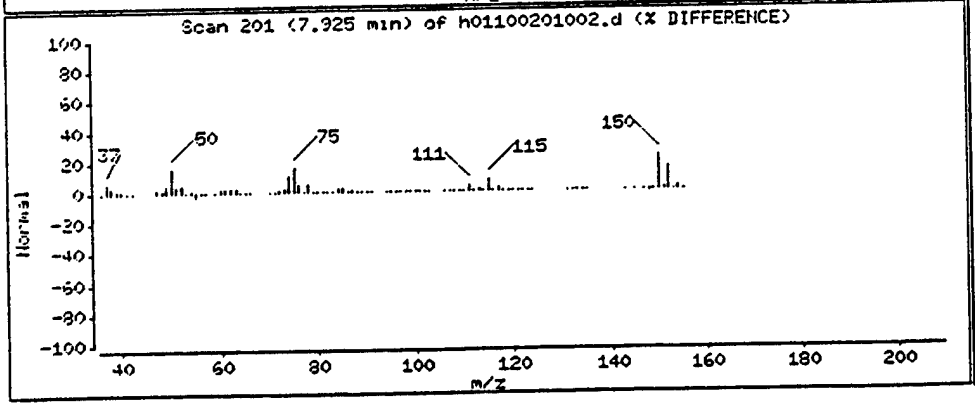












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

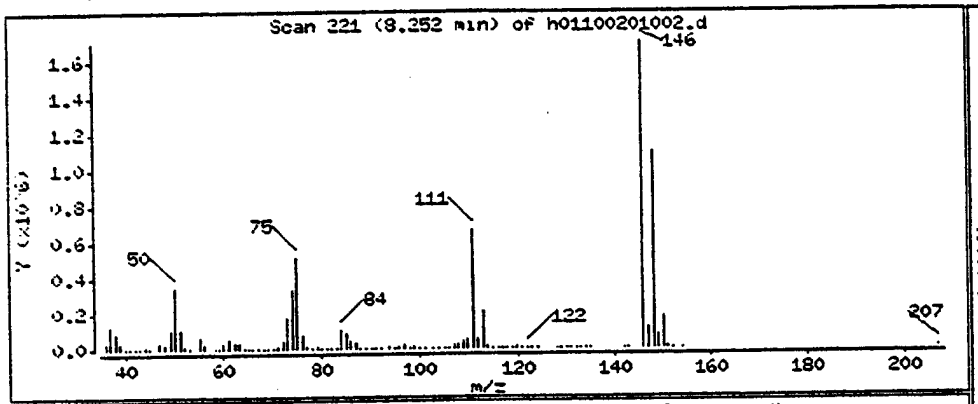
Operator: hch

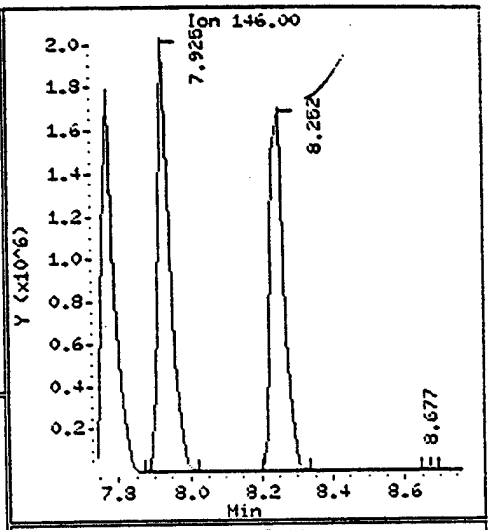
Column phase:

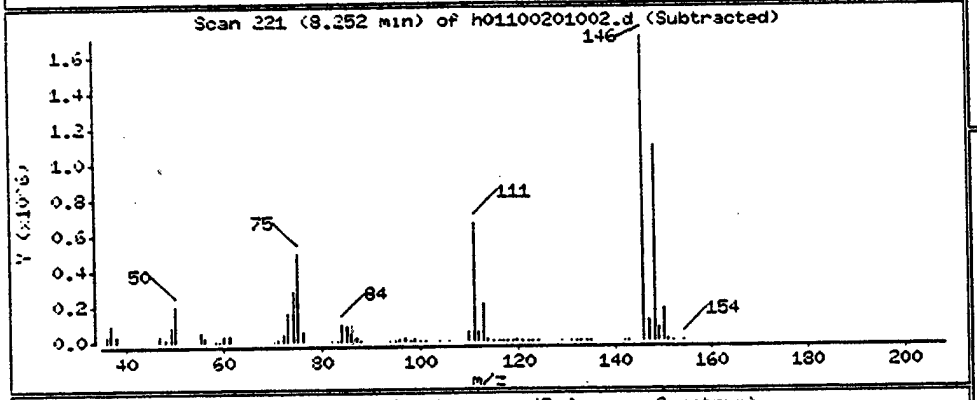
Column diameter: 2.00

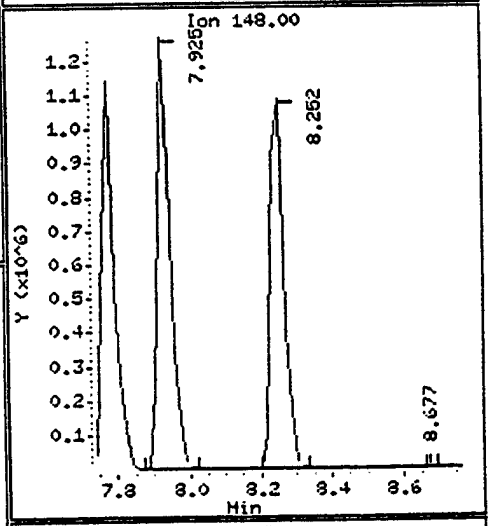
9 1,2-Dichlorobenzene

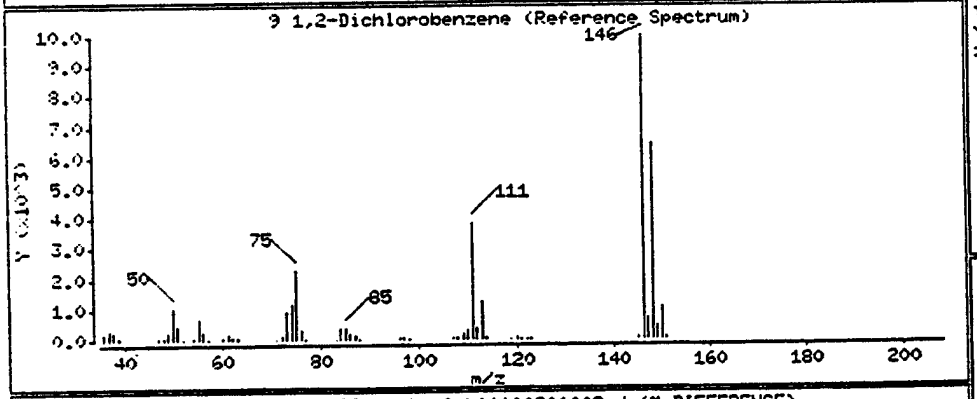
Concentration: 82.1 ug

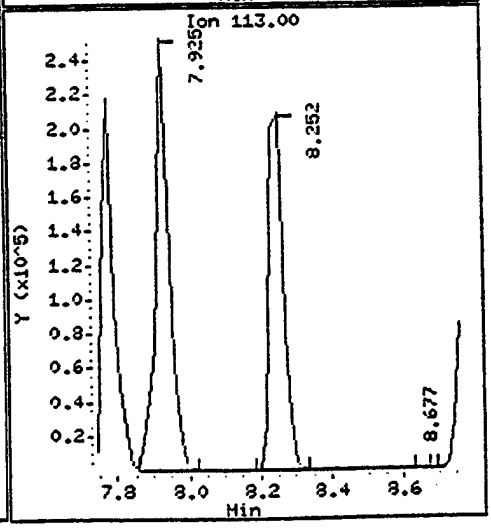


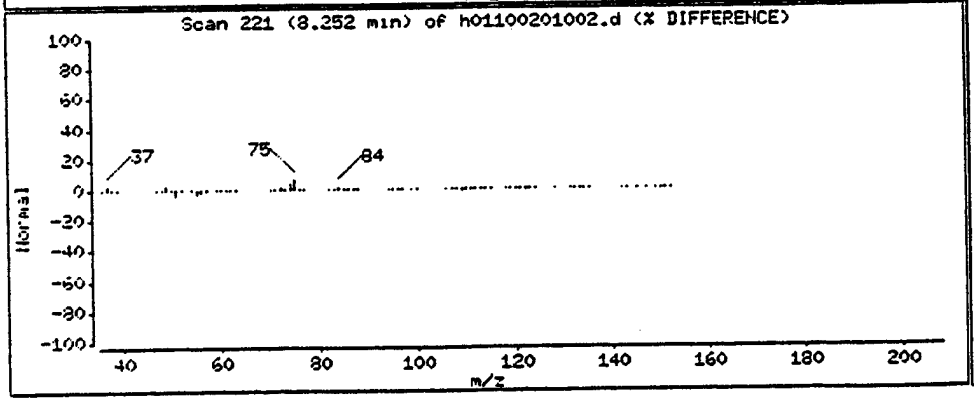












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

Column phase:

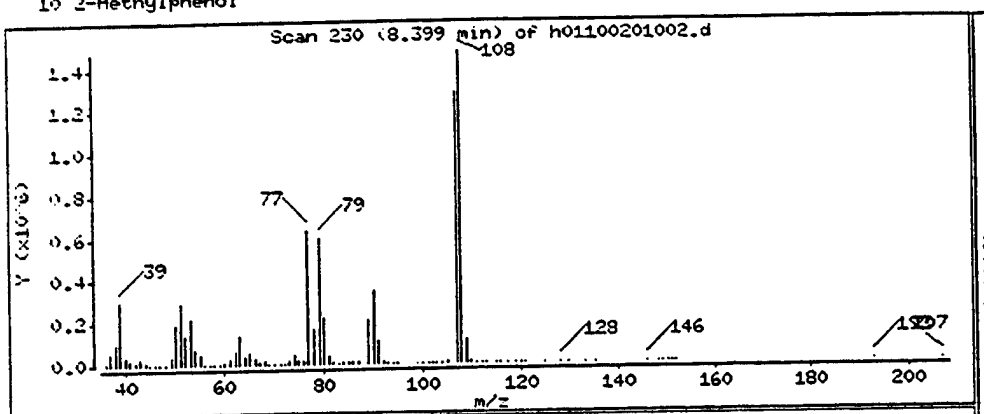
Instrument: msdh.i

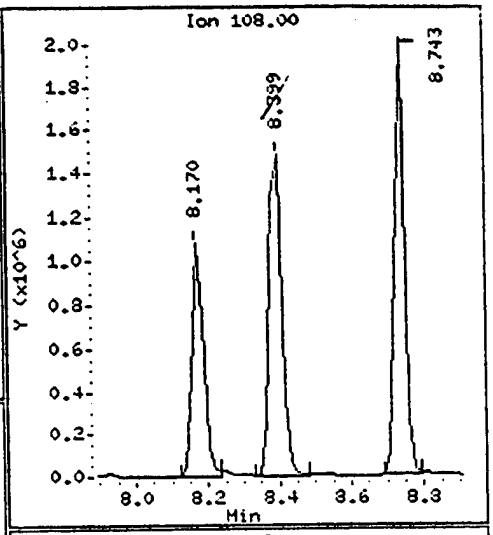
Operator: hch

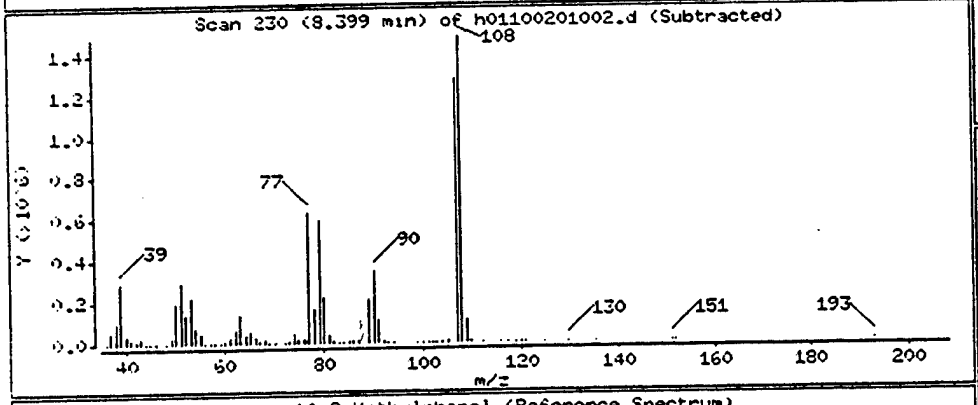
Column diameter: 2.00

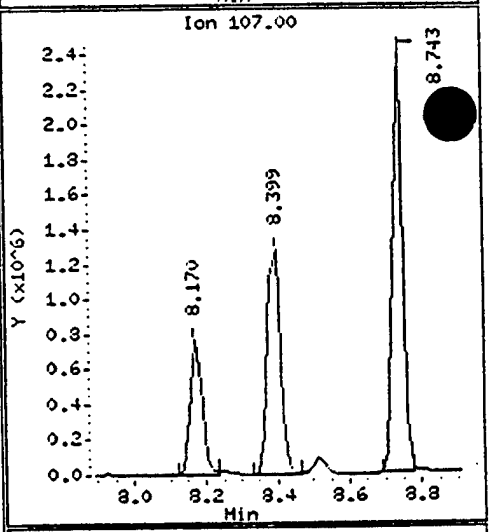
Concentration: 77.9 ug

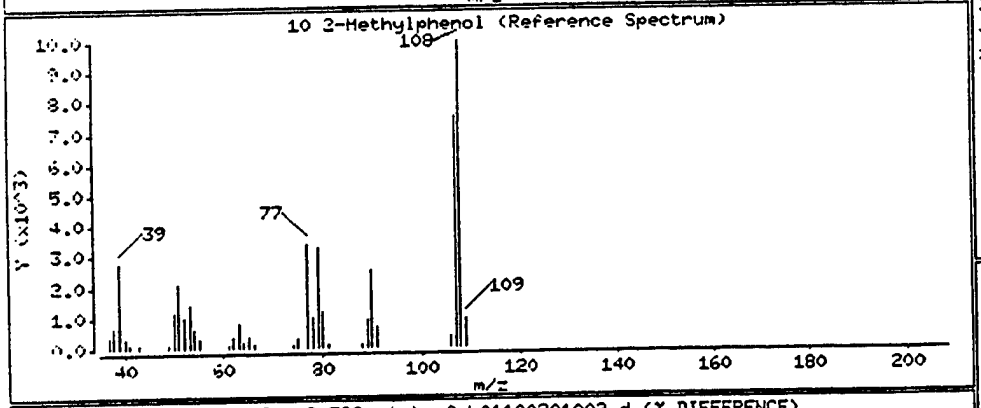
10 2-Methylphenol

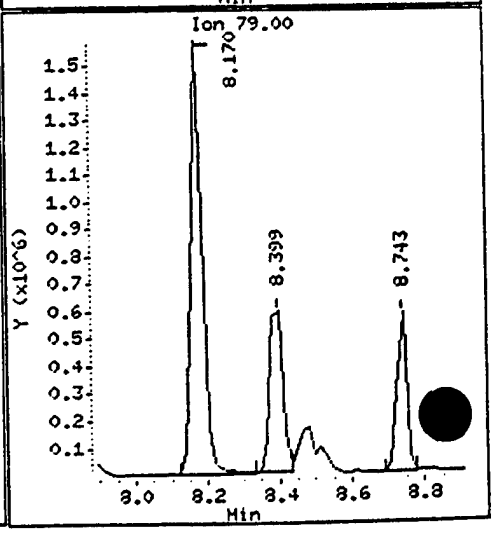


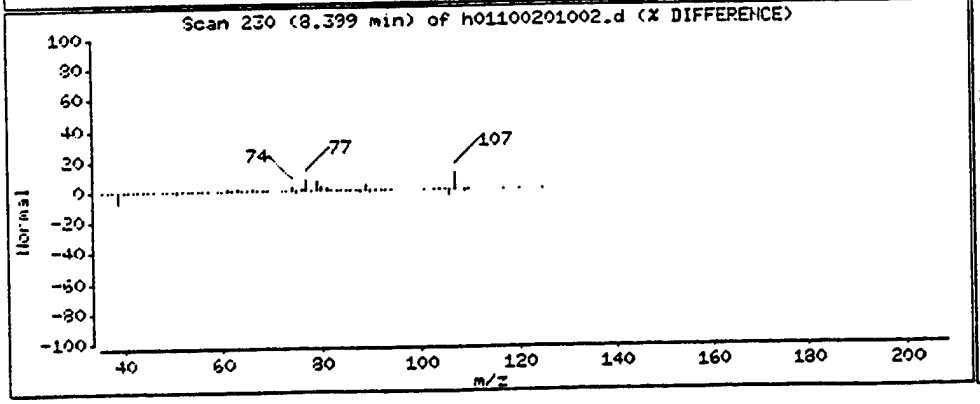










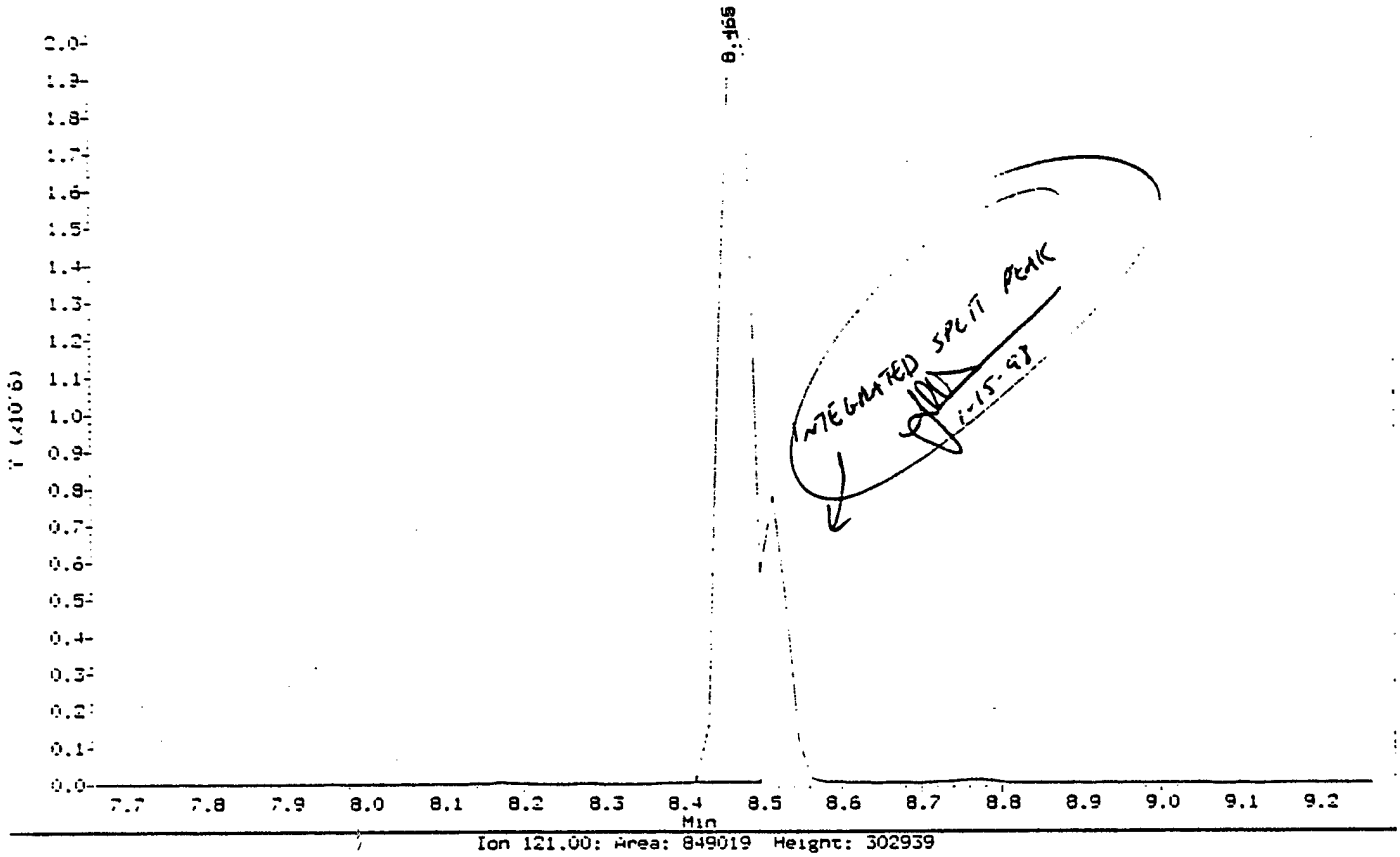


Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d
Injection Date: 10-JAN-1998 11:57
Instrument: msdh.i
Client Sample ID: Method Spike

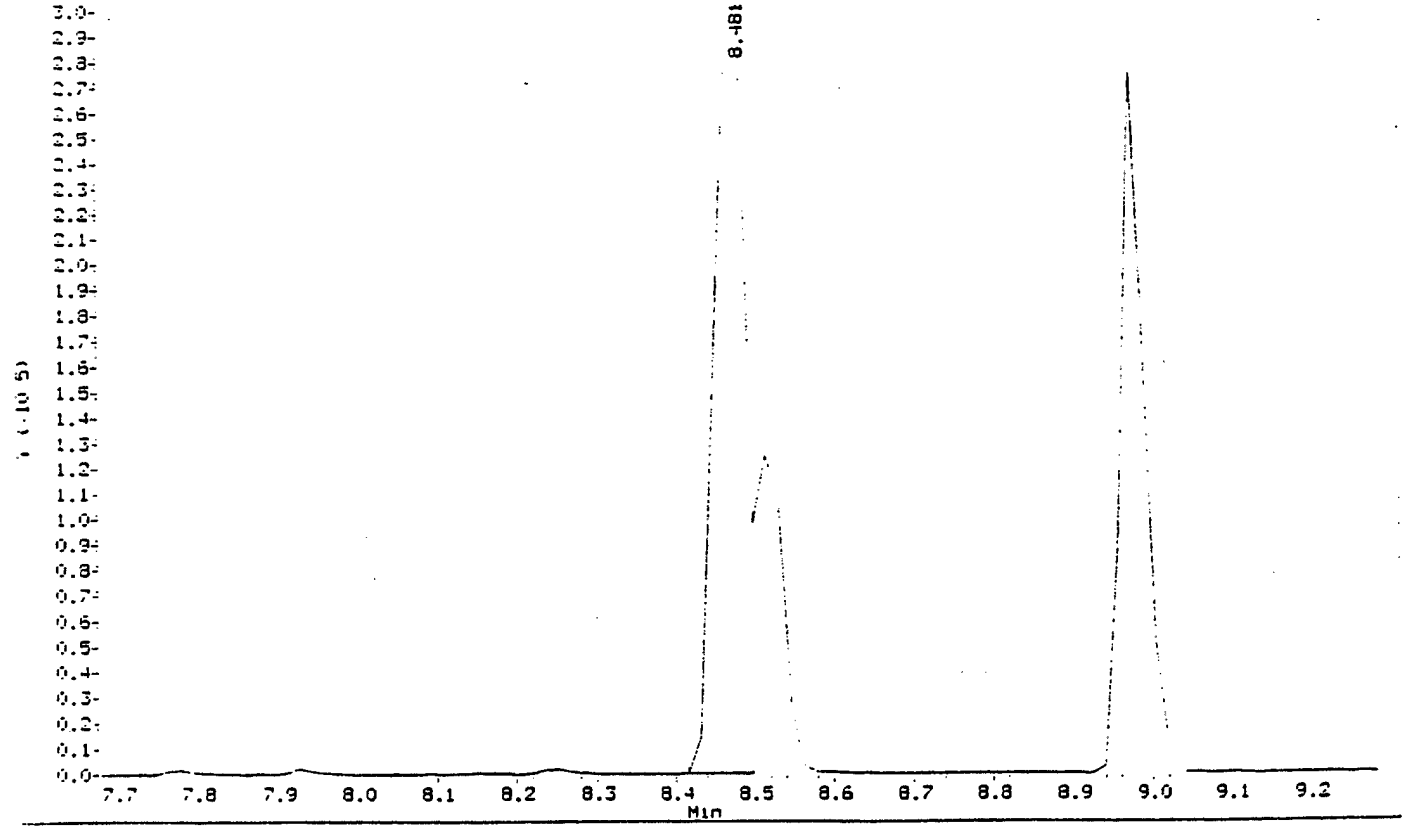
475A

Compound: bis(2-Chloroisopropyl)ether
CAS Number: 108-60-1

Ion 45.00: Area: 5945885 Height: 2086723



Ion 121.00: Area: 849019 Height: 302939



4753

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

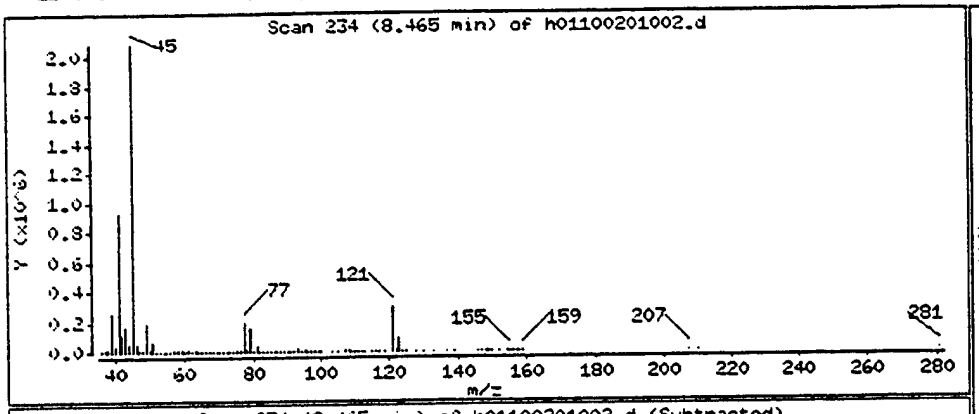
Operator: hch

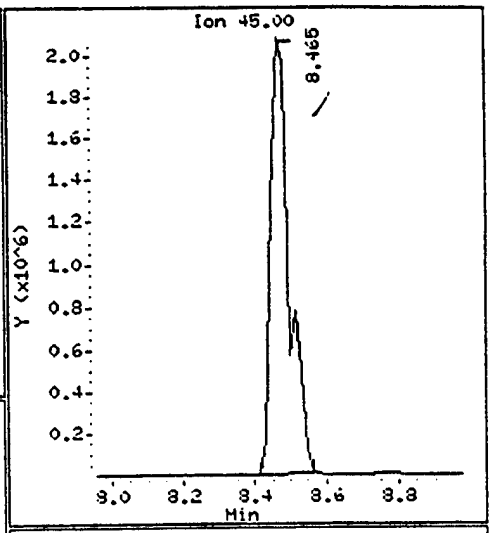
Column phase:

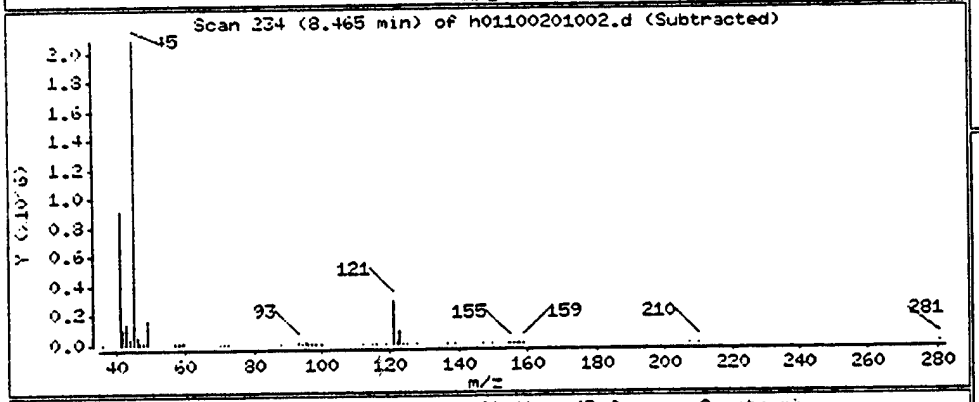
Column diameter: 2.00

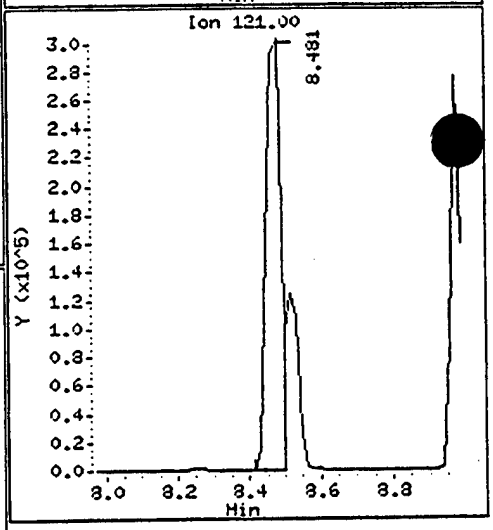
11 bis(2-Chloroisopropyl)ether

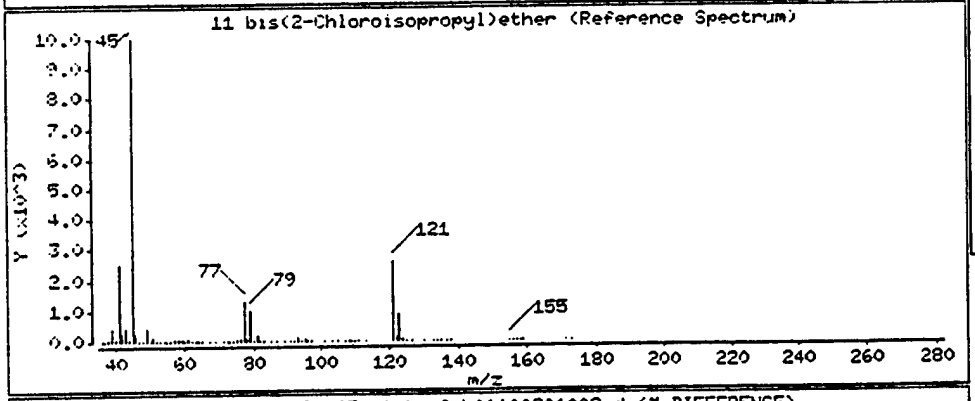
Concentration: 78.2 ug

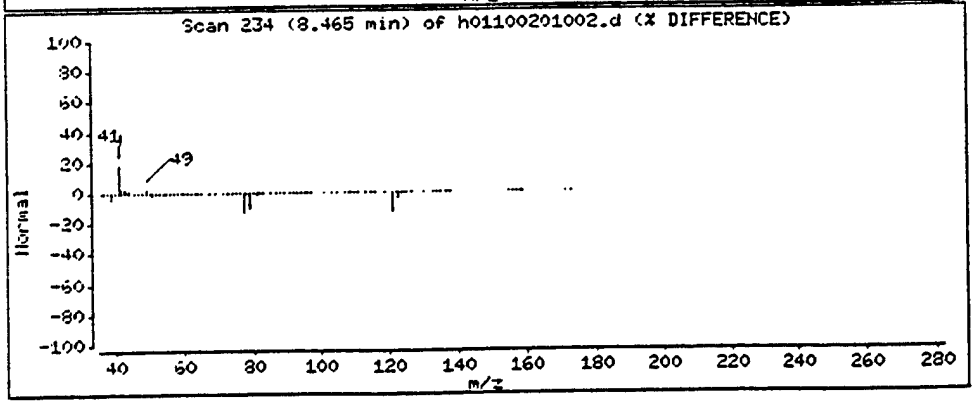












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

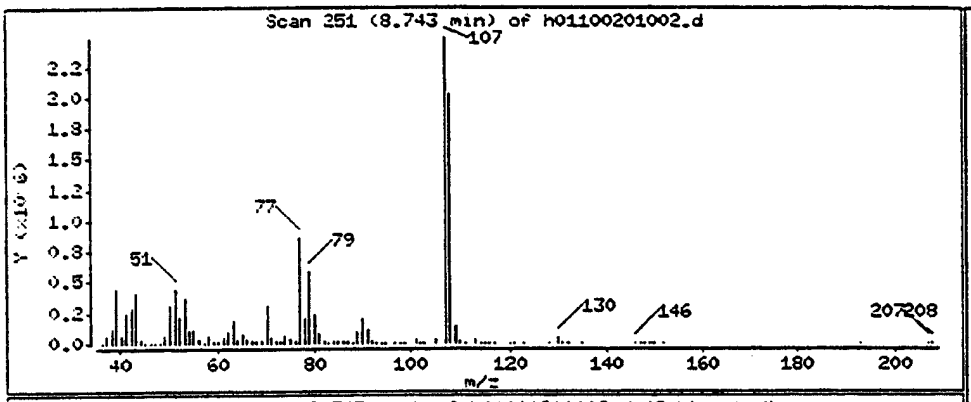
Operator: hch

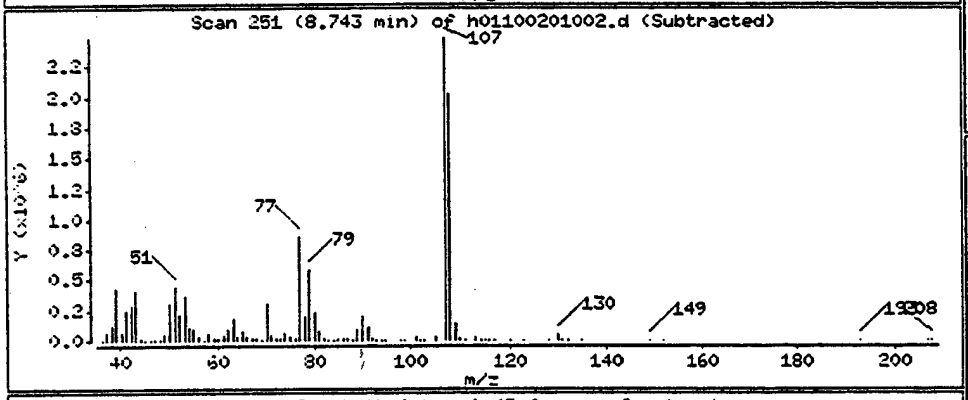
Column phase:

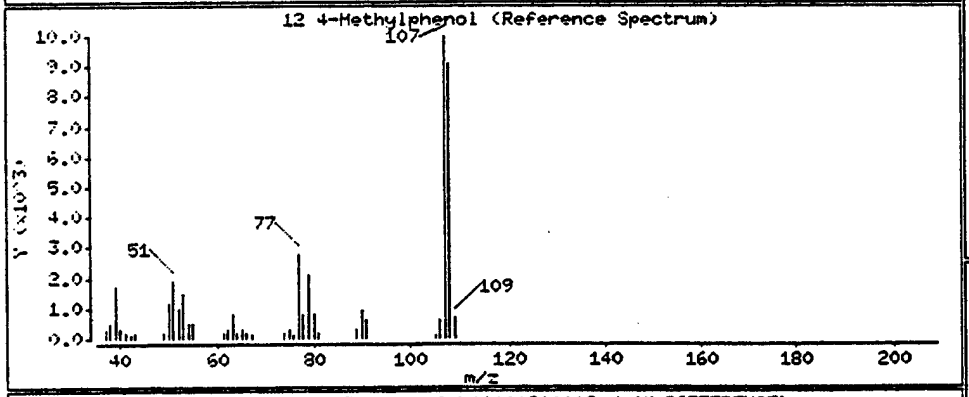
Column diameter: 2.00

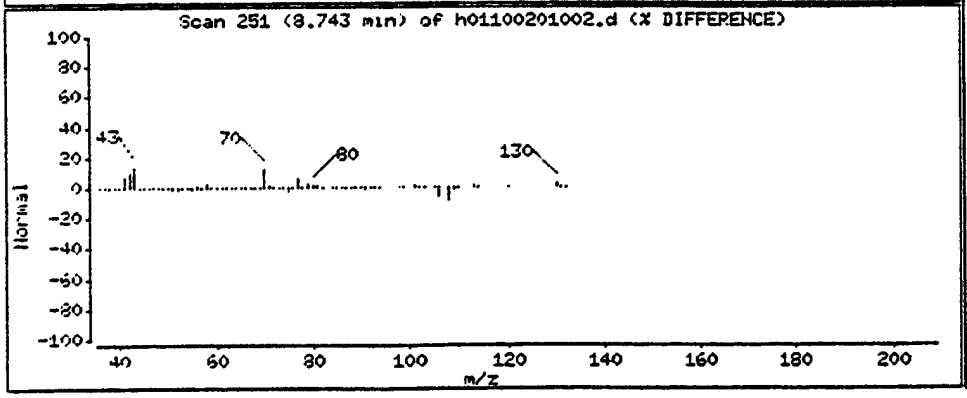
12 4-Methylphenol

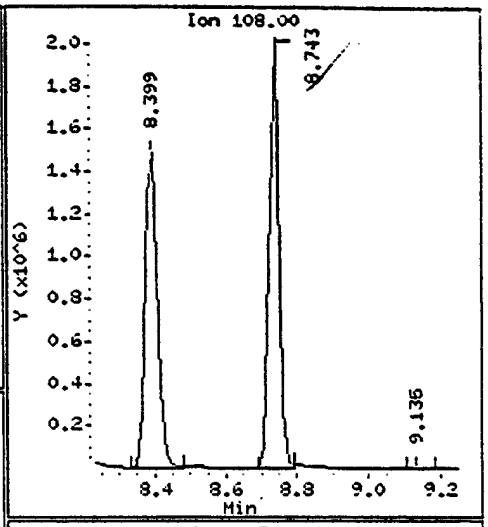
Concentration: 73.3 ug

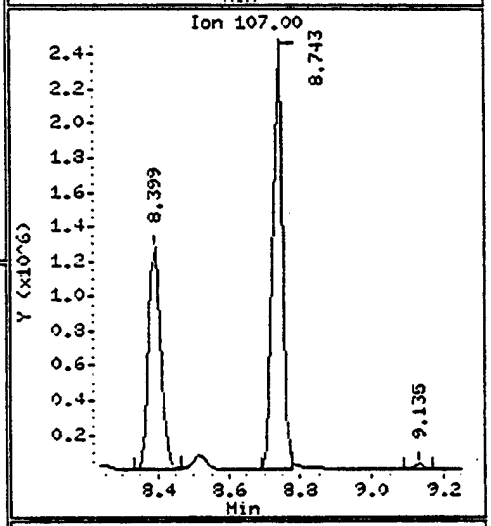


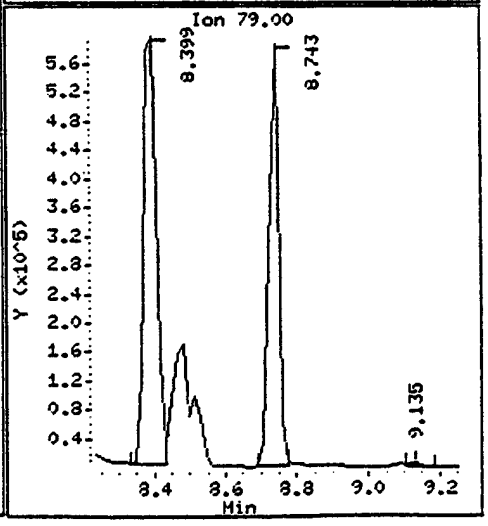












477

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

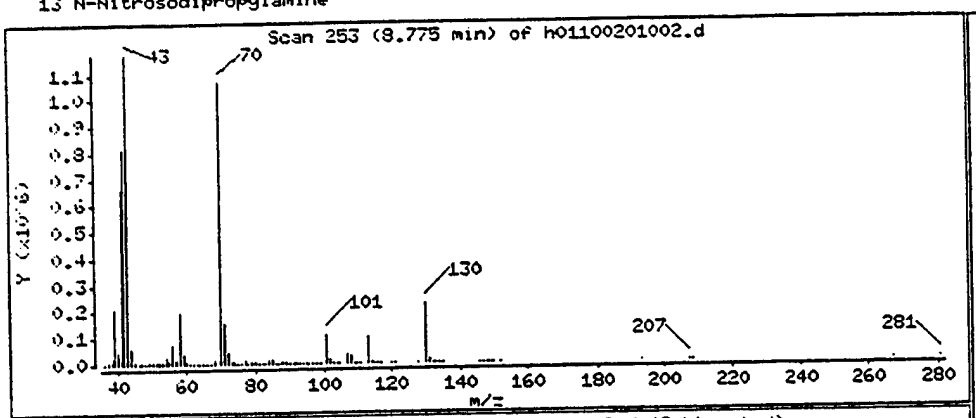
Operator: hch

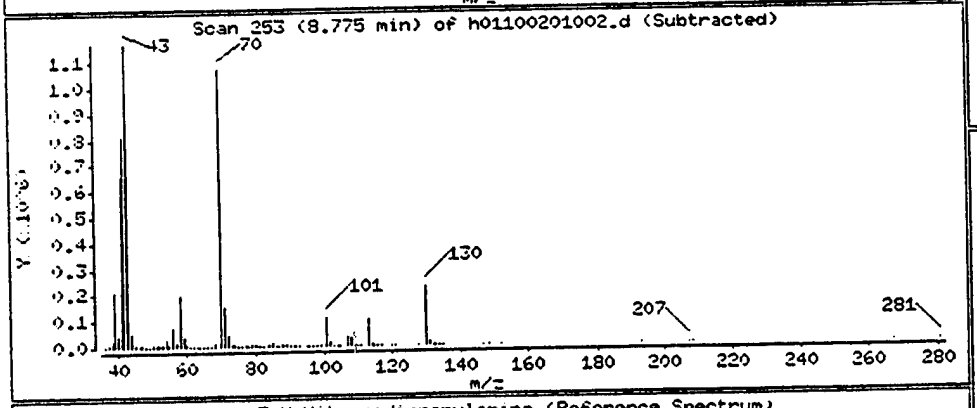
Column phase:

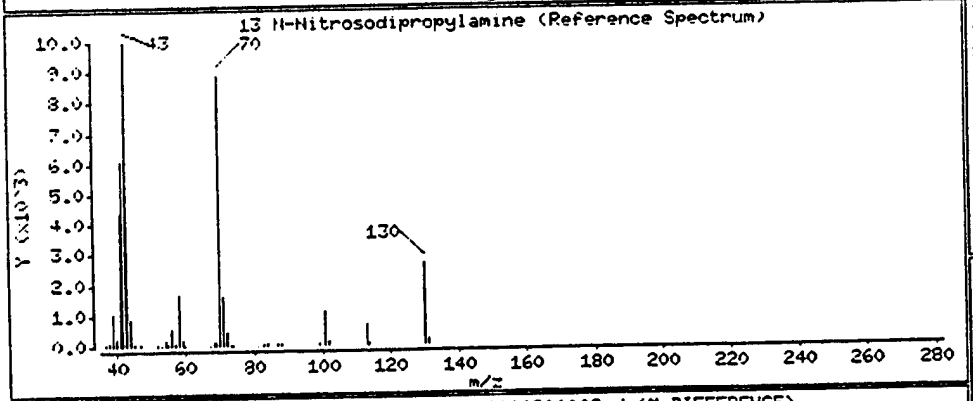
Column diameter: 2.00

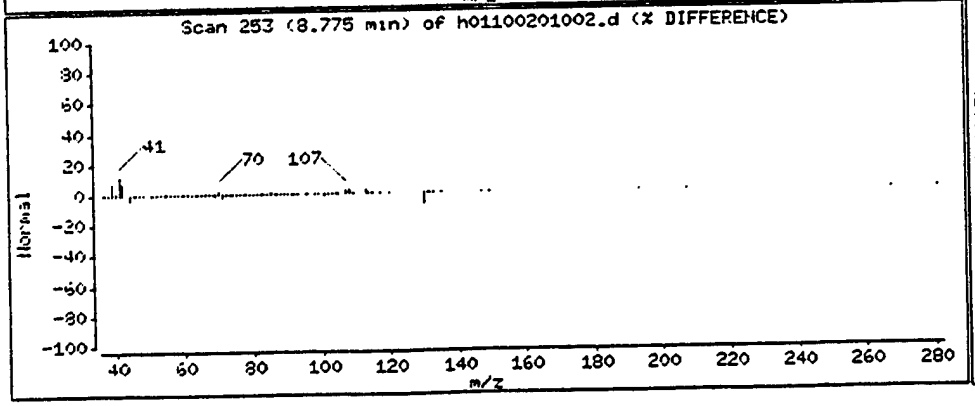
13 N-Nitrosodipropylamine

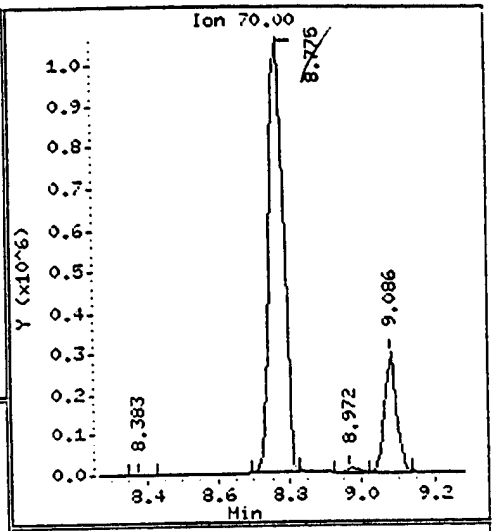
Concentration: 78.1 ug

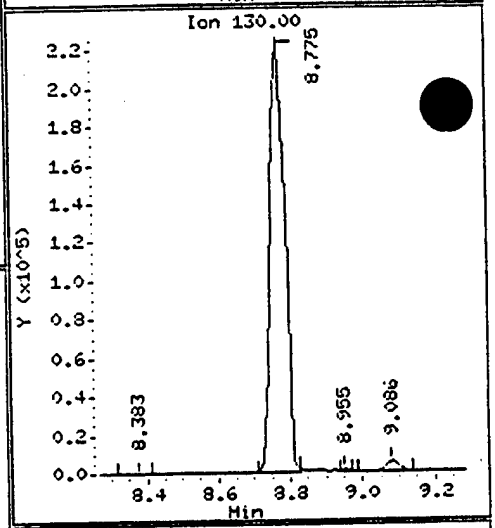


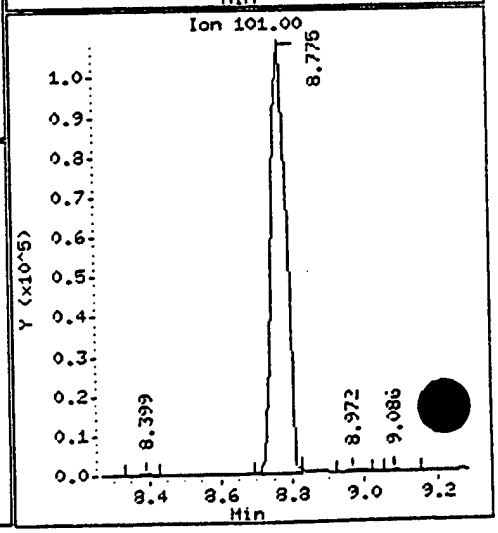












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

Operator: hch

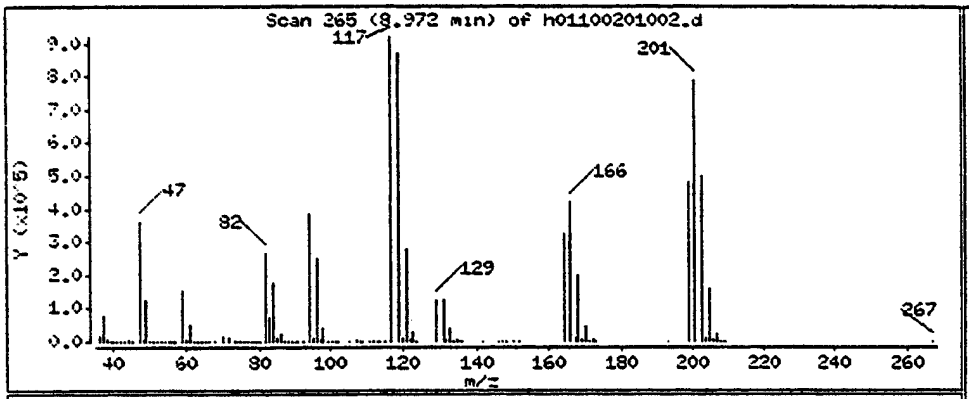
Column phase:

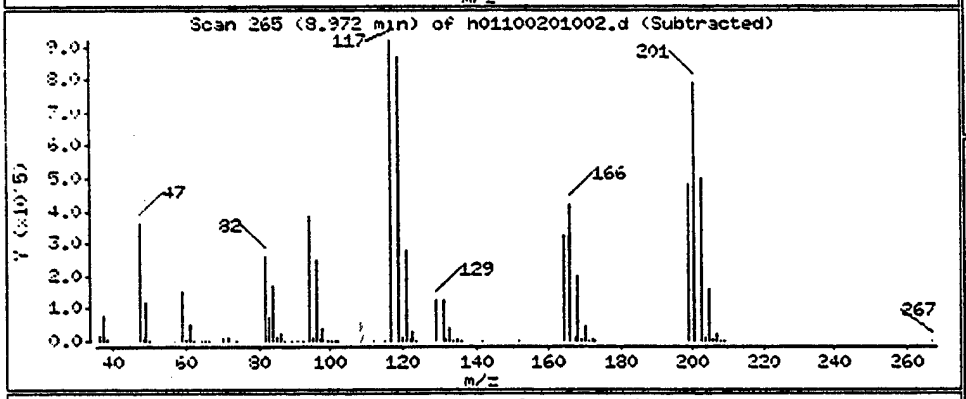
Column diameter: 2.00

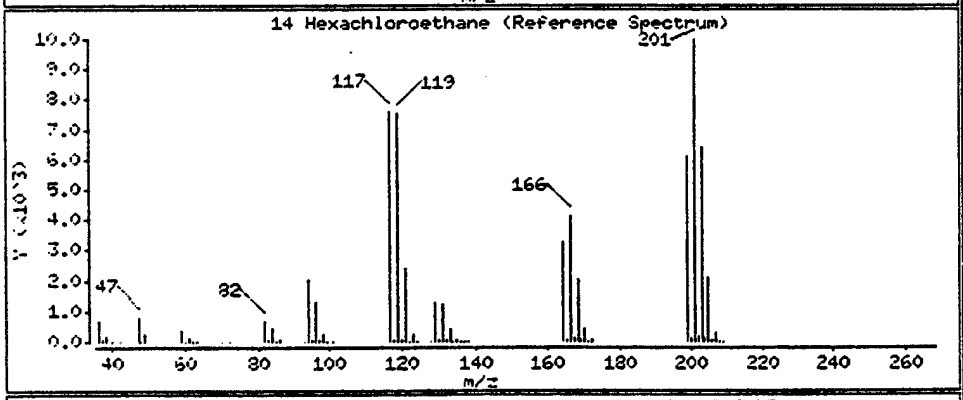
14 Hexachloroethane

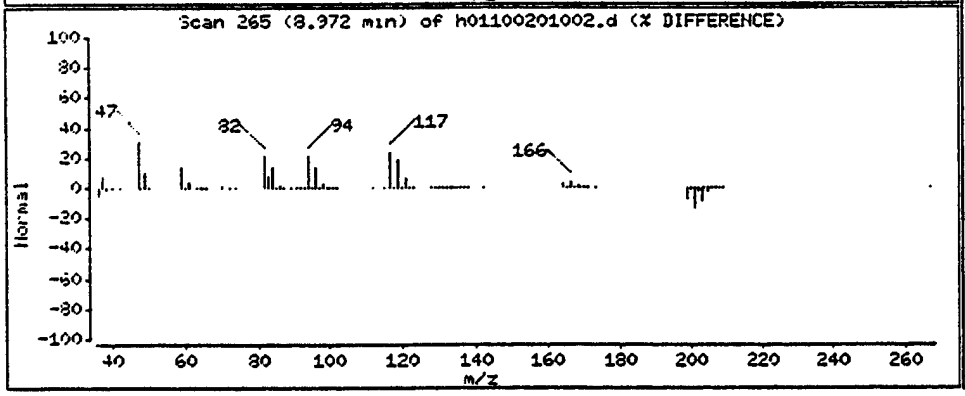
Concentration: 82.1 ug

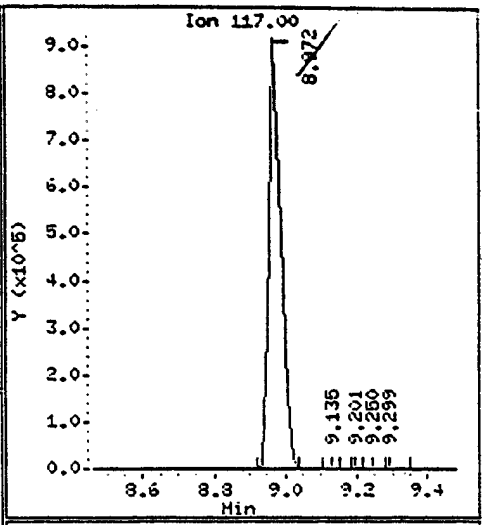
478

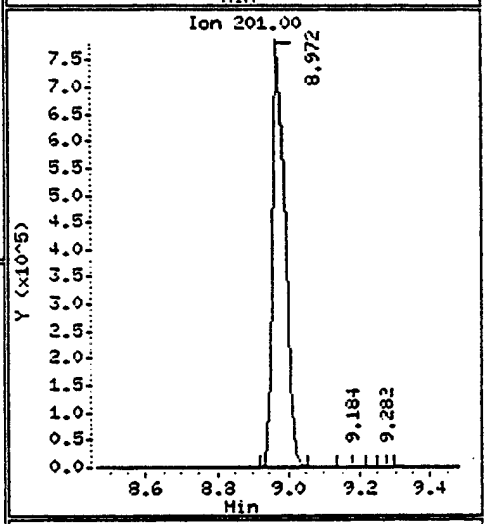


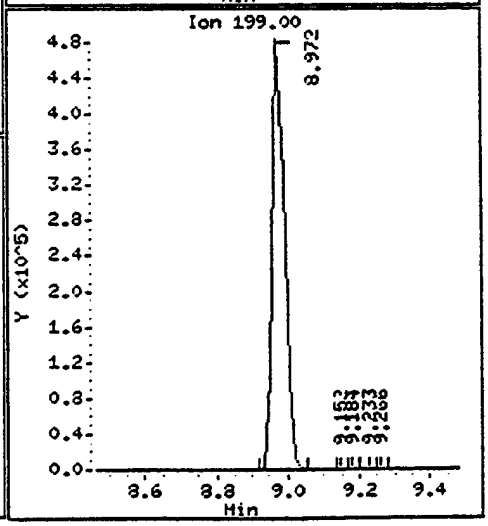












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

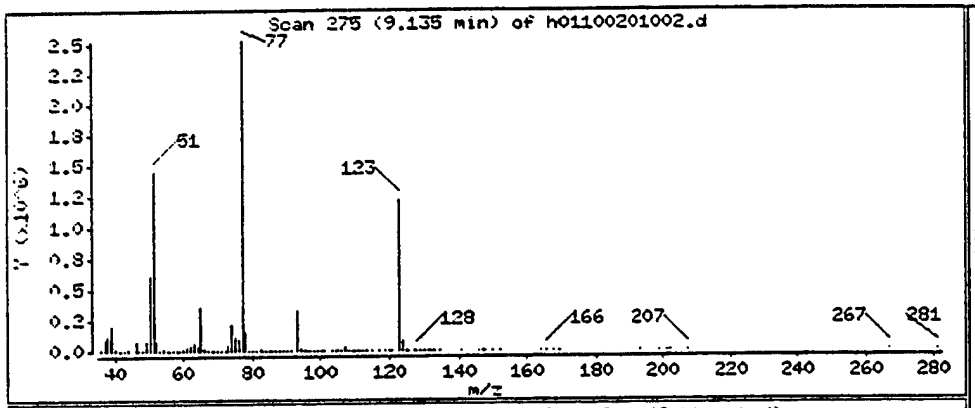
Operator: hch

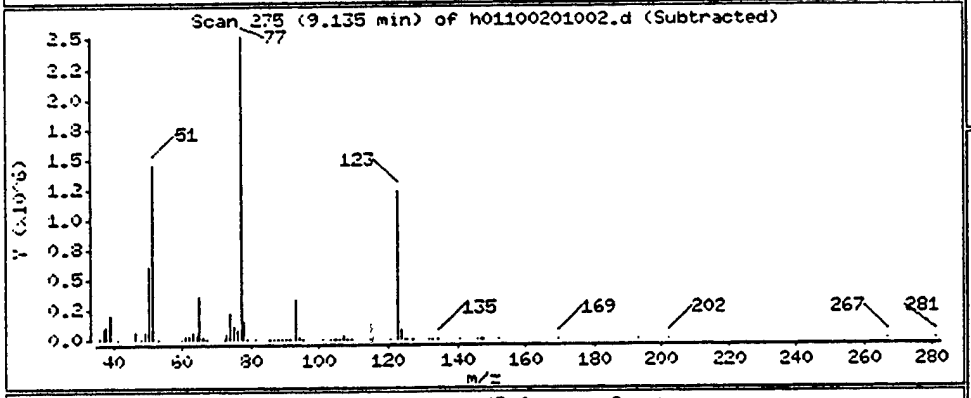
Column phase:

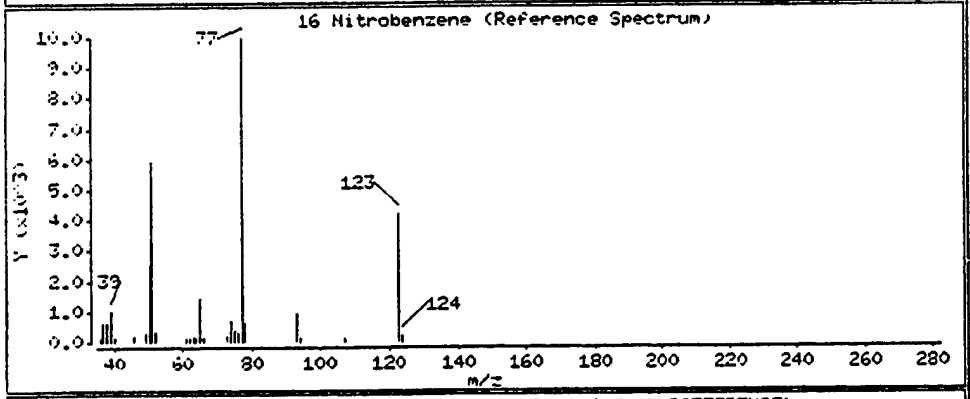
Column diameter: 2.00

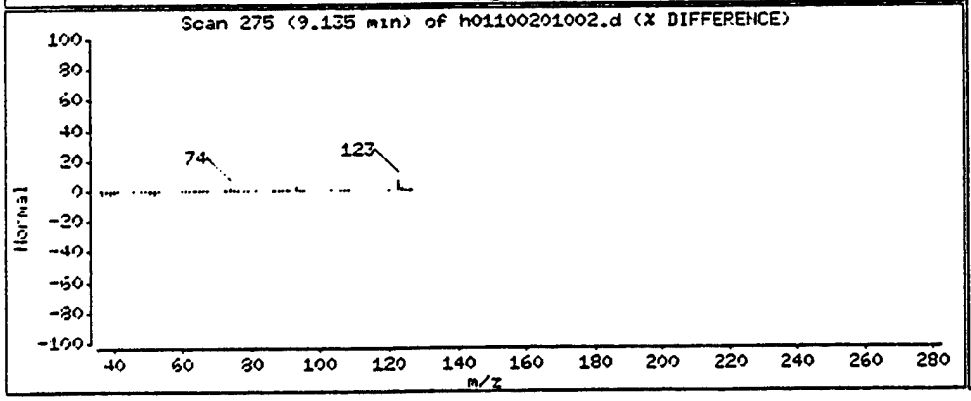
16 Nitrobenzene

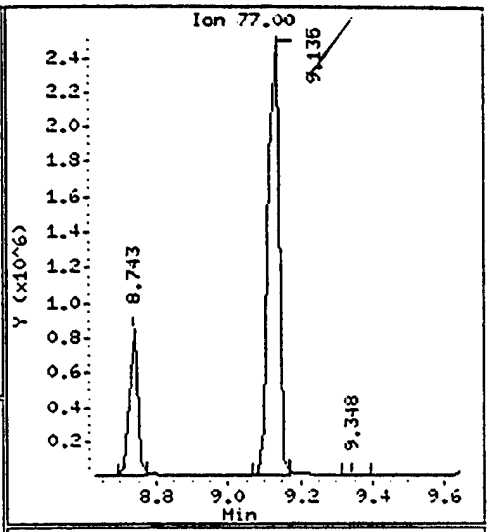
Concentration: 81.9 ug

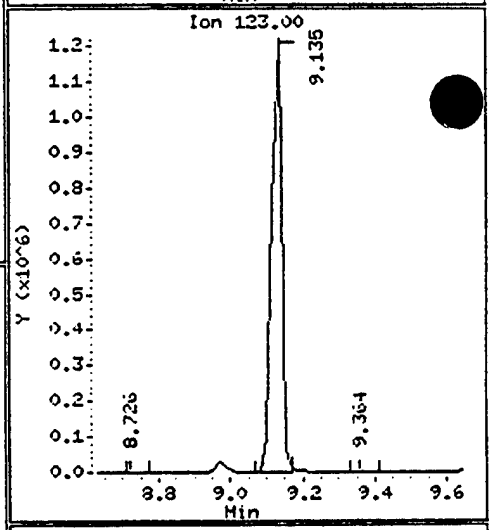


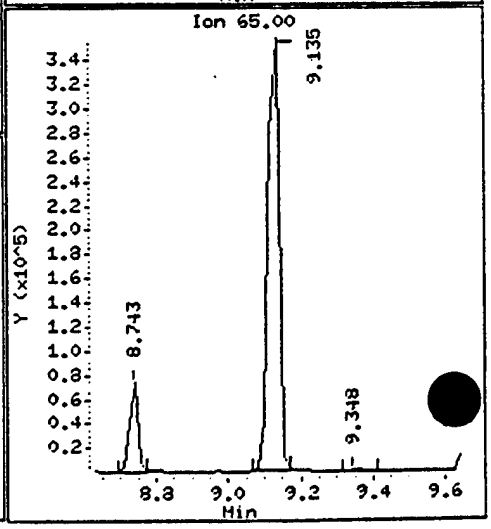












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

480

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

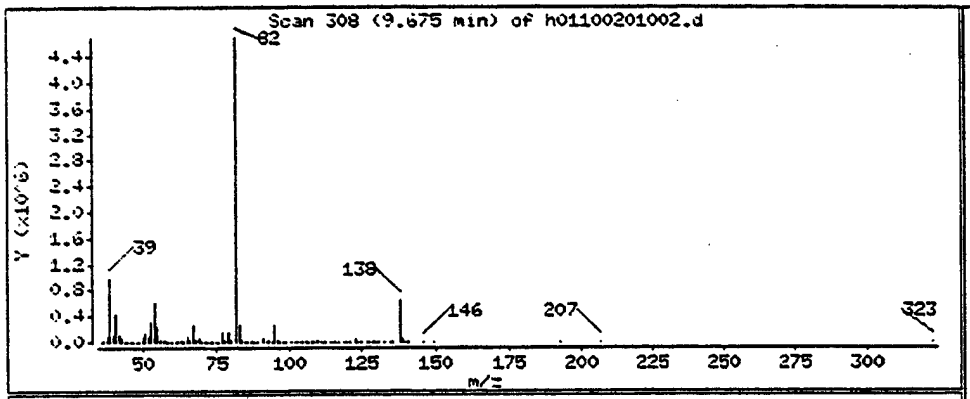
Operator: hch

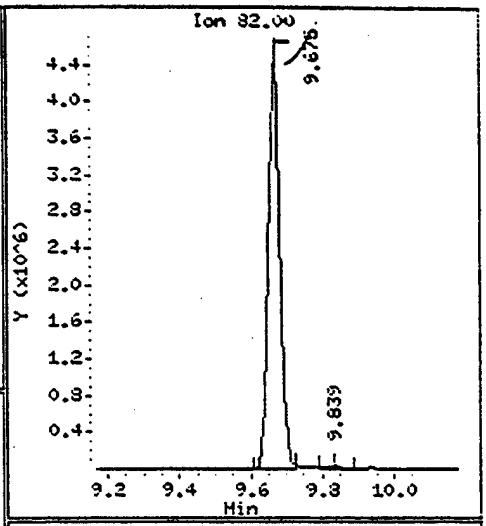
Column phase:

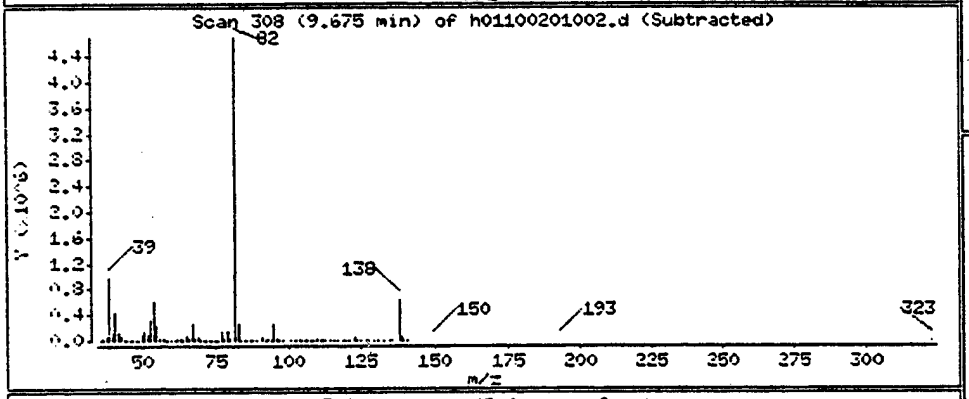
Column diameter: 2.00

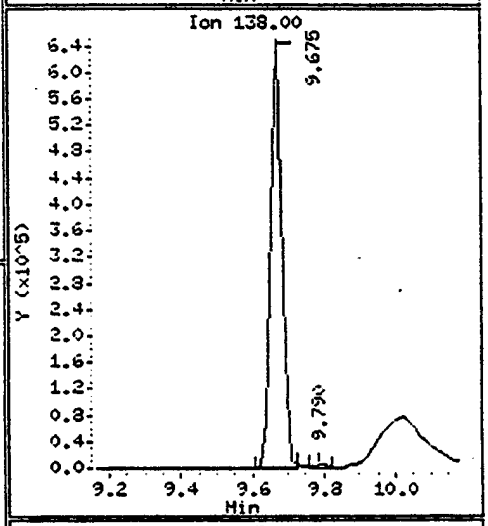
17 Isophorone

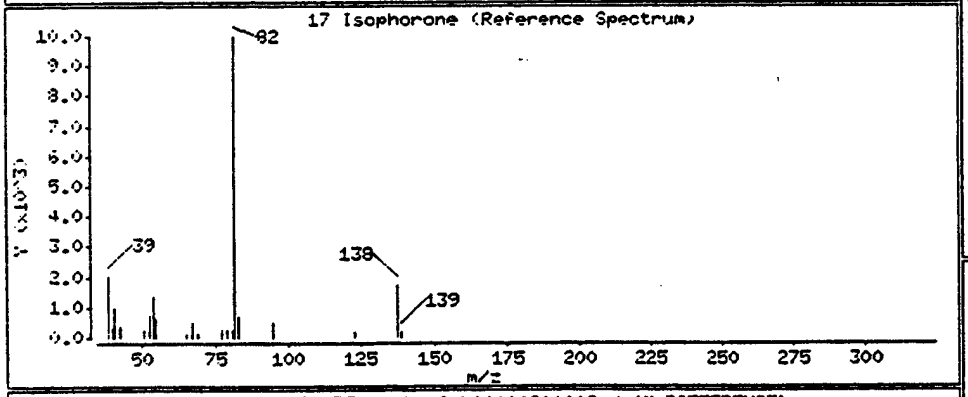
Concentration: 78.7 ug

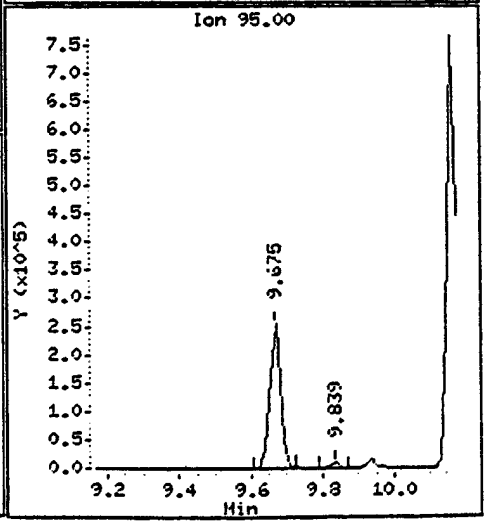


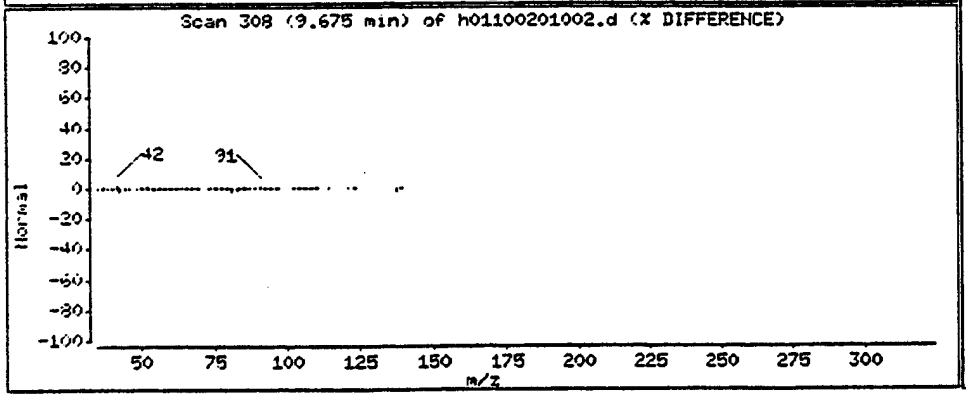












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

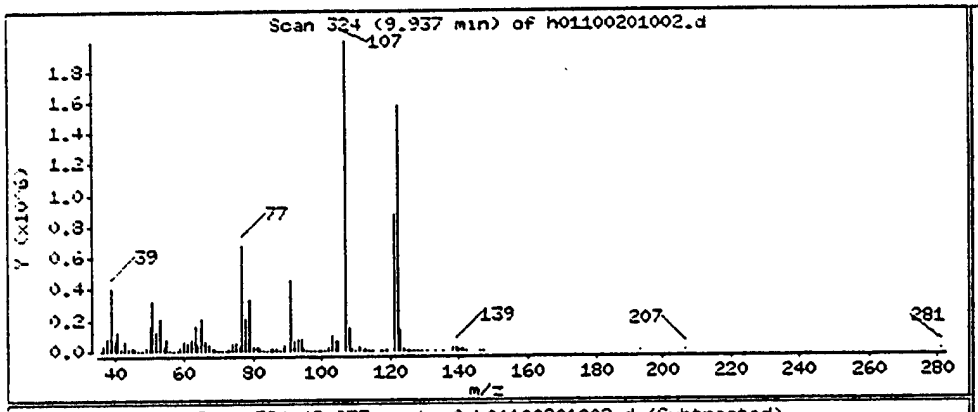
Operator: hch

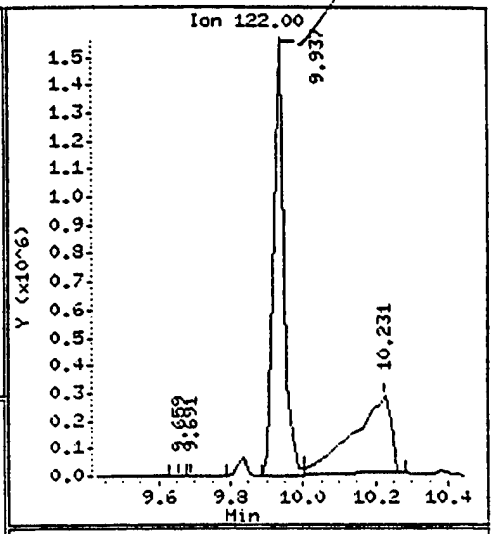
Column phase:

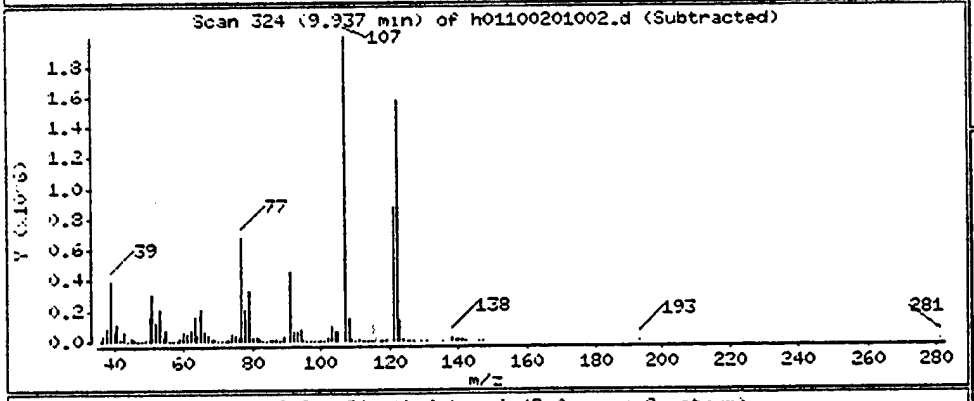
Column diameter: 2.00

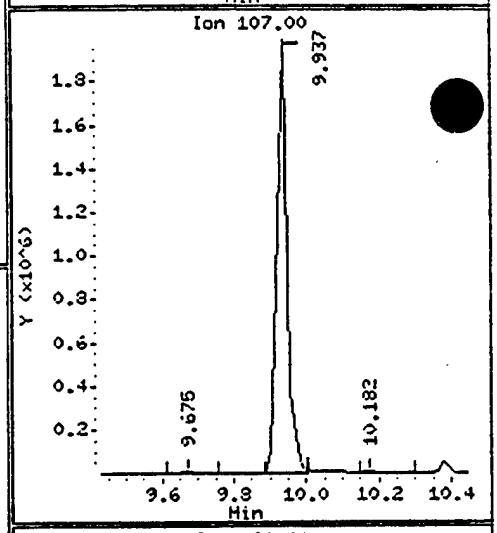
1S 2,4-Dimethylphenol

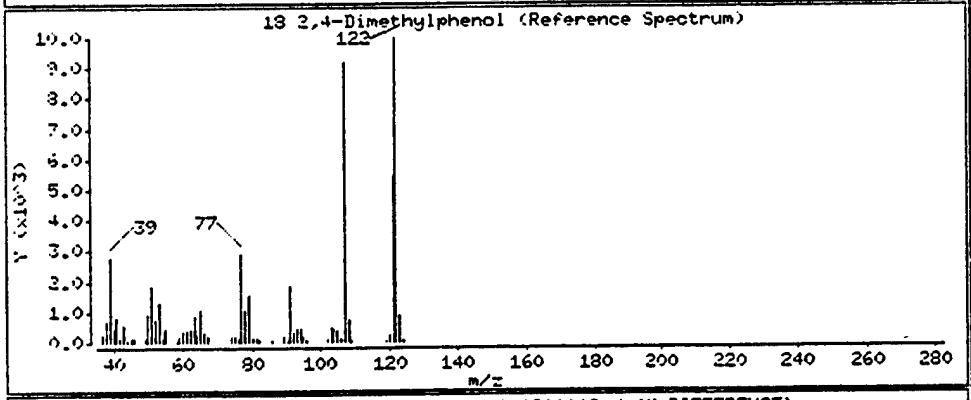
Concentration: 77.4 ug

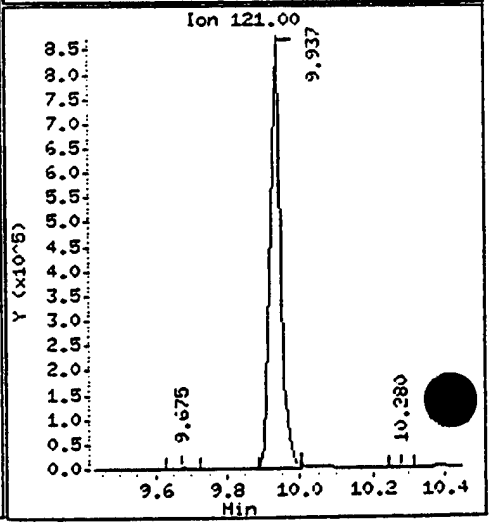


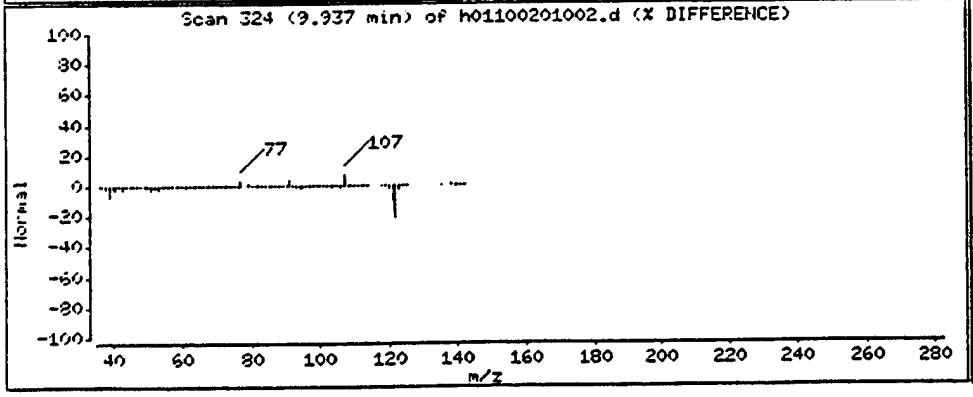












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

482

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

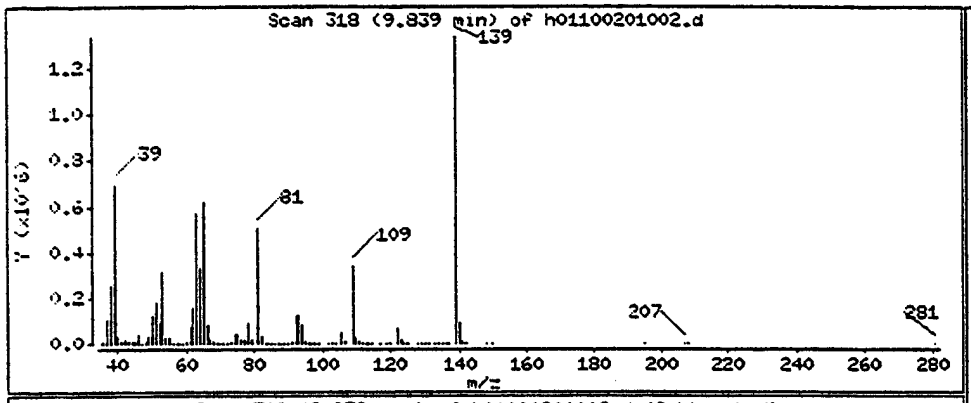
Operator: hch

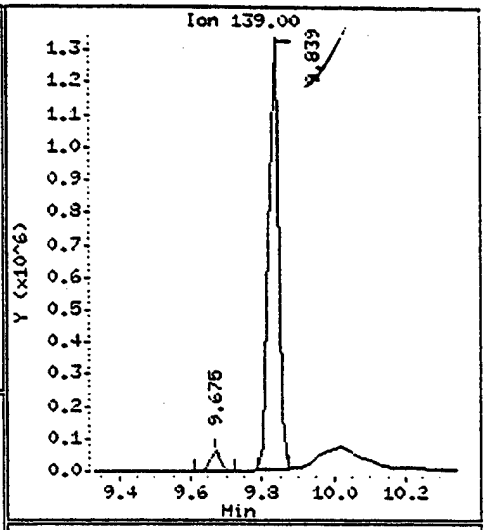
Column phase:

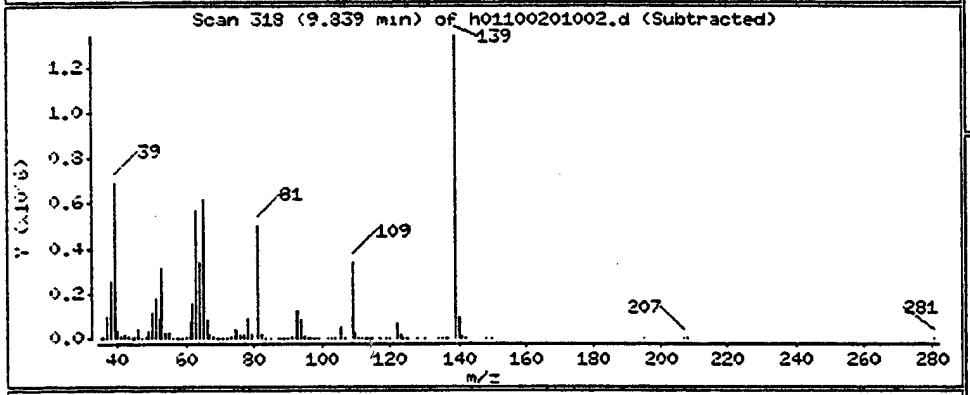
Column diameter: 2.00

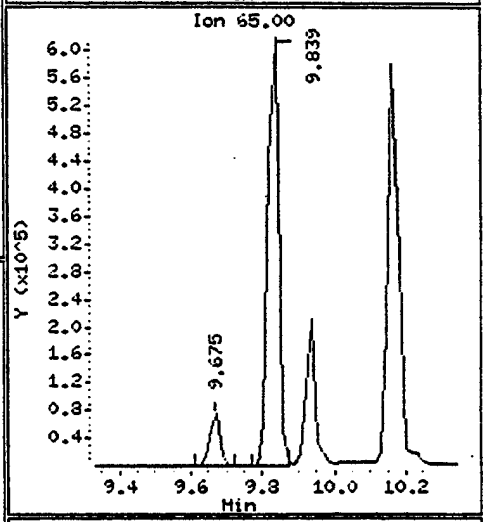
19 2-Nitrophenol

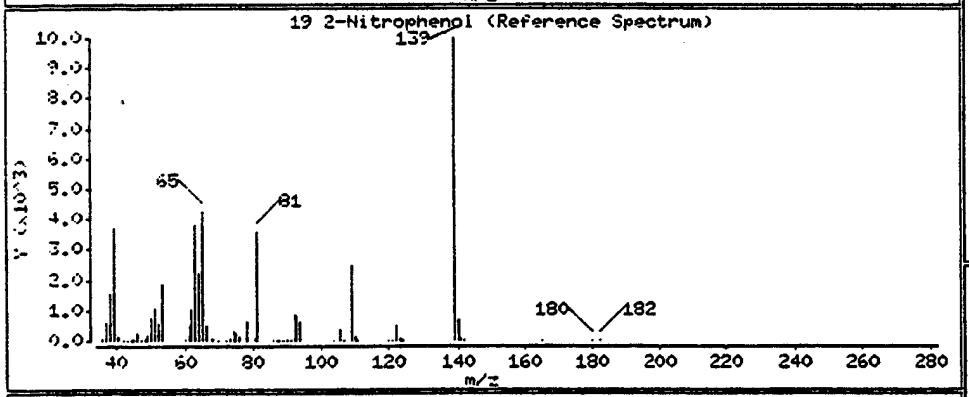
Concentration: 73.5 ug

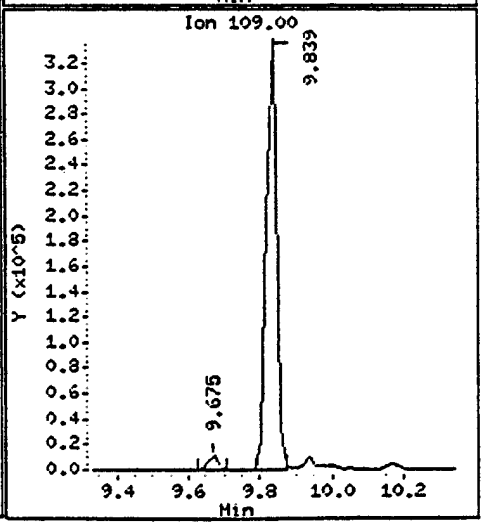


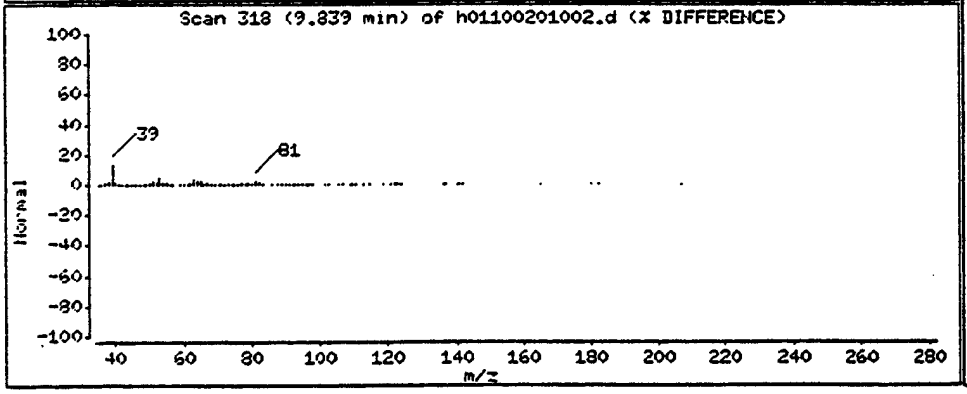












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

Operator: hch

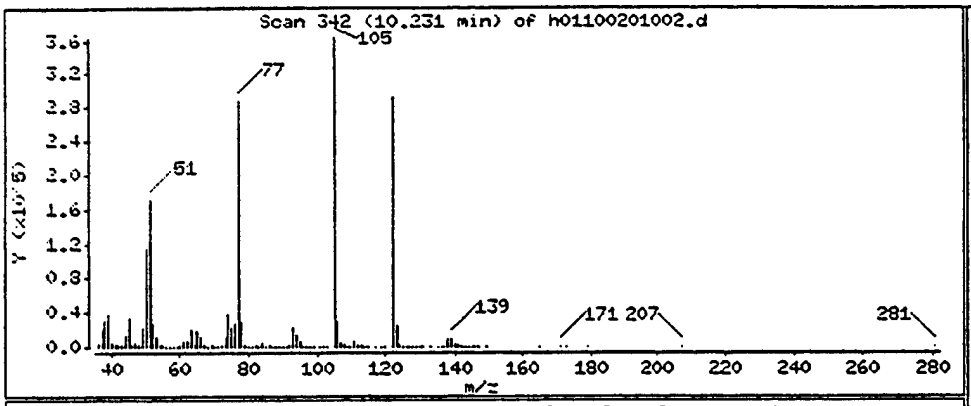
Column phase:

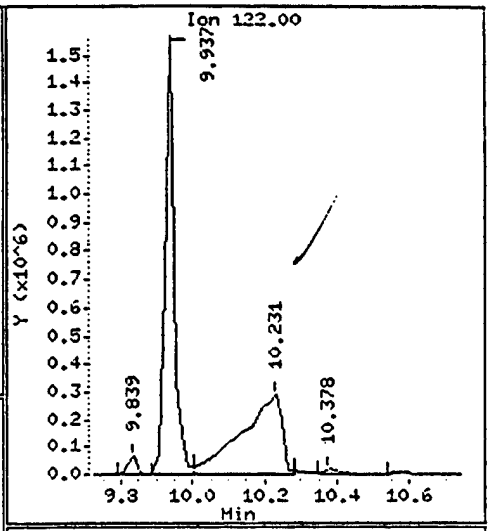
Column diameter: 2.00

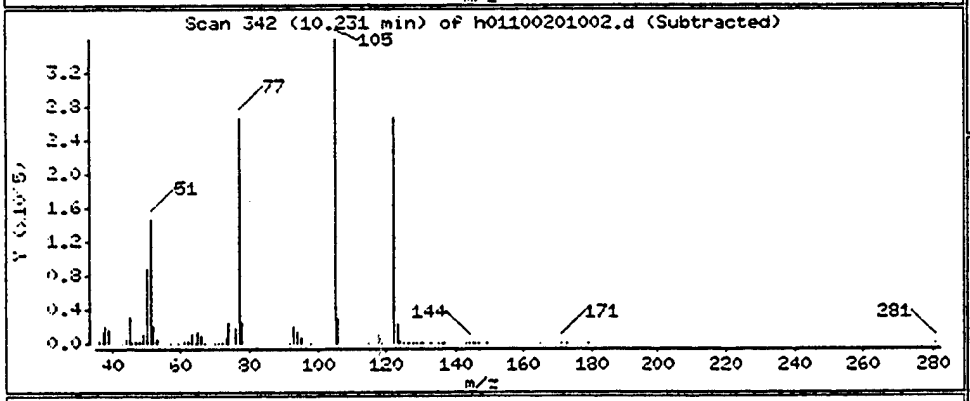
20 Benzoic Acid

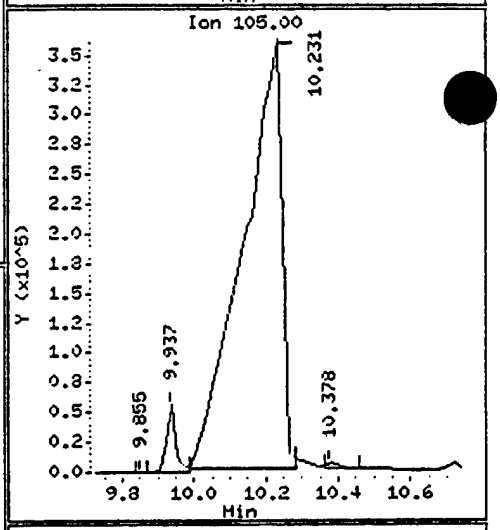
Concentration: 83.7 ug

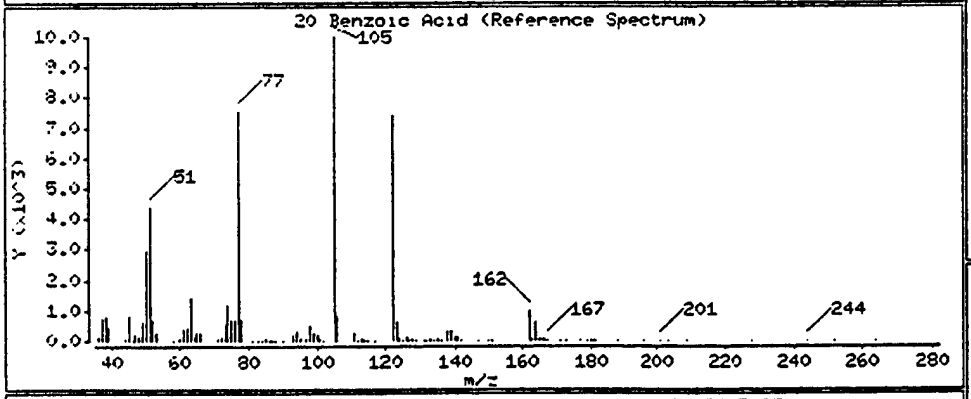
483

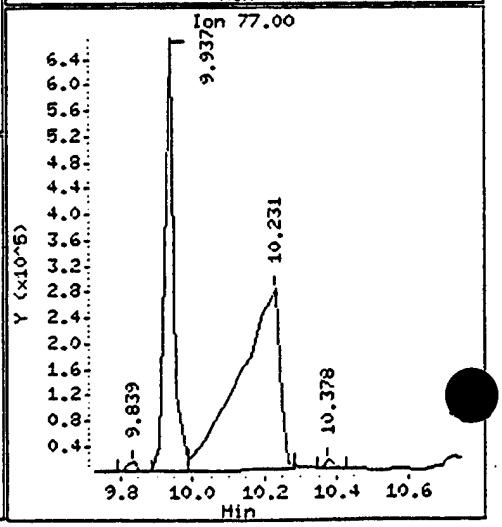


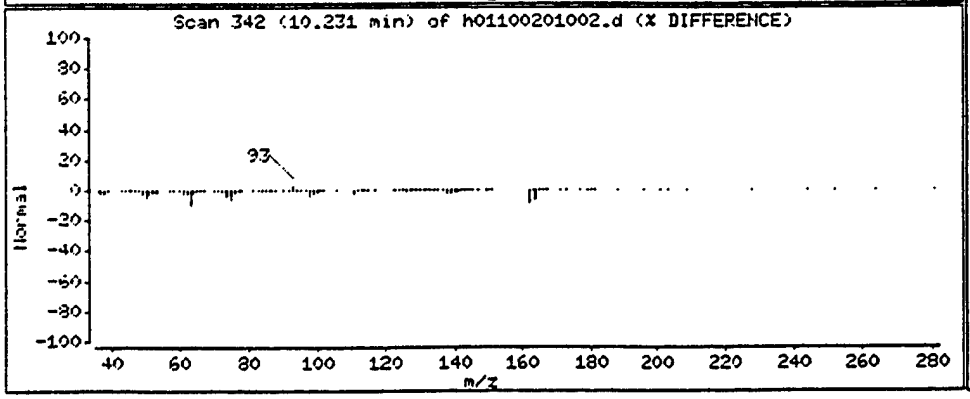












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

Operator: hch

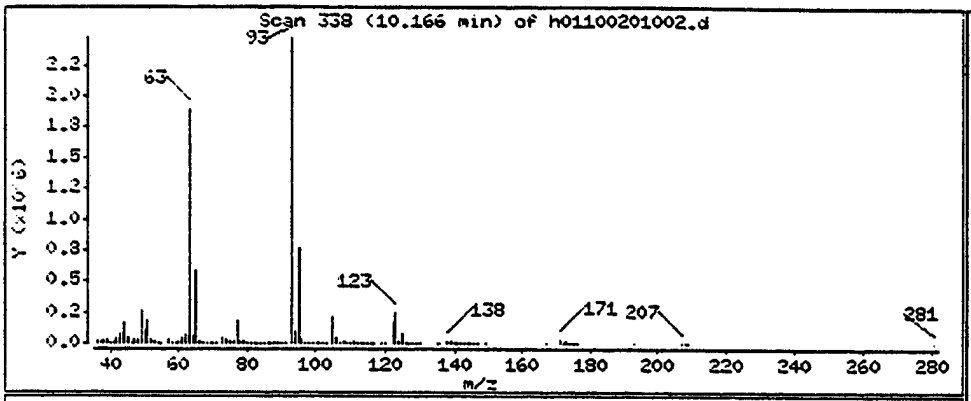
Column phase:

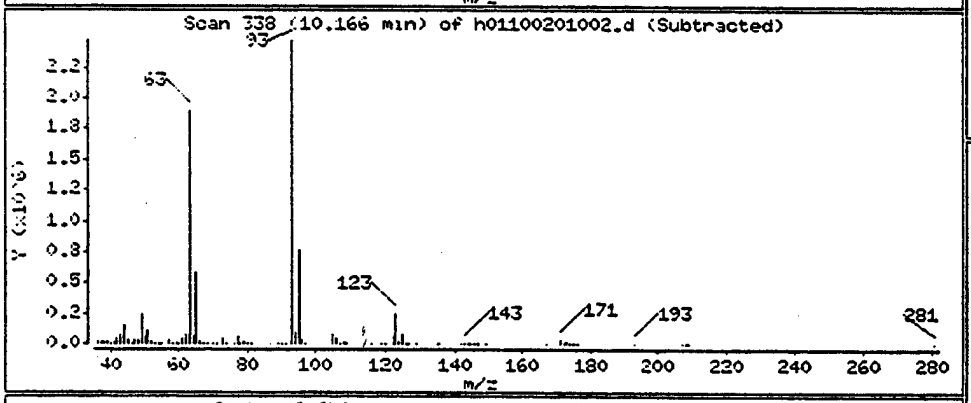
Column diameter: 2.00

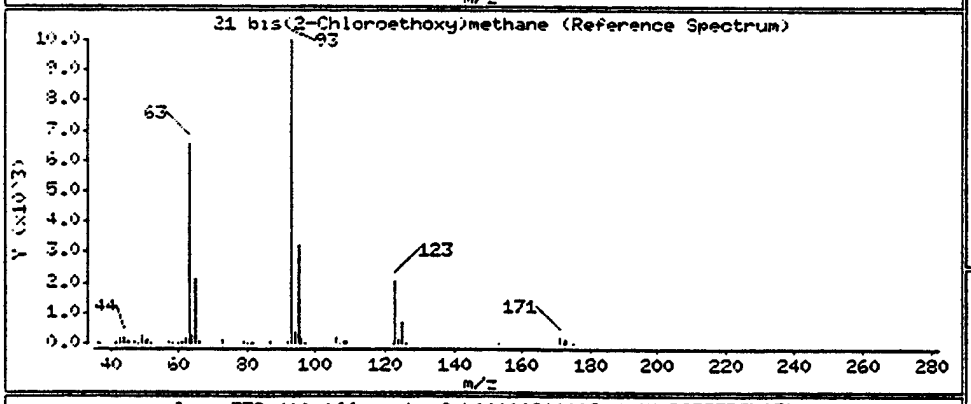
21 bis(2-Chloroethoxy)methane

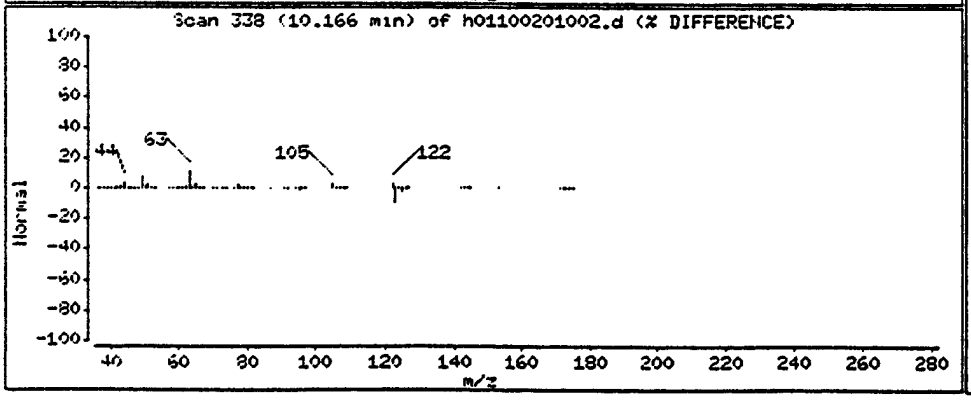
Concentration: 74.2 ug

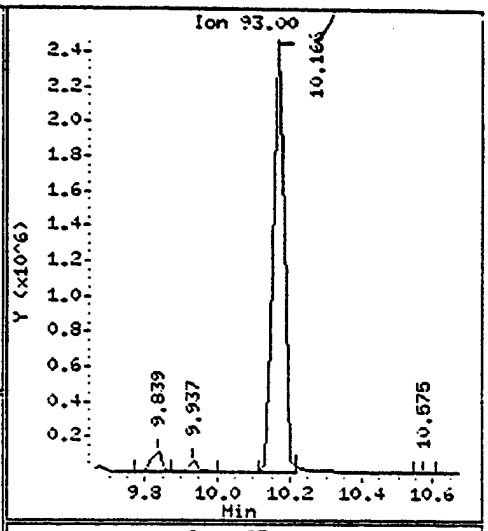
484

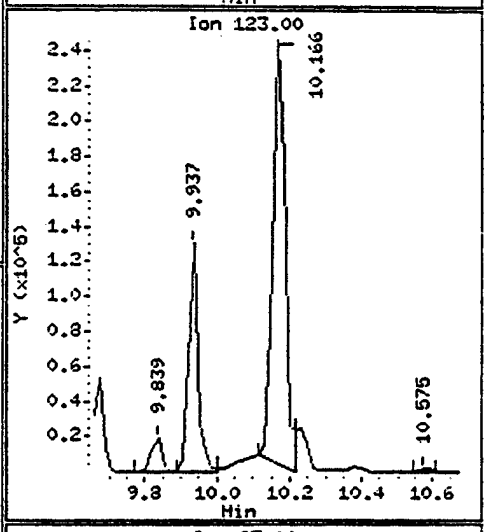


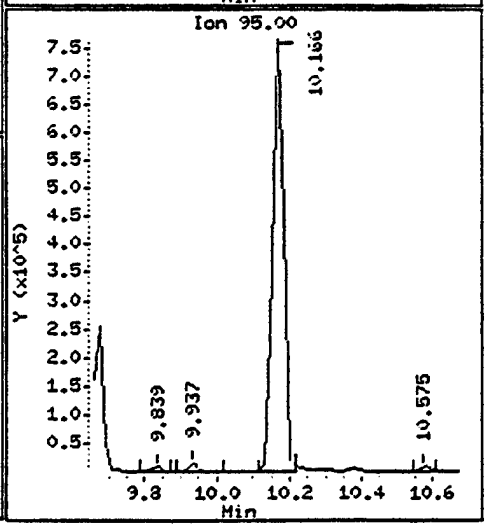












485

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

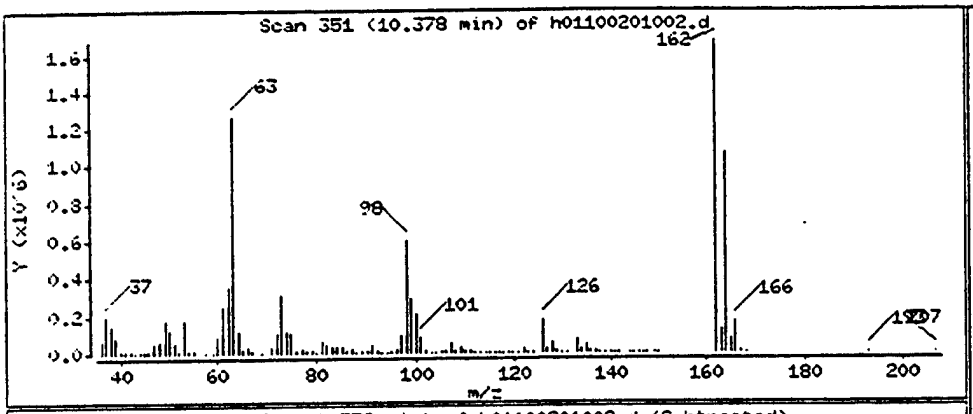
Operator: hch

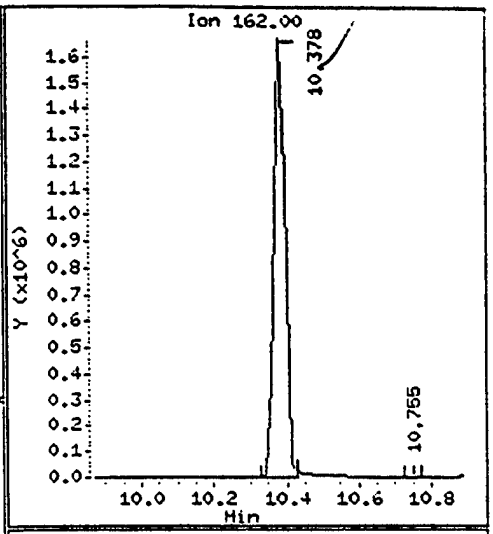
Column phase:

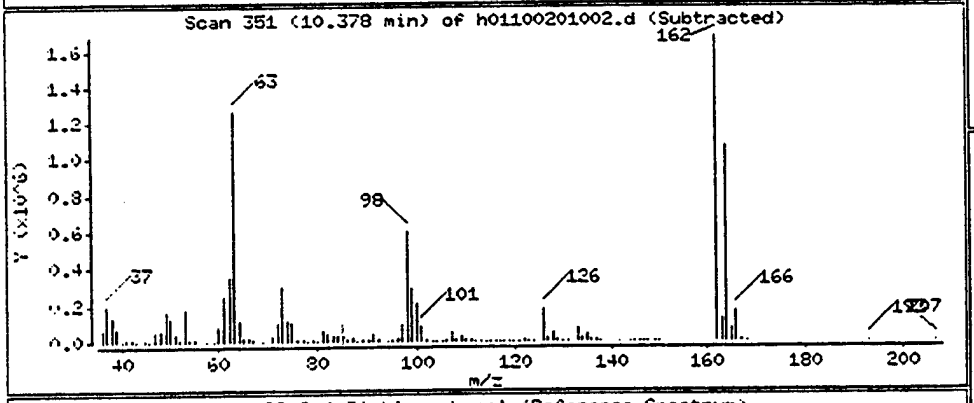
Column diameter: 2.00

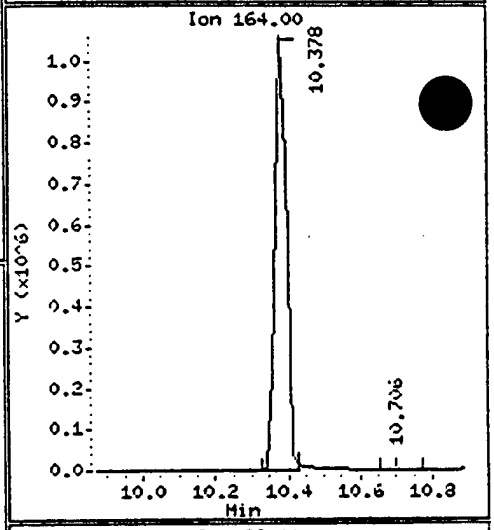
22 2,4-Dichlorophenol

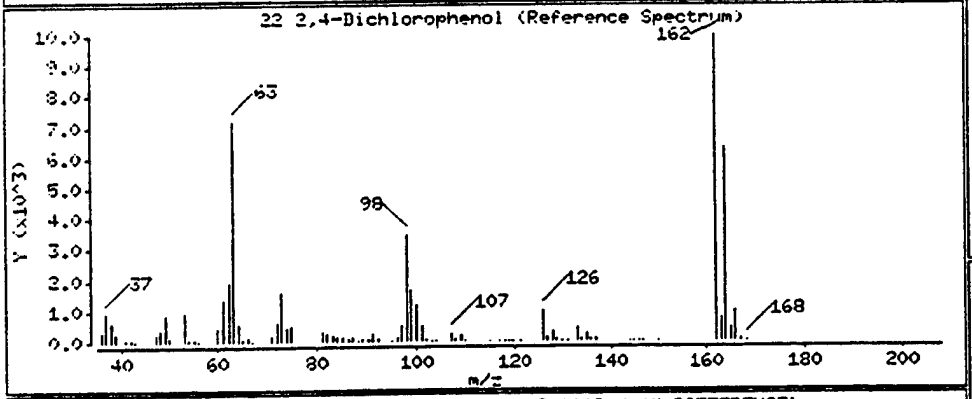
Concentration: 79.2 ug

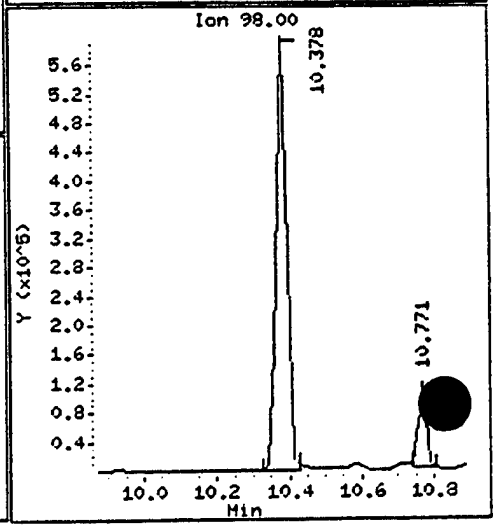


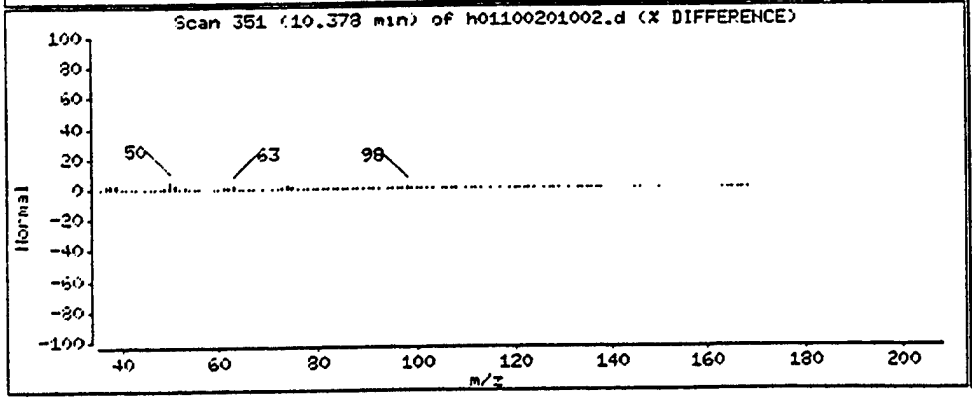












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

Operator: hch

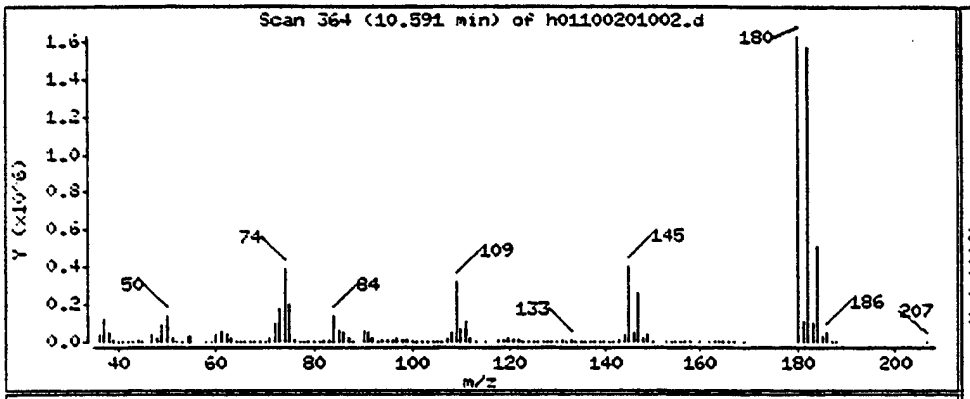
Column phase:

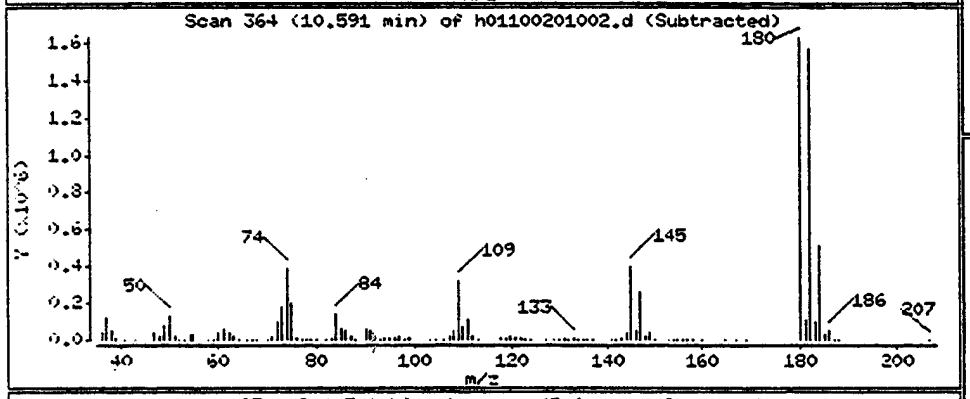
Column diameter: 2.00

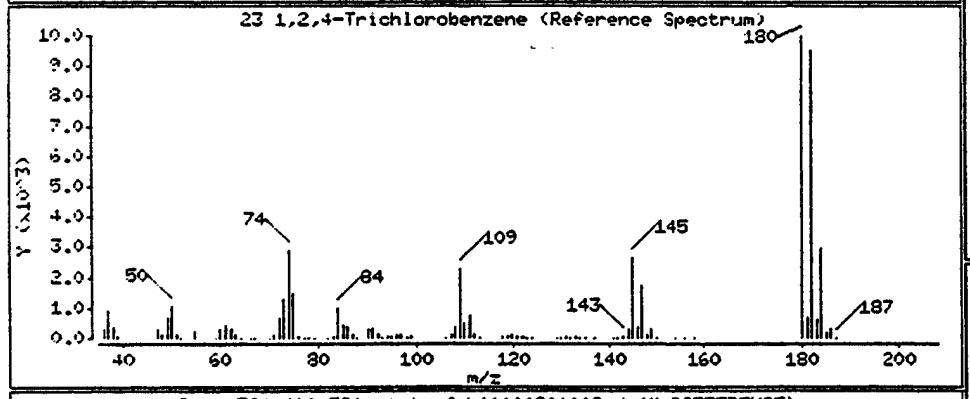
23 1,2,4-Trichlorobenzene

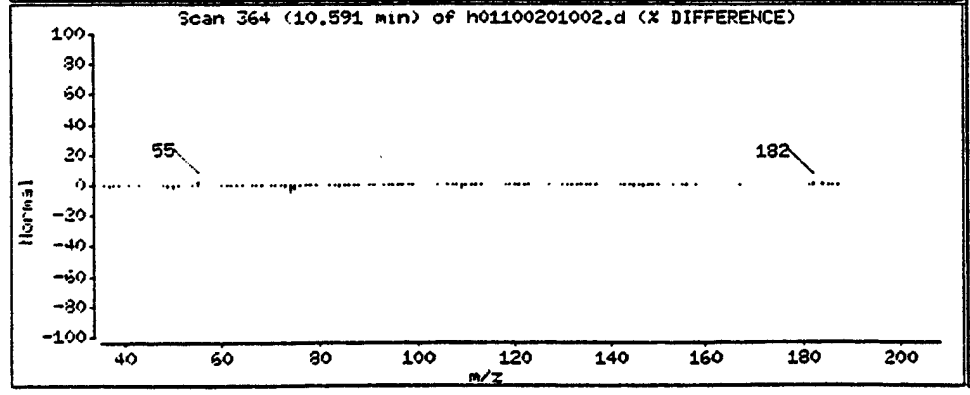
Concentration: 76.6 ug

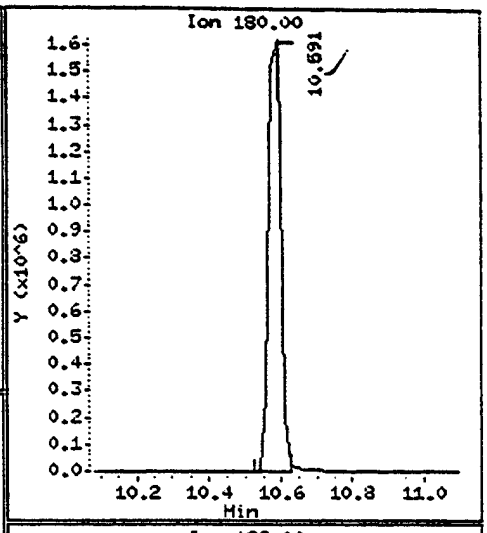
486

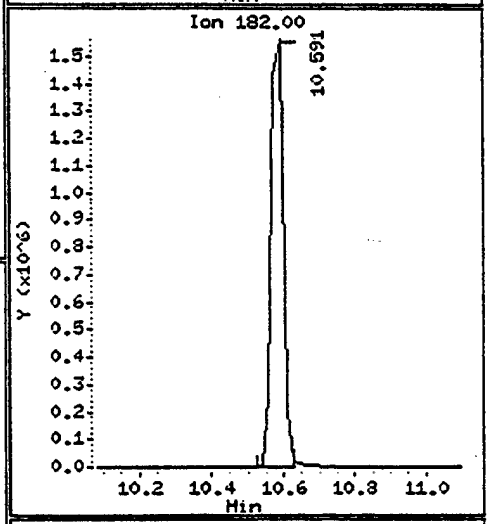


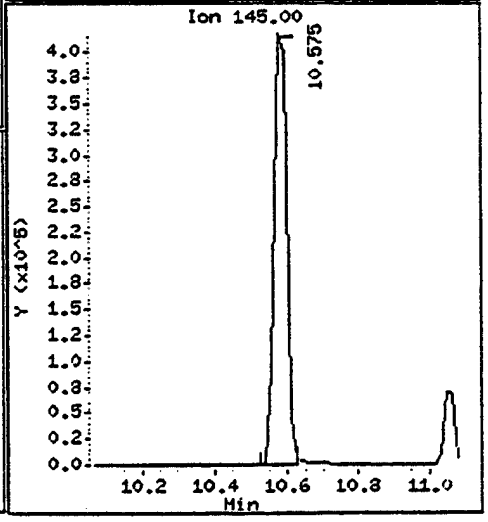












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

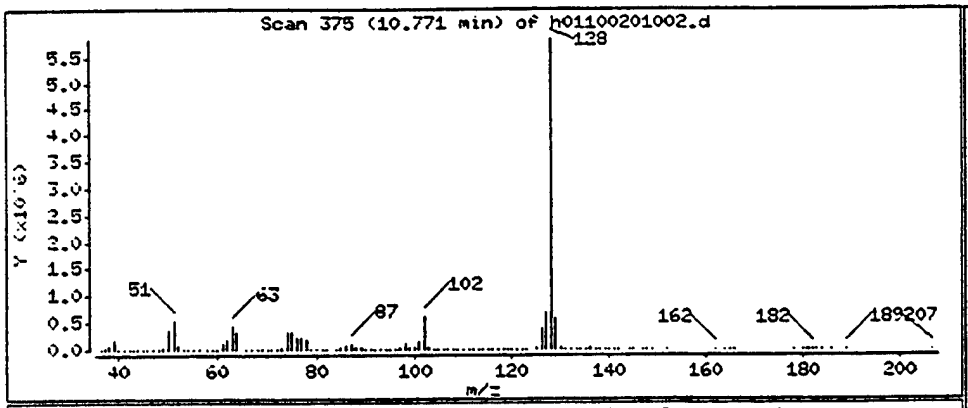
Operator: hch

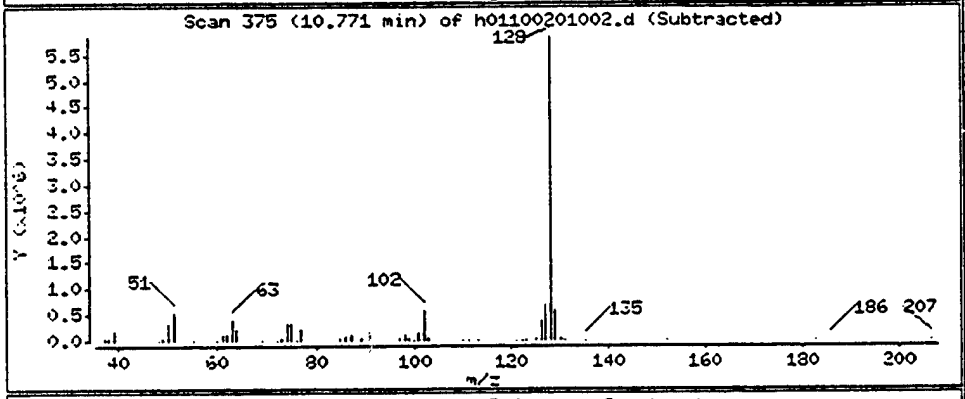
Column phase:

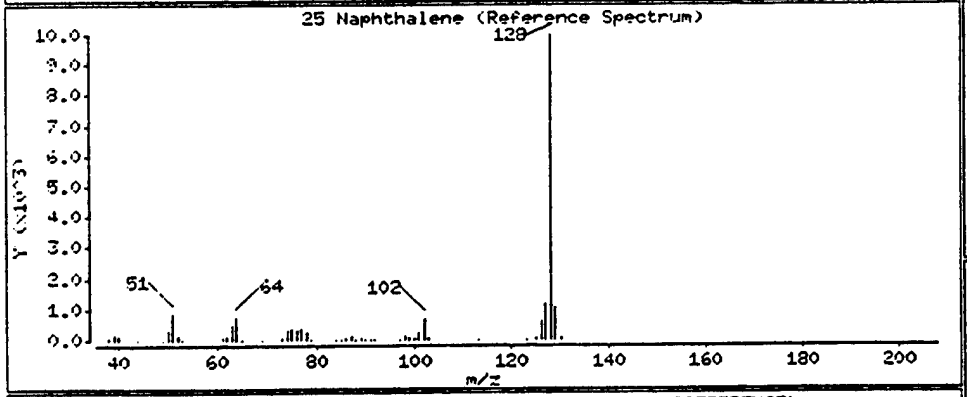
Column diameter: 2.00

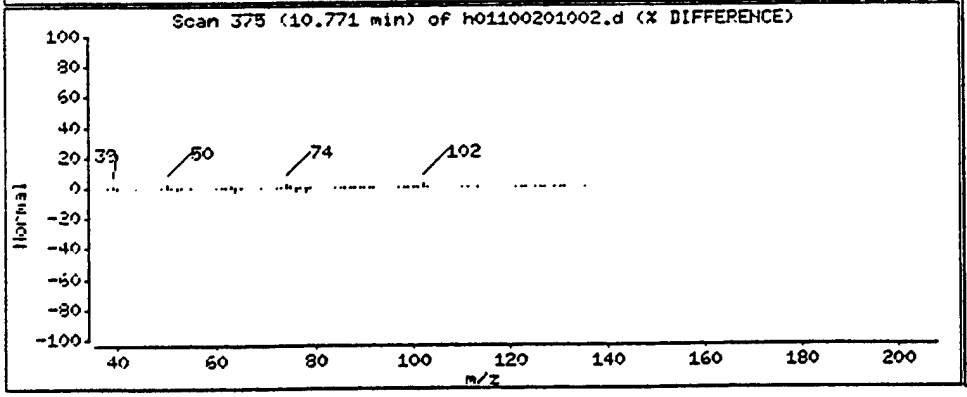
25 Naphthalene

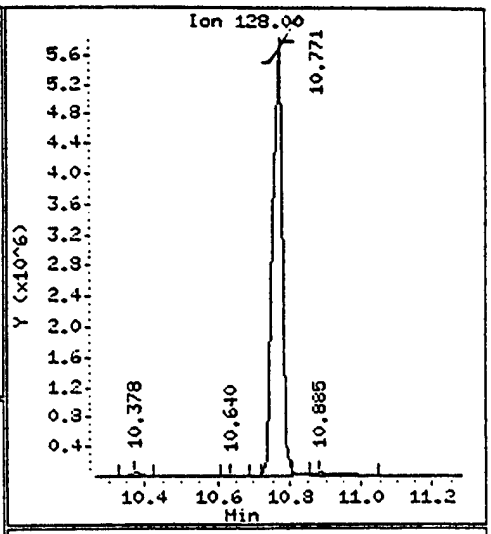
Concentration: 79.5 ug

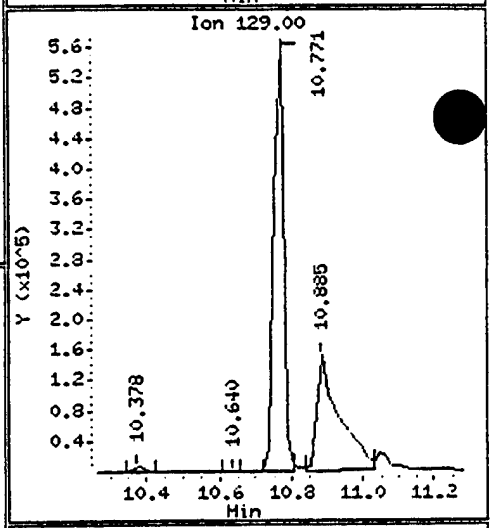


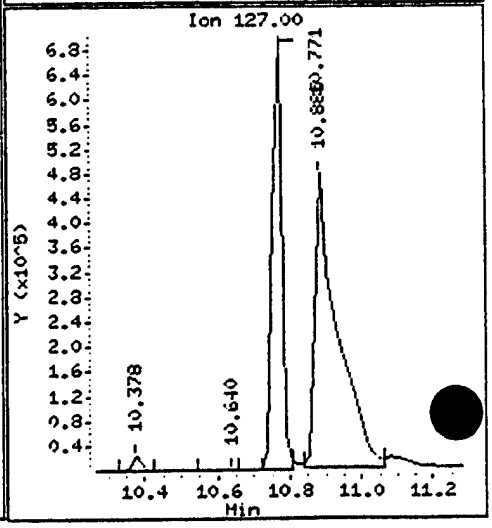












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

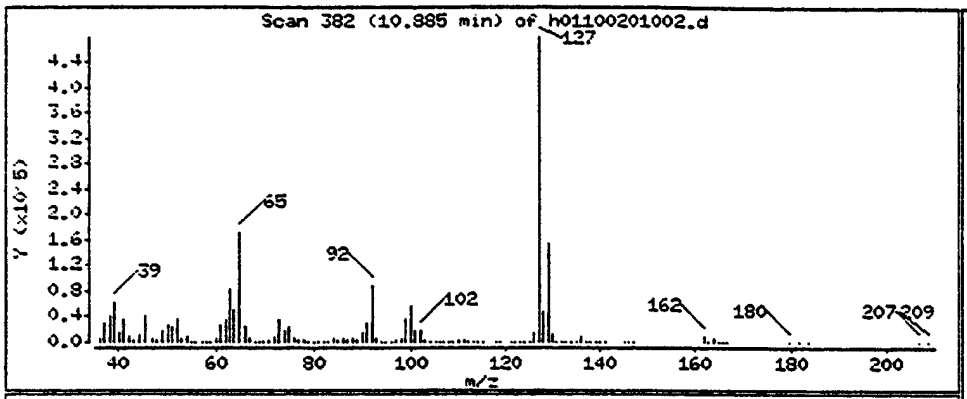
Operator: hch

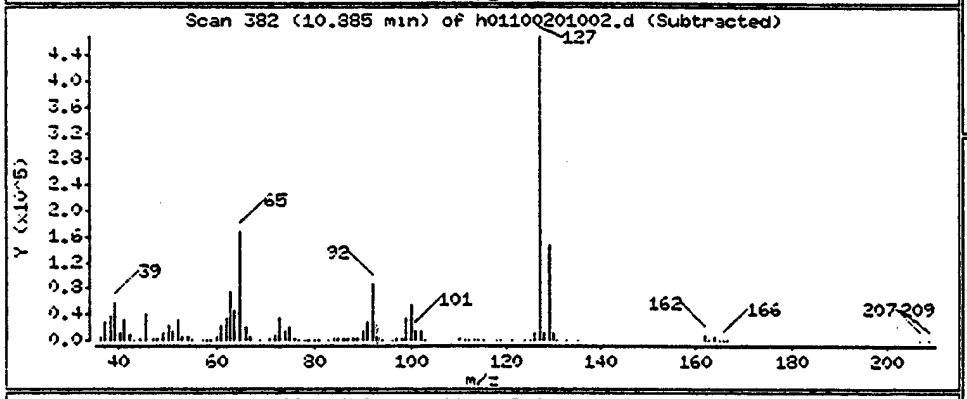
Column phase:

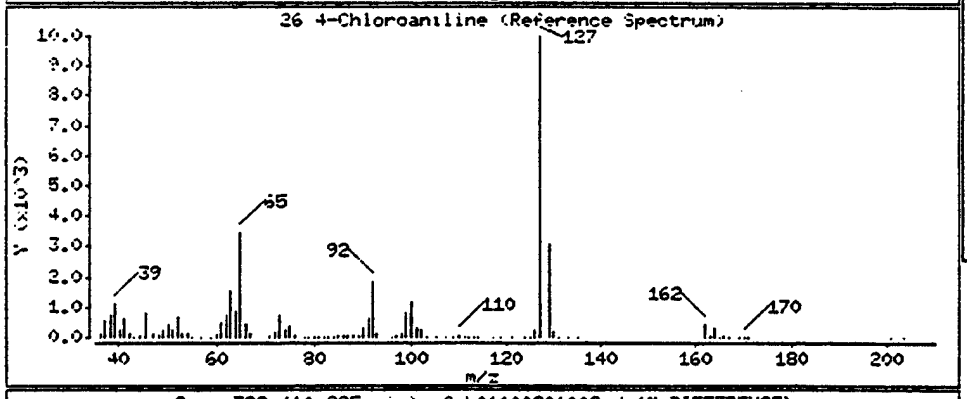
Column diameter: 2.00

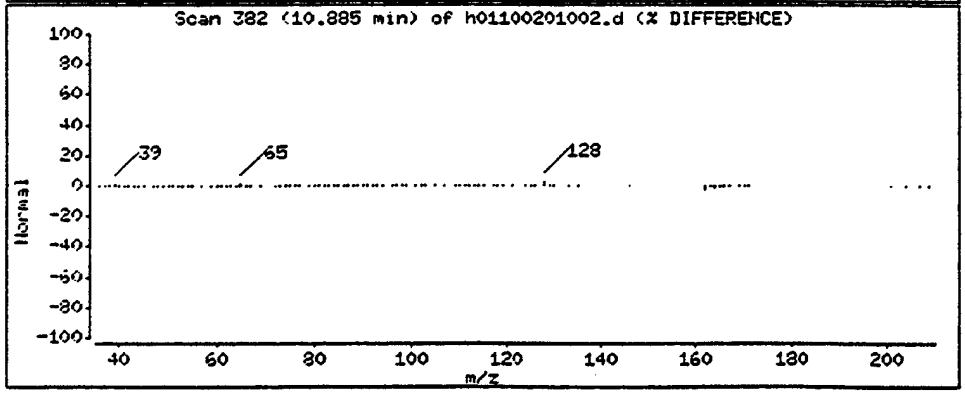
26 4-Chloroaniline

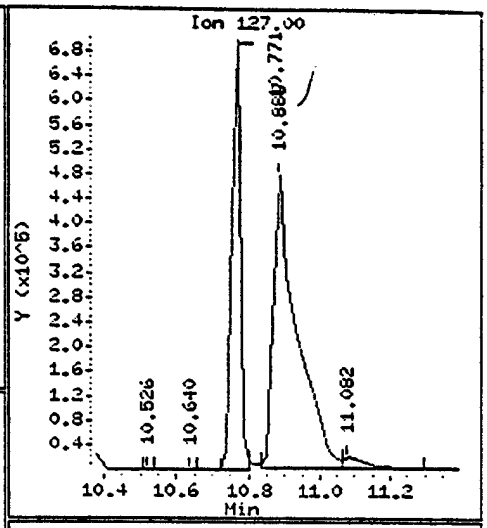
Concentration: 69.3 ug

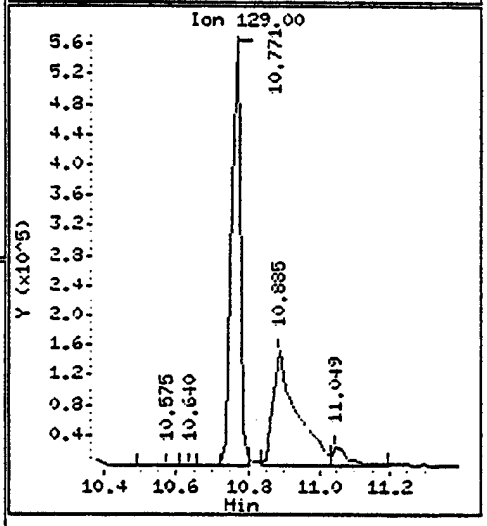












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

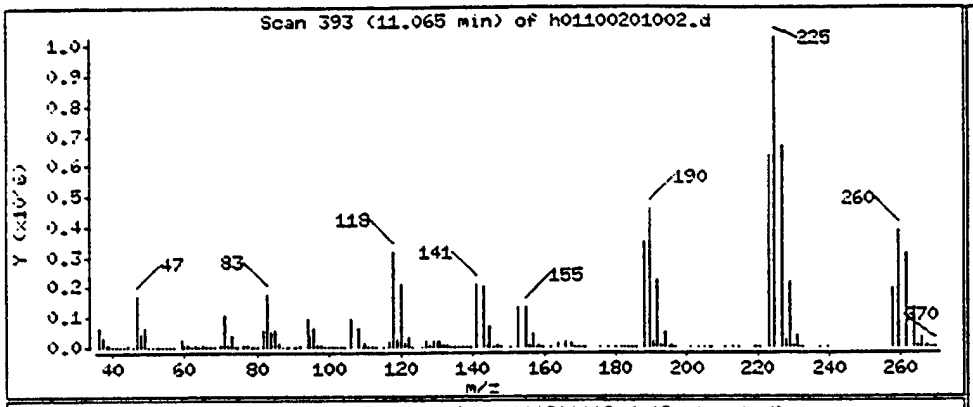
Operator: hch

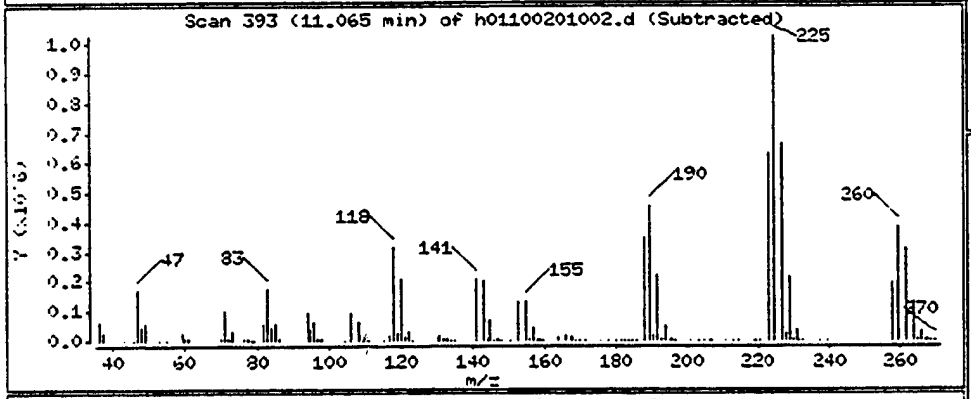
Column phase:

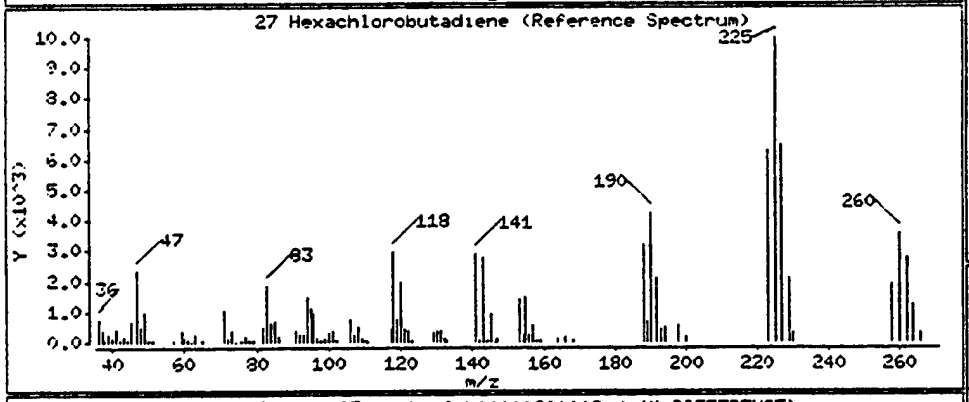
Column diameter: 2.00

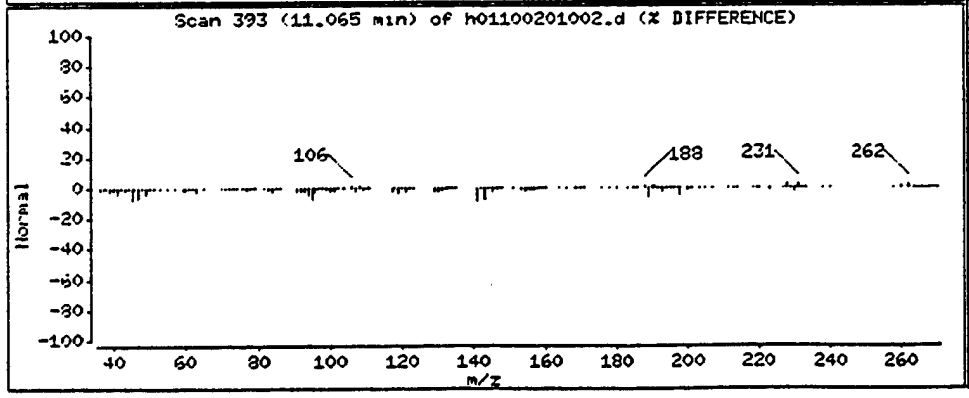
27 Hexachlorobutadiene

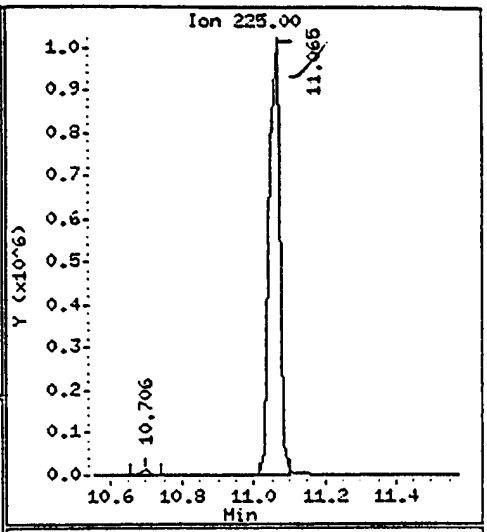
Concentration: 82.1 ug

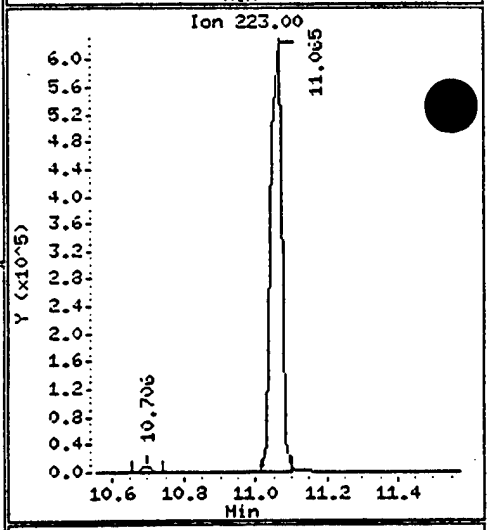


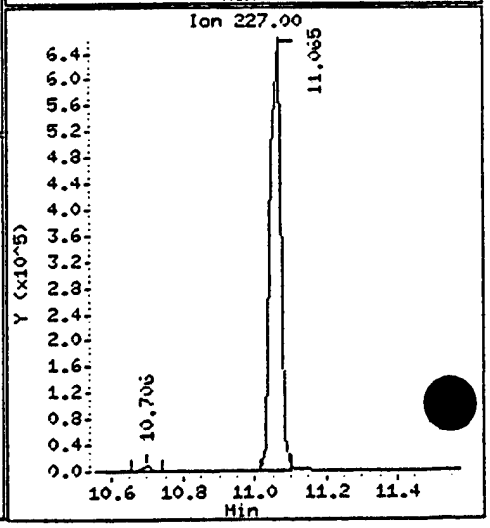












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

490

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

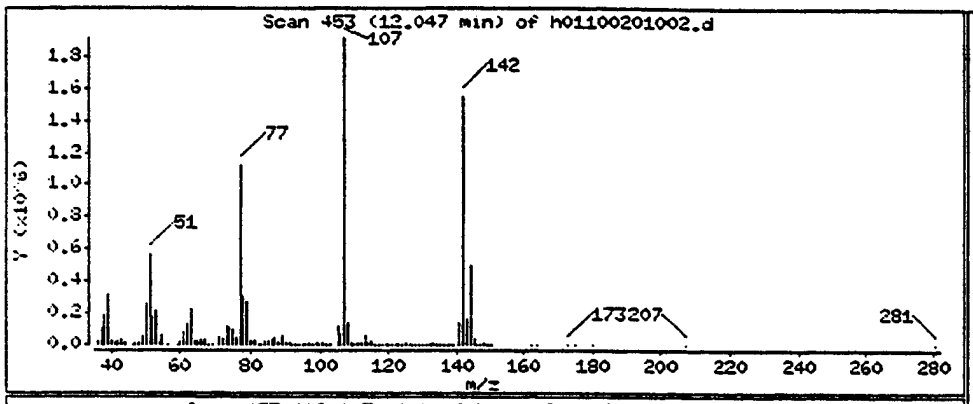
Operator: hch

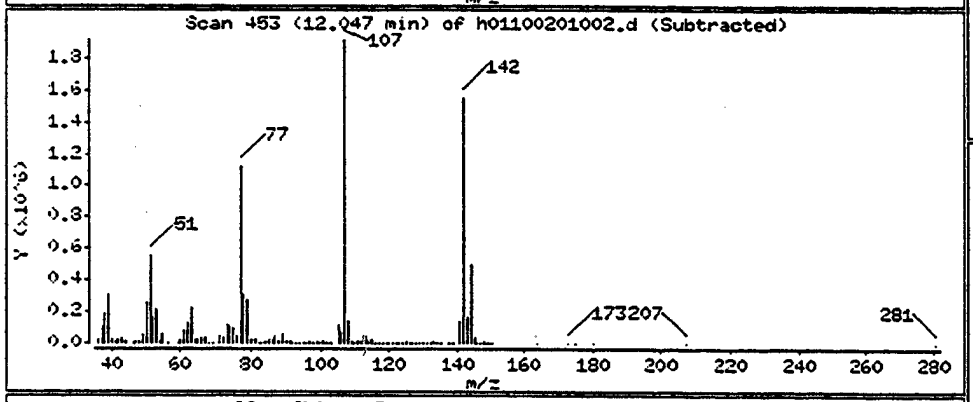
Column phase:

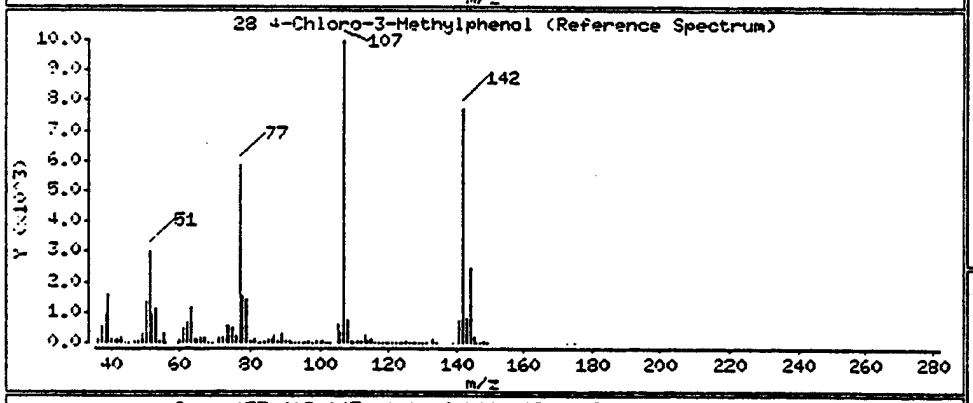
Column diameter: 2.00

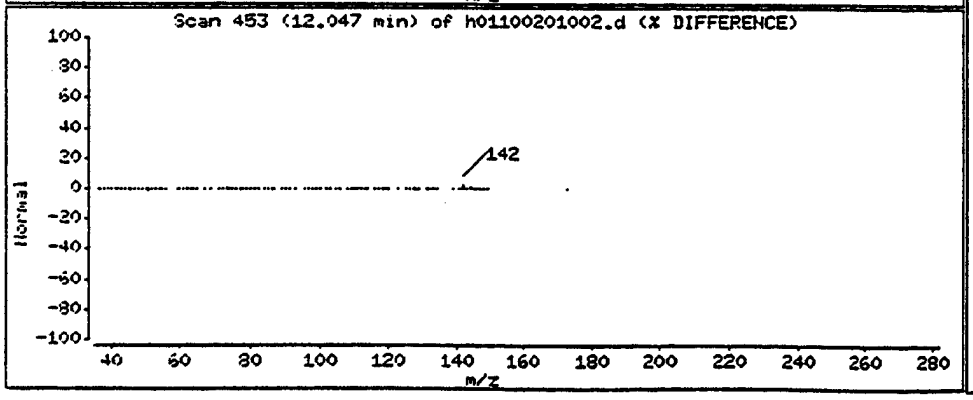
28 4-Chloro-3-Methylphenol

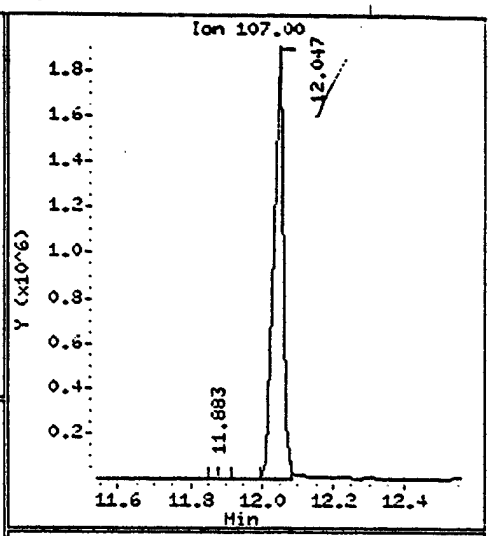
Concentration: 76.7 ug

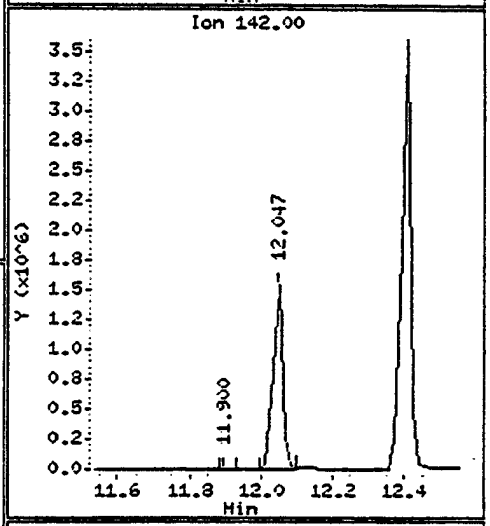


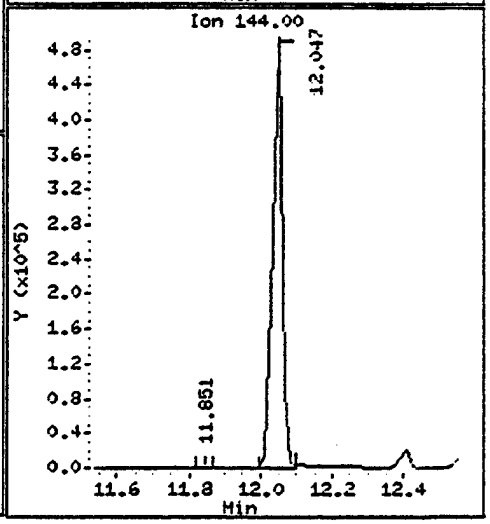












491

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

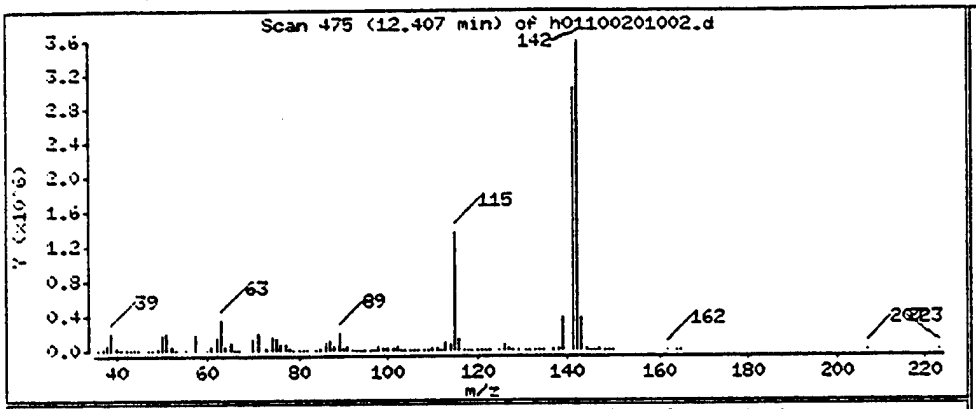
Operator: hch

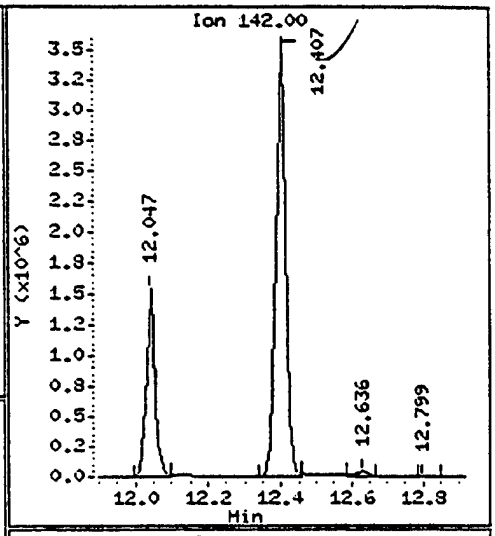
Column phase:

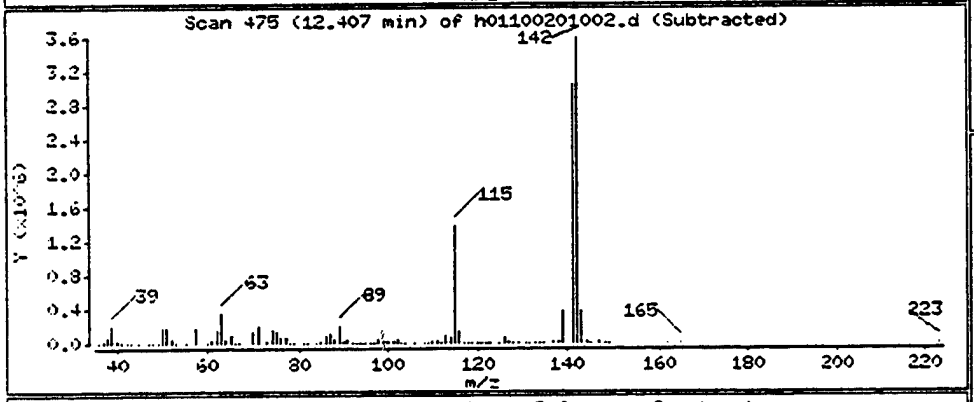
Column diameter: 2.00

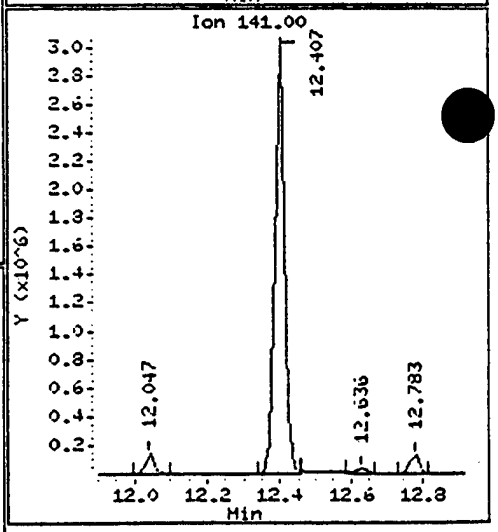
29 2-Methylnaphthalene

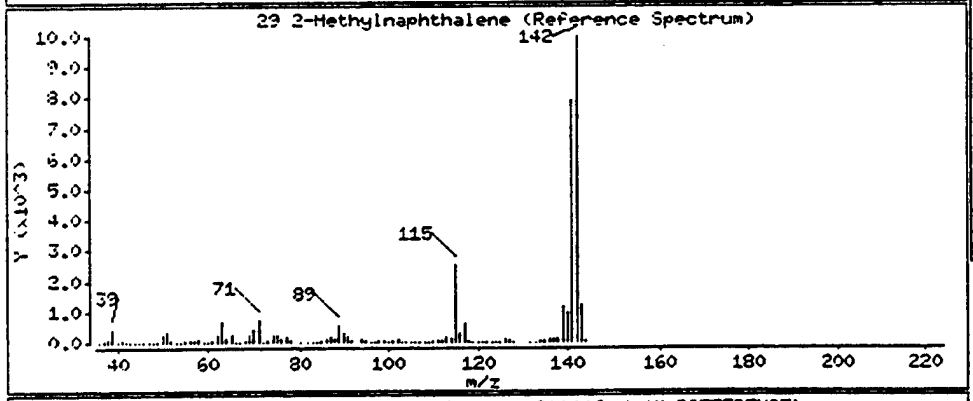
Concentration: 74.6 ug

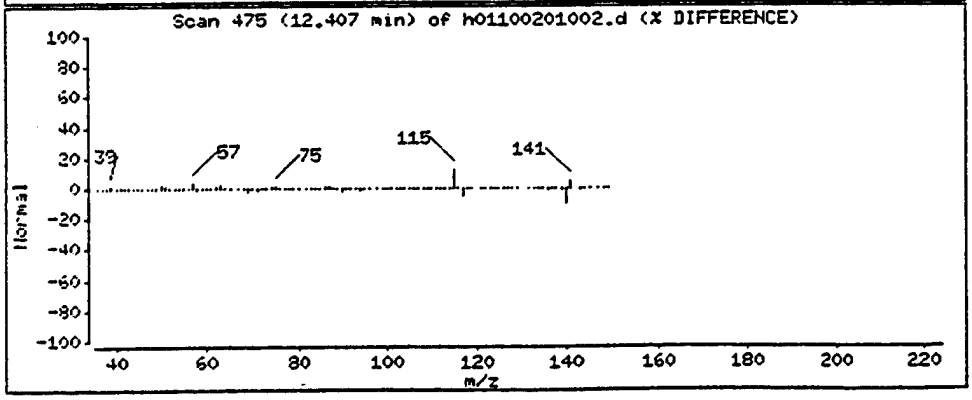












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Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

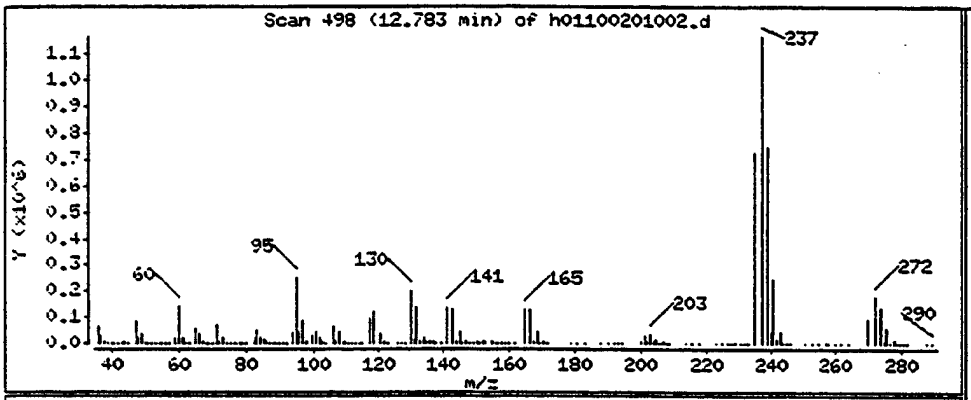
Operator: hch

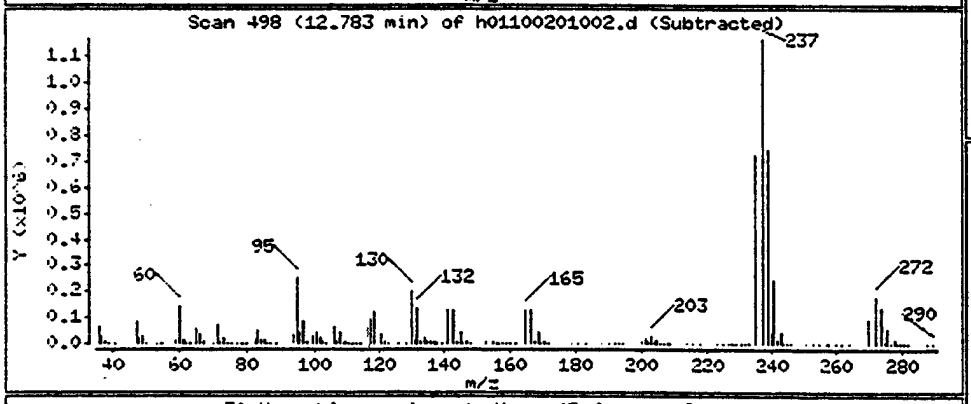
Column phase:

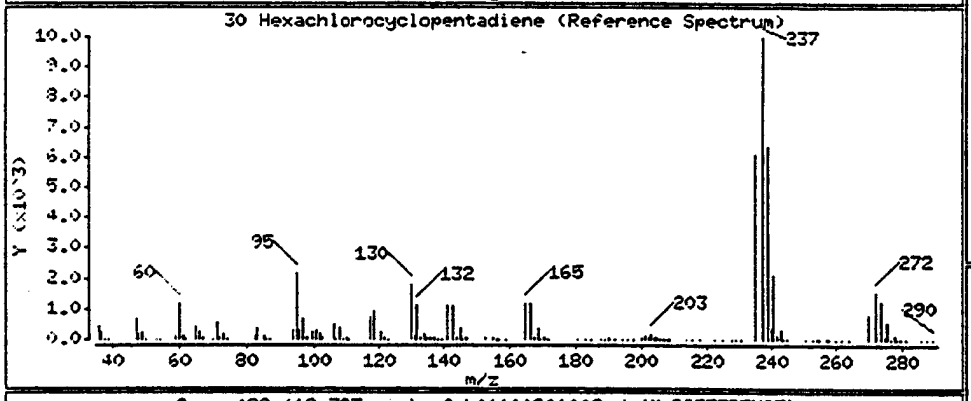
Column diameter: 2.00

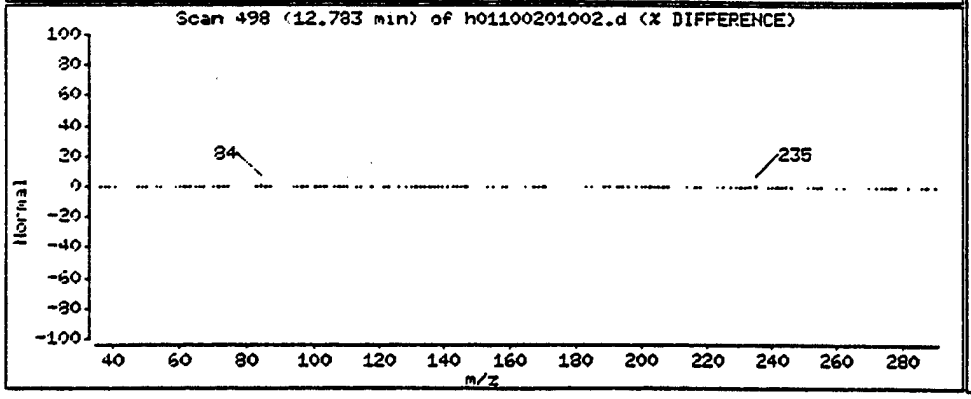
30 Hexachlorocyclopentadiene

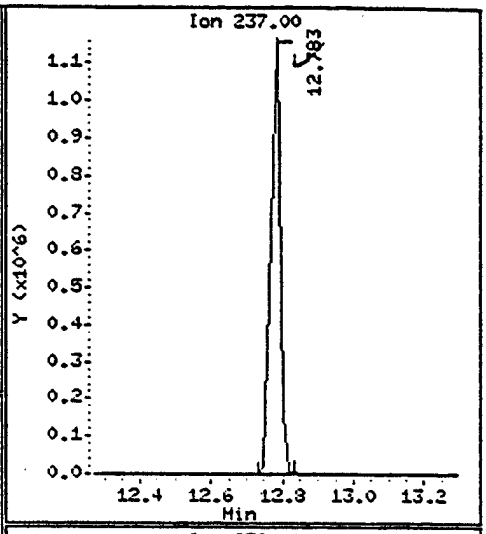
Concentration: 85.2 ug

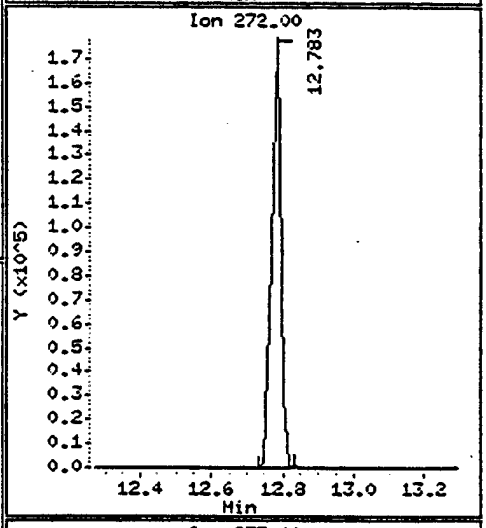


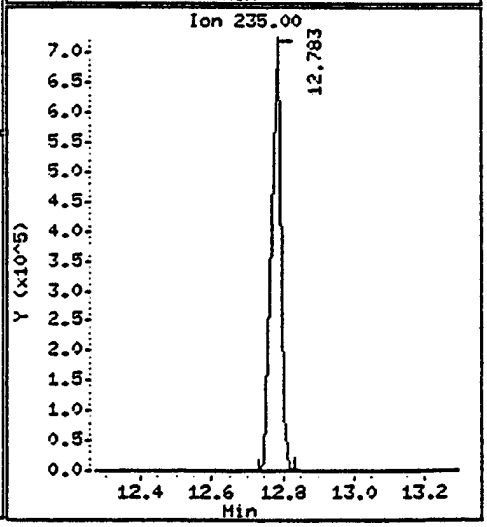












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80 ·

Volume Injected (uL): 1.0

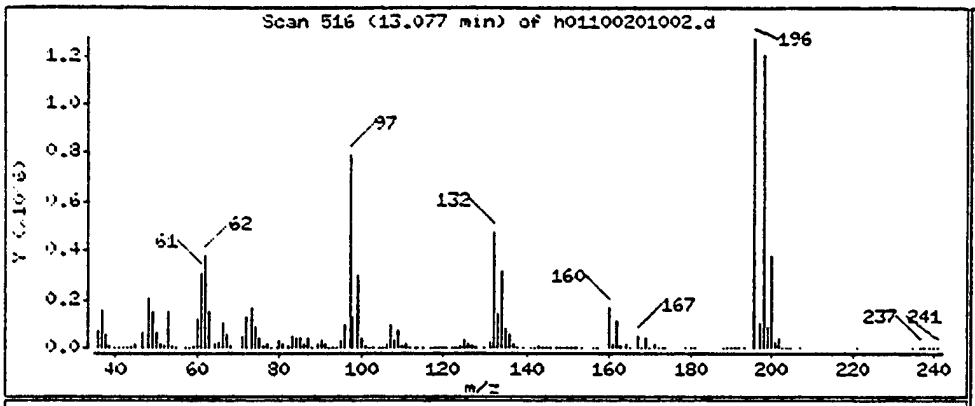
Operator: hch

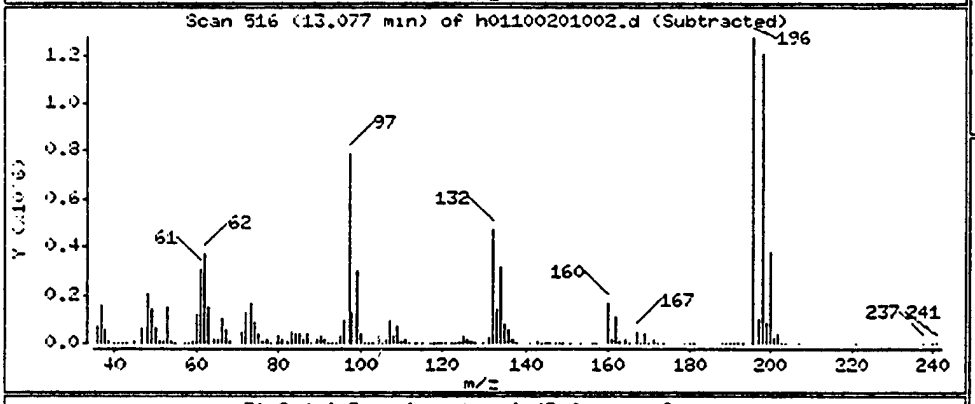
Column phase:

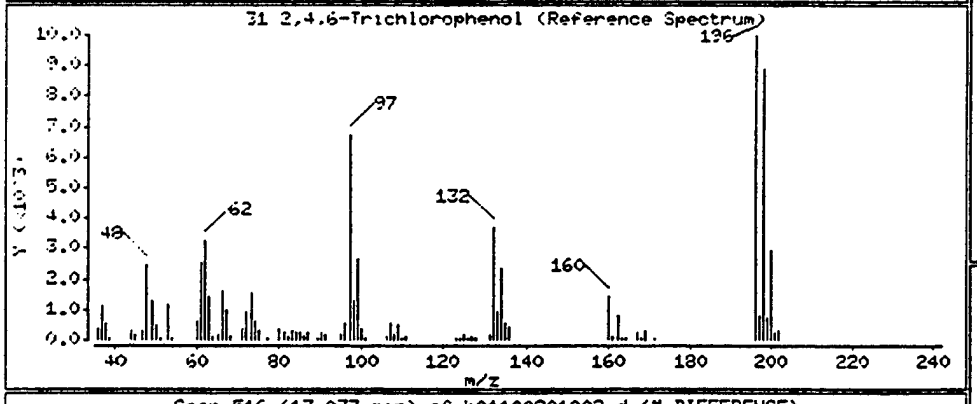
Column diameter: 2.00

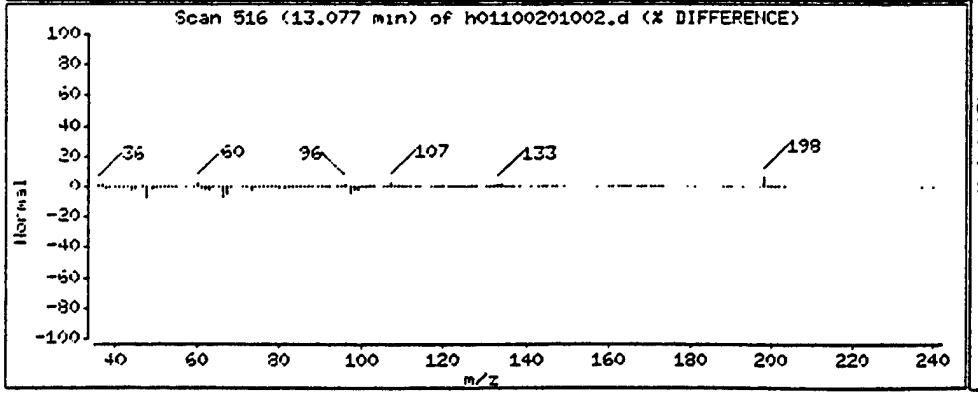
31 2,4,6-Trichlorophenol

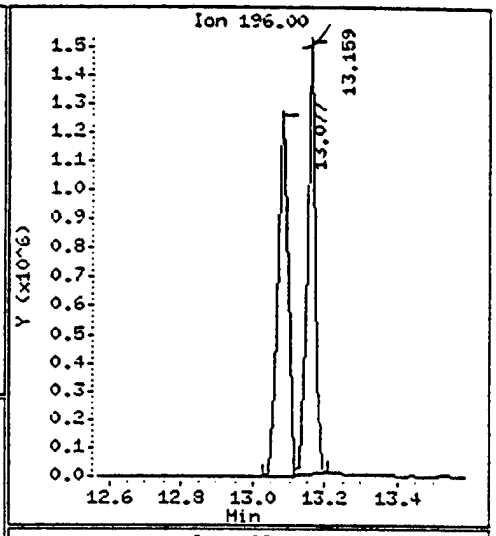
Concentration: 84.2 ug

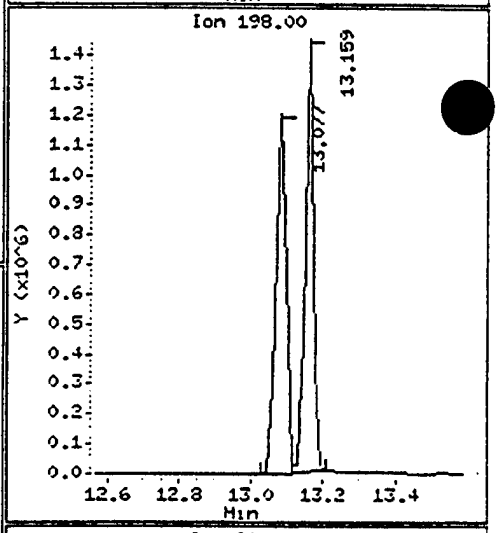


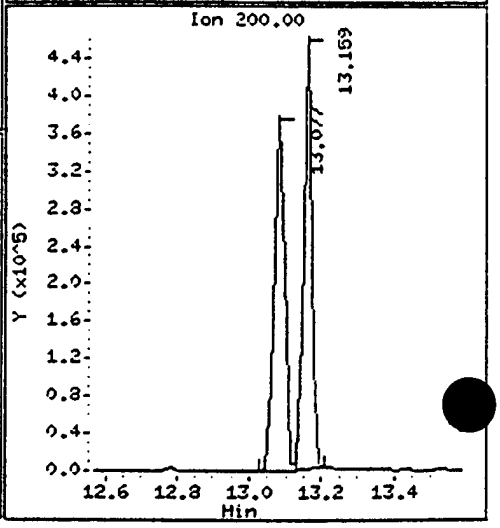












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

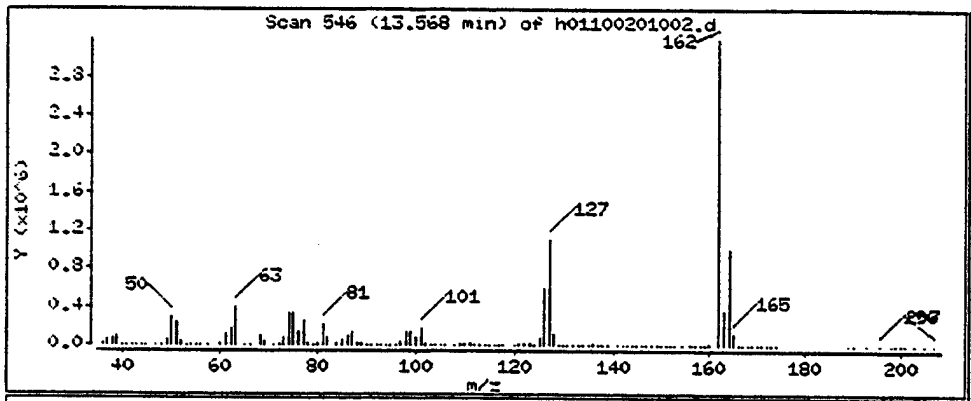
Operator: hch

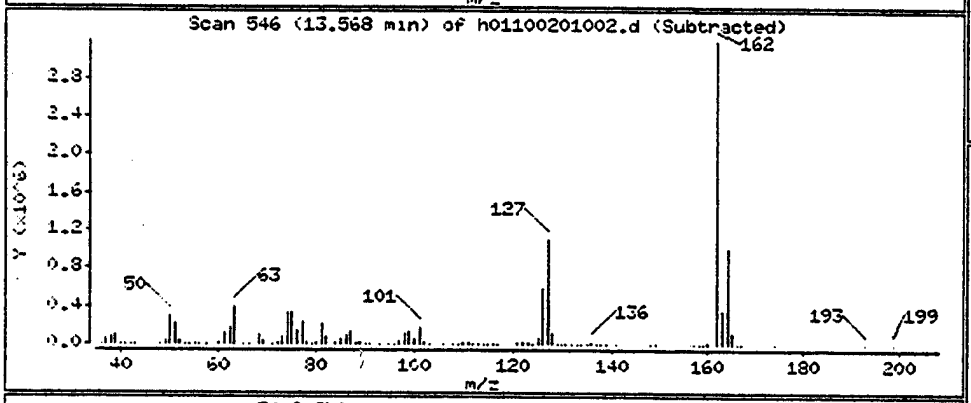
Column phase:

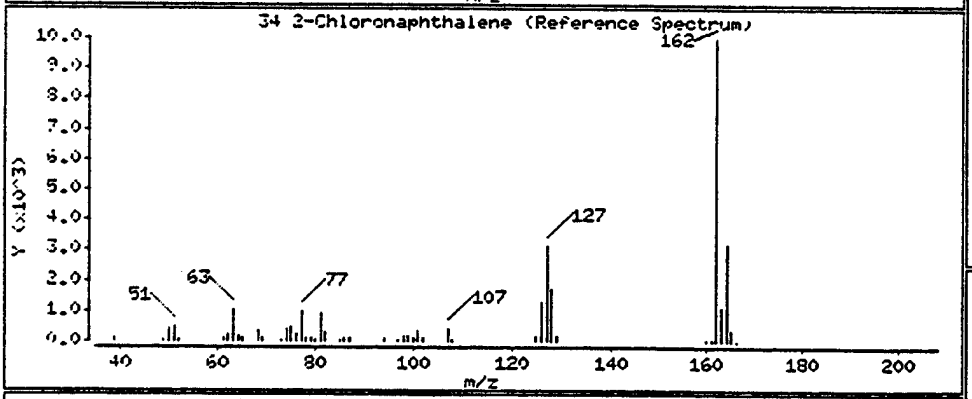
Column diameter: 2.00

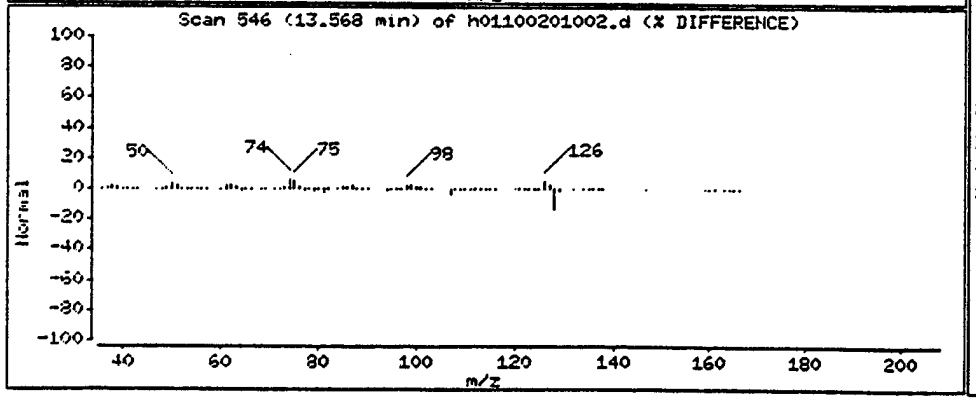
34 2-Chloronaphthalene

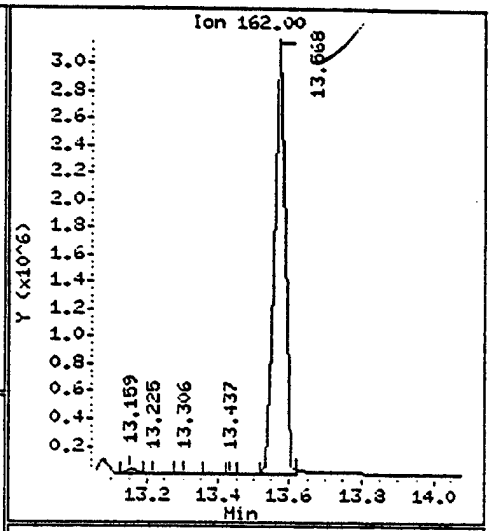
Concentration: 80.8 ug

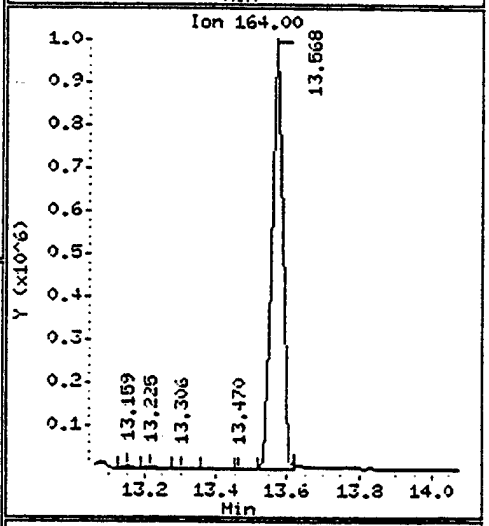


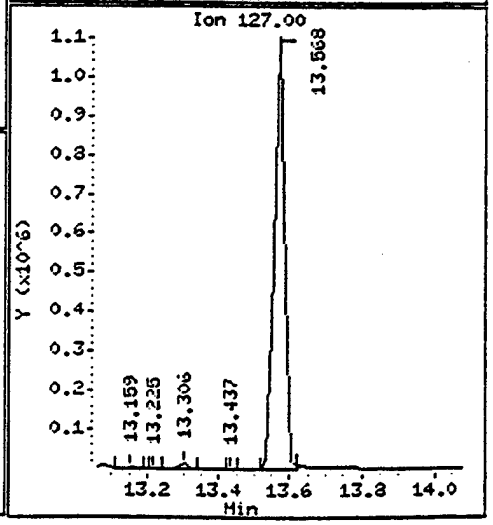












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

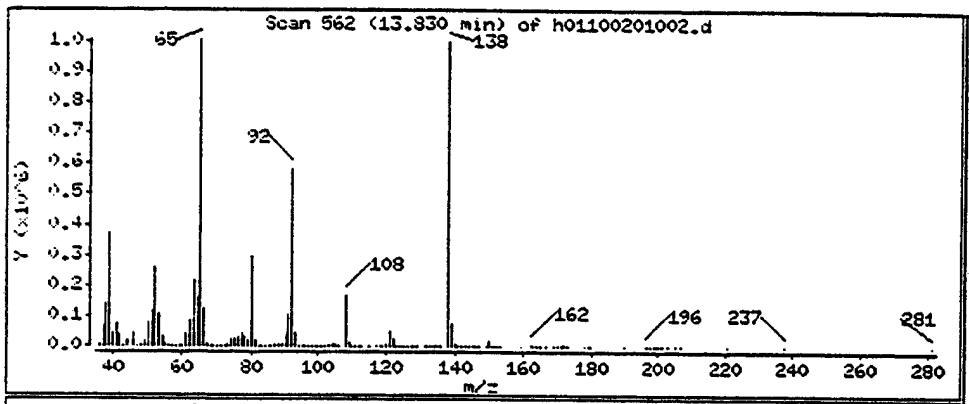
Operator: hch

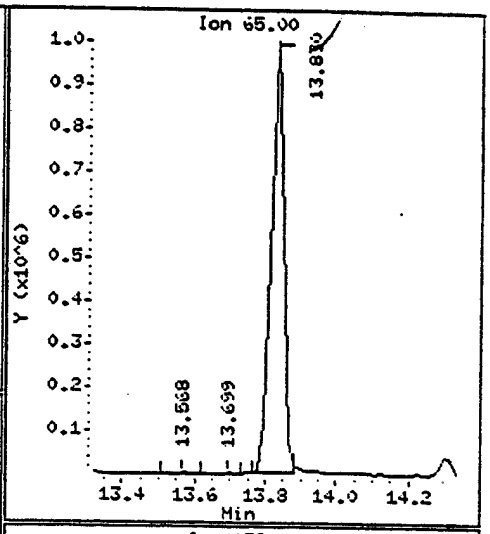
Column phase:

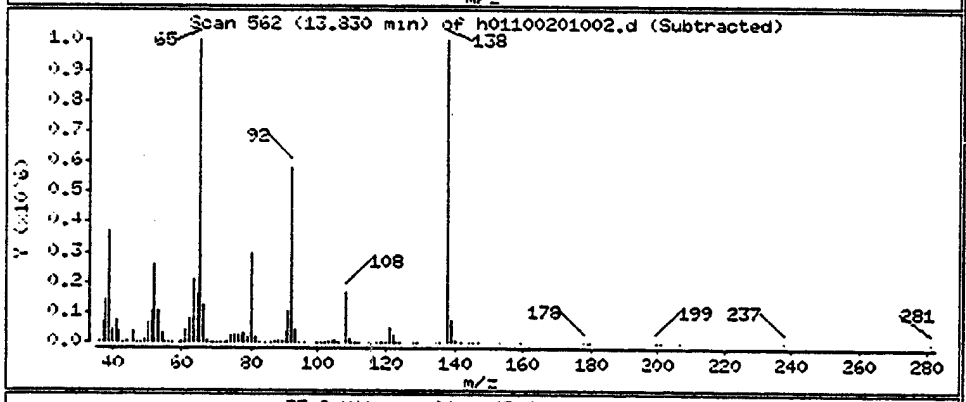
Column diameter: 2.00

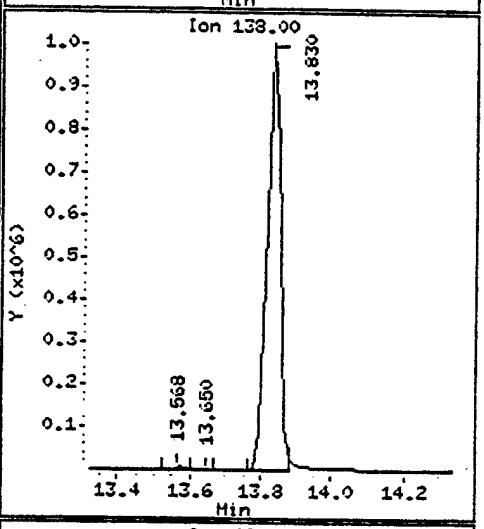
35 2-Nitroaniline

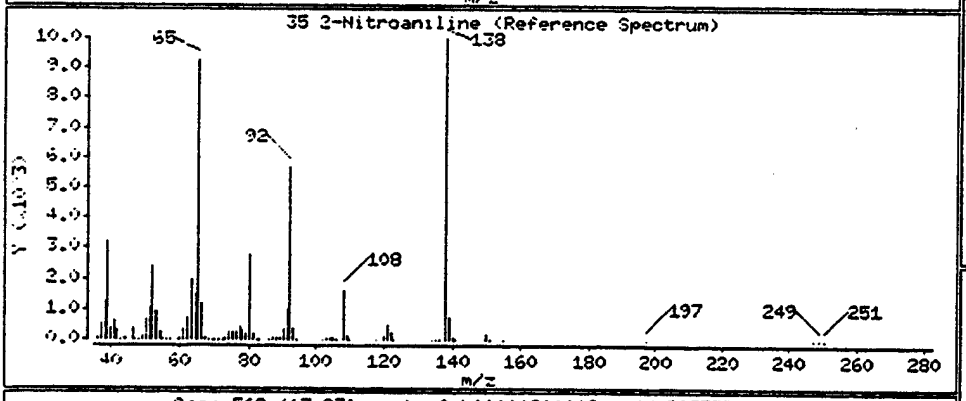
Concentration: 94.2 ug

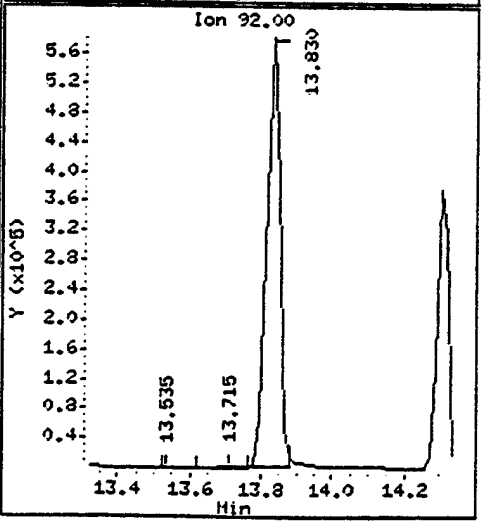


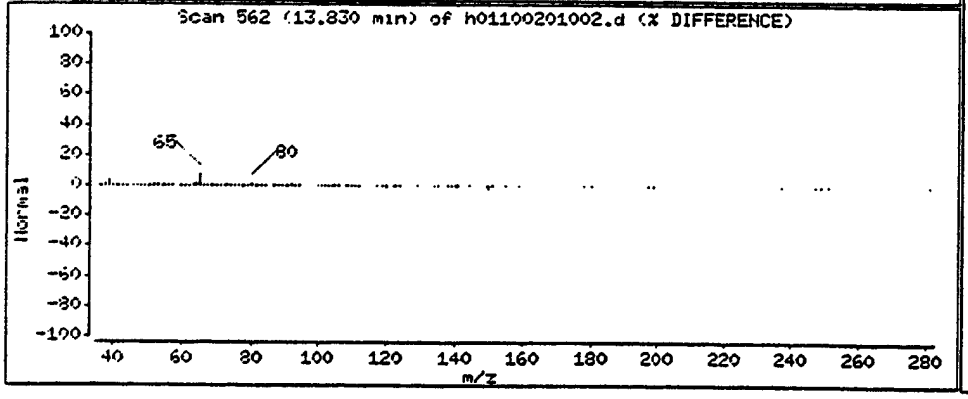












496

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

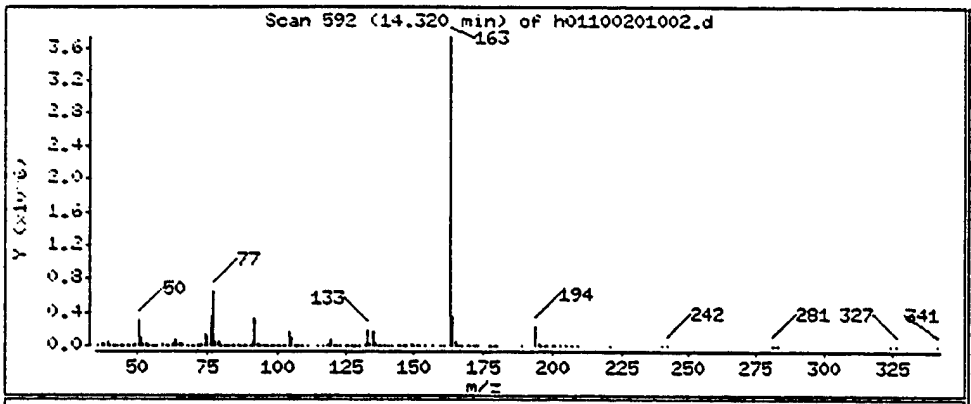
Operator: hch

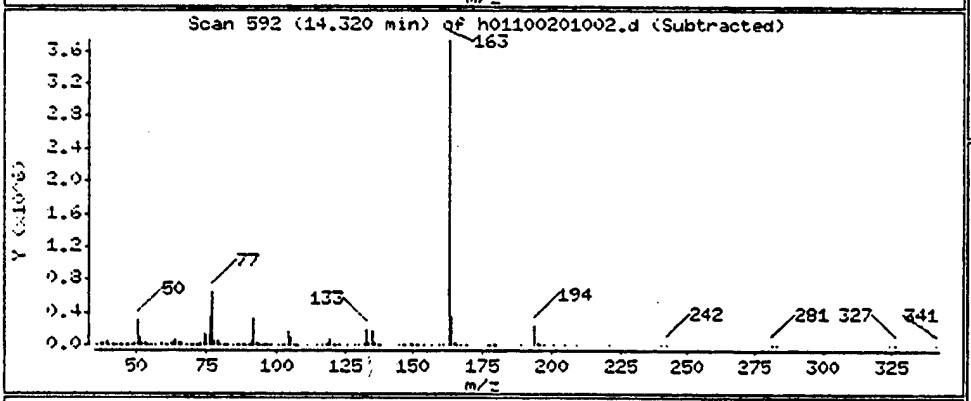
Column phase:

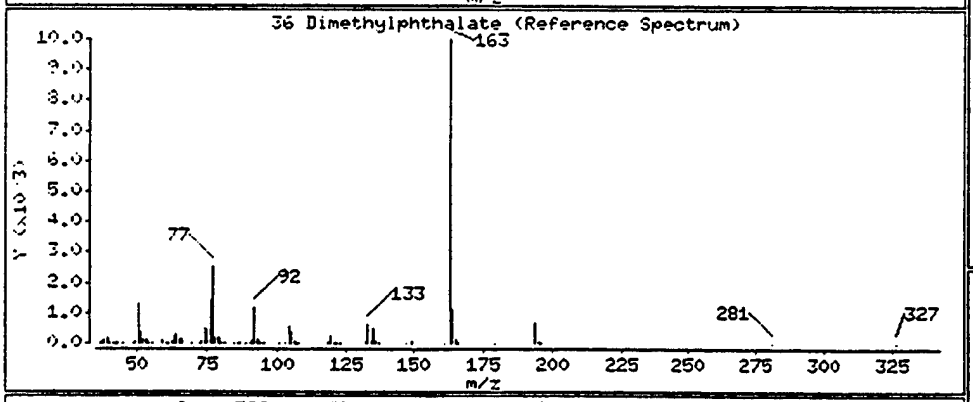
Column diameter: 2.00

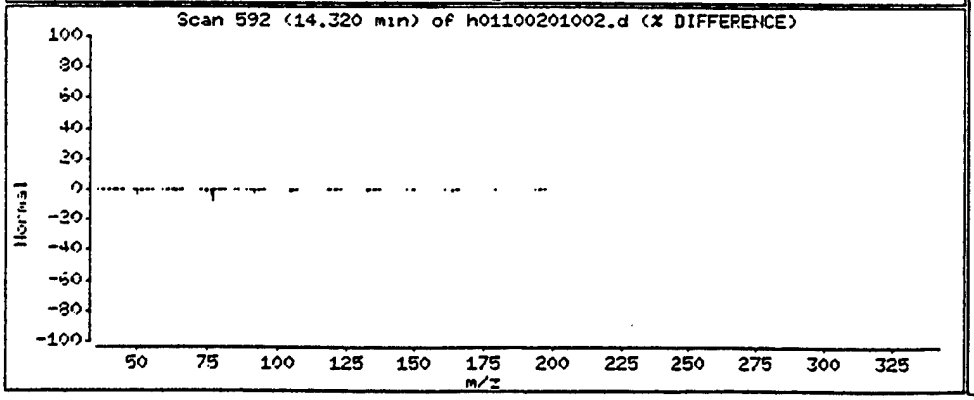
36 Dimethylphthalate

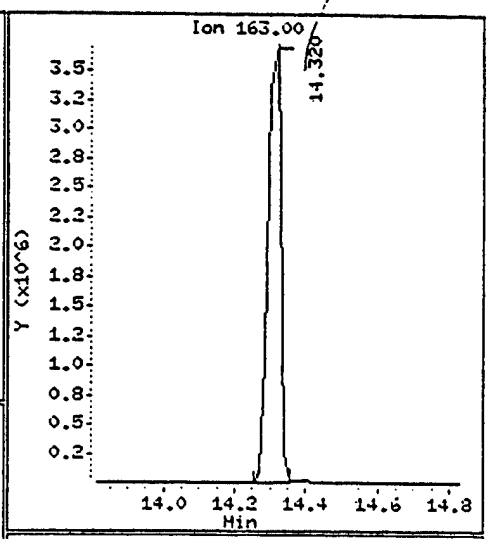
Concentration: 89.9 ug

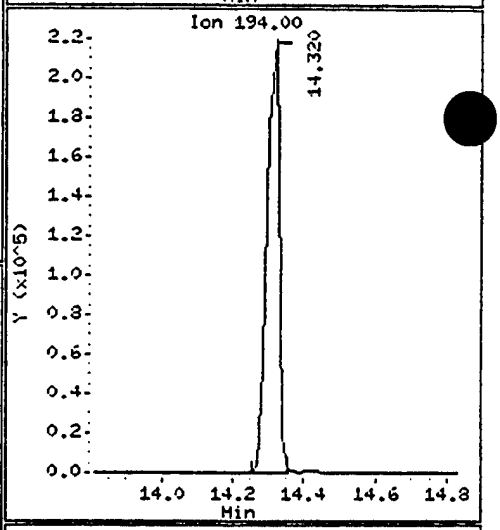


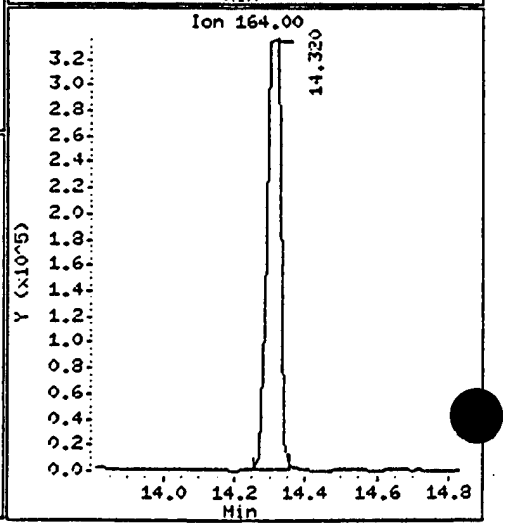












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

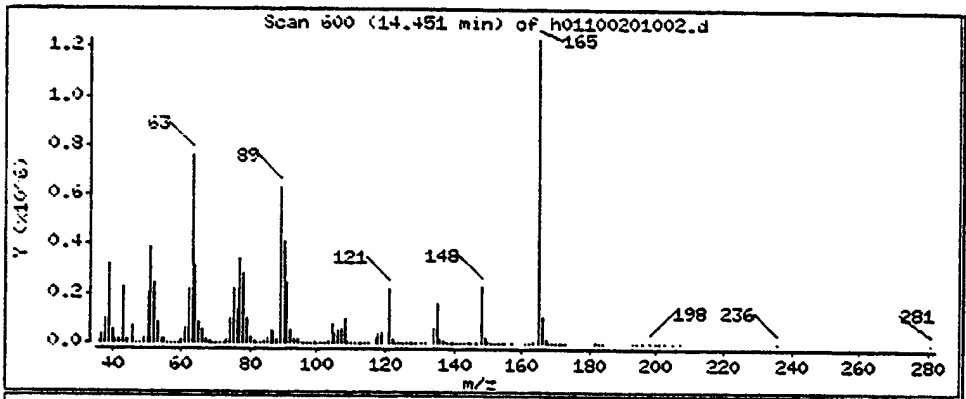
Operator: hch

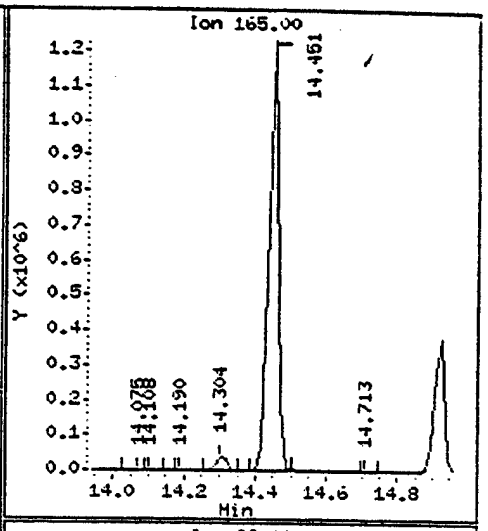
Column phase:

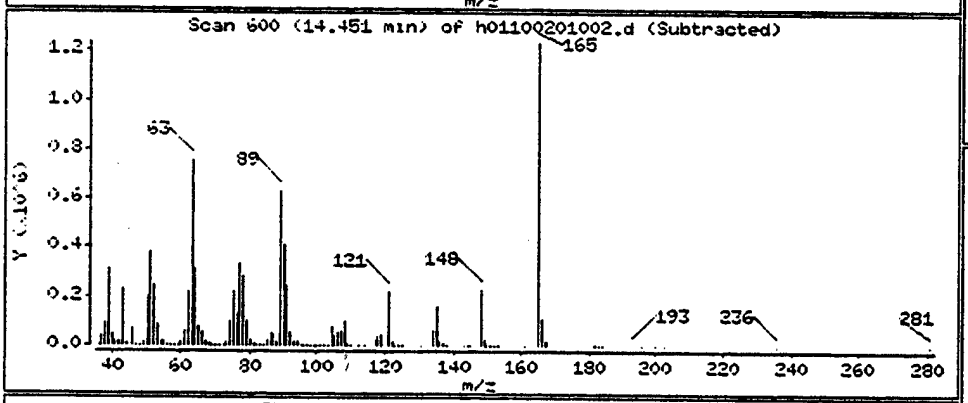
Column diameter: 2.00

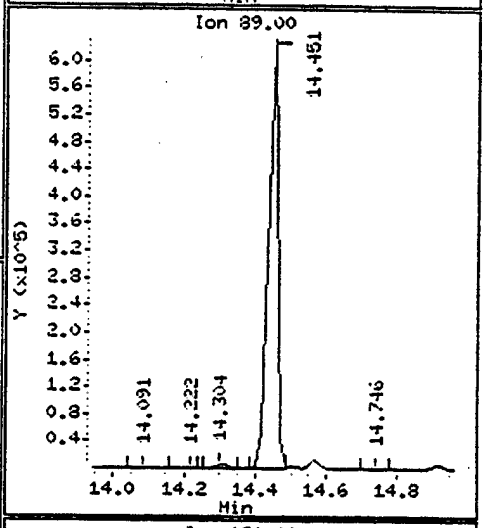
37 2,6-Dinitrotoluene

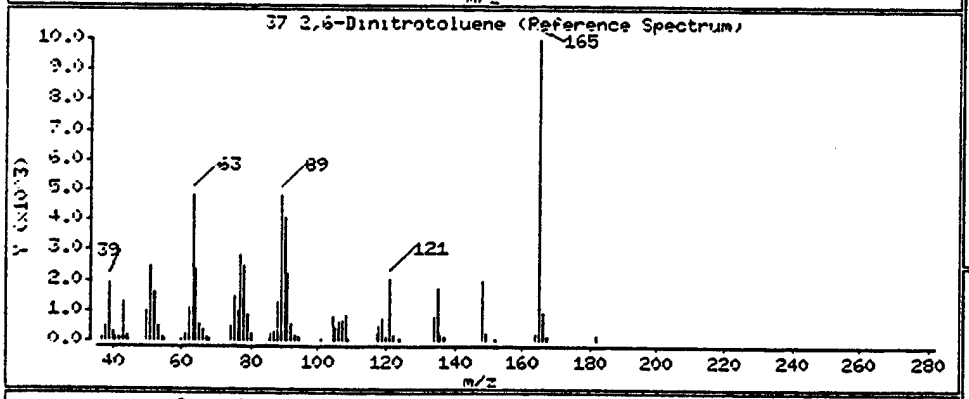
Concentration: 92.3 ug

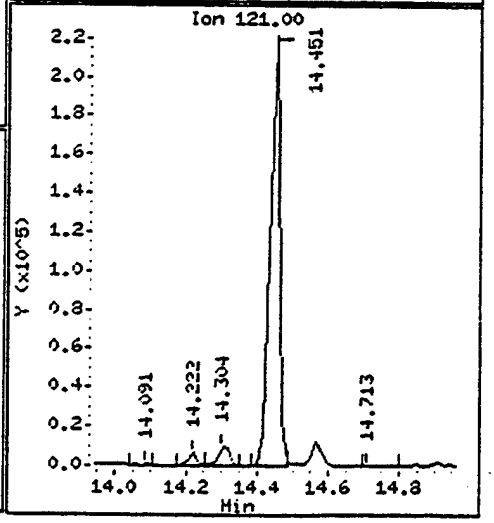


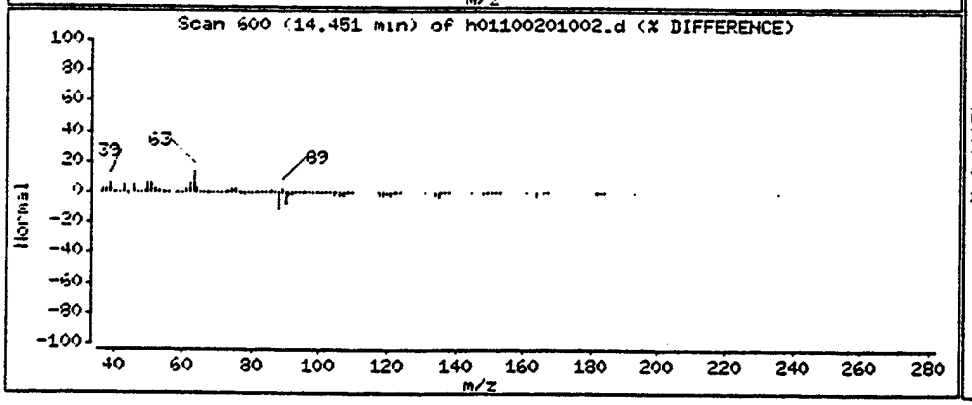












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

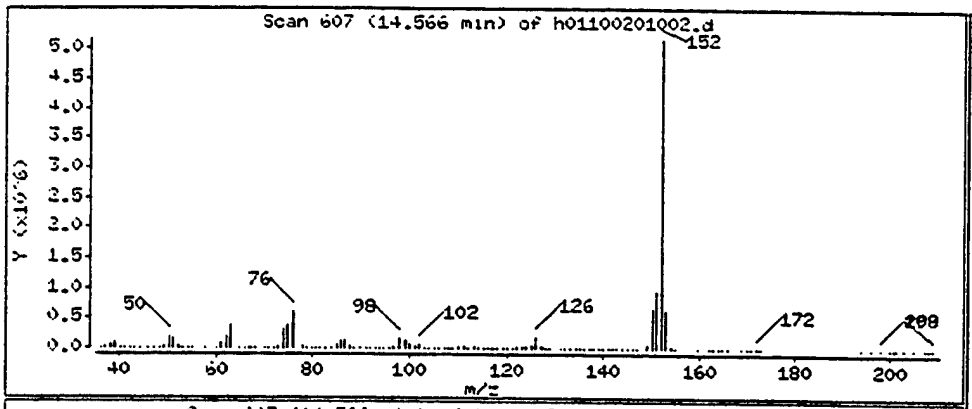
Operator: hch

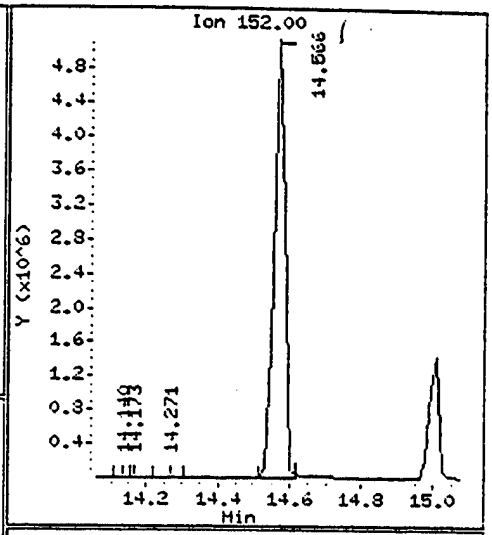
Column phase:

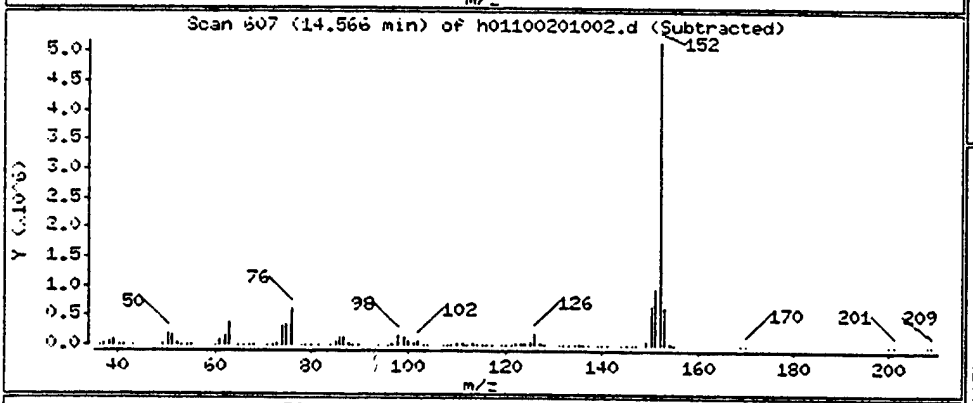
Column diameter: 2.00

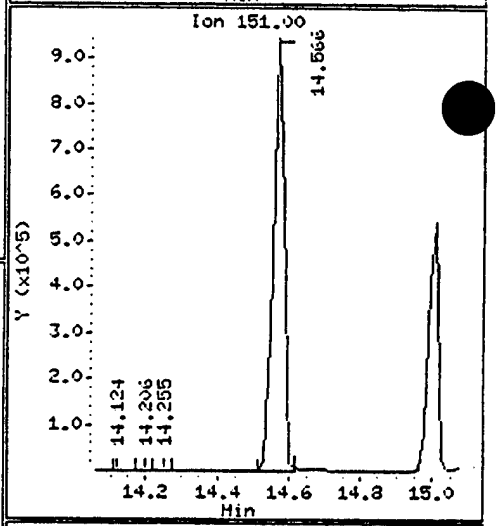
38 Acenaphthylene

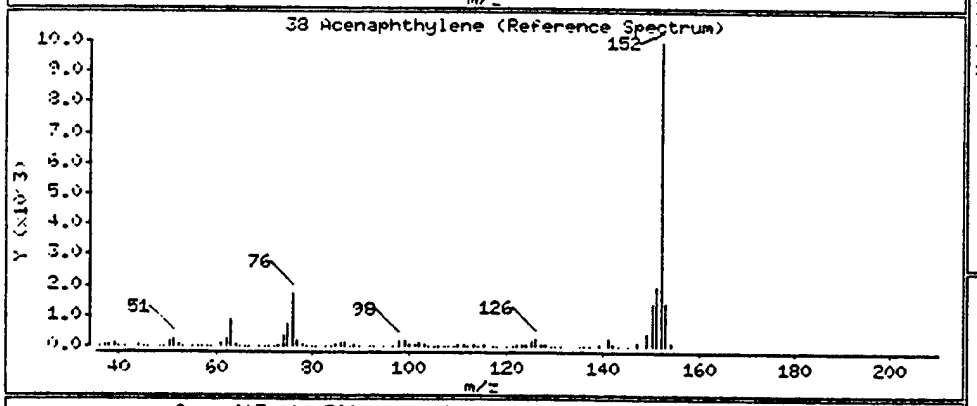
Concentration: 87.8 ug

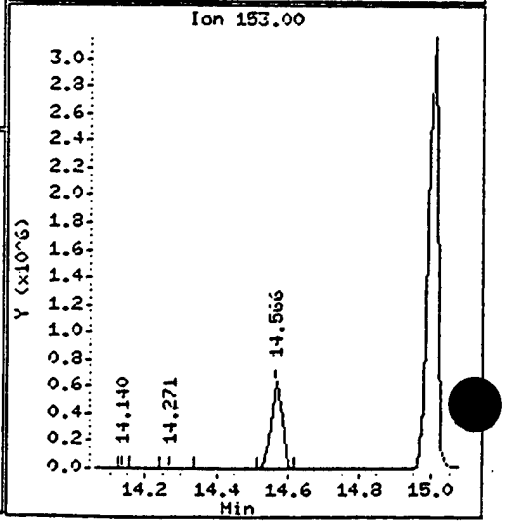


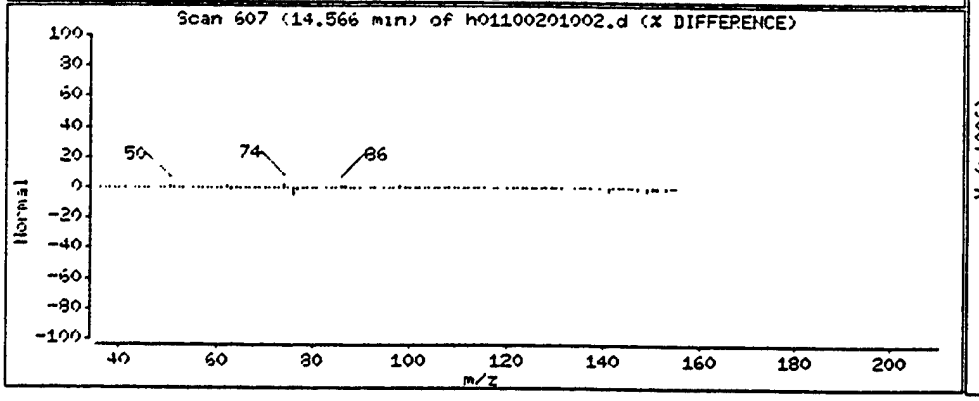












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

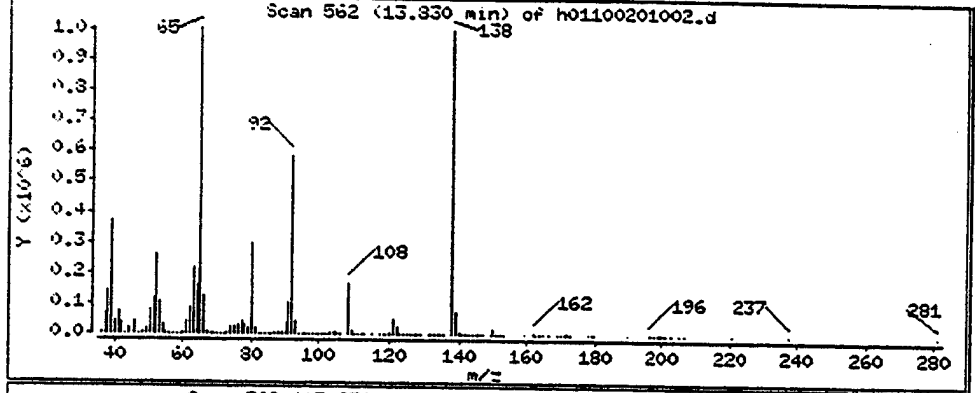
Operator: hch

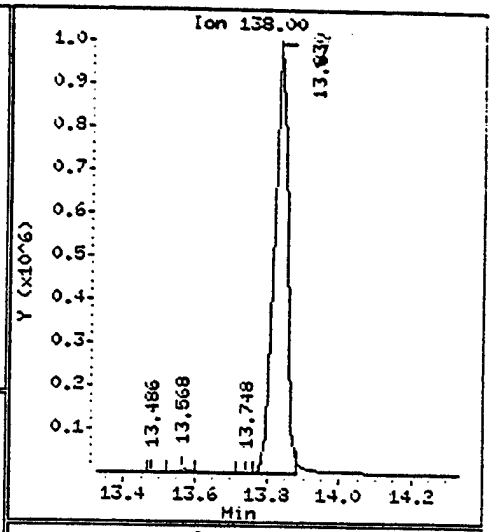
Column phase:

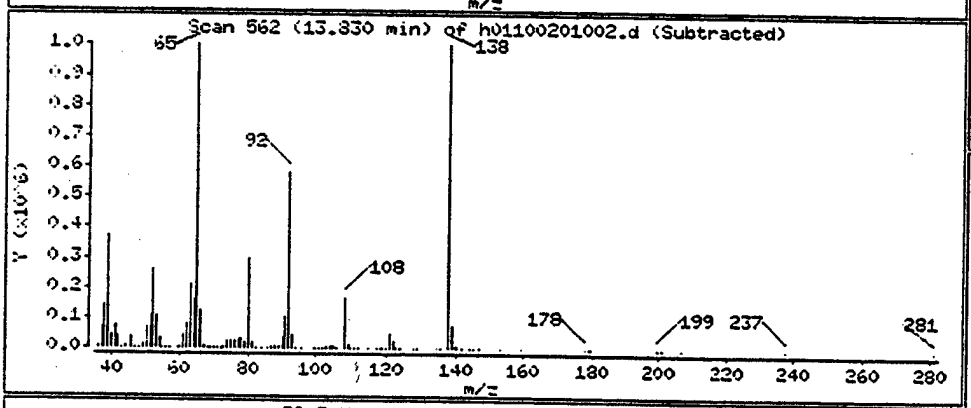
Column diameter: 2.00

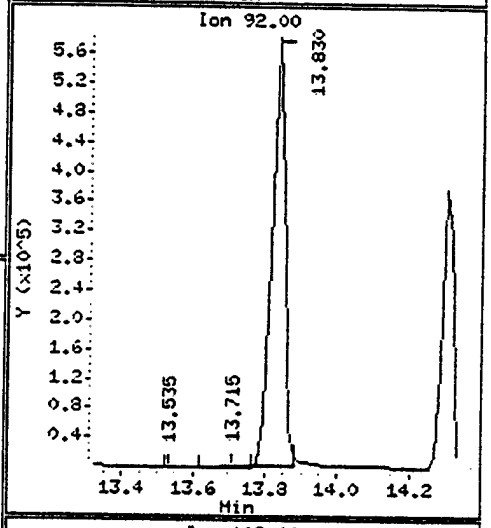
39 3-Nitroaniline

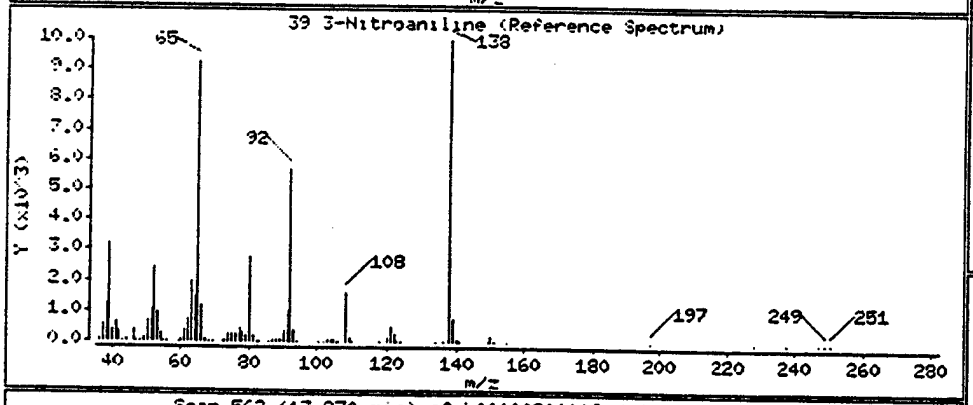
Concentration: 94.8 ug

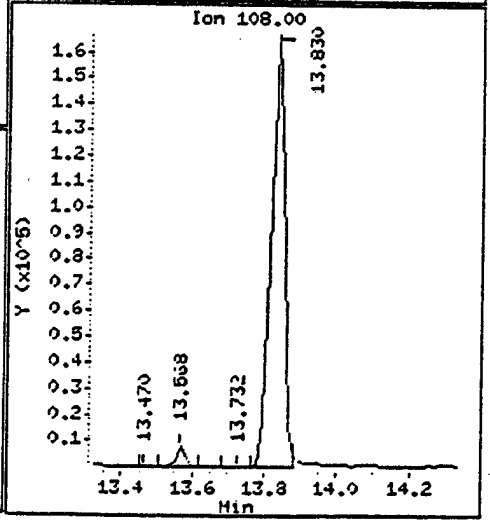


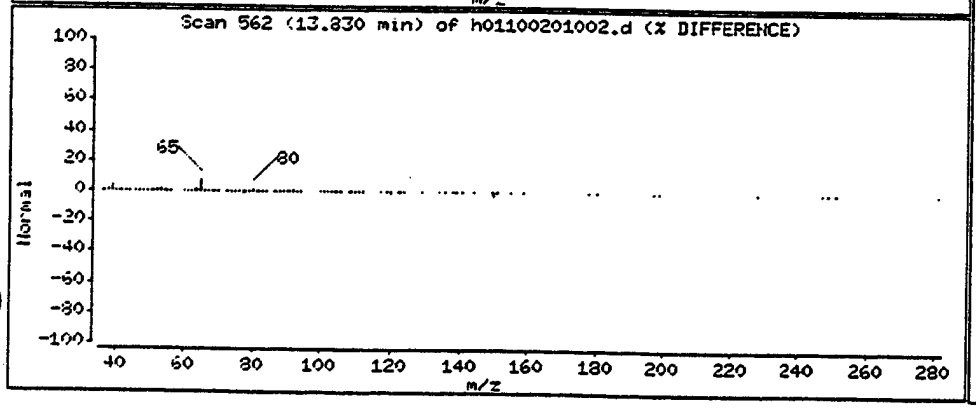












500

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

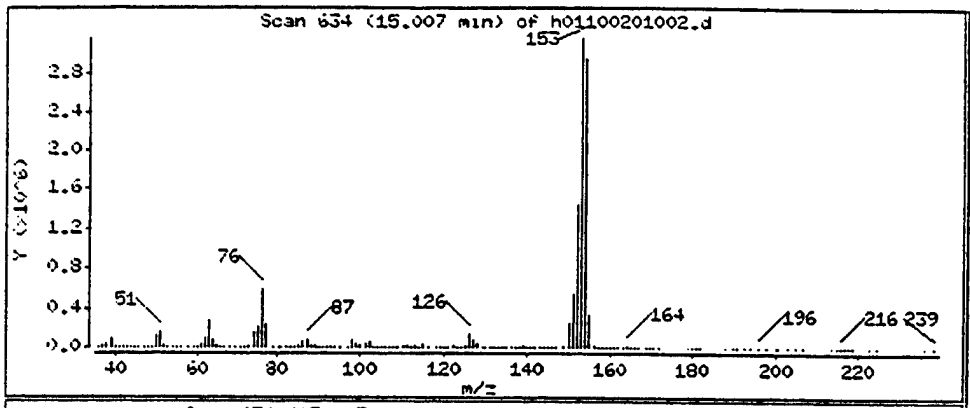
Operator: hch

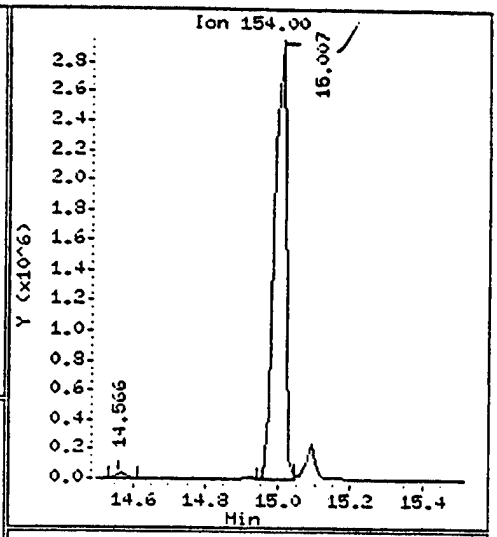
Column phase:

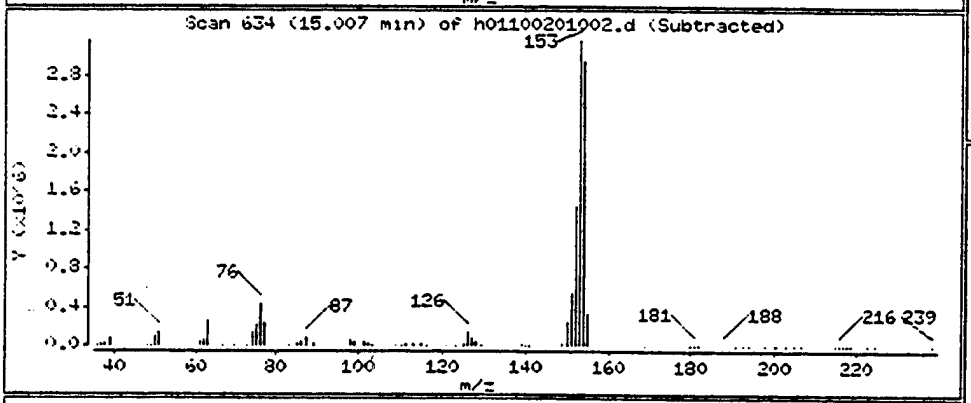
Column diameter: 2.00

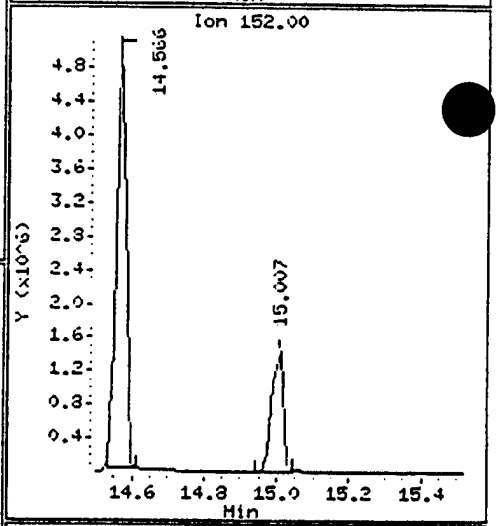
41 Acenaphthene

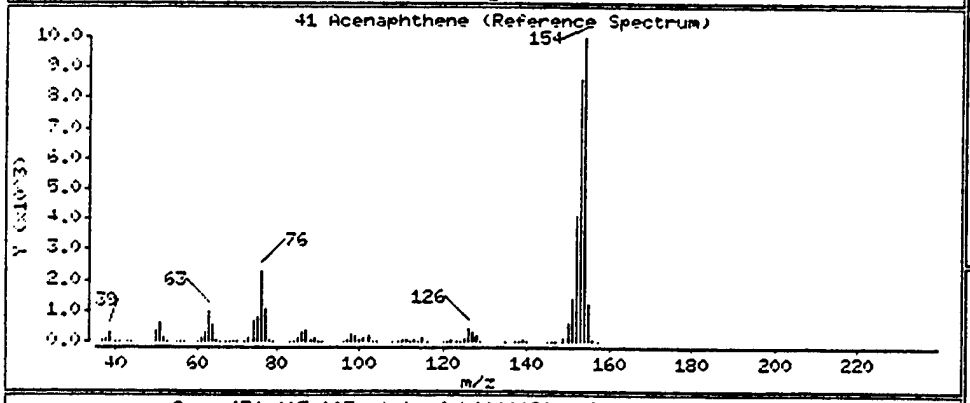
Concentration: 85.7 ug

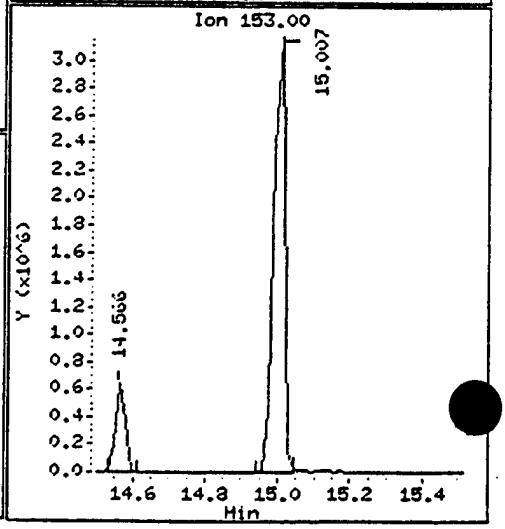


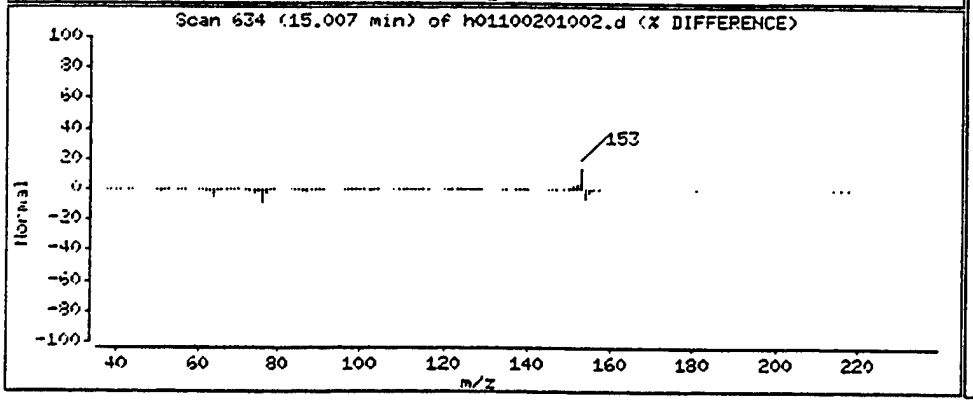












501

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

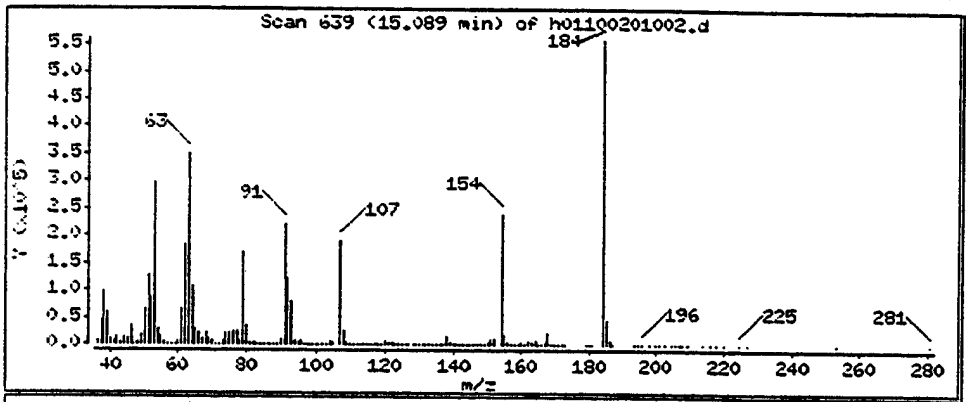
Operator: hch

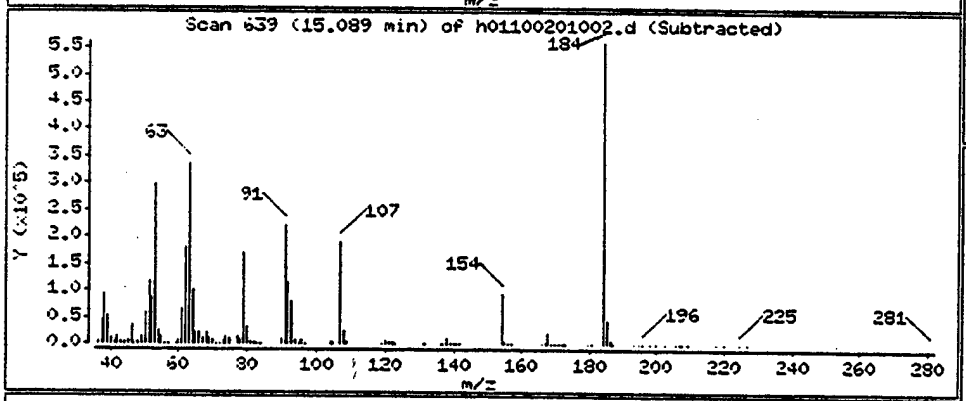
Column phase:

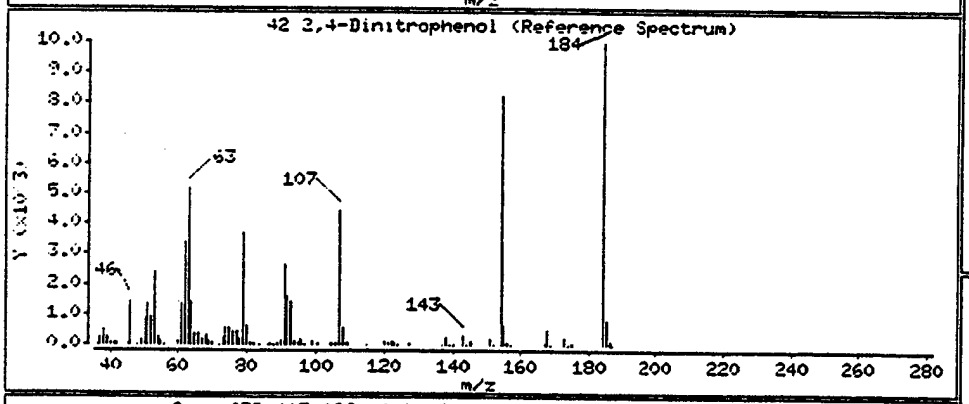
Column diameter: 2.00

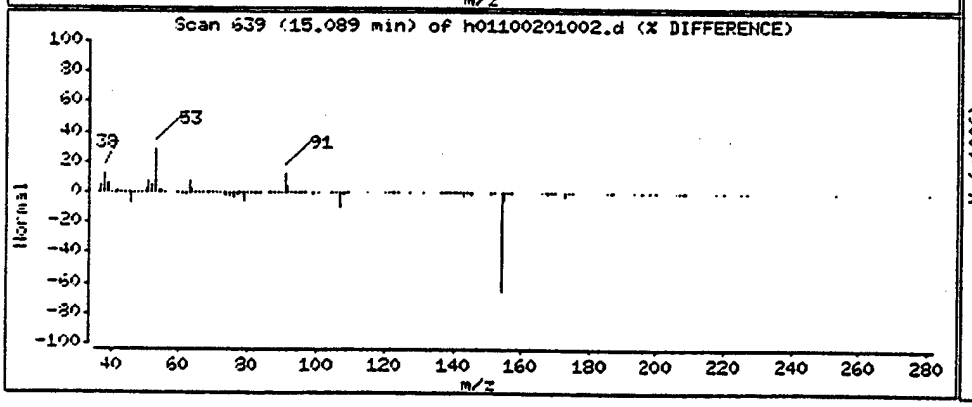
42 2,4-Dinitrophenol

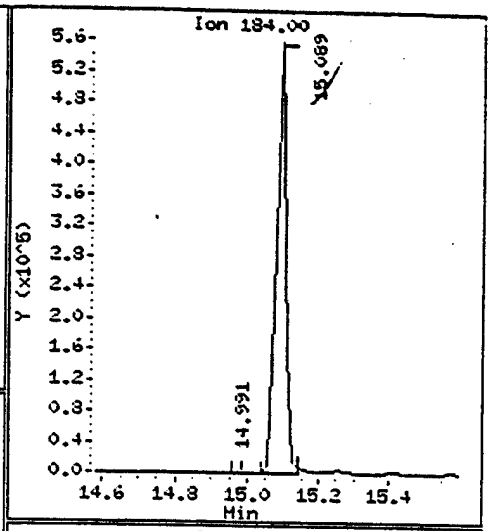
Concentration: 79.4 ug

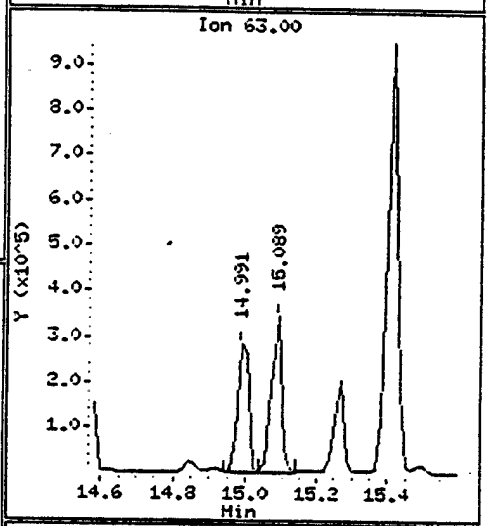


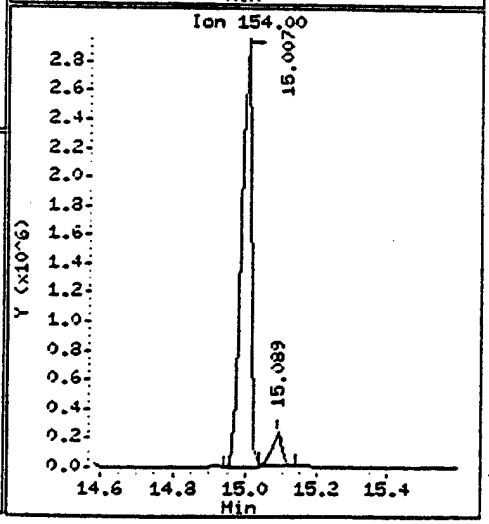












502

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

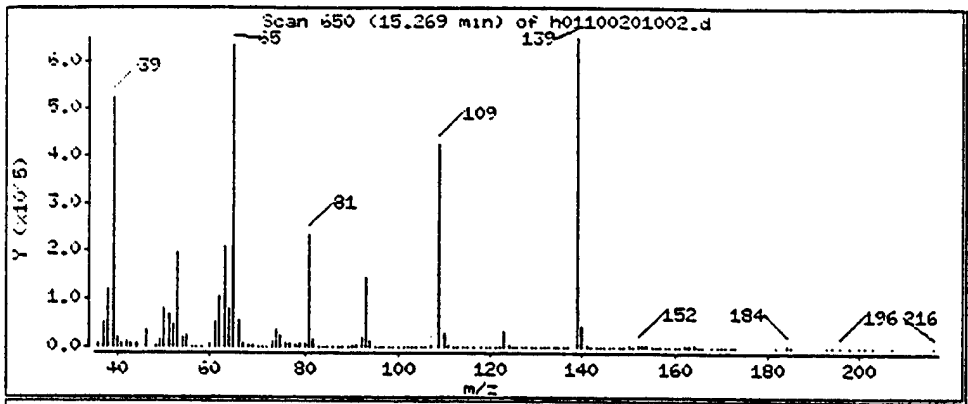
Operator: hch

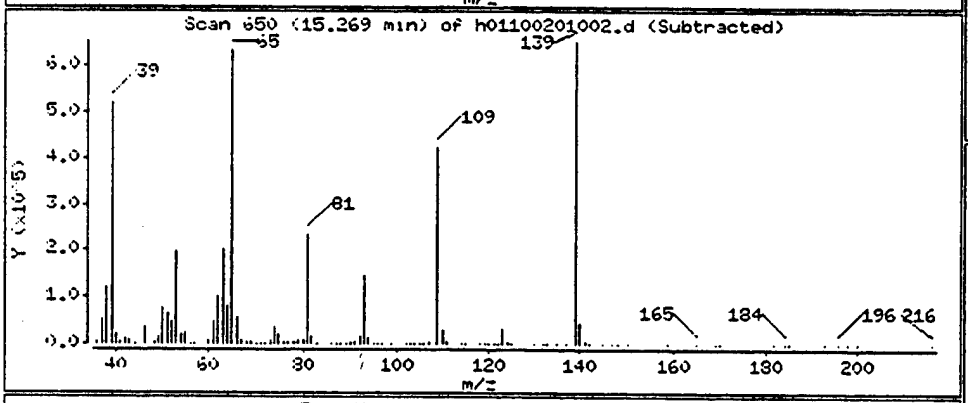
Column phase:

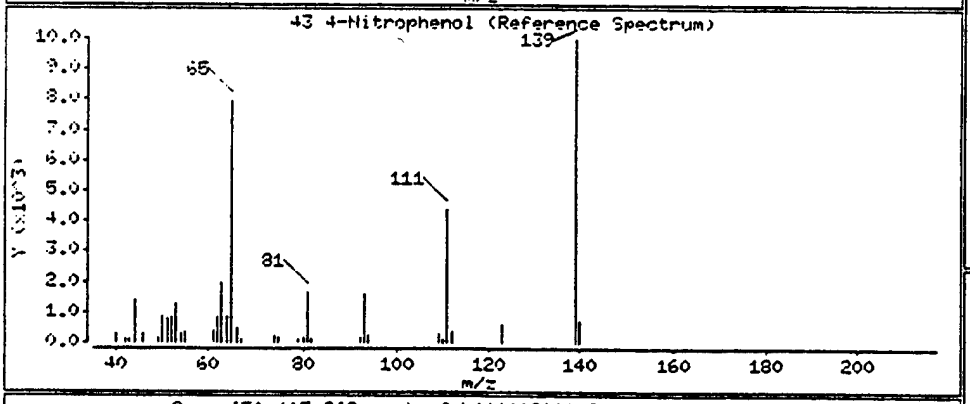
Column diameter: 2.00

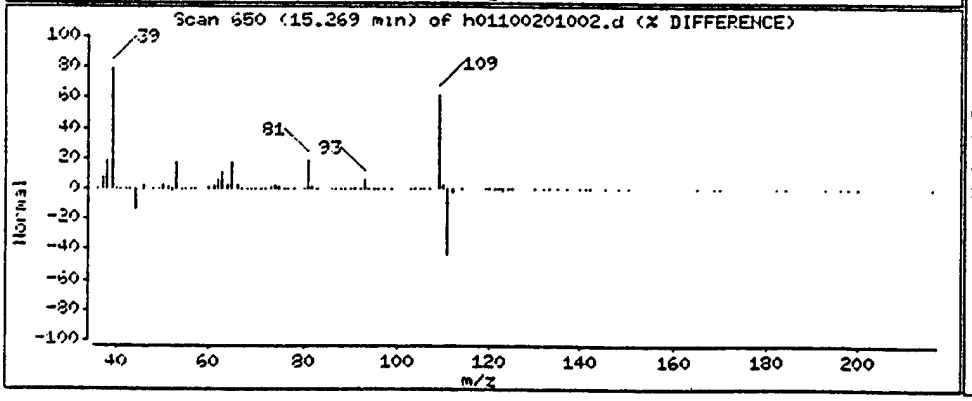
43 4-Nitrophenol

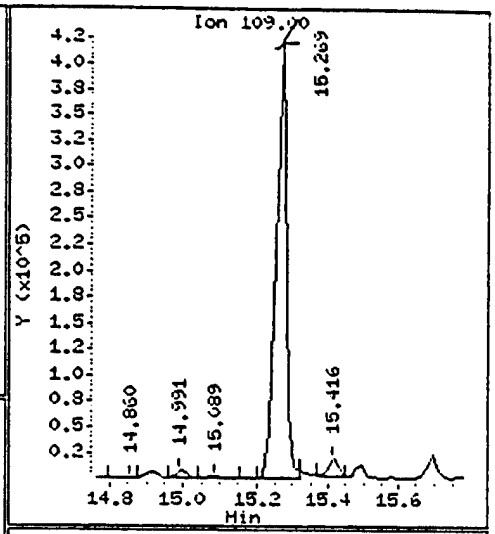
Concentration: 88.5 ug

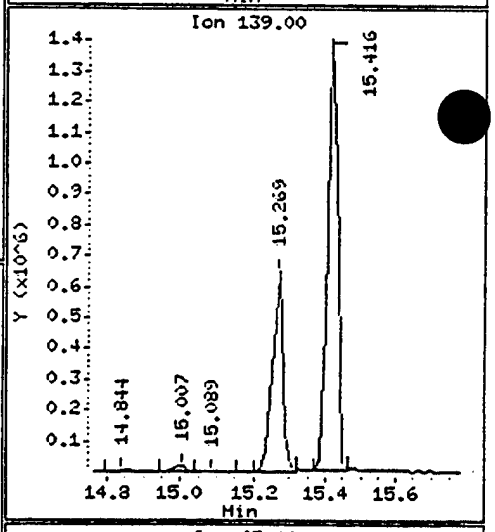


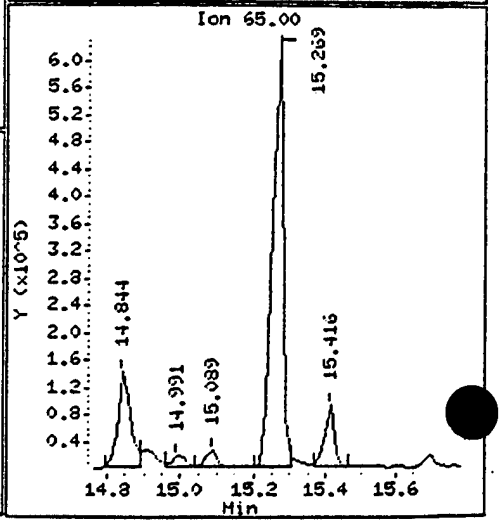












503

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

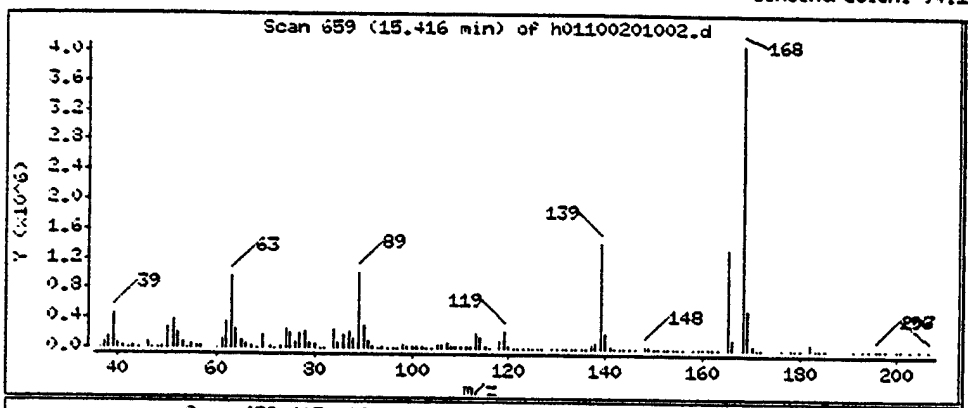
Operator: hch

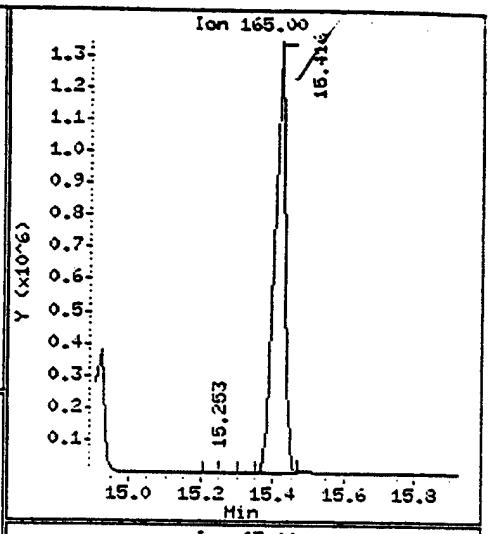
Column phase:

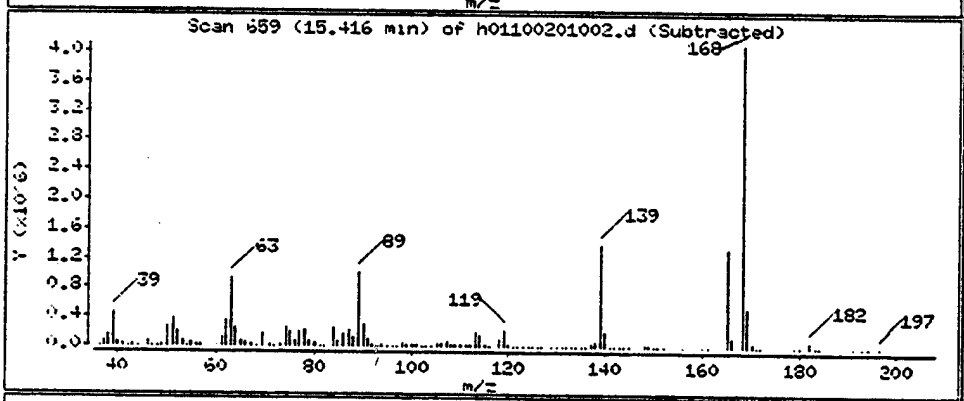
Column diameter: 2.00

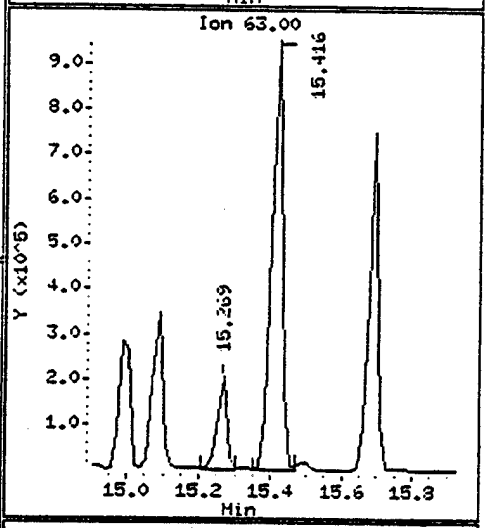
44 2,4-Dinitrotoluene

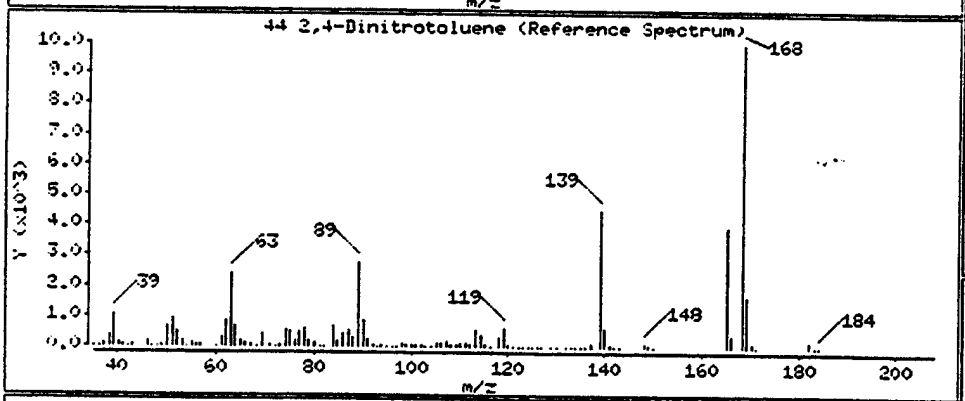
Concentration: 94.1 ug

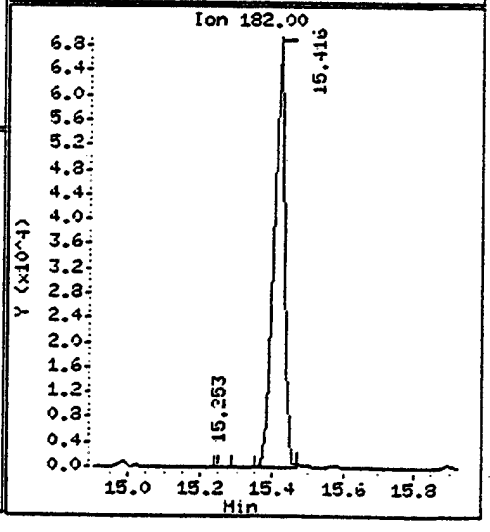


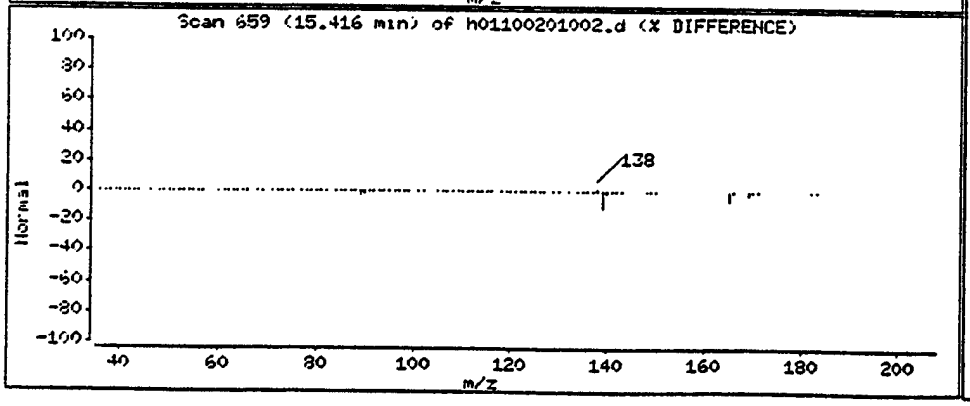












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

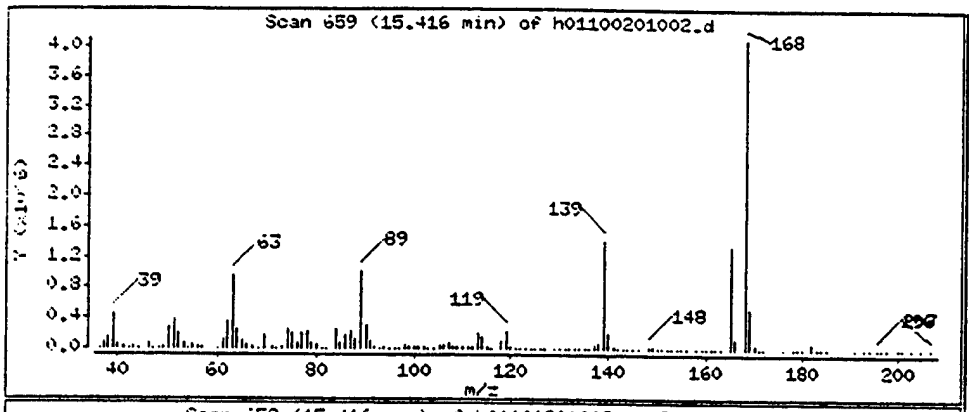
Operator: hch

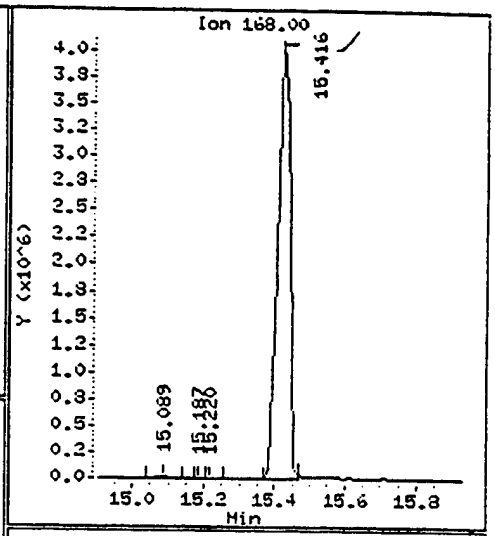
Column phase:

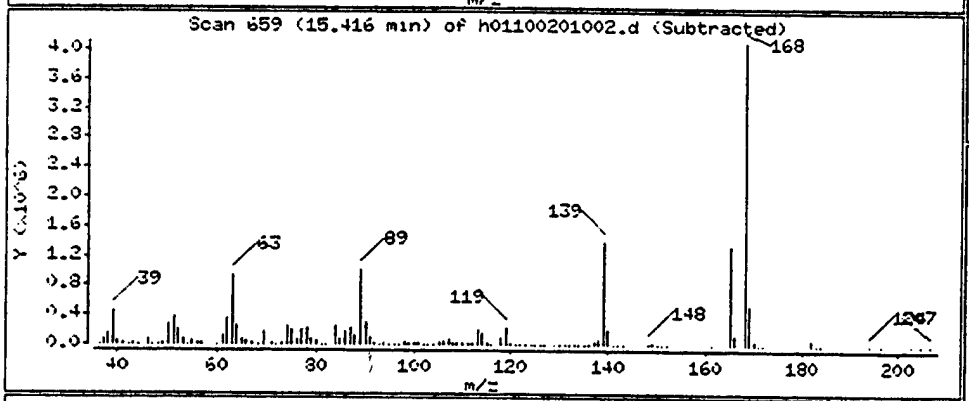
Column diameter: 2.00

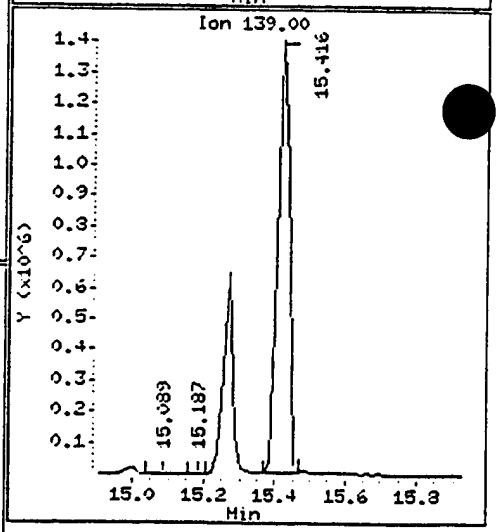
45 Dibenzofuran

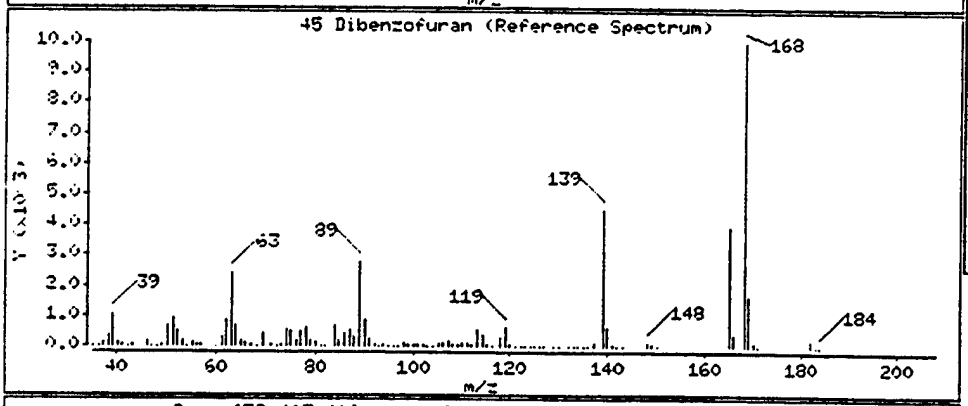
Concentration: 88.4 ug

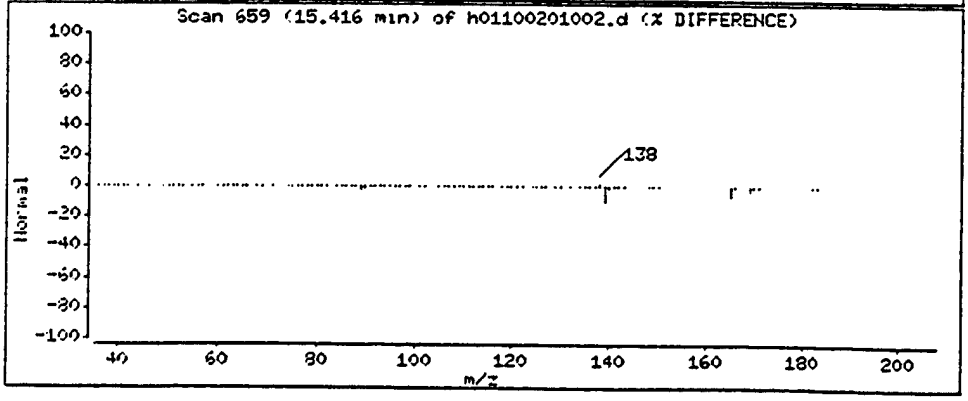












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

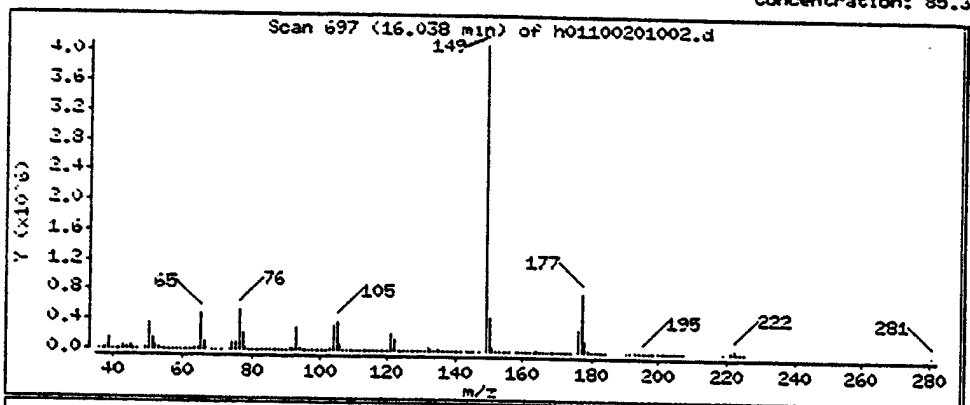
Operator: hch

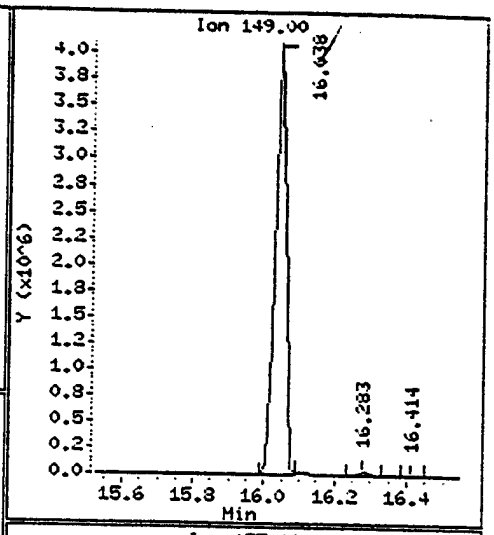
Column phase:

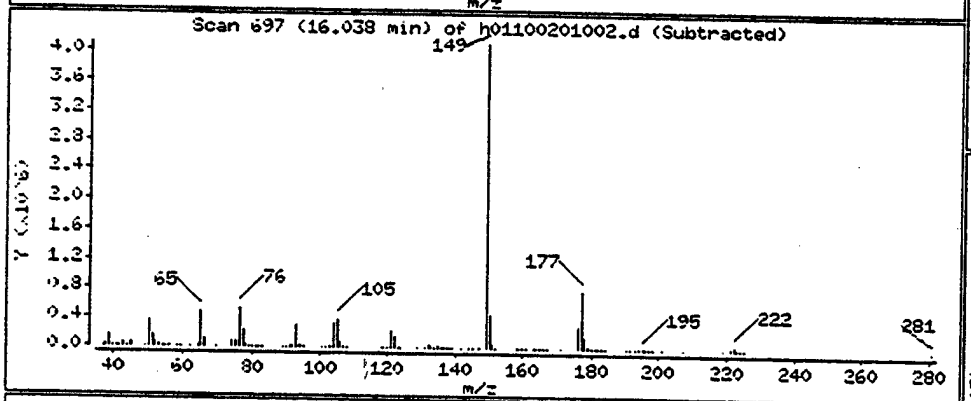
Column diameter: 2.00

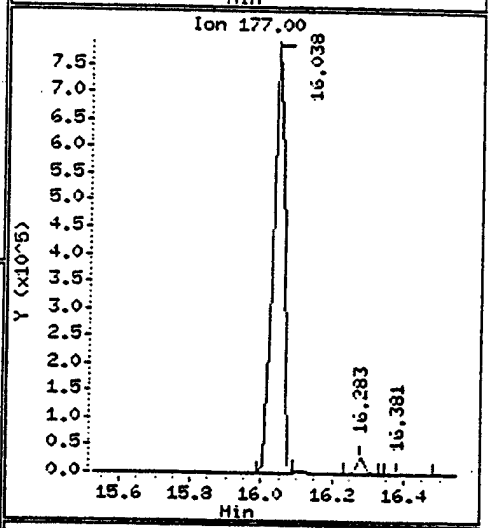
46 Diethylphthalate

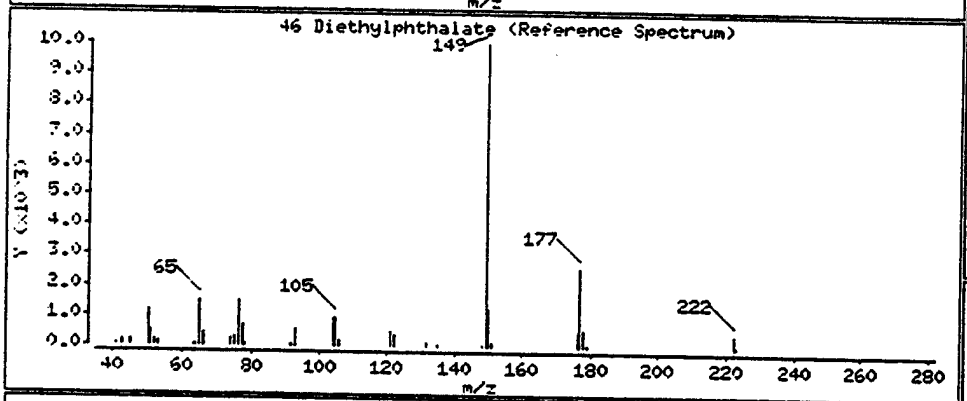
Concentration: 85.3 ug

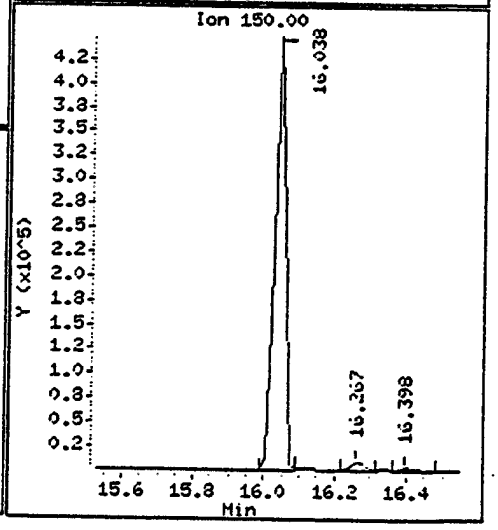


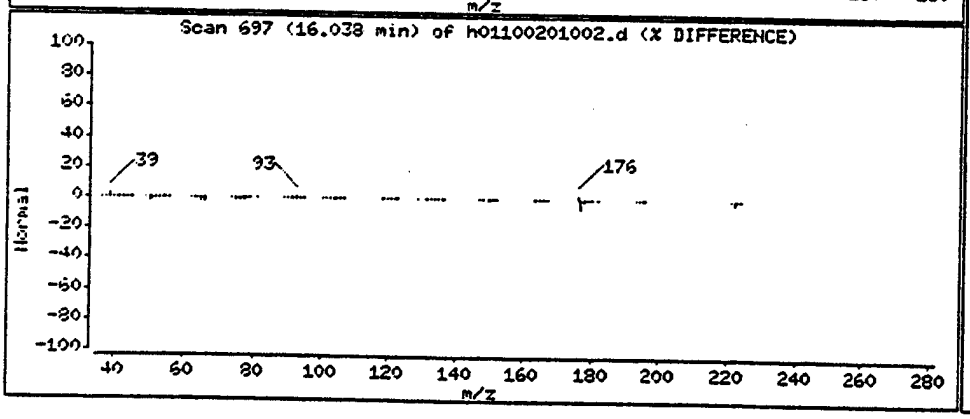












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

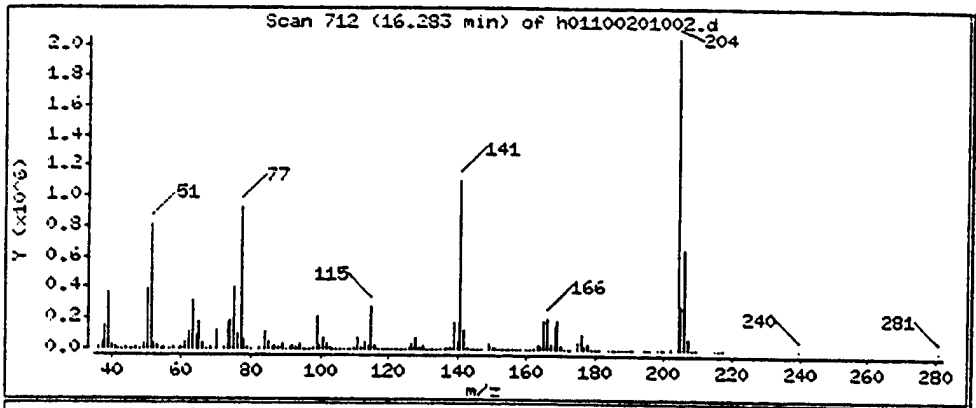
Operator: hch

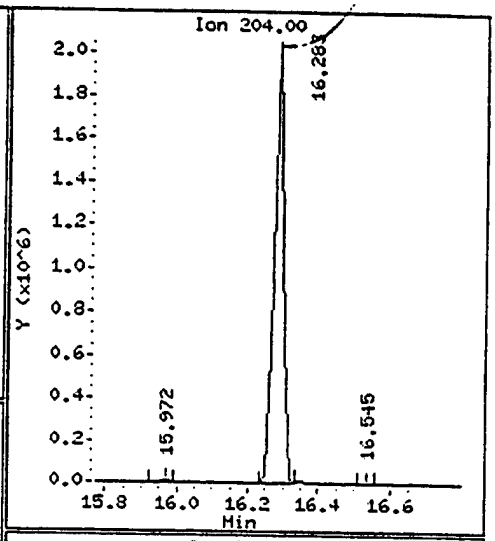
Column phase:

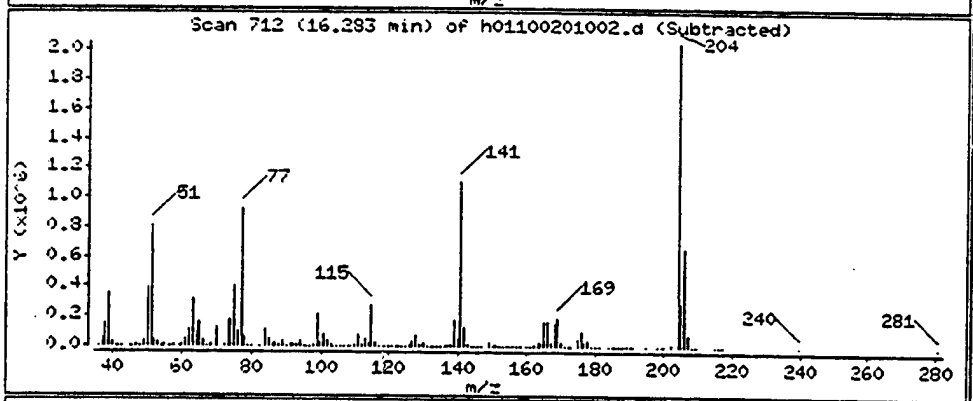
Column diameter: 2.00

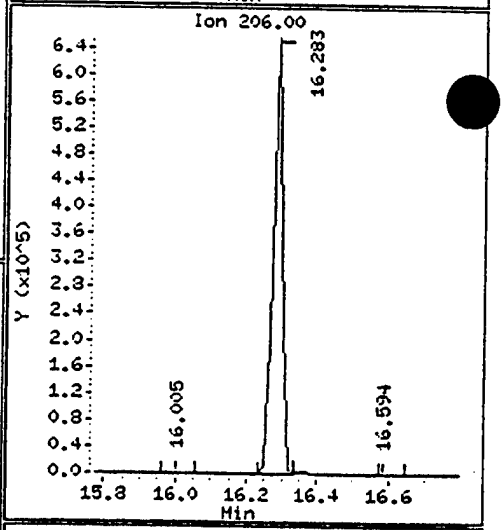
47 4-Chlorophenyl phenyl ether

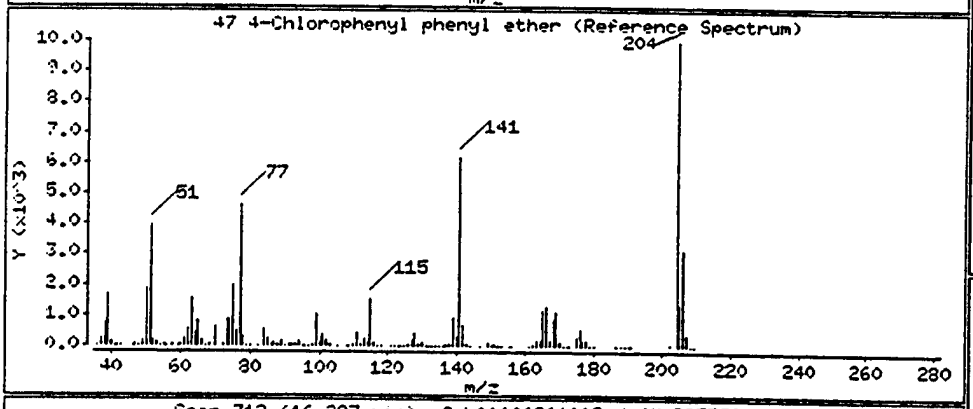
Concentration: 87.4 ug

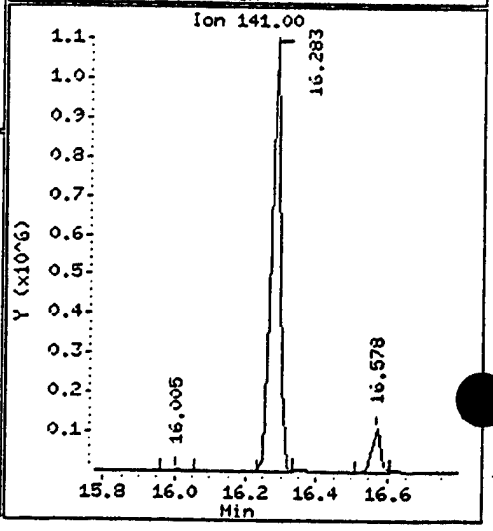


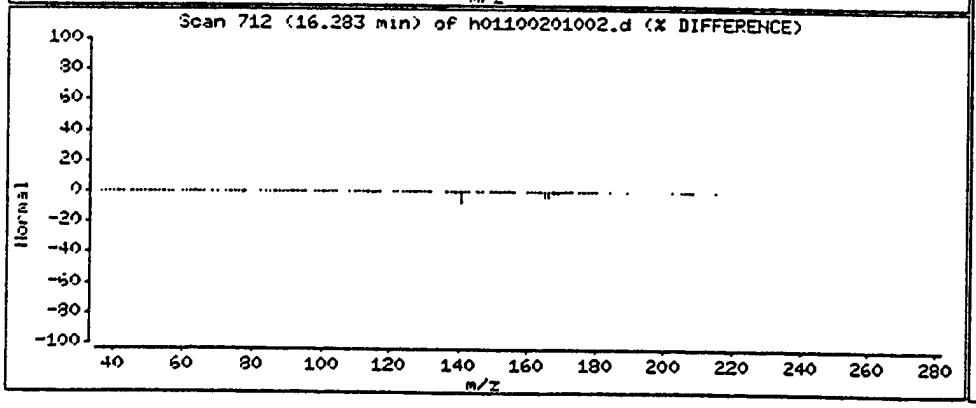












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

Operator: hch

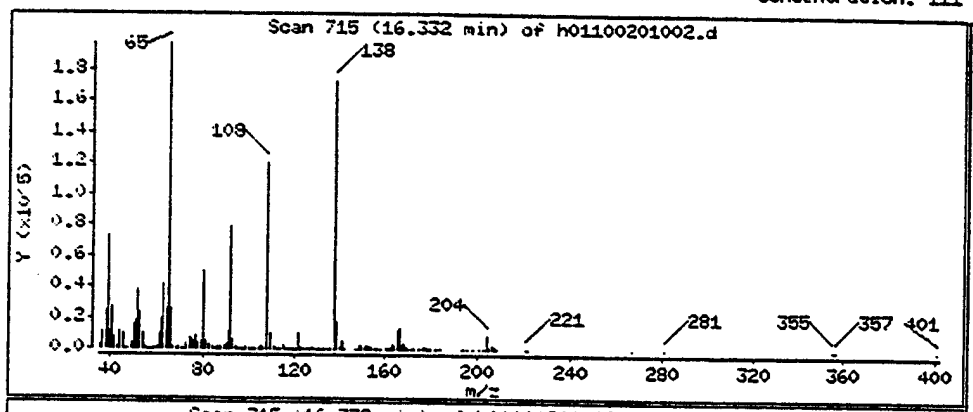
Column phase:

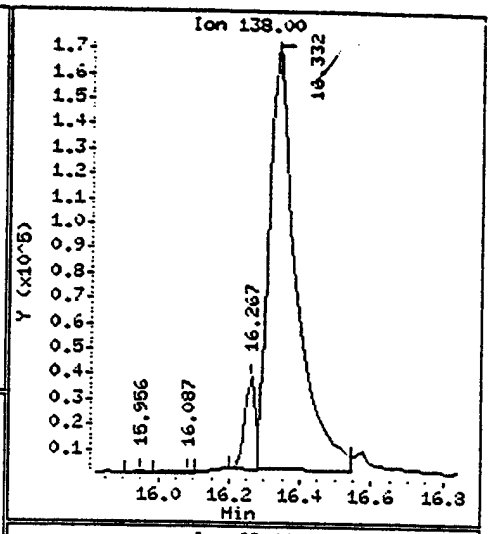
Column diameter: 2.00

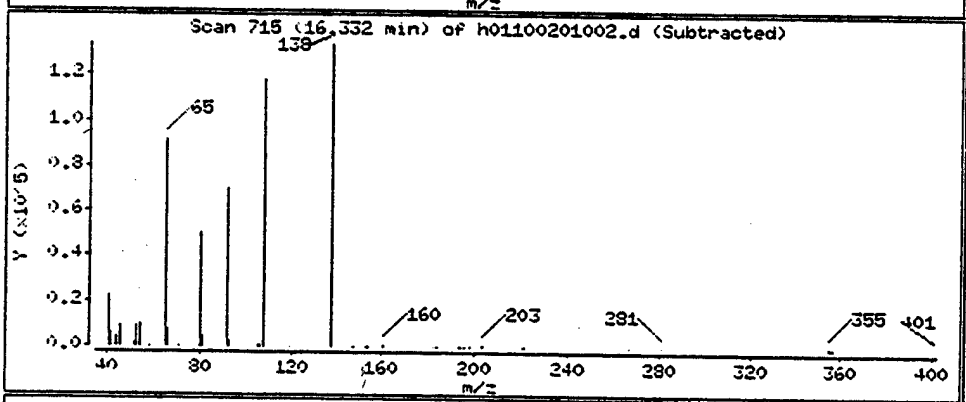
48 4-Nitroaniline

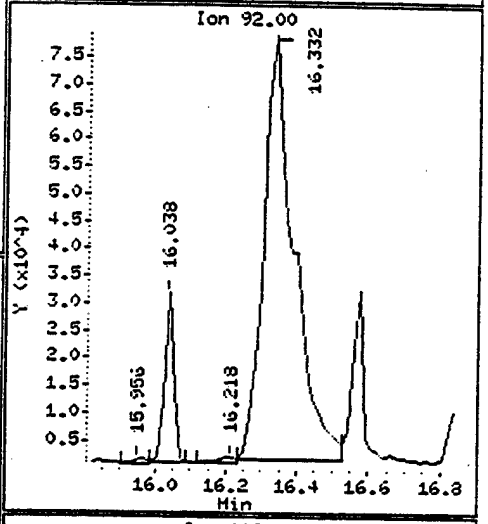
Concentration: 111 ug

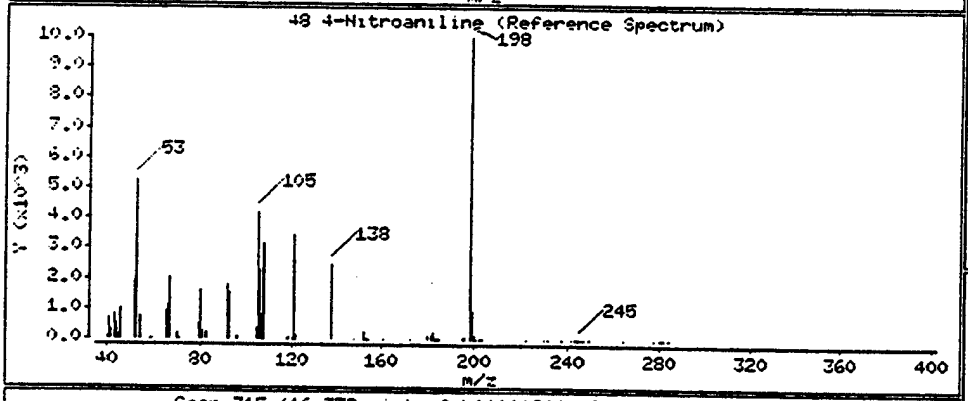
507

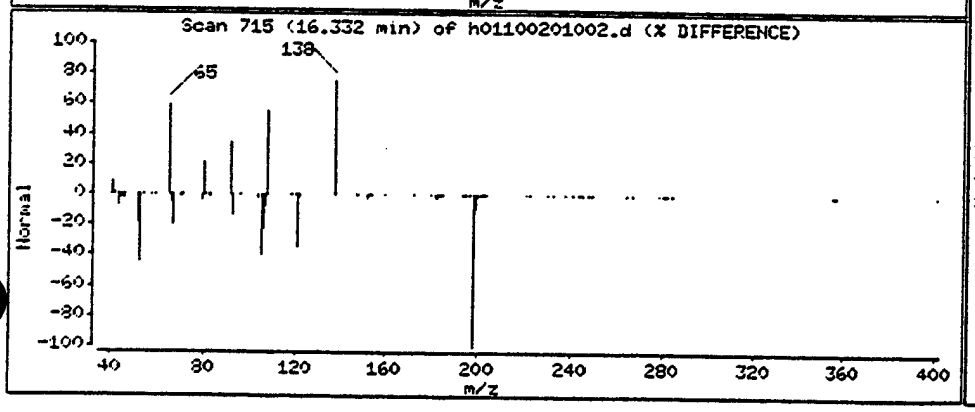


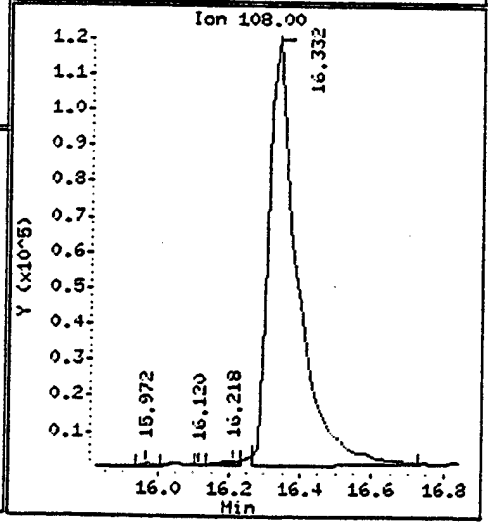












508

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

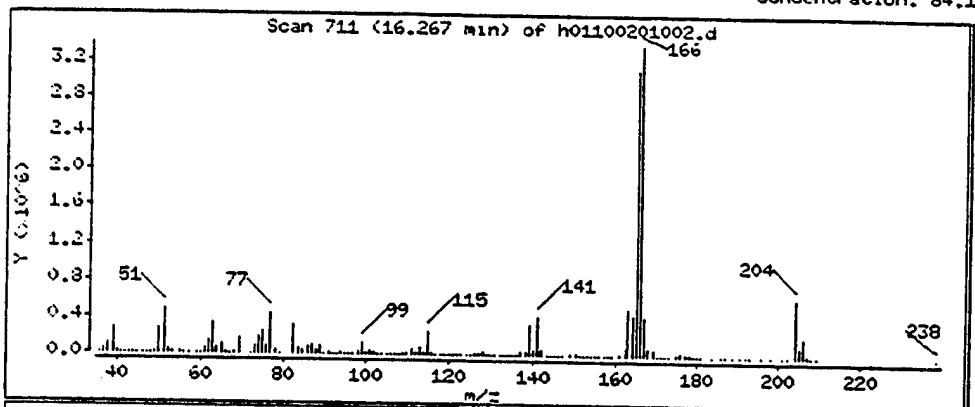
Operator: hch

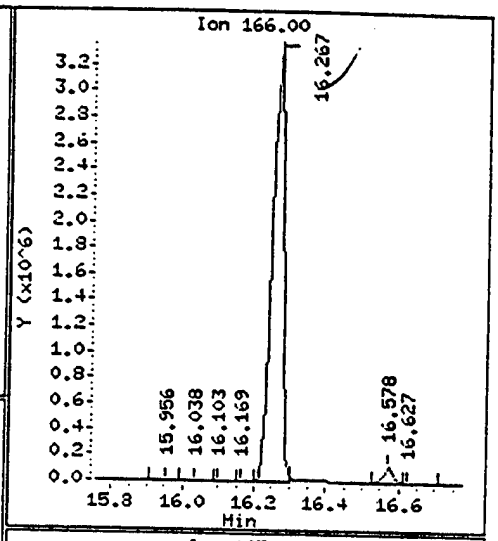
Column phase:

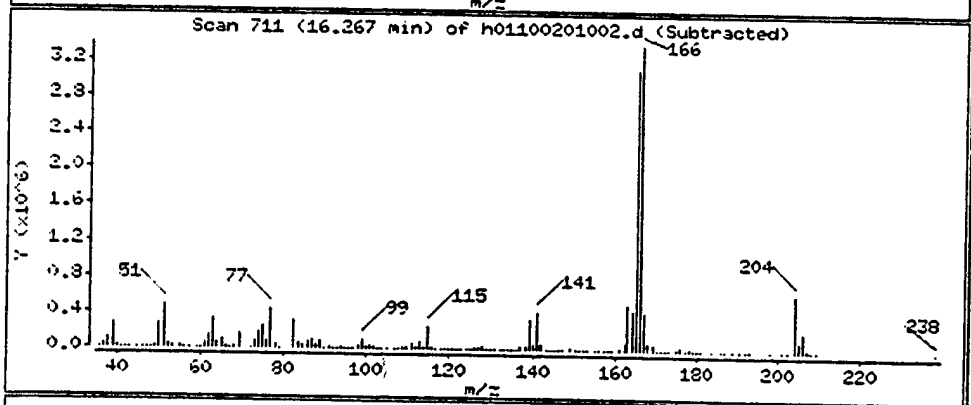
Column diameter: 2.00

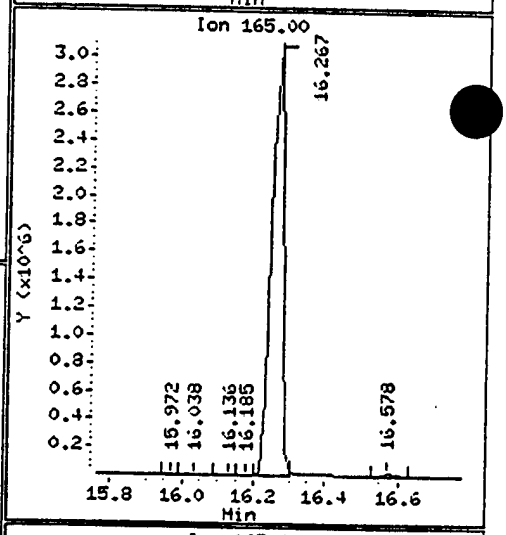
49 Fluorene

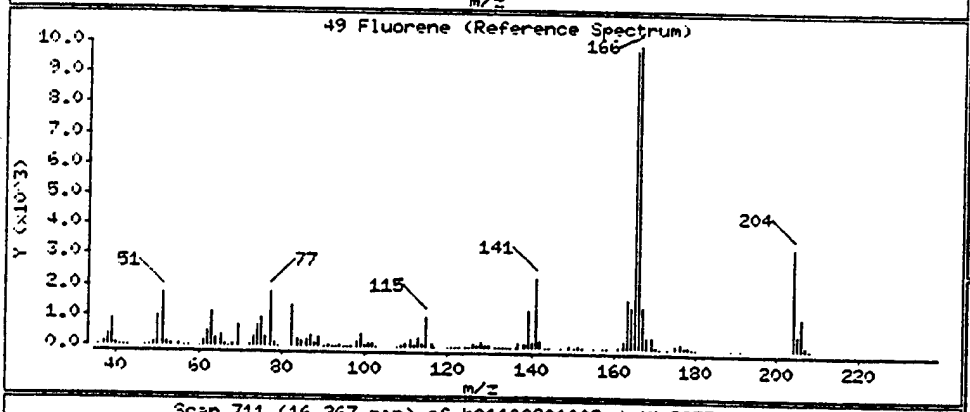
Concentration: 84.1 ug

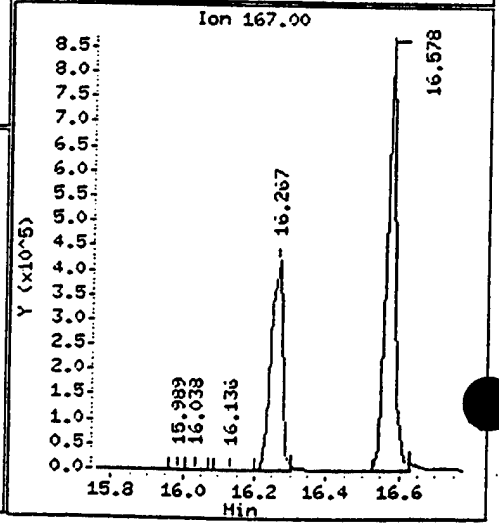


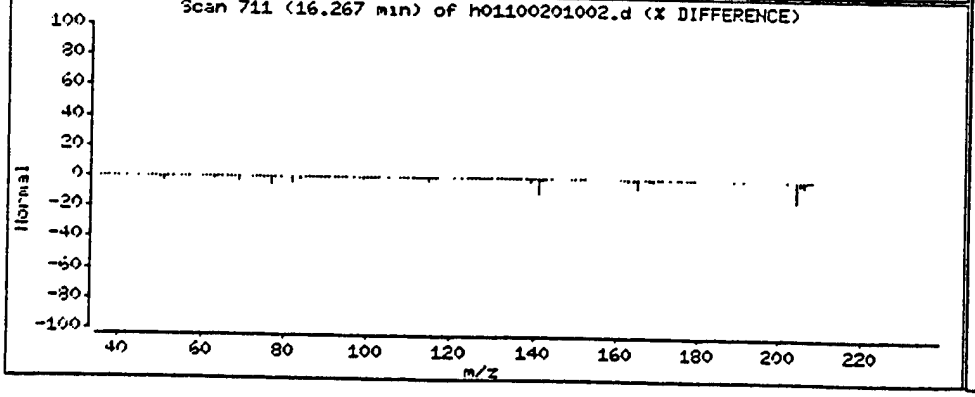












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

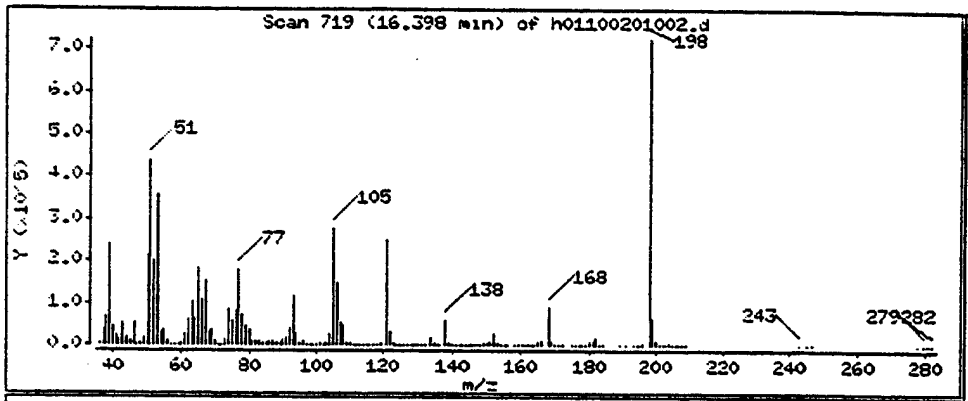
Operator: hch

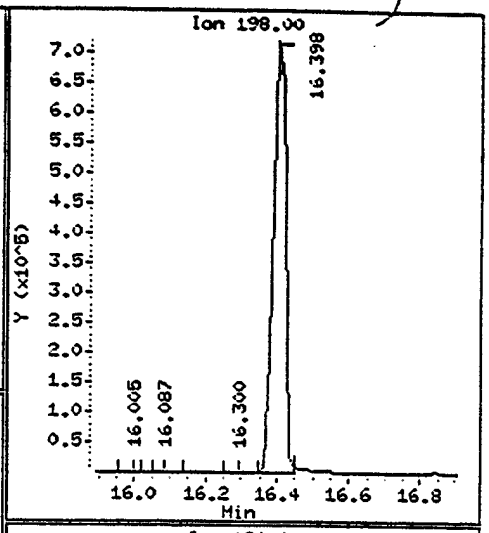
Column phase:

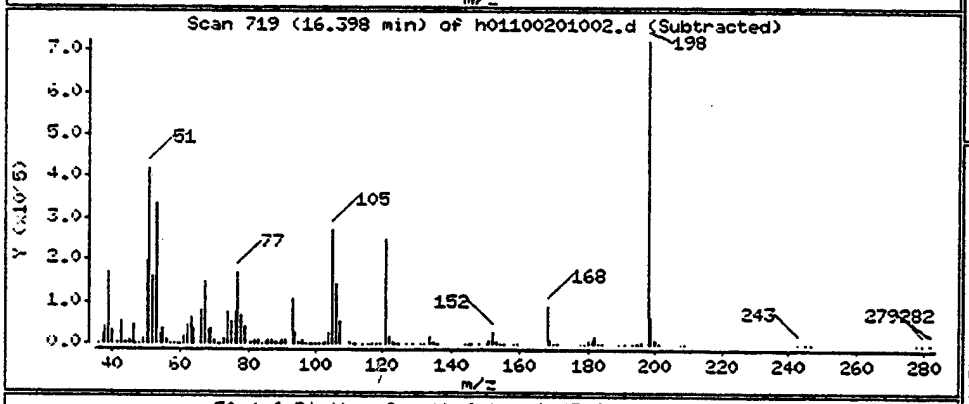
Column diameter: 2.00

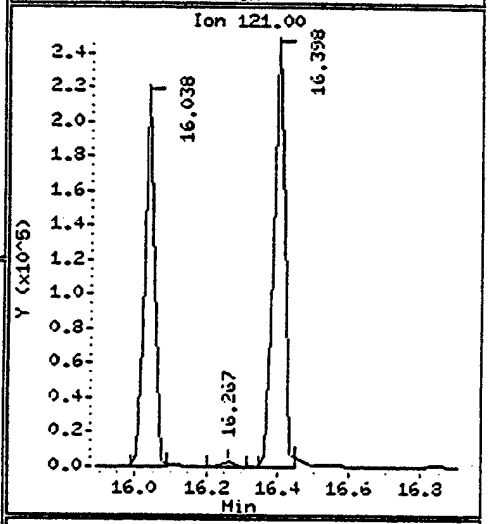
50 4,6-Dinitro-2-methylphenol

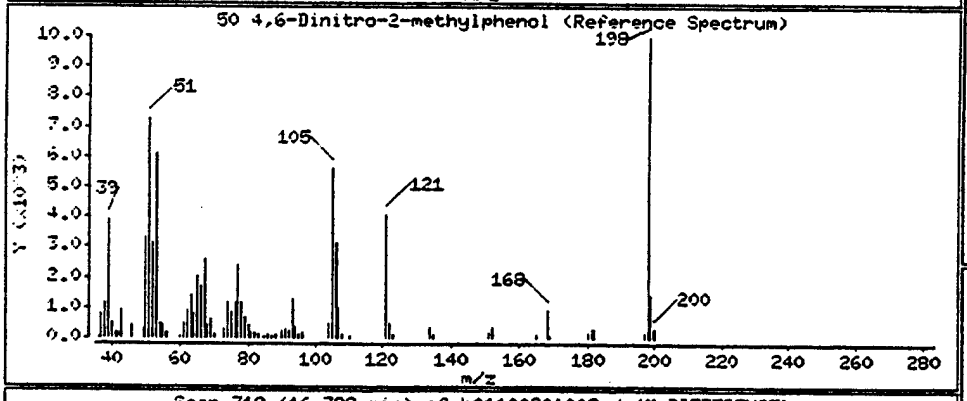
Concentration: 87.0 ug

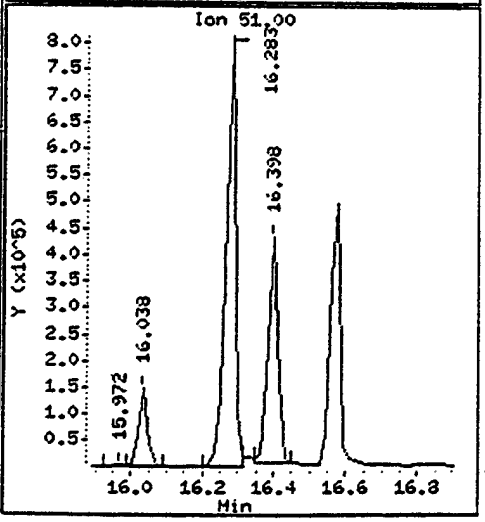


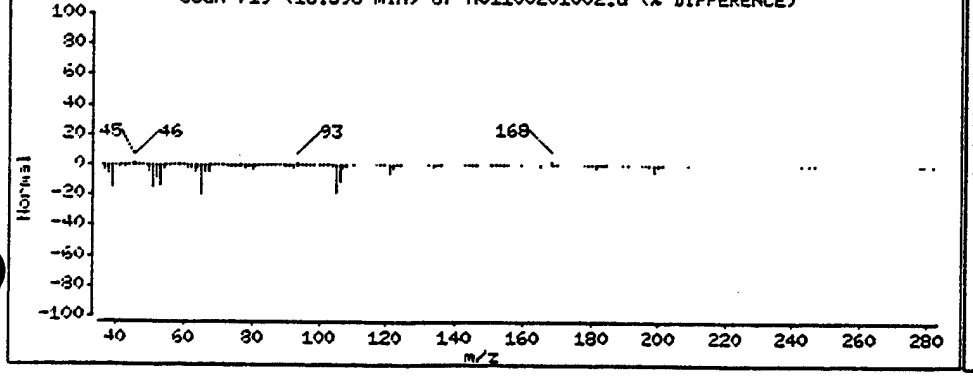












510

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

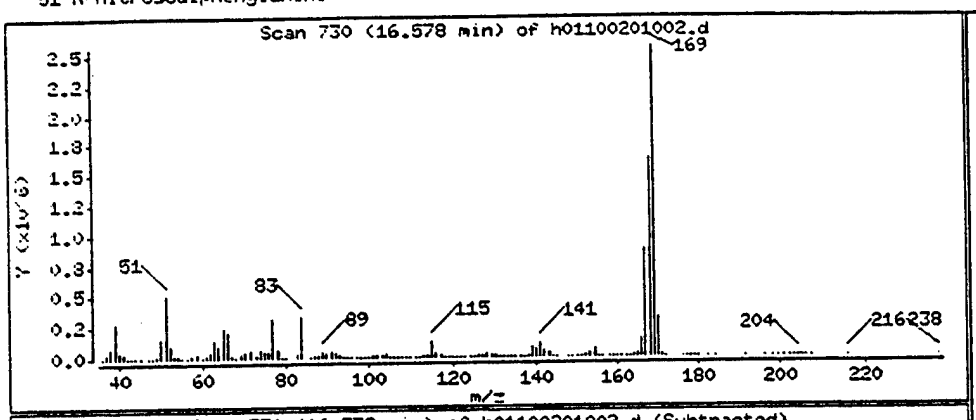
Operator: hch

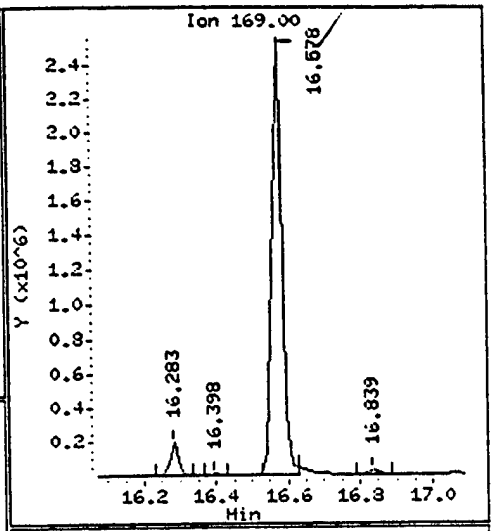
Column phase:

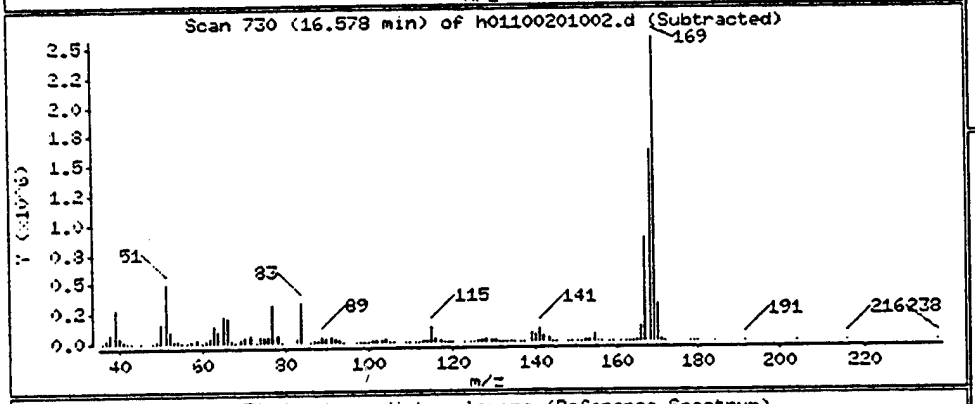
Column diameter: 2.00

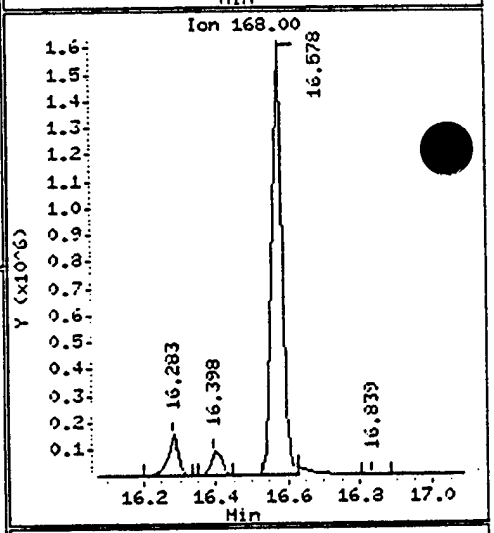
51 N-nitrosodiphenylamine

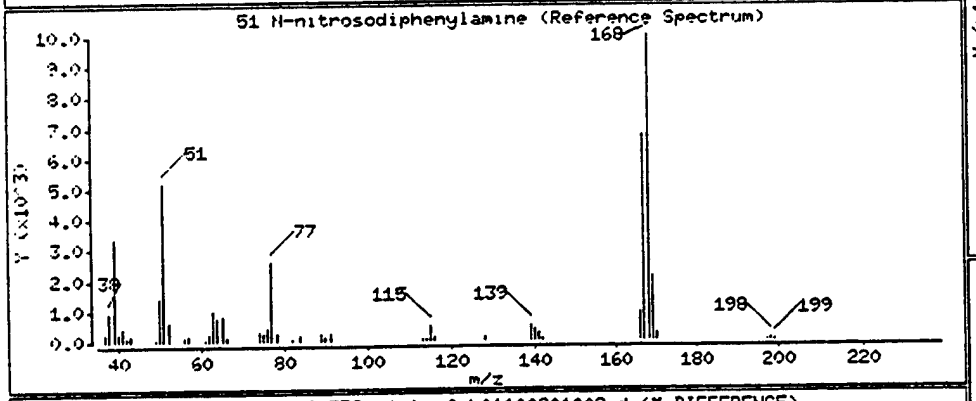
Concentration: 82.0 ug

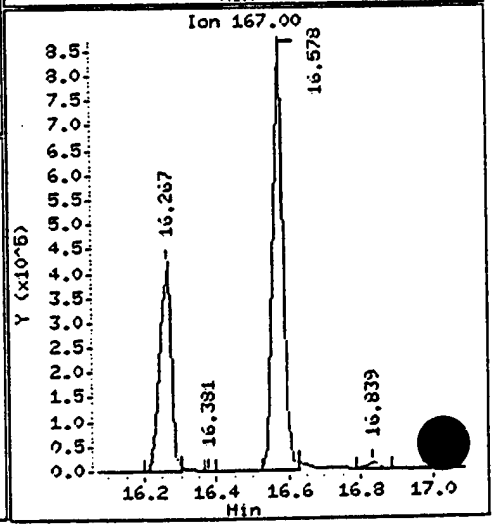


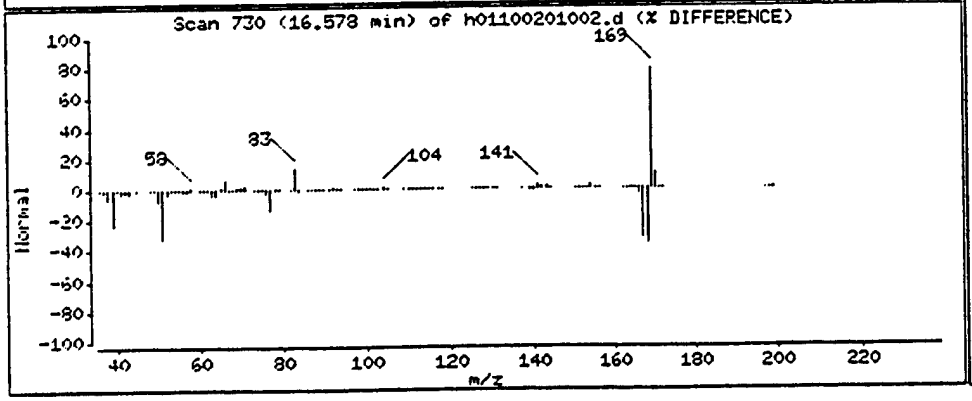












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

511

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

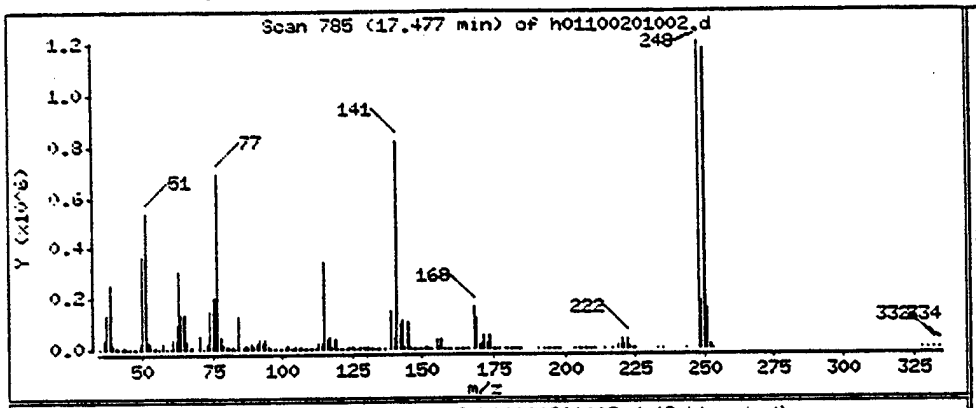
Operator: hch

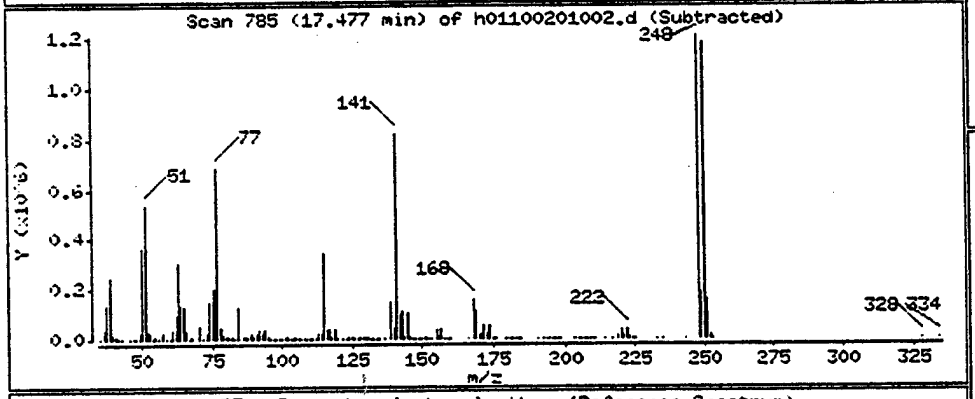
Column phase:

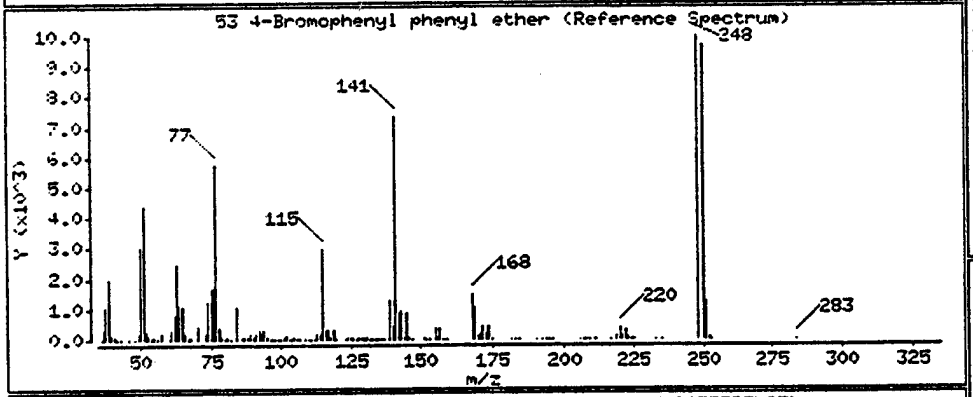
Column diameter: 2.00

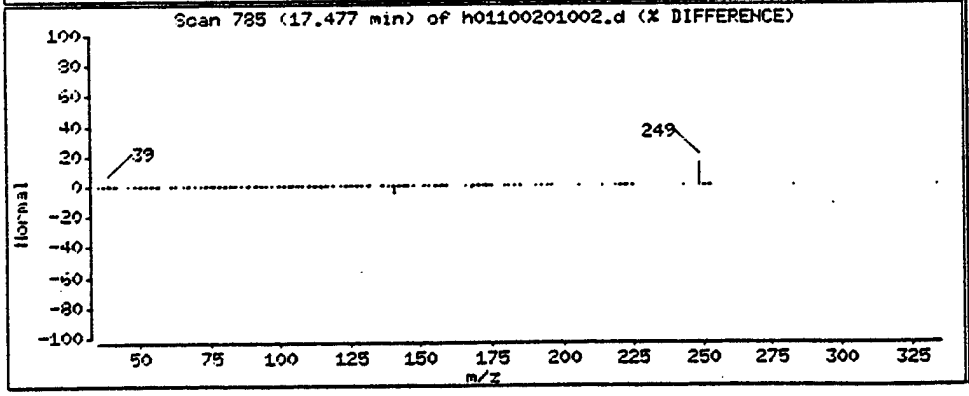
53 4-Bromophenyl phenyl ether

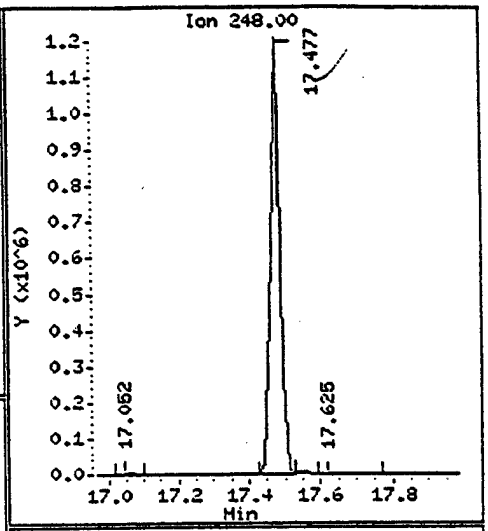
Concentration: 81.8 ug

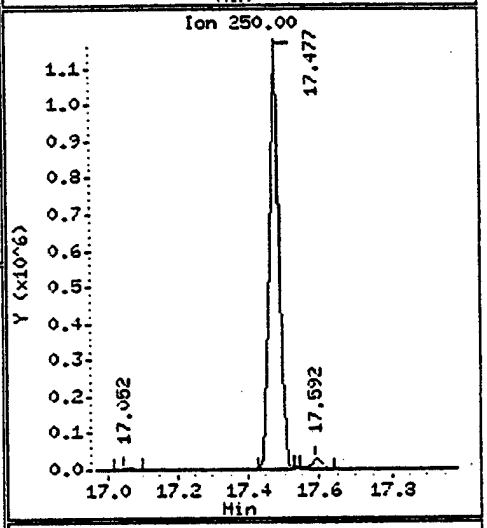


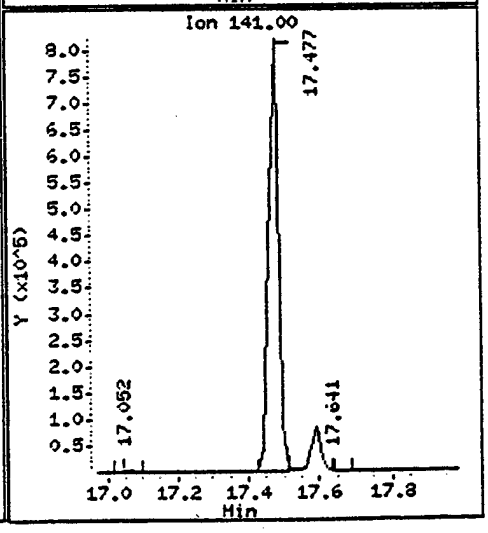












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

Operator: hch

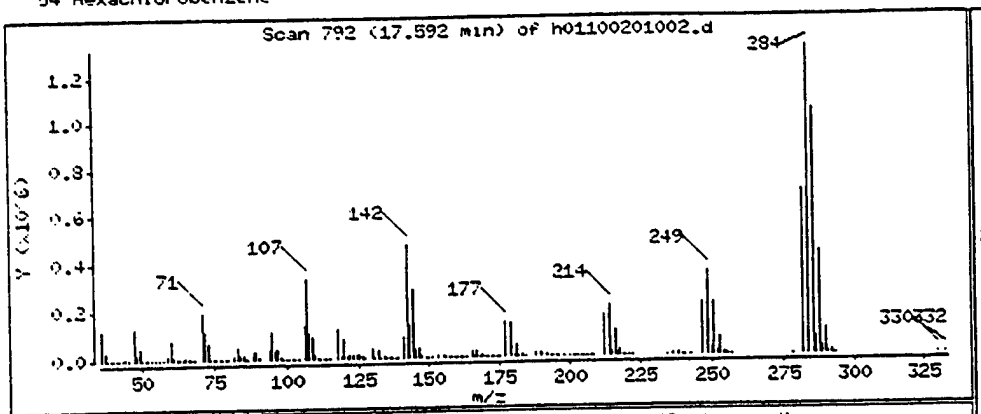
Column phase:

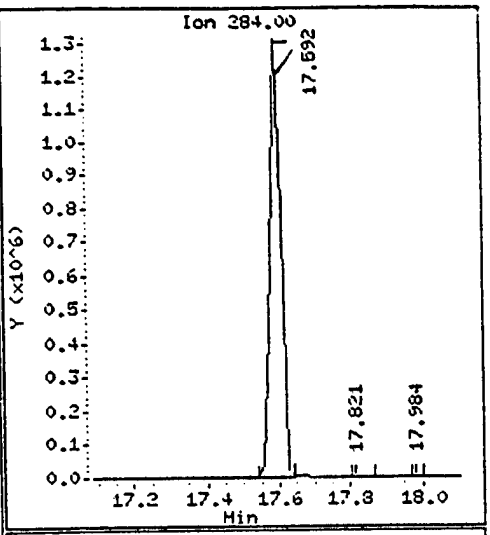
Column diameter: 2.00

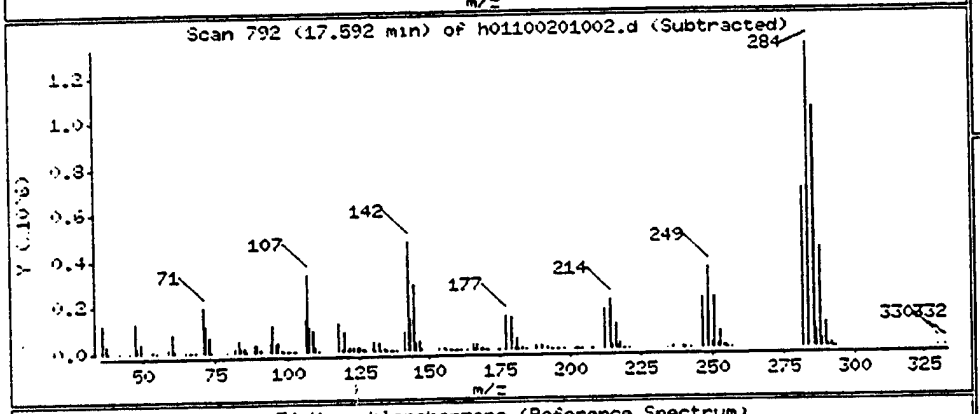
54 Hexachlorobenzene

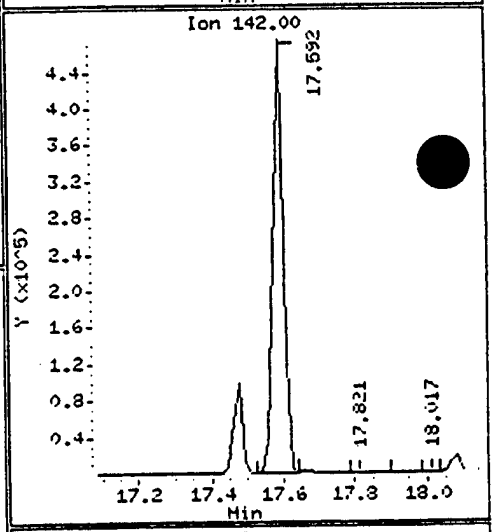
Concentration: 82.1 ug

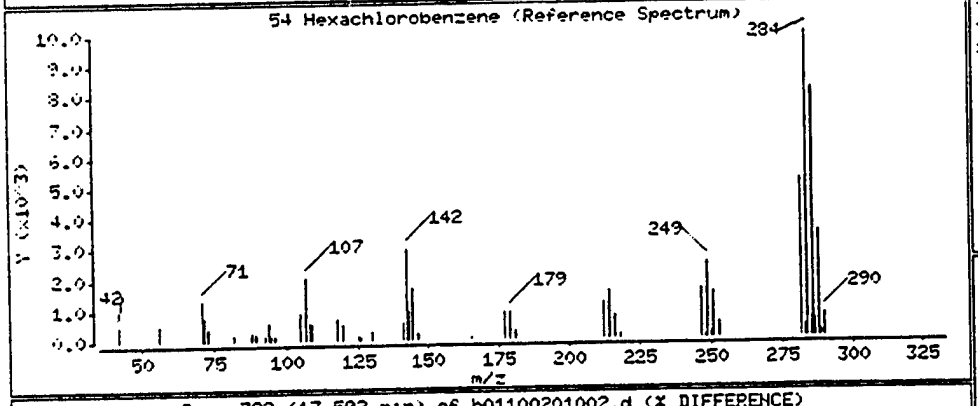
512

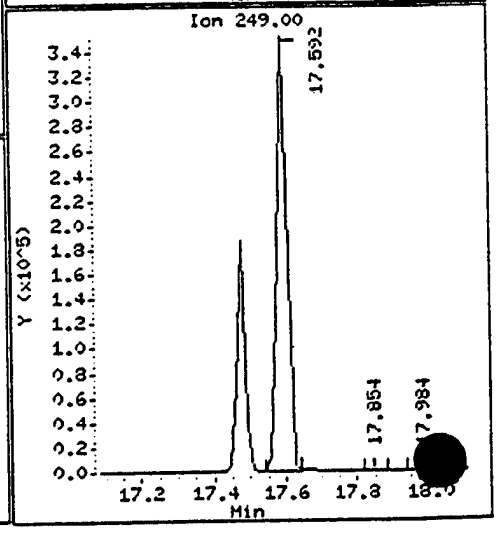


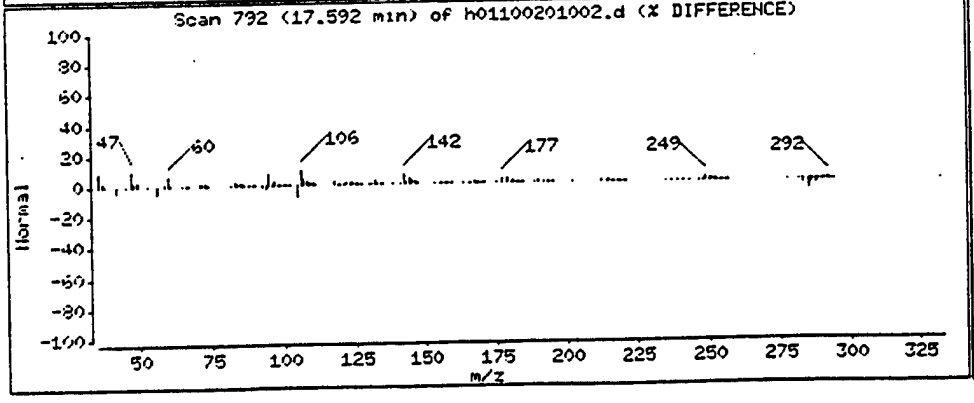












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

513

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

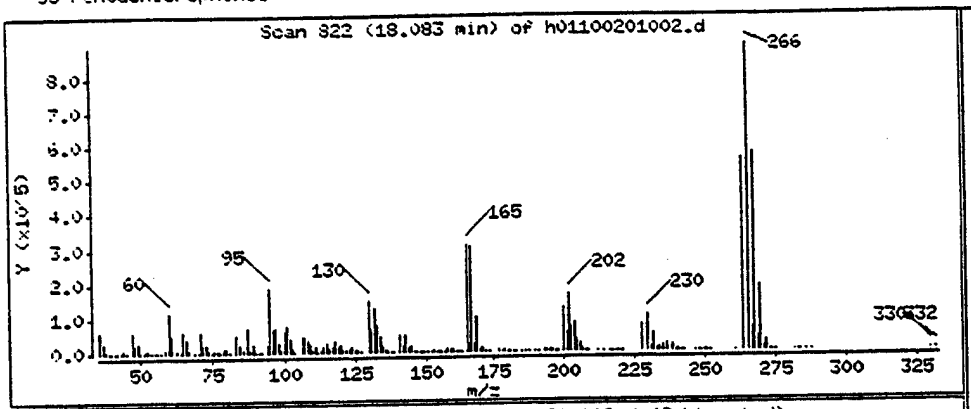
Operator: hch

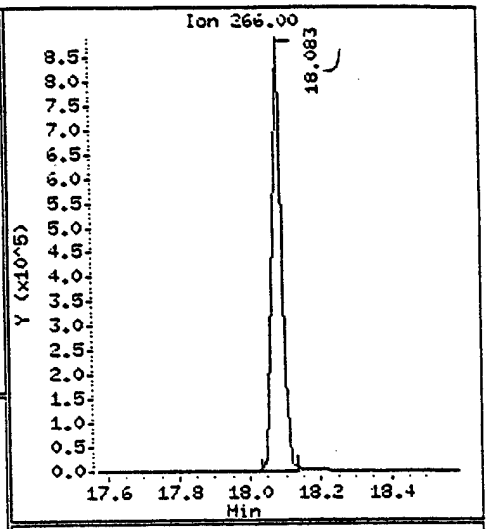
Column phase:

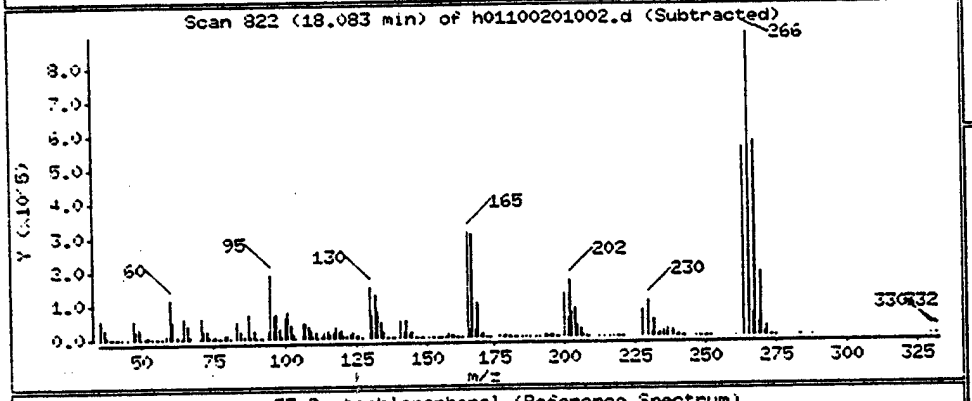
Column diameter: 2.00

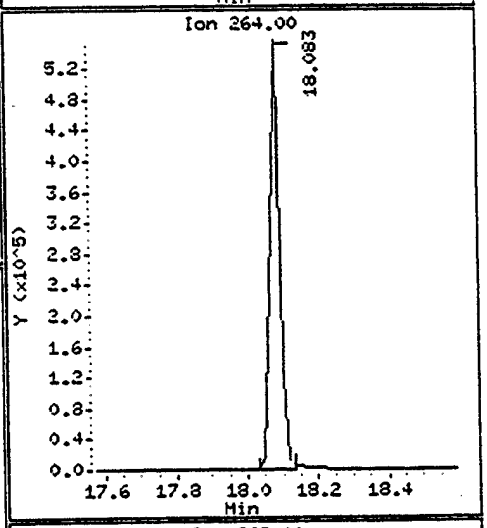
55 Pentachlorophenol

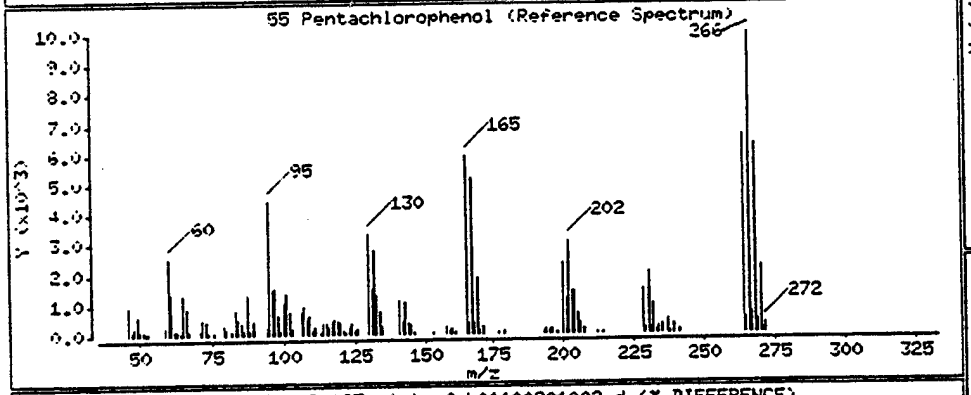
Concentration: 81.8 ug

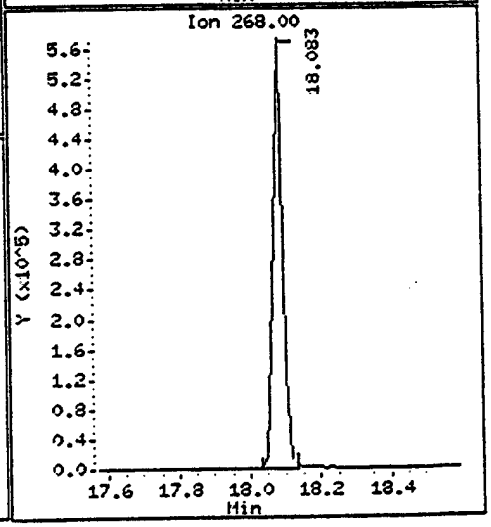


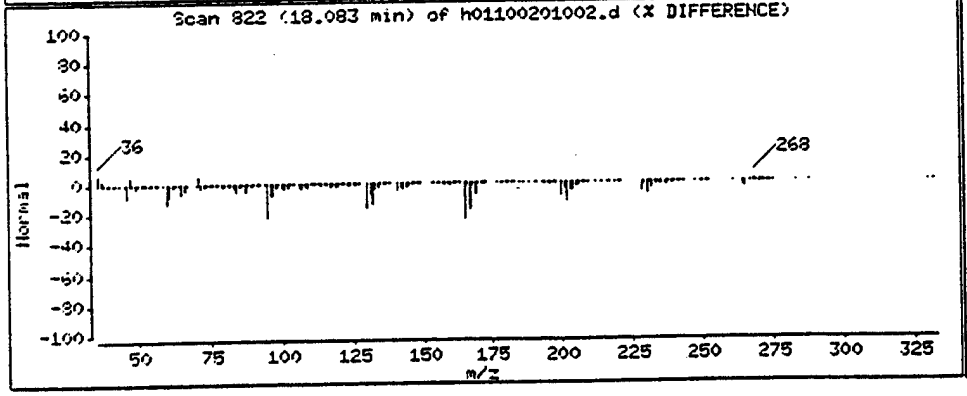












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

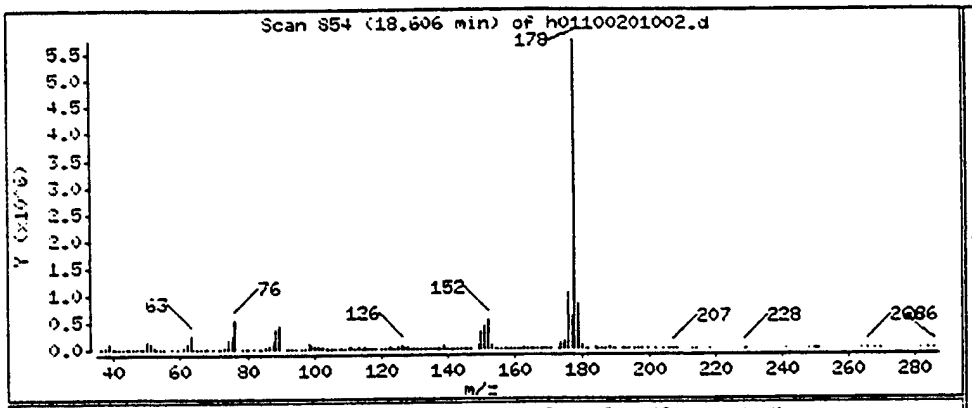
Operator: hch

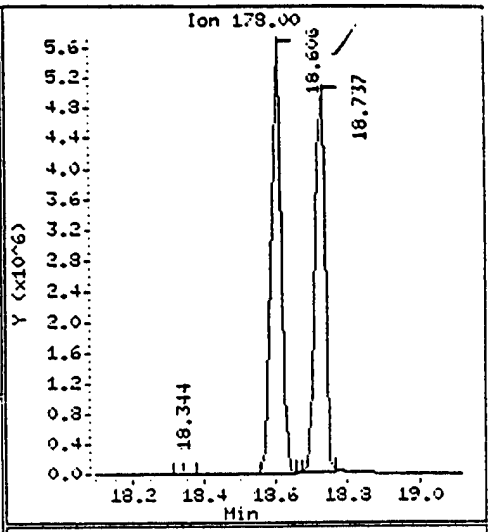
Column phase:

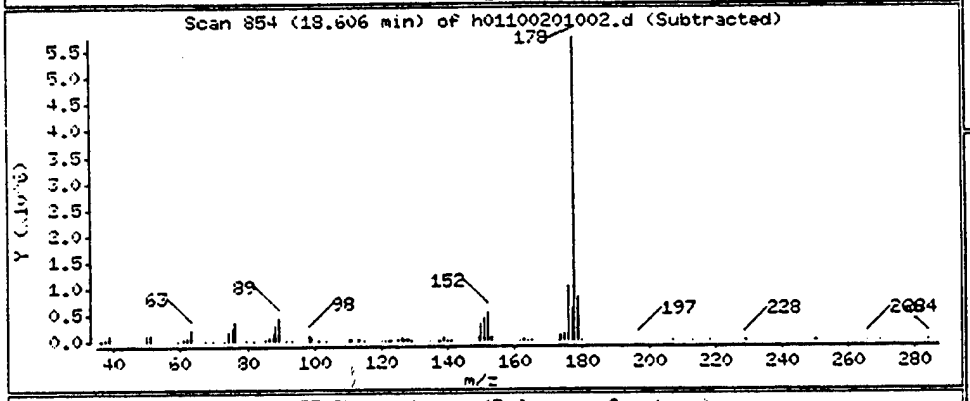
Column diameter: 2.00

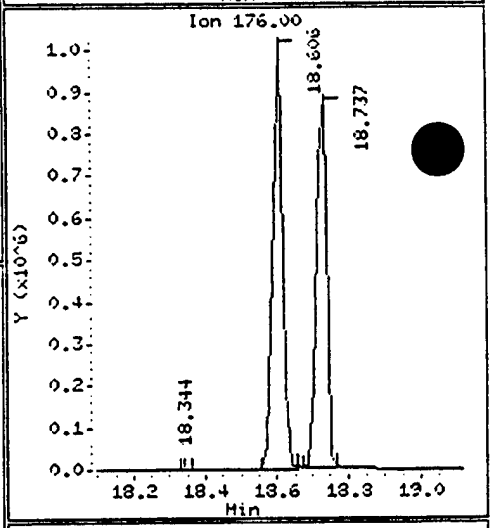
57 Phenanthrene

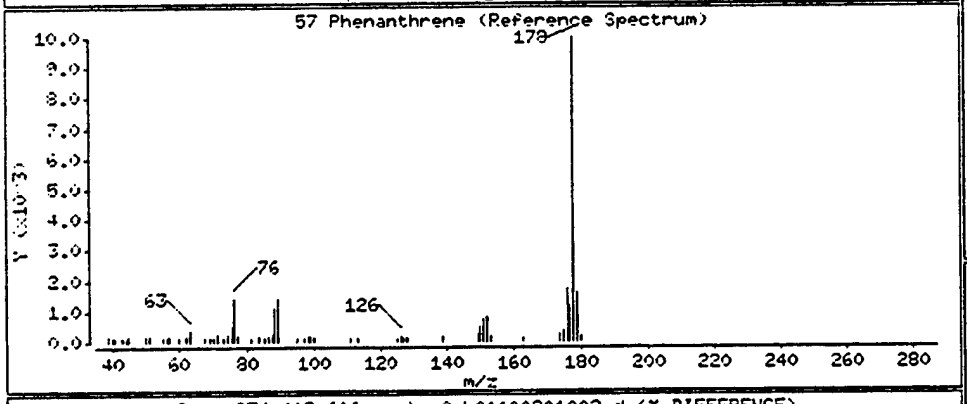
Concentration: 83.2 ug

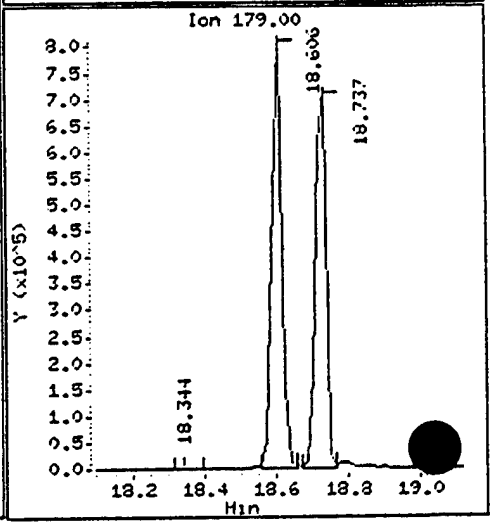


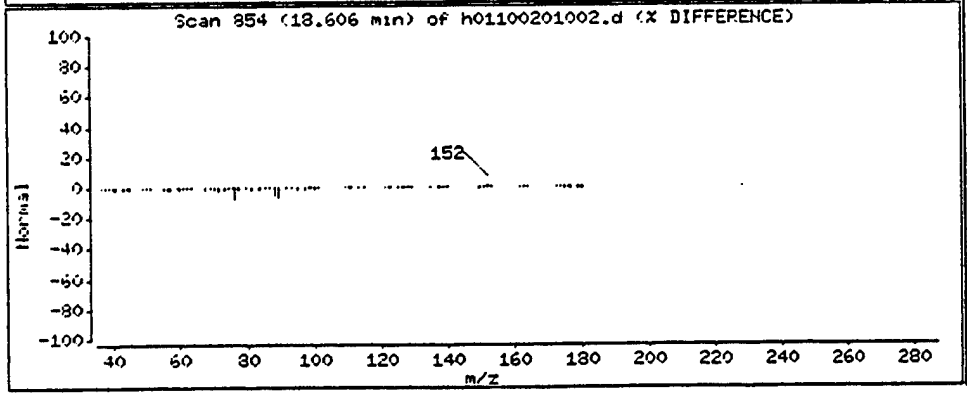












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

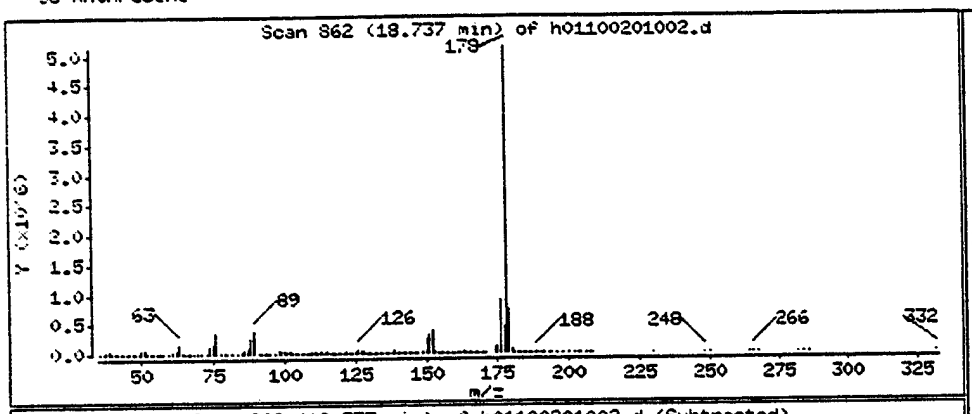
Operator: hch

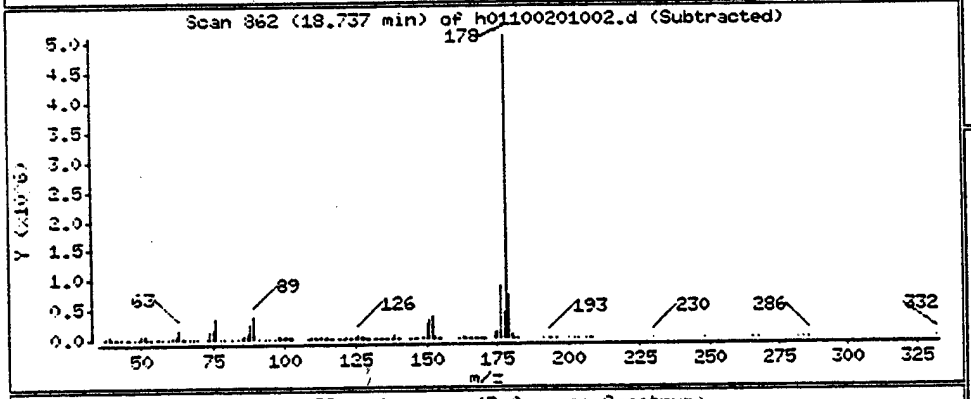
Column phase:

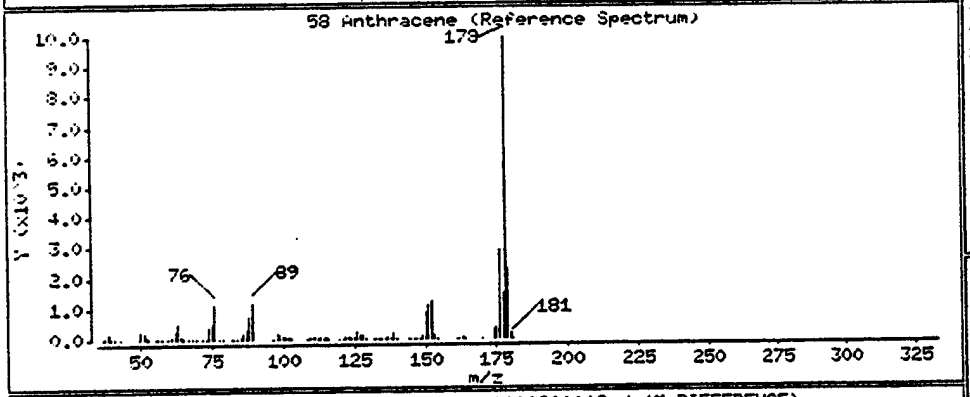
Column diameter: 2.00

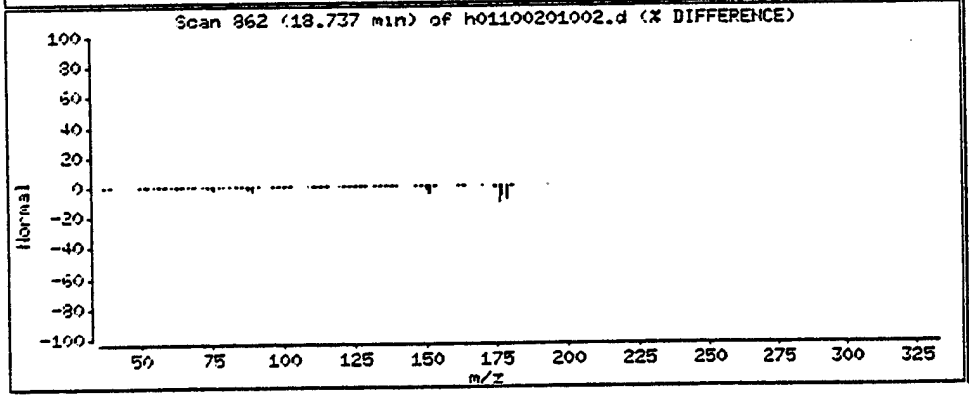
58 Anthracene

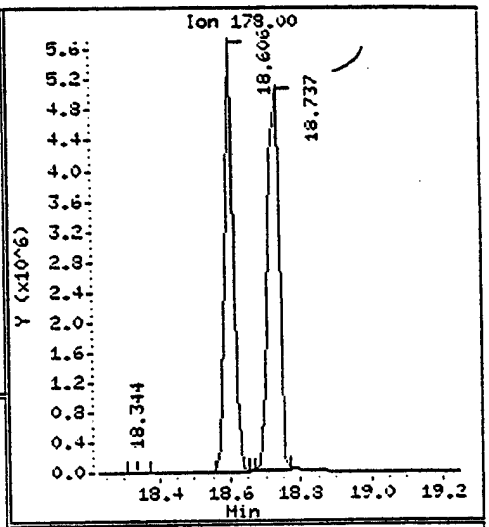
Concentration: 92.6 ug

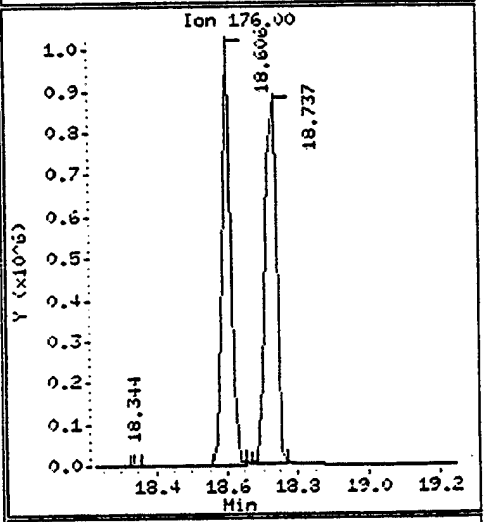


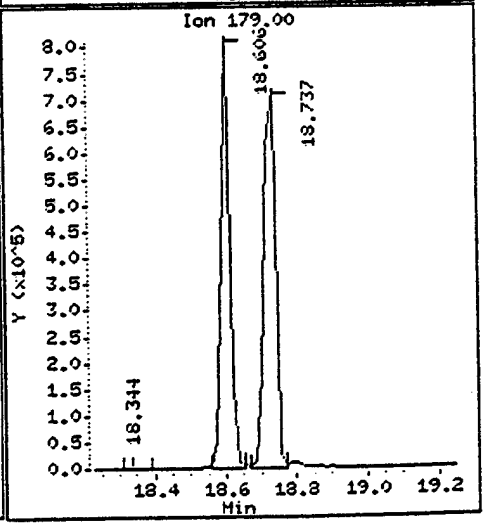












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

Operator: hch

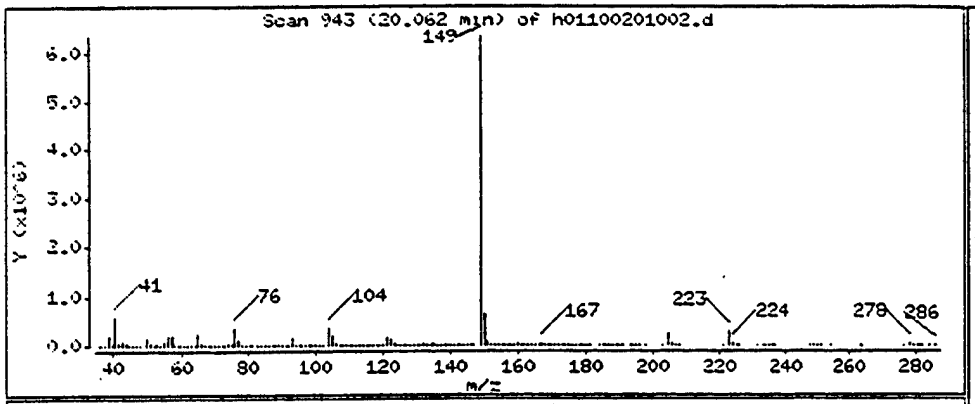
Column phase:

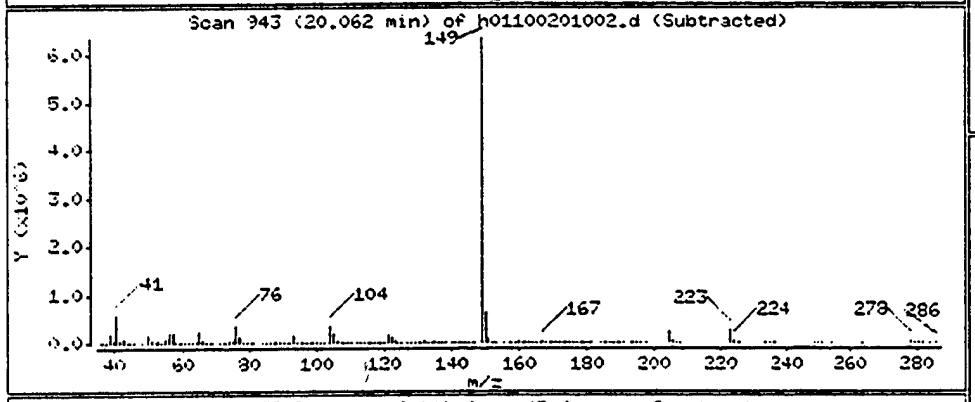
Column diameter: 2.00

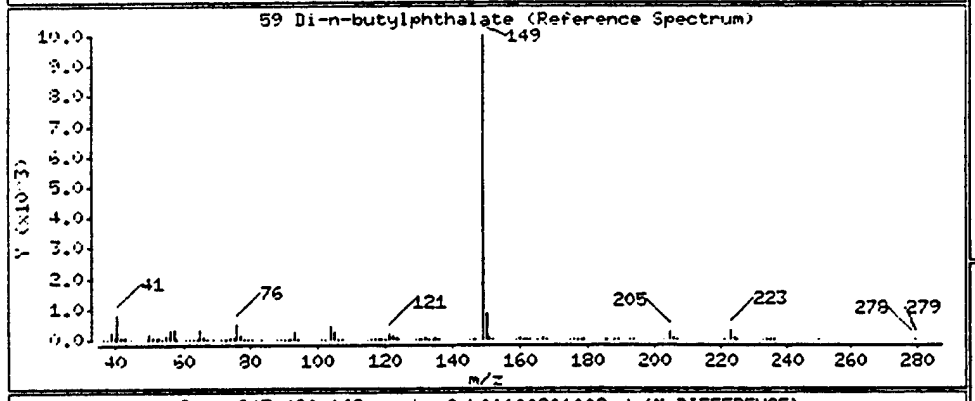
59 Di-n-butylphthalate

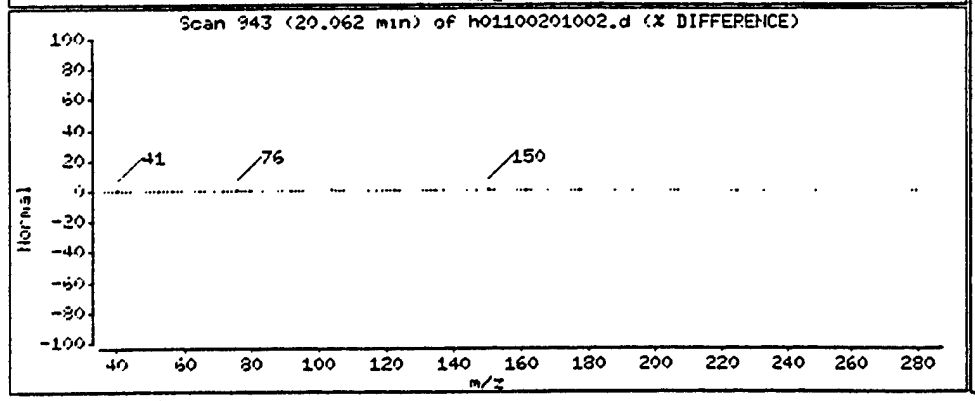
Concentration: 88.0 ug

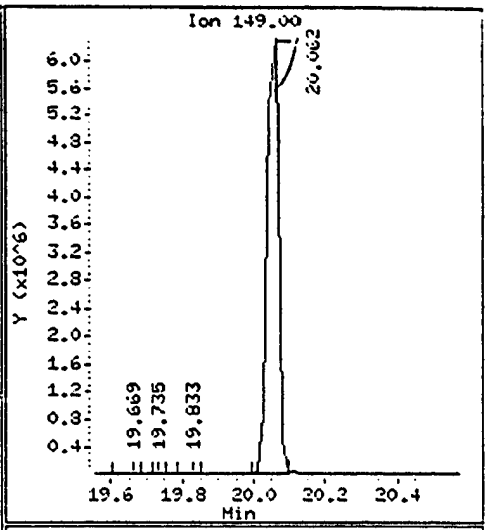
516

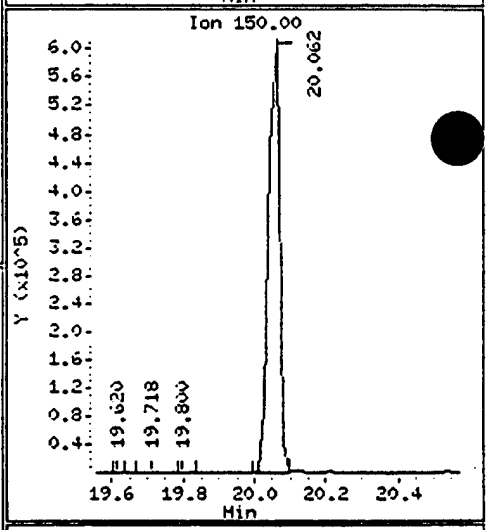


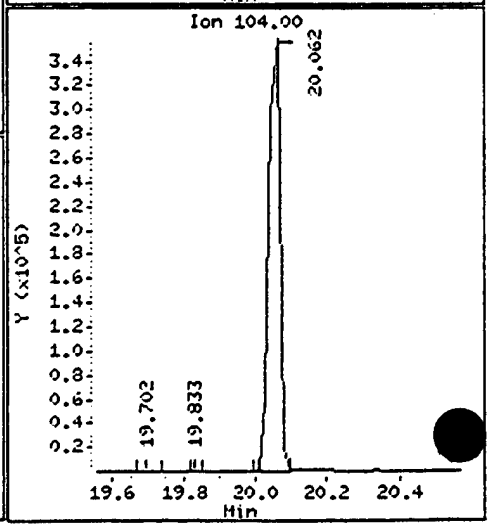












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

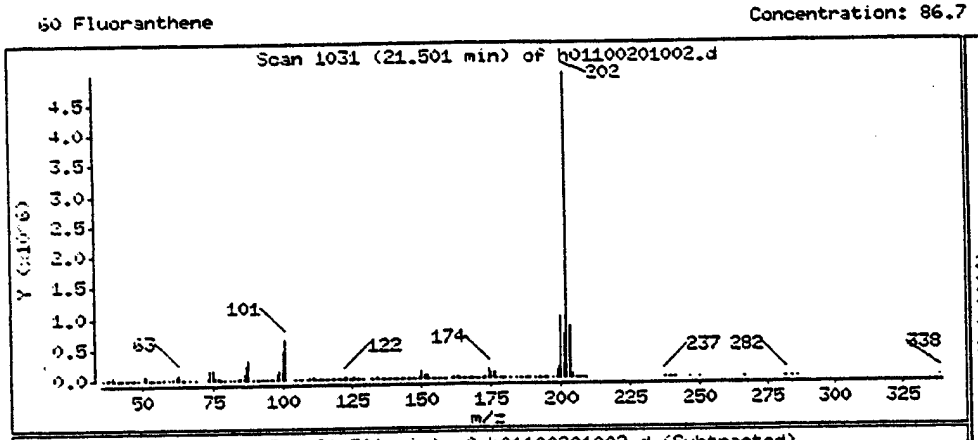
Operator: hch

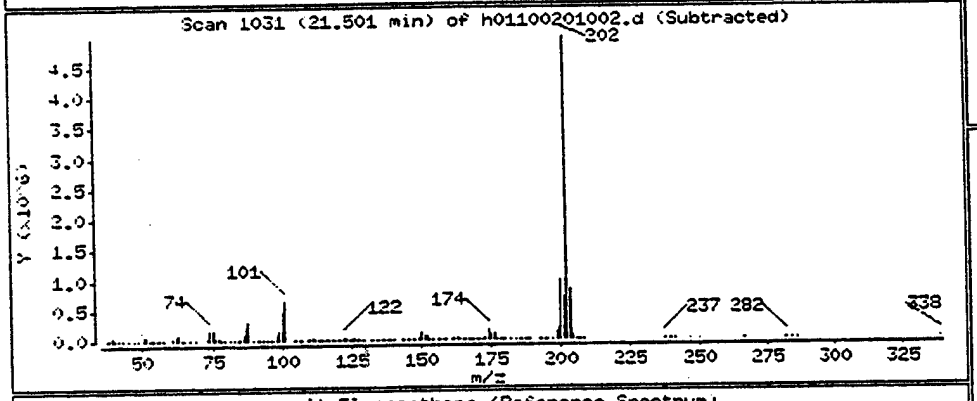
Column phase:

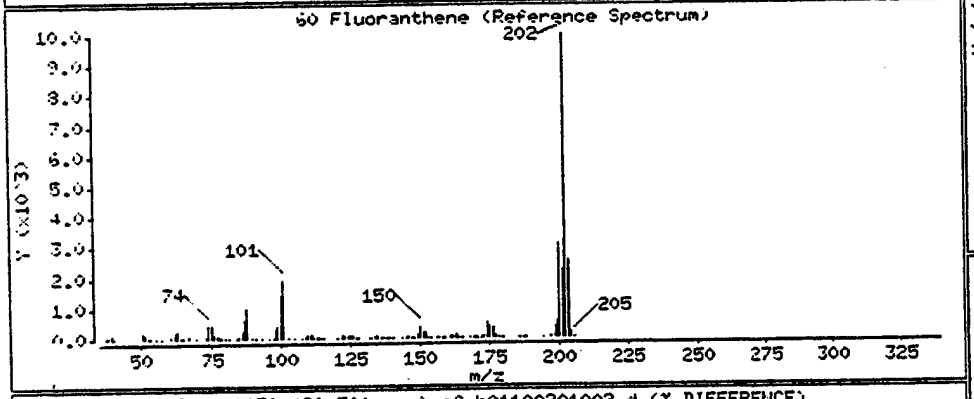
Column diameter: 2.00

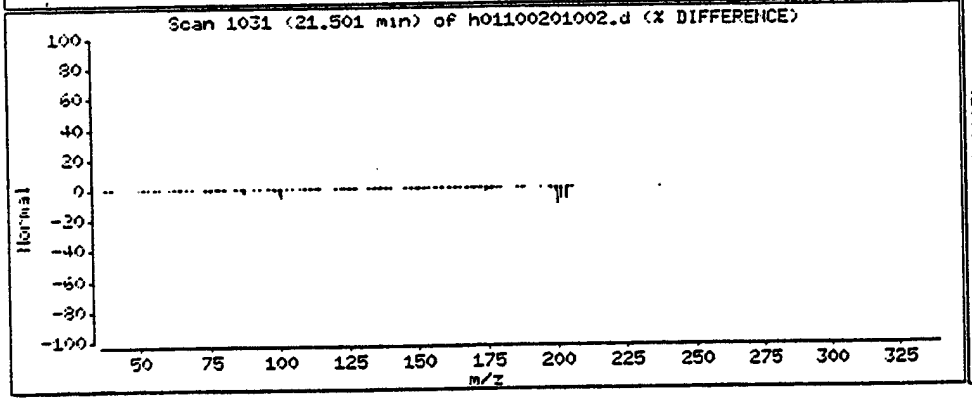
Concentration: 86.7 ug

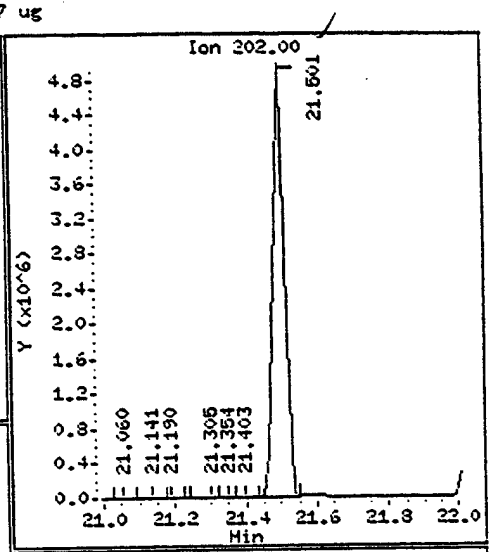
60 Fluoranthene

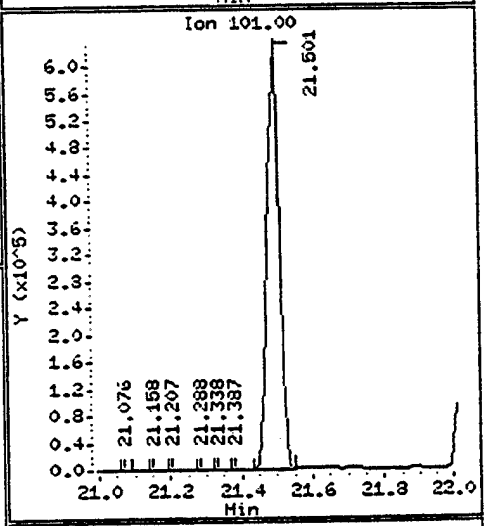


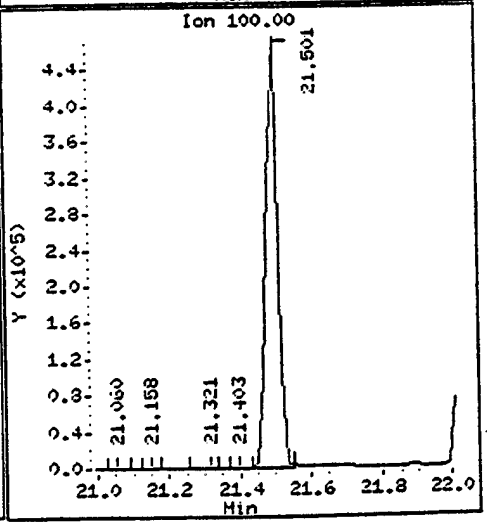












518

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

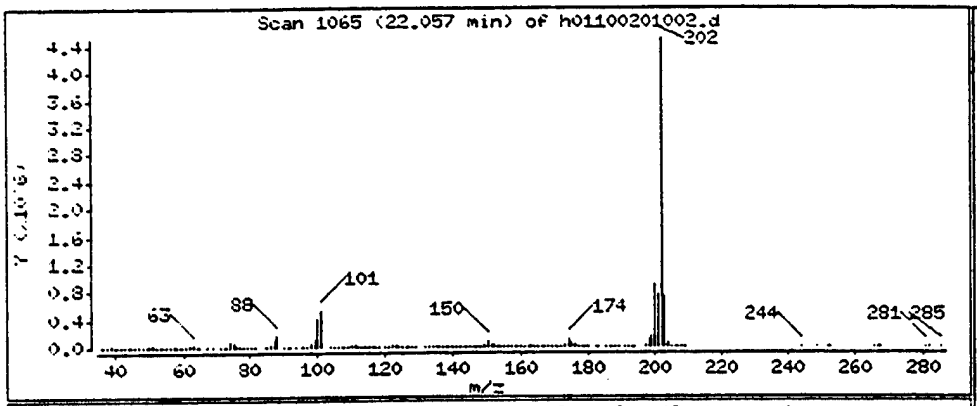
Operator: hch

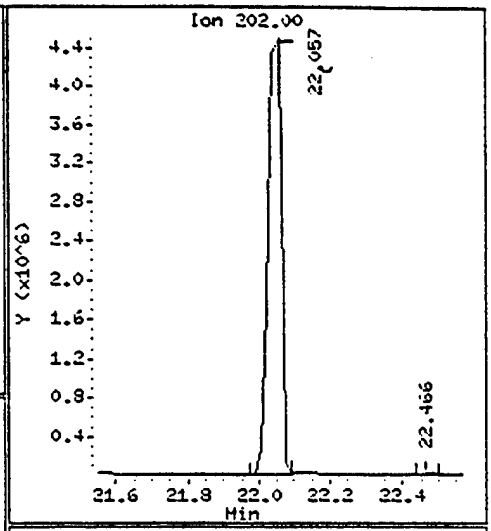
Column phase:

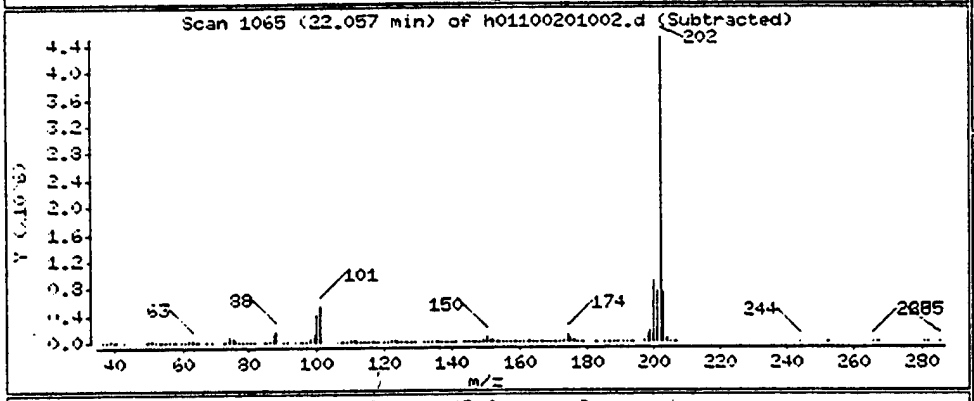
Column diameter: 2.00

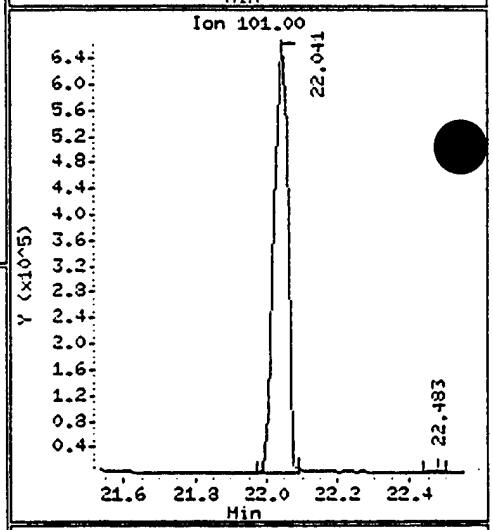
61 Pyrene

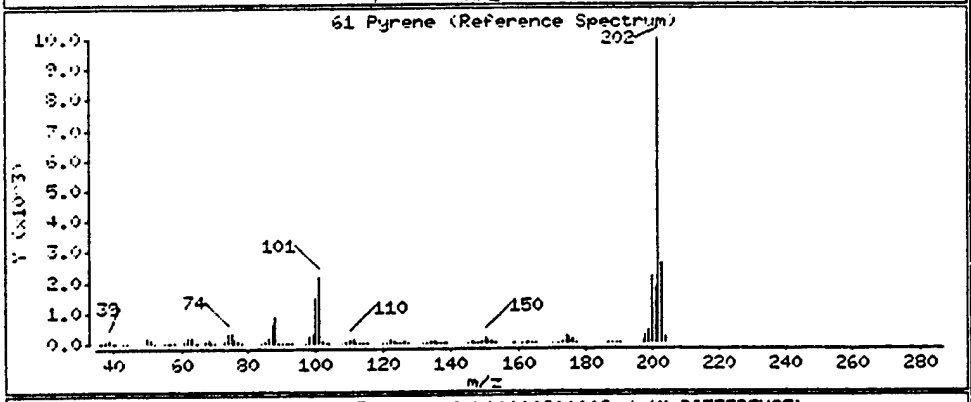
Concentration: 92.3 ug

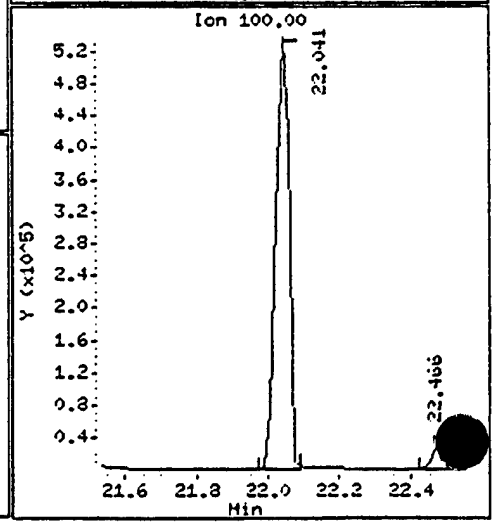


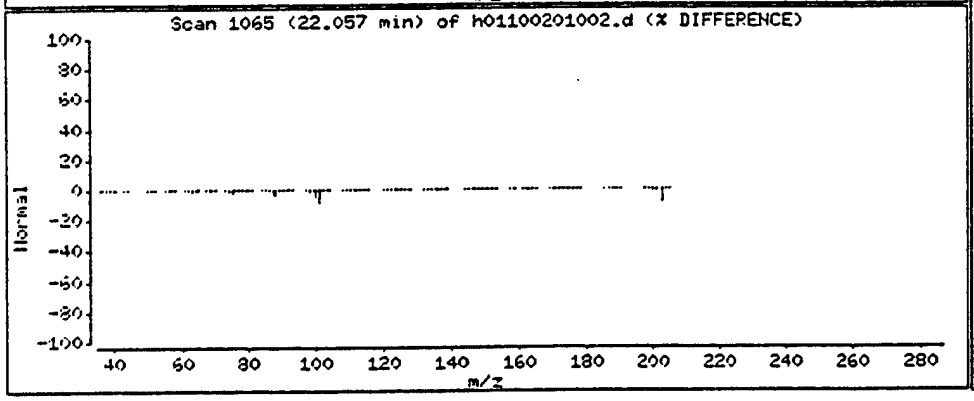












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

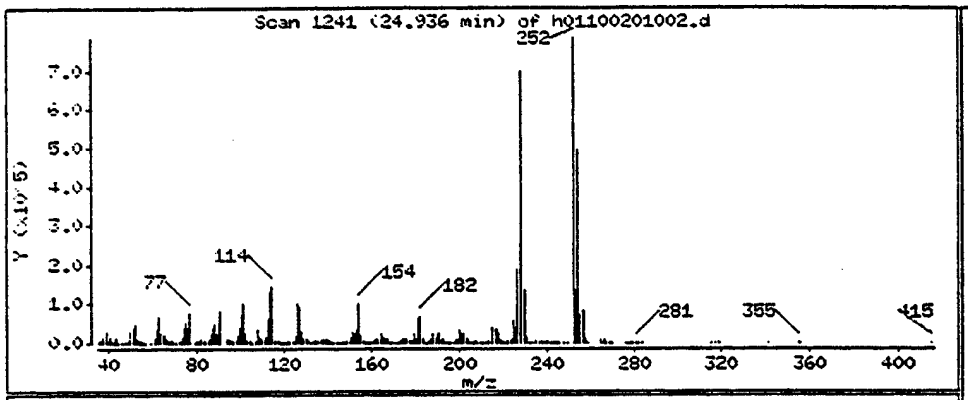
Operator: hch

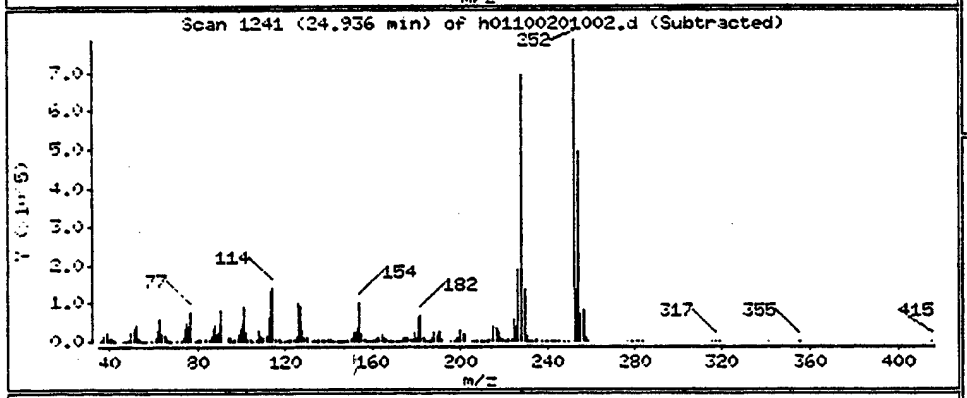
Column phase:

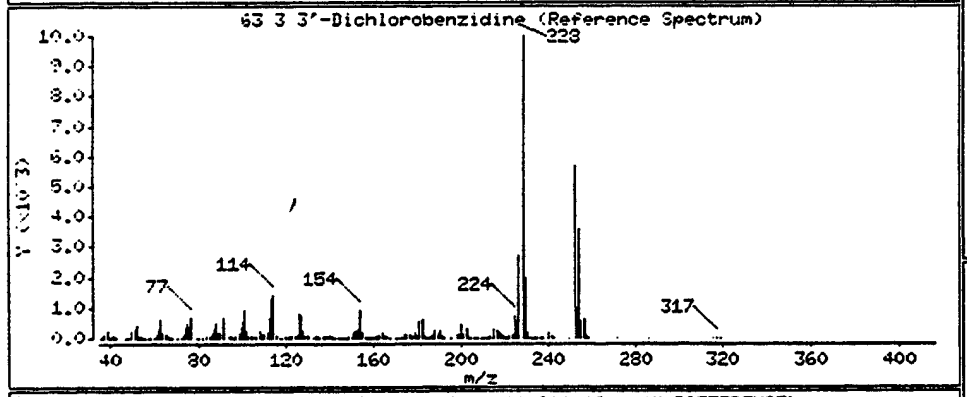
Column diameter: 2.00

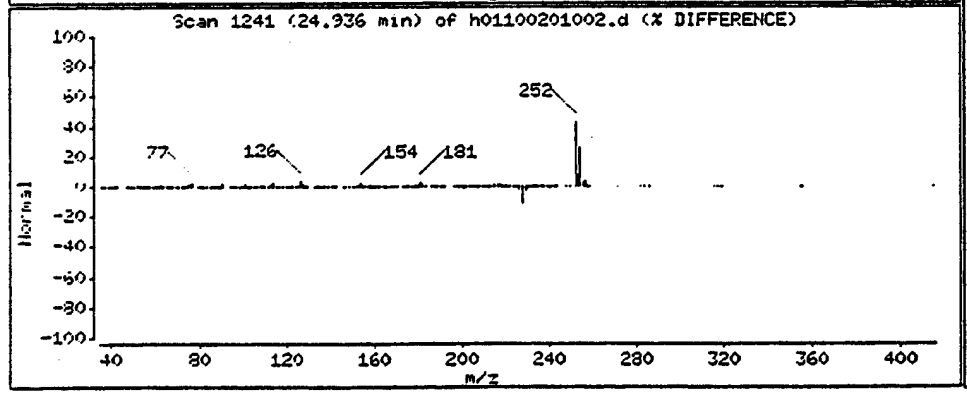
63 3 3'-Dichlorobenzidine

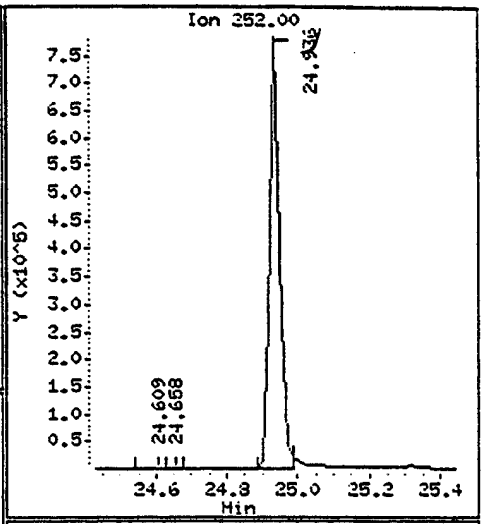
Concentration: 84.3 ug

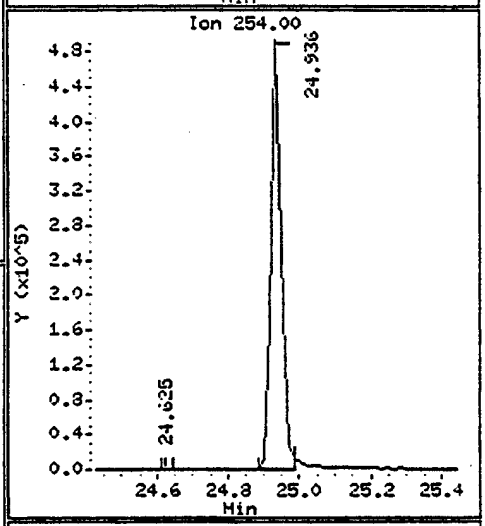


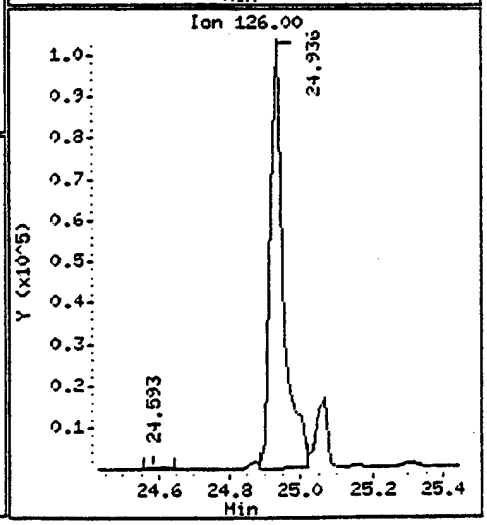












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Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Operator: hch

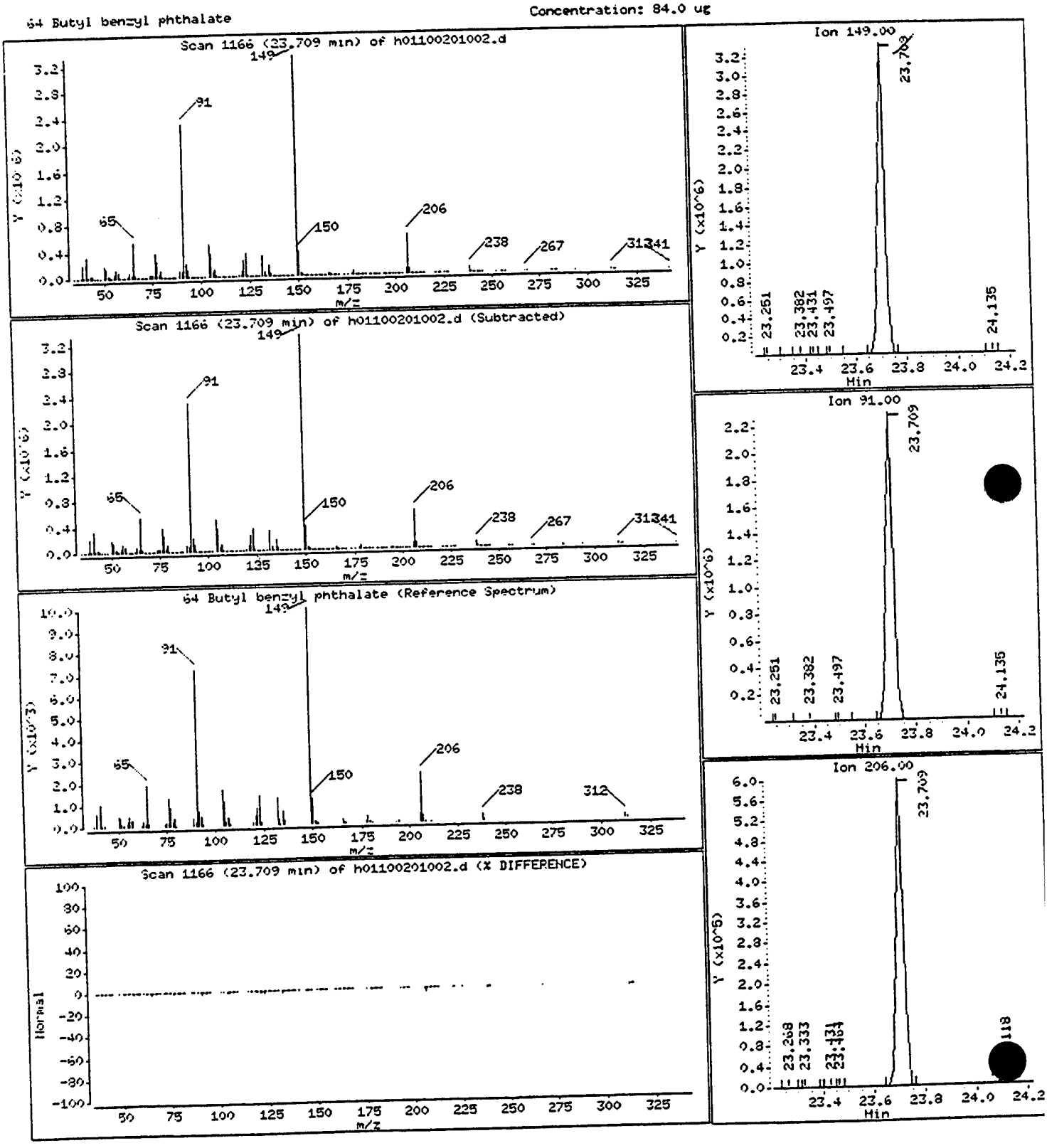
Volume Injected (uL): 1.0

Column diameter: 2.00

Column phase:

Concentration: 84.0 ug

64 Butyl benzyl phthalate



Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

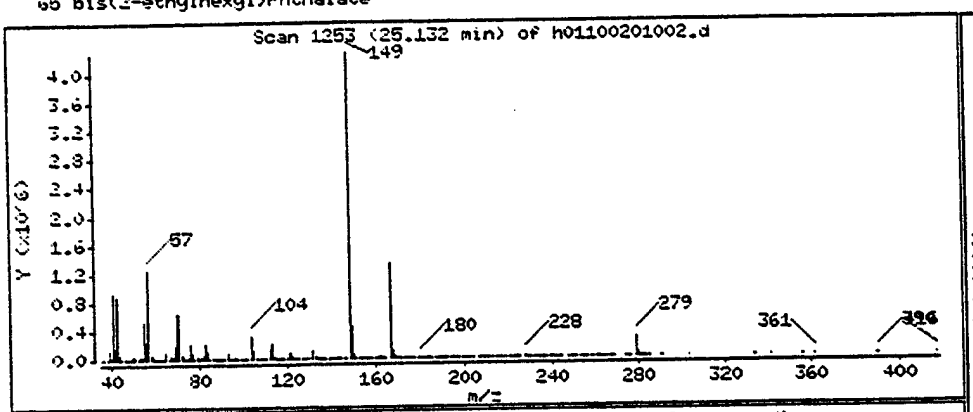
Operator: hch

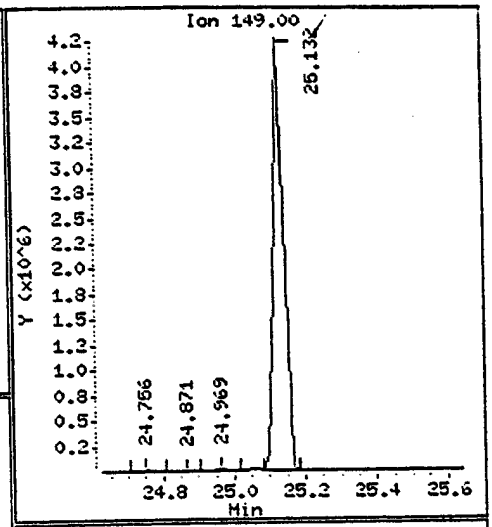
Column phase:

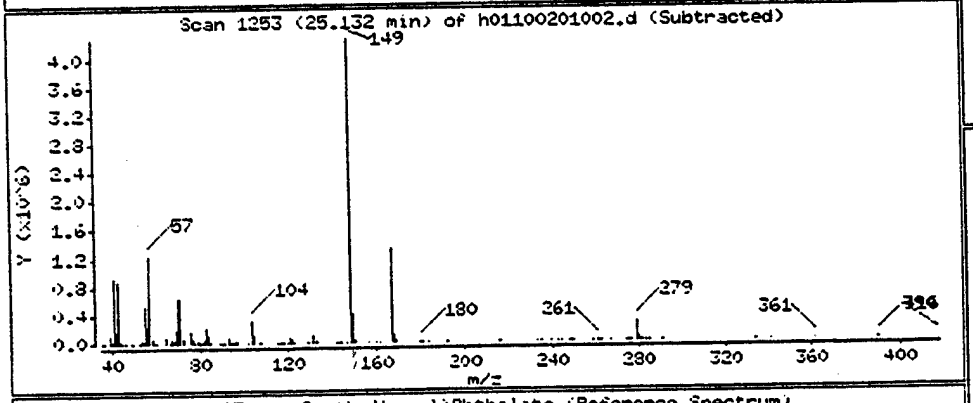
Column diameter: 2.00

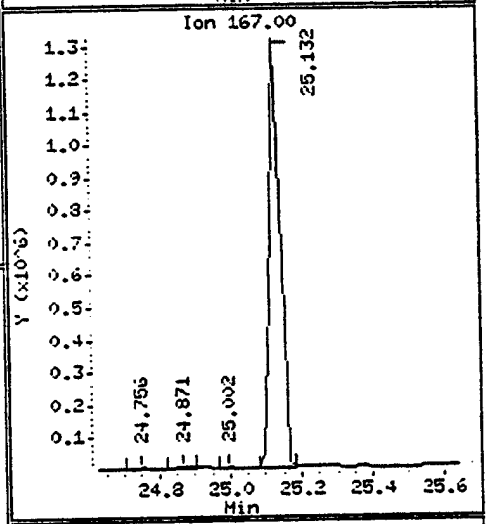
65 bis(2-ethylhexyl)Phthalate

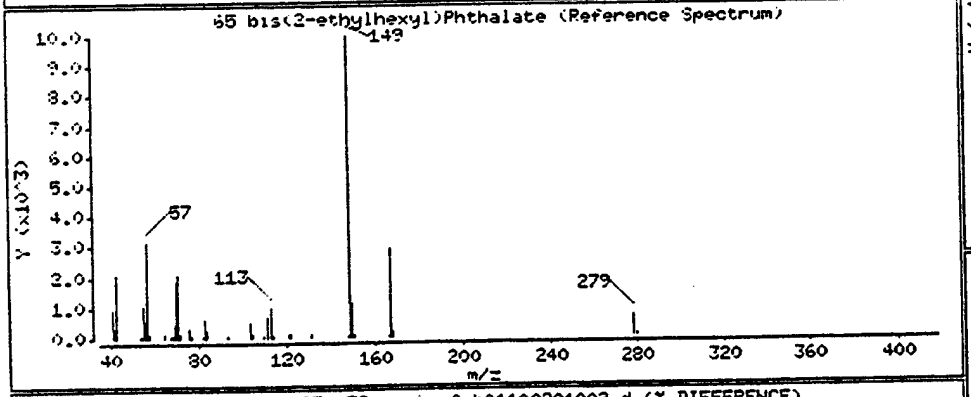
Concentration: 84.8 ug

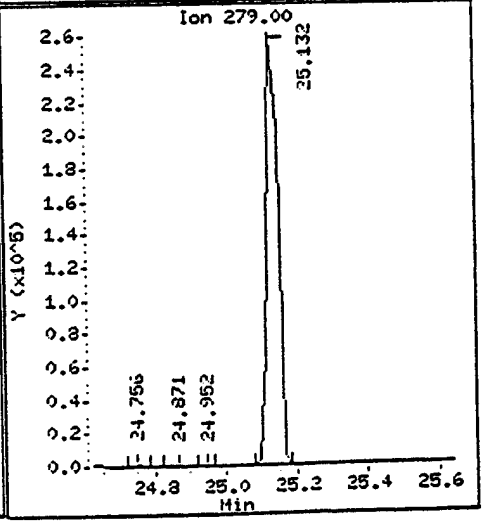


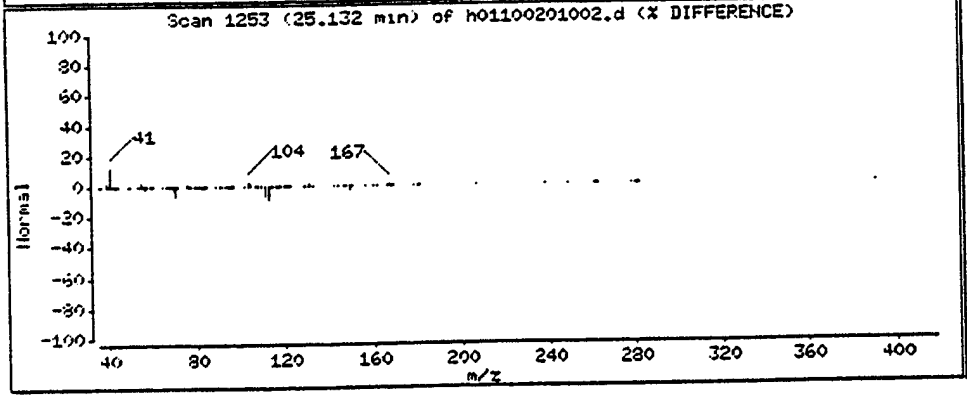












522

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

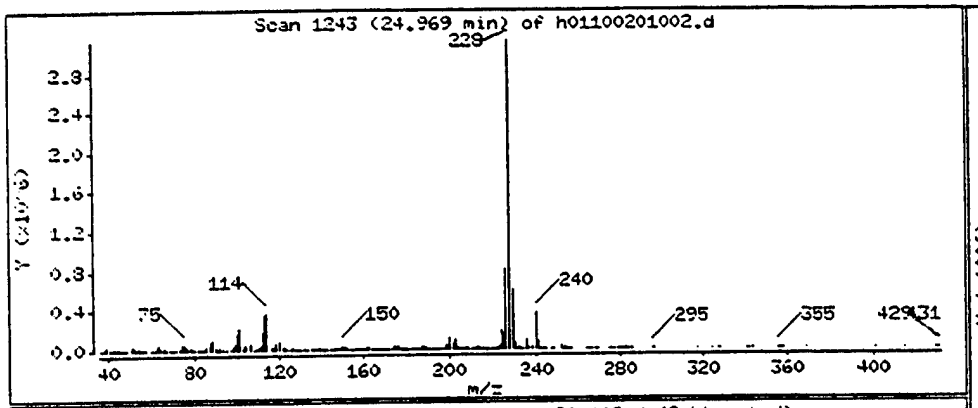
Operator: hch

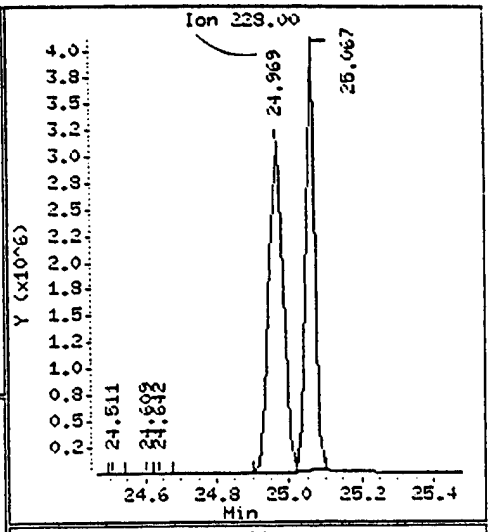
Column phase:

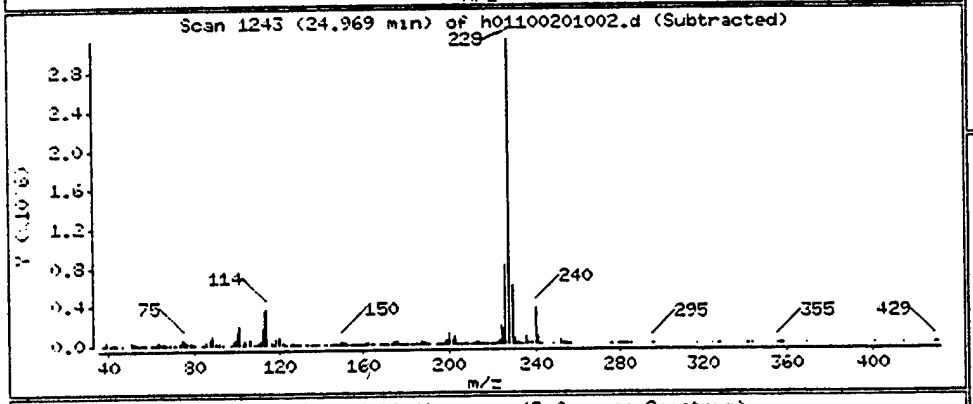
Column diameter: 2.00

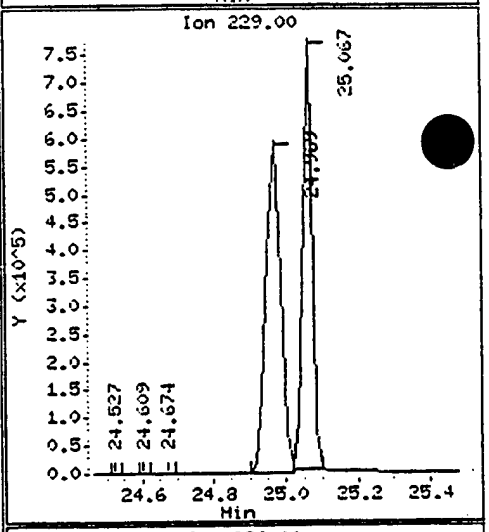
66 Benzo(a)Anthracene

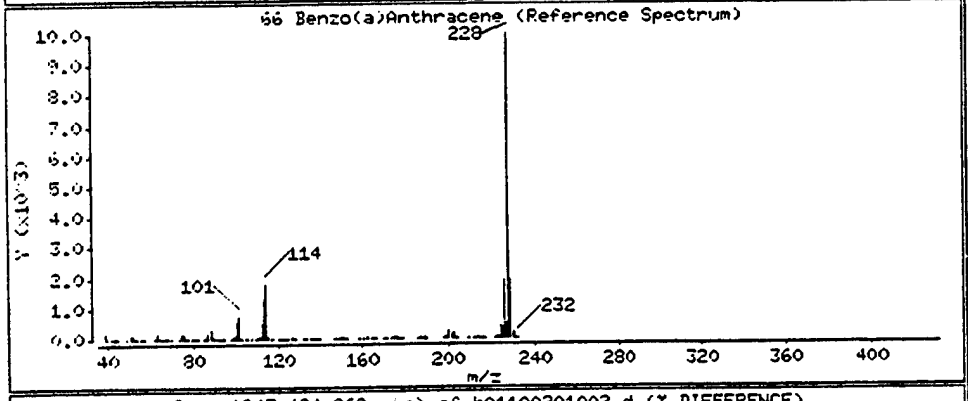
Concentration: 86.9 ug

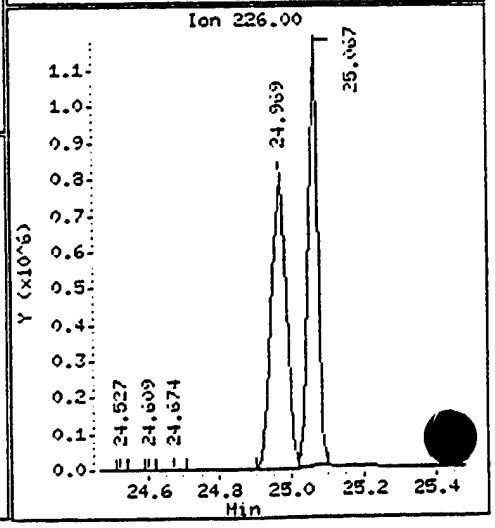


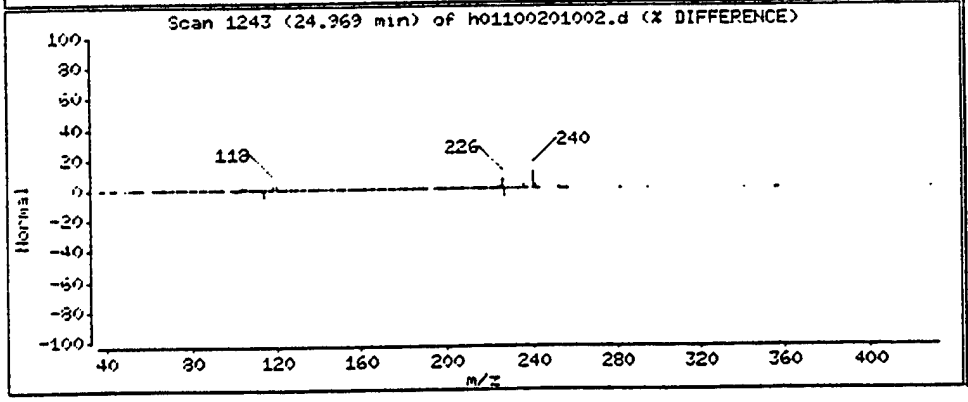












523

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

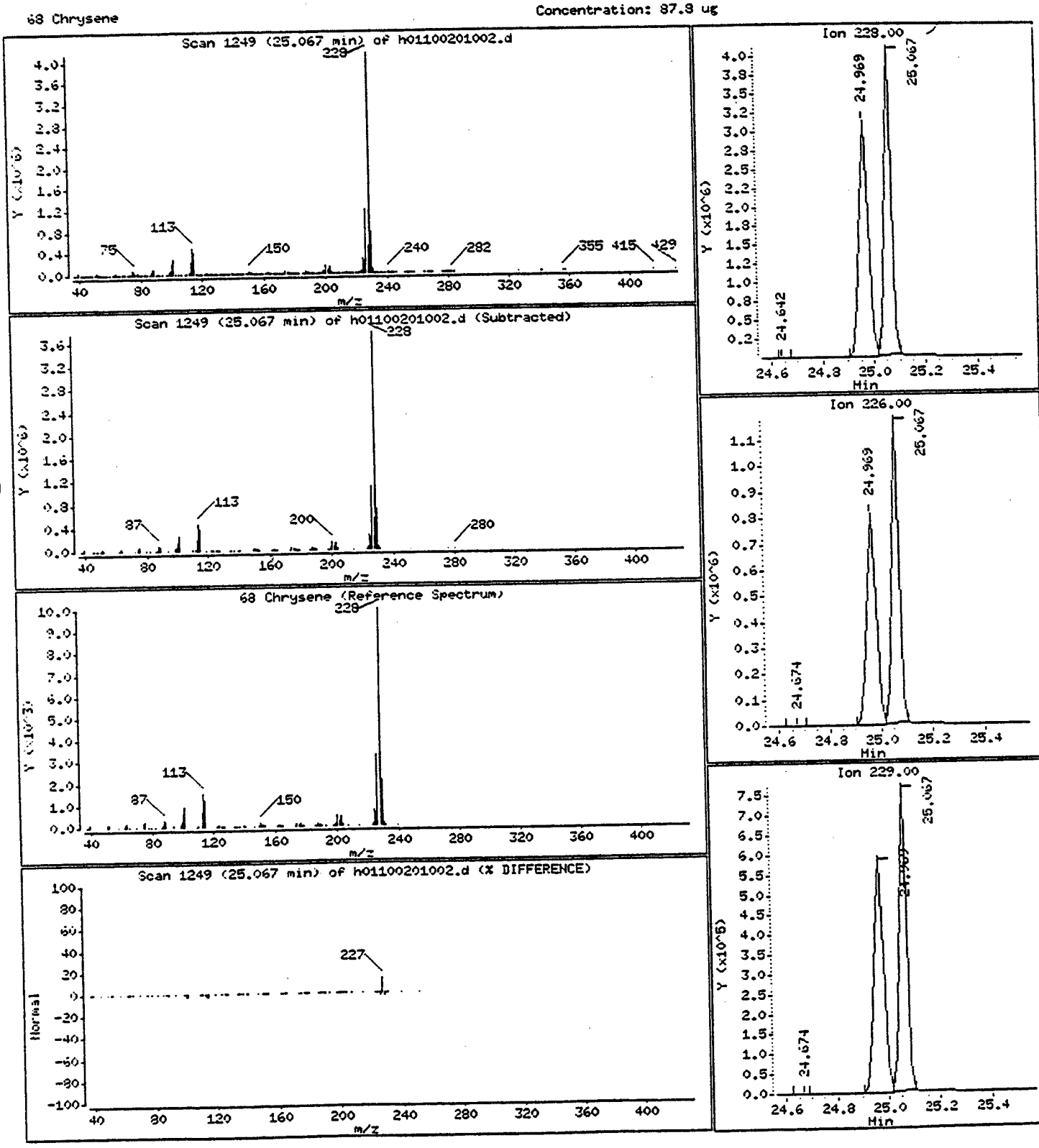
Operator: hch

Column phase:

Column diameter: 2.00

68 Chrysene

Concentration: 87.8 ug



524

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

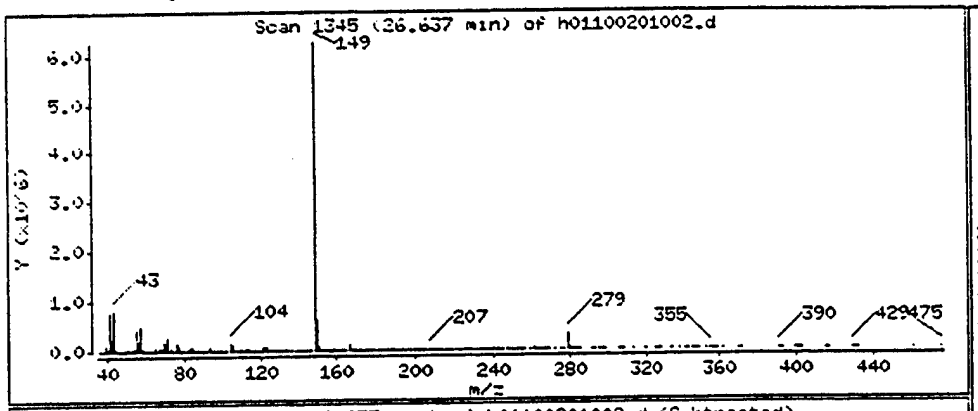
Operator: hch

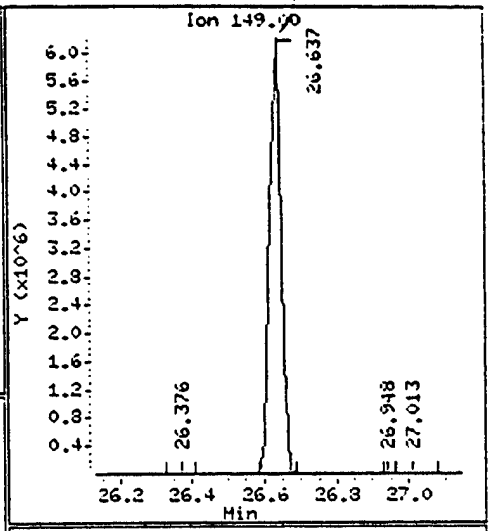
Column phase:

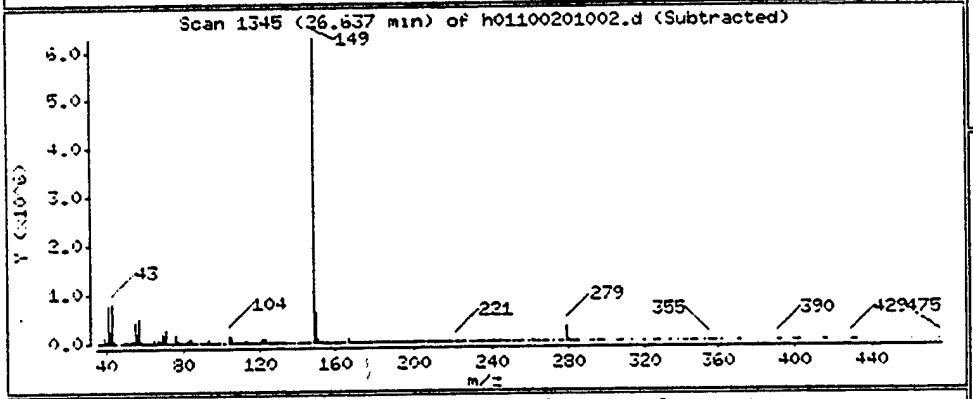
Column diameter: 2.00

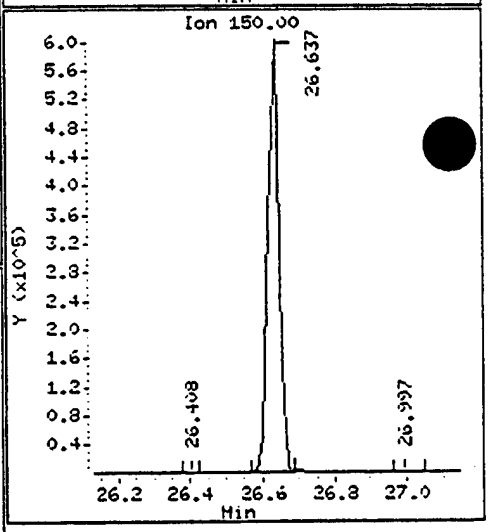
69 Di-n-octyl phthalate

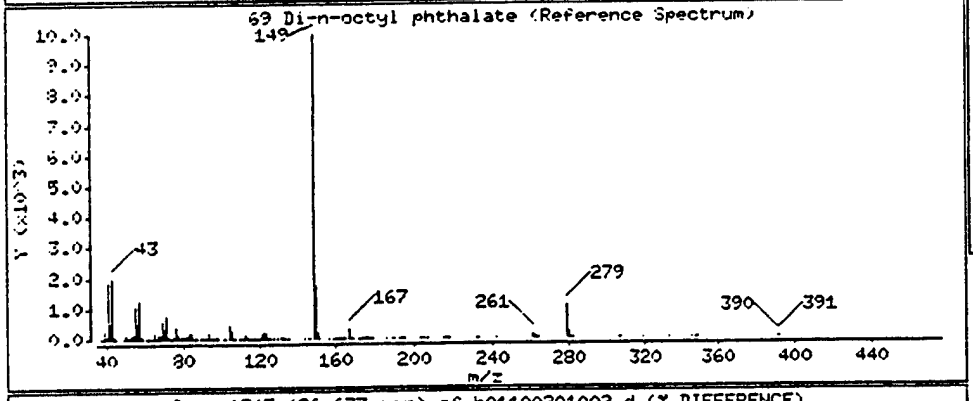
Concentration: 101 ug

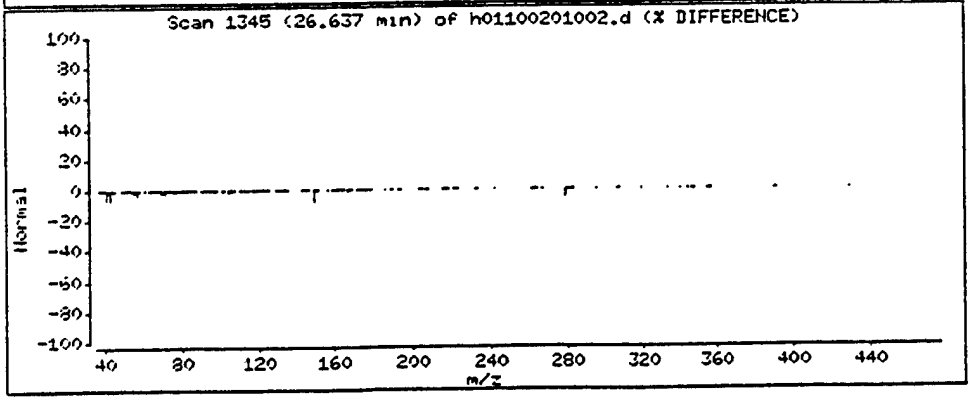












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

525

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

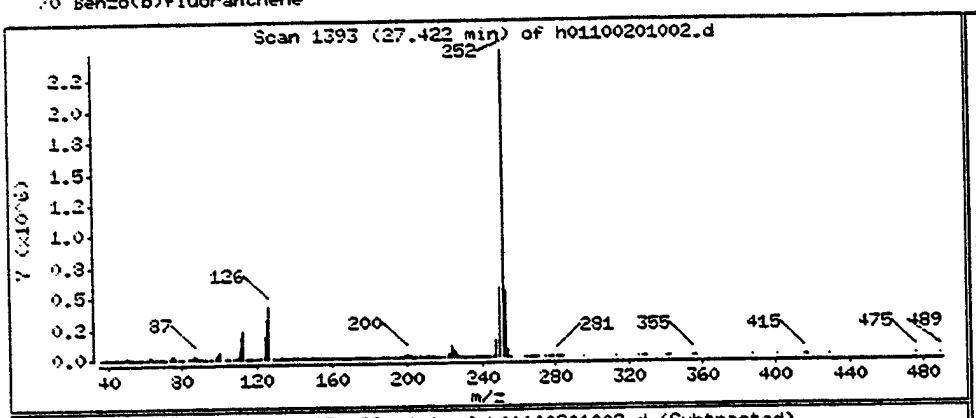
Operator: hch

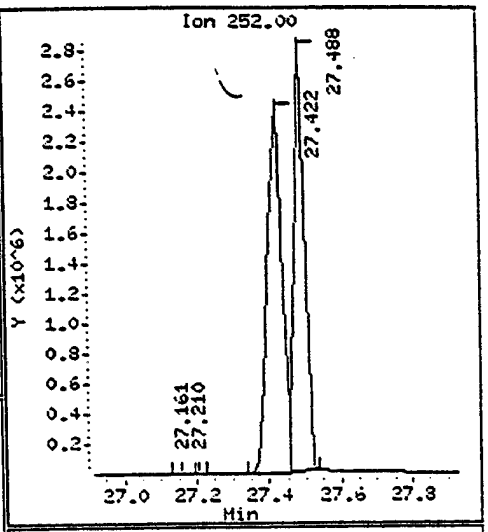
Column phase:

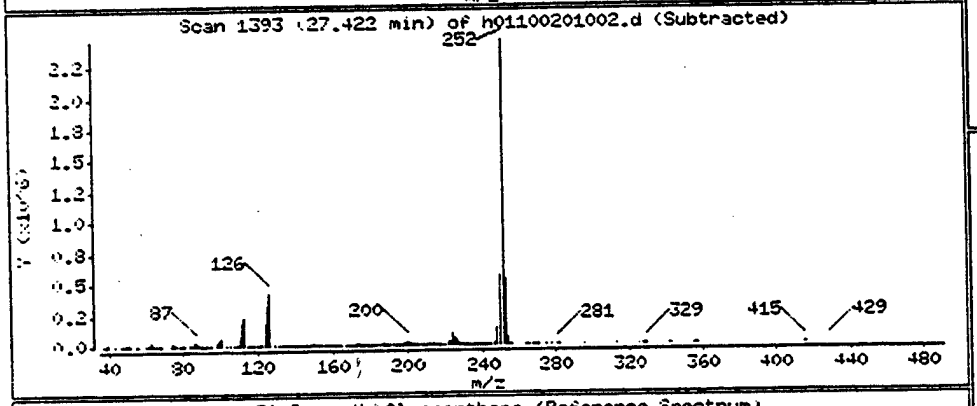
Column diameter: 2.00

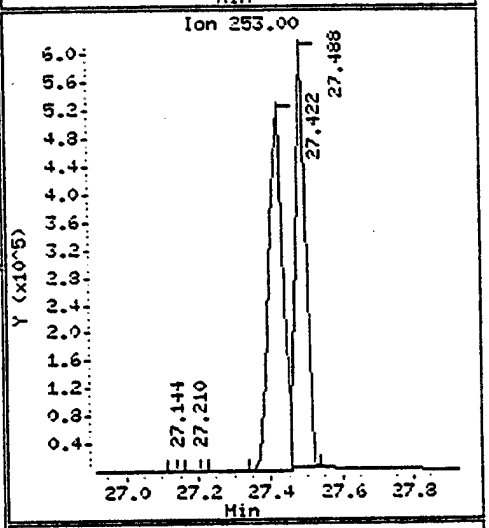
70 Benzo(b)fluoranthene

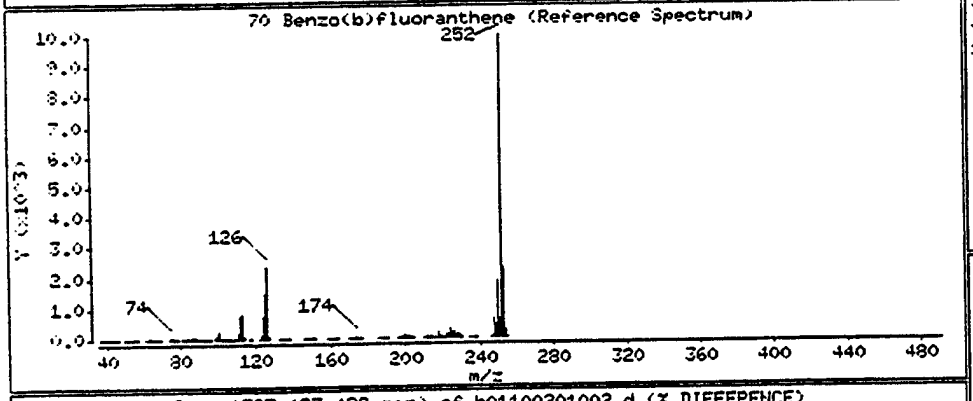
Concentration: 88.9 ug

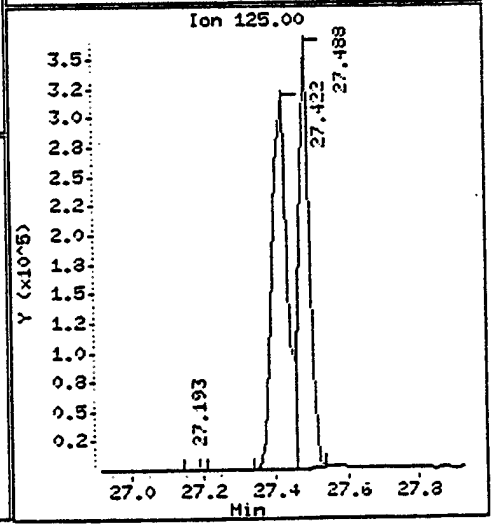


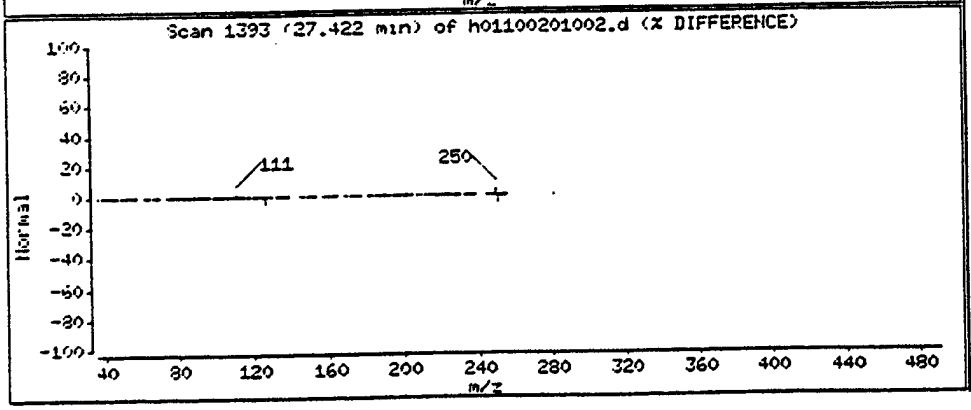












526

Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

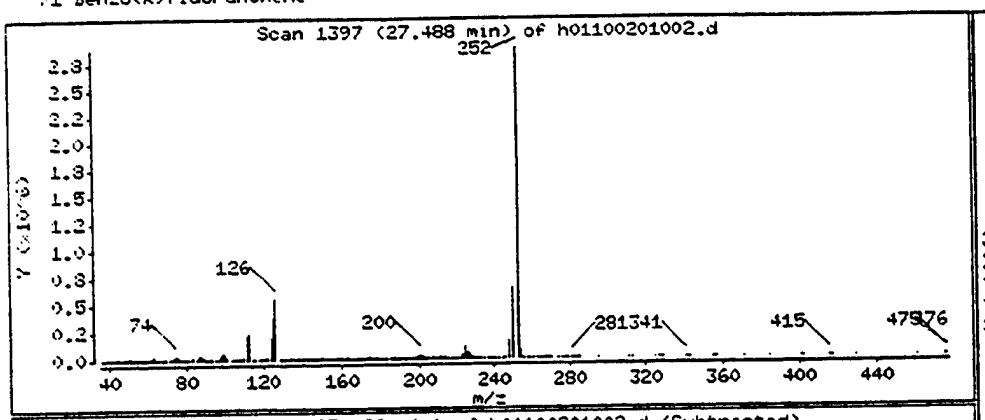
Operator: hch

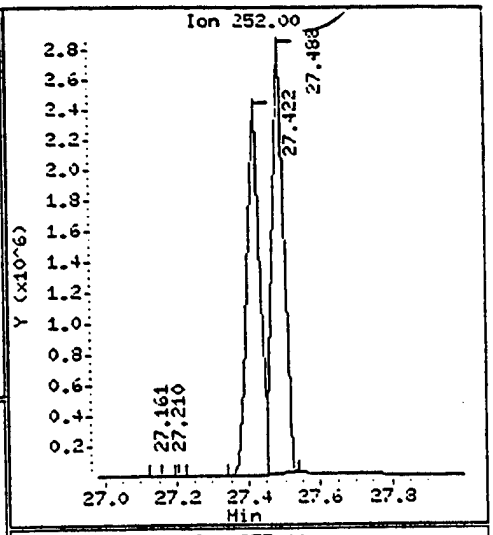
Column phase:

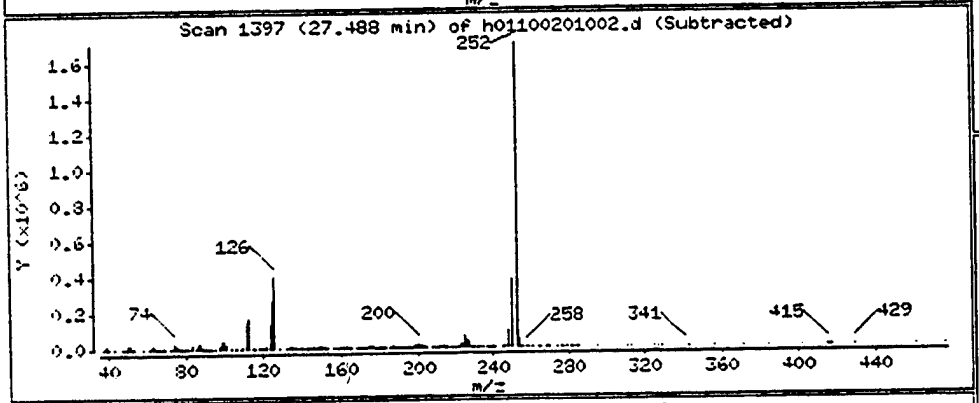
Column diameter: 2.00

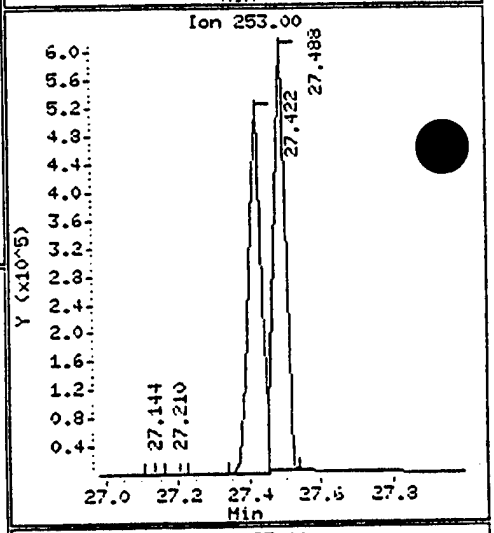
71 Benzo(k)fluoranthene

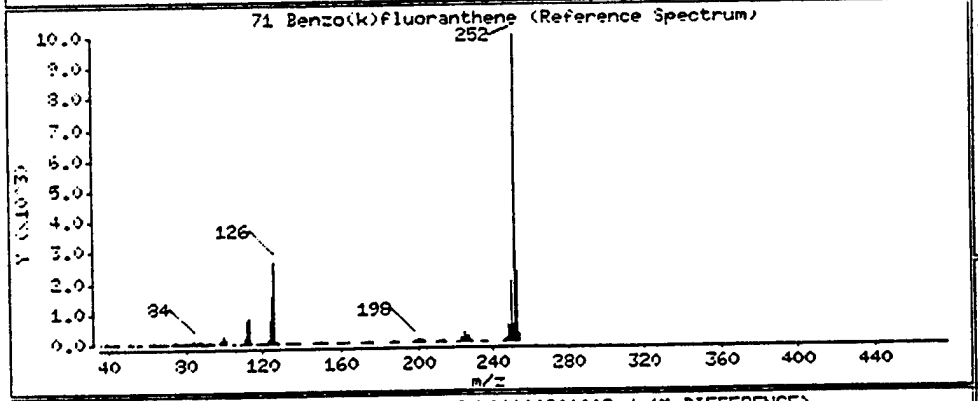
Concentration: 86.0 ug

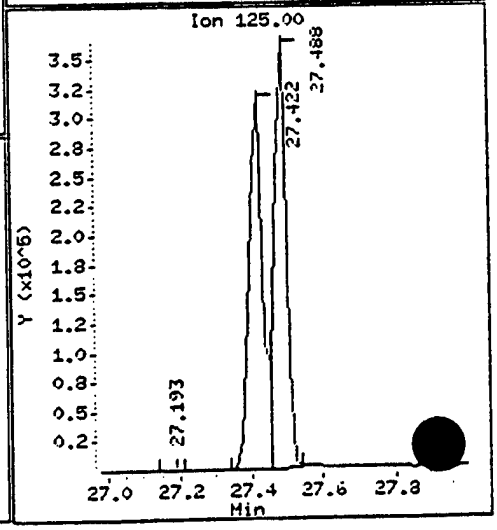


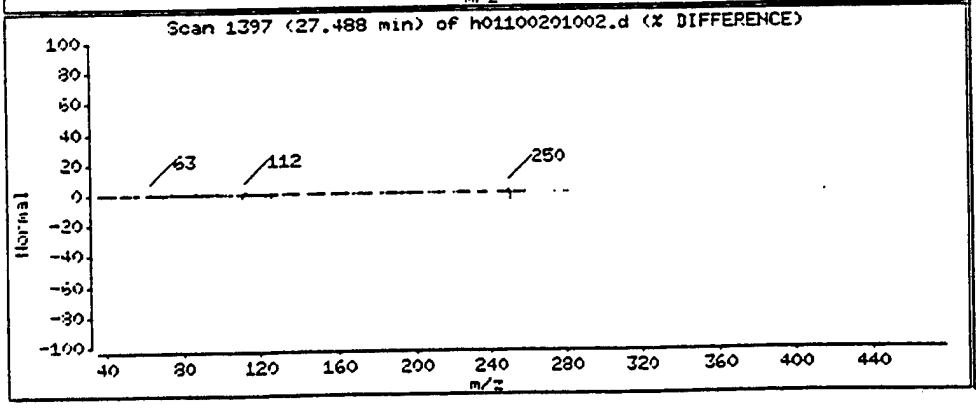












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

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Volume Injected (uL): 1.0

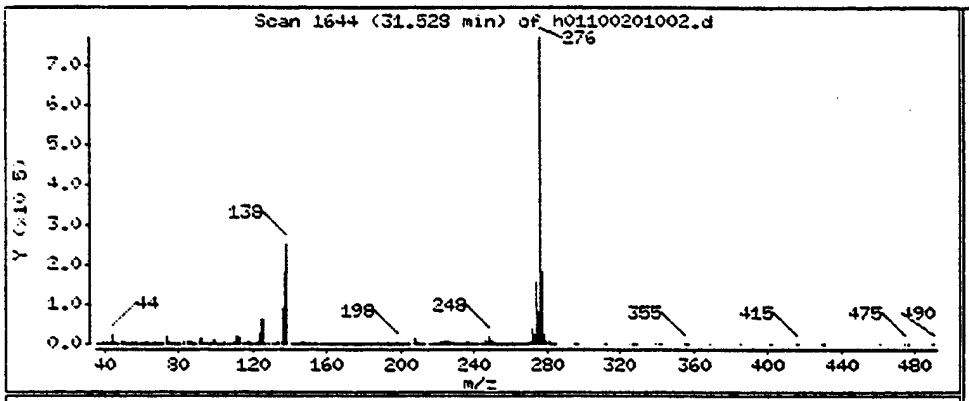
Operator: hch

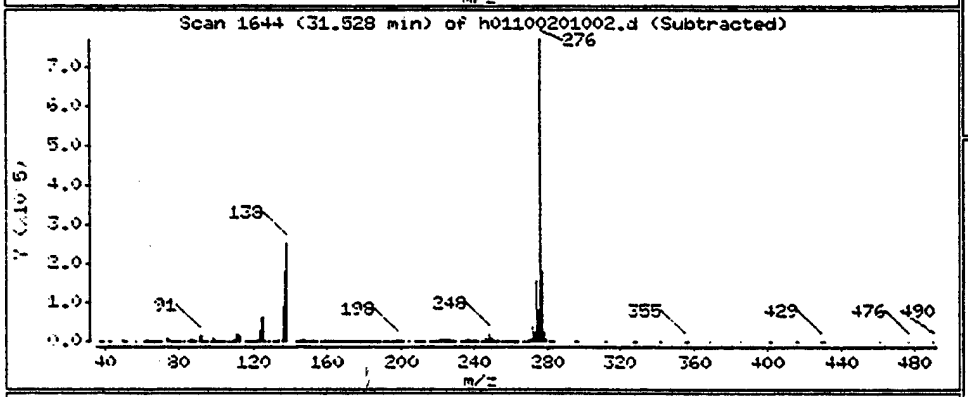
Column phase:

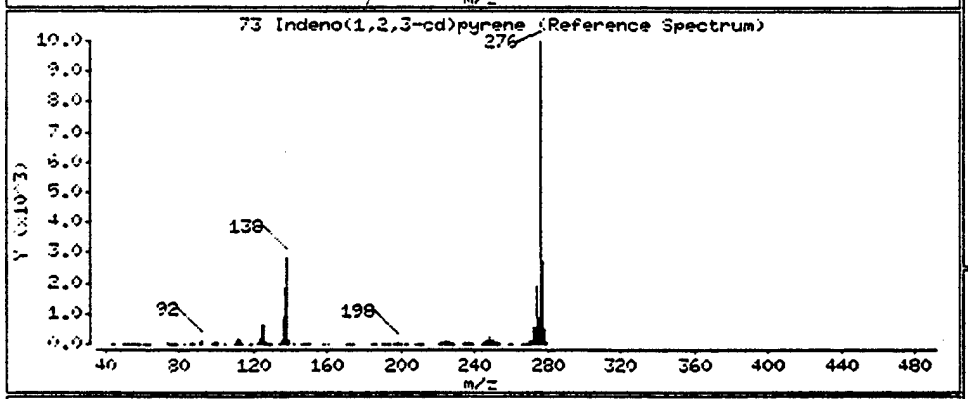
Column diameter: 2.00

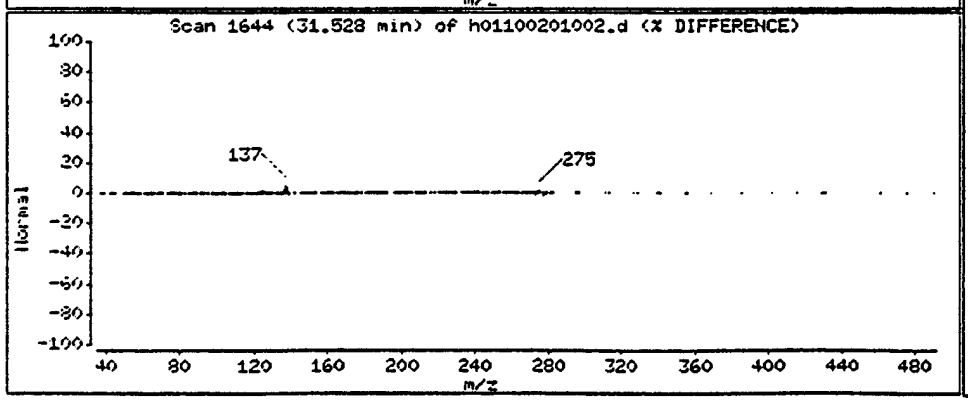
73 Indeno(1,2,3-cd)pyrene

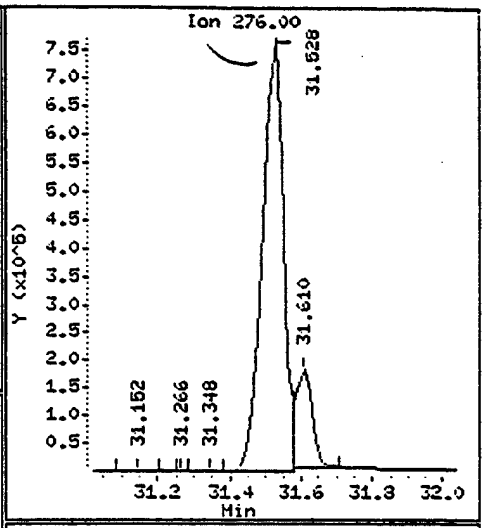
Concentration: 72.2 ug

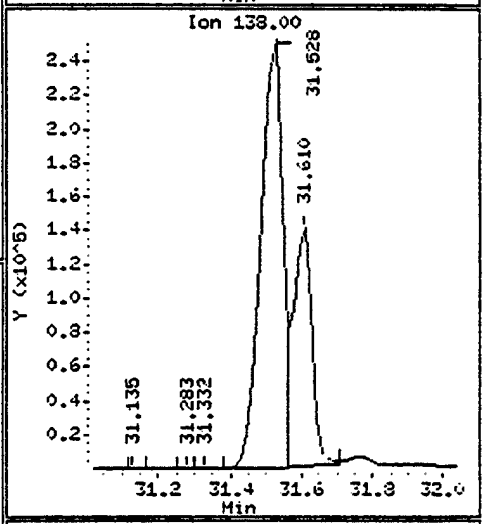


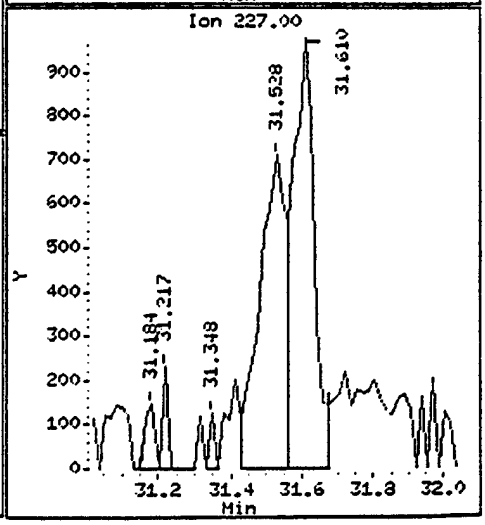












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Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

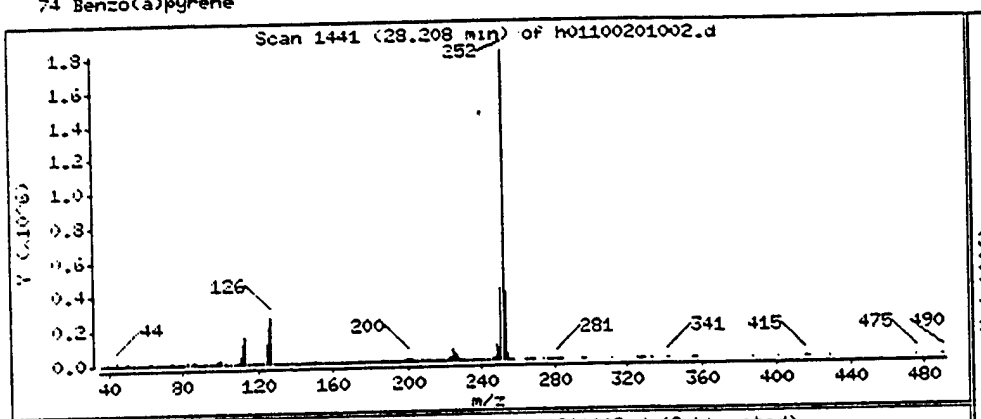
Operator: hch

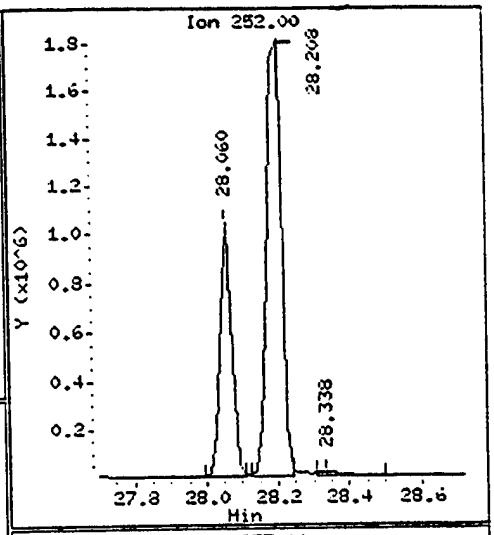
Column phase:

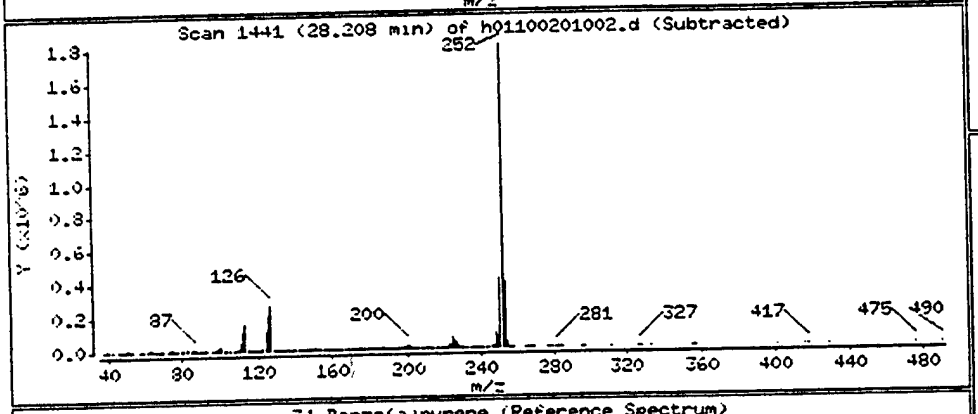
Column diameter: 2.00

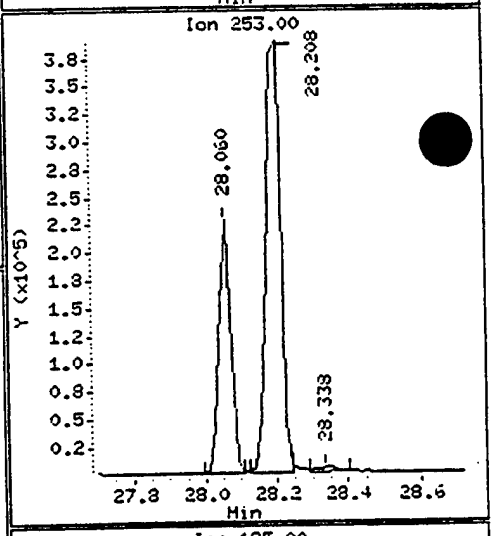
74 Benzo(a)pyrene

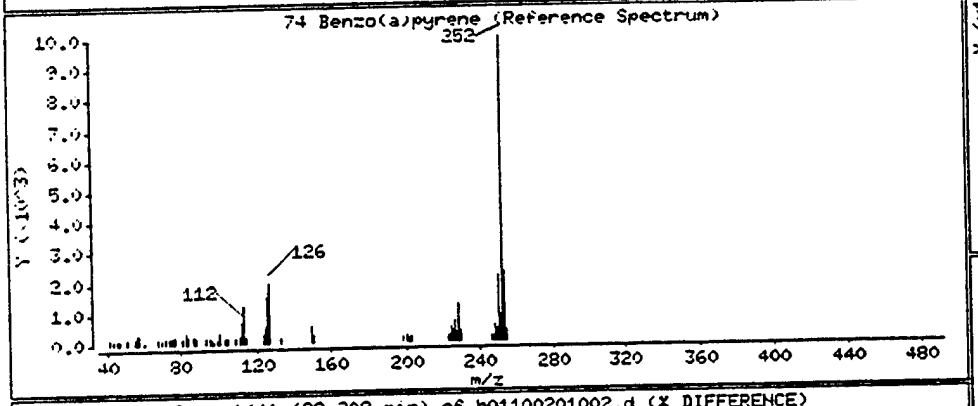
Concentration: 84.8 ug

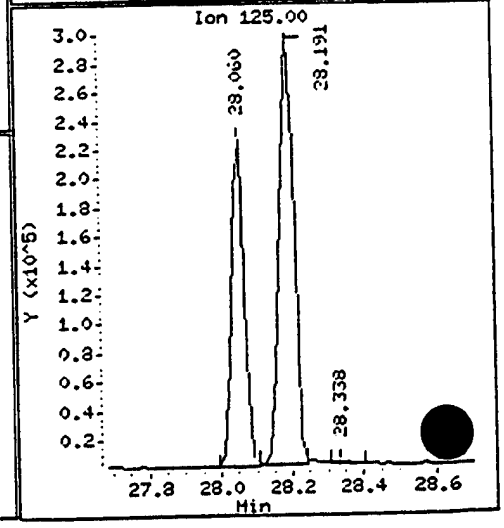


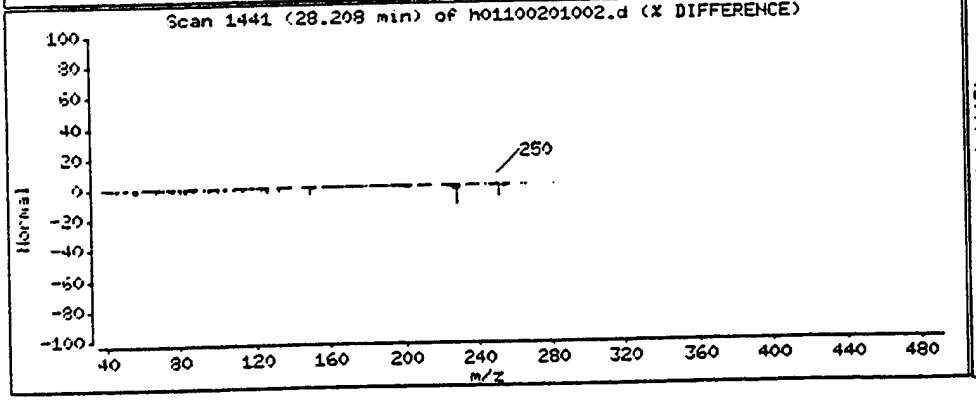












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Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

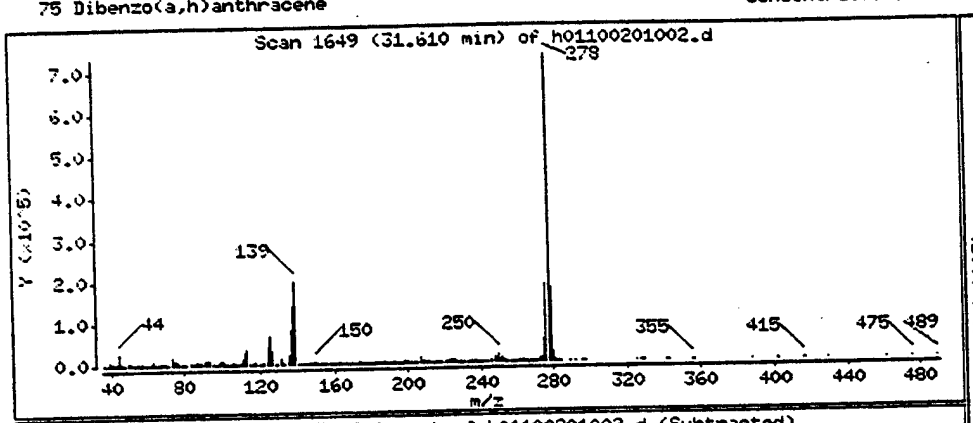
Operator: hch

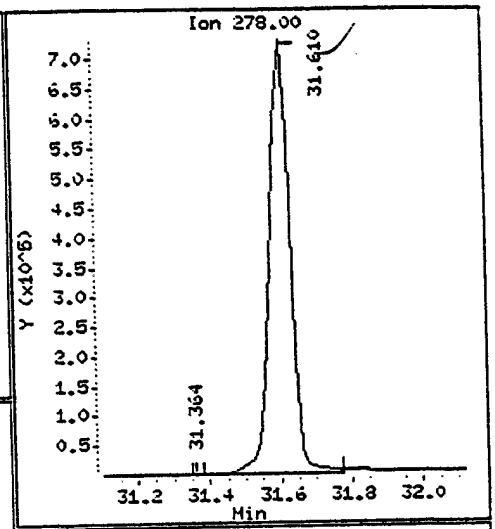
Column phase:

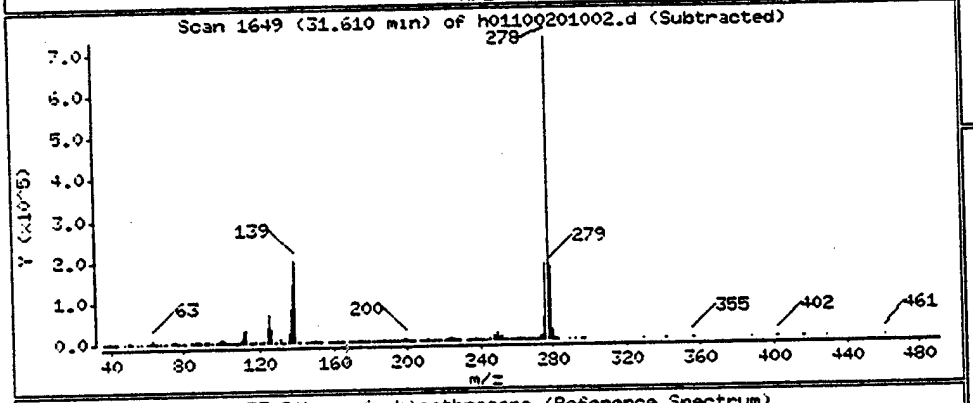
Column diameter: 2.00

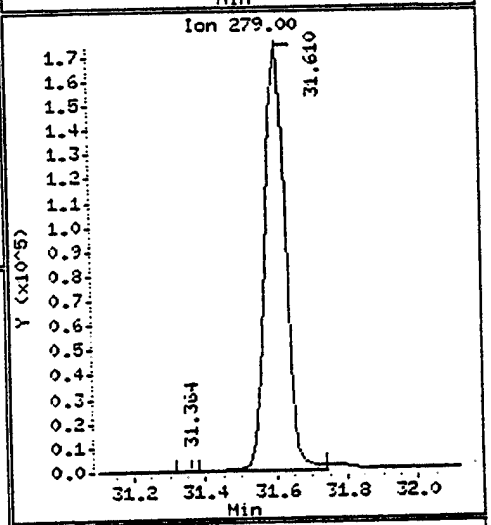
75 Dibenzo(a,h)anthracene

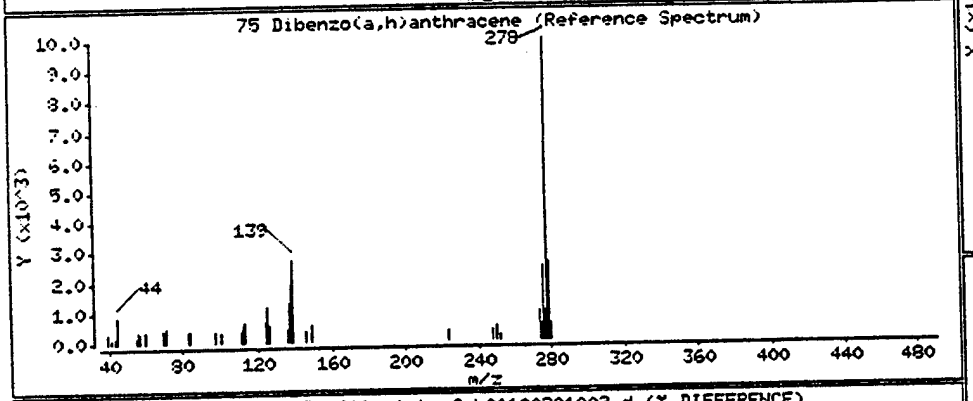
Concentration: 75.2 ug

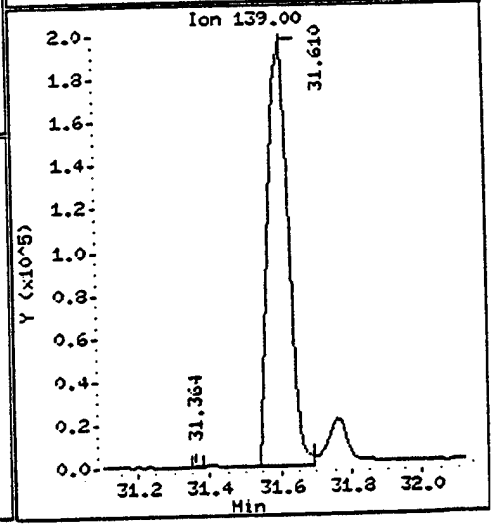


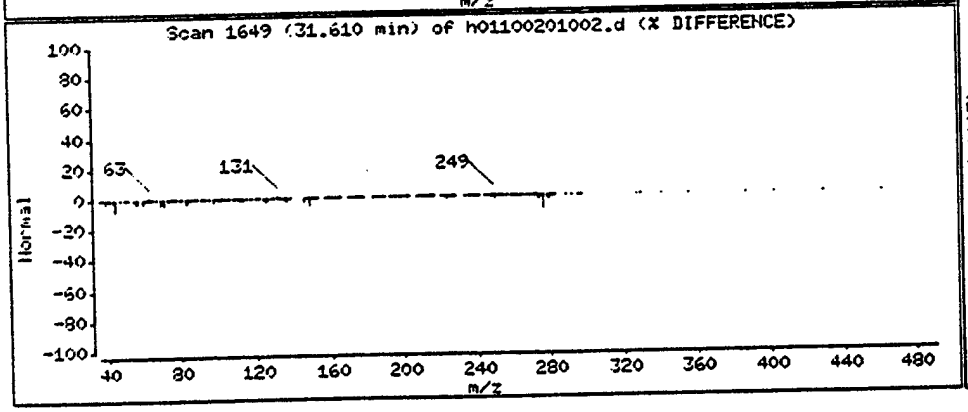












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

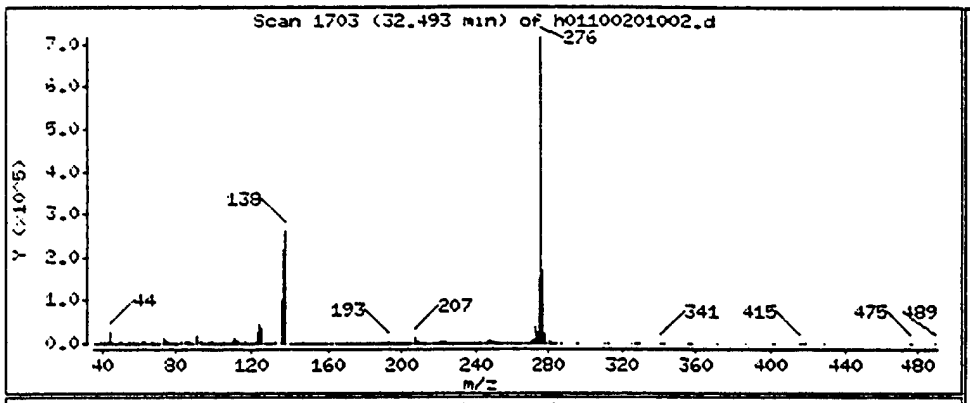
Operator: hch

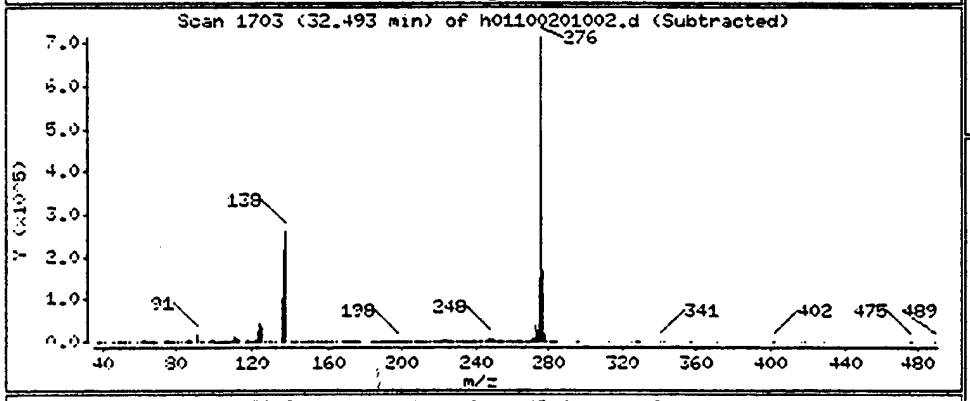
Column phase:

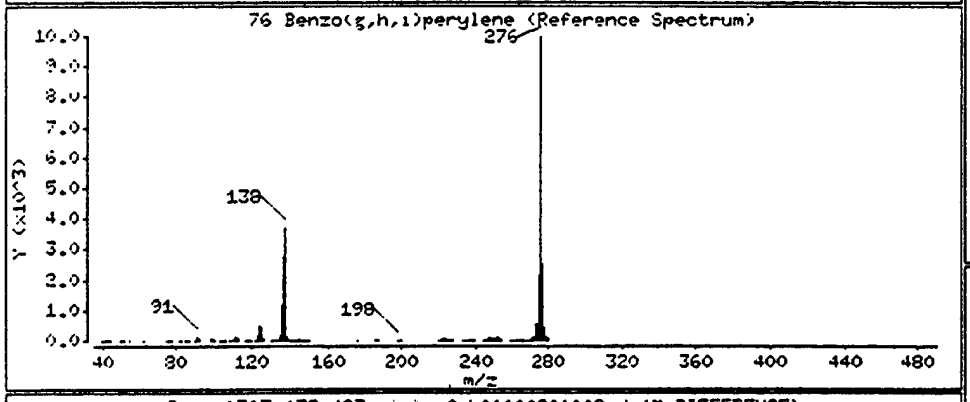
Column diameter: 2.00

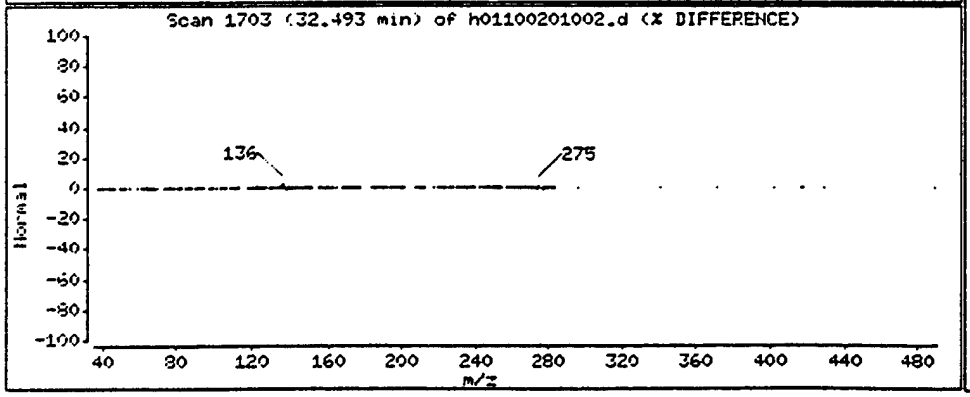
76 Benzo(g,h,i)perylene

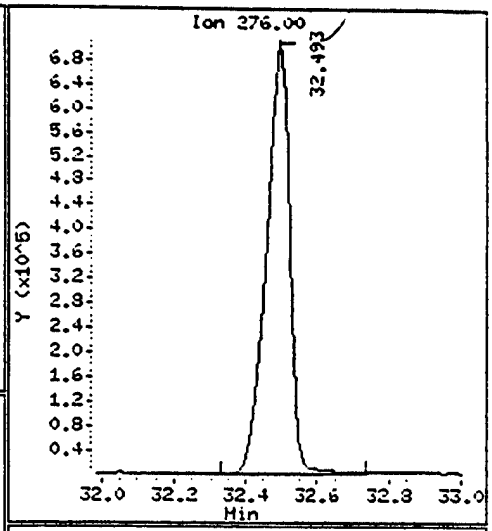
Concentration: 71.6 ug

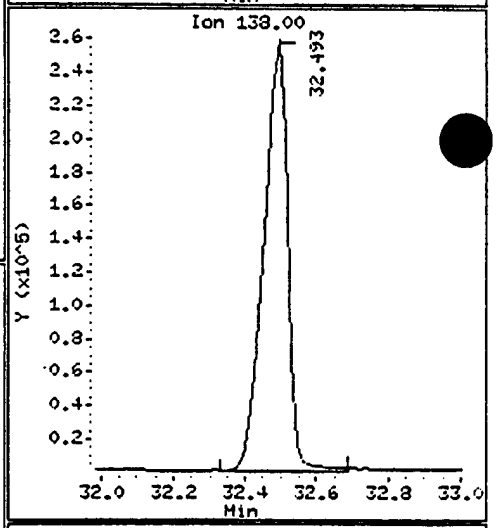


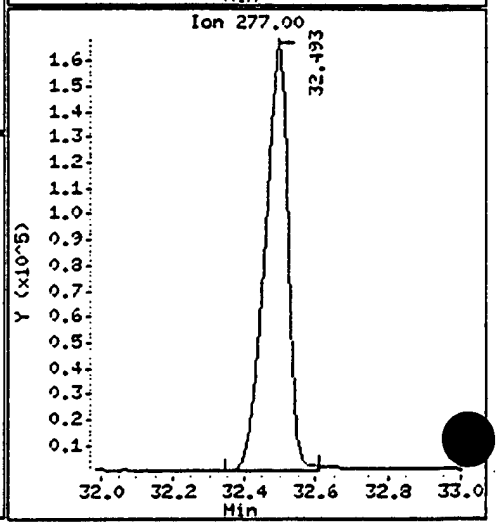












Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

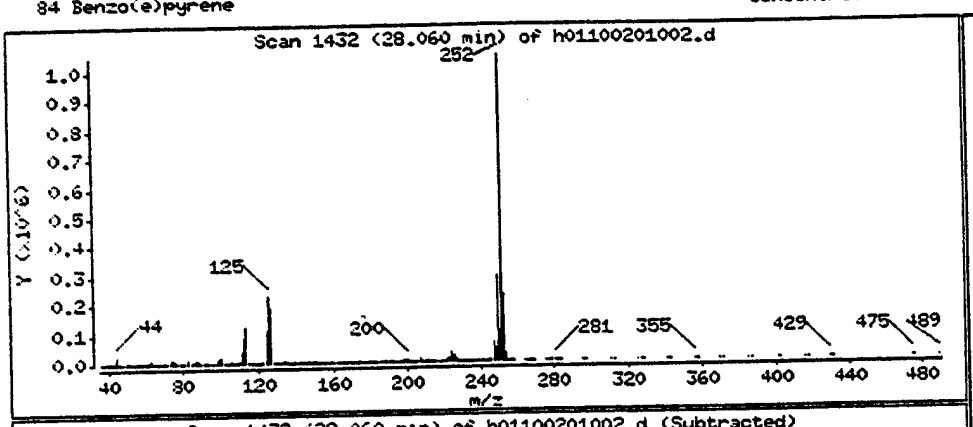
Operator: hch

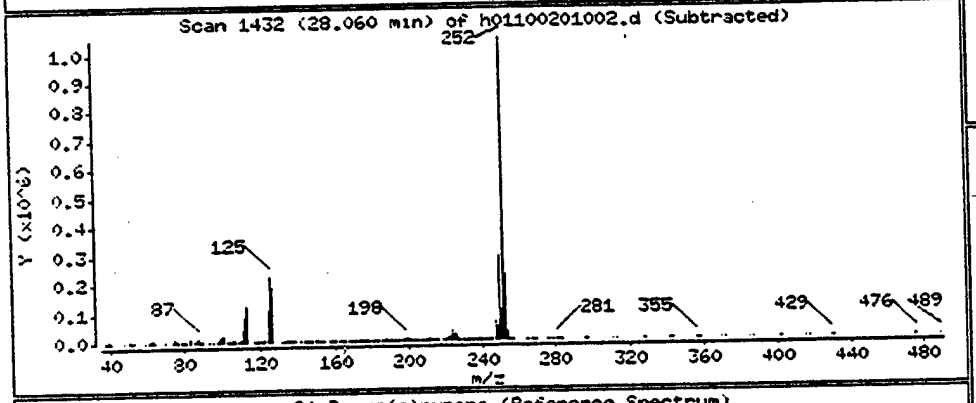
Column phase:

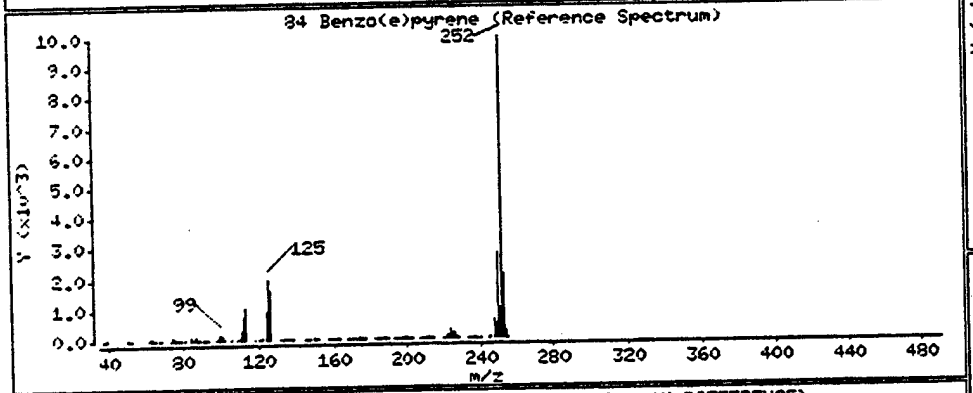
Column diameter: 2.00

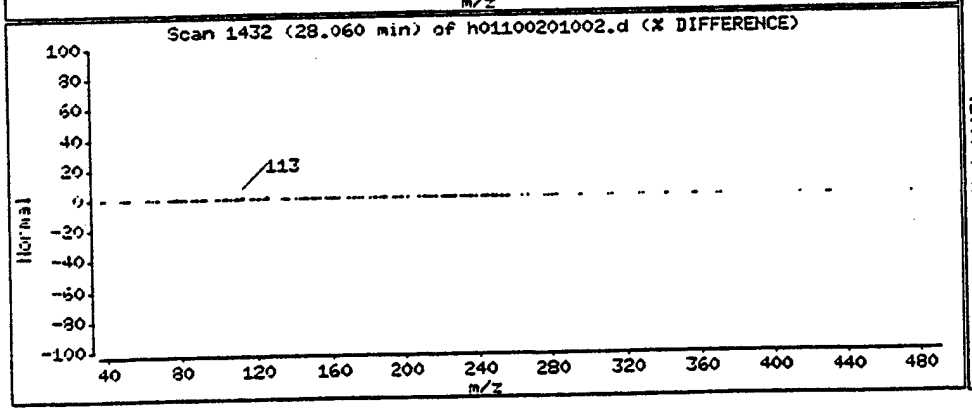
Concentration: 39.7 ug

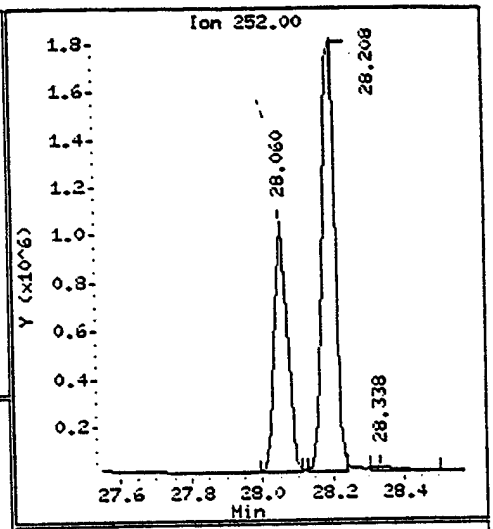
84 Benzo(e)pyrene

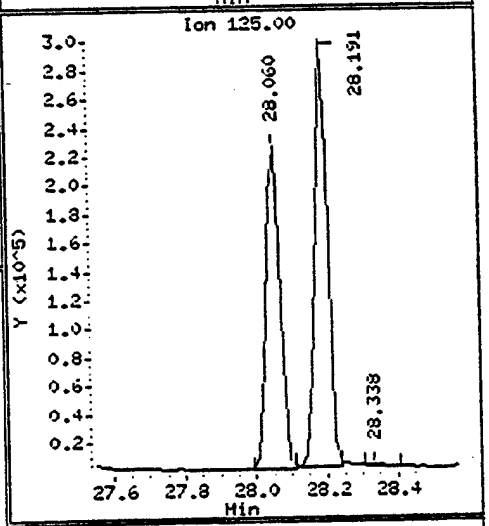


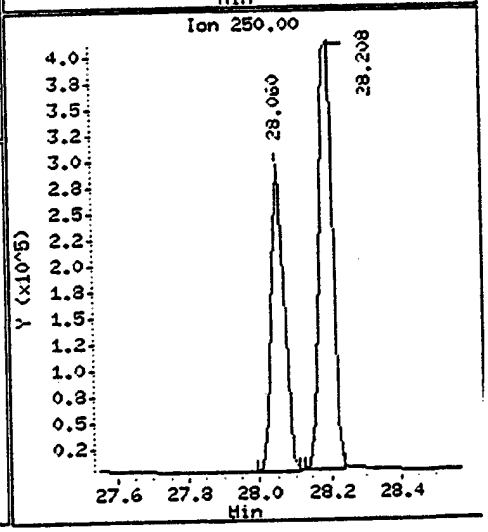












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Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

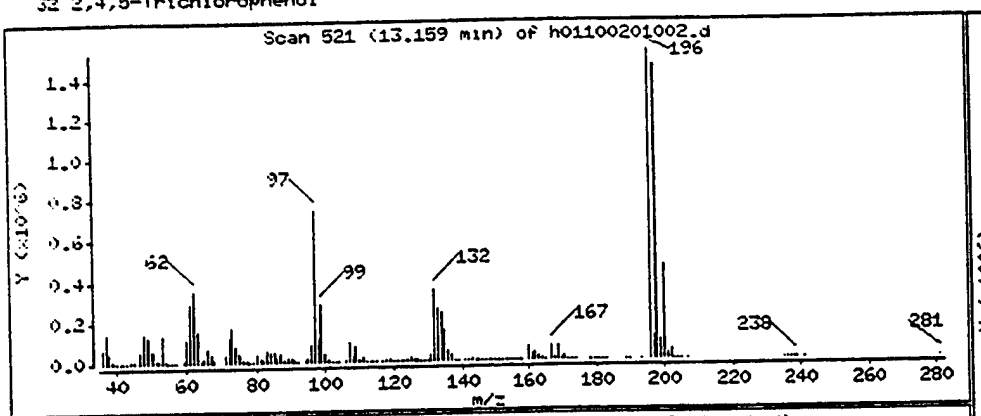
Operator: hch

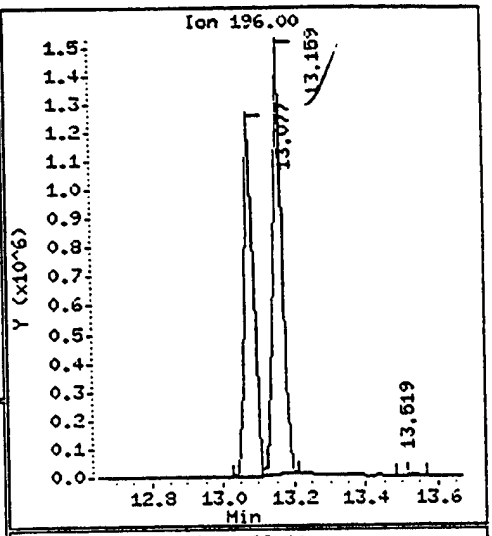
Column phase:

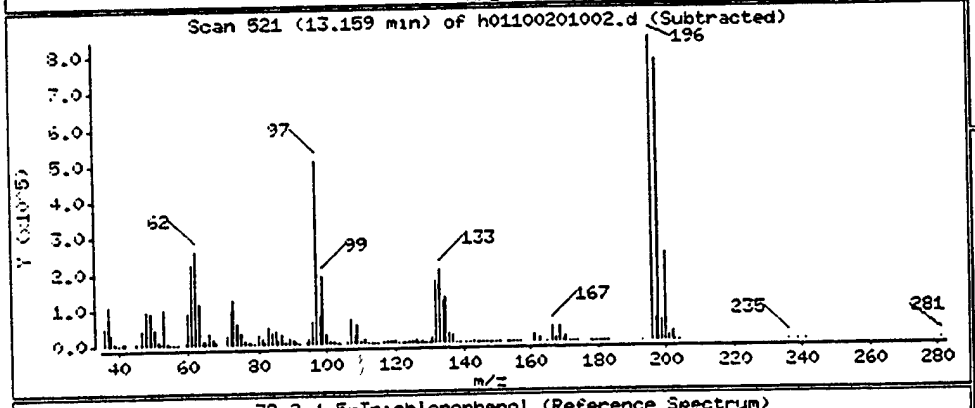
Column diameter: 2.00

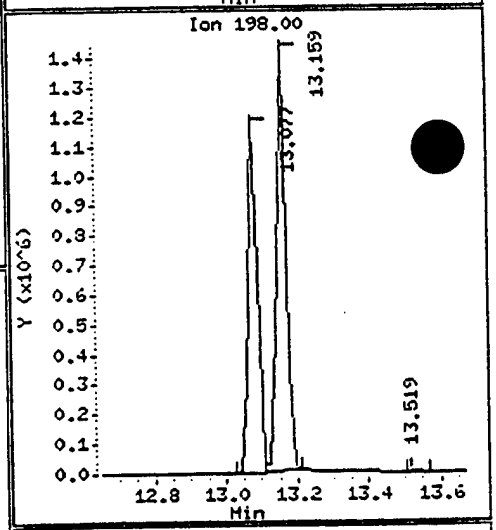
32 2,4,5-Trichlorophenol

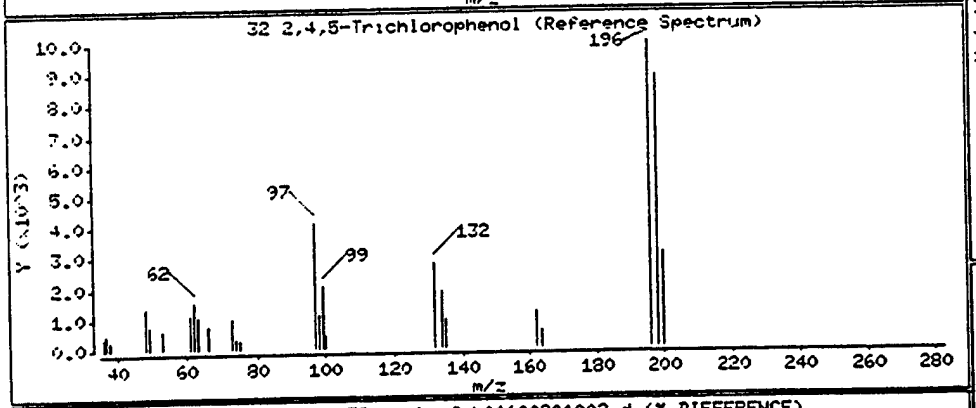
Concentration: 85.3 ug

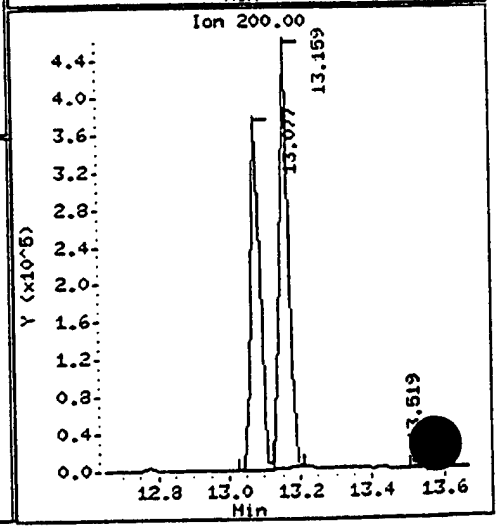


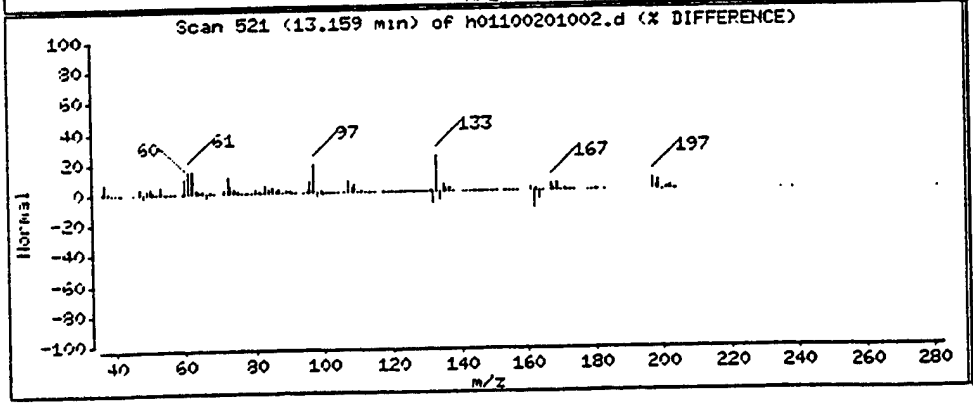












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Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Volume Injected (uL): 1.0

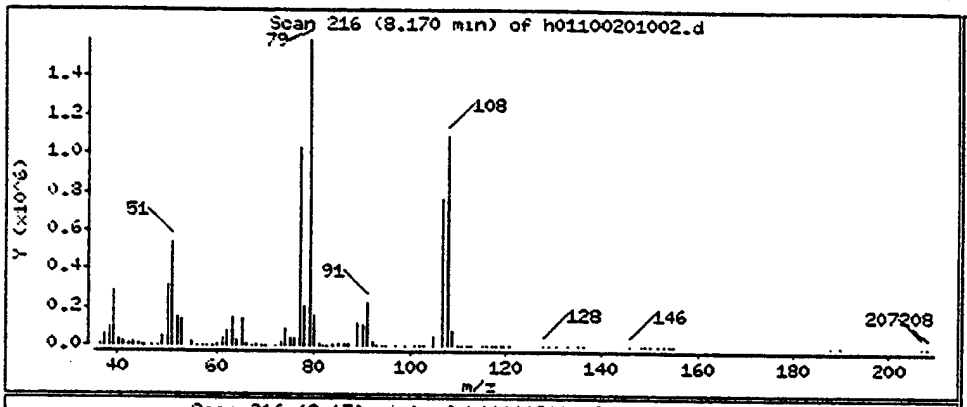
Operator: hch

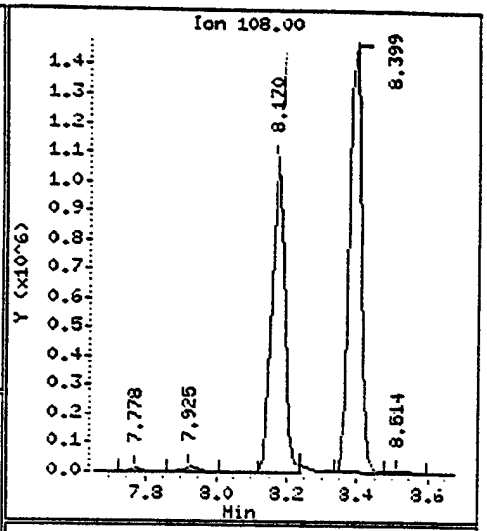
Column phase:

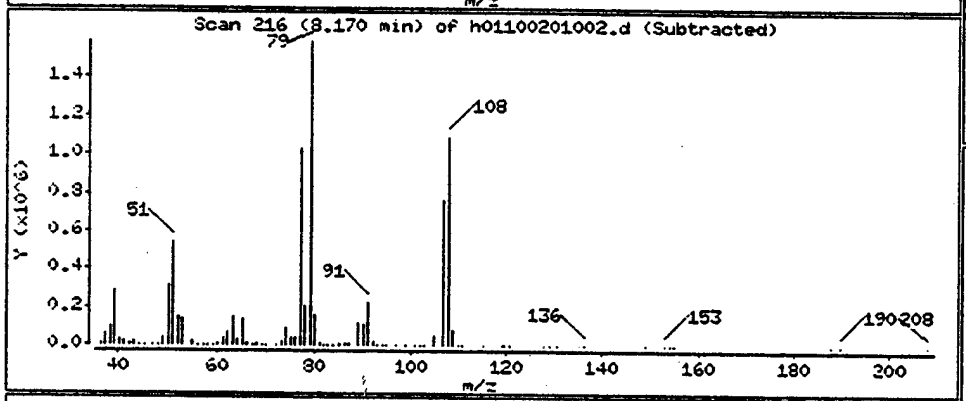
Column diameter: 2.00

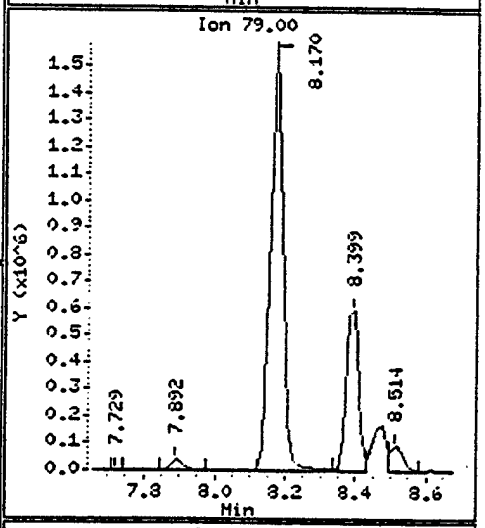
124 Benzyl Alcohol

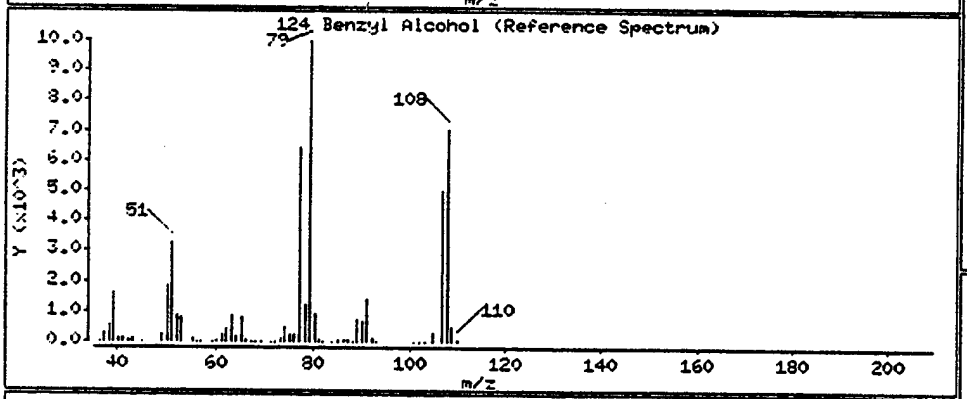
Concentration: 78.9 ug

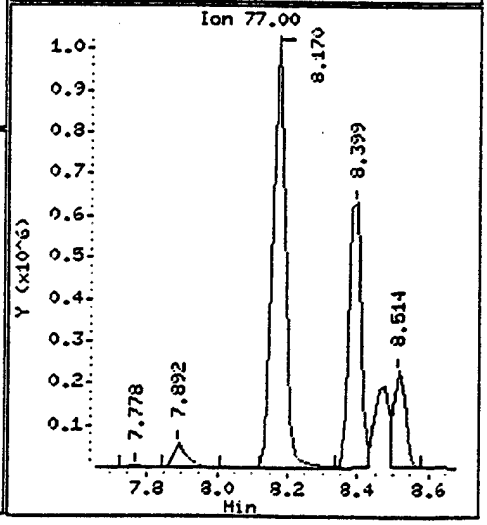


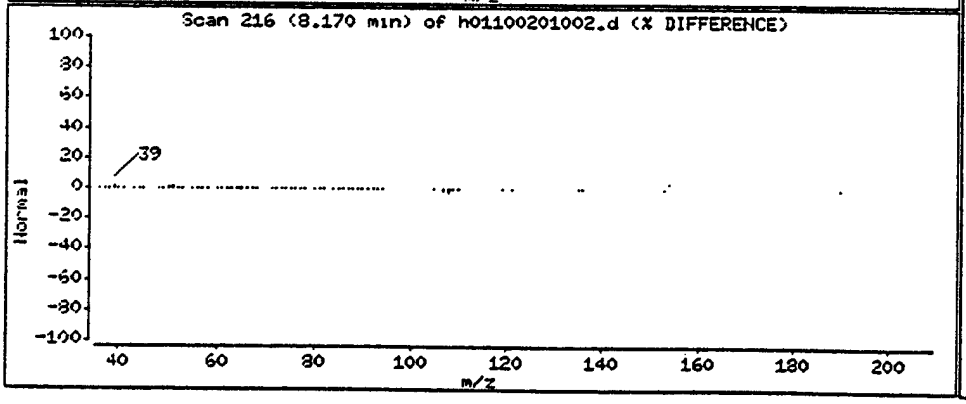












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Data File: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Date : 10-JAN-1998 11:57

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 80 ug Method Spike 396-5-80

Operator: hch

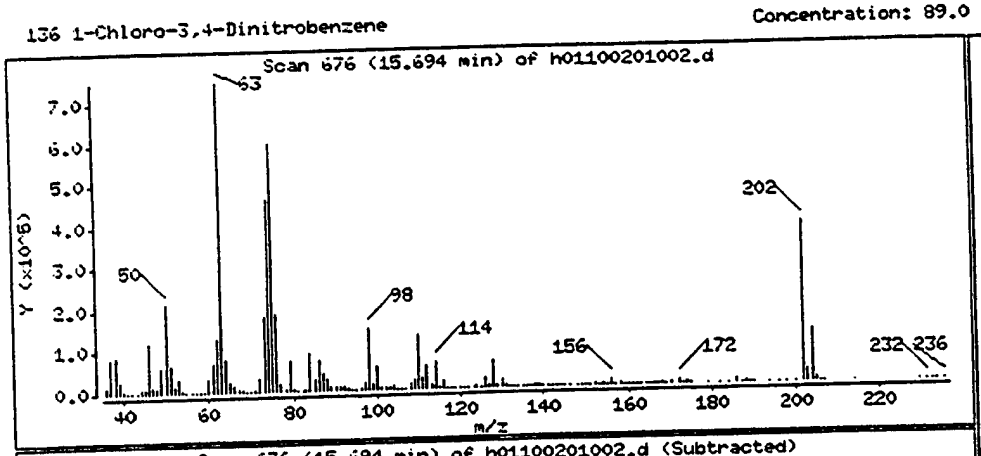
Volume Injected (uL): 1.0

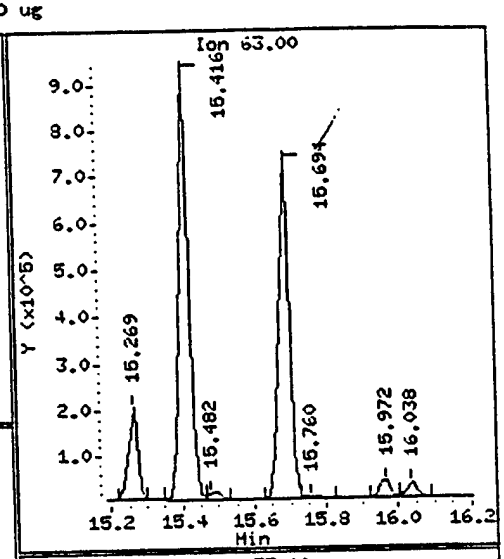
Column diameter: 2.00

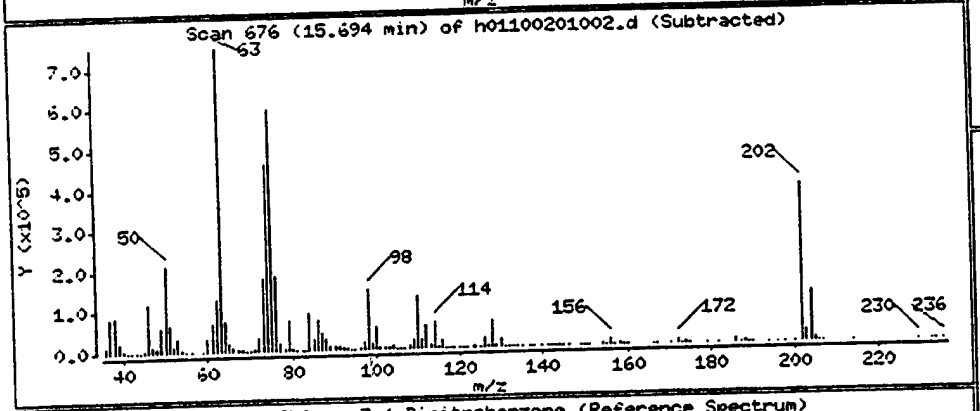
Column phase:

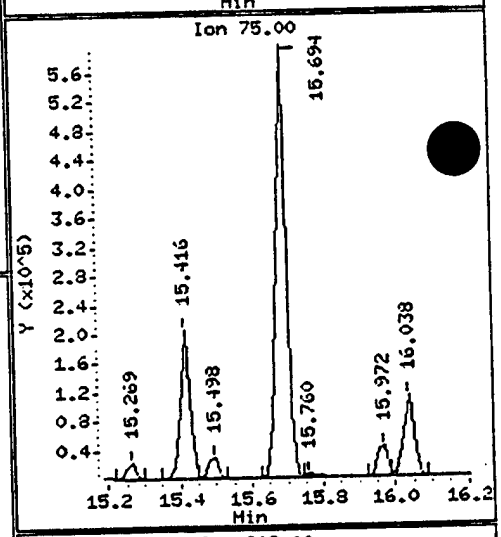
Concentration: 89.0 ug

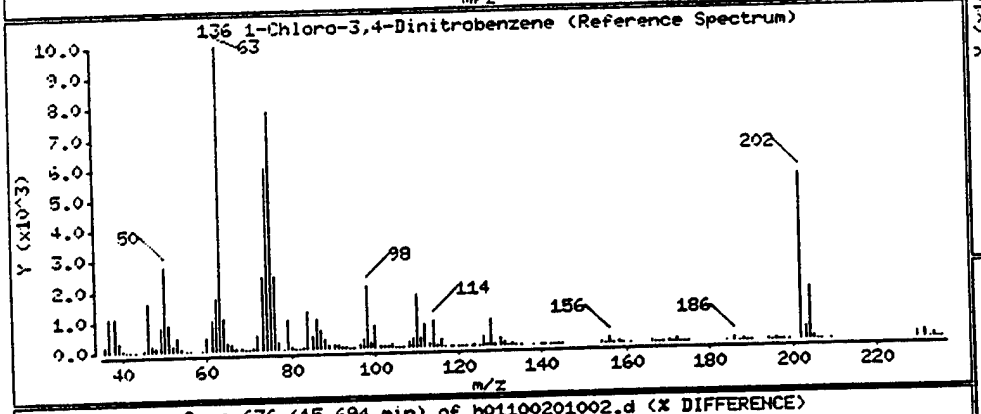
136 1-Chloro-3,4-Dinitrobenzene

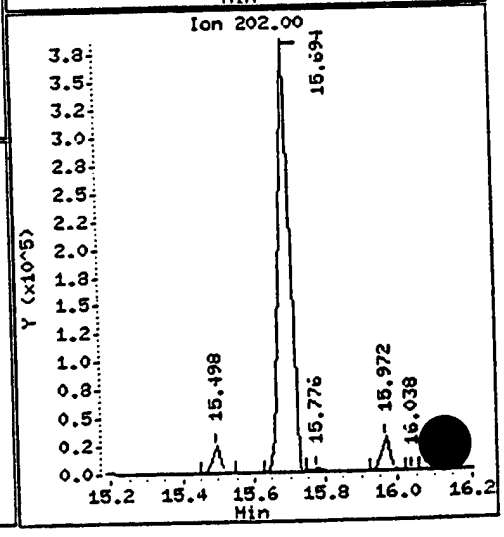


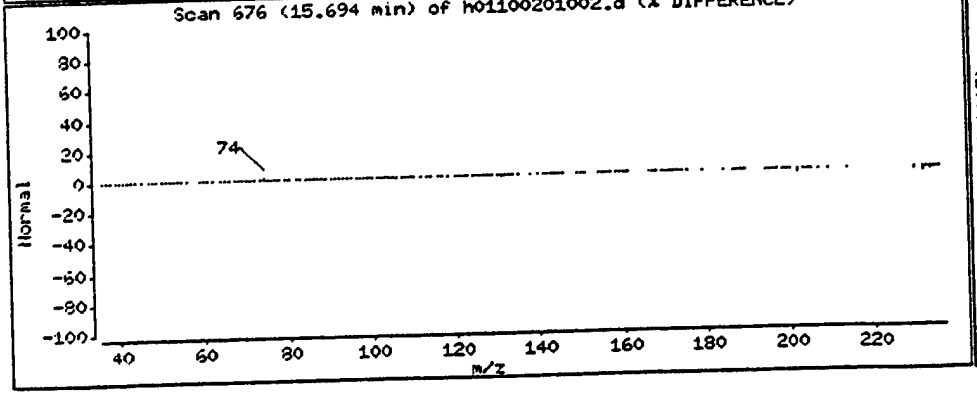












Audit History For: /chem/msdh.i/h-10Jan98.b/h01100201002.d

Change Date: 10-Jan-1998 12:42
Change Made by: Automation

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Complete Target Compound Processing

Change Date: 10-Jan-1998 12:50
Change Made by: jheffel

Parameter: Manual reintegration of bis(2-Chloroisopropyl)ether (Signal 1)
Old Value: Old Area/Time: 5945885 / 8.46
New Value: New Area/Time: 7260155 / 8.46
Reason For Change: N/A

Change Date: 10-Jan-1998 12:50
Change Made by: jheffel

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #4
New Value: New Hit #5
Reason For Change: N/A

Change Date: 10-Jan-1998 12:50
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 10-Jan-1998 12:51
Change Made by: jheffel

Parameter: Best Hit for 3-Nitroaniline changed
Old Value: Old Hit #3
New Value: New Hit #4
Reason For Change: N/A

Change Date: 10-Jan-1998 12:51
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 10-Jan-1998 12:51
Change Made by: jheffel

Parameter: Best Hit for 4-Nitroaniline changed
Old Value: Old Hit #4
New Value: New Hit #5
Reason For Change: N/A

Change Date: 10-Jan-1998 12:51
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 10-Jan-1998 12:51
Change Made by: jheffel

Parameter: Best Hit for Benzo(a)Anthracene changed
Old Value: Old Hit #1
New Value: New Hit #4
Reason For Change: N/A

Change Date: 10-Jan-1998 12:51
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 10-Jan-1998 12:51
Change Made by: jheffel

Parameter: Best Hit for Benzo(b)fluoranthene changed
Old Value: Old Hit #1
New Value: New Hit #3
Reason For Change: N/A

Change Date: 10-Jan-1998 12:51
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 10-Jan-1998 12:52
Change Made by: jheffel

Parameter: Best Hit for 2,4,5-Trichlorophenol changed
Old Value: Old Hit #3
New Value: New Hit #2
Reason For Change: N/A

Change Date: 10-Jan-1998 12:52
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 12-Jan-1998 07:58
Change Made by: jheffel

Parameter: Compound Sublist
Old Value: 8270.sub
New Value: MM5X.sub
Reason For Change: N/A

Change Date: 12-Jan-1998 07:58
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Complete Target Compound Processing

Change Date: 12-Jan-1998 08:00
Change Made by: jheffel

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Old Hit #3
New Value: New Hit #2
Reason For Change: N/A

Change Date: 12-Jan-1998 08:00
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 12-Jan-1998 08:00
Change Made by: jheffel

Parameter: Manual reintegration of bis(2-Chloroisopropyl)ether (Signal 1)
Old Value: Old Area/Time: 5945885 / 8.46
New Value: New Area/Time: 7295796 / 8.46
Reason For Change: N/A

Change Date: 12-Jan-1998 08:00
Change Made by: jheffel

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #3
New Value: New Hit #2
Reason For Change: N/A

Change Date: 12-Jan-1998 08:00
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 12-Jan-1998 08:01
Change Made by: jheffel

Parameter: Best Hit for Benzo(a)Anthracene changed
Old Value: Old Hit #1
New Value: New Hit #3
Reason For Change: N/A

Change Date: 12-Jan-1998 08:01
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 12-Jan-1998 08:02
Change Made by: jheffel

Parameter: Best Hit for Benzo(b)fluoranthene changed
Old Value: Old Hit #1
New Value: New Hit #2
Reason For Change: N/A

Change Date: 12-Jan-1998 08:02
Change Made by: jheffel

Parameter: Requantitate all compounds

Old Value:
New Value:
Reason For Change: N/A

Change Date: 12-Jan-1998 08:02
Change Made by: jheffel

Parameter: Best Hit for Benzo(b)fluoranthene changed
Old Value: Old Hit #2
New Value: New Hit #3
Reason For Change: N/A

Change Date: 12-Jan-1998 08:02
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 12-Jan-1998 08:03
Change Made by: jheffel

Parameter: Best Hit for 2,4,5-Trichlorophenol changed
Old Value: Old Hit #3
New Value: New Hit #2
Reason For Change: N/A

Change Date: 12-Jan-1998 08:03
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 12-Jan-1998 08:04
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 15-Jan-1998 15:06
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Complete Target Compound Processing

Change Date: 15-Jan-1998 15:10
Change Made by: jheffel

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Old Hit #3
New Value: New Hit #2
Reason For Change: N/A

Change Date: 15-Jan-1998 15:10
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:

Reason For Change: N/A

Change Date: 15-Jan-1998 15:10
Change Made by: jheffel

Parameter: Manual reintegration of bis(2-Chloroisopropyl)ether (Signal 1)
Old Value: Old Area/Time: 5945885 / 8.46
New Value: New Area/Time: 7262687 / 8.46
Reason For Change: N/A

Change Date: 15-Jan-1998 15:12
Change Made by: jheffel

Parameter: Best Hit for Benzo(a)Anthracene changed
Old Value: Old Hit #1
New Value: New Hit #4
Reason For Change: N/A

Change Date: 15-Jan-1998 15:12
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 15-Jan-1998 15:12
Change Made by: jheffel

Parameter: Best Hit for Benzo(b)fluoranthene changed
Old Value: Old Hit #1
New Value: New Hit #3
Reason For Change: N/A

Change Date: 15-Jan-1998 15:12
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 15-Jan-1998 15:12
Change Made by: jheffel

Parameter: Best Hit for 2,4,5-Trichlorophenol changed
Old Value: Old Hit #3
New Value: New Hit #2
Reason For Change: N/A

Change Date: 15-Jan-1998 15:12
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 15-Jan-1998 15:14
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 15-Jan-1998 15:38
Change Made by: jheffel

Parameter: Sample Info
Old Value: 80 ug Method Spike 396-5-80
New Value: 80 ug Method Spike 396-4-80
Reason For Change: N/A

Change Date: 15-Jan-1998 15:38
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 15-Jan-1998 15:38
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 15-Jan-1998 15:38
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 28-Jan-1998 10:45
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 28-Jan-1998 12:01
Change Made by: jheffel

Parameter: Sample Prep. Date
Old Value:
New Value: 08-DEC-1997 11:57
Reason For Change: N/A

Change Date: 28-Jan-1998 12:03
Change Made by: jheffel

Parameter: Sample Prep. Date
Old Value: 08-DEC-1997 11:57
New Value: 08-DEC-1997 17:30
Reason For Change: N/A

Change Date: 28-Jan-1998 16:05
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Reason For Change: Quantitation

Change Date: 30-Jan-1998 10:51
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Reason For Change: Quantitation

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d
Report Date: 27-Jan-1998 15:24

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Air Toxics Limited

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: msdh.i
Lab File ID: h01150201019.d
Analysis Type: WATER
Lab Sample ID: Method Spike
Quant Type: ISTD

Injection Date: 15-JAN-1998 18:36
Init. Calibration Date(s): JAN/15/98 JAN/15/98
Init. Calibration Times: 12:11 16:27
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598

	COMPOUND	RRF	RF80	MIN RRF	%D	MAX %D	
$	1 2-Fluorophenol	0.764	0.774	0.050	-1.3	30.0	
$	2 Phenol-d5	0.551	0.545	0.050	1.0	30.0	
$	17 Nitrobenzene-d5	0.641	0.647	0.050	-1.0	30.0	
$	62 2,4,6-Tribromophenol	0.160	0.171	0.050	-7.0	30.0	
$	82 Terphenyl-d14	0.700	0.771	0.050	-10.2	30.0	
$	38 2-Fluorobiphenyl	0.610	0.672	0.050	-10.3	30.0	
$	34 1-Methylnaphthalene-d10	0.529	0.517	0.050	2.2	30.0	
	3 Phenol	0.879	0.876	0.050	0.3	30.0	
	4 bis(2-Chloroethyl)ether	0.713	0.658	0.050	7.7	30.0	
	5 2-Chlorophenol	0.665	0.672	0.050	-1.1	30.0	
	6 1,3-Dichlorobenzene	0.664	0.638	0.050	4.0	30.0	
	9 1,4-Dichlorobenzene	0.688	0.680	0.050	1.1	30.0	
	10 Benzyl Alcohol	0.427	0.432	0.050	-1.2	30.0	
	11 1,2-Dichlorobenzene	0.622	0.585	0.050	6.0	30.0	
	12 2-Methylphenol	0.620	0.613	0.050	1.2	30.0	
	13 bis(2-Chloroisopropyl)ether	0.933	0.827	0.050	11.3	30.0	
	14 4-Methylphenol	0.594	0.564	0.050	5.1	30.0	
	15 N-Nitrosodipropylamine	0.382	0.354	0.050	7.5	30.0	
	16 Hexachloroethane	0.294	0.293	0.050	0.1	30.0	
	18 Nitrobenzene	0.401	0.406	0.050	-1.1	30.0	
	19 Isophorone	0.858	0.826	0.050	3.8	30.0	
	20 2-Nitrophenol	0.216	0.220	0.050	-1.4	30.0	
	21 2,4-Dimethylphenol	0.297	0.290	0.050	2.4	30.0	
	23 bis(2-Chloroethoxy)methane	0.516	0.513	0.050	0.5	30.0	
	24 Benzoic Acid	0.206	0.231	0.050	-12.3	30.0	
	25 2,4-Dichlorophenol	0.281	0.277	0.050	1.6	30.0	
	26 1,2,4-Trichlorobenzene	0.318	0.307	0.050	3.6	30.0	
	28 Naphthalene	1.066	0.790	0.050	25.9	30.0	
	29 4-Chloroaniline	0.246	0.157	0.050	36.1	30.0	<-
	30 Hexachlorobutadiene	0.172	0.176	0.050	-2.3	30.0	
	32 4-Chloro-3-Methylphenol	0.319	0.341	0.050	-6.9	30.0	
	33 2-Methylnaphthalene	0.625	0.599	0.050	4.1	30.0	
	35 Hexachlorocyclopentadiene	0.209	0.228	0.050	-9.1	30.0	
	36 2,4,6-Trichlorophenol	0.270	0.270	0.050	0.2	30.0	
	37 2,4,5-Trichlorophenol	0.268	0.286	0.050	-7.0	30.0	

1-27-98
CCC's & SPCC's OK
1.29.98

Air Toxics Limited

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CONTINUING CALIBRATION COMPOUNDS

Instrument ID: msdh.i Injection Date: 15-JAN-1998 18:36
Lab File ID: h01150201019.d Init. Calibration Date(s): JAN/15/98 JAN/15/98
Analysis Type: WATER Init. Calibration Times: 12:11 16:27
Lab Sample ID: Method Spike Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598
Quant Type: ISTD

	COMPOUND	RRF	RF80	MIN RRF	%D	MAX %D	
39	2-Chloronaphthalene	0.787	0.776	0.050	1.4	30.0	
40	2-Nitroaniline	0.251	0.266	0.050	-5.8	30.0	
46	3-Nitroaniline	0.088	0.054	0.050	38.8	30.0	<-
42	Dimethylphthalate	0.989	1.013	0.050	-2.4	30.0	
44	2,6-Dinitrotoluene	0.213	0.239	0.050	-12.5	30.0	
45	Acenaphthylene	1.220	1.110	0.050	9.0	30.0	
48	Acenaphthene	0.763	0.760	0.050	0.4	30.0	
49	2,4-Dinitrophenol	0.101	0.118	0.050	-17.3	30.0	
50	4-Nitrophenol	0.116	0.106	0.050	8.4	30.0	
51	Dibenzofuran	1.060	1.094	0.050	-3.2	30.0	
52	2,4-Dinitrotoluene	0.305	0.337	0.050	-10.4	30.0	
53	1-Chloro-3,4-Dinitrobenzene	0.100	0.113	0.050	-12.7	30.0	
56	Diethylphthalate	1.025	0.993	0.050	3.0	30.0	
57	Fluorene	0.867	0.853	0.050	1.7	30.0	
58	4-Chlorophenyl phenyl ether	0.434	0.430	0.050	0.9	30.0	
59	4-Nitroaniline	0.093	0.088	0.050	5.8	30.0	
60	4,6-Dinitro-2-methylphenol	0.107	0.128	0.050	-20.3	30.0	
61	N-nitrosodiphenylamine	0.355	0.341	0.050	3.9	30.0	
65	4-Bromophenyl phenyl ether	0.179	0.192	0.050	-7.6	30.0	
66	Hexachlorobenzene	0.228	0.237	0.050	-3.9	30.0	
68	Pentachlorophenol	0.122	0.143	0.050	-16.9	30.0	
72	Phenanthrene	0.793	0.771	0.050	2.7	30.0	
73	Anthracene	0.733	0.809	0.050	-10.4	30.0	
78	Di-n-butylphthalate	1.084	0.945	0.050	12.8	30.0	
80	Fluoranthene	0.768	0.823	0.050	-7.2	30.0	
81	Pyrene	0.978	0.962	0.050	1.7	30.0	
85	Butyl benzyl phthalate	0.588	0.586	0.050	0.4	30.0	
88	Benzo(a)Anthracene	0.787	0.827	0.050	-5.1	30.0	
91	Chrysene	0.685	0.810	0.050	-18.2	30.0	
93	bis(2-ethylhexyl)Phthalate	0.764	0.874	0.050	-14.5	30.0	
94	Di-n-octyl phthalate	1.585	1.573	0.050	0.7	30.0	
95	Benzo(b)fluoranthene	0.967	0.967	0.050	0.0	30.0	
96	Benzo(k)fluoranthene	0.855	1.006	0.050	-17.7	30.0	
97	Benzo(e)pyrene	0.841	0.838	0.050	0.4	30.0	
98	Benzo(a)pyrene	0.727	0.751	0.050	-3.2	30.0	

Air Toxics Limited

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: msdh.i
Lab File ID: h01150201019.d
Analysis Type: WATER
Lab Sample ID: Method Spike
Quant Type: ISTD

Injection Date: 15-JAN-1998 18:36
Init. Calibration Date(s): JAN/15/98 JAN/15/98
Init. Calibration Times: 12:11 16:27
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598

COMPOUND	RRF	RF80	MIN RRF	%D	MAX %D
103 Indeno(1,2,3-cd)pyrene	0.492	0.513	0.050	-4.2	30.0
104 Dibenzo(a,h)anthracene	0.431	0.444	0.050	-3.0	30.0
105 Benzo(g,h,i)perylene	0.514	0.498	0.050	3.0	30.0

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150201019.d
Lab Smp Id: Method Spike Client Smp ID: Method Spike
Inj Date : 15-JAN-1998 18:36
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 80ug Method Spike 396-4-80
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 27-Jan-1998 15:24 jheffel Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 2 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

1-27-98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

					AMOUNTS CAL-AMT	ON-COL		
	RT	EXP RT (REL RT)	MASS	RESPONSE	(NG)	(NG)	TARGET RANGE	RATIO
*	7 1,4-Dichlorobenzene-d4					CAS #: 3855-82-1		
	7.021	7.021 (1.000)	150	11270581	80.0000		80.00- 120.00	100.00
	7.021	7.021 (1.000)	152	6594157			0.00-10058.51	58.51
	7.021	7.021 (1.000)	115	4236824			0.00-10037.59	37.59
*	27 Naphthalene-d8					CAS #: 1146-65-2		
	9.769	9.769 (1.000)	136	17745391	80.0000		80.00- 120.00	100.00
	9.769	9.769 (1.000)	68	1203049			0.00-10006.78	6.78
*	47 Acenaphthene-d10					CAS #: 15067-26-2		
	13.907	13.907 (1.000)	164	12494791	80.0000		80.00- 120.00	100.00
	13.907	13.907 (1.000)	162	11862796			0.00-10094.94	94.94
	13.907	13.907 (1.000)	160	5125414			0.00-10041.02	41.02

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
* 71 Phenanthrene-d10						CAS #: 1517-22-2	
17.489	17.489 (1.000)	188	17937870	80.0000		80.00- 120.00	100.00
17.489	17.489 (1.000)	94	2589788			0.00-10014.44	14.44
17.489	17.489 (1.000)	80	2468035			0.00-10015.28	13.76
* 90 Chrysene-d12						CAS #: 1719-03-5	
23.885	23.885 (1.000)	240	15301801	80.0000		80.00- 120.00	100.00
23.885	23.885 (1.000)	236	3978390			0.00-10026.00	26.00
23.885	23.885 (1.000)	120	2770541			0.00-10018.11	18.11
* 99 Perylene-d12						CAS #: 1520-96-3	
27.058	27.058 (1.000)	264	9954932	80.0000		80.00- 120.00	100.00
27.058	27.058 (1.000)	260	2185554			0.00-10021.95	21.95
27.058	27.058 (1.000)	265	2080140			0.00-10020.90	20.90
$ 1 2-Fluorophenol						CAS #: 367-12-4	
4.649	4.649 (0.662)	112	8720915	80.0000	81.0	80.00- 120.00	100.00
4.649	4.649 (0.662)	64	4021174			0.00-10046.11	46.11
4.649	4.649 (0.662)	92	1669890			0.00-10019.15	19.15
$ 2 Phenol-d5						CAS #: 4165-62-2	
6.317	6.317 (0.647)	99	9668836	80.0000	79.2	80.00- 120.00	100.00
6.317	6.317 (0.647)	71	2874409			0.00-10029.73	29.73
$ 17 Nitrobenzene-d5						CAS #: 4165-60-0	
8.182	8.182 (0.588)	82	8085718	80.0000	80.8	80.00- 120.00	100.00
8.182	8.182 (0.588)	54	4242066			0.00-10052.46	52.46
8.182	8.182 (0.588)	128	4008955			0.00-10049.58	49.58
$ 62 2,4,6-Tribromophenol						CAS #: 118-79-6	
15.804	15.804 (0.662)	330	2611495	80.0000	85.6	80.00- 120.00	100.00
15.804	15.804 (0.662)	332	2514331			0.00-10096.28	96.28
15.804	15.804 (0.662)	141	719617			0.00-10029.68	27.56
$ 82 Terphenyl-d14						CAS #: 98904-43-9	
21.415	21.415 (0.897)	244	11803615	80.0000	88.1	80.00- 120.00	100.00
21.415	21.415 (0.897)	122	1930149			0.00-10016.35	16.35
21.415	21.415 (0.897)	212	721718			0.00-10005.98	6.11
$ 38 2-Fluorobiphenyl						CAS #: 321-60-8	
12.337	12.337 (0.705)	172	12060224	80.0000	88.2	80.00- 120.00	100.00
12.337	12.337 (0.705)	171	4078050			0.00-10033.81	33.81
$ 34 1-Methylnaphthalene-d10						CAS #: 38072-94-5	
11.584	11.584 (1.186)	152	9175869	80.0000	78.2	80.00- 120.00	100.00
11.584	11.584 (1.186)	122	3638536			0.00-10038.76	39.65

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
$ 34 1-Methylnaphthalene-d10 (continued)							
11.584	11.584 (1.186)	150	7769671			0.00-10084.36	84.68
3 Phenol					CAS #: 108-95-2		
6.350	6.350 (0.904)	94	9869158	80.0000	79.7	80.00- 120.00	100.00
6.350	6.350 (0.904)	66	3679721			0.00-10037.29	37.29
6.350	6.350 (0.904)	65	2442198			0.00-10025.14	24.75
4 bis(2-Chloroethyl)ether					CAS #: 111-44-4		
6.514	6.514 (0.928)	93	7417603	80.0000	73.8	80.00- 120.00	100.00
6.514	6.514 (0.928)	63	4667046			0.00-10062.92	62.92
6.514	6.514 (0.928)	95	2373182			0.00-10031.42	31.99
5 2-Chlorophenol					CAS #: 95-57-8		
6.595	6.595 (0.939)	128	7573086	80.0000	80.9	80.00- 120.00	100.00
6.595	6.595 (0.939)	130	2339704			0.00-10030.89	30.89
6.595	6.595 (0.939)	64	3116540			0.00-10041.15	41.15
6 1,3-Dichlorobenzene					CAS #: 541-73-1		
6.890	6.890 (0.981)	146	7185390	80.0000	76.8	80.00- 120.00	100.00(H)
6.890	6.890 (0.981)	148	4551295			0.00-10063.34	63.34
6.890	6.890 (0.981)	113	997415			0.00-10013.88	13.88
9 1,4-Dichlorobenzene					CAS #: 106-46-7		
7.053	7.053 (1.005)	146	7665032	80.0000	79.1	80.00- 120.00	100.00
7.053	7.053 (1.005)	148	4849564			0.00-10063.27	63.27
7.053	7.053 (1.005)	113	1238996			0.00-10016.16	16.16
10 Benzyl Alcohol					CAS #: 100-51-6		
7.315	7.315 (1.042)	108	4873990	80.0000	81.0	80.00- 120.00	100.00
7.315	7.315 (1.042)	79	5453614			0.00-10116.61	111.89
7.315	7.315 (1.042)	77	3583472			0.00-10078.86	73.52
11 1,2-Dichlorobenzene					CAS #: 95-50-1		
7.348	7.348 (1.047)	146	6588561	80.0000	75.2	80.00- 120.00	100.00(H)
7.348	7.348 (1.047)	148	4180924			0.00-10063.46	63.46
7.348	7.348 (1.047)	113	947509			0.00-10014.38	14.38
12 2-Methylphenol					CAS #: 95-48-7		
7.560	7.560 (1.077)	108	6905317	80.0000	79.0	80.00- 120.00	100.00
7.560	7.560 (1.077)	107	5951056			0.00-10086.18	86.18
7.560	7.560 (1.077)	79	2627859			0.00-10041.55	38.06
13 bis(2-Chloroisopropyl)ether					CAS #: 108-60-1		
7.609	7.609 (1.084)	45	9325846	80.0000	70.9	80.00- 120.00	100.00
7.609	7.609 (1.084)	121	1889659	80.0000	75.4	0.00-10020.26	20.26

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
14 4-Methylphenol					CAS #: 106-44-5		
7.904	7.904 (1.126)	108	6354396	80.0000	75.9	80.00- 120.00	100.00
7.904	7.904 (1.126)	107	7757336			0.00-10122.08	122.08
7.904	7.904 (1.126)	79	1511495			0.00-10025.12	23.79
15 N-Nitrosodipropylamine					CAS #: 621-64-7		
7.904	7.904 (1.126)	70	3986201	80.0000	74.0	80.00- 120.00	100.00
7.904	7.904 (1.126)	130	1049399			0.00-10026.33	26.33
7.904	7.904 (1.126)	101	485956			0.00-10012.19	12.19
16 Hexachloroethane					CAS #: 67-72-1		
8.051	8.051 (1.147)	117	3307602	80.0000	79.9	80.00- 120.00	100.00
8.051	8.051 (1.147)	201	2261576			0.00-10068.38	68.38
8.051	8.051 (1.147)	199	1383488			0.00-10041.83	41.83
18 Nitrobenzene					CAS #: 98-95-3		
8.231	8.231 (0.843)	77	7200052	80.0000	80.9	80.00- 120.00	100.00
8.231	8.231 (0.843)	123	3848470			0.00-10053.45	53.45
8.231	8.231 (0.843)	65	999876			0.00-10013.89	13.89
19 Isophorone					CAS #: 78-59-1		
8.771	8.771 (0.898)	82	14653425	80.0000	77.0	80.00- 120.00	100.00
8.771	8.771 (0.898)	138	2153512			0.00-10014.70	14.70
8.771	8.771 (0.898)	95	842712			0.00-10005.51	5.75
20 2-Nitrophenol					CAS #: 88-75-5		
8.918	8.918 (0.913)	139	3895502	80.0000	81.1	80.00- 120.00	100.00
8.918	8.918 (0.913)	65	1673415			0.00-10042.96	42.96
8.918	8.918 (0.913)	109	1020929			0.00-10026.21	26.21
21 2,4-Dimethylphenol					CAS #: 105-67-9		
9.065	9.065 (0.928)	122	5146840	80.0000	78.1	80.00- 120.00	100.00
9.065	9.065 (0.928)	107	6374786			0.00-10123.86	123.86
9.065	9.065 (0.928)	121	2844507			0.00-10055.27	55.27
23 bis(2-Chloroethoxy)methane					CAS #: 111-91-1		
9.294	9.294 (0.951)	93	9106168	80.0000	79.6	80.00- 120.00	100.00
9.294	9.294 (0.951)	123	990745			0.00-10010.88	10.88
9.294	9.294 (0.951)	95	2836197			0.00-10031.15	31.15
24 Benzoic Acid					CAS #: 65-85-0		
9.441	9.441 (0.967)	122	4095583	80.0000	89.8	80.00- 120.00	100.00
9.441	9.441 (0.967)	105	5050778			0.00-10123.32	123.32
9.441	9.441 (0.967)	77	3339890			0.00-10081.55	81.55
25 2,4-Dichlorophenol					CAS #: 120-83-2		
9.474	9.474 (0.970)	162	4910385	80.0000	78.7	80.00- 120.00	100.00

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
25 2,4-Dichlorophenol (continued)							
9.474	9.474 (0.970)	164	3119269			0.00-10063.52	63.52
9.474	9.474 (0.970)	98	1920874			0.00-10039.12	39.12
26 1,2,4-Trichlorobenzene					CAS #: 120-82-1		
9.654	9.654 (0.988)	180	5444505	80.0000	77.1	80.00- 120.00	100.00
9.654	9.654 (0.988)	182	5237423			0.00-10096.20	96.20
9.654	9.654 (0.988)	145	1561446			0.00-10028.68	28.68
28 Naphthalene					CAS #: 91-20-3		
9.818	9.818 (1.005)	128	14020462	80.0000	59.3	80.00- 120.00	100.00
9.818	9.818 (1.005)	129	1860788			0.00-10013.27	13.27
9.818	9.818 (1.005)	127	2224852			0.00-10013.22	15.87
29 4-Chloroaniline					CAS #: 106-47-8		
10.014	10.014 (1.025)	127	2789943	80.0000	51.1	80.00- 120.00	100.00(MH)
9.965	9.965 (1.020)	129	289826			0.00-10010.39	10.39
30 Hexachlorobutadiene					CAS #: 87-68-3		
10.128	10.128 (1.037)	225	3126996	80.0000	81.8	80.00- 120.00	100.00
10.128	10.128 (1.037)	223	1929615			0.00-10061.71	61.71
10.128	10.128 (1.037)	227	2010229			0.00-10063.44	64.29
32 4-Chloro-3-Methylphenol					CAS #: 59-50-7		
11.159	11.159 (1.142)	107	6053481	80.0000	85.5	80.00- 120.00	100.00
11.159	11.159 (1.142)	142	4461992			0.00-10073.71	73.71
11.159	11.159 (1.142)	144	1405616			0.00-10023.72	23.22
33 2-Methylnaphthalene					CAS #: 91-57-6		
11.437	11.437 (1.171)	142	10632249	80.0000	76.7	80.00- 120.00	100.00
11.437	11.437 (1.171)	141	9580664			0.00-10090.11	90.11
35 Hexachlorocyclopentadiene					CAS #: 77-47-4		
11.813	11.813 (0.849)	237	2848622	80.0000	87.3	80.00- 120.00	100.00
11.813	11.813 (0.849)	272	419721			0.00-10014.73	14.73
11.813	11.813 (0.849)	235	1757988			0.00-10061.71	61.71
36 2,4,6-Trichlorophenol					CAS #: 88-06-2		
12.124	12.124 (0.872)	196	3368858	80.0000	79.8	80.00- 120.00	100.00(H)
12.124	12.124 (0.872)	198	3195035			0.00-10094.84	94.84
12.124	12.124 (0.872)	200	1025956			0.00-10030.07	30.45
37 2,4,5-Trichlorophenol					CAS #: 95-95-4		
12.206	12.206 (0.878)	196	3576025	80.0000	85.6	80.00- 120.00	100.00(H)
12.206	12.206 (0.878)	198	3399590			0.00-10095.07	95.07
12.206	12.206 (0.878)	200	1095185			0.00-10030.67	30.63

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
39 2-Chloronaphthalene					CAS #: 91-58-7		
12.582	12.582 (0.905)	162	9696466	80.0000	78.9	80.00- 120.00	100.00
12.582	12.582 (0.905)	164	3025200			0.00-10031.20	31.20
12.582	12.582 (0.905)	127	3753700			0.00-10038.71	38.71
40 2-Nitroaniline					CAS #: 88-74-4		
12.860	12.860 (0.925)	65	3325695	80.0000	84.7	80.00- 120.00	100.00
12.876	12.876 (0.926)	138	4247722			0.00-10127.72	127.72
12.860	12.860 (0.925)	92	2456291			0.00-10073.86	73.86
46 3-Nitroaniline					CAS #: 99-09-2		
12.874	13.874 (0.998)	138	675584	80.0000	48.9	80.00- 120.00	100.00
13.874	13.874 (0.998)	92	812641			0.00-10120.29	120.29
13.907	13.907 (1.000)	108	366657			0.00-10080.06	54.27
42 Dimethylphthalate					CAS #: 131-11-3		
13.367	13.367 (0.961)	163	12653108	80.0000	81.9	80.00- 120.00	100.00
13.367	13.367 (0.961)	194	653192			0.00-10005.16	5.16
13.367	13.367 (0.961)	164	1212243			0.00-10009.58	9.58
44 2,6-Dinitrotoluene					CAS #: 606-20-2		
13.498	13.498 (0.971)	165	2991782	80.0000	90.0	80.00- 120.00	100.00
13.498	13.498 (0.971)	89	1791122			0.00-10059.87	59.87
13.498	13.498 (0.971)	121	667603			0.00-10022.31	22.31
45 Acenaphthylene					CAS #: 208-96-8		
13.563	13.563 (0.975)	152	13870639	80.0000	72.8	80.00- 120.00	100.00
13.563	13.563 (0.975)	151	3298753			0.00-10023.78	23.78
13.563	13.563 (0.975)	153	2112455			0.00-10015.23	15.23
48 Acenaphthene					CAS #: 83-32-9		
13.989	13.989 (1.006)	154	9499371	80.0000	79.7	80.00- 120.00	100.00
13.989	13.989 (1.006)	152	4705772			0.00-10049.54	49.54
13.989	13.989 (1.006)	153	10093622			0.00-10106.26	106.26
49 2,4-Dinitrophenol					CAS #: 51-28-5		
14.120	14.120 (1.015)	184	1478151	80.0000	93.8	80.00- 120.00	100.00
14.103	14.103 (1.014)	63	867353			0.00-10058.68	58.68
14.120	14.120 (1.015)	154	566245			0.00-10038.31	38.31
50 4-Nitrophenol					CAS #: 100-02-7		
14.349	14.349 (1.032)	109	1328543	80.0000	73.2	80.00- 120.00	100.00
14.349	14.349 (1.032)	139	2061532			0.00-10155.17	155.17
14.349	14.349 (1.032)	65	1772008			0.00-10133.38	133.38
51 Dibenzofuran					CAS #: 132-64-9		
14.414	14.414 (1.036)	168	13667911	80.0000	82.6	80.00- 120.00	100.00

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
51 Dibenzofuran (continued)							
14.414	14.414 (1.036)	139	5307557			0.00-10038.83	38.83
52 2,4-Dinitrotoluene					CAS #: 121-14-2		
14.447	14.447 (1.039)	165	4212905	80.0000	88.3	80.00- 120.00	100.00
14.430	14.430 (1.038)	63	2676746			0.00-10063.54	63.54
14.447	14.447 (1.039)	182	204584			0.00-10004.86	4.86
53 1-Chloro-3,4-Dinitrobenzene					CAS #:		
14.708	14.708 (1.506)	63	2004221	80.0000	90.1	80.00- 120.00	100.00
14.708	14.708 (1.506)	75	1647242			0.00-10081.72	82.19
14.725	14.725 (1.507)	202	1170061			0.00-10054.68	58.38
56 Diethylphthalate					CAS #: 84-66-2		
15.085	15.085 (1.085)	149	12411706	80.0000	77.6	80.00- 120.00	100.00
15.085	15.085 (1.085)	177	2441759			0.00-10019.67	19.67
15.085	15.085 (1.085)	150	1432210			0.00-10011.54	11.54
57 Fluorene					CAS #: 86-73-7		
15.232	15.232 (1.095)	166	10654636	80.0000	78.7	80.00- 120.00	100.00
15.232	15.232 (1.095)	165	9939146			0.00-10093.28	93.28
15.232	15.232 (1.095)	167	1367126			0.00-10012.75	12.83
58 4-Chlorophenyl phenyl ether					CAS #: 7005-72-3		
15.281	15.281 (1.099)	204	5368262	80.0000	79.2	80.00- 120.00	100.00
15.281	15.281 (1.099)	206	1741688			0.00-10032.44	32.44
15.281	15.281 (1.099)	141	2877329			0.00-10053.60	53.60
59 4-Nitroaniline					CAS #: 100-01-6		
15.330	15.330 (1.102)	138	1097402	80.0000	75.3	80.00- 120.00	100.00
15.330	15.330 (1.102)	92	358773			0.00-10032.69	32.69
15.330	15.330 (1.102)	108	808617			0.00-10073.68	73.68
60 4,6-Dinitro-2-methylphenol					CAS #: 534-52-1		
15.412	15.412 (0.881)	198	2304385	80.0000	96.2	80.00- 120.00	100.00
15.412	15.412 (0.881)	121	833457			0.00-10036.17	36.17
15.412	15.412 (0.881)	51	1244978			0.00-10054.03	54.03
61 N-nitrosodiphenylamine					CAS #: 86-30-6		
15.575	15.575 (0.891)	169	6124693	80.0000	76.8	80.00- 120.00	100.00
15.575	15.575 (0.891)	168	4044928			0.00-10066.04	66.04
15.575	15.575 (0.891)	167	2169773			0.00-10035.43	35.43
65 4-Bromophenyl phenyl ether					CAS #: 101-55-3		
16.459	16.459 (0.941)	248	3450087	80.0000	86.1	80.00- 120.00	100.00
16.459	16.459 (0.941)	250	3332366			0.00-10096.59	96.59

RT	EXP RT (REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
65 4-Bromophenyl phenyl ether (continued)							
16.459	16.459 (0.941)	141	2246412			0.00-10065.11	65.11
66 Hexachlorobenzene					CAS #: 118-74-1		
16.540	16.540 (0.946)	284	4244520	80.0000	83.1	80.00- 120.00	100.00
16.540	16.540 (0.946)	142	1411963			0.00-10033.27	33.27
16.540	16.540 (0.946)	249	1035116			0.00-10024.51	24.39
68 Pentachlorophenol					CAS #: 87-86-5		
17.047	17.047 (0.975)	266	2568909	80.0000	93.6	80.00- 120.00	100.00
17.047	17.047 (0.975)	264	1594125			0.00-10062.05	62.05
17.047	17.047 (0.975)	268	1639185			0.00-10063.81	63.81
72 Phenanthrene					CAS #: 85-01-8		
17.538	17.538 (1.003)	178	13833388	80.0000	77.8	80.00- 120.00	100.00
17.538	17.538 (1.003)	176	2816232			0.00-10020.36	20.36
17.538	17.538 (1.003)	179	2291793			0.00-10016.57	16.57
73 Anthracene					CAS #: 120-12-7		
17.669	17.669 (1.010)	178	14509773	80.0000	88.3	80.00- 120.00	100.00
17.669	17.669 (1.010)	176	2845677			0.00-10019.61	19.61
17.669	17.669 (1.010)	179	2358911			0.00-10016.26	16.26
78 Di-n-butylphthalate					CAS #: 84-74-2		
19.059	19.059 (1.090)	149	16951368	80.0000	69.8	80.00- 120.00	100.00
19.059	19.059 (1.090)	150	1902623			0.00-10011.22	11.22
19.059	19.059 (1.090)	104	1155884			0.00-10006.82	6.82
80 Fluoranthene					CAS #: 206-44-0		
20.401	20.401 (1.166)	202	14758121	80.0000	85.7	80.00- 120.00	100.00
20.401	20.401 (1.166)	101	2637334			0.00-10017.87	17.87
20.401	20.401 (1.166)	100	1953644			0.00-10013.24	13.24
81 Pyrene					CAS #: 129-00-0		
20.940	20.940 (0.877)	202	14713774	80.0000	78.7	80.00- 120.00	100.00
20.940	20.940 (0.877)	101	3280638			0.00-10022.30	22.30
20.940	20.940 (0.877)	100	2602171			0.00-10017.69	17.69
85 Butyl benzyl phthalate					CAS #: 85-68-7		
22.674	22.674 (0.949)	149	8965405	80.0000	79.6	80.00- 120.00	100.00
22.674	22.674 (0.949)	91	6576045			0.00-10073.35	73.35
22.674	22.674 (0.949)	206	1376688			0.00-10015.36	15.36
88 Benzo(a)Anthracene					CAS #: 56-55-3		
23.836	23.836 (0.998)	228	12648299	80.0000	84.0	80.00- 120.00	100.00(H)
23.836	23.836 (0.998)	229	2393232			0.00-10018.92	18.92

RT	EXP RT	(REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
88 Benzo(a)Anthracene (continued)								
22.836	23.836	(0.998)	226	3276613			0.00-10025.91	25.91
91 Chrysene						CAS #: 218-01-9		
23.950	23.950	(1.003)	228	12387636	80.0000	94.6	80.00- 120.00	100.00
23.950	23.950	(1.003)	226	3485943			0.00-10028.14	28.14
23.950	23.950	(1.003)	229	2310580			0.00-10018.65	18.65
93 bis(2-ethylhexyl)Phthalate						CAS #: 117-81-7		
24.130	24.130	(1.010)	149	13377904	80.0000	91.6	80.00- 120.00	100.00
24.130	24.130	(1.010)	167	3741152			0.00-10027.97	27.97
24.130	24.130	(1.010)	279	773750			0.00-10005.78	5.78
94 Di-n-octyl phthalate						CAS #: 117-84-0		
25.619	25.619	(0.947)	149	15660277	80.0000	79.4	80.00- 120.00	100.00
25.619	25.619	(0.947)	150	1766678			0.00-10011.28	11.28
95 Benzo(b)fluoranthene						CAS #: 205-99-2		
26.273	26.273	(0.971)	252	9626004	80.0000	80.0	80.00- 120.00	100.00(H)
26.273	26.273	(0.971)	253	2039097			0.00-10021.18	21.18
26.256	26.256	(0.970)	125	1722563			0.00-10017.89	17.89
96 Benzo(k)fluoranthene						CAS #: 207-08-9		
26.322	26.322	(0.973)	252	10016657	80.0000	94.2	80.00- 120.00	100.00
26.322	26.322	(0.973)	253	2096664			0.00-10020.93	20.93
26.322	26.322	(0.973)	125	1612162			0.00-10016.09	16.09
97 Benzo(e)pyrene						CAS #:		
26.813	26.813	(0.991)	252	4170115	40.0000	39.8	80.00- 120.00	100.00
26.813	26.813	(0.991)	125	1092417			0.00-10027.28	26.20
26.813	26.813	(0.991)	250	1149824			0.00-10027.55	27.57
98 Benzo(a)pyrene						CAS #: 50-32-8		
26.927	26.927	(0.995)	252	7476770	80.0000	82.6	80.00- 120.00	100.00
26.927	26.927	(0.995)	253	1577056			0.00-10021.09	21.09
26.927	26.927	(0.995)	125	1398346			0.00-10021.00	18.70
103 Indeno(1,2,3-cd)pyrene						CAS #: 193-39-5		
29.528	29.528	(1.091)	276	5109474	80.0000	83.4	80.00- 120.00	100.00
29.528	29.528	(1.091)	138	1820767			0.00-10035.87	35.64
29.528	29.528	(1.091)	227	5598			0.00-10000.11	0.11
104 Dibenzo(a,h)anthracene						CAS #: 53-70-3		
29.593	29.593	(1.094)	278	4415222	80.0000	82.4	80.00- 120.00	100.00
29.593	29.593	(1.094)	279	997372			0.00-10022.59	22.59
29.593	29.593	(1.094)	139	1208236			0.00-10027.37	27.37

RT	EXP RT	(REL RT)	MASS	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)	TARGET RANGE	RATIO
105 Benzo(g,h,i)perylene						CAS #: 191-24-2		
30.264	30.264	(1.118)	276	4958969	80.0000	77.6	80.00- 120.00	100.00
30.264	30.264	(1.118)	138	1909278			0.00-10038.50	38.50
30.264	30.264	(1.118)	277	1159733			0.00-10023.39	23.39

QC Flag Legend

M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

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Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150201019.d
Lab Smp Id: Method Spike Client Smp ID: Method Spike
Inj Date : 15-JAN-1998 18:36
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 80ug Method Spike 396-4-80
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 19-Jan-1998 18:45 m Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 2 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: MM5X.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)
* 7 1,4-Dichlorobenzene-d4	150	7.021	7.021	(1.000)	11270581	80.0000	
	150	6.661	7.021	(1.000)	139	80.0000	
	150	7.266	7.021	(1.000)	2543	80.0000	
	150	7.348	7.021	(1.000)	664773	80.0000	
* 27 Naphthalene-d8	136	9.769	9.769	(1.000)	17745391	80.0000	
	136	9.327	9.769	(1.000)	1112	80.0000	
	136	9.409	9.769	(1.000)	207	80.0000	
	136	9.474	9.769	(1.000)	30435	80.0000	
	136	9.589	9.769	(1.000)	286	80.0000	
* 47 Acenaphthene-d10	164	13.907	13.907	(1.000)	12494791	80.0000	
	164	13.727	13.907	(1.000)	2638	80.0000	
* 71 Phenanthrene-d10	188	17.489	17.489	(1.000)	17937870	80.0000	
	188	17.047	17.489	(1.000)	659	80.0000	
	188	17.162	17.489	(1.000)	1530	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)
	188	17.227	17.489	(1.000)	371	80.0000	
	188	17.326	17.489	(1.000)	470	80.0000	
* 90 Chrysene-d12	240	23.885	23.885	(1.000)	15301801	80.0000	
	240	23.590	23.885	(1.000)	520	80.0000	
	240	23.623	23.885	(1.000)	47	80.0000	
	240	23.688	23.885	(1.000)	674	80.0000	
* 99 Perylene-d12	264	27.058	27.058	(1.000)	9954932	80.0000	
	264	26.764	27.058	(1.000)	738	80.0000	
	264	26.878	27.058	(1.000)	737	80.0000	
$ 1 2-Fluorophenol	112	4.649	4.649	(0.662)	8720915	80.0000	81.0
	112	4.289	4.649	(0.611)	751967	80.0000	7.0
$ 2 Phenol-d5	99	6.317	6.317	(0.647)	9668836	80.0000	79.2
	99	5.925	6.317	(0.607)	701	80.0000	0.0057
	99	5.990	6.317	(0.613)	306	80.0000	0.0025
	99	6.023	6.317	(0.617)	523	80.0000	0.0043
	99	6.121	6.317	(0.627)	301	80.0000	0.0025
	99	6.170	6.317	(0.632)	126	80.0000	0.0010
	99	6.595	6.317	(0.675)	431174	80.0000	3.5
$ 17 Nitrobenzene-d5	82	8.182	8.182	(0.588)	8085718	80.0000	80.8
	82	7.773	8.182	(0.559)	363	80.0000	0.0036
	82	7.904	8.182	(0.568)	30897	80.0000	0.31
	82	8.051	8.182	(0.579)	778971	80.0000	7.8
$ 62 2,4,6-Tribromophenol	330	15.804	15.804	(0.662)	2611495	80.0000	85.6
	330	16.115	15.804	(0.675)	2691	80.0000	0.088
$ 82 Terphenyl-d14	244	21.415	21.415	(0.897)	11803615	80.0000	88.1
	244	21.022	21.415	(0.880)	941	80.0000	0.0070
	244	21.104	21.415	(0.884)	588	80.0000	0.0044
	244	21.169	21.415	(0.886)	123	80.0000	0.00092
	244	21.235	21.415	(0.889)	805	80.0000	0.0060
$ 38 2-Fluorobiphenyl	172	12.337	12.337	(0.705)	12060224	80.0000	88.2
	172	12.124	12.337	(0.693)	2890	80.0000	0.021
	172	12.206	12.337	(0.698)	7823	80.0000	0.057
	172	12.271	12.337	(0.702)	865	80.0000	0.0063
$ 34 1-Methylnaphthalene-d10	152	11.584	11.584	(1.186)	9175869	80.0000	78.2
	152	11.143	11.584	(1.141)	276	80.0000	0.0024
	152	11.208	11.584	(1.147)	383	80.0000	0.0033
	152	11.257	11.584	(1.152)	384	80.0000	0.0033
	152	11.355	11.584	(1.162)	9496	80.0000	0.081
	152	11.486	11.584	(1.176)	1247	80.0000	0.011
3 Phenol	94	6.350	6.350	(0.904)	9869158	80.0000	79.7
	94	5.974	6.350	(0.851)	382	80.0000	0.0031(a)
	94	6.072	6.350	(0.865)	957	80.0000	0.0077(a)
	94	6.105	6.350	(0.870)	290	80.0000	0.0023(a)
	94	6.186	6.350	(0.881)	476	80.0000	0.0038(a)
	94	6.514	6.350	(0.928)	291313	80.0000	2.4(a)
	94	6.595	6.350	(0.939)	22079	80.0000	0.18(a)
4 bis(2-Chloroethyl)ether	93	6.514	6.514	(0.928)	7417603	80.0000	73.8

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)
	93	6.088	6.514	(0.867)	524	80.0000	0.0052(a)
	93	6.186	6.514	(0.881)	621	80.0000	0.0062(a)
	93	6.252	6.514	(0.890)	880	80.0000	0.0088(a)
	93	6.350	6.514	(0.904)	108944	80.0000	1.1
	93	6.595	6.514	(0.939)	189489	80.0000	1.9
	93	6.923	6.514	(0.986)	1285	80.0000	0.013(aQ)
5 2-Chlorophenol	128	6.595	6.595	(0.939)	7573086	80.0000	80.9
	128	7.004	6.595	(0.998)	213	80.0000	0.0023(aQ)
6 1,3-Dichlorobenzene	146	6.366	6.366	(0.907)	108	80.0000	0.0012(a)
	146	6.432	6.366	(0.916)	106	80.0000	0.0011(a)
	146	6.514	6.366	(0.928)	5275	80.0000	0.056(a)
	146	6.890	6.366	(0.981)	7185390	80.0000	76.8
9 1,4-Dichlorobenzene	146	7.053	7.053	(1.005)	7665032	80.0000	79.1
	146	6.890	7.053	(0.981)	7249572	80.0000	74.8
10 Benzyl Alcohol	108	7.315	7.315	(1.042)	4873990	80.0000	81.0
	108	6.890	7.315	(0.981)	57159	80.0000	0.95(a)
	108	7.053	7.315	(1.005)	88390	80.0000	1.5(a)
	108	7.560	7.315	(1.077)	6905317	80.0000	115
11 1,2-Dichlorobenzene	146	8.084	8.084	(1.151)	341	80.0000	0.0039(a)
	146	7.348	8.084	(1.047)	6588561	80.0000	75.2
	146	7.691	8.084	(1.096)	3093	80.0000	0.035(a)
	146	8.035	8.084	(1.144)	744	80.0000	0.0085(a)
12 2-Methylphenol	108	7.560	7.560	(1.077)	6905317	80.0000	79.0
	108	7.315	7.560	(1.042)	4873990	80.0000	55.8
	108	7.904	7.560	(1.126)	6327923	80.0000	72.4
13 bis(2-Chloroisopropyl)ether	45	7.609	7.609	(1.084)	9325846	80.0000	70.9
14 4-Methylphenol	108	7.904	7.904	(1.126)	6354396	80.0000	75.9
15 N-Nitrosodipropylamine	70	7.904	7.904	(1.126)	3986201	80.0000	74.0
	70	7.560	7.904	(1.077)	2487	80.0000	0.046(a)
	70	7.708	7.904	(1.098)	942	80.0000	0.017(a)
	70	7.773	7.904	(1.107)	232	80.0000	0.0043(a)
	70	8.182	7.904	(1.165)	1049979	80.0000	19.5
16 Hexachloroethane	117	8.051	8.051	(1.147)	3307602	80.0000	79.9
	117	8.411	8.051	(1.198)	84	80.0000	0.0020(a)
	117	8.444	8.051	(1.203)	430	80.0000	0.010(a)
18 Nitrobenzene	77	8.231	8.231	(0.843)	7200052	80.0000	80.9
	77	7.904	8.231	(0.809)	2131650	80.0000	23.9
	77	8.476	8.231	(0.868)	22548	80.0000	0.25(a)
	77	8.607	8.231	(0.881)	1099	80.0000	0.012(a)
19 Isophorone	82	8.771	8.771	(0.898)	14653425	80.0000	77.0
20 2-Nitrophenol	139	8.918	8.918	(0.913)	3895502	80.0000	81.1
	139	8.607	8.918	(0.881)	205	80.0000	0.0043(a)
	139	8.771	8.918	(0.898)	214621	80.0000	4.5(a)
	139	9.180	8.918	(0.940)	929530	80.0000	19.4
21 2,4-Dimethylphenol	122	9.065	9.065	(0.928)	5146840	80.0000	78.1
	122	8.771	9.065	(0.898)	5883	80.0000	0.089(a)
	122	8.918	9.065	(0.913)	216424	80.0000	3.3(a)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)
23 bis(2-Chloroethoxy)methane	93	9.294	9.294	(0.951)	9106168	80.0000	79.6
	93	8.918	9.294	(0.913)	369738	80.0000	3.2
	93	9.065	9.294	(0.928)	199318	80.0000	1.7
	93	9.654	9.294	(0.988)	13142	80.0000	0.11(a)
24 Benzoic Acid	122	9.441	9.441	(0.967)	4095583	80.0000	89.8
	122	9.065	9.441	(0.928)	5146840	80.0000	113
	122	9.769	9.441	(1.000)	12385	80.0000	0.27(a)
	122	9.818	9.441	(1.005)	46394	80.0000	1.0(a)
25 2,4-Dichlorophenol	162	9.474	9.474	(0.970)	4910385	80.0000	78.7
	162	9.065	9.474	(0.928)	291	80.0000	0.0047(a)
	162	9.180	9.474	(0.940)	106	80.0000	0.0017(a)
	162	9.229	9.474	(0.945)	500	80.0000	0.0080(a)
	162	9.278	9.474	(0.950)	91	80.0000	0.0014(a)
	162	9.327	9.474	(0.955)	225	80.0000	0.0036(a)
26 1,2,4-Trichlorobenzene	180	9.654	9.654	(0.988)	5444505	80.0000	77.1
	180	9.507	9.654	(0.973)	114	80.0000	0.0016(a)
28 Naphthalene	128	9.818	9.818	(1.005)	14020462	80.0000	64.0
	128	9.474	9.818	(0.970)	179477	80.0000	0.82(a)
	128	9.654	9.818	(0.988)	574	80.0000	0.0026(a)
	128	9.965	9.818	(1.020)	65658	80.0000	0.30(a)
29 4-Chloroaniline	127	9.818	9.818	(1.005)	2224852	80.0000	40.8
	127	9.392	9.818	(0.961)	451	80.0000	0.0083(a)
	127	9.474	9.818	(0.970)	72851	80.0000	1.3
	127	9.572	9.818	(0.980)	377	80.0000	0.0069(a)
	127	9.654	9.818	(0.988)	2903	80.0000	0.053(a)
	127	9.965	9.818	(1.020)	931551	80.0000	17.1
30 Hexachlorobutadiene	225	10.128	10.128	(1.037)	3126996	80.0000	81.8
	225	9.769	10.128	(1.000)	42469	80.0000	1.1
	225	10.407	10.128	(1.065)	885	80.0000	0.023(a)
	225	10.472	10.128	(1.072)	1535	80.0000	0.040(a)
	225	10.537	10.128	(1.079)	1364	80.0000	0.036(a)
32 4-Chloro-3-Methylphenol	107	11.159	11.159	(1.142)	6053481	80.0000	85.5
	107	10.766	11.159	(1.102)	222	80.0000	0.0031(a)
	107	10.799	11.159	(1.105)	542	80.0000	0.0076(a)
	107	10.979	11.159	(1.124)	5322	80.0000	0.075(a)
33 2-Methylnaphthalene	142	11.437	11.437	(1.171)	10632249	80.0000	76.7
	142	11.159	11.437	(1.142)	4461992	80.0000	32.2
	142	11.650	11.437	(1.193)	129451	80.0000	0.93(a)
	142	11.830	11.437	(1.211)	26804	80.0000	0.19(a)
35 Hexachlorocyclopentadiene	237	11.813	11.813	(0.849)	2848622	80.0000	87.3
36 2,4,6-Trichlorophenol	196	11.813	11.813	(0.849)	137	80.0000	0.0032(a)
	196	11.846	11.813	(0.852)	579	80.0000	0.014(a)
	196	11.895	11.813	(0.855)	249	80.0000	0.0059(a)
	196	12.124	11.813	(0.872)	3368858	80.0000	79.8
	196	12.206	11.813	(0.878)	3576029	80.0000	84.7
37 2,4,5-Trichlorophenol	196	12.549	12.549	(0.902)	11904	80.0000	0.28(a)
	196	12.124	12.549	(0.872)	3368858	80.0000	80.6

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)
	196	12.206	12.549	(0.878)	3576025	80.0000	85.6
39 2-Chloronaphthalene	162	12.582	12.582	(0.905)	9696466	80.0000	78.9
	162	12.206	12.582	(0.878)	97306	80.0000	0.79(a)
	162	12.271	12.582	(0.882)	4921	80.0000	0.040(a)
	162	12.369	12.582	(0.889)	1280	80.0000	0.010(a)
40 2-Nitroaniline	65	12.860	12.860	(0.925)	3325695	80.0000	84.7
	65	12.582	12.860	(0.905)	8169	80.0000	0.21(a)
	65	13.253	12.860	(0.953)	5309	80.0000	0.14(a)
41 3-Nitroaniline	138	13.874	13.874	(0.998)	675584	80.0000	48.9
	138	13.498	13.874	(0.971)	2193	80.0000	0.16(aQ)
	138	13.629	13.874	(0.980)	8291	80.0000	0.60(a)
	138	13.989	13.874	(1.006)	55774	80.0000	4.0
	138	14.103	13.874	(1.014)	89882	80.0000	6.5
43 Dimethylphthalate	163	13.367	13.367	(0.961)	12653108	80.0000	81.9
	163	13.187	13.367	(0.948)	598	80.0000	0.0039(a)
45 2,6-Dinitrotoluene	165	13.498	13.498	(0.971)	2991782	80.0000	90.0
	165	13.089	13.498	(0.941)	444	80.0000	0.013(a)
	165	13.155	13.498	(0.946)	210	80.0000	0.0063(a)
	165	13.285	13.498	(0.955)	70	80.0000	0.0021(aQ)
	165	13.367	13.498	(0.961)	125535	80.0000	3.8
	165	13.792	13.498	(0.992)	548	80.0000	0.016(a)
	165	13.907	13.498	(1.000)	1535934	80.0000	46.2
46 Acenaphthylene	152	13.563	13.563	(0.975)	13870639	80.0000	72.8
	152	13.269	13.563	(0.954)	1909	80.0000	0.010(a)
	152	13.384	13.563	(0.962)	1846	80.0000	0.0097(a)
	152	13.989	13.563	(1.006)	4670381	80.0000	24.5
48 Acenaphthene	154	13.989	13.989	(1.006)	9499371	80.0000	79.7
	154	13.563	13.989	(0.975)	124101	80.0000	1.0(Q)
49 2,4-Dinitrophenol	184	14.120	14.120	(1.015)	1478151	80.0000	93.8
	184	14.332	14.120	(1.031)	4565	80.0000	0.29(aQ)
	184	14.381	14.120	(1.034)	1212	80.0000	0.077(aQ)
	184	14.512	14.120	(1.044)	1032	80.0000	0.066(a)
50 4-Nitrophenol	109	14.349	14.349	(1.032)	1328543	80.0000	73.2
	109	13.989	14.349	(1.006)	21204	80.0000	1.2(a)
	109	14.103	14.349	(1.014)	11267	80.0000	0.62(a)
	109	14.218	14.349	(1.022)	1929	80.0000	0.11(a)
	109	14.414	14.349	(1.036)	116175	80.0000	6.4
	109	14.725	14.349	(1.059)	76063	80.0000	4.2(a)
51 Dibenzofuran	168	14.414	14.414	(1.036)	13667911	80.0000	82.6
	168	13.972	14.414	(1.005)	295	80.0000	0.0018(aQ)
	168	14.054	14.414	(1.011)	1117	80.0000	0.0067(a)
	168	14.120	14.414	(1.015)	49804	80.0000	0.30(a)
	168	14.708	14.414	(1.058)	25562	80.0000	0.15(a)
52 2,4-Dinitrotoluene	165	14.447	14.447	(1.039)	4212905	80.0000	88.3
53 1-Chloro-3,4-Dinitrobenzene	63	14.708	14.708	(1.506)	2004221	80.0000	90.1
	63	14.349	14.708	(1.469)	569879	80.0000	25.6
	63	14.430	14.708	(1.477)	2706299	80.0000	122

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	ON-COL (NG)
	63	14.512	14.708	(1.486)	71402	80.0000	3.2
	63	14.970	14.708	(1.532)	113394	80.0000	5.1
	63	15.085	14.708	(1.544)	82224	80.0000	3.7
56 Diethylphthalate	149	15.085	15.085	(1.085)	12411706	80.0000	77.6
	149	15.281	15.085	(1.099)	87240	80.0000	0.54(a)
	149	15.412	15.085	(1.108)	5885	80.0000	0.037(a)
57 Fluorene	166	15.232	15.232	(1.095)	10654636	80.0000	78.7
	166	14.987	15.232	(1.078)	1627	80.0000	0.012(a)
	166	15.085	15.232	(1.085)	9120	80.0000	0.067(a)
	166	15.134	15.232	(1.088)	879	80.0000	0.0065(a)
	166	15.575	15.232	(1.120)	332565	80.0000	2.4
58 4-Chlorophenyl phenyl ether	204	15.281	15.281	(1.099)	5368262	80.0000	79.2
	204	14.970	15.281	(1.076)	33532	80.0000	0.49(a)
59 4-Nitroaniline	138	15.330	15.330	(1.102)	1097402	80.0000	75.3
	138	15.232	15.330	(1.095)	263801	80.0000	18.1
60 4,6-Dinitro-2-methylphenol	198	15.412	15.412	(0.881)	2304385	80.0000	96.2
	198	15.052	15.412	(0.861)	490	80.0000	0.020(aQ)
	198	15.101	15.412	(0.863)	214	80.0000	0.0089(aQ)
	198	15.134	15.412	(0.865)	187	80.0000	0.0078(aQ)
	198	15.216	15.412	(0.870)	560	80.0000	0.023(aQ)
	198	15.297	15.412	(0.875)	222	80.0000	0.0093(aQ)
	198	15.804	15.412	(0.904)	5180	80.0000	0.22(a)
61 N-nitrosodiphenylamine	169	15.575	15.575	(0.891)	6124693	80.0000	76.8
	169	15.281	15.575	(0.874)	483390	80.0000	6.1
	169	15.412	15.575	(0.881)	23724	80.0000	0.30(a)
	169	15.804	15.575	(0.904)	69681	80.0000	0.87(a)
65 4-Bromophenyl phenyl ether	248	16.459	16.459	(0.941)	3450087	80.0000	86.1
	248	16.033	16.459	(0.917)	10274	80.0000	0.26(a)
	248	16.573	16.459	(0.948)	9524	80.0000	0.24(a)
66 Hexachlorobenzene	284	16.540	16.540	(0.946)	4244520	80.0000	83.1
	284	16.851	16.540	(0.964)	2671	80.0000	0.052(a)
	284	16.933	16.540	(0.968)	1550	80.0000	0.030(a)
68 Pentachlorophenol	266	17.047	17.047	(0.975)	2568909	80.0000	93.6
72 Phenanthrene	178	17.538	17.538	(1.003)	13833388	80.0000	81.8
	178	17.113	17.538	(0.978)	166	80.0000	0.00098(a)
	178	17.178	17.538	(0.982)	1073	80.0000	0.0063(a)
	178	17.244	17.538	(0.986)	403	80.0000	0.0024(a)
	178	17.358	17.538	(0.993)	626	80.0000	0.0037(a)
	178	17.669	17.538	(1.010)	14509773	80.0000	85.8
73 Anthracene	178	17.669	17.669	(1.010)	14509773	80.0000	88.3
	178	17.244	17.669	(0.986)	403	80.0000	0.0024(a)
	178	17.358	17.669	(0.993)	633	80.0000	0.0038(a)
	178	17.538	17.669	(1.003)	13833388	80.0000	84.2
78 Di-n-butylphthalate	149	19.059	19.059	(1.090)	16951368	80.0000	69.8
80 Fluoranthene	202	20.401	20.401	(1.166)	14758121	80.0000	85.7
	202	20.008	20.401	(1.144)	1154	80.0000	0.0067(a)
	202	20.123	20.401	(1.151)	702	80.0000	0.0041(a)

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)
81 Pyrene	202	20.940	20.940	(0.877)	14713774	80.0000	78.7
85 Butyl benzyl phthalate	149	22.674	22.674	(0.949)	8965405	80.0000	79.6
	149	22.216	22.674	(0.930)	4546	80.0000	0.040(a)
	149	22.429	22.674	(0.939)	1405	80.0000	0.012(a)
	149	22.462	22.674	(0.940)	1863	80.0000	0.016(a)
	149	22.527	22.674	(0.943)	1096	80.0000	0.0097(a)
89 Benzo(a)Anthracene	228	23.034	23.034	(0.964)	354	80.0000	0.0024(a)
	228	23.214	23.034	(0.972)	202	80.0000	0.0013(a)
	228	23.296	23.034	(0.975)	365	80.0000	0.0024(a)
	228	23.329	23.034	(0.977)	358	80.0000	0.0024(a)
	228	23.378	23.034	(0.979)	258	80.0000	0.0017(a)
	228	23.459	23.034	(0.982)	460	80.0000	0.0030(a)
	228	23.541	23.034	(0.986)	990	80.0000	0.0066(a)
	228	23.639	23.034	(0.990)	913	80.0000	0.0061(a)
	228	23.836	23.034	(0.998)	12648299	80.0000	84.0
91 Chrysene	228	23.950	23.950	(1.003)	12387636	80.0000	94.6
	228	23.541	23.950	(0.986)	990	80.0000	0.0076(a)
	228	23.639	23.950	(0.990)	913	80.0000	0.0070(a)
	228	23.836	23.950	(0.998)	12648299	80.0000	96.6
93 bis(2-ethylhexyl)Phthalate	149	24.130	24.130	(1.010)	13377904	80.0000	91.6
	149	23.738	24.130	(0.994)	27386	80.0000	0.19(a)
	149	23.836	24.130	(0.998)	59795	80.0000	0.41(a)
94 Di-n-octyl phthalate	149	25.619	25.619	(0.947)	15660277	80.0000	79.4
	149	25.340	25.619	(0.937)	1748	80.0000	0.0089(a)
	149	25.946	25.619	(0.959)	18750	80.0000	0.095(a)
	149	26.044	25.619	(0.963)	878	80.0000	0.0044(a)
95 Benzo(b)fluoranthene	252	25.635	25.635	(0.947)	2022	80.0000	0.017(a)
	252	25.684	25.635	(0.949)	867	80.0000	0.0072(a)
	252	25.717	25.635	(0.950)	479	80.0000	0.0040(a)
	252	25.782	25.635	(0.953)	1483	80.0000	0.012(a)
	252	25.978	25.635	(0.960)	2047	80.0000	0.017(a)
	252	26.027	25.635	(0.962)	424	80.0000	0.0035(a)
	252	26.077	25.635	(0.964)	534	80.0000	0.0044(a)
	252	26.273	25.635	(0.971)	9626004	80.0000	80.0
	252	26.322	25.635	(0.973)	10016657	80.0000	83.3
96 Benzo(k)fluoranthene	252	26.322	26.322	(0.973)	10016657	80.0000	94.2
	252	25.978	26.322	(0.960)	2047	80.0000	0.019(a)
	252	26.027	26.322	(0.962)	466	80.0000	0.0044(a)
	252	26.077	26.322	(0.964)	556	80.0000	0.0052(a)
	252	26.273	26.322	(0.971)	9626004	80.0000	90.5
97 Benzo(e)pyrene	252	26.813	26.813	(0.991)	4170115	40.0000	39.8
	252	26.927	26.813	(0.995)	7469456	40.0000	71.4
	252	27.058	26.813	(1.000)	206164	40.0000	2.0
98 Benzo(a)pyrene	252	26.927	26.927	(0.995)	7476770	80.0000	82.6
	252	26.813	26.927	(0.991)	4170115	80.0000	46.1
	252	27.058	26.927	(1.000)	226799	80.0000	2.5
103 Indeno(1,2,3-cd)pyrene	276	29.528	29.528	(1.091)	5109474	80.0000	83.4

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Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (NG)	AMOUNTS ON-COL (NG)
	276	29.086	29.528	(1.075)	1456	80.0000	0.024(a)
	276	29.168	29.528	(1.078)	647	80.0000	0.010(a)
	276	29.233	29.528	(1.080)	442	80.0000	0.0072(a)
	276	29.593	29.528	(1.094)	976834	80.0000	15.9
104 Dibenzo(a,h)anthracene	278	29.593	29.593	(1.094)	4415222	80.0000	82.4
	278	29.152	29.593	(1.077)	130	80.0000	0.0024(a)
	278	29.233	29.593	(1.080)	5062	80.0000	0.094(a)
	278	29.381	29.593	(1.086)	165	80.0000	0.0031(a)
	278	30.019	29.593	(1.109)	1229	80.0000	0.023(a)
105 Benzo(g,h,i)perylene	276	30.264	30.264	(1.118)	4958969	80.0000	77.6

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).
Q - Qualifier signal failed the ratio test.

563

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01150201019.d
Lab Smp Id: Method Spike
Analysis Type: SV
Quant Type: ISTD
Operator: jgh
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/15/98
Calibration Time: 1501
Client Smp ID: Method Spike
Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	10654771	5327386	21309542	11270581	5.78
27 Naphthalene-d8	16919358	8459679	33838716	17745391	4.88
47 Acenaphthene-d10	12271905	6135952	24543810	12494791	1.82
71 Phenanthrene-d10	19162935	9581468	38325870	17937870	-6.39
90 Chrysene-d12	16491029	8245514	32982058	15301801	-7.21
99 Perylene-d12	9979847	4989924	19959694	9954932	-0.25

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.02	6.52	7.52	7.02	0.05
27 Naphthalene-d8	9.78	9.28	10.28	9.77	-0.13
47 Acenaphthene-d10	13.92	13.42	14.42	13.91	-0.09
71 Phenanthrene-d10	17.49	16.99	17.99	17.49	0.02
90 Chrysene-d12	23.90	23.40	24.40	23.88	-0.05
99 Perylene-d12	27.05	26.55	27.55	27.06	0.01

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

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Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

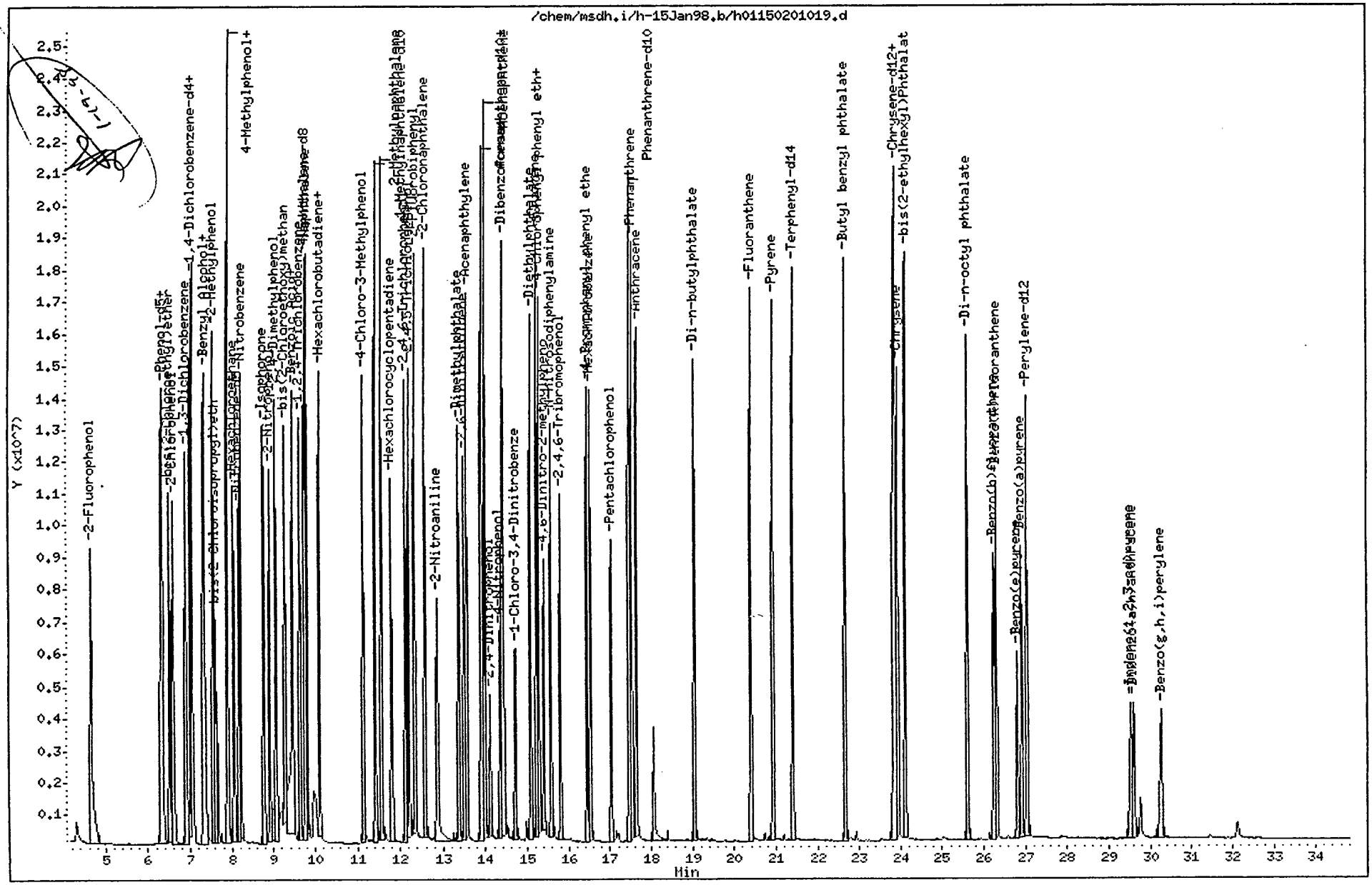
Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

Operator: jgh

Column phase:

Column diameter: 2.00



Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

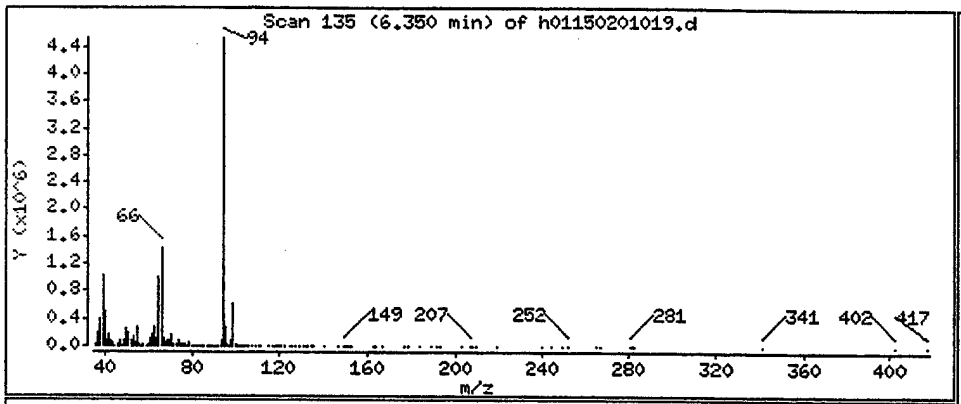
Operator: jgh

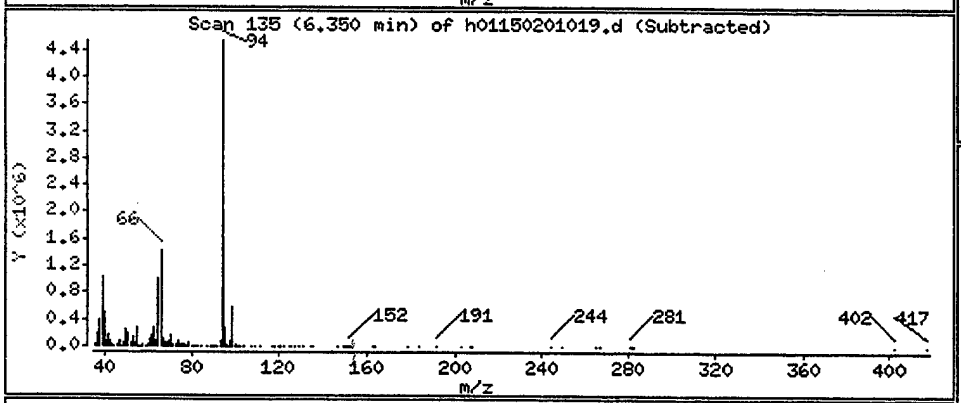
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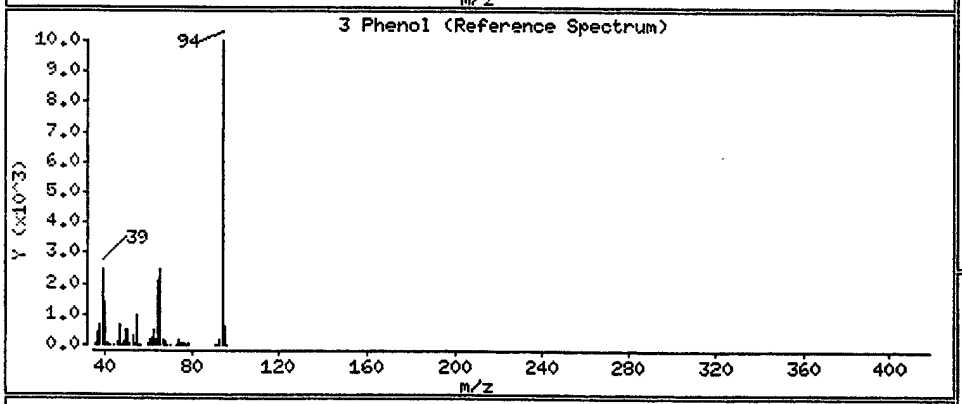
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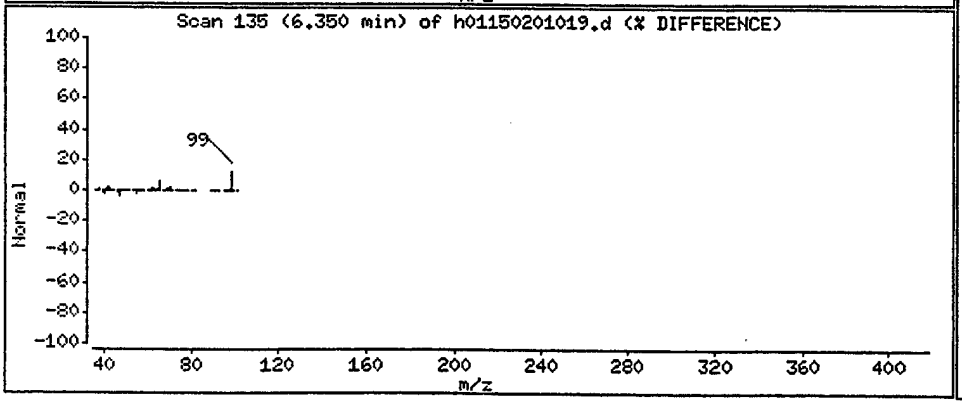
3 Phenol

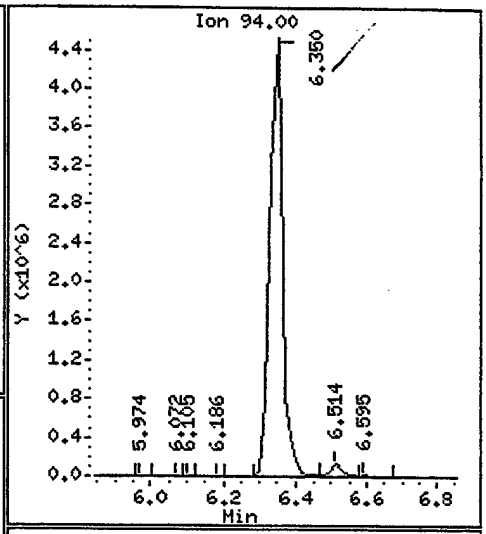
Concentration: 79.7 ug

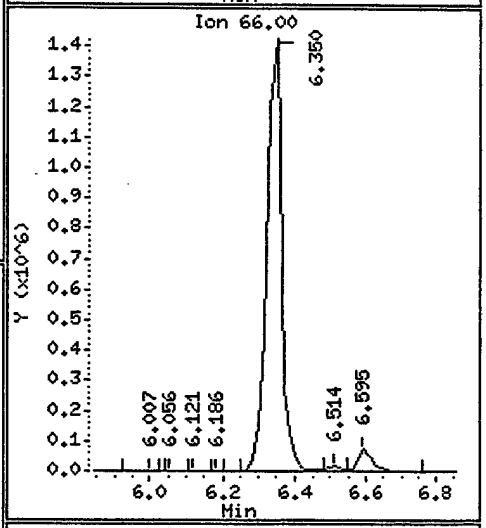


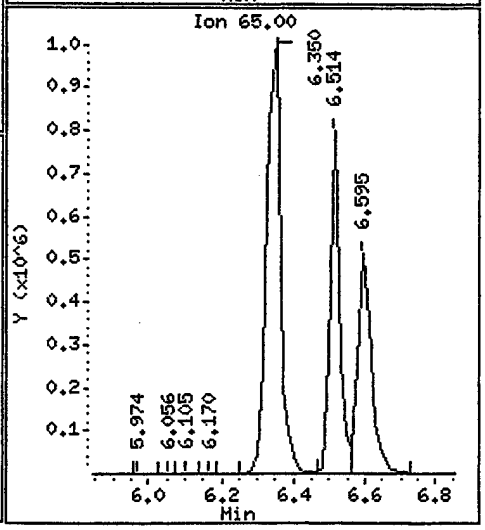












566

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

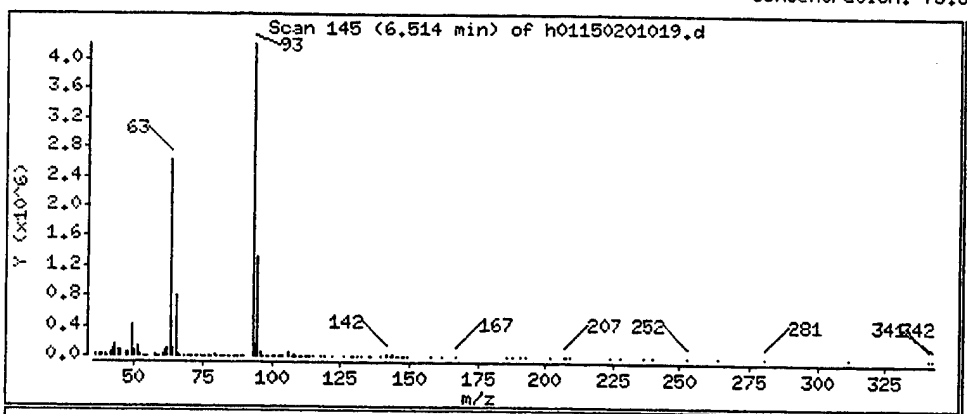
Operator: jgh

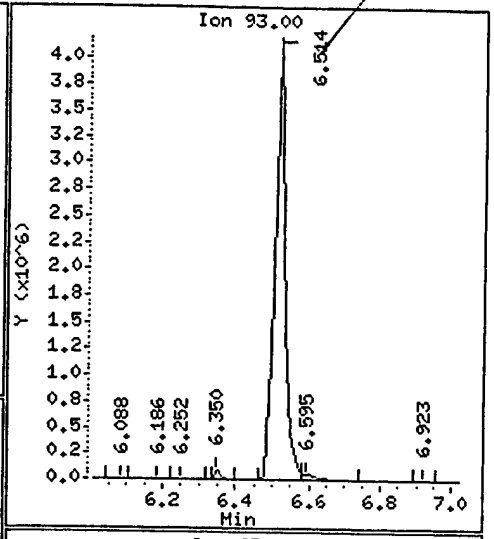
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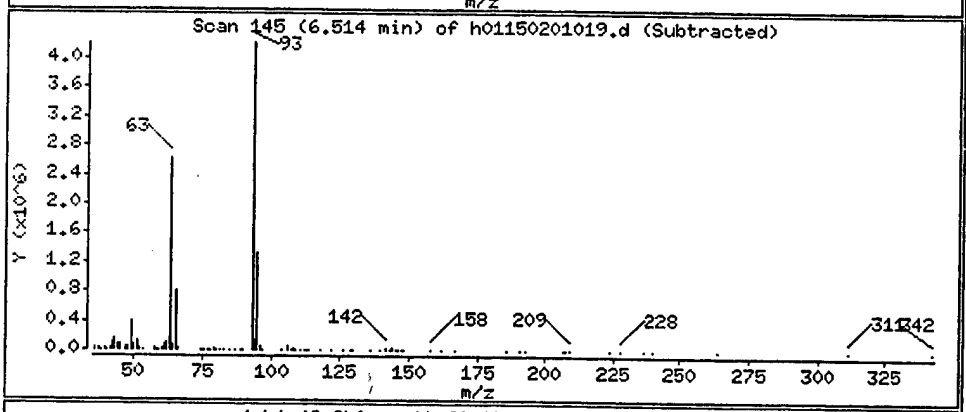
Column diameter: 2.00

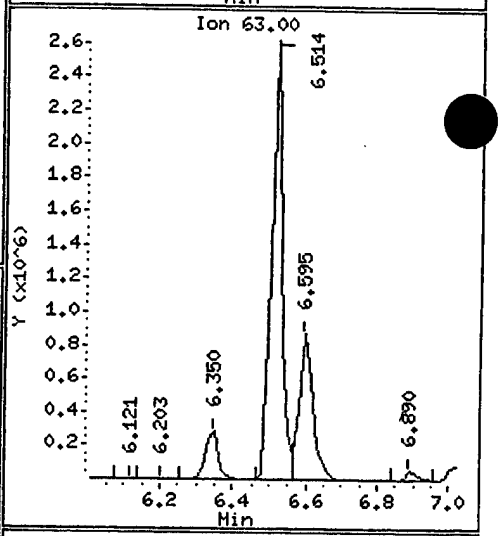
4 bis(2-Chloroethyl)ether

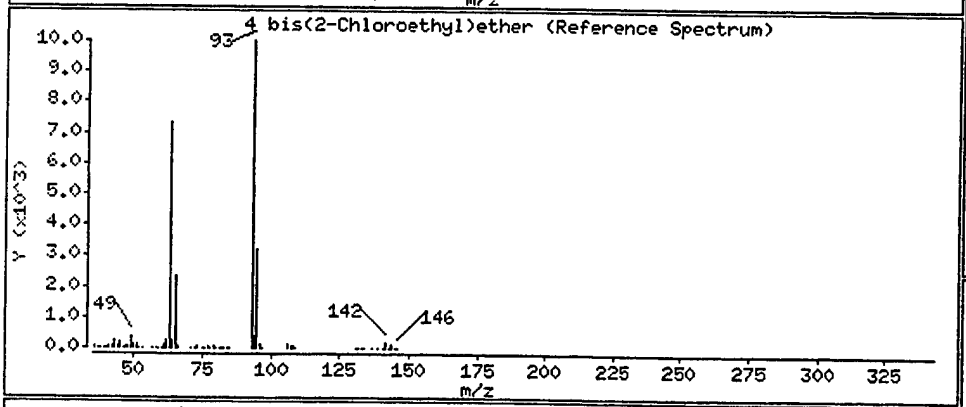
Concentration: 73.8 ug

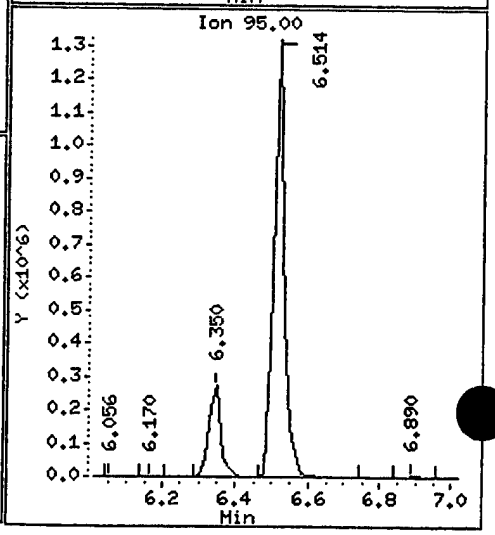


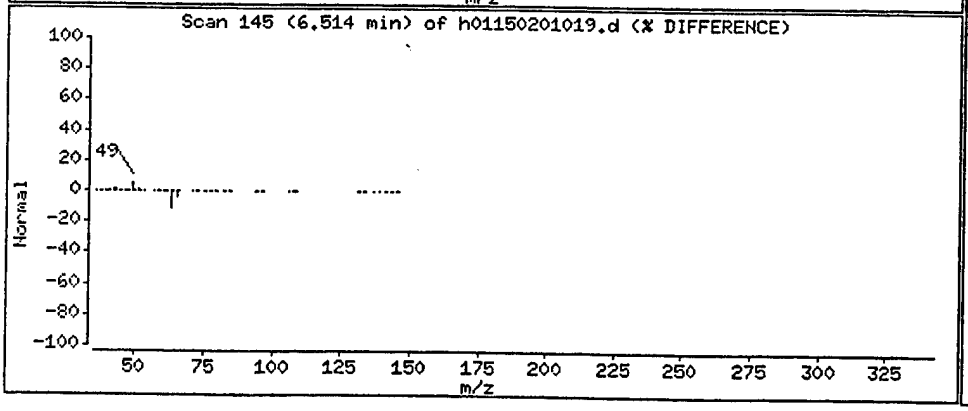












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

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Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

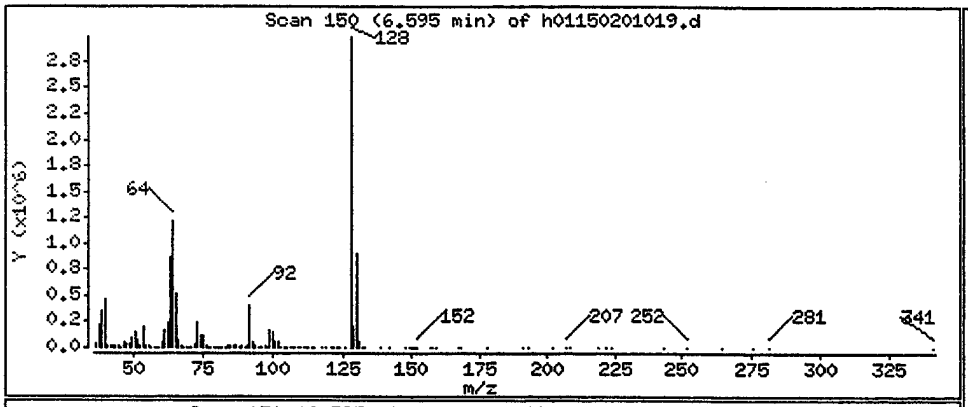
Operator: jgh

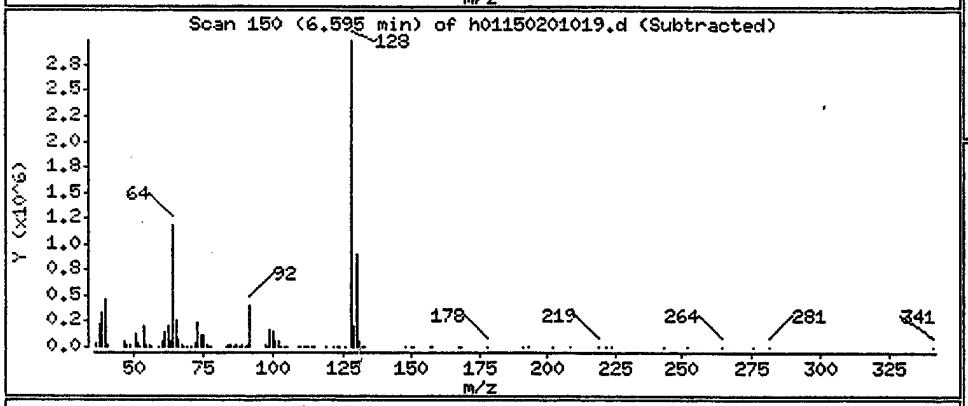
Column phase:

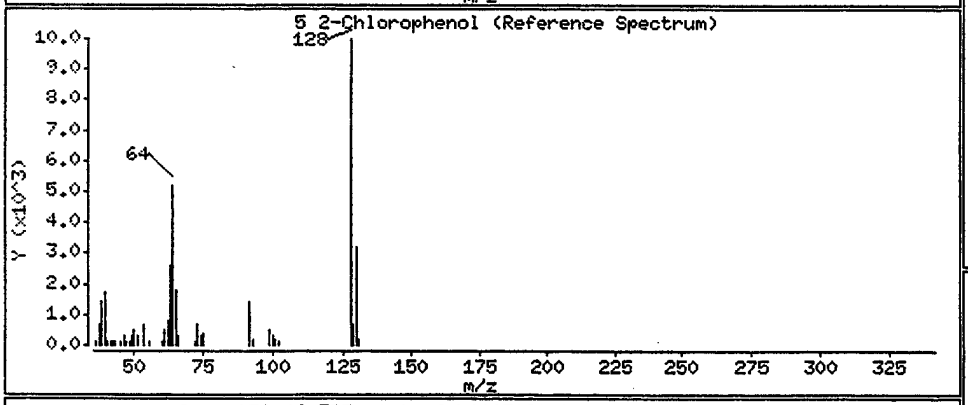
Column diameter: 2.00

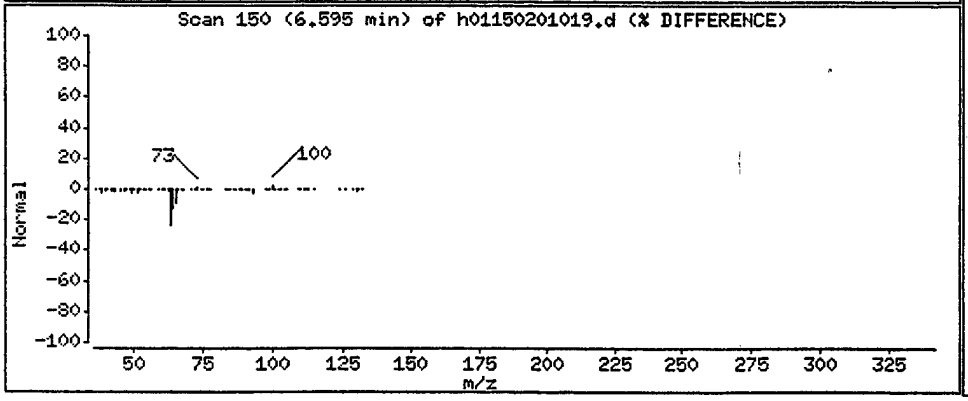
5 2-Chlorophenol

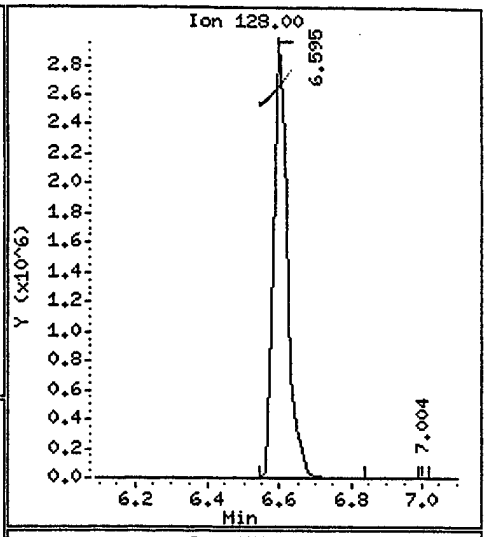
Concentration: 80.9 ug

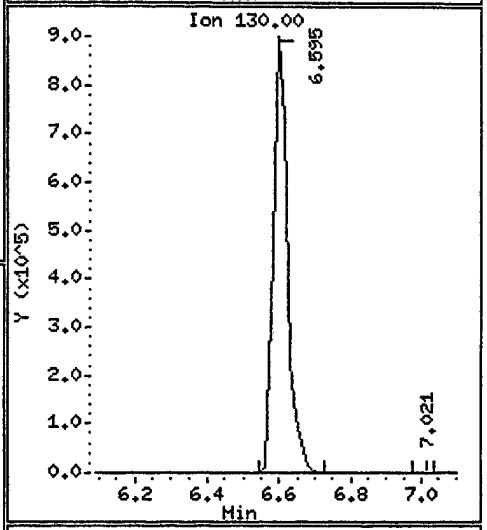


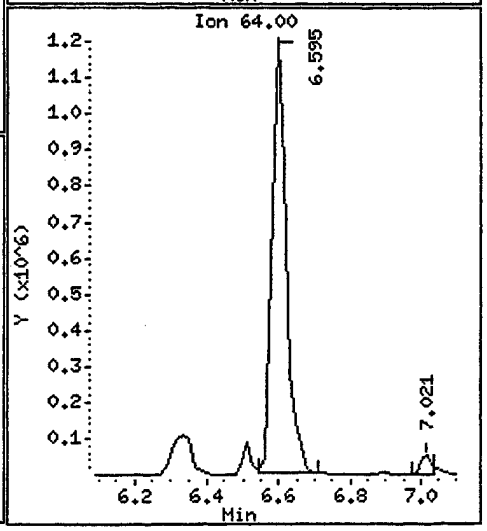












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

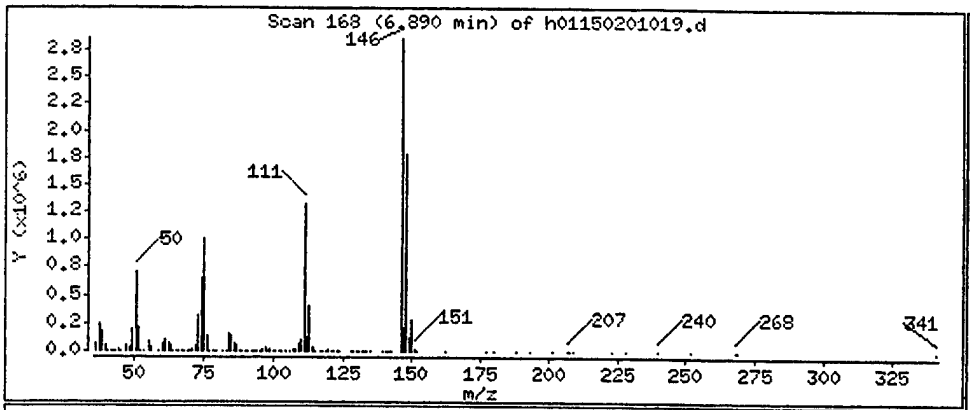
Operator: jgh

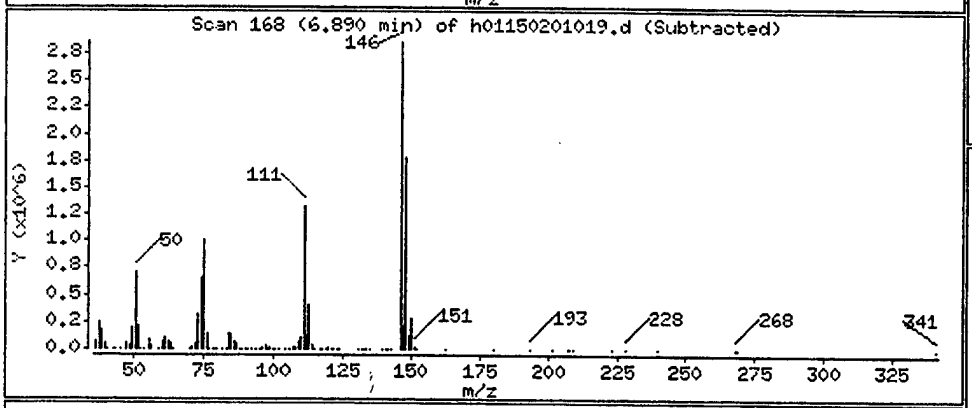
Column phase:

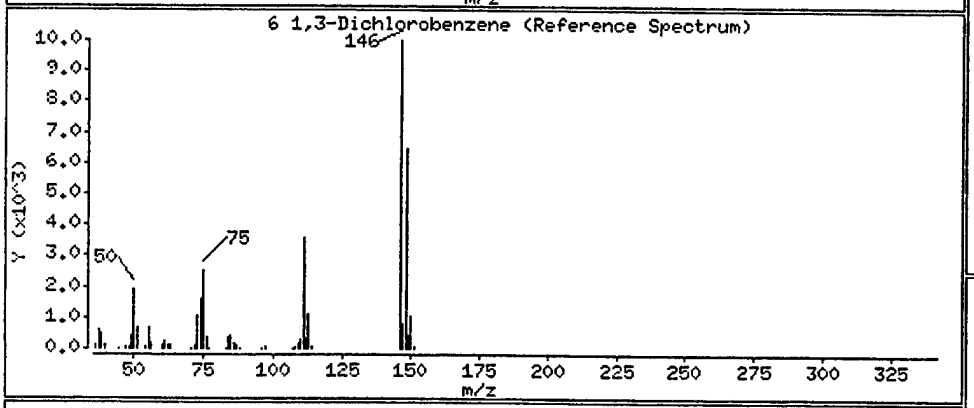
Column diameter: 2.00

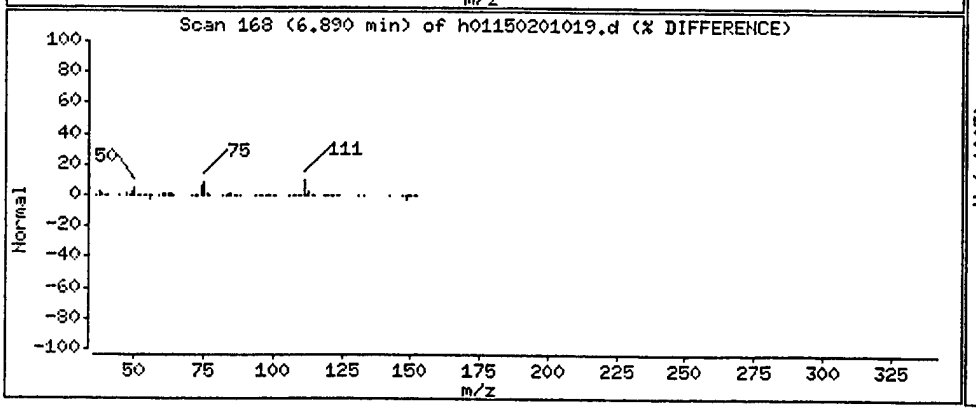
6 1,3-Dichlorobenzene

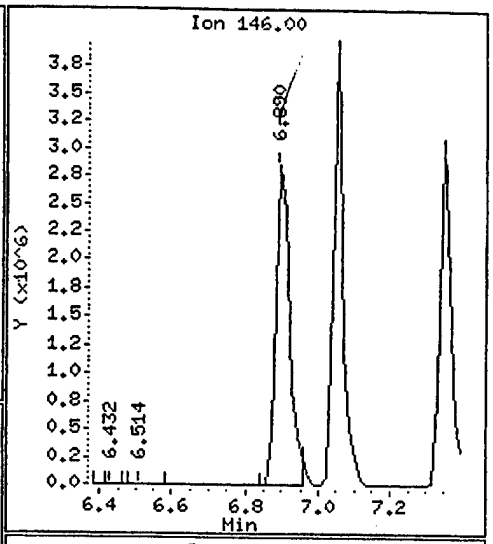
Concentration: 76.8 ug

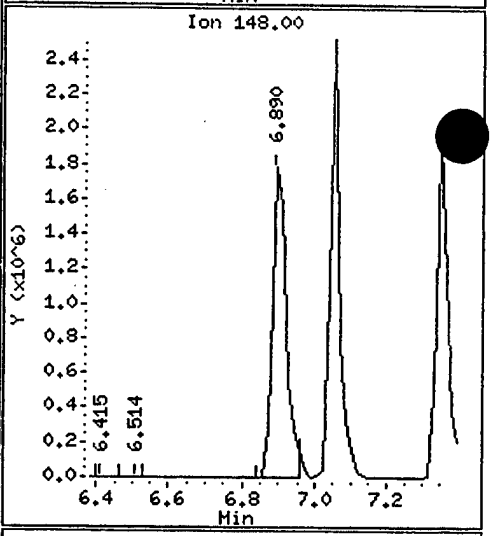


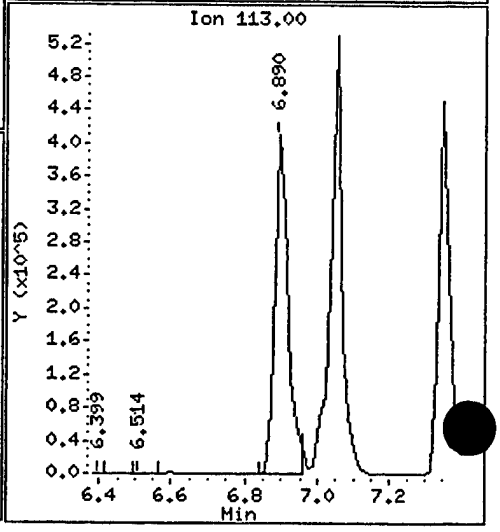












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

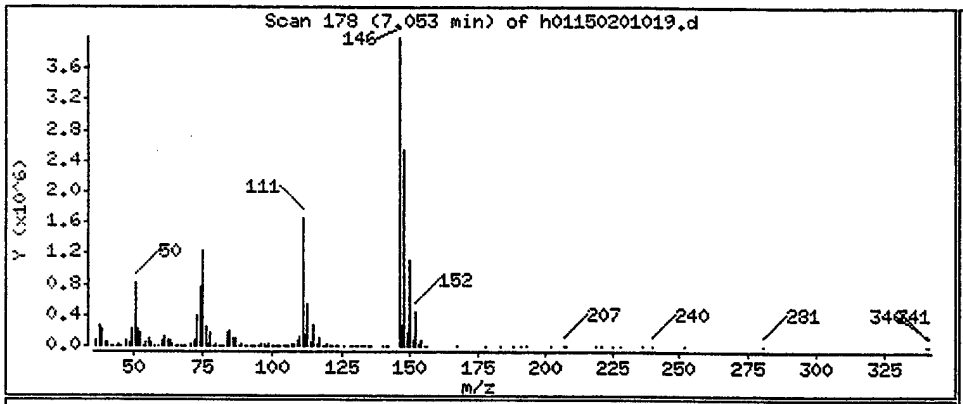
Operator: jgh

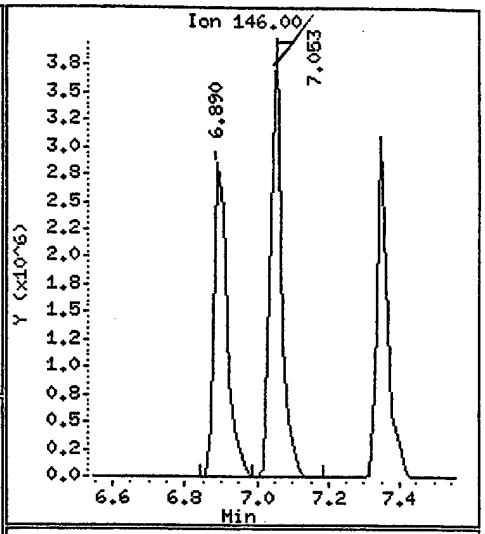
Column phase:

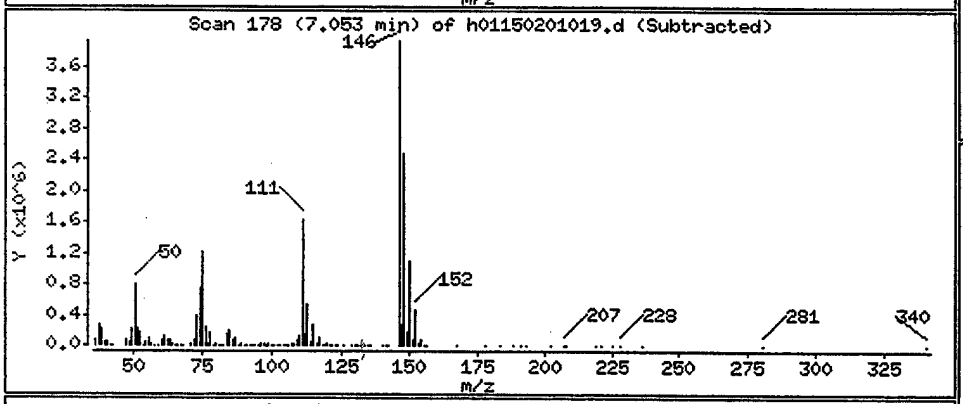
Column diameter: 2.00

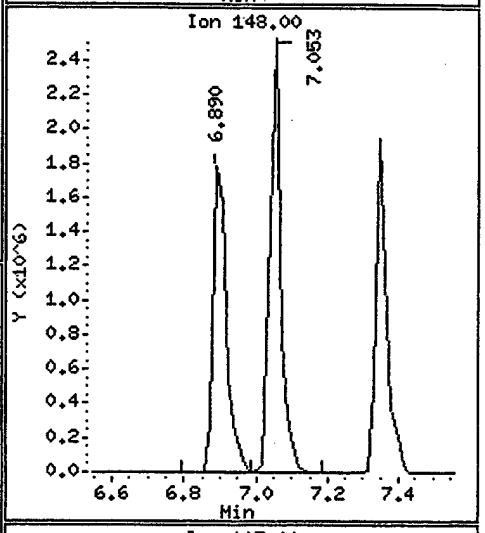
9 1,4-Dichlorobenzene

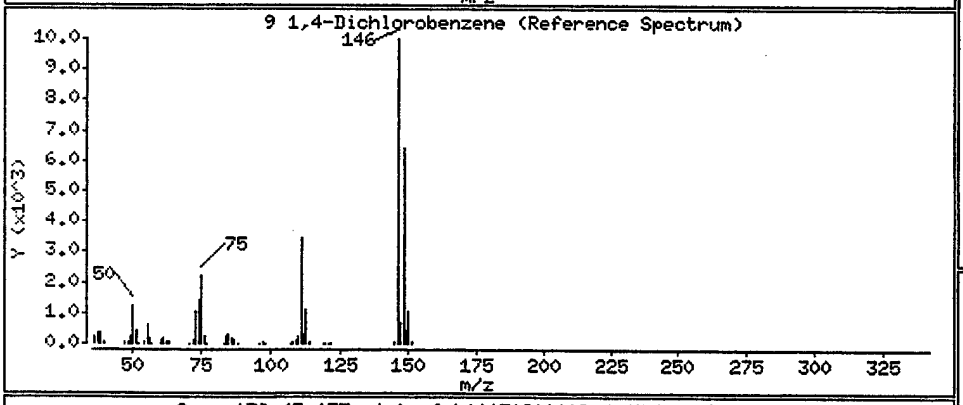
Concentration: 79.1 ug

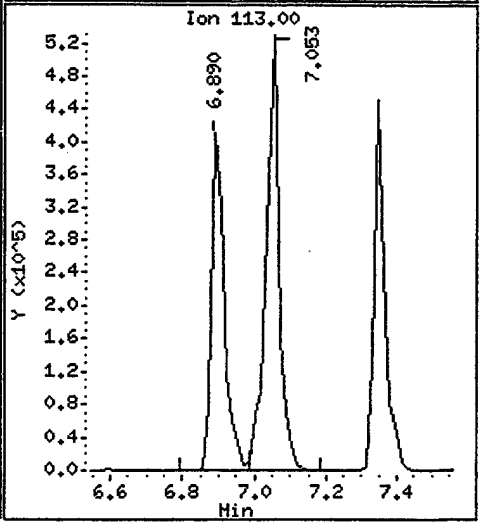


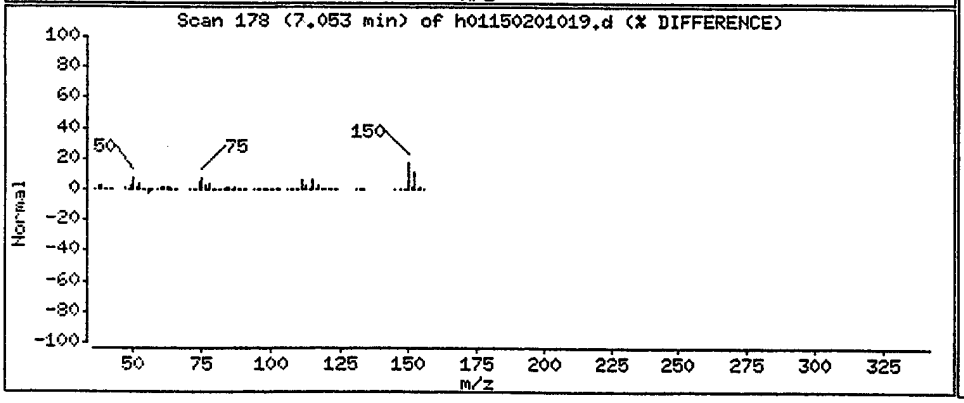












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

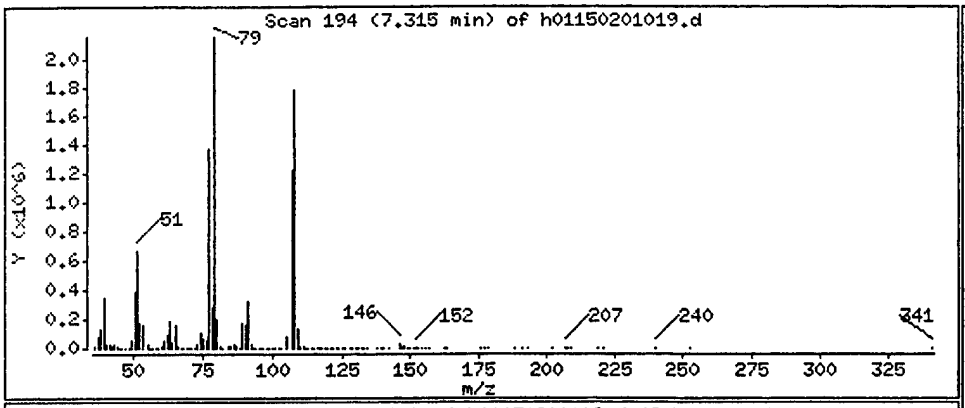
Operator: jgh

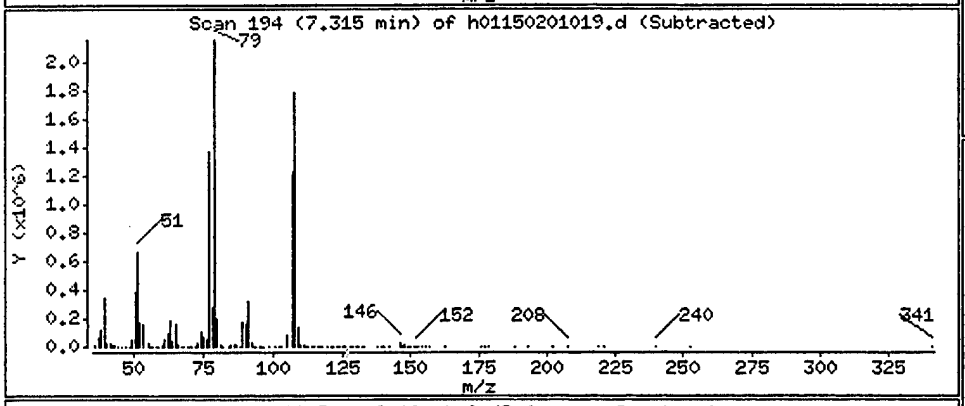
Column phase:

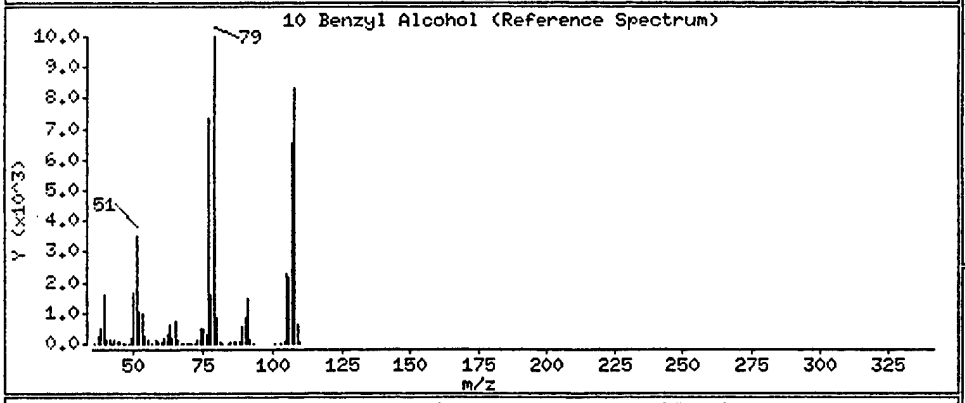
Column diameter: 2.00

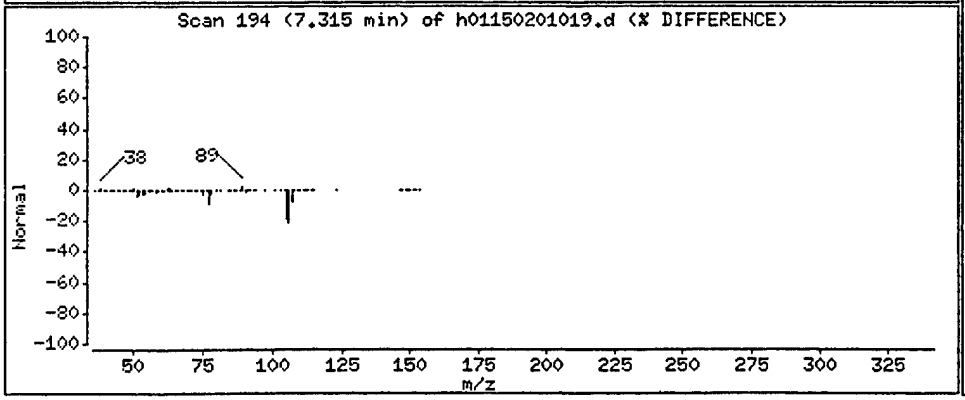
10 Benzyl Alcohol

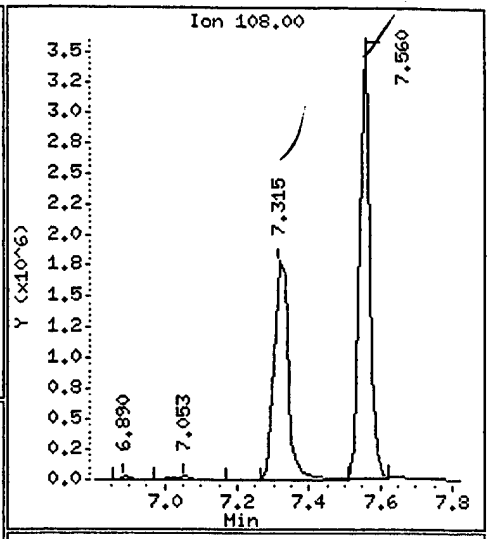
Concentration: 81.0 ug

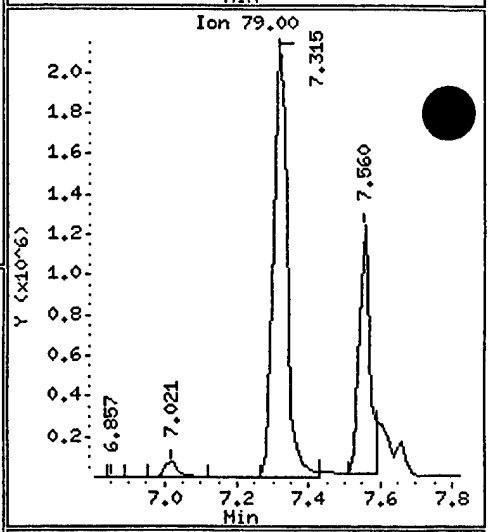


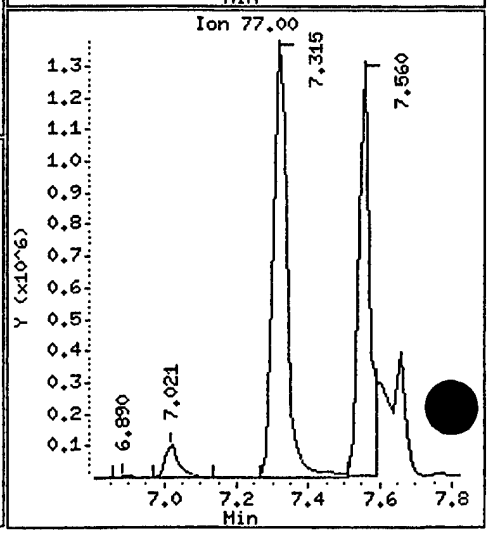












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Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

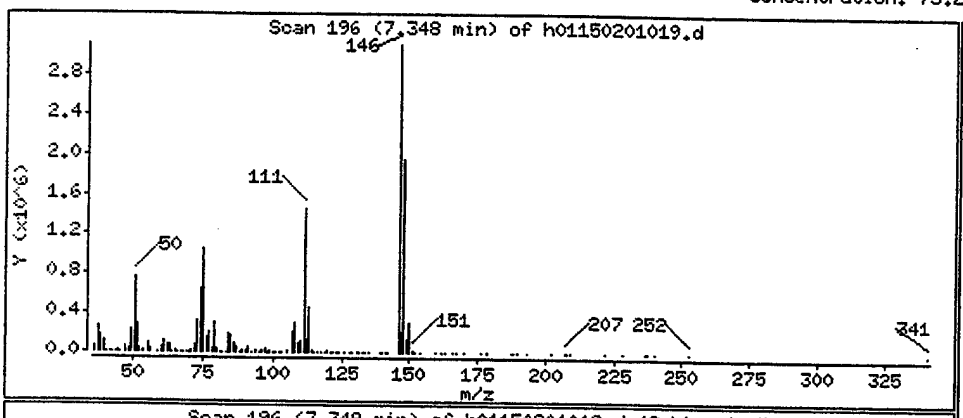
Operator: jgh

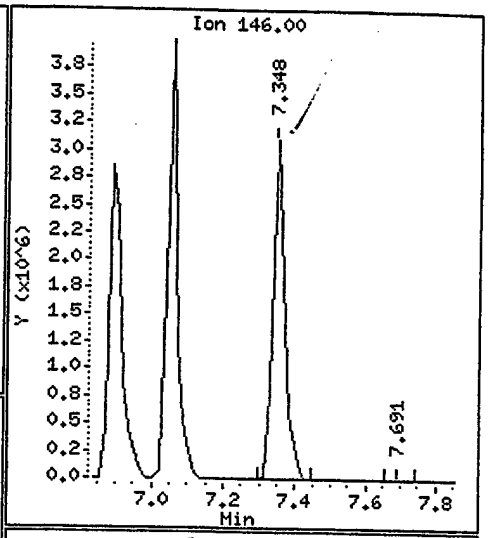
Column phase:

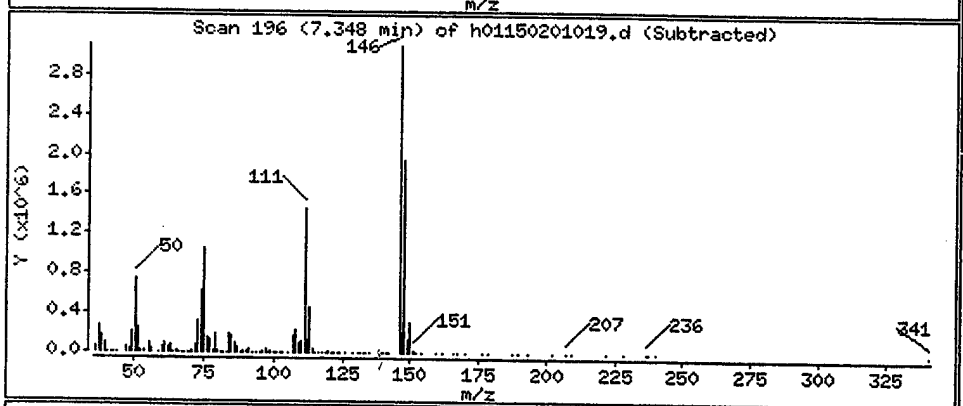
Column diameter: 2.00

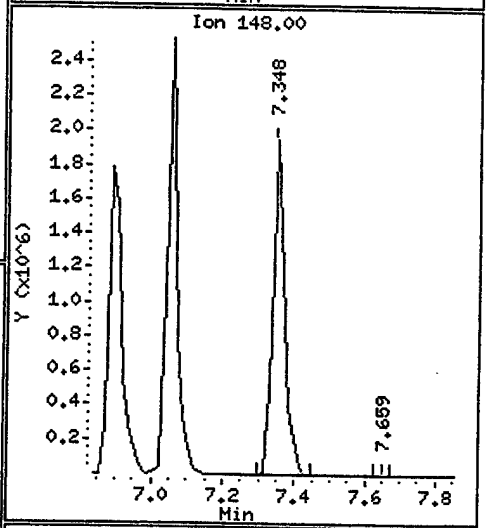
11 1,2-Dichlorobenzene

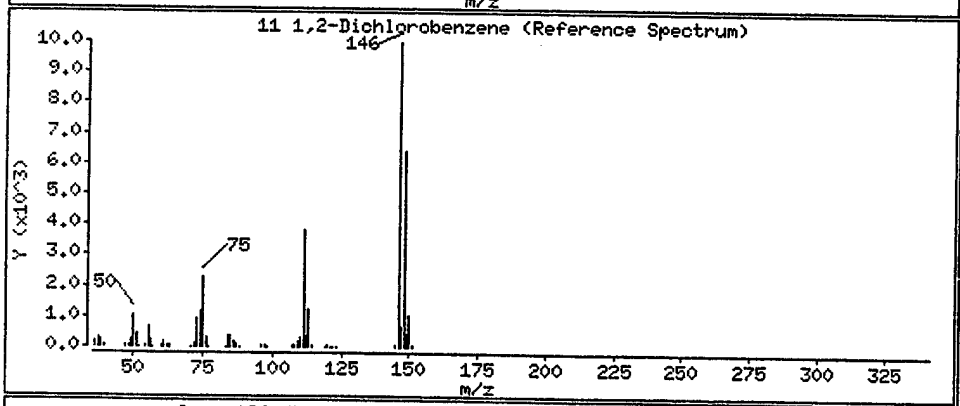
Concentration: 75.2 ug

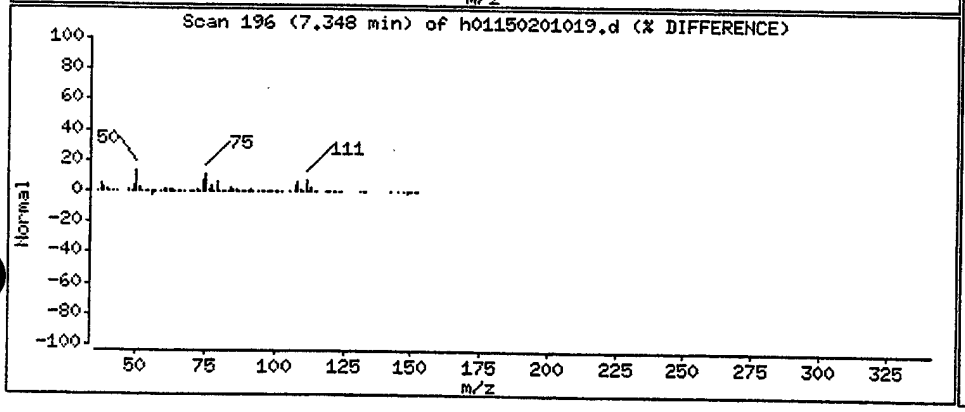


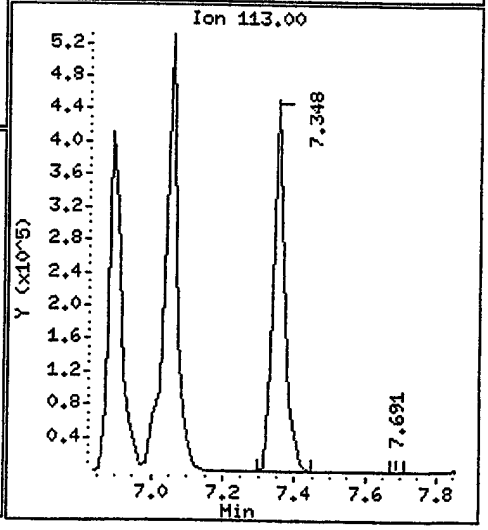












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Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

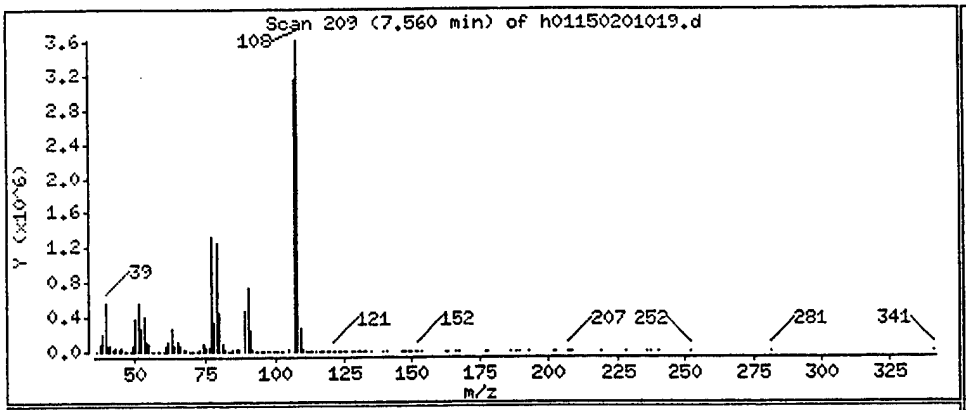
Operator: jgh

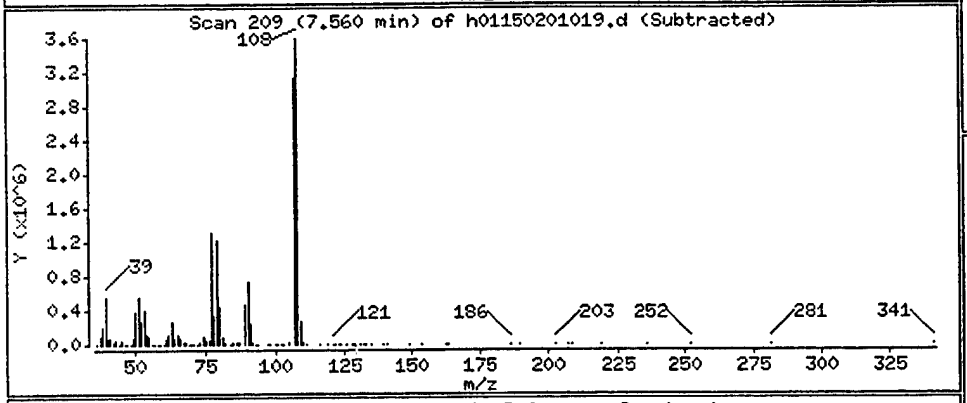
Column phase:

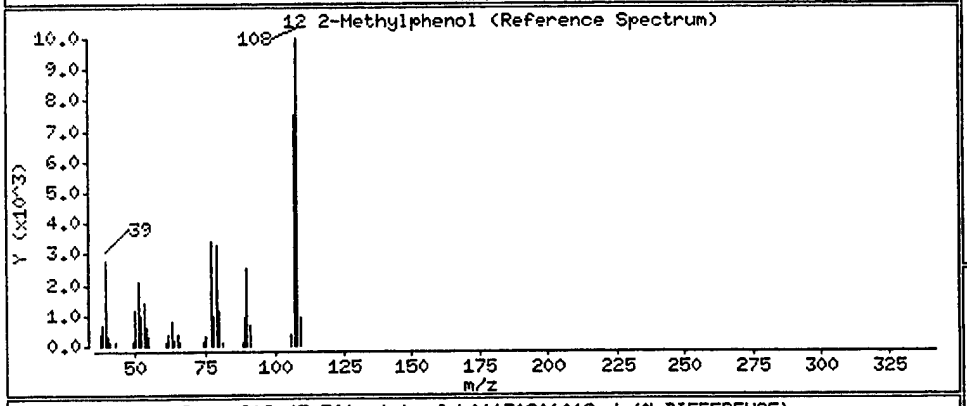
Column diameter: 2.00

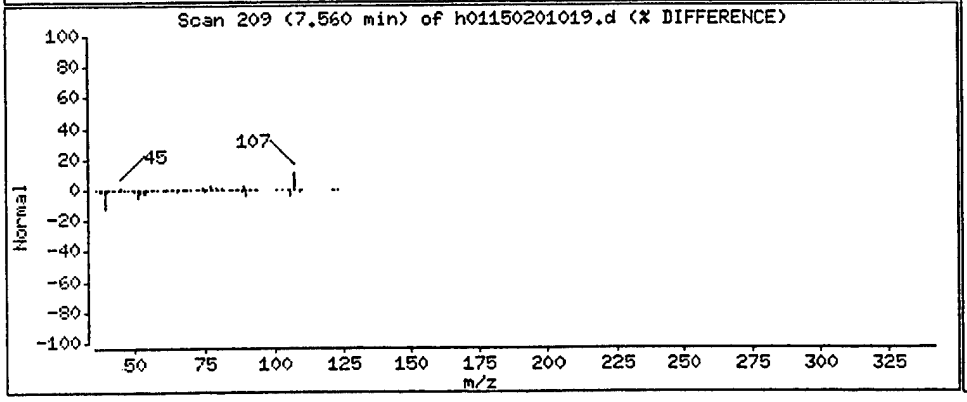
12 2-Methylphenol

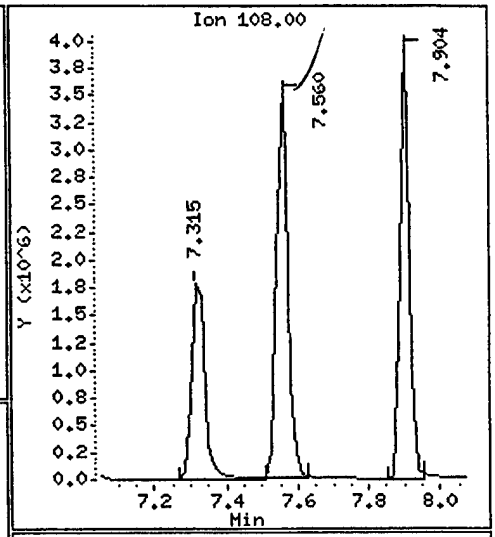
Concentration: 79.0 ug

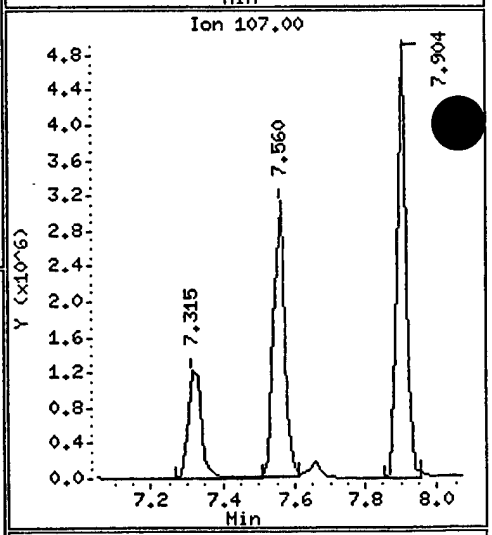


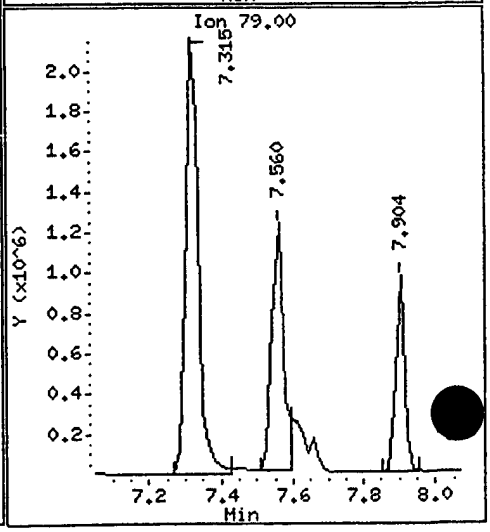












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

Operator: jgh

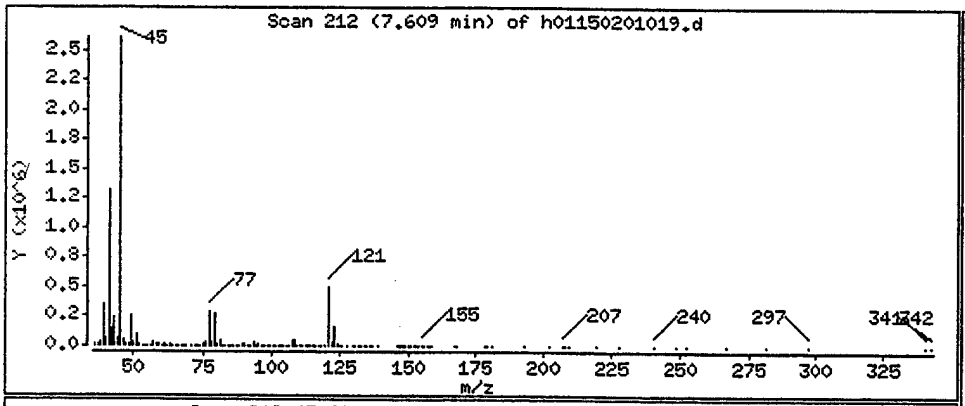
Column phase:

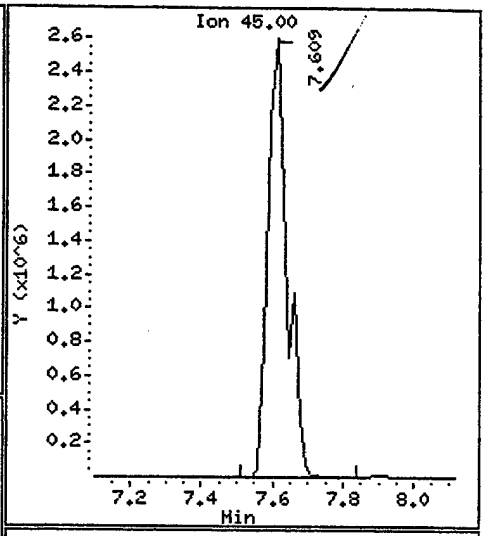
Column diameter: 2.00

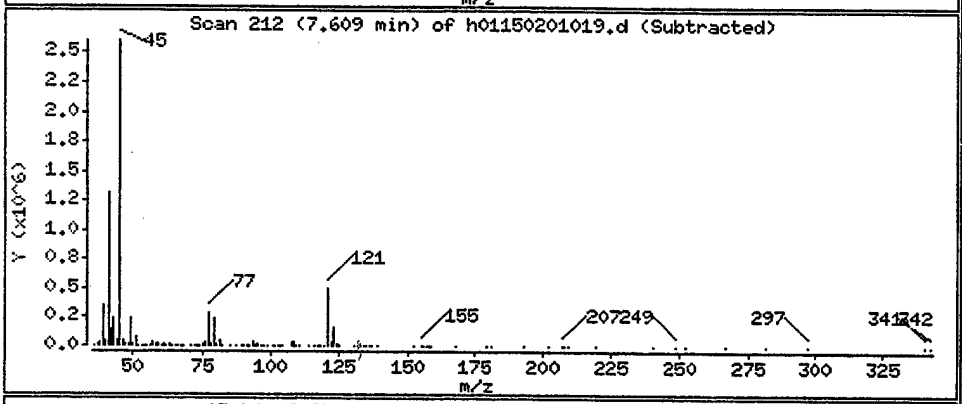
13 bis(2-Chloroisopropyl)ether

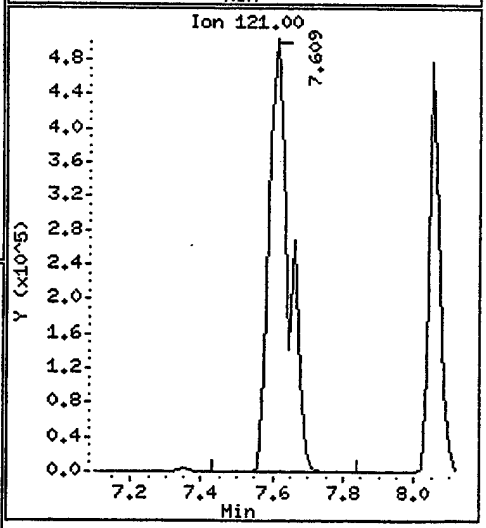
Concentration: 70.9 ug

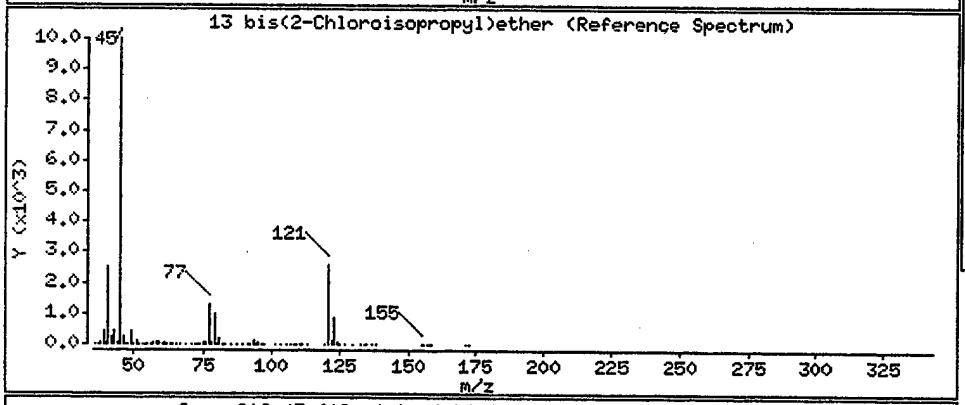
573

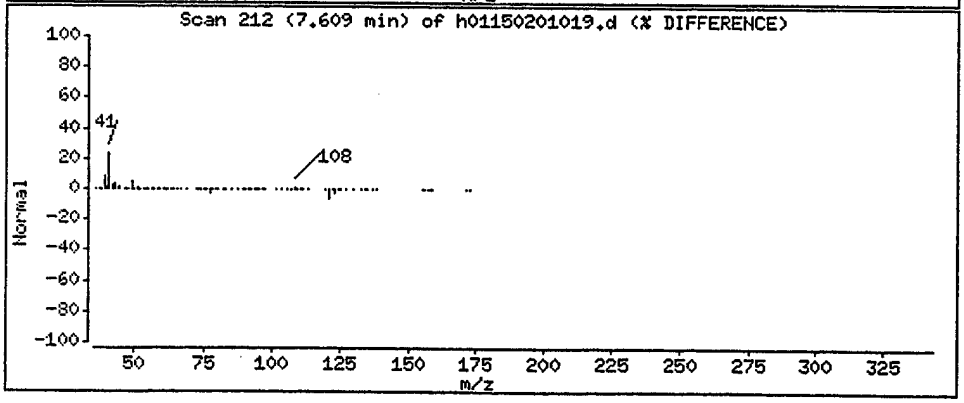












574

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

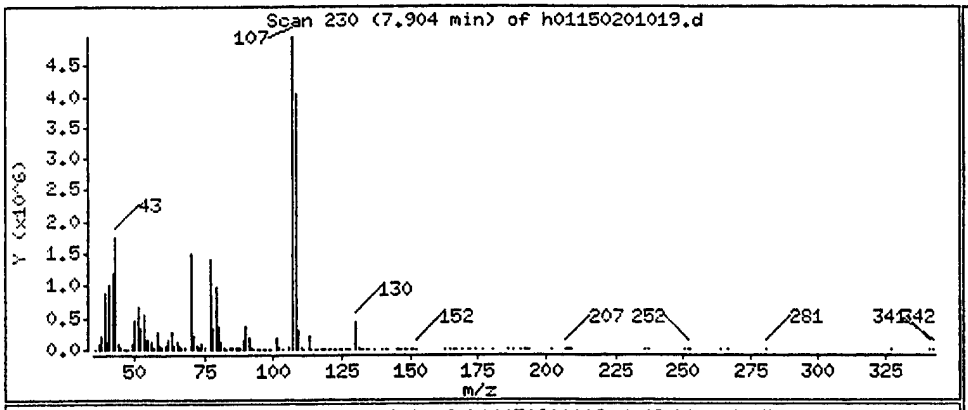
Operator: jgh

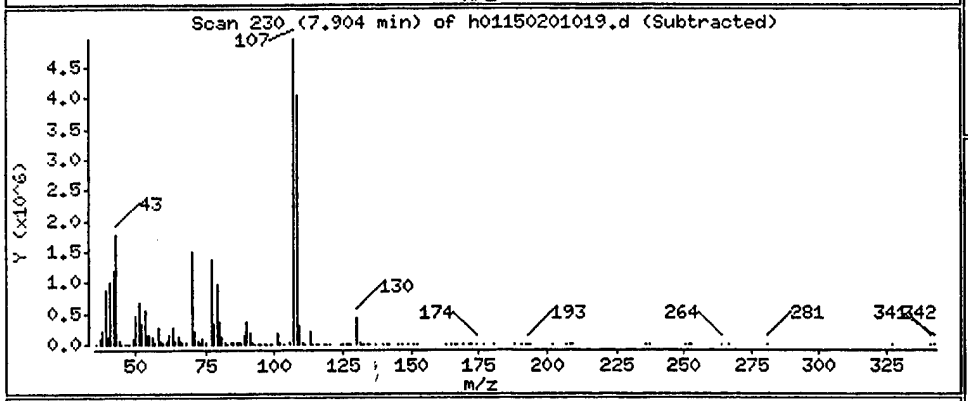
Column phase:

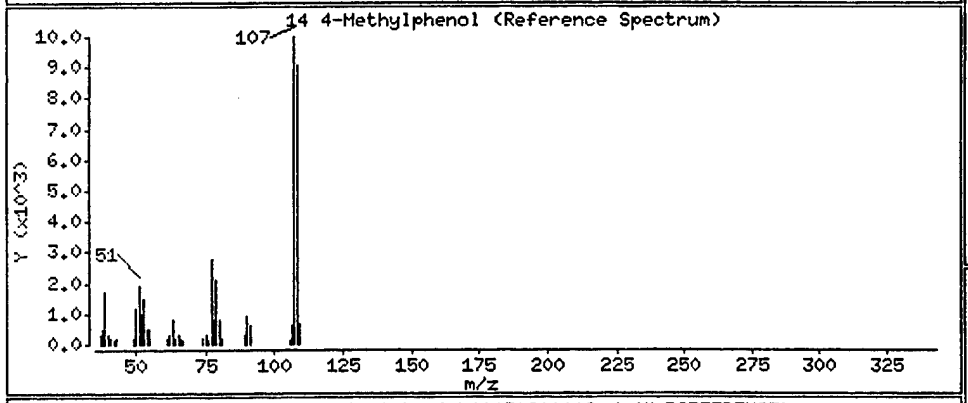
Column diameter: 2.00

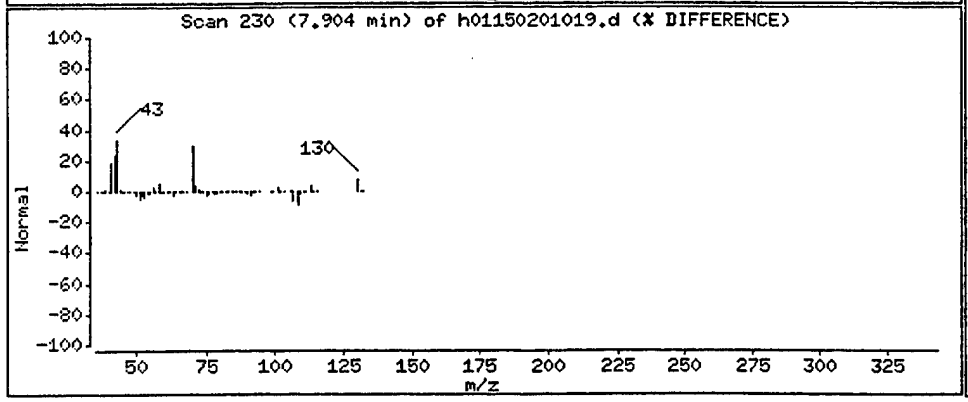
14 4-Methylphenol

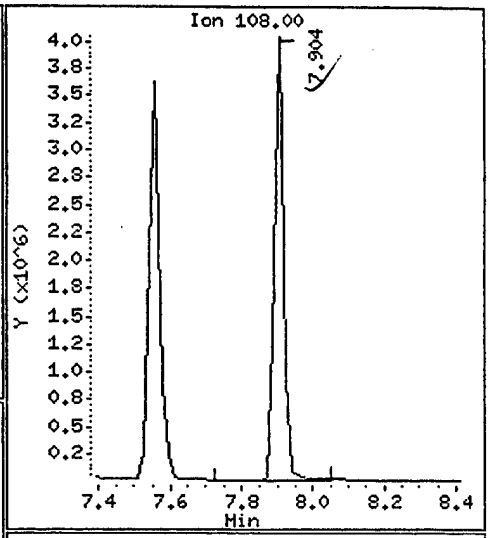
Concentration: 75.9 ug

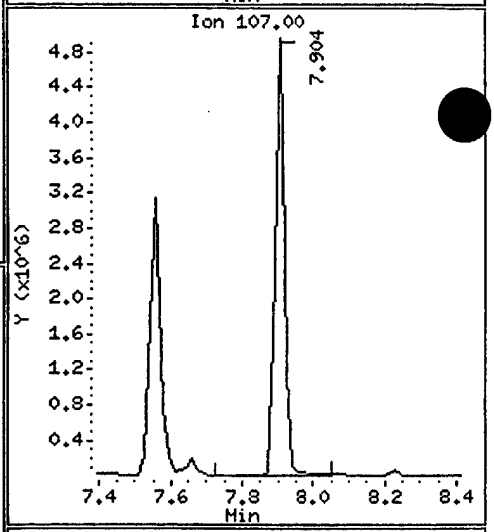


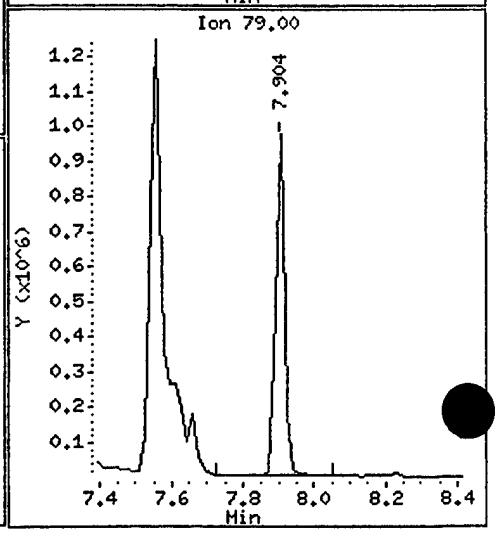












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

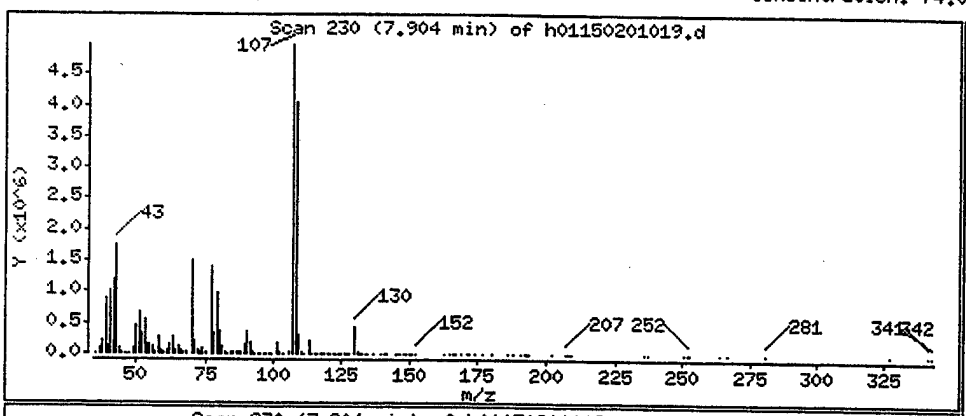
Operator: jgh

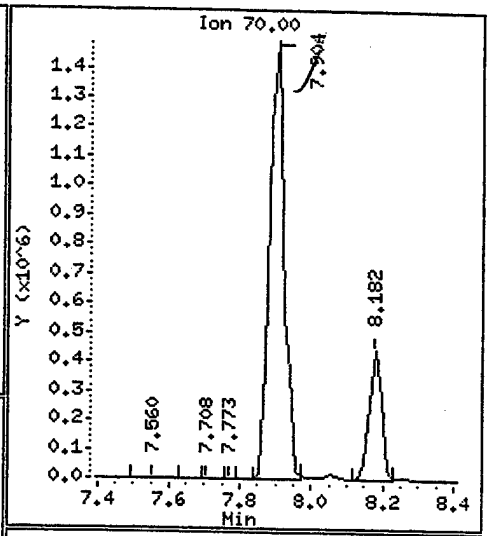
Column phase:

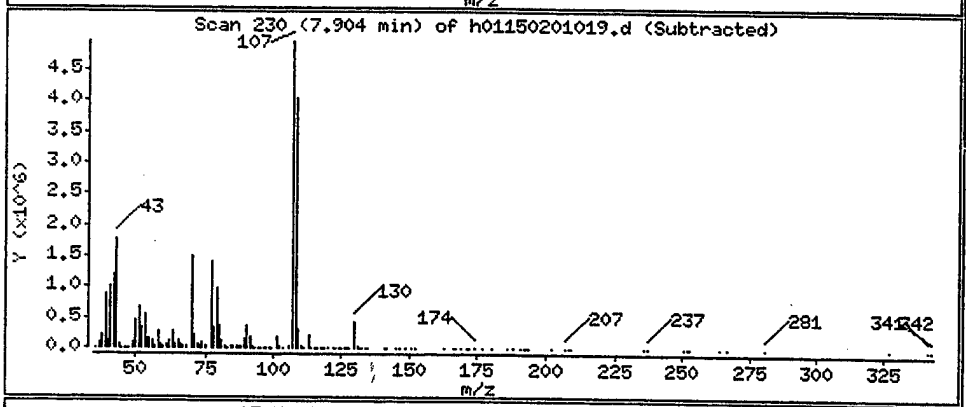
Column diameter: 2.00

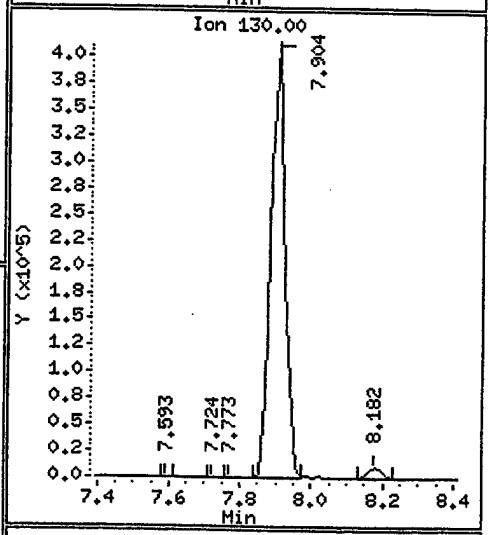
15 N-Nitrosodipropylamine

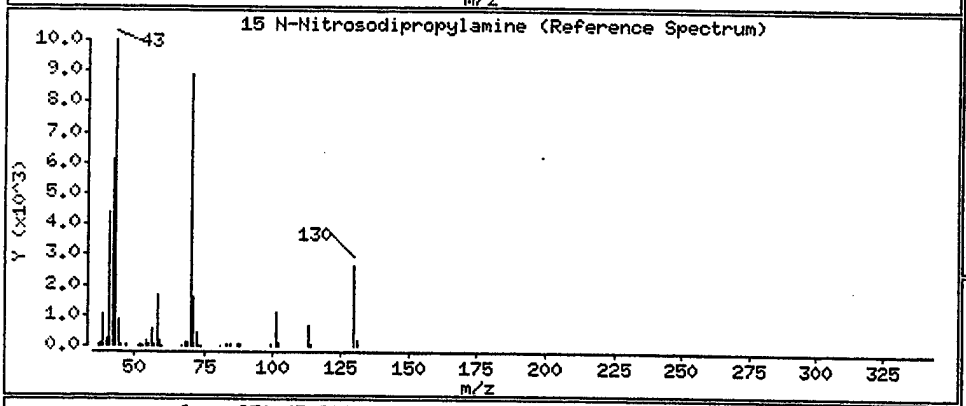
Concentration: 74.0 ug

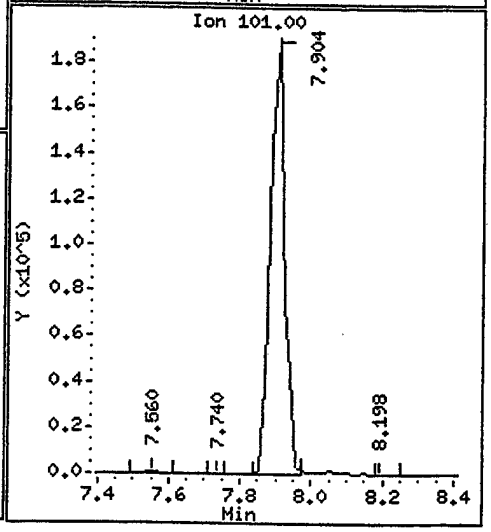


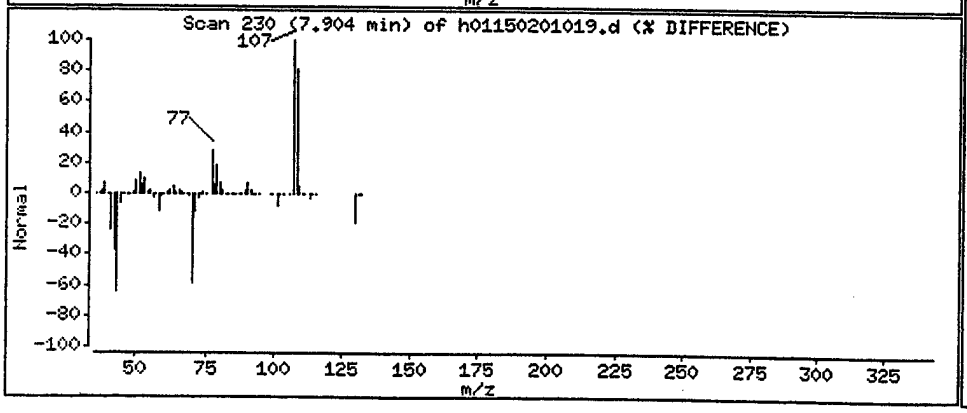












576

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

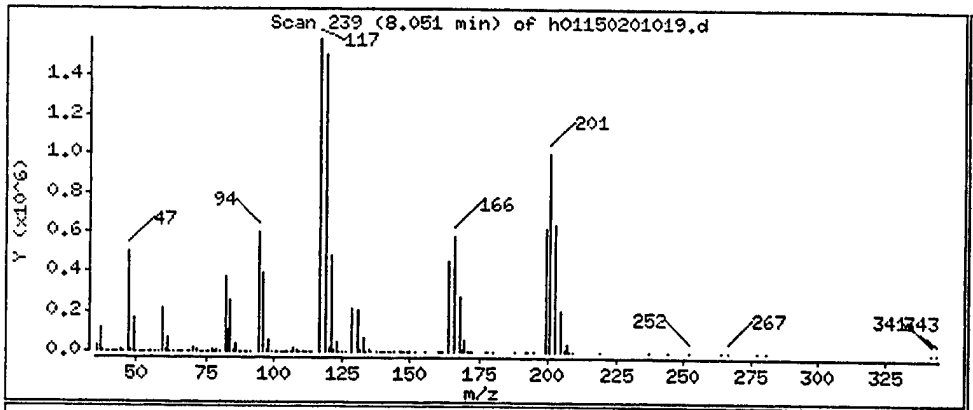
Operator: jgh

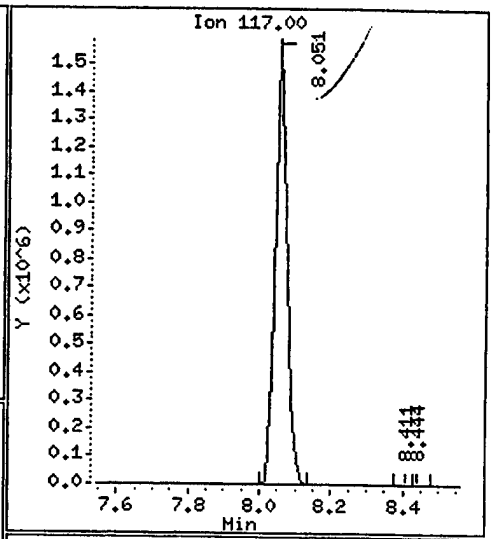
Column phase:

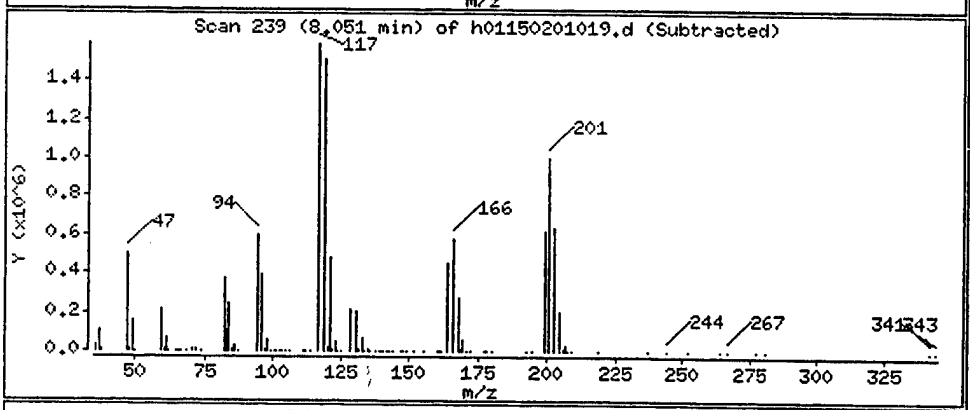
Column diameter: 2.00

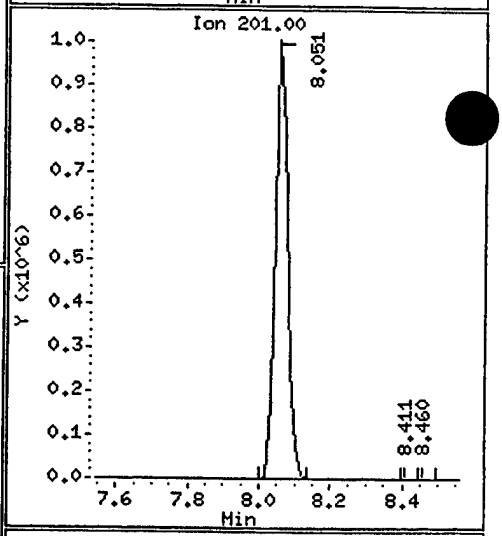
16 Hexachloroethane

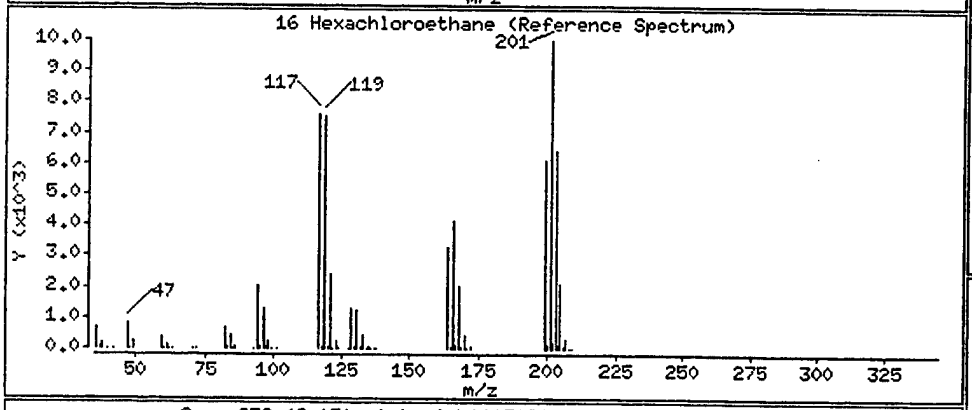
Concentration: 79.9 ug

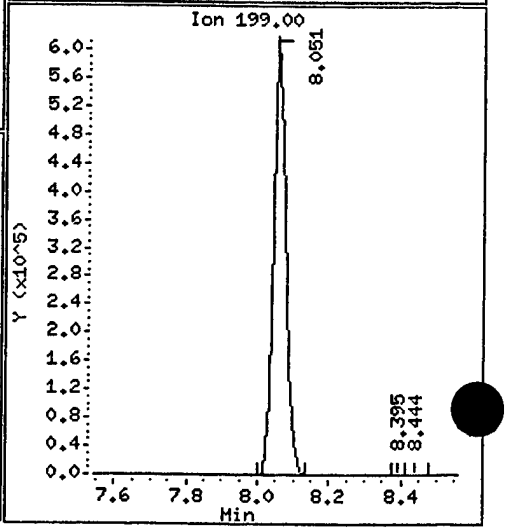


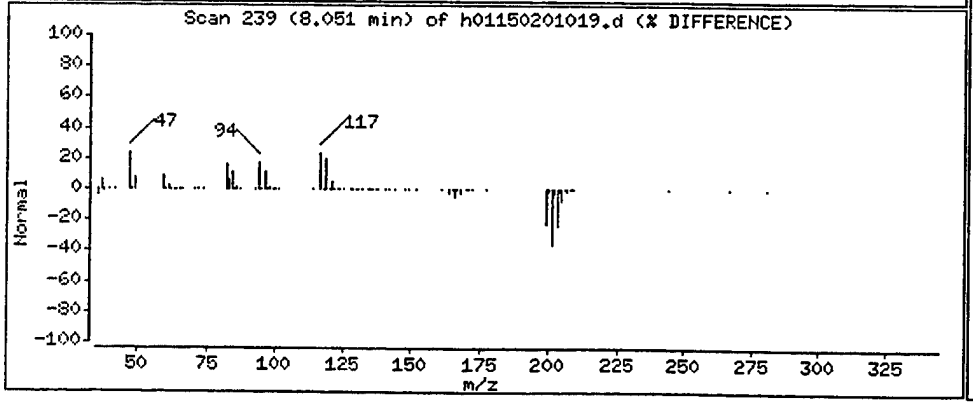












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

577

Volume Injected (uL): 1.0

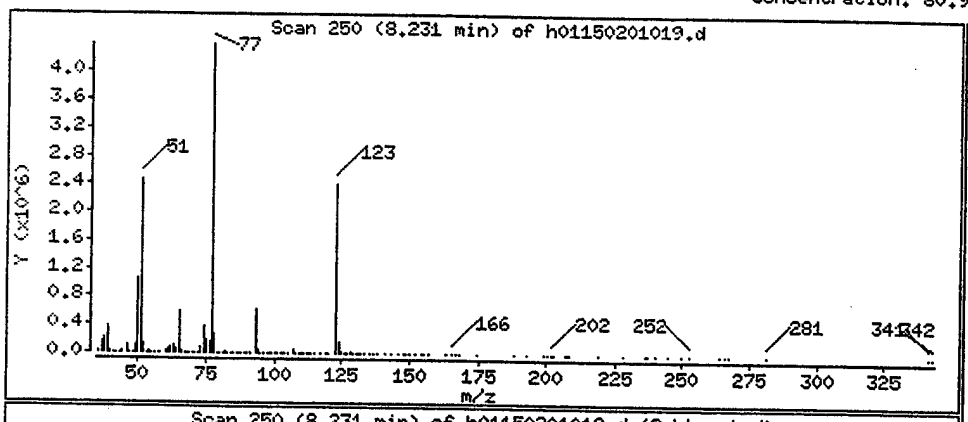
Operator: jgh

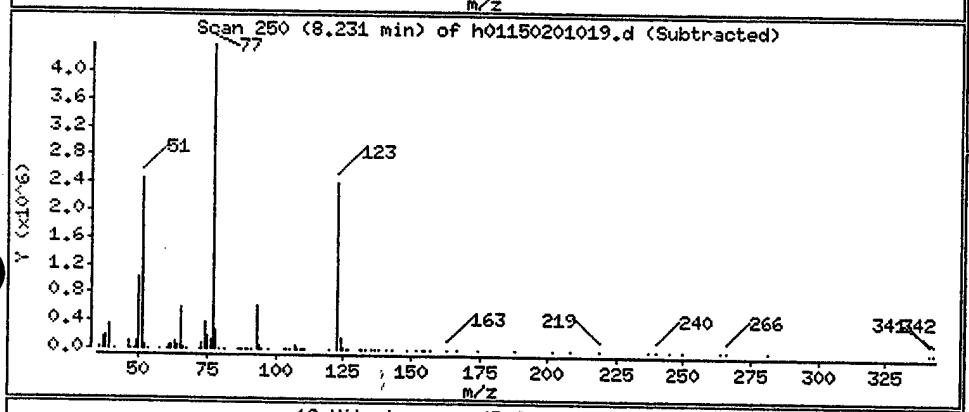
Column phase:

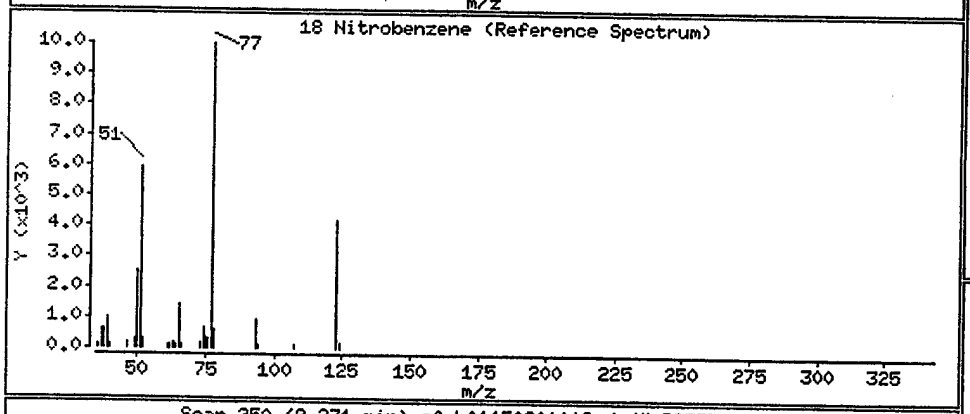
Column diameter: 2.00

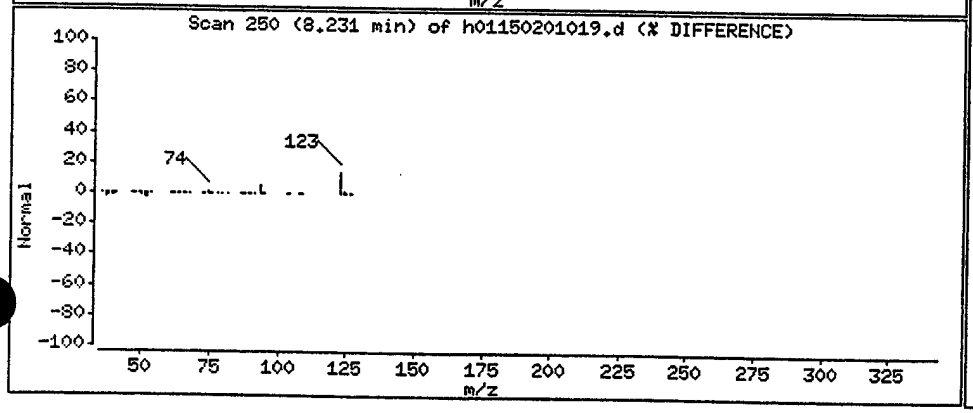
18 Nitrobenzene

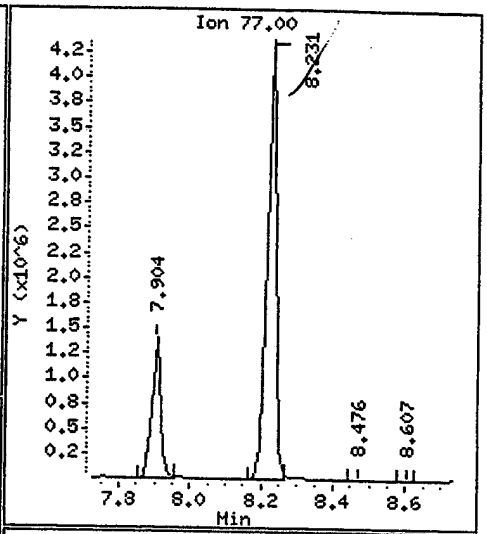
Concentration: 80.9 ug

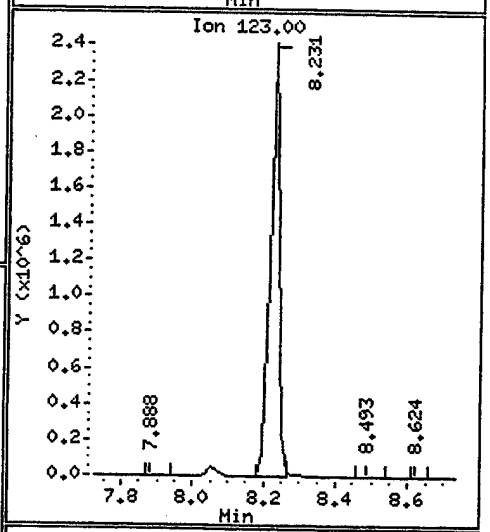


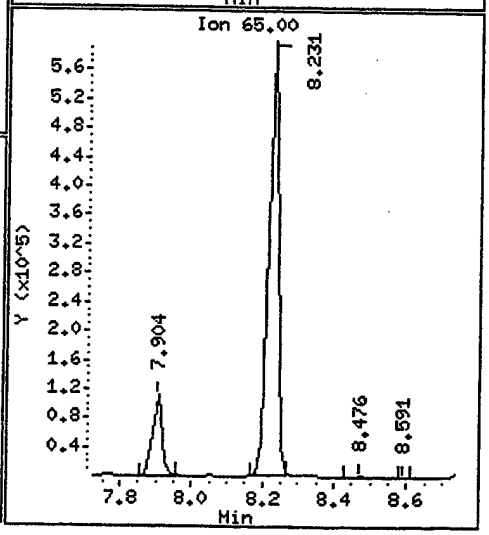












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Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

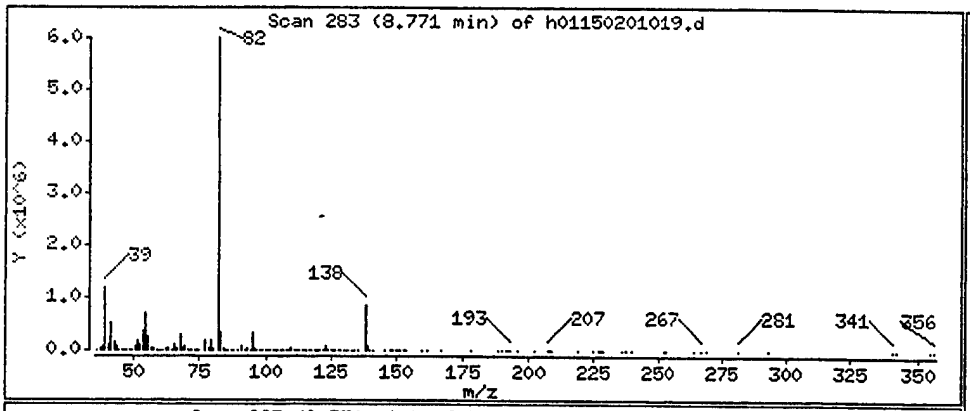
Operator: jgh

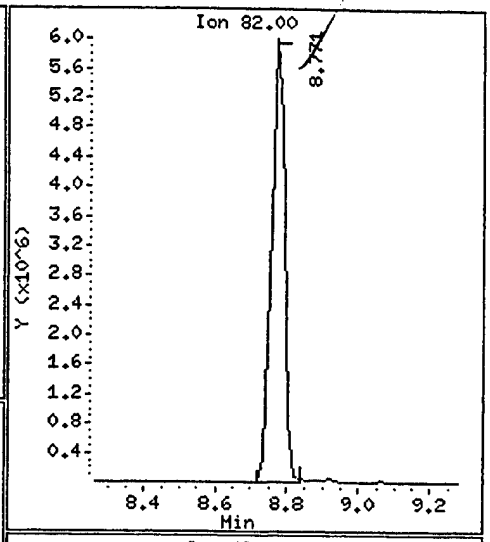
Column phase:

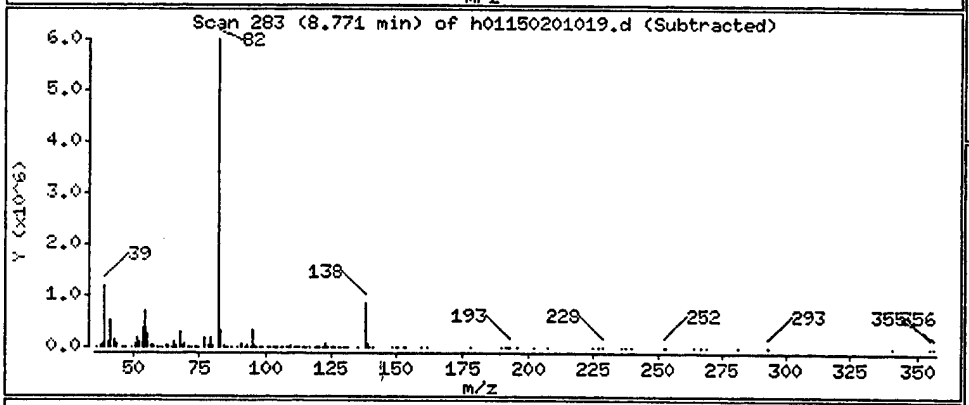
Column diameter: 2.00

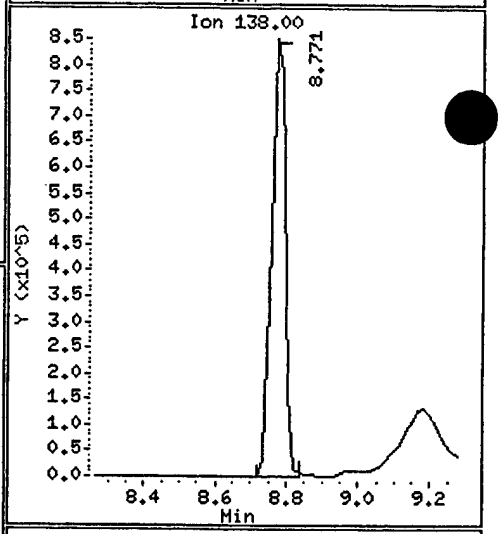
19 Isophorone

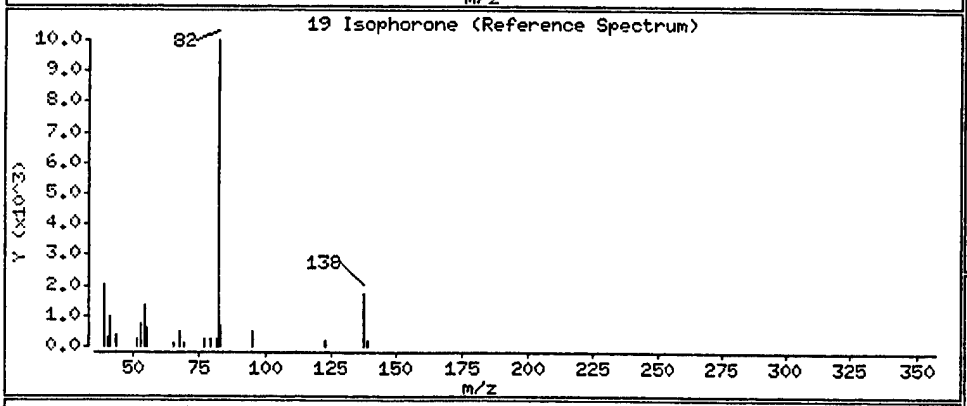
Concentration: 77.0 ug

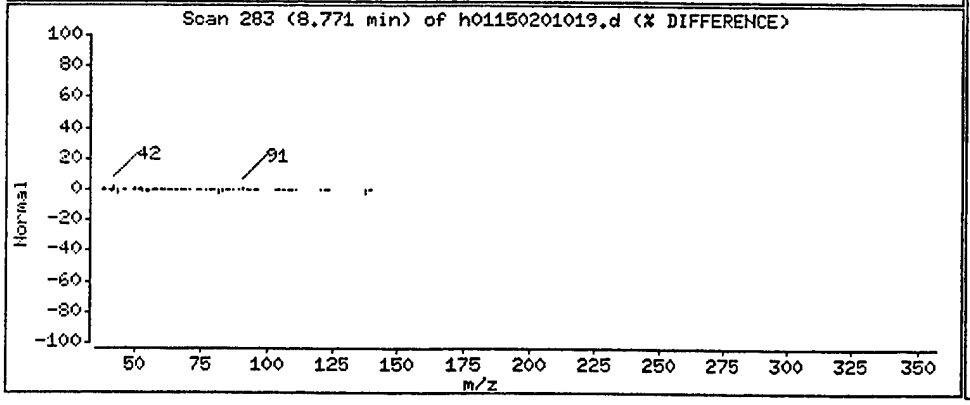


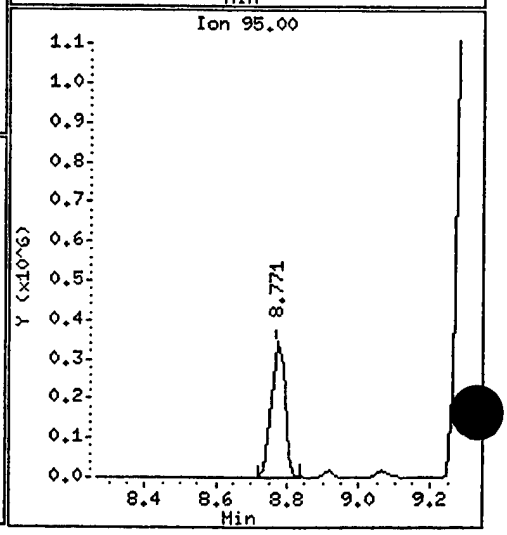












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

579

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

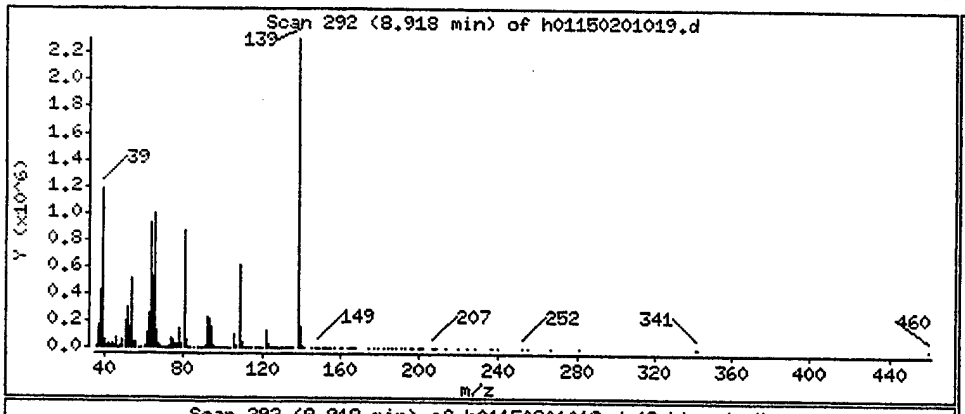
Operator: jgh

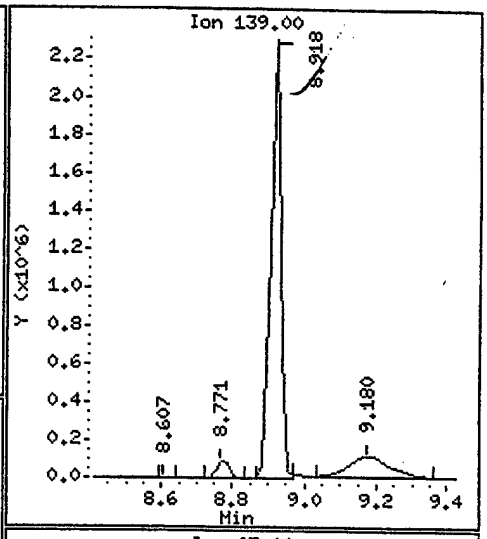
Column phase:

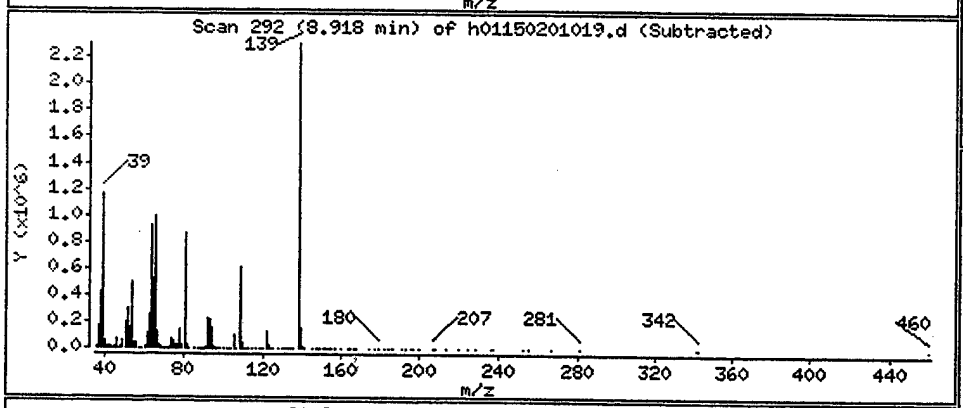
Column diameter: 2.00

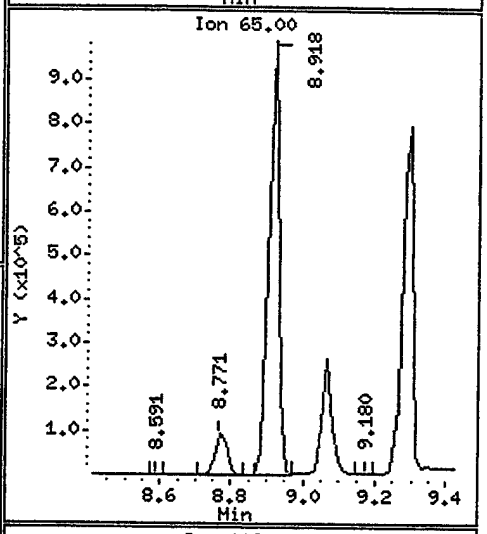
20 2-Nitrophenol

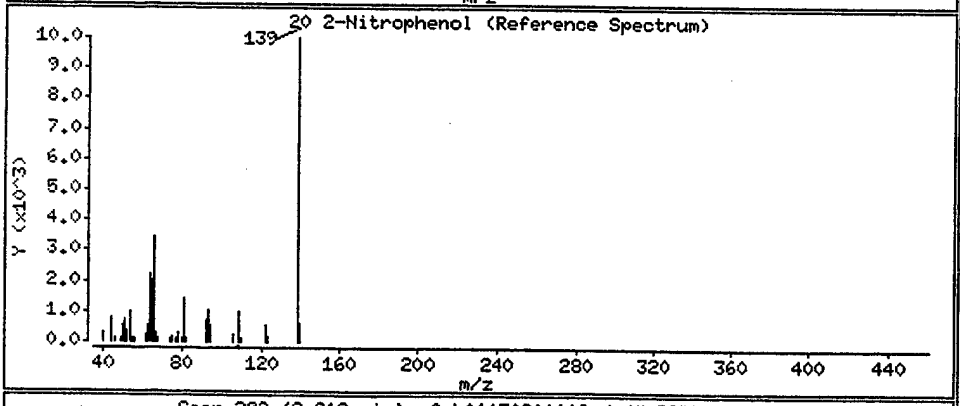
Concentration: 81.1 ug

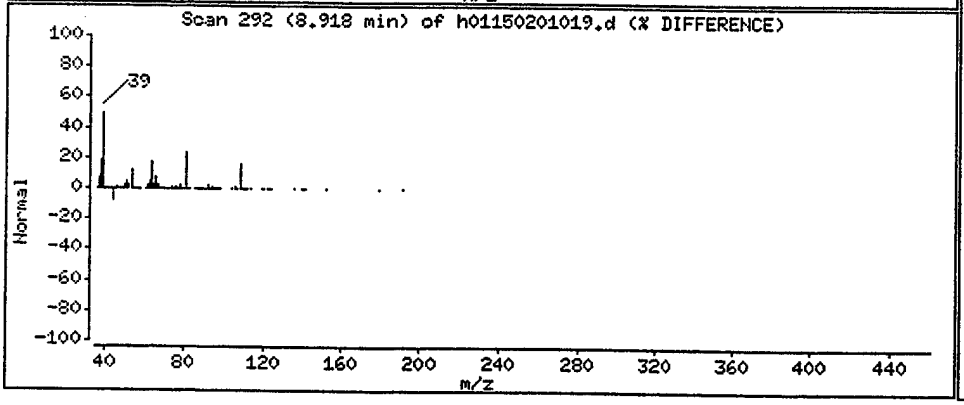


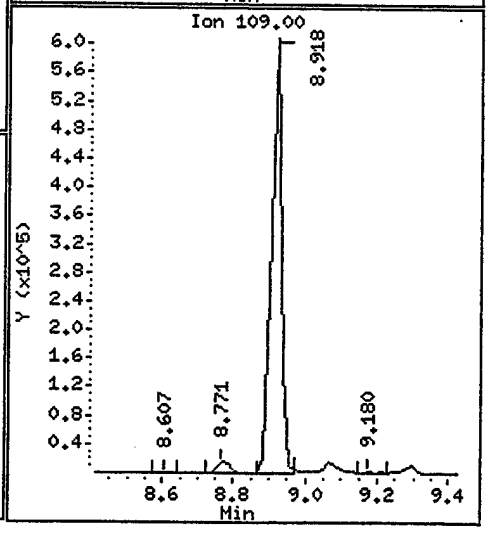












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

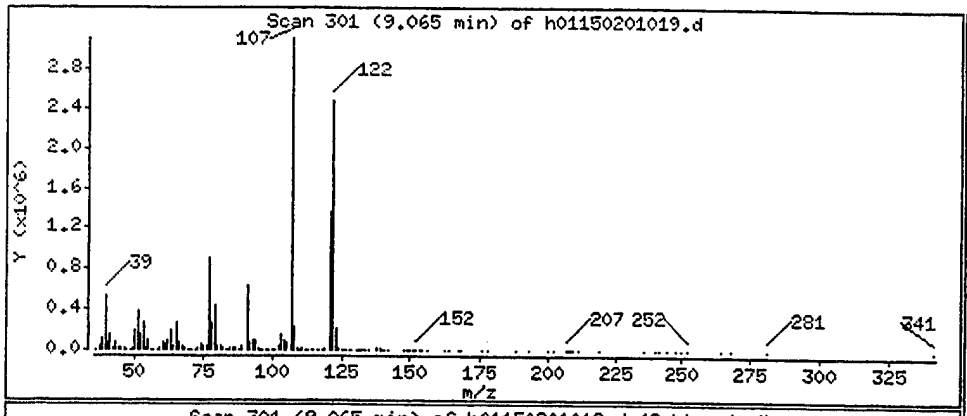
Operator: jgh

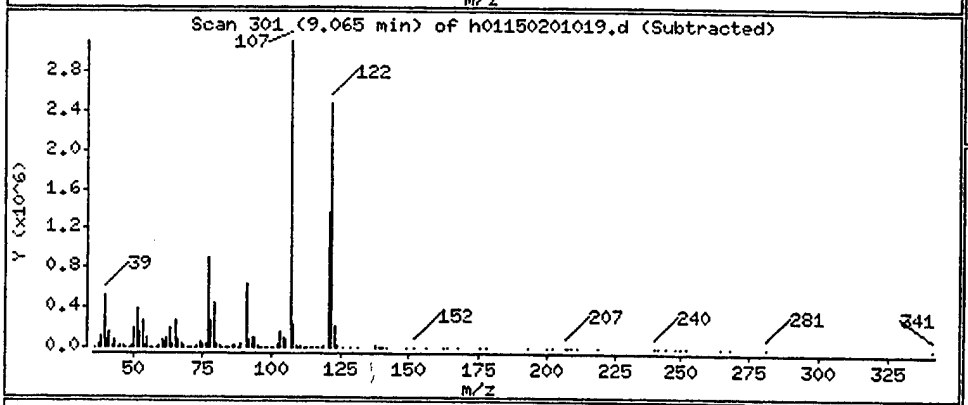
Column phase:

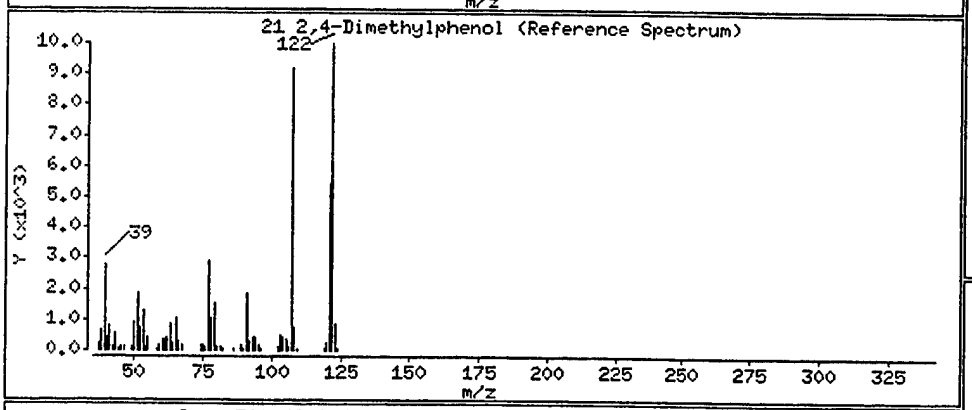
Column diameter: 2.00

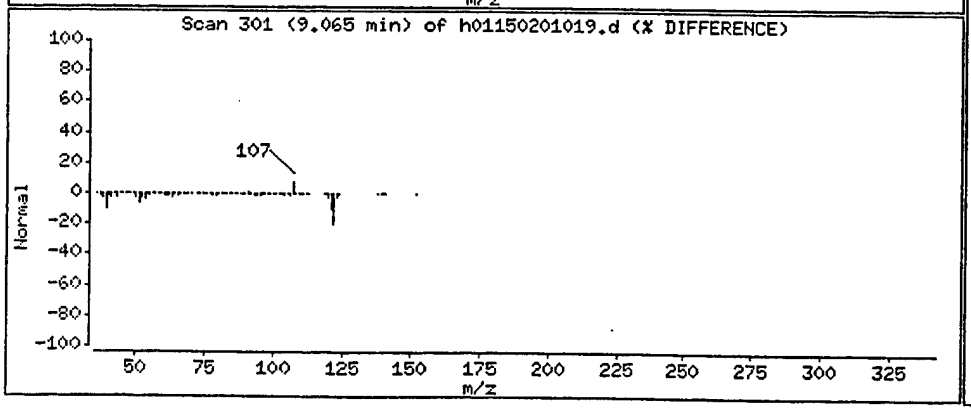
21 2,4-Dimethylphenol

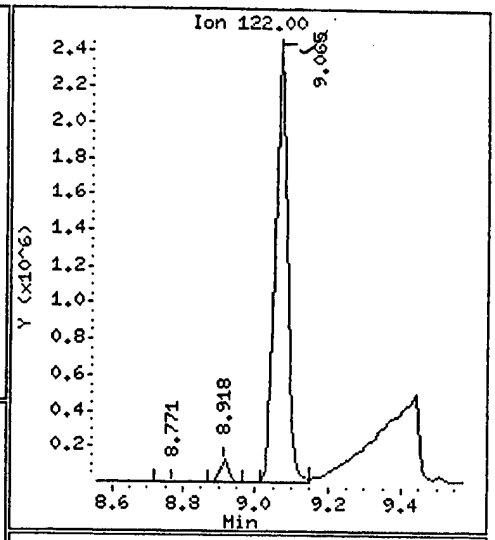
Concentration: 78.1 ug

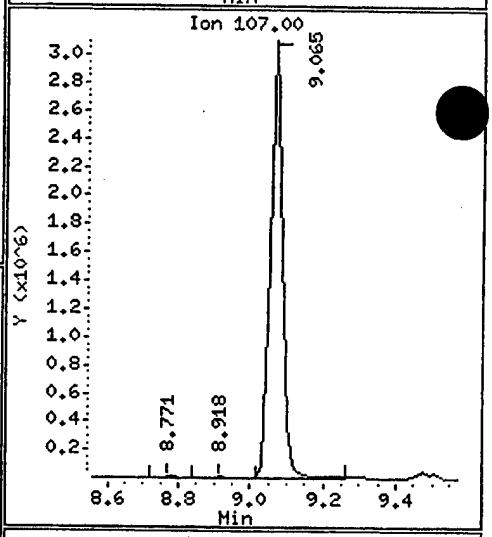


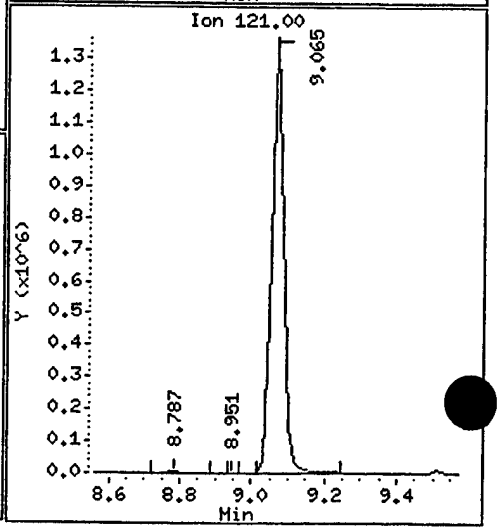












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

Operator: jgh

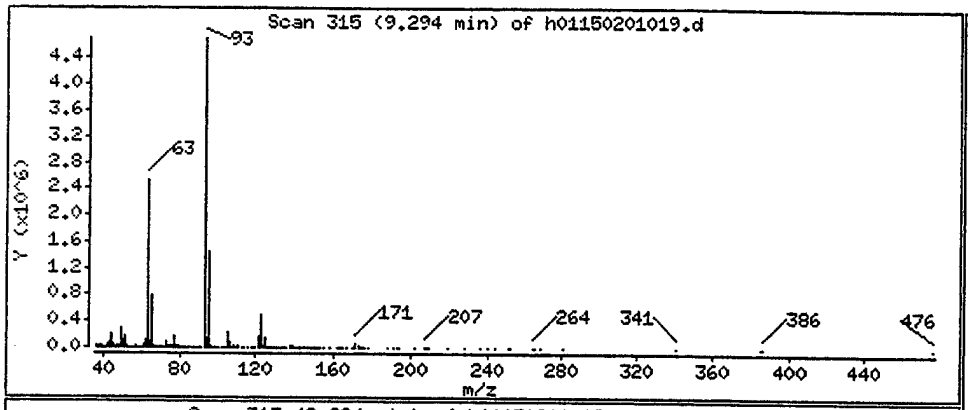
Column phase:

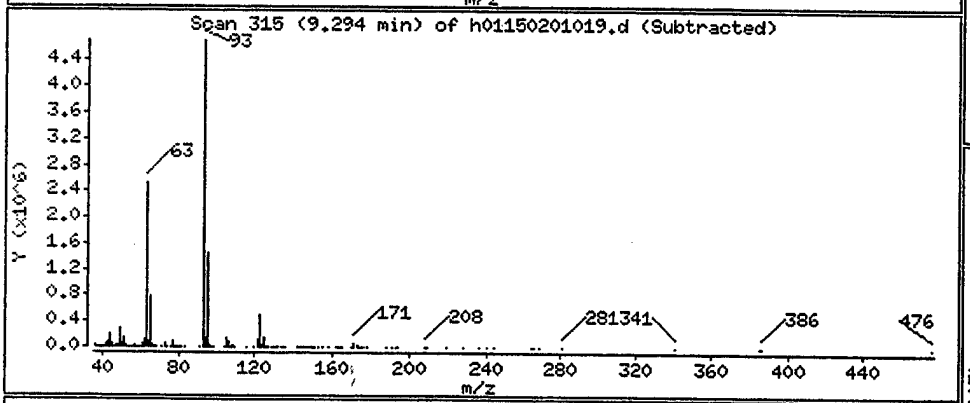
Column diameter: 2.00

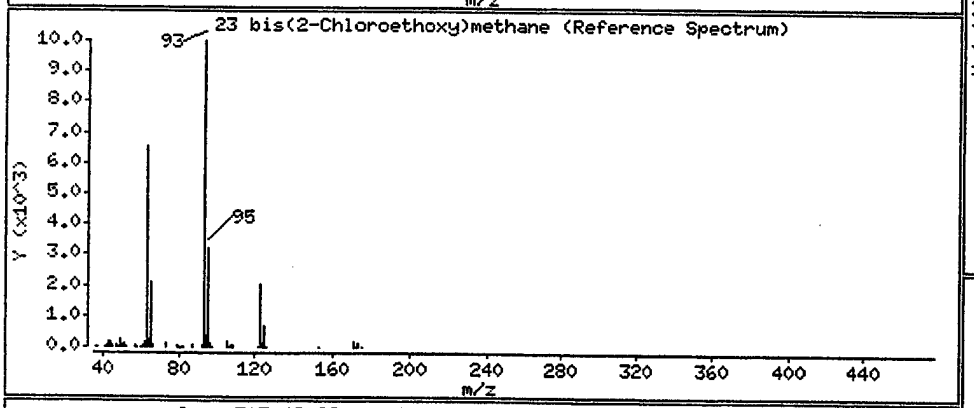
23 bis(2-Chloroethoxy)methane

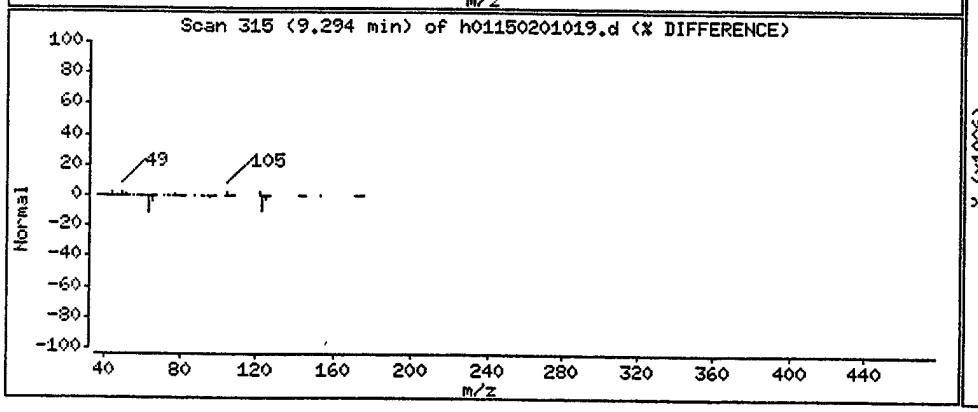
Concentration: 79.6 ug

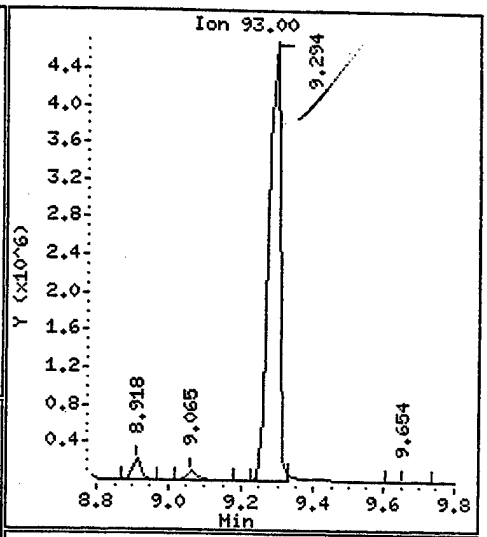
581

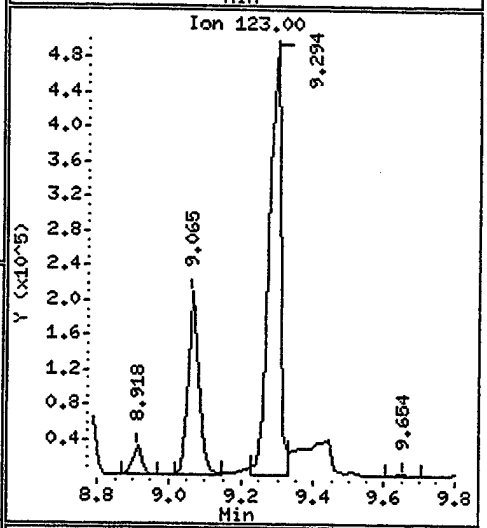


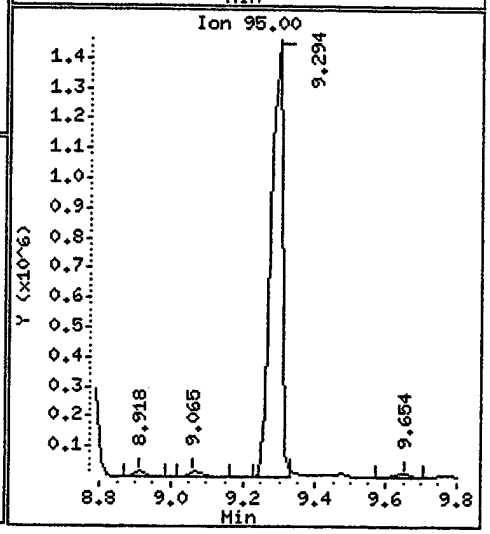












582

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

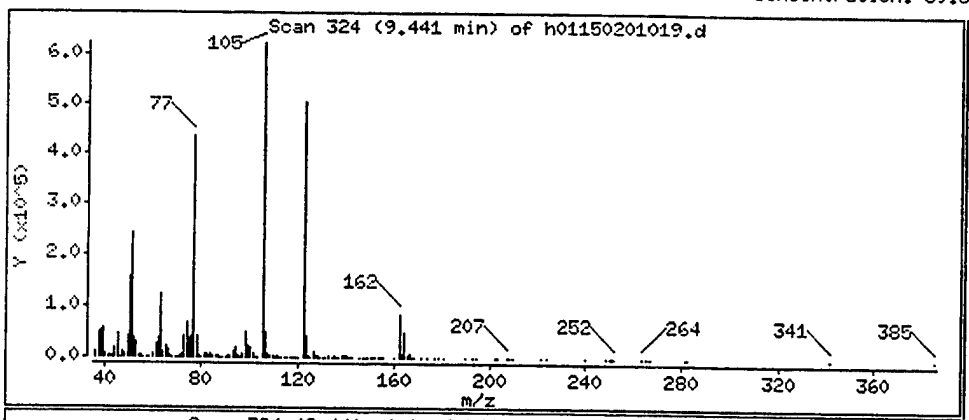
Operator: jgh

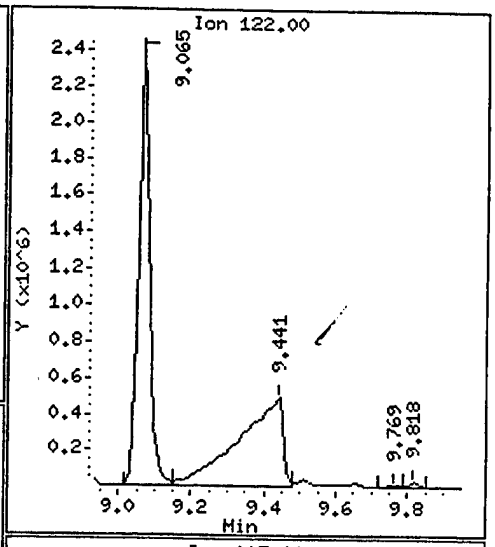
Column phase:

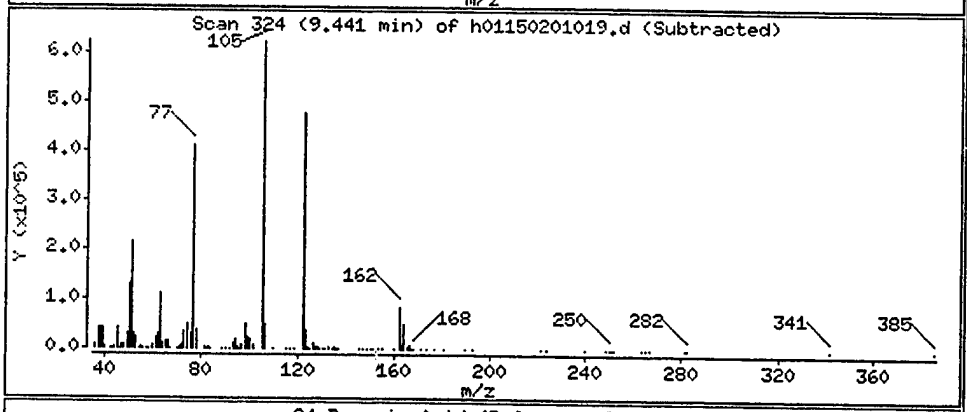
Column diameter: 2.00

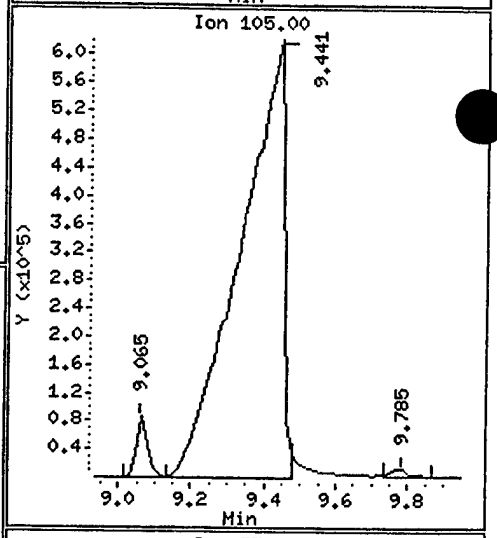
24 Benzoic Acid

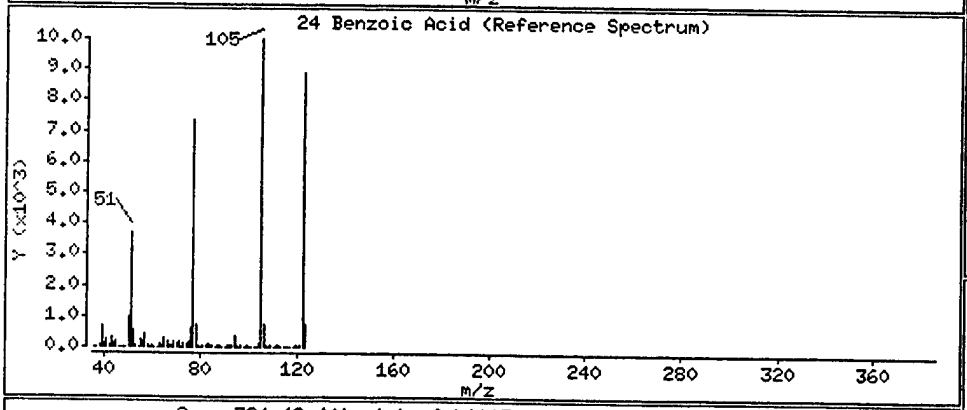
Concentration: 89.8 ug

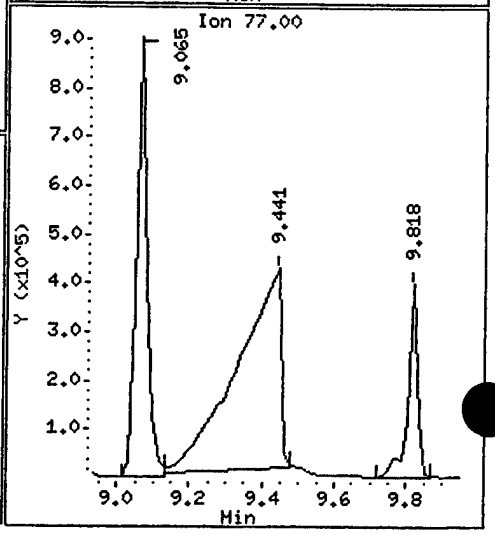


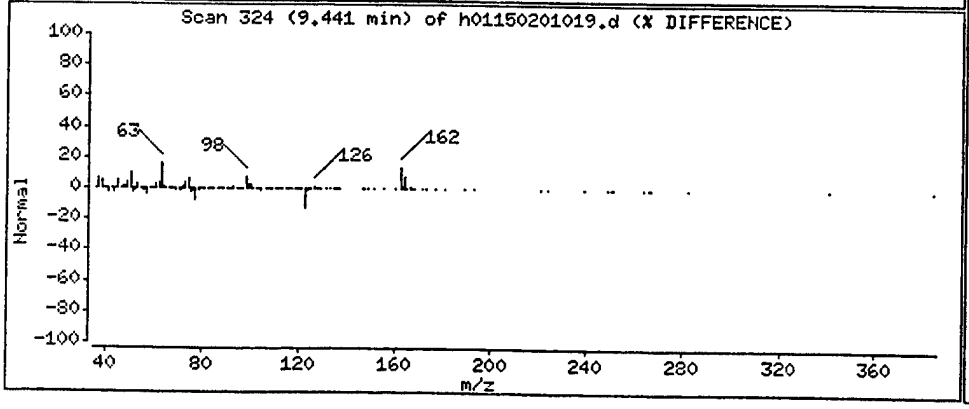












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

583

Volume Injected (uL): 1.0

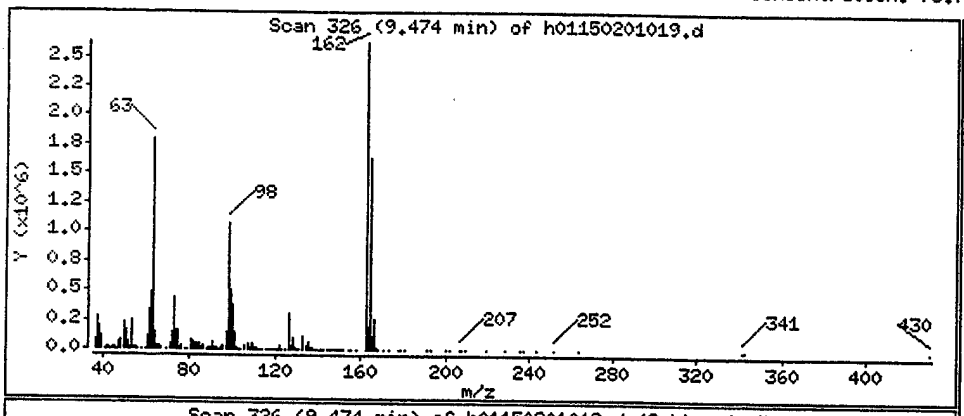
Operator: jgh

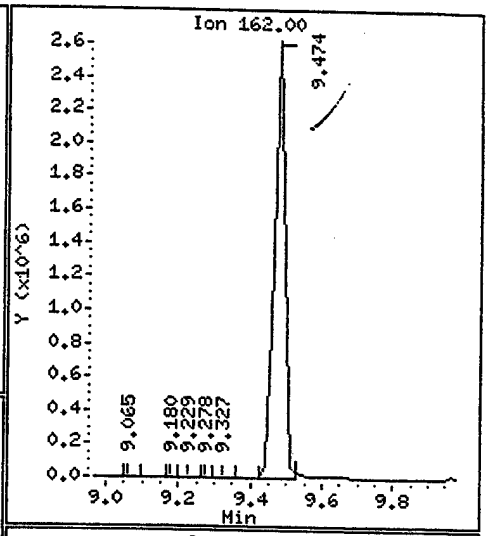
Column phase:

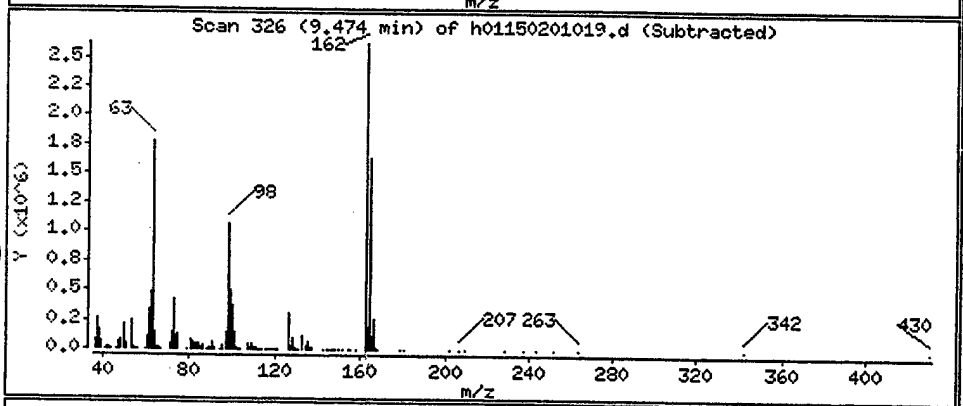
Column diameter: 2.00

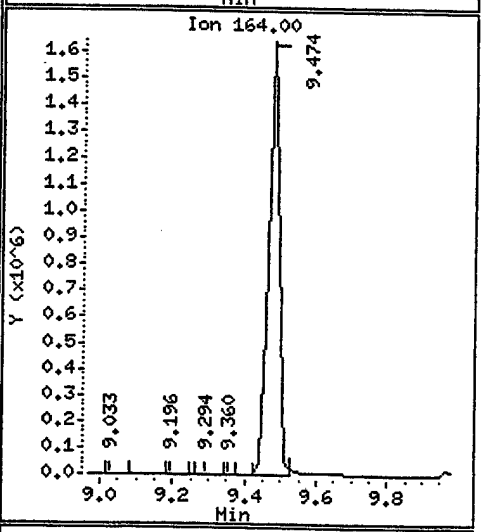
25 2,4-Dichlorophenol

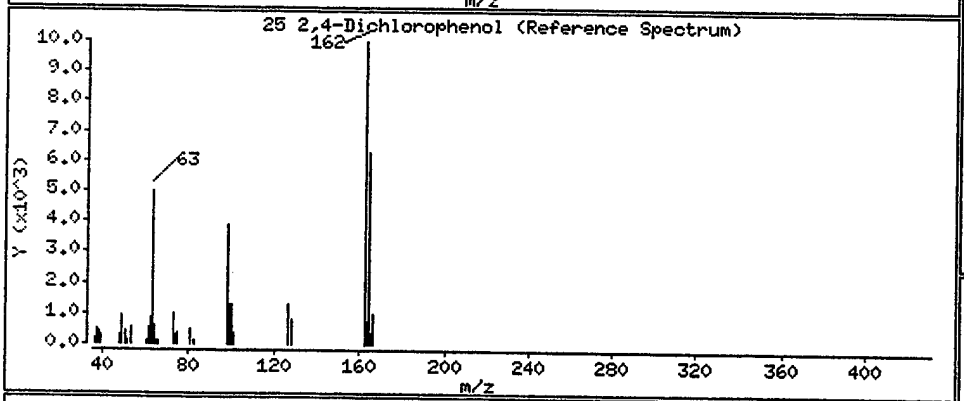
Concentration: 78.7 ug

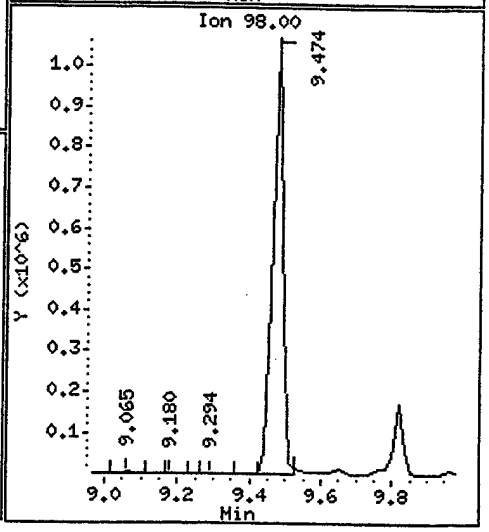


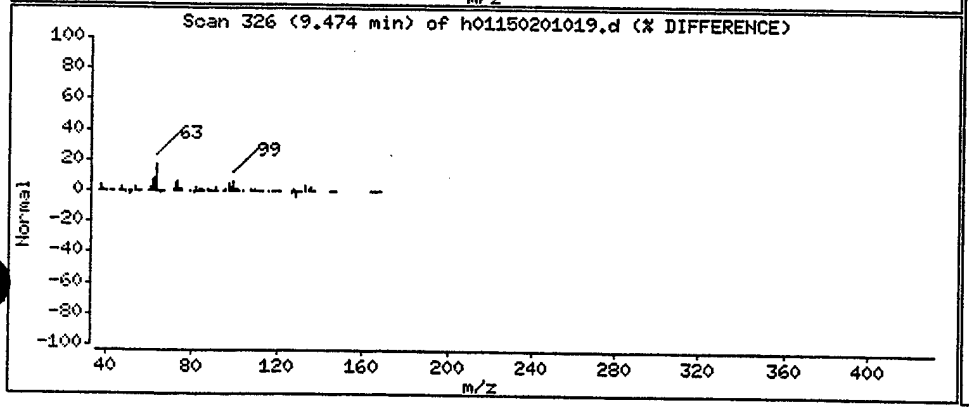












584

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

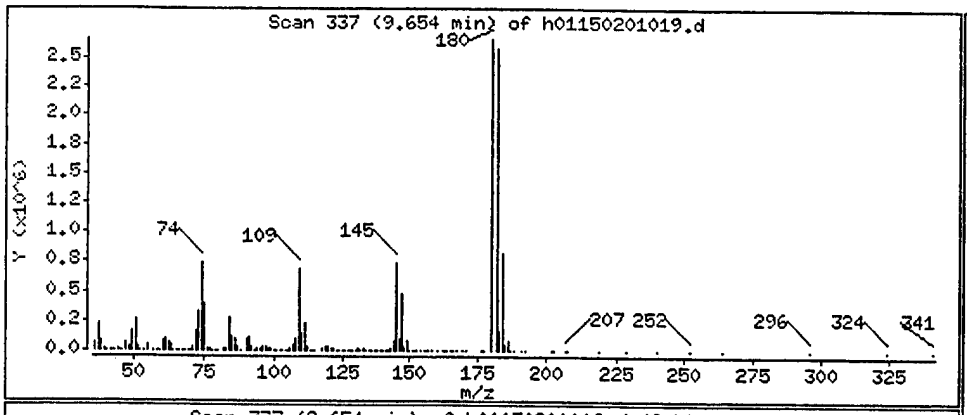
Operator: jgh

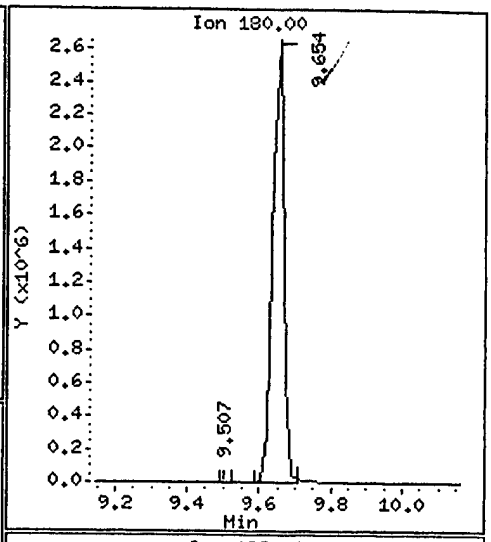
Column phase:

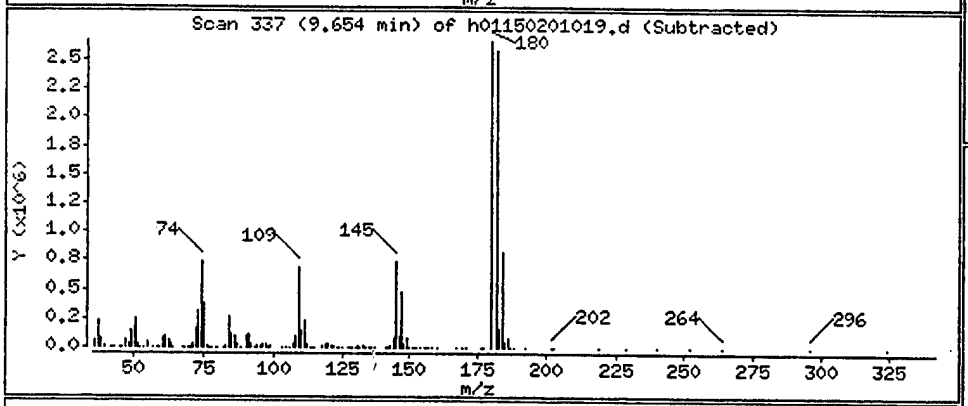
Column diameter: 2.00

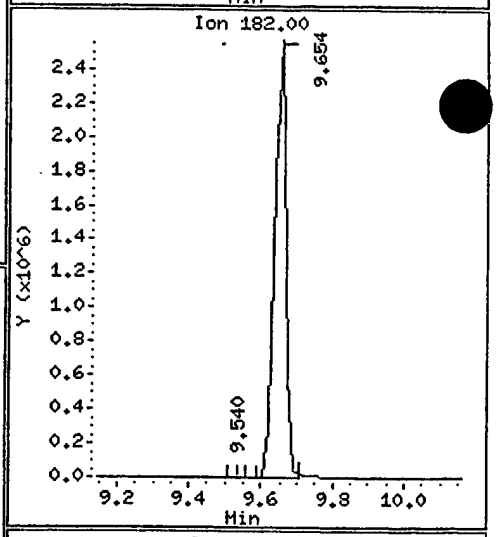
26 1,2,4-Trichlorobenzene

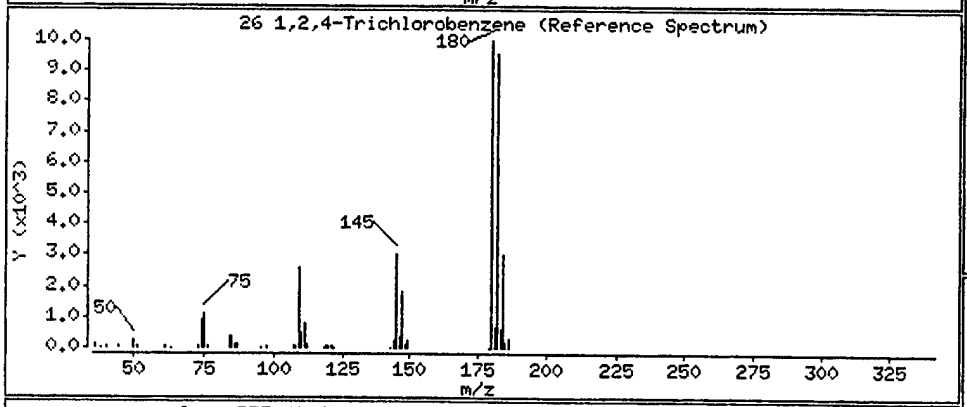
Concentration: 77.1 ug

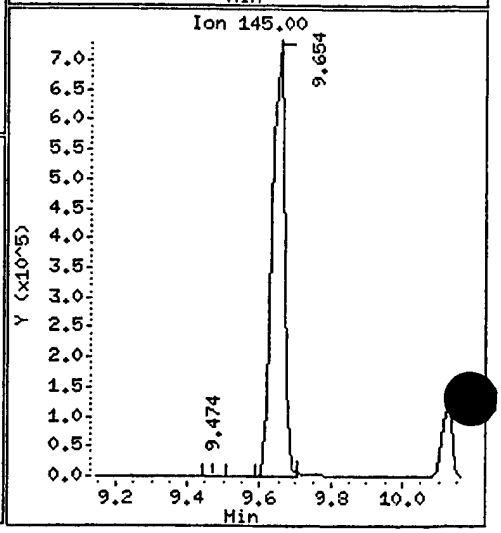


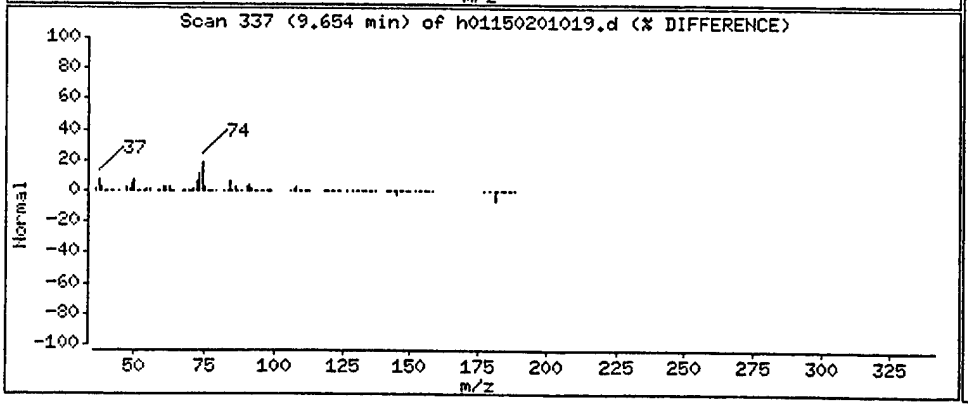












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

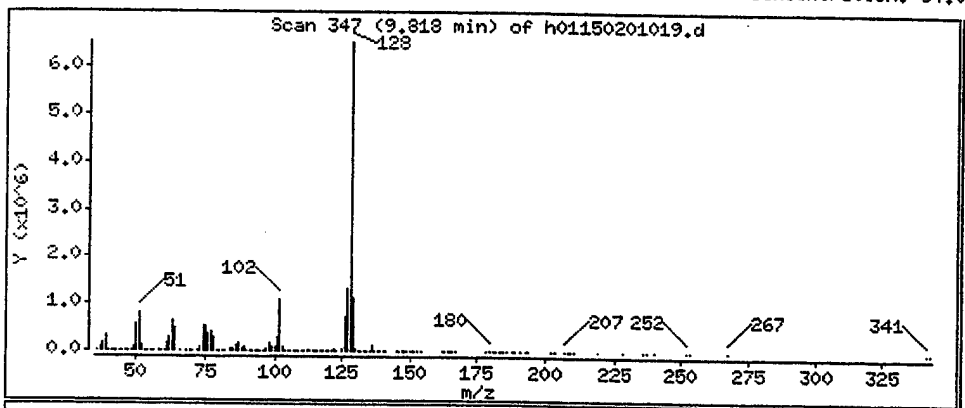
Operator: jgh

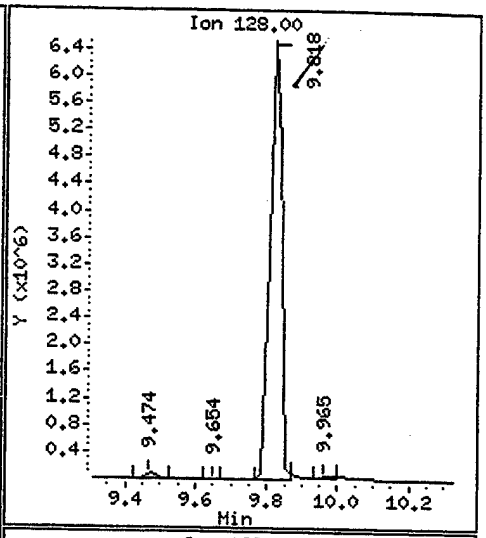
Column phase:

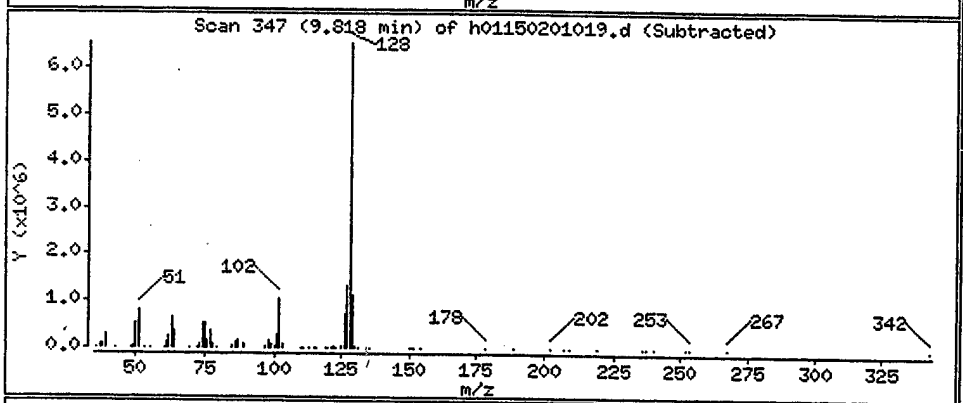
Column diameter: 2.00

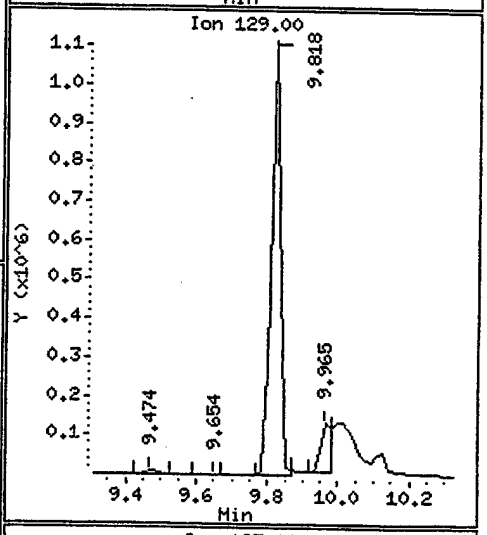
28 Naphthalene

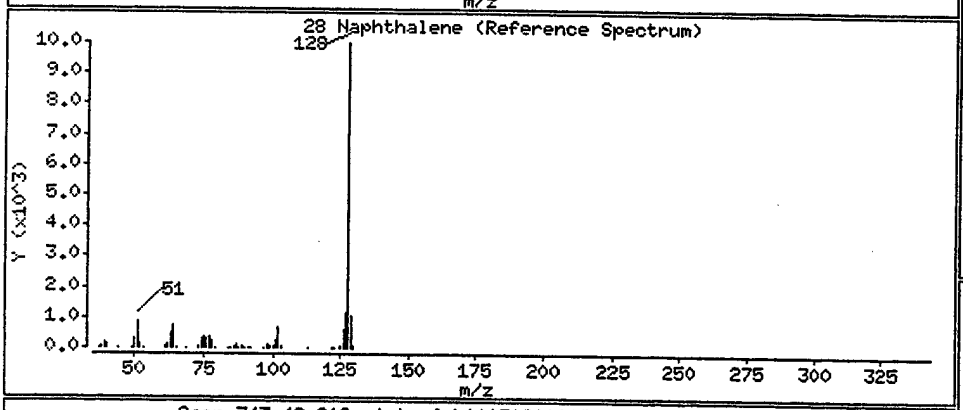
Concentration: 64.0 ug

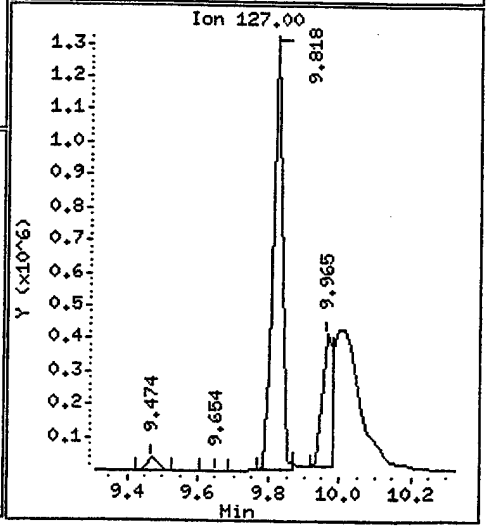


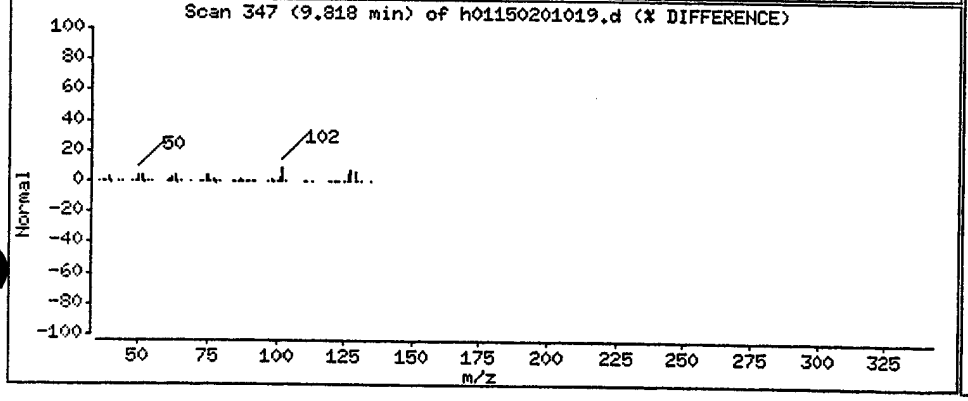












586

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

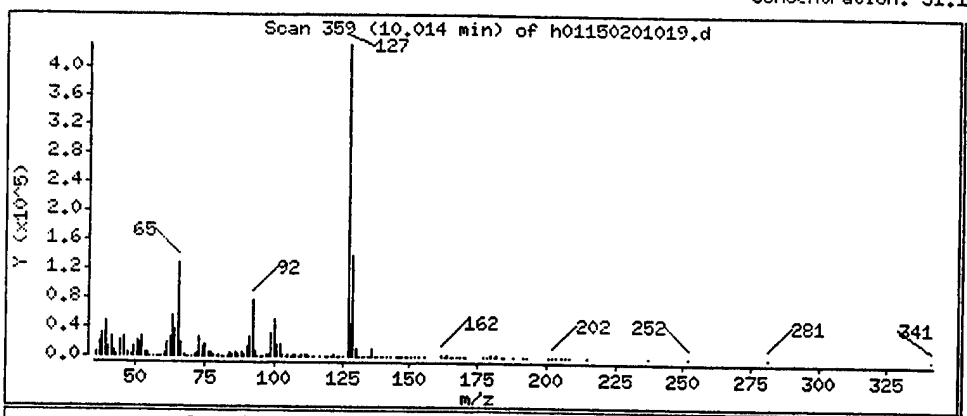
Operator: jgh

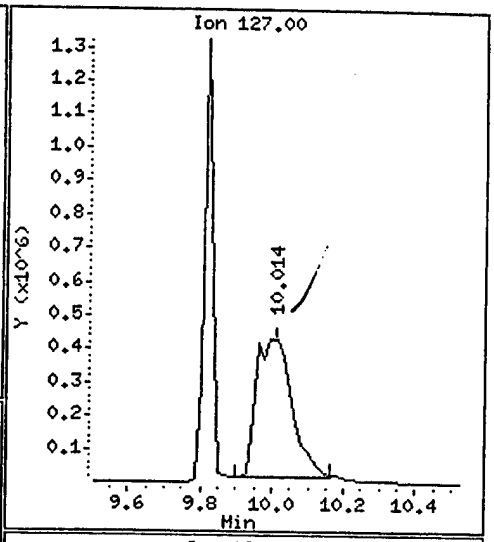
Column phase:

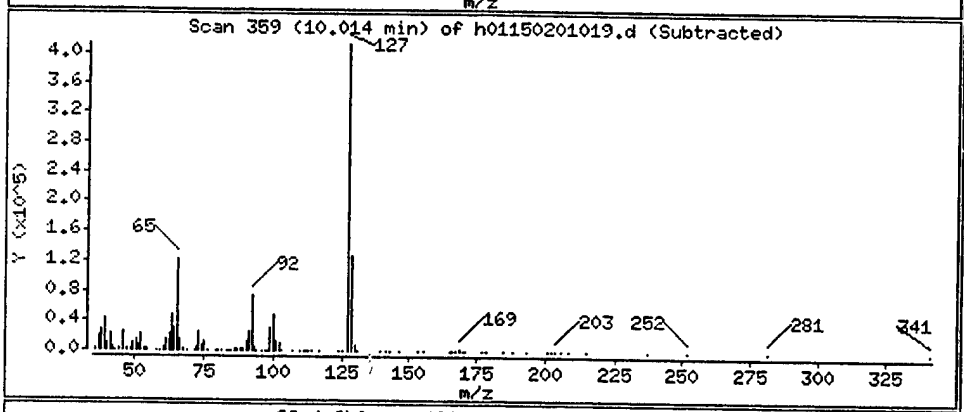
Column diameter: 2.00

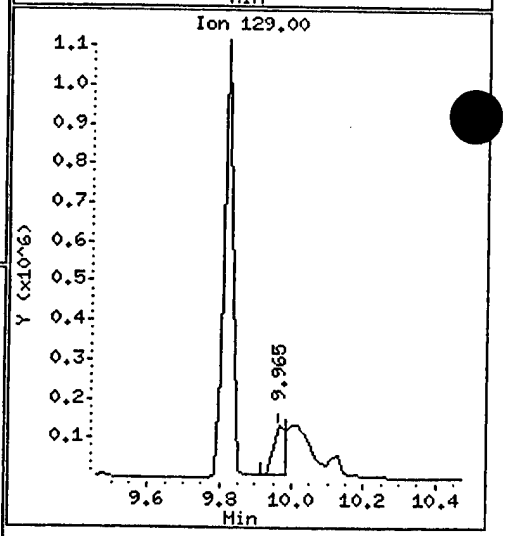
29 4-Chloroaniline

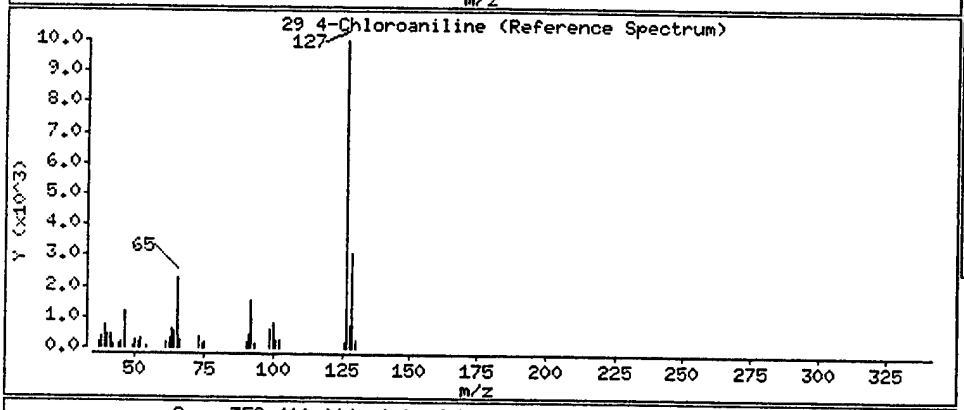
Concentration: 51.1 ug

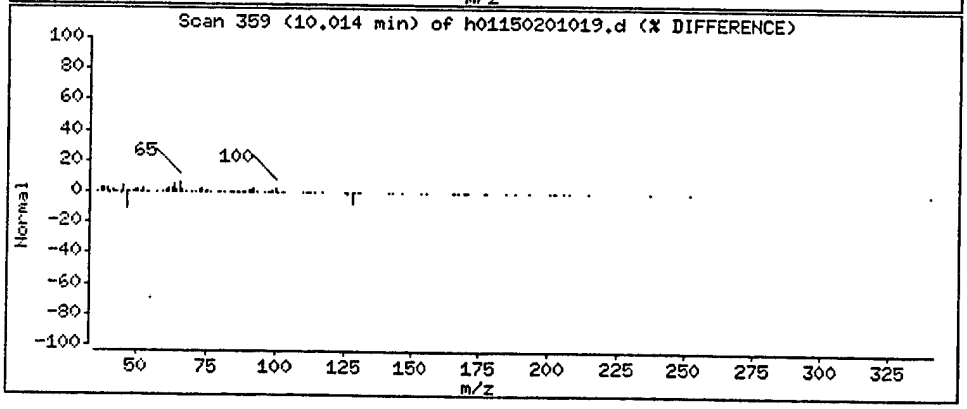






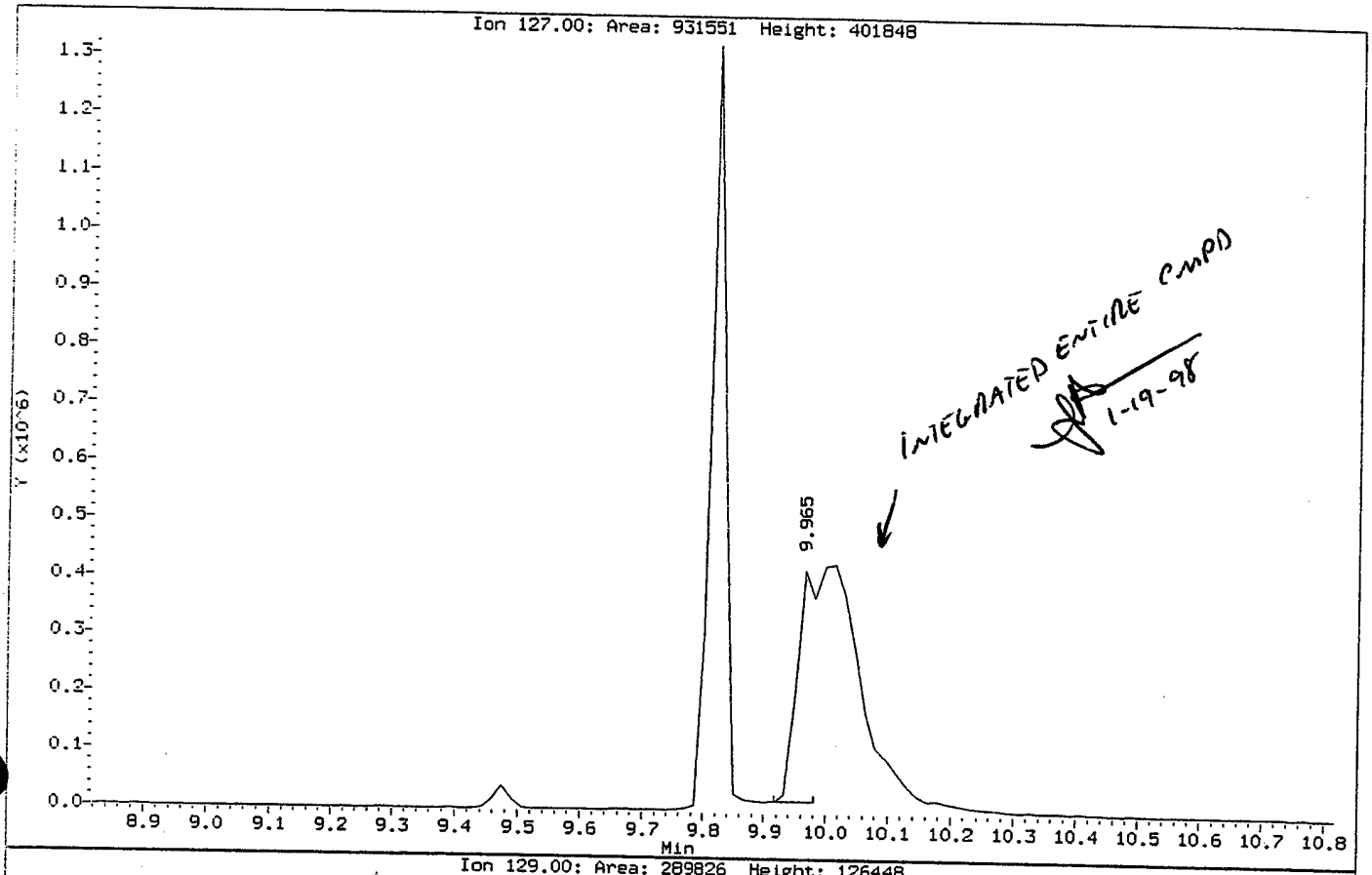


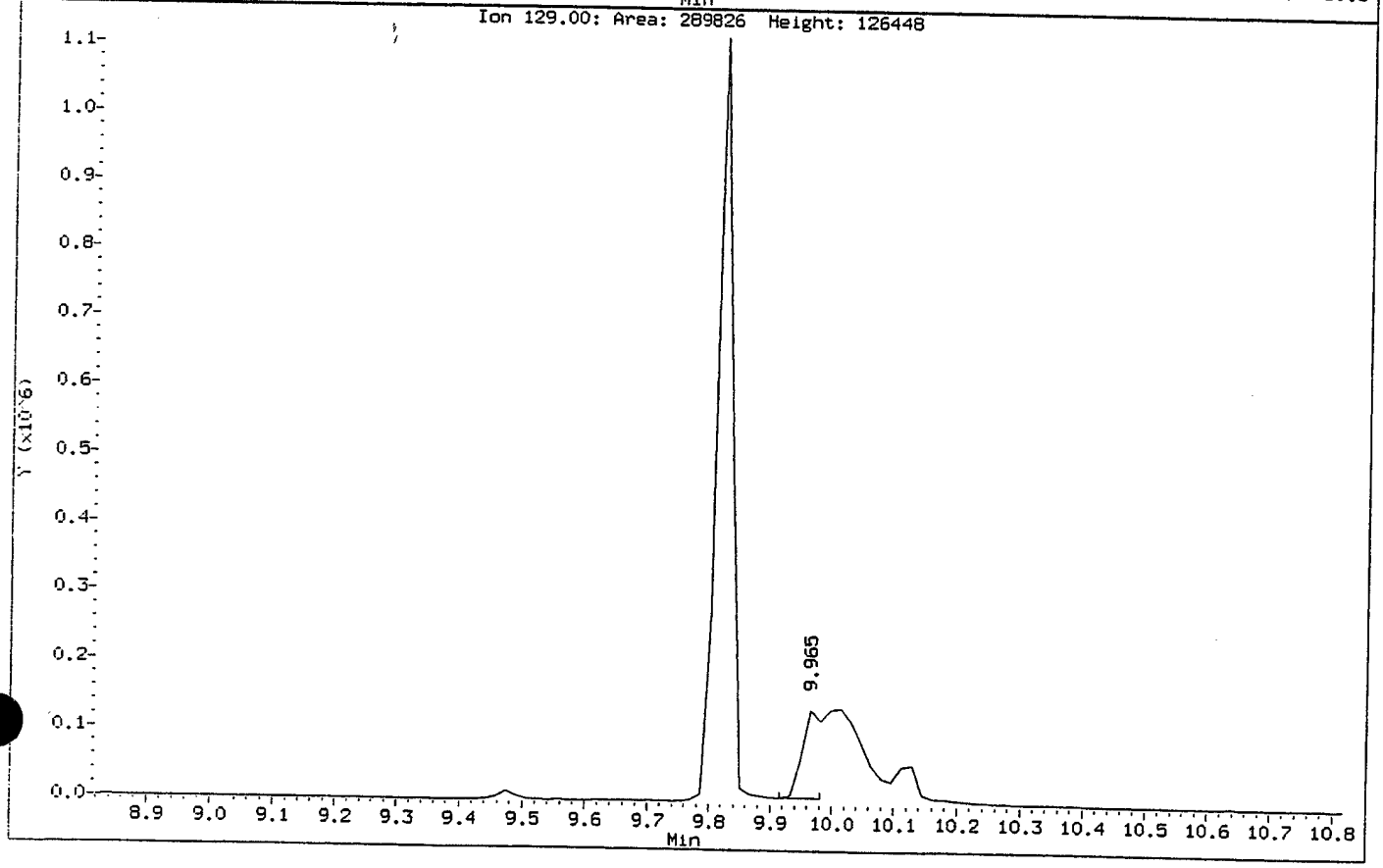




Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d
Injection Date: 15-JAN-1998 18:36
Instrument: msdh.i
Client Sample ID: Method Spike

Compound: 4-Chloroaniline
CAS Number: 106-47-8





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Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

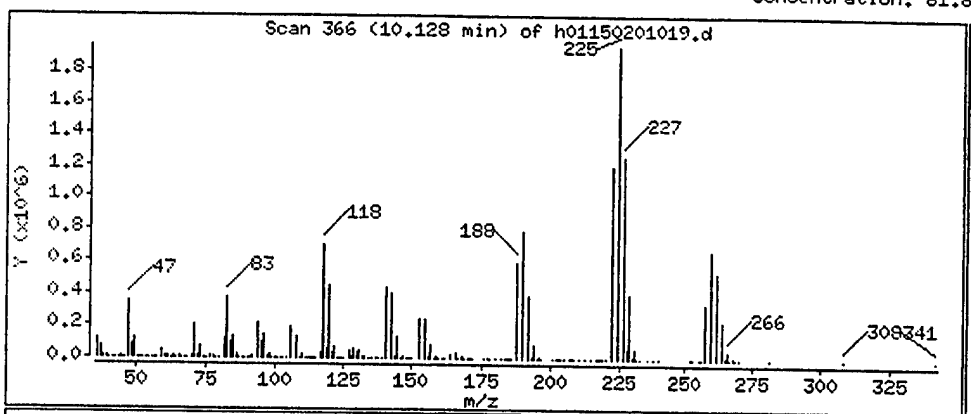
Operator: jgh

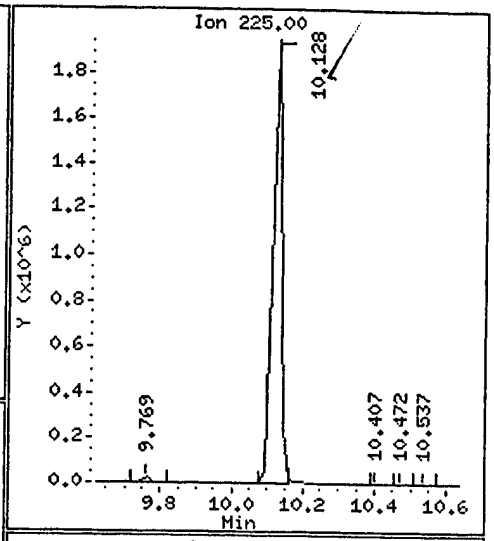
Column phase:

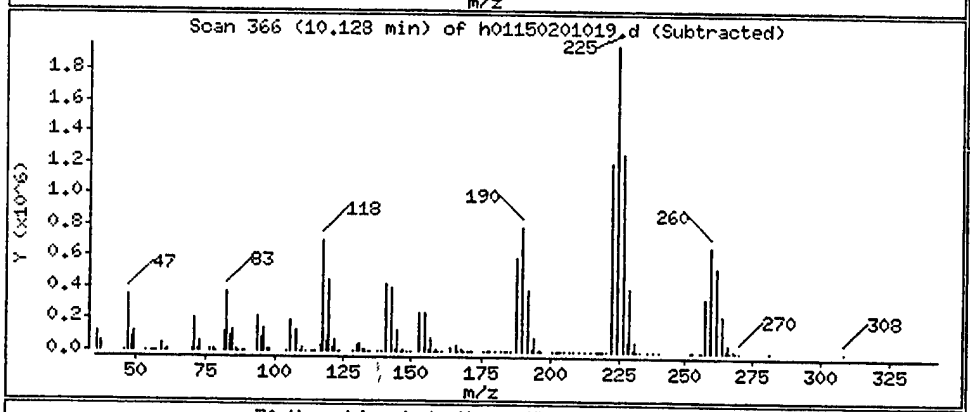
Column diameter: 2.00

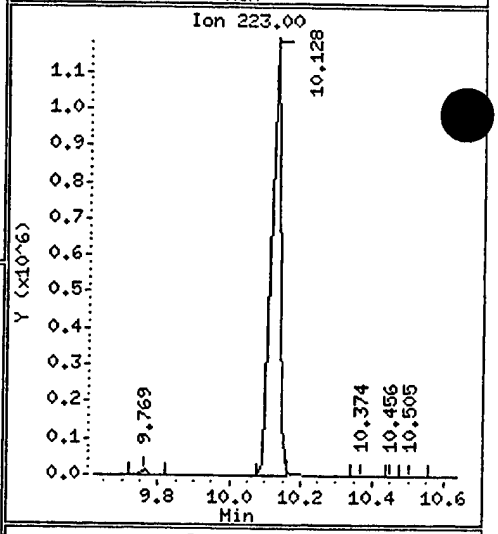
30 Hexachlorobutadiene

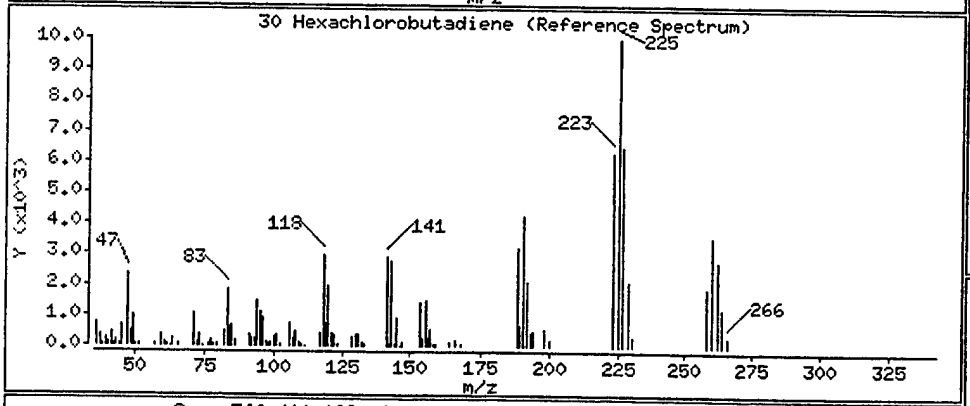
Concentration: 81.8 ug

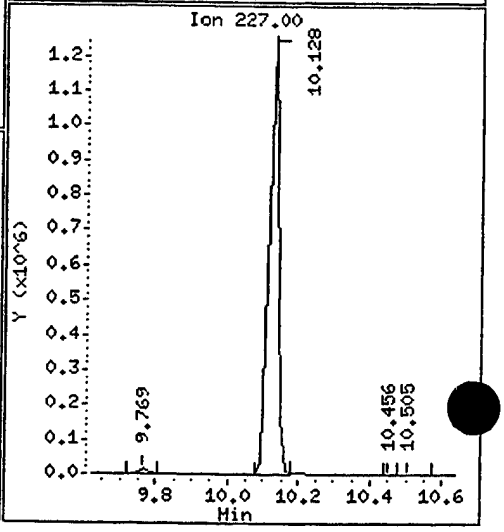


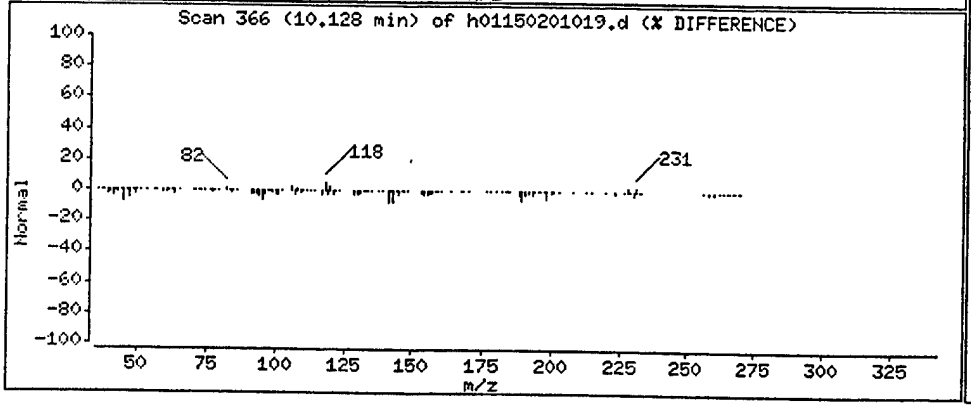












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

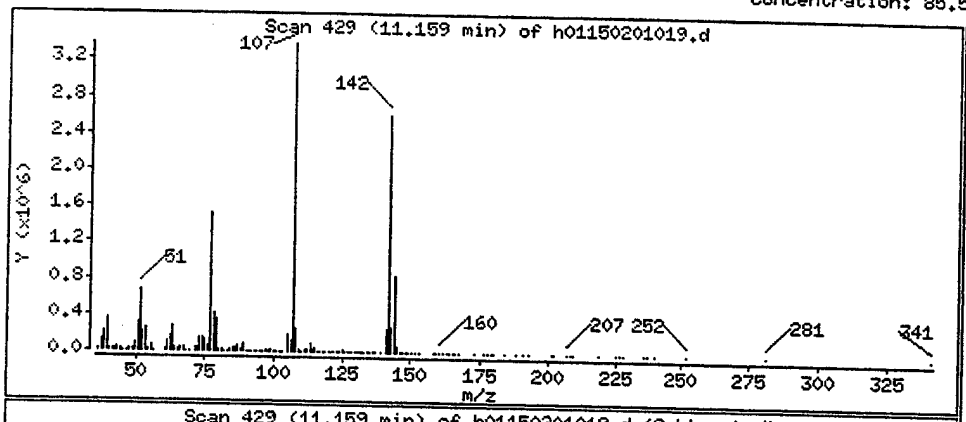
Operator: jgh

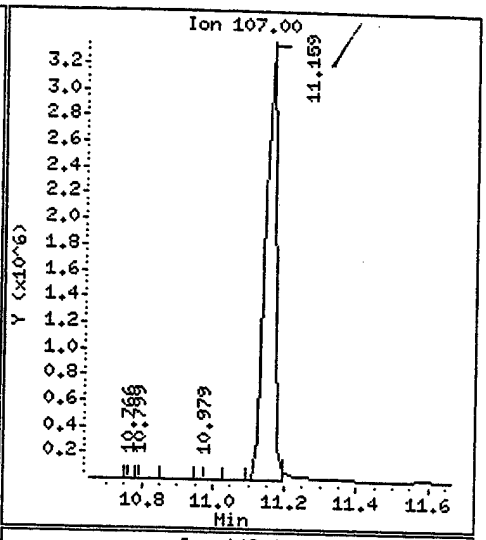
Column phase:

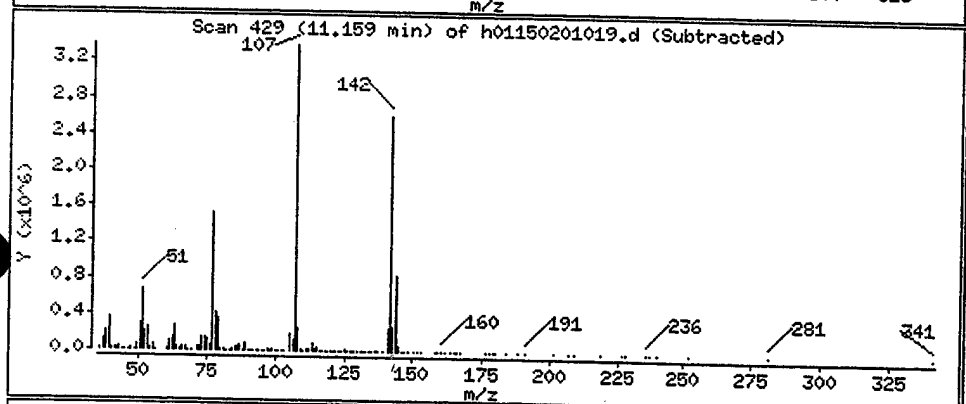
Column diameter: 2.00

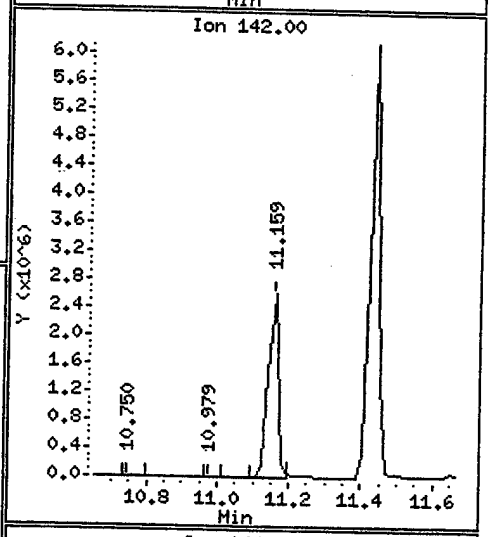
32 4-Chloro-3-Methylphenol

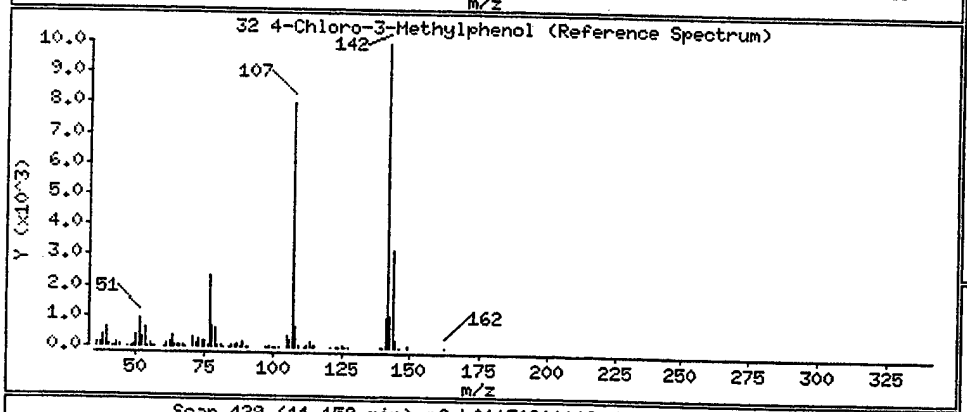
Concentration: 85.5 ug

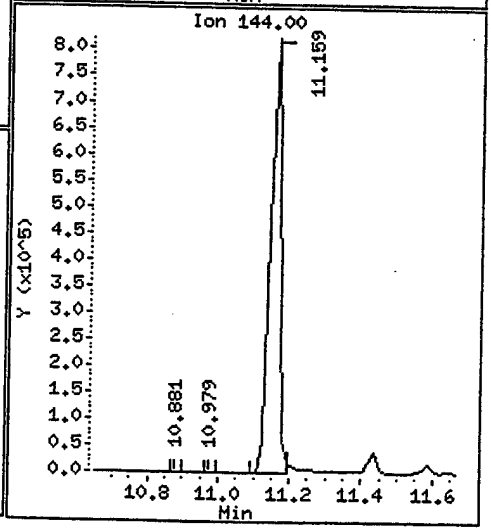


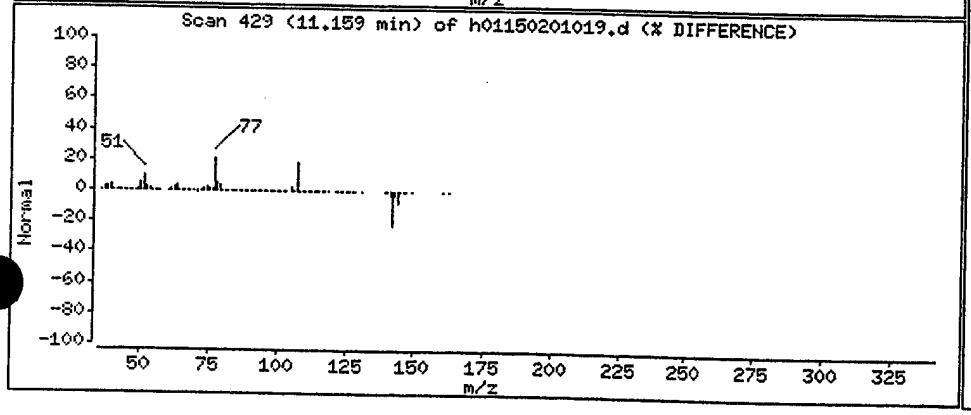












590

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

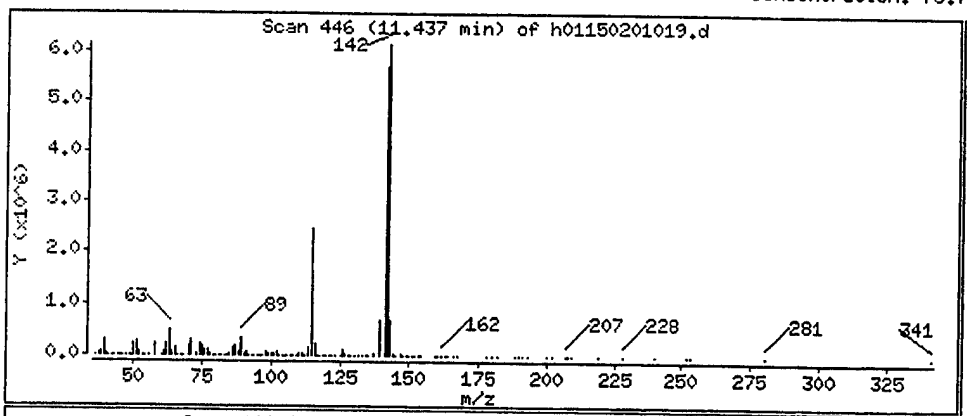
Operator: jgh

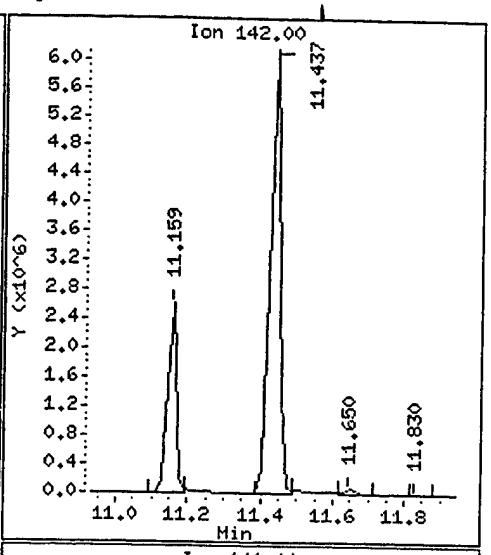
Column phase:

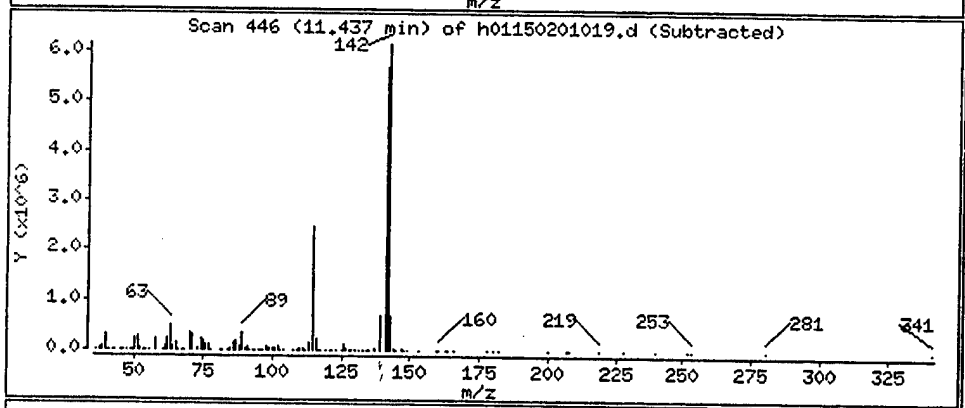
Column diameter: 2.00

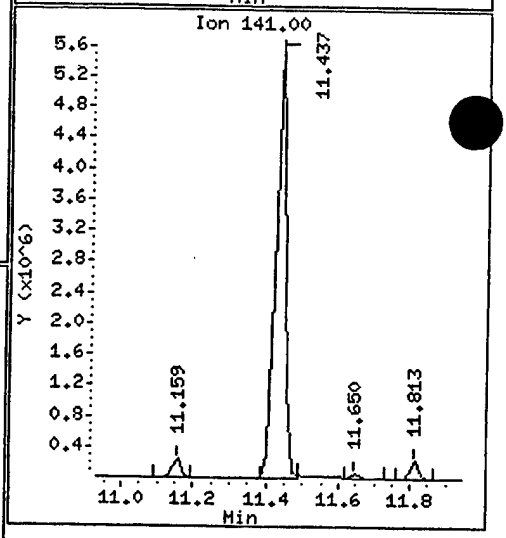
33 2-Methylnaphthalene

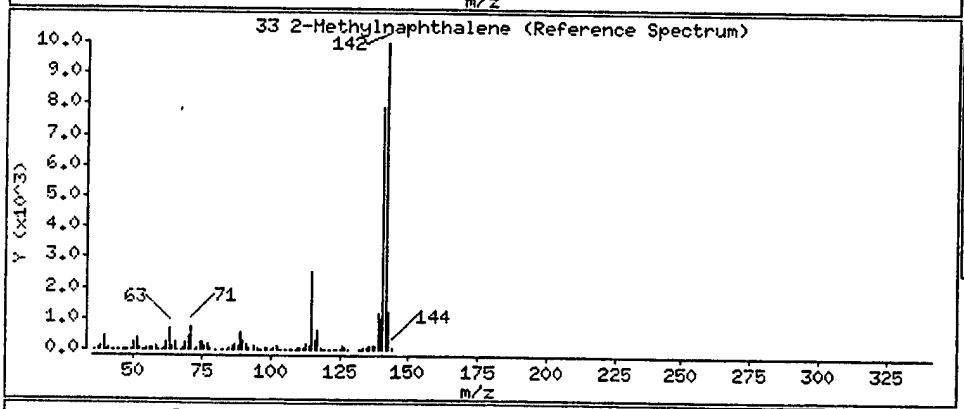
Concentration: 76.7 ug

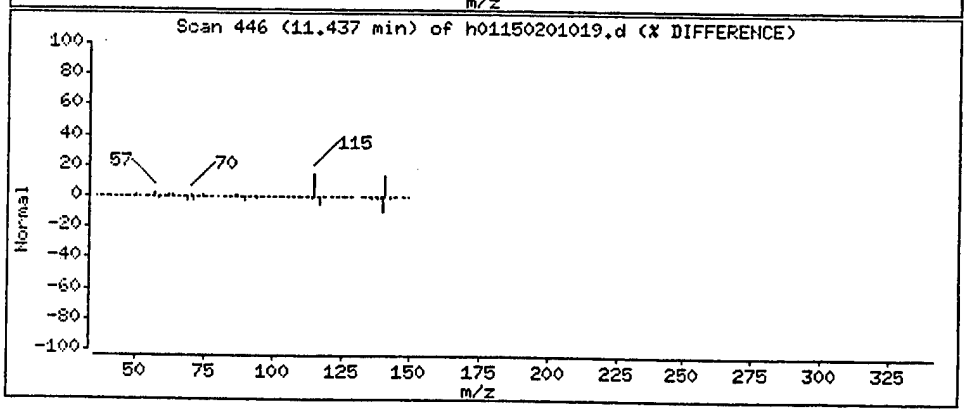












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

591

Volume Injected (uL): 1.0

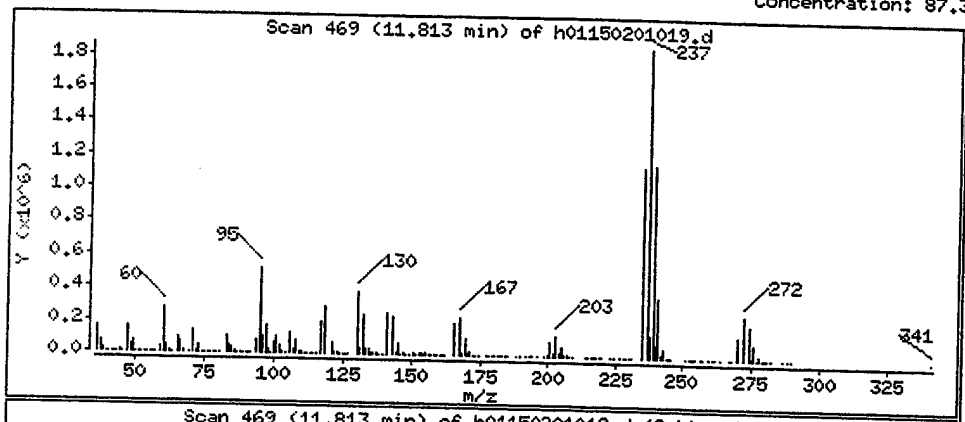
Operator: jgh

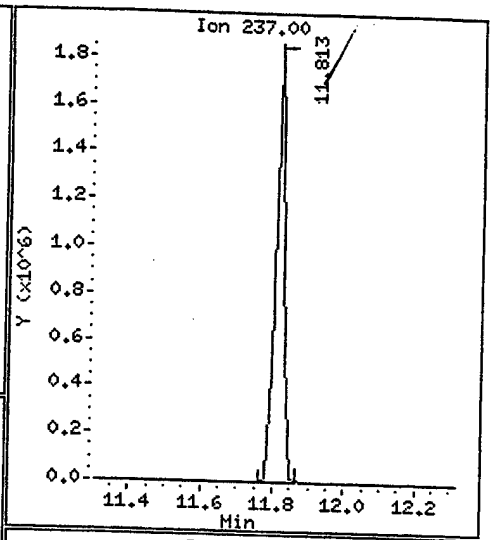
Column phase:

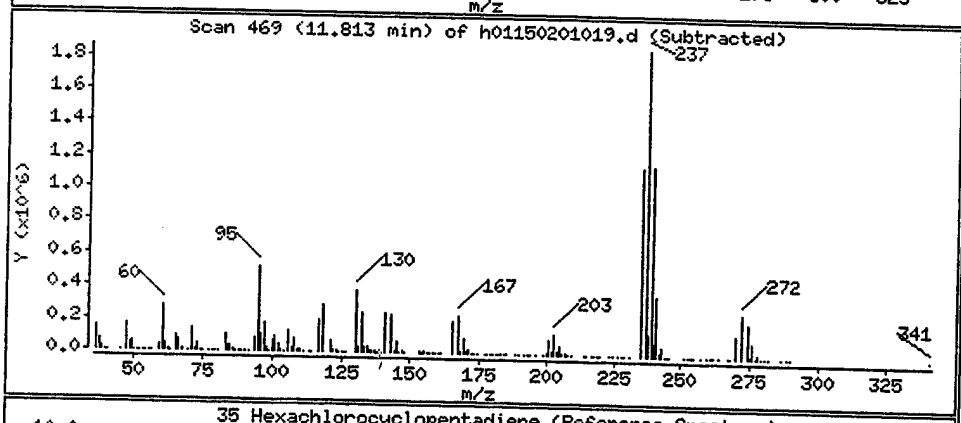
Column diameter: 2.00

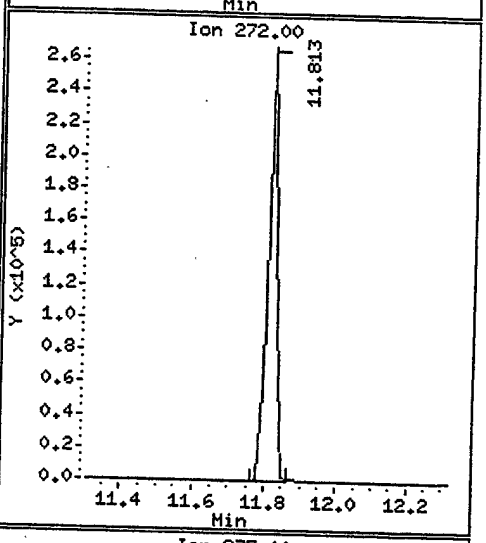
35 Hexachlorocyclopentadiene

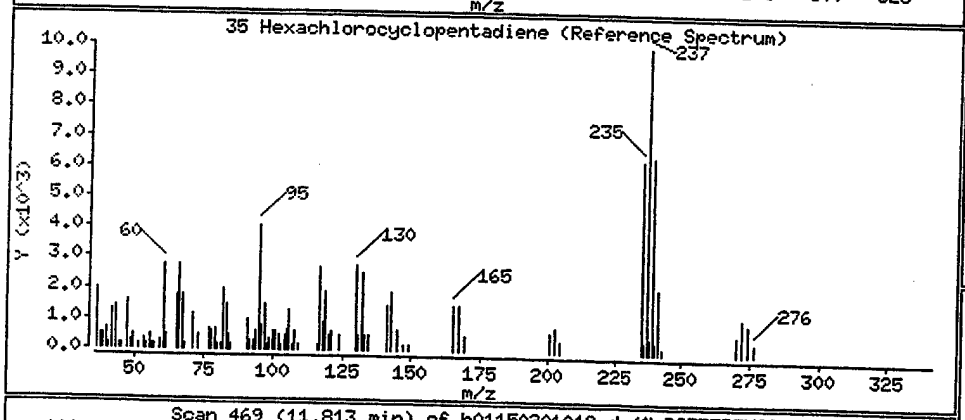
Concentration: 87.3 ug

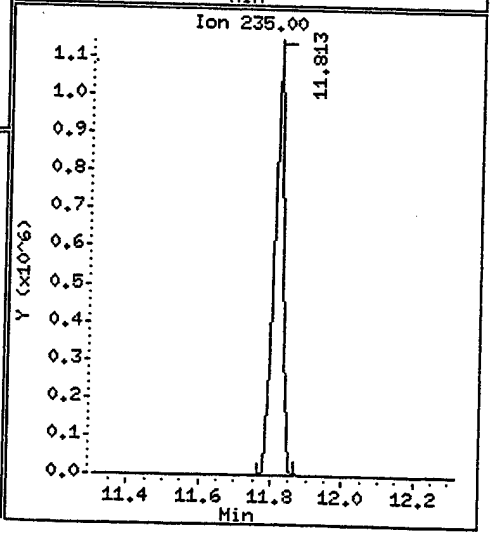


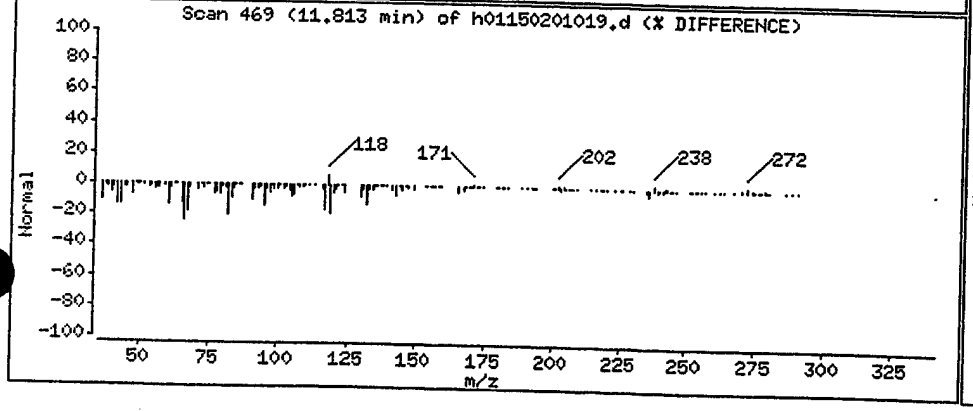












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

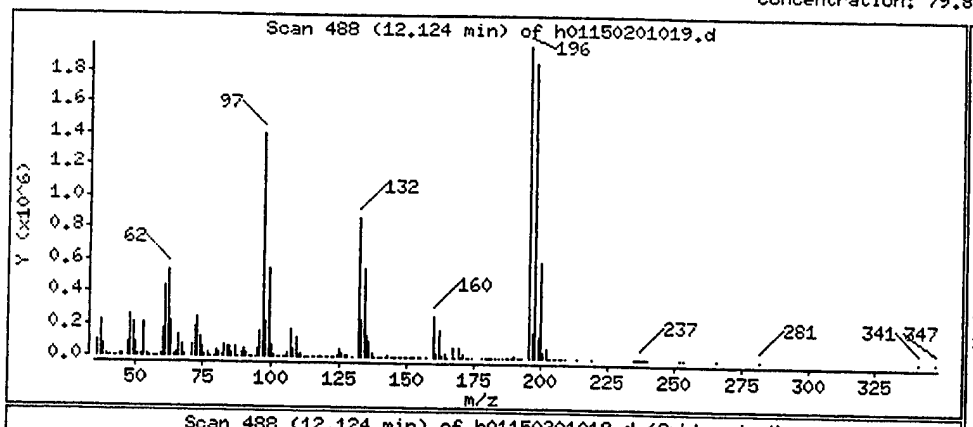
Operator: jgh

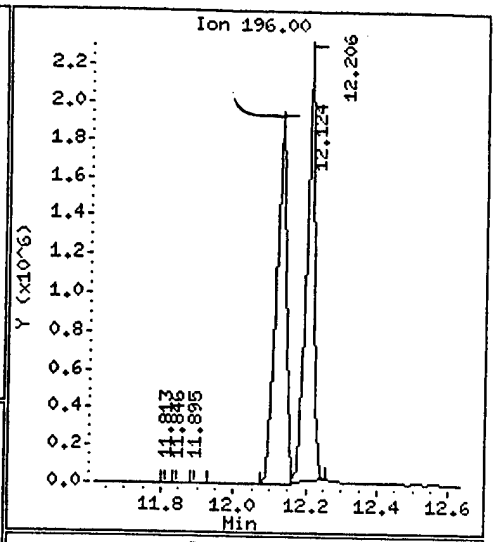
Column phase:

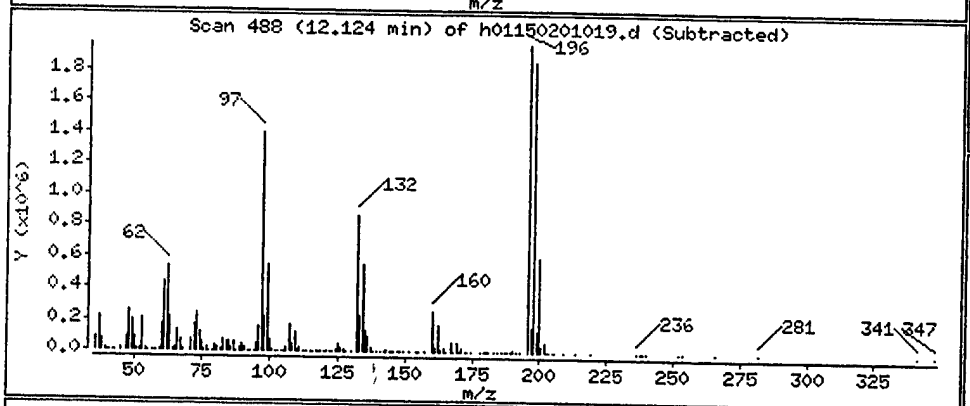
Column diameter: 2.00

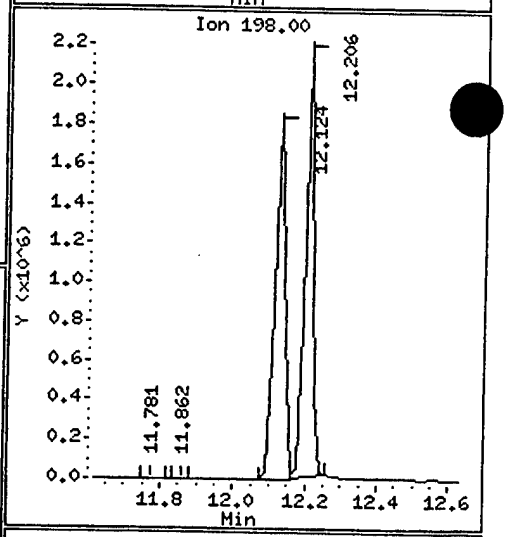
36 2,4,6-Trichlorophenol

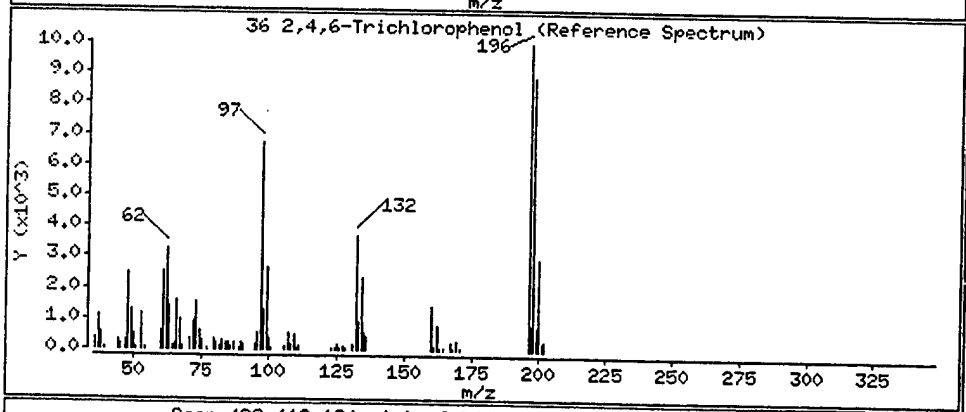
Concentration: 79.8 ug

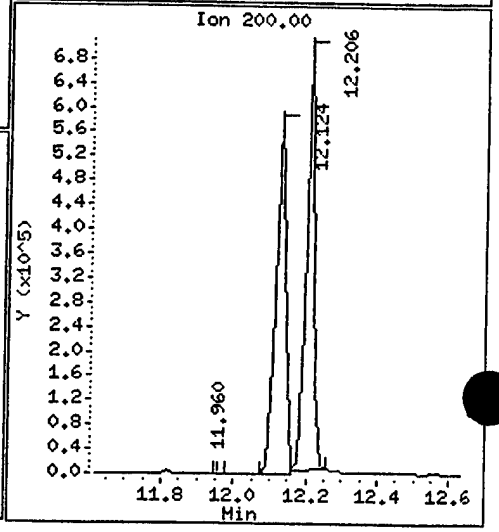


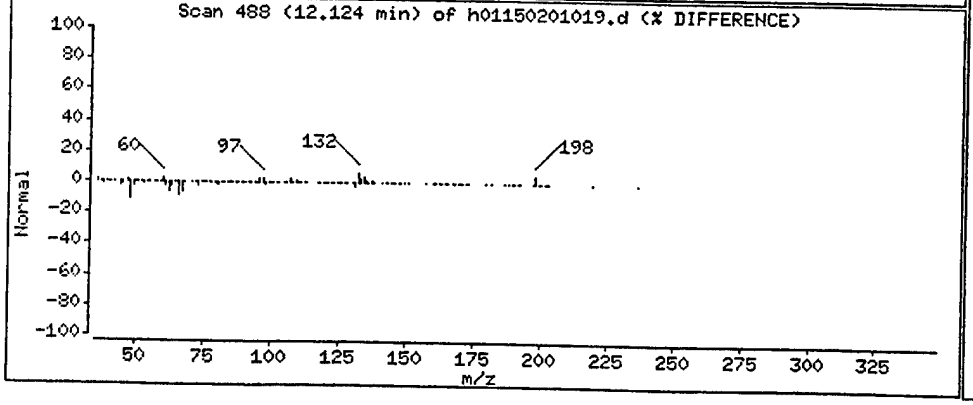












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

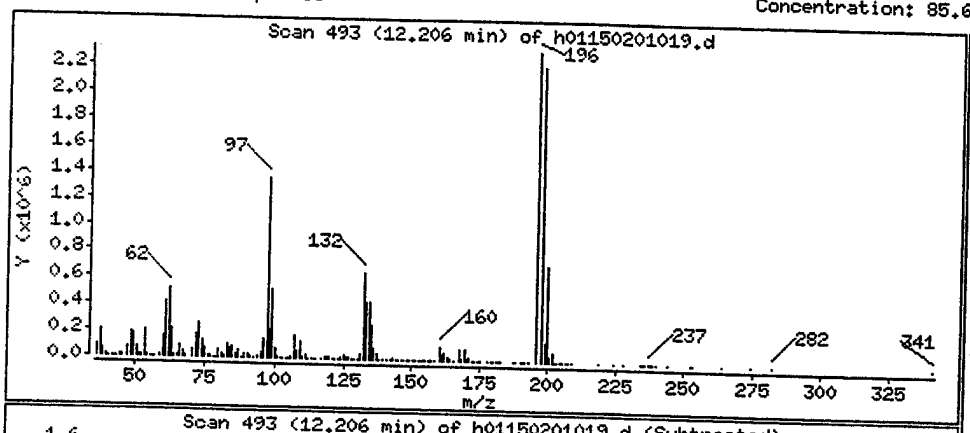
Operator: jgh

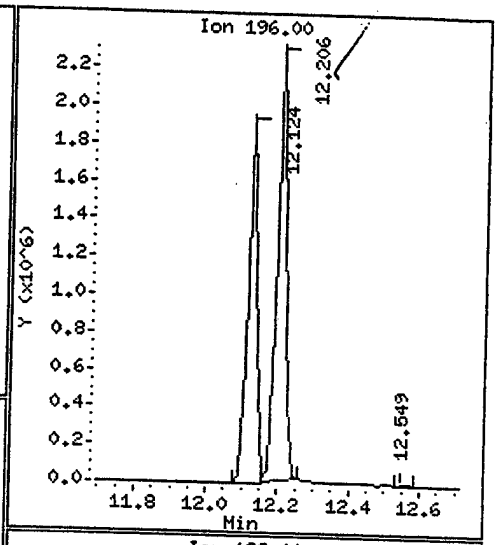
Column phase:

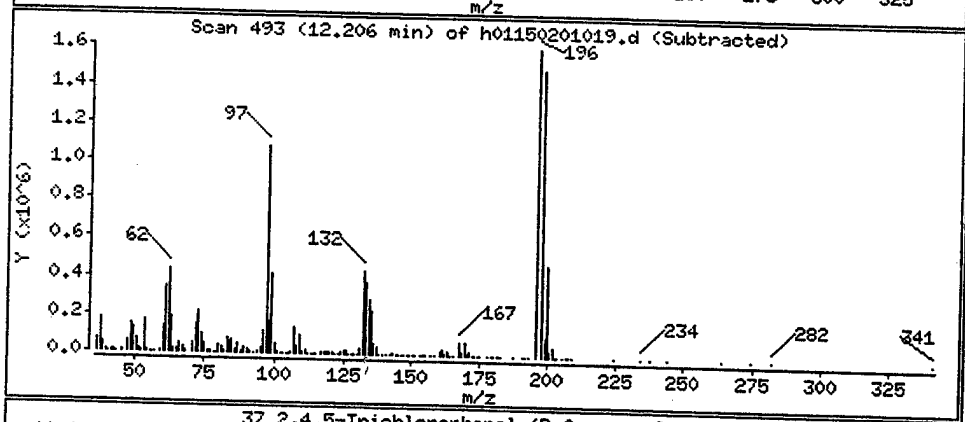
Column diameter: 2.00

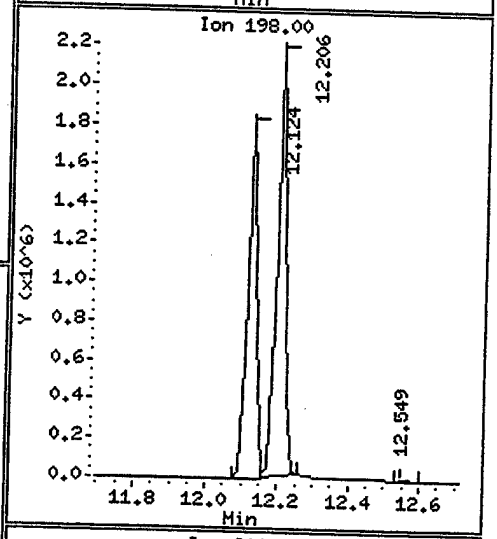
37 2,4,5-Trichlorophenol

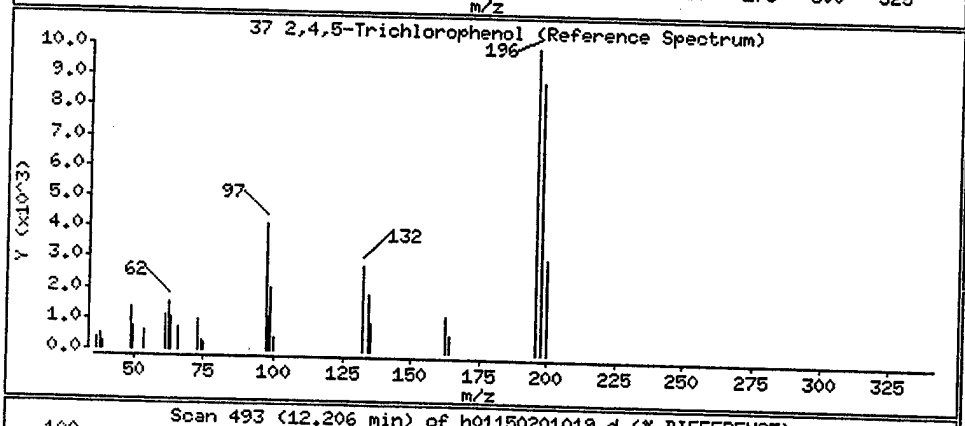
Concentration: 85.6 ug

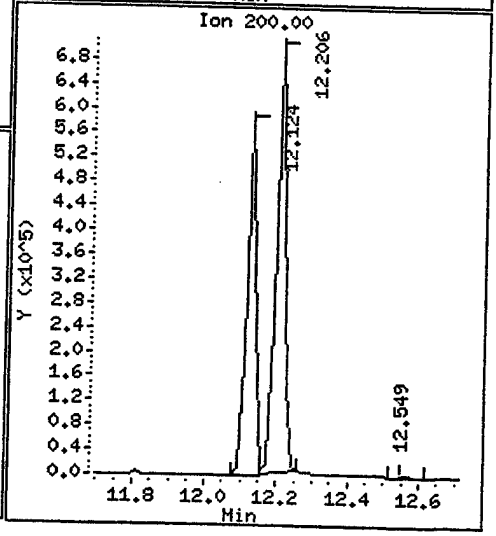


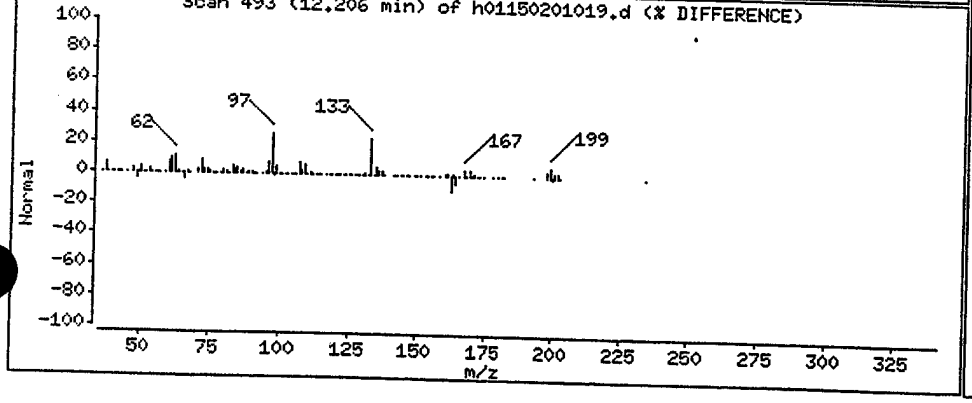












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

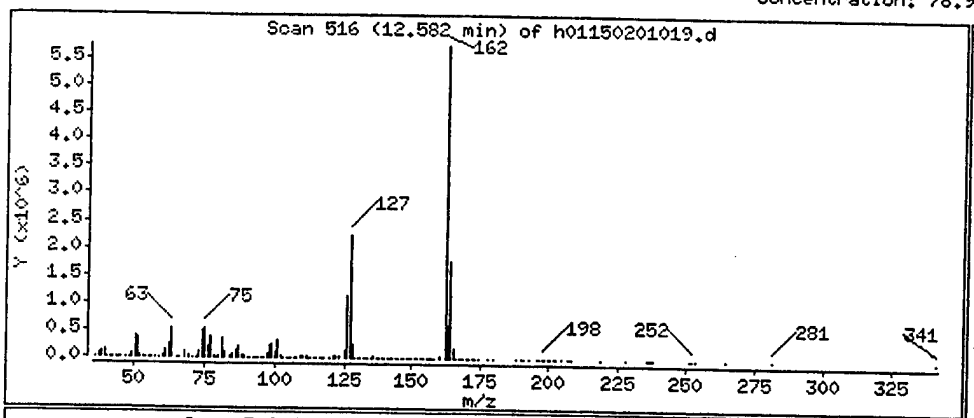
Operator: jgh

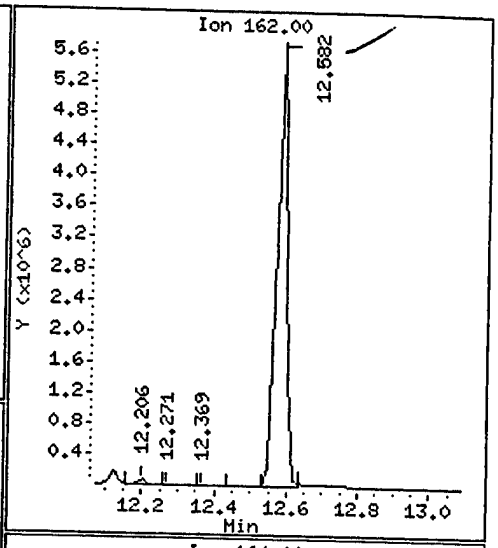
Column phase:

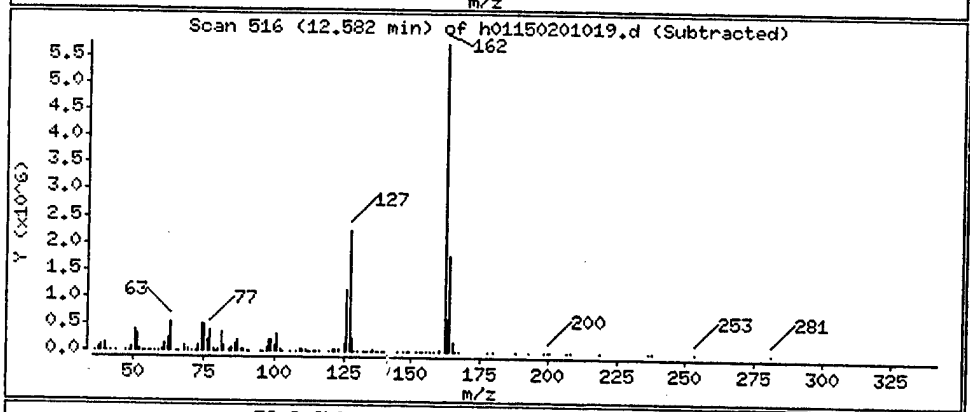
Column diameter: 2.00

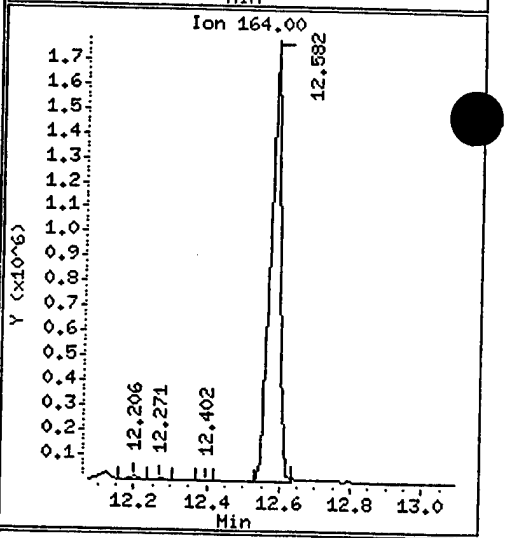
39 2-Chloronaphthalene

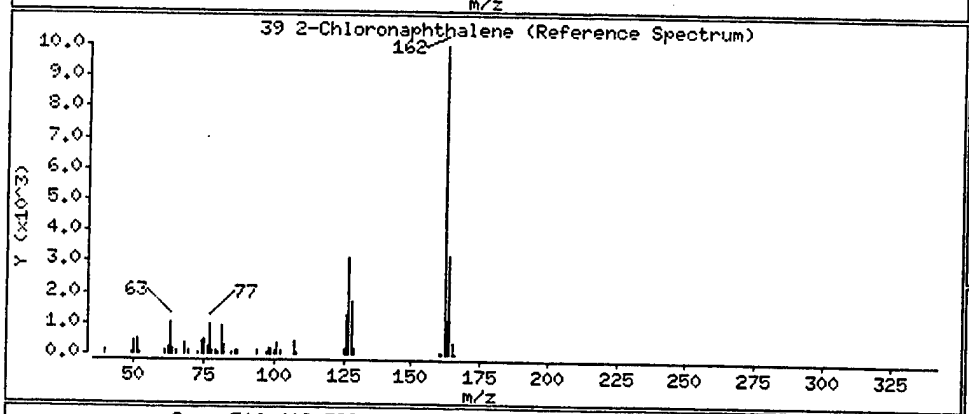
Concentration: 78.9 ug

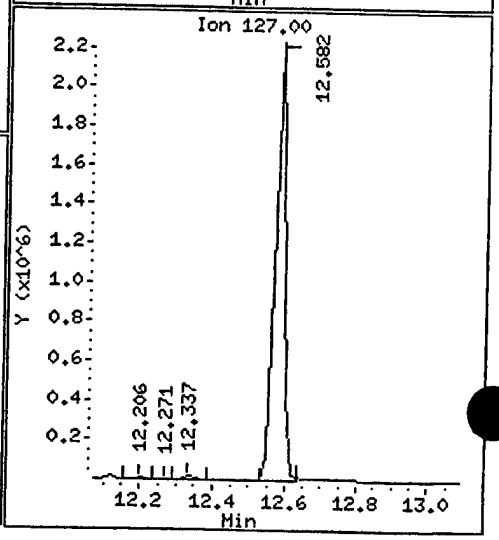


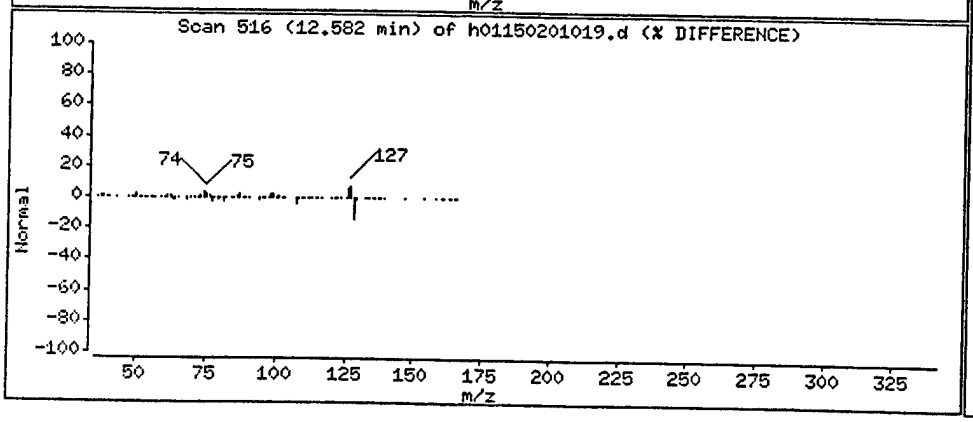












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

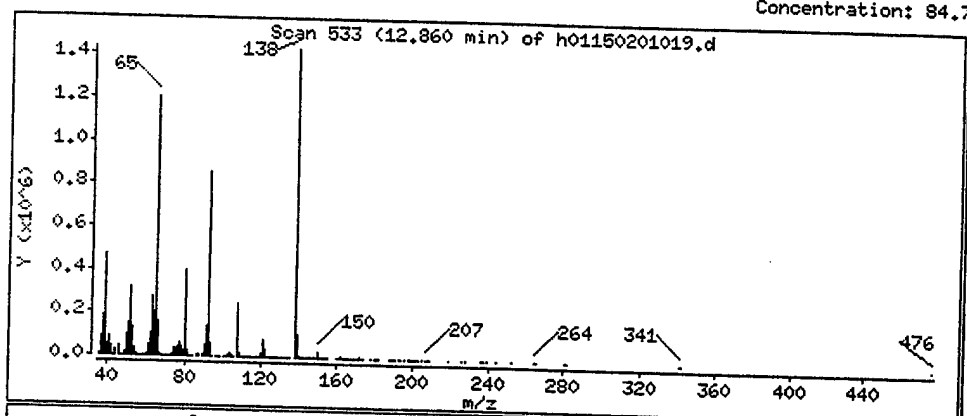
Operator: jgh

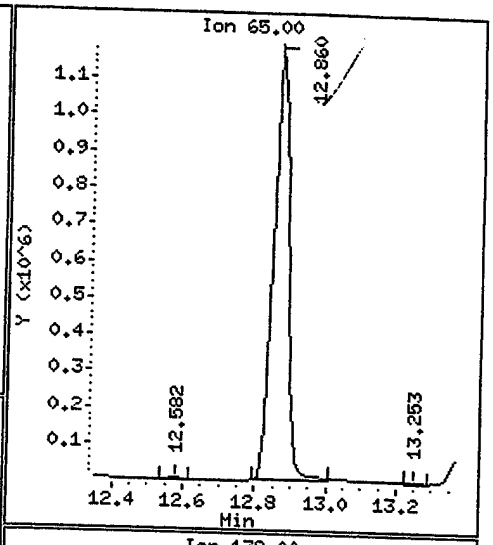
Column phase:

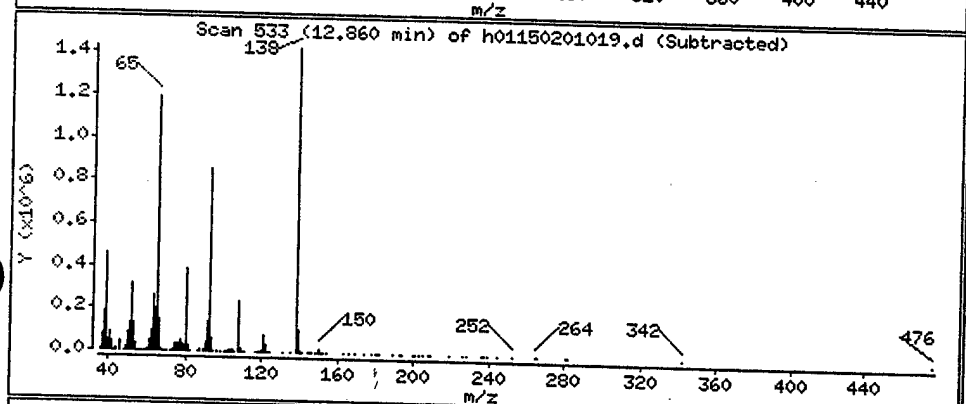
Column diameter: 2.00

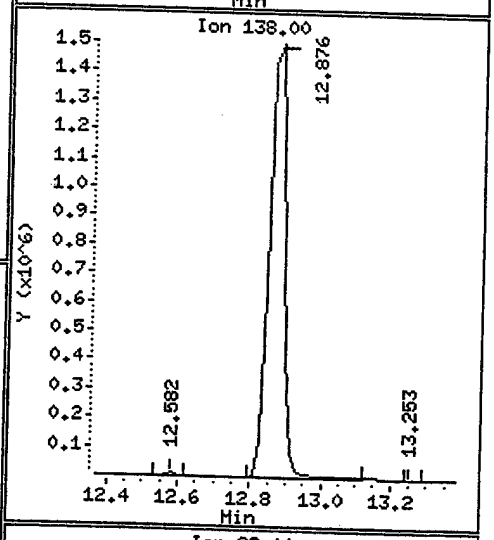
40 2-Nitroaniline

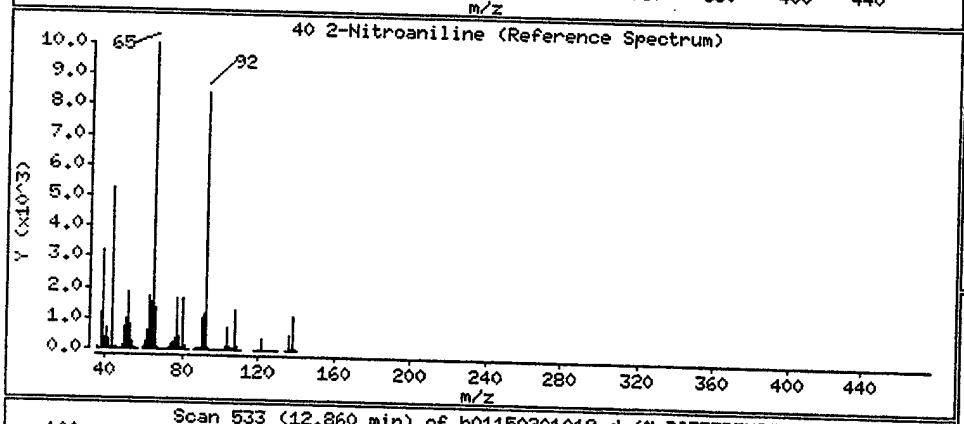
Concentration: 84.7 ug

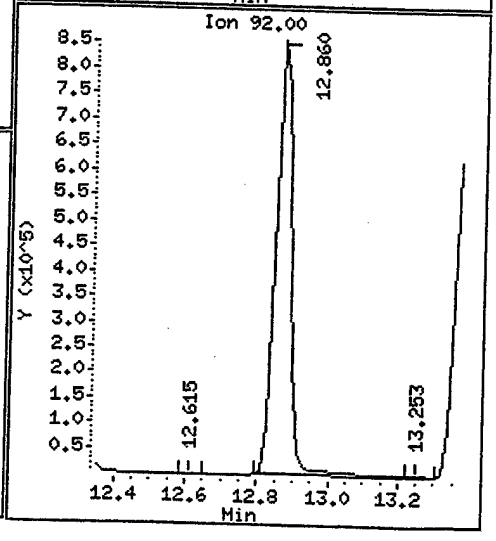


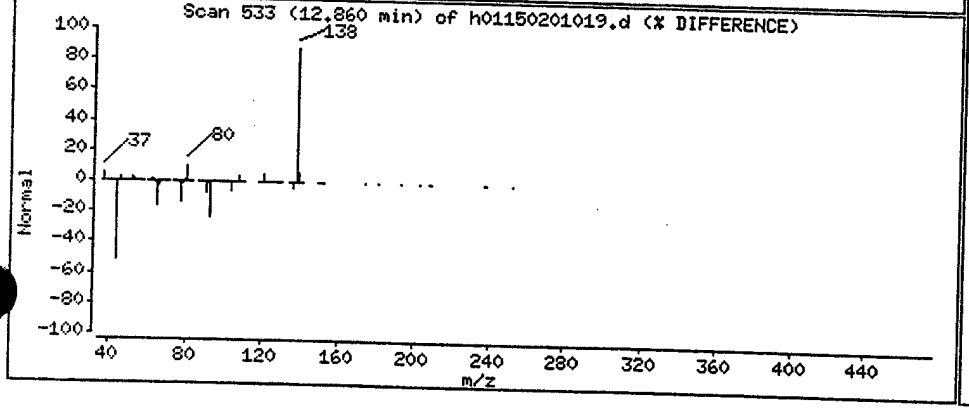












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

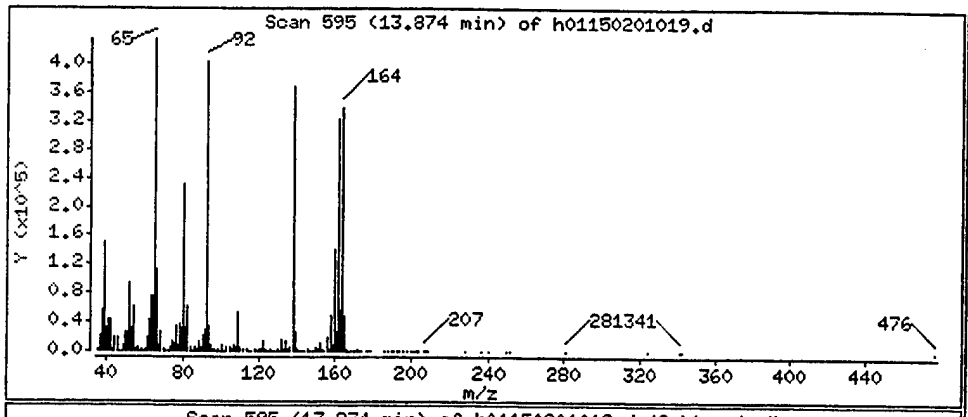
Operator: jgh

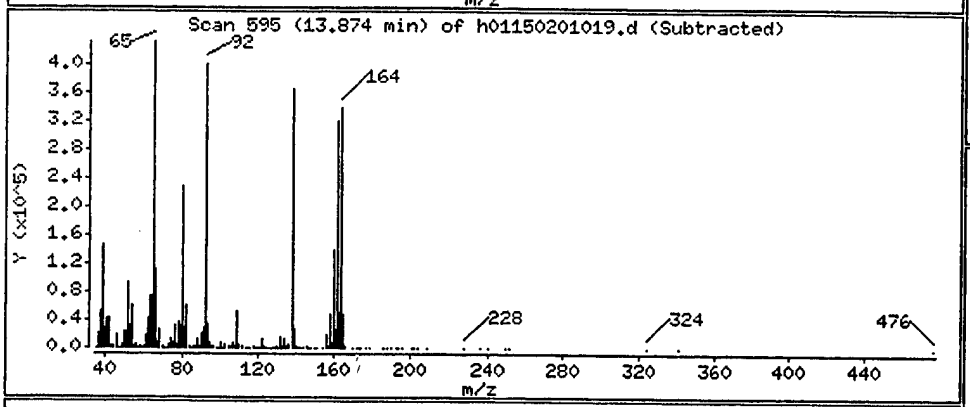
Column phase:

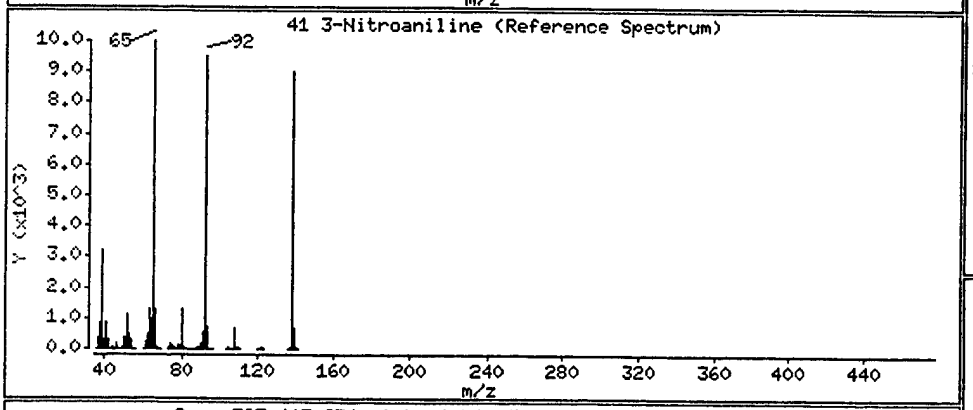
Column diameter: 2.00

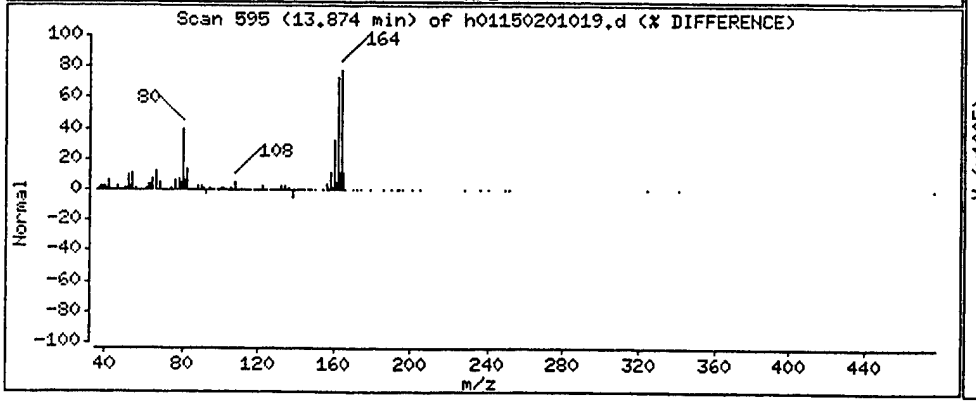
41 3-Nitroaniline

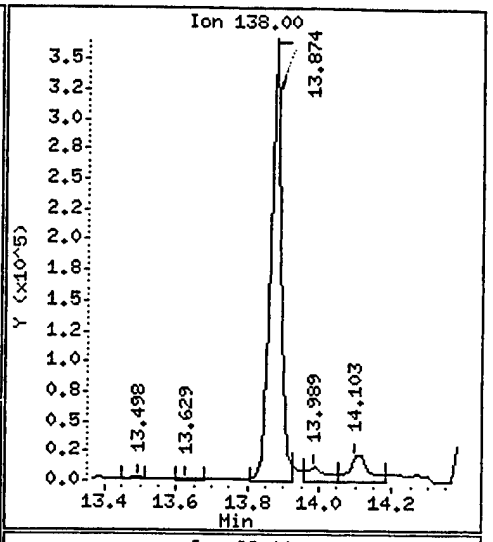
Concentration: 48.9 ug

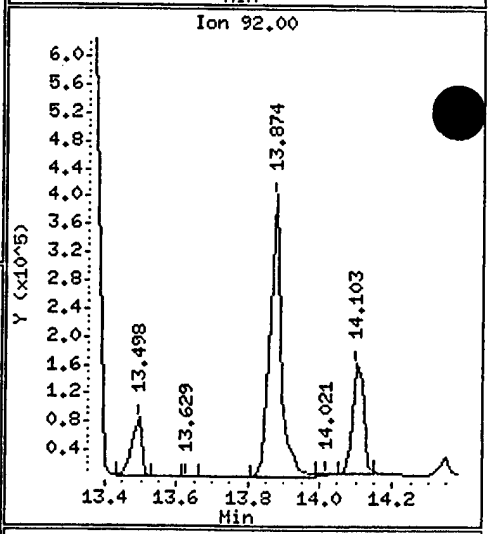


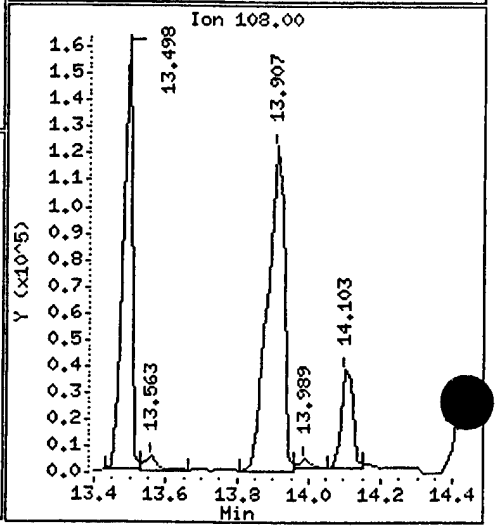












Data File: /chem/msdh.i/h-15Jan98.b/h0115020l019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

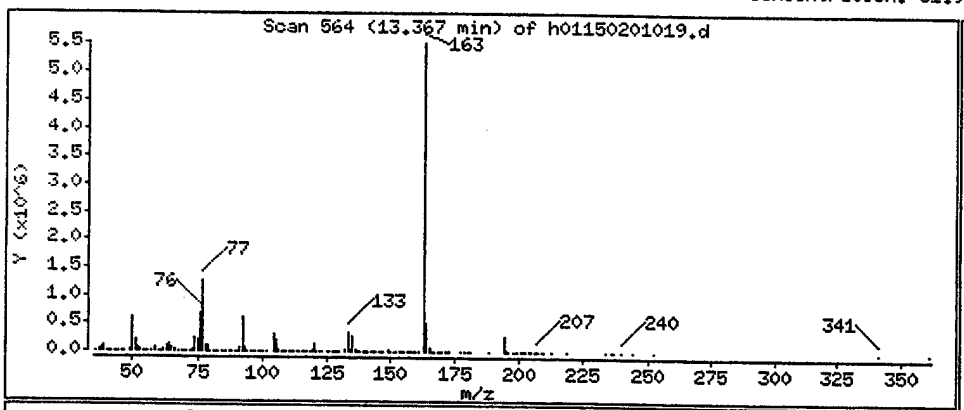
Operator: jgh

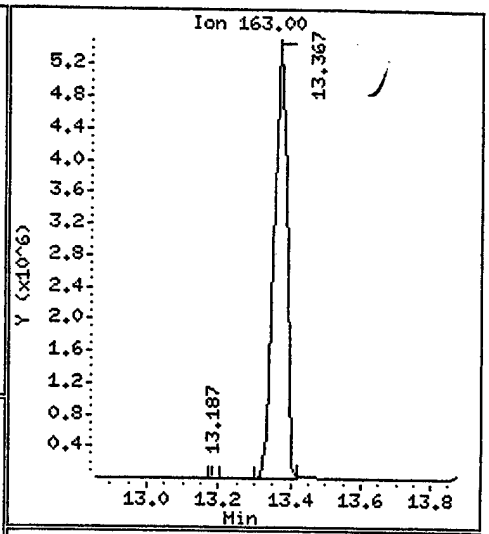
Column phase:

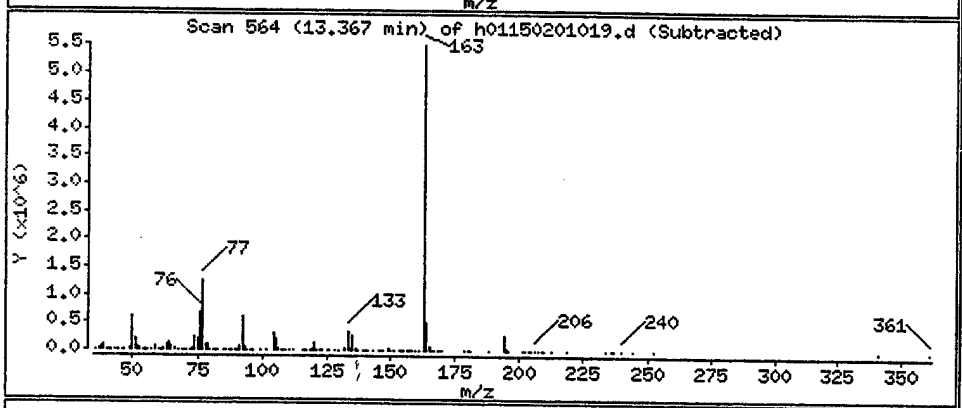
Column diameter: 2.00

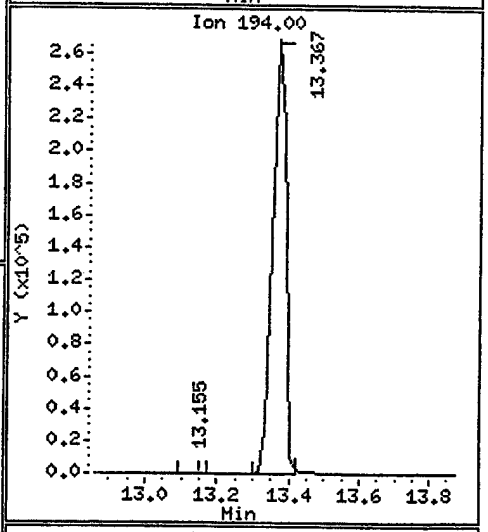
43 Dimethylphthalate

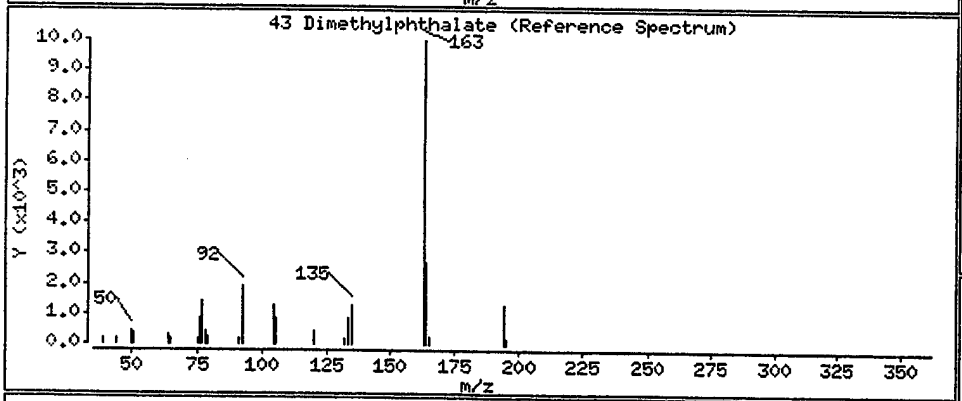
Concentration: 81.9 ug

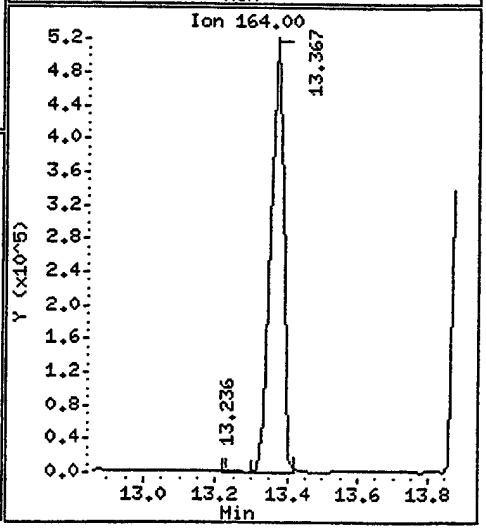


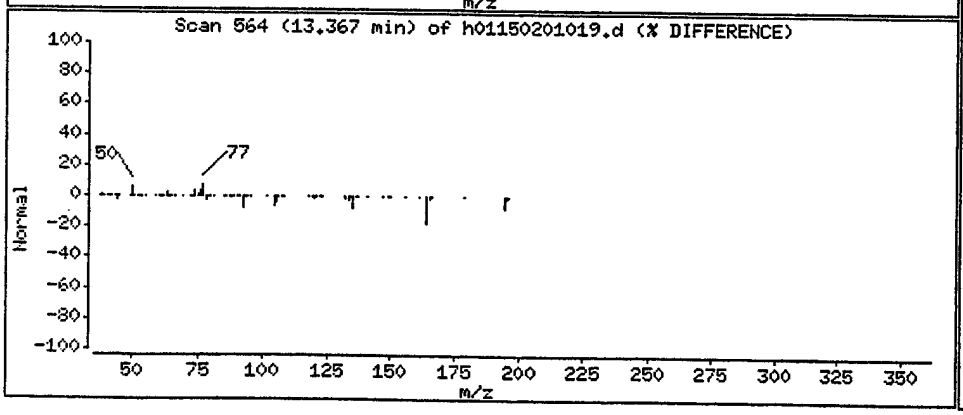












598

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

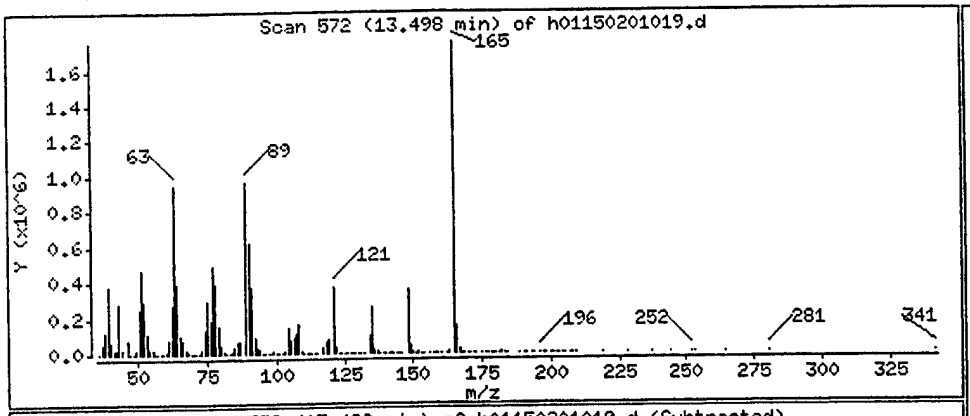
Operator: jgh

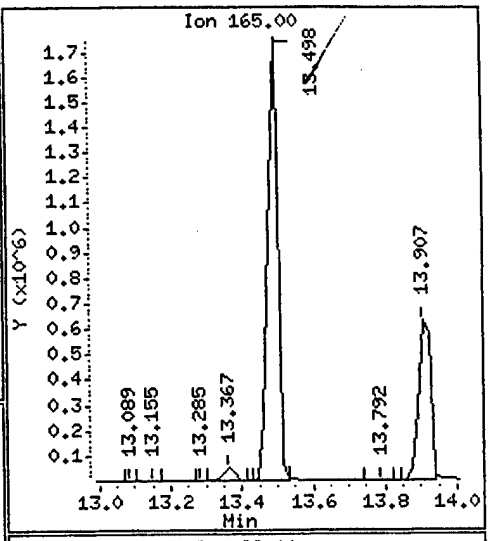
Column phase:

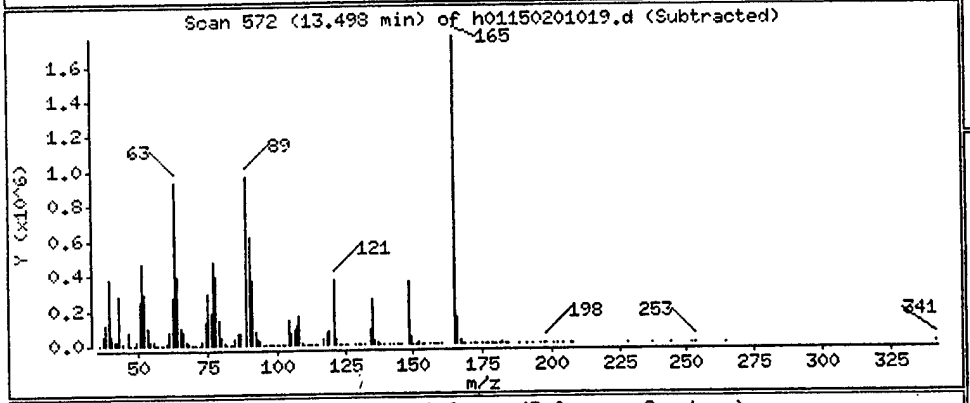
Column diameter: 2.00

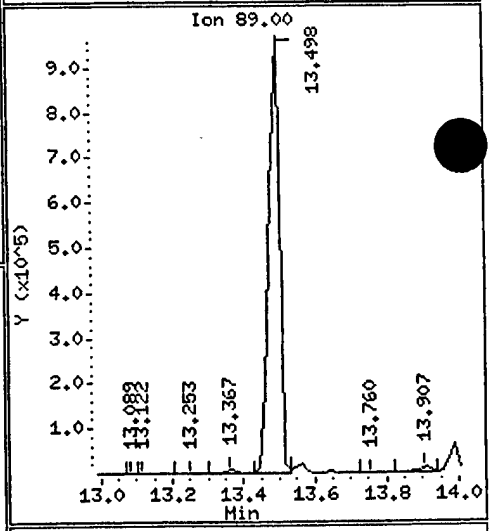
45 2,6-Dinitrotoluene

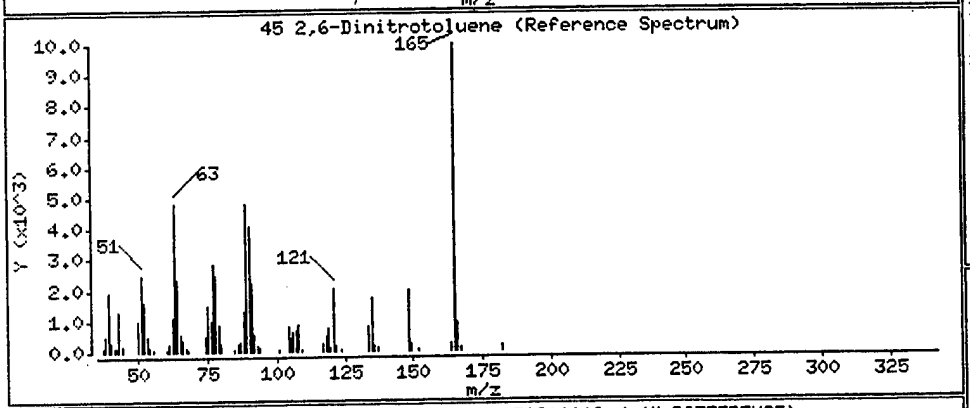
Concentration: 90.0 ug

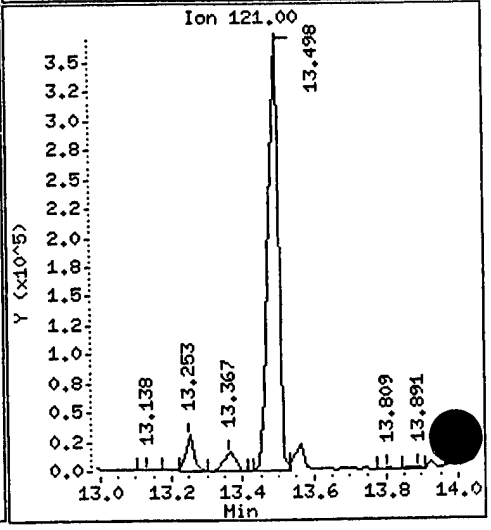


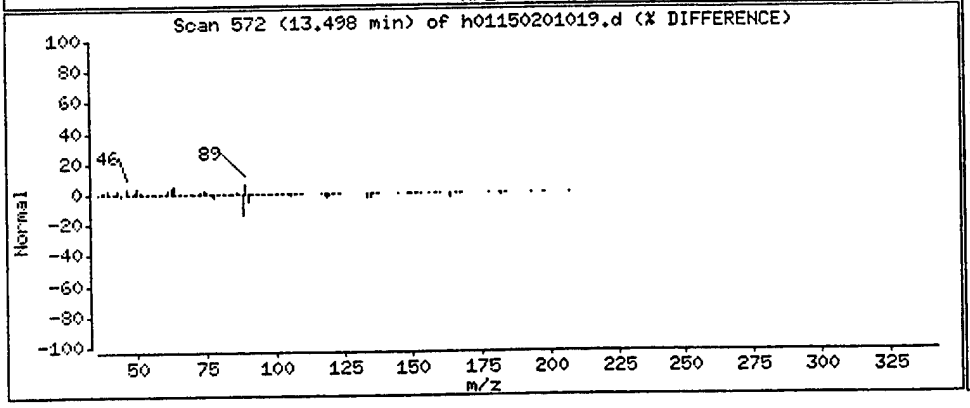












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

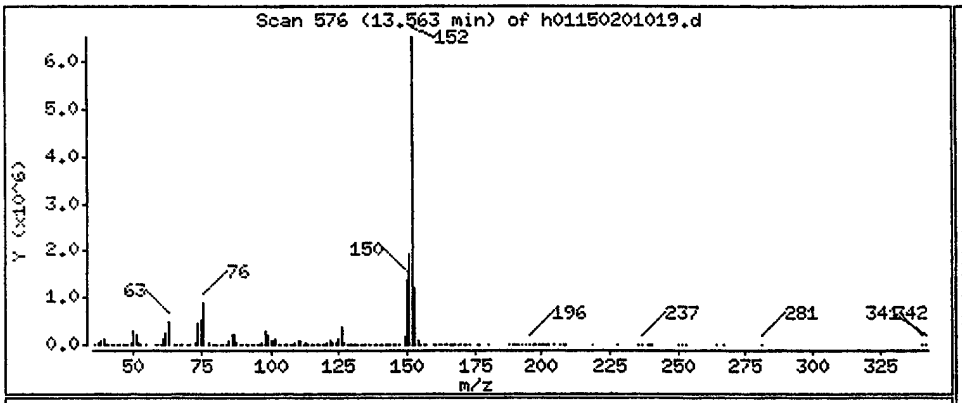
Operator: jgh

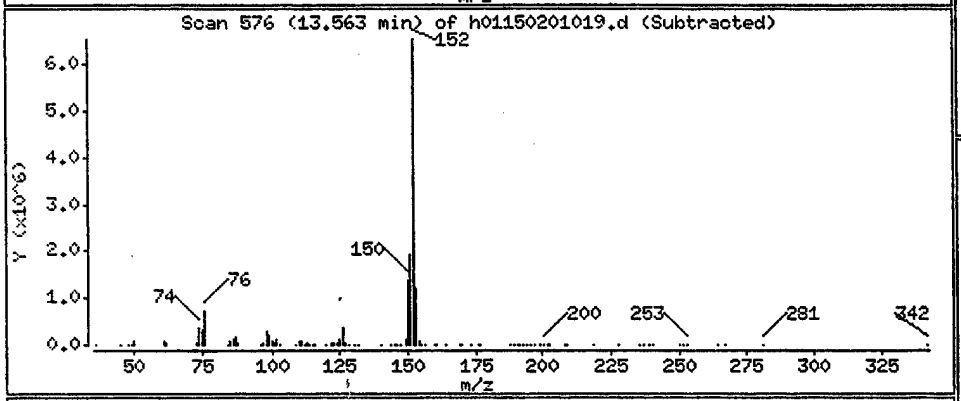
Column phase:

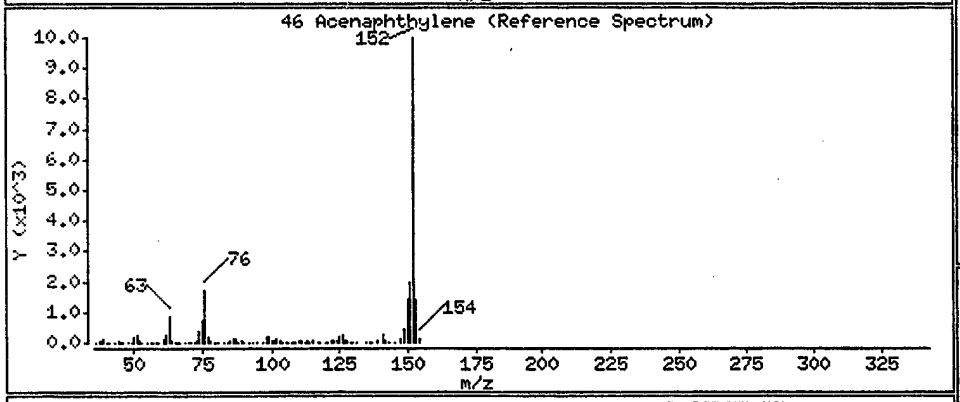
Column diameter: 2.00

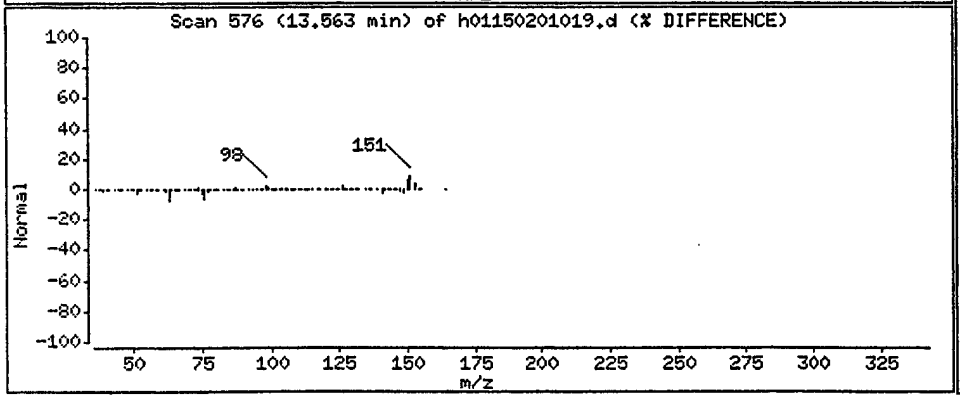
46 Acenaphthylene

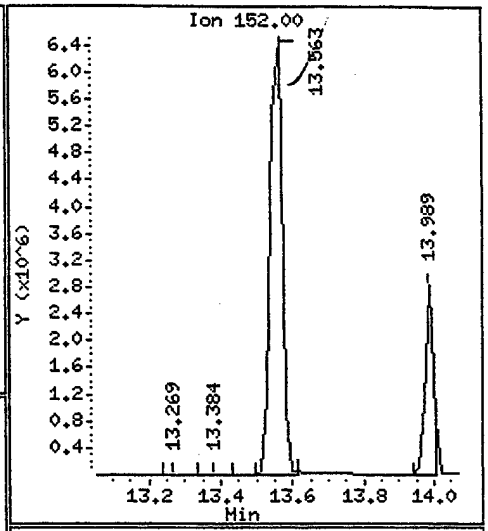
Concentration: 72.8 ug

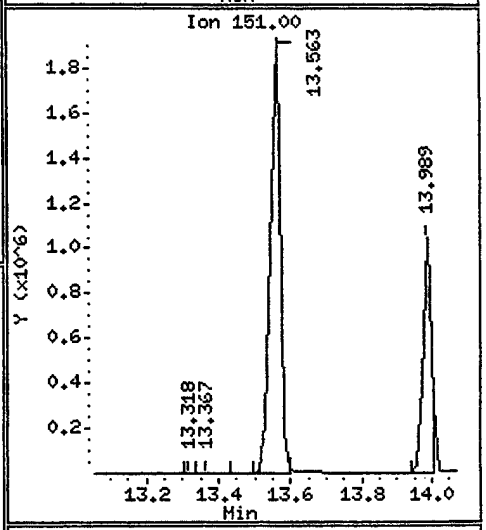


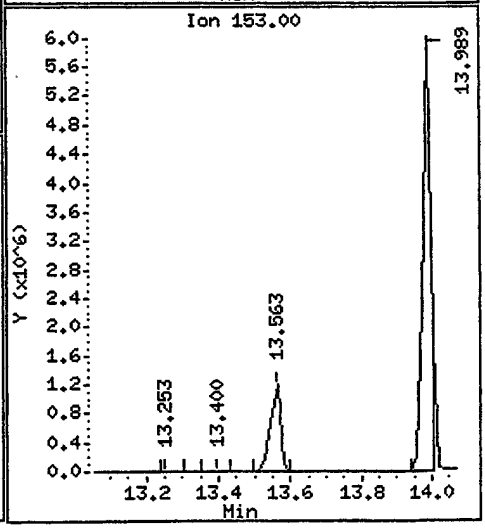












Data File: /chem/msdh.i/h-15Jan98.b/h0115020l019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

Operator: jgh

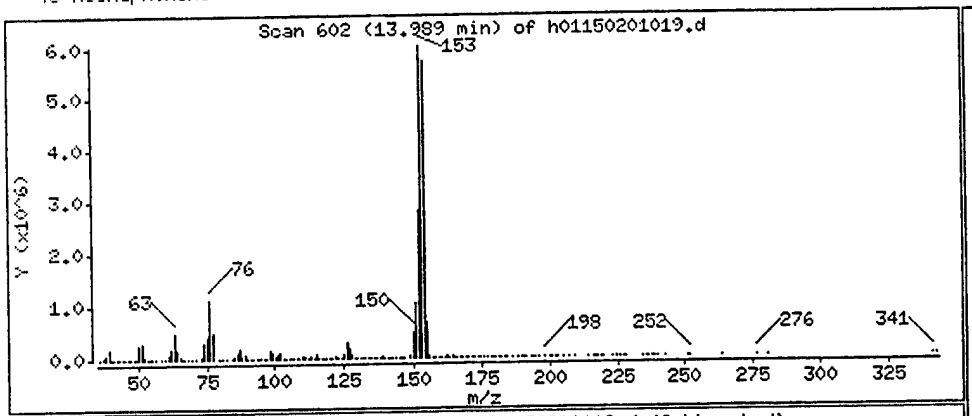
Column phase:

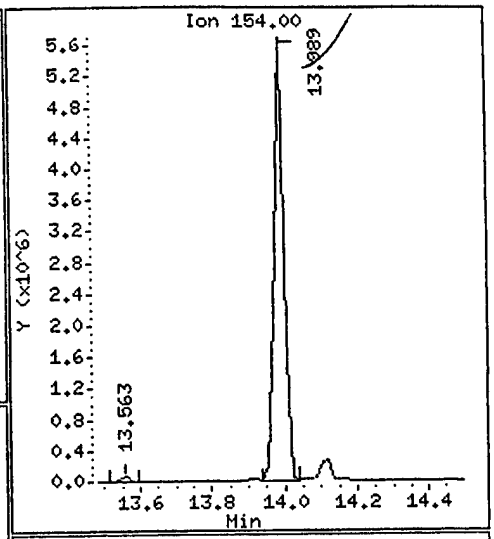
Column diameter: 2.00

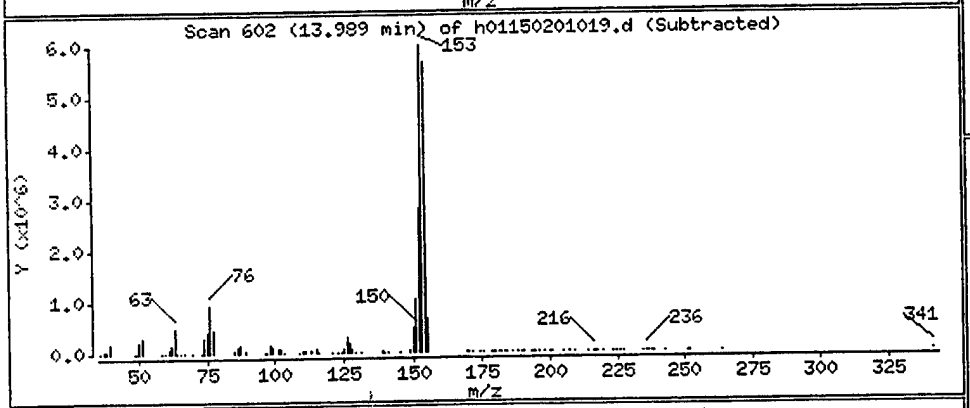
Concentration: 79.7 ug

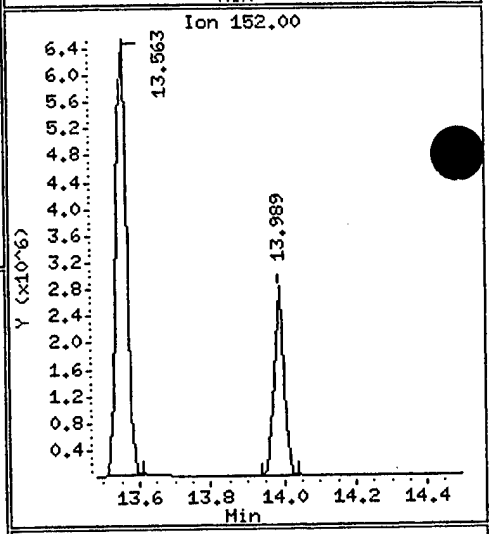
48 Acenaphthene

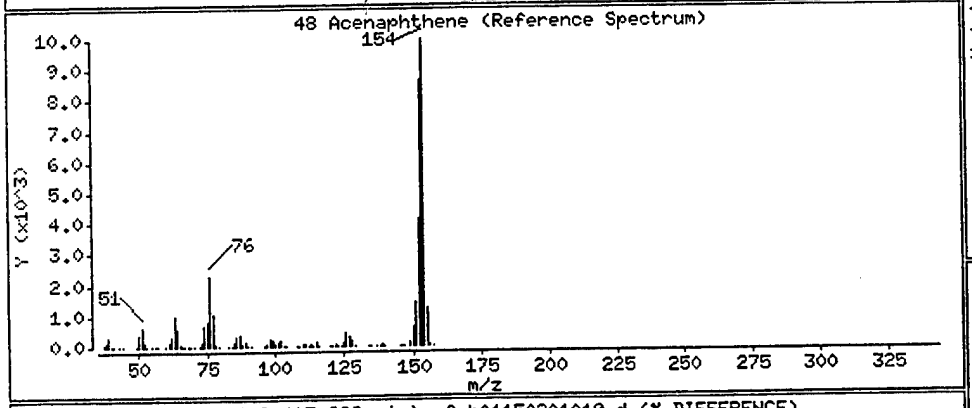
600

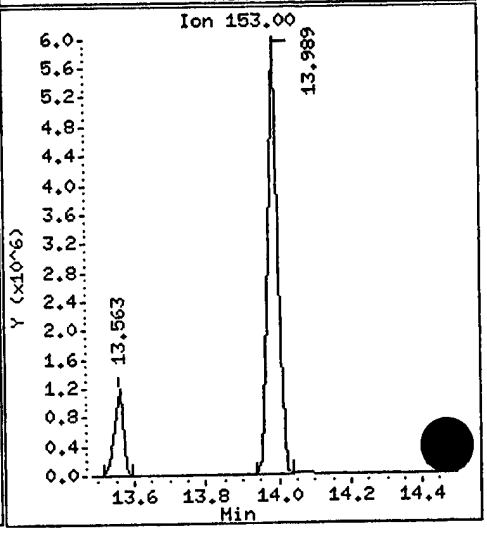


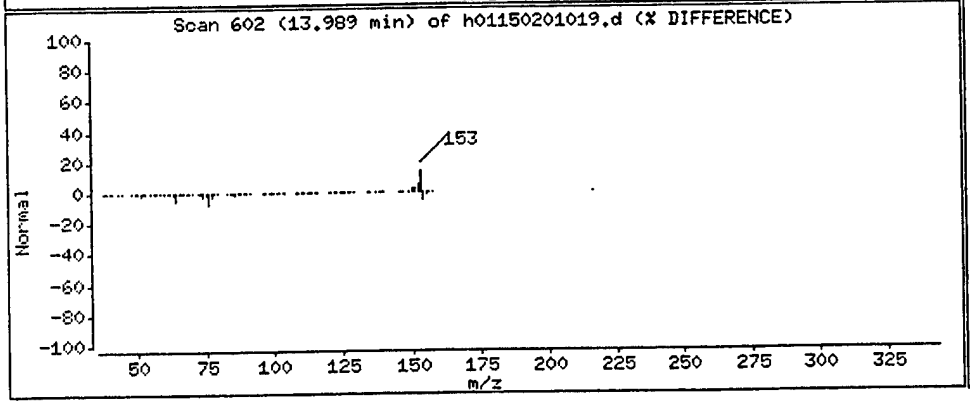












601

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

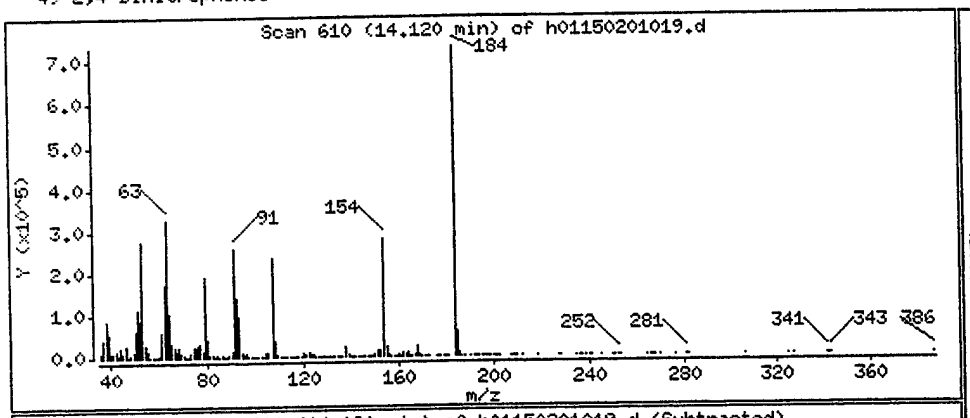
Operator: jgh

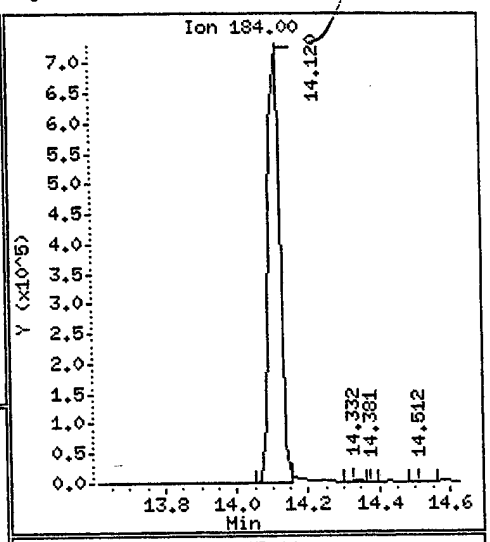
Column phase:

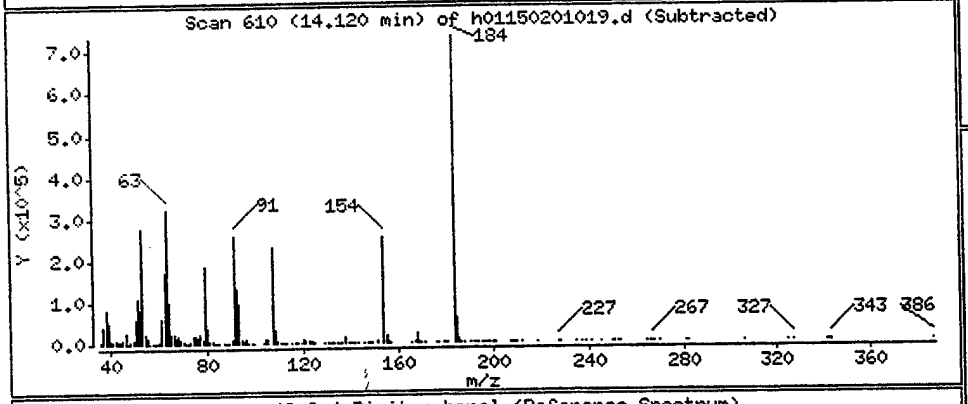
Column diameter: 2.00

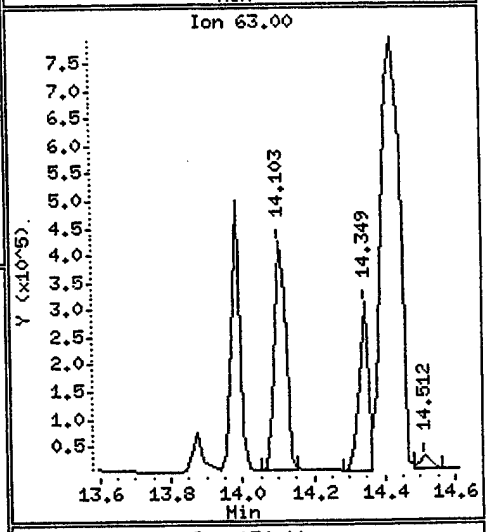
49 2,4-Dinitrophenol

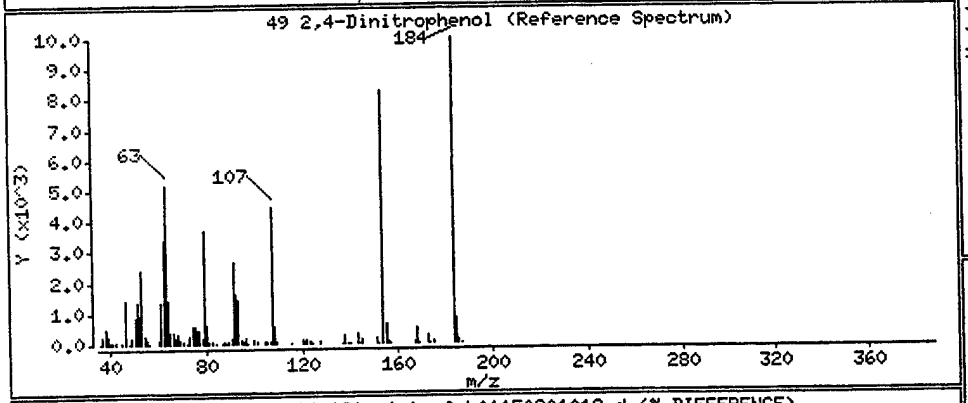
Concentration: 93.8 ug

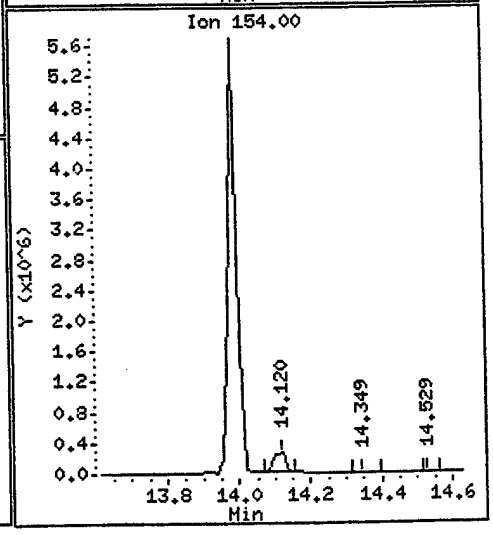


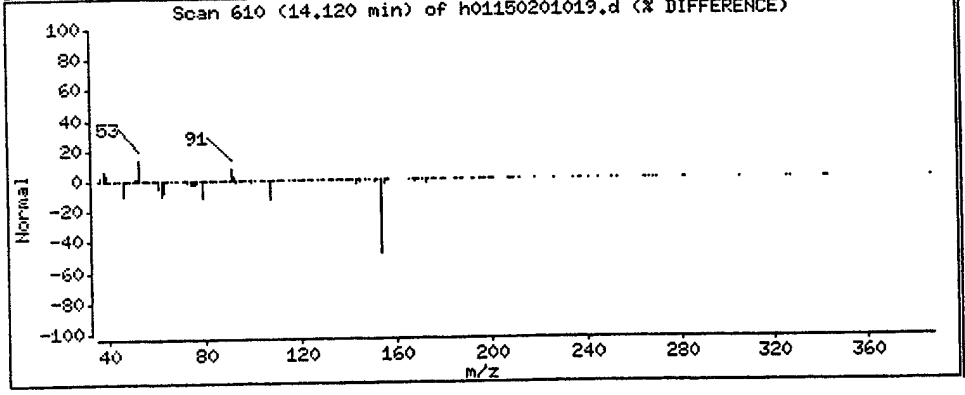












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

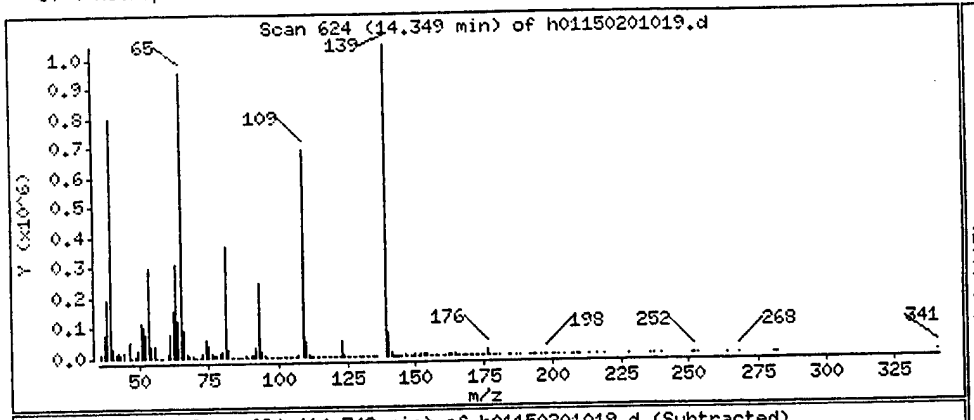
Operator: jgh

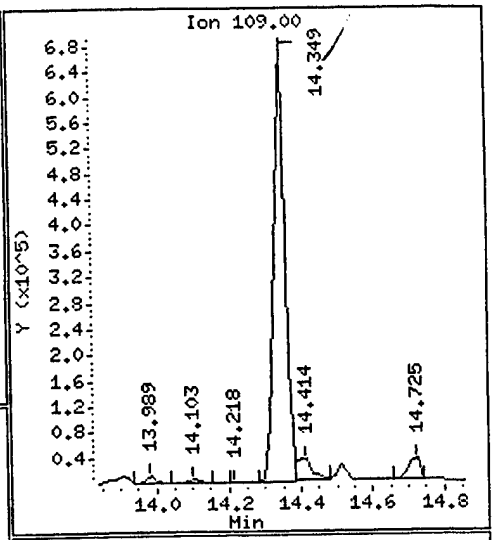
Column phase:

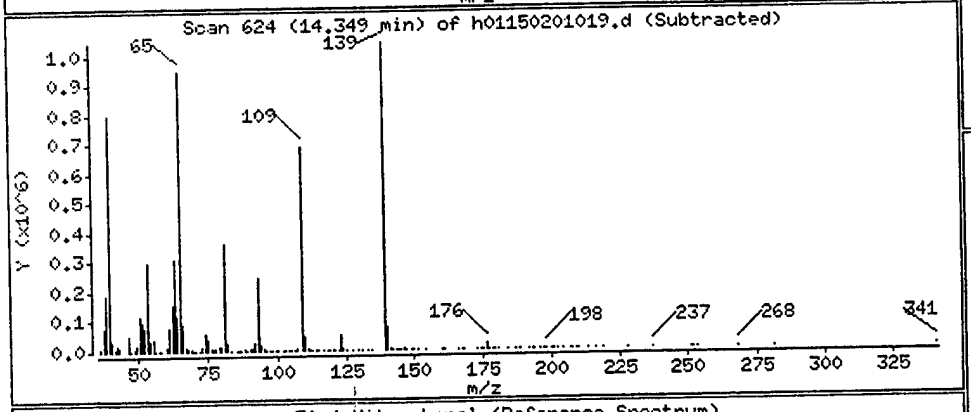
Column diameter: 2.00

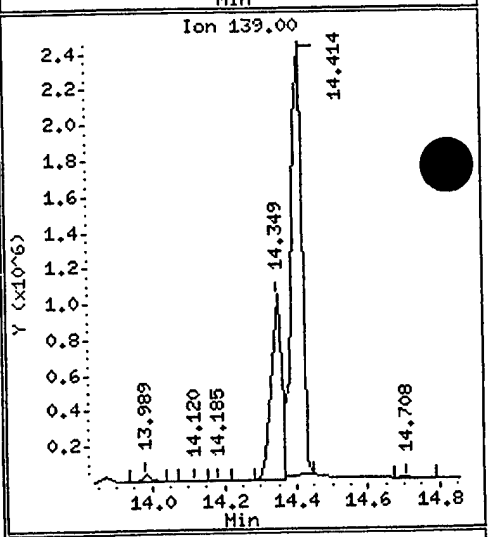
50 4-Nitrophenol

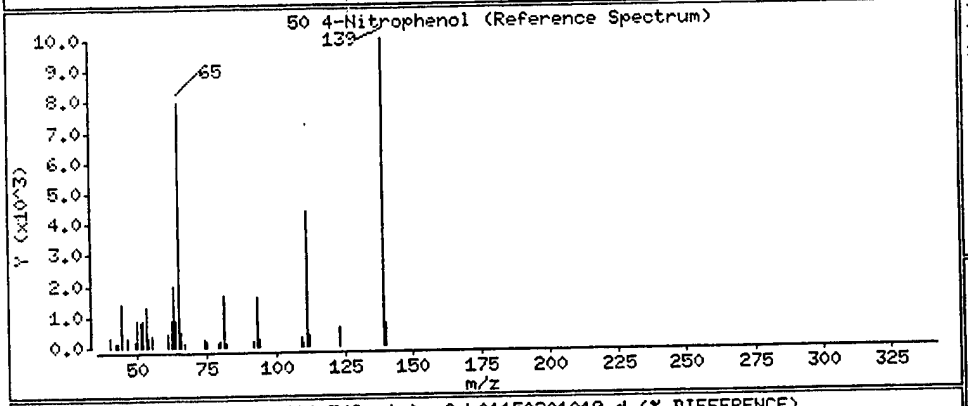
Concentration: 73.2 ug

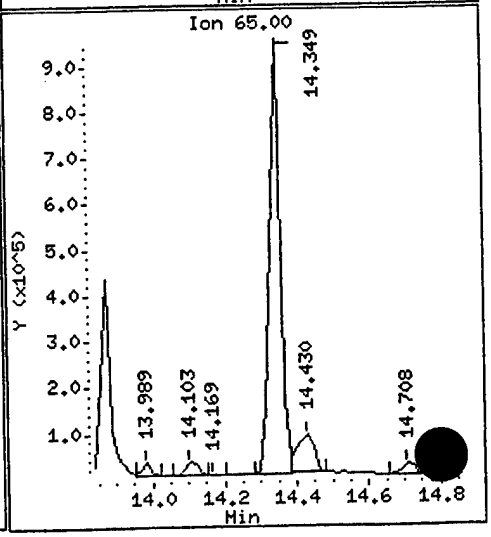


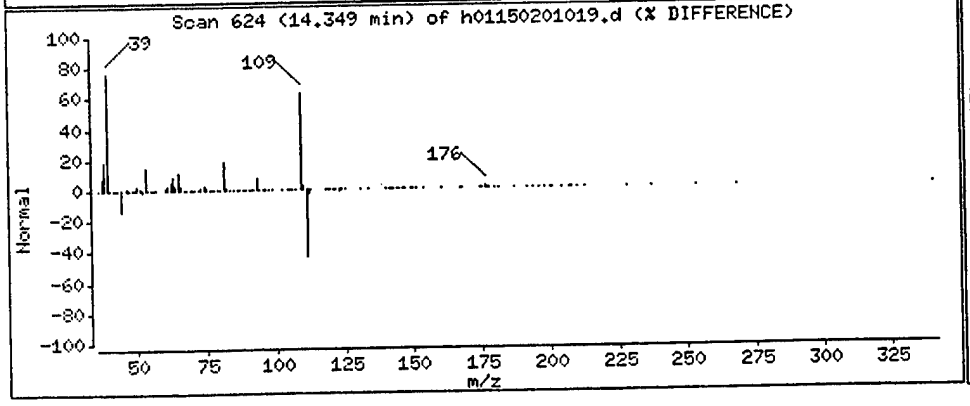












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

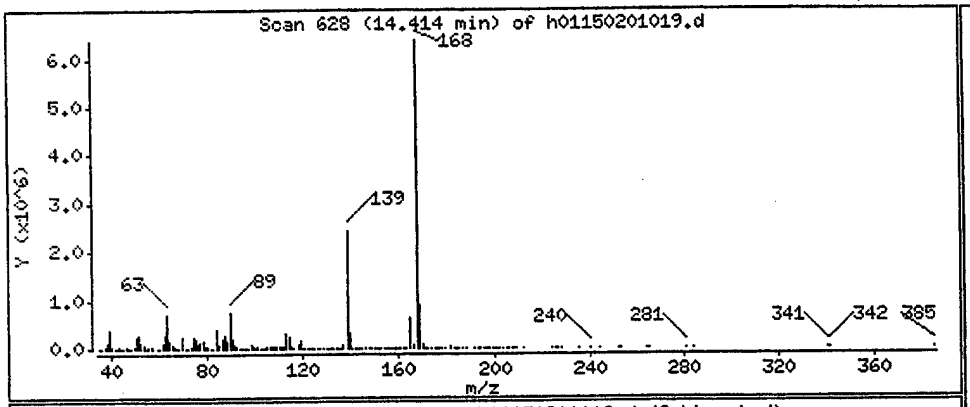
Operator: jgh

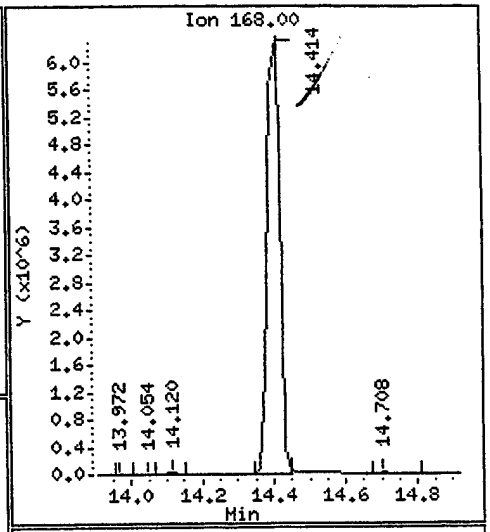
Column phase:

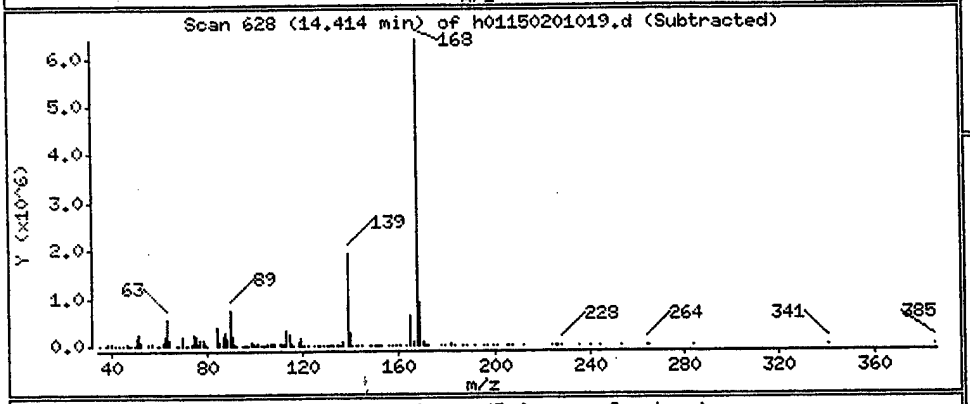
Column diameter: 2.00

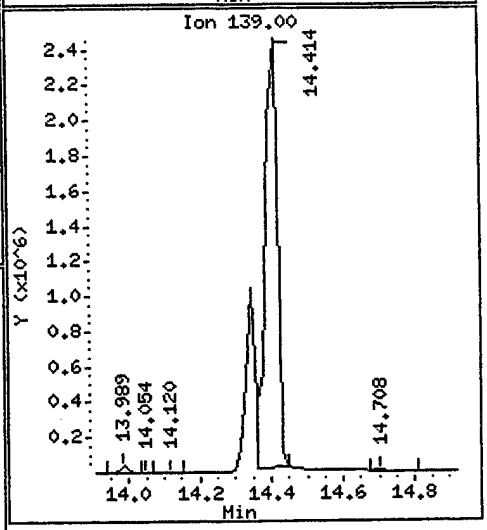
51 Dibenzofuran

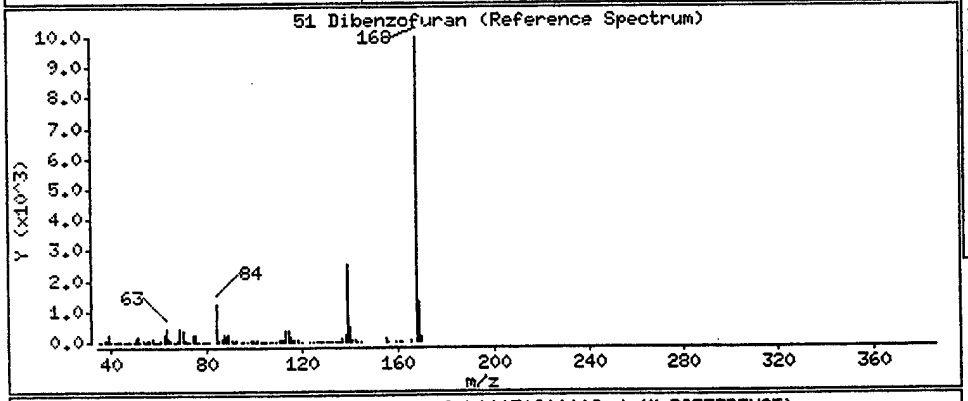
Concentration: 82.6 ug

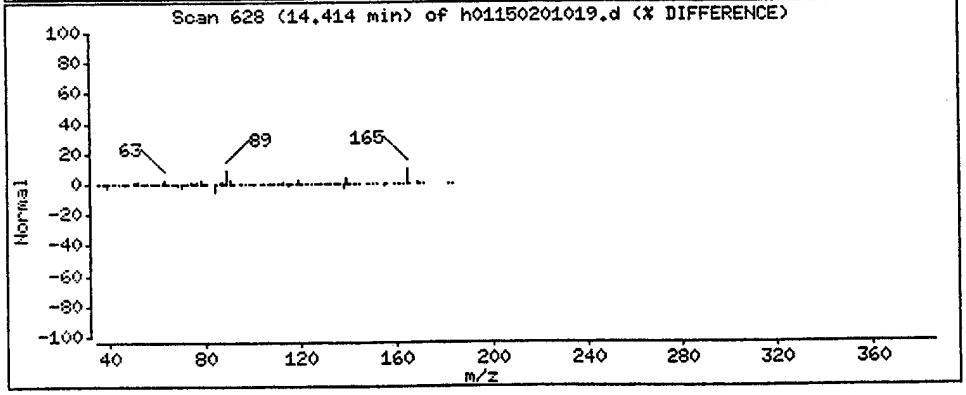












604

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

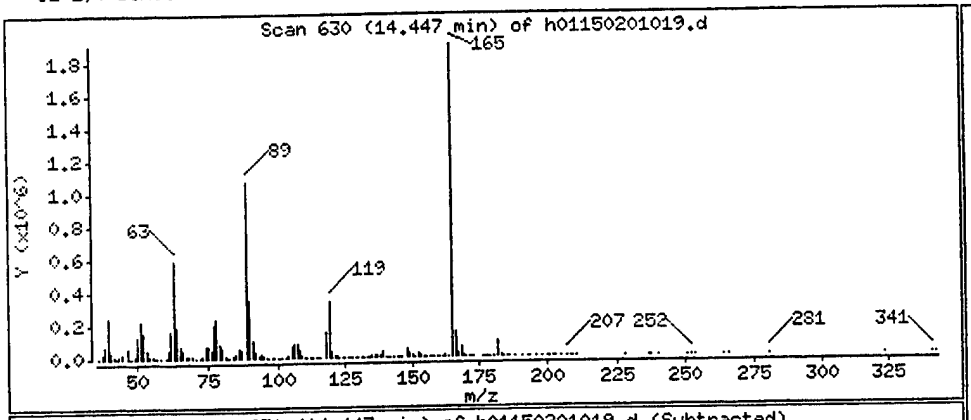
Operator: jgh

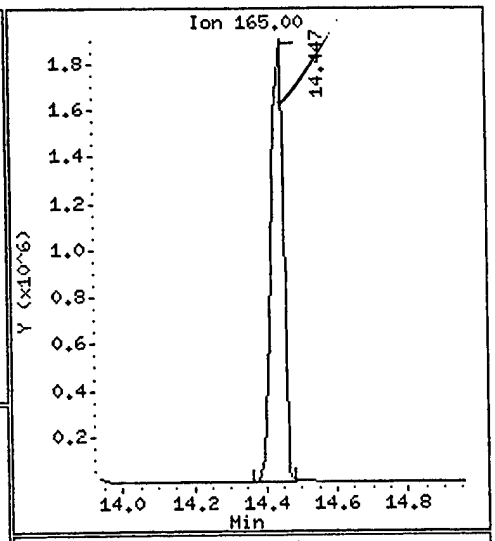
Column phase:

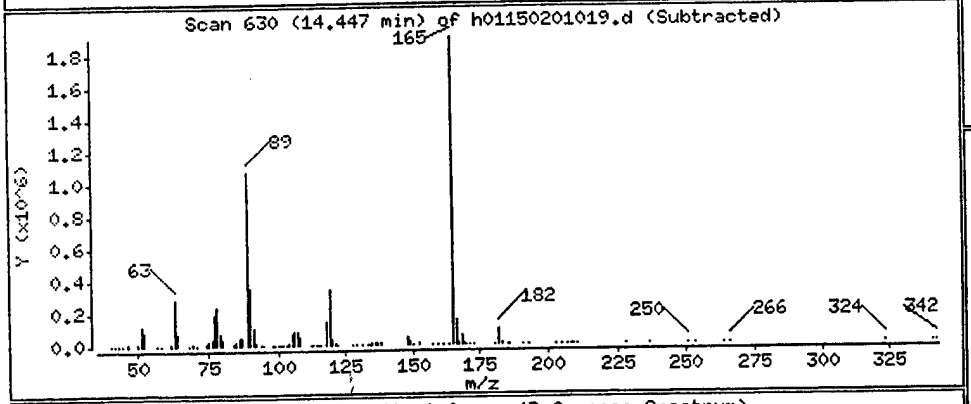
Column diameter: 2.00

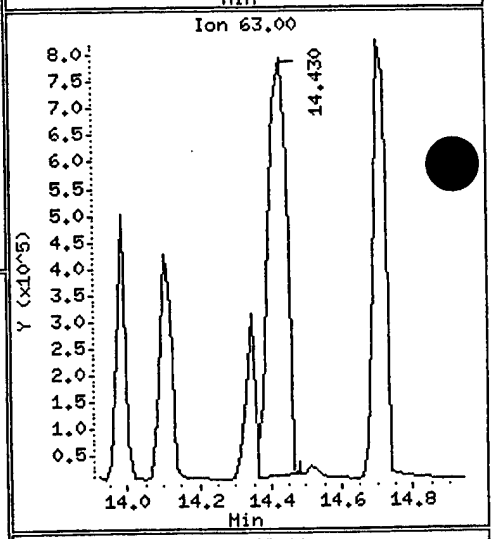
52 2,4-Dinitrotoluene

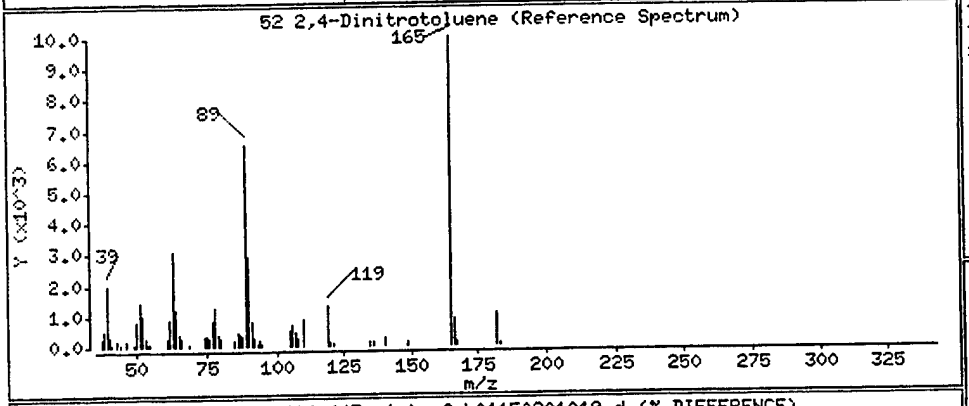
Concentration: 88.3 ug

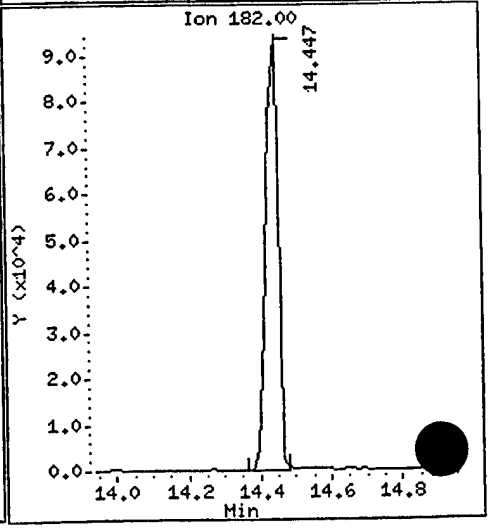


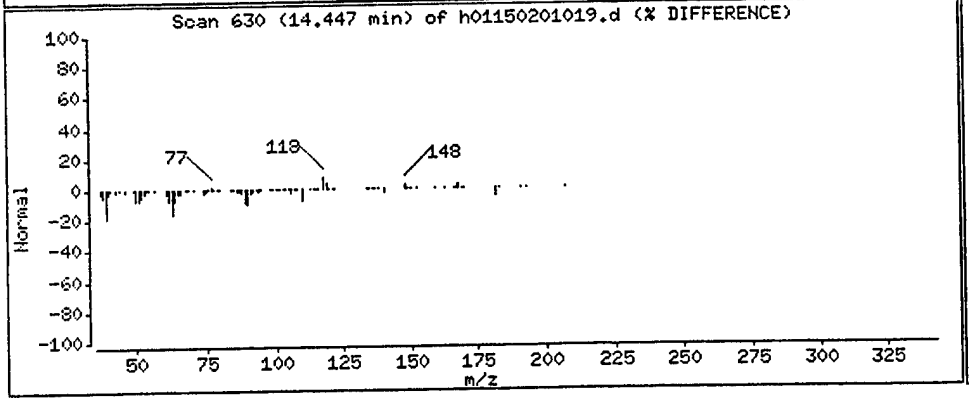












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Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

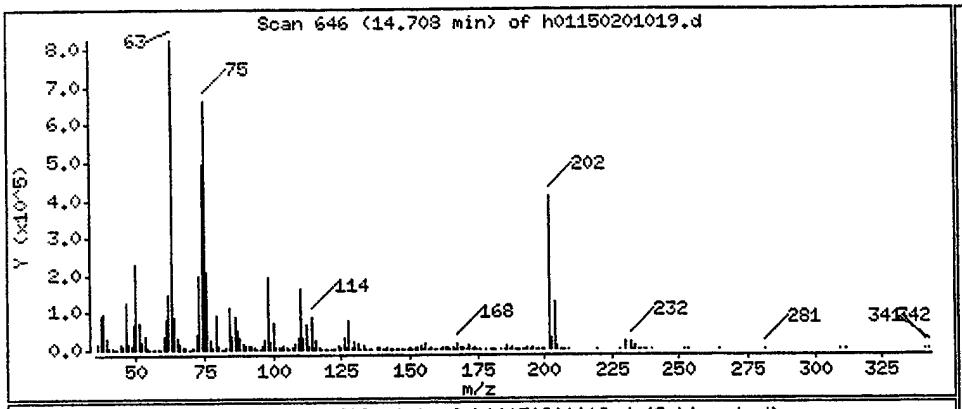
Operator: jgh

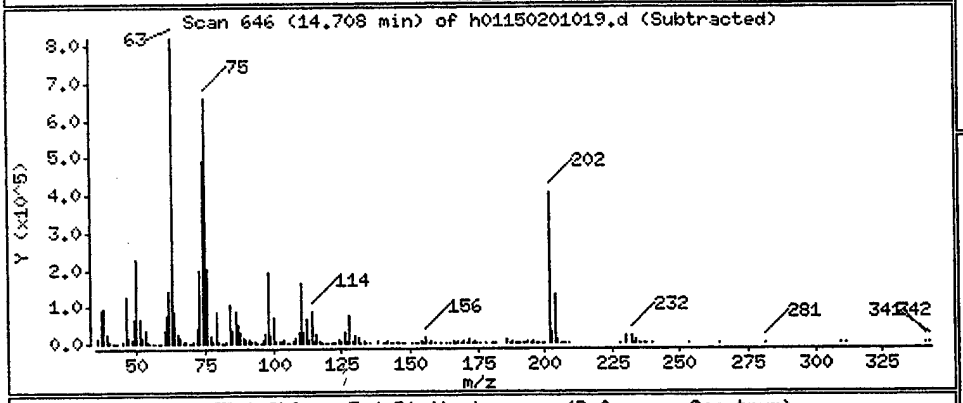
Column phase:

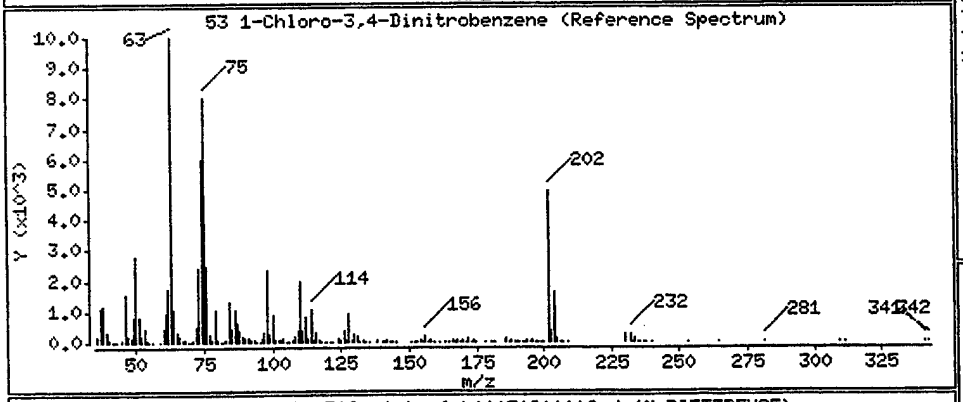
Column diameter: 2.00

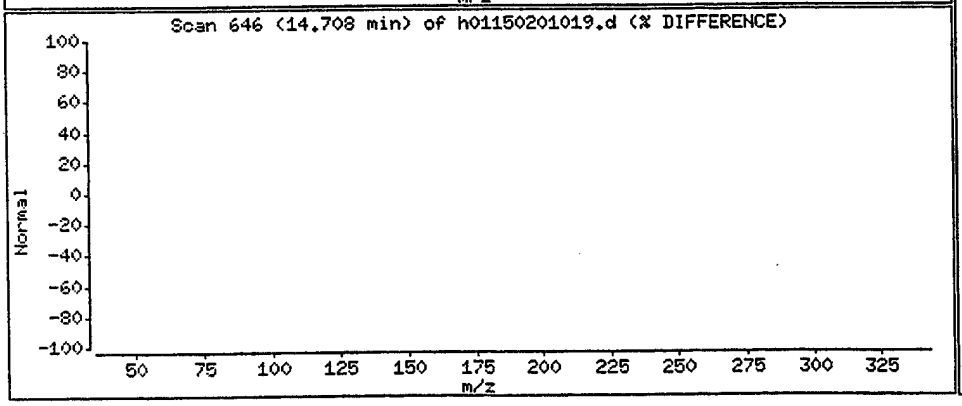
53 1-Chloro-3,4-Dinitrobenzene

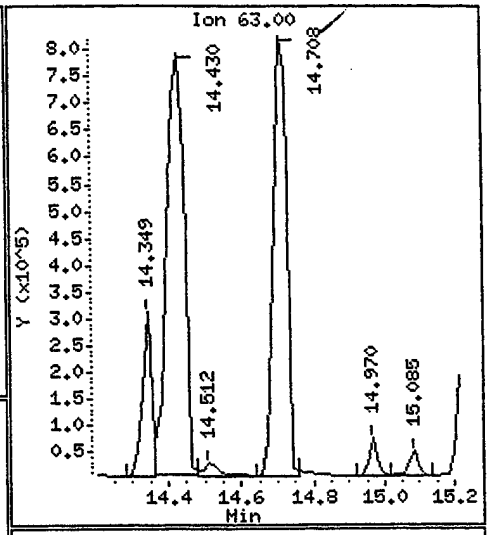
Concentration: 90.1 ug

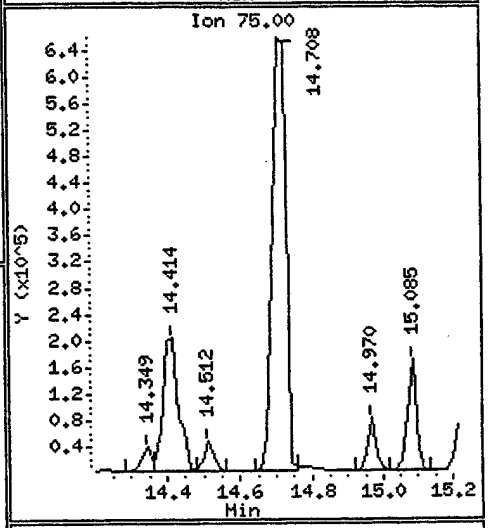


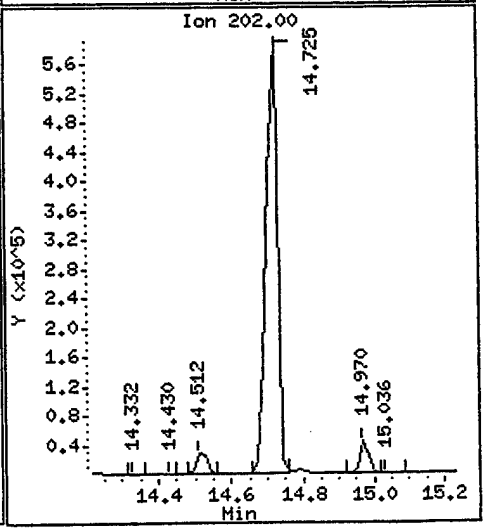












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

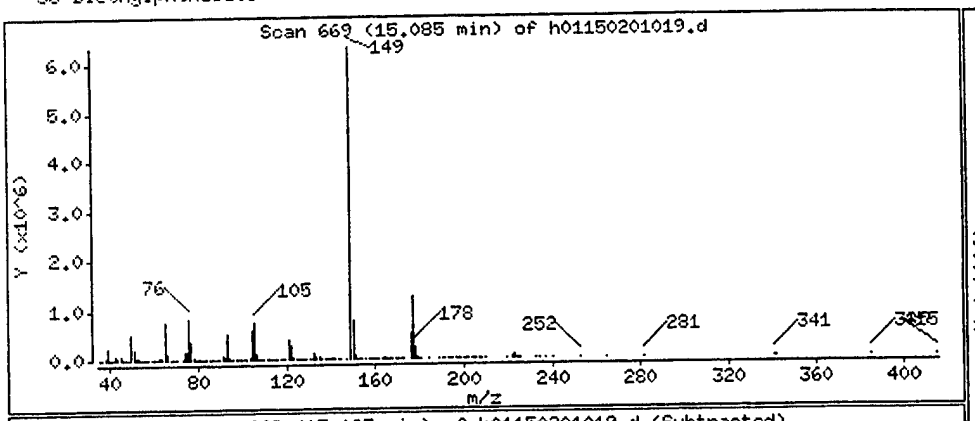
Operator: jgh

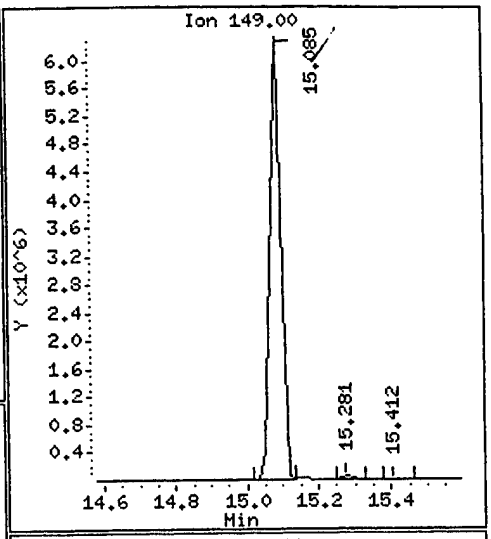
Column phase:

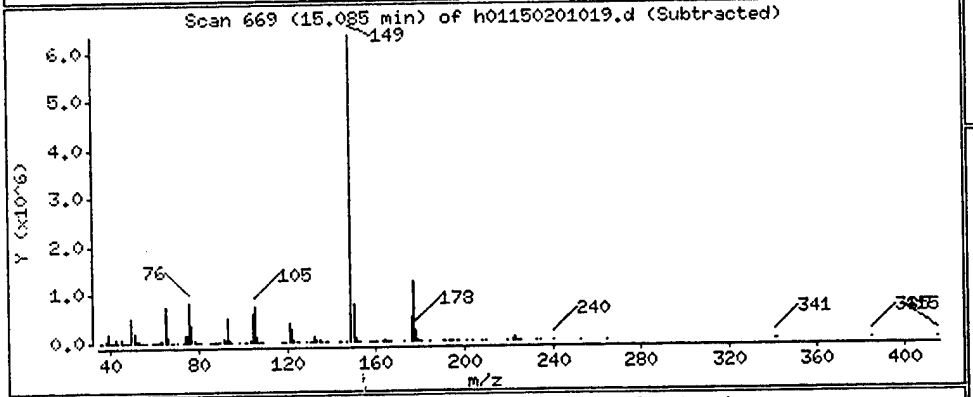
Column diameter: 2.00

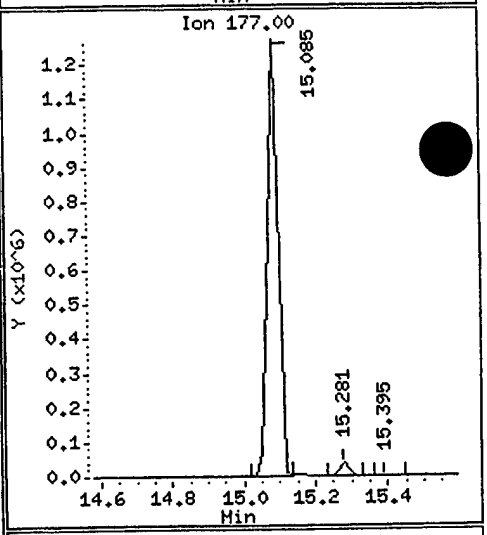
Concentration: 77.6 ug

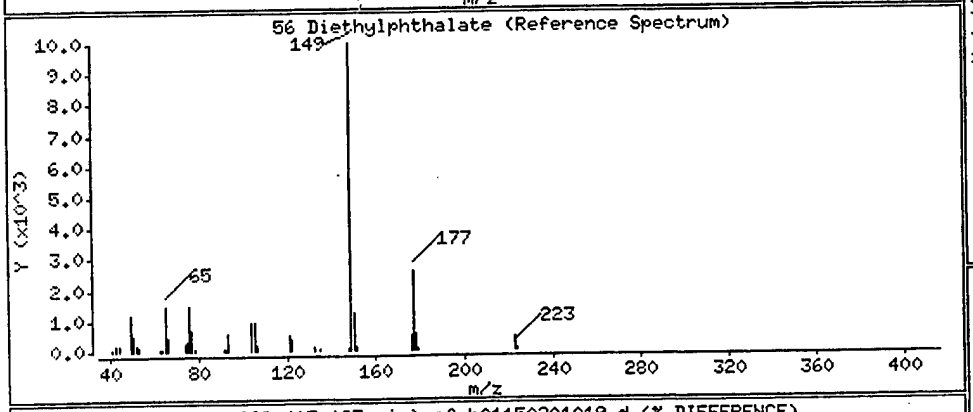
56 Diethylphthalate

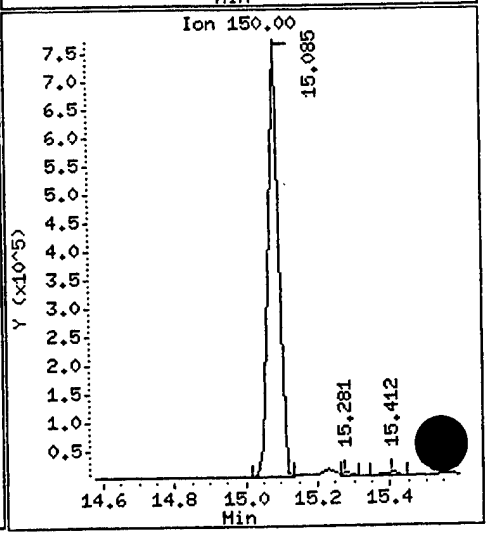


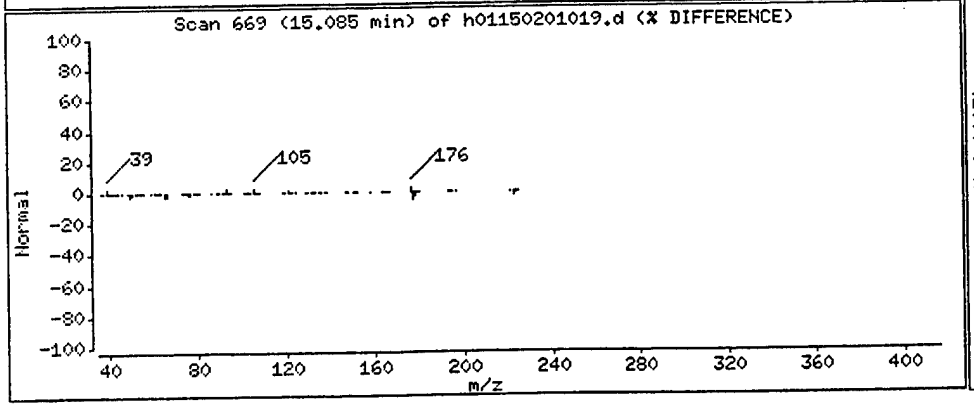












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

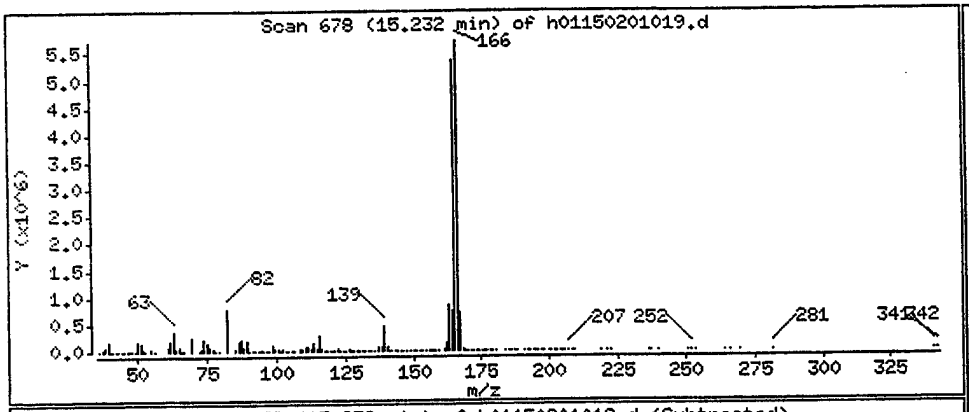
Operator: jgh

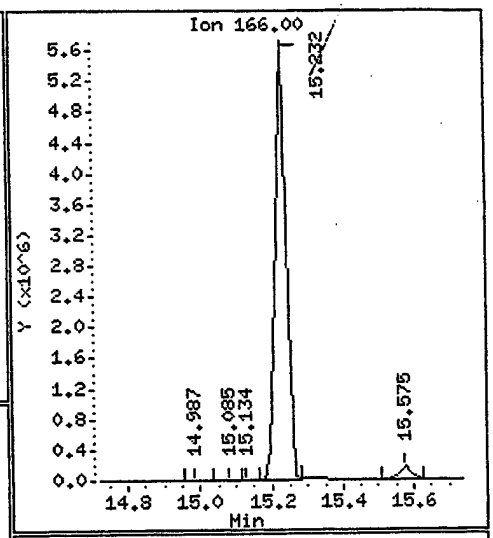
Column phase:

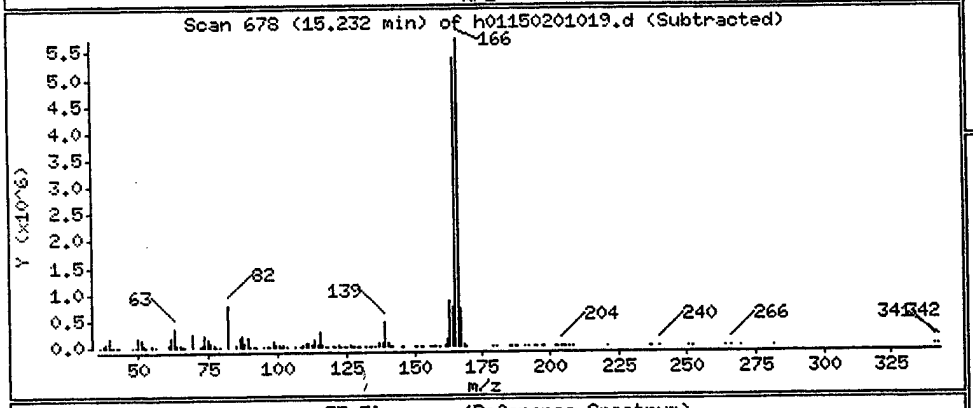
Column diameter: 2.00

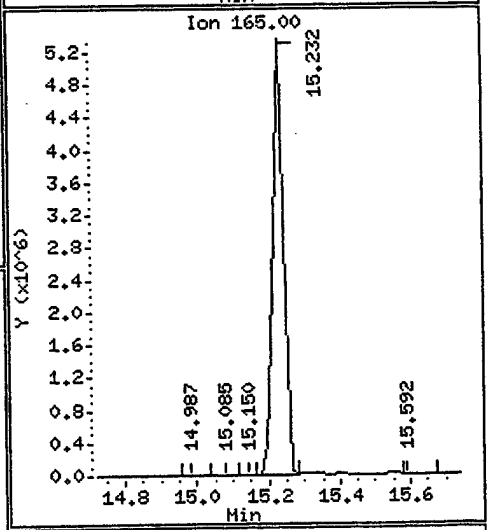
57 Fluorene

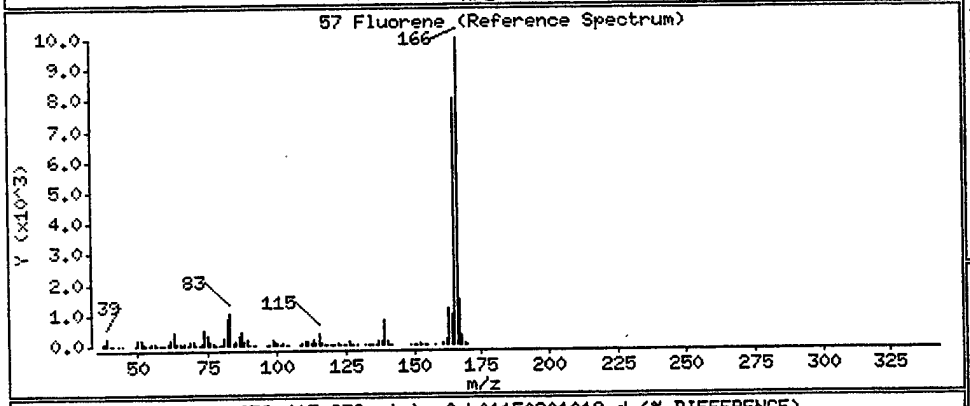
Concentration: 78.7 ug

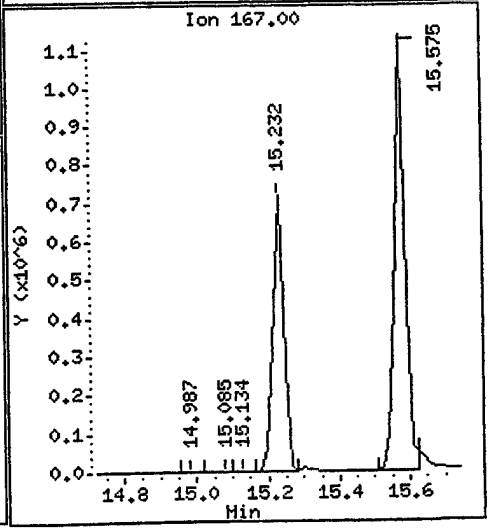


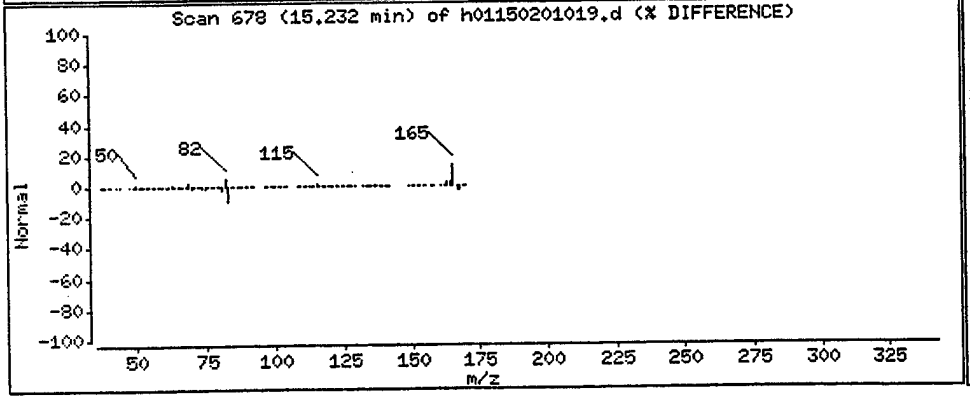












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Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

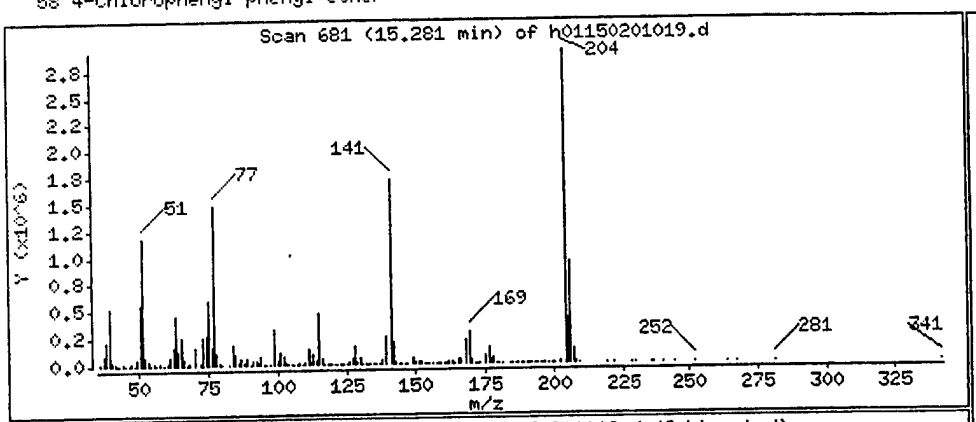
Operator: jgh

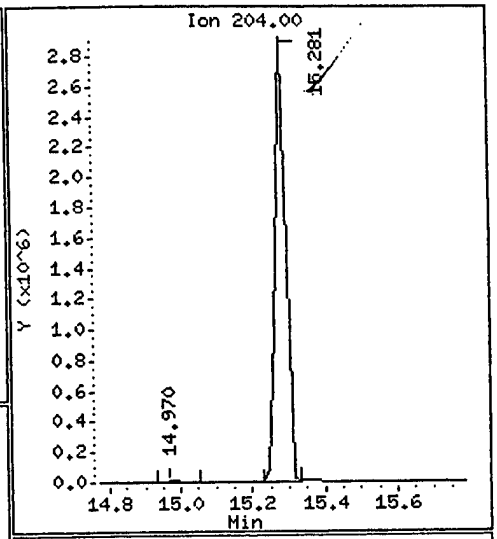
Column phase:

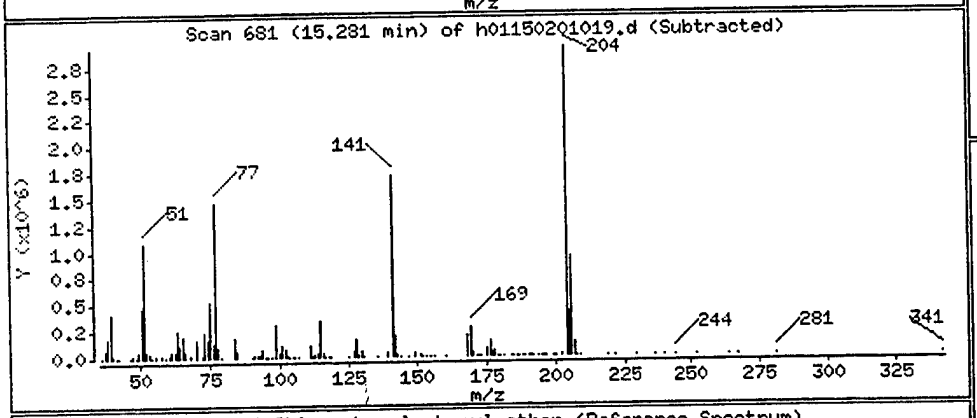
Column diameter: 2.00

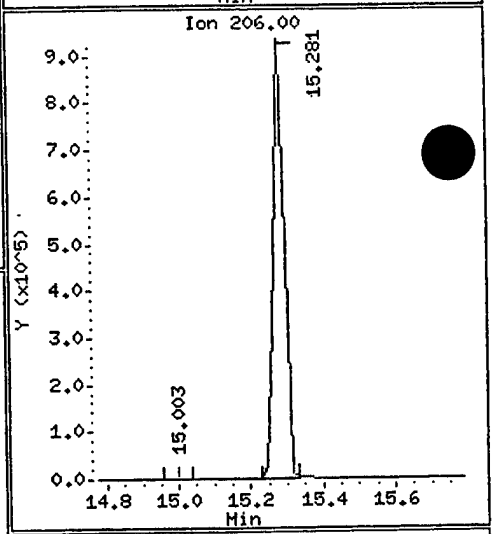
58 4-Chlorophenyl phenyl ether

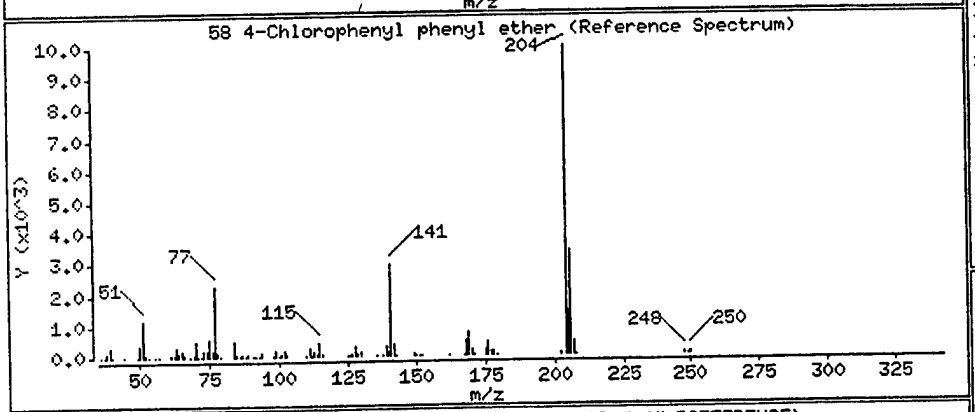
Concentration: 79.2 ug

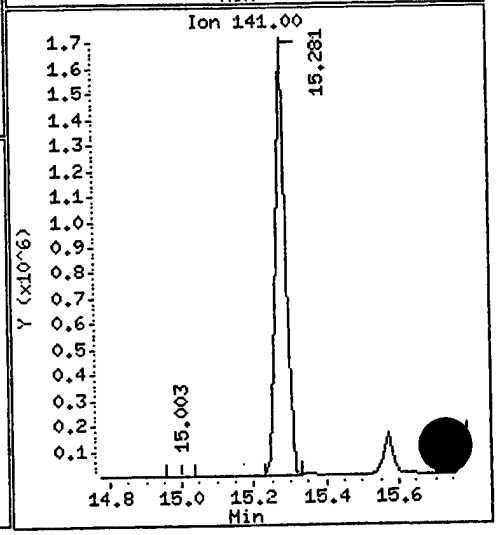


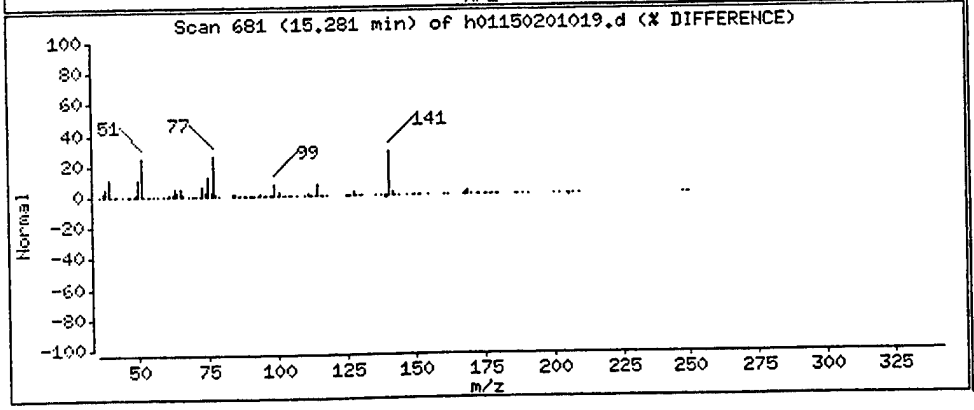












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

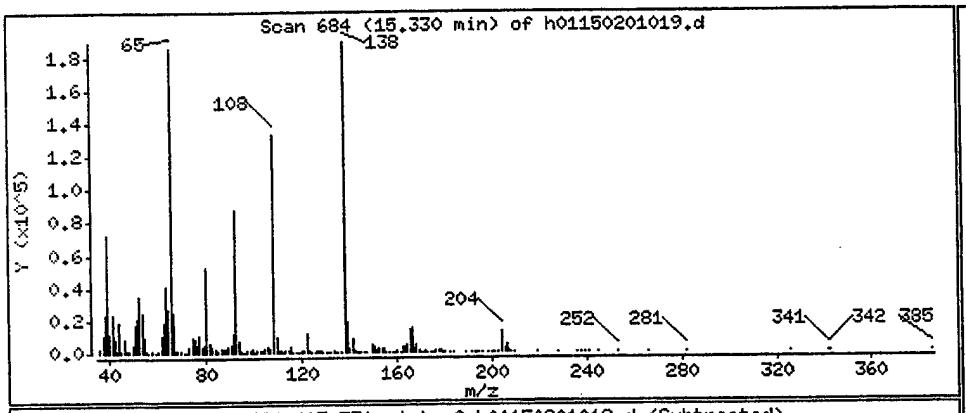
Operator: jgh

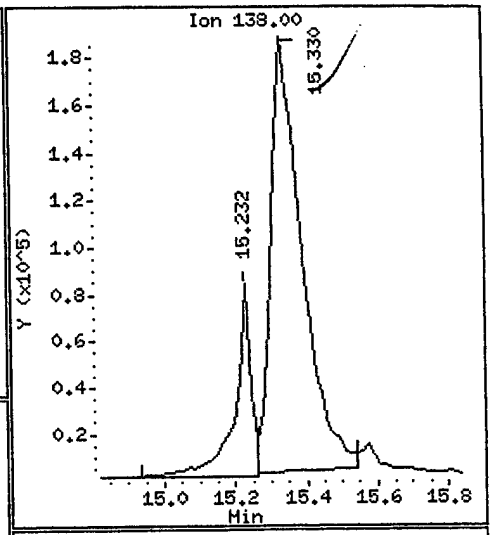
Column phase:

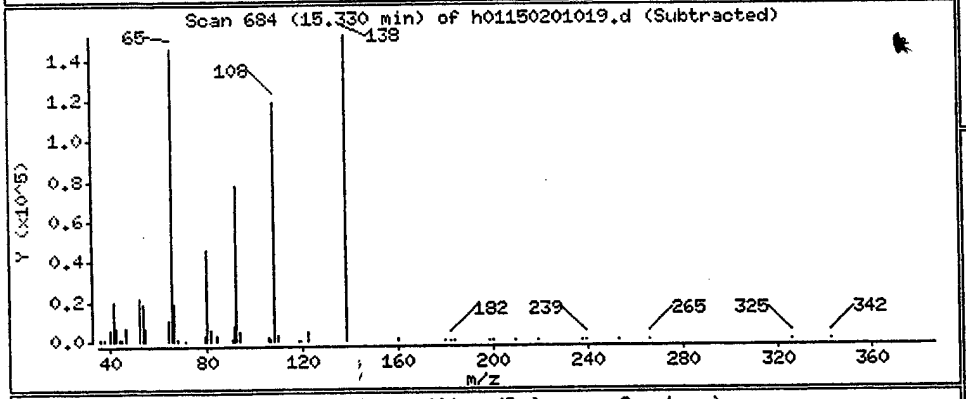
Column diameter: 2.00

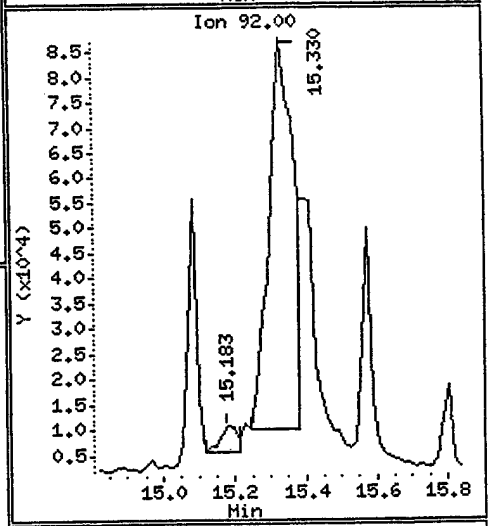
59 4-Nitroaniline

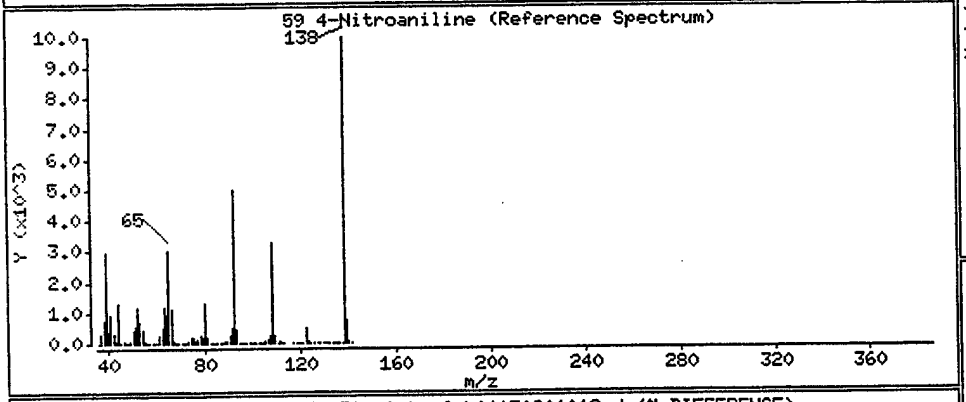
Concentration: 75.3 ug

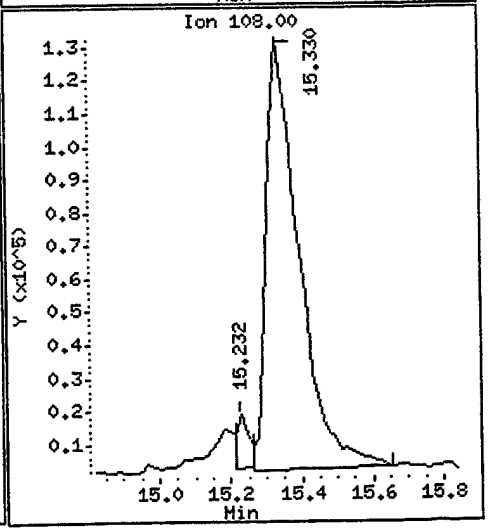


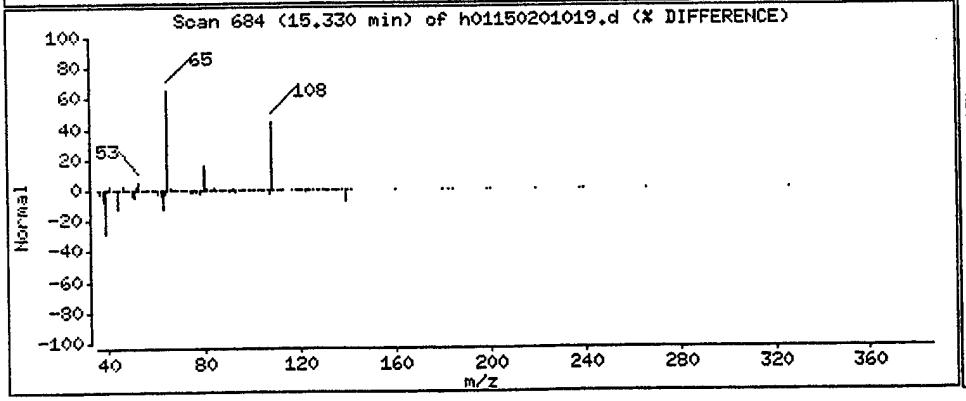












610

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

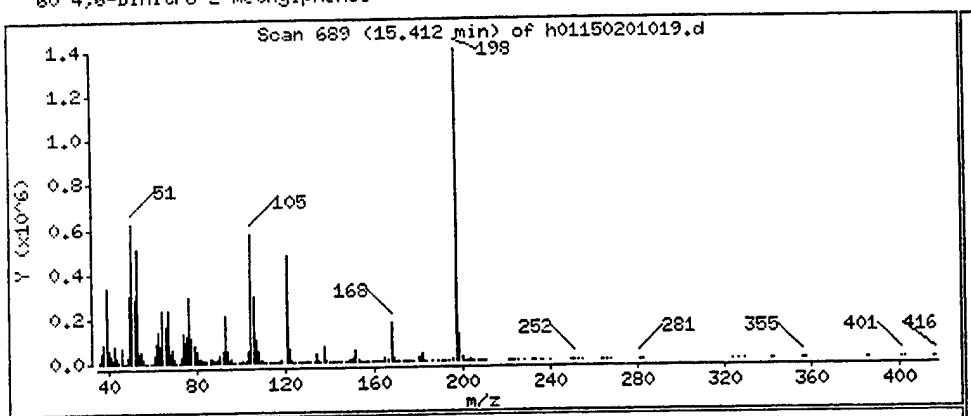
Operator: jgh

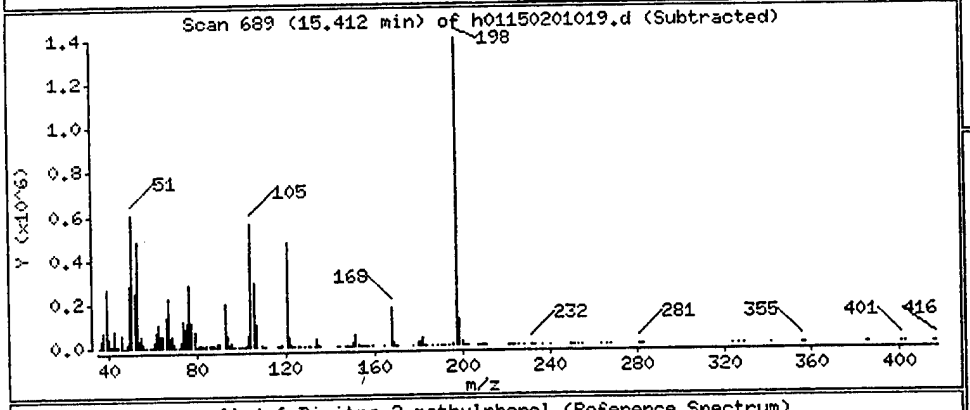
Column phase:

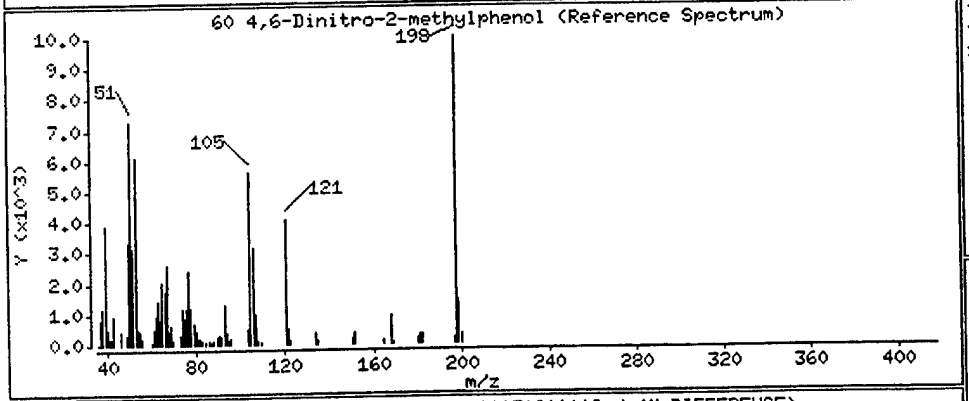
Column diameter: 2.00

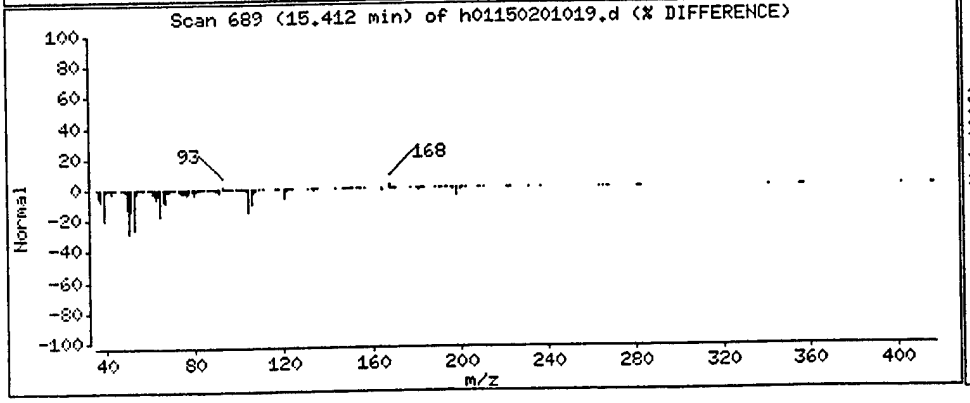
60 4,6-Dinitro-2-methylphenol

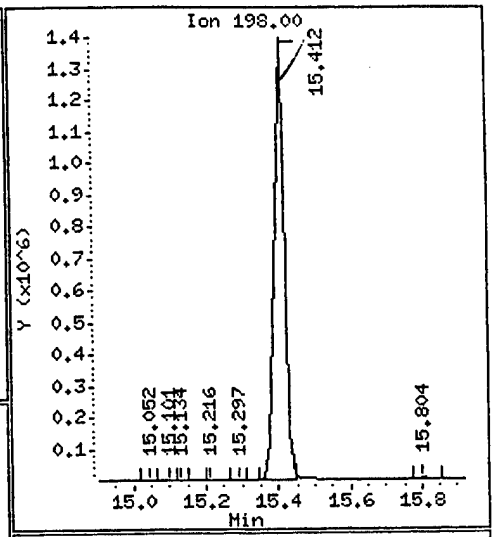
Concentration: 96.2 ug

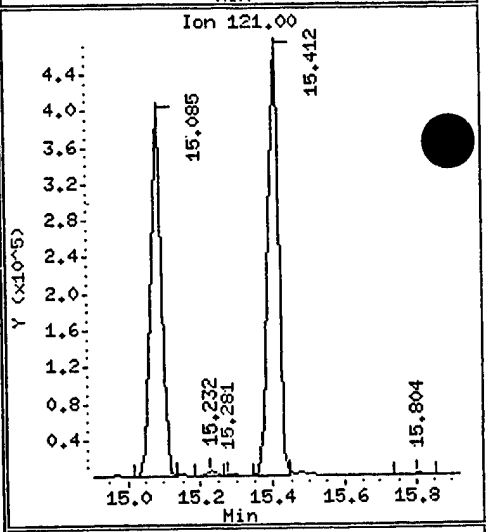


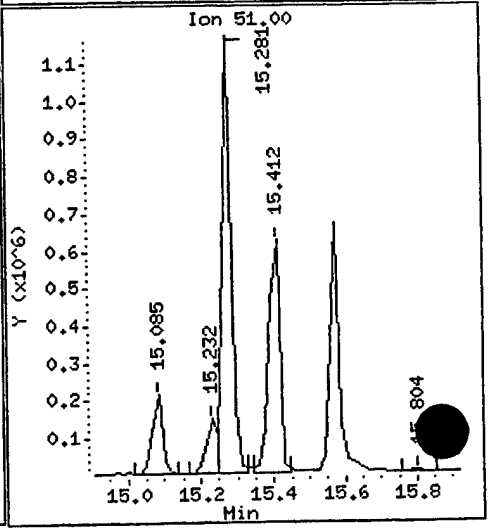












611

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

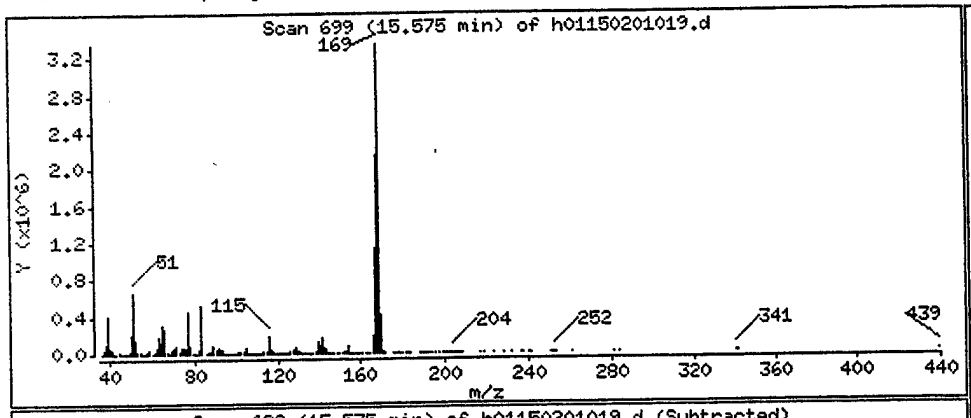
Operator: jgh

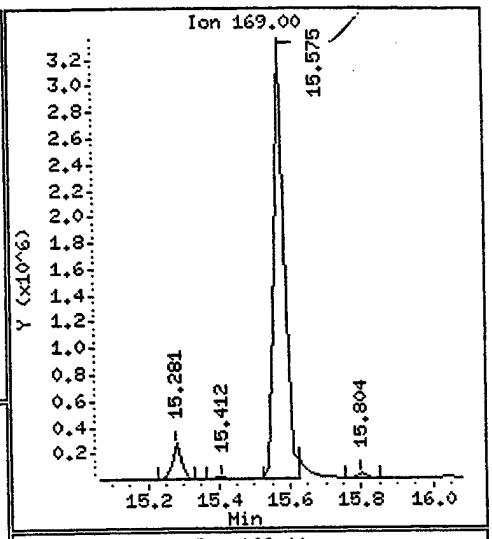
Column phase:

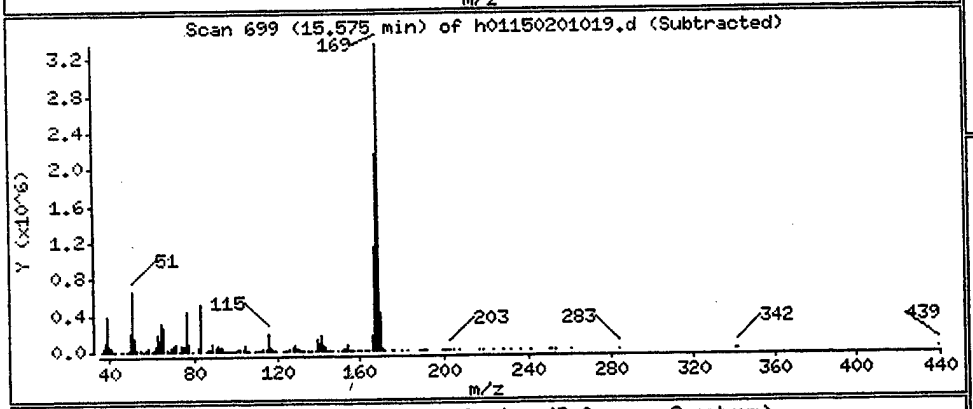
Column diameter: 2.00

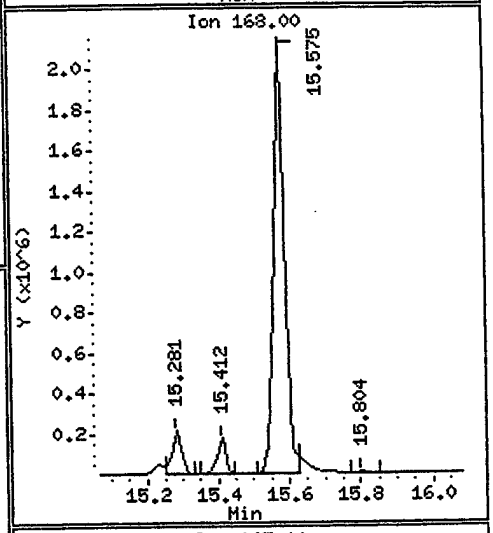
61 N-nitrosodiphenylamine

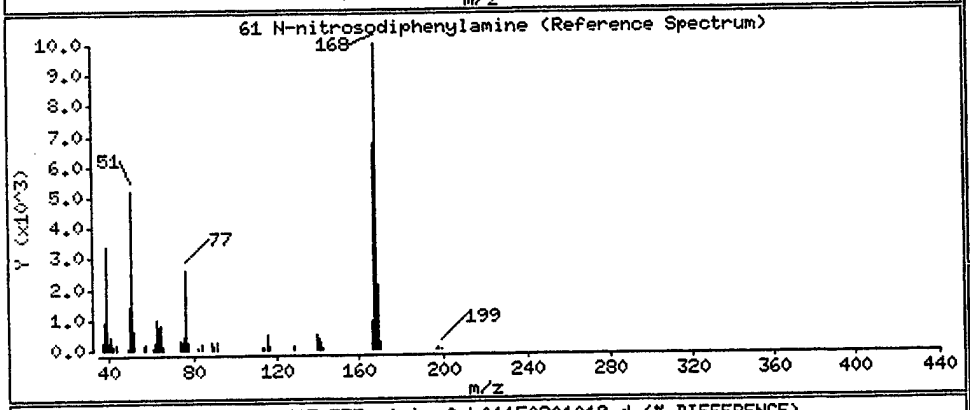
Concentration: 76.8 ug

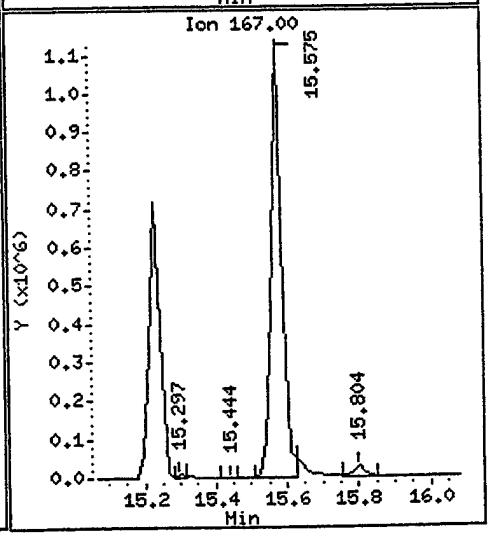


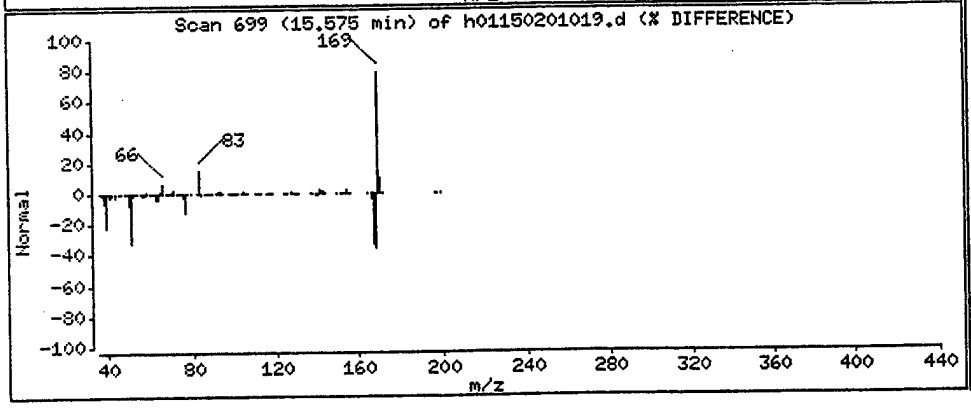












612

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

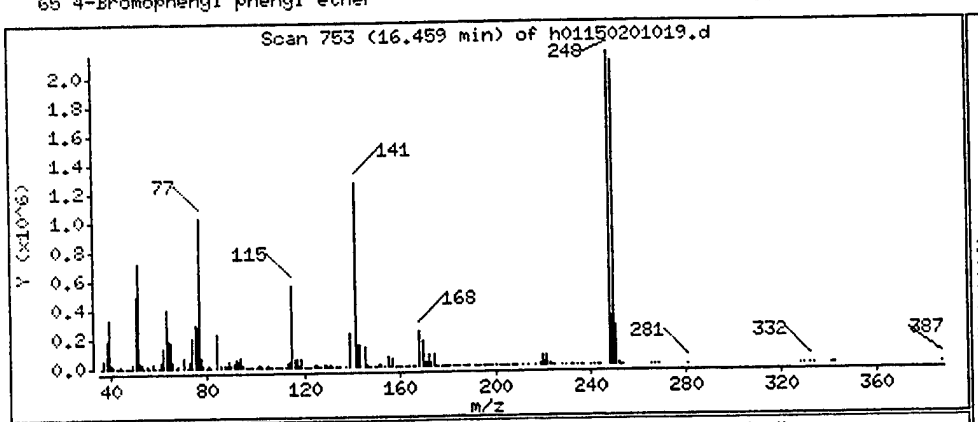
Operator: jgh

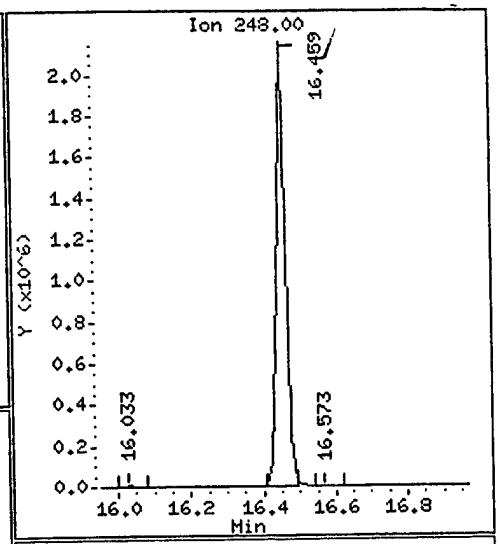
Column phase:

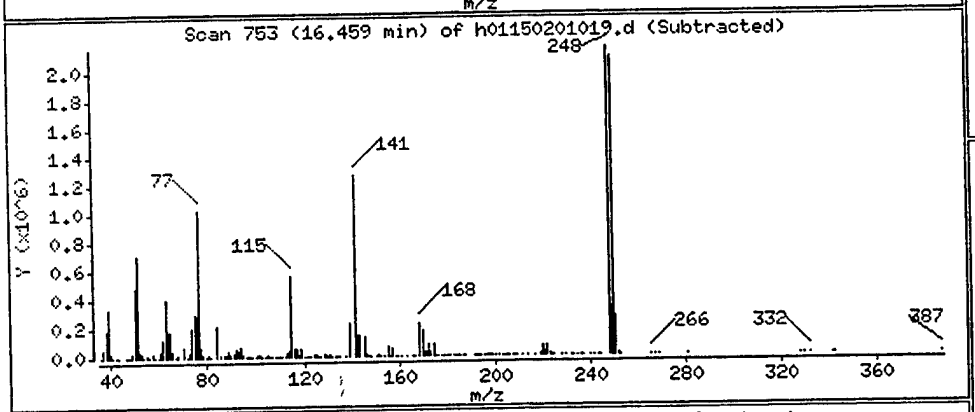
Column diameter: 2.00

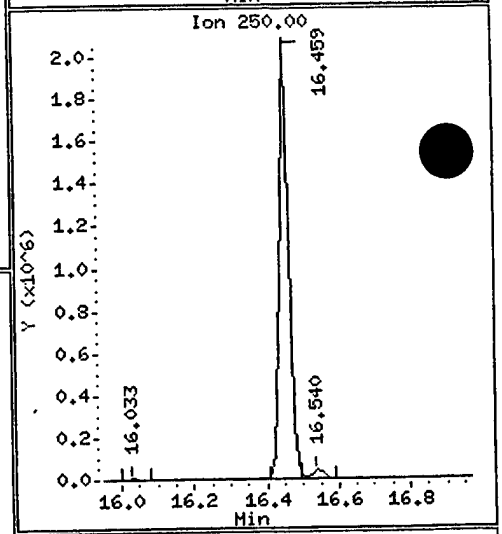
65 4-Bromophenyl phenyl ether

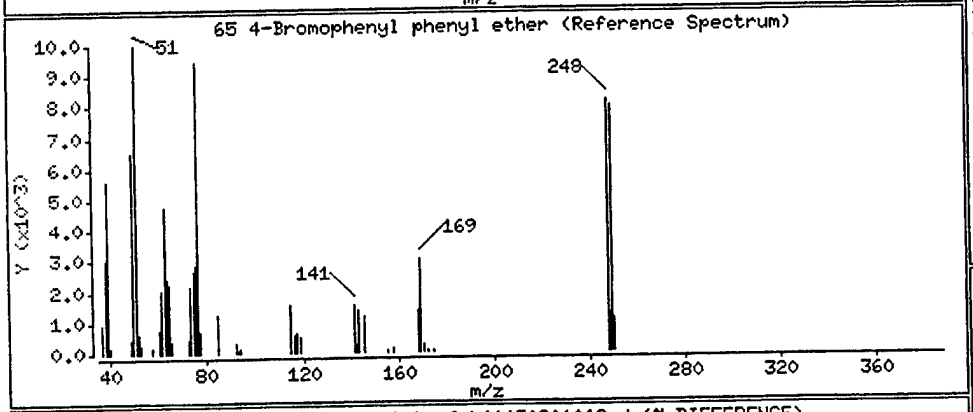
Concentration: 86.1 ug

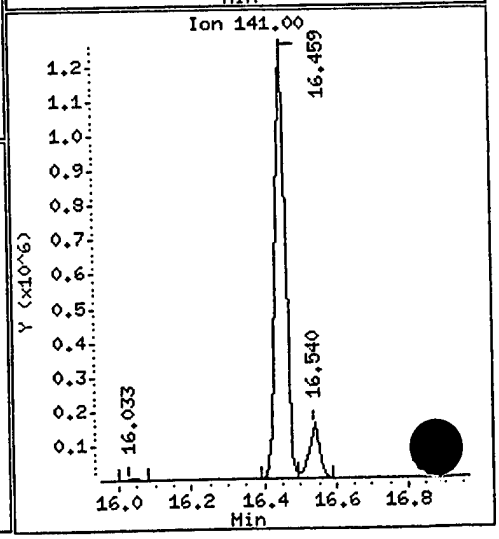


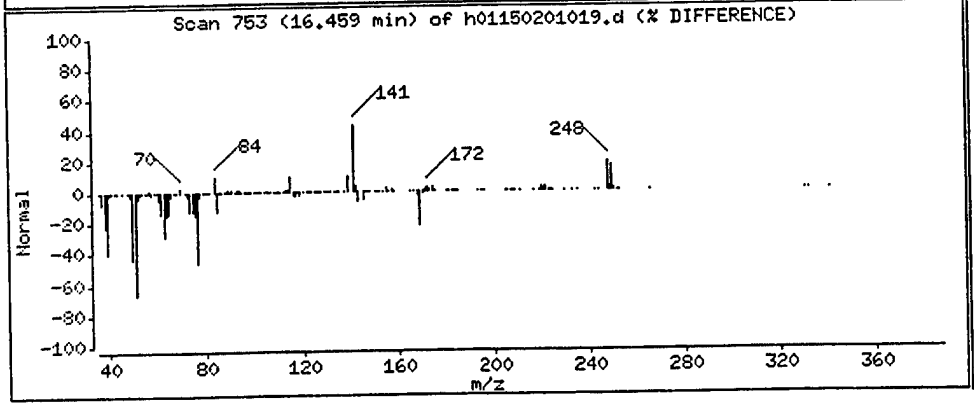












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

Operator: jgh

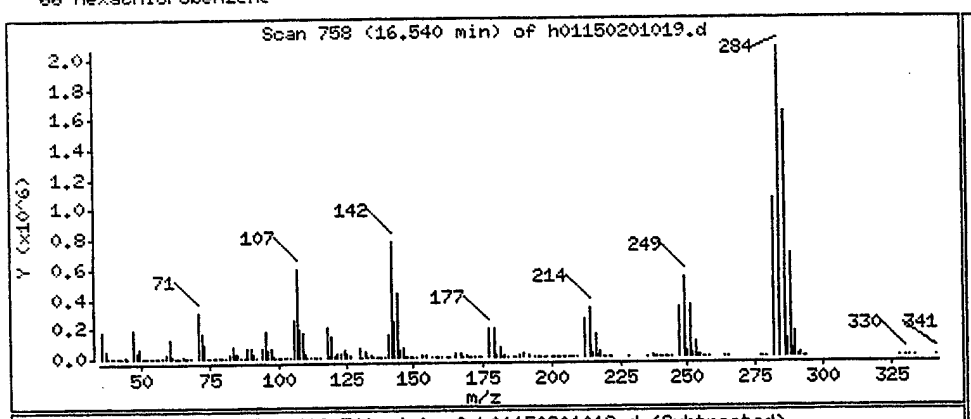
Column phase:

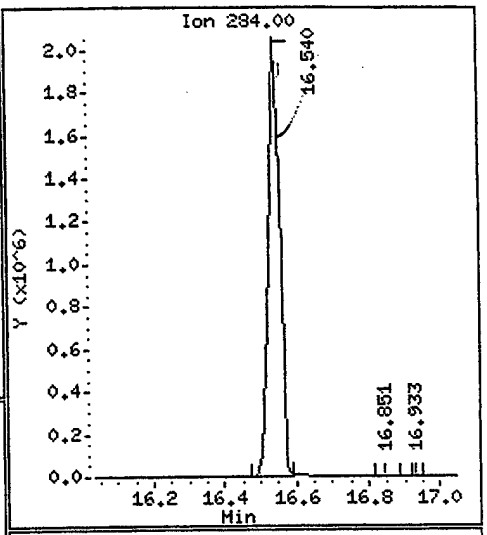
Column diameter: 2.00

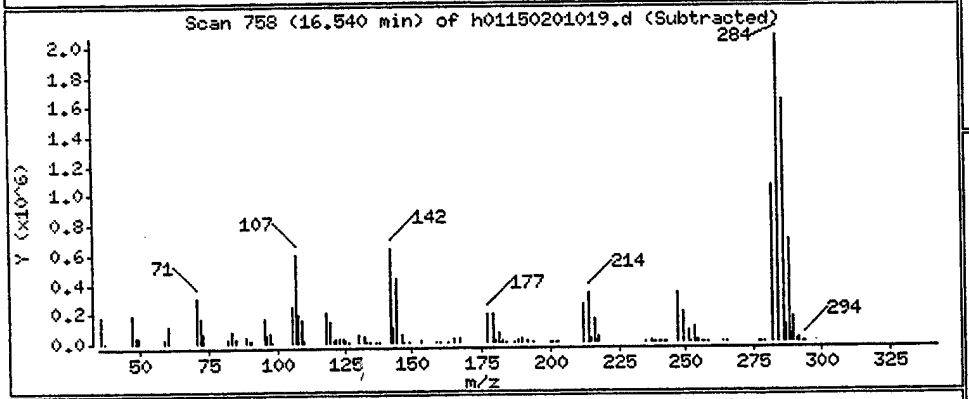
66 Hexachlorobenzene

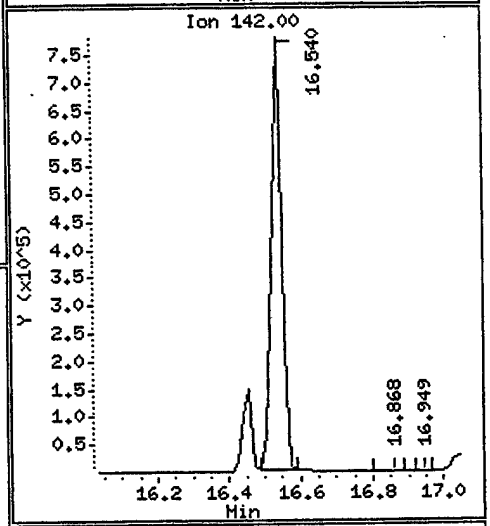
Concentration: 83.1 ug

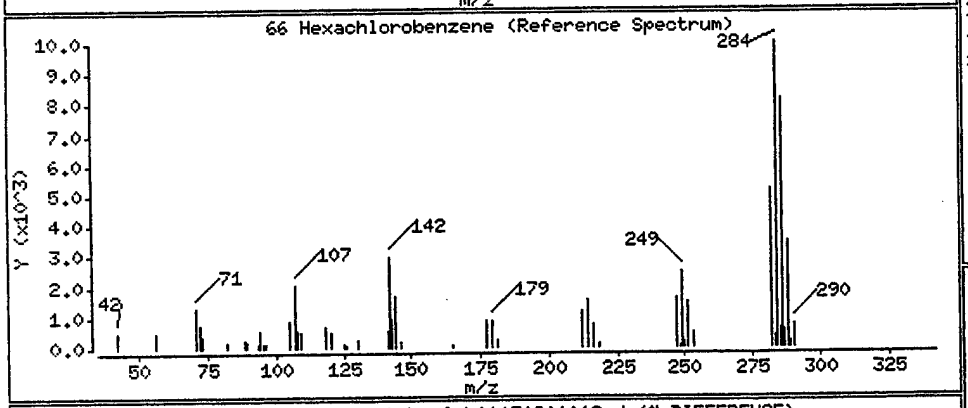
613

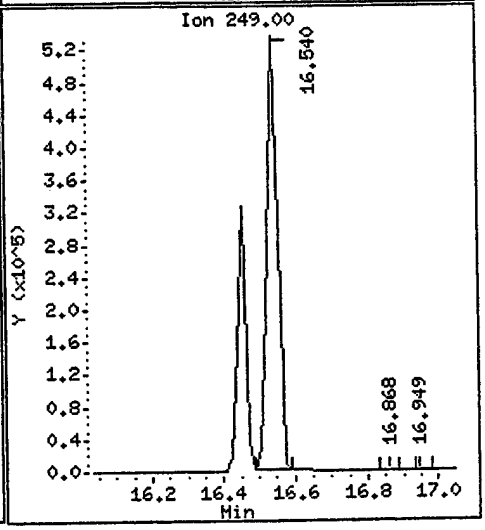


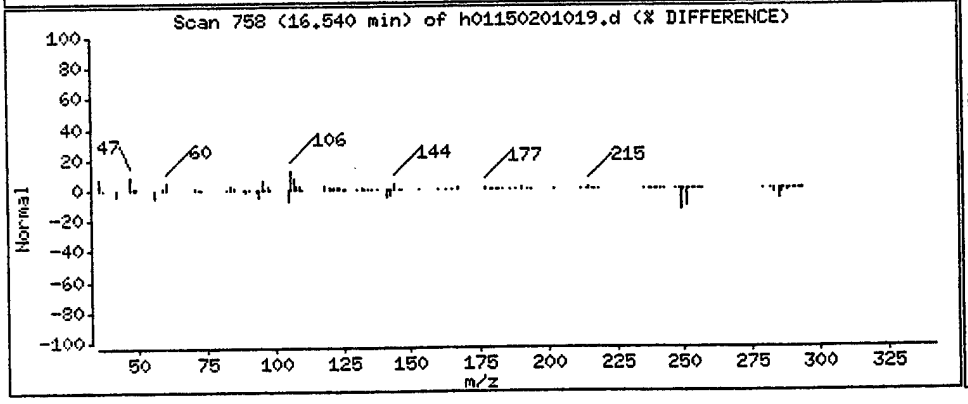












614

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

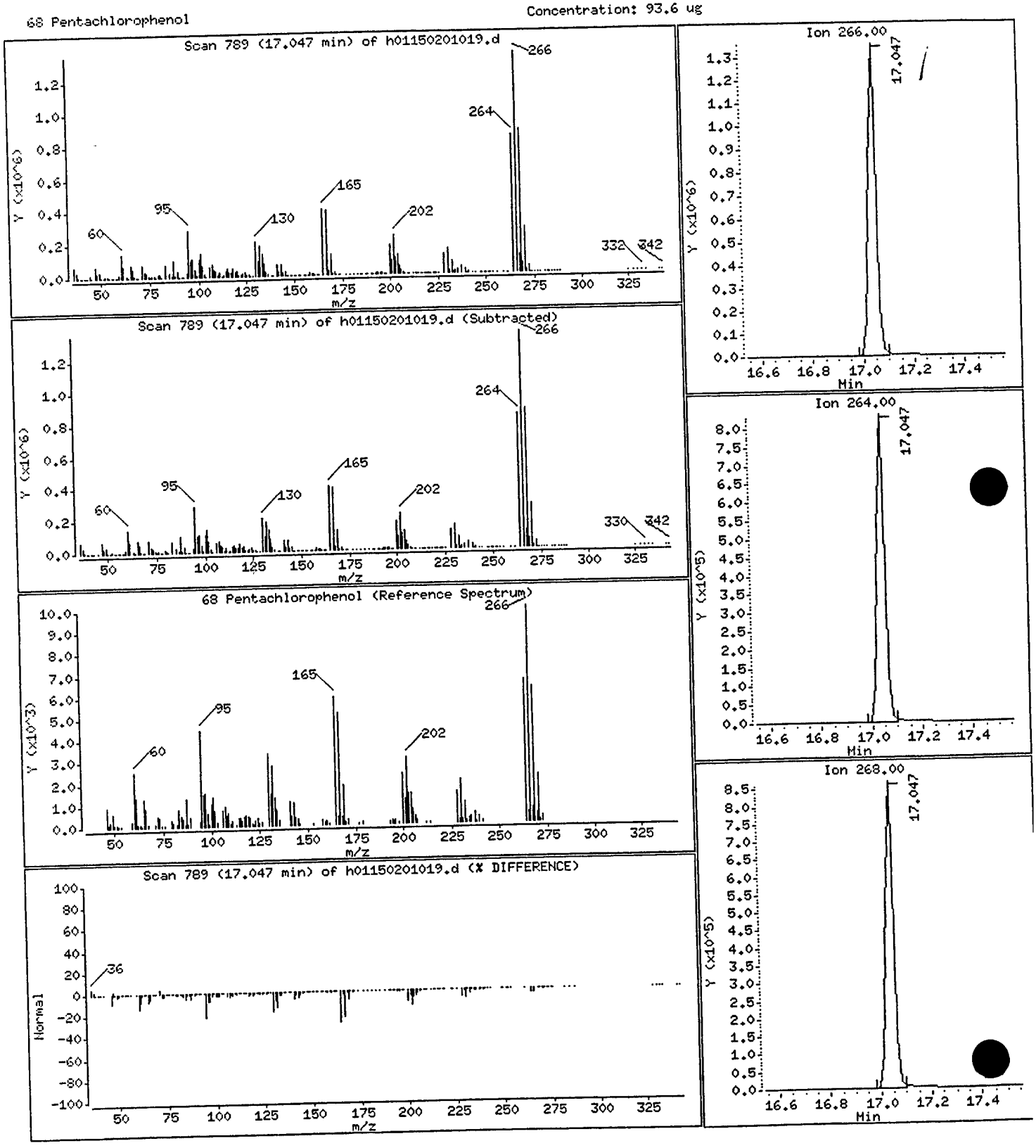
Operator: jgh

Column phase:

Column diameter: 2.00

Concentration: 93.6 ug

68 Pentachlorophenol



Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

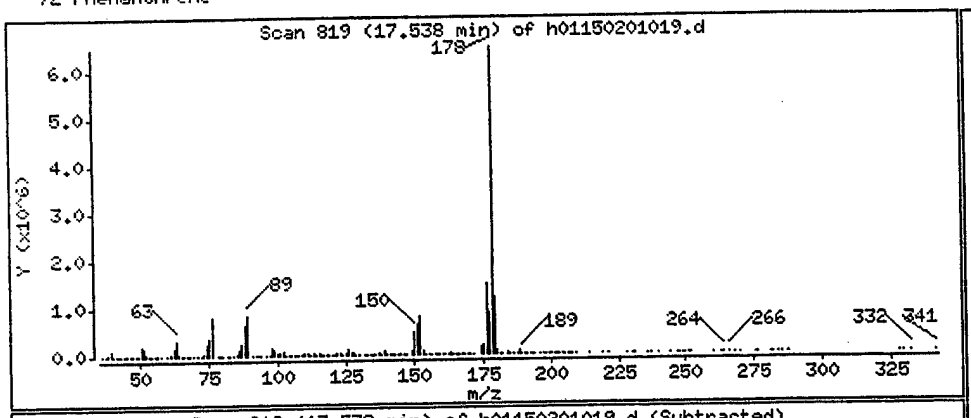
Operator: jgh

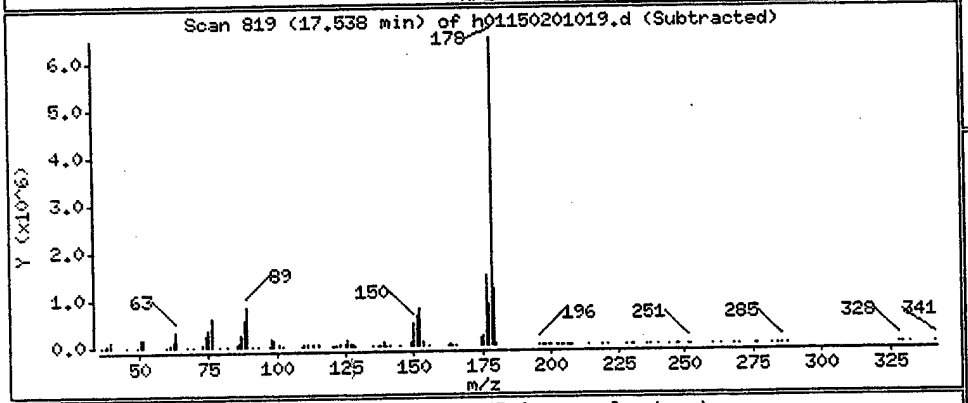
Column phase:

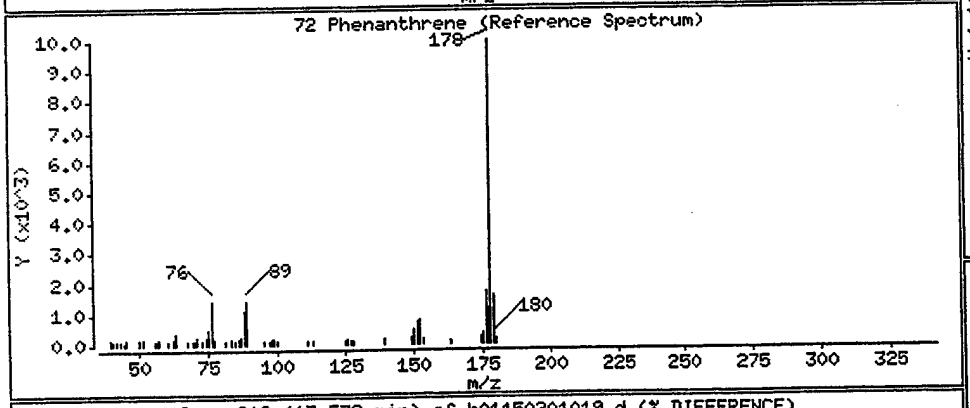
Column diameter: 2.00

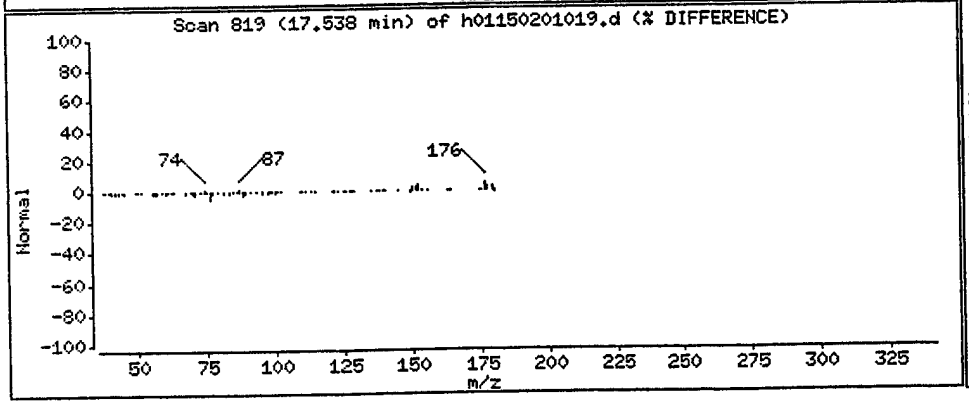
72 Phenanthrene

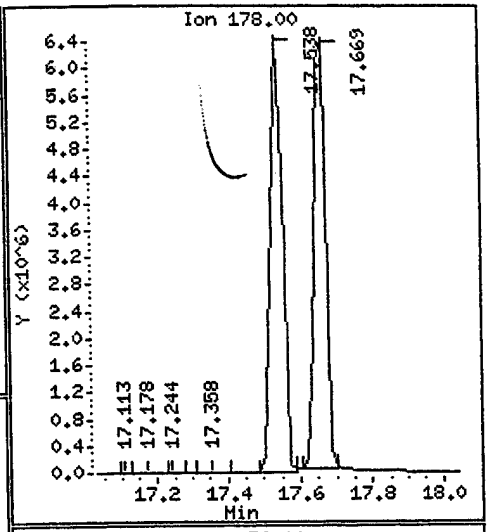
Concentration: 81.8 ug

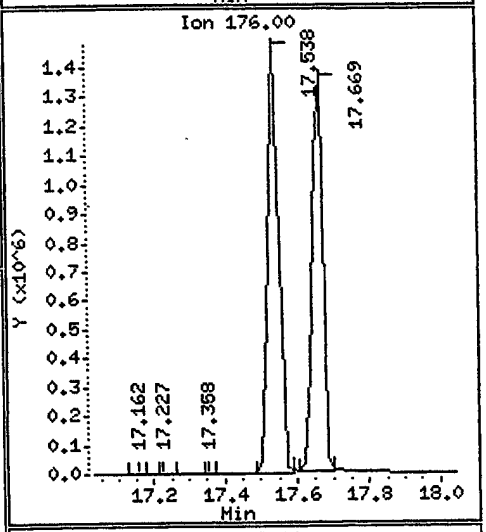


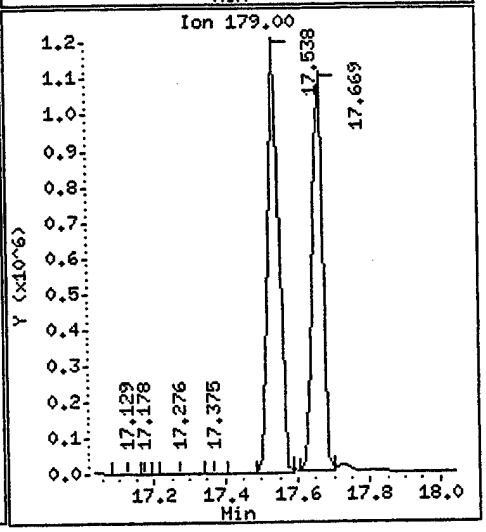












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

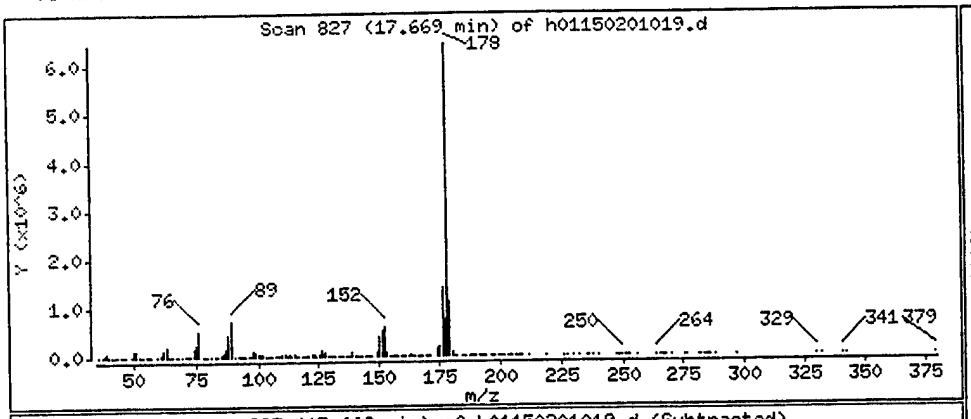
Operator: jgh

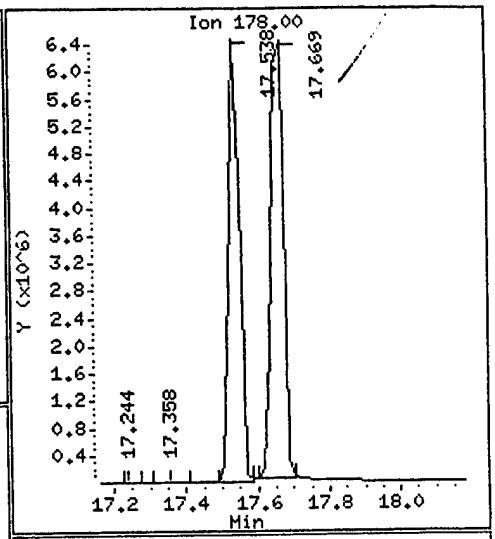
Column phase:

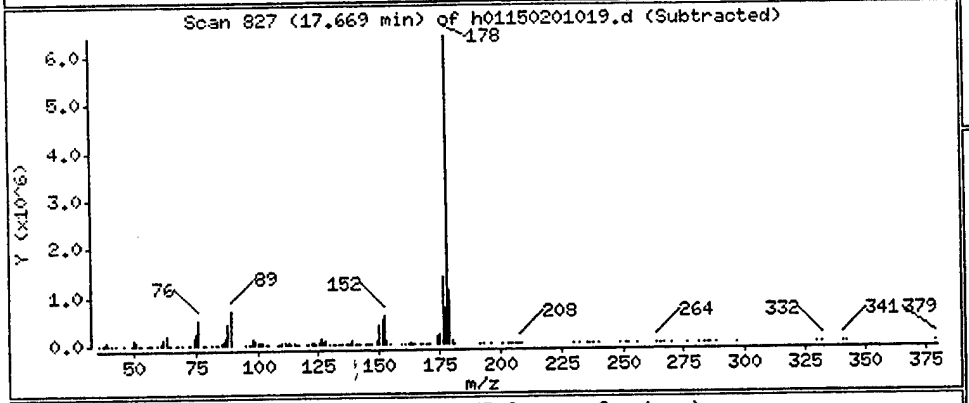
Column diameter: 2.00

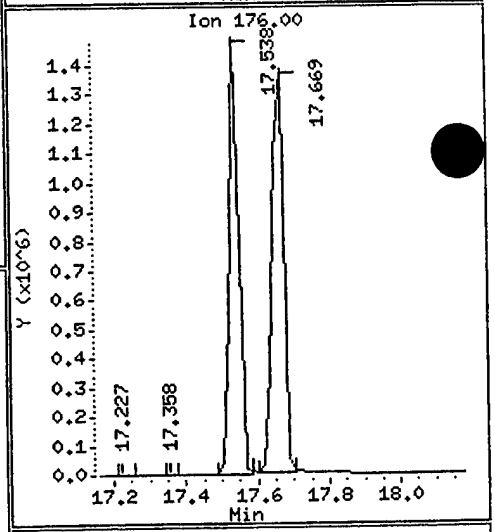
73 Anthracene

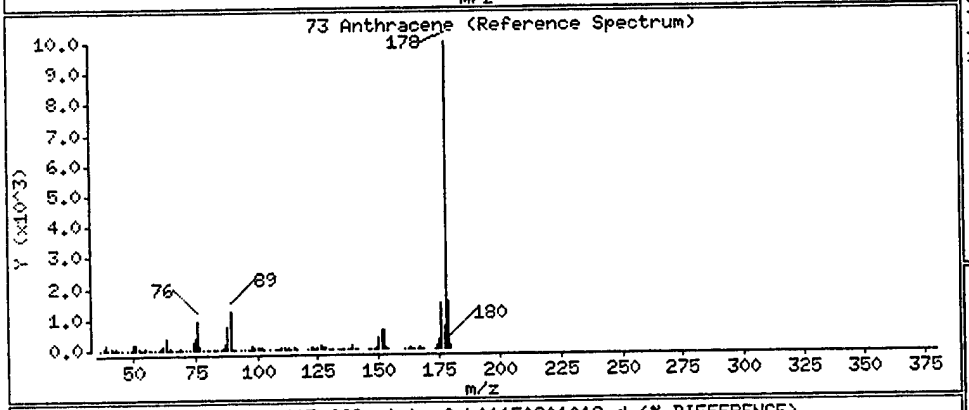
Concentration: 88.3 ug

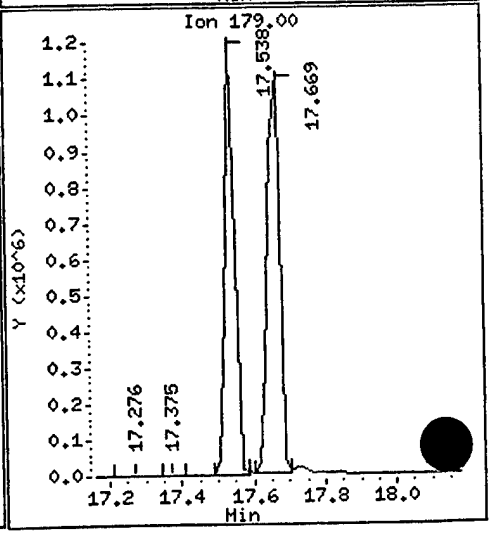


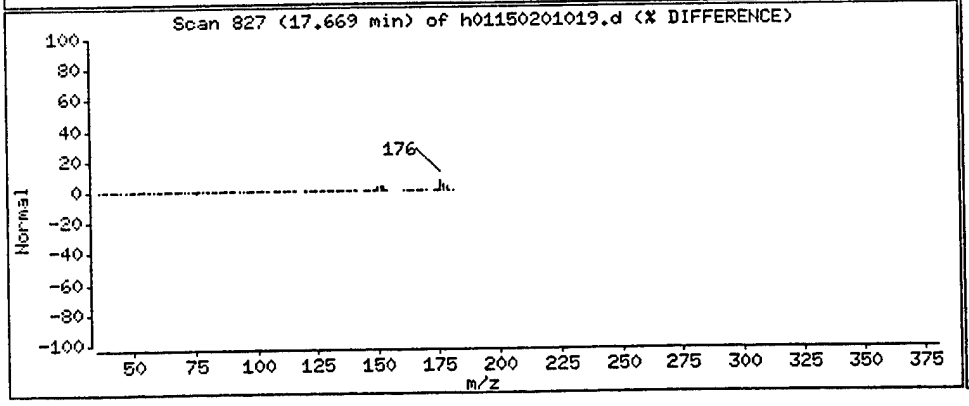












Data File: /chem/msdh.i/h-15Jan98.b/h0115020l019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

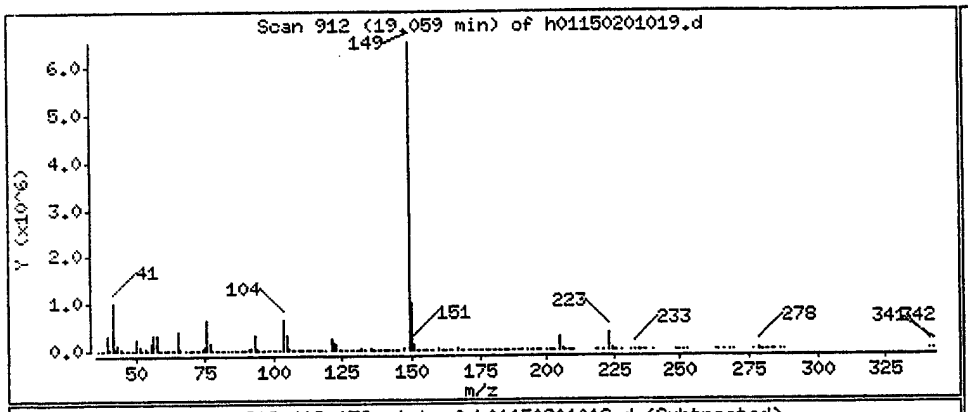
Operator: jgh

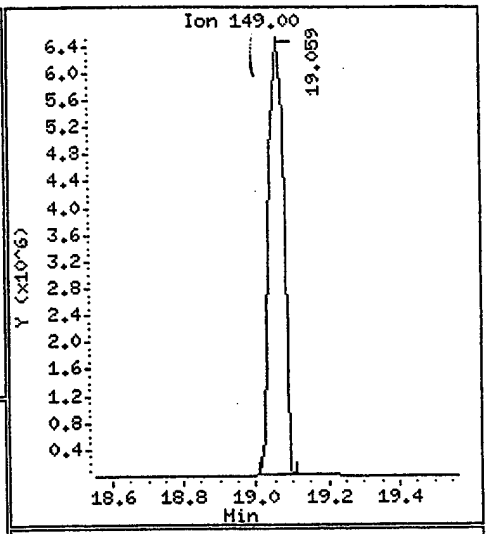
Column phase:

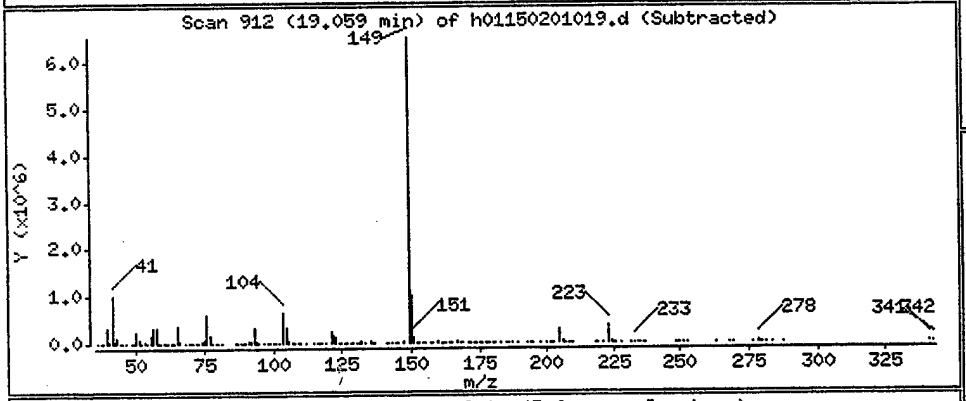
Column diameter: 2.00

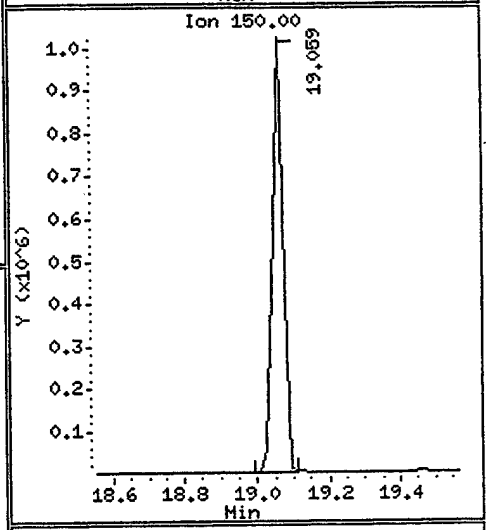
78 Di-n-butylphthalate

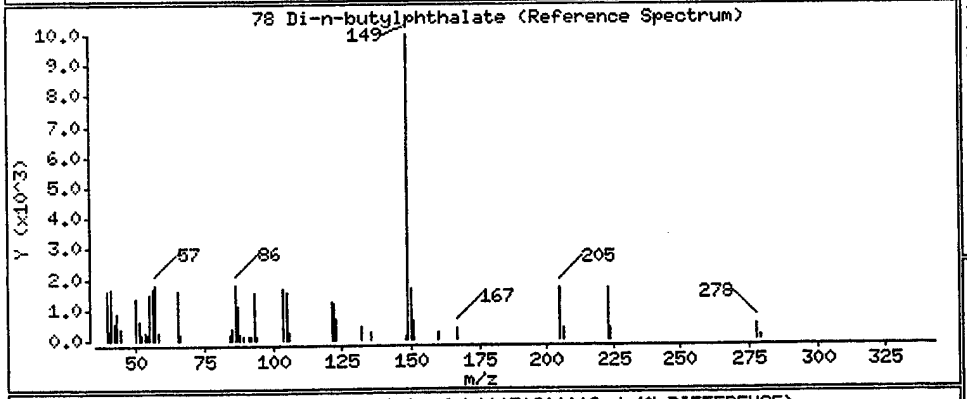
Concentration: 69.8 ug

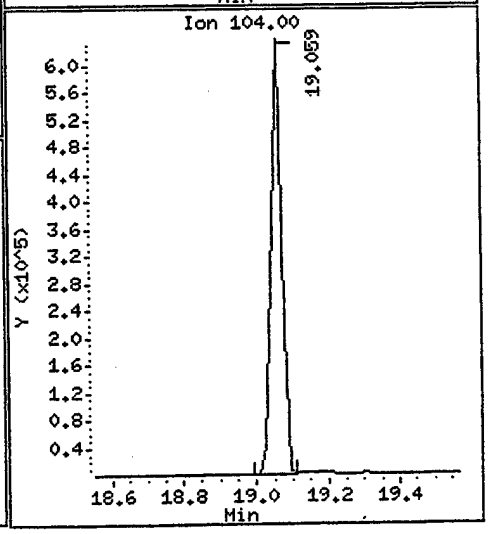


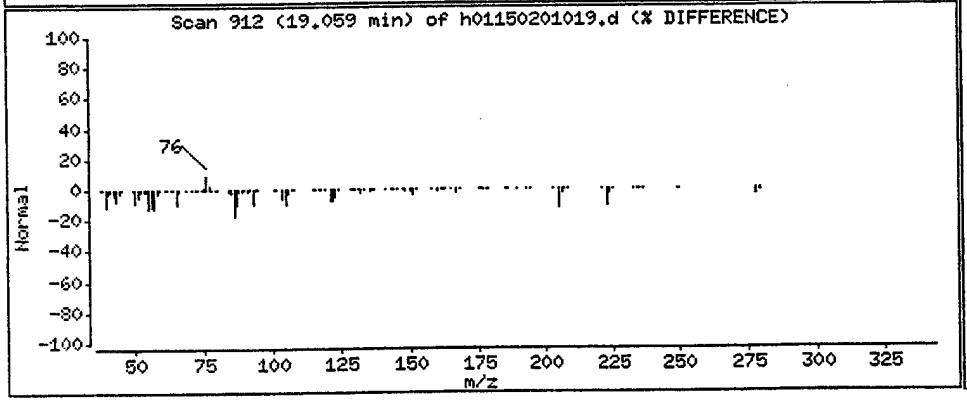












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

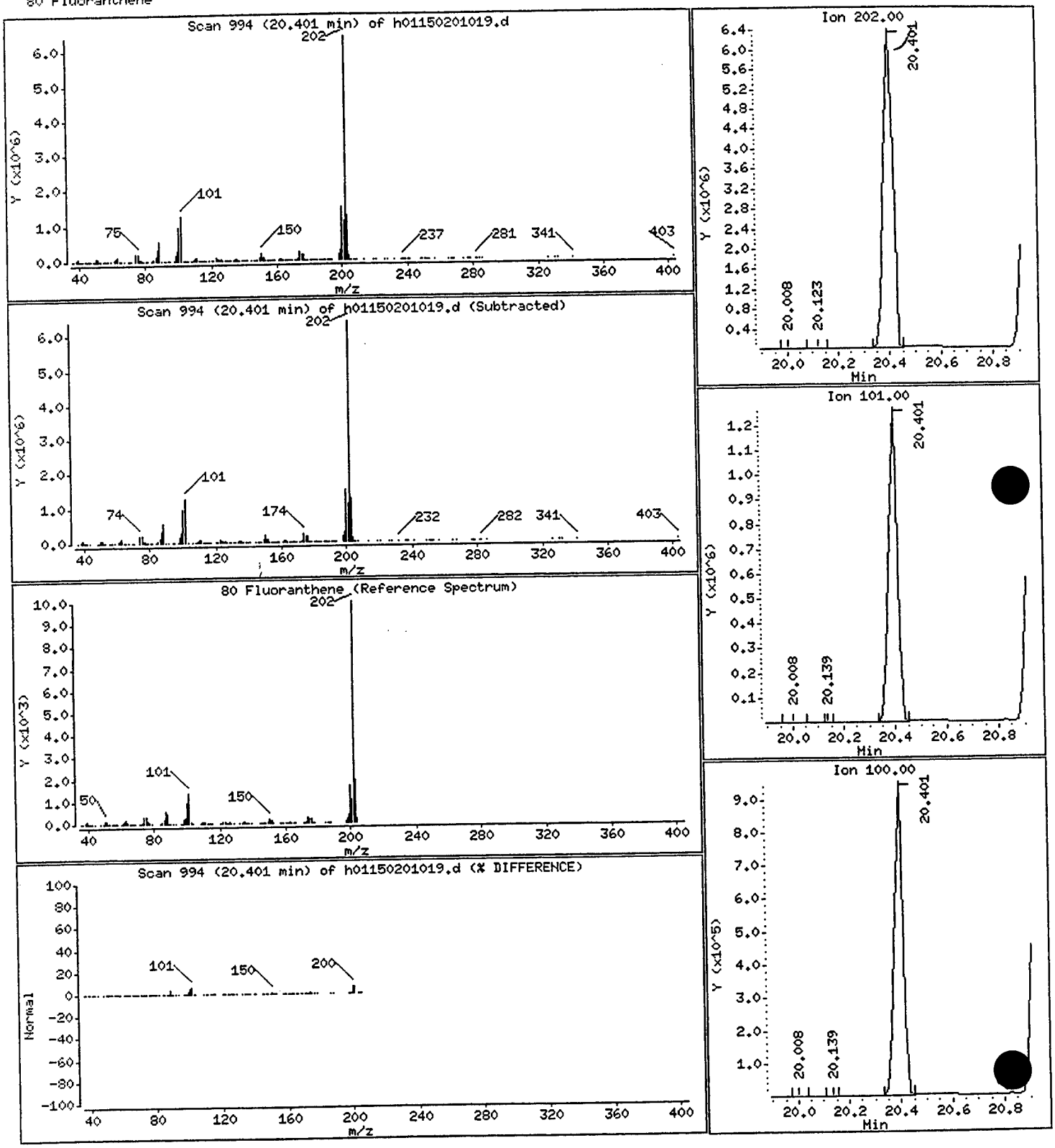
Operator: jgh

Column phase:

Column diameter: 2.00

80 Fluoranthene

Concentration: 85.7 ug



Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

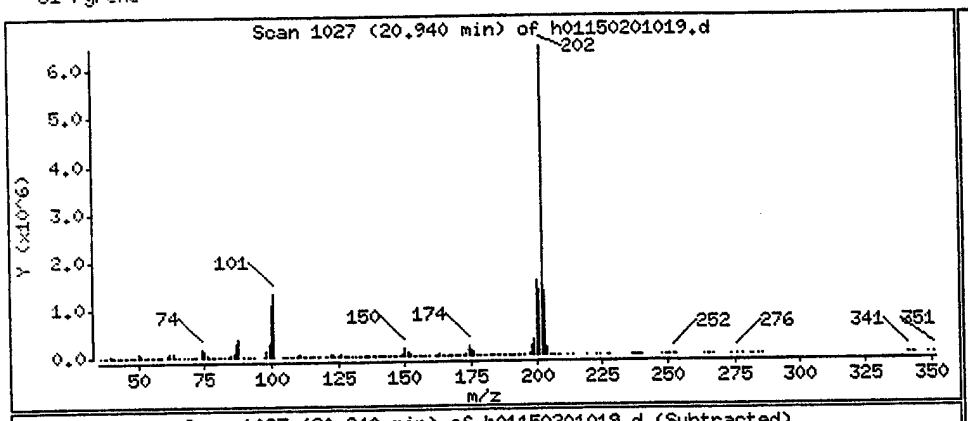
Operator: jgh

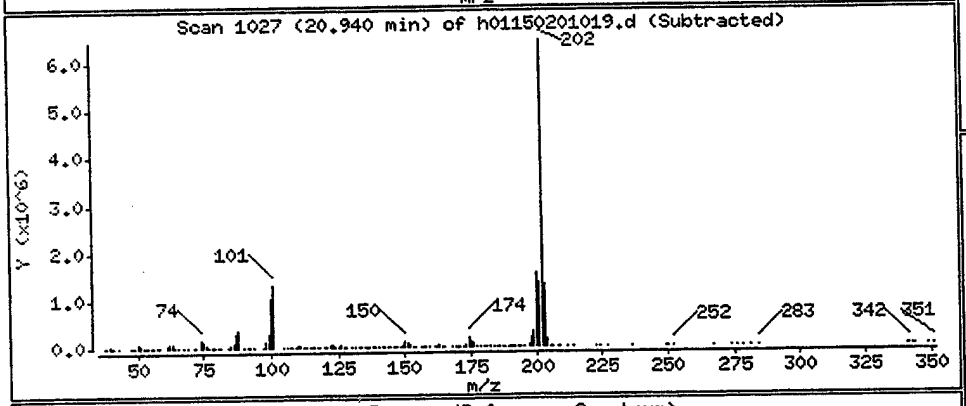
Column phase:

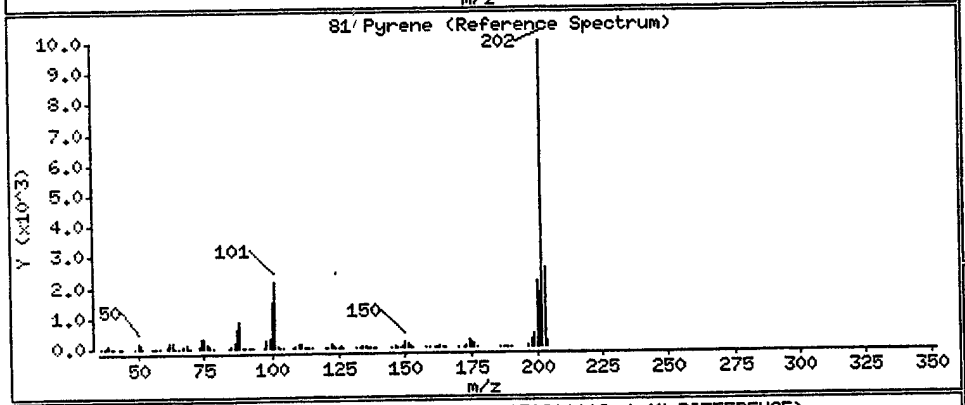
Column diameter: 2.00

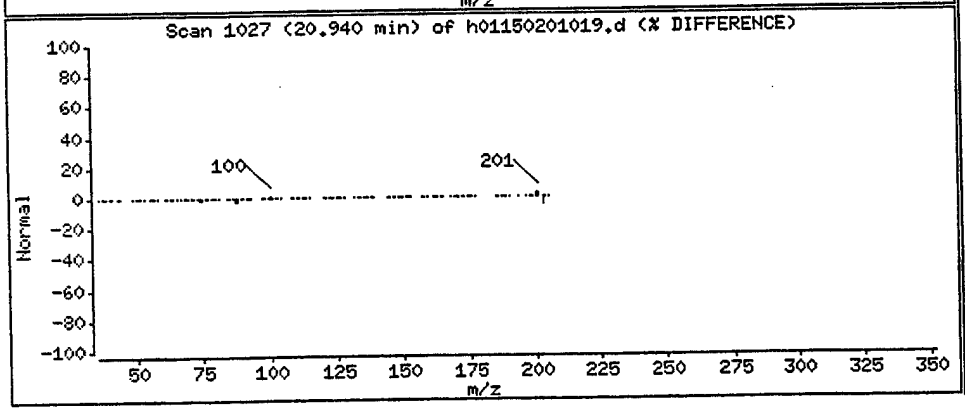
81 Pyrene

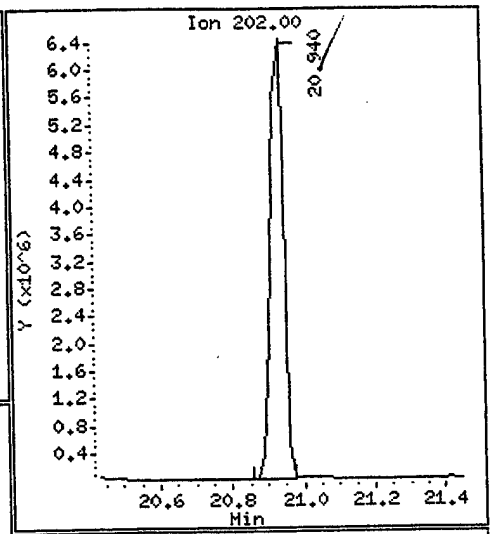
Concentration: 78.7 ug

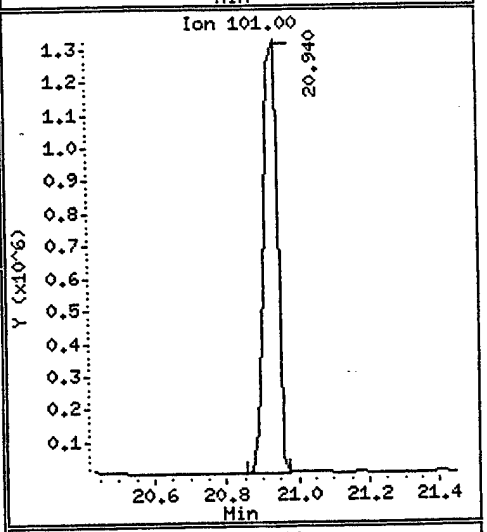


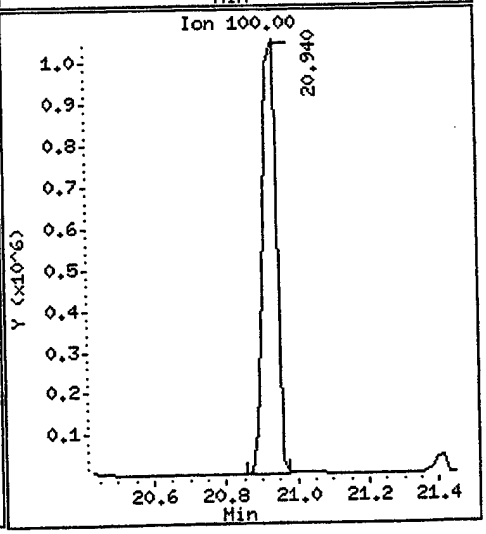












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

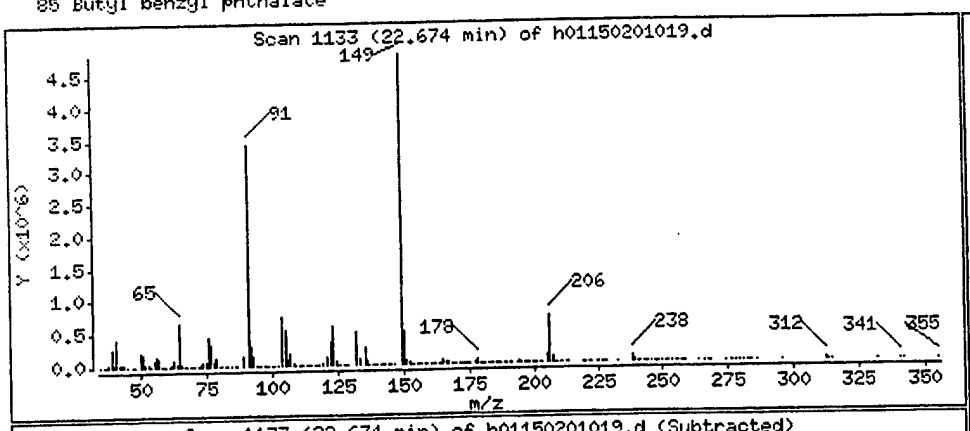
Operator: jgh

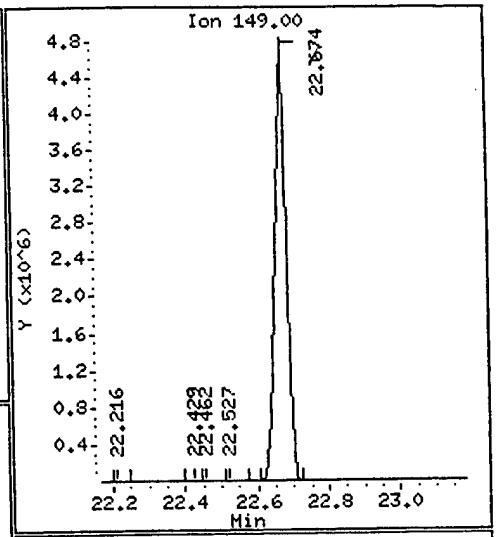
Column phase:

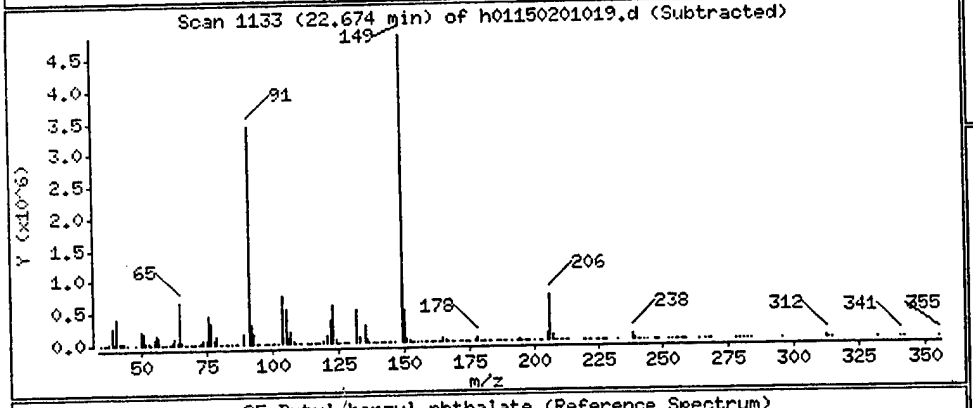
Column diameter: 2.00

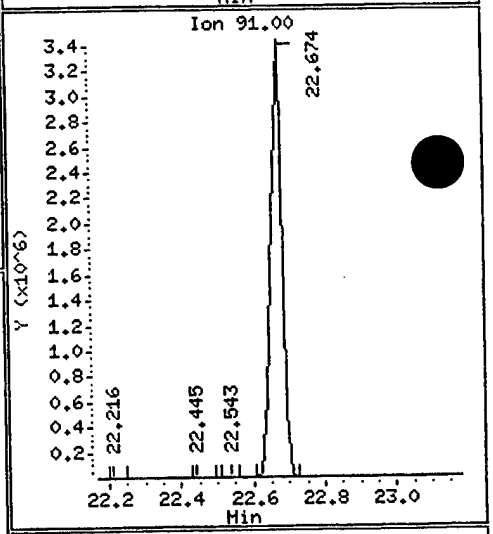
85 Butyl benzyl phthalate

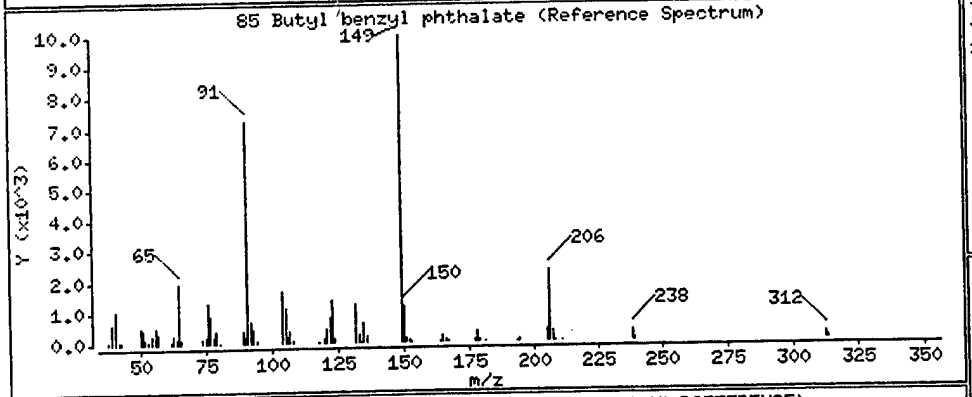
Concentration: 79.6 ug

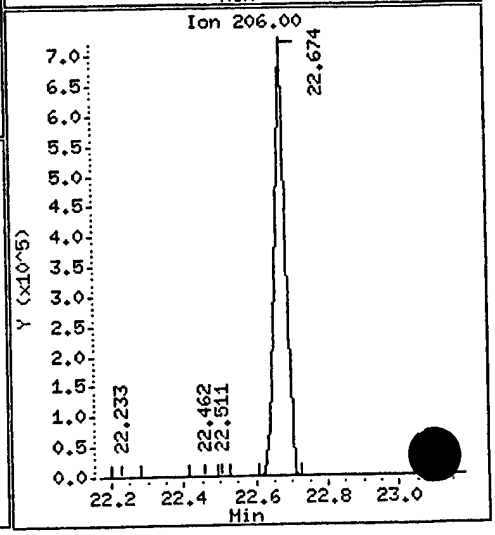


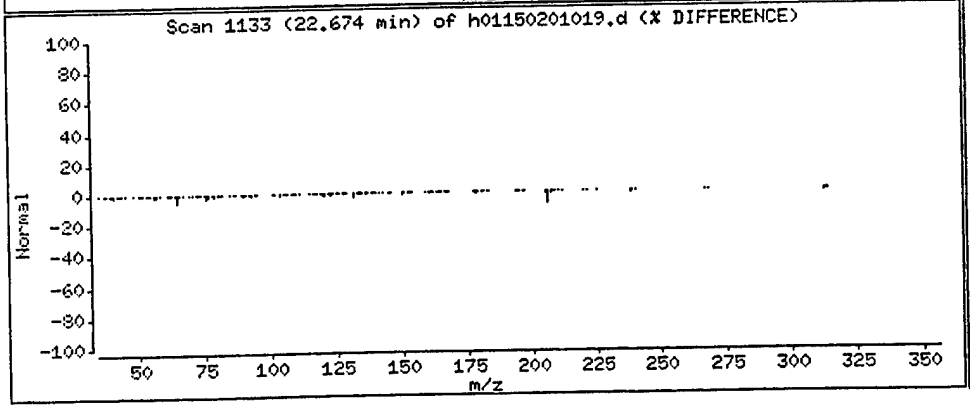












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

621

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

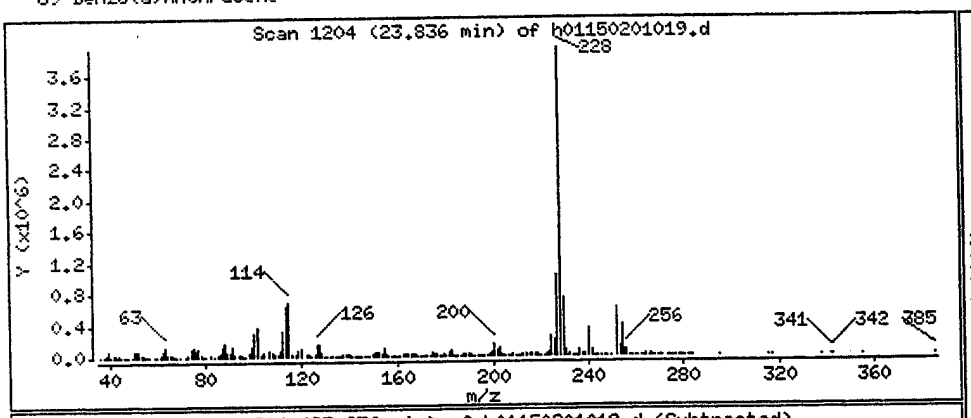
Operator: jgh

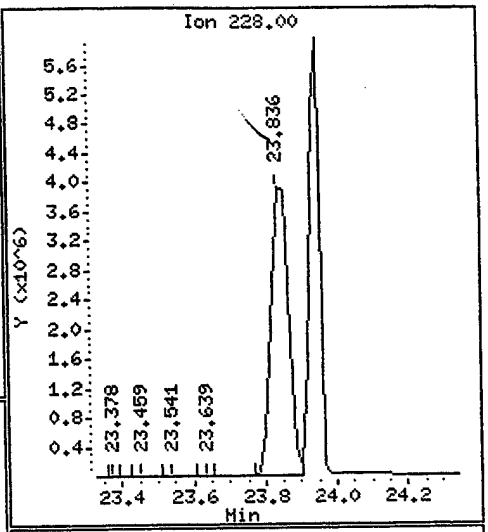
Column phase:

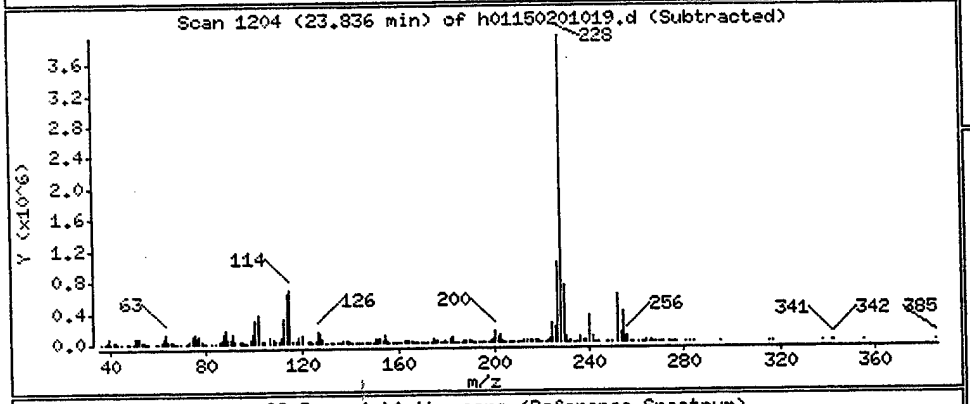
Column diameter: 2.00

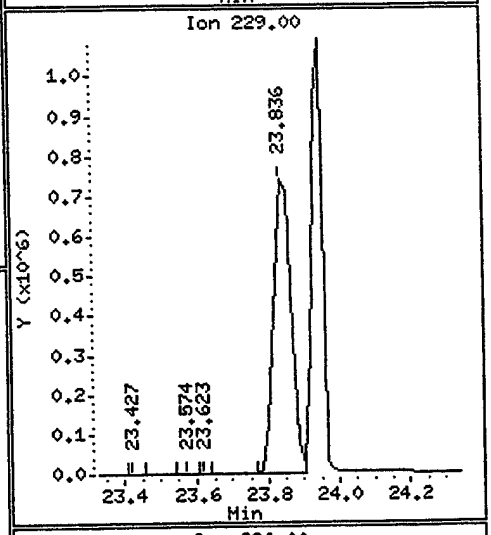
89 Benzo(a)Anthracene

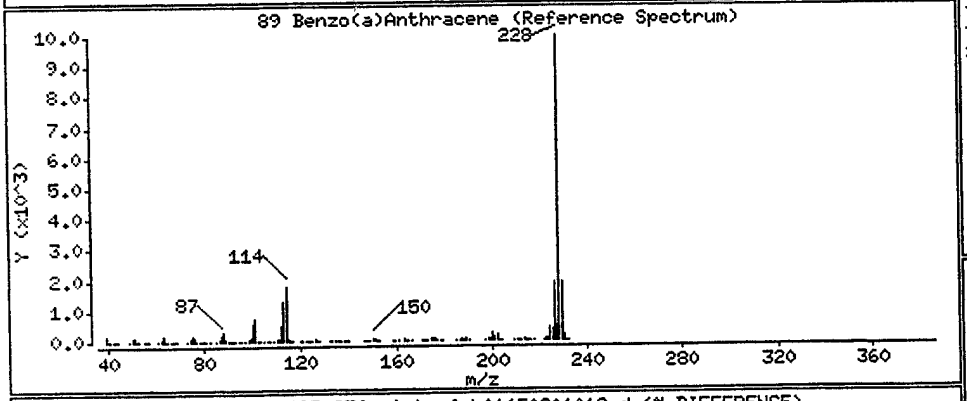
Concentration: 84.0 ug

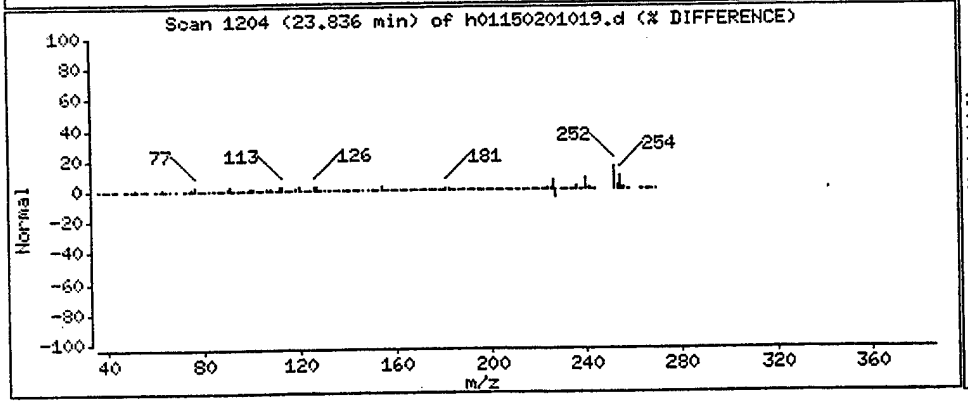


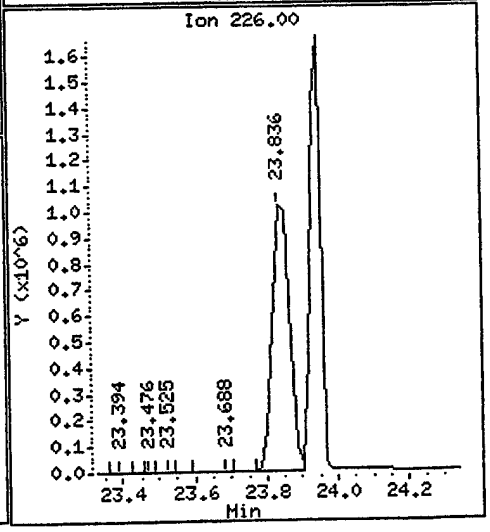












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

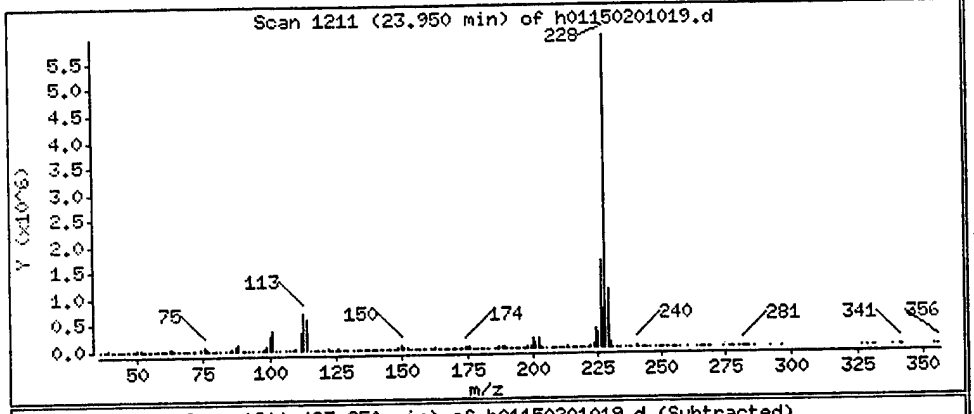
Operator: jgh

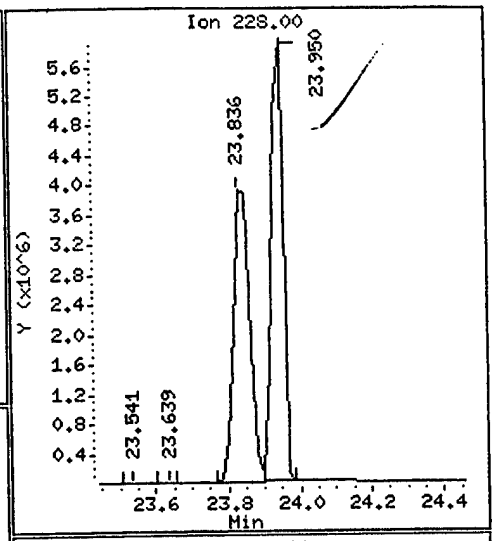
Column phase:

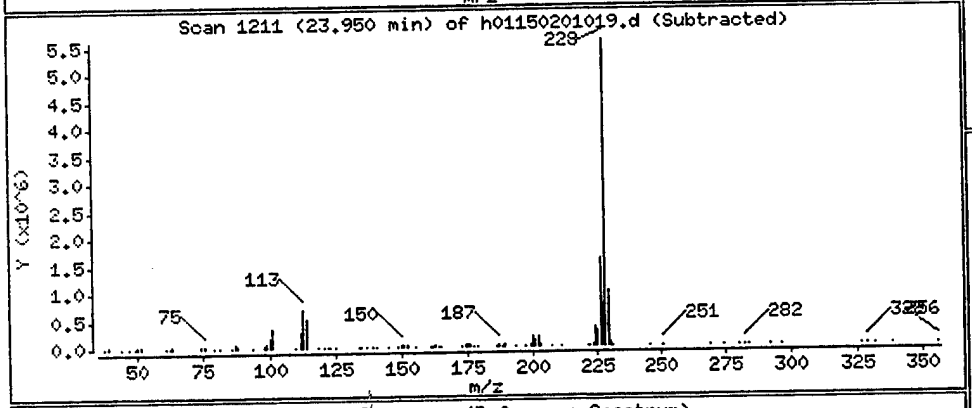
Column diameter: 2.00

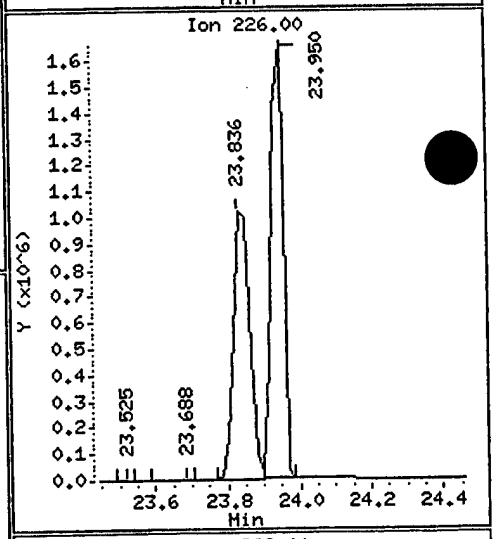
91 Chrysene

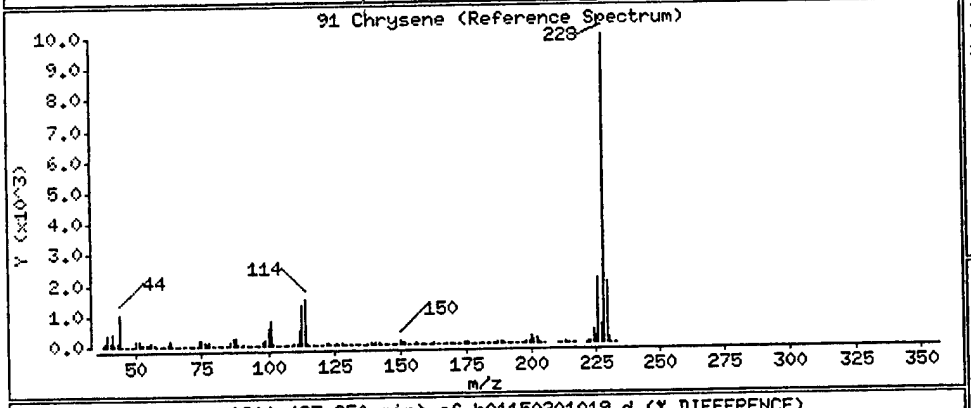
Concentration: 94.6 ug

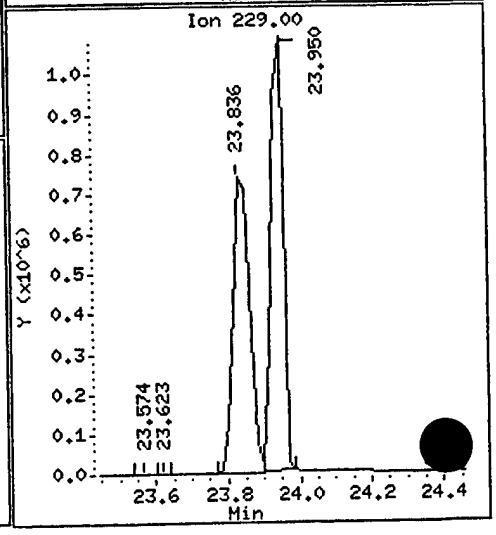


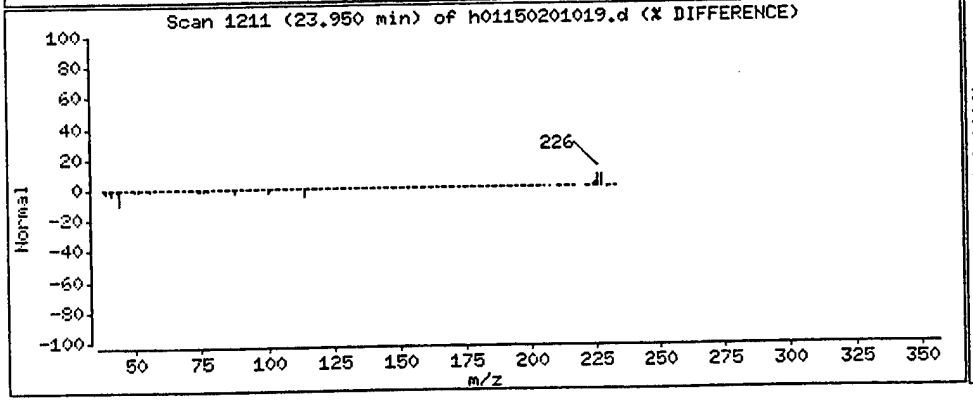












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

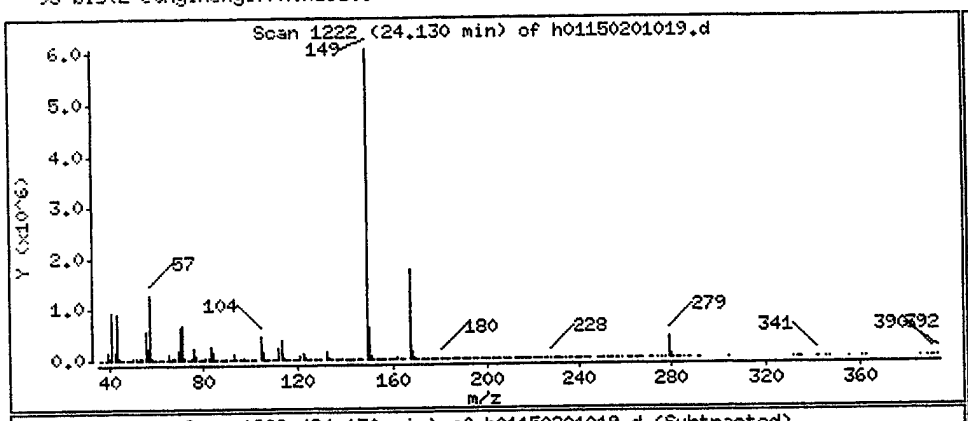
Operator: jgh

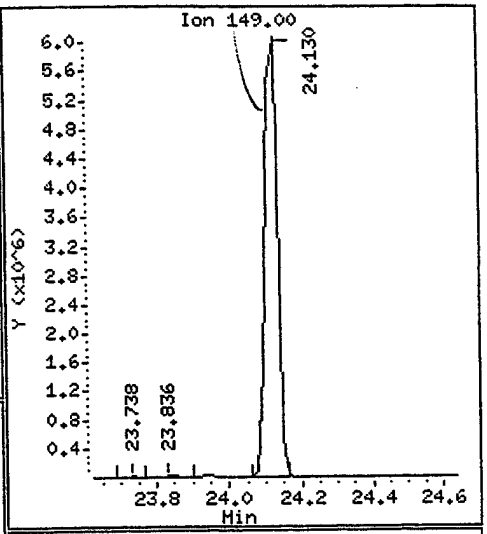
Column phase:

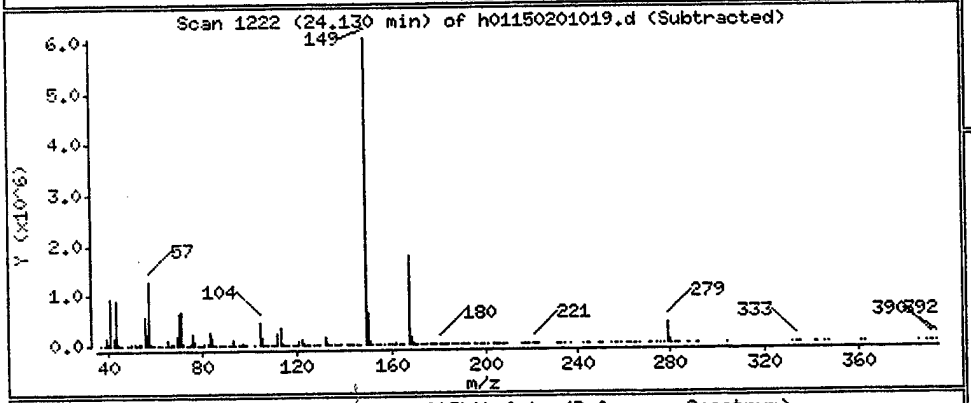
Column diameter: 2.00

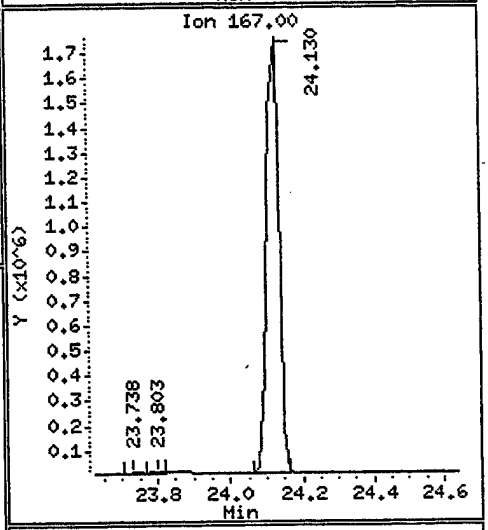
93 bis(2-ethylhexyl)Phthalate

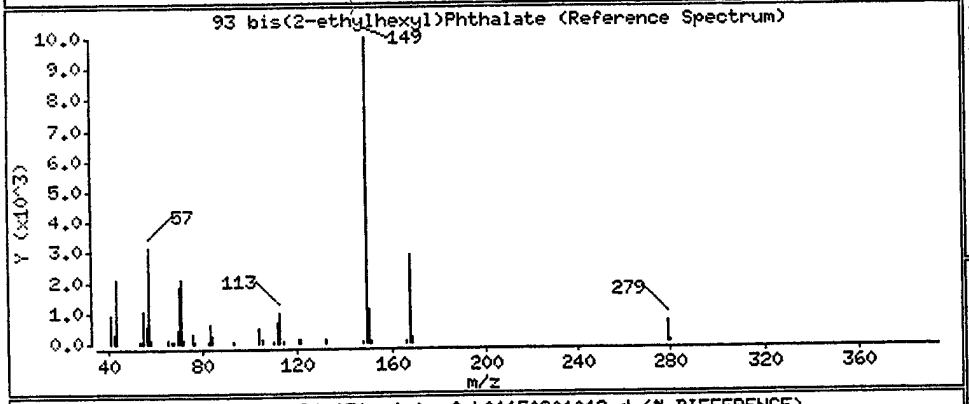
Concentration: 91.6 ug

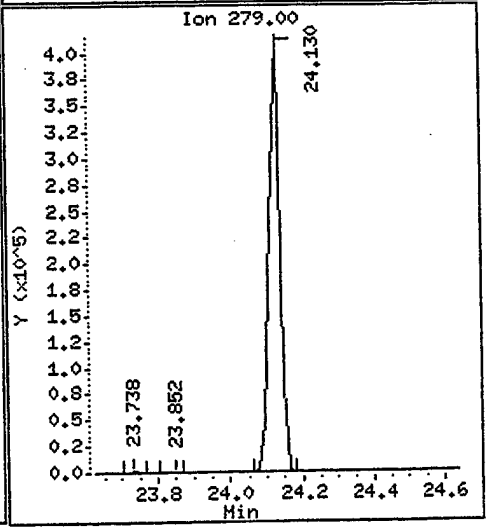


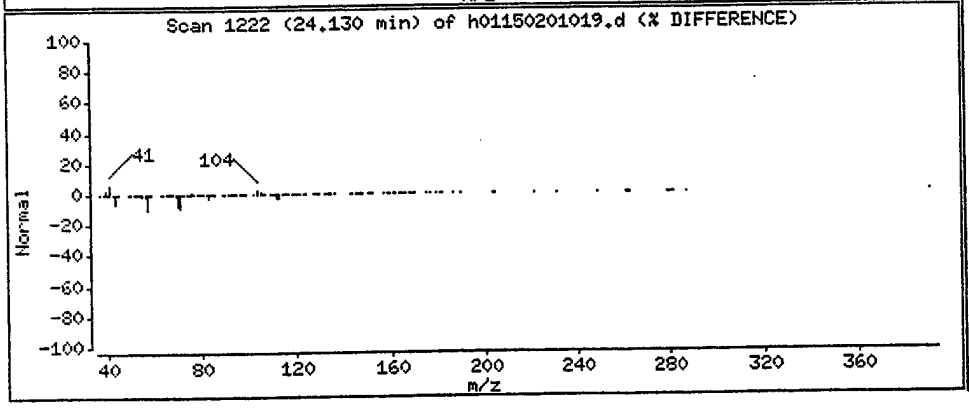












624

Data File: /chem/msdh.i/h-15Jan98.b/h0115020l019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

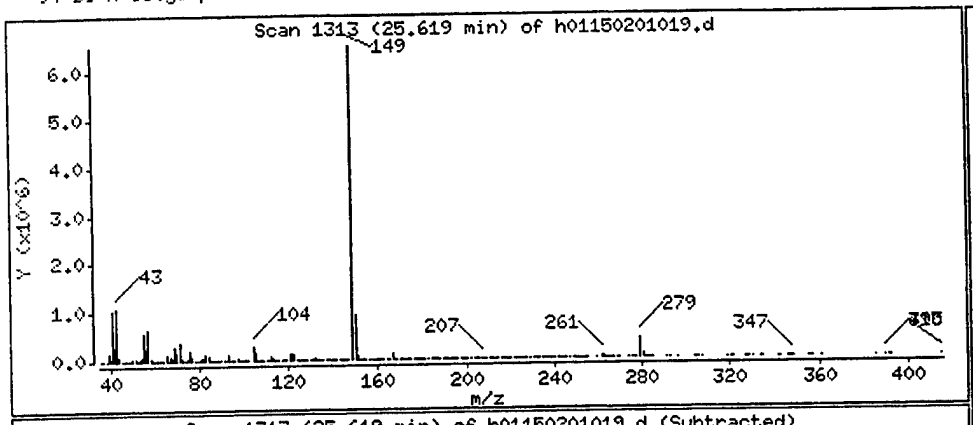
Operator: jgh

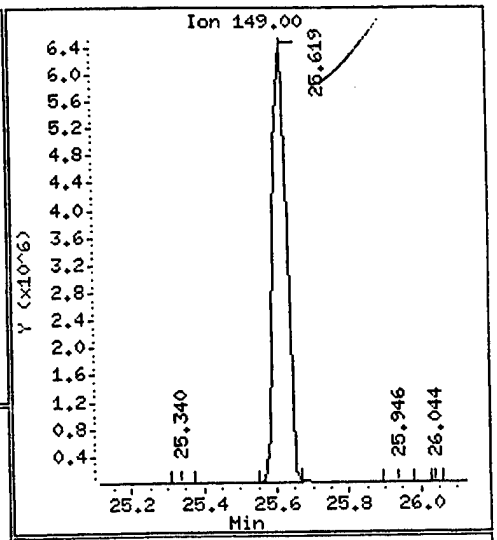
Column phase:

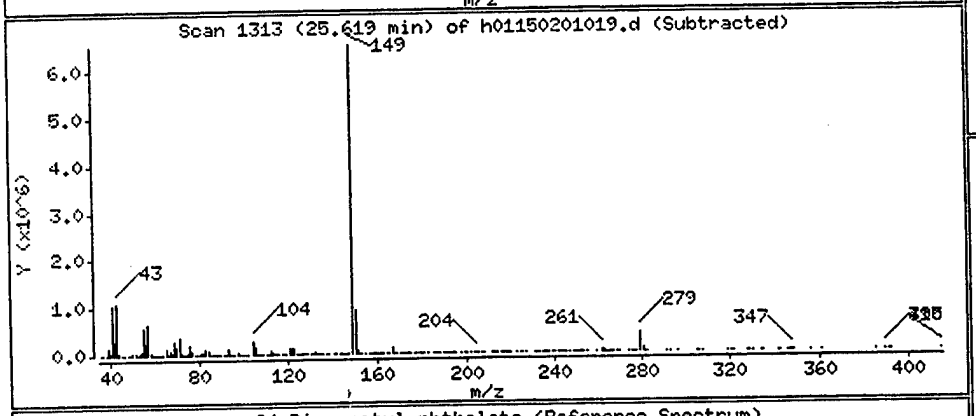
Column diameter: 2.00

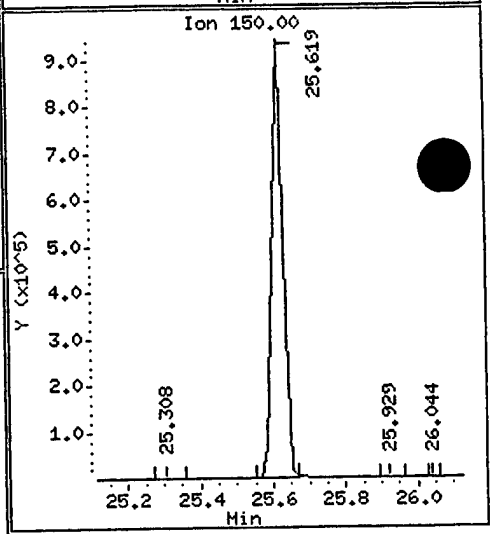
94 Di-n-octyl phthalate

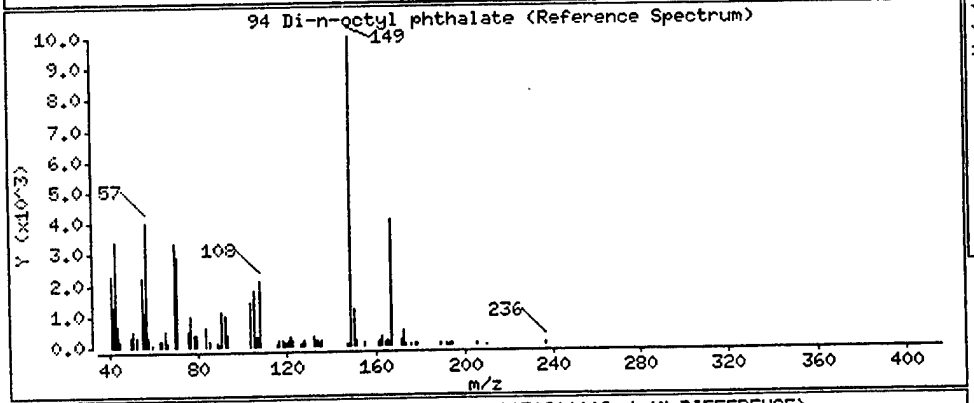
Concentration: 79.4 ug

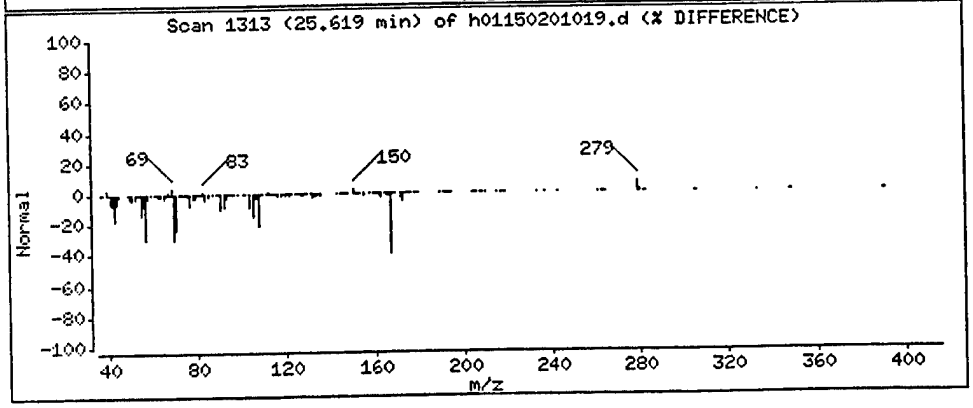












625

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

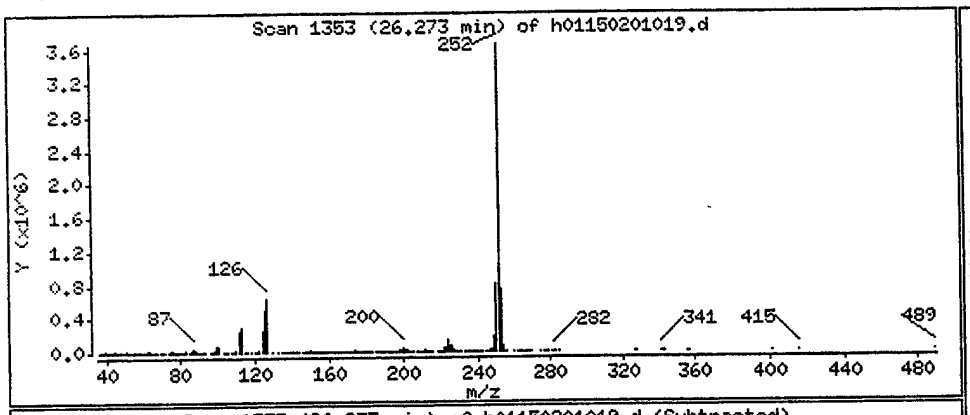
Operator: jgh

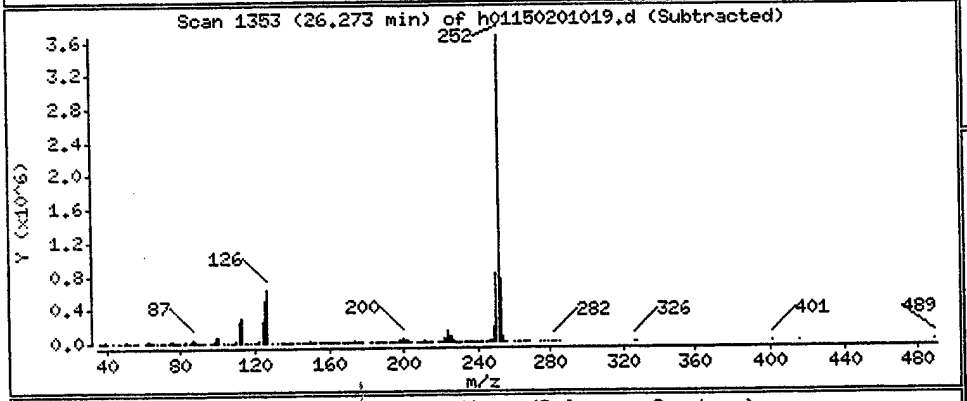
Column phase:

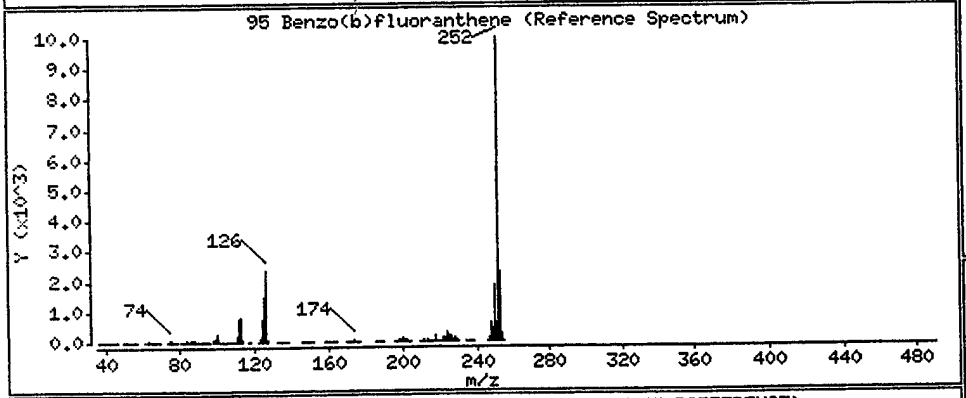
Column diameter: 2.00

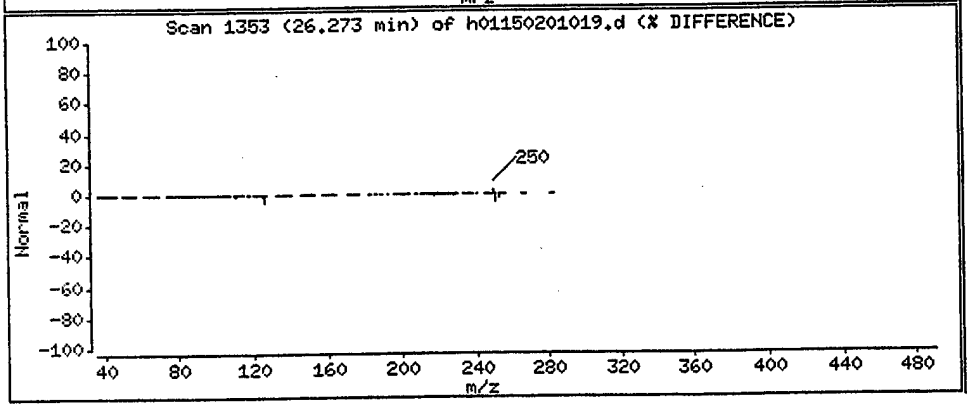
95 Benzo(b)fluoranthene

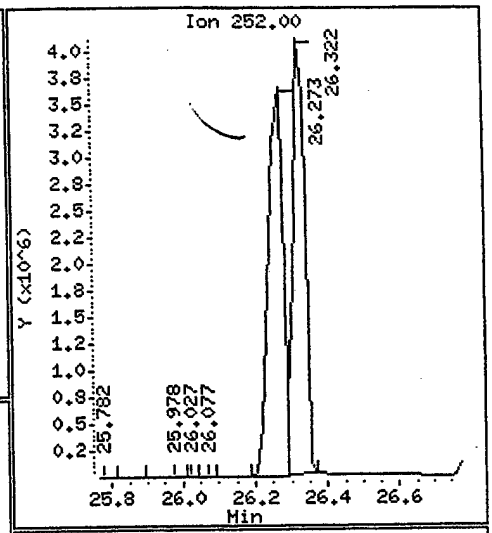
Concentration: 80.0 ug

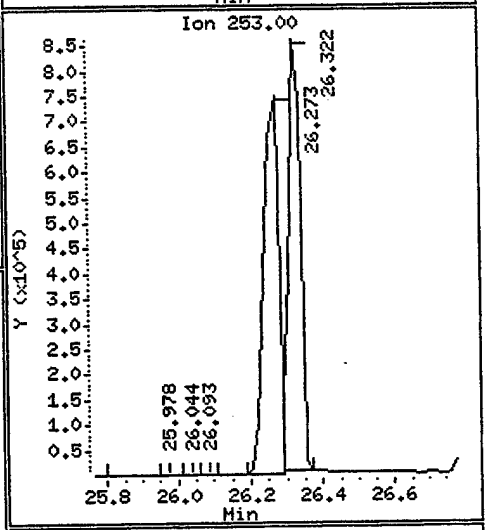


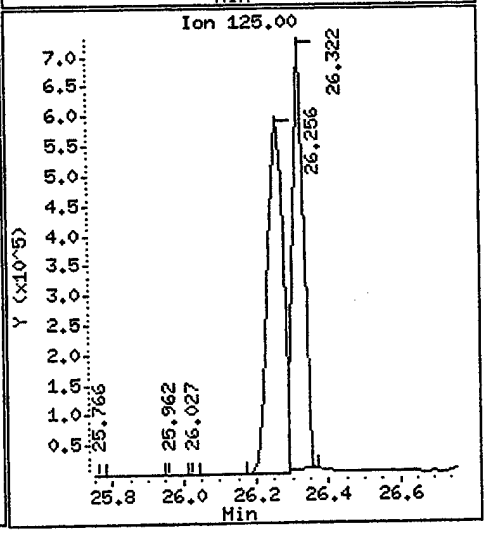












626A

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

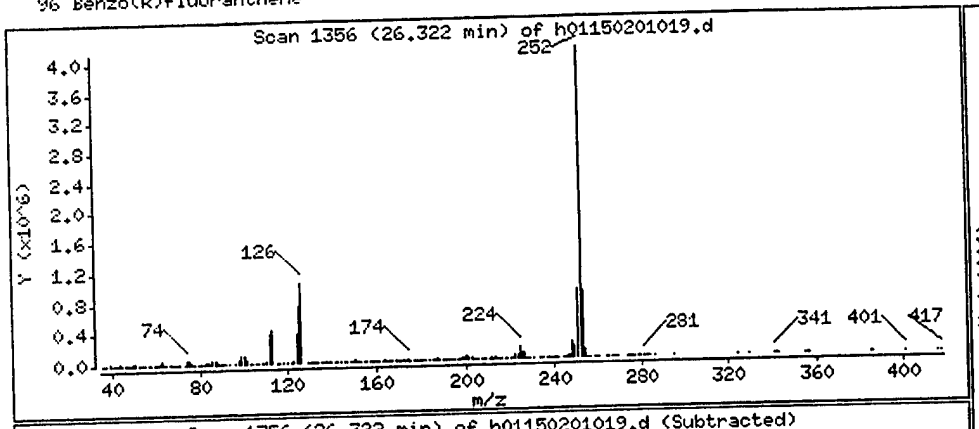
Operator: jgh

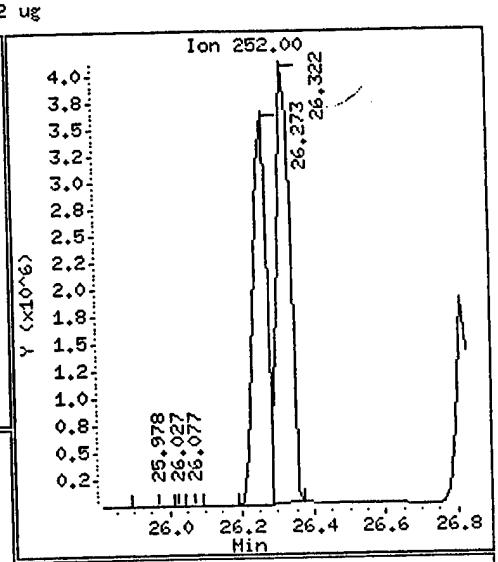
Column phase:

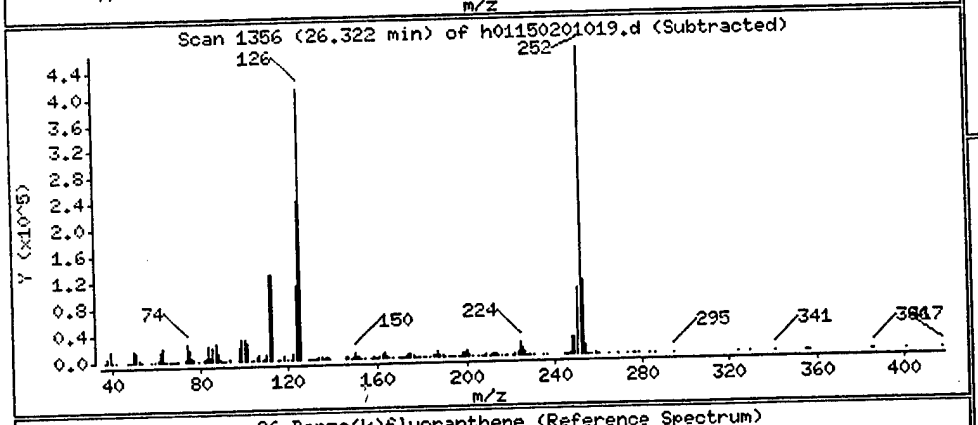
Column diameter: 2.00

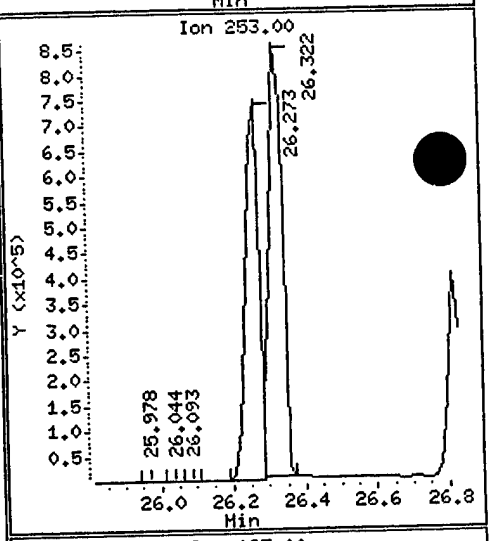
Concentration: 94.2 ug

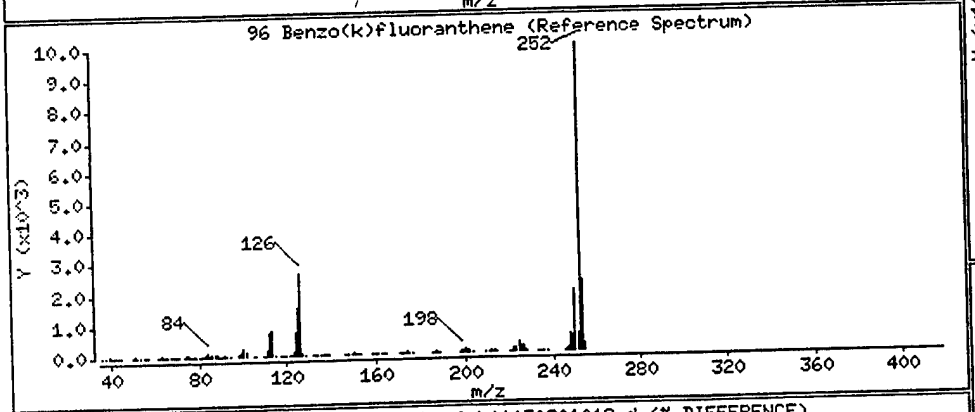
96 Benzo(k)fluoranthene

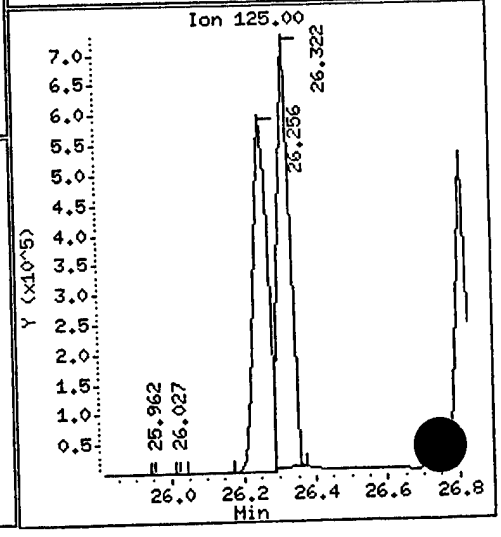


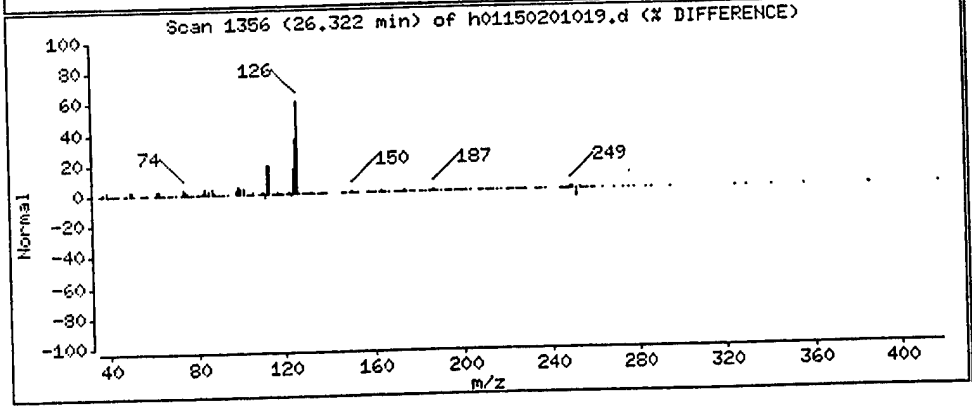












626B

Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

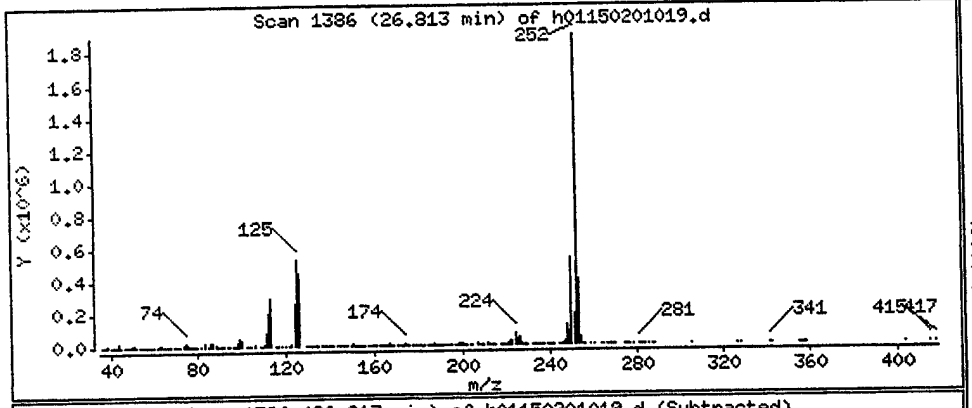
Operator: jgh

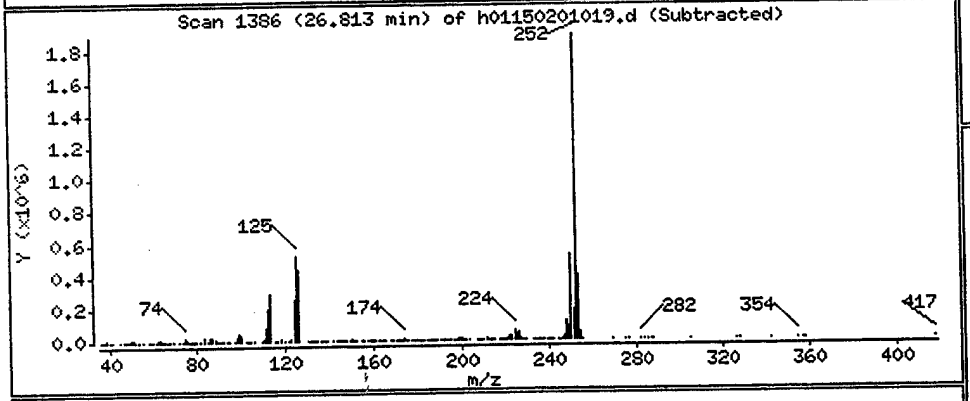
Column phase:

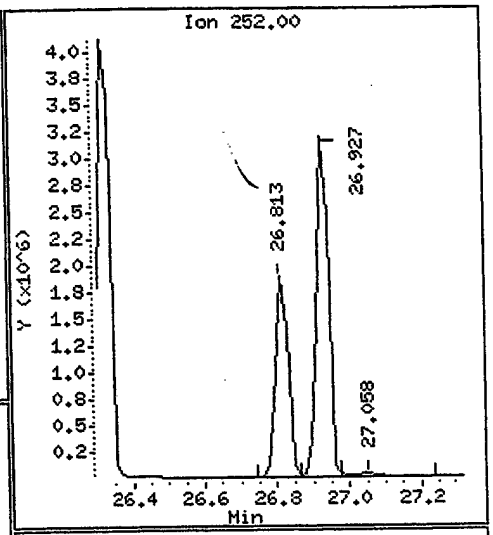
Column diameter: 2.00

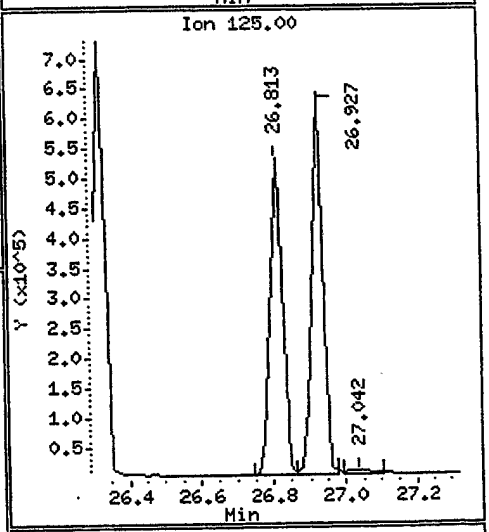
97 Benzo(e)pyrene

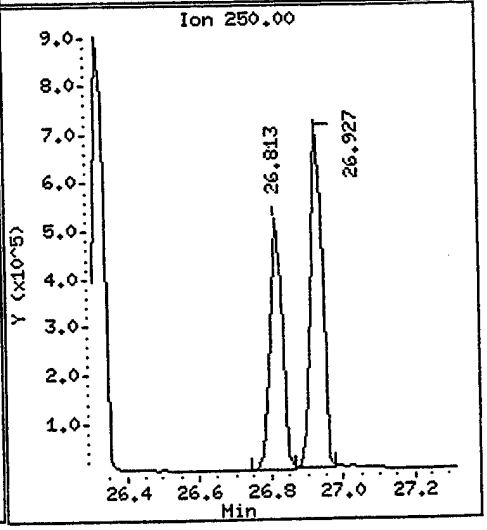
Concentration: 39.8 ug











Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

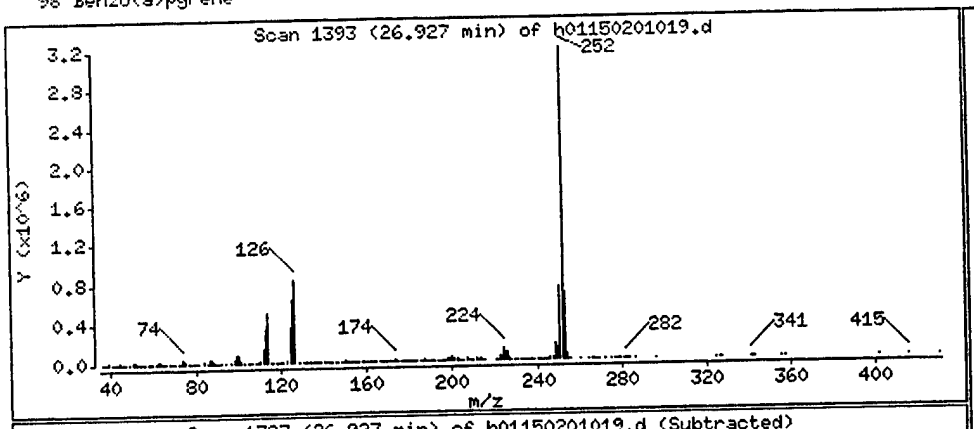
Operator: jgh

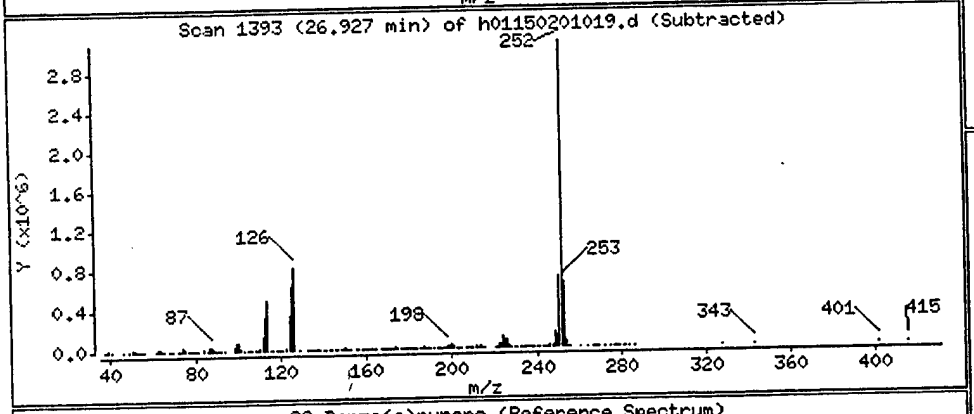
Column phase:

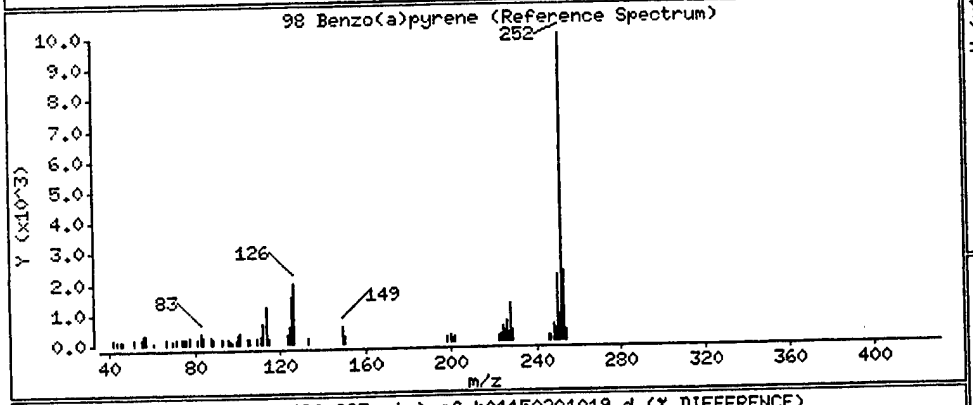
Column diameter: 2.00

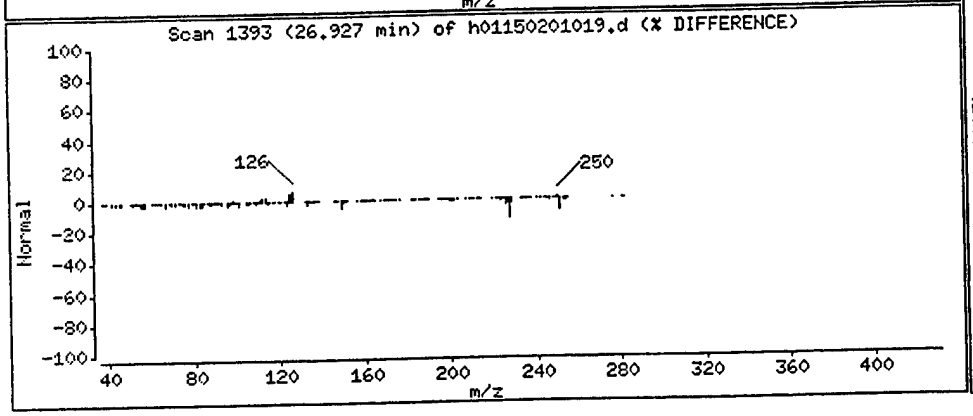
Concentration: 82.6 ug

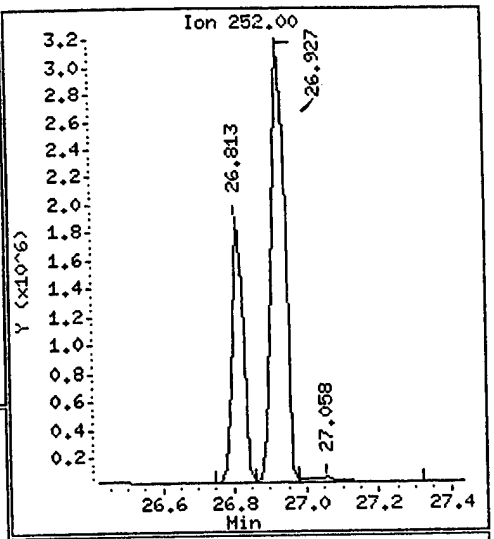
98 Benzo(a)pyrene

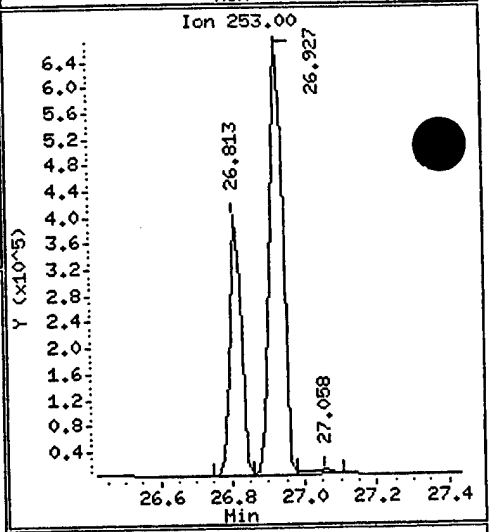


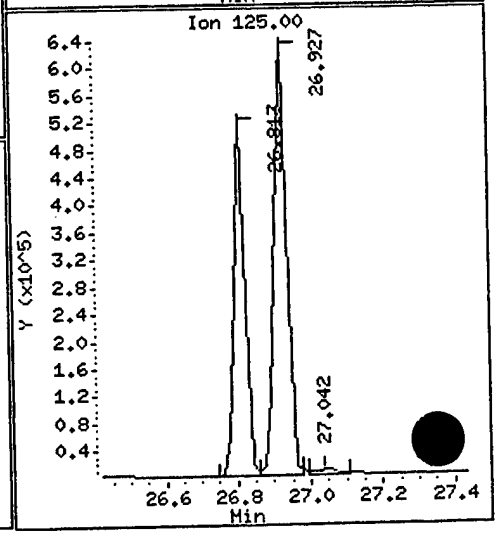












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

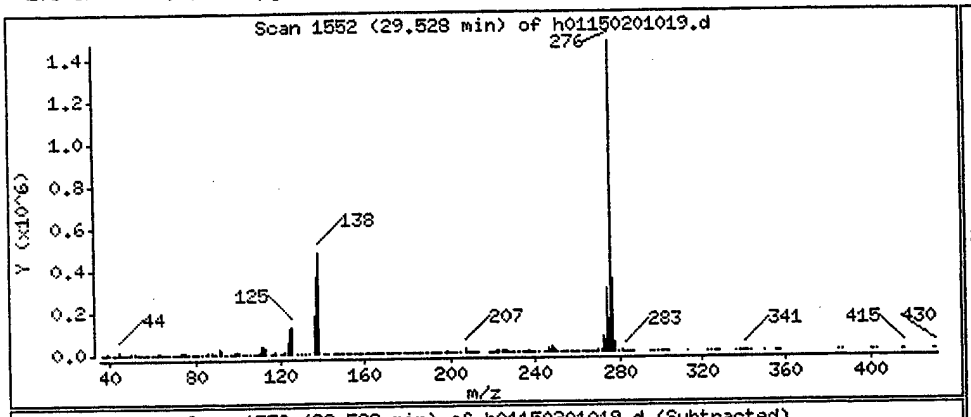
Operator: jgh

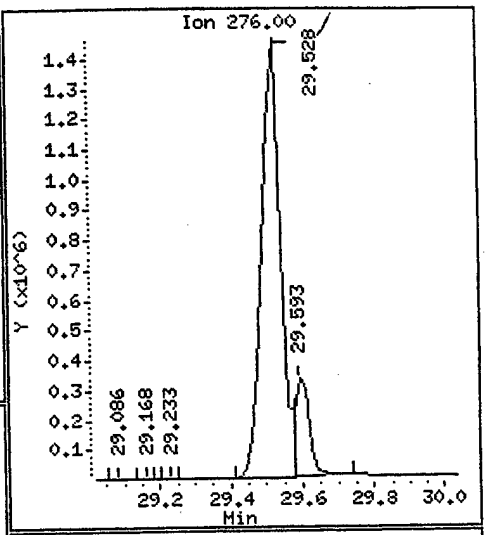
Column phase:

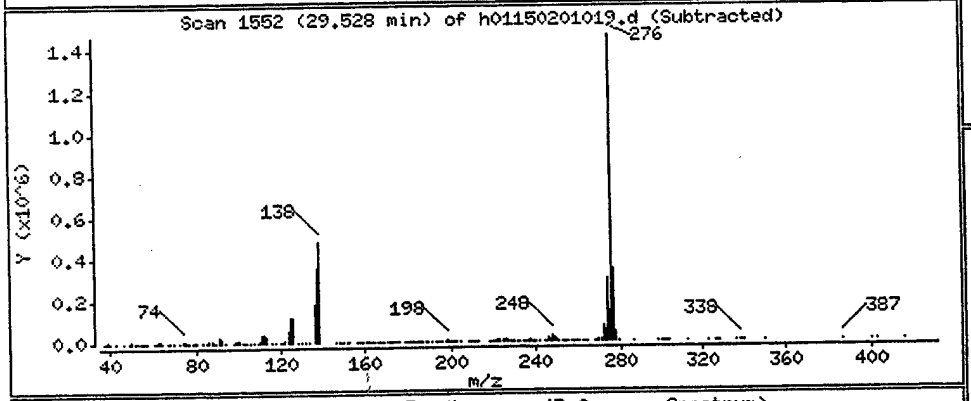
Column diameter: 2.00

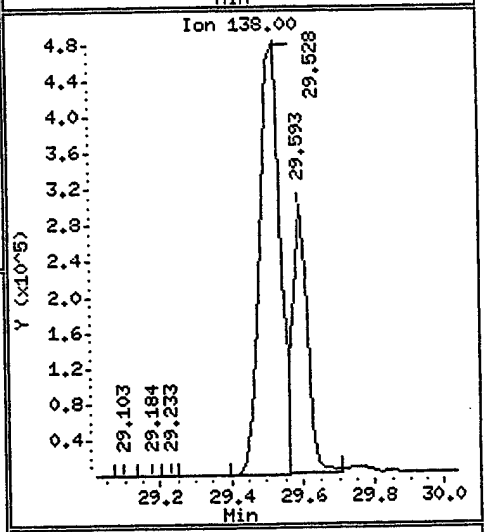
103 Indeno(1,2,3-cd)pyrene

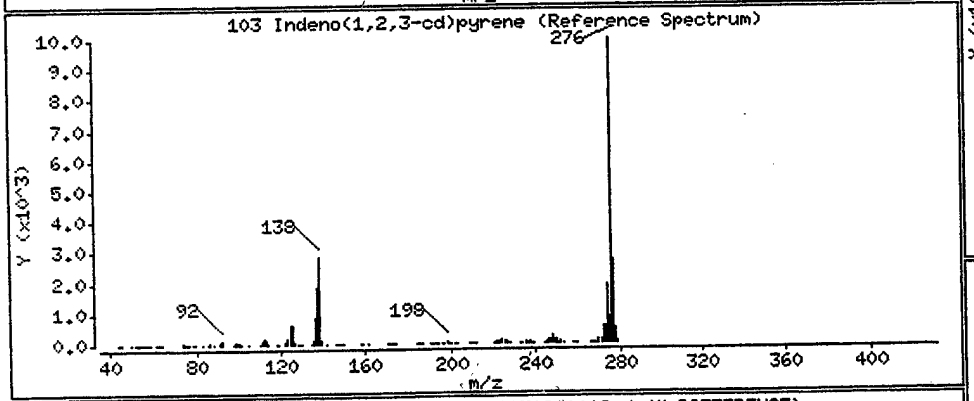
Concentration: 83.4 ug

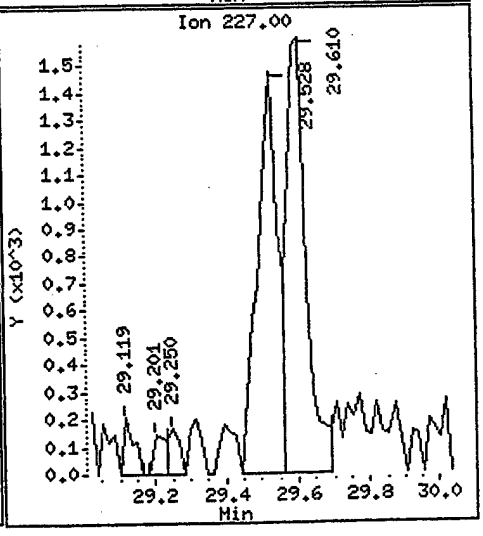


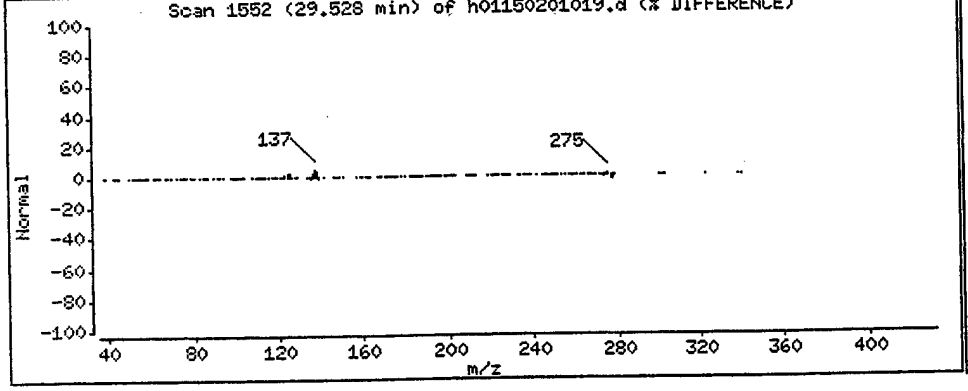












Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

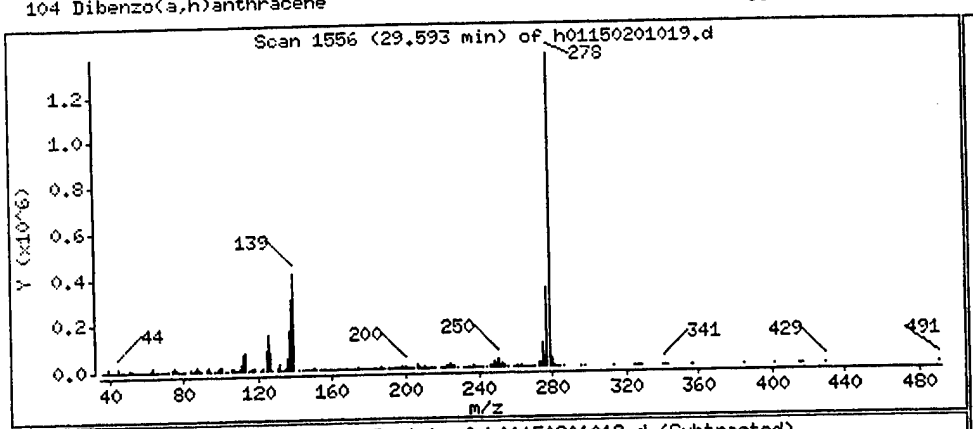
Operator: jgh

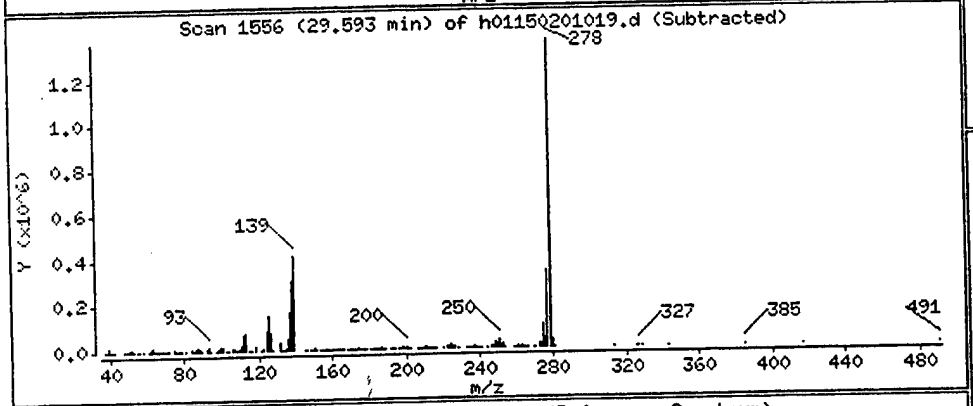
Column phase:

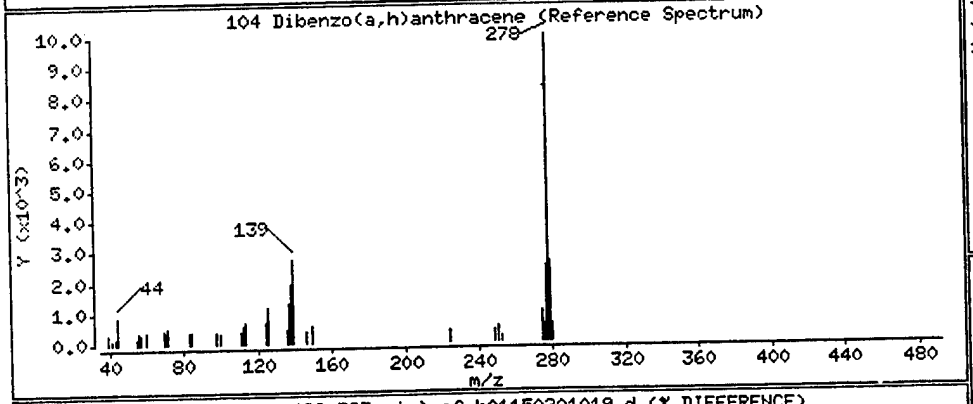
Column diameter: 2.00

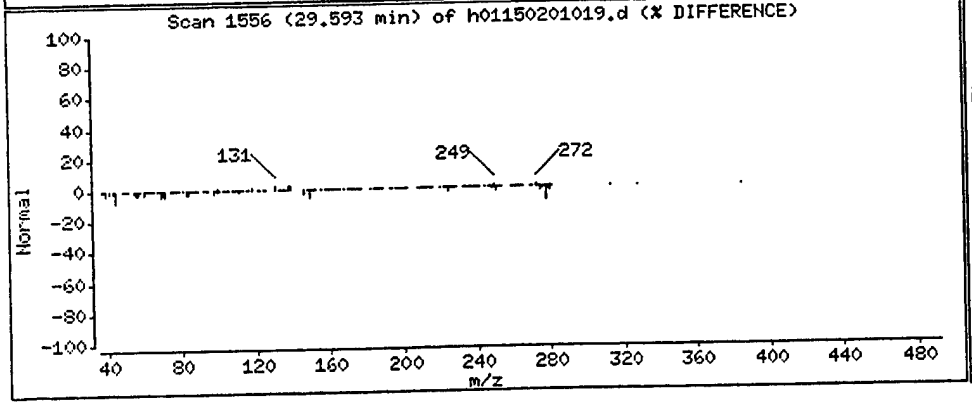
Concentration: 82.4 ug

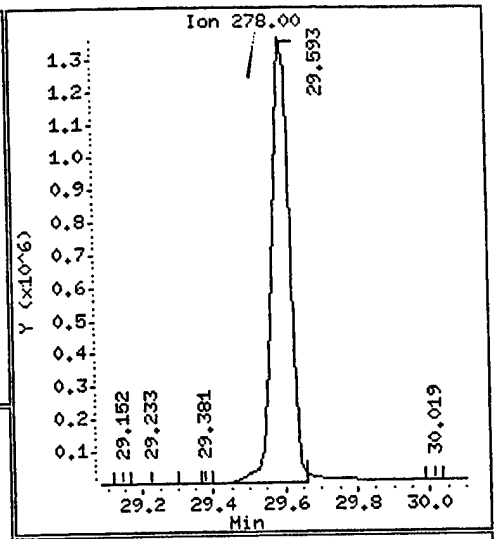
104 Dibenzo(a,h)anthracene

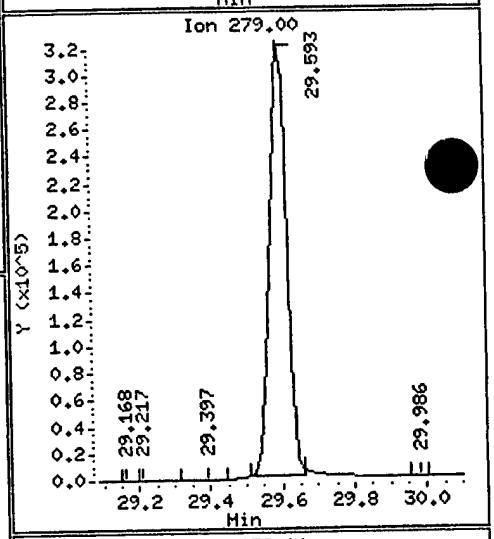


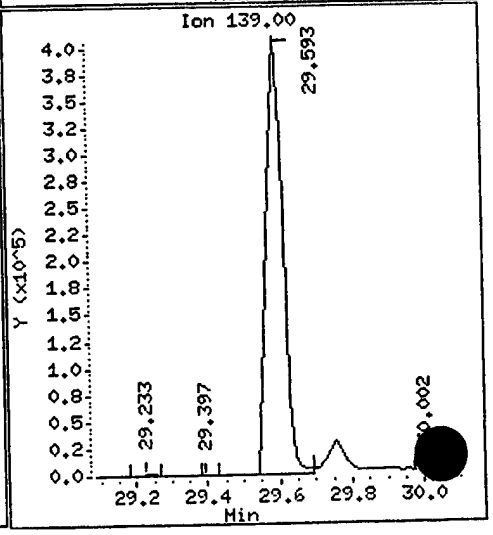












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Data File: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Date : 15-JAN-1998 18:36

Client ID: Method Spike

Instrument: msdh.i

Sample Info: 1.0ul 80ug Method Spike 396-4-80

Volume Injected (uL): 1.0

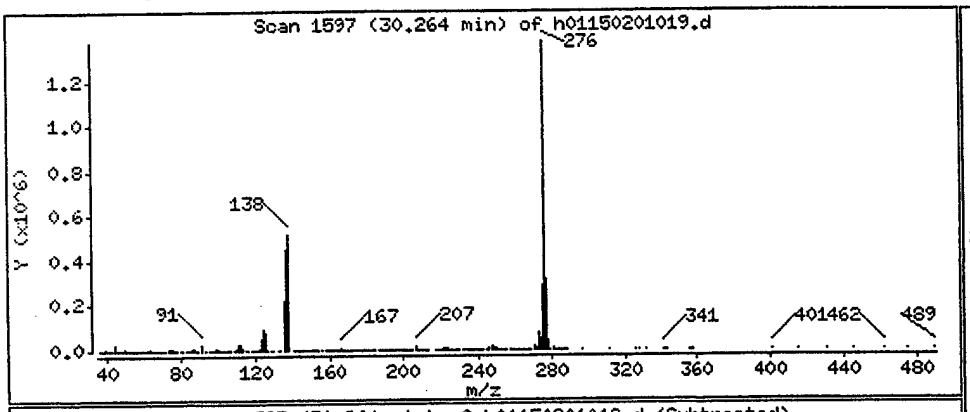
Operator: jgh

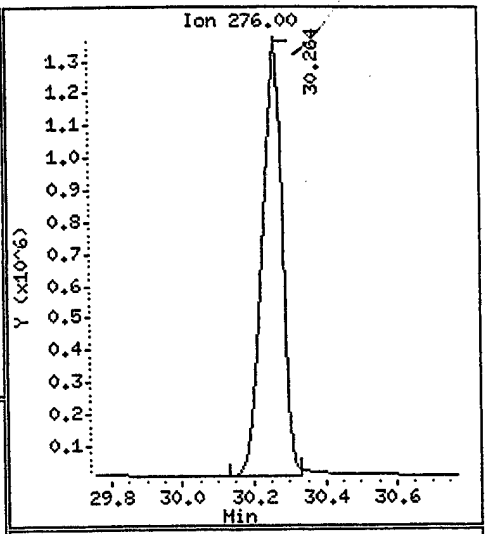
Column phase:

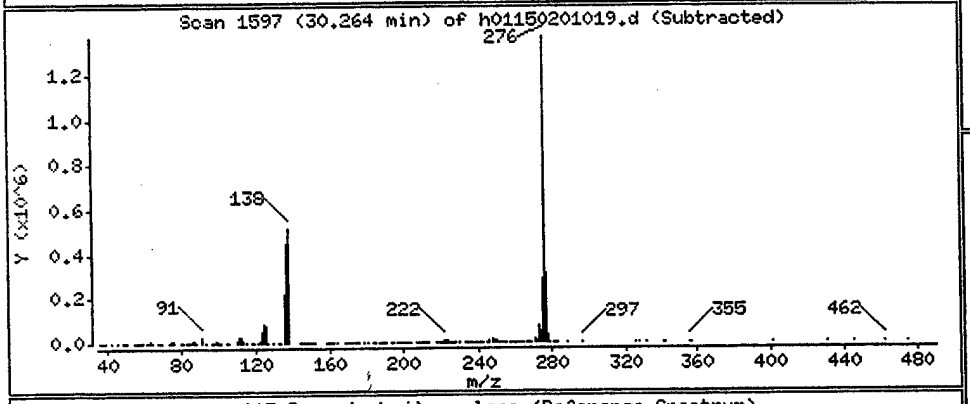
Column diameter: 2.00

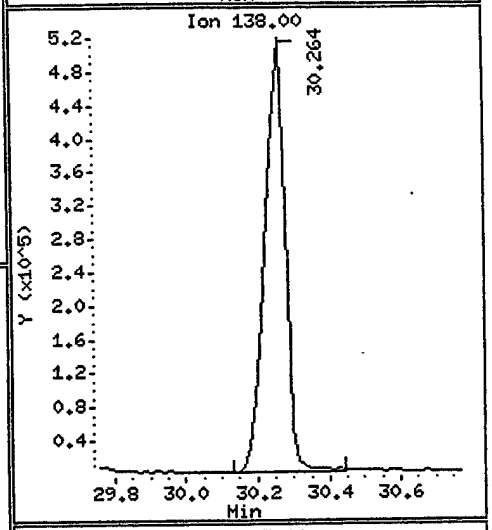
105 Benzo(g,h,i)perylene

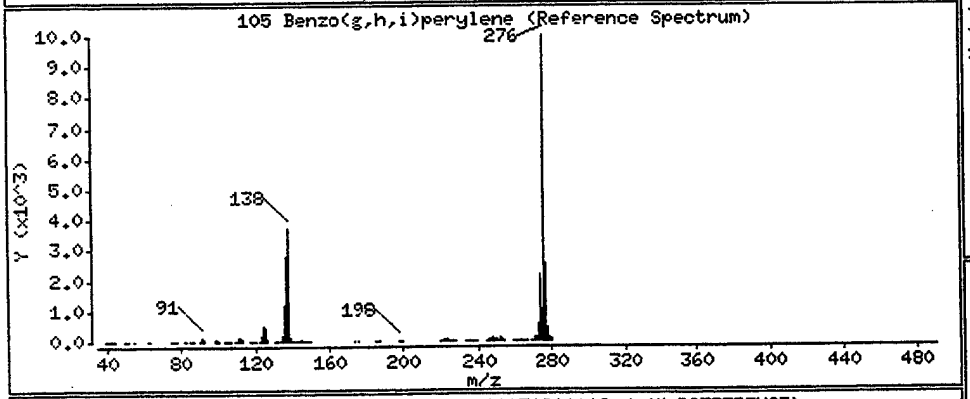
Concentration: 77.6 ug

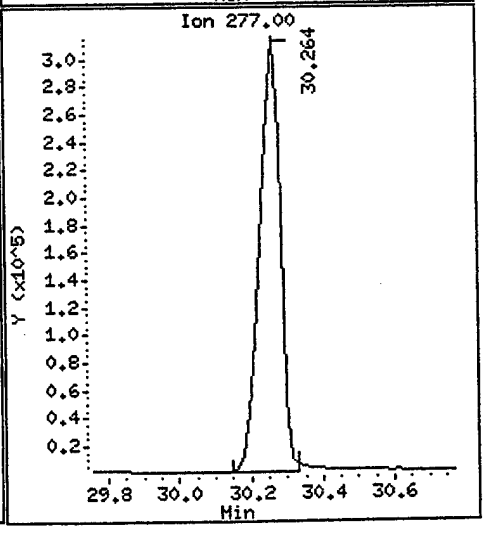


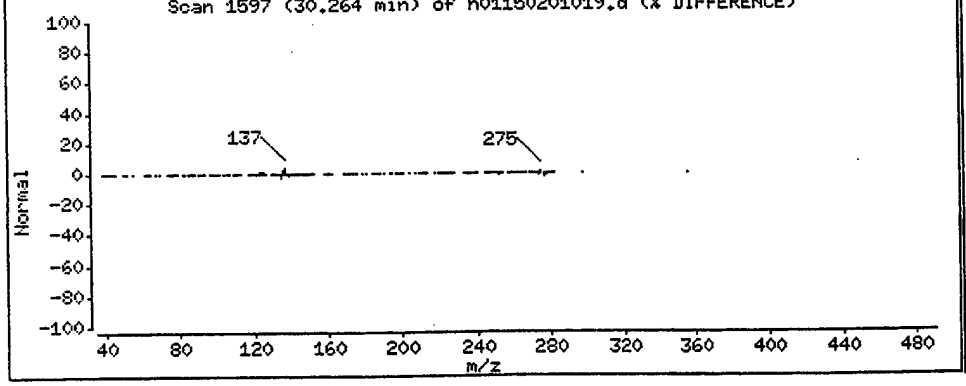












Audit History For: /chem/msdh.i/h-15Jan98.b/h01150201019.d

Change Date: 15-Jan-1998 19:23
Change Made by: Automation

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 15-Jan-1998 19:25
Change Made by: jheffel

Parameter: Best Hit for 1,3-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: New Hit #2
Reason For Change: N/A

Change Date: 15-Jan-1998 19:25
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 15-Jan-1998 19:25
Change Made by: jheffel

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Old Hit #4
New Value: New Hit #3
Reason For Change: N/A

Change Date: 15-Jan-1998 19:25
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 15-Jan-1998 19:25
Change Made by: jheffel

Parameter: Best Hit for 4-Chloroaniline changed
Old Value: Old Hit #2
New Value: New Hit #3
Reason For Change: N/A

Change Date: 15-Jan-1998 19:25
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 15-Jan-1998 19:25
Change Made by: jheffel

Parameter: Manual reintegration of 4-Chloroaniline (Signal 1)
Old Value: Old Area/Time: 931551 / 9.96
New Value: New Area/Time: 2778681 / 10.01
Reason For Change: N/A

Change Date: 15-Jan-1998 19:25
Change Made by: jheffel

Parameter: Best Hit for 2,4,6-Trichlorophenol changed
Old Value: Old Hit #1
New Value: New Hit #4
Reason For Change: N/A

Change Date: 15-Jan-1998 19:25
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 15-Jan-1998 19:26
Change Made by: jheffel

Parameter: Best Hit for Benzo(a)Anthracene changed
Old Value: Old Hit #1
New Value: New Hit #4
Reason For Change: N/A

Change Date: 15-Jan-1998 19:26
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 15-Jan-1998 19:26
Change Made by: jheffel

Parameter: Best Hit for Benzo(b)fluoranthene changed
Old Value: Old Hit #1
New Value: New Hit #4
Reason For Change: N/A

Change Date: 15-Jan-1998 19:26
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 15-Jan-1998 19:27
Change Made by: jheffel

Parameter: Manual reintegration of Indeno(1,2,3-cd)pyrene (Signal 1)
Old Value: Old Area/Time: 4958969 / 30.26
New Value: New Area/Time: 5066144 / 29.53
Reason For Change: N/A

Change Date: 15-Jan-1998 19:27
Change Made by: jheffel

Parameter: Best Hit for 2,4,5-Trichlorophenol changed
Old Value: Old Hit #6
New Value: New Hit #5
Reason For Change: N/A

Change Date: 15-Jan-1998 19:27
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 14:27
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 19-Jan-1998 14:31
Change Made by: kbadal

Parameter: Best Hit for 1,3-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: New Hit #2
Reason For Change: N/A

Change Date: 19-Jan-1998 14:31
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 14:31
Change Made by: kbadal

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Old Hit #4
New Value: New Hit #3
Reason For Change: N/A

Change Date: 19-Jan-1998 14:31
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 14:32
Change Made by: kbadal

Parameter: Manual reintegration of bis(2-Chloroisopropyl)ether (Signal 1)
Old Value: Old Area/Time: 9325846 / 7.61
New Value: New Area/Time: 2281863 / 7.66
Reason For Change: N/A

Change Date: 19-Jan-1998 14:33
Change Made by: kbadal

Parameter: Manual reintegration of bis(2-Chloroisopropyl)ether (Signal 1)
Old Value: Old Area/Time: 2281863 / 7.66
New Value: New Area/Time: 7958831 / 7.61
Reason For Change: N/A

Change Date: 19-Jan-1998 14:34
Change Made by: kbadal

Parameter: Manual reintegration of bis(2-Chloroisopropyl)ether (Signal 1)

Old Value: Old Area/Time: 7958831 / 7.61
New Value: New Area/Time: 9255127 / 7.61
Reason For Change: N/A

Change Date: 19-Jan-1998 14:39
Change Made by: kbadal

Parameter: Best Hit for 4-Chloroaniline changed
Old Value: Old Hit #3
New Value: New Hit #4
Reason For Change: N/A

Change Date: 19-Jan-1998 14:39
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 14:40
Change Made by: kbadal

Parameter: Manual reintegration of 4-Chloroaniline (Signal 1)
Old Value: Old Area/Time: 931551 / 9.96
New Value: New Area/Time: 2699894 / 10.01
Reason For Change: N/A

Change Date: 19-Jan-1998 14:40
Change Made by: kbadal

Parameter: Best Hit for 2,4,6-Trichlorophenol changed
Old Value: Old Hit #1
New Value: New Hit #4
Reason For Change: N/A

Change Date: 19-Jan-1998 14:40
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 14:41
Change Made by: kbadal

Parameter: Best Hit for 2,4,5-Trichlorophenol changed
Old Value: Old Hit #6
New Value: New Hit #5
Reason For Change: N/A

Change Date: 19-Jan-1998 14:41
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 14:41
Change Made by: kbadal

Parameter: Best Hit for 2,4,5-Trichlorophenol changed
Old Value: Old Hit #5
New Value: Compound Undetected

Reason For Change: N/A

Change Date: 19-Jan-1998 14:41
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 14:41
Change Made by: kbadal

Parameter: Best Hit for 2,4,5-Trichlorophenol changed
Old Value: Compound Undetected
New Value: New Hit #5
Reason For Change: N/A

Change Date: 19-Jan-1998 14:41
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 14:42
Change Made by: kbadal

Parameter: Manual reintegration of 3-Nitroaniline (Signal 1)
Old Value: Old Area/Time: 4247722 / 12.88
New Value: New Area/Time: 655931 / 13.87
Reason For Change: N/A

Change Date: 19-Jan-1998 14:50
Change Made by: kbadal

Parameter: Best Hit for 4-Nitroaniline changed
Old Value: Old Hit #2
New Value: New Hit #1
Reason For Change: N/A

Change Date: 19-Jan-1998 14:50
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 14:50
Change Made by: kbadal

Parameter: Best Hit for 4-Nitroaniline changed
Old Value: Old Hit #1
New Value: New Hit #2
Reason For Change: N/A

Change Date: 19-Jan-1998 14:50
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 14:55
Change Made by: kbadal

Parameter: Manual reintegration of 2,4-Dinitrotoluene (Signal 1)
Old Value: Old Area/Time: 4212905 / 14.45
New Value: New Area/Time: 9939815 / 15.23
Reason For Change: N/A

Change Date: 19-Jan-1998 14:55
Change Made by: kbadal

Parameter: Manual reintegration of 2,4-Dinitrotoluene (Signal 1)
Old Value: Old Area/Time: 9939815 / 15.23
New Value: New Area/Time: 4200007 / 14.45
Reason For Change: N/A

Change Date: 19-Jan-1998 14:55
Change Made by: kbadal

Parameter: Manual reintegration of 2,4-Dinitrotoluene (Signal 1)
Old Value: Old Area/Time: 4200007 / 14.45
New Value: New Area/Time: 2969433 / 13.50
Reason For Change: N/A

Change Date: 19-Jan-1998 14:56
Change Made by: kbadal

Parameter: Manual reintegration of 2,4-Dinitrotoluene (Signal 1)
Old Value: Old Area/Time: 2969433 / 13.50
New Value: New Area/Time: 4210603 / 14.45
Reason For Change: N/A

Change Date: 19-Jan-1998 15:06
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

Change Date: 19-Jan-1998 15:09
Change Made by: kbadal

Parameter: Best Hit for Benzo(a)Anthracene changed
Old Value: Old Hit #1
New Value: New Hit #4
Reason For Change: N/A

Change Date: 19-Jan-1998 15:09
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 15:10
Change Made by: kbadal

Parameter: Best Hit for Benzo(b)fluoranthene changed
Old Value: Old Hit #1
New Value: New Hit #4
Reason For Change: N/A

Change Date: 19-Jan-1998 15:10
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 16:37
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 19-Jan-1998 16:39
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 19-Jan-1998 16:40
Change Made by: jheffel

Parameter: Best Hit for 1,3-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: New Hit #4
Reason For Change: N/A

Change Date: 19-Jan-1998 16:40
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 16:41
Change Made by: jheffel

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Old Hit #4
New Value: New Hit #1
Reason For Change: N/A

Change Date: 19-Jan-1998 16:41
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 16:43
Change Made by: jheffel

Parameter: Best Hit for 4-Chloroaniline changed
Old Value: Old Hit #5
New Value: New Hit #6
Reason For Change: N/A

Change Date: 19-Jan-1998 16:43
Change Made by: jheffel

Parameter: Requantitate all compounds

Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 16:43
Change Made by: jheffel

Parameter: Manual reintegration of 4-Chloroaniline (Signal 1)
Old Value: Old Area/Time: 931551 / 9.96
New Value: New Area/Time: 2736300 / 10.01
Reason For Change: N/A

Change Date: 19-Jan-1998 16:44
Change Made by: jheffel

Parameter: Best Hit for 2,4,6-Trichlorophenol changed
Old Value: Old Hit #1
New Value: New Hit #4
Reason For Change: N/A

Change Date: 19-Jan-1998 16:44
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 16:45
Change Made by: jheffel

Parameter: Best Hit for 2,4,5-Trichlorophenol changed
Old Value: Old Hit #3
New Value: New Hit #2
Reason For Change: N/A

Change Date: 19-Jan-1998 16:45
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 16:48
Change Made by: jheffel

Parameter: Best Hit for Benzo(a)Anthracene changed
Old Value: Old Hit #1
New Value: New Hit #9
Reason For Change: N/A

Change Date: 19-Jan-1998 16:48
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 16:49
Change Made by: jheffel

Parameter: Best Hit for Benzo(b)fluoranthene changed
Old Value: Old Hit #1
New Value: New Hit #8

Reason For Change: N/A

Change Date: 19-Jan-1998 16:49
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 18:43
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 19-Jan-1998 18:45
Change Made by: jheffel

Parameter: Compound Sublist
Old Value: all.sub
New Value: MM5X.sub
Reason For Change: N/A

Change Date: 19-Jan-1998 18:45
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 19-Jan-1998 18:48
Change Made by: jheffel

Parameter: Best Hit for 1,3-Dichlorobenzene changed
Old Value: Old Hit #1
New Value: New Hit #4
Reason For Change: N/A

Change Date: 19-Jan-1998 18:48
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 18:48
Change Made by: jheffel

Parameter: Best Hit for 1,2-Dichlorobenzene changed
Old Value: Old Hit #4
New Value: New Hit #1
Reason For Change: N/A

Change Date: 19-Jan-1998 18:48
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 18:48
Change Made by: jheffel

Parameter: Best Hit for 4-Chloroaniline changed
Old Value: Old Hit #5
New Value: New Hit #6
Reason For Change: N/A

Change Date: 19-Jan-1998 18:48
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 18:49
Change Made by: jheffel

Parameter: Manual reintegration of 4-Chloroaniline (Signal 1)
Old Value: Old Area/Time: 931551 / 9.96
New Value: New Area/Time: 2789944 / 10.01
Reason For Change: N/A

Change Date: 19-Jan-1998 18:49
Change Made by: jheffel

Parameter: Best Hit for 2,4,6-Trichlorophenol changed
Old Value: Old Hit #1
New Value: New Hit #4
Reason For Change: N/A

Change Date: 19-Jan-1998 18:49
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 18:49
Change Made by: jheffel

Parameter: Best Hit for 2,4,5-Trichlorophenol changed
Old Value: Old Hit #3
New Value: New Hit #2
Reason For Change: N/A

Change Date: 19-Jan-1998 18:49
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 18:50
Change Made by: jheffel

Parameter: Best Hit for Benzo(a)Anthracene changed
Old Value: Old Hit #1
New Value: New Hit #9
Reason For Change: N/A

Change Date: 19-Jan-1998 18:50
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 18:50
Change Made by: jheffel

Parameter: Best Hit for Benzo(b)fluoranthene changed
Old Value: Old Hit #1
New Value: New Hit #8
Reason For Change: N/A

Change Date: 19-Jan-1998 18:50
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 19-Jan-1998 18:51
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

Change Date: 19-Jan-1998 18:57
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

Change Date: 19-Jan-1998 20:00
Change Made by: jheffel

Parameter: Sample Prep. Date
Old Value:
New Value: 29-DEC-1997 18:36
Reason For Change: N/A

Change Date: 19-Jan-1998 20:26
Change Made by: jheffel

Parameter: Sample Prep. Date
Old Value: 29-DEC-1997 18:36
New Value: 18-DEC-1997 18:36
Reason For Change: N/A

Change Date: 27-Jan-1998 15:24
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

Data File: /chem/msdh.i/h-08Jan98.b/h01080101001.d
Report Date: 13-Jan-1998 13:26

Air Toxics Limited

Data file : /chem/msdh.i/h-08Jan98.b/h01080101001.d
Lab Smp Id: DFTPP02 Client Smp ID: DFTPP02
Inj Date : 08-JAN-1998 22:48 MS Autotune Date:
Operator : JGH Inst ID: msdh.i
Smp Info : 1.0ul 50ng DFTPP tune check 264-84-50
Misc Info :
Comment :
Method : /chem/msdh.i/h-08Jan98.b/dftpp1.m
Meth Date : 08-Jan-1998 22:24 Quant Type: ISTD
Cal Date : Cal File:
Als bottle: 1 QC Sample: DFTPP
Dil Factor: 1.00000 Compound Sublist: all.sub
Integrator: HP RTE Sample Matrix: WATER
Target Version: 3.40

1-13-98

Concentration Formula: Amt * DF * Uf * Vf * Vi

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vf	1.000	Volumetric correction factor
Vi	1.000	Injection Volume

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (ug/L)	CONCENTRATIONS FINAL (ug/L)	TARGET RANGE	RATIO
1 dftpp							CAS #:	
5.209	5.280	(0.000)	51	302686			30.00- 60.00	50.74
5.209	5.280	(0.000)	68	0			0.00- 2.00	0.00
5.209	5.280	(0.000)	69	388829			0.00- 99.90	65.18
5.209	5.280	(0.000)	70	658			0.00- 2.00	0.17
5.209	5.280	(0.000)	127	249852			40.00- 60.00	41.88
5.209	5.280	(0.000)	197	0			0.00- 1.00	0.00
5.209	5.280	(0.000)	199	38805			5.00- 9.00	6.50
5.209	5.280	(0.000)	275	109250			10.00- 30.00	18.31
5.209	5.280	(0.000)	365	12351			1.00- 0.00	2.07
5.209	5.280	(0.000)	441	52077			0.01- 99.99	77.89
5.209	5.280	(0.000)	442	346538			40.00- 100.00	58.09
5.209	5.280	(0.000)	443	66858			17.00- 23.00	19.29

Data File: /chem/msdh.i/h-08Jan98.b/h01080101001.d

Date : 08-JAN-1998 22:48

Client ID: DFTPP02

Instrument: msdh.i

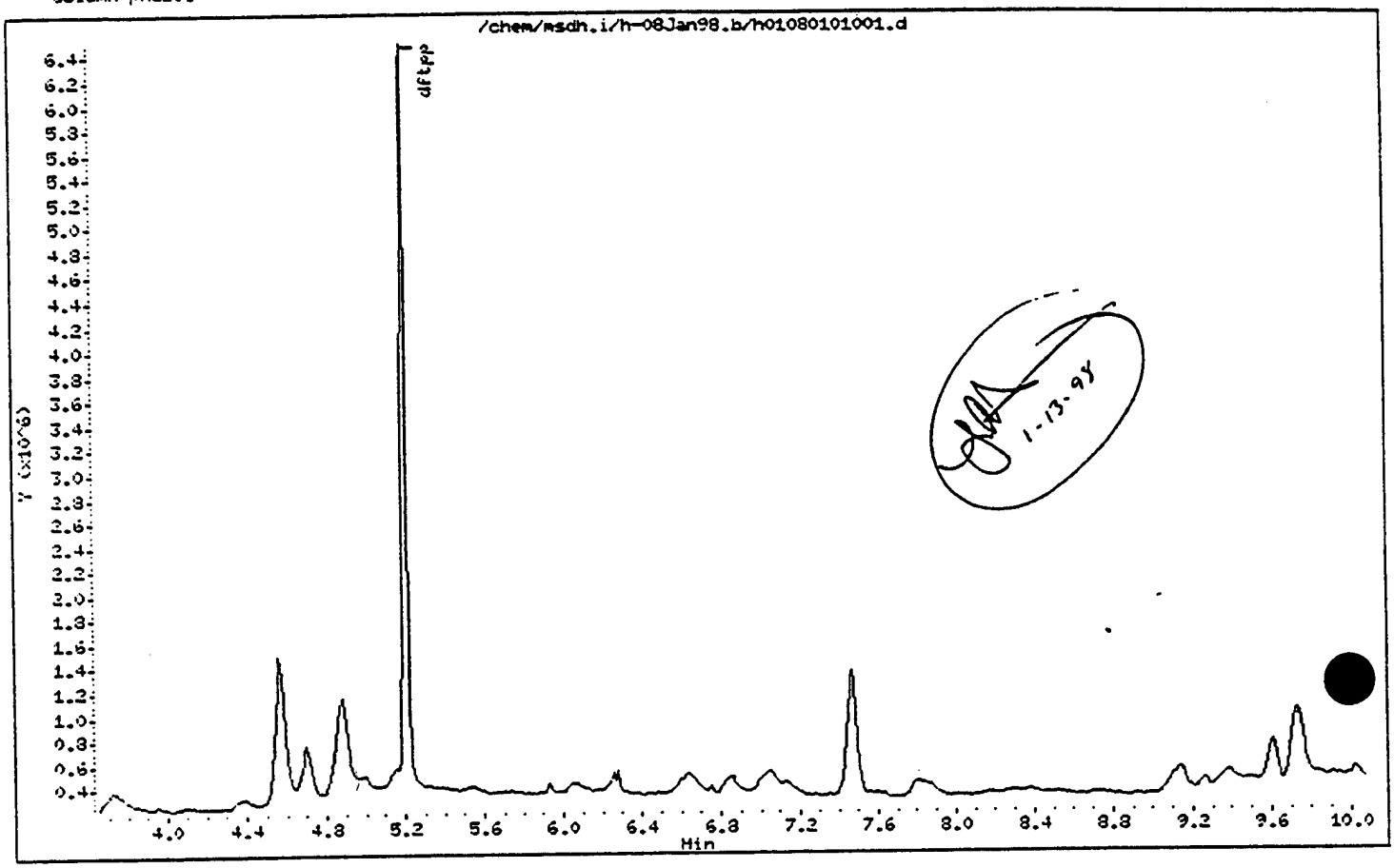
Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Volume Injected (uL): 1.0

Operator: JGH

Column phase:

Column diameter: 2.00



1-13-98

Data File: /chem/msdh.i/h-08Jan98.b/h01080101001.d

Date : 08-JAN-1998 22:48

Client ID: DFTPP02

Instrument: msdh.i

Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

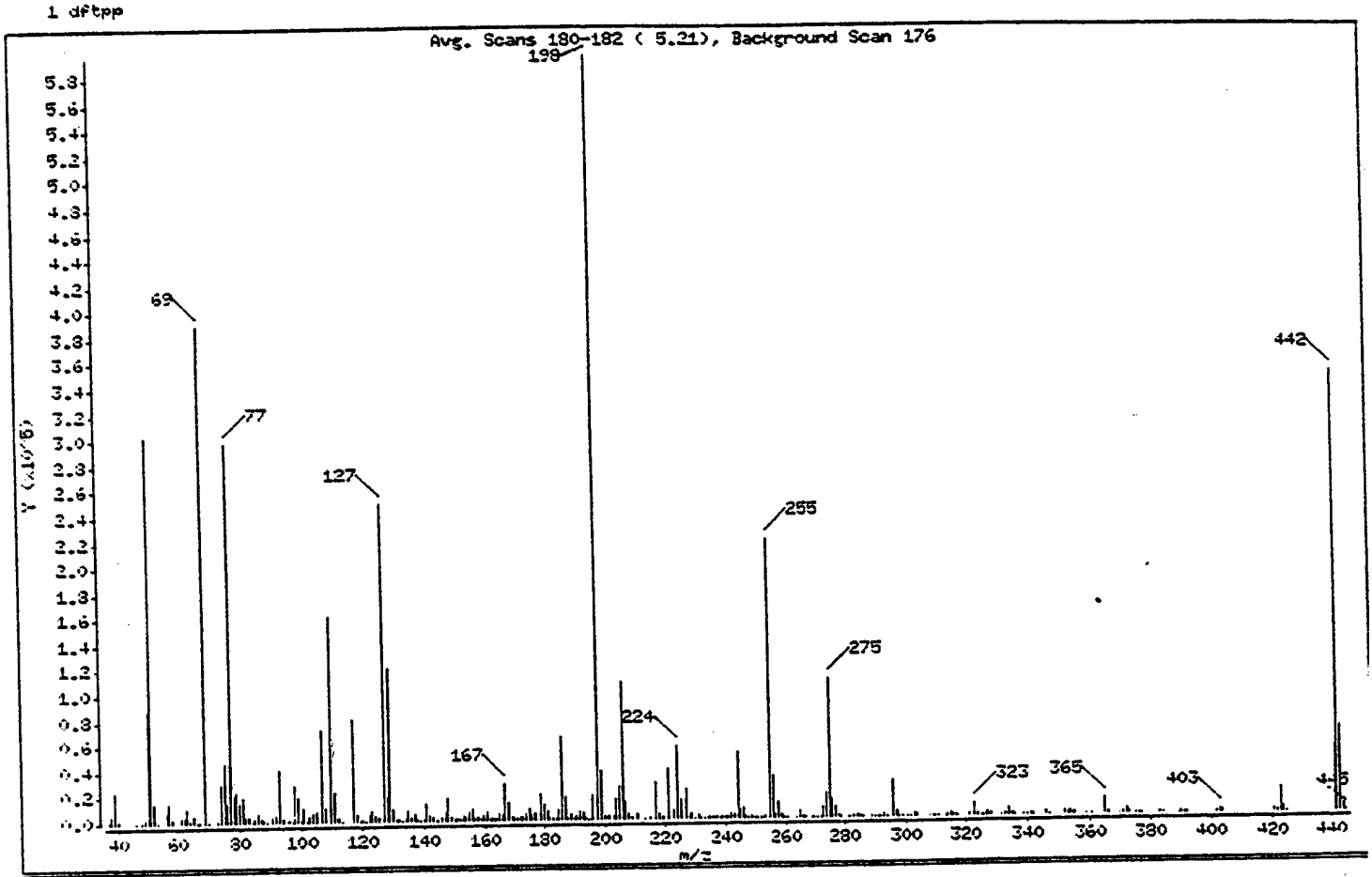
Volume Injected (uL): 1.0

Operator: JGH

Column phase:

Column diameter: 2.00

1 dftpp



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
198	Base Peak, 100% relative abundance	100.00
51	30.00 - 60.00% of mass 198	50.74
68	Less than 2.00% of mass 69	0.00 (0.00)
69	Less than 99.90% of mass 198	65.18
70	Less than 2.00% of mass 69	0.11 (0.17)
127	40.00 - 60.00% of mass 198	41.88
197	Less than 1.00% of mass 198	0.00
199	5.00 - 9.00% of mass 198	6.50
275	10.00 - 30.00% of mass 198	18.31
365	Greater than 1.00% of mass 198	2.07
441	Present, but less than mass 443	8.73
442	40.00 - 100.00% of mass 198	58.09
443	17.00 - 23.00% of mass 442	11.21 (19.29)

645

Data File: /chem/msdh.i/h-08Jan98.b/h01080101001.d

Date : 08-JAN-1998 22:48

Client ID: DFTPP02 Instrument: msdh.i

Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Volume Injected (uL): 1.0 Operator: JGH

Column phase: Column diameter: 2.00

Data File: H01080101001.d

Spectrum: Avg. Scans 180-182 (5.21), Background Scan 176

Location of Maximum: 197.90

Number of points: 291

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.95	1649	129.90	9810	205.95	107984	292.85	2208
37.95	5114	131.00	2008	206.95	14281	293.95	608
38.95	24936	132.00	829	207.85	3736	295.85	29024
39.95	1440	133.00	281	208.95	1179	296.85	4140
45.00	317	133.90	3048	210.85	4658	297.95	114
45.90	123	134.90	8188	212.95	530	298.95	117
48.00	315	135.90	3380	214.90	1199	300.85	267
49.00	2140	136.90	4840	216.90	29288	301.90	616
50.00	87160	137.90	977	217.90	3554	302.90	3384
51.00	302656	138.90	609	219.00	734	303.90	826
52.00	14807	139.95	1046	220.90	39712	307.80	507
53.05	120	140.95	14023	222.90	6812	309.00	105
56.05	8157	141.95	4692	223.90	57440	309.90	525
56.95	15680	142.95	2944	224.90	14567	310.90	114
58.05	2203	143.95	675	226.85	22728	313.25	562
60.95	3657	144.95	600	227.85	3111	313.95	1362
61.95	4602	145.95	2559	228.85	4568	314.85	2891
62.95	11188	146.95	7141	229.95	664	315.85	1802
64.00	1488	147.85	18328	230.85	2142	316.85	357
65.00	4827	148.85	3299	231.85	490	320.85	948
66.00	363	150.00	1065	232.35	607	322.85	9328
67.00	232	151.00	1611	233.85	1728	324.00	1676
68.90	388800	151.80	946	234.95	1498	324.80	119
70.00	658	153.00	4191	235.85	1217	325.90	147
73.00	1050	154.00	2875	236.90	1687	326.90	2062
73.90	29776	155.00	6939	238.10	337	327.80	963
74.95	47056	155.90	9936	239.00	716	331.90	534
76.05	15125	157.00	2013	240.00	738	332.80	806
76.95	298240	157.90	2223	240.80	1625	333.95	5826
77.95	20256	158.90	2056	241.90	3456	334.95	1525
78.95	22952	159.90	4361	243.00	2729	335.95	109
79.95	15151	160.95	6298	243.90	52128	338.95	163
80.95	19800	161.85	1486	244.90	7082	339.85	120
81.95	4010	162.95	1527	245.90	8367	340.95	951
83.05	3616	163.95	1016	246.80	1576	341.85	376

Data File: /chem/msdh.i/h-08Jan98.b/h01080101001.d

Date : 08-JAN-1998 22:48

Client ID: DFTPP02

Instrument: msdh.i

Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Volume Injected (uL): 1.0

Operator: JGH

Column phase:

Column diameter: 2.00

Data File: h01080101001.d

Spectrum: Avg. Scans 180-182 (5.21), Background Scan 176

Location of Maximum: 197.90

Number of points: 291

m/z	Y	m/z	Y	m/z	Y	m/z	Y
83.95	608	164.85	5068	247.85	562	345.90	2490
85.00	3328	165.95	3533	248.85	1837	346.90	384
86.00	6284	166.95	28184	249.85	516	351.90	2915
87.00	2329	167.85	13183	250.95	578	352.90	1840
87.90	1106	168.95	2231	251.95	484	353.90	2778
88.90	511	169.95	954	252.85	908	354.90	778
90.90	3799	170.85	1252	254.85	219712	358.75	111
92.00	5379	171.90	2909	255.85	33216	361.05	116
92.90	41528	173.00	3261	256.85	2535	364.85	12351
94.00	2250	173.90	5653	257.85	12734	365.85	1698
96.05	1334	174.90	9075	258.90	2076	369.90	282
97.15	193	175.90	3679	259.90	344	370.90	800
97.95	28184	176.90	4852	260.90	488	371.90	4781
98.95	19544	178.90	21112	263.90	346	372.90	1224
100.05	1474	179.90	12440	264.90	5327	375.10	347
100.95	10425	180.90	6570	265.90	841	376.20	84
101.95	486	181.90	1022	266.90	418	376.90	131
102.85	3902	182.95	896	269.05	127	382.85	1192
103.95	6880	183.85	1684	269.95	228	383.85	322
104.95	7757	184.95	8730	270.95	590	389.10	117
107.00	72624	185.95	65496	271.85	682	389.90	702
108.00	10464	186.95	18024	272.95	7562	390.90	571
109.90	161920	187.95	1814	273.95	19272	392.00	193
110.90	23680	188.95	4189	274.85	109248	400.95	258
112.00	2264	189.95	958	275.85	14294	401.85	1868
113.00	648	190.85	2180	276.85	7917	402.95	2290
116.90	81416	191.85	6355	277.85	1384	403.85	1098
117.95	5519	192.85	6142	278.85	372	420.95	2523
118.95	541	193.90	1298	281.00	225	422.05	1589
119.95	735	194.90	13	281.90	532	422.95	18648
121.05	511	195.90	18968	283.00	746	423.95	3604
121.95	5659	197.90	596544	283.90	689	424.95	147
122.95	8026	198.90	38800	284.90	1473	441.00	52072
123.95	3734	199.90	2747	285.90	269	441.90	346496
124.95	2842	201.40	3160	288.90	401	442.95	66856

Data File: /chem/msdh.i/h-08Jan98.b/h01080101001.d

Date : 08-JAN-1998 22:48

Client ID: DFTPP02

Instrument: msdh.i

Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Volume Injected (uL): 1.0

Operator: JGH

Column phase:

Column diameter: 2.00

Data File: h01080101001.d

Spectrum: Avg. Scans 180-182 (5.21), Background Scan 176

Location of Maximum: 197.90

Number of points: 291

m/z	Y	m/z	Y	m/z	Y	m/z	Y
126.95	249792	202.90	2861	289.90	264	443.95	6000
127.95	19192	203.90	16313	291.15	127	444.85	101
128.90	120296	204.95	26712	291.95	434		

Air Toxics Limited

Data file : /chem/msdh.i/h-10Jan98.b/h01100101001.d
Lab Smp Id: DFTPP02 Client Smp ID: DFTPP02
Inj Date : 10-JAN-1998 11:42 MS Autotune Date:
Operator : hch Inst ID: msdh.i
Smp Info : 50 ng DFTPP Tune Check
Misc Info : 264-84-50
Comment :
Method : /chem/msdh.i/h-10Jan98.b/dftpp1.m
Meth Date : 10-Jan-1998 11:39 Quant Type: ISTD
Cal Date : Cal File:
Als bottle: 1 QC Sample: DFTPP
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.40 Sample Matrix: WATER

1-26-98

1.29.98

Concentration Formula: Amt * DF * Uf * Vf * Vi

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vf	1.000	Volumetric correction factor
Vi	1.000	Injection Volume

					CONCENTRATIONS ON-COL	FINAL		
RT	EXP RT	(REL RT)	MASS	RESPONSE	(ug/L)	(ug/L)	TARGET RANGE	RATIO
1 dftpp						CAS #:		
5.212	5.280	(0.000)	51	460613			30.00- 60.00	55.47
5.212	5.280	(0.000)	68	0			0.00- 2.00	0.00
5.212	5.280	(0.000)	69	589390			0.00- 99.90	70.98
5.212	5.280	(0.000)	70	1405			0.00- 2.00	0.24
5.212	5.280	(0.000)	127	360960			40.00- 60.00	43.47
5.212	5.280	(0.000)	197	0			0.00- 1.00	0.00
5.212	5.280	(0.000)	199	54269			5.00- 9.00	6.54
5.212	5.280	(0.000)	275	152602			10.00- 30.00	18.38
5.212	5.280	(0.000)	365	17070			1.00- 0.00	2.06
5.212	5.280	(0.000)	441	29872			0.01- 99.99	38.16
5.212	5.280	(0.000)	442	411378			40.00- 100.00	49.54
5.212	5.280	(0.000)	443	78274			17.00- 23.00	19.03

Data File: /chem/msdh.i/h-10Jan98.b/h01100101001.d

Date : 10-JAN-1998 11:42

Client ID: DFTPP02

Instrument: msdh.i

Sample Info: 50 ng DFTPP Tune Check

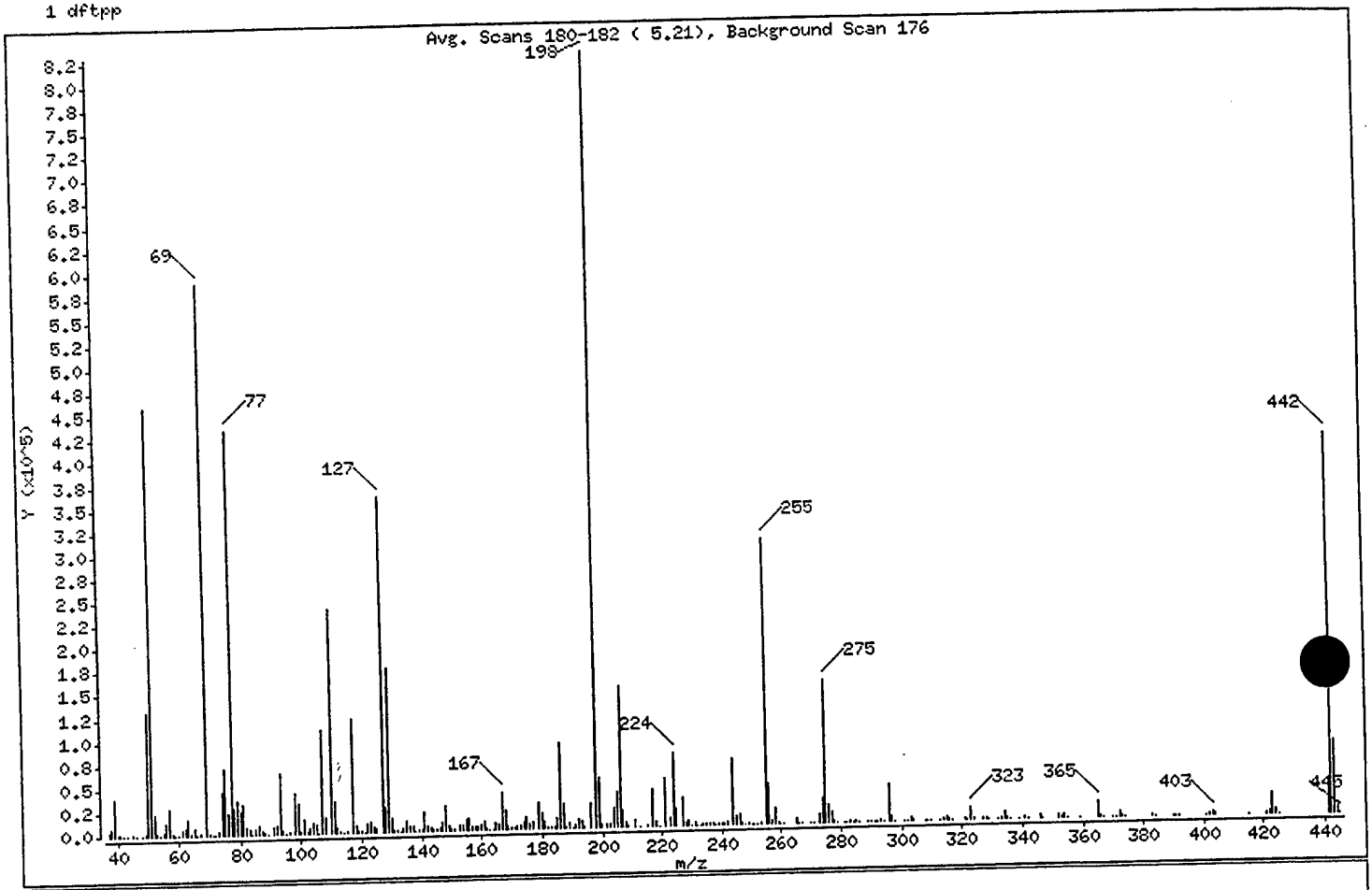
Operator: hch

Volume Injected (uL): 1.0

Column diameter: 2.00

Column phase:

1 dftpp



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
198	Base Peak, 100% relative abundance	100.00
51	30.00 - 60.00% of mass 198	55.47
68	Less than 2.00% of mass 69	0.00 (0.00)
69	Less than 99.90% of mass 198	70.98
70	Less than 2.00% of mass 69	0.17 (0.24)
127	40.00 - 60.00% of mass 198	43.47
197	Less than 1.00% of mass 198	0.00
199	5.00 - 9.00% of mass 198	6.54
275	10.00 - 30.00% of mass 198	18.38
365	Greater than 1.00% of mass 198	2.06
441	Present, but less than mass 443	3.60
442	40.00 - 100.00% of mass 198	49.54
443	17.00 - 23.00% of mass 442	9.43 (19.03)

Data File: /chem/msdh.i/h-10Jan98.b/h01100101001.d

Date : 10-JAN-1998 11:42

Client ID: DFTPP02

Instrument: msdh.i

Sample Info: 50 ng DFTPP Tune Check

Volume Injected (uL): 1.0

Operator: hch

Column phase:

Column diameter: 2.00

Data File: h01100101001.d

Spectrum: Avg. Scans 180-182 (5.21), Background Scan 176

Location of Maximum: 197.90

Number of points: 292

m/z	Y	m/z	Y	m/z	Y	m/z	Y
37.05	2988	117.95	8518	195.90	25952	289.90	411
38.05	7170	118.95	1028	197.90	830400	291.05	118
38.95	40936	119.85	1423	198.90	54264	291.85	354
39.95	1538	120.95	53	199.90	3493	292.85	2479
40.95	963	121.95	8618	201.40	4472	294.05	652
42.00	99	122.95	12228	202.90	4550	295.85	39440
43.00	106	123.95	5992	203.90	21840	296.85	5116
45.00	979	124.95	4611	204.95	37256	297.85	372
46.00	101	126.95	360960	205.95	150464	300.85	434
48.00	54	127.95	27624	206.95	19520	301.90	789
49.00	2643	128.90	175040	207.95	4793	302.90	4122
50.00	131456	129.90	14795	208.85	1650	303.90	1108
51.00	460608	130.90	2445	210.85	6694	307.80	509
52.00	23192	131.90	1604	212.85	370	308.80	324
52.95	1163	132.90	561	214.90	1471	309.90	443
53.95	129	133.90	4752	216.90	39688	312.85	163
54.95	2954	134.90	12076	217.90	4914	313.95	1812
55.95	13685	135.90	4815	219.00	618	314.85	4316
56.95	29296	136.90	6430	220.90	51672	315.95	2345
57.95	1118	137.80	850	222.90	9038	316.85	378
58.95	344	138.90	1036	223.90	78032	320.85	1229
60.05	586	139.95	2114	224.90	19496	321.85	121
60.95	6087	140.95	21856	226.95	30928	322.85	12591
61.95	6835	141.95	6656	227.95	4514	323.90	2361
62.95	17120	142.85	4509	228.85	6253	326.90	2561
64.00	2496	143.95	1200	229.95	622	327.90	1192
65.00	7684	144.95	979	230.95	2928	328.90	148
65.90	908	145.95	4162	231.85	491	331.90	819
67.00	1095	146.95	9893	232.85	640	332.90	1137
68.90	589376	147.85	26152	233.85	2126	333.95	7904
69.90	1405	148.85	4839	234.95	2042	334.95	2061
70.90	174	149.90	1628	235.85	1443	335.85	122
71.90	125	151.00	2820	236.90	2340	338.75	103
73.00	3560	152.90	6468	237.90	421	340.85	1579
73.90	46336	153.90	4803	238.90	1170	341.85	368

651

Data File: /chem/msdh.i/h-10Jan98.b/h01100101001.d

Date : 10-JAN-1998 11:42

Client ID: DFTPP02 Instrument: msdh.i

Sample Info: 50 ng DFTPP Tune Check

Volume Injected (uL): 1.0 Operator: hch

Column phase: Column diameter: 2.00

Data File: h01100101001.d

Spectrum: Avg. Scans 180-182 (5.21), Background Scan 176

Location of Maximum: 197.90

Number of points: 292

m/z	Y	m/z	Y	m/z	Y	m/z	Y
74.95	70440	154.90	10590	239.90	1105	345.90	3066
76.05	22288	155.90	14031	240.90	1783	346.80	414
76.95	435712	157.00	3063	241.90	4216	351.90	3772
77.95	29192	157.80	3825	243.90	71336	352.90	2458
78.95	36168	158.90	2930	244.90	9623	353.90	3777
79.95	24552	159.90	6244	245.90	11876	354.90	856
80.95	31928	160.95	8950	246.80	2399	358.95	126
81.95	7203	161.85	2519	247.85	505	364.85	17064
82.95	6552	162.95	821	248.95	2424	365.85	2479
83.85	454	163.95	859	249.95	472	366.90	118
85.00	5903	164.85	7211	250.85	602	369.90	275
85.90	10478	165.95	5507	251.95	643	370.90	880
87.00	4395	166.85	40088	252.95	1211	371.90	6552
87.90	1719	167.85	21800	254.85	307584	372.90	1595
89.00	629	168.95	3070	255.85	44296	373.80	115
90.90	8336	170.05	1332	256.85	3579	382.85	1690
92.00	9075	170.85	1617	257.85	17696	383.85	462
92.90	65512	171.90	3654	258.90	2735	390.00	779
93.90	3972	172.90	3796	259.90	525	390.90	582
94.90	864	173.90	7415	260.90	511	391.90	397
96.05	2246	174.90	12738	264.90	6658	400.85	226
97.95	43728	175.90	4966	265.90	831	401.95	2485
98.95	32296	176.90	7236	266.80	226	402.95	3498
99.95	2522	178.90	27696	269.95	295	403.95	1179
100.95	15559	179.90	17160	270.95	706	414.90	125
101.95	1025	180.90	8566	272.95	9993	420.95	2840
102.95	6334	181.90	1243	273.95	27448	422.05	3014
103.85	10983	182.95	1111	274.85	152576	422.95	22696
104.85	9389	183.95	2039	275.85	19920	423.95	4846
105.85	752	184.95	12327	276.85	11454	424.85	465
106.90	110120	185.95	92240	277.85	2103	441.00	29872
108.00	17104	186.95	25904	278.85	405	441.90	411328
109.90	240896	187.95	2561	280.90	377	442.95	78272
110.90	35176	188.85	5790	281.90	552	443.95	6892
111.90	4835	189.85	931	282.90	1285	444.95	361

Data File: /chem/msdh.i/h-10Jan98.b/h01100101001.d

Date : 10-JAN-1998 11:42

Client ID: DFTPP02

Instrument: msdh.i

Sample Info: 50 ng DFTPP Tune Check

Volume Injected (uL): 1.0

Operator: hch

Column phase:

Column diameter: 2.00

Data File: h01100101001.d

Spectrum: Avg. Scans 180-182 (5.21), Background Scan 176

Location of Maximum: 197.90

Number of points: 292

m/z	Y	m/z	Y	m/z	Y	m/z	Y
112.90	1610	190.95	3215	283.90	933		
114.20	315	191.85	8973	284.90	1881		
115.00	1172	192.85	8289	286.00	261		
116.90	122240	193.90	1795	288.80	395		

653

Data File: /chem/msdh.i/h-10Jan98.b/h01100101001.d

Date : 10-JAN-1998 11:42

Client ID: DFTPP02

Sample Info: 50 ng DFTPP Tune Check

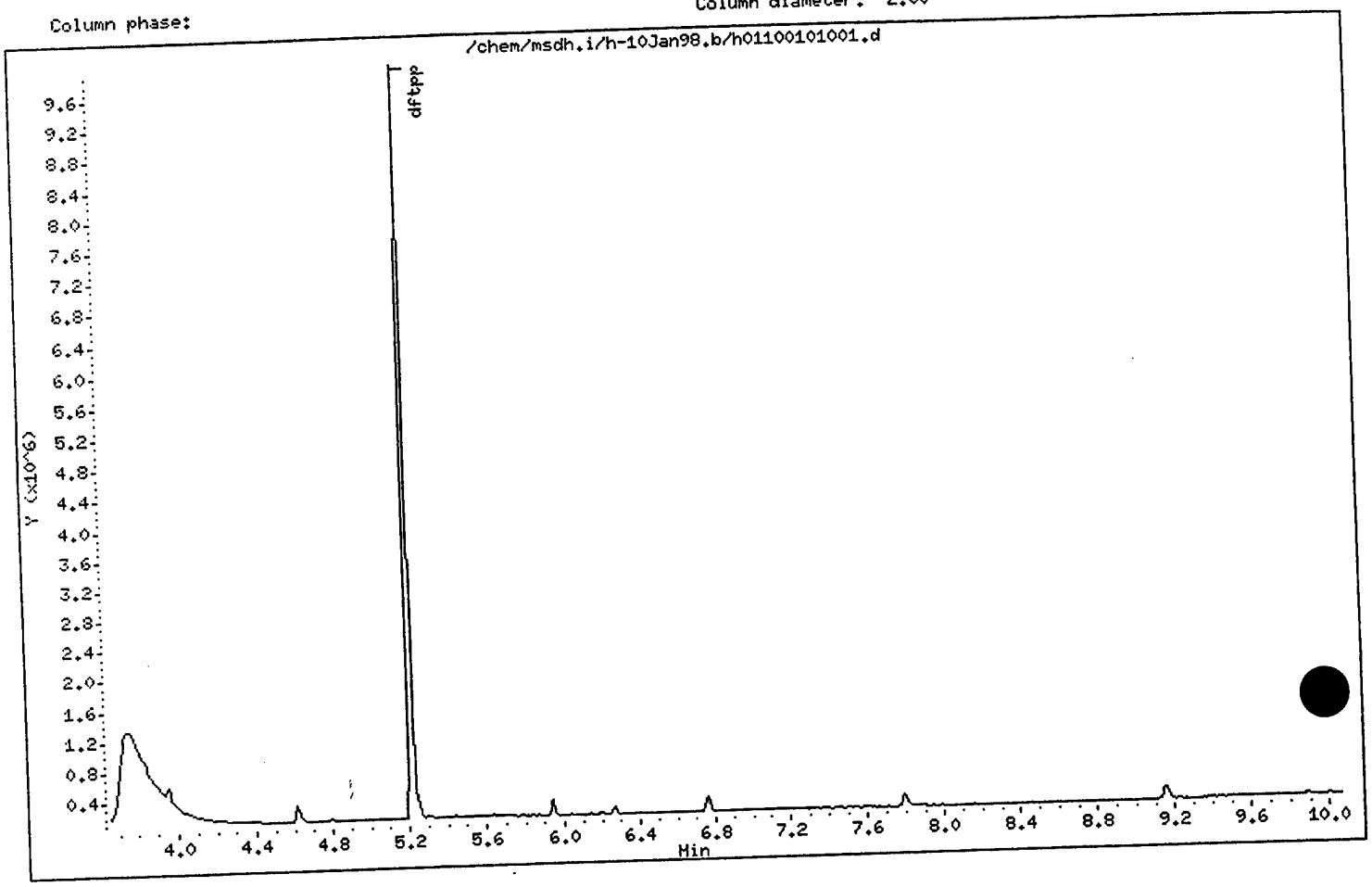
Volume Injected (uL): 1.0

Column phase:

Instrument: msdh.i

Operator: hch

Column diameter: 2.00



654

Air Toxics Limited

Data file : /chem/msdh.i/h-15Jan98.b/h01150101001.d
Lab Smp Id: DFTPP02 Client Smp ID: DFTPP02
Inj Date : 15-JAN-1998 08:43
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 50ng DFTPP tune check 264-84-50
Misc Info :
Comment :
Method : /chem/msdh.i/h-15Jan98.b/dftpp1.m
Meth Date : 15-Jan-1998 08:39 Quant Type: ISTD
Cal Date : Cal File:
Als bottle: 1 QC Sample: DFTPP
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.40 Sample Matrix: WATER

Concentration Formula: Amt * DF * Uf * Vf * Vi

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vf	1.000	Volumetric correction factor
Vi	1.000	Injection Volume

1-19-98

					CONCENTRATIONS ON-COL	FINAL			
RT	EXP RT	(REL RT)	MASS	RESPONSE	(ug/L)	(ug/L)	TARGET RANGE		RATIO
1 dftpp						CAS #:			
4.618	5.280	(0.000)	51	734272			30.00-	60.00	48.81
4.618	5.280	(0.000)	68	0			0.00-	2.00	0.00
4.618	5.280	(0.000)	69	953472			0.00-	99.90	63.38
4.618	5.280	(0.000)	70	4324			0.00-	2.00	0.45
4.618	5.280	(0.000)	127	708608			40.00-	60.00	47.11
4.618	5.280	(0.000)	197	0			0.00-	1.00	0.00
4.618	5.280	(0.000)	199	96656			5.00-	9.00	6.43
4.618	5.280	(0.000)	275	309952			10.00-	30.00	20.61
4.618	5.280	(0.000)	365	37360			1.00-	0.00	2.48
4.618	5.280	(0.000)	441	159040			0.01-	99.99	79.52
4.618	5.280	(0.000)	442	1055232			40.00-	100.00	70.15
4.618	5.280	(0.000)	443	200000			17.00-	23.00	18.95

655

Data File: /chem/msdh.i/h-15Jan98.b/h01150101001.d

Date : 15-JAN-1998 08:43

Client ID: DFTPP02

Instrument: msdh.i

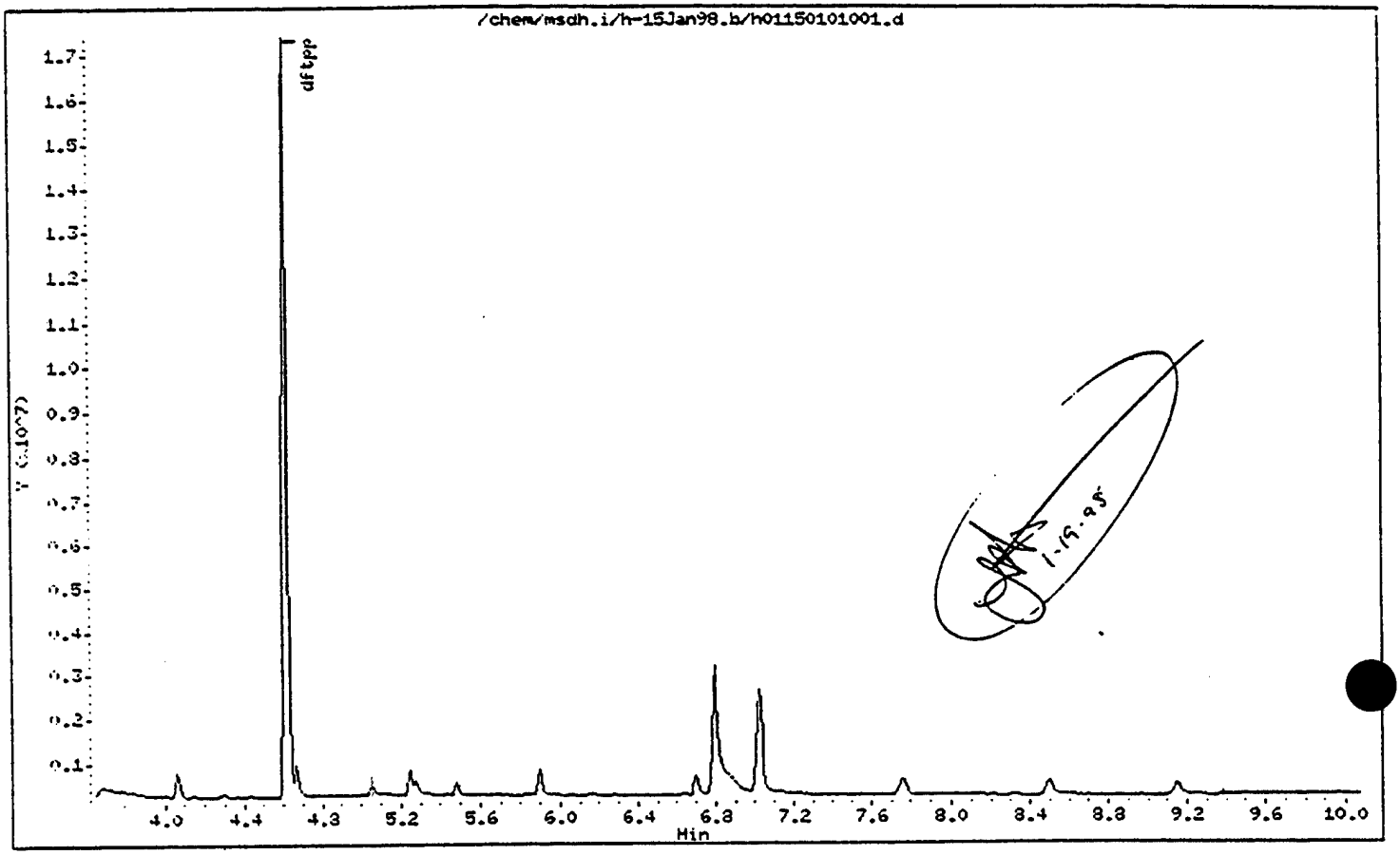
Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Volume Injected (uL): 1.0

Operator: jgh

Column phase:

Column diameter: 2.00



Data File: /chem/msdh.i/h-15Jan98.b/h01150101001.d

Date : 15-JAN-1998 08:43

Client ID: DFTPP02

Instrument: msdh.i

Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Operator: jgh

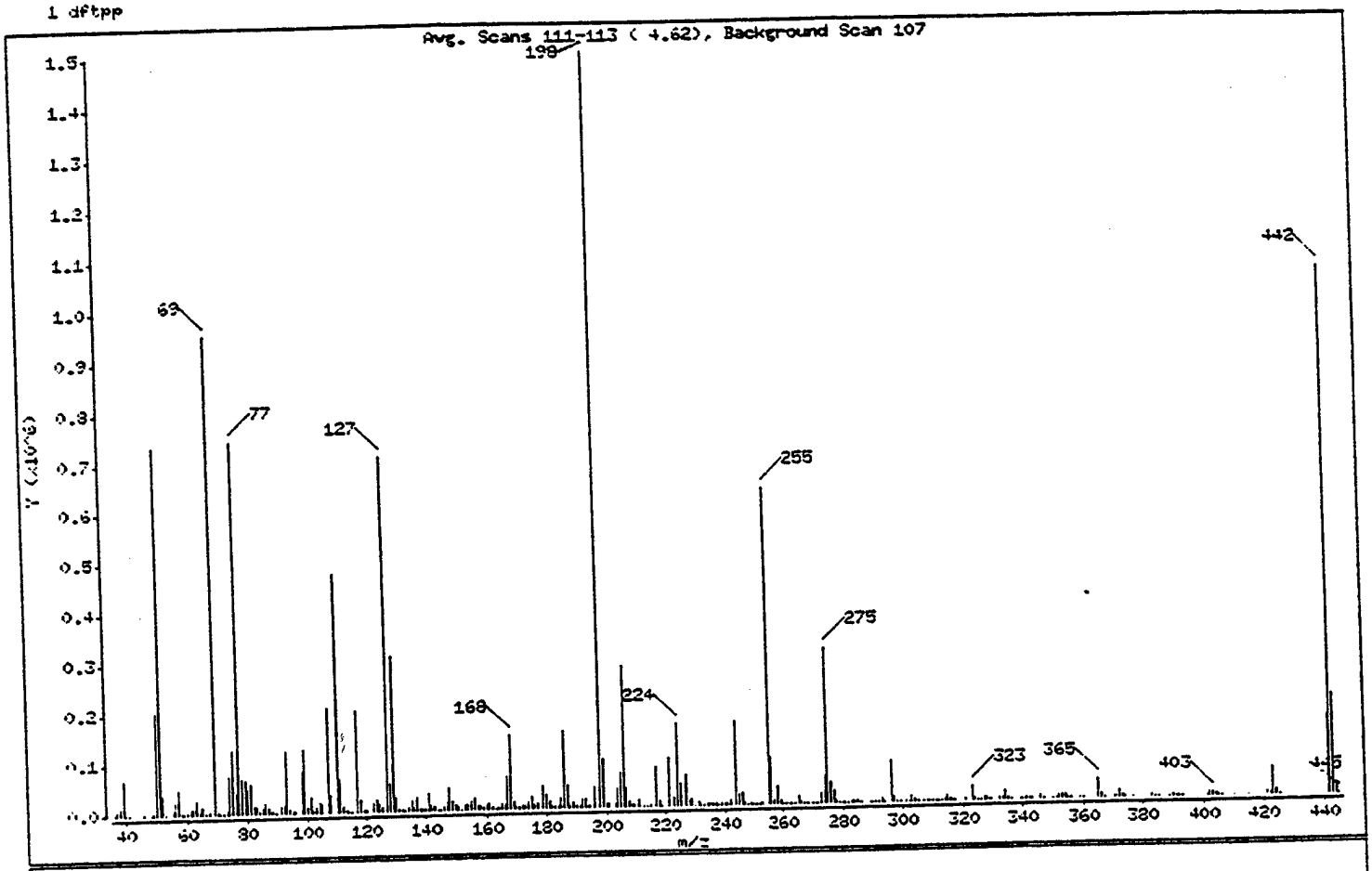
Volume Injected (uL): 1.0

Column diameter: 2.00

Column phase:

1 dftpp

656



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
198	Base Peak, 100% relative abundance	100.00
51	30.00 - 60.00% of mass 198	48.81
68	Less than 2.00% of mass 69	0.00 (0.00)
69	Less than 99.90% of mass 198	63.38
70	Less than 2.00% of mass 69	0.29 (0.45)
127	40.00 - 60.00% of mass 198	47.11
197	Less than 1.00% of mass 198	0.00
199	5.00 - 9.00% of mass 198	6.43
275	10.00 - 30.00% of mass 198	20.61
365	Greater than 1.00% of mass 198	2.48
441	Present, but less than mass 443	10.57
442	40.00 - 100.00% of mass 198	70.15
443	17.00 - 23.00% of mass 442	13.30 (18.95)

Data File: /chem/msdh.i/h-15Jan98.b/h01150101001.d

Date : 15-JAN-1998 08:43

Client ID: DFTPP02 Instrument: msdh.i

Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Volume Injected (uL): 1.0 Operator: jgh

Column phase: Column diameter: 2.00

Data File: h01150101001.d

Spectrum: Avg. Scans 111-113 (4.62), Background Scan 107

Location of Maximum: 198.00

Number of points: 315

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	686	128.00	55600	213.00	1143	303.00	9353
37.00	7334	129.00	311040	214.00	392	304.00	2437
38.00	12666	130.00	25936	215.00	3202	305.00	290
39.00	68480	131.00	4268	217.00	79744	307.00	134
40.00	1401	132.00	3787	218.00	11282	308.00	1108
41.00	928	133.00	1328	219.00	1606	309.00	637
45.00	810	134.00	8309	221.00	96112	310.00	1165
46.00	342	135.00	19824	223.00	18984	311.00	278
48.00	761	136.00	8448	224.00	165248	312.00	116
49.00	2963	137.00	28528	225.00	44528	313.00	874
50.00	204224	138.00	3817	227.00	61400	314.00	4141
51.00	734272	139.00	1744	228.00	8740	315.00	8941
52.00	38632	140.00	2191	229.00	13131	316.00	5111
53.00	1591	141.00	33592	230.00	1658	317.00	883
55.00	5353	142.00	11911	231.00	5902	321.00	2424
56.00	23240	143.00	7888	232.00	964	323.00	28368
57.00	48064	144.00	1687	233.00	1025	324.00	5176
58.00	1206	145.00	1605	234.00	4381	325.00	366
59.00	376	146.00	6198	235.00	4009	326.00	244
60.00	2066	147.00	16008	236.00	2987	327.00	5234
61.00	11961	148.00	43336	237.00	5081	328.00	2921
62.00	10893	149.00	17072	238.00	788	329.00	437
63.00	27360	150.00	11049	239.00	2380	332.00	1806
64.00	3600	151.00	5608	240.00	2102	333.00	2634
65.00	12260	152.00	1612	241.00	3913	334.00	18856
66.00	861	153.00	10341	242.00	10037	335.00	4667
67.00	1865	154.00	9053	244.00	169536	336.00	492
69.00	953472	155.00	16288	245.00	21560	339.00	393
70.00	4324	156.00	23600	246.00	22488	340.00	194
71.00	133	157.00	5749	247.00	4854	341.00	2969
72.00	225	158.00	5902	248.00	1005	342.00	955
73.00	6177	159.00	4115	249.00	4619	343.00	166
74.00	75968	160.00	9854	250.00	877	346.00	6167
75.00	129272	161.00	14558	251.00	1111	347.00	1064
76.00	39776	162.00	4683	252.00	1238	350.00	125

658

Data File: /chem/msdh.i/h-15Jan98.b/h01150101001.d

Date : 15-JAN-1998 08:43

Client ID: DFTPP02

Instrument: msdh.i

Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Volume Injected (uL): 1.0

Operator: jgh

Column phase:

Column diameter: 2.00

Data File: h01150101001.d

Spectrum: Avg. Scans 111-113 (4.62), Background Scan 107

Location of Maximum: 198.00

Number of points: 315

m/z	Y	m/z	Y	m/z	Y	m/z	Y
77.00	743168	163.00	1439	253.00	2849	351.00	138
78.00	69072	164.00	2370	255.00	631936	352.00	7819
79.00	66384	165.00	11631	256.00	92160	353.00	5620
80.00	47632	166.00	9274	257.00	6512	354.00	8391
81.00	58312	167.00	65320	258.00	36112	355.00	1664
82.00	13099	168.00	147200	259.00	5546	356.00	117
83.00	12196	169.00	12132	260.00	1085	359.00	582
84.00	3493	170.00	2397	261.00	1330	360.00	140
85.00	10626	171.00	2658	262.00	247	365.00	37360
86.00	20072	172.00	5618	263.00	448	366.00	5737
87.00	9369	173.00	7144	264.00	247	367.00	329
88.00	4007	174.00	12845	265.00	14418	370.00	715
89.00	1451	175.00	22888	266.00	2247	371.00	2337
91.00	14103	176.00	8575	267.00	309	372.00	14630
92.00	16263	177.00	10539	268.00	232	373.00	3618
93.00	125480	179.00	45832	270.00	526	374.00	372
94.00	7346	180.00	28936	271.00	1357	377.00	391
95.00	1624	181.00	14537	272.00	449	383.00	3987
96.00	4404	182.00	2537	273.00	20912	384.00	1040
98.00	81440	183.00	1931	274.00	56144	385.00	418
99.00	127312	184.00	3577	275.00	309952	389.00	106
100.00	9308	185.00	21688	276.00	41208	390.00	1898
101.00	30288	186.00	155968	277.00	23240	391.00	1148
102.00	2220	187.00	44584	278.00	3832	392.00	1072
103.00	11672	188.00	4191	279.00	870	393.00	122
104.00	19776	189.00	9302	280.00	121	401.00	964
105.00	18728	190.00	1803	281.00	491	402.00	5252
107.00	209920	191.00	4474	282.00	784	403.00	7896
108.00	32904	192.00	15693	283.00	2566	404.00	2812
110.00	476160	193.00	16488	284.00	1813	405.00	191
111.00	66592	194.00	3198	285.00	3777	406.00	114
112.00	9395	196.00	42680	286.00	879	410.00	192
113.00	2855	198.00	1504256	289.00	988	415.00	392
114.00	644	199.00	96656	290.00	740	421.00	7128
115.00	1288	200.00	6828	291.00	717	422.00	1819

Data File: /chem/msdh.i/h-15Jan98.b/h01150101001.d

Date : 15-JAN-1998 08:43

Client ID: DFTPP02

Instrument: msdh.i

659

Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Volume Injected (uL): 1.0

Operator: jgh

Column phase:

Column diameter: 2.00

Data File: h01150101001.d

Spectrum: Avg. Scans 111-113 (4.62), Background Scan 107

Location of Maximum: 198.00

Number of points: 315

m/z	Y	m/z	Y	m/z	Y	m/z	Y
117.00	205184	201.00	8250	292.00	1230	423.00	55816
118.00	24424	203.00	7746	293.00	6016	424.00	11520
119.00	2838	204.00	39304	294.00	1612	425.00	1000
120.00	2133	205.00	70856	296.00	83336	441.00	159040
122.00	17360	206.00	284992	297.00	10900	442.00	1055232
123.00	23008	207.00	37160	298.00	916	443.00	200000
124.00	14183	208.00	10285	299.00	136	444.00	17872
125.00	8616	209.00	3046	301.00	1068	445.00	563
127.00	708608	211.00	12871	302.00	979		

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Air Toxics Limited

Data file : /chem/msdh.i/h-15Jan98.b/h01150101018.d
Lab Smp Id: DFTPP02 Client Smp ID: DFTPP02
Inj Date : 15-JAN-1998 18:23
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 50ng DFTPP tune check 264-84-50
Misc Info :
Comment :
Method : /chem/msdh.i/h-15Jan98.b/dftpp1.m
Meth Date : 15-Jan-1998 08:39 Quant Type: ISTD
Cal Date : Cal File:
Als bottle: 1 QC Sample: DFTPP
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: all.sub
Target Version: 3.40 Sample Matrix: WATER

1-15-98

Concentration Formula: Amt * DF * Uf * Vf * Vi

Name	Value	Description
DF	1.000	Dilution Factor
Uf	1.000	ng unit correction factor
Vf	1.000	Volumetric correction factor
Vi	1.000	Injection Volume

JGH 1.29.98

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (ug/L)	CONCENTRATIONS FINAL (ug/L)	TARGET RANGE	RATIO
1 dftpp						CAS #:		
4.609	5.280	(0.000)	51	711616			30.00- 60.00	52.89
4.609	5.280	(0.000)	68	0			0.00- 2.00	0.00
4.609	5.280	(0.000)	69	926464			0.00- 99.90	68.85
4.609	5.280	(0.000)	70	1697			0.00- 2.00	0.18
4.609	5.280	(0.000)	127	667840			40.00- 60.00	49.63
4.609	5.280	(0.000)	197	0			0.00- 1.00	0.00
4.609	5.280	(0.000)	199	90056			5.00- 9.00	6.69
4.609	5.280	(0.000)	275	277568			10.00- 30.00	20.63
4.609	5.280	(0.000)	365	31448			1.00- 0.00	2.34
4.609	5.280	(0.000)	441	130536			0.01- 99.99	81.88
4.609	5.280	(0.000)	442	842368			40.00- 100.00	62.60
4.609	5.280	(0.000)	443	159424			17.00- 23.00	18.93

661

Data File: /chem/msdh.i/h-15Jan98.b/h01150101018.d

Date : 15-JAN-1998 18:23

Client ID: DFTPP02

Instrument: msdh.i

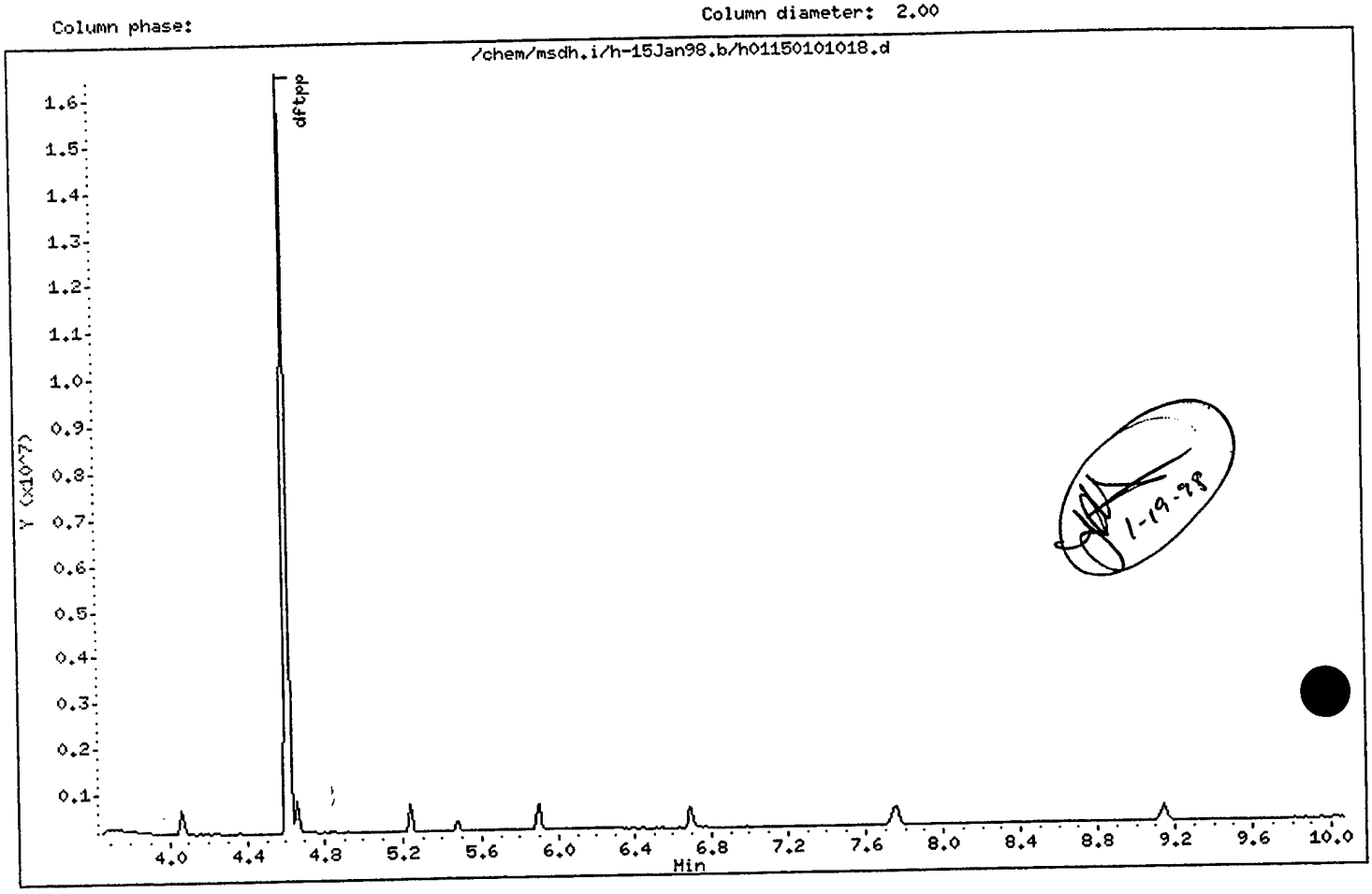
Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Volume Injected (uL): 1.0

Operator: jgh

Column phase:

Column diameter: 2.00



1-19-98

Data File: /chem/msdh.i/h-15Jan98.b/h01150101018.d

Date : 15-JAN-1998 18:23

Client ID: DFTPP02

Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Volume Injected (uL): 1.0

Column phase:

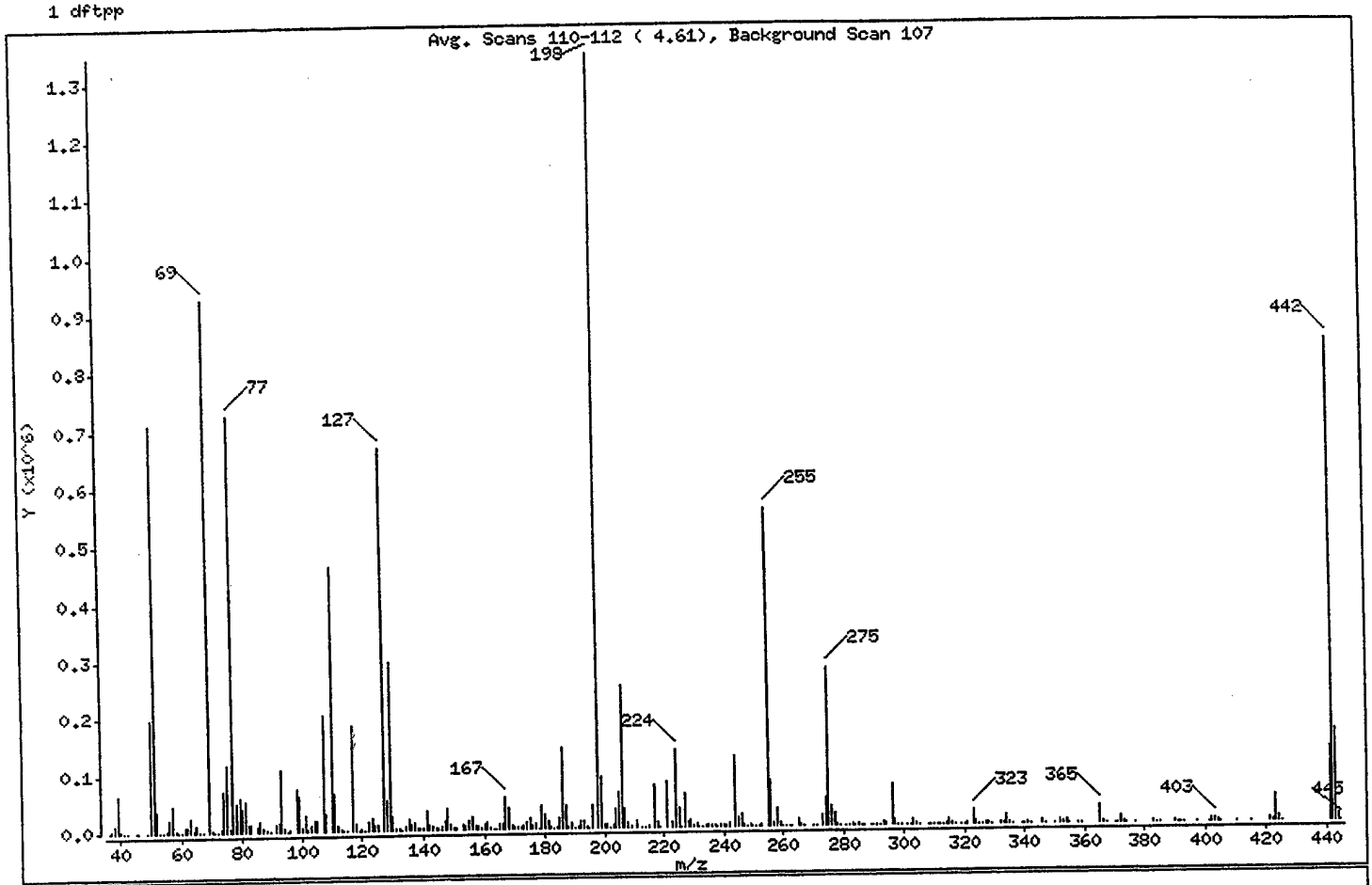
1 dftpp

Instrument: msdh.i

Operator: jgh

Column diameter: 2.00

662



m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
198	Base Peak, 100% relative abundance	100.00
51	30.00 - 60.00% of mass 198	52.89
68	Less than 2.00% of mass 69	0.00 (0.00)
69	Less than 99.90% of mass 198	68.85
70	Less than 2.00% of mass 69	0.13 (0.18)
127	40.00 - 60.00% of mass 198	49.63
197	Less than 1.00% of mass 198	0.00
199	5.00 - 9.00% of mass 198	6.69
275	10.00 - 30.00% of mass 198	20.63
365	Greater than 1.00% of mass 198	2.34
441	Present, but less than mass 443	9.70
442	40.00 - 100.00% of mass 198	62.60
443	17.00 - 23.00% of mass 442	11.85 (18.93)

Data File: /chem/msdh.i/h-15Jan98.b/h01150101018.d

Date : 15-JAN-1998 18:23

Client ID: DFTPP02

Instrument: msdh.i

663

Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Volume Injected (uL): 1.0

Operator: jgh

Column phase:

Column diameter: 2.00

Data File: h01150101018.d

Spectrum: Avg. Scans 110-112 (4.61), Background Scan 107

Location of Maximum: 198.00

Number of points: 313

m/z	Y	m/z	Y	m/z	Y	m/z	Y
36.00	481	127.00	667840	208.00	8785	302.00	552
37.00	4439	128.00	51064	209.00	3070	303.00	7815
38.00	11618	129.00	298240	211.00	11027	304.00	2144
39.00	65920	130.00	23944	213.00	537	305.00	252
40.00	1712	131.00	4085	214.00	334	308.00	946
41.00	1296	132.00	2415	215.00	2635	309.00	545
42.00	64	133.00	906	217.00	72768	310.00	981
45.00	952	134.00	7223	218.00	8493	311.00	130
46.00	160	135.00	18136	219.00	952	312.00	243
49.00	985	136.00	8000	221.00	81312	313.00	709
50.00	198656	137.00	11508	223.00	8647	314.00	3569
51.00	711616	138.00	2602	224.00	137472	315.00	7739
52.00	36320	139.00	1650	225.00	35176	316.00	4524
53.00	1528	140.00	3041	226.00	347	317.00	692
54.00	158	141.00	32608	227.00	58136	319.00	150
55.00	4217	142.00	9798	228.00	7756	320.00	200
56.00	21824	143.00	6363	229.00	11353	321.00	2202
57.00	45520	144.00	1661	230.00	1710	323.00	24128
58.00	1744	145.00	1816	231.00	5605	324.00	4794
59.00	372	146.00	5501	232.00	1003	325.00	411
60.00	812	147.00	14950	233.00	922	326.00	307
61.00	8637	148.00	36032	234.00	3782	327.00	4266
62.00	9627	149.00	8106	235.00	3551	328.00	2097
63.00	25184	150.00	3281	236.00	2657	329.00	416
64.00	3329	151.00	3797	237.00	4211	332.00	1627
65.00	12067	153.00	9037	238.00	602	333.00	2197
66.00	736	154.00	7307	239.00	2420	334.00	14572
67.00	799	155.00	15491	240.00	2040	335.00	3645
69.00	926464	156.00	21136	241.00	3299	336.00	390
70.00	1697	157.00	5325	242.00	7642	339.00	358
71.00	100	158.00	5710	244.00	124776	340.00	407
72.00	334	159.00	3849	245.00	16688	341.00	3046
73.00	5611	160.00	9090	246.00	21256	342.00	823
74.00	71656	161.00	12185	247.00	4273	346.00	5497
75.00	117584	162.00	3835	248.00	1167	347.00	894

Data File: /chem/msdh.i/h-15Jan98.b/h01150101018.d

Date : 15-JAN-1998 18:23

Client ID: DFTPP02 Instrument: msdh.i

Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Volume Injected (uL): 1.0 Operator: jgh

Column phase: Column diameter: 2.00

Data File: h01150101018.d

Spectrum: Avg. Scans 110-112 (4.61), Background Scan 107

Location of Maximum: 198.00

Number of points: 313

m/z	Y	m/z	Y	m/z	Y	m/z	Y
76.00	5402	163.00	1059	249.00	4085	350.00	127
77.00	726720	164.00	850	250.00	827	352.00	7129
78.00	49336	165.00	10431	251.00	1264	353.00	4542
79.00	57384	166.00	8164	252.00	870	354.00	7287
80.00	39856	167.00	56416	253.00	2430	355.00	1385
81.00	53168	168.00	38088	255.00	555456	358.00	129
82.00	13235	169.00	5959	256.00	79952	359.00	586
83.00	11050	170.00	2065	257.00	6388	365.00	31448
85.00	9776	171.00	2315	258.00	31984	366.00	4312
86.00	17240	172.00	4632	259.00	4991	367.00	194
87.00	7084	173.00	6617	260.00	891	370.00	678
88.00	2784	174.00	11423	261.00	832	371.00	1413
89.00	1343	175.00	19864	262.00	108	372.00	12900
91.00	13858	176.00	7007	263.00	319	373.00	3204
92.00	15263	177.00	10301	265.00	12685	374.00	283
93.00	109384	178.00	386	266.00	1780	377.00	415
94.00	6266	179.00	41192	267.00	122	383.00	3331
95.00	1081	180.00	25240	270.00	690	384.00	872
96.00	4190	181.00	12719	271.00	858	385.00	311
98.00	74008	182.00	2245	273.00	18864	390.00	1777
99.00	61776	183.00	1332	274.00	48656	391.00	1020
100.00	5653	184.00	3123	275.00	277568	392.00	975
101.00	28512	185.00	19560	276.00	35560	393.00	108
102.00	1766	186.00	141952	277.00	20832	397.00	139
103.00	10704	187.00	38784	278.00	3392	401.00	728
104.00	18984	188.00	4238	279.00	664	402.00	4650
105.00	17688	189.00	8854	281.00	127	403.00	6861
107.00	205184	190.00	1364	282.00	574	404.00	2321
108.00	31152	191.00	4567	283.00	2155	405.00	399
110.00	464320	192.00	13027	284.00	1441	410.00	164
111.00	65200	193.00	13365	285.00	3492	415.00	421
112.00	7976	194.00	2642	286.00	696	421.00	5983
113.00	2262	195.00	191	287.00	114	422.00	2001
114.00	422	196.00	40712	289.00	827	423.00	45208
115.00	1341	198.00	1345536	290.00	557	424.00	9278

Data File: /chem/msdh.i/h-15Jan98.b/h01150101018.d

Date : 15-JAN-1998 18:23

Client ID: DFTPP02

Instrument: msdh.i

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Sample Info: 1.0ul 50ng DFTPP tune check 264-84-50

Volume Injected (uL): 1.0

Operator: jgh

Column phase:

Column diameter: 2.00

Data File: h01150101018.d

Spectrum: Avg. Scans 110-112 (4.61), Background Scan 107

Location of Maximum: 198.00

Number of points: 313

m/z	Y	m/z	Y	m/z	Y	m/z	Y
117.00	186368	199.00	90056	291.00	478	425.00	959
118.00	13840	200.00	5661	292.00	569	441.00	130536
119.00	1465	201.00	6797	293.00	4883	442.00	842368
120.00	2545	202.00	2	294.00	1633	443.00	159424
121.00	214	203.00	7282	296.00	72280	444.00	13908
122.00	14739	204.00	34664	297.00	9691	445.00	836
123.00	20856	205.00	62656	298.00	726		
124.00	9595	206.00	251968	299.00	107		
125.00	8866	207.00	32864	301.00	756		

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-15

CLIENT SAMPLE NO.
SVBLK01

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-07A
Lab File ID: H011012
Date Received: NA
Date Extracted: 12/8/97
Date Analyzed: 1/10/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	1.0	U
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	1.0	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	1.0	U

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

SVBLK01

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-07A
Lab File ID: H011012
Date Received: NA
Date Extracted: 12/8/97
Date Analyzed: 1/10/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	1.4	
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	1.0	U
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	1.0	U
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT SVBLK 01

Data file : /chem/msdh.i/h-10Jan98.b/h01101201012.d
Lab Smp Id: Method Blank Client Smp ID: 12/8 Method Blank
Inj Date : 10-JAN-1998 19:11
Operator : hch Inst ID: msdh.i
Smp Info : 12/8 Blank 9712088A
Misc Info : 80 ng ISTD #267-91-1
Comment : 9712088A-07A
Method : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Meth Date : 29-Jan-1998 16:36 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 12
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8270.sub
Target Version: 3.40
Processing Host: frodo

1-30-98
JM 1.30.98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)	
$ 1 2-Fluorophenol	112	5.389	5.389	(0.683)	3347633	58.7071	58.7	(H)
$ 2 Phenol-d5	99	7.106	7.107	(0.664)	4414886	62.8328	62.8	
* 7 1,4-Dichlorobenzene-d4	150	7.891	7.892	(1.000)	5658460	80.0000		
$ 15 Nitrobenzene-d5	82	9.069	9.086	(0.608)	3856435	63.8750	63.9	
* 24 Naphthalene-d8	136	10.705	10.722	(1.000)	11703422	80.0000		
$ 33 2-Fluorobiphenyl	172	13.289	13.306	(0.717)	6315809	57.9705	58.0	
* 40 Acenaphthene-d10	164	14.909	14.926	(1.000)	6789928	80.0000		
$ 52 2,4,6-Tribromophenol	330	16.822	16.839	(0.674)	1465559	78.4979	78.5	
* 56 Phenanthrene-d10	188	18.524	18.541	(1.000)	12677782	80.0000		
59 Di-n-butylphthalate	149	20.028	20.062	(1.081)	238970	1.41079	1.4	
$ 62 Terphenyl-d14	244	22.466	22.483	(0.900)	9075761	100.525	100	
* 67 Chrysene-d12	240	24.968	25.002	(1.000)	9067998	80.0000		
* 72 Perylene-d12	264	28.321	28.338	(1.000)	6213155	80.0000		
$ 123 Benzo(e)pyrene-d12	264	28.011	28.027	(0.989)	455			(aR)

QC Flag Legend

a - Target compound detected but, quantitated amount
    Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.
H - Operator selected an alternate compound hit.

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-10Jan98.b/h01101201012.d
Lab Smp Id:
Inj Date : 10-JAN-1998 19:11
Operator : hch Inst ID: msdh.i
Smp Info : 12/8 blank
Misc Info :
Comment :
Method : /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Meth Date : 10-Jan-1998 11:38 Quant Type: ISTD
Cal Date : 09-JAN-1998 00:49 Cal File: h01080301007.d
Als bottle: 12
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8270.sub
Target Version: 3.40
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
$ 1 2-Fluorophenol	112	5.389	5.389	(0.683)	3347633	58.7071	58.7
$ 2 Phenol-d5	99	7.106	7.107	(0.664)	4414886	62.8328	62.8
* 7 1,4-Dichlorobenzene-d4	150	7.891	7.892	(1.000)	5658460	80.0000	
	150	8.202	7.892	(1.000)	5213	80.0000	
	150	8.300	7.892	(1.000)	250	80.0000	
13 N-Nitrosodipropylamine	70	9.069	8.775	(1.149)	558371	14.4685	14.5
$ 15 Nitrobenzene-d5	82	9.069	9.086	(0.608)	3856435	63.8720	63.9
18 2,4-Dimethylphenol	122	10.018	9.937	(0.936)	32250	0.81161	0.81(a)
20 Benzoic Acid	122	10.018	10.231	(0.936)	32250	1.11486	1.1
* 24 Naphthalene-d8	136	10.705	10.722	(1.000)	11703422	80.0000	
	136	10.280	10.722	(1.000)	247	80.0000	
	136	10.329	10.722	(1.000)	334	80.0000	
	136	10.361	10.722	(1.000)	204	80.0000	
	136	10.394	10.722	(1.000)	105	80.0000	

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)	
	136	10.492	10.722	(1.000)	282	80.0000		
$ 33 2-Fluorobiphenyl	172	13.289	13.306	(0.717)	6315809	57.9705	58.0	
* 40 Acenaphthene-d10	164	14.909	14.926	(1.000)	6789928	80.0000		
	164	14.516	14.926	(1.000)	345	80.0000		
43 4-Nitrophenol	109	14.909	15.269	(1.000)	13830	1.43691	1.4	
51 N-nitrosodiphenylamine	169	16.822	16.578	(0.908)	42561	0.70772	0.71	(a)
$ 52 2,4,6-Tribromophenol	330	16.822	16.839	(0.674)	1465559	78.4979	78.5	
* 56 Phenanthrene-d10	188	18.524	18.541	(1.000)	12677782	80.0000		
	188	18.213	18.541	(1.000)	1346	80.0000		
	188	18.327	18.541	(1.000)	306	80.0000		
	188	18.393	18.541	(1.000)	303	80.0000		
59 Di-n-butylphthalate	149	20.028	20.062	(1.081)	238970	1.41079	1.4	
$ 62 Terphenyl-d14	244	22.466	22.483	(0.900)	9075761	100.525	100	
* 67 Chrysene-d12	240	24.968	25.002	(1.000)	9067998	80.0000		
	240	24.625	25.002	(1.000)	668	80.0000		
	240	24.723	25.002	(1.000)	562	80.0000		
* 72 Perylene-d12	264	28.321	28.338	(1.000)	6213155	80.0000		
	264	28.011	28.338	(1.000)	455	80.0000		
	264	28.191	28.338	(1.000)	2000	80.0000		
$ 122 Benzo(e)pyrene-d12	264	28.011	27.995	(0.989)	455			(aR)
	264	27.733	27.995	(0.979)	145			(aR)
	264	27.798	27.995	(0.982)	523			(aR)
	264	27.863	27.995	(0.984)	200			(aR)
	264	27.929	27.995	(0.986)	1159			(aR)
	264	28.191	27.995	(0.995)	2000			(aR)
	264	28.321	27.995	(1.000)	6213155			(aR)
124 Benzyl Alcohol	108	7.891	8.170	(1.000)	18306	0.55736	0.56	(a)

QC Flag Legend

a - Target compound detected but, quantitated amount Below Limit Of Quantitation(BLOQ).
R - Spike/Surrogate failed recovery limits.

Data File: /chem/msdh.i/h-10Jan98.b/h01101201012.d
Report Date: 10-Jan-1998 20:00

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Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01101201012.d
Lab Smp Id:
Analysis Type: SV
Quant Type: ISTD
Operator: hch
Method File: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Misc Info:

Calibration Date: JAN/10/98
Calibration Time: 1157

Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	5433602	2716801	10867204	5658460	4.14
24 Naphthalene-d8	10679247	5339624	21358494	11703422	9.59
40 Acenaphthene-d10	6057945	3028972	12115890	6789928	12.08
56 Phenanthrene-d10	11000079	5500040	22000158	12677782	15.25
67 Chrysene-d12	8154182	4077091	16308364	9067998	11.21
72 Perylene-d12	5122068	2561034	10244136	6213155	21.30

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.89	7.39	8.39	7.89	-0.01
24 Naphthalene-d8	10.72	10.22	11.22	10.70	-0.16
40 Acenaphthene-d10	14.93	14.43	15.43	14.91	-0.11
56 Phenanthrene-d10	18.54	18.04	19.04	18.52	-0.09
67 Chrysene-d12	25.00	24.50	25.50	24.97	-0.13
72 Perylene-d12	28.34	27.84	28.84	28.32	-0.06

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

JM 1.28.98

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Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: Method Blank
Level: LOW
Data Type: MS DATA
SpikeList File: 8270.spk
Sublist File: 8270.sub
Method File: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Misc Info: 80 ng ISTD #267-91-1

Client SDG: h-10Jan98
Fraction: SV
Client Smp ID: 12/8 Method Blank
Operator: hch
SampleType: SAMPLE
Quant Type: ISTD

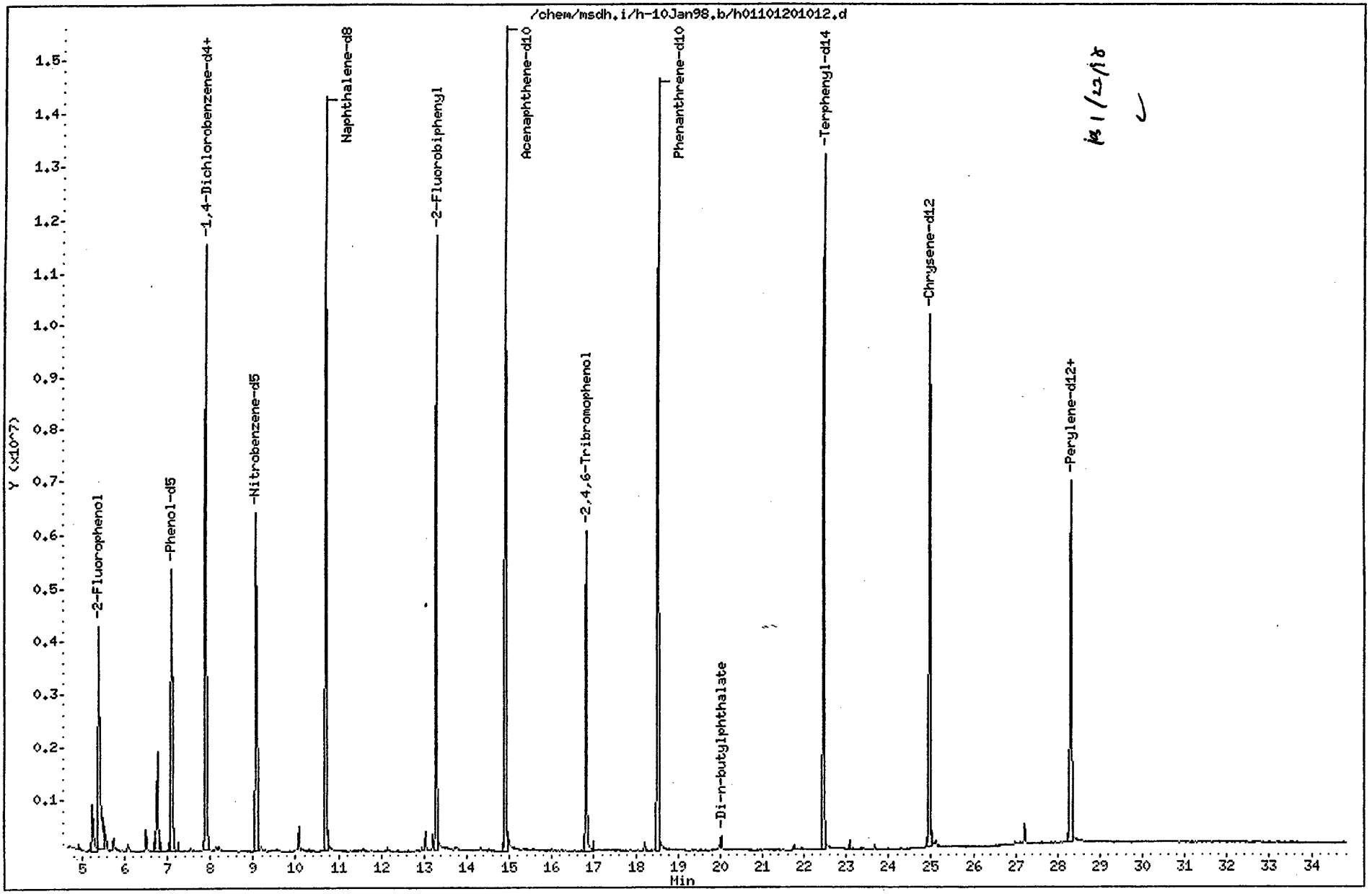
SURROGATE COMPOUND	CONC ADDED ug	CONC RECOVERED ug	% RECOVERED	LIMITS
$ 1 2-Fluorophenol	100	58.7	58.71	25-121
$ 3 Phenol-d5	100	62.8	62.83	24-113
$ 17 Nitrobenzene-d5	100	63.9	63.88	23-120
$ 38 2-Fluorobiphenyl	100	58.0	57.97	30-115
$ 65 2,4,6-Tribromophen	100	78.5	78.50	19-122
$ 84 Terphenyl-d14	100	100	100.53	18-137

1.29.98

674

Data File: /chem/msdh.i/h-10Jan98.b/h01101201012.d
Date : 10-JAN-1998 19:11
Client ID: 12/8 Method Blank
Sample Info: 12/8 Blank 9712088A
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i
Operator: hch
Column diameter: 2.00



Data File: /chem/msdh.i/h-10Jan98.b/h01101201012.d

Date : 10-JAN-1998 19:11

Client ID: 12/8 Method Blank

Sample Info: 12/8 Blank 9712088A

Volume Injected (uL): 1.0

Column phase:

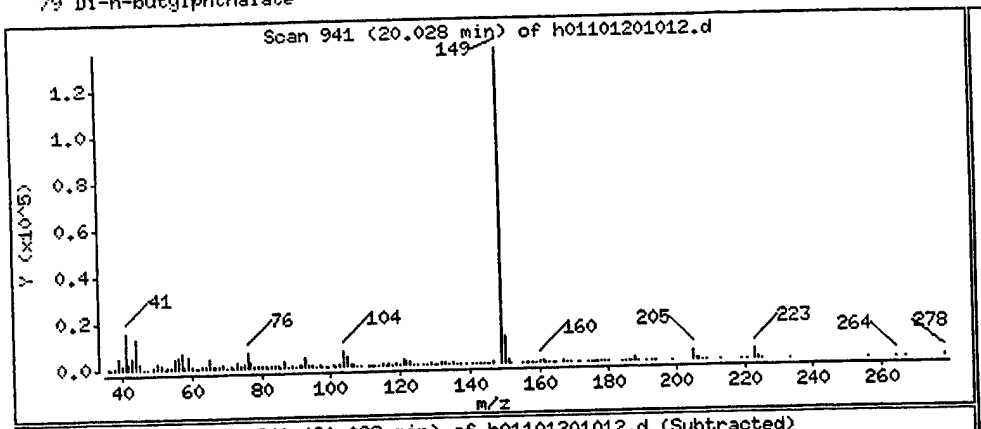
Instrument: msdh.i

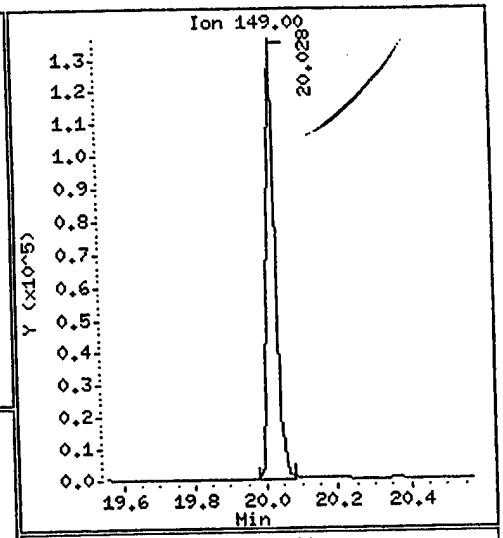
Operator: hch

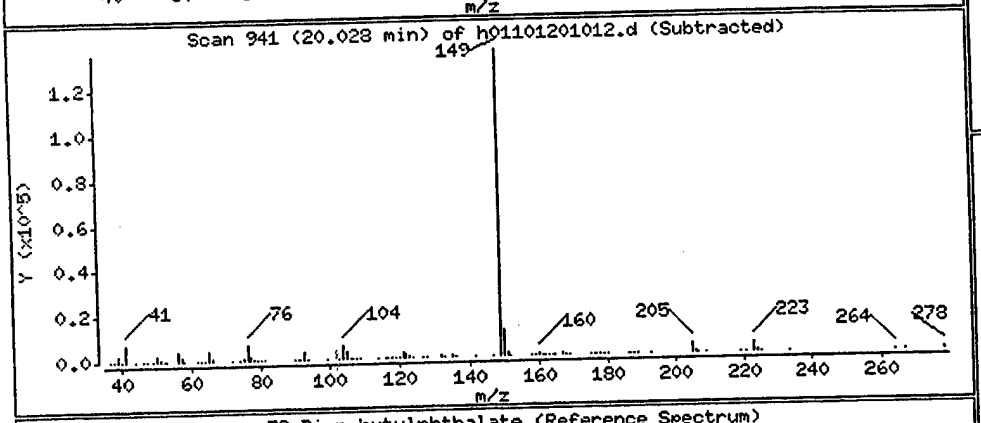
Column diameter: 2.00

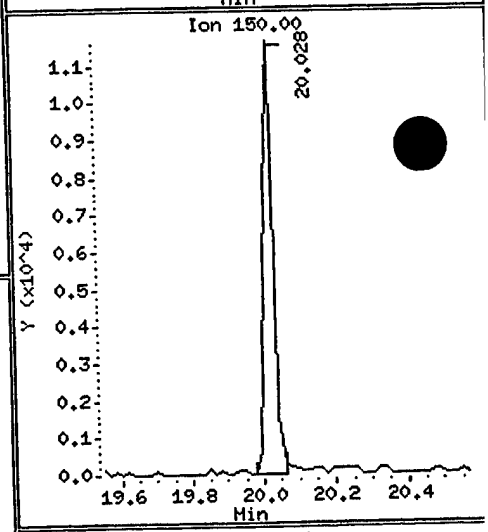
Concentration: 1.4 ug

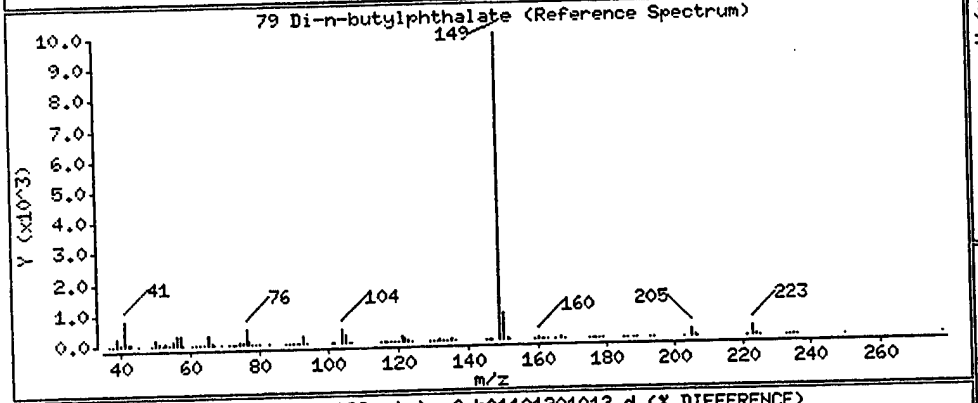
79 Di-n-butylphthalate

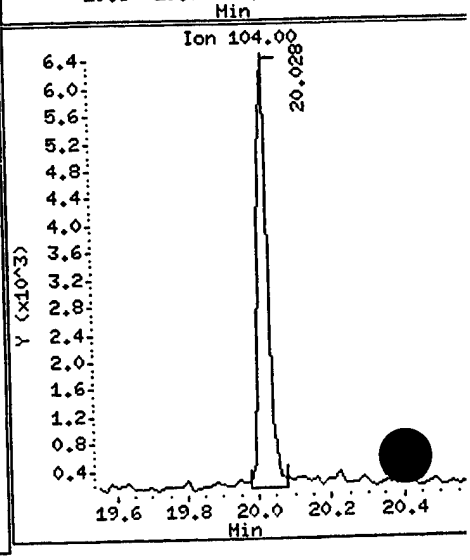


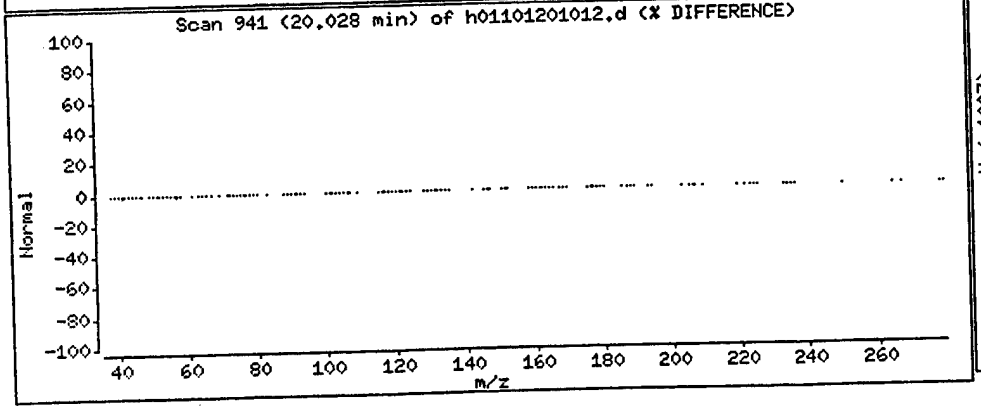












Audit History For: /chem/msdh.i/h-10Jan98.b/m1101201012.d

Change Date: 10-Jan-1998 20:00
Change Made by: Automation

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 09:33
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: 8270.sub
New Value: MM5A.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:35
Change Made by: kbadal

Parameter: Misc Information
Old Value:
New Value: 80 ng ISTD #267-91-1
Reason For Change: N/A

Change Date: 22-Jan-1998 09:35
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: MM5A.sub
New Value: MM5.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:35
Change Made by: kbadal

Parameter: Lab ID
Old Value:
New Value: Method Spike
Reason For Change: N/A

Change Date: 22-Jan-1998 09:35
Change Made by: kbadal

Parameter: Client ID
Old Value:
New Value: 12/8 Blank
Reason For Change: N/A

Change Date: 22-Jan-1998 09:39
Change Made by: kbadal

Parameter: Sample Info
Old Value: 12/8 blank
New Value: 12/8 blank 9712088A
Reason For Change: N/A

Change Date: 22-Jan-1998 09:41
Change Made by: kbadal

Parameter: Sample Prep. Date
Old Value:
New Value: 08-DEC-1997 17:30
Reason For Change: N/A

Change Date: 22-Jan-1998 09:42
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 09:59
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: MM5.sub
New Value: 8270.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:59
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 13:34
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 13:34
Change Made by: kbadal

Parameter: Best Hit for N-Nitrosodipropylamine changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:34
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:34
Change Made by: kbadal

Parameter: Best Hit for 2,4-Dimethylphenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:34
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:35
Change Made by: kbadal

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:35
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:35
Change Made by: kbadal

Parameter: Best Hit for 4-Nitrophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:35
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:35
Change Made by: kbadal

Parameter: Best Hit for N-nitrosodiphenylamine changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:35
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:35
Change Made by: kbadal

Parameter: Best Match for Unknown compound at 6.763 min. changed.
Old Value: Old match: Unknown
New Value: New match: Unknown Compound Deleted
Reason For Change: N/A

Change Date: 22-Jan-1998 13:36
Change Made by: kbadal

Parameter: Sample Info
Old Value: 12/8 blank 9712088A
New Value: 12/8 Blank 9712088A
Reason For Change: N/A

Change Date: 22-Jan-1998 13:36
Change Made by: kbadal

Parameter: Lab ID

Old Value: Method Spike
New Value: Method Blank
Reason For Change: N/A

Change Date: 22-Jan-1998 13:36
Change Made by: kbadal

Parameter: Client ID
Old Value: 12/8 Blank
New Value: 12/8 Method Blank
Reason For Change: N/A

Change Date: 22-Jan-1998 13:36
Change Made by: kbadal

Parameter: Best Hit for 2-Fluorophenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 22-Jan-1998 13:36
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 22-Jan-1998 13:36
Change Made by: kbadal

Parameter: Best Hit for 2-Fluorophenol changed
Old Value: Compound Undetected
New Value: New Hit #1
Reason For Change: N/A

Change Date: 22-Jan-1998 13:36
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 10:53
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 30-Jan-1998 08:48
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Reason For Change: Quantitation

Change Date: 30-Jan-1998 08:49
Change Made by: kbadal

Parameter: Best Hit for Benzyl Alcohol changed
Old Value: Old Hit #1
New Value: Compound Undetected

Reason For Change: N/A

Change Date: 30-Jan-1998 08:49
Change Made by: kbadal

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 30-Jan-1998 08:51
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Reason For Change: Quantitation

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13

CLIENT SAMPLE NO.
SVBLK02

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-07B
Lab File ID: H011503
Date Received: NA
Date Extracted: NA
Date Analyzed: 1/15/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
108-95-2	Phenol	5.0	U
111-44-4	bis(2-Chloroethyl) Ether	1.0	U
95-57-8	2-Chlorophenol	5.0	U
541-73-1	1,3-Dichlorobenzene	1.0	U
106-46-7	1,4-Dichlorobenzene	1.0	U
95-50-1	1,2-Dichlorobenzene	1.0	U
95-48-7	2-Methylphenol	5.0	U
108-60-1	bis(2-Chloroisopropyl) Ether	1.0	U
621-64-7	N-Nitroso-di-n-propylamine	1.0	U
106-44-5	4-Methylphenol	5.0	U
67-72-1	Hexachloroethane	1.0	U
98-95-3	Nitrobenzene	1.0	U
78-59-1	Isophorone	1.0	U
88-75-5	2-Nitrophenol	5.0	U
105-67-9	2,4-Dimethylphenol	5.0	U
65-85-0	Benzoic Acid	20	U
111-91-1	bis(2-Chloroethoxy) Methane	1.0	U
120-83-2	2,4-Dichlorophenol	5.0	U
120-82-1	1,2,4-Trichlorobenzene	1.0	U
91-20-3	Naphthalene	1.0	U
106-47-8	4-Chloroaniline	1.0	U
87-68-3	Hexachlorobutadiene	1.0	U
59-50-7	4-Chloro-3-methylphenol	5.0	U
91-57-6	2-Methylnaphthalene	1.0	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	5.0	U
95-95-4	2,4,5-Trichlorophenol	5.0	U
91-58-7	2-Chloronaphthalene	1.0	U
88-74-4	2-Nitroaniline	1.0	U
131-11-3	Dimethylphthalate	1.0	U
208-96-8	Acenaphthylene	1.0	U
606-20-2	2,6-Dinitrotoluene	1.0	U
99-09-2	3-Nitroaniline	1.0	U
83-32-9	Acenaphthene	1.0	U
51-28-5	2,4-Dinitrophenol	20	U
100-02-7	4-Nitrophenol	20	U
121-14-2	2,4-Dinitrotoluene	1.0	U
132-64-9	Dibenzofuran	1.0	U
84-66-2	Diethylphthalate	1.0	U

LEVEL-IV VALIDATABLE

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA Method TO-13 (Cont.)

CLIENT SAMPLE NO.

SVBLK02

Lab Name: AIR TOXICS LIMITED
Lab Code:
Contract:
Matrix: AMBIENT AIR
Sample Vol: 1.0uL
% Moisture: NA
Instrument ID: MSD-H

SDG No:
Lab Sample ID: 9712088A-07B
Lab File ID: H011503
Date Received: NA
Date Extracted: NA
Date Analyzed: 1/15/98
Dilution Factor: 1.0

CAS #	COMPOUND	CONCENTRATION: (ug)	Q
86-73-7	Fluorene	1.0	U
7005-72-3	4-Chlorophenyl-phenyl Ether	1.0	U
100-01-6	4-Nitroaniline	1.0	U
534-52-1	4,6-Dinitro-2-methylphenol	5.0	U
86-30-6	N-Nitrosodiphenylamine	1.0	U
101-55-3	4-Bromophenyl-phenyl Ether	1.0	U
118-74-1	Hexachlorobenzene	1.0	U
87-86-5	Pentachlorophenol	10	U
85-01-8	Phenanthrene	1.0	U
120-12-7	Anthracene	1.0	U
84-74-2	di-n-Butylphthalate	1.3	
206-44-0	Fluoranthene	1.0	U
129-00-0	Pyrene	1.0	U
85-68-7	Butylbenzylphthalate	1.0	U
91-94-1	3,3'-Dichlorobenzidine	1.0	U
218-01-9	Chrysene	1.0	U
56-55-3	Benzo(a)anthracene	1.0	U
117-81-7	bis(2-Ethylhexyl)phthalate	1.0	U
117-84-0	Di-n-Octylphthalate	1.0	U
205-99-2	Benzo(b)fluoranthene	1.0	U
207-08-9	Benzo(k)fluoranthene	1.0	U
50-32-8	Benzo(a)pyrene	1.0	U
193-39-5	Indeno(1,2,3-c,d)pyrene	1.0	U
191-24-2	Benzo(g,h,i)perylene	1.0	U
100-51-6	Benzyl alcohol	5.0	U

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150301023.d
Lab Smp Id: Method blank — Client Smp ID: Method Blank
Inj Date : 15-JAN-1998 20:31 — Inst ID: msdh.i
Operator : jgh
Smp Info : 1.0ul 12/8 Method Blank
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 27-Jan-1998 15:24 jheffel — Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 — Cal File: h01150901014.d
Als bottle: 3
Dil Factor: 1.00000
Integrator: HP RTE — Compound Sublist: 8270.sub
Target Version: 3.40 — Sample Matrix: WATER
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

1.29.98
1-29-98

	RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
$ 1 2-Fluorophenol							CAS #: 367-12-4	
	4.643	4.649 (0.662)	112	4979473	54.8369	54.8	80.00- 120.00	100.00
	4.643	4.649 (0.662)	64	2265101			0.00-10046.11	45.49
	4.643	4.649 (0.662)	92	979199			0.00-10019.15	19.66
$ 2 Phenol-d5							CAS #: 4165-62-2	
	6.295	6.317 (0.645)	99	6763785	60.4705	60.5	80.00- 120.00	100.00
	6.295	6.317 (0.645)	71	1948821			0.00-10029.73	28.81
$ 17 Nitrobenzene-d5							CAS #: 4165-60-0	
	8.176	8.182 (0.588)	82	5680826	59.5409	59.5	80.00- 120.00	100.00
	8.160	8.182 (0.587)	54	2892302			0.00-10052.46	50.91
	8.176	8.182 (0.588)	128	2727449			0.00-10049.58	48.01

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
$ 38 2-Fluorobiphenyl						CAS #: 321-60-8	
12.331	12.337 (0.705)	172	8470839	66.2124	66.2	80.00- 120.00	100.00
12.331	12.337 (0.705)	171	2876239			0.00-10033.81	33.95
$ 62 2,4,6-Tribromophenol						CAS #: 118-79-6	
15.798	15.804 (0.662)	330	1904943	70.7840	70.8	80.00- 120.00	100.00
15.798	15.804 (0.662)	332	1851684			0.00-10096.28	97.20
15.782	15.804 (0.661)	141	551863			0.00-10029.68	28.97
$ 82 Terphenyl-d14						CAS #: 98904-43-9	
21.409	21.415 (0.897)	244	11155672	94.4309	94.4	80.00- 120.00	100.00
21.409	21.415 (0.897)	122	1857622			0.00-10016.35	16.65
21.409	21.415 (0.897)	212	690377			0.00-10005.98	6.19
* 7 1,4-Dichlorobenzene-d4						CAS #: 3855-82-1	
7.015	7.021 (1.000)	150	9507665	80.0000		80.00- 120.00	100.00
7.015	7.021 (1.000)	152	5953618			0.00-10058.51	62.62
7.015	7.021 (1.000)	115	3924537			0.00-10037.59	41.28
* 27 Naphthalene-d8						CAS #: 1146-65-2	
9.763	9.769 (1.000)	136	16252091	80.0000		80.00- 120.00	100.00
9.763	9.769 (1.000)	68	1105814			0.00-10006.78	6.80
* 47 Acenaphthene-d10						CAS #: 15067-26-2	
13.901	13.907 (1.000)	164	11916161	80.0000		80.00- 120.00	100.00
13.901	13.907 (1.000)	162	11302531			0.00-10094.94	94.85
13.901	13.907 (1.000)	160	4887729			0.00-10041.02	41.02
* 71 Phenanthrene-d10						CAS #: 1517-22-2	
17.483	17.489 (1.000)	188	16785802	80.0000		80.00- 120.00	100.00
17.467	17.489 (1.000)	94	2404429			0.00-10014.44	14.32
17.467	17.489 (1.000)	80	2299940			0.00-10015.28	13.70
* 90 Chrysene-d12						CAS #: 1719-03-5	
23.862	23.885 (1.000)	240	13496035	80.0000		80.00- 120.00	100.00
23.862	23.885 (1.000)	236	3247366			0.00-10026.00	24.06
23.862	23.885 (1.000)	120	2448799			0.00-10018.11	18.14
* 99 Perylene-d12						CAS #: 1520-96-3	
27.036	27.058 (1.000)	264	8894759	80.0000		80.00- 120.00	100.00
27.036	27.058 (1.000)	260	1935080			0.00-10021.95	21.76
27.036	27.058 (1.000)	265	1854308			0.00-10020.90	20.85
78 Di-n-butylphthalate						CAS #: 84-74-2	
19.037	19.059 (1.089)	149	303079	1.33310	1.3	80.00- 120.00	100.00
19.037	19.059 (1.089)	150	28012			0.00-10011.22	9.24

RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
78 Di-n-butylphthalate (continued)								
19.037	19.059	(1.089)	104	17671			0.00-10006.82	5.83

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-15Jan98.b/h01150301023.d
Lab Smp Id: Method blank Client Smp ID: Method Blank
Inj Date : 15-JAN-1998 20:31
Operator : jgh Inst ID: msdh.i
Smp Info : 1.0ul 12/8 Method Blank
Misc Info : 80ng ISTD 267-91-1
Comment :
Method : /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Meth Date : 27-Jan-1998 15:24 jheffel Quant Type: ISTD
Cal Date : 15-JAN-1998 16:27 Cal File: h01150901014.d
Als bottle: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: 8270.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

					CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
$ 1 2-Fluorophenol						CAS #: 367-12-4		
4.643	4.649	(0.662)	112	4979473	54.8369	54.8	80.00- 120.00	100.00
4.643	4.649	(0.662)	64	2265101			0.00-10046.11	45.49
4.643	4.649	(0.662)	92	979199			0.00-10019.15	19.66
$ 2 Phenol-d5						CAS #: 4165-62-2		
6.295	6.317	(0.645)	99	6763785	60.4705	60.5	80.00- 120.00	100.00
6.295	6.317	(0.645)	71	1948821			0.00-10029.73	28.81
$ 17 Nitrobenzene-d5						CAS #: 4165-60-0		
8.176	8.182	(0.588)	82	5680826	59.5409	59.5	80.00- 120.00	100.00
8.160	8.182	(0.587)	54	2892302			0.00-10052.46	50.91
8.176	8.182	(0.588)	128	2727449			0.00-10049.58	48.01

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
$ 38 2-Fluorobiphenyl					CAS #: 321-60-8		
12.331	12.337 (0.705)	172	8470839	66.2124	66.2	80.00- 120.00	100.00
12.331	12.337 (0.705)	171	2876239			0.00-10033.81	33.95
$ 62 2,4,6-Tribromophenol					CAS #: 118-79-6		
15.798	15.804 (0.662)	330	1904943	70.7840	70.8	80.00- 120.00	100.00
15.798	15.804 (0.662)	332	1851684			0.00-10096.28	97.20
15.782	15.804 (0.661)	141	551863			0.00-10029.68	28.97
$ 82 Terphenyl-d14					CAS #: 98904-43-9		
21.409	21.415 (0.897)	244	11155672	94.4309	94.4	80.00- 120.00	100.00
21.409	21.415 (0.897)	122	1857622			0.00-10016.35	16.65
21.409	21.415 (0.897)	212	690377			0.00-10005.98	6.19
* 7 1,4-Dichlorobenzene-d4					CAS #: 3855-82-1		
7.015	7.021 (1.000)	150	9507665	80.0000		80.00- 120.00	100.00
7.015	7.021 (1.000)	152	5953618			0.00-10058.51	62.62
7.015	7.021 (1.000)	115	3924537			0.00-10037.59	41.28
* 27 Naphthalene-d8					CAS #: 1146-65-2		
9.763	9.769 (1.000)	136	16252091	80.0000		80.00- 120.00	100.00
9.763	9.769 (1.000)	68	1105814			0.00-10006.78	6.80
* 47 Acenaphthene-d10					CAS #: 15067-26-2		
13.901	13.907 (1.000)	164	11916161	80.0000		80.00- 120.00	100.00
13.901	13.907 (1.000)	162	11302531			0.00-10094.94	94.85
13.901	13.907 (1.000)	160	4887729			0.00-10041.02	41.02
* 71 Phenanthrene-d10					CAS #: 1517-22-2		
17.483	17.489 (1.000)	188	16785802	80.0000		80.00- 120.00	100.00
17.467	17.489 (1.000)	94	2404429			0.00-10014.44	14.32
17.467	17.489 (1.000)	80	2299940			0.00-10015.28	13.70
* 90 Chrysene-d12					CAS #: 1719-03-5		
23.862	23.885 (1.000)	240	13496035	80.0000		80.00- 120.00	100.00
23.862	23.885 (1.000)	236	3247366			0.00-10026.00	24.06
23.862	23.885 (1.000)	120	2448799			0.00-10018.11	18.14
* 99 Perylene-d12					CAS #: 1520-96-3		
27.036	27.058 (1.000)	264	8894759	80.0000		80.00- 120.00	100.00
27.036	27.058 (1.000)	260	1935080			0.00-10021.95	21.76
27.036	27.058 (1.000)	265	1854308			0.00-10020.90	20.85
15 N-Nitrosodipropylamine					CAS #: 621-64-7		
8.176	7.904 (1.166)	70	717548	15.7979	15.8	80.00- 120.00	100.00
8.176	7.904 (1.166)	130	16973			0.00-10026.33	2.37

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
15 N-Nitrosodipropylamine (continued)							
8.176	7.904 (1.166)	101	2672			0.00-10012.19	0.37
21 2,4-Dimethylphenol					CAS #: 105-67-9		
9.174	9.065 (0.940)	122	49766	0.82450	0.82	80.00- 120.00	100.00(a)
9.141	9.065 (0.936)	107	1472			0.00-10123.86	2.96
9.157	9.065 (0.938)	121	784			0.00-10055.27	1.58
24 Benzoic Acid					CAS #: 65-85-0		
9.174	9.441 (0.940)	122	49766	1.19183	1.2	80.00- 120.00	100.00(a)
9.174	9.441 (0.940)	105	65424			0.00-10123.32	131.46
9.157	9.441 (0.938)	77	60126			0.00-10081.55	120.82
44 2,6-Dinitrotoluene					CAS #: 606-20-2		
13.901	13.498 (1.000)	165	1464555	46.2107	46.2	80.00- 120.00	100.00
13.901	13.498 (1.000)	89	26206			0.00-10059.87	1.79
13.917	13.498 (1.001)	121	9531			0.00-10022.31	0.65
61 N-nitrosodiphenylamine					CAS #: 86-30-6		
15.782	15.575 (0.903)	169	46749	0.62690	0.63	80.00- 120.00	100.00(a)
15.782	15.575 (0.903)	168	3634			0.00-10066.04	7.78
15.782	15.575 (0.903)	167	33174			0.00-10035.43	70.96
78 Di-n-butylphthalate					CAS #: 84-74-2		
19.037	19.059 (1.089)	149	303079	1.33310	1.3	80.00- 120.00	100.00
19.037	19.059 (1.089)	150	28012			0.00-10011.22	9.24
19.037	19.059 (1.089)	104	17671			0.00-10006.82	5.83
103 Indeno(1,2,3-cd)pyrene					CAS #: 193-39-5		
29.473	29.528 (1.090)	276	52797	0.96427	0.96	80.00- 120.00	100.00(a)
29.456	29.528 (1.090)	138	13452			0.00-10035.87	25.48
0.000	29.528 (0.000)	227	0			0.00-10000.11	0.00
104 Dibenzo(a,h)anthracene					CAS #: 53-70-3		
29.555	29.593 (1.093)	278	39648	0.82811	0.83	80.00- 120.00	100.00(a)
29.555	29.593 (1.093)	279	10106			0.00-10022.59	25.49
29.538	29.593 (1.093)	139	11958			0.00-10027.37	30.16
105 Benzo(g,h,i)perylene					CAS #: 191-24-2		
30.193	30.264 (1.117)	276	50863	0.89049	0.89	80.00- 120.00	100.00(a)
30.193	30.264 (1.117)	138	16649			0.00-10038.50	32.73
30.193	30.264 (1.117)	277	10811			0.00-10023.39	21.26

QC Flag Legend

a - Target compound detected but, quantitated amount
Below Limit Of Quantitation(BLOQ).

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Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01150301023.d
Lab Smp Id: Method blank
Analysis Type: SV
Quant Type: ISTD
Operator: jgh
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80ng ISTD 267-91-1

Calibration Date: JAN/15/98
Calibration Time: 1836
Client Smp ID: Method Blank
Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	11270581	5635290	22541162	9507665	-15.64
27 Naphthalene-d8	17745391	8872696	35490782	16252091	-8.42
47 Acenaphthene-d10	12494791	6247396	24989582	11916161	-4.63
71 Phenanthrene-d10	17937870	8968935	35875740	16785802	-6.42
90 Chrysene-d12	15301801	7650900	30603602	13496035	-11.80
99 Perylene-d12	9954932	4977466	19909864	8894759	-10.65

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
7 1,4-Dichlorobenze	7.02	6.52	7.52	7.01	-0.09
27 Naphthalene-d8	9.77	9.27	10.27	9.76	-0.06
47 Acenaphthene-d10	13.91	13.41	14.41	13.90	-0.04
71 Phenanthrene-d10	17.49	16.99	17.99	17.48	-0.03
90 Chrysene-d12	23.88	23.38	24.38	23.86	-0.09
99 Perylene-d12	27.06	26.56	27.56	27.04	-0.08

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

JGH 1.29.98

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Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: Method blank
Level: LOW
Data Type: MS DATA
SpikeList File: 8270.spk
Sublist File: 8270.sub
Method File: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Misc Info: 80ng ISTD 267-91-1

Client SDG: h-15Jan98
Fraction: SV
Client Smp ID: Method Blank
Operator: jgh
SampleType: SAMPLE
Quant Type: ISTD

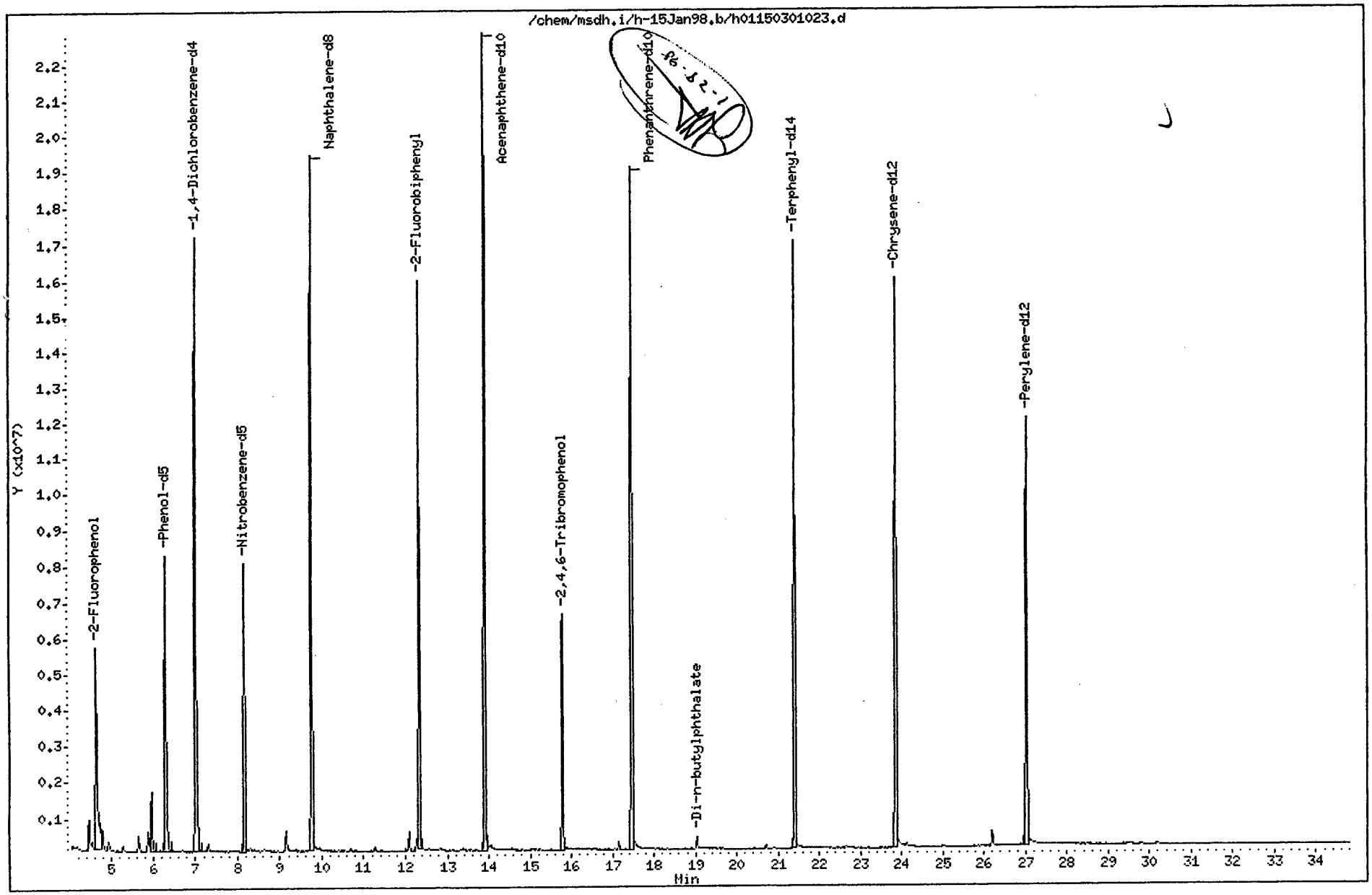
SURROGATE COMPOUND	CONC ADDED ug	CONC RECOVERED ug	% RECOVERED	LIMITS
$ 1 2-Fluorophenol	100	54.8	54.84	25-121
$ 2 Phenol-d5	100	60.5	60.47	24-113
$ 17 Nitrobenzene-d5	100	59.5	59.54	23-120
$ 38 2-Fluorobiphenyl	100	66.2	66.21	30-115
$ 62 2,4,6-Tribromophen	100	70.8	70.78	19-122
$ 82 Terphenyl-d14	100	94.4	94.43	18-137

JGH 1.29.98

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Data File: /chem/msdh.i/h-15Jan98.b/h01150301023.d
Date : 15-JAN-1998 20:31
Client ID: Method Blank
Sample Info: 1.0ul 12/8 Method Blank
Volume Injected (uL): 1.0
Column phase:

Instrument: msdh.i
Operator: jgh
Column diameter: 2.00



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Data File: /chem/msdh.i/h-15Jan98.b/h01150301023.d

Date : 15-JAN-1998 20:31

Client ID: Method Blank

Instrument: msdh.i

Sample Info: 1.0ul 12/8 Method Blank

Volume Injected (uL): 1.0

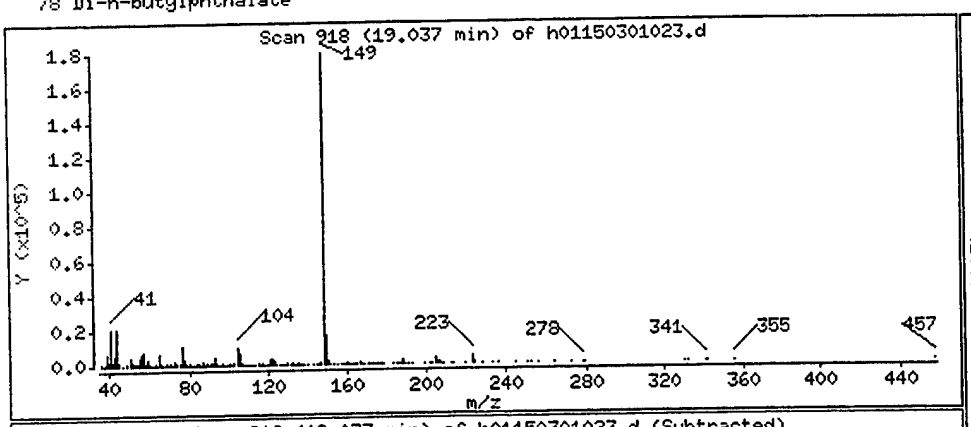
Operator: jgh

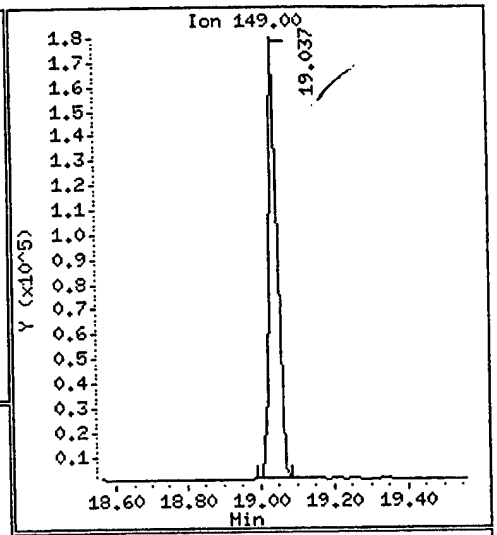
Column phase:

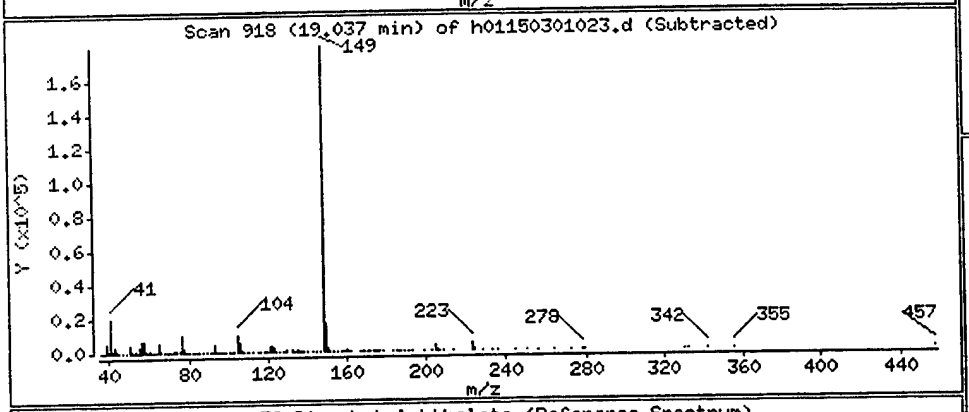
Column diameter: 2.00

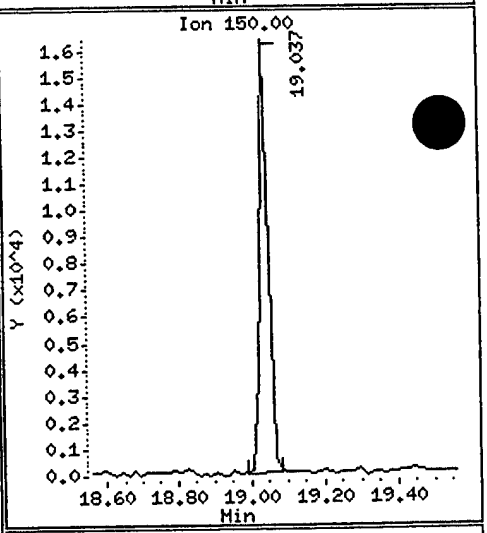
78 Di-n-butylphthalate

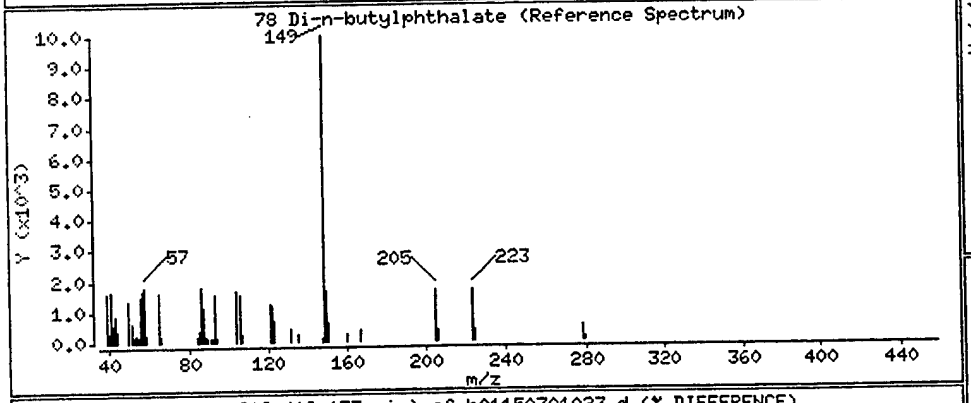
Concentration: 1.3 ug

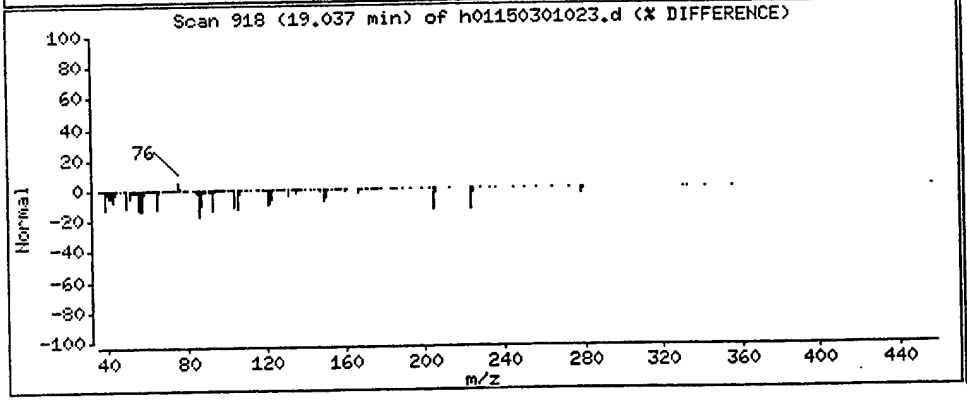


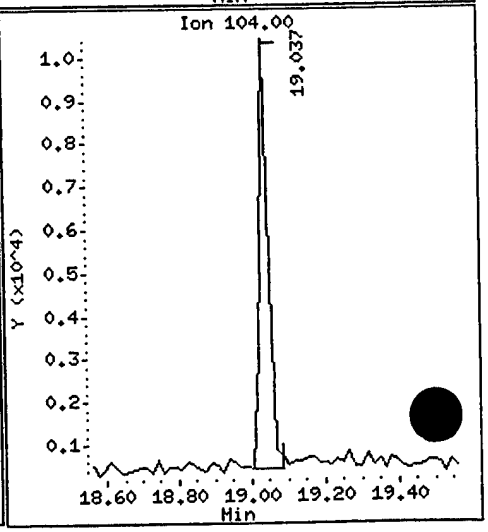












Audit History For: /chem/msdh.i/h-15Jan98.b/h01150301023.d

Change Date: 15-Jan-1998 21:18
Change Made by: Automation

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 28-Jan-1998 10:25
Change Made by: jheffel

Parameter: Misc Information
Old Value:
New Value: 80ng ISTD 267-91-1
Reason For Change: N/A

Change Date: 28-Jan-1998 10:25
Change Made by: jheffel

Parameter: Sample Info
Old Value: 12/8 Method Blank
New Value: 1.0ul 12/8 Method Blank
Reason For Change: N/A

Change Date: 28-Jan-1998 10:25
Change Made by: jheffel

Parameter: Lab ID
Old Value:
New Value: Method blank
Reason For Change: N/A

Change Date: 28-Jan-1998 10:25
Change Made by: jheffel

Parameter: Client ID
Old Value:
New Value: Method Blank
Reason For Change: N/A

Change Date: 28-Jan-1998 10:25
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Complete Target Compound Processing

Change Date: 28-Jan-1998 10:26
Change Made by: jheffel

Parameter: Best Hit for N-Nitrosodipropylamine changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 10:26
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 10:26
Change Made by: jheffel

Parameter: Best Hit for 2,4-Dimethylphenol changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 10:26
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 10:27
Change Made by: jheffel

Parameter: Best Hit for Benzoic Acid changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 10:27
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 10:27
Change Made by: jheffel

Parameter: Best Hit for 2,6-Dinitrotoluene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 10:27
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 10:27
Change Made by: jheffel

Parameter: Best Hit for N-nitrosodiphenylamine changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 10:27
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 10:27
Change Made by: jheffel

Parameter: Best Hit for Indeno(1,2,3-cd)pyrene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 10:27
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 10:27
Change Made by: jheffel

Parameter: Best Hit for Dibenzo(a,h)anthracene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 10:27
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 10:27
Change Made by: jheffel

Parameter: Best Hit for Benzo(g,h,i)perylene changed
Old Value: Old Hit #1
New Value: Compound Undetected
Reason For Change: N/A

Change Date: 28-Jan-1998 10:27
Change Made by: jheffel

Parameter: Requantitate all compounds
Old Value:
New Value:
Reason For Change: N/A

Change Date: 28-Jan-1998 10:28
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

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Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

SUBLK01MBS

Data file : /chem/msdh.i/h-10Jan98.b/h01101301013.d
Lab Smp Id: LCS1 Client Smp ID: 12/8 Spike
Inj Date : 10-JAN-1998 19:54
Operator : hch 9712088A-08A Inst ID: msdh.i
Smp Info : 1.0ul 12/8 spike 9712088A
Misc Info : 80 ng ISTD #267-91-1
Comment :
Method : /chem/msdh.i/h-10Jan98.b/EBNA-010898.m ✓
Meth Date : 29-Jan-1998 16:36 jheffel Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 13 QC Sample: MS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LCS.sub ✓
Target Version: 3.40
Processing Host: frodo

1.30.98

1.30.98

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	FINAL (ug)
$	1 2-Fluorophenol	112	5.389	5.389	(0.683)	2877764	50.9525	51.0
$	2 Phenol-d5	99	7.106	7.107	(0.664)	3756401	55.8835	55.9
	3 Phenol	94	7.123	7.123	(0.903)	3826821	58.1386	58.1
	5 2-Chlorophenol	128	7.450	7.450	(0.944)	2900752	59.2188	59.2
*	7 1,4-Dichlorobenzene-d4	150	7.891	7.892	(1.000)	5604549	80.0000	
	8 1,4-Dichlorobenzene	146	7.924	7.925	(1.004)	3229620	57.4107	57.4
	13 N-Nitrosodipropylamine	70	8.742	8.775	(1.108)	2173715	56.8669	56.9
$	15 Nitrobenzene-d5	82	9.069	9.086	(0.608)	3333286	56.2588	56.2
	23 1,2,4-Trichlorobenzene	180	10.574	10.591	(0.988)	2723600	55.3050	55.3
*	24 Naphthalene-d8	136	10.705	10.722	(1.000)	11196149	80.0000	
	28 4-Chloro-3-Methylphenol	107	12.046	12.047	(1.125)	2661485	67.2354	67.2
$	33 2-Fluorobiphenyl	172	13.289	13.306	(0.717)	5789236	57.6771	57.7
*	40 Acenaphthene-d10	164	14.909	14.926	(1.000)	6663349	80.0000	
	41 Acenaphthene	154	14.990	15.007	(1.005)	4768841	65.2993	65.3

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (NG)	CONCENTRATIONS FINAL (ug)
	43 4-Nitrophenol	109	15.252	15.269	(1.023)	823546	93.4556	93.4
	44 2,4-Dinitrotoluene	165	15.399	15.416	(1.033)	2468506	87.1700	87.2
$	52 2,4,6-Tribromophenol	330	16.822	16.839	(0.673)	1339407	77.5857	77.6
	55 Pentachlorophenol	266	18.066	18.083	(0.975)	1673738	86.3658	86.4
*	56 Phenanthrene-d10	188	18.524	18.541	(1.000)	11679917	80.0000	
	61 Pyrene	202	22.040	22.057	(0.882)	11912428	99.0840	99.1
$	62 Terphenyl-d14	244	22.466	22.483	(0.899)	8092458	96.9363	96.9
*	67 Chrysene-d12	240	24.985	25.002	(1.000)	8384886	80.0000	
*	72 Perylene-d12	264	28.321	28.338	(1.000)	5184453	80.0000	

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: LCS1
Level: LOW
Data Type: MS DATA
SpikeList File: 8270.spk
Sublist File: LCS.sub
Method File: /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Misc Info: 80 ng ISTD #267-91-1

Client SDG: h-10Jan98
Fraction: SV
Client Smp ID: 12/8 Spike
Operator: hch
SampleType: MS
Quant Type: ISTD

	SPIKE COMPOUND	CONC ADDED ug	CONC RECOVERED ug	% RECOVERED	LIMITS
3	Phenol	100	58.1	58.14	26-90
5	2-Chlorophenol	100	59.2	59.22	25-102
8	1,4-Dichlorobenzen	100	57.4	57.41	28-104
13	N-Nitrosodipropyla	100	56.9	56.87	41-126
23	1,2,4-Trichloroben	100	55.3	55.31	38-107
28	4-Chloro-3-Methylp	100	67.2	67.24	26-103
41	Acenaphthene	100	65.3	65.30	31-137
43	4-Nitrophenol	100	93.4	93.46	11-114
44	2,4-Dinitrotoluene	100	87.2	87.17	28-89
55	Pentachlorophenol	100	86.4	86.37	17-109
61	Pyrene	100	99.1	99.08	35-142

	SURROGATE COMPOUND	CONC ADDED ug	CONC RECOVERED ug	% RECOVERED	LIMITS
$ 1	2-Fluorophenol	100	51.0	50.95	25-121
$ 2	Phenol-d5	100	55.9	55.88	24-113
$ 15	Nitrobenzene-d5	100	56.2	56.26	23-120
$ 33	2-Fluorobiphenyl	100	57.7	57.68	30-115
$ 52	2,4,6-Tribromophen	100	77.6	77.59	19-122
$ 62	Terphenyl-d14	100	96.9	96.94	18-137

1.30.98

700

Air Toxics Limited

BASE NEUTRAL QUANT AND RATIO REPORT

Data file : /chem/msdh.i/h-10Jan98.b/h01101301013.d
Lab Smp Id: LCS1 Client Smp ID: 12/8 Spike
Inj Date : 10-JAN-1998 19:54
Operator : hch Inst ID: msdh.i
Smp Info : 12/8 spike 9712088A
Misc Info : 80 ng ISTD #267-91-1
Comment :
Method : /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Meth Date : 22-Jan-1998 09:32 kbadal Quant Type: ISTD
Cal Date : 09-JAN-1998 05:04 Cal File: h01080901013.d
Als bottle: 13 QC Sample: MS
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: LCS.sub
Target Version: 3.40 Sample Matrix: WATER
Processing Host: frodo

Concentration Formula: Amt * DF * Uf * Vt/(Vo * Vi)

Name	Value	Description
DF	1.000	Dilution Factor
Vo	1000.000	Volume of sample extracted (mL)
Vt	1000.000	Volume of final extract (uL)
Vi	1.000	Volume injected (uL)
Uf	1.000	ng unit correction factor

					CONCENTRATIONS ON-COL	FINAL		
RT	EXP RT	(REL RT)	MASS	RESPONSE	(NG)	(ug)	TARGET RANGE	RATIO
1 2-Fluorophenol						CAS #: 367-12-4		
5.389	5.389	(0.683)	112	2877764	50.9525	51.0	80.00- 120.00	100.00
5.389	5.389	(0.683)	64	1784353			0.00-10060.50	62.00
5.389	5.389	(0.683)	92	626184			0.00-10021.73	21.76
3 Phenol-d5						CAS #: 4165-62-2		
7.106	7.107	(0.664)	99	3756401	55.8835	55.9	80.00- 120.00	100.00
7.106	7.107	(0.664)	71	1383316			0.00-10036.75	36.83
4 Phenol						CAS #: 108-95-2		
7.123	7.123	(0.903)	94	3826821	57.7990	57.8	80.00- 120.00	100.00
7.123	7.123	(0.903)	66	1755196			0.00-10044.95	45.87
7.123	7.123	(0.903)	65	1192211			0.00-10030.19	31.15

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	FINAL (ug)	TARGET RANGE	RATIO
6 2-Chlorophenol					CAS #: 95-57-8		
7.450	7.450 (0.944)	128	2900752	58.2145	58.2	80.00- 120.00	100.00
7.450	7.450 (0.944)	130	930786			0.00-10031.72	32.09
7.450	7.450 (0.944)	64	1612678			0.00-10054.33	55.60
* 8 1,4-Dichlorobenzene-d4					CAS #: 3855-82-1		
7.891	7.892 (1.000)	150	5604549	80.0000		80.00- 120.00	100.00
7.891	7.892 (1.000)	152	3375179			0.00-10058.72	60.22
7.891	7.892 (1.000)	115	1931936			0.00-10032.98	34.47
9 1,4-Dichlorobenzene					CAS #: 106-46-7		
7.924	7.925 (1.004)	146	3229620	57.6784	57.7	80.00- 120.00	100.00
7.924	7.925 (1.004)	148	2037985			0.00-10063.49	63.10
7.924	7.925 (1.004)	113	491733			0.00-10013.88	15.23
15 N-Nitrosodipropylamine					CAS #: 621-64-7		
8.742	8.775 (1.108)	70	2173715	56.8669	56.9	80.00- 120.00	100.00
8.742	8.775 (1.108)	130	441785			0.00-10020.76	20.32
8.742	8.775 (1.108)	101	211040			0.00-10009.99	9.71
17 Nitrobenzene-d5					CAS #: 4165-60-0		
9.069	9.086 (0.608)	82	3333286	56.2588	56.2	80.00- 120.00	100.00
9.069	9.086 (0.608)	54	2030033			0.00-10058.73	60.90
9.069	9.086 (0.608)	128	1478849			0.00-10043.76	44.37
26 1,2,4-Trichlorobenzene					CAS #: 120-82-1		
10.574	10.591 (0.988)	180	2723600	55.3050	55.3	80.00- 120.00	100.00
10.574	10.591 (0.988)	182	2609833			0.00-10095.38	95.82
10.574	10.591 (0.988)	145	734396			0.00-10026.34	26.96
* 27 Naphthalene-d8					CAS #: 1146-65-2		
10.705	10.722 (1.000)	136	11196149	80.0000		80.00- 120.00	100.00
10.705	10.722 (1.000)	68	809474			0.00-10007.32	7.23
32 4-Chloro-3-Methylphenol					CAS #: 59-50-7		
12.046	12.047 (1.125)	107	2661485	64.9520	65.0	80.00- 120.00	100.00
12.046	12.047 (1.125)	142	2173854			0.00-10081.63	81.68
12.046	12.047 (1.125)	144	705137			0.00-10026.07	26.49
38 2-Fluorobiphenyl					CAS #: 321-60-8		
13.289	13.306 (0.717)	172	5789236	57.6771	57.7	80.00- 120.00	100.00
13.289	13.306 (0.717)	171	1944076			0.00-10033.42	33.58
* 48 Acenaphthene-d10					CAS #: 15067-26-2		
14.909	14.926 (1.000)	164	6663349	80.0000		80.00- 120.00	100.00
14.909	14.926 (1.000)	162	6205190			0.00-10092.80	93.12

RT	EXP RT (REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
14.909	14.926 (1.000)	160	2744677			0.00-10040.80	41.19
	49 Acenaphthene				CAS #: 83-32-9		
14.990	15.007 (1.005)	154	4768841	65.2993	65.3	80.00- 120.00	100.00
14.990	15.007 (1.005)	152	2366826			0.00-10048.82	49.63
14.990	15.007 (1.005)	153	5111394			0.00-10106.81	107.18
	52 4-Nitrophenol				CAS #: 100-02-7		
15.252	15.269 (1.023)	109	823546	87.1927	87.2	80.00- 120.00	100.00
15.252	15.269 (1.023)	139	1261173			0.00-10156.24	153.14
15.252	15.269 (1.023)	65	1135919			0.00-10152.55	137.93
	53 2,4-Dinitrotoluene				CAS #: 121-14-2		
15.399	15.416 (1.033)	165	2468506	87.3357	87.3	80.00- 120.00	100.00
15.399	15.416 (1.033)	63	1181039			0.00-10072.10	47.84
15.399	15.416 (1.033)	182	124549			0.00-10005.24	5.05
	65 2,4,6-Tribromophenol				CAS #: 118-79-6		
16.822	16.839 (0.673)	330	1339407	77.5857	77.6	80.00- 120.00	100.00
16.822	16.839 (0.673)	332	1291778			0.00-10096.16	96.44
16.822	16.839 (0.673)	141	445252			0.00-10031.37	33.24
	70 Pentachlorophenol				CAS #: 87-86-5		
18.066	18.083 (0.975)	266	1673738	86.3658	86.4	80.00- 120.00	100.00
18.066	18.083 (0.975)	264	1051000			0.00-10062.38	62.79
18.066	18.083 (0.975)	268	1062124			0.00-10064.35	63.46
	71 Phenanthrene-d10				CAS #: 1517-22-2		
18.524	18.541 (1.000)	188	11679917	80.0000		80.00- 120.00	100.00
18.524	18.541 (1.000)	94	1177135			0.00-10010.18	10.08
18.524	18.541 (1.000)	80	1320478			0.00-10012.01	11.31
	83 Pyrene				CAS #: 129-00-0		
22.040	22.057 (0.882)	202	11912428	99.0840	99.1	80.00- 120.00	100.00
22.024	22.057 (0.881)	101	1835572			0.00-10015.61	15.41
22.024	22.057 (0.881)	100	1458944			0.00-10012.39	12.25
	84 Terphenyl-d14				CAS #: 98904-43-9		
22.466	22.483 (0.899)	244	8092458	96.9363	96.9	80.00- 120.00	100.00
22.466	22.483 (0.899)	122	1080465			0.00-10012.81	13.35
22.466	22.483 (0.899)	212	507245			0.00-10006.58	6.27
	91 Chrysene-d12				CAS #: 1719-03-5		
24.985	25.002 (1.000)	240	8384886	80.0000		80.00- 120.00	100.00
24.985	25.002 (1.000)	236	2020980			0.00-10023.68	24.10

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RT	EXP RT	(REL RT)	MASS	RESPONSE	CONCENTRATIONS ON-COL (NG)	CONCENTRATIONS FINAL (ug)	TARGET RANGE	RATIO
**	======	========	====	========	=======	=======	==========	=====
* 91 Chrysene-d12 (continued)								
24.968	25.302	(1.000)	120	1123387			0.00-10012.09	13.40
* 100 Perylene-d12						CAS #: 1520-96-3		
28.321	28.338	(1.000)	264	5184453	80.0000		80.00- 120.00	100.00
28.321	28.338	(1.000)	260	1160843			0.00-10022.24	22.39
28.321	28.338	(1.000)	265	1093826			0.00-10021.06	21.10

Air Toxics Limited

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: msdh.i
Lab File ID: h01101301013.d
Lab Smp Id: LCS1
Analysis Type: SV
Quant Type: ISTD
Operator: hch
Method File: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Misc Info: 80 ng ISTD #267-91-1

Calibration Date: JAN/10/98
Calibration Time: 1157
Client Smp ID: 12/8 Spike
Level: LOW
Sample Type: WATER

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	5433602	2716801	10867204	5604549	3.15
27 Naphthalene-d8	10679247	5339624	21358494	11196149	4.84
48 Acenaphthene-d10	6057945	3028972	12115890	6663349	9.99
73 Phenanthrene-d10	11000079	5500040	22000158	11679917	6.18
91 Chrysene-d12	8154182	4077091	16308364	8384886	2.83
100 Perylene-d12	5122068	2561034	10244136	5184453	1.22

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	7.89	7.39	8.39	7.89	-0.01
27 Naphthalene-d8	10.72	10.22	11.22	10.70	-0.16
48 Acenaphthene-d10	14.93	14.43	15.43	14.91	-0.11
73 Phenanthrene-d10	18.54	18.04	19.04	18.52	-0.09
91 Chrysene-d12	25.00	24.50	25.50	24.98	-0.07
100 Perylene-d12	28.34	27.84	28.84	28.32	-0.06

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

1.29.98

Air Toxics Limited

RECOVERY REPORT

Client Name:
Sample Matrix: LIQUID
Lab Smp Id: LCS1
Level: LOW
Data Type: MS DATA
SpikeList File: 8270.spk
Sublist File: LCS.sub
Method File: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Misc Info: 80 ng ISTD #267-91-1

Client SDG: h-10Jan98
Fraction: SV
Client Smp ID: 12/8 Spike
Operator: hch
SampleType: MS
Quant Type: ISTD

	SPIKE COMPOUND	CONC ADDED ug	CONC RECOVERED ug	% RECOVERED	LIMITS
4	Phenol	100	57.8	57.80	26-90
6	2-Chlorophenol	100	58.2	58.21	25-102
9	1,4-Dichlorobenzen	100	57.7	57.68	28-104
15	N-Nitrosodipropyla	100	56.9	56.87	41-126
26	1,2,4-Trichloroben	100	55.3	55.31	38-107
32	4-Chloro-3-Methylp	100	65.0	64.95	26-103
49	Acenaphthene	100	65.3	65.30	31-137
52	4-Nitrophenol	100	87.2	87.19	11-114
53	2,4-Dinitrotoluene	100	87.3	87.34	28-[illegible]
70	Pentachlorophenol	100	86.4	86.37	17-[illegible]9
83	Pyrene	100	99.1	99.08	35-142

	SURROGATE COMPOUND	CONC ADDED ug	CONC RECOVERED ug	% RECOVERED	LIMITS
$ 1	2-Fluorophenol	100	51.0	50.95	25-121
$ 3	Phenol-d5	100	55.9	55.88	24-113
$ 17	Nitrobenzene-d5	100	56.2	56.26	23-120
$ 38	2-Fluorobiphenyl	100	57.7	57.68	30-115
$ 65	2,4,6-Tribromophen	100	77.6	77.59	19-122
$ 84	Terphenyl-d14	100	96.9	96.94	18-137

706

Data File: /chem/msdh.i/h-10Jan98.b/h01101301013.d

Date : 10-Jan-1998 19:54

Client ID: 12/8 Spike

Sample Info: 12/8 spike 9712088A

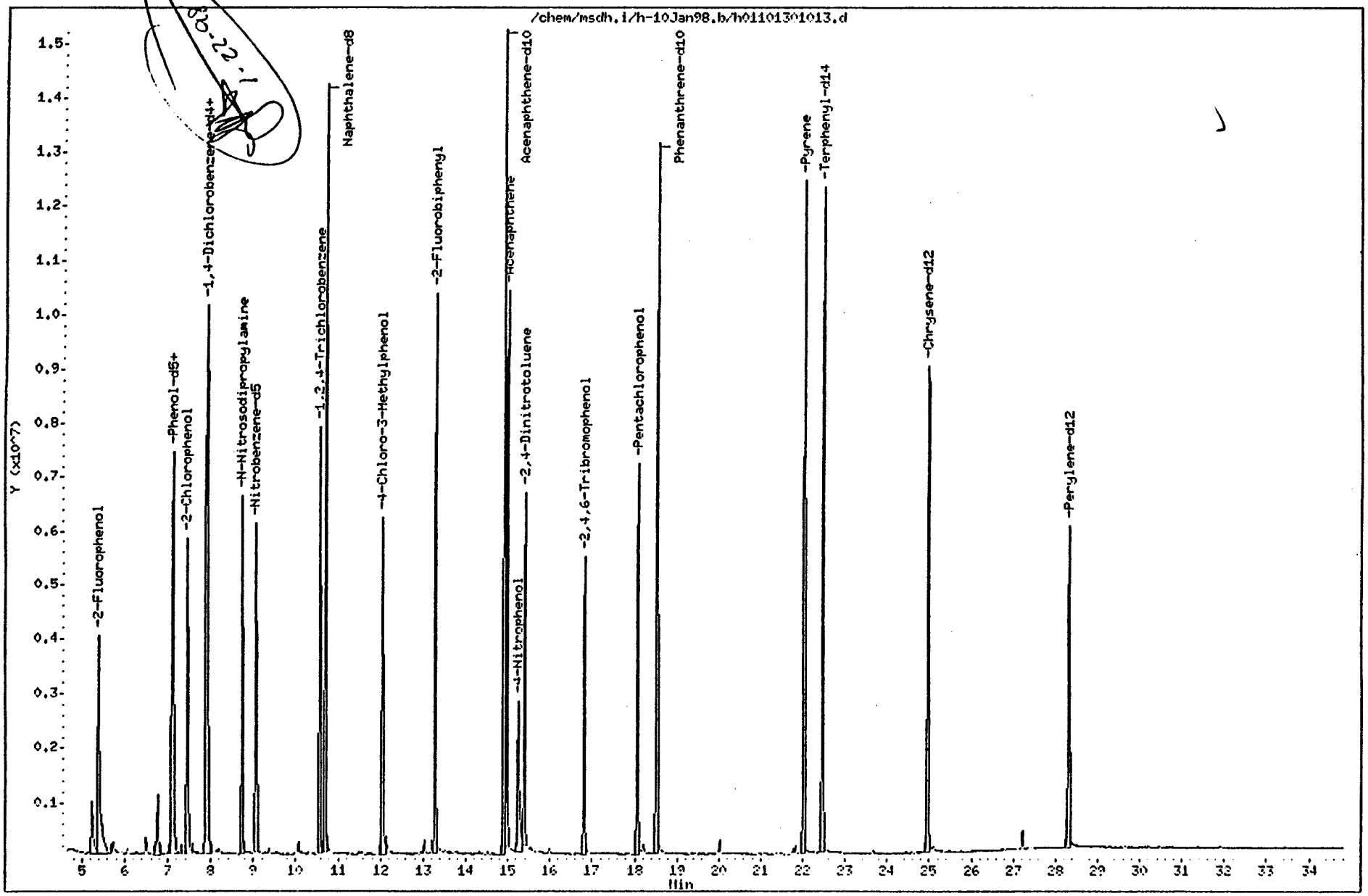
Volume Injected (uL): 1.0

Column phase:

Instrument: msdh.i

Operator: hch

Column diameter: 2.00



Data File: /chem/msdh.i/h-10Jan98.b/h01101301013.d

Date : 10-JAN-1998 19:54

Client ID: 12/8 Spike

Instrument: msdh.i

Sample Info: 12/8 spike 9712088A

Volume Injected (uL): 1.0

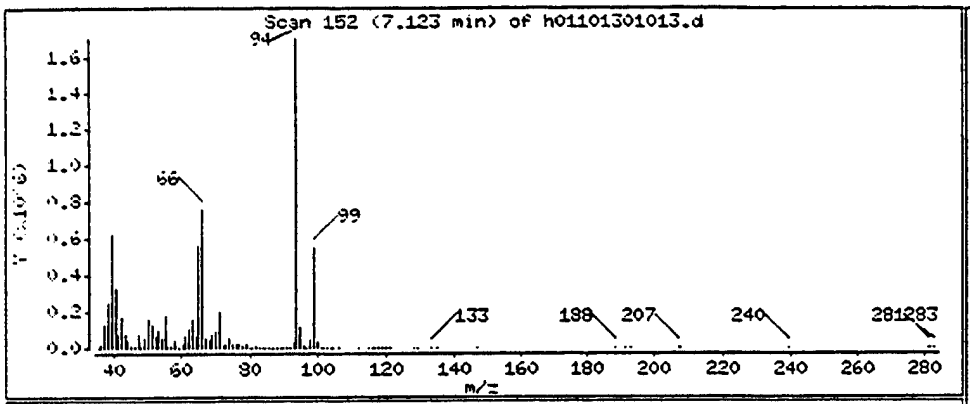
Operator: hch

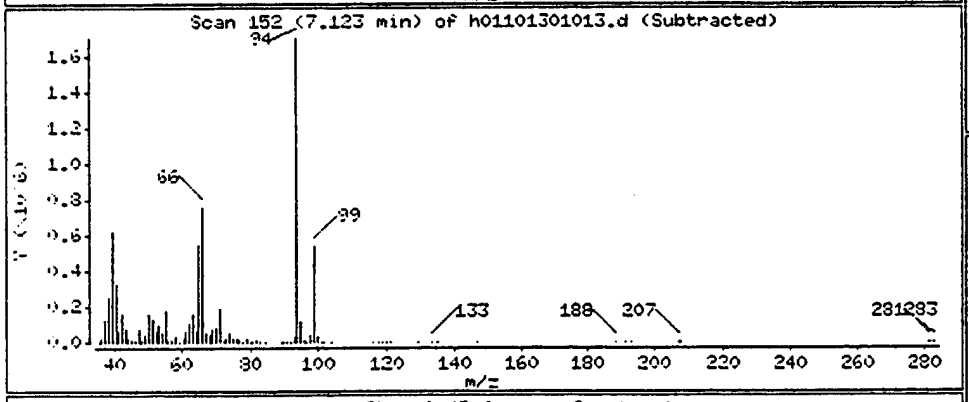
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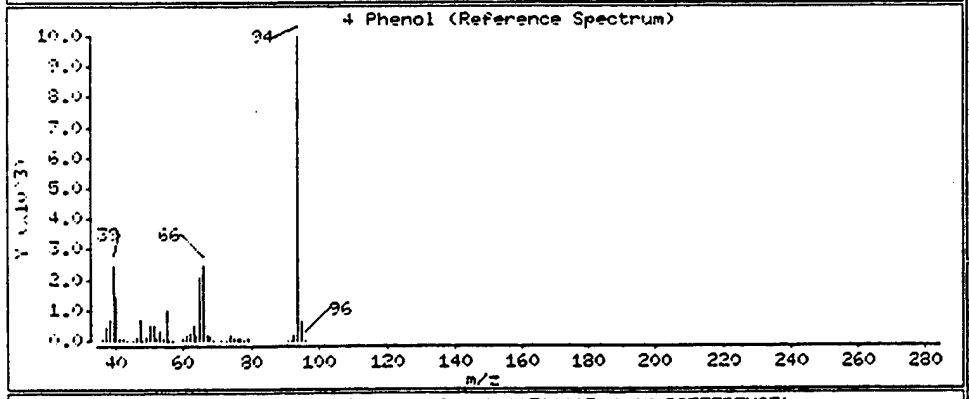
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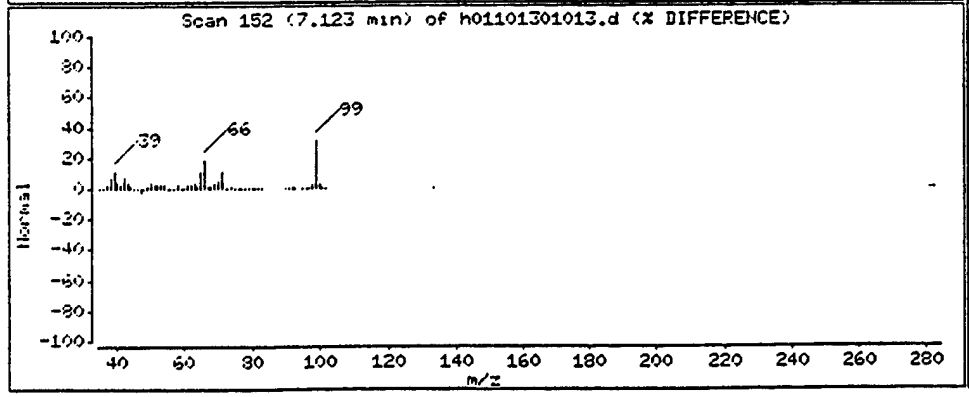
4 Phenol

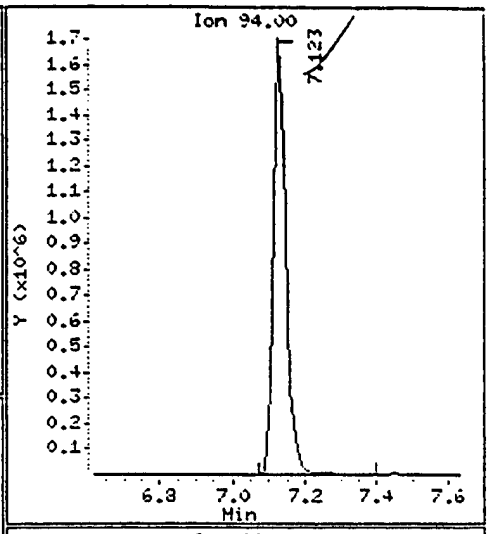
Concentration: 57.8 ug

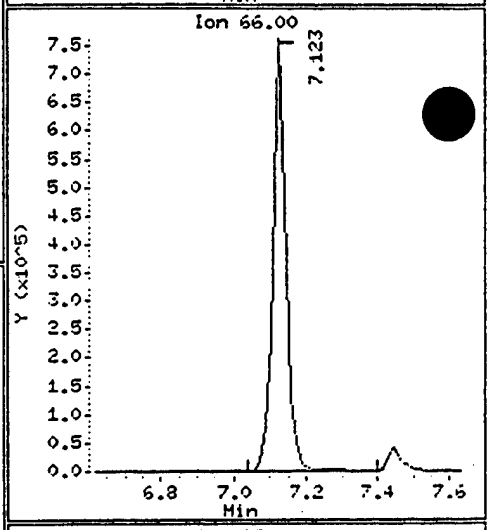


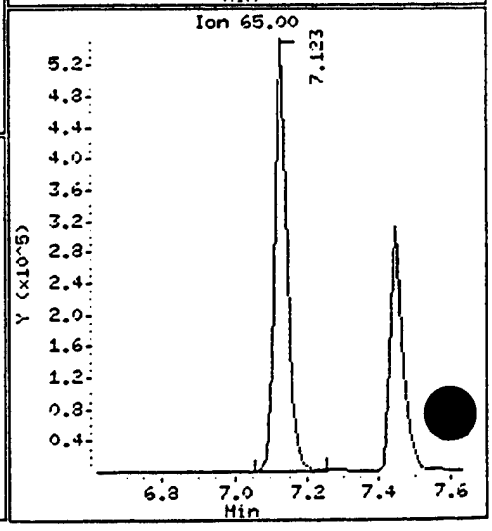












Data File: /chem/msdh.i/h-10Jan98.b/h01101301013.d

Date : 10-JAN-1998 19:54

Client ID: 12/8 Spike

Instrument: msdh.i

Sample Info: 12/8 spike 9712088A

Volume Injected (uL): 1.0

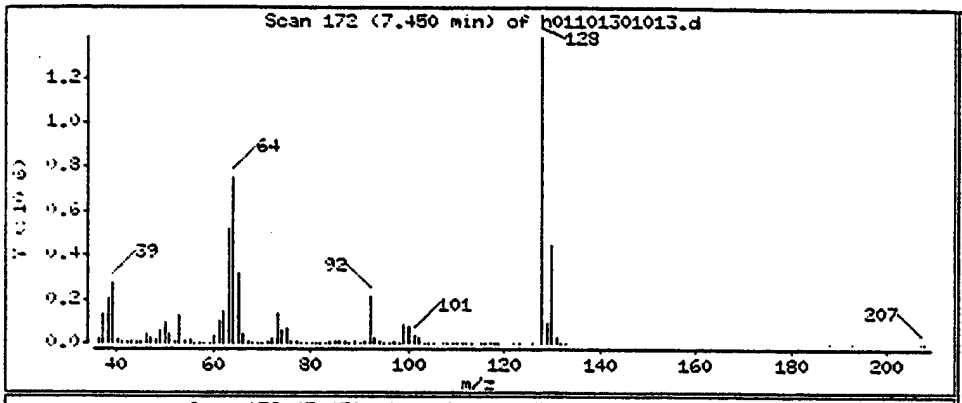
Operator: hch

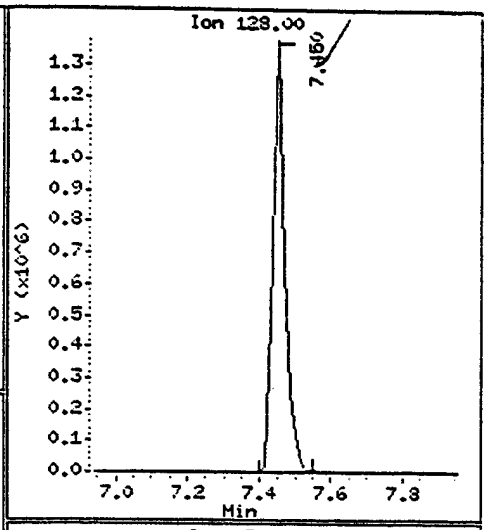
Column phase:

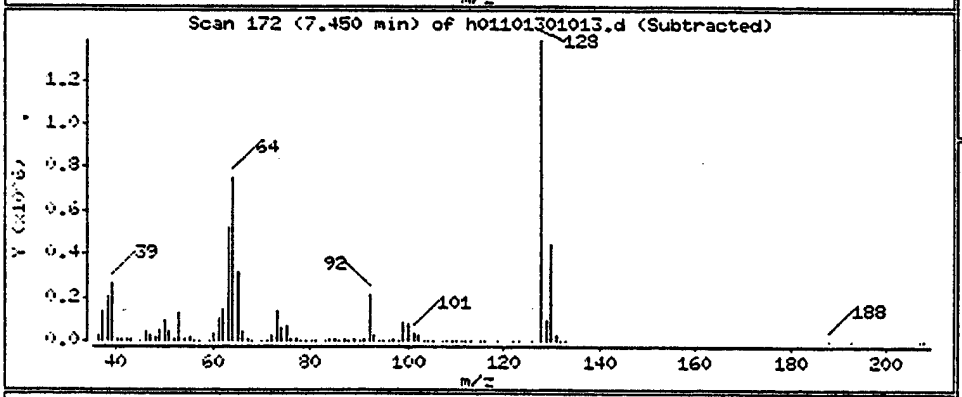
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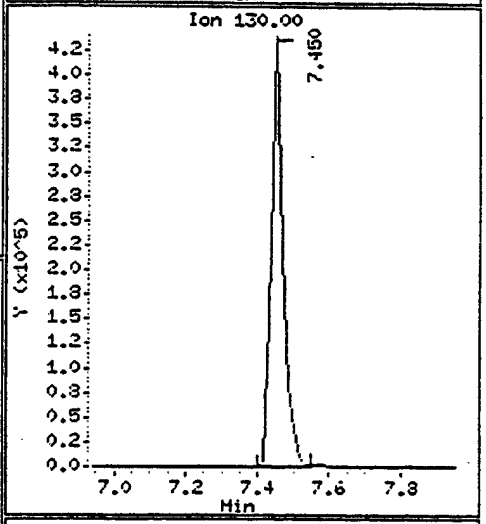
6 2-Chlorophenol

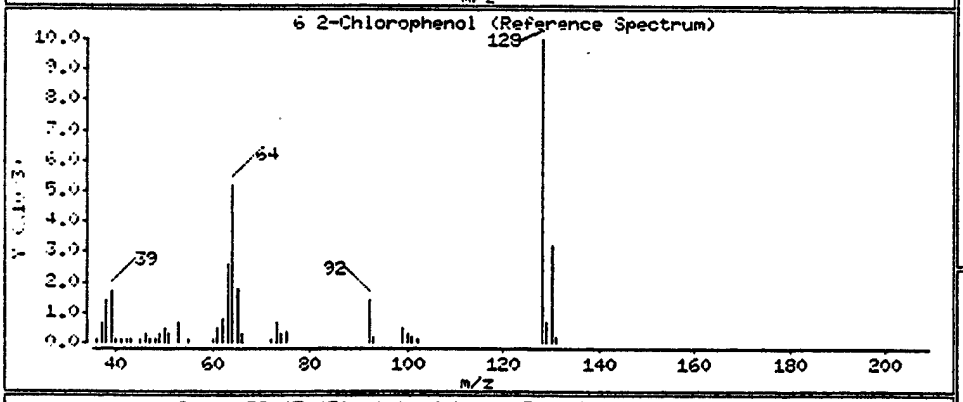
Concentration: 58.2 ug

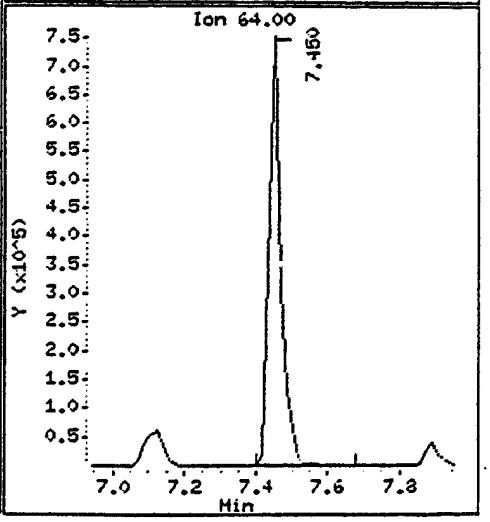


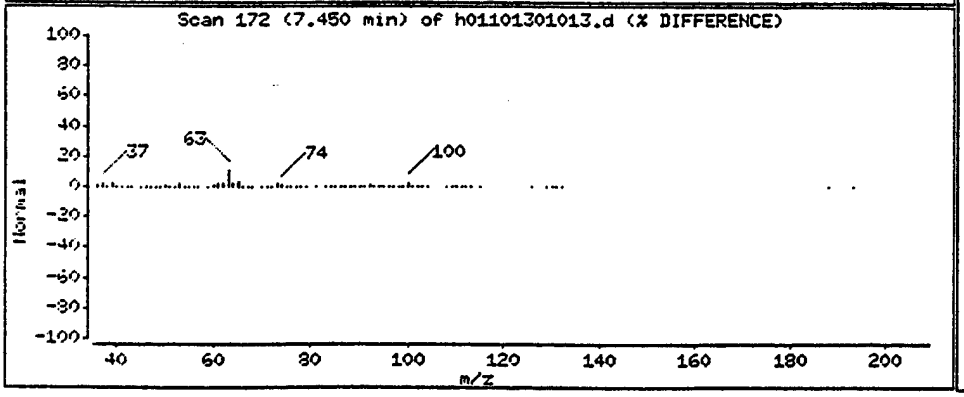












709

Data File: /chem/msdh.i/h-10Jan98.b/h01101301013.d

Date : 10-JAN-1998 19:54

Client ID: 12/8 Spike

Instrument: msdh.i

Sample Info: 12/8 spike 9712088A

Volume Injected (uL): 1.0

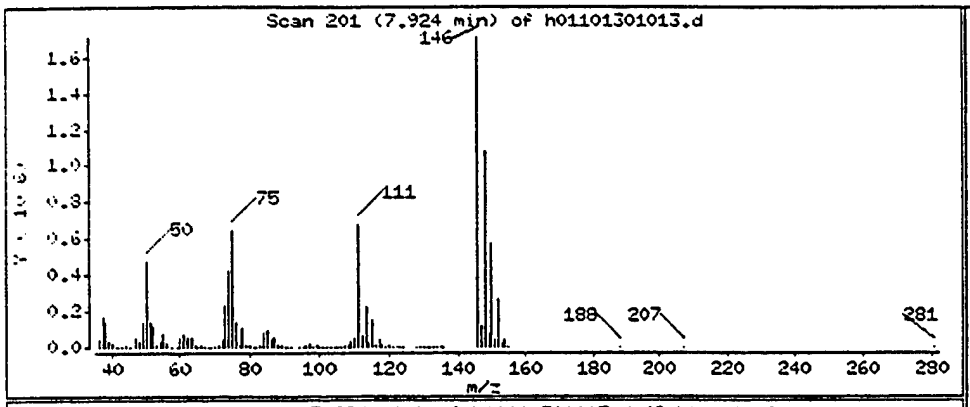
Operator: hch

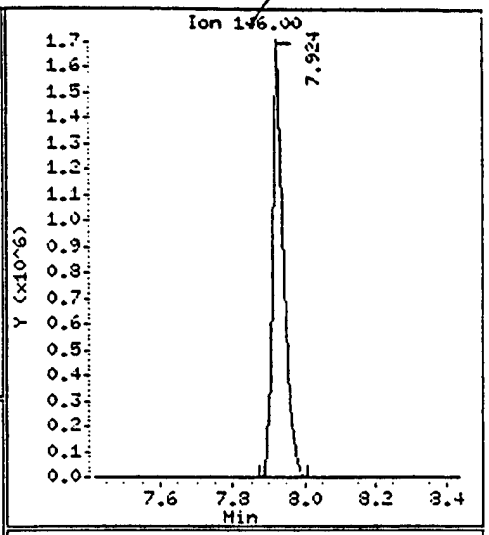
Column phase:

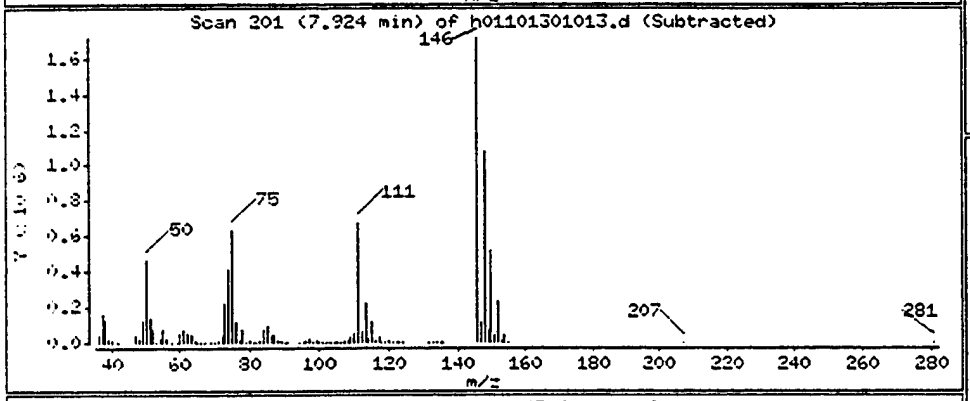
Column diameter: 2.00

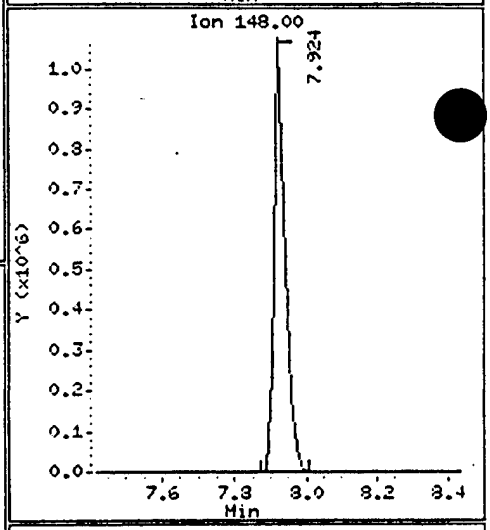
9 1,4-Dichlorobenzene

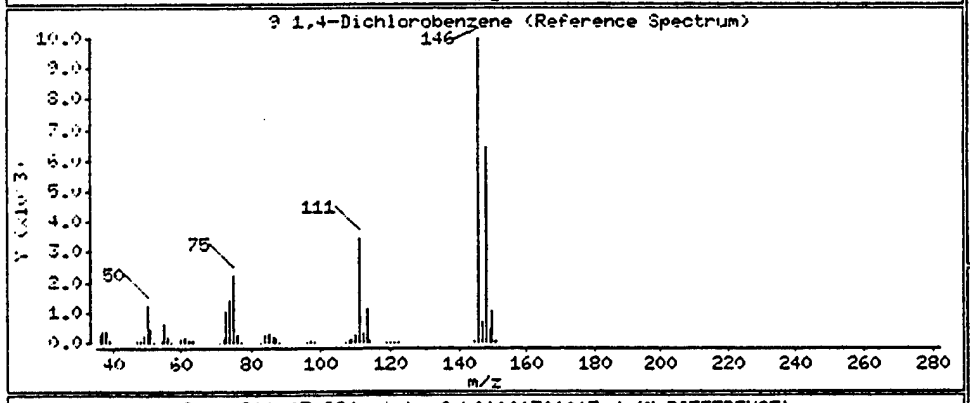
Concentration: 57.7 ug

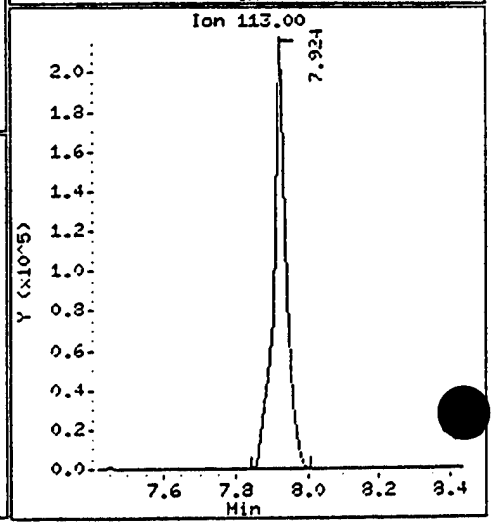


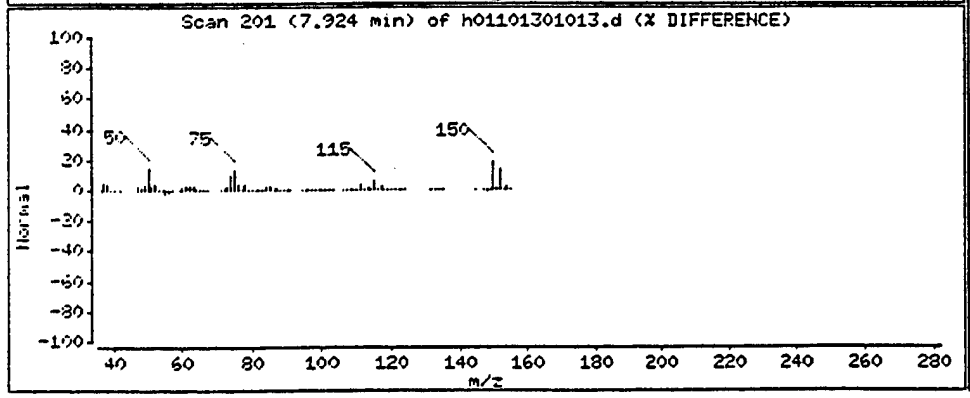












Data File: /chem/msdh.i/h-10Jan98.b/h01101301013.d

Date : 10-JAN-1998 19:54

Client ID: 12/8 Spike

Instrument: msdh.i

Sample Info: 12/8 spike 9712088A

Volume Injected (uL): 1.0

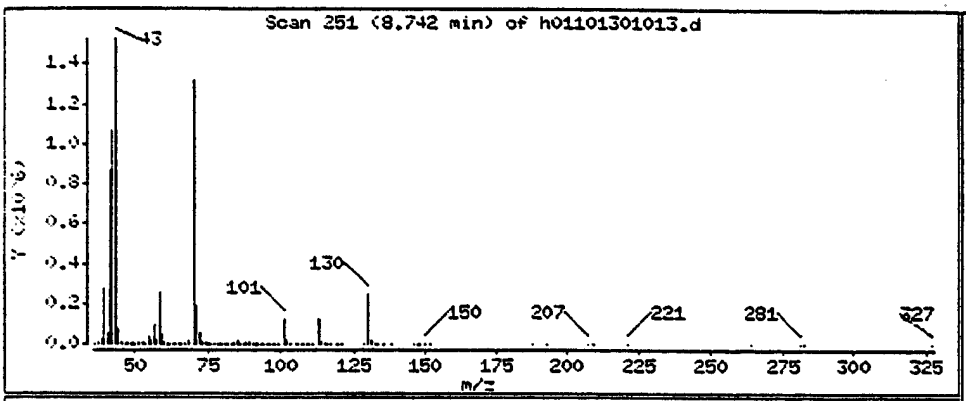
Operator: hch

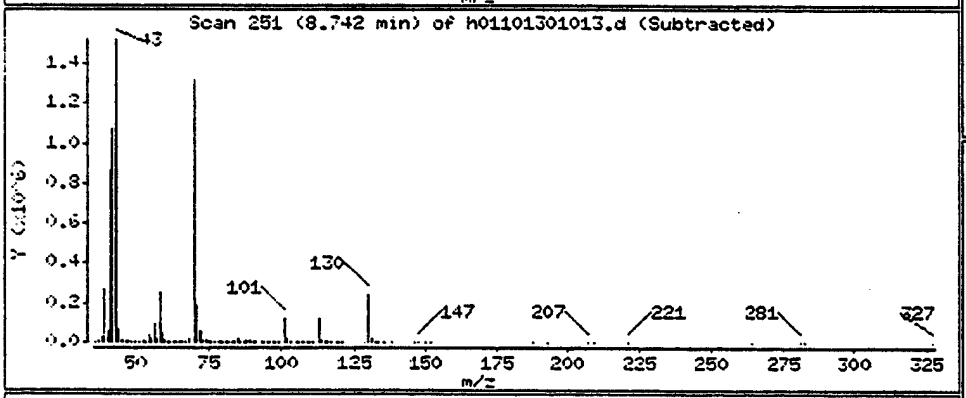
Column phase:

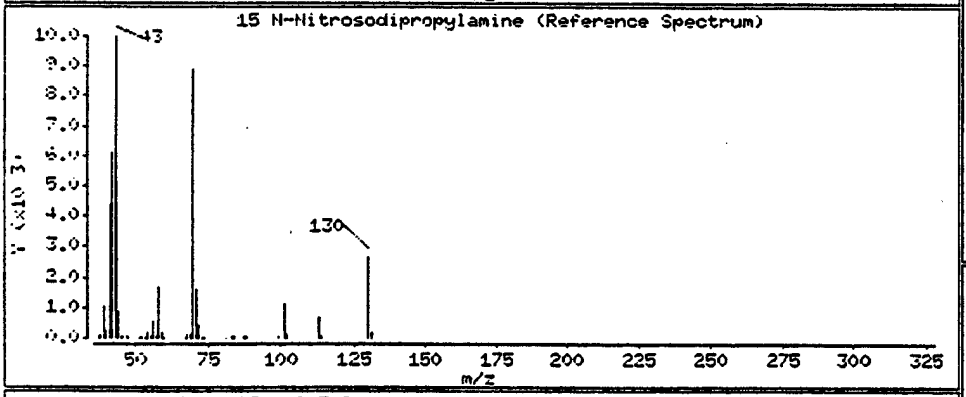
Column diameter: 2.00

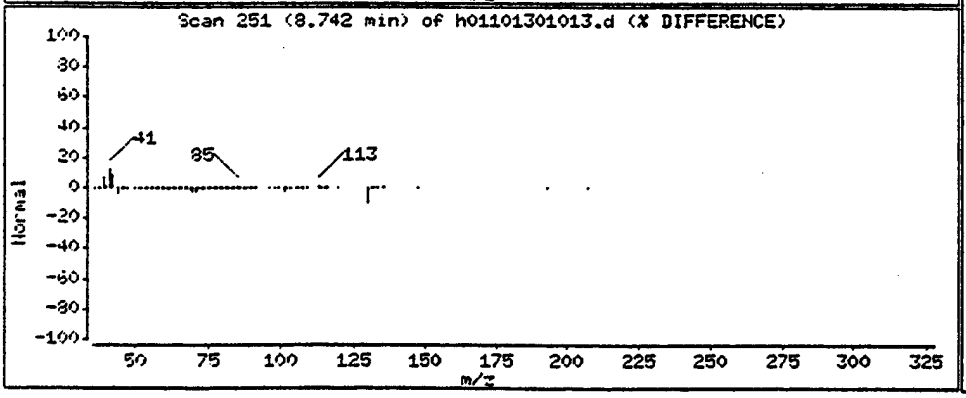
15 N-Nitrosodipropylamine

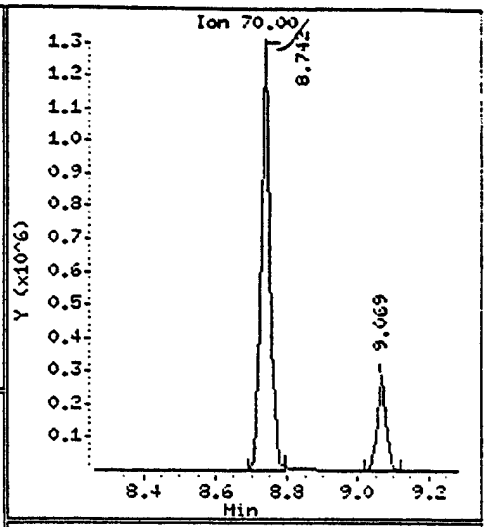
Concentration: 56.9 ug

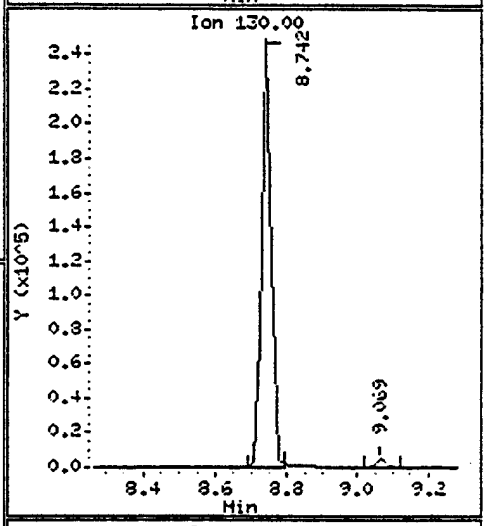


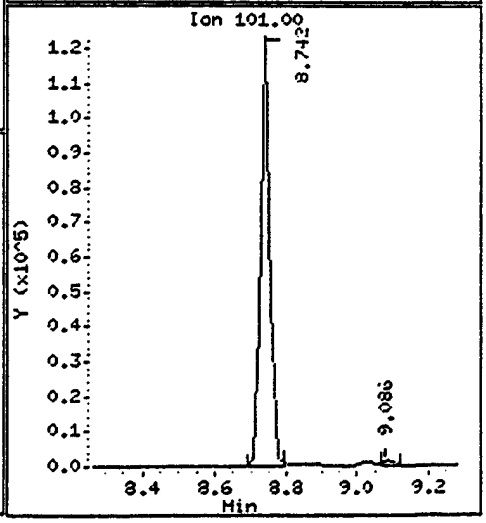












Data File: /chem/msdh.i/h-10Jan98.b/h01101301013.d

Date : 10-JAN-1998 19:54

Client ID: 12/8 Spike

Instrument: msdh.i

Sample Info: 12/8 spike 9712088A

Volume Injected (uL): 1.0

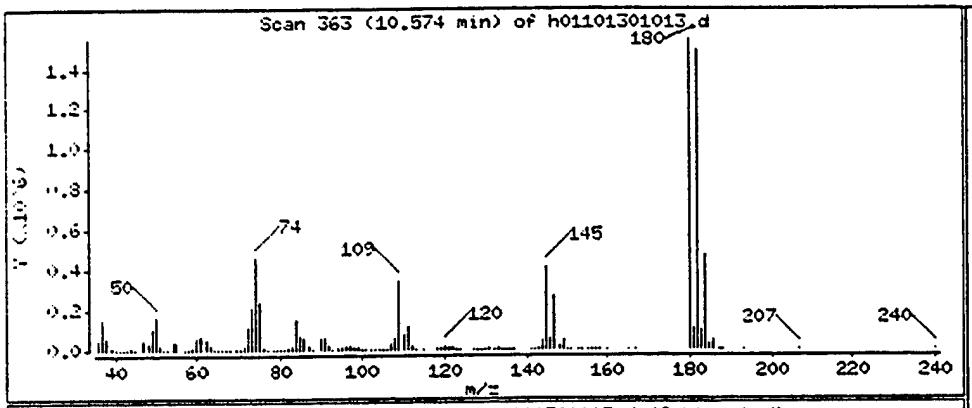
Operator: hch

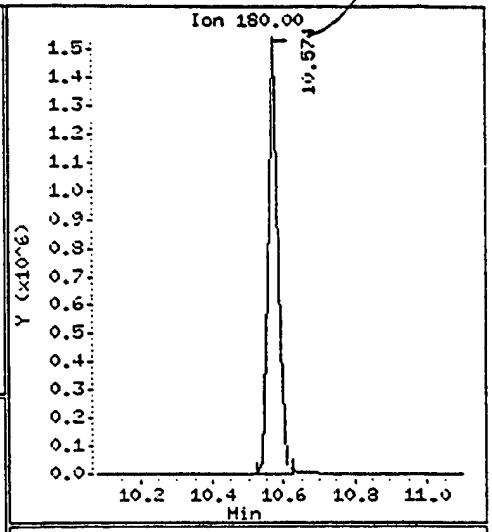
Column phase:

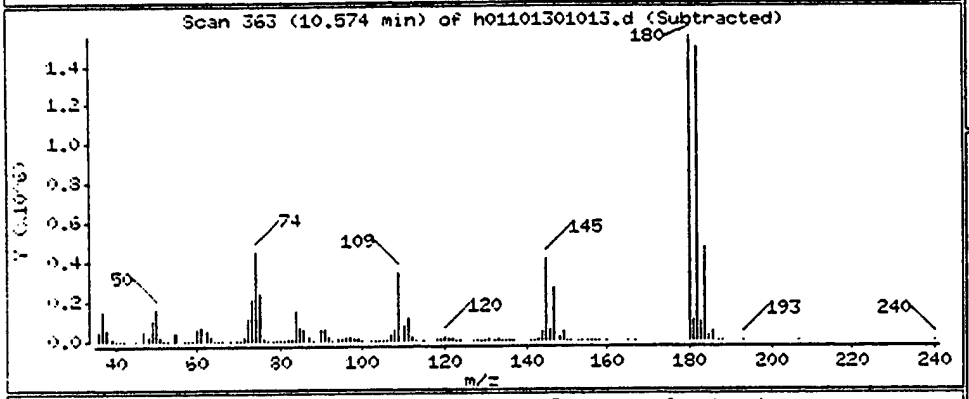
Column diameter: 2.00

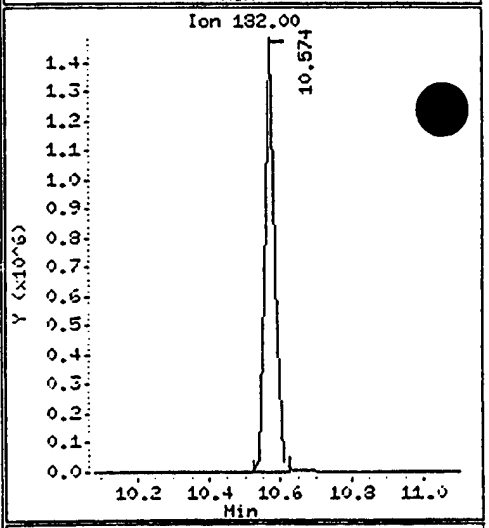
26 1,2,4-Trichlorobenzene

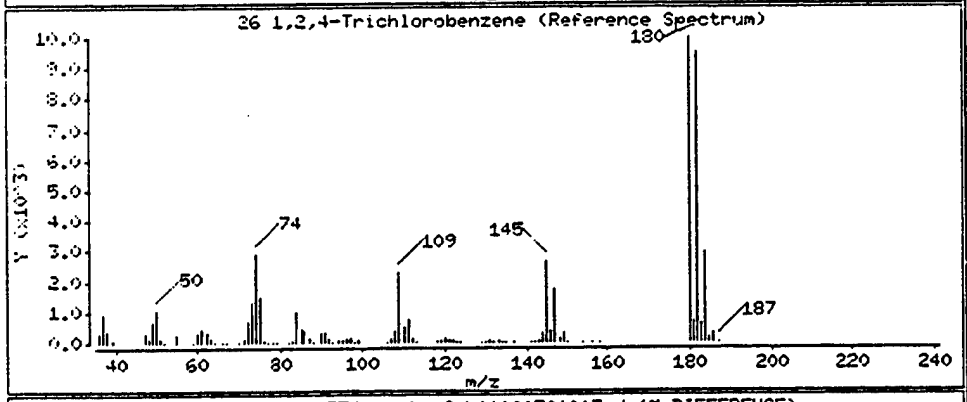
Concentration: 55.3 ug

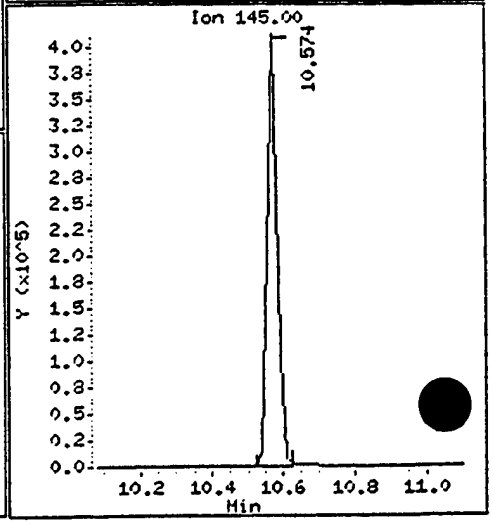


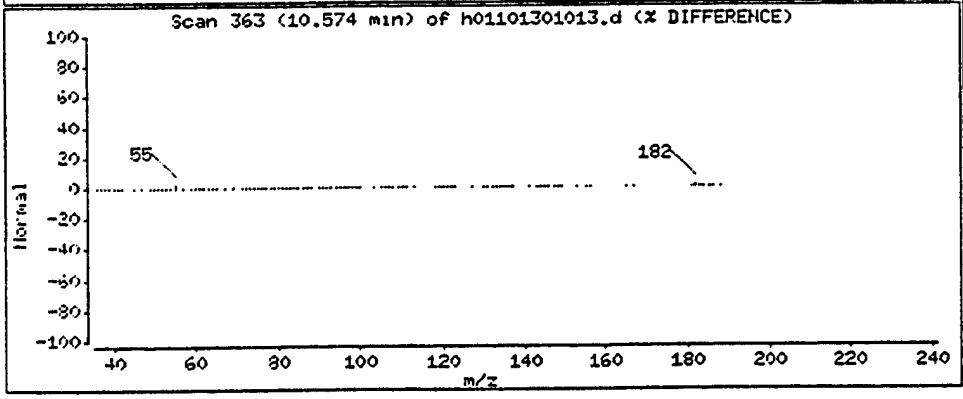












Data File: /chem/msdh.i/h-10Jan98.b/h01101301013.d

Date : 10-JAN-1998 19:54

Client ID: 12/8 Spike

Instrument: msdh.i

Sample Info: 12/8 spike 9712088A

Volume Injected (uL): 1.0

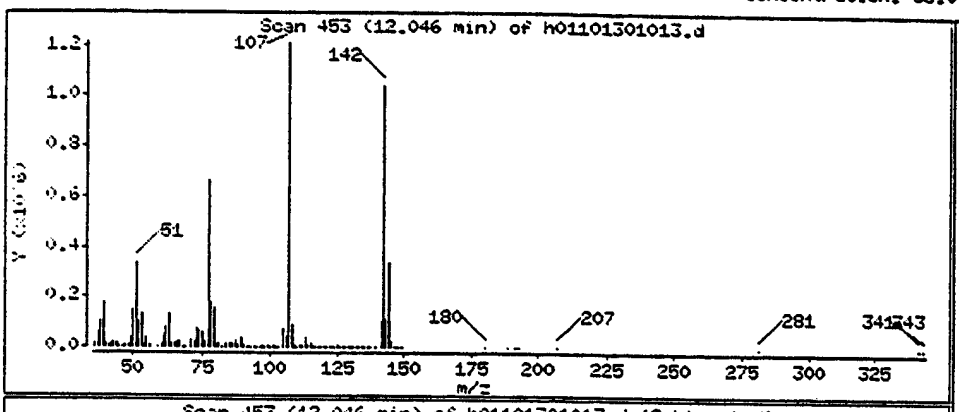
Operator: hch

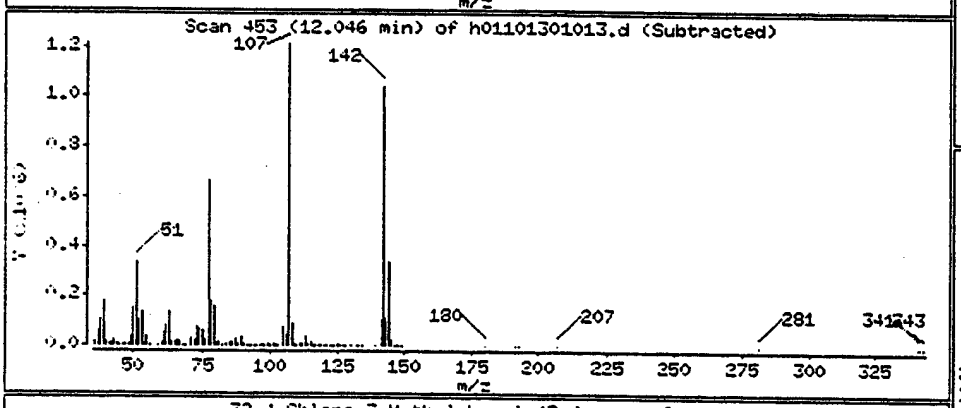
Column phase:

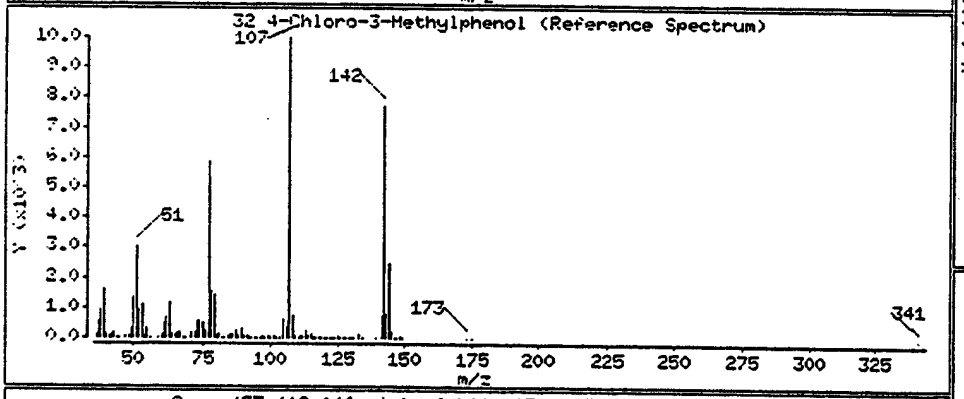
Column diameter: 2.00

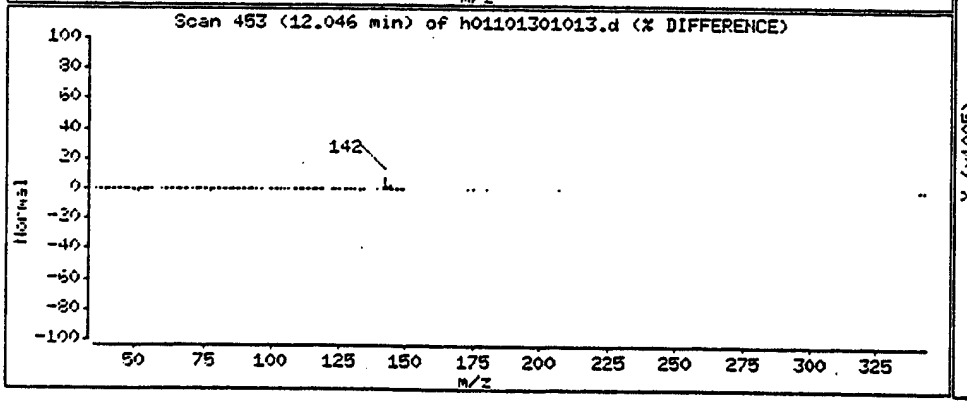
32 4-Chloro-3-Methylphenol

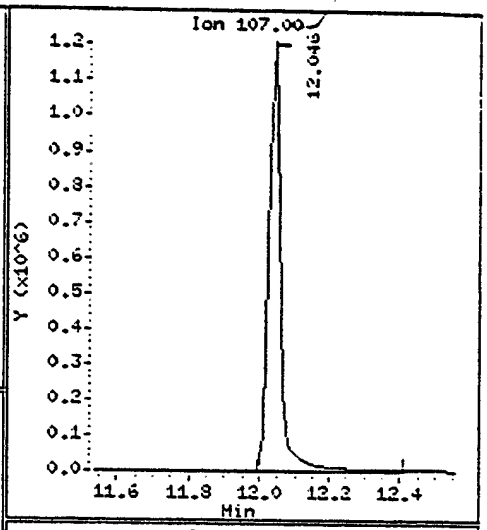
Concentration: 65.0 ug

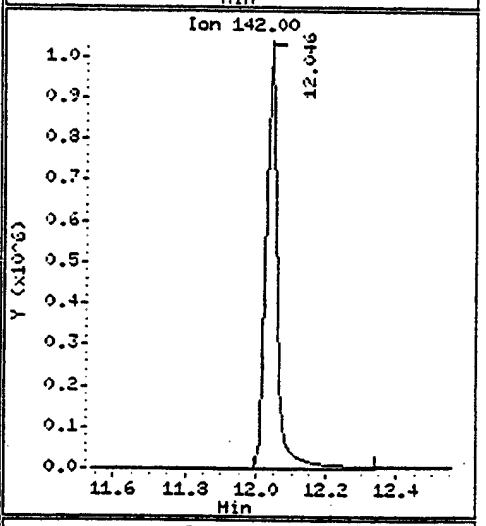


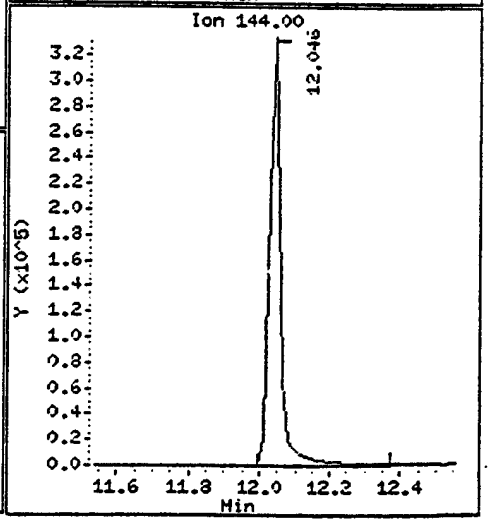












Data File: /chem/msdh.i/h-10Jan98.b/h01101301013.d

Date : 10-JAN-1998 19:54

Client ID: 12/8 Spike

Instrument: msdh.i

Sample Info: 12/8 spike 9712088A

Volume Injected (uL): 1.0

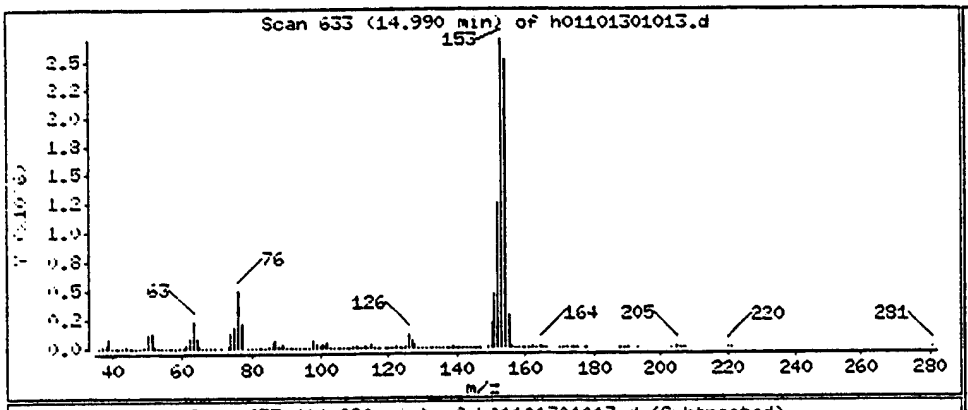
Operator: hch

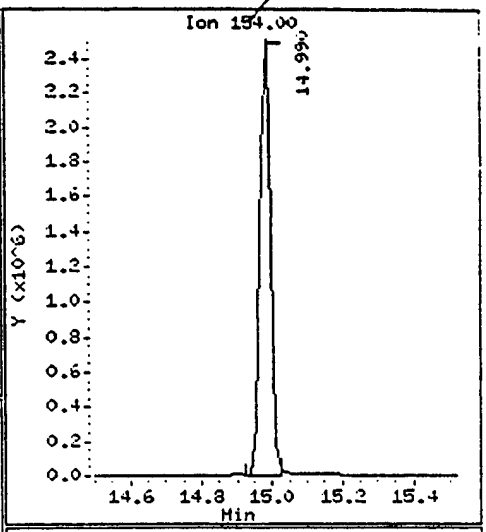
Column phase:

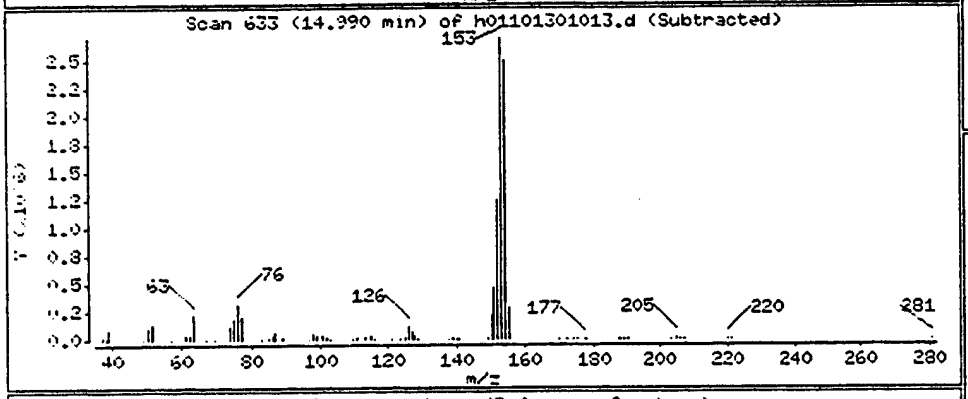
Column diameter: 2.00

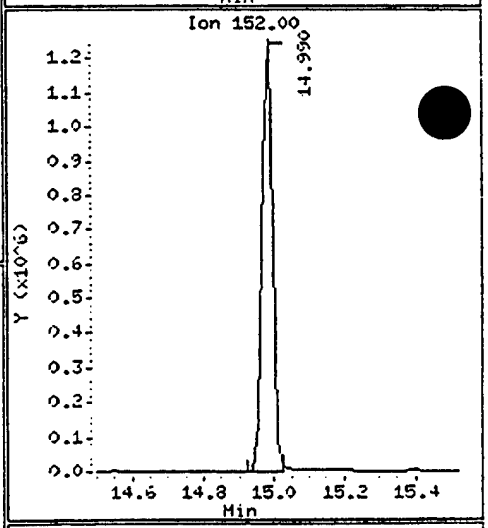
49 Acenaphthene

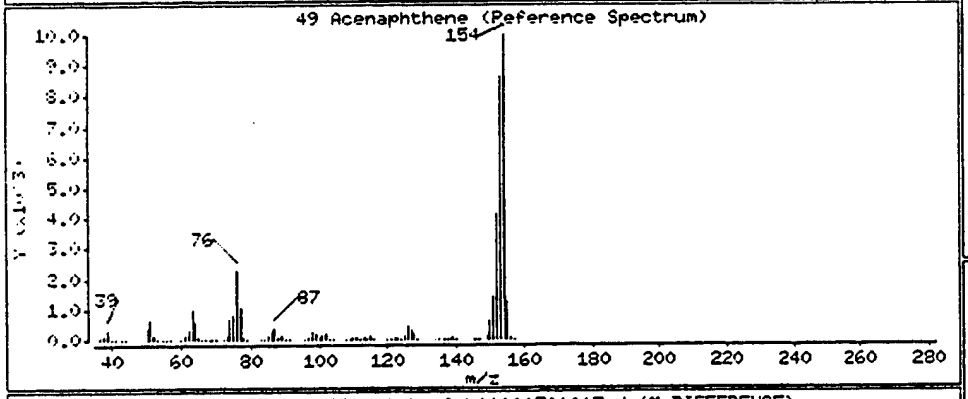
Concentration: 65.3 ug

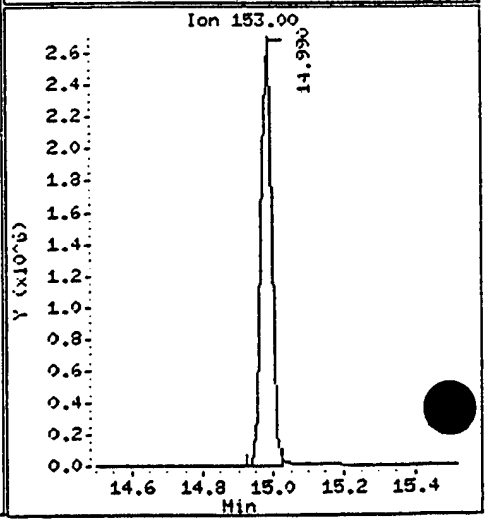


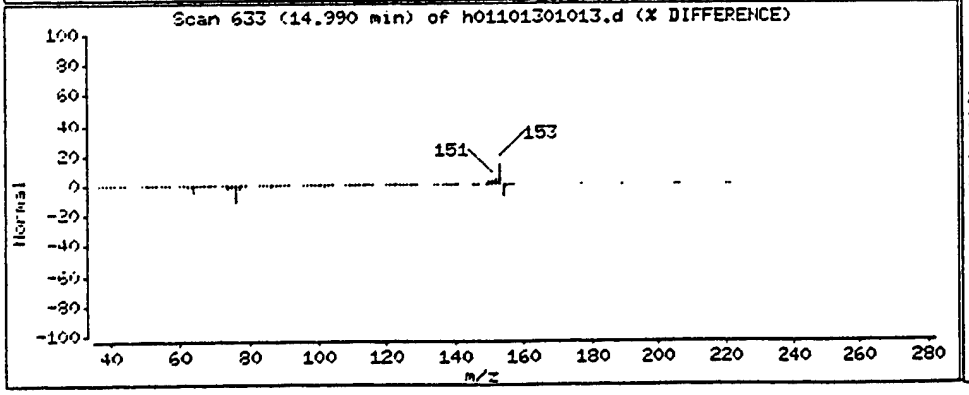












Data File: /chem/msdh.i/h-10Jan98.b/h01101301013.d

Date : 10-JAN-1998 19:54

Client ID: 12/8 Spike

Instrument: msdh.i

Sample Info: 12/8 spike 9712088A

Volume Injected (uL): 1.0

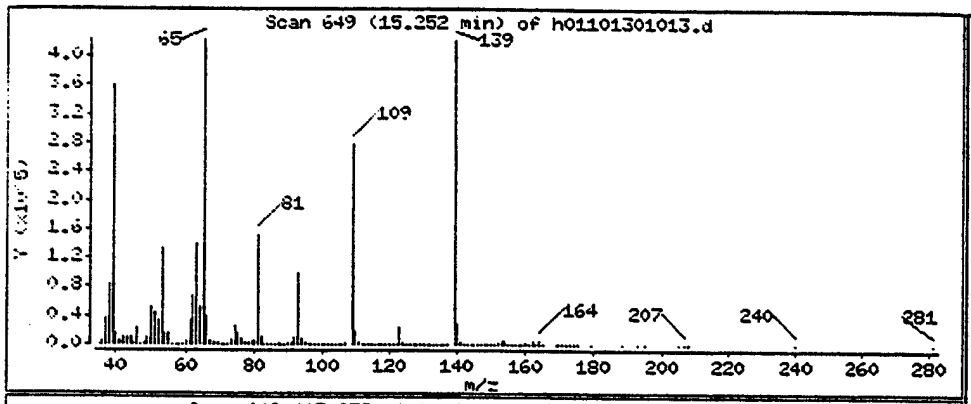
Operator: hch

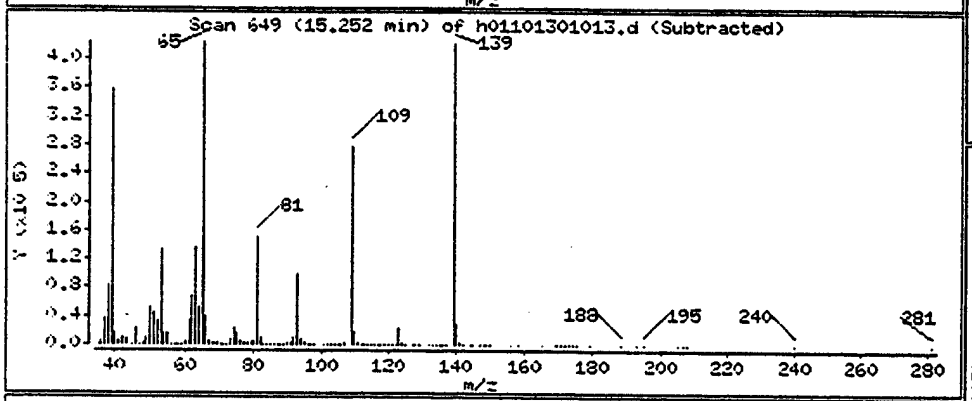
Column phase:

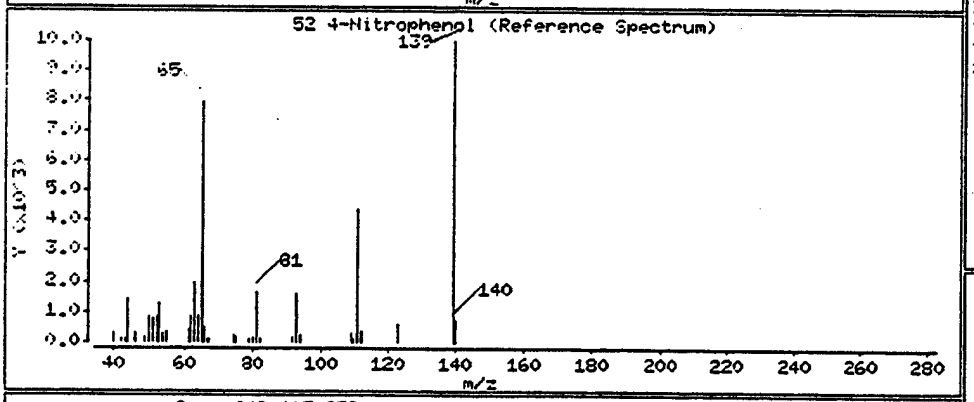
Column diameter: 2.00

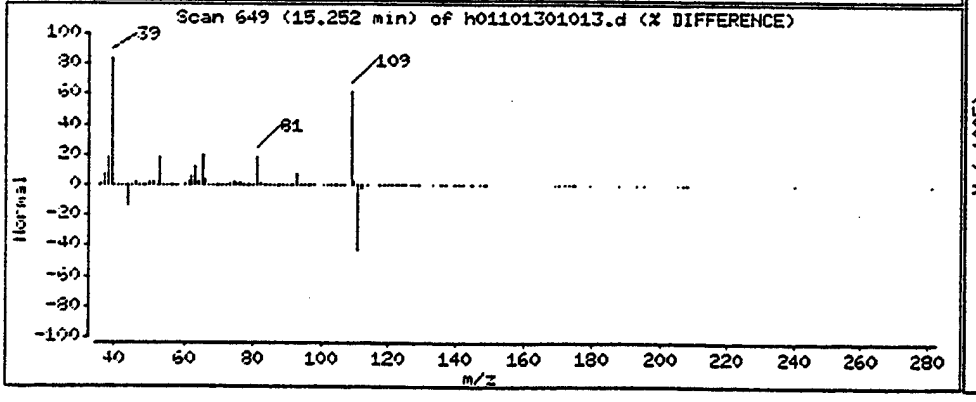
52 4-Nitrophenol

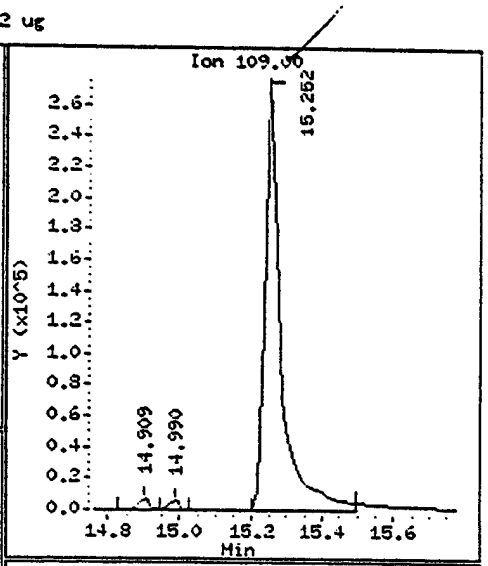
Concentration: 87.2 ug

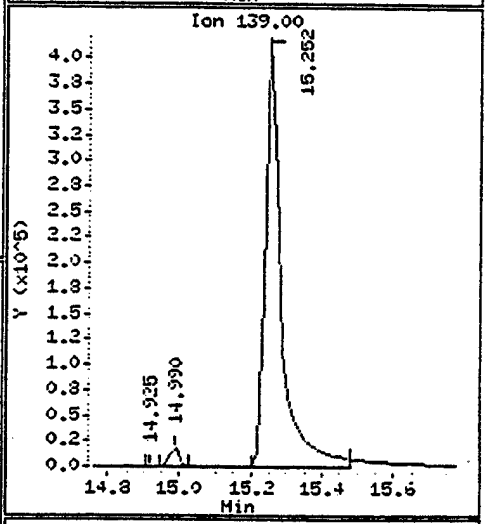


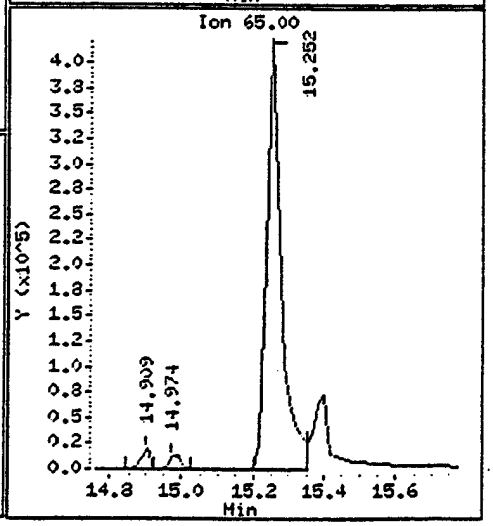












Data File: /chem/msdh.i/h-10Jan98.b/h01101301013.d

Date : 10-JAN-1998 19:54

Client ID: 12/8 Spike

Instrument: msdh.i

Sample Info: 12/8 spike 9712088A

Volume Injected (uL): 1.0

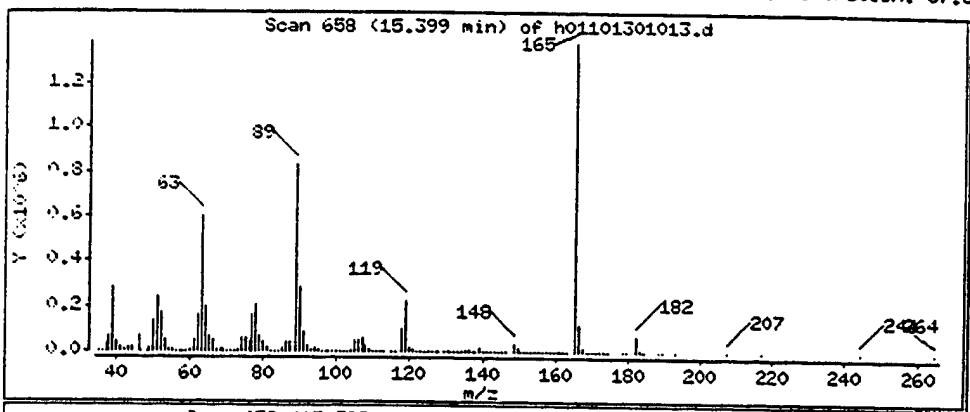
Operator: hch

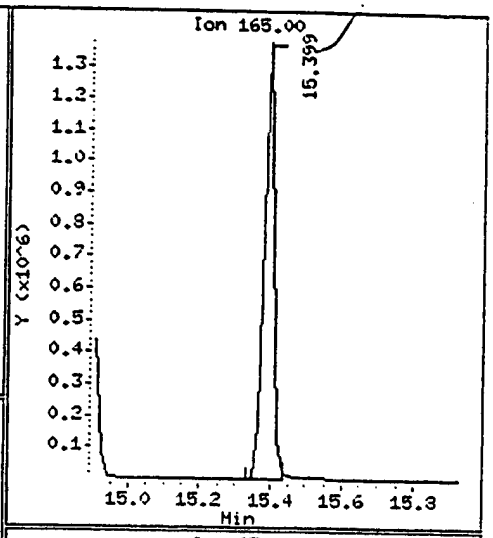
Column phase:

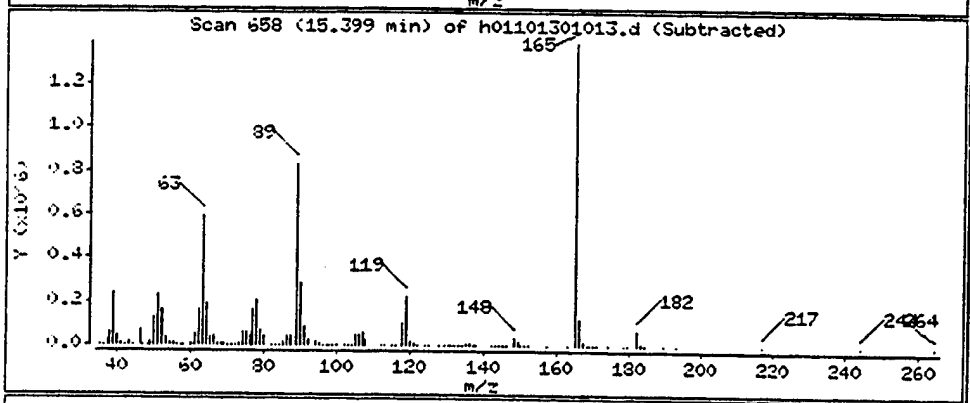
Column diameter: 2.00

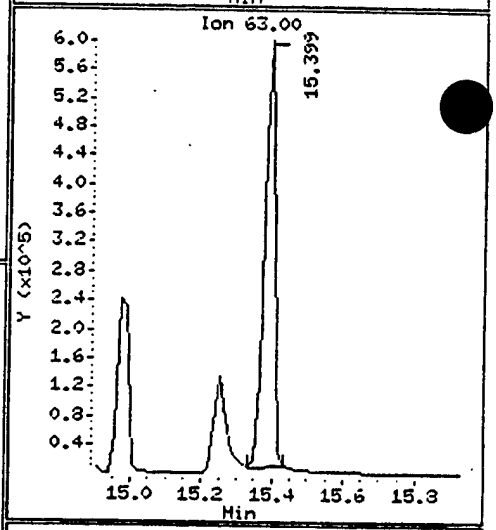
53 2,4-Dinitrotoluene

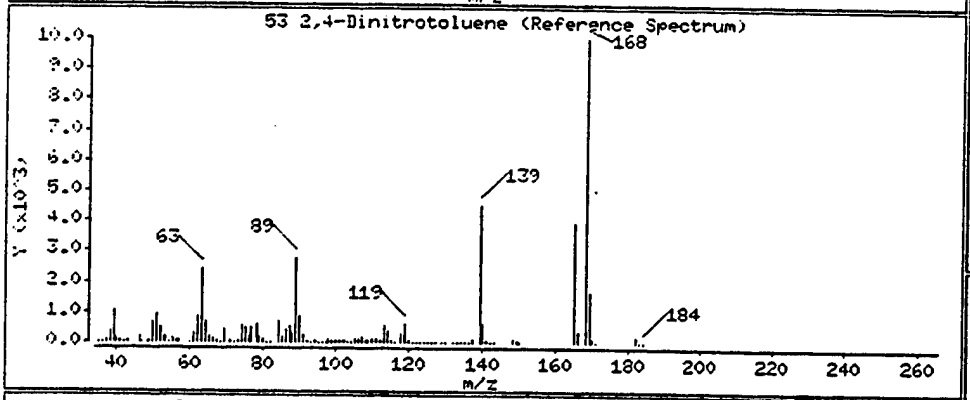
Concentration: 87.3 ug

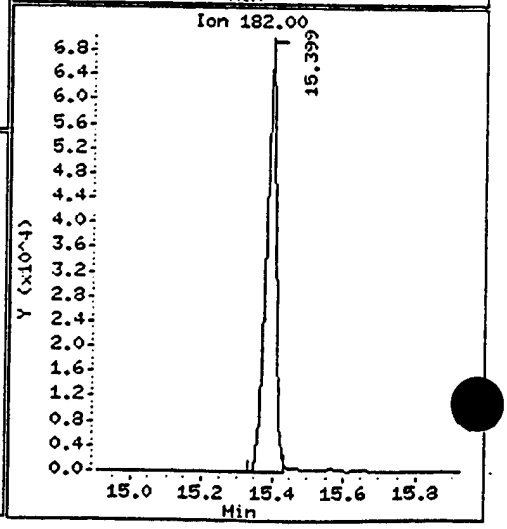


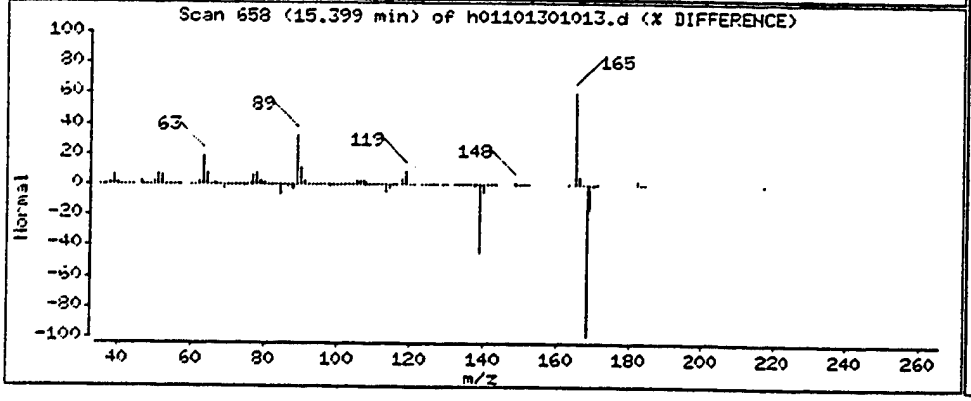












Data File: /chem/msdh.i/h-10Jan98.b/h01101301013.d

Date : 10-JAN-1998 19:54

Client ID: 12/8 Spike

Instrument: msdh.i

Sample Info: 12/8 spike 9712088A

Volume Injected (uL): 1.0

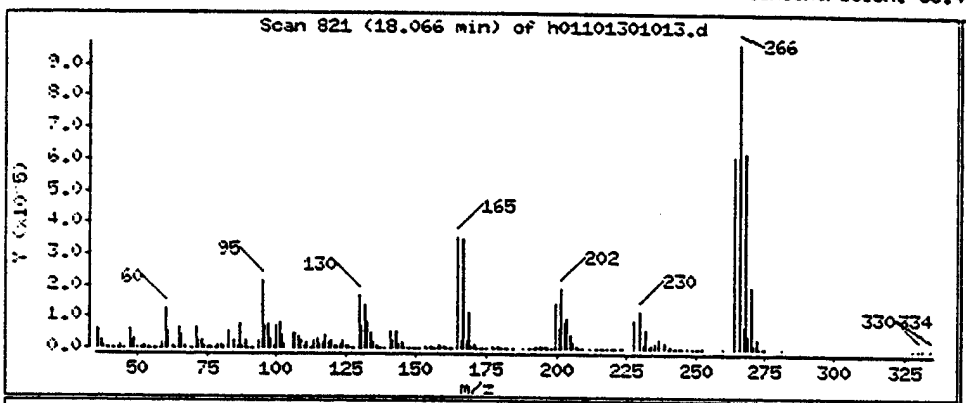
Operator: hch

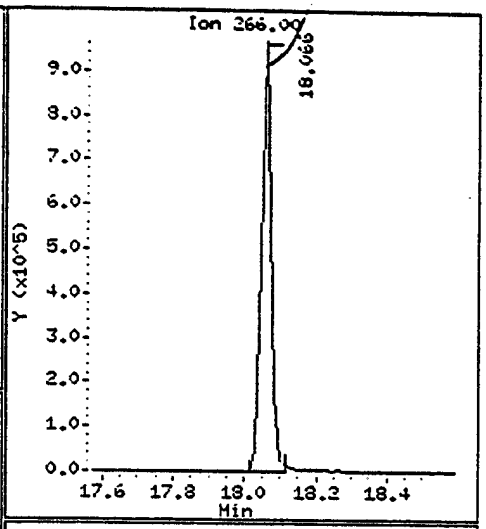
Column phase:

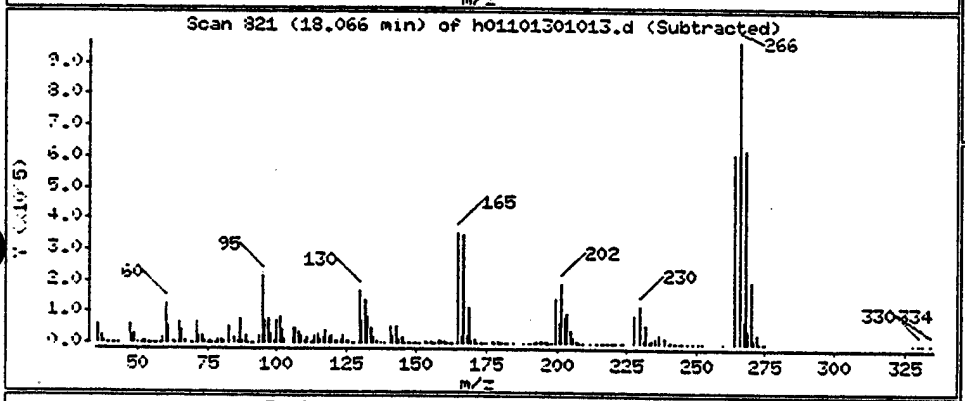
Column diameter: 2.00

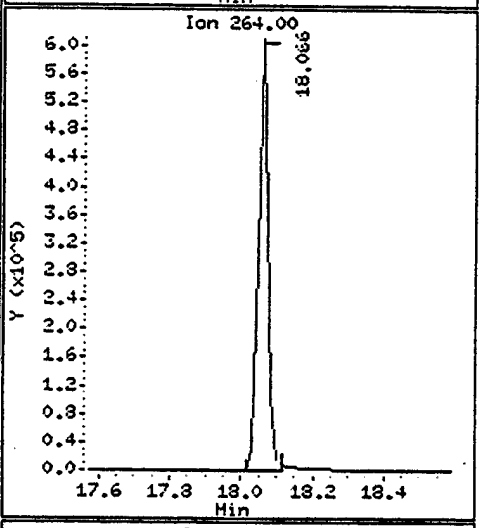
70 Pentachlorophenol

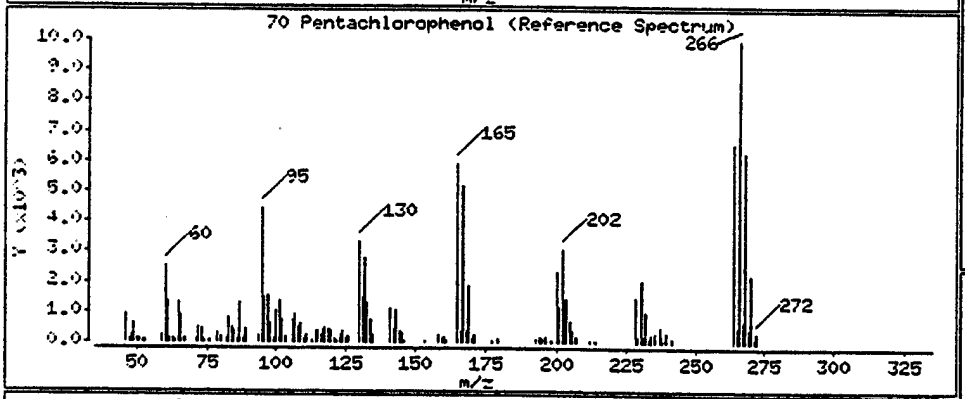
Concentration: 86.4 ug

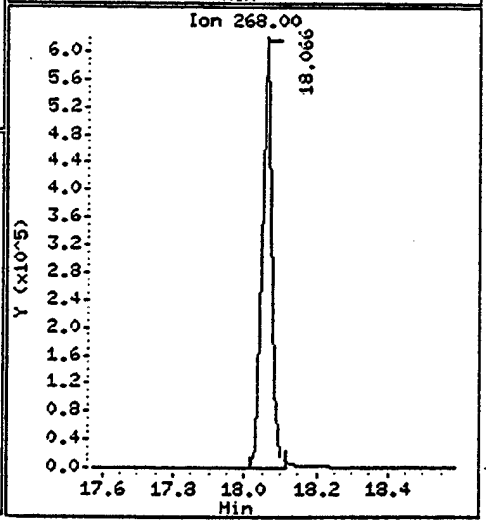


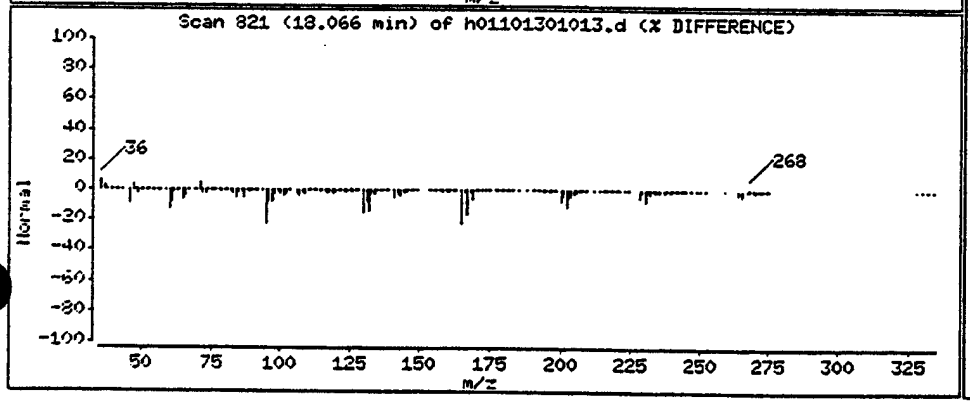












717

Data File: /chem/msdh.i/h-10Jan98.b/h01101301013.d

Date : 10-JAN-1998 19:54

Client ID: 12/8 Spike

Instrument: msdh.i

Sample Info: 12/8 spike 9712088A

Volume Injected (uL): 1.0

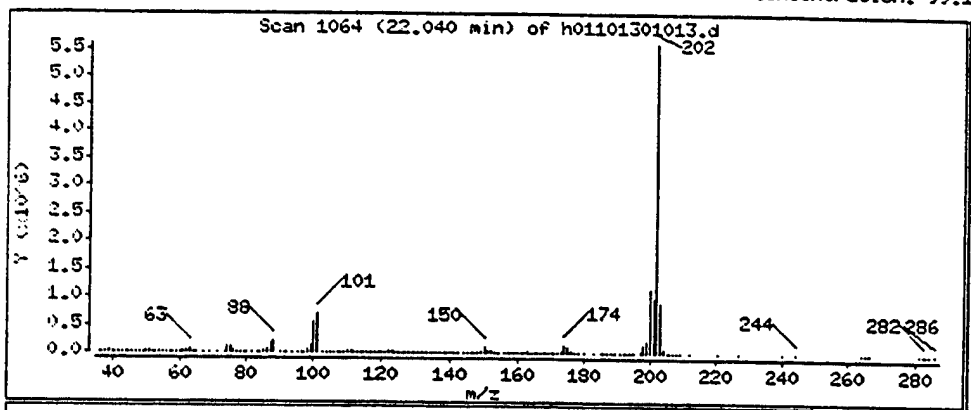
Operator: hch

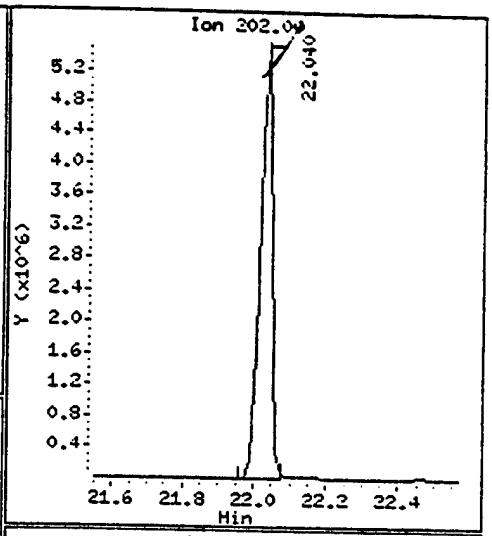
Column phase:

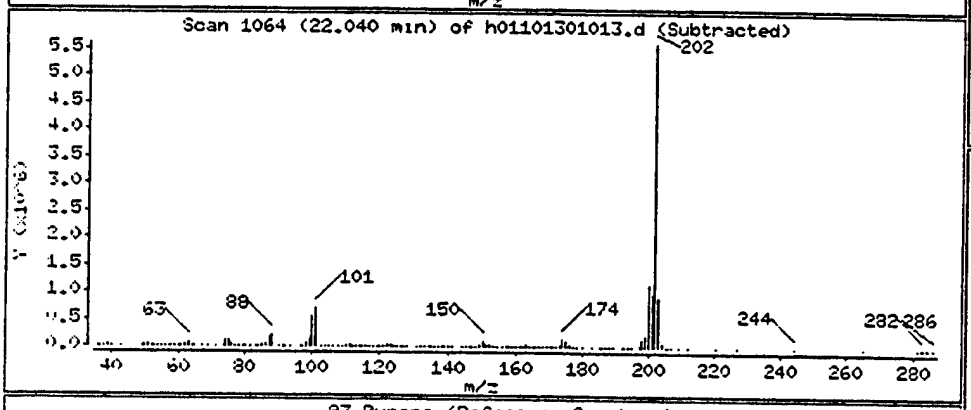
Column diameter: 2.00

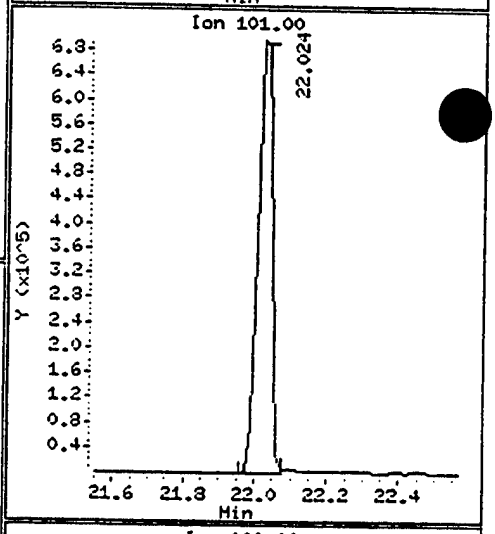
83 Pyrene

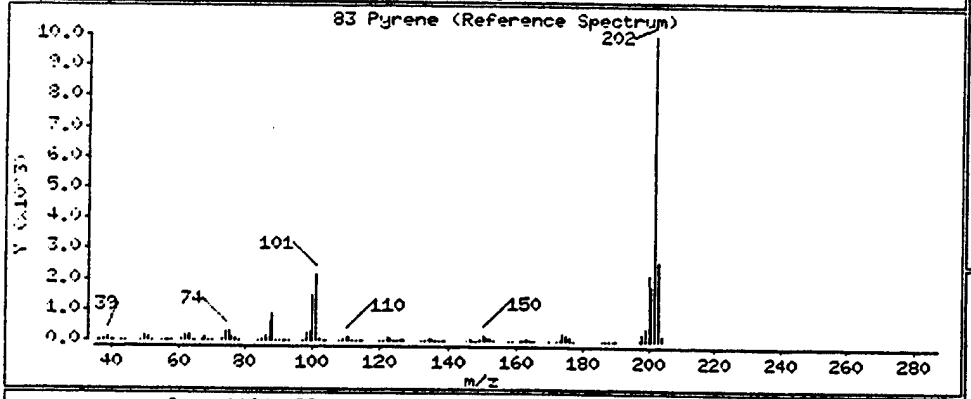
Concentration: 99.1 ug

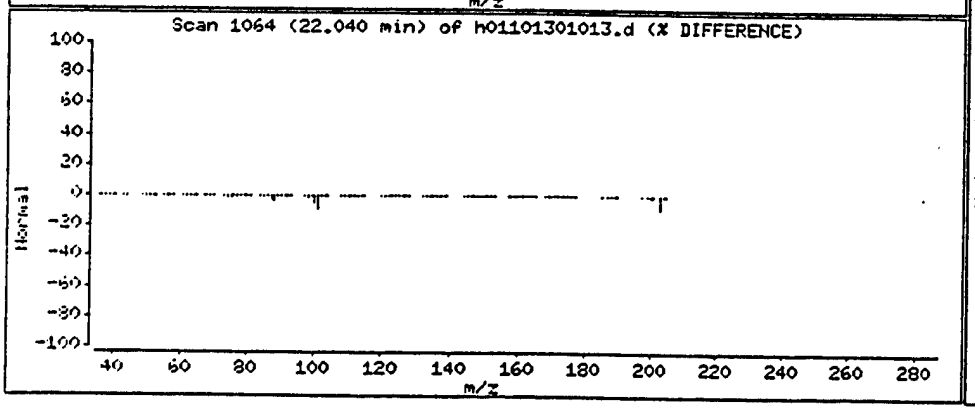


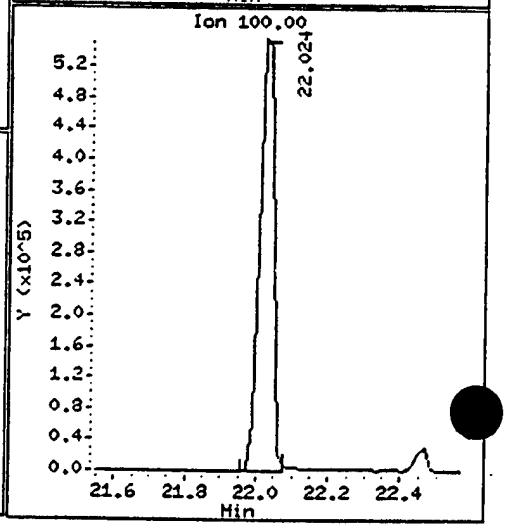












Audit History For: /chem/msdh.i/h-10Jan98.b/h011101301013.d

718

Change Date: 10-Jan-1998 20:43
Change Made by: Automation

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 09:33
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: 8270.sub
New Value: MM5.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:36
Change Made by: kbadal

Parameter: Misc Information
Old Value:
New Value: 80 ng ISTD #3267-91-1
Reason For Change: N/A

Change Date: 22-Jan-1998 09:36
Change Made by: kbadal

Parameter: Lab ID
Old Value:
New Value: LCS1
Reason For Change: N/A

Change Date: 22-Jan-1998 09:36
Change Made by: kbadal

Parameter: Client ID
Old Value:
New Value: 12/8 Spike
Reason For Change: N/A

Change Date: 22-Jan-1998 09:40
Change Made by: kbadal

Parameter: Sample Info
Old Value: 12/8 spike
New Value: 12/8 spike 9712088A
Reason For Change: N/A

Change Date: 22-Jan-1998 09:41
Change Made by: kbadal

Parameter: Sample Prep. Date
Old Value:
New Value: 08-DEC-1997 17:30
Reason For Change: N/A

Change Date: 22-Jan-1998 09:42
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 09:59
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: MM5.sub
New Value: 8270.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 09:59
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-15Jan98.b/BNA-011598.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 11:17
Change Made by: kbadal

Parameter: Sample Type
Old Value: Non-Calibration Sample
New Value: QC Control Sample
Reason For Change: N/A

Change Date: 22-Jan-1998 11:17
Change Made by: kbadal

Parameter: QC Sample Type
Old Value: BLANK
New Value: MS
Reason For Change: N/A

Change Date: 22-Jan-1998 11:17
Change Made by: kbadal

Parameter: Spike Sample
Old Value: Off
New Value: On
Reason For Change: N/A

Change Date: 22-Jan-1998 11:17
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 11:32
Change Made by: kbadal

Parameter: Misc Information
Old Value: 80 ng ISTD #3267-91-1
New Value: 80 ng ISTD #267-91-1
Reason For Change: N/A

Change Date: 22-Jan-1998 11:32
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 12:51
Change Made by: kbadal

Parameter: Compound Sublist
Old Value: 8270.sub
New Value: LCS.sub
Reason For Change: N/A

Change Date: 22-Jan-1998 12:51
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 22-Jan-1998 12:55
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Complete Target Compound Processing

Change Date: 22-Jan-1998 12:56
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 28-Jan-1998 11:22
Change Made by: jheffel

Parameter: Sample Info
Old Value: 12/8 spike 9712088A
New Value: 1.0ul 12/8 spike 9712088A
Reason For Change: N/A

Change Date: 28-Jan-1998 11:23
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/BNA-010898.m
Reason For Change: Quantitation

Change Date: 28-Jan-1998 15:47
Change Made by: jheffel

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Reason For Change: Quantitation

Change Date: 30-Jan-1998 10:43
Change Made by: kbadal

Parameter: Target Processing
Old Value:
New Value: Method: /chem/msdh.i/h-10Jan98.b/EBNA-010898.m
Reason For Change: Quantitation

9712088

Lab Tracking Number

Chain-of-Custody Record/Lab Work Request

Client	USAF/EQM	**Phone Number**	513-825-7500
Work Order Number	3214-008-040	**Turn Around Time**	10 Day
Contact Person	Tom Gerstel		

			Analyses Requested/Other Info					
Lab ID	ample ID	**Sample Date**	**Analysis**	**Sample Type**	**Canister / Filter / No.**		**Method**	**Sample Check-off**
01V	AF - A - EF117 PAH	12/3/97	PAH	PUF/filter			PAH	
	AF - A - EF117 VOC	12/3/97	VOC	Canister	12654		VOC	
			–					
			–					

Notes:

Canister Inital Vacuum 27.5 "Hg

Canister Final Vacuum 10 "Hg

Relinquished By	Received By	Date	Time	Lab Use Only	
	FedEx	12/5		Shipper	Air Bill #
	Theresa Stroppel	12/4/97	1400	Opened By	Date/Time
				Temp °C	Condition
				Custody Seals: Yes No None N/A	

Laboratory Comments:

Boxes - Ambient Condition when received: good

Custody Seal intact? Y N None — Temp. Cooler ice

9712088/

Lab Tracking Number

Chain-of-Custody Record/Lab Work Request

WESTON

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Page ___ of ___

Client	USAF/EQM	**Phone Number**	513-825-7500
Work Order Number	3214-008-040	**Turn Around Time**	10 Day
Contact Person	Tom Gerstel		

			Analyses Requested/Other Info					
Lab ID	ample ID	**Sample Date**	**Analysis**	**Sample Type**	**Canister / Filter / No.**		**Method**	**Sample Check-off**
01	AF - 1 - EF117 PAH	12/3/97	PAH	PUF/filter			PAH	
	AF - 1 - EF117 VOC	12/3/97	VOC	Canister	12540		VOC	

Notes:

Canister Inital Vacuum 22.5 "Hg
Canister Final Vacuum 7.5 "Hg

Relinquished By	**Received By**	**Date**	**Time**	**Lab Use Only**	
	Fed	12/5		Shipper	Air Bill #
	[illegible]	12/16/97	1400	Opened By	Date/Time
				Temp °C	Condition
				Custody Seals: Yes No None N/A	

Laboratory Comments:

Custody Seal intact: Y N None Temp. Cooler-ice Boxes Amber

Condition when received: good

9712088A

Lab Tracking Number

Chain-of-Custody Record/Lab Work Request

WESTON 23

Page ___ of ___

Client	USAF/EQM	**Phone Number**	513-825-7500
Work Order Number	3214-008-040	**Turn Around Time**	10 Day
Contact Person	Tom Gerstel		

Lab ID	Sample ID	Sample Date	Analyses Requested/Other Info: Analysis	Sample Type	Canister / Filter / No.		Method	Sample Check-off
02	AF - M - EF404 - PAH	12/4/97	PAH	PUF/filter			PAH	
	AF - M - EF404 - VOC	12/4/97	VOC	Canister	427		VOC	

Notes:

Canister Inital Vacuum 27.5 "Hg

Canister Final Vacuum 1.5 "Hg

Relinquished By	Received By	Date	Time	Lab Use Only	
	Fed X	12/5		Shipper	Air Bill #
	Theresa Stregole AM	12/6/97	1401	Opened By	Date/Time
				Temp °C	Condition
				Custody Seals: Yes No None N/A	

Laboratory Comments:

Custody Seal Intact (Y) N None Temp. Boxes-Ambient Cooler-Ice Condition when received good

9712088

Lab Tracking Number

Chain-of-Custody Record/Lab Work Request

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Page ___ of ___

Client	USAF/EQM	**Phone Number**	513-825-7500
Work Order Number	3214-008-040	**Turn Around Time**	10 Day
Contact Person	Tom Gerstel		

Lab ID	Sample ID	Sample Date	Analysis	Sample Type	Canister / Filter / No.		Method	Sample Check-off
			Analyses Requested/Other Info					
0247V	AF - N - EF404 - PAH	12/4/97	PAH	PUF/filter			PAH	
0247V								
	AF - N - EF404 - VOC	12/4/97	VOC	Canister	1009		VOC	

Notes:

Canister Inital Vacuum 27.5 "Hg

Canister Final Vacuum 5 "Hg

Relinquished By	Received By	Date	Time	Lab Use Only	
	Fed Ex	12/5		Shipper	Air Bill #
	Theresa Stapleton	12/6/97	1450	Opened By	Date/Time
				Temp °C	Condition
				Custody Seals: Yes No None N/A	

Laboratory Comments:

Custody Seal intact Y N None Temp. Coolers-on ice Boxes-Ambient Condition when received good

9712088/N

Lab Tracking Number

Chain-of-Custody Record/Lab Work Request

WESTON 725

Client	USAF/EQM	**Phone Number**	513-825-7500
Work Order Number	3214-008-040	**Turn Around Time**	10 Day
Contact Person	Tom Gerstel		

			Analyses Requested/Other Info					
Lab ID	**Sample ID**	**Sample Date**	**Analysis**	**Sample Type**	**Canister / Filter / No.**		**Method**	**Sample Check-off**
OSN	AF - B - EF404 - PAH - FB	12/5/97	PAH	PUF/filter			PAH - FB	
OSN								
	AF - B - EF404 - VOC - FB	12/5/97	VOC	Canister	21015		VOC - FB	

Notes:

Canister Inital Vacuum 27 "Hg

Canister Final Vacuum 27 "Hg

Relinquished By	Received By	Date	Time	Lab Use Only	
	FedEx	12/5		Shipper	Air Bill #
	Theresa Stapleton	12/6/97	1400	Opened By	Date/Time
				Temp °C	Condition
				Custody Seals: Yes No None N/A	

Laboratory Comments:

Custody Seal Intact? Y N None Temp. Boxes-Ambient Coolers-on ice Condition when received Good

9712088A

Lab Tracking Number

Chain-of-Custody Record/Lab Work Request

WESTON 726

Page ___ of ___

Client	USAF/EQM	**Phone Number**	513-825-7500
Work Order Number	3214-008-040	**Turn Around Time**	10 Day
Contact Person	Tom Gerstel		

Lab ID	Sample ID	Sample Date	Analyses Requested/Other Info: Analysis	Sample Type	Canister / Filter / No.		Method	Sample Check-off
06M	AF - B - EF404 - PAH	12/5/97	PAH	PUF/filter			PAH	
	AF - B - EF404 - VOC	12/5/97	VOC	Canister	1271C		VOC	

Notes:

Canister Inital Vacuum 27.5 "Hg

Canister Final Vacuum 7.1 "Hg

Relinquished By	Received By	Date	Time	Lab Use Only	
	FedEx	12/5		Shipper	Air Bill #
	Theresa Stepke-17	12/6/97	1400	Opened By	Date/Time
				Temp °C	Condition
				Custody Seals: Yes No None N/A	

Laboratory Comments:

Custody Seal Intact? Y N None Temp. Boxes - Ambient Cooler - On-ice Condition when received: good

@AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

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LOGIN INFORMATION

WORKORDER 9712088A

Client

Ms. Jackie Doan
Environmental Quality Management, Inc.
1310 Kemper Meadows Drive
Cincinnati, OH 45240

Phone
800-500-0575
FAX
513-825-9728

Date Completed: 1/30/98
Date Received: 12/6/97
PO#: 5768
Project#: 3214-008-040 USAF/EQM
Total $: $1,890.00
Logged By: CK

Fraction	Sample #	Analysis	Collected	Amount$
01A	AF - A - EF117 PAH	TO-13	12/3/97	$270.00
01AA	AF - A - EF117 PAH-DUP	TO-13	12/3/97	$270.00
02A	AF - I - EF117 PAH	TO-13	12/3/97	$270.00
03A	AF - M - EF404 - PAH	TO-13	12/4/97	$270.00
04A	AF - N - EF404 - PAH	TO-13	12/4/97	$270.00
05A	AF - B - EF404 - PAH - FB	TO-13	12/5/97	$270.00
06A	AF - B - EF404 - PAH	TO-13	12/5/97	$270.00
07A	Method Blank	TO-13	NA	NC
07B	Method Blank	TO-13	NA	NC
08A	Method Spike	TO-13	NA	NC

BILL TO: Same

REMARKS Are there any receiving nonconformities? no

Sample Receipt Discrepancy Report

728

Initiated By: CKoppel Date: 12/4/97 Given To: Walter

Sections I - III must be filled out by the person initiating this sample discrepancy report.

Technical Expert / Lab Manager: Walt McCoy Date: 12-11-97 Ok to Login Fax

☐ Login Fax ☐ Client Services

I. Method(s) affected: VOST 8240 SW-846

Work order(s) affected: 97120 88C

Sample(s) affected: All

Client(s) affected: EQM

Client Service Contact: DLP

II. Discrepancies:

- ☐ Custody seal on the outside of the cooler was broken.
- ☐ Chain of Custody Record (COC) was not received with sample(s).
- ☐ COC improperly relinquished
- ☐ COC was not filled out in ink.
- ☐ Number of samples on the COC do not match the number of samples that were received.
- ☐ Sampling date is not documented on the COC.
- ☐ Sampling time is not documented on the COC.
- ☐ Analysis method(s) is not specified on the COC.
- ☐ Sample tags do not match sample IDs documented on the COC.
- ☐ Sample(s) received out of holding time.
- ☐ Samples received at wrong temperature.
- ☐ Sample container (Tube/VOA vial) was received broken.
- ☐ Container for VOA analysis received with headspace.
- ☐ Tedlar Bag received leaking.
- ☐ Tedlar Bag received flat.
- ☐ Canister received with a leaky valve.
- ☐ Tedlar bag / canister received emitting a strong odor (sample cannot be analyzed).
- ☐ Sample received with insufficient amount of sample to analyze.
- ☐ Initial laboratory Vac./Press. does not match final field pressure.
- ☒ Other

III. Describe the discrepancy.

No temperature blank was present in cooler with VOST samples (per Sam Cadwell)

(continued)

TO-13 Extraction Logbook

@Air Toxics Ltd.

Log Book #: 329

Date Extracted: 12/8/97

Time Start: 1730 12/8/97
End Start: 1300 12/9/97

Initial Solvent: CH_2Cl_2
XAD-2 Lot #:
PUF Batch #:
Surrogate I.D.: 361-15-2000 ng/ml
Spike I.D.: 361-11-200 ng/ml

Lot #: BR57[redacted]

ATL Work Order #	ATL Fraction	Clients I.D. #	Cartridge type & size	Final Volume (ml)	Surr. Amount (ul)	Spike Amount (ul)
9717067	01BC/BLC	See Pg	XAD Trap	1.0 ml	500 ul	
	02BC					
	03BC					
	05BC					
	06BC			5.0		
	MM5 Blank		PUF/XAD	1.0		
9717067A	01A/10A					
	02A					
	03A					
	04A					
	05A					
	06A					
	MM5 Blank					
	07A/08A SPIKE					500 ul

12/8/97

Comments:

Page 93

Signed

12/11/97
Date

Revised 5/97

General Corrective Action Request

No. G005

730

Initiated By: FA Date: 1/27/98 Given To: H.H

Sections I - IV must be filled out by the person initiating this corrective action request.

QA Manager: _____ Date: _____ Given To: _____

Client Services: _____ Date: _____ Given To: QA/QC

√ ***This corrective action request will be forwarded to the following:***

- ☐ Team Leader: _____ Date: _____ Given To: QA/QC
- ☐ Lab manager: _____ Date: _____ Given To: QA/QC
- ☐ Lab Director: _____ Date: _____ Given To: QA/QC

I. Method(s) affected: TO-13

Work order(s) affected: 9712088A

Sample(s) affected: ~~ALL~~ 03A → 06A

Client(s) affected: EQM

Client Service Contact: D.P

II. Nonconformities:

- ☐ Systematic QA/QC issue
- ☐ Corrective Action Request not issued.
- ☑ Method QC requirements not met.
- ☐ Narration not included on final report.
- ☐ Data transcription error.
- ☐ Data calculation error.
- ☐ Incomplete folder.
- ☐ Correction to hard copy result.
- ☐ Logbook(s) is not reviewed monthly.
- ☐ Refrigerator(s) / Freezer(s) is outside of control limits.
- ☐ Ohaus balance is outside of control limits.
- ☐ Sartorius balance is outside of control limits.
- ☐ Can cleaning ovens (A/B/C) temperatures are not verified once a week.
- ☐ Monthly flow controller calibration are not performed.
- ☐ Daily conductivity check outside of control limit.
- ☐ 2nd conductivity check not performed monthly.
- ☐ 2nd conductivity check outside of control limit.
- ☐ Canister pressurization check is not performed weekly.
- ☐ Other

III. Describe the nonconformity and its cause.

PAH cumpands exceeded ~~method~~ client requirements of ≤ 20% RSD for ~~all~~ some PAHs in the initial calibration.

(continued)

I will fax Jackie Dean a copy of narrative ahead of the date of the data package

731

IV. Describe the corrective actions initially attempted to resolve this issue.

The first 5 points of the calibration curve were used in order to achieve %RSD ≤ 20% as required by client. JJH 1-30-98

AFTER MAKING THE ABOVE CHANGES, ONLY NAPHTHALENE ON 1-15-98 DID NOT FALL WITHIN 20% OF THE INITIAL CURVE, AND ALL PAH'S MEET 20% RSD LINEARITY REQUIREMENTS OF INITIAL CURVE. JJH 1-28-98

To be filled out by Client Services or QA Department Representative Only

V. Client Notification:

Person notified: ~~Jackie Dean~~ Notified by: D. Pearce Date: 1-28-98

Client Instructions:

Write narrative explaining why this information was not given to CS in a timely manner to notify Client, and how we will prevent this from happening in the future. Or how would we have done this differently if notified in a timely manner etc. . . .

To be filled out by QA Department Representative Only

VI. Additional Recommended Corrective Action:

QA/QC went over EQM QAPP criteria for method TO-13 with the Team Leader & Bench chemist. This problem was addressed and QA was assured that it would not occur again. A binder with project specific requirement will be placed by the instruments. JJH 1.30.98

Date Implemented: 1.30.98

VII. Follow up Action Necessary? (Y) (N)

Describe follow-up action.

QA will ~~Track~~ review next round of samples from EQM for Method TO-13.

Date Follow up Action Completed: _____

QA Department Closure Date: _____

QA Department Signature: _____

@ Air Toxics Ltd. 9712088A

DATA REVIEW CHECK SHEET

QA Time (min.) _____
Analysis 732
# of Samples _____

A	T	Q	
☑	☑	☑	Correct Method and Analyte List
☑	☑	☐	Passed Tune Check Criteria
(1) ☑	☑	☑	Appropriate Initial Curve Info. Present
☑	☑	☑	Passed Calibration Check
(3) ☑	☑	☐	All Analytes < Det. Limit in the Method Blank
☑	☑	☐	Samples Analyzed Within the Holding Time
☑	☑	☐	Internal Standard Areas Within Limits
☑	☑	☐	Surrogate Recoveries Within Limits
☑	☑	☑	The Dilution Factor was Correctly Calculated
☑	☑	☐	Correct Amount of Sample Analyzed
☑	☑	☐	Duplicate RPD's Within Limits
☑	☑	☐	Duplicate Performed on the Correct Sample
☑	☑	☐	Chromatograms are Properly Labelled
☑	☑	☐	All Peaks in the Chromatograms are Identified or Discounted
☑	☑	☑	Retention Times have been Verified
☑	☑	☐	Peak Area Integration Correct
☑	☑	☐	Spectra Verified - Documentation of Difficult Calls Included
☑	☐	☑	Transcriptions have been Checked
(4) ☑	☑	☐	Appropriate Data Qualifier Flags were Used
☐	☑ (5)	☐	Unusual Circumstances have been Narrated
(2) ☑	☑	☑	The Data Sheets have the Correct Detection Limits, Units, Etc.
☐	☐	☐	The Final Report Cover Sheet is Correct
☐	☐	☐	The Data Sheets have the Correct Header Info.
☐	☐	☐	Correct Blanks Reported
☐	☐	☐	Two Significant Figures for All Results
☐	☐	☐	The Detection Limit was Correctly Calculated
☑	☑	☐	Checked the C.O.C. for Field Blanks and Dups.
☑	☑	☐	Checked Samples for Trends
☐	☐	☐	Special Units were Correctly Calculated

Shaded boxes indicate items that do not require review on every folder.

Notes: (to include: noting samples with QA/QC problems, blanks with positive hits, narratives, etc.)

(1) INITIAL CURVE OF 1-8-98 WAS NOT LINEAR FOR 2,4-DINITROPHENOL
" " " " 1-15-98 " " " " " " " " + 3-NITROANILINE
(2) SEVERAL CORRECTIONS MADE TO SHEET
(3) BLANK RUN 1-10-98 HAS 1.4 ug HIT OF DI-N-BUTYLPHTHALATE
(4) FRACTIONS 01A, 01AA, 02A, 03A, 03A + 04A WERE "B" FLAGGED FOR DI-N-BUTYL PHTHALATE
(5) Refer to General Corrective Action Request #6005. Narrate deficiencies. ~~each report.~~
(5) CONTINUING CALIBRATION OF 1-15-98 WAS OUTSIDE OF 70% WINDOW FOR PAH REQUIREMENTS.

Analytical ~~Review~~/Date 1-27-98
Technical Review/Date 1.30.98
QA Review/Date 1/27/98

APPENDIX D

JP-8 FUEL ANALYSIS

DEPARTMENT OF THE AIR FORCE
OLAC, PHILLIPS LABORATORY (AFMC)
EDWARDS AIR FORCE BASE, CALIFORNIA

27 Feb 1997

Memorandum for HSC/YAL
Attn: Mark Wade

From: OLAC PL/RKS
10 East Saturn Blvd.
Edwards AFB CA 93524

Subject: JP-8 Analysis Results

1. The following results are from the JP-8 samples delivered to Phillips Laboratory from a Mr. Tom Gerstle. Analysis was performed according to the attached Analysis Request and Chain of Custody Record.

	#011197	#011797	#012497	#012797
Net ΔH_c (BTU/lb) ASTM D240	18609.9	18646.9	18642.4	18596.9
Gross ΔH_c (BTU/lb) ASTM D240	19851.6	19872.2	19857.6	19820.5
API Gravity @ 15°C	42.27	42.40	41.93	41.91
Carbon (%) ASTM E191	86.03	86.15	86.27	86.18
Hydrogen (%) ASTM E191	13.61	13.43	13.32	13.42
Nitrogen (%) ASTM D4629	0.0021	0.0021	0.0022	0.0022
Sulfur (%) ASTM D4294	0.010	0.006	0.012	0.010

2. Phoenix Laboratory (Chicago ,ILL) performed the Carbon, Hydrogen, Nitrogen, and Sulfur analysis for these samples. Phillips Laboratory completed the remaining analysis.

Paul Jones

Paul Jones
Research Chemist
Propulsion Sciences Division

DEPARTMENT OF THE AIR FORCE
OLAC, PHILLIPS LABORATORY (AFMC)
EDWARDS AIR FORCE BASE, CALIFORNIA

23 April 1997

Memorandum for HSC/YAL
Attn: Mark Wade

From: OLAC PL/RKS
10 East Saturn Blvd.
Edwards AFB CA 93524

Subject: JP-8 Analysis Results

1. The following results are from the JP-8 samples delivered to Phillips Laboratory from a Mr. Tom Gerstle. Analysis was performed according to the attached Analysis Request and Chain of Custody Record.

	#031497	#031897
Net ΔH_c (BTU/lb) ASTM D240	18645.4	18721.3
Gross ΔH_c (BTU/lb) ASTM D240	19902.5	19952.9
API Gravity @ 15°C	44.34	44.58
Density (g/ml) @ 15°C	.8047	.8036
Carbon (%) ASTM E191	86.04	86.11
Hydrogen (%) ASTM E191	13.78	13.50
Nitrogen (%) ASTM D4629	0.0050	0.0046
Sulfur (%) ASTM D4294	0.041	0.039

2. Phoenix Laboratory (Chicago ,ILL) performed the Carbon, Hydrogen, Nitrogen, and Sulfur analysis for these samples. Phillips Laboratory completed the remaining analysis.

Paul Jones
Research Chemist
Propulsion Sciences Division

LABORATORY ANALYTICAL REPORT

Hughes STX Analytical Services
USAF Phillips Laboratory
Emerging Technologies Branch
OL-AC PL/RKS, 10 E. Saturn Blvd.
Edwards AFB CA 93524-7680

Date Received:
5-May-97

Date Completed:
26-Jun-97

Report No: 97-278

Requester:

Mark Wade
HSCYEAL
240-2993

Analytical Results

JP-8	#050297	#043097
Heat of Combustion (BTU/lb)		
Gross	19,922	19,925
Net	18,720	18,713
Density (Kg/L) @ 15°C	0.8094	0.8093
API Denity @ 60°F	43.17	43.19
Carbon (%)	86.80	86.18
Hydrogen (%)	13.17	13.36
Nitrogen (%)	0.0019	0.0022
Sulfur (%)	0.011	0.025

Note: Carbon, hydrogen, nitrogen and sulfur analyses performed by Phoenix Chemical Laboratory, Inc.

Analyst:

Jo ann C. La Rue

Comm Ph. (805) 275-5317 DSN Ph. 525-5317

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300459 Report Date: 04/02/1997

Project Name: ARMSTRONG METALS
Project No: 3214-008-050
Analysis: Inorganics

Field ID: AFCT10-030597-JP8
Sampling Loc'n: JP8
Sampling Date: 03/05/1997
Sampling Time: 1415
ARDL No: 300459-01
Received: 03/20/1997
Matrix: PETROLEUM
Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ARSENIC	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BARIUM	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BERYLLIUM	0.0025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CADMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CHROMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COBALT	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COPPER	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
LEAD	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
MANGANESE	0.013	0.051 B	MG/KG		6010	03/26/97	03/27/97	P1943
MERCURY	0.00050	ND	MG/KG		7470	03/26/97	04/01/97	C0828
NICKEL	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SELENIUM	0.10	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SILVER	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
THALLIUM	0.075	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ZINC	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
PHOSPHORUS, TOTAL	0.025	0.040	MG/KG		365.2	03/26/97	03/28/97	04013977

Reviewed by: Debra M Jones Date: 4/2/97 10004

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300459 Report Date: 04/02/1997

Project Name: ARMSTRONG METALS Analysis: Inorganics
Project No: 3214-008-050

Field ID: AFCT10-030597-DUP ARDL No: 300459-02
Sampling Loc'n: JP8 Received: 03/20/1997
Sampling Date: 03/05/1997 Matrix: PETROLEUM
Sampling Time: 1415 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ARSENIC	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BARIUM	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BERYLLIUM	0.0025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CADMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CHROMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COBALT	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COPPER	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
LEAD	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
MANGANESE	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
MERCURY	0.00050	ND	MG/KG		7470	03/26/97	04/01/97	C082
NICKEL	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P194
SELENIUM	0.10	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SILVER	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
THALLIUM	0.075	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ZINC	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
PHOSPHORUS, TOTAL	0.025	ND	MG/KG		365.2	03/26/97	03/28/97	04013977

Reviewed by: Debra McGowan Date: 4/2/97 0005

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300459 Report Date: 04/02/1997

Project Name: ARMSTRONG METALS Analysis: Inorganics
Project No: 3214-008-050

Field ID: AFCT10-030697-JP8 ARDL No: 300459-03
Sampling Loc'n: JP8 Received: 03/20/1997
Sampling Date: 03/06/1997 Matrix: PETROLEUM
Sampling Time: 1430 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ARSENIC	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BARIUM	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BERYLLIUM	0.0025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CADMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CHROMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COBALT	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COPPER	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
LEAD	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
MANGANESE	0.013	0.015 B	MG/KG		6010	03/26/97	03/27/97	P1943
MERCURY	0.00050	ND	MG/KG		7470	03/26/97	04/01/97	C0828
NICKEL	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SELENIUM	0.10	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SILVER	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
THALLIUM	0.075	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ZINC	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
PHOSPHORUS, TOTAL	0.025	ND	MG/KG		365.2	03/26/97	03/28/97	04013977

Reviewed by: Debra M Gore Date: 4/2/97 10006

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300459 Report Date: 04/02/1997

Project Name: ARMSTRONG METALS Analysis: Inorganics
Project No: 3214-008-050

Field ID: AFCT10-030697-DUP ARDL No: 300459-04
Sampling Loc'n: JP8 Received: 03/20/1997
Sampling Date: 03/06/1997 Matrix: PETROLEUM
Sampling Time: 1430 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ARSENIC	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BARIUM	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BERYLLIUM	0.0025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CADMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CHROMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COBALT	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COPPER	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
LEAD	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
MANGANESE	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
MERCURY	0.00050	ND	MG/KG		7470	03/26/97	04/01/97	C0828
NICKEL	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SELENIUM	0.10	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SILVER	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
THALLIUM	0.075	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ZINC	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
PHOSPHORUS, TOTAL	0.025	ND	MG/KG		365.2	03/26/97	03/28/97	04013977

Sample 300459-04, Inorganic Analyses

Reviewed by: Debra McJones Date: 4/2/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300459 Report Date: 04/02/1997

Project Name: ARMSTRONG METALS Analysis: Inorganics
Project No: 3214-008-050

Field ID: AFLJ69-031497-JP8 ARDL No: 300459-05
Sampling Loc'n: JP8 Received: 03/20/1997
Sampling Date: 03/14/1997 Matrix: PETROLEUM
Sampling Time: 1410 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ARSENIC	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BARIUM	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BERYLLIUM	0.0025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CADMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CHROMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COBALT	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COPPER	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
LEAD	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
MANGANESE	0.013	0.046 B	MG/KG		6010	03/26/97	03/27/97	P1943
MERCURY	0.00050	ND	MG/KG		7470	03/26/97	04/01/97	C0828
NICKEL	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SELENIUM	0.10	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SILVER	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
THALLIUM	0.075	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ZINC	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
PHOSPHORUS, TOTAL	0.025	ND	MG/KG		365.2	03/26/97	03/28/97	04013977

Reviewed by: Debra McGowan Date: 4/2/97 10708

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300459 Report Date: 04/02/1997

Project Name: ARMSTRONG METALS Analysis: Inorganics
Project No: 3214-008-050

Field ID: AFLJ69-031497-DUP ARDL No: 300459-06
Sampling Loc'n: JP8 Received: 03/20/1997
Sampling Date: 03/14/1997 Matrix: PETROLEUM
Sampling Time: 1410 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ARSENIC	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BARIUM	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BERYLLIUM	0.0025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CADMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CHROMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COBALT	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COPPER	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
LEAD	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
MANGANESE	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
MERCURY	0.00050	ND	MG/KG		7470	03/26/97	04/01/97	C0828
NICKEL	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P194
SELENIUM	0.10	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SILVER	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
THALLIUM	0.075	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ZINC	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
PHOSPHORUS, TOTAL	0.025	ND	MG/KG		365.2	03/26/97	03/28/97	04013977

Sample 300459-06, Inorganic Analyses

Reviewed by: Debra McGowan Date: 4/2/97 10005

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300459 Report Date: 04/02/1997

Project Name: ARMSTRONG METALS Analysis: Inorganics
Project No: 3214-008-050

Field ID: AFLJ85-031897-JP8 ARDL No: 300459-07
Sampling Loc'n: JP8 Received: 03/20/1997
Sampling Date: 03/18/1997 Matrix: PETROLEUM
Sampling Time: 1215 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ARSENIC	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BARIUM	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BERYLLIUM	0.0025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CADMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CHROMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COBALT	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COPPER	0.025	0.039	MG/KG		6010	03/26/97	03/27/97	P1943
LEAD	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
MANGANESE	0.013	0.015 B	MG/KG		6010	03/26/97	03/27/97	P1943
MERCURY	0.00050	ND	MG/KG		7470	03/26/97	04/01/97	C0828
NICKEL	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SELENIUM	0.10	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SILVER	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
THALLIUM	0.075	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ZINC	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
PHOSPHORUS, TOTAL	0.025	ND	MG/KG		365.2	03/26/97	03/28/97	04013977

Sample 300459-07, Inorganic Analyses

Reviewed by: Debra McJones Date: 4/2/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300459 Report Date: 04/02/1997

Project Name: ARMSTRONG METALS Analysis: Inorganics
Project No: 3214-008-050

Field ID: AFLJ85-031897-DUP ARDL No: 300459-08
Sampling Loc'n: JP8 Received: 03/20/1997
Sampling Date: 03/18/1997 Matrix: PETROLEUM
Sampling Time: 1215 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ARSENIC	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BARIUM	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
BERYLLIUM	0.0025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CADMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
CHROMIUM	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COBALT	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
COPPER	0.025	ND	MG/KG		6010	03/26/97	03/27/97	P1943
LEAD	0.063	ND	MG/KG		6010	03/26/97	03/27/97	P1943
MANGANESE	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
MERCURY	0.00050	ND	MG/KG		7470	03/26/97	04/01/97	C08[illegible]
NICKEL	0.050	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SELENIUM	0.10	ND	MG/KG		6010	03/26/97	03/27/97	P1943
SILVER	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
THALLIUM	0.075	ND	MG/KG		6010	03/26/97	03/27/97	P1943
ZINC	0.013	ND	MG/KG		6010	03/26/97	03/27/97	P1943
PHOSPHORUS, TOTAL	0.025	ND	MG/KG		365.2	03/26/97	03/28/97	04013977

Reviewed by: Debra M Jones Date: 4/2/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300516 Report Date: 05/16/1997

Project Name: ARMSTRONG METALS Analysis: Inorganics
Project No: 3214-008-050

Field ID: AF-TF101-043097 ARDL No: 300516-01
Sampling Loc'n: JP8 Received: 05/05/1997
Sampling Date: 04/30/1997 Matrix: LIQUID-WASTE
Sampling Time: 1900 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	05/06/97	05/07/97	P2057
ARSENIC	0.063	ND	MG/KG		6010	05/06/97	05/07/97	P2057
BARIUM	0.025	ND	MG/KG		6010	05/06/97	05/07/97	P2057
BERYLLIUM	0.0025	ND	MG/KG		6010	05/06/97	05/07/97	P2057
CADMIUM	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
CHROMIUM	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
COBALT	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
COPPER	0.025	ND	MG/KG		6010	05/06/97	05/07/97	P2057
LEAD	0.063	ND	MG/KG		6010	05/06/97	05/07/97	P2057
MANGANESE	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
MERCURY	0.00050	ND	MG/KG		7470	05/06/97	05/08/97	C0868
NICKEL	0.050	ND	MG/KG		6010	05/06/97	05/07/97	P2057
SELENIUM	0.10	ND	MG/KG		6010	05/06/97	05/07/97	P2057
SILVER	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
THALLIUM	0.075	ND	MG/KG		6010	05/06/97	05/07/97	P2057
ZINC	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
PHOSPHORUS, TOTAL	0.025	ND	MG/KG		365.2	05/06/97	05/09/97	05154085

Reviewed by: [signature] Date: 5/16/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300516 Report Date: 05/16/1997

Project Name: ARMSTRONG METALS
Project No: 3214-008-050
Analysis: Inorganics

Field ID: AF-TF101-043097DUP
Sampling Loc'n: JP8
Sampling Date: 04/30/1997
Sampling Time: 1900
ARDL No: 300516-02
Received: 05/05/1997
Matrix: LIQUID-WASTE
Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	05/06/97	05/07/97	P2057
ARSENIC	0.063	ND	MG/KG		6010	05/06/97	05/07/97	P2057
BARIUM	0.025	ND	MG/KG		6010	05/06/97	05/07/97	P2057
BERYLLIUM	0.0025	ND	MG/KG		6010	05/06/97	05/07/97	P2057
CADMIUM	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
CHROMIUM	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
COBALT	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
COPPER	0.025	ND	MG/KG		6010	05/06/97	05/07/97	P2057
LEAD	0.063	ND	MG/KG		6010	05/06/97	05/07/97	P2057
MANGANESE	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
MERCURY	0.00050	ND	MG/KG		7470	05/06/97	05/08/97	C086
NICKEL	0.050	ND	MG/KG		6010	05/06/97	05/07/97	P2057
SELENIUM	0.10	ND	MG/KG		6010	05/06/97	05/07/97	P2057
SILVER	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
THALLIUM	0.075	ND	MG/KG		6010	05/06/97	05/07/97	P2057
ZINC	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
PHOSPHORUS, TOTAL	0.025	0.025	MG/KG		365.2	05/06/97	05/09/97	05154085

Reviewed by: [signature] Date: 5/16/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300516 Report Date: 05/16/1997

Project Name: ARMSTRONG METALS
Project No: 3214-008-050
Analysis: Inorganics

Field ID: AF-TF33-050297
Sampling Loc'n: JP8
Sampling Date: 05/02/1997
Sampling Time: 1900
ARDL No: 300516-03
Received: 05/05/1997
Matrix: LIQUID-WASTE
Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	05/06/97	05/07/97	P2057
ARSENIC	0.063	ND	MG/KG		6010	05/06/97	05/07/97	P2057
BARIUM	0.025	ND	MG/KG		6010	05/06/97	05/07/97	P2057
BERYLLIUM	0.0025	ND	MG/KG		6010	05/06/97	05/07/97	P2057
CADMIUM	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
CHROMIUM	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
COBALT	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
COPPER	0.025	ND	MG/KG		6010	05/06/97	05/07/97	P2057
LEAD	0.063	ND	MG/KG		6010	05/06/97	05/07/97	P2057
MANGANESE	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
MERCURY	0.00050	ND	MG/KG		7470	05/06/97	05/08/97	C0868
NICKEL	0.050	ND	MG/KG		6010	05/06/97	05/07/97	P2057
SELENIUM	0.10	ND	MG/KG		6010	05/06/97	05/07/97	P2057
SILVER	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
THALLIUM	0.075	ND	MG/KG		6010	05/06/97	05/07/97	P2057
ZINC	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
PHOSPHORUS, TOTAL	0.025	0.035	MG/KG		365.2	05/06/97	05/09/97	05154085

Sample 300516-03, Inorganic Analyses

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Reviewed by: [signature] Date: 5/16/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300516 Report Date: 05/16/1997

Project Name: ARMSTRONG METALS Analysis: Inorganics
Project No: 3214-008-050

Field ID: AF-TF33-050297DUP ARDL No: 300516-04
Sampling Loc'n: JP8 Received: 05/05/1997
Sampling Date: 05/02/1997 Matrix: LIQUID-WASTE
Sampling Time: 1900 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	05/06/97	05/07/97	P2057
ARSENIC	0.063	ND	MG/KG		6010	05/06/97	05/07/97	P2057
BARIUM	0.025	ND	MG/KG		6010	05/06/97	05/07/97	P2057
BERYLLIUM	0.0025	ND	MG/KG		6010	05/06/97	05/07/97	P2057
CADMIUM	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
CHROMIUM	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
COBALT	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
COPPER	0.025	ND	MG/KG		6010	05/06/97	05/07/97	P2057
LEAD	0.063	ND	MG/KG		6010	05/06/97	05/07/97	P2057
MANGANESE	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
MERCURY	0.00050	ND	MG/KG		7470	05/06/97	05/08/97	C086
NICKEL	0.050	ND	MG/KG		6010	05/06/97	05/07/97	P2057
SELENIUM	0.10	ND	MG/KG		6010	05/06/97	05/07/97	P2057
SILVER	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
THALLIUM	0.075	ND	MG/KG		6010	05/06/97	05/07/97	P2057
ZINC	0.013	ND	MG/KG		6010	05/06/97	05/07/97	P2057
PHOSPHORUS, TOTAL	0.025	0.025	MG/KG		365.2	05/06/97	05/09/97	05154085

Sample 300516-04, Inorganic Analyses

Reviewed by: Date: 5/16/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300730 Report Date: 03/10/1998

Project Name: ARMSTRONG LABS Analysis: Inorganics
Project No: D.O. 8

Field ID: CPT64-0128 ARDL No: 300730-01
Sampling Loc'n: JP-8 FUEL Received: 02/13/1998
Sampling Date: 01/28/1998 Matrix: PETROLEUM
Sampling Time: 1430 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.05	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
ARSENIC	0.063	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
BARIUM	0.025	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
BERYLLIUM	0.0025	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
CADMIUM	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
CHROMIUM	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
COBALT	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
COPPER	0.025	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
LEAD	0.063	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
MANGANESE	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
MERCURY	0.0005	ND	MG/KG		7470A	03/09/98	03/09/98	C1037
NICKEL	0.05	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
SELENIUM	0.075	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
SILVER	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
THALLIUM	0.075	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
ZINC	0.013	0.018	MG/KG		6010A	02/25/98	03/03/98	P2585
PHOSPHORUS, TOTAL	0.025	ND	MG/KG		365.2	03/04/98	03/04/98	03065007

Sample 300730-01, Inorganic Analyses

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Reviewed by: [signature] Date: 3/10/98

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300730 Report Date: 03/10/1998

Project Name: ARMSTRONG LABS Analysis: Inorganics
Project No: D.O. 8

Field ID: CPT64-0128D ARDL No: 300730-02
Sampling Loc'n: JP-8 FUEL Received: 02/13/1998
Sampling Date: 01/28/1998 Matrix: PETROLEUM
Sampling Time: 1430 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.05	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
ARSENIC	0.063	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
BARIUM	0.025	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
BERYLLIUM	0.0025	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
CADMIUM	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
CHROMIUM	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
COBALT	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
COPPER	0.025	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
LEAD	0.063	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
MANGANESE	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
MERCURY	0.0005	ND	MG/KG		7470A	03/09/98	03/09/98	C103
NICKEL	0.05	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
SELENIUM	0.075	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
SILVER	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
THALLIUM	0.075	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
ZINC	0.013	0.019	MG/KG		6010A	02/25/98	03/03/98	P2585
PHOSPHORUS, TOTAL	0.025	0.040	MG/KG		365.2	03/04/98	03/04/98	03065007

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Sample 300730-02, Inorganic Analyses

Reviewed by: _____ Date: 3/11/98

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300730 Report Date: 03/10/1998

Project Name: ARMSTRONG LABS
Project No: D.O. 8
Analysis: Inorganics

Field ID: BTF34-0212
Sampling Loc'n: JP-8 FUEL
Sampling Date: 02/12/1998
Sampling Time: 1600
ARDL No: 300730-03
Received: 02/13/1998
Matrix: PETROLEUM
Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.05	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
ARSENIC	0.063	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
BARIUM	0.025	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
BERYLLIUM	0.0025	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
CADMIUM	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
CHROMIUM	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
COBALT	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
COPPER	0.025	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
LEAD	0.063	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
MANGANESE	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
MERCURY	0.0005	ND	MG/KG		7470A	03/09/98	03/09/98	C1037
NICKEL	0.05	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
SELENIUM	0.075	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
SILVER	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
THALLIUM	0.075	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
ZINC	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
PHOSPHORUS, TOTAL	0.025	ND	MG/KG		365.2	03/04/98	03/04/98	03065007

Sample 300730-03, Inorganic Analyses

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Reviewed by: ASS Date: 3/11/98

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300730 Report Date: 03/10/1998

Project Name: ARMSTRONG LABS Analysis: Inorganics
Project No: D.O. 8

Field ID: BTF34-0212D ARDL No: 300730-04
Sampling Loc'n: JP-8 FUEL Received: 02/13/1998
Sampling Date: 02/12/1998 Matrix: PETROLEUM
Sampling Time: 1600 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.05	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
ARSENIC	0.063	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
BARIUM	0.025	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
BERYLLIUM	0.0025	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
CADMIUM	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
CHROMIUM	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
COBALT	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
COPPER	0.025	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
LEAD	0.063	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
MANGANESE	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
MERCURY	0.0005	ND	MG/KG		7470A	03/09/98	03/09/98	C10
NICKEL	0.05	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
SELENIUM	0.075	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
SILVER	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
THALLIUM	0.075	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
ZINC	0.013	ND	MG/KG		6010A	02/25/98	03/03/98	P2585
PHOSPHORUS, TOTAL	0.025	ND	MG/KG		365.2	03/04/98	03/04/98	03065007

Sample 300730-04, Inorganic Analyses

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Reviewed by: DSD Date: 3/11/98

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300401 Report Date: 02/06/1997

Project Name: ARMSTRONG METALS
Project No: 3214-008-050
Analysis: Inorganics

Field ID: AFKP85-012497-JP8
Sampling Loc'n: JP8
Sampling Date: 01/24/1997
Sampling Time: 1130
ARDL No: 300401-01
Received: 01/28/1997
Matrix: LIQUID-WASTE
Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ARSENIC	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BARIUM	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BERYLLIUM	0.0025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CADMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CHROMIUM	0.013	0.024	MG/KG		6010	01/31/97	01/31/97	P1843
COBALT	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COPPER	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
LEAD	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
MANGANESE	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
MERCURY	0.00050	ND	MG/KG		7470	02/04/97	02/04/97	C0776
NICKEL	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SELENIUM	0.10	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SILVER	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
THALLIUM	0.075	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ZINC	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
PHOSPHORUS, TOTAL	0.050	ND	MG/KG		365.2	02/03/97	02/03/97	02063821

Reviewed by: Richard McGowan Date: 2/6/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300401 Report Date: 02/06/1997

Project Name: ARMSTRONG METALS Analysis: Inorganics
Project No: 3214-008-050

Field ID: AFKP85DUP ARDL No: 300401-02
Sampling Loc'n: JP8 Received: 01/28/1997
Sampling Date: 01/24/1997 Matrix: LIQUID-WASTE
Sampling Time: 1130 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ARSENIC	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BARIUM	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BERYLLIUM	0.0025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CADMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CHROMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COBALT	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COPPER	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
LEAD	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
MANGANESE	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P18
MERCURY	0.00050	ND	MG/KG		7470	02/04/97	02/04/97	C0776
NICKEL	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SELENIUM	0.10	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SILVER	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
THALLIUM	0.075	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ZINC	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
PHOSPHORUS, TOTAL	0.050	ND	MG/KG		365.2	02/03/97	02/03/97	02063821

Reviewed by: [signature] Date: 2/6/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300401 Report Date: 02/06/1997

Project Name: ARMSTRONG METALS
Project No: 3214-008-050
Analysis: Inorganics

Field ID: AFP65-012497-JP8
Sampling Loc'n: JP8
Sampling Date: 01/27/1997
Sampling Time: 0700
ARDL No: 300401-03
Received: 01/28/1997
Matrix: LIQUID-WASTE
Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ARSENIC	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BARIUM	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BERYLLIUM	0.0025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CADMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CHROMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COBALT	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COPPER	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
LEAD	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
MANGANESE	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
MERCURY	0.00050	ND	MG/KG		7470	02/04/97	02/04/97	C0776
NICKEL	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SELENIUM	0.10	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SILVER	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
THALLIUM	0.075	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ZINC	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
PHOSPHORUS, TOTAL	0.050	ND	MG/KG		365.2	02/03/97	02/03/97	02063821

Sample 300401-03, Inorganic Analyses

Reviewed by: Debra McJones Date: 2/6/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300401 Report Date: 02/06/1997

Project Name: ARMSTRONG METALS Analysis: Inorganics
Project No: 3214-008-050

Field ID: AFP65DUP ARDL No: 300401-04
Sampling Loc'n: JP8 Received: 01/28/1997
Sampling Date: 01/27/1997 Matrix: LIQUID-WASTE
Sampling Time: 0700 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ARSENIC	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BARIUM	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BERYLLIUM	0.0025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CADMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CHROMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COBALT	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COPPER	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
LEAD	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
MANGANESE	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P18[illegible]
MERCURY	0.00050	ND	MG/KG		7470	02/04/97	02/04/97	C0776
NICKEL	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SELENIUM	0.10	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SILVER	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
THALLIUM	0.075	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ZINC	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
PHOSPHORUS, TOTAL	0.050	ND	MG/KG		365.2	02/03/97	02/03/97	02063821

10007

Reviewed by: Debra M Jones Date: 2/6/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300393 Report Date: 02/06/1997

Project Name: ARMSTRONG METALS DO
Project No: 3214-008-050
Analysis: Inorganics

Field ID: AFKT56-011197-JP8
Sampling Loc'n: JP8 FUEL
Sampling Date: 01/11/1997
Sampling Time: 1130
ARDL No: 300393-01
Received: 01/21/1997
Matrix: LIQUID-WASTE
Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ARSENIC	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BARIUM	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BERYLLIUM	0.0025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CADMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CHROMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COBALT	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COPPER	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
LEAD	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
MANGANESE	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
MERCURY	0.00050	ND	MG/KG		7470	02/04/97	02/04/97	C0776
NICKEL	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SELENIUM	0.10	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SILVER	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
THALLIUM	0.075	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ZINC	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
PHOSPHORUS, TOTAL	0.050	ND	MG/KG		365.2	02/03/97	02/03/97	02063821

Sample 300393-01, Inorganic Analyses

 10013

Reviewed by: Debra M Jones Date: 2/6/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300393 Report Date: 02/06/1997

Project Name: ARMSTRONG METALS DO
Project No: 3214-008-050
Analysis: Inorganics

Field ID: AFKTF39-011197-JP8
Sampling Loc'n: JP8 FUEL
Sampling Date: 01/17/1997
Sampling Time: 1100
ARDL No: 300393-02
Received: 01/21/1997
Matrix: LIQUID-WASTE
Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ARSENIC	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BARIUM	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BERYLLIUM	0.0025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CADMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CHROMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COBALT	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COPPER	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
LEAD	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
MANGANESE	0.013	0.059	MG/KG		6010	01/31/97	01/31/97	P1843
MERCURY	0.00050	ND	MG/KG		7470	02/04/97	02/04/97	C0776
NICKEL	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SELENIUM	0.10	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SILVER	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
THALLIUM	0.075	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ZINC	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
PHOSPHORUS, TOTAL	0.050	ND	MG/KG		365.2	02/03/97	02/03/97	02063821

10014

Reviewed by: Debra M Jones Date: 2/6/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300393 Report Date: 02/06/1997

Project Name: ARMSTRONG METALS DO
Project No: 3214-008-050
Analysis: Inorganics

Field ID: AFKT56DUP
Sampling Loc'n: JP8 FUEL
Sampling Date: 01/11/1997
Sampling Time: 1130
ARDL No: 300393-03
Received: 01/27/1997
Matrix: LIQUID-WASTE
Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ARSENIC	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BARIUM	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BERYLLIUM	0.0025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CADMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CHROMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COBALT	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COPPER	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
LEAD	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
MANGANESE	0.013	0.022	MG/KG		6010	01/31/97	01/31/97	P1843
MERCURY	0.00050	ND	MG/KG		7470	02/04/97	02/04/97	C0776
NICKEL	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SELENIUM	0.10	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SILVER	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
THALLIUM	0.075	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ZINC	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
PHOSPHORUS, TOTAL	0.050	ND	MG/KG		365.2	02/03/97	02/03/97	02063821

10015

Sample 300393-03, Inorganic Analyses

Reviewed by: Debra M Jones Date: 2/6/97

ARDL, INC.
Rt. 15E, Mt. Vernon Airport Industrial Park
Mt. Vernon, Illinois 62864

Lab Report No: 300393 Report Date: 02/06/1997

Project Name: ARMSTRONG METALS DO Analysis: Inorganics
Project No: 3214-008-050

Field ID: AFKTF39DUP ARDL No: 300393-04
Sampling Loc'n: JP8 FUEL Received: 01/27/1997
Sampling Date: 01/17/1997 Matrix: LIQUID-WASTE
Sampling Time: 1100 Moisture: No Moisture Present

Analyte	Detection Limit	Result	Units	Prep Method	Analysis Method	Prep Date	Analysis Date	Run Number
ANTIMONY	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ARSENIC	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BARIUM	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
BERYLLIUM	0.0025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CADMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
CHROMIUM	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COBALT	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
COPPER	0.025	ND	MG/KG		6010	01/31/97	01/31/97	P1843
LEAD	0.063	ND	MG/KG		6010	01/31/97	01/31/97	P184[illegible]
MANGANESE	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P184[illegible]
MERCURY	0.00050	ND	MG/KG		7470	02/04/97	02/04/97	C0776
NICKEL	0.050	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SELENIUM	0.10	ND	MG/KG		6010	01/31/97	01/31/97	P1843
SILVER	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
THALLIUM	0.075	ND	MG/KG		6010	01/31/97	01/31/97	P1843
ZINC	0.013	ND	MG/KG		6010	01/31/97	01/31/97	P1843
PHOSPHORUS, TOTAL	0.050	ND	MG/KG		365.2	02/03/97	02/03/97	02063821

10016

Reviewed by: Debra M Jones Date: 2/6/97

ENVIRONMENTAL QUALITY MANAGEMENT, INC.
MEMORANDUM

Date: April 14, 1998

To: Tom Gerstle, Project Manager

From: Jackie Doan, QA/QC Chemist

Subject: Data Quality Assurance Level II Review of Jet Fuel Samples for Analysis of Metals and Phosphorus by Methods 6010, 7470, and 365.2.. Chain of Custody Forms # A-3013.

cc: Julia Fields
File

A data quality assurance review was conducted on the results of the two(2) fuel samples collected at the Naval Aviation Depot, Cherry Point (Cherry Point) and the Barnes Air National Guard Base (Barnes ANGB) for the Armstrong Laboratory Contract Delivery Order 08B. The samples were collected on January 28 and February 12, 1998 by EQ personnel at the site. The samples were submitted to Applied Research and Development Laboratory (ARDL) in Mt. Vernon, IL for preparation and analysis. The following procedure was utilized in the preparation of the samples: Successive 10 gram aliquots of fuel were combusted in an evaporating dish until 100 grams of fuel had been flashed. The combustion residue was ashed in a muffle furnace at 550°C. The ash product was treated with aqua regia and the solution was diluted to 250 mL. Analysis for Metals (Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Ni, Se, Ag, Tl) was performed according to SW846 Method 6010. Mercury (Hg) was analyzed by SW846 Method 7470 and Phosphorus (P) was analyzed by EPA Method 365.2. The samples were labeled as follows:

CPT64-0128	BTF34-0212
CPT64-0128D	BTF34-0212D

Data Qualifiers

This data package has been evaluated by the criteria outlined in the Data Quality Assurance Plan (DQAP) for this Delivery Order, which are based on the method as listed in SW-846. The following definitions provide brief explanations of the national qualifiers assigned to results in the data review process:

A - The associated numerical value is accepted. Procedures from which value was obtained meets the quality control criteria as defined by the DQAP.

QA Level II Data Use

The colleetion, preparation, analysis and evaluation of this data was performed under the requirements specified as Quality Assurance Level II. This data quality objective is utilized for verification of qualitative and/or quantitative field screening data acquired using non-rigorous methods of analysis and quality assurance. A minimum of 10% verification of results is required. This quality objective is intended to give the decision-maker a level of confidence for a portion of the data. The validated results of the 10% of substantiated data gives an associated sense of confidence for the remaining 90%. Guidelines for QA Level II requirements are specified in the USEPA Contract Laboratory Program National Functional Guidelines for Organic Review (EPA540/R-94/012).

Chemical Classification / Analytes

The following chemical classifications / analytes were evaluated in the sample set.

Chemical Class	***Analytes***	***Method***
ICP Metals	Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Ni, Se, Ag, Tl	SW846 6010
Phosphorus		EPA 365.2
Mercury		SW846 7470

Data Review Abbreviations

%D - Percent difference
%R - Percent recovery
RSD - Relative standard deviation
RPD - Relative percent difference
RRT - Relative retention time
COC - Chain of custody
LCS - Laboratory control sample
MS - Matrix spike sample
MSD - Matrix spike duplicate sample

Project: Armstrong Laboratory D.O. 08B, Cherry Point & Barnes ANGB **COC#:** A-3013 **Reviewer:** Jackie Doan

Assessment Characteristic	Chemical Class (Analyte)	Qualifier	Comment
Sample Holding Time	ICP Metals, Hg, P	A	The samples were received February 13, extracted February 25 and analyzed March 3, 1998. Internal chain of custody procedures were followed. The samples were analyzed within holding time requirements.
Instrument Performance	ICP Metals	A	An Interference Check Sample was analyzed at the beginning and end of the analytical run. Recoveries were within acceptable limits.
Initial and Continuing Calibration	ICP Metals, Hg, P	A	Initial and continuing calibration standard checks were within acceptable limits and analyzed at the required frequency.
Method Blanks	ICP Metals, Hg, P	A	Method blanks were evaluated with each sample set and found to be free of target analytes at or above the detection limit for all analytes.
Duplicates	ICP Metals, Hg, P	A	A laboratory duplicate was performed on all samples submitted for this project. All samples were within 20% of the duplicates.
Compound Quantitation	ICP Metals, Hg, P	A	All reported values have been correctly adjusted to reflect dilutions, dry weight factors, and other adjustments.
Laboratory Control Samples	ICP Metals, Hg, P	A	A laboratory control sample was performed with the sample set and recovered within established control limits. Data is acceptable.

Summary	ICP Metals, Hg, P	A	All associated numerical values are accepted. Procedures from which values were obtained meet the quality criteria as defined by the Data Quality Assurance Plan for this Delivery Order.

APPENDIX E

REFERENCES

APPENDIX F
REFERENCES

1. Code of Federal Regulation (40CFR), Protection of the Environment, Part 266 – Standards for Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities, Appendix IX – Methods for Compliance with the BIF Regulations.

2. Code of Federal Regulation (40CFR), Protection of the Environment, Part 60 – Standards of Performance for New Stationary Sources, Appendix A – Test Methods

3. Mauch,S. at al., Field Application of Annular Denuder Tubes for Formaldehyde Measurements in Ambient Air, Proceedings from 88th Annual Meeting and Conference of the Air and Waste Management Association, June 1995.

4. The Engine Handbook (Turbofan, Turbojet, Turboshaft/Turboprop, Reciprocating Small Gas Turbines), Propulsion Product Group Manager, San Antonio Air Logistics Center (SA-ALC/LR), 1995 Edition

5.

Title:	Analysis of Aviation Gas Turbines Fuels
Branch of Service:	Department of Transportation
Test Firm:	Bartlesville Energy Research Center
Date of Report:	December 1973
Engines Tested:	J85-GE-5

6.

Title:	Air Force Turbine Engine Emission Survey Volume III Engine Model Summaries
Branch of Service:	Air Force
Test Firm:	Scott Environmental Technology, Inc.
Date of Report:	January 1975 - June 1978
Engines Tested:	

J69-T25	TF39	J57-43	J75-19W
J85-5	J57-P21B	J57-19W	TF33-P3
J6	TF38-P7	TF41-A1	F100-PW100
J79-15	TF38-P10B	TF33-P7	TF34-100
T56-A7B	TF38-P3	J75-P17	

7.

Title:	T400-CP-400 Engine Emissions Data
Branch of Service:	Navy; Aircraft Environmental Support Office (AESO)
Test Firm:	AESO
Date of Report:	August 1975
Engines Tested:	T400-CP-400

8.

Title:	The Impact of JP-4/JP-8 Conversion on Aircraft Engine Exhaust Emissions; AFAPL-TR-76-20
Branch of Service:	Air Force; Air Force Aero Propulsion Laboratory; Air Force Wright Aeronautical Laboratory
Test Firm:	Air Force Aero Propulsion Laboratory, Fuels Branch, Fuels and Lubrication Division
Date of Report:	May 1976
Engines Tested:	J85-5

9.

Title:	T-62T-27 Engine Emissions Data
Branch of Service:	Navy; Aircraft Environmental Support Office (AESO)
Test Firm:	AESO
Date of Report:	June 1976
Engines Tested:	T-62T-27

10.

Title:	Gaseous Emissions from a T56-A-16 Engine
Branch of Service:	Navy; Aircraft Environmental Support Office (AESO)
Test Firm:	AESO
Date of Report:	June 1976
Engines Tested:	T56-A-16

11.

Title:	Air Pollution Emissions Test Data on the T700-GE-700
Branch of Service:	Air Force
Test Firm:	General Electric Emissions Data
Date of Report:	September 1976
Engines Tested:	T700-GE-700

12.

Title: U.S. Air Force Turbine Engine Emission Survey Volume I Test Summaries; CEEDO-TR-78-34
Branch of Service: Air Force; Civil and Environmental Engineering Development Office
Test Firm: Scott Environmental Technology, Inc.
Date of Report: August 1978
Engines Tested:

J69-T25	TF39	J57-19W	J57-P21B
J85-5	TF33-P3	J57-43	F100-PW100
J60-P5	J75-19W	J57-43WB	TF34-DEV
J60-P3	J75-P17	TF30-P3	TF34-100
J79-15	TF33-P7	TF30-P100	T700
T56-A7B	TF41-A1	TF30-P7	

Author: Souza, A.F. and Daley, P.S.

13.

Title: Evaluation of Fuel Character Effects on F101 Engine Combustion System; AFAPL-TR-79-2018/CEEDO-TR-79-07
Branch of Service: Air Force; Air Force Aero Propulsion Laboratory
Test Firms: General Electric Company, Advanced Engineering and Technology Programs
Date of Report: 1979
Engines Tested: F101

14.

Title: Evaluation of Fuel Character Effects on J79 Engine Combustion System; AFAPL-TR-79-2015; CEEDO-TR-70-06
Branch of Service: Air Force; Air Force Aero Propulsion Laboratory; Air Force Wright Aeronautical Laboratory
Test Firm: General Electric Company
Date of Report: June 1979
Engines Tested: J79-17A

15.

Title: T-41 Engine Technical Report
Branch of Service: Air Force
Test Firm: Detroit Diesel Alison (DDA), Division of General Motors
Date of Report: ~ 1980
Engines Tested: T-41

16.

Title:	Fuel Character Effects on Current High Pressure Ratio, Can Type Turbine Combustion Systems; AFAPL TR-79-2072; ESL TR-79-29
Branch of Service:	Air Force; Air Force Aero Propulsion Laboratory; Air Force Wright Aeronautical Laboratory
Test Firm:	Detroit Diesel Allison Division, Division of General Motors Corporation
Date of Report:	April 1980
Engines Tested:	TF41

17.

Title:	Evaluation of Fuel Character Effects on J79 Smokeless Combustor; AFWAL-TR-80-2092; ESL-TR-80-46
Branch of Service:	Air Force; Air Force Aero Propulsion Laboratory; Air Force Wright Aeronautical Laboratory
Test Firm:	General Electric Company, Aircraft Engine Group Technology Programs and Performance Technology Department
Date of Report:	November 1980
Engines Tested:	J79-17C

18.

Title:	F110-GE-400 Emissions Data General Electric
Branch of Service:	Navy; Aircraft Environmental Support Office (AESO)
Test Firm:	AESO
Date of Report:	1981
Engines Tested:	F110-GE-400

19.

Title:	Aircraft Engine Emissions, International Standards and Recommended Practices - Environmental Protection, Annex 16, Volume II, First Edition
Branch of Service:	
Test Firm:	International Civil Aviation Organization
Date of Report:	June 1981
Engines Tested:	N/A

20.

Title:	Particulate Emissions Test Program, Volume I, Turbofan Jet Engine Test Cell Facility; Cell A, Building 545; Naval Air Station Mirarina, San Diego CA; AESO Report No. 110-01-82
Branch of Service:	Navy; Aeronautical Engineering Service Organization
Test Firm:	York Research Consultants
Date of Report:	March 1982
Engines Tested:	J79-GE-8D TF30-P-414 J52-P-6B

21.

Title:	Fuel Mainburner/Turbine Effects; AFWAL-TR-81-2100
Branch of Service:	Air Force; Air Force Wright Aeronautical Laboratories; Air Force Aero Propulsion Laboratory
Test Firm:	General Electric Company
Date of Report:	May 1982
Engines Tested:	J-85
Author:	Oller, T.L. et al.

22.

Title:	F117-PW-100 Emissions Data (Manufacturer's Date)
Branch of Service:	Air Force
Test Firm:	Pratt Whitney
Date of Report:	August 1983
Engines Tested:	F117-PW-100

23.

Title:	Aircraft Engine Exhaust Plume Dynamics
Branch of Service:	Air Force; Engineering and Services Laboratory
Test Firm:	Science Engineering Associates, Inc.
Date of Report:	August 1985
Engines Tested:	TF-30 J52-P408 J52-P8

24.

Title:	Aircraft Engine Emissions Estimator; ESL-TR-85-14
Branch of Service:	Air Force; Air Force Engineering and Services Laboratory; (AirForce Engineering and Service Center)
Test Firm:	N/A
Date of Report:	November 1985
Engines Tested:	Included engines

TF-41-1	J57-43WB	F100-200	0300D
TF-34-100	J60-5A/B	J75-17	I0300D
T56-9	TF33-7	TF30-3	F109-100
T56-15	J60-3A	TF30-9	J75-13
F101-100	T56-9	TF30-100	R2800-99W
	TF33-100A	TF30-7	J85-17
J-57-19W	F103-100	501-D13H	PT6A-27
J-57-43WB	TF33-5	IO-360O	R2800-103W
TF33-3	TF33-9	J85-17A	JT3-3B
TF39-1	TF33-102	T76-10/418	
JT8D-9	J79-15	T76-12/419	
PT6A-41	J79-17	J58	
TFE731-2	J85-13	J33-35	
T56-7	J85-21	J69-25	
J57-59W	F100-100	J85-5	

Author: Seitcheck, G.D.

25.

Title: Gaseous Emissions from Aircraft Engines, A Handbook for the Calculation of Emission Indexes and Gaseous Emissions form Aircraft Engines
Branch of Service: Navy; Aircraft Environmental Support Office (AESO)
Test Firm: AESO
Date of Report: September 1987
Engines Tested:

F101 DFE	J52-P-408	T56-A-16	T406-AD-400
F402	J57-P-10	T63-A-5A	GTC85-72
F404-GE-400	J65-W-5F	T64-GE-6B	GPC95-2
TF30-P-6C	J79-GE-8D	T58-GE-8F	GTCP100-54
TF30-P-412A	J79-GE-10B	T58-GE-16	T-62T-27
TF34-GE-400	J85-GE-2	T64-GE-413	WR27-1
TF41-A-2	7LM1500-PB-104A	T64-GE-415	
J52-P-6B	LM2500	T76-G-12A	
J52-P-8B	T53-L-11D	T400-CP-400	

26.

Title: Aircraft Emissions Characterization: TF41-A2, TF30-P103, and TF30-P109 Engines; ESL-TR-87-27
Branch of Service: Air Force; Air Force Engineering & Services Laboratory
Test Firm: Battelle, Columbus Division
Date of Report: December 1987
Engines Tested: TF41-A2
TF30-P103
TF30-P109
Author: Spicer, C.W. et al.

27.

Title: Aircraft Emissions Characterization; ESL-TR-87-63
Branch of Service: Air Force; Air Force Engineering Services Laboratory
Test Firm: Battelle, Columbus Division
Date of Report: March 1988
Engines Tested: TF33-P3
TF33-P7
J79-17G
Author: Spicer, C.W. et al.

28.

Title:	Characterization of Chemicals on Engine Exhaust Particles: F101 and F110 Engines; ESL-TR-89-20
Branch of Service:	Air Force; Air Force Engineering Services Laboratory
Test Firm:	Battelle Memorial Institute
Date of Report:	August 1989
Engines Tested:	F101 F110
Author:	Kuhlman, M.R. and Chuany, J.C.

29.

Title:	Aircraft Emissions Characterization: F101 and F110 Engines ESL-TR-89-13
Branch of Service:	Air Force;
Test Firm:	Battelle, Columbus Division
Date of Report:	March 1990
Engines Tested:	F101 F110
Author:	Spicer, C.W., et al.

30.

Title:	Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines; AESO Report No. 6-90
Branch of Service:	Navy, Aircraft Environmental Support Office
Test Firm:	Naval
Date of Report:	June 1990
Engines Tested:	

F101 DFE	J52-P-408	T56-A-16	GTPC95-2
F402	J57-P-10	T58-GE-8F	CTP100-54
F404-GE-400	J57-P-420	T58-GE-16	T-62T-27
TF30-P-6C	J65-W-5F	T63-A-5A	WR27-1
TF30-P-412A	J79-GE-8C	T64-GE-6B	
TF30-P-414	J79-GE-8D	T64-GE-413	
TF34-GE-400	J79-GE-10B	T64-GE-415	
TF34-GE-400A	J85-GE-2	T76-G-12A	
TF41-A-2	7LM1500-PB-104A	T400-CP-400	
J52-P-6B		T406-AD-400	
J52-P-8B	T53-L-11D	GTC-85-72	

31.

Title: Calculation Methods for Criteria Air Pollutant Emission Inventories

Branch of Service: Air Force; Armstrong Laboratory, Occupational and Environmental Health Directorate, Bioenvironmental Engineering Division

Test Firm: N/A

Date of Report: February 1993 - May 1994

Engines Tested:

F100-100	F110**	J69-25	FT33-5
F100-220	F119**	J79-17	TF33-7
F100-229	JT3D-3B	J85-5A	TF33-100A
F101-102	JT8D-9	TF30-103	TF34-100
F103-100	J57-43WB	TF30-109	FT39-1
F103-101	J57-59	TF30-111	T56-7
F108-100	J60-5B	TF33-3	T56-15

32.

Title: JT15D-5B Emissions Data (Manufacturer's Date)

Branch of Service: Air Force

Test Firm: Pratt & Whitney

Date of Report: April 1993

Engines Tested: JT15D-5B, JT15D-5, JT15D-5A

33.

Title: JT3D-7/TF33-7 Emissions Data (Manufacturer's Date)

Branch of Service: Air Force

Test Firm: Pratt and Whitney

Date of Report: October 1993

Engines Tested: JT3D-7
TF33-7

34.

Title: Factors for Obtaining Jet Engine emissions Derived from Previous Testing, Version 4.1

Branch of Service:

Test Firm: N/A

Date of Report: May 1994

Engines Tested:

F100100	J6005B	JT3DB	TF330090
F100200	J6925	JT8D09	TF33100A
F100220	J7517	JT8D17	TF33102
F100229	J7519W	T5607	TF33102A
F101100	J7915	T5609	TF24100
F101102	J7917	T5615	TF3901C
F103100	J8513	T7610	TF4101
F103101	J8517A	T7612	

F108100	J8521	T76418
F110100	J855A	T76419
F110229	J855B	TF3003
F119ANY	J855C	TF3007
F404400	J855D	TF3009
IO360D	J855E	TF30100
J3335	J855F	TF30103
J5719W	J855G	TF30109
J5743WB	J855H	TF30111
J5759W	J855I	TF33003
J6003A	J855J	TF33005
J6005A	J855K	TF33007

35.

Title: Characterization and Evaluation of Hydrocarbon Fuels in Environmental Samples by GC/MS; AL/EO-TR-1994-0045
Branch of Service: Air Force; Armstrong Laboratory Occupational and Environmental Health Directorate, Analytical Service Division
Test Firm:
Date of Report: June 1994
Engines Tested: N/A
Author: Thomas T.C., et al.

36.

Title: Characterization of JETC Exhaust Gases at McClellan Air Force Base, Interim Report
Branch of Service: Air Force
Test Firm:
Date of Report: March 1995
Engines Tested: TF30-P111

37.

Title: JP-8 Composition and Variability; Al/EQ-TR-1996-0006
Branch of Service: Air Force; Armstrong Laboratory Environmental Research Division (EQL)
Test Firm: Armstrong Laboratory Environmental Research Division (EQL)
Date of Report: May 1996
Engines Tested: N/A

38.

Title: Engine and Hush House Emissions from a TF30-P109 Jet Engine Tested at Cannon Air Force Base, NM, Volume I, II and III
Branch of Service: Air Force; Air Combat Command
Test Firm: Radian Corporation
Date of Report: June 1996
Engines Tested: TF30-P109

39.

Title: Engine and Hush House Emissions from a F100-PW-100 Jet Engine Tested at Langley Air Force Base, VA, Volumes I, II and III
Branch of Service: Department of the Air Force
Test Firm: Radian Corporation
Date of Report: November 1996
Engines Tested: F100-PW-100

40.

Title: Aircraft Engine and Auxiliary Power Unit Emissions Testing for Human Systems Center, Environmental Sampling and Analysis Plan
Branch of Service: Air Force; Armstrong Laboratory, Occupational and Environmental Health Directorate, Bioenvironmental Engineering Division
Test Firm: Environmental Quality Management, Inc.
Date of Report: December 1996
Engines Tested:

F110-GE-100	T700-GE-700	F108-CF-100	T56-A-15
F101-GE-102	TF33-PW-102	Auxiliary Power Units	TF39-GE-1C

41.

Title: Jet Engine Emissions Data
Branch of Service: Air Force
Navy
Test Firms: Roy F. Weston, Inc.; Environmental Quality Management Inc.
Date of Report: January 1997 - February 1998
Engines Tested: N/A

F110-GE-100	J60-25	GTCP85-180	F404-GE-F1D2/400
F101-GE-102	J85-5A	GTCP165-1	F118-GE-100
TF33-P-102	TF33-P-7/7A	FF110-GE-229	F117-PW-100
F108-CF-100	TF39-GE-1C	F100-PW-100	T64-GE-100
T56-A-15	T700-GE-700	F110-GE-129	TF34-GE-100A

42.

Title: Engine and Hush House Emissions from a F100-PW-200 Jet Engine Tested at Kelly Air Force Base, Volume I, II and III
Branch of Service: Air Force; Air Combat Command
Test Firm: Radian Corporation
Date of Report: February 1997
Engines Tested: F100-PW-200

43.

Title: Jet Engine Emissions Data
Branch of Service: Air Force; Navy
Test Firms: FAA (Compiler)
Radian Corporation
Environmental Quality Management Inc.
Navy Aircraft Emissions Support Office
Date of Report: November 1997
Engines Tested:

F108-CF-100	GTCP165-1 APU	TF33-P-103	PT6A-42
F110-GE-100	FTE731-2/2A	TF30-P-109	PT6A-27
F110-GE-129	TF39-GE-1C	T700-GE-700	JT3D-3B
F113-RR-100	TF34-GE-100	T64-GE-100	JT15D-5B
F100-PW-200	TF34-GE-100A	T64-GE-100	J85-5H
F100-PW-220	TF33-P-102	T58-GE-5	J69-25A
F100-PW-229	TF33-P-102A	T56-A-15	F404-GE-F102
F101-GE-102	TF33-P-100A	T56-A-9	F118-GE-100
F103-GE-100	TF33-P-7	T56-A-7	F100-PW-100
F103-GE-101	TF33-P-5	T53-L-13	GTCP85-180
T62T27APU	TF33-P-9	T400-CP-400	
GTCP85-180	TF33-P-3	PT6A-41	

44.

Title: USAF Engines and Available Emission Test Data
Branch of Service: Air Force
Test Firms: Air Force
FAA
Navy
Various Manufacturers
Date of Report:
Engines Tested:

F100-PW-100	F117-PW-100	PT6A-42	TF33-P-5
F100-PW-200	F118-GE-100	T53-L-13B	TF33-P-7/-7A
F100-PW-220	F404-GE-F1D2	T56-A-7	TF33-P-9
F100-PW-229	1O-540	T56-A9D	TF33-P100A
F110-GE-100	J69-T-25/-25	T56-A-15	TF33-P-102

F110-GE-129	J85-GE-5	T58-GE-5	TF34-GE-100/100A
F101-GE-102	JT3D-3B	T64-GE-100	TF39-GE-1A/1C
F103-GE-100	JT8D-9A	T400-CP-400	TFE731-2/-2A
F103-GE-101	JT15D-5B	T700-GE-700	
F108-CF-100	PT6A-27	TF30-P-109	
F113-RR-100	PT6A-41	TF33-P-3/103	

45.

Title:	F404-GE-400 Engine Emissions Data
Branch of Service:	Navy
Test Firms:	AESO
Date of Report:	1981
Engine Tested:	F404-GE-400

46.

Title:	Procedure for the Calculation of Basic Emission Parameters for Aircraft Turbine Engines
Branch of Service:	
Test Firms:	Society of Automotive Engineers
Date of Report:	April 30, 1982
Engine Tested:	

47.

Title:	The Impact of JP-4/JP-8 Conversion on Aircraft Engine Exhaust Emissions, AFAPL-TR-76-20
Branch of Service:	Air Force
Test Firms:	Air Force AERO Propulsion Laboratory
Date of Report:	May 1976
Engine Tested:	J85-5 T56

APPENDIX F

REGULATORY REVIEW

KERN COUNTY AIR POLLUTION CONTROL DISTRICT

THOMAS PAXSON, P.E., APCO

BAKERSFIELD OFFICE
2700 "M" STREET, SUITE 290
BAKERSFIELD, CA 93301
PHONE: (805) 862-5250
FAX: (805) 862-5251

MOJAVE OFFICE
1775 HIGHWAY 58
MOJAVE, CA 93501
PHONE: (805) 824-4631
FAX: (805) 824-1140

January 17, 1996

Mr. John Franz
Edwards Air Quality Manager
AFFTC/EM
70 N. Wolfe Avenue
Edwards AFB, CA 93524-6225

SUBJECT: Review of Proposed Test Plan for Pratt and Whitney Model #'s F100-PW-200 and 220 Turbofan Engines Emission Factor Determination Testing

Dear Mr. Franz:

Thank you for your submittal of a Proposed Test Plan for Subject Jet Engines. We have reviewed this plan and have made the following findings:

	YES	NO	
1.	X	__	You are proposing to test for all necessary pollutants;
2.	X	__	Sample collection location is acceptable;
3.	X	__	Test methods proposed are acceptable;
4.	X	__	Test schedule is acceptable;
5.	X	__	Quality assurance proposed is acceptable;
6.	__	X	CARB Certification has been verified;

NOTE: If any item is checked "NO" (except item 6), an explanation is attached.

Please be aware:

1. Rule 108.1 requires 3 test runs for determining compliance with applicable standard or numerical limitation.

2. Record fuel and/or process rates during testing.

3. Tested units to be operated at maximum capacity. If batch process, during which stage of process will testing be conducted? Will this represent worst case emissions?

4. Test results to be reported in units specified in Table 1 (attached).

5. Kern County Standard Conditions: 29.92" Hg., 60 F.

6. Is planned sampling time, planned sampling volume, and minimum level of detection adequate for determining compliance? Protocol should address this specifically for unit being tested and considering test equipment to be on-site.

7. Ensure test methods chosen are specifically applicable to units to be tested and that testing follows:

   a) EPA/CARB test requirements and procedures [including sampling time, proper equipment (glass vs. metallic liners), quality checks, etc.]

   b) Kern County APCD Guidelines for Compliance Test Reports.

NOTE: CARB Advisory listing "Independent Contractor Program - Approvals" lists only contractors capable of doing both sampling and analysis. Companies which send samples to outside lab for analysis are not evaluated by CARB. CARB approval is required only for companies which do all testing in-house.

Please submit tests results within 60 days of collection and as outlined in Kern County APCD's "Guidelines for Compliance Test Reports". Should you not have a copy of this document, you can obtain one for $10.

Thank you for your cooperation in this matter. Should you have any questions, please telephone Mr. William Lund of our office at (805) 862-5250.

Sincerely,

Thomas Paxson, P.E.
Air Pollution Control Officer

TP:WL:bjm
WL1174