Environment

Prepared for:
NYSDEC
Albany, NY

Prepared by:
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Chestnut Ridge, NY
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December 2015

Feasibility Study Report
Crystal Cleaners Site (No. 3-60-053)

AECOM Environment

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ENGINEERING CERTIFICATION

I, Claire Hunt, certify that I am currently a NYS registered professional engineer and that this Feasibility Study Report was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

Respectfully submitted,
AECOM Technical Services Northeast, Inc.

_____ _____

Claire Hunt, PE
Registered Professional Engineer
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Date

Note: It is a violation of the of the State Education Law (Section 7209 of Article 145) for any person to alter any document that bears the seal of a professional engineer, unless the person is acting under the direction of a licensed professional engineer.

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1.0 INTRODUCTION

AECOM Technical Services Northeast, Inc. (AECOM) was issued work assignment no. 35 under the New York State Department of Environmental Conservation (NYSDEC) State Superfund Standby Contract for Investigation and Design Services (D00436). The scope of work is to conduct a remedial investigation (RI) and feasibility study (FS) at the Crystal Cleaners site, Village of Pelham, New York 10803, located in Westchester County. The site location is shown on Figure 1.

This report presents the results of a feasibility study prepared by AECOM Technical Services Northeast, Inc. (AECOM) of alternatives for the environmental remediation of the Crystal Cleaners site. Crystal Cleaners site is listed as a Class 2 site on the New York State Department of Environmental Conservation (NYSDEC) Registry of Inactive Hazardous Waste Sites, Site No. 3-60-053.

In response to documented groundwater contamination at the site, NYSDEC commissioned a Remedial Investigation/Feasibility Study for groundwater. The objective of the RI was to characterize the nature and extent of contamination of groundwater and to provide data for completing the FS. The results of the RI (AECOM, 2015) are summarized in, and serve as the basis for, this FS report. Sampling to further delineate soil contamination on the Village of Pelham Department of Public Works (DPW) property was completed in April 2015 and is documented in Appendix A.

Contaminated soil vapor will not be addressed in this FS. NYSDEC has installed sub-slab depressurization systems in structures where the owner agreed to have the systems installed and has conducted subsequent monitoring at other structures. NYSDEC will continue to work with the owners of structures requiring monitoring or mitigation to implement the appropriate remedial strategies.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Description

The Crystal Cleaners site is located at 113 Wolfs Lane in the Village of Pelham, Westchester County, New York 10803 (Figure 1). The surrounding area is urban with commercial establishments as well as residences nearby. The Crystal Cleaners site is an active dry cleaning business adjacent to several businesses along Wolfs Lane. Property owned by the Village of Pelham DPW is located west of the site. The site is situated to the north of the former Pelham Residence Voluntary Cleanup Program site (V00258-3) at 195 Sparks Avenue. The Voluntary Cleanup Program site work was never completed.

2.2 Historical Uses

The site appears to have operated as a dry cleaner since 1997, initially under the name H&M Crystal Cleaners Launderers, Inc.

2.3 Prior Investigations Conducted at the Site

The following investigations were conducted within the study area:

- The Village of Pelham offices are located in the Pelham Residence site at 195 Sparks Avenue, immediately adjacent to and south of the Village of Pelham DPW. A site investigation of the Pelham Residence site was conducted from 1997 to 2000 and included the removal of underground storage tanks (USTs), installation of monitoring wells, and the sampling of the wells. Groundwater data obtained as part of the investigations at the Pelham Residence site indicated high concentrations of tetracholoroethene (PCE) (1300 µg/L), trichloroethene (TCE) (22 µg/L), and dichloroethene (DCE; isomer not specified) (36 µg/L). Based on the direction of groundwater flow and the upgradient location of the site, Crystal Cleaners was identified as a possible source of the contamination. Crystal Cleaners is also listed as a large quantity generator of hazardous waste, and utilizes solvents (typically chlorinated hydrocarbons). Crystal Cleaners was classified as a “P” site on April 21, 2000 subsequent to the site investigation at the Pelham Residence site. On September 11, 2000, the Pelham Residence site withdrew from the Voluntary Cleanup Program.

- Nine USTs were removed from a property at 101 Wolfs Lane in 1998; all contained petroleum products (six gasoline tanks, plus one each with used oil, hydraulic fluid, and fuel oil). About 135 tons of petroleum-contaminated soils were removed concurrently with the removal of the USTs. The 101 Wolfs Lane site is located north of Crystal Cleaners as shown in Figure 2.

- NYSDEC conducted a site characterization of Crystal Cleaners in 2008 (EarthTech, 2009). The field investigation was conducted to determine the existence of contamination at the site and to identify the nature of the contamination. NYSDEC determined that contamination present at the site is a significant threat to the public health and the environment based on

exceedance of class GA groundwater criteria. Soil vapor concentrations were elevated compared to the New York State Department of Health (NYSDOH) guidance (2006) matrices and indicate a potential threat to human health. The source appeared to be Crystal Cleaners site since the elevated levels of PCE and TCE were detected downgradient of the site and no other potential sources of PCE and TCE contamination were identified. Based on these findings, NYSDEC reclassified the site as Class 2 on the Registry of Inactive Hazardous Waste Disposal Sites.

- NYSDEC conducted a soil vapor intrusion study at four structures located near the Crystal Cleaners site. The samples were collected in February 2009. Levels of TCE detected in indoor and sub-slab air at two structures indicated the need for mitigation to minimize current or potential exposures associated with soil vapor intrusion. Levels of PCE detected in sub-slab and indoor air samples collected at three structures indicated the need for mitigation. A sub-slab sample was not collected at the fourth structure at the owners request (Structure B03). The level of PCE detected in the indoor air sample at the fourth structure indicated the need to take reasonable and practical actions to identify the source for the detected PCE and reduce exposures. Following review of the data by NYSDEC and NYSDOH and discussions with the property owners, one structure was mitigated by installation of a sub-slab depressurization system (Structure B02).

- NYSDEC conducted an RI of the site in between 2011 and 2014 which is documented in AECOM (2014).

- NYSDEC conducted additional soil delineation sampling at the Village of Pelham DPW in 2015 which is documented in Appendix A as an addendum to the RI.

3.0 REMEDIAL INVESTIGATION

A RI was conducted to determine the sources and location of contamination within the site and its threat to human health or the environment. The scope and execution of the RI is discussed below. An addendum to the RI was prepared which documents additional soil sampling at the Village of Pelham DPW (Appendix A). The work to date consisted of the following:

- Direct push soil sampling (June 2011, September 2013, April 2014, and April 2015);
- Well installation and groundwater sampling (June 2011 to October 2011, January 2012 to
- February 2012, September 2012 to November 2012, September 2013, and April 2014);
- Soil vapor sampling (July 2011); and,
- Soil vapor intrusion sampling (March 2011, February 2012, and April 2012).

3.1 Direct Push Soil Sampling

Direct push sampling was conducted west of the site on DPW property, along Manning Circle and Brookside Avenue to characterize the extent of contamination within the soil.

Soil sample locations are shown on Figure 3. VOC concentrations in soil samples are presented in Table 1. PCE was detected in three of the six RI samples located directly to the west of the Crystal Cleaners facility. One PCE detection at 17,000 µg/kg exceeds the unrestricted use SCO of 1,300 µg/kg on the DPW property. Since dry cleaners typically use PCE based solvents, PCE is considered a source contaminant. Additional soil sampling was completed in April 2015 to further delineate soil on the DPW property. The sample results, which were collected from between 5 and 6 feet (ft) below ground surface (bgs) ranged in concentration from 2,400 µg/kg to 10,000 µg/kg PCE.

Soil samples were collected at four temporary well points shown on Figure 3: TWP-3, TWP-4, TWP-12, and TWP-13. At the temporary well borings, PCE was detected at low levels (2 µg/kg to 6 µg/kg) below the 1300 µg/kg unrestricted use SCO in three of the four samples. Cis-1,2-DCE was detected below the 250 µg/kg unrestricted use SCO in the two soil samples. There were no exceedances of criteria. Acetone was detected in the sample from TWP-12 collected from 10 to 10.5 ft bgs at 59 µg/kg, exceeding the 50 µg/kg unrestricted use SCO. Acetone was detected in soil samples closer to the site at concentrations below the unrestricted use criteria (2 µg/kg to 13 µg/kg). Because the acetone concentrations are lower in soil near the site, this exceedance is unlikely to be associated with the site.

The chemical of concern in the soil is PCE.

AECOM attempted to collect a soil boring on the elevated area immediately adjacent to the Crystal Cleaners facility using a hand auger, but no exposed soil was present that will permit soil collection.

3.2 Groundwater Sampling

Nine overburden and five bedrock wells were installed. Well construction information is provided in Table 2. The wells were installed to determine the extent of the groundwater contamination in the overburden and bedrock. Groundwater sampling activities were conducted on October 18 to 20, 2011 for Phase 1, February 22 and 23, 2012 for Phase 2, and November 15, 2012 for Phase 3. Temporary well samples were collected with a Geoprobe sampler at two locations following installation of MW-14 by direct push. Well locations are shown on Figure 4. VOC sample concentrations in groundwater are presented in Table 3.

The VOCs detected in the overburden wells at concentrations exceeding the class GA groundwater criteria are the chlorinated aliphatics PCE, TCE, cis-1,2-DCE, and vinyl chloride. The VOCs detected in the bedrock wells at concentrations exceeding the class GA groundwater criteria are the chlorinated aliphatics PCE, TCE, cis-1,2-DCE, vinyl chloride, trans-1,2-DCE, and 1,2-dichloroethane. Since dry cleaners typically use PCE based solvents, PCE is considered a source contaminant. The remaining chlorinated organic compounds are likely to have been an impurity in the dry cleaning solvent or other chemicals used in operations or result from the degradation or dechlorination of PCE.

MTBE was detected above the class GA criterion in bedrock wells MW-C11, MW-C15, and MW-C16. This parameter is likely to originate from another source since MTBE is almost exclusively used as a fuel additive in motor gasoline and is not associated with dry cleaning operations. MTBE may be associated with Pelham Residence site (including the DPW) or the 110 Wolfs Lane site, both of which stored petroleum products.

The chemicals of concern in the overburden groundwater are: PCE, TCE, cis-1,2-DCE, and vinyl chloride. The chemicals of concern in the bedrock groundwater are: PCE, TCE, cis-1,2-DCE, vinyl chloride, trans-1,2-DCE, and 1,2-dichloroethane.

3.3 Soil Vapor Sampling

Three temporary soil vapor points were installed and sampled to determine the extent of soil vapor contamination and determine if additional soil vapor intrusion sampling was needed in nearby structures. Soil vapor sampling was conducted on July 8, 2011.

PCE and TCE were detected above the USEPA generic screening levels. Since dry cleaners typically use PCE based solvents, PCE is considered a source contaminant. TCE is likely to have been an impurity in the dry cleaning solvent or results from the degradation or dechlorination of PCE.

Chloroform and benzene were also detected above the USEPA generic screening levels. Chloroform may be associated with laundry services. Benzene may be associated with fuel sources. There is no clear link to Crystal Cleaners as the source of these compounds.

The chemicals of concern in the soil vapor are: PCE and TCE.

3.4 Soil Vapor Intrusion Sampling

Soil vapor intrusion sampling was conducted in structures near the site to determine whether actions were needed to address exposures to site-related contaminants. Soil vapor intrusion sampling was conducted in seven structures. The structures were selected by NYSDEC and NYSDOH. Sampling

dates are as follows: Structures B01 through B03 - March 25 to 26, 2011; Structure B04 – February 4 to 5, 2012; Structure B05 – February 11 to 12, 2012; Structure B06 – April 13 to 14, 2012; and, Structure B07 – April 16 to 17, 2012. All air samples were analyzed for VOCs by USEPA method TO-15.

The soil vapor intrusion data were also compared to the soil vapor/indoor air matrices in the NYSDOH (2006) guidance. Based on the guidance, the recommendations for the structures are as follows: take reasonable and practical actions to identify sources and reduce exposures for B01, B05, and B06; and, mitigate for B01, B04, and B07. No recommendation can be made for B03 based on the guidance, because a sub-slab result is not available for this structure. A sub-slab depressurization system is in operation at B02. NYSDEC and NYSDOH will determine the appropriate course of action for the structures in consultation with the property owners.

3.5 Geology/Hydrogeology

The site is located in an area of Westchester County that is characterized by a thin surficial layer of glacial till and stream deposited (fluvial) sediments overlying shallow metamorphic and igneous bedrock. Fill, sand, and gravel were identified in the surface soils within the study area. Rocks and boulders were encountered during drilling activities. The depth to bedrock surface varies across the study area from 8 ft bgs at MW-C01 to 47 ft bgs at MW-C11. Based on review of rock cores, the bedrock in the study area is Manhattan schist. The surface of the bedrock beneath the DPW property is highly fractured. Competent rock is found below 5 ft of the bedrock surface. At MW-C15, more than 10 ft of unfractured rock was encountered beneath the top of rock.

The regional groundwater flow is assumed to mimic the surface topography, which slopes from the north and east to the south and west towards the Hutchinson River. Groundwater elevations collected in November 2012 are shown on Figure 5 for overburden wells and Figure 6 for bedrock wells. It is likely that groundwater beneath the study area discharges to the Hutchinson River.

Groundwater was encountered in the overburden at depths ranging from approximately 5.5 to 20.9 ft bgs and in the bedrock wells at 7.5 to 14.1 ft bgs. Groundwater elevations measured during the February 2012 and November 2012 sampling events indicate that groundwater flow is from the northeast to the southwest/south-southwest in the overburden and bedrock wells.

3.6 Human Health Exposure Assessment

Based on the RI findings, the source of contamination is a limited area of soil PCE contamination adjacent to the site on DPW property; and groundwater contamination in the overburden and bedrock within the study area. The chemicals of concern are PCE, TCE, cis-1,2-DCE, vinyl chloride, trans-1,2-DCE, and 1,1-dichloroethane. The extent of contamination is represented by PCE isopleths shown in Figure 7 for groundwater in the overburden and Figure 8 for groundwater in bedrock.

There are no current complete exposure pathways for soil or groundwater.

There is currently a complete exposure pathway for inhalation of soil vapor to some off-site receptors. This pathway has being investigated by soil vapor intrusion sampling. This exposure pathway is expected to be complete in the future, unless structures requiring mitigation as determined by NYSDEC and NYSDOH are remediated. On-site receptors may be exposed to contaminated soil vapor, but soil vapor intrusion sampling was not conducted at the dry cleaning facility.

The future exposure pathway for construction workers to soil, groundwater, and soil vapor via dermal contact, incidental ingestion, and soil vapor inhalation is complete.

3.7 Extent of the Areas of Concern

For soil, groundwater, and soil vapor, the extent of the area of concern is determined by the extent of PCE impacts. For groundwater and soil vapor, there are other VOC contaminants of concern, but in each case, PCE is elevated.

Based on the data collected to date, the PCE concentration exceeded the unrestricted use SCO in six soil borings on the DPW property. The extent of the PCE concentrations exceeding the criterion is limited to a relatively small area west of the Crystal Cleaners facility on the DPW property. Soil closer to or beneath the Crystal Cleaners site may be impacted, but this area was not sampled and is a possible source area.

A contaminant distribution map was developed for PCE in the overburden wells (Figure 7). The areas with concentrations greater than 5 µg/L approximates the horizontal extent of the groundwater plume exceeding the class GA groundwater criterion for PCE. The highest concentrations of PCE are centered on the DPW property. The concentrations decrease to non-detect to the west at MW-C05 and MW-C06 and to the southwest at wells MW-C12 and MW-C13. The area at the southern end of Manning Circle is unbounded. The PCE concentrations at well MW-14 and temporary wells TW-1 and TW-2 exceed the class GA criterion for PCE. The extent of the plume is bounded towards the east, because groundwater was not observed in the overburden in the area approaching Wolfs Lane.

A similar contaminant distribution map was developed for PCE in the bedrock wells (Figure 8).The highest concentration of PCE was detected on the DPW property. The PCE concentrations in bedrock are unbounded vertically and horizontally. The levels are well above the class GA criterion and the groundwater is likely to migrate through fractures in the bedrock. The extent of contamination cannot be confidently predicted from this information.

The volume between the groundwater surface and the depth of PCE contamination in the overburden was estimated. The horizontal extent is limited to the area exceeding 5 µg/L shown on Figure 7 for the overburden wells. The impacted area is approximately 193,000 square ft (SF), although the southern extent is not documented. The approximate depth of the groundwater above bedrock is 27 ft. The volume of soil and groundwater is 5,000,000 cubic feet (CF). This volume was multiplied by the effective porosity to estimate the volume of impacted groundwater. An effective porosity value of 0.2 was selected from Argonne National Laboratory (1993) assuming the lower end of the range for sand. The estimated volume of contaminated groundwater is 8 million gallons in the overburden.

An estimate of the volume of impacted groundwater in bedrock cannot be estimated from the data collected to date, because the horizontal and vertical extent of groundwater in bedrock exceeding the class GA criterion cannot be ascertained.

The PCE soil vapor intrusion distribution approximates the overburden groundwater distribution. The highest concentrations of PCE are centered on the DPW property. The concentrations decrease to the south and west of the site.

3.8 Conceptual Site Model

The original sources of the primary contamination were PCE wastes (likely as liquid) from dry cleaning and laundry operations that were disposed on-site or in an unpaved area to the west of the site on DPW property, entering the subsurface through an unpaved area or drywell. PCE may be present as a source beneath the Crystal Cleaners facility. This waste flowed downward through the soil and entered the groundwater. Some of the PCE remains in the on-site soils and may be continuing to act as a source, while much of it has dissolved into the groundwater. The groundwater flowing to the southwest carried the dissolved phase PCE, contaminating groundwater for at least 500 to 700 ft, although the farthest extent of the plume to the south has not been determined. In a secondary transport mechanism, PCE adsorbed to the soil and PCE dissolved in the groundwater has volatilized into the soil vapor of the vadose zone, allowing for potential soil vapor intrusion into buildings. There is evidence that bacteria in the groundwater have degraded some of the PCE. However, the degradation has stalled at cis-1,2-DCE. VOCs may volatilize from the soil and groundwater matrix. The contaminants may then enter structures through soil vapor intrusion. VOCs contamination in the groundwater may be transported and diluted by groundwater flow. The contamination appears to be transported southwest of the site.

Currently, there is no direct contact with contaminated media. The aquifer in this section of Westchester County is not used for water supply. The area over contaminated soil is paved. There is the potential for exposure through soil vapor intrusion in on-site and off-site structures. NYSDEC has conducted soil monitoring or implemented soil vapor controls in impacted structures where the owners have allowed access. Future construction could potentially result in contact with contaminated soil, groundwater or soil vapor. No environmental receptors were identified in this urban setting.

4.0 REMEDIAL GOALS AND REMEDIAL OBJECTIVES

4.1 Remedial Goals

For the State Superfund program, the default goal is to restore the site to pre-disposal conditions, to the extent feasible. According to 6 New York Codes, Rules and Regulations (NYCRR) Part 375-2.8, "The goal of the remedial program for a specific site is to restore that site to pre-disposal conditions, to the extent feasible. At a minimum, the remedy selected shall eliminate or mitigate all significant threats to the public health and to the environment presented by contaminants disposed at the site through the proper application of scientific and engineering principles and in a manner not inconsistent with the national oil and hazardous substances pollution contingency plan as set forth in section 105 of CERCLA, as amended by SARA."

Per Environmental Conservation Law (ECL) Article 27 Title 13, "The goal of any such remedial program shall be a complete cleanup of the site through the elimination of the significant threat to the environment posed by the disposal of hazardous wastes at the site and of the imminent danger of irreversible or irreparable damage to the environment caused by such disposal."

4.2 Remedial Action Objectives

This section presents the objectives for remedial actions that may be taken to protect human health and the environment. To develop the remedial action objectives (RAOs), AECOM identified contaminants present in the environmental media in the study area; evaluated existing or potential exposure pathways in which the contaminants may affect human health and the environment; identified pathways having a moderate to high likelihood for exposure; identified chemical-specific standards, criteria, and guidance (SCGs) that apply to the likely exposure routes to establish the contaminants of concern and proposed cleanup goals for purposes of remediation; and established RAOs for the contaminants of concern to reduce the potential for future exposure. RAOs are presented for the environmental media in the study area, based on the generic NYSDEC RAOs, contaminants of concern, and SCGs.

4.2.1 Generic Remedial Action Objectives

The generic RAOs identified in DER-10 for groundwater will be applied to this site. The generic RAOs are listed below for each matrix.

Groundwater

RAOs for Public Health Protection

- Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.

- Prevent contact with, or inhalation of volatiles, from contaminated groundwater.

RAOs for Environmental Protection

- Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.

- Prevent the discharge of contaminants to surface water.
- Remove the source of ground or surface water contamination.

Soil

RAOs for Public Health Protection

- Prevent ingestion/direct contact with contaminated soil.
- Prevent inhalation of or exposure from contaminants volatilizing from contaminants in soil.

RAOs for Environmental Protection

- Prevent migration of contaminants that would result in groundwater or surface water contamination.
- Prevent impacts to biota from ingestion/direct contact with soil causing toxicity or impacts from bioaccumulation through the terrestrial food chain.

4.2.2 Standards Criteria and Guidance

The applicable SCGs for the site are described below. SCG selection is based on the following:

- The current, intended and reasonably anticipated future use of the site and its surroundings (mixed residential and non-residential);
- All contaminants exceeding applicable SCGs;
- The environmental media impacted by the contaminants exceeding the SCGs;
- The extent of the impact to the environmental media; and,
- All actual or potential human exposures and/or environmental impacts resulting from the contaminants in environmental media.

Chemical-specific SCGs are typically technology or health-risk based numerical limitations on the contaminant concentrations in the ambient environment. They are used to assess the extent of the remedial action required and to establish cleanup goals for a site. Chemical-specific SCGs may be directly used as actual cleanup goals, or as a basis for establishing appropriate cleanup goals for the contaminants of concern at a site. Chemical-specific SCGs are listed in Table 4.

Contaminants of concern in groundwater are PCE, TCE, cis-1,2-DCE, trans-1,2-DCE, VC, 1,1-DCE, and chloroform with the extent as described in Section 3.7 of this document. The NYSDEC class GA groundwater criteria for the contaminants of concern are PCE: 5 µg/L, TCE: 5 µg/L, cis-1,2-DCE: 5 µg/L, trans-1,2-DCE: 5 µg/L, vinyl chloride: 2 µg/L, and 1,2-dichloroethane: 0.6 µg/L.

The contaminant of concern in soil is PCE. The extent of soil contamination is limited to the DPW property. The unrestricted use soil cleanup objective is 1,300 µg/kg.

Action-specific SCGs are usually administrative or activity-based limitations that guide how remedial actions are conducted. These may include record-keeping and reporting requirements; permitting

requirements; design and performance standards for remedial actions; and treatment, storage and disposal practices. Action-specific SCGs are listed in Table 4.

Location-specific SCGs apply to sites that contain features such as wetlands, floodplains, sensitive ecosystems, or historic buildings that are located on, or in close proximity to the site. Based on the RI, wetlands, floodplains, sensitive ecosystems or historic buildings are not located on, or in close proximity to the site. A local permit is required for alternatives requiring temporary structures and road opening. No other location-specific SCGs were identified.

5.0 GENERAL RESPONSE ACTIONS

In keeping with the requirements of DER-10, the general response actions based on the RAOs for this site were developed with the following considerations:

- Consider the estimates of the area and volume for the contaminated media;
- Include non-technology specific categories;
- Are specific to the impacted medium, contaminants, and geologic characterization of the site;
- Consider the use of innovative technologies where available and applicable; and,
- Eliminate technologies that are not appropriate for the site due to site-specific factors or constraints.

General response actions are remedial approaches encompassing those actions that will satisfy the RAOs. General response actions may include treatment, containment, removal, disposal, institutional controls, or a combination of these, if required, to address varied site environmental problems and to be effective in meeting all the RAOs. General response actions and potentially applicable remedial technologies for addressing RAOs for each medium of concern were identified and evaluated for potential applicability in Tables 5 and 6 for groundwater and soil, respectively.

The general response actions do not give preference to presumptive remedies, because the DER-15 (NYSDEC, 2007) guidance was rescinded by NYSDEC in December 2013. The following non-technology specific remedial categories defined in Section 4.1 of DER-10 are considered for each contaminated matrix:

- Removal and/or treatment;
- Containment;
- Elimination of exposure; and,
- Treatment of source at the point of exposure.

5.1 Soil

Soil samples collected during the RI indicate that PCE contamination is present on the adjacent DPW property. There was an exceedance of the unrestricted use SCO at one of the six sample locations. Based on the data collected for the RI (Figure 3 and Table 1), the extent of PCE soil contamination on the DPW property is limited (270 CY). Additional soil contamination may be present under the facility, but data are not available for this area.

There is currently no exposure to soil, because the areas are paved and the contamination is found at depth. Construction workers may come into contact with the contaminated soil during excavation. Treatment of the source at the point of exposure is not applicable to this site.

Remedies for VOC contamination in soil include containment and treatment responses. The remedies are as follows:

- Soil vapor extraction;
- Thermal desorption;
- Incineration;
- Bioremediation; and,
- Excavation/off-site disposal.

Bioremediation is not considered further because this technology is recommended for petroleum hydrocarbons.

The general response actions evaluated in this FS for soil include the following:

- No action;
- Limited action;
- Treatment; and,
- Removal.

5.2 Groundwater

As described in the RI, the estimated area and volume of contaminated overburden groundwater to assist in evaluating remedial alternatives are 193,000 ft^2 (4.5 acres) and 8 (8 million gallons). The horizontal extent is limited to the area exceeding 5 µg/L, shown on Figure 7 for the overburden wells. The volume of impacted groundwater in bedrock cannot be estimated from the data collected to date, because the horizontal and vertical extent of groundwater in bedrock exceeding the class GA criterion cannot be ascertained (Figure 8).

There is currently no exposure to groundwater. Construction workers may come into contact with the groundwater during excavation. Treatment of the source at the point of exposure is not applicable to this site because groundwater is not extracted for potable or non-potable use. Removal and/or treatment is the primary non-technology specific remedial category considered.

The general response actions evaluated in this FS for groundwater include the following:

- No action;
- Limited action;

- In situ treatment;
- Ex situ treatment; and,
- Removal.

6.0 SCREENING OF TECHNOLOGIES

Technologies labeled as general response actions and technologies labeled as applicable or potentially applicable in Section 5.0 undergo a process of initial screening. The purpose of the initial screening is to eliminate remedial technologies that may not be effective based on anticipated on-site conditions and/or that cannot be implemented technically at the site as well as to more narrowly focus the list of alternatives that will be developed and evaluated in greater detail. Specifically, the initial screening reviewed each technology in terms of effectiveness in providing protection to human health and in reducing toxicity, mobility, or volume of the waste; and implementability.

6.1 All Media

6.1.1 No Action

No remedial activities are included under this alternative. No environmental sampling is performed. No actions are proposed to limit exposure to contaminants.

Effectiveness – The no action alternative does not mitigate on-site risk or mitigate exposures, comply with SCGs, reduce the contaminant concentrations, or limit plume mobility, toxicity, or volume of contamination.

Implementability – No action is easily implemented.

No action will be retained for further consideration in this FS as required by DER-10.

6.1.2 Limited Action

Institutional controls restrict access to contaminated areas through physical and/or administrative measures. The institutional control response is not intended to reduce the toxicity, mobility, or volume of hazardous site constituents, but to reduce the potential for human and wildlife exposure to these constituents. Common institutional controls are environmental easements, deed restrictions, and environmental notices. These documents are recorded with the appropriate county's land records to ensure proper notice and effectiveness of the control. An environmental easement may be chosen by NYSDEC as the appropriate control. Property surveys and approval by property owners are required. Where approval by the property owners cannot be obtained, NYSDEC may opt to employ environmental notices. The control would be implemented according to DER-33 guidance (NYSDEC, 2010a).

For groundwater, monitored natural attenuation (MNA) involves taking no further action to remedy groundwater conditions at the site with the exception of conducting annual long term monitoring. Groundwater monitoring tracks the progress of natural attenuation of the contaminant plume.

Effectiveness – Institutional controls mitigate on-site risk by reducing exposure to human and environmental receptors. Not all SCGs will be addressed. Institutional controls do not reduce the contaminant concentrations, or limit plume mobility, toxicity, or volume of contamination in a short period of time. Natural attenuation will reduce contaminant concentrations over time.

Implementability – In general, the limited actions can make this response action easy to implement. However, the subject area encompasses numerous individual properties with different owners. Implementation would require contacting the owners, attempting to obtain their agreement with the institutional controls, and surveying the properties. Environmental sampling is standard practice for contaminated sites.

Limited actions will be considered further in this FS.

6.2 Groundwater

6.2.1 Containment

6.2.1.1 Physical Containment

The purpose of groundwater containment is to restrict the flow of contaminated groundwater. This is generally accomplished by a physical barrier (slurry wall, sheet piling), hydraulic control (removing water from the ground, such as by pumping from extraction wells), or reactive barriers. Containment technologies that rely on groundwater extraction are occasionally supplemented with a low permeability subsurface barrier wall to improve the effectiveness of the extraction system. Another groundwater containment technology includes groundwater collection trenches, which are constructed for the purpose of collecting groundwater.

Effectiveness – Physical barriers could contain the contaminated groundwater. A geotechnical study would be required. Long term monitoring to document the effectiveness of the technology would be recommended.

Groundwater extraction wells may be used to exert hydraulic control to prevent the migration of the groundwater. Prior to the design of such a system a thorough analysis of the aquifer properties including pump tests would need to be performed to ensure an adequate array of extraction wells are installed. The extracted groundwater would be routed to an ex situ treatment unit.

Implementability – While construction of physical barriers is possible, significant disruption to the community is anticipated, e.g. construction noise in the immediate vicinity of a residential community. Current land use would limit placement of the barrier walls.

Groundwater extraction wells are an implementable technology for exerting hydraulic control to prevent further migration of the plume. The materials, equipment, and labor necessary to install extraction wells are readily available.

Physical barriers will not be considered further in this FS due to limits on placement.

6.2.1.2 Hydraulic Containment

Groundwater extraction is a commonly used method to control the migration of contaminated groundwater and to collect contaminated groundwater for subsequent (ex situ) treatment. Groundwater extraction wells are generally installed with a drill rig. Well screens and filter packs are generally installed to intercept the saturated thickness of the contaminated water-bearing zone. Extraction wells can be installed to provide a hydraulic barrier for control of migration of contaminated groundwater, or at specific locations for source area remediation.

Effectiveness –In general, extraction wells are a proven and reliable technology for removal of groundwater for remediation. At this site, the low permeability soils make this technology infeasible.

Implementability – Complete capture of the plume may not be practical. There are limitations on well placement due to the existence of residences, businesses, and roadways. The materials, equipment and labor necessary to install extraction wells are readily available. Extraction wells can be reliably installed to the required depth and the screened interval can be installed to meet the subsurface conditions.

Groundwater extraction for containment is not considered further in this FS due to the low permeability soils and limitations on placement.

6.2.2 In Situ Treatment

6.2.2.1 Biological Treatment

Enhanced bioremediation refers to the addition of substrates, microbes, and/or electron acceptors to the groundwater through injection wells. Biodegradation occurs when indigenous microorganisms consume organic compounds to obtain energy for reproduction and growth. Indigenous or introduced microorganisms obtain this energy by facilitating the transfer of electrons from an electron donor (organic substrate) to an electron acceptor (typically native inorganics). Common electron donors at contaminated sites can be natural organic carbon or fuel hydrocarbons. Electron acceptors commonly found in groundwater include oxygen, nitrate, manganese, ferric iron, sulfate, and carbon dioxide. Under anaerobic conditions, contaminants may be used as an electron acceptor, as in the reductive dechlorination of TCE.

Effectiveness – Bioremediation can be effective for the destruction of chlorinated VOCs in groundwater; and a properly designed enhanced bioremediation system can be effective at the complete oxidation of chlorinated VOCs. The effectiveness of bioremediation could be tested prior to implementation using biotraps as an alternative to pilot or bench testing. Aerobic bioremedation is not effective in degrading PCEs. Anerobic bioremediation and bioaugmentation are highly effective in reducing the contaminants of concern at the site.

Implementability – Enhanced bioremediation is implementable but is limited by the presence of roadways and residences. To counter these impediments, injections could target the area of the plume with highest measured concentrations. Lower concentrations would naturally attenuate.

Biological treatment is retained for further evaluation as a potential remedial technology in this FS.

6.2.2.2 Chemical Oxidation

In situ chemical oxidation is a technology whereby an oxidant is injected into an aquifer or subsurface soils. Common oxidants include peroxide, ozone, and permanganate. These compounds cause rapid and complete chemical destruction of many organic chemicals. The process includes placing injection points throughout the area to be treated, and injection of the selected oxidant into the aquifer/subsurface.

Effectiveness – High treatment efficiencies have been demonstrated for unsaturated aliphatics. Chemical oxidants are capable of oxidizing chlorinated VOCs such as PCE.

Implementability – Implementation of this technology is limited by the presence of residences and roadways, although permission may be granted for implementation in these areas. Injections could target the area of the plume with highest measured concentrations as described for bioremediation in Section 6.2.1. The materials, equipment and labor necessary to implement this technology are available from several vendors.

Application of an in situ oxidant is retained for further evaluation as a potential remedial technology in this FS.

6.2.2.3 Chemical Reduction

In situ chemical reduction involves the injection of amendments to treat subsurface contaminants through reduction reactions (i.e., zero valent iron).

Effectiveness –In situ chemical reduction is commonly applied and is effective in reducing the contaminant concentrations of chlorinated VOCs.

Implementability – Implementation of this technology is limited by the presence of residences and roadways, although permission may be granted for implementation in these areas. Injections could target the area of the plume with highest measured concentrations as described for bioremediation. The materials, equipment and labor necessary to implement this technology are available from several vendors.

In situ chemical reduction is retained for further evaluation as a potential remedial technology in this FS.

6.2.2.4 Colloidal Activated Carbon

In situ colloidal activated carbon (CAC) treatment involves the injection of amendments to treat subsurface contaminants. The contaminants are concentrated in the liquid activated carbon matrix and destroyed by means of biodegradation.

Effectiveness –In situ CAC is a newer technology that has been shown to be effective in reducing chlorinated VOCs concentrations in groundwater.

Implementability – Implementation of this technology is limited by the presence of residences and roadways, although permission may be granted for implementation in these areas. Injections could target the area of the plume with highest measured concentrations as described for bioremediation.

The materials, equipment and labor necessary to implement this technology are available from vendors including Regenesis under the name PlumeStop®. Remediation is expected to be effective in one injection and in a shorter timeframe than for other injection technologies.

In situ CAC treatment is retained for further evaluation as a potential remedial technology in this FS.

6.2.3 Ex Situ Treatment

This general response action involves aboveground treatment of groundwater removed from the subsurface and discharge/disposal of the treated effluent. The extraction wells would be placed within the plume. The groundwater would be extracted at a sufficient rate to capture the area where the highest concentrations have been detected. The extraction rate and estimated contaminant concentration within the extracted groundwater would be required to design the system, through a pumping test as part of the remedial design. Applicable treatment technologies include air sparging and chemical oxidation. Disposal of the treated water would comply with the requirements listed in TOGS 2.1.2.

Effectiveness –In general, extraction wells are a proven and reliable technology for removal of groundwater for remediation. At this site, the low permeability soils make this technology infeasible.

Implementability –There are limitations on well placement due to the existence of residences, businesses, and roadways. The materials, equipment and labor necessary to install extraction wells are readily available. Extraction wells can be reliably installed to the required depth and the screened interval can be installed to meet the subsurface conditions. A property would need to be identified for installation of the recovery system, possibly at the DPW.

Groundwater extraction for treatment is not considered further in this FS due to the low permeability soils and limitations on placement.

6.2.4 Electrical Resistive Heating/Thermal Conductive Heating

Electrical Resistive Heating/Thermal Conductive Heating involves the injection of energy into the subsurface and recovery of volatile and semi-volatile organic contaminants. This technology can be used to address contamination that is not amenable to excavation, such as at depth or below the water table.

Effectiveness – Thermal technologies are effective in reducing contaminant concentrations in soil and groundwater.

Implementability – Utilities, site operations, community concerns, make implementation of thermal technologies challenging. A property would need to be identified for installation of the recovery system, possibly at the DPW.

Thermal technologies are not retained for further evaluation in this FS.

6.2.5 Removal

Heavily contaminated soil is removed to prevent a continuing source to groundwater.

Effectiveness – With the exception of several soil samples collected on the DPW property, heavily contaminated soil was not identified in the subject area. Removal of soil is not expected to significantly reduce groundwater concentrations. Removal of the contaminated soil is addressed separately in this FS.

Implementability – Soil removal with the purpose of significantly reducing groundwater concentrations cannot be implemented because contaminated soil was not identified throughout most of the extent of the contaminated groundwater plume.

Soil removal for the purpose of reducing groundwater concentrations is not retained for further evaluation in this FS.

6.3 Soil

6.3.1 In Situ Treatment

6.3.1.1 Bioremediation

Bioremediation refers to the in situ degradation of contaminants by microbes with the addition of substrates and microbes

Effectiveness – Bioremediation is generally not effective in reducing the contaminant concentrations of chlorinated VOCs in soil.

Implementability – Soil contamination is limited to a paved area on the DPW located 5 to 6 ft bgs. The area could be treated if permission was granted by the municipality. However, the impacted area is located in the center of the DPW facility. Any treatment of this area may meet with resistance from the DPW since treatment will disrupt DPW operations.

Bioremediation is not retained for further evaluation as a potential remedial technology in this FS.

6.3.1.2 Thermal

Thermal treatment involves the introduction of conduction heating by heater elements hung in borings to mobilize and extract the contaminants.

Effectiveness – Thermal treatment is effective in reducing the contaminant concentrations of chlorinated VOCs in soil.

Implementability – Soil contamination is limited to an area on the DPW. The area could be treated if permission was granted by the municipality. However, the impacted area is located in the center of the DPW facility. Any treatment of this area may meet with resistance from the DPW since treatment will disrupt DPW operations. The heat may damage underground structures and utilities in the area.

Thermal treatment is not retained for further evaluation as a potential remedial technology in this FS.

6.3.2 Removal

6.3.2.1 Excavation and Off-Site Disposal

The contaminated soils located at the DPW would be removed and transported to an off-site disposal facility.

Effectiveness – Soil removal and off-site disposal is effective for rapidly reducing contaminant mass. This technology reduces the time to remediate lower concentrations of residual source mass using other remedial technologies and is able to meet residential and/or non-residential remedial standards to avoid engineering/institutional source area controls for soil.

Implementability – Although the impacted soil is located on the DPW, excavation of the soil would require a several days to accomplish and could potentially be scheduled outside of DPW working hours. Subsurface utilities would be identified and avoided or an appropriate means of excavation could be implemented to avoid adverse impacts. The contaminated soil was sampled between 5 ft bgs and 6 ft bgs in the soil with the highest PID readings. PID readings were above 0 ppm in some borings down to 21 ft bgs. Structure supports may be required. Groundwater is encountered below this depth (at approximately 14 ft bgs at MW-C03). Dewatering of the excavation may be needed. The soil could be excavated to roll-offs for waste characterization testing and later disposal. An area for equipment and soil staging would need to be identified, possibly on the adjacent municipal property.

Excavation and off-site disposal is retained for further evaluation as a potential remedial technology in this FS.

6.3.2.2 Excavation, On-Site Treatment and Backfill

The contaminated soils located at the DPW would be removed and transported to an off-site disposal facility.

Effectiveness – Soil removal and off-site disposal is effective for rapidly reducing contaminant mass. Thermal treatment is effective in reducing chlorinated VOCs.

Implementability – Implementation regarding excavation of soils is discussed above. A treatment area would need to be identified, possibly at the DPW. The relatively small quantity of soil is likely to make this ex situ treatment impractical.

Excavation and on-site treatment is not retained for further evaluation in this FS.

7.0 DEVELOPMENT AND ANALYSIS OF ALTERNATIVES

Based on the technology review and screening, six remedial alternatives have been developed for the remediation of contaminated groundwater. These alternatives include readily available technologies which have been proven to be effective at similar sites with VOC contamination in groundwater and soil and one innovative technology for groundwater treatment. The selected alternatives consist of the following:

Alternative 1: No remedial action with institutional controls (environmental easements covering the extent of the PCE plume >5µg/L);

Alternative 2: MNA with the same institutional controls as Alternative 1;

Alternative 3: MNA with the same institutional controls as Alternative 1 and soil removal/off-site disposal;

Alternative 4: In situ treatment of overburden (500 µg/L or greater PCE concentrations) plus MNA, and soil removal/off-site disposal. Four types of reagents are evaluated: 4a – in situ chemical oxidation (ISCO), 4b – ISCO + enhanced reductive dechlorination (ERD), 4C – zero valence iron (ZVI)-ERD, and 4D – CAC;

Alternative 5: In situ treatment of overburden (500 µg/L or greater PCE concentrations) and bedrock (limited areas) plus MNA, and soil removal/off-site disposal. ISCO is evaluated; and,

Alternative 6: In situ treatment of groundwater by injection in overburden (50 µg/L or greater PCE concentrations) and bedrock (limited areas) plus limited MNA, and soil removal/off-site disposal. ISCO is evaluated.

Alternative 1 represents the baseline for comparison. Alternatives 1, 2, and 3 are limit actions. Alternative 3 includes removal of the contaminated soil on the DPW property. Alternatives 4, 5, and 6 include active remediation through in situ treatment of groundwater. Alternatives 4 and 5 limit the groundwater treatment to municipal property and three residential lots. Alternative 6 targets a broader area covering some residential lots and is included to have the least restrictive use of the subject area. For the injection alternatives, the cost analysis is based on chemical oxidation except for Alternative 4 for which three additional treatment scenarios were evaluated. Budget is included in the analysis for a remedial design for refinement of the technology through a limited study.

7.1 Remedial Action Alternatives

As described above, site remedial action alternatives have been assembled using general response actions and remedial technologies that passed the preliminary screening. An expanded description of each of the alternatives is provided below. The following information is provided for each alternative:

- Size and configuration of process options

- Time for remediation
- Spatial requirements
- Options for disposal
- Substantive technical permit requirements
- Limitations or other factors necessary to evaluate the alternatives
- Beneficial and /or adverse impacts on fish and wildlife resources
- Cost

Capital costs, O&M costs, and present worth costs were estimated for each alternative. All direct and indirect capital costs and engineering costs for the construction of all facilities and process equipment, labor, materials, construction equipment and services were estimated for the alternatives. The estimates included herein assume contingencies, engineering costs, and project management costs. Costs for performance monitoring and periodic review reports were estimated. A present worth analysis is made to compare the remedial alternatives on the basis of a single dollar amount for the base year. For the present worth analysis, assumptions are made regarding the interest rate applicable to borrowed funds and the average inflation rate. The period of performance evaluated does not exceed 30 years. Construction will be completed in a single year. Cost sheets are provided in Appendix B. Supporting information is provided in Appendix C.

7.1.1 Alternative 1 – No Remedial Action with Institutional Controls

For Alternative 1, no remedial action would be completed. Limited action consisting of institutional controls would be implemented. It is assumed that institutional controls would be implemented at all properties within the overburden groundwater plume exceeding the class GA groundwater criteria as shown in Figure 7 to notify the property owners and limit use of the groundwater. Soil contamination exceeding the unrestricted use SCO would be identified for the DPW property. There are 26 lots plus the roadways identified within the plume.

Size and configuration of process options - Not applicable.

Time for remediation - Groundwater concentrations would remain above the NYS Class GA groundwater criteria for more than 30 years.

Spatial requirements - Not applicable.

Options for disposal - Not applicable.

Substantive technical permit requirements – None.

Limitations or other factors necessary to evaluate the alternatives – No limitations or other factors necessary to evaluate the alternative were identified. Some property owners may be difficult to contact or resistant to agreeing to the limitations.

Beneficial and /or adverse impacts on fish and wildlife resources – No beneficial and/or adverse impacts to fish and wildlife resources were identified.

Cost - A cost estimate is provided in Appendix B. The costs for this option are: present worth capital costs of $151,000, there are no O&M costs for this alternative, and total present worth for 30 years of $151,000.

7.1.2 Alternative 2 – MNA with Institutional Controls

Alternative 2 would involve performing groundwater monitoring in addition to the institutional controls defined in Alternative 1. This alternative monitors the natural attenuation of impacted groundwater. This alternative assumes that annual groundwater monitoring would be conducted every year for five years then once every five years. The 14 existing monitoring wells and two new overburden wells located on Manning Circle and Brookside Avenue would be sampled using low flow sampling. All wells would be sampled for VOCs by EPA method 8260 and water levels in the wells would be measured. Three of the groundwater samples would also be analyzed for monitored natural attenuation parameters. Costs also include a report summarizing the monitoring data following each sampling event, preparation of a site management plan (one time) and periodic review reports (every 5 years).

Size and configuration of process options - Not applicable.

Time for remediation- Groundwater concentrations would remain above the NYS Class GA groundwater criteria for more than 30 years.

Spatial requirements - Not applicable.

Options for disposal - Not applicable.

Substantive technical permit requirements – None.

Limitations or other factors necessary to evaluate the alternatives – No limitations or other factors necessary to evaluate the alternative were identified. Some property owners may be difficult to contact or resistant to agreeing to an institutional control.

Beneficial and /or adverse impacts on fish and wildlife resources – No beneficial and/or adverse impacts to fish and wildlife resources were identified.

Cost - A cost estimate is provided in Appendix B. The costs for this option are: present worth capital costs of $168,000, present worth O&M costs for 30 years of $576,000, and total present worth for 30 years of $744,000.

7.1.3 Alternative 3 – MNA with Institutional Controls and Soil Removal

Alternative 3 adds contaminated soil removal from the DPW property to Alternative 2 MNA and institutional controls. The extent of the removal area is 770 SF as shown in Figure 9. Soil delineation samples were collected in April 2015 to refine the extent of contamination. The depth of the removal area is 14 ft on average to capture the extent of PID readings above 0 ppm or refusal. The excavation will be limited to the south and east by DPW structures. The excavation is not fully delineated to the west, but the concentration in the sample from SB-15 was significantly lower in concentration than the

adjacent sample and there were no PID reading from the boring over 0 ppm. Utilities are likely to be present within the excavation. The four sides and bottom of the excavation will be sampled for VOCs with one day turnaround. Additional material would be excavated if concentrations exceed the unrestricted SCO. For the estimate, it is assumed that 15 percent additional soil will be removed for sloping and 10 percent additional soil will need to be excavated to meet the remedial goal. The soil will be placed in roll-offs. The excavation will be backfilled and the asphalt cover replaced. The soil removed is assumed to be non-hazardous. The concentration of PCE exceeding the unrestricted SCO ranged from 2.4 mg/kg to 17 mg/kg. The maximum PCE soil concentration detected is slightly higher that the concentration in soil expected to exceed the concentration specified in the toxicity characteristic (40 CFR 261.24) of 0.7 mg/kg times a factor of 20. If apparently highly contaminated material is encountered during excavation, it would be segregated and drummed.

Size and configuration of process options – Approximately 4000 SF will be required for staging the equipment and the roll-off and drums, mini excavator, and clean backfill. The area of the excavation is approximately 770 SF.

Time for remediation- Groundwater concentrations would remain above the NYS Class GA groundwater criteria for more than 30 years.

Spatial requirements - For soil removal, approximately 4000 SF will be required for staging the equipment and the roll-offs, excavator, and clean backfill. The area of the excavation is approximately 770 SF.

Options for disposal – Landfill disposal of soil is assumed. Ex situ treatment is not considered since there is no on site area for ex situ treatment.

Substantive technical permit requirements – None.

Limitations or other factors necessary to evaluate the alternatives – No limitations or other factors necessary to evaluate the alternative were identified. An access agreement would be required to complete the soil removal on the DPW property. A location for staging the equipment would need to be determined, possibly in the municipal parking area adjacent to the DPW. Some property owners may be difficult to contact or resistant to agreeing to an institutional control.

Beneficial and /or adverse impacts on fish and wildlife resources – No beneficial and/or adverse impacts to fish and wildlife resources were identified.

Cost - A cost estimate is provided in Appendix B. The costs for this option are: present worth capital costs of $574,000, present worth O&M costs for 30 years of $576,000, and total present worth for 30 years of $1,150,000.

7.1.4 Alternative 4 – In Situ Treatment of Overburden Groundwater (500 µg/L or greater PCE concentrations) plus MNA with Institutional Controls and Soil Removal

This alternative would implement in situ treatment of groundwater in addition to MNA with institutional controls and soil removal. This in situ treatment would be used to reduce PCE levels in the area with concentrations of 500 µg/L or greater in areas that are owned by the public and limited areas of

private property. The four reagents evaluated are 4a – ISCO, 4b – ISCO+ERD, 4C – ZVI+ERD and 4D-CAC.

Size and configuration of process options - Injections would be made on approximately a grid with spacing of 7 ft (110 injection points) for CAC or 15 ft (24 injection points) for all other options considered between the two target areas: one on the DPW property and one on Manning Circle. One injection using temporary wells is assumed for CAC. Permanent well installation and abandonment is assumed for all other options which have multiple injections. The proposed treatment areas are shown in Figure 10. Groundwater samples results collected from wells sampled prior to the RI are also shown, but may not accurately reflect current site conditions.

For Alternative 4a, two injections are assumed to occur in 2016.

For Alternative 4b, two injections are assumed to occur in 2016 with one injection for ISCO and the other for ERD.

For Alternative 4c, two injections are assumed with the first occurring in 2016 and the second in 2019. The amount of the application would be reduced to 50 percent of the initial application in 2019.

For Alternative 4d, one injection is assumed to occur in 2016.

Periodic groundwater sampling would be required to evaluate the effectiveness of the treatment. Groundwater sampling would be conducted as described for Alternative 2 at a different frequency. Quarterly sampling is assumed for years 2017 and 2018. Annual sampling is assumed for 2019, 2020, and 2021 with sampling frequency reduced to every five years through 2046.

Time for remediation - Reduction of PCE concentrations in the source areas to SCGs is expected within the two years from the initial time of application. The remainder of the plume is expected to attenuate within 30 years.

Spatial requirements – For soil removal, approximately 4000 SF will be required for staging the equipment and the roll-offs, excavator, and clean backfill. The area of the excavation is approximately 770 SF. Approximately, 900 SF of space will be required for staging equipment during the groundwater treatment phase.

Options for disposal – Landfill disposal of soil is assumed. Ex situ treatment is not considered since there is no on site area for ex situ treatment.

Substantive technical permit requirements – No permits are required for chemical injections in New York. Roadway opening permits would be required for the injections in the right-of-way.

Limitations or other factors necessary to evaluate the alternatives – The area of the plume where injections can be made is primarily on public property. Access agreements would be needed for the private lots. Some property owners may be difficult to contact or resistant to agreeing to an institutional control. A location for staging the equipment would need to be determined, possibly in the municipal parking area adjacent to the DPW.

Beneficial and /or adverse impacts on fish and wildlife resources – No beneficial and/or adverse impacts to fish and wildlife resources were identified.

Cost Alternative 4a - A cost estimate is provided in Appendix B. The costs for this option are: present worth capital costs of $1,235,000, present worth O&M costs for 30 years of $832,000, and present worth for 30 years of $2,067,000.

Cost Alternative 4b - A cost estimate is provided in Appendix B. The costs for this option are: present worth capital costs of $1,073,000, present worth O&M costs for 30 years of $834,000, and present worth for 30 years of $1,908,000.

Cost Alternative 4c - A cost estimate is provided in Appendix B. The costs for this option are: present worth capital costs of $862,000, present worth O&M costs for 30 years of $898,000, and present worth for 30 years of $1,760,000.

Cost Alternative 4d - A cost estimate is provided in Appendix B. The costs for this option are: present worth capital costs of $804,000, present worth O&M costs for 30 years of $752,000, and present worth for 30 years of $1,556,000.

7.1.5 Alternative 5 – In Situ Treatment of Overburden (500 µg/L or greater PCE concentrations) and Bedrock (Limited Areas) Groundwater plus MNA with Institutional Controls and Soil Removal

This alternative would implement in situ treatment of groundwater in addition to MNA with institutional controls and soil removal. This in situ treatment would be used to reduce PCE levels in the area with concentrations of 500 µg/L or greater in areas that are owned by the public and limited areas of private property. In situ treatment would also be implemented in the bedrock aquifer where elevated concentrations have been measured. ISCO is evaluated.

Size and configuration of process options - Injections would be made on approximately a grid with spacing of 15 ft for a total of 24 injection points (in the overburden) and 79 injection points in the bedrock aquifer within the target areas, The target areas are the same for the overburden as Alternative 4. For bedrock, the areas of measured groundwater exceedances of the class GA criteria are targeted on the DPW property and along Manning Circle. The proposed treatment areas are shown in Figure 11 for the overburden and bedrock aquifers. Groundwater samples results collected from wells sampled prior to the RI are also shown, but may not accurately reflect current site conditions.

Two injections are assumed to occur in 2016.

Periodic groundwater sampling would be required to evaluate the effectiveness of the treatment. Groundwater sampling would be conducted as described for Alternative 2 at a different frequency. Quarterly sampling is assumed for years 2017 and 2018. Annual sampling is assumed for 2019, 2020, and 2021 with sampling frequency reduced to every five years through 2046.

Time for remediation - Reduction of PCE concentrations in the source areas to SCGs is expected within the two years from the initial time of application. The remainder of the plume is expected to attenuate within 30 years.

Spatial requirements – For soil removal, approximately 4000 SF will be required for staging the equipment and the roll-off, excavator, and clean backfill. The area of the excavation is approximately 770 SF. Approximately, 900 SF of space will be required for staging equipment during the groundwater treatment phase.

Options for disposal – Landfill disposal of soil is assumed. Ex situ treatment is not considered since there is no on site area for ex situ treatment.

Substantive technical permit requirements – No permits are required for chemical oxidant injections in New York. Roadway opening permits would be required for the injections in the right-of-way.

Limitations or other factors necessary to evaluate the alternatives – The area of the plume where injections can be made is primarily on public property. Access agreements would be needed for the private lots. Some property owners may be difficult to contact or resistant to agreeing to an institutional control. A location for staging the equipment would need to be determined, possibly in the municipal parking area adjacent to the DPW.

Beneficial and /or adverse impacts on fish and wildlife resources – No beneficial and/or adverse impacts to fish and wildlife resources were identified.

Cost - A cost estimate is provided in Appendix B. The costs for this option are: present worth capital costs of $3,394,000, present worth O&M costs for 30 years of $996,000, and present worth for 30 years of $4,345,000.

7.1.6 Alternative 6 – In Situ Treatment of Overburden (50 µg/L or greater PCE concentrations) and Bedrock (Limited Areas) Groundwater plus MNA (Limited to 5 years) and Soil Removal

This alternative would implement in situ treatment of groundwater in addition to MNA with institutional controls and soil removal. This in situ treatment would be used to reduce PCE levels in the area with concentrations of 50 µg/L or greater. In situ treatment would also be implemented in the bedrock aquifer where elevated concentrations have been measured. ISCO is evaluated. The MNA period is assumed to be 5 years and no institutional controls on groundwater use are included due to the expansion of the treatment area.

Size and configuration of process options - Injections would be made on approximately a grid with spacing of 15 ft for a total of 195 injection points (in the overburden) and 79 injection points in the bedrock aquifer within the target areas. For the overburden aquifer, the treatment area covers the estimated extent off the PCE plume exceeding 50 µg/L excluding structures. The target areas are the same for the bedrock as Alternative 5. The proposed treatment areas are shown in Figure 12 for the overburden and bedrock aquifers. Groundwater samples results collected from wells sampled prior to the RI are also shown, but may not accurately reflect current site conditions.

Two injections are assumed with the first occurring in 2015 and the second in 2016.

Periodic groundwater sampling would be required to evaluate the effectiveness of the treatment. Groundwater sampling would be conducted as described for Alternative 2 at a different frequency.

Quarterly sampling is assumed for years 2017 and 2018. Annual sampling is assumed for 2019, 2020, and 2021.

Time for remediation - Reduction of PCE concentrations to SCGs is expected within the two years from the initial time of application.

Spatial requirements – For soil removal, approximately 4000 SF will be required for staging the equipment and the roll-off and drums, mini excavator, and clean backfill. The area of the excavation is approximately 770 SF. Approximately, 900 SF of space will be required for staging equipment during the groundwater treatment phase.

Options for disposal – Landfill disposal of soil is assumed. Ex situ treatment is not considered since there is no on site area for ex situ treatment.

Substantive technical permit requirements – No permits are required for chemical oxidant injections in New York. Roadway opening permits would be required for the injections in the right-of-way.

Limitations or other factors necessary to evaluate the alternatives – Access agreements would be needed for the numerous privately owned lots. Some areas may be inaccessible because of utilities, obstructions, refusal of access to portions of private property, significant slopes or other factors. A location for staging the equipment would need to be determined, possibly in the municipal parking area adjacent to the DPW.

Beneficial and /or adverse impacts on fish and wildlife resources – No beneficial and/or adverse impacts to fish and wildlife resources were identified.

Cost - A cost estimate is provided in Appendix B. The costs for this option are: present worth capital costs of $9,483,000, present worth O&M costs for 30 years of $922,000, and present worth for 30 years of $10,406,000.

7.2 Detailed Analysis of Alternatives – General

The purpose of the detailed analysis of remedial action alternatives is to present the relevant information to select an on-site remedy. During the detailed analysis, the alternatives established in Section 7.1 are compared on the basis of environmental benefits and costs using criteria established by NYSDEC in DER-10 (NYSDEC, 2010b). This approach is intended to provide needed information to compare the merits of each alternative and select an appropriate remedy that satisfies the RAOs for the site.

7.2.1 Description of Evaluation Criteria

The alternatives were evaluated against the following remedy selection evaluation criteria. Of these criteria, the first two are threshold criteria that must be satisfied in order for an alternative to be considered for selection. The remaining seven criteria are balancing criteria used to compare the positive and negative aspects of the alternatives. Community acceptance is evaluated after completion of the proposed remedial action plan by NYSDEC. Green remediation is a tenth criteria that is conserved in order to comply with DER-31 expectation for proactive consideration of green remediation techniques to all phases of cleanups.

1 Overall Protection of Human Health and the Environment: This criterion is an evaluation of the ability of the alternative to protect public health and the environment: the ability of the alternative to eliminate, reduce or control any existing or potential human exposures or environmental impacts identified in the RI and to achieve the RAOs identified in Section 4. This assessment considers other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with SCGs.

2 SCGs: This criterion is used to evaluate the extent to which each alternative conforms to the SCGs identified in Section 4.

3 Long-Term Effectiveness and Permanence: This criterion addresses the long-term effectiveness and permanence of the alternative after implementation. If contamination remains after implementation, this criterion requires evaluation of human exposures, ecological receptors or impacts to the environment. In addition, long-term impacts to the community may occur through the consumption of materials, resources, and energy and gas emissions (including carbon dioxide, nitrogen oxides, and sulfur oxides) associated with the operation and maintenance following construction of a remedy.

4 Reduction of Toxicity, Mobility, and Volume: This criterion is an evaluation of the ability of the alternatives to reduce the toxicity, mobility and volume of site contamination. Alternatives that permanently or significantly reduce the toxicity, mobility or volume of the contamination at the site are preferred.

5 Short-Term Impacts and Effectiveness: This criterion is an evaluation of potential short-term adverse environmental impacts and human exposures during construction or implementation of the alternative. Short-term impacts are conditions which may cause human exposures, adverse environmental impacts and nuisance conditions. Means of controlling short-term impacts are identified. The effectiveness of these controls is evaluated. Examples of short-term impacts include increased truck traffic, odors, vapors, dust, habitat disturbance, run off, consumption of materials, resources, and energy, gas emissions (including carbon dioxide, nitrogen oxides, and sulfur oxides), and noise. In general, the longer the construction schedule at a site the greater the short-term impacts.

6 Implementability: This criterion evaluates the technical and administrative feasibility of implementing an alternative. Technical feasibility includes difficulties associated with construction and the ability to monitor the effectiveness of the alternative. Administrative feasibility includes the availability of the necessary personnel and material and potential difficulties in obtaining approvals, access, etc.

7 Cost Effectiveness: An evaluation of the overall cost effectiveness of an alternative. An assessment is made as to whether the cost is proportional to the overall effectiveness of the alternative.

8 Land Use: This criterion is an evaluation of the current, intended and reasonable anticipated future use of the site and its surroundings as it relates to the alternative when unrestricted levels are not achieved.

9 Community Acceptance: This criterion is evaluated after the public review of the remedy selection process as part of the final DER selection/approval of the remedy for the site.

10. Green Remediation: This criterion is an evaluation of the extent to which green and sustainable practices and technologies are incorporated into the remedy during its implementation. Proposed NYSDEC Guidance DER-31(NYSDEC, 2010c) establishes a preference for remediating sites in the most sustainable manner while still meeting legal, regulatory and program requirements. Green remediation is addressed in the comparative analysis of alternatives in Section 8.9

7.3 Detailed Analysis of Site Alternatives

Alternatives 1 through 3 are evaluated individually in terms of the seven environmental and one cost criteria described above. Descriptions of the alternatives are provided in Section 7.1.

7.3.1 Alternative 1 – No Remedial Action with Institutional Controls

The No Action alternative is developed as a baseline to which other alternatives can be compared, in accordance with USEPA RI/FS Guidance [USEPA, 1988] and DER-10. Under this alternative, no remedial action is taken and as a result, only naturally occurring processes would be working to achieve RAOs. The time to achieve RAOs under the No Action alternative would likely exceed 30 years, based on the mixture of VOCs, the areal extent of the VOC groundwater contamination, the residual high concentrations in groundwater, and the site conditions that are not favorable for natural bioremediation of chlorinated VOCs (slightly anaerobic to aerobic). The costs for no remediation are for the limited action of institutional controls. The detailed analysis of Alternative 1 compared to the evaluation criteria is presented in Table 7. The present work (30 year life) cost for this alternative is estimated to total approximately $151,000.

7.3.2 Alternative 2 – MNA with Institutional Controls

1 Overall Protection of Human Health and the Environment: This alternative is not protective of human health and the environment, since the site would remain in its present condition. Groundwater can continue to migrate off site, possibly resulting in soil vapor intrusion in additional structures over time.

2 Compliance with Applicable or Relevant and Appropriate SCGs and Remediation Goals: Reduction in PCE contamination below the chemical-specific SCGs for the site is not expected for several decades. No location-specific SCGs were identified. Action-specific SCGs (e.g., OSHA regulations) can be met during sampling activities. Soil in exceedance of the unrestricted SCO would remain in place.

3 Long-Term Effectiveness and Permanence: Because this alternative does not involve removal or treatment of the contaminated groundwater or soil, the risks involved with the migration of contaminants and direct contact with contaminants remain essentially the same over a long period of time.

4 Reduction of Toxicity, Mobility, and Volume: This alternative does not involve the removal or treatment of the source of site contamination. Therefore, neither the toxicity, nor mobility, nor volume of contamination is expected to be reduced significantly. Natural attenuation of contaminants is

expected to reduce the concentration in groundwater over time. The level of soil contamination is likely to remain unchanged.

5 Short-Term Impacts and Effectiveness: No short-term impacts are anticipated during the implementation of this alternative, since no construction activities are involved, only sampling. Field personnel wear appropriate personal protective equipment during groundwater sampling in order to limit health risks due to exposure to contaminants and physical hazards. In addition, equipment used for sampling purposes is decontaminated prior to leaving the site, as needed, in order to avoid the transport of contaminants.

6 Implementability: This alternative is readily implementable. Groundwater sampling can be performed without sophisticated equipment, and the necessary services and equipment are readily available.

7 Cost Effectiveness: The present work (30 year life) cost for this alternative is estimated to total approximately $744,000. This alternative does not effectively mitigate risk from contamination at the site.

8 Land Use: Institutional controls (e.g., deed or access restrictions) would be required for the on-site property to preclude contact with contaminated media (i.e., groundwater withdrawal or use restrictions and contact with soil on the DPW property).

7.3.3 Alternative 3 – MNA with Institutional Controls and Soil Removal

1 Overall Protection of Human Health and the Environment: This alternative is not protective of human health and the environment, since the site would remain in its present condition. Groundwater can continue to migrate off site. This alternative would remove the contaminated soil on the DPW property.

2 Compliance with Applicable or Relevant and Appropriate SCGs and Remediation Goals: Reduction in PCE contamination below the chemical-specific SCGs in groundwater for the site is not expected for several decades. No location-specific SCGs were identified. Action-specific SCGs (e.g., OSHA regulations) can be met during sampling activities.

3 Long-Term Effectiveness and Permanence: Because this alternative does not involve removal or treatment of the contaminated groundwater, the risks involved with the migration of contaminants and direct contact with contaminants remain essentially the same over a long period of time. Soil contamination would be effectively removed.

4 Reduction of Toxicity, Mobility, and Volume: This alternative does not involve the removal or treatment of the source of site groundwater contamination. Therefore, with the exception of the contaminated soil on the DPW property, neither the toxicity, nor mobility, nor volume of contamination is expected to be reduced significantly. A reduction in contaminant toxicity, mobility and volume in soil is addressed by this alternative. Natural attenuation of contaminants is expected to reduce the concentration in groundwater over time.

5 Short-Term Impacts and Effectiveness: Short-term impacts associated with the soil removal include risks to workers during removal. Health and safety monitoring will be implemented. Field

personnel wear appropriate personal protective equipment during groundwater sampling in order to limit health risks due to exposure to contaminants and physical hazards. In addition, equipment used for sampling purposes is decontaminated prior to leaving the site, as needed, in order to avoid the transport of contaminants.

6 Implementability: This alternative is readily implementable. Groundwater sampling can be performed without sophisticated equipment, and the necessary services and equipment are readily available. Coordination with the DPW will be necessary, in order to implement the soil removal without impacting site operations.

7 Cost Effectiveness: The present work (30 year life) cost for this alternative is estimated to total approximately $1,150,000. This alternative effectively mitigates risk associated with the soil contamination on the DPW property. This alternative does not effectively mitigate risk from contamination at the site. The costs for this alternative are lower than for alternatives providing active remediation of treatment at the public wells.

8 Land Use: Institutional controls (e.g., deed or access restrictions) would be required for the on-site property to preclude contact with contaminated media (i.e., groundwater withdrawal or use restrictions).

7.3.4 Alternative 4 – In Situ Treatment of Overburden Groundwater (500 µg/L or greater PCE concentrations) plus MNA with Institutional Controls and Soil Removal

1 Overall Protection of Human Health and the Environment: This alternative is considered to be protective of human health and the environment. Implementation of this alternative would result in remediation of groundwater within the area of higher contamination in the overburden aquifer and remove the contaminated soil on the DPW property.

2 SCGs: This alternative is expected to meet the chemical-specific SCGs for on-site groundwater between the source area and the plume limits within a 30-year timeframe for the majority of the site areas within the overburden. No location-specific SCGs were identified. Action-specific SCGs (e.g., OSHA regulations) will be met during construction activities.

3 Long-Term Effectiveness and Permanence: This alternative is considered an adequate and reliable remedy for mitigating human health and environmental impacts (in terms of affecting habitat or vegetation) due to groundwater. The injections have the potential to eliminate impacts within the region of the plume with highest PCE concentrations, allowing the lower concentrations of VOCs to further dissipate through bioremediation and natural attenuation.

4 Reduction of Toxicity, Mobility, and Volume: The injections will reduce the concentration of VOCs within the injected area. The injections will target groundwater impacts at the DPW and Manning Circle in the overburden aquifer. The remainder of the plume in the overburden is expected to reduce in concentration over time by natural attenuation. The plume in the bedrock will remain unchanged. A reduction in contaminant toxicity, mobility and volume in soil is addressed by this alternative.

5 Short-Term Impacts and Effectiveness: Short-term impacts associated with the soil removal include risks to workers during removal. Short-term impacts associated with the injected chemicals include risks to workers during handling of the solution. Injections will be accomplished with a drill rig. There would be some disruption to traffic and some noise. Field personnel would wear appropriate personal protective equipment during groundwater sampling in order to limit health risks due to exposure to contaminants and physical hazards. In addition, equipment used for sampling purposes would be decontaminated prior to leaving the site, as necessary, in order to avoid the transport of contaminants.

6 Implementability: This alternative is readily implementable on a technical basis. Construction and installation of the injection systems would involve standard construction methods and equipment; and materials and services necessary for construction are readily available. Several vendors supply the chemicals. Confirmatory groundwater sampling would be performed to monitor the effectiveness of injections. A pilot study may be implemented as part of pre-design work. Modification of the construction schedule to minimizing disruptions to the DPW would be considered. Coordination with the DPW will be necessary, in order to implement the soil removal without impacting site operations.

7 Cost Effectiveness: The present work cost for this alternative is estimated to total approximately $2,067,000 for Alternative 4a, $1,908,000 for Alternative 4b, or $1,760,000 for Alternative 4c, or $1,556,000 for Alternative 4d. This alternative effectively mitigates risk from contamination at the site in the soil on the DPW property and in the groundwater source areas of the overburden aquifer allowing monitored natural attenuation to reduce contaminant levels in the remainder of the plume.

8 Land Use: Institutional controls (e.g., deed or access restrictions) would be required for the on-site property to preclude contact with contaminated media (i.e., groundwater withdrawal or use restrictions) until groundwater concentrations were compliant with the SCGs.

7.3.5 Alternative 5 – In Situ Treatment of Overburden (500 µg/L or greater PCE concentrations) and Bedrock (Limited Areas) Groundwater plus MNA with Institutional Controls and Soil Removal

1 Overall Protection of Human Health and the Environment: This alternative is considered to be protective of human health and the environment. Implementation of this alternative would result in remediation of groundwater within the area of higher contamination in the overburden and bedrock aquifers and remove the contaminated soil on the DPW property.

2 SCGs: This alternative is expected to meet the chemical-specific SCGs for on-site groundwater between the source area and the plume limits within a 30-year timeframe for the majority of the site areas. No location-specific SCGs were identified. Action-specific SCGs (e.g., OSHA regulations) will be met during construction activities.

3 Long-Term Effectiveness and Permanence: This alternative is considered an adequate and reliable remedy for mitigating human health and environmental impacts (in terms of affecting habitat or vegetation) due to groundwater. The injections have the potential to eliminate impacts within the region of the plume with highest PCE concentrations, allowing the lower concentrations of VOCs to further dissipate through bioremediation and natural attenuation.

4 Reduction of Toxicity, Mobility, and Volume: The injections will reduce the concentration of VOCs within the injected area. The injections will target groundwater impacts at the DPW and Manning Circle in the overburden aquifer. The remainder of the plume in the overburden and bedrock is expected to reduce in concentration over time by natural attenuation. A reduction in contaminant toxicity, mobility and volume in soil is addressed by this alternative.

5 Short-Term Impacts and Effectiveness: Short-term impacts associated with the soil removal include risks to workers during removal. Short-term impacts associated with the injected chemicals include risks to workers during handling of the solution. Injections will be accomplished with a drill rig. There would be some disruption to traffic and some noise. Field personnel would wear appropriate personal protective equipment during groundwater sampling in order to limit health risks due to exposure to contaminants and physical hazards. In addition, equipment used for sampling purposes would be decontaminated prior to leaving the site, as necessary, in order to avoid the transport of contaminants.

6 Implementability: This alternative is readily implementable on a technical basis. Construction and installation of the injection systems would involve standard construction methods and equipment; and materials and services necessary for construction are readily available. Several vendors supply the chemicals. Confirmatory groundwater sampling would be performed to monitor the effectiveness of injections. A pilot study may be implemented as part of pre-design work. Modification of the construction schedule to minimizing disruptions to the DPW would be considered. Coordination with the DPW will be necessary, in order to implement the soil removal without impacting site operations.

7 Cost Effectiveness: The present work cost for this alternative is estimated to total approximately $4,345,000. This alternative effectively mitigates risk from contamination at the site in the soil on the DPW property and in the groundwater source areas of the overburden and bedrock aquifers allowing monitored natural attenuation to reduce contaminant levels in the remainder of the plume.

8 Land Use: Institutional controls (e.g., deed or access restrictions) would be required for the on-site property to preclude contact with contaminated media (i.e., groundwater withdrawal or use restrictions) until groundwater concentrations were compliant with the SCGs.

7.3.6 Alternative 6 – In Situ Treatment of Overburden (50 µg/L or greater PCE concentrations) and Bedrock (Limited Areas) Groundwater plus MNA (Limited to 5 years) and Soil Removal

1 Overall Protection of Human Health and the Environment: This alternative is considered to be protective of human health and the environment. Implementation of this alternative would result in remediation of groundwater within the area of higher contamination and remove the contaminated soil on the DPW property.

2 SCGs: This alternative is expected to meet the chemical-specific SCGs for on-site groundwater between the source area and the plume limits in less than a 5-year timeframe for the majority of the site areas. No location-specific SCGs were identified. Action-specific SCGs (e.g., OSHA regulations) will be met during construction activities.

3 Long-Term Effectiveness and Permanence: This alternative is considered an adequate and reliable remedy for mitigating human health and environmental impacts (in terms of affecting habitat or

vegetation) due to groundwater. The injections have the potential to eliminate impacts within the region of the plume with highest PCE concentrations, allowing the lower concentrations of VOCs to further dissipate through bioremediation and natural attenuation.

4 Reduction of Toxicity, Mobility, and Volume: The injections will reduce the concentration of VOCs within the injected area. The injections will target groundwater impacts at the DPW and Manning Circle in the overburden aquifer. The remainder of the plume in the overburden and bedrock is expected to reduce in concentration over time by natural attenuation. A reduction in contaminant toxicity, mobility and volume in soil is addressed by this alternative.

5 Short-Term Impacts and Effectiveness: Short-term impacts associated with the soil removal include risks to workers during removal. Short-term impacts associated with the injected chemicals include risks to workers during handling of the solution. Injections will be accomplished with a drill rig. There would be some disruption to traffic and some noise. Field personnel would wear appropriate personal protective equipment during groundwater sampling in order to limit health risks due to exposure to contaminants and physical hazards. In addition, equipment used for sampling purposes would be decontaminated prior to leaving the site, as necessary, in order to avoid the transport of contaminants. Property owners would be in close proximity to the work zone. Control of access to the work zone would be maintained.

6 Implementability: This alternative is readily implementable on a technical basis. Construction and installation of the injection systems would involve standard construction methods and equipment; and materials and services necessary for construction are readily available. Several vendors supply the chemicals. Confirmatory groundwater sampling would be performed to monitor the effectiveness of injections. A pilot study may be implemented as part of pre-design work. Modification of the construction schedule to minimizing disruptions to the DPW would be considered. It is likely that some property owners would not agree to allow access, and some areas would not be accessible due to obstructions, utilities, or difficult topography. Coordination with the DPW will be necessary, in order to implement the soil removal without impacting site operations.

7 Cost Effectiveness: The present work cost for this alternative is estimated to total approximately $10,406,000. This alternative effectively mitigates risk from contamination at the site in the soil on the DPW property and in the impacted groundwater overburden aquifer and in source areas of the bedrock aquifers allowing monitored natural attenuation to reduce contaminant levels in the remainder of the plume in bedrock. Chemical injections may not be cost effective for lower concentrations of PCE contamination in groundwater (50 µg/L).

8 Land Use: This alternative is expected to achieve the chemical-specific SCGs for this site within a reasonable timeframe. No changes to land use are anticipated.

8.0 COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES

This section presents a comparative analysis of remedial alternatives. The alternatives are compared below on the basis of criteria defined in Section 7.2.1. The cost comparison is provided on Table 8, and the overall comparative analysis is summarized on Table 7.

8.1 Overall Protection of Human Health and the Environment

Alternatives 1 and 2 are not protective of human health and the environment because the contamination remains in place. Property owners would be notified of the contamination through institutional controls. Alternatives 3, 4, 5, and 6 provide increasing levels of protection by contamination removal.

8.2 SCGs

Alternatives 3 through 6 attain compliance of the soil SCGs through removal of the soil contamination on the DPW property. Alternatives 4, 5, and 6 are expected to attain compliance with the groundwater SCGs over time. Alternatives 1, 2 and 3 are not expected to achieve compliance within 30 years. Each of the alternatives evaluated is considered to be in compliance with action-specific SCGs; permits and approvals necessary for implementing these alternatives will be obtained prior to initiating the remedial action. No location-specific SCGs were identified.

8.3 Long-Term Effectiveness and Permanence

Alternatives 3 through 6 attain long-term effectiveness in regard to removal of the contaminated soil on the DPW property. Alternatives 4, 5, and 6 are considered to be adequate, reliable and permanent remedies for the remediation of groundwater. Alternatives 1, 2 and 3 are not considered an adequate, reliable, or permanent long-term remedy for groundwater at the site.

8.4 Reduction of Toxicity, Mobility, and Volume

Alternatives 3, 4, 5, and 6 provide for the reduction of toxicity, mobility and volume of impacted soil. Alternatives 4, 5, and 6 provide for the reduction of toxicity, mobility and volume of impacted groundwater. Alternatives 1, 2 and 3 are expected to provide for the reduction of toxicity, mobility and volume of impacted groundwater over an extended period of time (greater than 30 years).

8.5 Short-Term Impacts and Effectiveness

No significant short-term impacts are identified for Alternatives 1 and 2. Alternatives 3, 4, 5, and 6 involve intrusive work which may provide some disruption at the DPW or residents during construction activities and risks to works. CAMP and HASP requirements would be implemented.

Alternatives 3, 4, 5, and 6 are effective at reducing risks from the soil contamination in the short-term. Alternatives 1, 2, and 3 are not effective at reducing risks from the groundwater contamination in the

short-term. Alternatives 4, 5, and 6 are expected to realize significant reductions in the groundwater contaminant levels within the first year after construction.

8.6 Implementability

Each alternative is technically implementable with readily available methods, equipment, materials, and services. The alternatives are also administratively implementable. The DPW and/or property owners or tenants may object to the intrusive work required for Alternatives 3, 4, 5, and 6. Access to portions of the remedial area may be limited for Alternative 6.

8.7 Cost Effectiveness

The estimated costs associated with the implementation of each alternative are summarized on Table 8. The lowest present worth cost of $151,000 is for Alternative 1 which does not include remedial actions; rather, this alternative only includes institutional controls. Alternative 2 provides MNA in addition to institutional controls for $744,000. Alternatives 3, 4, 5, and 6 provide effective remediation of soil on the DPW property. Alternatives 4, 5, and 6 are expected to provide effective remediation of groundwater. Injections may not be cost effective for lower levels of groundwater contamination (Alternative 6). The present worth costs for Alternatives 3 through 6 range from $1,556,000 to $10,406,000. Alternative 4d provides the lowest cost and shortest time to complete for the alternatives including groundwater treatment.

8.8 Land Use

Institutional controls are required for all alternatives with the exception of Alternative 6. The institutional controls covering groundwater would be removed once the groundwater attained SCGs for Alternatives 4 and 5.

8.9 Green Remediation

All remediation and construction activities pose an environmental impact from vehicle usage, chemical and materials manufacture, sampling activities, and laboratory analysis. The alternatives were evaluated using guidance provided in DER-31 and include a range of environmental impacts. Excavation would have the greatest environmental impact due to the heavy vehicle usage to excavate and transport contaminated materials off-site. Generally, in situ remediation technologies can be completed more sustainably than removal/ex situ processes. The MNA sub-alternatives rely on natural processes which are viewed favorably by DER-31.

9.0 RECOMMENDED REMEDY

NYSDEC will determine the recommended remedy following review of this document and discussions with stakeholders.

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Table 1
VOCs in Soil
Crystal Cleaners, Pelham, New York

	Station ID:	SB-01	SB-02	SB-03	SB-04	SB-05	SB-09	SB-09 (Dup)
	Depth (ft.):	2.6-3.1	0.3-1	5-5.2	11.1-11.4	0.3-0.8	0.8-0.9	0.8-0.9
	Sample ID:	SB-01-31-37	SB-02-03-12	SB-03-60-62	SB-04-133-137	SB-05-04-09	SB-09-09-11	SB-59-09-11
	Sample Date:	6/27/11	6/27/11	6/27/11	6/27/11	6/27/11	6/27/11	6/27/11
Unit: µg/Kg	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Duplicate
1,1,1,2-Tetrachloroethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,1,1-Trichloroethane	680	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,1,2,2-Tetrachloroethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,1,2-Trichloroethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,1-Dichloroethane	270	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,1-Dichloroethene	330	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,1-Dichloropropene	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,2,3-Trichlorobenzene	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 UJ	5.6 U
1,2,3-Trichloropropane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,2,4-Trichlorobenzene	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 UJ	5.6 U
1,2,4-Trimethylbenzene	3600	5.2 U	**1.2** J	5.1 U	5.4 U	5.5 U	5.6 UJ	5.6 U
1,2-Dibromo-3-chloropropane	NA	5.2 UJ	5.4 UJ	5.1 UJ	5.4 UJ	5.5 UJ	5.6 UJ	5.6 UJ
1,2-Dibromoethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,2-Dichlorobenzene	1100	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 UJ	5.6 U
1,2-Dichloroethane	20	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,2-Dichloropropane	NA	5.2 U	**1.1** J	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,3,5-Trimethylbenzene	8400	5.2 U	**11**	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,3-Dichlorobenzene	2400	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 UJ	5.6 U
1,3-Dichloropropane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
1,4-Dichlorobenzene	1800	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 UJ	5.6 U
1,4-Dioxane	100	R	R	R	R	R	R	R
2,2-Dichloropropane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
2-Butanone	120	R	R	R	R	R	R	R
2-Chlorotoluene	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
2-Hexanone	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
4-Chlorotoluene	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 UJ	5.6 U
4-Isopropyltoluene	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 UJ	5.6 U
4-Methyl-2-pentanone	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Acetone	50	R	**2.9** J	**2.9** J	**2.9** J	**4** J	**4.7** J	R
Benzene	60	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Bromobenzene	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Bromochloromethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Bromodichloromethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Bromoform	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Bromomethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Carbon disulfide	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Carbon tetrachloride	760	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Chlorobenzene	1100	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Chloroethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Chloroform	370	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Chloromethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
cis-1,2-Dichloroethene	250	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U

Table 1
VOCs in Soil
Crystal Cleaners, Pelham, New York

	Station ID:	SB-01	SB-02	SB-03	SB-04	SB-05	SB-09	SB-09 (Dup)
	Depth (ft.):	2.6-3.1	0.3-1	5-5.2	11.1-11.4	0.3-0.8	0.8-0.9	0.8-0.9
	Sample ID:	SB-01-31-37	SB-02-03-12	SB-03-60-62	SB-04-133-137	SB-05-04-09	SB-09-09-11	SB-59-09-11
	Sample Date:	6/27/11	6/27/11	6/27/11	6/27/11	6/27/11	6/27/11	6/27/11
Unit: µg/Kg	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Duplicate
cis-1,3-Dichloropropene	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Cyclohexane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Dibromochloromethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Dichlorodifluoromethane								
Dibromomethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Dichlorodifluoromethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Ethylbenzene	1000	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Hexachlorobutadiene	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Iodomethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Isopropylbenzene	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
m,p-Xylene	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 UJ	5.6 U
Methyl acetate	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Methyl tert-butyl ether	930	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Methylcyclohexane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Methylene chloride	50	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Naphthalene	NA	**1.2** J	5.4 U	5.1 U	5.4 U	**1.8** J	5.6 UJ	5.6 U
o-Xylene	NA	5.2 U	**1.1** J	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
sec-Butylbenzene	11000	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Styrene	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
tert-Butylbenzene	5900	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Tetrachloroethene (PCE)	1300	5.2 U	**4.8** J	**17000**	5.4 U	**93**	5.6 U	**6.8**
Toluene	700	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
trans-1,2-Dichloroethene	190	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
trans-1,3-Dichloropropene	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Trichloroethene (TCE)	470	5.2 U	5.4 U	**1.1** J	5.4 U	5.5 U	5.6 U	5.6 U
Trichlorofluoromethane	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Vinyl acetate	NA	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 UJ	5.6 U
Vinyl chloride	20	5.2 U	5.4 U	5.1 U	5.4 U	5.5 U	5.6 U	5.6 U
Xylene (Total)	260	5.2 U	**1.1** J	5.1 U	5.4 U	5.5 U	5.6 UJ	5.6 U

Table 1
VOCs in Soil
Crystal Cleaners, Pelham, New York

	Station ID:	TWP-3	TWP-4	TWP-4	TWP-12	TWP-13	TWP-13	SB-15	SB-16
	Depth (ft.):	17.5-18	14.5-15	14.5-15	10-10.5	0.5-1	0.5-1	5.5-6	5.5-6
	Sample ID:	TWP-3-17.5-18	TWP-4-14.5-15	TWP-54-14.5-15	TWP-12-10	TWP-13-1	TWP-63-10	SB-15-5.5-6.0	SB-16-5.5-6.0
	Sample Date:	9/10/13	9/10/13	9/10/13	4/16/14	4/16/14	4/16/14	4/15/15	4/15/15
Unit: µg/Kg	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Duplicate	Env. Sample	Env. Sample
1,1,1,2-Tetrachloroethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	680	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
1,1,2,2-Tetrachloroethane	NA	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	10 U	11 U	11 U	13 UJ	13 UJ	11 UJ	5 U	5 U
1,1,2-Trichloroethane	NA	10 U	11 U	11 U	13 U	13 U	11 U	5 U	**60** J
1,1-Dichloroethane	270	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
1,1-Dichloroethene	330	10 U	11 U	11 U	13 UJ	13 UJ	11 UJ	5 U	5 U
1,1-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	10 UJ	11 UJ	11 UJ	13 UJ	13 UJ	11 UJ	5 U	5 U
1,2,4-Trimethylbenzene	3600	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	R	R	R	13 U	13 U	11 U	5 U	5 U
1,2-Dibromoethane	NA	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
1,2-Dichlorobenzene	1100	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
1,2-Dichloroethane	20	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
1,2-Dichloropropane	NA	10 U	11 U	11 U	13 U	13 U	11 U	NA	NA
1,3,5-Trimethylbenzene	8400	NA	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	2400	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
1,3-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	1800	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
1,4-Dioxane	100	NA	NA	NA	NA	NA	NA	NA	NA
2,2-Dichloropropane	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Butanone	120	9.7 UJ	11 UJ	11 UJ	**4** J	**4** J	**4** J	5 U	**59** J
2-Chlorotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	10 UJ	11 UJ	11 UJ	13 U	13 U	11 U	5 U	5 U
4-Chlorotoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	9.7 UJ	11 UJ	11 UJ	13 U	13 U	11 U	NA	NA
Acetone	50	**13** J	**8** J	**8** J	**59**	13 U	11 U	5 U	**4** J
Benzene	60	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
Bromobenzene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
Bromoform	NA	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
Bromomethane	NA	10 UJ	11 UJ	11 UJ	13 UJ	13 UJ	11 UJ	5 U	5 U
Carbon disulfide	NA	10 U	11 U	11 U	13 UJ	13 UJ	11 UJ	5 U	5 U
Carbon tetrachloride	760	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
Chlorobenzene	1100	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
Chloroethane	NA	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
Chloroform	370	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
Chloromethane	NA	10 U	11 U	11 U	13 UJ	13 UJ	11 UJ	5 U	5 U
cis-1,2-Dichloroethene	250	**1** J	**7** J	**11** U	13 U	13 U	11 U	5 U	5 U

Table 1
VOCs in Soil
Crystal Cleaners, Pelham, New York

	Station ID:	TWP-3	TWP-4	TWP-4	TWP-12	TWP-13	TWP-13	SB-15	SB-16
	Depth (ft.):	17.5-18	14.5-15	14.5-15	10-10.5	0.5-1	0.5-1	5.5-6	5.5-6
	Sample ID:	TWP-3-17.5-18	TWP-4-14.5-15	TWP-54-14.5-15	TWP-12-10	TWP-13-1	TWP-63-10	SB-15-5.5-6.0	SB-16-5.5-6.0
	Sample Date:	9/10/13	9/10/13	9/10/13	4/16/14	4/16/14	4/16/14	4/15/15	4/15/15
Unit: µg/Kg	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Duplicate	Env. Sample	Env. Sample
cis-1,3-Dichloropropene	NA	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
Cyclohexane	NA	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
Dibromochloromethane	NA	10 U	11 U	11 U	13 UJ	13 UJ	11 UJ	5 U	5 U
Dichlorodifluoromethane								5 UJ	5 UJ
Dibromomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NA	10 UJ	11 UJ	11 UJ	13 U	13 U	11 U	NA	NA
Ethylbenzene	1000	10 U	11 U	11 U	13 U	**2** J	**6** J	5 U	5 U
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iodomethane	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NA	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
m,p-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	NA	10 UJ	11 UJ	11 UJ	13 U	13 U	11 U	5 UJ	5 UJ
Methyl tert-butyl ether	930	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
Methylcyclohexane	NA	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
Methylene chloride	50	10 U	11 U	**2** J	13 UJ	13 UJ	11 UJ	5 U	5 UJ
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	11000	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	NA	10 U	11 U	11 U	13 U	**7** J	**15**	5 U	5 U
tert-Butylbenzene	5900	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene (PCE)	1300	**3** J	**2** J	**1** J	13 U	**6** J	**11** J	**4700**	**11000**
Toluene	700	10 U	11 U	11 U	**11** J	**7** J	**12**	5 U	**0.5** J
trans-1,2-Dichloroethene	190	10 U	11 U	11 U	13 UJ	13 UJ	11 UJ	5 U	5 U
trans-1,3-Dichloropropene	NA	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
Trichloroethene (TCE)	470	10 U	11 U	11 U	13 U	13 U	11 U	5 U	**2** J
Trichlorofluoromethane	NA	10 U	11 U	11 U	13 U	13 U	11 U	**1** J	**2** J
Vinyl acetate	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	20	10 U	11 U	11 U	13 U	13 U	11 U	5 U	5 U
Xylene (Total)	260	10 U	11 U	11 U	**3** J	**24**	**55**	5 U	5 U

Table 1
VOCs in Soil
Crystal Cleaners, Pelham, New York

	Station ID:	SB-17	SB-18	SB-19
	Depth (ft.):	5-5.5	5-5.5	5.5-6
	Sample ID:	SB-17-5.0-5.5	SB-18-5.0-5.5	SB-19-5.5-6.0
	Sample Date:	4/15/15	4/15/15	4/15/15
Unit: µg/Kg	Criteria	Env. Sample	Env. Sample	Env. Sample
1,1,1,2-Tetrachloroethane	NA	NA	NA	NA
1,1,1-Trichloroethane	680	6 U	5 U	5 U
1,1,2,2-Tetrachloroethane	NA	6 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	6 U	5 U	5 U
1,1,2-Trichloroethane	NA	6 U	5 U	**65** J
1,1-Dichloroethane	270	6 U	5 U	5 U
1,1-Dichloroethene	330	6 U	5 U	5 U
1,1-Dichloropropene	NA	NA	NA	NA
1,2,3-Trichlorobenzene	NA	NA	NA	NA
1,2,3-Trichloropropane	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	6 U	5 U	5 U
1,2,4-Trimethylbenzene	3600	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	6 U	5 U	5 U
1,2-Dibromoethane	NA	6 U	5 U	5 U
1,2-Dichlorobenzene	1100	6 U	5 U	5 U
1,2-Dichloroethane	20	6 U	5 U	5 U
1,2-Dichloropropane	NA	NA	NA	NA
1,3,5-Trimethylbenzene	8400	NA	NA	NA
1,3-Dichlorobenzene	2400	6 U	5 U	5 U
1,3-Dichloropropane	NA	NA	NA	NA
1,4-Dichlorobenzene	1800	6 U	5 U	5 U
1,4-Dioxane	100	NA	NA	NA
2,2-Dichloropropane	NA	NA	NA	NA
2-Butanone	120	5.9 U	4.7 U	5.1 U
2-Chlorotoluene	NA	NA	NA	NA
2-Hexanone	NA	6 U	5 U	5 U
4-Chlorotoluene	NA	NA	NA	NA
4-Isopropyltoluene	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA
Acetone	50	6 U	5 U	5 U
Benzene	60	6 U	5 U	5 U
Bromobenzene	NA	NA	NA	NA
Bromochloromethane	NA	NA	NA	NA
Bromodichloromethane	NA	6 U	5 U	5 U
Bromoform	NA	6 U	5 U	5 U
Bromomethane	NA	6 U	5 U	5 U
Carbon disulfide	NA	6 U	5 U	5 U
Carbon tetrachloride	760	6 U	5 U	5 U
Chlorobenzene	1100	6 U	5 U	5 U
Chloroethane	NA	6 U	5 U	5 U
Chloroform	370	6 U	5 U	5 U
Chloromethane	NA	6 U	5 U	5 U
cis-1,2-Dichloroethene	250	6 U	5 U	5 U

Table 1
VOCs in Soil
Crystal Cleaners, Pelham, New York

	Station ID:	SB-17	SB-18	SB-19
	Depth (ft.):	5-5.5	5-5.5	5.5-6
	Sample ID:	SB-17-5.0-5.5	SB-18-5.0-5.5	SB-19-5.5-6.0
	Sample Date:	4/15/15	4/15/15	4/15/15
Unit: µg/Kg	Criteria	Env. Sample	Env. Sample	Env. Sample
cis-1,3-Dichloropropene	NA	6 U	5 U	5 U
Cyclohexane	NA	6 U	5 U	5 U
Dibromochloromethane	NA	6 U	5 U	5 U
Dichlorodifluoromethane		6 UJ	5 UJ	5 UJ
Dibromomethane	NA	NA	NA	NA
Dichlorodifluoromethane	NA	NA	NA	NA
Ethylbenzene	1000	6 U	5 U	5 U
Hexachlorobutadiene	NA	NA	NA	NA
Iodomethane	NA	NA	NA	NA
Isopropylbenzene	NA	6 U	5 U	5 U
m,p-Xylene	NA	NA	NA	NA
Methyl acetate	NA	6 UJ	5 UJ	5 UJ
Methyl tert-butyl ether	930	6 U	5 U	5 U
Methylcyclohexane	NA	6 U	5 U	5 U
Methylene chloride	50	6 U	5 U	5 U
Naphthalene	NA	NA	NA	NA
o-Xylene	NA	NA	NA	NA
sec-Butylbenzene	11000	NA	NA	NA
Styrene	NA	6 U	5 U	5 U
tert-Butylbenzene	5900	NA	NA	NA
Tetrachloroethene (PCE)	1300	**5700**	**2400**	**10000**
Toluene	700	6 U	5 U	5 U
trans-1,2-Dichloroethene	190	6 U	5 U	5 U
trans-1,3-Dichloropropene	NA	6 U	5 U	5 U
Trichloroethene (TCE)	470	**5** J	5 U	**0.8** J
Trichlorofluoromethane	NA	**2** J	**5** U	**0.7** J
Vinyl acetate	NA	NA	NA	NA
Vinyl chloride	20	6 U	5 U	5 U
Xylene (Total)	260	6 U	5 U	5 U

Criteria - 6 New York Codes, Rules and Regulations [NYCRR] Part 375-6.8(a) unrestricted soil cleanup objectives
Dup - Field duplicate sample
U - Not detected
J - Estimated
R - Rejected
NA - Not available
Detections are bolded
Exceedances are highlighted

Table 2
Well Construction Data
Crystal Cleaners, Pelham, New York

Well Number	Installed	Northing	Easting	Ground Elevation (ft)	Top of Casing Elevation (ft)	Total Depth of Well (ft)	Well Material	Aquifer	Depth to Screen (ft)	Screen Length (ft)	Well Diameter (ft)
MW-C01	7/2/2008	756,953.80	682,668.53	46.54	46.11	26	PVC	Bedrock	16-26	10	0.17
MW-C03	9/13/2011	756,949.67	682,429.35	28.49	28	17.2	PVC	Overburden	7.2-17.2	10	0.17
MW-C04	9/12/2011	756,851.68	682,361.61	25.73	25.54	22	PVC	Overburden	12-22	10	0.17
MW-C05	9/15/2011	756,987.59	682,254.39	18.38	18.05	22	PVC	Overburden	12-22	10	0.17
MW-C06	9/28/2011	756,832.45	682,091.43	22.69	22.28	18	PVC	Overburden	8-18	10	0.17
MW-C07	6/23/2011	756,720.64	682,251.66	26.25	26	29	PVC	Overburden	19-29	10	0.08
MW-C08	6/23/2011	756,765.13	682,339.24	32.31	32.13	23	PVC	Overburden	18-23	5	0.17
MW-C09	2/23/2012	756,948.19	682,445.59	29.25	28.85	41	PVC	Bedrock	31-41	10	0.17
MW-C10	2/4/2012	756,853.04	682,365.34	25.88	25.67	48.5	PVC	Bedrock	42.5-47.5	5	0.17
MW-C11	10/3/2012	756,714.67	682,250.91	25.69	25.42	67	PVC	Bedrock	57-67	10	0.17
MW-C12	1/31/2012	756,563.19	682,210.84	18.8	18.55	18	PVC	Overburden	8-18	10	0.17
MW-C13	1/31/2012	756,660.07	681,944.75	18.82	18.43	17.7	PVC	Overburden	7.7-17.7	10	0.17
MW-C14	10/16/2012	756,648.85	682,266.05	21.18	20.86	22	PVC	Overburden	12-22	10	0.17
MW-C15	10/5/2012	756,566.00	682,211.18	18.82	18.4	60	PVC	Bedrock	50-60	10	0.17
MW-C16	9/25/2012	756,842.78	682,361.01	26	25.51	95	PVC	Bedrock	85-95	10	0.17

Notes:
Vertical datum: NAVD88
Horizontal datum: NY State Plane NAD83
NA - Not available
MW-C02 and other wells sampled for the site characterization report were removed by the Village of Pelham during construction at the DPW.

Table 3
VOCs in Groundwater
Crystal Cleaners, Pelham, New York

	Station ID:	MW-C01	MW-C01	MW-C03	MW-C03	MW-C04	MW-C04	MW-C05	MW-C05	MW-C06	MW-C06
	Sample ID:	MW-01	MW-C01	MW-03	MW-C03	MW-04	MW-C04	MW-05	MW-C05	MW-06	MW-C06
	Sample Date:	10/25/2011	3/1/2012	10/25/2011	3/1/2012	10/25/2011	3/1/2012	10/25/2011	3/1/2012	10/25/2011	3/1/2012
	Aquifer:	Bedrock	Bedrock	Overburden	Overburden	Overburden	Overburden	Overburden	Overburden	Overburden	Overburden
Unit: µg/L	Class GA	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
1,1,1,2-Tetrachloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,1-Trichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	1	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5	5 U	5 U	5 U	5 U	5 U	**2** J	5 U	5 U	5 U	5 U
1,1-Dichloropropene	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,3-Trichlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,3-Trichloropropane	0.04	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ	5 U
1,2,4-Trichlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2,4-Trimethylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	0.04	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dibromoethane	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichlorobenzene	3	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	0.6	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	1	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3,5-Trimethylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichlorobenzene	3	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,3-Dichloropropane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dichlorobenzene	3	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,4-Dioxane	NA	R	R	R	R	R	R	R	R	R	R
2,2-Dichloropropane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone	50	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U
2-Chlorotoluene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	50	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ	5 U
4-Chlorotoluene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Isopropyltoluene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	50	R	5 UJ	R	5 UJ	R	5 UJ	R	5 UJ	R	5 UJ
Benzene	1	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ	5 U
Bromobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromochloromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromodichloromethane	50	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	50	5 UJ	5 U	5 UJ	5 U	5 UJ	5 U	5 UJ	5 U	5 UJ	5 U
Bromomethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon disulfide	60	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Carbon tetrachloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloroform	7	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chloromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	5	5 U	5 U	5 U	5 U	**1300** J	**1900** D	5 U	5 U	5 U	5 U

Table 3
VOCs in Groundwater
Crystal Cleaners, Pelham, New York

	Station ID:	MW-C01	MW-C01	MW-C03	MW-C03	MW-C04	MW-C04	MW-C05	MW-C05	MW-C06	MW-C06
	Sample ID:	MW-01	MW-C01	MW-03	MW-C03	MW-04	MW-C04	MW-05	MW-C05	MW-06	MW-C06
	Sample Date:	10/25/2011	3/1/2012	10/25/2011	3/1/2012	10/25/2011	3/1/2012	10/25/2011	3/1/2012	10/25/2011	3/1/2012
	Aquifer:	Bedrock	Bedrock	Overburden	Overburden	Overburden	Overburden	Overburden	Overburden	Overburden	Overburden
Unit: µg/L	Class GA	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
cis-1,3-Dichloropropene	0.4	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Cyclohexane	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromochloromethane	50	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dibromomethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Dichlorodifluoromethane	5	5 U	5 UJ	5 U	5 UJ	5 U	5 UJ	5 U	5 UJ	5 U	5 UJ
Ethylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Hexachlorobutadiene	0.5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Iodomethane	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Isopropylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
m,p-Xylene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methyl acetate	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ	5 U
Methyl tert-butyl ether	10	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Methylcyclohexane	NA	5 U	5 U	5 U	5 U	**6.6**	5 U	5 U	5 U	5 U	5 U
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Naphthalene	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
o-Xylene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
sec-Butylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
tert-Butylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene (PCE)	5	5 U	5 U	**100**	**53**	**750** J	**650** D	5 U	5 U	5 U	5 U
Toluene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
trans-1,2-Dichloroethene	5	5 U	5 U	5 U	5 U	**2.6** J	**4** J	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	0.4	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Trichloroethene (TCE)	5	5 U	5 U	5 U	5 U	340 U	**620** D	5 U	5 U	5 U	5 U
Trichlorofluoromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl acetate	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl chloride	2	5 U	5 U	5 U	5 U	**34**	**170**	5 U	5 U	5 U	5 U
Xylene (Total)	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ	5 U

Table 3
VOCs in Groundwater
Crystal Cleaners, Pelham, New York

	Station ID:	MW-C07	MW-C07 Dup	MW-C07	MW-C08	MW-C08	MW-C09	MW-C10	MW-C11	MW-C12	MW-C13
	Sample ID:	MW-07	MW-57 DUP	MW-C07	MW-08	MW-C08	MW-C09	MW-C10	MW-C11	MW-C12	MW-C13
	Sample Date:	10/25/2011	10/25/2011	3/2/2012	10/25/2011	3/2/2012	3/1/2012	3/1/2012	11/14/2012	3/1/2012	3/1/2012
	Aquifer:	Overburden	Overburden	Overburden	Overburden	Overburden	Bedrock	Bedrock	Bedrock	Overburden	Overburden
Unit: µg/L	Class GA	Env. Sample	Env. Duplicate	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
1,1,1,2-Tetrachloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
1,1,1-Trichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
1,1,2-Trichloroethane	1	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
1,1-Dichloroethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
1,1-Dichloroethene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
1,1-Dichloropropene	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
1,2,3-Trichlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
1,2,3-Trichloropropane	0.04	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
1,2,4-Trichlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
1,2,4-Trimethylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
1,2-Dibromo-3-chloropropane	0.04	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 UJ	5 U	5 U
1,2-Dibromoethane	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
1,2-Dichlorobenzene	3	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
1,2-Dichloroethane	0.6	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
1,2-Dichloropropane	1	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
1,3,5-Trimethylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
1,3-Dichlorobenzene	3	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
1,3-Dichloropropane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
1,4-Dichlorobenzene	3	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
1,4-Dioxane	NA	R	R	R	R	R	R	R	NA	R	R
2,2-Dichloropropane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
2-Butanone	50	R	R	R	R	R	5 U	5 U	10 U	5 U	5 U
2-Chlorotoluene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
2-Hexanone	50	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 UJ	5 U	5 U
4-Chlorotoluene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
4-Isopropyltoluene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
4-Methyl-2-pentanone	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 UJ	5 U	5 U
Acetone	50	R	R	R	R	R	5 UJ	5 UJ	10 U	5 UJ	5 UJ
Benzene	1	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Bromobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
Bromochloromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
Bromodichloromethane	50	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Bromoform	50	5 UJ	5 UJ	5 U	5 UJ	5 U	5 U	5 U	10 U	5 U	5 U
Bromomethane	5	5 U	5 U	5 UJ	5 U	5 UJ	5 U	5 U	10 UJ	5 U	5 U
Carbon disulfide	60	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Carbon tetrachloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Chlorobenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Chloroethane	5	5 U	5 U	5 UJ	5 U	5 UJ	5 U	5 U	10 U	5 U	5 U
Chloroform	7	5 U	5 U	5 U	5 U	5 U	**1.1** J	5 U	**1.1** J	5 U	5 U
Chloromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
cis-1,2-Dichloroethene	5	**33**	**33**	**2.3** J	**7.5**	**7.4**	**92**	**91**	**27**	5 U	5 U

Table 3
VOCs in Groundwater
Crystal Cleaners, Pelham, New York

	Station ID:	MW-C07	MW-C07 Dup	MW-C07	MW-C08	MW-C08	MW-C09	MW-C10	MW-C11	MW-C12	MW-C13
	Sample ID:	MW-07	MW-57 DUP	MW-C07	MW-08	MW-C08	MW-C09	MW-C10	MW-C11	MW-C12	MW-C13
	Sample Date:	10/25/2011	10/25/2011	3/2/2012	10/25/2011	3/2/2012	3/1/2012	3/1/2012	11/14/2012	3/1/2012	3/1/2012
	Aquifer:	Overburden	Overburden	Overburden	Overburden	Overburden	Bedrock	Bedrock	Bedrock	Overburden	Overburden
Unit: µg/L	Class GA	Env. Sample	Env. Duplicate	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
cis-1,3-Dichloropropene	0.4	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Cyclohexane	NA	5 U	5 U	5 U	5 U	5 U	**12**	5 U	10 U	5 U	5 U
Dibromochloromethane	50	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Dibromomethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
Dichlorodifluoromethane	5	5 U	5 U	5 U	5 U	5 U	5 UJ	5 UJ	10 UJ	5 UJ	5 UJ
Ethylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Hexachlorobutadiene	0.5	5 U	5 U	5 UJ	5 U	5 UJ	5 U	5 U	NA	5 U	5 U
Iodomethane	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
Isopropylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
m,p-Xylene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
Methyl acetate	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Methyl tert-butyl ether	10	5 U	5 U	5 U	5 U	5 U	**3.3** J	**9.6**	**90**	5 U	5 U
Methylcyclohexane	NA	5 U	5 U	5 U	5 U	5 U	**2.7** J	5 U	10 U	5 U	5 U
Methylene chloride	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Naphthalene	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
o-Xylene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
sec-Butylbenzene	5	5 U	5 U	5 U	5 U	5 U	**1.5** J	5 U	NA	5 U	5 U
Styrene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
tert-Butylbenzene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
Tetrachloroethene (PCE)	5	**53**	**58**	6.2 U	**37**	**27**	**340** D	**1400** D	**790**	5 U	5 U
Toluene	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
trans-1,2-Dichloroethene	5	5 U	5 U	5 U	5 U	5 U	**7.3**	5 U	10 U	5 U	5 U
trans-1,3-Dichloropropene	0.4	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Trichloroethene (TCE)	5	**12**	**13**	**1.1** J	**7**	**11**	**440** D	**99**	**44**	5 U	5 U
Trichlorofluoromethane	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U
Vinyl acetate	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	NA	5 U	5 U
Vinyl chloride	2	5 U	5 U	5 U	5 U	5 U	**5.2**	5 U	10 U	5 U	5 U
Xylene (Total)	5	5 U	5 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U

Table 3
VOCs in Groundwater
Crystal Cleaners, Pelham, New York

	Station ID:	MW-C13 Dup	MW-C14	MW-C15	MW-C16	MW-C16 Dup	TWP-1	TWP-2	TWP-3
	Sample ID:	MW-C63	MW-C14	MW-C15	MW-C16	MW-C66	TWP-1	TWP-2	TWP-3
	Sample Date:	3/1/2012	11/14/2012	11/14/2012	11/14/2012	11/14/2012	10/16/2012	10/16/2012	9/10/2013
	Aquifer:	Overburden	Overburden	Bedrock	Bedrock	Bedrock	Overburden	Overburden	Overburden
Unit: µg/L	Class GA	Env. Duplicate	Env. Sample	Env. Sample	Env. Sample	Env. Duplicate	Env. Sample	Env. Sample	Env. Sample
1,1,1,2-Tetrachloroethane	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	NA
1,1,1-Trichloroethane	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	1	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloropropene	NA	5 U	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	5	5 U	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	0.04	5 U	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
1,2,4-Trimethylbenzene	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	NA
1,2-Dibromo-3-chloropropane	0.04	5 U	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 UJ
1,2-Dibromoethane	NA	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	3	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	0.6	5 U	10 U	10 U	**2.5** J	**2.5** J	10 U	10 U	10 U
1,2-Dichloropropane	1	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3,5-Trimethylbenzene	5	5 U	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	3	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichloropropane	5	5 U	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	3	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dioxane	NA	R	NA	NA	NA	NA	NA	NA	NA
2,2-Dichloropropane	5	5 U	NA	NA	NA	NA	NA	NA	NA
2-Butanone	50	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
2-Chlorotoluene	5	5 U	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	5 U	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 UJ
4-Chlorotoluene	5	5 U	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	5	5 U	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	5 U	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 UJ
Acetone	50	5 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	1	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromobenzene	5	5 U	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	5	5 U	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	50	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	50	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
Bromomethane	5	5 U	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 UJ
Carbon disulfide	60	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	7	5 U	10 U	10 U	**2.8** J	**2.8** J	10 U	10 U	10 U
Chloromethane	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene	5	5 U	**62**	**18**	**37**	**37**	**510** D	**26**	**8** J

Table 3
VOCs in Groundwater
Crystal Cleaners, Pelham, New York

	Station ID:	MW-C13 Dup	MW-C14	MW-C15	MW-C16	MW-C16 Dup	TWP-1	TWP-2	TWP-3
	Sample ID:	MW-C63	MW-C14	MW-C15	MW-C16	MW-C66	TWP-1	TWP-2	TWP-3
	Sample Date:	3/1/2012	11/14/2012	11/14/2012	11/14/2012	11/14/2012	10/16/2012	10/16/2012	9/10/2013
	Aquifer:	Overburden	Overburden	Bedrock	Bedrock	Bedrock	Overburden	Overburden	Overburden
Unit: µg/L	Class GA	Env. Duplicate	Env. Sample	Env. Sample	Env. Sample	Env. Duplicate	Env. Sample	Env. Sample	Env. Sample
cis-1,3-Dichloropropene	0.4	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	NA	5 U	10 U	10 U	**5.2** J	**5.2** J	10 U	10 U	10 U
Dibromochloromethane	50	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromomethane	5	5 U	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	5	5 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U	10 UJ
Ethylbenzene	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	0.5	5 U	NA	NA	NA	NA	NA	NA	NA
Iodomethane	NA	5 U	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
m,p-Xylene	5	5 U	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	NA	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl tert-butyl ether	10	5 U	10 U	**18**	**35**	**35**	10 U	10 U	10 U
Methylcyclohexane	NA	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene chloride	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	NA	5 U	NA	NA	NA	NA	NA	NA	NA
o-Xylene	5	5 U	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	5	5 U	NA	NA	NA	NA	NA	NA	NA
Styrene	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
tert-Butylbenzene	5	5 U	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene (PCE)	5	5 U	**150**	**560**	**310**	**310**	**610**	**20**	**17**
Toluene	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,2-Dichloroethene	5	5 U	10 U	10 U	**6.4** J	**6.6** J	**1** J	10 U	10 U
trans-1,3-Dichloropropene	0.4	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene (TCE)	5	**1.4** J	**17**	**22**	**170**	**170**	**72**	**4** J	**2** J
Trichlorofluoromethane	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 UJ
Vinyl acetate	NA	5 U	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2	5 U	10 U	10 U	**2.1** J	**2.1** J	10 U	10 U	10 U
Xylene (Total)	5	5 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U

Table 3
VOCs in Groundwater
Crystal Cleaners, Pelham, New York

	Station ID:	TWP-4	TWP-4	TWP-5	TWP-6	TWP-7	TWP-12	TWP-13
	Sample ID:	TWP-4	TWP-54	TWP-5	TWP-6	TWP-7	TWP-12	TWP-13
	Sample Date:	9/10/2013	9/10/2013	9/10/2013	9/10/2013	9/10/2013	4/16/2014	4/16/2014
	Aquifer:	Overburden	Overburden	Overburden	Overburden	Overburden	Overburden	Overburden
Unit: µg/L	Class GA	Env. Duplicate	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
1,1,1,2-Tetrachloroethane	5	NA	NA	NA	NA	NA	NA	NA
1,1,1-Trichloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2,2-Tetrachloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1,2-Trichloroethane	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloroethene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,1-Dichloropropene	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	5	NA	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	0.04	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	5	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
1,2,4-Trimethylbenzene	5	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.04	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	R	R
1,2-Dibromoethane	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloroethane	0.6	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,2-Dichloropropane	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3,5-Trimethylbenzene	5	NA	NA	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,3-Dichloropropane	5	NA	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	3	10 U	10 U	10 U	10 U	10 U	10 U	10 U
1,4-Dioxane	NA	NA	NA	NA	NA	NA	NA	NA
2,2-Dichloropropane	5	NA	NA	NA	NA	NA	NA	NA
2-Butanone	50	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U
2-Chlorotoluene	5	NA	NA	NA	NA	NA	NA	NA
2-Hexanone	50	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
4-Chlorotoluene	5	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	5	NA	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Acetone	50	10 U	10 U	10 U	10 U	10 U	25	10 U
Benzene	1	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromobenzene	5	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	5	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Bromoform	50	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U
Bromomethane	5	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U
Carbon disulfide	60	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbon tetrachloride	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chlorobenzene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroform	7	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloromethane	5	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
cis-1,2-Dichloroethene	5	**190**	**200**	**4** J	**49**	**270**	10 U	10 U

Table 3
VOCs in Groundwater
Crystal Cleaners, Pelham, New York

	Station ID:	TWP-4	TWP-4	TWP-5	TWP-6	TWP-7	TWP-12	TWP-13
	Sample ID:	TWP-4	TWP-54	TWP-5	TWP-6	TWP-7	TWP-12	TWP-13
	Sample Date:	9/10/2013	9/10/2013	9/10/2013	9/10/2013	9/10/2013	4/16/2014	4/16/2014
	Aquifer:	Overburden	Overburden	Overburden	Overburden	Overburden	Overburden	Overburden
Unit: µg/L	Class GA	Env. Duplicate	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
cis-1,3-Dichloropropene	0.4	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cyclohexane	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromochloromethane	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibromomethane	5	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	5	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Ethylbenzene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Hexachlorobutadiene	0.5	NA	NA	NA	NA	NA	NA	NA
Iodomethane	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U
m,p-Xylene	5	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	NA	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Methyl tert-butyl ether	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylcyclohexane	NA	10 U	10 U	10 U	10 U	10 U	10 UJ	10 UJ
Methylene chloride	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	5	NA	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	5	NA	NA	NA	NA	NA	NA	NA
Styrene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U
tert-Butylbenzene	5	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene (PCE)	5	**320**	**330**	**7** J	**57**	**770**	**17**	10 U
Toluene	5	10 U	10 U	10 U	10 U	10 U	**9** J	**2** J
trans-1,2-Dichloroethene	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U
trans-1,3-Dichloropropene	0.4	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichloroethene (TCE)	5	**42**	**42**	10 U	**10**	**87**	10 U	10 U
Trichlorofluoromethane	5	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 U	10 U
Vinyl acetate	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Xylene (Total)	5	10 U	10 U	10 U	10 U	10 U	10 U	10 U

TWP-1 through TWP-7, TWP-12, and TWP-13 are temporary wells.
Dup - Field duplicate sample
U - Not detected
J - Estimated
R - Rejected
D - Value from dilution
NA - Not available
Detections are bolded
Exceedances are highlighted

Table 4
Standards, Criteria, and Guidance

Chemical-Specific

Title	Citation	Description/applicability
Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations	6 New York Codes, Rules and Regulations [NYCRR] 700-706 Water Quality Regulations; especially Part 703.5; summarized in TOGS 1.1.1.	Groundwater (Class GA) standards and guidance values; applicable. Establishes long-term remediation goals. PCE: 5 µg/L, TCE: 5 µg/L, cis-1,2-DCE: 5 µg/L, and vinyl chloride: 2 µg/L
New York Public Water Supplies	10 NYCRR 5-1.52 (Tables); 10 NYCRR 170.4 (Standards for Raw Water)	Drinking Water standards; relevant. May be used where groundwater standard may not be protective of aquifer use for potable water supply. Principle Organic Contaminant Maximum Contaminant Level: 5 µg/L (Table 3)
Primary Drinking Water Regulations – Maximum Contaminant Levels	40 CFR 141.61	Establishes federal maximum contaminant levels for organic contaminants in drinking water; relevant where it addresses contaminants not included in state standards, or has more stringent criteria. PCE: 5 µg/L, TCE: 5 µg/L, cis-1,2-DCE: 70 µg/L, and vinyl chloride: 2 µg/L
Ambient (Surface Water) standards and guidance values	NYCRR 700-706; especially Part 701 (establishes water classes); (designates the Hutchingson River, NY as Class SB)	Surface Water Standards (Class SB); PCE: none, TCE: 40 µg/L, cis-1,2-DCE: none, and vinyl chloride: none
Remedial Program Soil Cleanup Objectives	6 NYCRR Part 375-6.8, restricted and unrestricted criteria	Unrestricted - PCE: 1.3 mg/kg, TCE: 0.47 mg/kg, cis-1,2-DCE: 0.25 mg/kg, and vinyl chloride: 0.02 mg/kg

Table 4, Continued
Standards, Criteria, and Guidance

Action-Specific

Title	Citation	Description/applicability
Hazardous Waste Regulations	6 NYCRR Part 370	Potentially applicable for off-site disposal of contaminated groundwater classified as hazardous waste
Solid Waste Regulations	6 NYCRR Part 360	Potentially applicable for off-site disposal of contaminated groundwater classified as hazardous waste
Selection of remedial actions at hazardous waste disposal sites	NYSDEC TAGM 4030	This TAGM provides guidelines to select an appropriate remedy at State Superfund sites, and sets forth a hierarchy of remedial technology treatments consistent with SARA and RCRA land disposal restrictions.
Guidelines for the Control of Toxic Ambient Air Contaminants	Air Guide 1	Potentially applicable for alternatives with discharges to air (e.g., air stripping)
Underground Injection/ Recirculation at Groundwater Remediation Sites	NYSDEC T.O.G.S. 2.1.2	Potentially applicable for alternatives involving re-injection of groundwater
Surface water standards	6 NYCRR 701.8 (best uses for Class SB); 6 NYCRR 703.5; TOGS 1.1.1.	Potentially applicable for alternatives with discharges to surface water
Municipal Code Discharge Restrictions	Pelham Municipal Code	Potentially Applicable for alternatives with discharges to sanitary sewer system
Stormwater discharge permit	State Pollutant Discharge Elimination System (SPDES); Westchester County Code; Pelham Municipal Code	Potentially applicable for discharges to stormwater sewer system

Table 5
Preliminary Screening of Technologies for Groundwater
Crystal Cleaners, Pelham, NY

General Response	Technology	Process	Description	Applicability to Site
No Action	(n/a)	(n/a)	(n/a)	**Applicable - Retained as a baseline to compare other remedial alternatives against.**
Limited Action	Institutional Controls	Environmental Easement	Non-physical means of enforcing a restriction on the site that limits exposure and use of impacted groundwater and prevents actions that would interfere with the remedial program.	**Applicable- May be required in addition to remediation, depending on the selected remedy.**
		Deed Restriction		
		Environmental Notice		
	Environmental Monitoring	Groundwater Monitoring	Monitoring natural attenuation mechanisms, and plume mobility. Assumes plume is stable.	**Applicable- May be required in addition to remediation.**
		Monitored Natural Attenuation		
Containment	Physical Containment	Slurry Wall, Solidification, Sheet Pile	Geotechnical methods for the isolation of source areas, thus preventing the ongoing migration of contaminants. Methods include sheet pile walls, diaphragm walls and bentonite slurry walls. Barrier will likely alter natural groundwater flow paths.	Not Applicable- This is a passive technology that would not treat VOCs within the plume, and therefore volatilization and indoor air exposures would remain. Requires significant civil works to install barrier wall.
	Hydraulic Containment	Induced Drawdown - Pump and Treat	Proven method for containment of dissolved phase contaminants. Extraction wells intercept groundwater and recirculate back to upgradient injection locations until contaminants have attenuated.	Not Applicable- Low permeability soils make this technology infeasible in the glacial till. Potentially applicable to the bedrock aquifer. Requires installation of extraction wells. Requires long-term infrastructure and operation.

Table 5
Preliminary Screening of Technologies for Groundwater
Crystal Cleaners, Pelham, NY

General Response	Technology	Process	Description	Applicability to Site
In-situ Treatment	Biological Treatment	Aerobic	Aerobic bioremediation enhances biodegradation with the addition of oxygen and/or limiting nutrients to subsurface.	Not Applicable - Aerobic bioremediation process will not treat the primary site contaminants and is only applicable to specific CVOCs (e.g. vinyl chloride) found in groundwater at the Site.
		Anaerobic	Anaerobic bioremediation enhances anaerobic reductive degradation by adding electron donor (carbon substrate and/or nutrients) to stimulate the microbial activity of dechlorinating bacteria.	**Applicable - Anaerobic bioremediation process is highly effective for CVOCs found in groundwater at the Site. Based on presence of daughter products, reductive degradation may be occurring naturally.**
		Bioaugmentation	Bioaugmentation consists of adding a known contaminant-degrading microbial culture (e.g. KB-1) to accelerate the bioremediation process.	**Applicable- Additional microbial cultures may enhance and/or increase the rate of biodegradation at the Site.**
		Colloidal Activated Carbon	Colloidal activated carbon is injected, dissolved phased contaminants sorb into the carbon,partition onto the surface of the carbon, and degrade with the aid of contaminant-degrading bacteria.	**Applicable- Colloidal Activated Carbon treatment is applicable to CVOCs. Likely to need one injection only. May result in higher rates of degradation that other types of injection.**
	Chemical Treatment	In-situ Chemical Oxidation (Injection)	Apply chemical oxidant into subsurface for oxidation/destruction of contaminants in soil and groundwater. Strong oxidants require careful handling procedures.	**Applicable- Chemical oxidation has been demonstrated to directly treat all site contaminants (CVOCs). Injection into lower permeability soils requires conservative design and more injection points. In-situ soil mixing allows for effective contact between oxidants and VOCs.**
		In-Situ Chemical Oxidation (Soil Mixing)		
		In-situ Chemical Reduction	Inject amendments to treat subsurface contaminants through reduction reactions (i.e., zero valent iron).	**Applicable- In-situ Chemical Reduction is most commonly applied for CVOCs. In-situ chemical reduction also enhances bioremediation of CVOCs by reductive dechlorination.**

Table 5
Preliminary Screening of Technologies for Groundwater
Crystal Cleaners, Pelham, NY

General Response	Technology	Process	Description	Applicability to Site
In-situ Treatment	Physical Treatment	Air Sparging	Strips VOCs from groundwater through addition of air below treatment zone, transferring VOCs to vapor phase for extraction and can enhance aerobic biodegradation by injecting air and providing oxygen source.	Not Applicable- Low permeability soils make this technology infeasible
		Electrical Resistive Heating (ERH)/Thermal Conductive Heating (TCH)	In-situ thermal remediation generates heat in-situ or applies heat directly to the subsurface, raising the temperature to above the boiling point of the target VOC contaminants (typically ~100°C or greater) and evaporating VOCs from the soil. Vapors are collected from the subsurface through soil vapor extraction wells for subsequent above-ground treatment.	Not Applicable- In-situ thermal treatment is more expensive than other in-situ treatment processes, but can complete treatment in a shorter time frame. Technology is applicable to both unsaturated and saturated soil. Utilities as well as active operations on the site may complicate design.
		Pump and Treat	Impacted groundwater is pumped from the subsurface and treated ex-situ using air strippers, adsorption, and/or filtration	Not Applicable - Low permeability soils make this technology infeasible for the overburden. Potentially applicable for the bedrock. Technology may provide plume containment but contaminant removal could be limited in diffusion-limiting geology. Pump and treat requires long-term infrastructure and operation.
		High Vacuum Multi-phase Extraction (MPE)	Utilize high vacuums to extract groundwater and expose impacted upper saturated zone soil for vapor extraction. Provides aggressive contaminant removal. Ideally applied in 48-hour continuous events.	Not Applicable- Low permeability soils make this technology infeasible

Table 5
Preliminary Screening of Technologies for Groundwater
Crystal Cleaners, Pelham, NY

General Respons e	Technology	Process	Description	Applicability to Site
Removal	Excavation	Off-Site Disposal	Contaminated soils would be removed and transported to an off-site disposal facility.	Not Applicable - Well-delineated hot spots of contaminated soil were not identified in the RI.
		On-Site Treatment and Backfill	Contaminated soils will be excavated and thermally treated. The treated soils will be backfilled.	Not Applicable - Well-delineated hot spots of contaminated soil were not identified in the RI. Also, although thermal soil treatment units are applicable for CVOCs, due to the small treatment area and volume, on-site treatment will not be cost effective.

Table 6
Preliminary Screening of Technologies for Soil
Crystal Cleaners, Pelham, NY

General Response Actions	Technology	Process	Description	Applicability to Site
No Action	(n/a)	(n/a)	(n/a)	**Applicable - Retained as a baseline.**
Limited Action	Institutional Controls	Environmental Easement	Non-physical means of enforcing a restriction on the site that limits exposure and prevents actions that would interfere with the remedial program.	**Applicable - May be required if soils remain in situ.**
		Deed Restriction		
		Environmental Notice		
Treatment	In Situ	Bioremediation	In-situ degradation of contaminants by microbes, enhanced by additives.	Not Applicable- Generally not effective on CVOCs.
		Thermal	Thermal conduction heating introduced by heater elements hung in borings is used to mobilize and extract the contaminants.	Not Applicable - Although effective, implementation would be costly given the relatively small quantity of material to be treated. The heat may damage underground structures and utilities on the DPW property.
Removal	Excavation	Off-Site Disposal	Contaminated soils would be removed and transported to an off-site disposal facility.	**Applicable**
		On-Site Treatment and Backfill	Contaminated soils will be excavated and thermally treated by thermal desorption, incineration, or bioremediation. The treated soils will be backfilled.	Not Applicable - Well-delineated hot spots of contaminated soil were not identified in the RI. Also, although thermal soil treatment units are applicable for CVOCs, due to the small treatment area and volume, on-site treatment will not be cost effective.

Table 7
Criteria Comparison and Ranking of Remedial Alternatives

Alternative	Overall Protection of Human Health & the Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, and Volume through Treatment	Short-Term Impacts and Effectiveness	Implementability	Land Use	Green Remediation	Cost (Present Value, $thousand)	Average Ranking
Remedial Alternatives (Ranking scale of 1 through 4, with 1 being least favorable and 4 being most favorable)										
Alternative 1 No Remedial Action with Institutional Controls	1 Alternative 1 would be least effective without any removal, immobilization, or containment of impacted materials, with only natural attenuation to treat impacted media without monitoring. Exposure is prevented by institutional controls.	1 Chemical SCGs may be met over a longer period of time; however, the alternative does not include monitoring to assess concentrations in site media.	1 Alternative 1 would be least effective as it does not involve removal, immobilization or containment of impacted materials. Alternative includes administrative means of preventing exposure.	1 Alternative 1 would reduce volume and toxicity over time due to natural attenuation. However, alternative does not include monitoring to evaluate reduction.	4 Alternative requires no remedial action.	4 Alternative 1 requires no technical action, and therefore is easy to implement.	1 Alternative includes institutional controls on soil and groundwater use.	4 Alternative 1 includes no removal, immobilization, or containment of impacted materials and does not include monitoring.	4 $151	**2.33**
Alternative 2 MNA with Institutional Controls	1 Alternative 2 would be ineffective without any removal, immobilization, or containment of impacted materials, with only natural attenuation to treat impacted media. Groundwater monitoring is included. Exposure to groundwater is prevented by institutional controls.	1 Chemical SCGs may be met over a longer period of time. Action-specific ARARs will be met. No location-specific ARARS were identified.	1 Alternative would be least effective as it does not involve removal, immobilization or containment of impacted materials. Alternative includes administrative means of preventing exposure.	1.5 Alternative would reduce volume and toxicity over time due to natural attenuation. Groundwater monitoring is included to evaluate the reduction.	4 Alternative requires no remedial action. There is limited potential exposure to contamination during well installation and sampling.	4 Alternative could be implemented easily.	1 Alternative includes institutional controls on soil and groundwater use.	3 Alternative would require off-site disposal of excavated material. Fuel required for groundwater sampling and worker transportation.	3.5 $744	**2.22**
Alternative 3 MNA with Institutional Controls and Soil Removal	2 Alternative 3 would be ineffective for groundwater without any removal, immobilization, or containment of impacted materials, with only natural attenuation to treat impacted media. Contaminated soil is removed Groundwater monitoring is included. Exposure to groundwater is prevented by institutional controls.	2 Chemical SCGs for groundwater may be met over a longer period of time. Chemical SCGs for soil will be met. Action-specific ARARs will be met. No location-specific ARARS were identified.	2 Alternative (excavation) permanently removes contaminants in soil. Alternative does not involve removal, immobilization or containment of impacted groundwater. Alternative includes administrative means of preventing exposure.	2 In the excavation area, Alternative would result in permanent reduction of mobility but does not reduce volume or toxicity (unless treatment performed at disposal facility). Volume and toxicity would be reduced over time due to natural attenuation. Alternative would reduce volume and toxicity in groundwater over time due to natural attenuation. Groundwater monitoring is included to evaluate the reduction.	3 Alternative has potential exposure to contamination during excavation for workers. Site-specific HASP and CAMP would be implemented to confirm that dust or volatilized organic vapors are within acceptable levels and specify additional engineering controls (e.g., use of water sprays and/or foam to suppress dust/vapors/odors) are needed. There is limited potential exposure to contamination during well installation and sampling.	3.5 Alternative could be implemented readily. Access to the DPW property for the soil removal is required. Utilities are present. Work may need to be scheduled on off-hours. An area for excavated soil will need to be established, preferably on the DPW property or parking area.	2 Alternative includes institutional controls on groundwater use. Temporary disruption of land use at the DPW, which may be mitigated by planning.	3.5 Alternative would require off-site disposal of excavated material. Fuel required for off-site soil disposal, soil excavation, groundwater sampling and worker transportation.	3 $1,150	**2.56**
Alternative 4 In-Situ Treatment of Overburden Groundwater (500 µg/L or greater PCE concentrations) plus MNA with Institutional Controls and Soil Removal	3 Alternative would be protective by permanently destroying site contaminants by in situ treatment in high concentration groundwater areas of the overburden. Contaminated soil is removed Groundwater monitoring is included. Exposure to groundwater is prevented by institutional controls until SCGs are met.	3 Alternative would meet chemical specific SCGs in shorter time than on alternatives relying on natural attenuation processes. Action-specific ARARs will be met. No location-specific ARARS were identified.	3 Alternative (excavation) permanently removes contaminants in soil. Alternative permanently treats/removes contaminants in high concentration areas of overburden, leaving the remainder to attenuate.	3 Alternative will result in permanent reduction in volume, toxicity, and mobility through in-situ treatment for groundwater in high concentration areas. The remainder of the overburden plume would reduce in volume and toxicity in groundwater over time due to natural attenuation. Groundwater monitoring is included to evaluate the reduction. See Alternative 3 for soil removal.	2 Alternative has potential exposure to contamination during excavation for workers. Site-specific HASP and CAMP would be implemented. Site remediation workers will be exposed to strong chemicals; proper PPE will be used by workers. There is limited potential exposure to contamination during injection, well installation, or sampling.	3 Alternative could be implemented readily. Same issues apply for soil removal as listed for Alternative 3. Access to private property required. Road opening permits required. Treatment chemicals are commercially available. Design would need to consider difficulties of treating site overburden including lower permeability soils.	3 Alternative includes institutional controls on groundwater use until the SCGs are met.	2 Alternative would require off-site disposal of excavated material. Fuel required for off-site soil disposal, soil excavation, groundwater sampling and worker transportation, well installation and injections.	2.5 $1556 - $2067	**2.72**

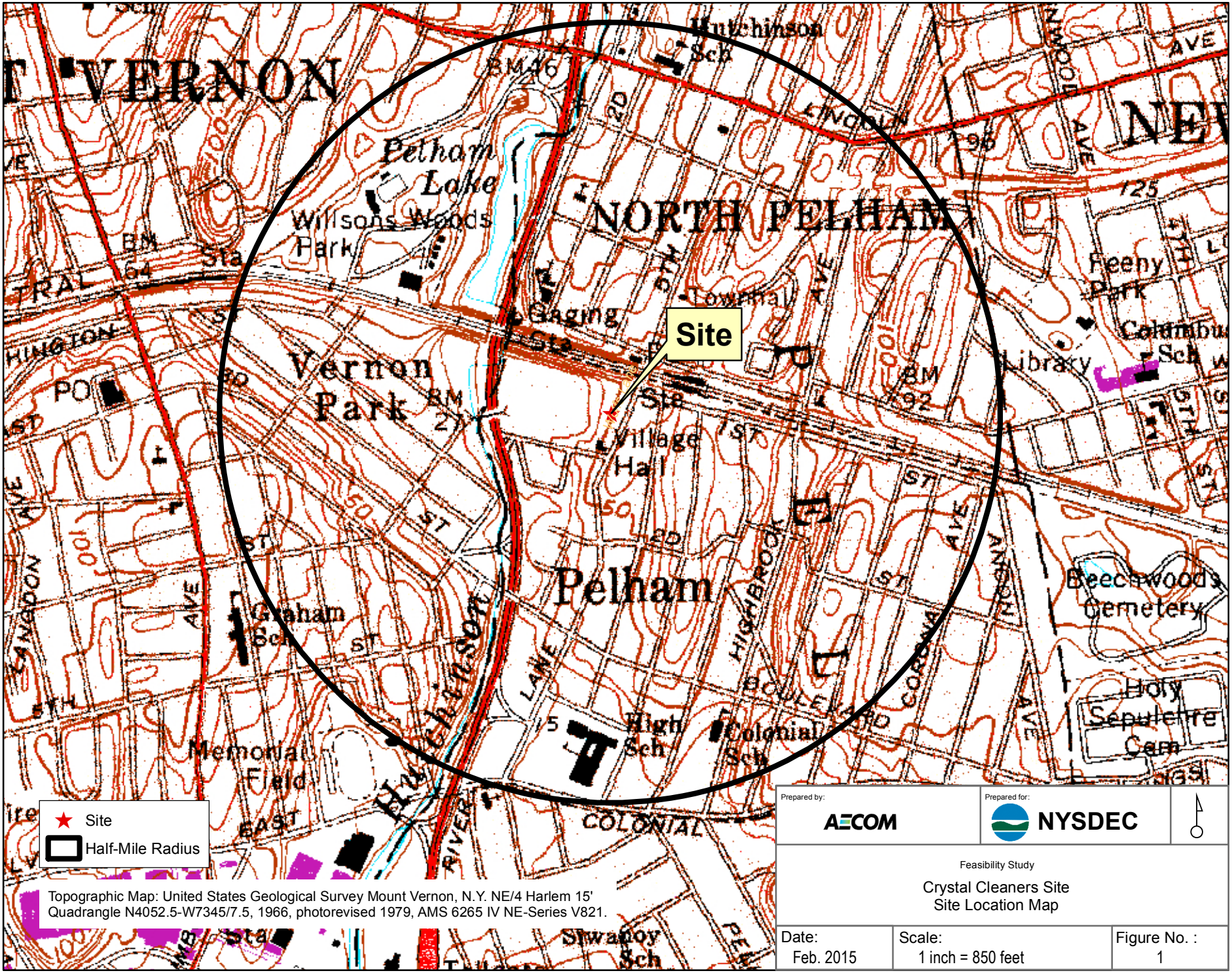
Table 7
Criteria Comparison and Ranking of Remedial Alternatives

Alternative	Overall Protection of Human Health & the Environment	Compliance with ARARs	Long-Term Effectiveness and Permanence	Reduction of Toxicity, Mobility, and Volume through Treatment	Short-Term Impacts and Effectiveness	Implementability	Land Use	Green Remediation	Cost (Present Value, $thousand)	Average Ranking
Alternative 5 In-Situ Treatment of Overburden (500 µg/L or greater PCE concentrations) and Bedrock (Limited Areas) Groundwater plus MNA with Institutional Controls and Soil Removal	3.5 Alternative would be protective by permanently destroying site contaminants by in situ treatment in high concentration groundwater areas. Contaminated soil is removed. Groundwater monitoring is included. Exposure to groundwater is prevented by institutional controls until SCGs are met.	3.5 Alternative would meet chemical specific SCGs in shorter time than on alternatives relying on natural attenuation processes. Action-specific ARARs will be met. No location-specific ARARS were identified.	3.5 Alternative (excavation) permanently removes contaminants in soil. Alternative permanently treats/removes contaminants in high concentration areas of overburden and bedrock, leaving the remainder to attenuate.	3 Alternative will result in permanent reduction in volume, toxicity, and mobility through in-situ treatment for groundwater in high concentration areas. The remainder of the plume would reduce in volume and toxicity in groundwater over time due to natural attenuation. Groundwater monitoring is included to evaluate the reduction. See Alternative 3 for soil removal.	2 Alternative has potential exposure to contamination during excavation for workers. Site-specific HASP and CAMP would be implemented. Site remediation workers will be exposed to strong chemicals; proper PPE will be used by workers. There is limited potential exposure to contamination during injection, well installation, or sampling.	2 Alternative could be implemented readily. Same issues apply for soil removal as listed for Alternative 3. Access to private property required. Road opening permits required. Treatment chemicals are commercially available. Design would need to consider difficulties of treating site overburden including lower permeability soils and bedrock.	3 Alternative includes institutional controls on groundwater use until the SCGs are met.	1.5 Alternative would require off-site disposal of excavated material. Fuel required for off-site soil disposal, soil excavation, groundwater sampling and worker transportation, well installation and injections.	2 $4,345	**2.67**
Alternative 6 In-Situ Treatment of Overburden (50 µg/L or greater PCE concentrations) and Bedrock (Limited Areas) Groundwater plus MNA (Limited to 5 years) and Soil Removal	4 Alternative would be protective by permanently destroying site contaminants by in situ treatment in high concentration groundwater areas. Contaminated soil is removed. Groundwater monitoring is included.	4 Alternative would meet chemical specific SCGs in shorter time than on alternatives relying on natural attenuation processes or treatment in primarily public areas. Action-specific ARARs will be met. No location-specific ARARS were identified.	4 Alternative (excavation) permanently removes contaminants in soil. Alternative permanently treats/removes contaminants in high concentration areas of overburden and bedrock, leaving the remainder to attenuate.	4 Alternative will result in permanent reduction in volume, toxicity, and mobility through in-situ treatment for groundwater in high concentration areas. The remainder of the plume would reduce in volume and toxicity in groundwater over time due to natural attenuation. See Alternative 3 for soil removal.	2 Alternative has potential exposure to contamination during excavation for workers. Site-specific HASP and CAMP would be implemented. Site remediation workers will be exposed to strong chemicals; proper PPE will be used by workers. There is limited potential exposure to contamination during injection, well installation, or sampling.	1 Alternative could be implemented readily. Same issues apply for soil removal as listed for Alternative 3. Access to numerous private property required. Road opening permits required. Treatment chemicals are commercially available. Design would need to consider difficulties of treating site overburden including lower permeability soils and bedrock.	4 No land use restrictions are anticipated for soil or groundwater.	1 Alternative would require off-site disposal of excavated material. Fuel required for off-site soil disposal, soil excavation, groundwater sampling and worker transportation, well installation and injections.	1 $10,406	**2.78**

Table 8
Remedial Action Alternatives-Cost Estimate Summary

Summary of Costs	1	2	3	4a	4b	4c	4d	5	6
Captial Costs (000)									
Total Construction Cost	$130	$144	$493	$1,060	$921	$740	$690	$2,874	$8,140
Contingencies (20%)	$7	$7	$25	$53	$46	$37	$35	$144	$407
Project Management (8%)	$10	$12	$39	$85	$74	$59	$55	$230	$651
Total Capital Cost	$147	$163	$557	$1,198	$1,041	$836	$780	$3,248	$9,198
Present Worth Capital Costs	$151	$168	$574	$1,235	$1,073	$862	$804	$3,349	$9,483
Annual O&M Costs									
Total Annual O&M Cost	$0	$40	$40	$108	$108	$156	$40	$243	$471
Contingency (20%)	$0	$2	$2	$5	$5	$8	$2	$12	$24
Project Management (8%)	$0	$3	$3	$9	$9	$13	$3	$19	$38
Total Annual O&M Cost	$0	$45	$45	$122	$122	$177	$45	$275	$532
Present Worth of O&M Costs (30 year life)	$0	$576	$576	$832	$834	$898	$752	$996	$922
Present Worth of Total Costs	**$151**	**$744**	**$1,150**	**$2,067**	**$1,908**	**$1,760**	**$1,556**	**$4,345**	**$10,406**

Alternatives:
1 - Limited Action (Easements)
2 - Limited Action (Easements) and MNA
3 - Easements, MNA, and Soil Removal at DPW
4a - Easements, MNA, Soil Removal at DPW, ISCO at PCE >= 500 µg/L in Overburden
4b - Easements, MNA, Soil Removal at DPW, ISCO+ERD at PCE >= 500 µg/L in Overburden
4c - Easements, MNA, Soil Removal at DPW, ZVI ERD at PCE >= 500 µg/L in Overburden
4d - Easements, MNA, Soil Removal at DPW, Colloidal Activated Carbon at PCE >= 500 µg/L in Overburden
5 - Easements, MNA, Soil Removal at DPW, ISCO at PCE >= 500 ug/L in Overburden and Limited Area of Bedrock
6 - Limited MNA, Soil Removal at DPW, ISCO at PCE >= 50 µg/L in Overburden and Limited Area of Bedrock



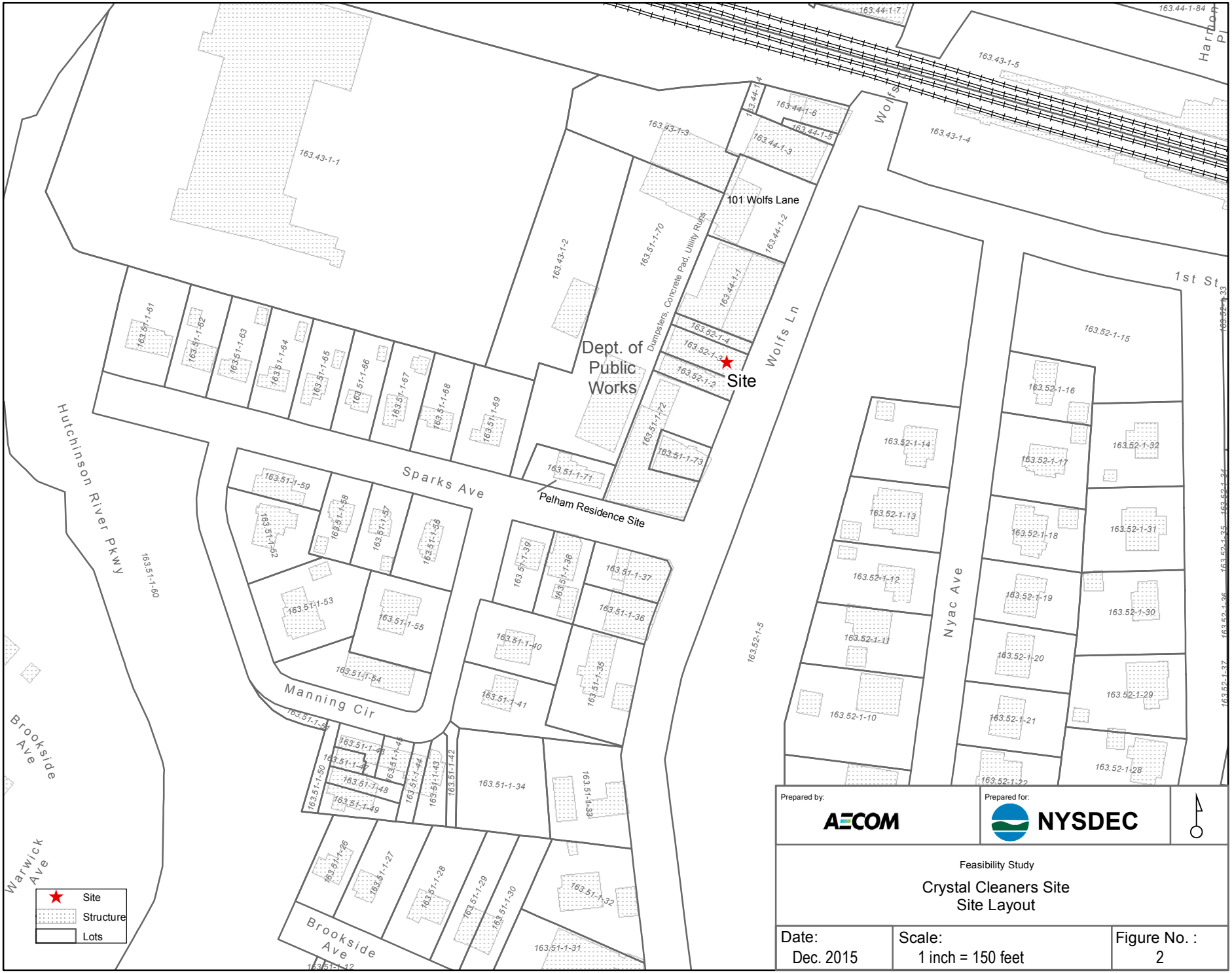
Prepared by: AECOM

Prepared for: NYSDEC

Feasibility Study

Crystal Cleaners Site
Site Location Map

Date:	Scale:	Figure No. :
Feb. 2015	1 inch = 850 feet	1



Prepared by: AECOM

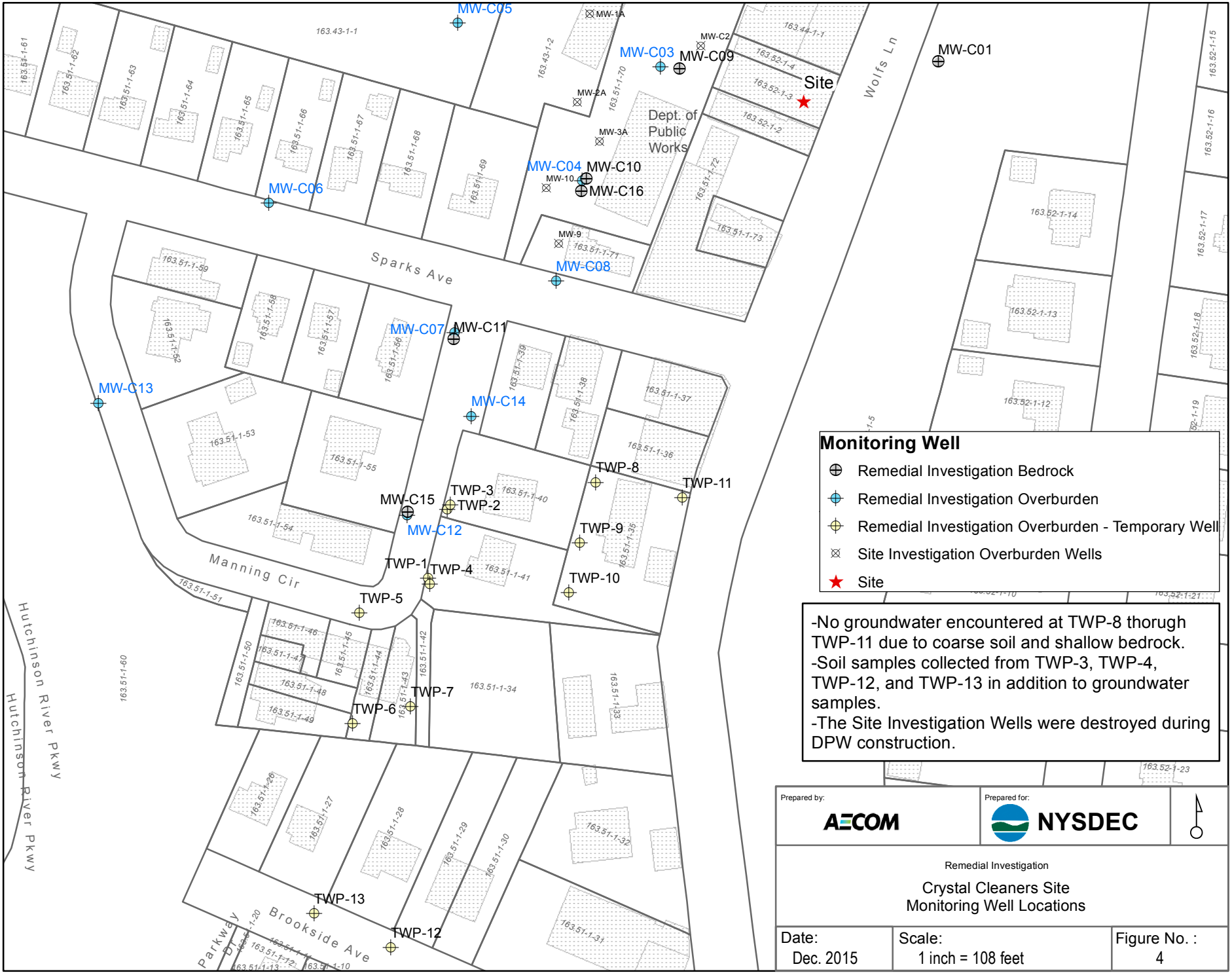
Prepared for: NYSDEC

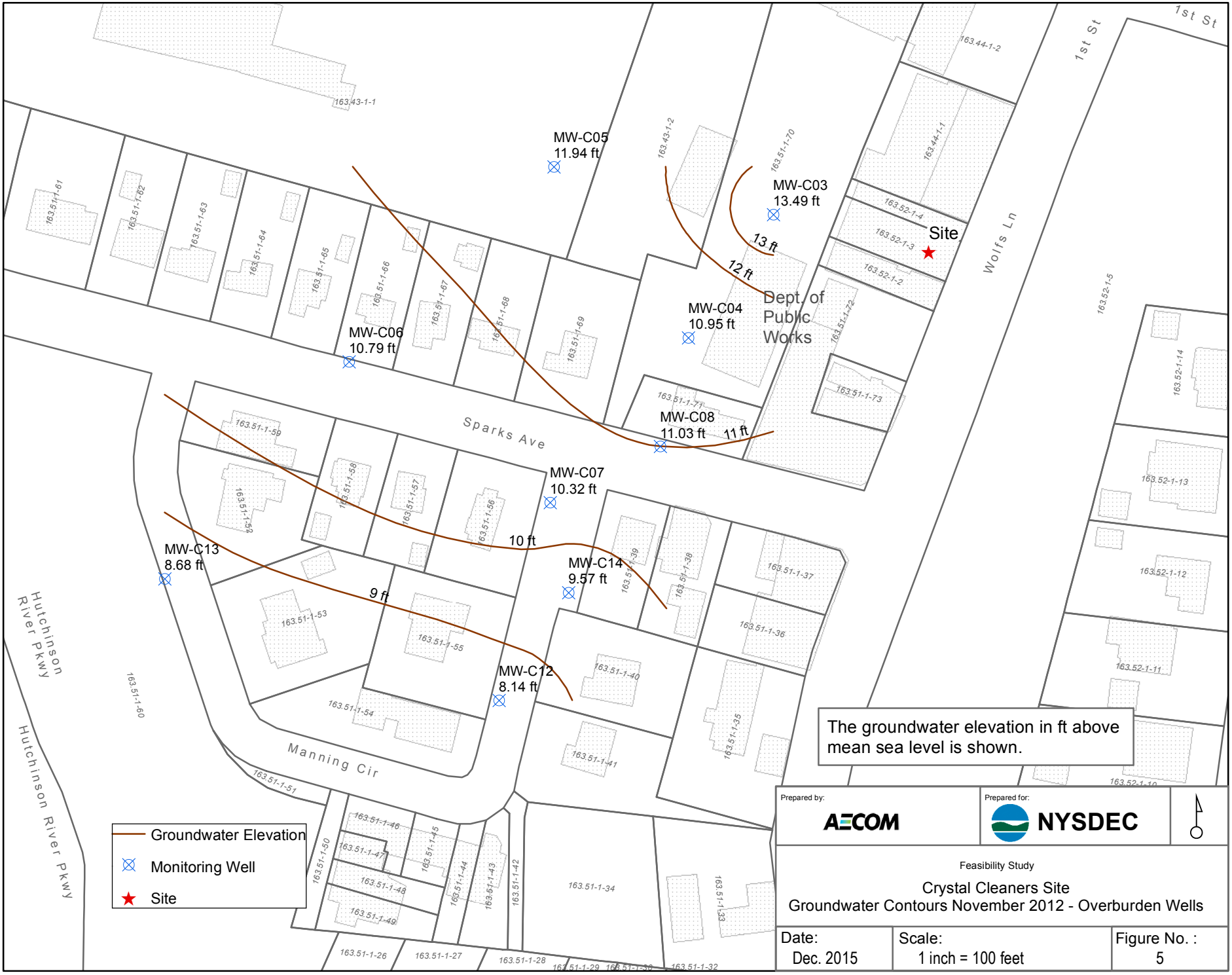
Feasibility Study

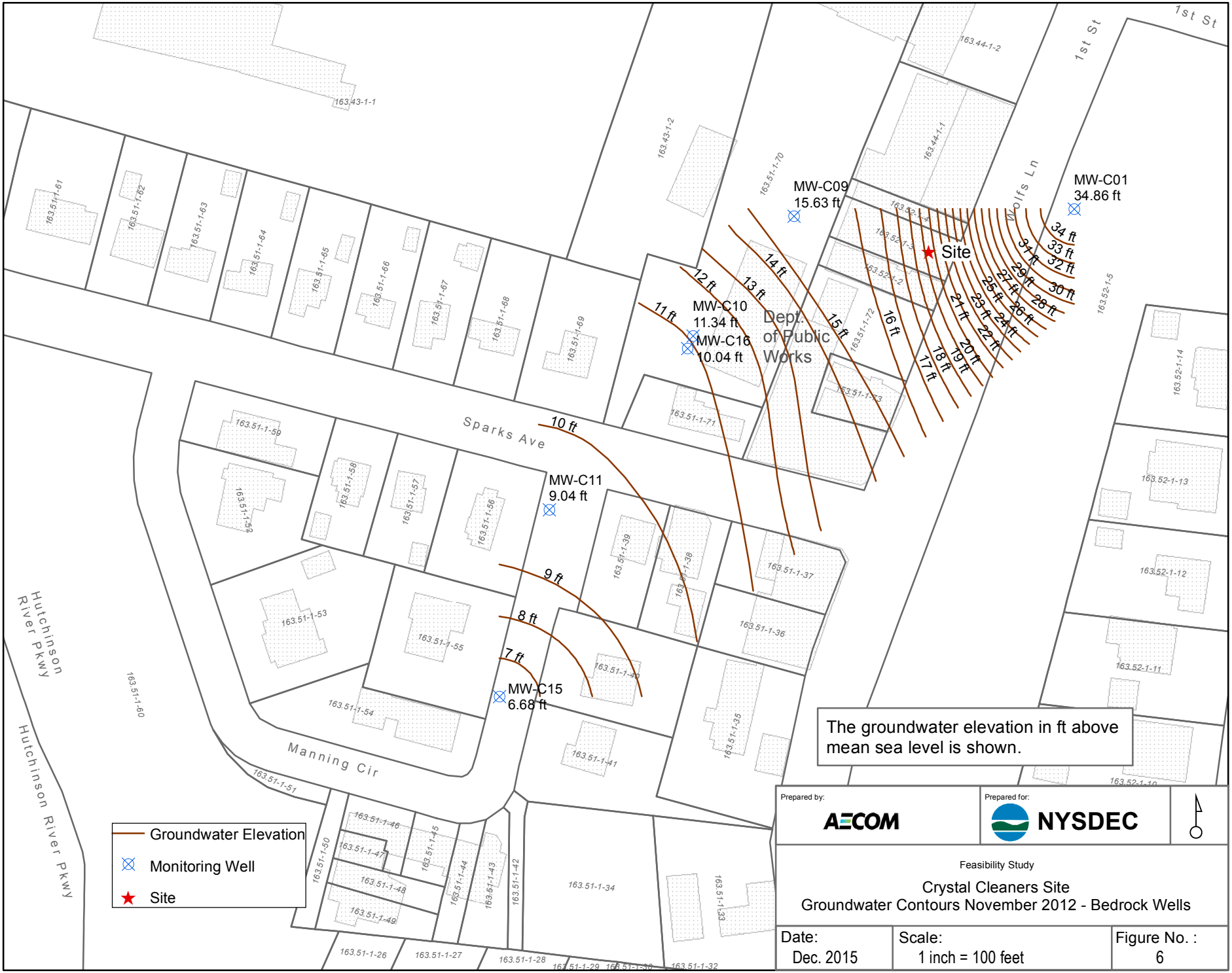
Crystal Cleaners Site
Site Layout

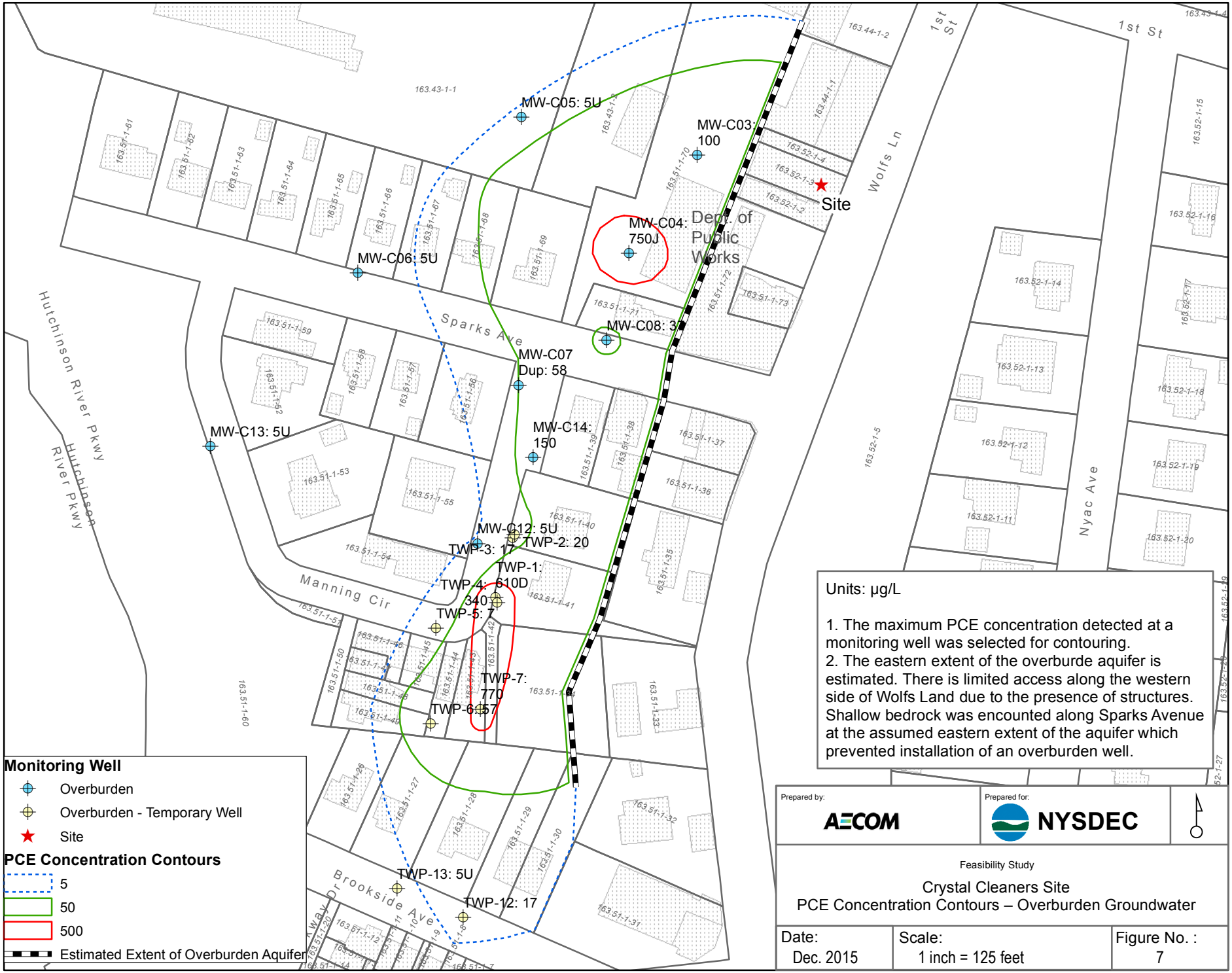
Date:	Scale:	Figure No. :
Dec. 2015	1 inch = 150 feet	2

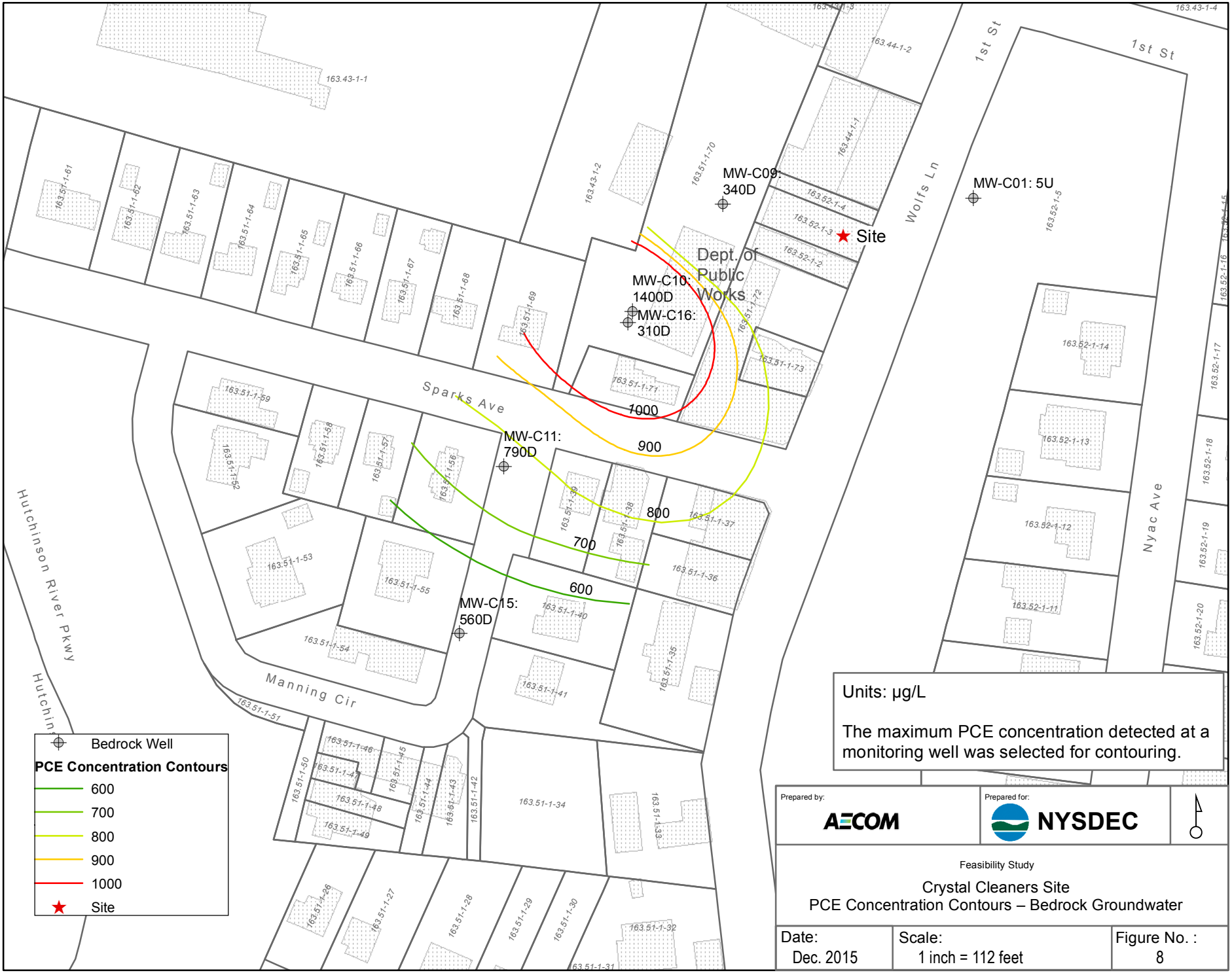
Dumpsters, Concrete Pad, Utility Ru
Dumpsters, Co
Dept. of Public Works
Dept. of Public Works
Site
Wolfs Ln
Wolfs Ln
1st St
Sparks Ave
Manning Cir
Hutchinson River Pkwy
Hutchinson River Pkwy
Brookside Ave
Warwick Ave
Parkway Dr
Carol Ave
Brookside Ave
Nyac Ave
TWP-3
TWP-4
TWP-13
TWP-12
SB-1
SB-2
SB-3
SB-4
SB-5
SB-9
SB-10
SB-11
SB-12
SB-13
SB-14
SB-15
SB-16
SB-17
SB-18
SB-19
Soil Borings
Overburden - Temporary Well Borings
Site
Structure
Lots
Prepared by:
AECOM
Prepared for:
NYSDEC
Feasibility Study
Crystal Cleaners Site
Soil Boring Locations
Date:
Dec. 2015
Scale:
1 inch = 150 feet
Figure No. :
3


MW-C05
MW-1A
MW-C2
MW-C03
MW-C09
MW-C01
Site
Wolfs Ln
MW-2A
Dept. of Public Works
MW-3A
MW-C04
MW-C10
MW-10
MW-C16
MW-C06
MW-9
MW-C08
Sparks Ave
MW-C07
MW-C11
MW-C13
MW-C14
TWP-8
TWP-11
MW-C15
TWP-3
TWP-2
MW-C12
TWP-9
TWP-1
TWP-4
TWP-10
Manning Cir
TWP-5
TWP-7
TWP-6
Hutchinson River Pkwy
TWP-13
TWP-12
Brookside Ave
Parkway
Monitoring Well
Remedial Investigation Bedrock
Remedial Investigation Overburden
Remedial Investigation Overburden - Temporary Well
Site Investigation Overburden Wells
Site
-No groundwater encountered at TWP-8 thorugh TWP-11 due to coarse soil and shallow bedrock.
-Soil samples collected from TWP-3, TWP-4, TWP-12, and TWP-13 in addition to groundwater samples.
-The Site Investigation Wells were destroyed during DPW construction.
Prepared by:
AECOM
Prepared for:
NYSDEC
Remedial Investigation
Crystal Cleaners Site
Monitoring Well Locations
Date:
Dec. 2015
Scale:
1 inch = 108 feet
Figure No. :
4

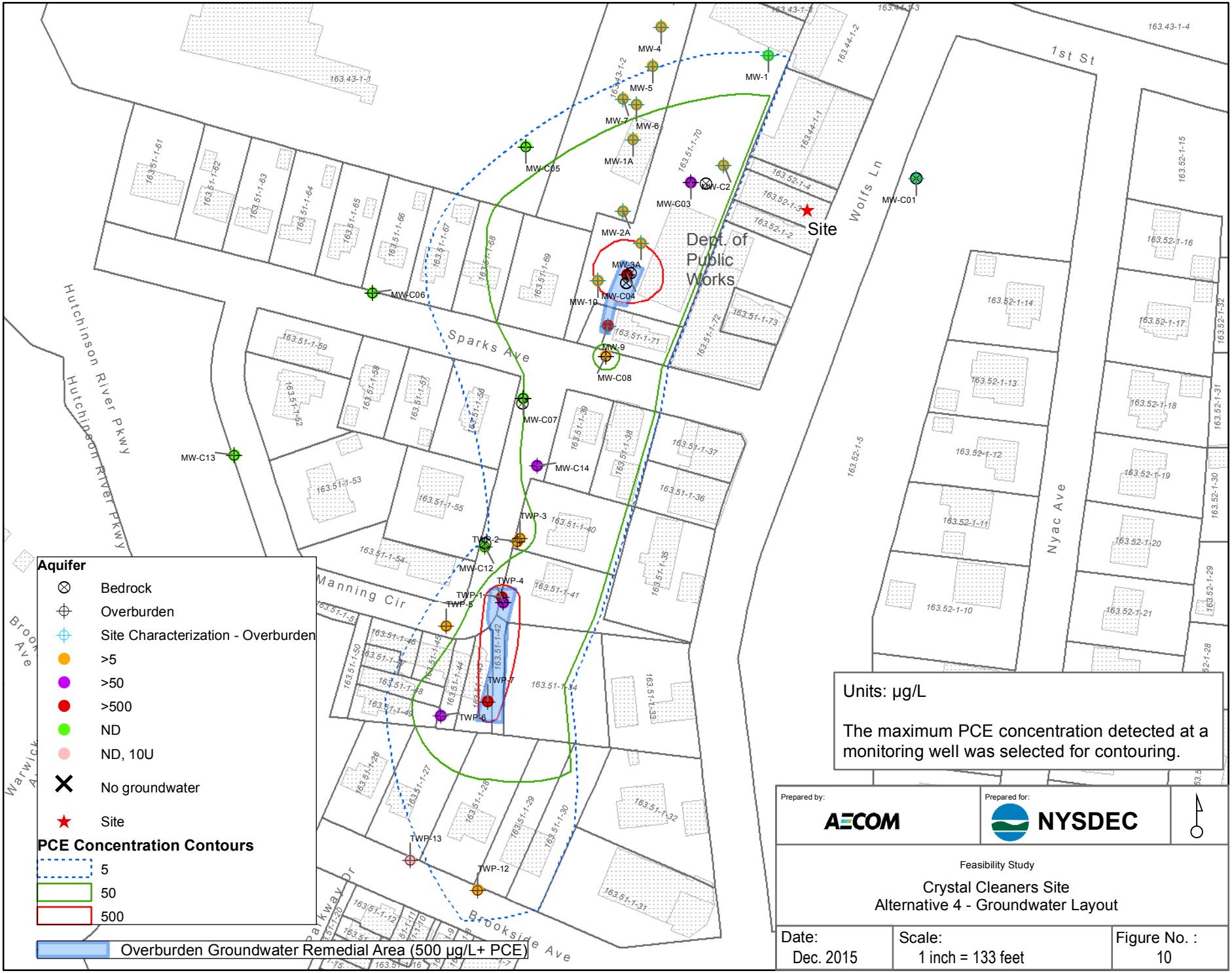

MW-C05
11.94 ft
MW-C03
13.49 ft
Site
13 ft
12 ft
Dept. of Public Works
MW-C04
10.95 ft
MW-C06
10.79 ft
MW-C08
11.03 ft
11 ft
Sparks Ave
MW-C07
10.32 ft
10 ft
MW-C13
8.68 ft
MW-C14
9.57 ft
9 ft
MW-C12
8.14 ft
Manning Cir
Hutchinson River Pkwy
Wolfs Ln
1st St
Groundwater Elevation
Monitoring Well
Site
The groundwater elevation in ft above mean sea level is shown.
Prepared by:
AECOM
Prepared for:
NYSDEC
Feasibility Study
Crystal Cleaners Site
Groundwater Contours November 2012 - Overburden Wells
Date:
Dec. 2015
Scale:
1 inch = 100 feet
Figure No. :
5


MW-C01
34.86 ft
MW-C09
15.63 ft
MW-C10
11.34 ft
MW-C16
10.04 ft
MW-C11
9.04 ft
MW-C15
6.68 ft
Site
Dept. of Public Works
Sparks Ave
Manning Cir
Wolfs Ln
1st St
Hutchinson River Pkwy
34 ft
33 ft
32 ft
31 ft
30 ft
29 ft
28 ft
27 ft
26 ft
25 ft
24 ft
23 ft
22 ft
21 ft
20 ft
19 ft
18 ft
17 ft
16 ft
15 ft
14 ft
13 ft
12 ft
11 ft
10 ft
9 ft
8 ft
7 ft
Groundwater Elevation
Monitoring Well
Site
The groundwater elevation in ft above mean sea level is shown.
Prepared by:
AECOM
Prepared for:
NYSDEC
Feasibility Study
Crystal Cleaners Site
Groundwater Contours November 2012 - Bedrock Wells
Date:
Dec. 2015
Scale:
1 inch = 100 feet
Figure No. :
6


MW-C05: 5U
MW-C03: 100
Site
MW-C04: 750J
Dept. of Public Works
MW-C06: 5U
MW-C08: 37
MW-C07 Dup: 58
MW-C14: 150
MW-C13: 5U
MW-C12: 5U
TWP-2: 20
TWP-3: 17
TWP-1: 610D
TWP-4: 340
TWP-5: 7
TWP-7: 770
TWP-6: 57
TWP-13: 5U
TWP-12: 17
Sparks Ave
Manning Cir
Brookside Ave
Hutchinson River Pkwy
Wolfs Ln
1st St
Nyac Ave
Monitoring Well
Overburden
Overburden - Temporary Well
Site
PCE Concentration Contours
5
50
500
Estimated Extent of Overburden Aquifer
Units: µg/L
1. The maximum PCE concentration detected at a monitoring well was selected for contouring.
2. The eastern extent of the overburde aquifer is estimated. There is limited access along the western side of Wolfs Land due to the presence of structures. Shallow bedrock was encounted along Sparks Avenue at the assumed eastern extent of the aquifer which prevented installation of an overburden well.
Prepared by:
AECOM
Prepared for:
NYSDEC
Feasibility Study
Crystal Cleaners Site
PCE Concentration Contours – Overburden Groundwater
Date:
Dec. 2015
Scale:
1 inch = 125 feet
Figure No. :
7


MW-C09: 340D
MW-C01: 5U
Site
Dept. of Public Works
MW-C10: 1400D
MW-C16: 310D
MW-C11: 790D
MW-C15: 560D
1000
900
800
700
600
Sparks Ave
Wolfs Ln
1st St
Nyac Ave
Hutchinson River Pkwy
Manning Cir
Bedrock Well
PCE Concentration Contours
600
700
800
900
1000
Site
Units: µg/L
The maximum PCE concentration detected at a monitoring well was selected for contouring.
Prepared by:
AECOM
Prepared for:
NYSDEC
Feasibility Study
Crystal Cleaners Site
PCE Concentration Contours – Bedrock Groundwater
Date:
Dec. 2015
Scale:
1 inch = 112 feet
Figure No. :
8

163.43-1-1
163.43-1-2
163.44-1-1
163.52-1-4
163.52-1-3
163.52-1-2
163.51-1-70
163.51-1-69
163.51-1-72
Dumpsters, Concrete Pad, Utility Runs
Concrete Pad, Equipment
Dept. of Public Works
Site
SB-1 5.2U
SB-1 5.4U
SB-2 4.8J
SB-5 93
SB-15 4700
SB-19 10000
SB-3 17000
SB-18 2400
SB-16 1000
SB-17 5700
SB-9 5.6U
PCE concentrations are listed.
Units: µg/kg.
Sample results compared to Part 375-6 unrestricted soil cleanup objectives.
PCE - 1300 µg/kg
Exceedances are in red text.
Soil Borings
Overburden - Temporary Well Borings
Site
Soil Removal Area
Structure
Lots
Prepared by:
AECOM
Prepared for:
NYSDEC
Feasibility Study
Crystal Cleaners Site
Soil Removal Area
Date:
Feb. 2015
Scale:
1 inch = 32 feet
Figure No. :
9


Aquifer
Bedrock
Overburden
Site Characterization - Overburden
>5
>50
>500
ND
ND, 10U
No groundwater
Site
PCE Concentration Contours
5
50
500
Overburden Groundwater Remedial Area (500 µg/L+ PCE)
Units: µg/L
The maximum PCE concentration detected at a monitoring well was selected for contouring.
Prepared by:
AECOM
Prepared for:
NYSDEC
Feasibility Study
Crystal Cleaners Site
Alternative 4 - Groundwater Layout
Date:
Dec. 2015
Scale:
1 inch = 133 feet
Figure No. :
10
Site
Dept. of Public Works
Sparks Ave
Wolfs Ln
1st St
Nyac Ave
Hutchinson River Pkwy
Manning Cir
Brookside Ave
MW-1
MW-1A
MW-2A
MW-3A
MW-4
MW-5
MW-6
MW-7
MW-9
MW-10
MW-C01
MW-C02
MW-C03
MW-C04
MW-C05
MW-C06
MW-C07
MW-C08
MW-C12
MW-C13
MW-C14
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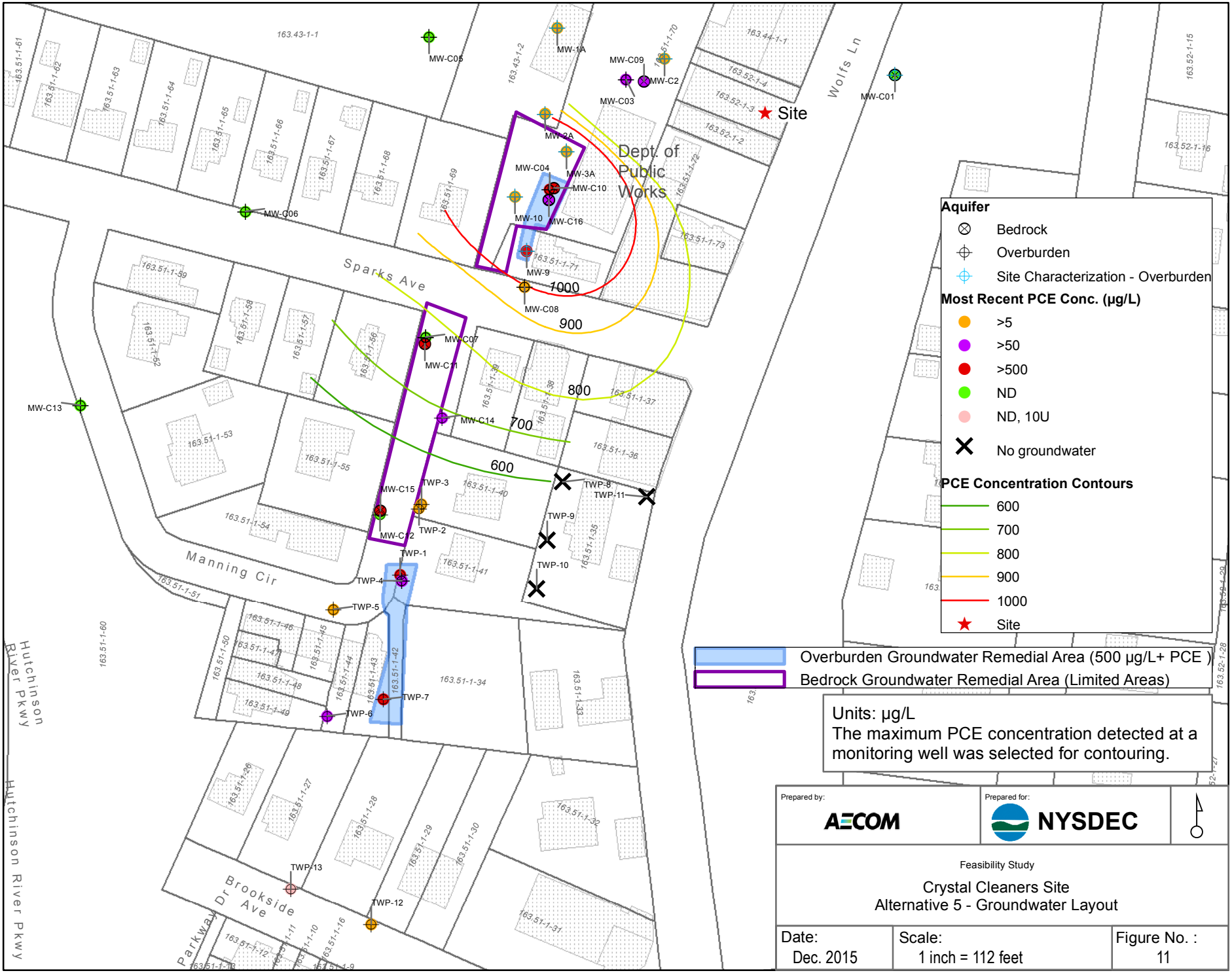
TWP-2
TWP-3
TWP-4
TWP-5
TWP-6
TWP-7
TWP-12
TWP-13


Aquifer
Bedrock
Overburden
Site Characterization - Overburden
Most Recent PCE Conc. (µg/L)
>5
>50
>500
ND
ND, 10U
No groundwater
PCE Concentration Contours
600
700
800
900
1000
Site
Overburden Groundwater Remedial Area (500 µg/L+ PCE)
Bedrock Groundwater Remedial Area (Limited Areas)
Units: µg/L
The maximum PCE concentration detected at a monitoring well was selected for contouring.
Prepared by:
AECOM
Prepared for:
NYSDEC
Feasibility Study
Crystal Cleaners Site
Alternative 5 - Groundwater Layout
Date:
Dec. 2015
Scale:
1 inch = 112 feet
Figure No. :
11
Dept. of Public Works
Site
Sparks Ave
Manning Cir
Wolfs Ln
Hutchinson River Pkwy
Brookside Ave
Parkway Dr
MW-C05
MW-1A
MW-C09
MW-C2
MW-C03
MW-C01
MW-2A
MW-C04
MW-3A
MW-C10
MW-10
MW-C16
MW-C06
MW-9
MW-C08
MW-C07
MW-C11
MW-C13
MW-C14
MW-C15
MW-C12
TWP-3
TWP-2
TWP-1
TWP-4
TWP-5
TWP-6
TWP-7
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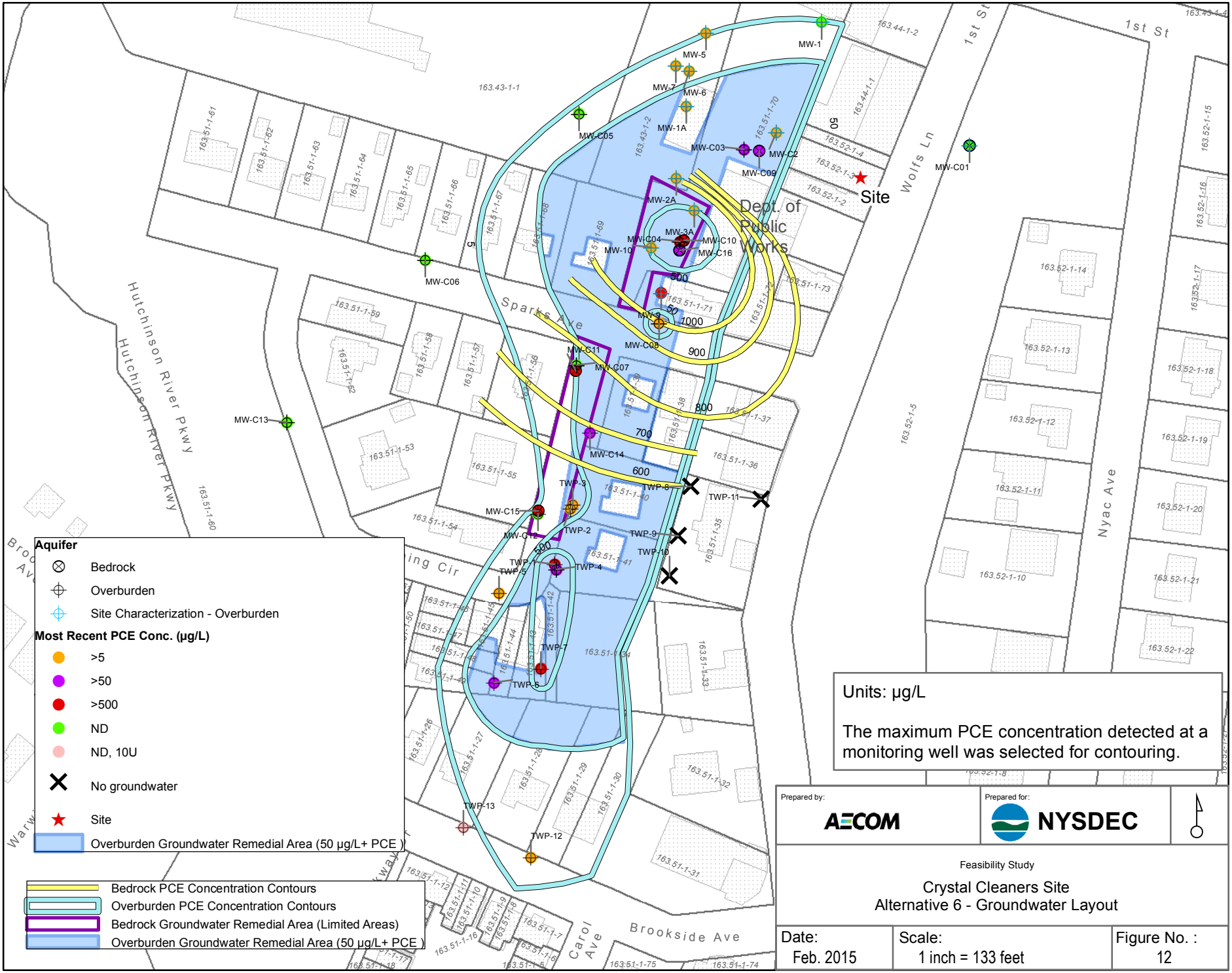
TWP-11
TWP-9
TWP-10
TWP-13
TWP-12
1000
900
800
700
600


Aquifer
Bedrock
Overburden
Site Characterization - Overburden
Most Recent PCE Conc. (µg/L)
>5
>50
>500
ND
ND, 10U
No groundwater
Site
Overburden Groundwater Remedial Area (50 µg/L+ PCE)
Bedrock PCE Concentration Contours
Overburden PCE Concentration Contours
Bedrock Groundwater Remedial Area (Limited Areas)
Overburden Groundwater Remedial Area (50 µg/L+ PCE)
Units: µg/L
The maximum PCE concentration detected at a monitoring well was selected for contouring.
Prepared by:
AECOM
Prepared for:
NYSDEC
Feasibility Study
Crystal Cleaners Site
Alternative 6 - Groundwater Layout
Date:
Feb. 2015
Scale:
1 inch = 133 feet
Figure No. :
12
Dept. of Public Works
Site
Wolfs Ln
1st St
Sparks Ave
Hutchinson River Pkwy
Nyac Ave
Brookside Ave
Carol Ave
MW-1
MW-5
MW-7
MW-6
MW-1A
MW-C05
MW-C03
MW-C2
MW-C09
MW-C01
MW-2A
MW-3A
MW-C04
MW-C10
MW-C16
MW-10
MW-C06
MW-9
MW-C08
MW-C11
MW-C07
MW-C13
MW-C14
TWP-3
TWP-8
TWP-11
MW-C15
MW-C12
TWP-2
TWP-9
TWP-10
TWP-1
TWP-5
TWP-4
TWP-7
TWP-6
TWP-13
TWP-12
50
5
500
50
1000
900
800
700
600
500

Appendix A

Remedial Investigation Report Addendum

Environment

Prepared for:
NYSDEC
Albany, NY

Prepared by:
AECOM
Chestnut Ridge, NY
60269812
December 2015

Remedial Investigation Report Addendum Crystal Cleaners Site (No. 3-60-053)

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1.0 INTRODUCTION

AECOM Technical Services Northeast, Inc. (AECOM) was issued work assignment no. 35 under the New York State Department of Environmental Conservation (NYSDEC) State Superfund Standby Contract for Investigation and Design Services (D00436). The scope of work is to conduct a remedial investigation (RI) and feasibility study (FS) at the Crystal Cleaners site, Village of Pelham, New York 10803, located in Westchester County (NYSDEC registry number 3-60-053). The site location is shown on Figure 1.

An RI report and draft FS were prepared in March 2015. NYSDEC determined that additional soil sampling was necessary in the Village of Pelham, New York Department of Public Works (DPW) property to delineate tetrachloroethene (PCE) contamination in this area. This RI addendum presents the findings of the field investigations outlined above.

Information on the location, previous investigations, and study area characteristics are provided in the March 2015 RI report (AECOM, 2015).

2.0 FIELD INVESTIGATION

Soil samples were collected April 15, 2015 on the DPW property behind the Crystal Cleaners Site to further delineate the potential source area. The RI soil sample results are shown on Figure 2.

Field forms for the sampling events are provided in Appendix A. A photo log is provided in Appendix B.

2.1 Direct Push Soil Sampling

Direct push sampling was conducted west of the site on DPW property to delineate the extent of contamination within the soil. Four soil borings were planned, SB-15 through SB-18. The soil boring locations are shown on Figure 2.

Enviroprobe Services, Inc. conducted a utility mark out for the soil borings on April 15, 2015. A geophysical investigation report is provided in Appendix C. Zebra Environmental Corp. (Zebra) conducted the drilling. Soil samples were collected in five foot intervals by macrocores to collect readings with a photoionization detector (PID) and for soil characterization. Soil samples were collected from stained soil or soil with PID readings above background. If no staining or PID detections were observed, a sample was collected from the deepest interval above the water table. One additional boring, SB-19, was advanced to delineate the soil contamination based on PID readings. All samples were collected between 5 and 6 feet below ground surface (ft bgs).

The soil samples were collected in unpreserved jars provided by the laboratory. The jars provided during the April 2015 sampling were pre-weighed vials and the soil added was measured using disposable open barrel syringes. The samples were kept cooled to 4ºC and sent to AECOM's subcontract laboratory. Samples were analyzed for VOCs (USEPA method SW846 8260).

2.2 Decontamination

Drilling equipment was decontaminated before the first use, between boreholes and prior to demobilization using high-pressure steam.

2.3 Investigation-Derived Waste Disposal

Excess soil was replaced into the boreholes. Macrocore sleeves, gloves were disposed off-site as municipal waste.

2.4 Probe Hole Closure

All probe holes were backfilled with bentonite, indigenous soil and clean sand. The asphalt was closed with cold-patch.

3.0 LABORATORY ANALYTICAL RESULTS

This section summarizes the laboratory analytical results and provides a comparison to the applicable environmental criteria or guideline values.

Five soil samples were collected from five direct push soil boring locations collected on the DPW property. The samples were submitted for laboratory analysis of VOCs. The soil analytical results are compared to the unrestricted use SCOs and presented in Table 1. PCE detections are summarized in Figure 2 for the DPW property.

On the DPW property, PCE was detected in all five soil samples above the unrestricted use soil clean objective (SCO) of 1300 µg/kg at concentrations ranging from 2,400 µg/kg (SB-18 at 5.5-6 feet below ground surface (ft bgs)) to 11,000 µg/kg (SB-16 at 5.5-6 ft bgs). The following parameters were detected below the unrestricted SCO in one or more of the five soil samples: 1,1,2-trichloroethane, 2-butanone, acetone, toluene, trichloroethene (TCE), and trichlorofluoromethane.

4.0 ANALYTICAL DATA AND USABILITY

Data were generated and validated for the soil sampling event. The laboratory data package and the data usability summary report (DUSR) are provided in Appendix B on CD. The sample data generated for this RI were validated by an independent subcontractor, Environmental Data Services, Inc. (EDS) of Williamsburg, VA. The tabulated data used in this report include any qualifiers applied during validation. The soil samples were analyzed by Pace Analytical Services, Inc. (Pace; formerly H2M Labs, Inc.), Melville, New York (ELAP ID 10478).

A trip blank was collected. In addition, the laboratory performed batch quality control samples as required by the methods.

A summary of the data quality review is provided below.

Soil data from samples collected in April 2015 were reported by Pace in one sample delivery group (SDG), AECOM 237. One DUSR was prepared for this SDG. A total of 11 analyses were validated, including one trip blank, five dilutions, and five environmental samples.

There were no rejections of the data. Overall, the data are acceptable for the intended purposes as qualified for the following deficiencies:

- Several compounds (dichlorodifluoromethane, 1,1,2-trichloroethane, bromomethane, chloroethane, trichlorofluoromethane, and carbon disulfide) were qualified as estimated in the dilution samples due to low and high laboratory control sample recoveries.

- Methylene chloride was qualified as non-detected in one sample due to method blank contamination.

- Several compounds (dichlorodifluoromethane, acetone, methyl acetate, and 1,2,4-trichlorobenzene) were qualified as estimated in all samples due to high continuing calibration percent difference values.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Extent of the Areas of Concern

For soil, the extent of the area of concern is determined by the extent of PCE impacts. Based on the data collected to date, the PCE concentration exceeded the unrestricted use SCO in six soil borings on the DPW property. The extent of the PCE concentrations exceeding the criterion is limited to a relatively small area west of the Crystal Cleaners facility on the DPW property. Soil closer to or beneath the Crystal Cleaners site may be impacted, but this area was not sampled and is a possible source area. A proposed soil excavation area is presented on Figure 2 to address the PCE soil exceedances.

5.2 Conceptual Site Model

See the March 2015 RI report (AECOM, 2015). The soil samples collected in the DPW property do not alter the conceptual site model.

5.3 Complete Exposure Pathways

See the March 2015 RI report (AECOM, 2015). The soil samples collected in the DPW property do not alter the exposure pathways.

5.4 Future Work Recommendations

See the March 2015 RI report (AECOM, 2015). The soil samples collected in the DPW property do not alter the recommendations for future work.

6.0 REFERENCES

AECOM, 2015. Remedial Investigation Report Crystal Cleaners Site (No. 3-60-053). Prepared for NYSDEC. March.

NYSDEC, 2010. NYSDEC Division of Environmental Remediation Draft DER-10 Technical Guidance for Site Investigation and Remediation. May.

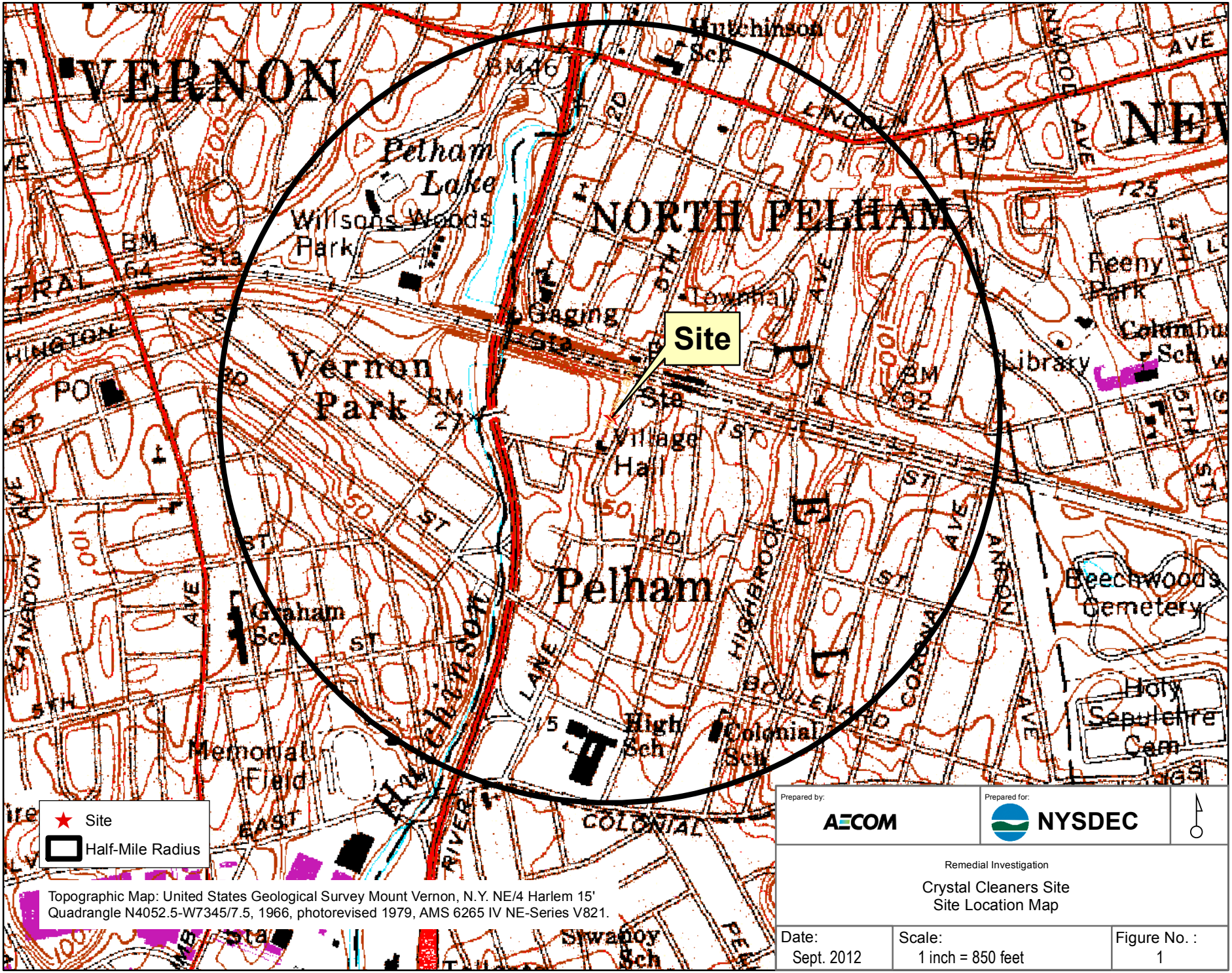
Table 1
VOCs in Soil
Crystal Cleaners, Pelham, New York

	Station ID:	SB-15	SB-16	SB-17	SB-18	SB-19
	Depth (ft.):	5.5-6	5.5-6	5-5.5	5-5.5	5.5-6
	Sample ID:	SB-15-5.5-6.0	SB-16-5.5-6.0	SB-17-5.0-5.5	SB-18-5.0-5.5	SB-19-5.5-6.0
	Sample Date:	4/15/15	4/15/15	4/15/15	4/15/15	4/15/15
Unit: µg/Kg	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
1,1,1-Trichloroethane	680	5 U	5 U	6 U	5 U	5 U
1,1,2,2-Tetrachloroethane	NA	5 U	5 U	6 U	5 U	5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NA	5 U	5 U	6 U	5 U	5 U
1,1,2-Trichloroethane	NA	5 U	**60** J	6 U	5 U	**65** J
1,1-Dichloroethane	270	5 U	5 U	6 U	5 U	5 U
1,1-Dichloroethene	330	5 U	5 U	6 U	5 U	5 U
1,1-Dichloropropene	NA	NA	NA	NA	NA	NA
1,2,3-Trichlorobenzene	NA	NA	NA	NA	NA	NA
1,2,3-Trichloropropane	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	5 U	5 U	6 U	5 U	5 U
1,2,4-Trimethylbenzene	3600	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	NA	5 U	5 U	6 U	5 U	5 U
1,2-Dibromoethane	NA	5 U	5 U	6 U	5 U	5 U
1,2-Dichlorobenzene	1100	5 U	5 U	6 U	5 U	5 U
1,2-Dichloroethane	20	5 U	5 U	6 U	5 U	5 U
1,2-Dichloropropane	NA	NA	NA	NA	NA	NA
1,3,5-Trimethylbenzene	8400	NA	NA	NA	NA	NA
1,3-Dichlorobenzene	2400	5 U	5 U	6 U	5 U	5 U
1,3-Dichloropropane	NA	NA	NA	NA	NA	NA
1,4-Dichlorobenzene	1800	5 U	5 U	6 U	5 U	5 U
1,4-Dioxane	100	NA	NA	NA	NA	NA
2,2-Dichloropropane	NA	NA	NA	NA	NA	NA
2-Butanone	120	5 U	**59** J	5.9 U	4.7 U	5.1 U
2-Chlorotoluene	NA	NA	NA	NA	NA	NA
2-Hexanone	NA	5 U	5 U	6 U	5 U	5 U
4-Chlorotoluene	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NA	NA	NA	NA	NA	NA
4-Methyl-2-pentanone	NA	NA	NA	NA	NA	NA
Acetone	50	5 U	**4** J	6 U	5 U	5 U
Benzene	60	5 U	5 U	6 U	5 U	5 U
Bromobenzene	NA	NA	NA	NA	NA	NA
Bromochloromethane	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NA	5 U	5 U	6 U	5 U	5 U
Bromoform	NA	5 U	5 U	6 U	5 U	5 U
Bromomethane	NA	5 U	5 U	6 U	5 U	5 U
Carbon disulfide	NA	5 U	5 U	6 U	5 U	5 U
Carbon tetrachloride	760	5 U	5 U	6 U	5 U	5 U
Chlorobenzene	1100	5 U	5 U	6 U	5 U	5 U
Chloroethane	NA	5 U	5 U	6 U	5 U	5 U
Chloroform	370	5 U	5 U	6 U	5 U	5 U
Chloromethane	NA	5 U	5 U	6 U	5 U	5 U
cis-1,2-Dichloroethene	250	5 U	5 U	6 U	5 U	5 U
cis-1,3-Dichloropropene	NA	5 U	5 U	6 U	5 U	5 U

Table 1
VOCs in Soil
Crystal Cleaners, Pelham, New York

	Station ID:	SB-15	SB-16	SB-17	SB-18	SB-19
	Depth (ft.):	5.5-6	5.5-6	5-5.5	5-5.5	5.5-6
	Sample ID:	SB-15-5.5-6.0	SB-16-5.5-6.0	SB-17-5.0-5.5	SB-18-5.0-5.5	SB-19-5.5-6.0
	Sample Date:	4/15/15	4/15/15	4/15/15	4/15/15	4/15/15
Unit: µg/Kg	Criteria	Env. Sample	Env. Sample	Env. Sample	Env. Sample	Env. Sample
Cyclohexane	NA	5 U	5 U	6 U	5 U	5 U
Dibromochloromethane	NA	5 U	5 U	6 U	5 U	5 U
Dichlorodifluoromethane		5 UJ	5 UJ	6 UJ	5 UJ	5 UJ
Dibromomethane	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NA	NA	NA	NA	NA	NA
Ethylbenzene	1000	5 U	5 U	6 U	5 U	5 U
Hexachlorobutadiene	NA	NA	NA	NA	NA	NA
Iodomethane	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NA	5 U	5 U	6 U	5 U	5 U
m,p-Xylene	NA	NA	NA	NA	NA	NA
Methyl acetate	NA	5 UJ	5 UJ	6 UJ	5 UJ	5 UJ
Methyl tert-butyl ether	930	5 U	5 U	6 U	5 U	5 U
Methylcyclohexane	NA	5 U	5 U	6 U	5 U	5 U
Methylene chloride	50	5 U	5 UJ	6 U	5 U	5 U
Naphthalene	NA	NA	NA	NA	NA	NA
o-Xylene	NA	NA	NA	NA	NA	NA
sec-Butylbenzene	11000	NA	NA	NA	NA	NA
Styrene	NA	5 U	5 U	6 U	5 U	5 U
tert-Butylbenzene	5900	NA	NA	NA	NA	NA
Tetrachloroethene (PCE)	1300	**4700**	**11000**	**5700**	**2400**	**10000**
Toluene	700	5 U	**0.5** J	6 U	5 U	5 U
trans-1,2-Dichloroethene	190	5 U	5 U	6 U	5 U	5 U
trans-1,3-Dichloropropene	NA	5 U	5 U	6 U	5 U	5 U
Trichloroethene (TCE)	470	5 U	**2** J	**5** J	5 U	**0.8** J
Trichlorofluoromethane	NA	**1** J	**2** J	**2** J	**5** U	**0.7** J
Vinyl acetate	NA	NA	NA	NA	NA	NA
Vinyl chloride	20	5 U	5 U	6 U	5 U	5 U
Xylene (Total)	260	5 U	5 U	6 U	5 U	5 U

Criteria - 6 New York Codes, Rules and Regulations [NYCRR] Part 375-6.8(a) unrestricted soil cleanup objectives
Dup - Field duplicate sample
U - Not detected
J - Estimated
R - Rejected
NA - Not available
Detections are bolded
Exceedances are highlighted



Topographic Map: United States Geological Survey Mount Vernon, N.Y. NE/4 Harlem 15' Quadrangle N4052.5-W7345/7.5, 1966, photorevised 1979, AMS 6265 IV NE-Series V821.

SB-1
5.2U
SB-4
5.4U
SB-2
4.8J
SB-5 93
SB-15
4700
SB-19
10000
SB-3
17000
SB-18
2400
SB-16
11000
SB-17
5700
SB-9
5.6U
Dept. of
Public
Works
163.43-1-2
163.51-1-69
163.51-1-70
163.51-1-72
163.52-1-4
163.52-1-3
163.52-1-2
Soil Borings
Remedial Investigation
Supplemental Samples
Site
Proposed Excavation Area
PCE concentrations are listed.
Units: µg/kg.
Sample results compared to Part 375-6
unrestricted soil cleanup objectives.
PCE - 1300 µg/kg
Exceedances are in red text.
Prepared by:
AECOM
Prepared for:
NYSDEC
Remedial Investigation
Crystal Cleaners Site
Soil Sample Results - DPW Property
Date:
Dec. 2015
Scale:
1 inch = 20 feet
Figure No. :
2

Appendix A

Field Forms

AECOM

SOIL EXPLORATION LOG

Boring No.: SB-15

PROJECT: Crystal Cleaners		PAGE 1 of 1
PROJECT No.: 60269812	CONTRACTOR: Zebra Environmental Corp	DATE: April 15, 2015
LOCATION: Pelham, NY	DRILLERS NAME: Charles	AECOM REP.: Celeste Foster

WATER LEVELS			SIZE AND TYPE OF EQUIPMENT: Geoprobe
DATE	TIME	DEPTH	LABORATORY ANALYSES: VOA 8260B
04/15/15	0905	16 ft	REFERENCE ELEVATION: Not surveyed DEPTH OF BOREHOLE: 25 ft bgs

Depth (ft)	Sample Number &Time	Rec. (in)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
1 2 3 4 5	S1 0845	31/60	0.0 0.0 0.0	0-6" Asphalt 6-14" Medium sand, some brick fragments (FILL), dry 14-27" Crushed stone, dry 27-31" Dark brown medium sand, some fine sand, dry
6 7 8 9 10	S2 0855	26/60	0.0 0.0	0-7" Crushed stone, dark brown medium to fine sand, dry 7-13" Dark brown medium to fine sand, dry 13-26" Dark brown fine to medium sand, dry Sample collected from 5.5-6 ft bgs at 0930
11 12 13 14 15	S3 0905	36/60	0.0 0.0 0.0	0-12" Dark brown fine to medium sand, dry 12-23" Brown medium sand, dry 23-36" Light brown medium sand, dry
16 17 18 19 20	S4 0915	42/60	0.0 0.0 0.0 0.0	0-6" Brown medium sand, dry 6-12" Dark Brown medium to coarse sand, dry 12-19" Brown medium sand, wet 19-42" Grey fine sand, trace medium sand, wet

Comments:

AECOM

SOIL EXPLORATION LOG

Boring No.: SB-15

PROJECT: Crystal Cleaners		PAGE 1 OF 1
PROJECT No.: 60269812	CONTRACTOR: Zebra Environmental Corp	DATE: April 15, 2015
LOCATION: Pelham, NY	DRILLERS NAME: Charles	AECOM REP.: Celeste Foster

WATER LEVELS			SIZE AND TYPE OF EQUIPMENT: Geoprobe
DATE	TIME	DEPTH	LABORATORY ANALYSES: VOA 8260B
04/15/15	0905	16 ft	REFERENCE ELEVATION: Not surveyed DEPTH OF BOREHOLE: 25 ft bgs

Depth (ft)	Sample Number &Time	Rec. (in)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
	S5 0930	41/60	0.0	0-20" Brown fine to medium sand, wet
21			0.0	20-27" Brown coarse to medium sand, wet
22			0.0	27-41" Brown medium sand, wet
23			0.0	
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

Comments:

AECOM

SOIL EXPLORATION LOG

Boring No.: SB-16

PROJECT: Crystal Cleaners		PAGE 1 of 1
PROJECT No.: 60269812	CONTRACTOR: Zebra Environmental Corp	DATE: April 15, 2015
LOCATION: Pelham, NY	DRILLERS NAME: Charles	AECOM REP.: Celeste Foster

WATER LEVELS			SIZE AND TYPE OF EQUIPMENT: Geoprobe
DATE	TIME	DEPTH	LABORATORY ANALYSES: VOA 8260B
04/15/15	1015	20 ft	REFERENCE ELEVATION: Not surveyed DEPTH OF BOREHOLE: 21 ft bgs

Depth (ft)	Sample Number &Time	Rec. (in)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
1	S1 0955	25/60	0.1	0-5" Asphalt 5-19" Dark brown coarse sand, bricks (FILL), dry 19-25" Brown fine sand, damp
2			0.1	
3			0.1	
4			0.4	
5				
6	S2 1000	25/60	0.3	0-12" Brown medium sand, some coarse sand 12-31" Brown fine sand, trace medium sand Sample collected from 5.5-6 ft bgs at 1010
7			4.0	
8			0.7	
9			0.2	
10			0.3	
11	S3 1005	42/60	0.5	0-7" Brown fine sand, trace medium sand 7-16" Light brown medium sand 16-24" Light brown coarse to medium sand 24-42" Light brown medium to fine sand
12			0.4	
13			0.1	
14			0.2	
15			0.2	
16	S4 1015	46/60	0.4	0-14" Brown medium to coarse sand 14-16" Dark brown medium to fine sand, damp 16-46" Light brown medium to fine sand, little coarse sand
17			0.3 0.7 0.1	
18			0.1 0.4	
19			0.3	
20				

Comments:

AECOM

SOIL EXPLORATION LOG

Boring No.: SB-16

PROJECT: Crystal Cleaners		PAGE 1 of 1
PROJECT No.: 60269812	CONTRACTOR: Zebra Environmental Corp	DATE: April 15, 2015
LOCATION: Pelham, NY	DRILLERS NAME: Charles	AECOM REP.: Celeste Foster

WATER LEVELS			SIZE AND TYPE OF EQUIPMENT: Geoprobe
DATE	TIME	DEPTH	LABORATORY ANALYSES: VOA 8260B
04/15/15	1015	20 ft	REFERENCE ELEVATION: Not surveyed DEPTH OF BOREHOLE: 21 ft bgs

Depth (ft)	Sample Number &Time	Rec. (in)	PID (ppm)	Readings
	S5 1030	12/12	0.1	0-6" Light brown medium to coarse sand, wet 6-12" Light brown medium to fine sand, wet
21				Refusal @ 21 ft
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

Comments:

AECOM

SOIL EXPLORATION LOG

Boring No.: SB-17

PROJECT: Crystal Cleaners		PAGE 1 of 1
PROJECT No.: 60269812	CONTRACTOR: Zebra Environmental Corp	DATE: April 15, 2015
LOCATION: Pelham, NY	DRILLERS NAME: Charles	AECOM REP.: Celeste Foster

WATER LEVELS			SIZE AND TYPE OF EQUIPMENT: Geoprobe
DATE	TIME	DEPTH	LABORATORY ANALYSES: VOA 8260B
04/15/15	1100	17 ft	REFERENCE ELEVATION: Not surveyed DEPTH OF BOREHOLE: 14 ft bgs

Depth (ft)	Sample Number &Time	Rec. (in)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
	S1 1045	38/60		0-6" Asphalt
1			0.2	6-12" Crushed stone
			0.3	12-21" Dark brown medium sand, trace coarse sand
2			1.0	21-38" Dark brown medium to coarse sand, glass (FILL)
			1.0	
3			1.7	
4				
5				
	S2 1050	40/60	3.4	0-6" Dark brown medium to coarse sand
6			0.7	6-14" Brown fine to medium coarse sand, damp
			0.7	14-40" Light brown medium to coarse sand
7			0.7	
			0.5	Sample collected from 5.5-6 ft bgs at 1055
8				
9				
10				
	S3 1100	41/48	0.3	0-21" Brown medum to coarse sand, wet at 17 ft
11			0.8	21-41" White gravel
			0.3	
12			0.1	
13				
14				Refusal @ 14 ft
15				
16				
17				
18				
19				
20				

Comments:

AECOM

SOIL EXPLORATION LOG

Boring No.: SB-18

PROJECT: Crystal Cleaners		PAGE 1 of 1
PROJECT No.: 60269812	CONTRACTOR: Zebra Environmental Corp	DATE: April 15, 2015
LOCATION: Pelham, NY	DRILLERS NAME: Charles	AECOM REP.: Celeste Foster

WATER LEVELS			SIZE AND TYPE OF EQUIPMENT: Geoprobe
DATE	TIME	DEPTH	LABORATORY ANALYSES: VOA 8260B
NA	NA	NA	REFERENCE ELEVATION: Not surveyed DEPTH OF BOREHOLE: 11 ft bgs

Depth (ft)	Sample Number &Time	Rec. (in)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
	S1 1115	50/60		0-3" Asphalt
1			0.1	3-12" Crushed stone
			0.1	12-50" Medium sand, brick, glass, crushed stone (FILL)
2			0.1	
			0.2	
3			0.5	
4				
5				
	S2 1120	35/60	0.5	0-12" Brown fine sand, some coarse sand, black gravel at 10-11"
6			0.1	12-28" Brown fine sand, some medium sand
			0.1	28-35" Light brown medium sand
7			0.3	
			0.1	Sample collected from 5.5-6 ft bgs at 1125
8			0.1	
9				
10				
	S3 1130	12/12	0.1	0-12" Light brown medium sand
11			0.1	
				Refusal @ 11 ft
12				
13				
14				
15				
16				
17				
18				
19				
20				

Comments:

AECOM

SOIL EXPLORATION LOG

Boring No.: SB-19

PROJECT: Crystal Cleaners		PAGE 1 of 1
PROJECT No.: 60269812	CONTRACTOR: Zebra Environmental Corp	DATE: April 15, 2015
LOCATION: Pelham, NY	DRILLERS NAME: Charles	AECOM REP.: Celeste Foster

WATER LEVELS			SIZE AND TYPE OF EQUIPMENT: Geoprobe
DATE	TIME	DEPTH	LABORATORY ANALYSES: VOA 8260B
04/15/15	1150	15 ft	REFERENCE ELEVATION: Not surveyed DEPTH OF BOREHOLE: 21 ft bgs

Depth (ft)	Sample Number &Time	Rec. (in)	PID Readings (ppm)	SAMPLE DESCRIPTION, REMARKS, AND STRATUM CHANGES
	S1 1135	23/60		0-4" Asphalt
1			0.1	4-16" Brown to dark brown medium to fine sand, trace glass
			0.1	16-17" White medium sand
2			0.1	17-19" Brick fragments
			0.1	19-23" Brown fine to medium sand
3				
4				
5				
	S2 1140	26/60	0.1	0-12" Dark brown medium sand, glass (FILL)
6			0.4	12-26" Brown fine to medium sand
			0.1	
7			0.1	Sample collected from 5.5-6 ft bgs at 1140
			0.1	
8				
9				
10				
	S3 1145	39/60	0.1	0-8" Dark brown medium sand (FILL)
11			0.1	8-25" Light brown medium to coarse sand, trace fine sand
			0.0	25-36" Brown medium to fine sand
12			0.1	36-39" Brown medium to fine sand, some gravel
			0.1	
13			0.1	
			0.0	
14				
15				
	S4 1150	27/60	0.1	0-6" Light brown medium sand, some fine sand
16			0.1	6-11" Light brown coarse to medium sand
			0.0	11-20" Light brown medium sand, some gravel
17			0.1	20-27" Light brown medium to fine sand
18				
19				
20				

Comments:

AECOM

SOIL EXPLORATION LOG

Boring No.: SB-19

PROJECT: Crystal Cleaners		PAGE 1 of 1
PROJECT No.: 60269812	CONTRACTOR: Zebra Environmental Corp	DATE: April 15, 2015
LOCATION: Pelham, NY	DRILLERS NAME: Charles	AECOM REP.: Celeste Foster

WATER LEVELS			SIZE AND TYPE OF EQUIPMENT: Geoprobe
DATE	TIME	DEPTH	LABORATORY ANALYSES: VOA 8260B
04/15/15	1150	15 ft	REFERENCE ELEVATION: Not surveyed DEPTH OF BOREHOLE: 21 ft bgs

Depth (ft)	Sample Number &Time	Rec. (in)	PID (ppm)	Readings
	S5 1200	18/18	NA	0-10" Tan coarse to medium sand 10-18" Tan medium to coarse sand
21				Refusal @ 21 ft
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

Comments:

Appendix B

Photo Log

Zebra Environmental direct push rig set up

Example of fill material encountered on DPW property, SB-19 0-5 ft bgs macrocore

Appendix C

Geophysical Survey Reports

GEOPHYSICAL INVESTIGATION REPORT

PERFORMED AT:

113 Wolfs Lane (D.P.W. Maintenance facility/yard)
Pelham, NY 10803

PREPARED FOR:

Claire Hunt
AECOM
100 Red Schoolhouse Road
Chestnut Ridge, NY 10977-6715

PREPARED BY:

John Rango
Geophysical Technician
Enviroprobe Service, Inc.
908 N. Lenola Road
Moorestown, NJ 08057
Phone: (856) 858-8584
Toll Free: (800) 596-7472

April 15, 2015

1.0 INTRODUCTION

Enviroprobe Service, Inc. (Enviroprobe) is an environmental investigation services firm which provides monitoring well installation (HSA), Geoprobe (DPT) drilling services and Environmental & Engineering Geophysics (EEG) services to the environmental consulting and engineering community.

Enviroprobe conducted a subsurface geophysical investigation at the subject property within client-specified areas of concern. Due to conditions and objectives, the investigation utilized an RD1000 cart-mounted ground penetrating radar (GPR) unit with a 250 MHz antenna, a Fisher TW-6 metallic locator, a Radiodetection multi-frequency transmitter, and a Radiodetection receiver.

Ground penetrating radar (commonly called GPR) is a geophysical method that has been developed over the past thirty years for shallow, high-resolution, subsurface investigations of the earth. GPR uses high frequency pulsed electromagnetic waves (generally 10 MHz to 2,000 MHz) to acquire subsurface information. An EM wave is propagated downward into the ground by a transmitting antenna. Where abrupt changes in electrical properties occur in the subsurface, a portion of the energy is reflected back to the surface. This reflected wave is detected by a receiver antenna and transmitted to a control unit for real time processing and display. The penetration depth of the GPR unit varies from several inches to tens of feet according to site-specific conditions. The penetration depth decreases with increased soil conductivity. The penetration depth is the greatest in ice, dry sands, and fine gravels. Clayey, highly saline or saturated soils, areas covered by concrete, foundry slag, or other highly conductive materials greatly reduce GPR penetration. GPR is a method that is commonly used for environmental, engineering, archaeological, and other shallow investigations.

The Fisher TW-6 metallic locator is designed to find pipes, cables and other metallic objects such as underground storage tanks (USTs). The TW-6 transmitter generates an electromagnetic field that induces electrical currents in the subsurface. These currents produce a secondary electromagnetic field that is measured by the TW-6 receiver. One surveyor can carry both the transmitter and receiver together to search for underground metallic objects, although the TW-6 response can also be affected by the electrical properties of non-metallic materials in the subsurface.

The Radiodetection (RD) transmitter and receiver are commonly used for pipe and cable locating. The multi-frequency transmitter can be directly connected, clamped, or used to induce a signal in a target line while the multi-frequency receiver is used to measure the signal from energized lines.

2.0 SCOPE OF WORK

On April 15, 2015, a geophysical technician from Enviroprobe Service Inc. was mobilized to the subject property to perform a geophysical investigation. The purpose of

the investigation was to clear proposed boring locations and designate underground conduits/utilities at an active D.P.W. Maintenance facility/yard. The ground surface of the survey area consisted of concrete and asphalt surfaces.

3.0 SURVEY RESULTS

The utility survey was conducted using a cart-mounted GPR unit and a RD unit. The RD unit was used to trace common utilities from sources in and around the survey area. The RD receiver was also used in the passive mode to search for live underground electrical power cables and other utilities emitting 60Hz electromagnetic signals. When possible, the location of utilities was confirmed with the GPR. The GPR survey was also performed in a grid pattern in at least two orthogonal directions to search for evident and non-evident underground utilities. All anomalies were designated on site with spray paint using the following colors: red – electric and green – storm sewer.

Approximately three proposed boring locations were investigated with the GPR, TW-6, and RD receiver. When possible, an area of approximately 10 ft by 10 ft surrounding each location was scanned. In some cases, obstructions prevented an investigation of the entire 10 ft by 10 ft area.

4.0 LIMITATIONS

Due to surface conditions and subsurface content, the GPR penetration depth was estimated as about 3 feet in the majority of the survey area.

Due to the dielectric properties of the subsurface, plastic polymer and fiberglass utilities may not have been detected.

The underground utility survey was conducted in compliance with the industry standard of care guidelines found in ASCE 38-02 (Level B).

5.0 WARRANTIES

The field observations and measurements reported herein are considered sufficient in detail and scope for this project. Enviroprobe Service, Inc. warrants that the findings and conclusions contained herein have been promulgated in accordance with generally accepted environmental engineering methods. There is a possibility that conditions may exist which could not be identified within the scope of this project and were not apparent during the site activities performed for this project.

Enviroprobe represents that the services were performed in a manner consistent with that level of care and skill ordinarily exercised by environmental consultants under

similar circumstances. No other representations to Client, express or implied, and no warranty or guarantee is included or intended in this agreement, or in any report, document, or otherwise.

Enviroprobe Service, Inc. believes that the information provided in this report is reliable. However, Enviroprobe cannot warrant or guarantee that the information provided by others is complete or accurate. No other warranties or guarantees are implied or expressed.

GPR data is subject to signal anomalies and operator interpretation. The GPR data is intended to provide the locations of areas of concern requiring additional investigation or the approximate location of underground structures and utilities. Great care must be utilized when excavating and/or drilling around underground structures and utilities since GPR data can only be used for estimation purposes and GPR data is subject to misinterpretation. Enviroprobe can not guarantee that utilities, post-tension cables, and/or rebar will not be incurred during drilling, cutting, coring, or excavating activities.

This report was prepared pursuant to the contract Enviroprobe has with the Client. That contractual relationship included an exchange of information about the property that was unique and between Enviroprobe and its client and serves as the basis upon which this report was prepared. Because of the importance of the communication between Enviroprobe and its client, reliance or any use of this report by anyone other than the Client, for whom it was prepared, is prohibited and therefore not foreseeable to Enviroprobe.

Reliance or use by any such third party without explicit authorization in the report does not make said third party a third party beneficiary to Enviroprobe contract with the Client. Any such unauthorized reliance on or use of this report, including any of its information or conclusions, will be at the third party's risk. For the same reasons, no warranties or representations, expressed or implied in this report, are made to any such third party.

ENVIROPROBE SERVICE INCORPORATED

Preliminary Geophysical Field Report

Client Name: AECOM

Office Address: 100 Red Schoolhouse Road, Suite B-1
Chestnut Ridge, N.Y. 10977-6715 Phone #:

Project Manager: Claire Hunt Phone #:

Site Contact: Celeste Foster Phone #: 914.334.8327

Purchase Order #:

Site Address: 113 Wolfs Lane (Crystal Cleaners) D.P.W. Yard
Pelham, N.Y. 10803

Type or Name of Facility:

Job Date: 4/15/15 Start Time: 7:30AM Finish Time:

Scope of Work: GPR survey

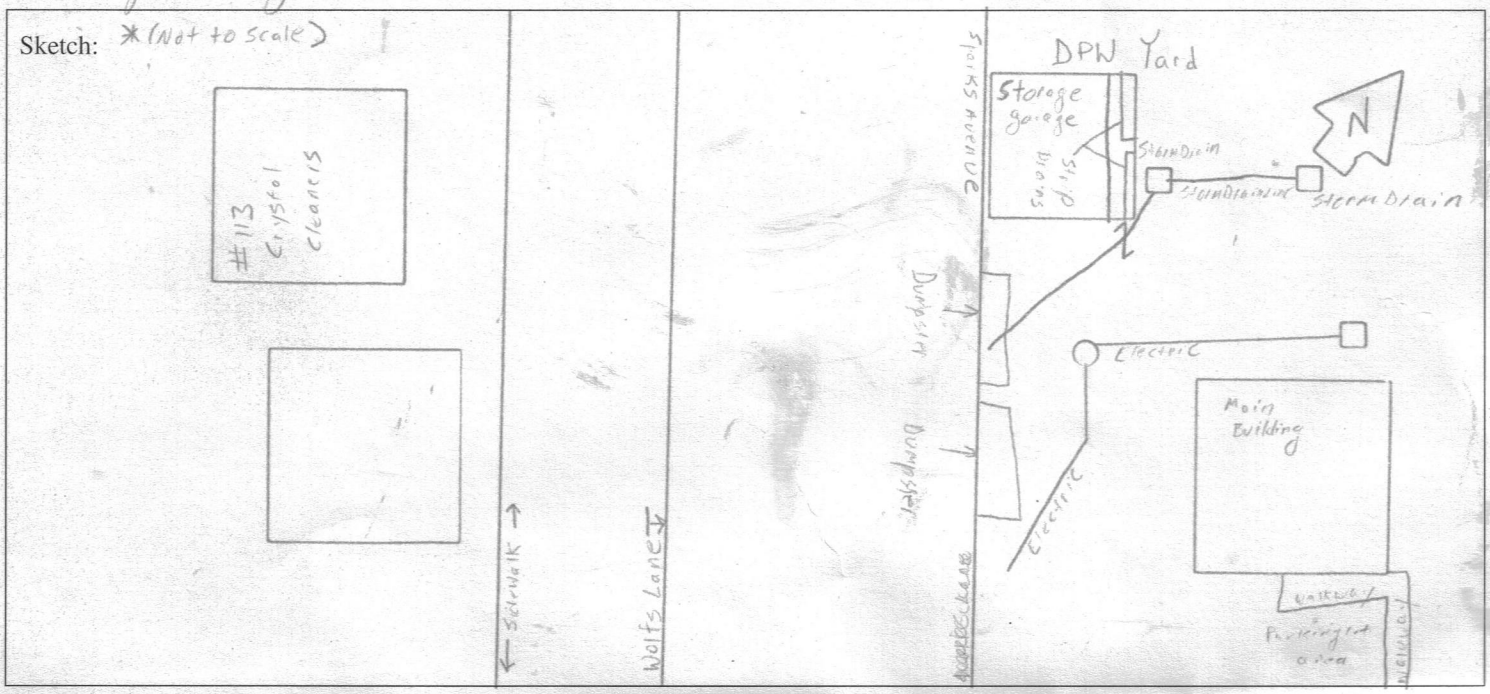
Conditions: Active ~~Dry cleaners~~ D.P.W. Maintenance facility

Limitations: Curb lines, ~~parking areas~~, exterior walls, storage areas, parked vehicles

Results: Designated all anomalies on site with spray paint using the following colors: red - electric and green - storm sewer. Approximately proposed locations were located in client-selected portions of subject property.

Signature: John Raugo x [signature] Email: Claire.Hunt@AECOM.COM

Sketch: *(Not to scale)



Appendix D

Laboratory Data and DUSRs on CD

ENVIRONMENTAL
Data Services, Inc.

DATA USABILITY SUMMARY REPORT
CRYSTAL CLEANERS, PELHAM, NEW YORK

Client: AECOM Technical Services, Inc., Chestnut Ridge, New York
SDG: AECOM 237
Laboratory: Pace Analytical, Melville, New York
Site: Crystal Cleaners, Pelham, New York
Date: June 2, 2015

EDS ID	Client Sample ID	Laboratory Sample ID	Matrix
1	SB-15-5.5-6.0	1504C96-001	Soil
1DL	SB-15-5.5-6.0DL	1504C96-001DL	Soil
2	SB-16-5.5-6.0	1504C96-002	Soil
2DL	SB-16-5.5-6.0DL	1504C96-002DL	Soil
3	SB-17-5.0-5.5	1504C96-003	Soil
3DL	SB-17-5.0-5.5DL	1504C96-003DL	Soil
4	SB-18-5.0-5.5	1504C96-004	Soil
4DL	SB-18-5.0-5.5DL	1504C96-004DL	Soil
5	SB-19-5.5-6.0	1504C96-005	Soil
5DL	SB-19-5.5-6.0DL	1504C96-005DL	Soil
6	TB	1504C96-006	Water

A Data Usability Summary Review was performed on the analytical data for five soil samples and one aqueous trip blank sample collected on April 15, 2015 by AECOM at the Crystal Cleaners site in Pelham, New York. The samples were analyzed under Environmental Protection Agency (USEPA) *"Test Methods for the Evaluation of Solid Waste, USEPA SW-846, Third Edition, September 1986, with revisions"*.

Specific method references are as follows:

Analysis	*Method References*
VOCs	USEPA SW-846 Method 8260C

The data have been validated according to the protocols and quality control (QC) requirements of the analytical methods and the USEPA Region II Data Review Standard Operating Procedures (SOPs) as follows:

- SOP Number HW-24, Revision 4, September 2014: Validating Volatile Organic Compounds by SW-846 Method 8260B & 8260C;
- and the reviewer's professional judgment.

Organics

The following items/criteria were reviewed for this report:

- Data Completeness
- Holding times and sample preservation
- Surrogate Spike recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) recoveries
- Laboratory Control Sample (LCS) recoveries
- Method blank and field blank contamination
- Gas Chromatography (GC)/Mass Spectroscopy (MS) tuning
- Initial and continuing calibration summaries
- Compound Quantitation
- Internal standard area and retention time summary forms
- Field Duplicate sample precision

Overall Usability Issues:

There were no rejections of data.

Overall the data is acceptable for the intended purposes as qualified for the following deficiencies.

- Several compounds were qualified as estimated in the dilution samples due to low and high LCS recoveries.
- Methylene chloride was qualified as nondetected in one sample due to method blank contamination.
- Several compounds were qualified as estimated in all samples due to high continuing calibration %D values.

Please note that any results qualified (U) due to blank contamination may be then qualified (J) due to another action. Therefore, the results may be qualified (UJ) due to the culmination of the blank contaminations and actions from other exceedences of QC criteria.

Data Completeness

- The data is a complete Category B data package as defined under the requirements for the NYS Department of Environmental Conservation Analytical Services Protocol.

Volatile Organic Compounds (VOCs)

Holding Times

- All samples were analyzed within 14 days for preserved water and soil samples.

Surrogate Spike Recoveries

- All samples exhibited acceptable surrogate recoveries.

Matrix Spike/Matrix Spike Duplicate (MS/MSD) Recoveries

- A MS/MSD sample was not analyzed.

Laboratory Control Samples

- The following table presents LCS percent recoveries (%R) outside the QC limits. A low %R may indicate a potential low bias while a high %R may indicate a potential high bias. For a low %R, positive results are considered estimated and qualified (J) while non-detects are estimated and qualified (UJ). For a high %R, positive results are considered estimated and qualified (J). Results are valid and usable, however possibly biased.

LCS ID	Compound	%R	Qualifier	Affected Samples
LFB042215	Dichlorodifluoromethane	45%	None	See CCAL
	1,1,2-Trichloroethane	123%	None	All Associated ND
LFB042315M	Dichlorodifluoromethane	22%	J/UJ	1DL-5DL
	Bromomethane	18%	J/UJ	
	Chloroethane	13%	J/UJ	
	Trichlorofluoromethane	12%	J/UJ	
	Carbon disulfide	60%	J/UJ	
	1,1,2-Trichloroethane	124%	J	2DL, 5DL

Method Blank

- The following table lists method blanks with contamination and the samples associated with the blanks that had results qualified as a consequence of the blank contamination. For detected compound concentrations <RL, the results are negated and qualified (U). For detected sample concentrations >RL of methylene chloride, 2-butanone or acetone (common laboratory contaminants) less than ten times (10x) the highest associated blank (after taking sample dilution levels, percent moisture and sample volume into account) are negated and qualified with a (U). For all other compounds >RL, an action level of five times (5x) the highest associated blank concentration is used.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
VBLK042015	Methylene chloride	1	None	All ND
VBLK042215	Methylene chloride	2 ug/kg	U	2

Field Blank

- Field QC results are summarized below.

Blank ID	Compound	Conc. ug/L	Qualifier	Affected Samples
TB	None - ND	-	-	-

GC/MS Tuning

- All criteria were met.

Initial Calibration

- The initial calibrations exhibited acceptable %RSD and/or correlation coefficients and mean RRF values.

Continuing Calibration

- The following table presents compounds that exceeded 20 percent deviation (%D) and/or RRF values <0.05 in the continuing calibration (CCAL). A low RRF indicates poor instrument sensitivity for these compounds. Positive results for these compounds in the affected samples are considered estimated and qualified (J). Non-detect results for these compounds in the affected samples are rejected (R) and are unusable for project objectives. A high %D may indicate a potential high or low bias. All results for these compounds in affected samples are considered estimated and qualified (J/UJ).

CCAL Date	Compound	%D/RRF	Qualifier	Affected Samples
04/20/15	Dichlorodifluoromethane	63.6%	J/UJ	6
	Acetone	31.8%	J/UJ	
04/22/15	Dichlorodifluoromethane	49.9%	J/UJ	1-5
	Methyl acetate	37.6%	J/UJ	
04/23/15	Dichlorodifluoromethane	70.3%	None	See LCS
	1,2,4-Trichlorobenzene	32.5%	J/UJ	1DL-5DL

Compound Quantitation

- All samples exhibited a high concentration of tetrachloroethene and were flagged (E) by the laboratory. The samples were reanalyzed at a dilution and these tetrachloroethene results should be used for reporting purposes. Several additional compounds were detected in the dilution analysis and transferred to the original Form Is for reporting purposes.

Internal Standard (IS) Area Performance

- All internal standards met response and retention time (RT) criteria.

Field Duplicate Sample Precision

- Field duplicate samples were not collected.

Tentatively Identified Compounds (TICs)

- All TICs were qualified estimated (J) for known compounds and (NJ) for tentatively identified compounds.

Please contact the undersigned at (757) 564-0090 if you have any questions or need further information.

Signed: Nancy Weaver Dated: 6/5/15

Nancy Weaver
Senior Chemist

Data Qualifiers

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ = The analyte was not detected above the sample reporting limit; and the reporting limit is approximate.

U = The analyte was analyzed for, but was not detected above the sample reporting limit.

R = The sample results is rejected due to serious deficiencies. The presence or absence of the analyte cannot be verified.

1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-15-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-001A

Sample wt/vol: 11.99 (g/mL) g Lab File ID: 5\A86064.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 16 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q	
75-71-8	Dichlorodifluoromethane	5	~~U~~	UJ
74-87-3	Chloromethane	5	U	
75-01-4	Vinyl chloride	5	U	
74-83-9	Bromomethane	5	U	
75-00-3	Chloroethane	5	U	
75-69-4	Trichlorofluoromethane	1	J	
75-35-4	1,1-Dichloroethene	5	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5	U	
67-64-1	Acetone	5	U	
75-15-0	Carbon disulfide	5	U	
79-20-9	Methyl Acetate	5	~~U~~	UJ
75-09-2	Methylene chloride	5	U	
156-60-5	trans-1,2-Dichloroethene	5	U	
1634-04-4	Methyl tert-butyl ether	5	U	
75-34-3	1,1-Dichloroethane	5	U	
156-59-2	cis-1,2-Dichloroethene	5	U	
78-93-3	2-Butanone	5	U	
67-66-3	Chloroform	5	U	
71-55-6	1,1,1-Trichloroethane	5	U	
110-82-7	Cyclohexane	5	U	
56-23-5	Carbon tetrachloride	5	U	
71-43-2	Benzene	5	U	
107-06-2	1,2-Dichloroethane	5	U	
79-01-6	Trichloroethene	5	U	
108-87-2	Methylcyclohexane	5	U	
78-87-5	1,2-Dichloropropane	5	U	
75-27-4	Bromodichloromethane	5	U	
10061-01-5	cis-1,3-Dichloropropene	5	U	
108-10-1	4-Methyl-2-pentanone	5	U	
108-88-3	Toluene	5	U	
10061-02-6	trans-1,3-Dichloropropene	5	U	
79-00-5	1,1,2-Trichloroethane	5	U	
127-18-4	Tetrachloroethene	4700 ~~130~~	~~E~~	
591-78-6	2-Hexanone	5	U	
124-48-1	Dibromochloromethane	5	U	

MW 6/2/15

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-15-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-001A

Sample wt/vol: 11.99 (g/mL) g Lab File ID: 5\A86064.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 16 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
1330-20-7	Xylene (total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U

MW 6/2/15

1F

EPA SAMPLE NO.

SB-15-5.5-6.0

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-001A

Sample wt/vol: 11.99 (g/mL) g Lab File ID: 5\A86064.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 16 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: (µl) Soil Aliquot Volume: 0 (µL)

CONCENTRATION UNITS:

Number TICs found: 1 (µg/L or µg/Kg) µg/Kg

CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q
1. 055429-85-1	Benzeneethanamine, N-((pentafluorop	8.64	4	~~JN~~ NJ

FORM I VOA-TIC OLM04.2

MV 6/2/15

AECOM237 V34

1DL

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-15-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-001ADL

Sample wt/vol: 10.5 (g/mL) g Lab File ID: 5\A86090.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 16 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

Use original results

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q	
75-71-8	Dichlorodifluoromethane	660	~~U~~	UJ
74-87-3	Chloromethane	660	U	
75-01-4	Vinyl chloride	660	U	
74-83-9	Bromomethane	660	~~U~~	UJ
75-00-3	Chloroethane	660	~~U~~	UJ
75-69-4	Trichlorofluoromethane	660	~~U~~	UJ
75-35-4	1,1-Dichloroethene	660	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	660	U	
67-64-1	Acetone	660	U	
75-15-0	Carbon disulfide	660	~~U~~	UJ
79-20-9	Methyl Acetate	660	U	
75-09-2	Methylene chloride	660	U	
156-60-5	trans-1,2-Dichloroethene	660	U	
1634-04-4	Methyl tert-butyl ether	660	U	
75-34-3	1,1-Dichloroethane	660	U	
156-59-2	cis-1,2-Dichloroethene	660	U	
78-93-3	2-Butanone	660	U	
67-66-3	Chloroform	660	U	
71-55-6	1,1,1-Trichloroethane	660	U	
110-82-7	Cyclohexane	660	U	
56-23-5	Carbon tetrachloride	660	U	
71-43-2	Benzene	660	U	
107-06-2	1,2-Dichloroethane	660	U	
79-01-6	Trichloroethene	660	U	
108-87-2	Methylcyclohexane	660	U	
78-87-5	1,2-Dichloropropane	660	U	
75-27-4	Bromodichloromethane	660	U	
10061-01-5	cis-1,3-Dichloropropene	660	U	
108-10-1	4-Methyl-2-pentanone	660	U	
108-88-3	Toluene	660	U	
10061-02-6	trans-1,3-Dichloropropene	660	U	
79-00-5	1,1,2-Trichloroethane	660	U	
127-18-4	Tetrachloroethene	4700	~~DZ~~	
591-78-6	2-Hexanone	660	U	
124-48-1	Dibromochloromethane	660	U	

MW 6/2/15

1DL

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-15-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-001ADL

Sample wt/vol: 10.5 (g/mL) g Lab File ID: 5\A86090.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 16 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

use original results

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	660	U
108-90-7	Chlorobenzene	660	U
100-41-4	Ethylbenzene	660	U
1330-20-7	Xylene (total)	660	U
100-42-5	Styrene	660	U
75-25-2	Bromoform	660	U
98-82-8	Isopropylbenzene	660	U
79-34-5	1,1,2,2-Tetrachloroethane	660	U
541-73-1	1,3-Dichlorobenzene	660	U
106-46-7	1,4-Dichlorobenzene	660	U
95-50-1	1,2-Dichlorobenzene	660	U
96-12-8	1,2-Dibromo-3-chloropropane	660	U
120-82-1	1,2,4-Trichlorobenzene	660	~~U~~ UJ

MW 6/2/15

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 2

SB-16-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-002A

Sample wt/vol: 12.00 (g/mL) g Lab File ID: 5\A86065.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 11 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg

CAS NO.	COMPOUND		Q	
75-71-8	Dichlorodifluoromethane	5	~~U~~	UJ
74-87-3	Chloromethane	5	U	
75-01-4	Vinyl chloride	5	U	
74-83-9	Bromomethane	5	U	
75-00-3	Chloroethane	5	U	
75-69-4	Trichlorofluoromethane	2	J	
75-35-4	1,1-Dichloroethene	5	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5	U	
67-64-1	Acetone	4	J	
75-15-0	Carbon disulfide	5	U	
79-20-9	Methyl Acetate	5	~~U~~	UJ
75-09-2	Methylene chloride	5 ~~2~~	~~BJ~~	U
156-60-5	trans-1,2-Dichloroethene	5	U	
1634-04-4	Methyl tert-butyl ether	5	U	
75-34-3	1,1-Dichloroethane	5	U	
156-59-2	cis-1,2-Dichloroethene	5	U	
78-93-3	2-Butanone	59 ~~8~~	~~U~~	J
67-66-3	Chloroform	5	U	
71-55-6	1,1,1-Trichloroethane	5	U	
110-82-7	Cyclohexane	5	U	
56-23-5	Carbon tetrachloride	5	U	
71-43-2	Benzene	5	U	
107-06-2	1,2-Dichloroethane	5	U	
79-01-6	Trichloroethene	2	J	
108-87-2	Methylcyclohexane	5	U	
78-87-5	1,2-Dichloropropane	5	U	
75-27-4	Bromodichloromethane	5	U	
10061-01-5	cis-1,3-Dichloropropene	5	U	
108-10-1	4-Methyl-2-pentanone	5	U	
108-88-3	Toluene	0.5	J	
10061-02-6	trans-1,3-Dichloropropene	5	U	
79-00-5	1,1,2-Trichloroethane	60 ~~5~~	~~U~~	J
127-18-4	Tetrachloroethene	11000 ~~220~~	~~E~~	
591-78-6	2-Hexanone	5	U	
124-48-1	Dibromochloromethane	5	U	

MW 6/2/15

2

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-16-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-002A

Sample wt/vol: 12.00 (g/mL) g Lab File ID: 5\A86065.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 11 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
1330-20-7	Xylene (total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U

MW 6/2/15

2

1F

EPA SAMPLE NO.

SB-16-5.5-6.0

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-002A

Sample wt/vol: 12.00 (g/mL) g Lab File ID: 5\A86065.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 11 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: (µl) Soil Aliquot Volume: 0 (µL)

CONCENTRATION UNITS:

Number TICs found: 1 (µg/L or µg/Kg) µg/Kg

CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q
1. 001000-05-1	Tetrasiloxane, 1,1,3,3,5,5,7,7-octa	8.64	4	~~JN~~ NJ

FORM I VOA-TIC OLM04.2

MW 6/2/15

AECOM237 V51

2DL

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-16-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-002ADL

Sample wt/vol: 11.1 (g/mL) g Lab File ID: 5\A86091.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 11 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

Use original results

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(µg/L or µg/Kg) µg/Kg	Q	
75-71-8	Dichlorodifluoromethane	560	~~U~~	UJ
74-87-3	Chloromethane	560	U	
75-01-4	Vinyl chloride	560	U	
74-83-9	Bromomethane	560	~~U~~	UJ
75-00-3	Chloroethane	560	~~U~~	↓
75-69-4	Trichlorofluoromethane	560	~~U~~	
75-35-4	1,1-Dichloroethene	560	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	560	U	
67-64-1	Acetone	560	U	
75-15-0	Carbon disulfide	560	~~U~~	UJ
79-20-9	Methyl Acetate	560	U	
75-09-2	Methylene chloride	560	U	
156-60-5	trans-1,2-Dichloroethene	560	U	
1634-04-4	Methyl tert-butyl ether	560	U	
75-34-3	1,1-Dichloroethane	560	U	
156-59-2	cis-1,2-Dichloroethene	560	U	
78-93-3	2-Butanone	59	~~U~~ J	
67-66-3	Chloroform	560	U	
71-55-6	1,1,1-Trichloroethane	560	U	
110-82-7	Cyclohexane	560	U	
56-23-5	Carbon tetrachloride	560	U	
71-43-2	Benzene	560	U	
107-06-2	1,2-Dichloroethane	560	U	
79-01-6	Trichloroethene	560	U	
108-87-2	Methylcyclohexane	560	U	
78-87-5	1,2-Dichloropropane	560	U	
75-27-4	Bromodichloromethane	560	U	
10061-01-5	cis-1,3-Dichloropropene	560	U	
108-10-1	4-Methyl-2-pentanone	560	U	
108-88-3	Toluene	560	U	
10061-02-6	trans-1,3-Dichloropropene	560	U	
79-00-5	1,1,2-Trichloroethane	60	~~DJ~~	J
127-18-4	Tetrachloroethene	11000	~~DZ~~	
591-78-6	2-Hexanone	560	U	
124-48-1	Dibromochloromethane	560	U	

MW 6/2/15

2DL

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-16-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-002ADL

Sample wt/vol: 11.1 (g/mL) g Lab File ID: 5\A86091.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 11 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

Use original results

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	560	U
108-90-7	Chlorobenzene	560	U
100-41-4	Ethylbenzene	560	U
1330-20-7	Xylene (total)	560	U
100-42-5	Styrene	560	U
75-25-2	Bromoform	560	U
98-82-8	Isopropylbenzene	560	U
79-34-5	1,1,2,2-Tetrachloroethane	560	U
541-73-1	1,3-Dichlorobenzene	560	U
106-46-7	1,4-Dichlorobenzene	560	U
95-50-1	1,2-Dichlorobenzene	560	U
96-12-8	1,2-Dibromo-3-chloropropane	560	U
120-82-1	1,2,4-Trichlorobenzene	560	~~U~~ UJ

MW 6/2/15

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 3

SB-17-5.0-5.5

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-003A

Sample wt/vol: 10.43 (g/mL) g Lab File ID: 5\A86066.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	6	~~U~~ UJ
74-87-3	Chloromethane	6	U
75-01-4	Vinyl chloride	6	U
74-83-9	Bromomethane	6	U
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	2	J
75-35-4	1,1-Dichloroethene	6	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6	U
67-64-1	Acetone	6	U
75-15-0	Carbon disulfide	6	U
79-20-9	Methyl Acetate	6	~~U~~ UJ
75-09-2	Methylene chloride	6	U
156-60-5	trans-1,2-Dichloroethene	6	U
1634-04-4	Methyl tert-butyl ether	6	U
75-34-3	1,1-Dichloroethane	6	U
156-59-2	cis-1,2-Dichloroethene	6	U
78-93-3	2-Butanone	6	U
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
110-82-7	Cyclohexane	6	U
56-23-5	Carbon tetrachloride	6	U
71-43-2	Benzene	6	U
107-06-2	1,2-Dichloroethane	6	U
79-01-6	Trichloroethene	5	J
108-87-2	Methylcyclohexane	6	U
78-87-5	1,2-Dichloropropane	6	U
75-27-4	Bromodichloromethane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	6	U
108-88-3	Toluene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
79-00-5	1,1,2-Trichloroethane	6	U
127-18-4	Tetrachloroethene	5700~~1200~~	~~E~~
591-78-6	2-Hexanone	6	U
124-48-1	Dibromochloromethane	6	U

ew 6/2/15

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 3

SB-17-5.0-5.5

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-003A

Sample wt/vol: 10.43 (g/mL) g Lab File ID: 5\A86066.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
1330-20-7	Xylene (total)	6	U
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropylbenzene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-chloropropane	6	U
120-82-1	1,2,4-Trichlorobenzene	6	U

MW 6/2/15

3DL

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-17-5.0-5.5DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-003ADL

Sample wt/vol: 12.9 (g/mL) g Lab File ID: 5\A86092.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

Use original results

CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg

CAS NO.	COMPOUND		Q
75-71-8	Dichlorodifluoromethane	590	~~U~~ UJ
74-87-3	Chloromethane	590	U
75-01-4	Vinyl chloride	590	U
74-83-9	Bromomethane	590	~~U~~ UJ
75-00-3	Chloroethane	590	~~U~~
75-69-4	Trichlorofluoromethane	590	~~U~~
75-35-4	1,1-Dichloroethene	590	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	590	U
67-64-1	Acetone	590	U
75-15-0	Carbon disulfide	590	~~U~~ UJ
79-20-9	Methyl Acetate	590	U
75-09-2	Methylene chloride	590	U
156-60-5	trans-1,2-Dichloroethene	590	U
1634-04-4	Methyl tert-butyl ether	590	U
75-34-3	1,1-Dichloroethane	590	U
156-59-2	cis-1,2-Dichloroethene	590	U
78-93-3	2-Butanone	590	U
67-66-3	Chloroform	590	U
71-55-6	1,1,1-Trichloroethane	590	U
110-82-7	Cyclohexane	590	U
56-23-5	Carbon tetrachloride	590	U
71-43-2	Benzene	590	U
107-06-2	1,2-Dichloroethane	590	U
79-01-6	Trichloroethene	590	U
108-87-2	Methylcyclohexane	590	U
78-87-5	1,2-Dichloropropane	590	U
75-27-4	Bromodichloromethane	590	U
10061-01-5	cis-1,3-Dichloropropene	590	U
108-10-1	4-Methyl-2-pentanone	590	U
108-88-3	Toluene	590	U
10061-02-6	trans-1,3-Dichloropropene	590	U
79-00-5	1,1,2-Trichloroethane	590	U
127-18-4	Tetrachloroethene	5700	~~DE~~
591-78-6	2-Hexanone	590	U
124-48-1	Dibromochloromethane	590	U

MW 6/2/15

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 3DL

SB-17-5.0-5.5DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-003ADL

Sample wt/vol: 12.9 (g/mL) g Lab File ID: 5\A86092.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

Use original results

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	590	U
108-90-7	Chlorobenzene	590	U
100-41-4	Ethylbenzene	590	U
1330-20-7	Xylene (total)	590	U
100-42-5	Styrene	590	U
75-25-2	Bromoform	590	U
98-82-8	Isopropylbenzene	590	U
79-34-5	1,1,2,2-Tetrachloroethane	590	U
541-73-1	1,3-Dichlorobenzene	590	U
106-46-7	1,4-Dichlorobenzene	590	U
95-50-1	1,2-Dichlorobenzene	590	U
96-12-8	1,2-Dibromo-3-chloropropane	590	U
120-82-1	1,2,4-Trichlorobenzene	590	~~U~~ UJ

MW 6/2/15

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 4

SB-18-5.0-5.5

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-004A

Sample wt/vol: 13.06 (g/mL) g Lab File ID: 5\A86067.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	5	~~U~~ UJ
74-87-3	Chloromethane	5	U
75-01-4	Vinyl chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5	U
67-64-1	Acetone	5	U
75-15-0	Carbon disulfide	5	U
79-20-9	Methyl Acetate	5	~~U~~ UJ
75-09-2	Methylene chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-Butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
110-82-7	Cyclohexane	5	U
56-23-5	Carbon tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
108-87-2	Methylcyclohexane	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	2400 ~~160~~	~~E~~
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U

MW 6/2/15

4

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-18-5.0-5.5

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-004A

Sample wt/vol: 13.06 (g/mL) g Lab File ID: 5\A86067.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
1330-20-7	Xylene (total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U

MW 6/2/15

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 4DL

SB-18-5.0-5.5DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-004ADL

Sample wt/vol: 13.3 (g/mL) g Lab File ID: 5\A86093.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

Use original results

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(µg/L or µg/Kg) µg/Kg	Q	
75-71-8	Dichlorodifluoromethane	570	~~U~~	UJ
74-87-3	Chloromethane	570	U	
75-01-4	Vinyl chloride	570	U	
74-83-9	Bromomethane	570	~~U~~	UJ
75-00-3	Chloroethane	570	~~U~~	↓
75-69-4	Trichlorofluoromethane	570	~~U~~	
75-35-4	1,1-Dichloroethene	570	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	570	U	
67-64-1	Acetone	570	U	
75-15-0	Carbon disulfide	570	~~U~~	UJ
79-20-9	Methyl Acetate	570	U	
75-09-2	Methylene chloride	570	U	
156-60-5	trans-1,2-Dichloroethene	570	U	
1634-04-4	Methyl tert-butyl ether	570	U	
75-34-3	1,1-Dichloroethane	570	U	
156-59-2	cis-1,2-Dichloroethene	570	U	
78-93-3	2-Butanone	570	U	
67-66-3	Chloroform	570	U	
71-55-6	1,1,1-Trichloroethane	570	U	
110-82-7	Cyclohexane	570	U	
56-23-5	Carbon tetrachloride	570	U	
71-43-2	Benzene	570	U	
107-06-2	1,2-Dichloroethane	570	U	
79-01-6	Trichloroethene	570	U	
108-87-2	Methylcyclohexane	570	U	
78-87-5	1,2-Dichloropropane	570	U	
75-27-4	Bromodichloromethane	570	U	
10061-01-5	cis-1,3-Dichloropropene	570	U	
108-10-1	4-Methyl-2-pentanone	570	U	
108-88-3	Toluene	570	U	
10061-02-6	trans-1,3-Dichloropropene	570	U	
79-00-5	1,1,2-Trichloroethane	570	U	
127-18-4	Tetrachloroethene	2400	~~DZ~~	
591-78-6	2-Hexanone	570	U	
124-48-1	Dibromochloromethane	570	U	

MW 6/2/15

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 4DL

SB-18-5.0-5.5DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-004ADL

Sample wt/vol: 13.3 (g/mL) g Lab File ID: 5\A86093.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

Use original results

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	570	U
108-90-7	Chlorobenzene	570	U
100-41-4	Ethylbenzene	570	U
1330-20-7	Xylene (total)	570	U
100-42-5	Styrene	570	U
75-25-2	Bromoform	570	U
98-82-8	Isopropylbenzene	570	U
79-34-5	1,1,2,2-Tetrachloroethane	570	U
541-73-1	1,3-Dichlorobenzene	570	U
106-46-7	1,4-Dichlorobenzene	570	U
95-50-1	1,2-Dichlorobenzene	570	U
96-12-8	1,2-Dibromo-3-chloropropane	570	U
120-82-1	1,2,4-Trichlorobenzene	570	~~U~~ UJ

MW 6/2/15

5

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-19-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-005A

Sample wt/vol: 12.13 (g/mL) g Lab File ID: 5\A86068.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 20 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q	
75-71-8	Dichlorodifluoromethane	5	~~U~~	UJ
74-87-3	Chloromethane	5	U	
75-01-4	Vinyl chloride	5	U	
74-83-9	Bromomethane	5	U	
75-00-3	Chloroethane	5	U	
75-69-4	Trichlorofluoromethane	0.7	J	
75-35-4	1,1-Dichloroethene	5	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5	U	
67-64-1	Acetone	5	U	
75-15-0	Carbon disulfide	5	U	
79-20-9	Methyl Acetate	5	~~U~~	UJ
75-09-2	Methylene chloride	5	U	
156-60-5	trans-1,2-Dichloroethene	5	U	
1634-04-4	Methyl tert-butyl ether	5	U	
75-34-3	1,1-Dichloroethane	5	U	
156-59-2	cis-1,2-Dichloroethene	5	U	
78-93-3	2-Butanone	5	U	
67-66-3	Chloroform	5	U	
71-55-6	1,1,1-Trichloroethane	5	U	
110-82-7	Cyclohexane	5	U	
56-23-5	Carbon tetrachloride	5	U	
71-43-2	Benzene	5	U	
107-06-2	1,2-Dichloroethane	5	U	
79-01-6	Trichloroethene	0.8	J	
108-87-2	Methylcyclohexane	5	U	
78-87-5	1,2-Dichloropropane	5	U	
75-27-4	Bromodichloromethane	5	U	
10061-01-5	cis-1,3-Dichloropropene	5	U	
108-10-1	4-Methyl-2-pentanone	5	U	
108-88-3	Toluene	5	U	
10061-02-6	trans-1,3-Dichloropropene	5	U	
79-00-5	1,1,2-Trichloroethane	65 ~~5~~	~~U~~	J
127-18-4	Tetrachloroethene	10000 ~~420~~	~~B~~	
591-78-6	2-Hexanone	5	U	
124-48-1	Dibromochloromethane	5	U	

MJ 6/2/15

5

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-19-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-005A

Sample wt/vol: 12.13 (g/mL) g Lab File ID: 5\A86068.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 20 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
1330-20-7	Xylene (total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U

MW 6/2/15

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 5DL

SB-19-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-005ADL

Sample wt/vol: 13.7 (g/mL) g Lab File ID: 5\A86094.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 20 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

Use original results

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(µg/L or µg/Kg) µg/Kg	Q	
75-71-8	Dichlorodifluoromethane	570	~~U~~	UJ
74-87-3	Chloromethane	570	U	
75-01-4	Vinyl chloride	570	U	
74-83-9	Bromomethane	570	~~U~~	UJ
75-00-3	Chloroethane	570	~~U~~	↓
75-69-4	Trichlorofluoromethane	570	~~U~~	
75-35-4	1,1-Dichloroethene	570	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	570	U	
67-64-1	Acetone	570	U	
75-15-0	Carbon disulfide	570	~~U~~	UJ
79-20-9	Methyl Acetate	570	U	
75-09-2	Methylene chloride	570	U	
156-60-5	trans-1,2-Dichloroethene	570	U	
1634-04-4	Methyl tert-butyl ether	570	U	
75-34-3	1,1-Dichloroethane	570	U	
156-59-2	cis-1,2-Dichloroethene	570	U	
78-93-3	2-Butanone	570	U	
67-66-3	Chloroform	570	U	
71-55-6	1,1,1-Trichloroethane	570	U	
110-82-7	Cyclohexane	570	U	
56-23-5	Carbon tetrachloride	570	U	
71-43-2	Benzene	570	U	
107-06-2	1,2-Dichloroethane	570	U	
79-01-6	Trichloroethene	570	U	
108-87-2	Methylcyclohexane	570	U	
78-87-5	1,2-Dichloropropane	570	U	
75-27-4	Bromodichloromethane	570	U	
10061-01-5	cis-1,3-Dichloropropene	570	U	
108-10-1	4-Methyl-2-pentanone	570	U	
108-88-3	Toluene	570	U	
10061-02-6	trans-1,3-Dichloropropene	570	U	
79-00-5	1,1,2-Trichloroethane	65	~~DJ~~	J
127-18-4	Tetrachloroethene	10000	~~DJ~~	
591-78-6	2-Hexanone	570	U	
124-48-1	Dibromochloromethane	570	U	

NW 6/2/15

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. SDL

SB-19-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-005ADL

Sample wt/vol: 13.7 (g/mL) g Lab File ID: 5\A86094.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 20 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

Use original results

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	570	U
108-90-7	Chlorobenzene	570	U
100-41-4	Ethylbenzene	570	U
1330-20-7	Xylene (total)	570	U
100-42-5	Styrene	570	U
75-25-2	Bromoform	570	U
98-82-8	Isopropylbenzene	570	U
79-34-5	1,1,2,2-Tetrachloroethane	570	U
541-73-1	1,3-Dichlorobenzene	570	U
106-46-7	1,4-Dichlorobenzene	570	U
95-50-1	1,2-Dichlorobenzene	570	U
96-12-8	1,2-Dibromo-3-chloropropane	570	U
120-82-1	1,2,4-Trichlorobenzene	570	~~U~~ UJ

MW 6/2/15

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 6

TB

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) WATER Lab Sample ID: 1504C96-006A

Sample wt/vol: 5 (g/mL) mL Lab File ID: 5\G31867.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. Date Analyzed: 04/20/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/L	Q	
75-71-8	Dichlorodifluoromethane	10	~~U~~	UJ
74-87-3	Chloromethane	10	U	
75-01-4	Vinyl chloride	10	U	
74-83-9	Bromomethane	10	U	
75-00-3	Chloroethane	10	U	
75-69-4	Trichlorofluoromethane	10	U	
75-35-4	1,1-Dichloroethene	10	U	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U	
67-64-1	Acetone	10	~~U~~	UJ
75-15-0	Carbon disulfide	10	U	
79-20-9	Methyl Acetate	10	U	
75-09-2	Methylene chloride	10	U	
156-60-5	trans-1,2-Dichloroethene	10	U	
1634-04-4	Methyl tert-butyl ether	10	U	
75-34-3	1,1-Dichloroethane	10	U	
156-59-2	cis-1,2-Dichloroethene	10	U	
78-93-3	2-Butanone	10	U	
67-66-3	Chloroform	10	U	
71-55-6	1,1,1-Trichloroethane	10	U	
110-82-7	Cyclohexane	10	U	
56-23-5	Carbon tetrachloride	10	U	
71-43-2	Benzene	10	U	
107-06-2	1,2-Dichloroethane	10	U	
79-01-6	Trichloroethene	10	U	
108-87-2	Methylcyclohexane	10	U	
78-87-5	1,2-Dichloropropane	10	U	
75-27-4	Bromodichloromethane	10	U	
10061-01-5	cis-1,3-Dichloropropene	10	U	
108-10-1	4-Methyl-2-pentanone	10	U	
108-88-3	Toluene	10	U	
10061-02-6	trans-1,3-Dichloropropene	10	U	
79-00-5	1,1,2-Trichloroethane	10	U	
127-18-4	Tetrachloroethene	10	U	
591-78-6	2-Hexanone	10	U	
124-48-1	Dibromochloromethane	10	U	

MW 6/2/15

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 6

TB

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) WATER Lab Sample ID: 1504C96-006A

Sample wt/vol: 5 (g/mL) mL Lab File ID: 5\G31867.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. Date Analyzed: 04/20/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/L	Q
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

NW 6/2/15

Pace Long Island

575 Broad Hollow Road
Melville, NY 11747

tel 631.694.3040
fax 631.420.8436

ANALYTICAL DATA PACKAGE

TABLE OF CONTENTS

AECOM
CRYSTAL CLEANERS SITE PELHAM NY
SOIL SAMPLE
SAMPLES RECEIVED: 4/16/15
SDG NO.: AECOM237

I. NYS DEC SUMMARY FORMS

II. SDG NARRATIVES

III. CHAIN OF CUSTODY DOCUMENTATION

IV. ANALYTICAL DATA PACKAGE

A. VOLATILES

DATA PACKAGE FOR CLIENT INFORMATION PURPOSES ONLY

Pace Long Island

575 Broad Hollow Road
Melville, NY 11747

tel 631.694.3040
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I. NYS DEC SUMMARY FORMS

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

SDG: AECOM237

Analytical Requirements

Customer Sample Code	Laboratory Sample Code	MSVOA
SB-15-5.5-6.0	1504C96-001	X
SB-16-5.5-6.0	1504C96-002	X
SB-17-5.0-5.5	1504C96-003	X
SB-18-5.0-5.5	1504C96-004	X
SB-19-5.5-6.0	1504C96-005	X
TB	1504C96-006	X

CLP/Non-CLP (Please indicate year of protocol)
TCL/~~TAL, HSL~~, Priority Pollutant,

ASP 03 2005

5/13/15

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
VOLATILE (VOA)
ANALYSES

SDG: AECOM237

Laboratory Samp ID	Client Sample ID	Matrix	Analytical Protocol	Date Collected	DateRecd at Lab	Date Extracted	Date Analyzed	Extraction Method	DF	Level	Aux Cleanup
1504C96-001A	SB-15-5.5-6.0	Soil	SW8260	15-Apr-15	16-Apr-15		22-Apr-15		1	LOW	
1504C96-001ADL	SB-15-5.5-6.0DL	Soil	SW8260	15-Apr-15	16-Apr-15		23-Apr-15		1	MED	
1504C96-002A	SB-16-5.5-6.0	Soil	SW8260	15-Apr-15	16-Apr-15		22-Apr-15		1	LOW	
1504C96-002ADL	SB-16-5.5-6.0DL	Soil	SW8260	15-Apr-15	16-Apr-15		23-Apr-15		1	MED	
1504C96-003A	SB-17-5.0-5.5	Soil	SW8260	15-Apr-15	16-Apr-15		22-Apr-15		1	LOW	
1504C96-003ADL	SB-17-5.0-5.5DL	Soil	SW8260	15-Apr-15	16-Apr-15		23-Apr-15		1	MED	
1504C96-004A	SB-18-5.0-5.5	Soil	SW8260	15-Apr-15	16-Apr-15		22-Apr-15		1	LOW	
1504C96-004ADL	SB-18-5.0-5.5DL	Soil	SW8260	15-Apr-15	16-Apr-15		23-Apr-15		1	MED	
1504C96-005A	SB-19-5.5-6.0	Soil	SW8260	15-Apr-15	16-Apr-15		22-Apr-15		1	LOW	
1504C96-005ADL	SB-19-5.5-6.0DL	Soil	SW8260	15-Apr-15	16-Apr-15		23-Apr-15		1	MED	
1504C96-006A	TB	Aqueous	SW8260	15-Apr-15	16-Apr-15		20-Apr-15		1	LOW	

Pace Long Island

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Melville, NY 11747

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II. SDG NARRATIVES

Pace Long Island

575 Broad Hollow Road
Melville, NY 11747

tel 631.694.3040
fax 631.420.8436

SDG NARRATIVE FOR VOLATILES ANALYSES
SAMPLE(S) RECEIVED: 4/16/15
SDG #: AECOM237

For Sample(s):

SB-15-5.5-6.0	SB-18-5.0-5.5
SB-16-5.5-6.0	SB-19-5.5-6.0
SB-17-5.0-5.5	TB

The above sample(s) and blank(s) was/were analyzed by EPA method 8260C for a select list of volatile organic analytes and reported with the deliverables of NYSDEC ASP 2005 Category B. The samples were collected and processed headspace free according to EPA method 5035A.

All Q. C. data and calibrations met the requirements of the method unless discussed below, and no problems were encountered with sample analysis. The following should be noted:

No sample was submitted for matrix spike/ matrix spike duplicate (MS/MSD) analysis, but a lab fortified blank was analyzed on each date of analysis. Two analytes in the low level LFB on 4/22/15 and six in the medium level LFB did not meet Q. C. limits. No data are affected, because the compounds were not present in the samples.

All samples were re-analyzed with medium level procedure due to concentrations of targeted analytes above the calibration ranges. Both sets of data are submitted.

In the initial calibrations, average response factors were employed as applicable, and regression functions were used for the compounds with an RSD above 20%. In the continuing calibration verification(s) (CCV), the variability (%D or % drift) for some compounds was above 20%. Results for these analytes are flagged with a "Z" qualifier in the spiked analyses and if found in the samples analyzed on that day, indicating that they are regarded estimated.

Please note that the variability listed in Form VII is %D calculated with the average response factors. The % "drift" differs from those values for the analytes calibrated with functions. For instance for acetone in the CCVs %D exceeded 20% but the variability ("drift") was acceptable and no qualifier was required.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Date Reported: May 12, 2015

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* *
* *
****

Ursula Middel
Quality Analyst

Pace Long Island

575 Broad Hollow Road
Melville, NY 11747

tel 631.694.3040
fax 631.420.8436

III. CHAIN OF CUSTODY DOCUMENTATION

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

AECOM 237

Page: 1 of 1

1907255

Section A Required Client Information:

Company: AECOM
Address: 100 Redschoolhouse Rd
Bldg Chestnut Ridge NY
Email To: claire.hunt@aecom.com
Phone: 845.425.4980 Fax: 4989
Requested Due Date/TAT: Std

Section B Required Project Information:

Report To: Claire Hunt
Copy To:
Purchase Order No.: 60269812
Project Name: Crystal Cleaners Pelham
Project Number: 60269812

Section C Invoice Information:

Claire Hunt
~~Jennifer Bracciz~~
Attention: ~~Claire Hunt~~
Company Name: AECOM
Address: Chestnut Ridge
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: NY

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N): N, N

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED GRAB ~~COMPOSITE~~ START DATE	COLLECTED GRAB ~~COMPOSITE~~ START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): VOCs	% moisture	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	SB-15-5.5-6.0	SL	G	4/15/15	930				5	✓								✓	✓		1504496-001
2	SB-16-5.5-6.0	↓	↓	↓	1010				5	✓								✓	✓		002
3	SB-17-5.0-5.5	↓	↓	↓	1055				5	✓								✓	✓		003
4	SB-18-5.0-5.5	↓	↓	↓	1125				5	✓								✓	✓		004
5	SB-19-5.5-6.0	↓	↓	↓	1140				5	✓								✓	✓		005
6	TB	TB	↓						2				✓					✓			006
7																					
8																					
9																					
10																					
11																					
12																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	[signature]	4/15/15	1315	[signature]	4/16/15	13:15				
	[signature]	4/16/15	18:10	[signature] Pace	4/16/15	18:10	2.0	Y	N	Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Celeste Foster
SIGNATURE of SAMPLER: [signature]
DATE Signed (MM/DD/YY): 4/15/15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

PACE ANALYTICAL
575 Broad Hollow Road
Melville, NY 11747
TEL: (631) 694-3040 FAX: (631) 420-8436
Website: www.pacelabs.com

AECOM 237

Sample Receipt Checklist

Client Name AECOM-N

Date and Time Received: 4/16/2015 6:10:00 PM

Work Order Number: 1504C96 RcptNo: 1

Received by Jaclyn Kuri

Completed by: Jaclyn Kuri

Reviewed by:

Completed Date: 4/16/2015 7:38:48 PM

Reviewed Date: 4/22/2015 10:23:02 PM

Carrier name: PACE Pickup

Chain of custody present?	Yes ☑	No ☐		
Chain of custody signed when relinquished and received?	Yes ☑	No ☐		
Chain of custody agrees with sample labels?	Yes ☑	No ☐		
Are matrices correctly identified on Chain of custody?	Yes ☑	No ☐		
Is it clear what analyses were requested?	Yes ☑	No ☐		
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present	☑
Samples in proper container/bottle?	Yes ☑	No ☐		
Were correct preservatives used and noted?	Yes ☑	No ☐	NA	☐
Preservative added to bottles:				
Sample Condition?	Intact ☑	Broken ☐	Leaking	☐
Sufficient sample volume for indicated test?	Yes ☑	No ☐		
Were container labels complete (ID, Pres, Date)?	Yes ☑	No ☐		
All samples received within holding time?	Yes ☑	No ☐		
Was an attempt made to cool the samples?	Yes ☑	No ☐	NA	☐
All samples received at a temp. of > 0° C to 6.0° C?	Yes ☑	No ☐	NA	☐
Response when temperature is outside of range:				
Sample Temp. taken and recorded upon receipt?	Yes ☑	No ☐	To	2 °
Water - Were bubbles absent in VOC vials?	Yes ☑	No ☐	No Vials	☐
Water - Was there Chlorine Present?	Yes ☐	No ☐	NA	☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	No Water	☐
Are Samples considered acceptable?	Yes ☑	No ☐		
Custody Seals present?	Yes ☐	No ☑		
Airbill or Sticker?	Air Bill ☐	Sticker ☐	Not Present	☑
Airbill No:				

Case Number: SDG: AECOM237 SAS:

Any No response should be detailed in the comments section below, if applicable.

Client Contacted? ☐ Yes ☐ No ☑ NA Person Contacted:

Contact Mode: ☐ Phone: ☐ Fax: ☐ Email: ☐ In Person:

Client Instructions:

Date Contacted: Contacted By:

Regarding:

Comments:

CorrectiveAction:

INTERNAL CHAIN OF CUSTODY

CLIENT: AECOM-N DELIVERABLES: B05-70P TURN AROUND TIME: 21

SDG: AECOM237 CASE#: _____ MATRIX: Soil pH CHECK Y or N

REMARKS: _____

RECEIVED BY: JK SIGNATURE: Jaclyn Kurle DATE: 4/16/15 TIME: 18:10

CLIENT SAMPLE ID	LAB #	DATE COLLECTED	BOTTLE TYPE	# OF BOTTLES	TESTS REQUESTED
1. SB-15-5.5-6.0	1504196-001A	4/15/15	D:AA	3:1	8260-S-4-2
2. SB-16-5.5-6.0	-002A				
3. SB-17-5.0-5.5	-003A				
4. SB-18-5.0-5.5	-004A				
5. SB-19-5.5-6.0	-005A				
6. TB	-006A				
7.					
8.					
9.					
10.					
11.		JK 4/16/15			
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					

CLIENT: AECOM-N
SDG: AECOM237

INTERNAL CHAIN OF CUSTODY

DATE	TIME	SAMPLE RELINQUISHED BY	SAMPLE RECEIVED BY	BOTTLE TYPE	PURPOSE OF CHANGE OF CUSTODY	INIT.
4/16/15	7:45am	Jaclyn Ricci	[illegible]	D:AA	Analysis	
4/22/15	1500	[illegible]	Matt [illegible]		Analysis	

INTERNAL CHAIN OF CUSTODY

CLIENT: AECOM-N DELIVERABLES: BOS-TOP TURN AROUND TIME: 21

SDG: AECOM 237 CASE#: _____ MATRIX: Soil pH CHECK Y or N

REMARKS: _____

RECEIVED BY: JK SIGNATURE: Jaclyn Kuri DATE: 4/16/15 TIME: 18:10

CLIENT SAMPLE ID	LAB #	DATE COLLECTED	BOTTLE TYPE	# OF BOTTLES	TESTS REQUESTED
1. SB-15-5.5-6.0	1504C96-001B	4/15/15	AA	1	PMDIST
2. SB-16-5.5-6.0	002B				
3. SB-17-5.0-5.5	003B				
4. SB-18-5.0-5.5	004B				
5. SB-19-5.5-6.0	005B				
6. TB	006B				
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					

JK 4/17/15

Pace Long Island

575 Broad Hollow Road
Melville, NY 11747

tel 631.694.3040
fax 631.420.8436

IV. ANALYTICAL DATA PACKAGE

A. VOLATILES

Pace Long Island

575 Broad Hollow Road
Melville, NY 11747

tel. 631.694.3040
fax. 631.420.8436

VOLATILE ORGANICS

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I. QC SUMMARY

II. SAMPLE DATA PACKAGE

III. STANDARDS DATA PACKAGE

IV. RAW QC DATA PACKAGE

V. DOCUMENTATION

Pace Long Island

575 Broad Hollow Road
Melville, NY 11747

tel. 631.694.3040
fax. 631.420.8436

I. QC SUMMARY FOR VOLATILE ORGANICS

- A. SYSTEM MONITORING COMPOUND RECOVERY SUMMARY
- B. MS/MSD SUMMARY*
- C. MSB SUMMARY*
- D. LFB SUMMARY*
- E. DUPLICATE SUMMARY*
- F. METHOD BLANK SUMMARY
- G. GC/MS TUNING SUMMARY
- H. INTERNAL STANDARD AREA AND RT SUMMARY
- I. INSTRUMENT DETECTION LIMITS OR MDL

*IF REQUIRED

2A

WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

	EPA SAMPLE NO.	SMC1 TOL #	SMC2 BFB #	SMC3 DCA #	OTHER	TOT OUT
01	VBLK042015	102	103	116		0
02	LFB042015	100	101	120		0
03	TB	101	101	119		0

			QC Limit
SMC 1	TOL	= Toluene-d8	(60-135)
SMC 2	BFB	= 4-Bromofluorobenzene	(63-140)
SMC 3	DCA	= 1,2-Dichloroethane-d4	(53-183)

Column to be used to flag recovery values

* Values outside of contract required QC limits

2B

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Level:(low/med) LOW

	EPA SAMPLE NO.	SMC1 TOL #	SMC2 BFB #	SMC3 DCA #	OTHER	TOT OUT
01	VBLK042215	111	112	109		0
02	LFB042215	116	111	109		0
03	SB-15-5.5-6.0	141	89	121		0
04	SB-16-5.5-6.0	131	95	120		0
05	SB-17-5.0-5.5	136	87	114		0
06	SB-18-5.0-5.5	114	104	116		0
07	SB-19-5.5-6.0	124	99	120		0

			QC Limit
SMC 1	TOL	= Toluene-d8	(43-157)
SMC 2	BFB	= 4-Bromofluorobenzene	(34-145)
SMC 3	DCA	= 1,2-Dichloroethane-d4	(33-150)

Column to be used to flag recovery values

* Values outside of contract required QC limits

2B

SOIL VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Level:(low/med) MED

	EPA SAMPLE NO.	SMC1 TOL #	SMC2 BFB #	SMC3 DCA #	OTHER	TOT OUT
01	VBLK042315M	110	116	111		0
02	LFB042315M	111	120	105		0
03	SB-15-5.5-6.0DL	109	117	111		0
04	SB-16-5.5-6.0DL	110	115	110		0
05	SB-17-5.0-5.5DL	108	113	106		0
06	SB-18-5.0-5.5DL	111	117	115		0
07	SB-19-5.5-6.0DL	109	118	117		0

			QC Limit
SMC 1	TOL	= Toluene-d8	(43-157)
SMC 2	BFB	= 4-Bromofluorobenzene	(34-145)
SMC 3	DCA	= 1,2-Dichloroethane-d4	(33-150)

Column to be used to flag recovery values

* Values outside of contract required QC limits

3A

SYSTEM MONITORING SPIKE RECOVERY

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM- SAS No.: _____ SDG No.: AECOM237

Sample ID LFB042015 Level:(low/med) LOW

Column ID Rtx-624 Column Diam .18

Inst. ID HP5972-2 Init. Calib. Date(s) 03/04/15 12:56

Analysis Date: 04/20/15 8:25 03/04/15 15:05

COMPOUND	SPIKE ADDED (µg/L)	SAMPLE CONCENTRATION (µg/L)	SPIKE CONCENTRATION (µg/L)	SPIKE % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	50	0	16	33	16-152
Chloromethane	50	0	40	81	58-142
Vinyl chloride	50	0	42	83	61-127
Bromomethane	50	0	44	88	67-126
Chloroethane	50	0	54	107	66-140
Trichlorofluoromethane	50	0	54	109	10-144
1,1-Dichloroethene	50	0	49	98	62-131
1,1,2-Trichloro-1,2,2-trifluoroethane	50	0	49	98	53-122
Acetone	50	0	45	90	33-175
Carbon disulfide	50	0	46	93	19-165
Methyl Acetate	50	0	65	131	45-175
Methylene chloride	50	0	49	99	47-159
trans-1,2-Dichloroethene	50	0	47	94	64-133
Methyl tert-butyl ether	50	0	52	104	64-117
1,1-Dichloroethane	50	0	58	116	52-152
cis-1,2-Dichloroethene	50	0	49	98	72-132
2-Butanone	50	0	49	99	33-175
Chloroform	50	0	53	107	56-142
1,1,1-Trichloroethane	50	0	54	109	24-129
Cyclohexane	50	0	56	113	33-152
Carbon tetrachloride	50	0	49	98	19-134
Benzene	50	0	49	98	64-139
1,2-Dichloroethane	50	0	60	120	48-133
Trichloroethene	50	0	47	94	43-150
Methylcyclohexane	50	0	43	85	22-171
1,2-Dichloropropane	50	0	57	114	40-152
Bromodichloromethane	50	0	56	111	55-138
cis-1,3-Dichloropropene	50	0	49	98	66-126
4-Methyl-2-pentanone	50	0	47	94	44-162
Toluene	50	0	43	85	69-124

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 48 outside limits

COMMENTS: _____

FORM III SW8260

3A

SYSTEM MONITORING SPIKE RECOVERY

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM- SAS No.: _____ SDG No.: AECOM237

Sample ID LFB042015 Level:(low/med) LOW

Column ID Rtx-624 Column Diam .18

Inst. ID HP5972-2 Init. Calib. Date(s) 03/04/15 12:56

Analysis Date: 04/20/15 8:25 03/04/15 15:05

trans-1,3-Dichloropropene	50	0	50	100	61-126
1,1,2-Trichloroethane	50	0	48	96	62-138
Tetrachloroethene	50	0	36	72	46-124
2-Hexanone	50	0	49	98	34-175
Dibromochloromethane	50	0	47	94	50-133
1,2-Dibromoethane	50	0	44	88	55-129
Chlorobenzene	50	0	44	87	65-135
Ethylbenzene	50	0	43	86	67-128
Xylene (total)	150	0	130	87	70-133
Styrene	50	0	44	87	71-132
Bromoform	50	0	39	78	51-126
Isopropylbenzene	50	0	42	85	58-131
1,1,2,2-Tetrachloroethane	50	0	47	94	46-164
1,3-Dichlorobenzene	50	0	43	86	61-133
1,4-Dichlorobenzene	50	0	42	84	59-134
1,2-Dichlorobenzene	50	0	43	86	60-134
1,2-Dibromo-3-chloropropane	50	0	50	101	33-137
1,2,4-Trichlorobenzene	50	0	30	60	10-175

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 48 outside limits

COMMENTS: _____

FORM III SW8260

3A

SYSTEM MONITORING SPIKE RECOVERY

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM- SAS No.: _____ SDG No.: AECOM237

Sample ID LFB042215 Level:(low/med) LOW

Column ID Rtx-624 Column Diam .18

Inst. ID HP5971 Init. Calib. Date(s) 03/31/15 17:19

Analysis Date: 04/22/15 10:51 03/31/15 19:04

COMPOUND	SPIKE ADDED (µg/Kg)	SAMPLE CONCENTRATION (µg/Kg)	SPIKE CONCENTRATION (µg/Kg)	SPIKE % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	50	0	22	45*	50-134
Chloromethane	50	0	47	94	33-149
Vinyl chloride	50	0	45	89	20-164
Bromomethane	50	0	47	94	58-144
Chloroethane	50	0	52	104	33-149
Trichlorofluoromethane	50	0	37	74	65-142
1,1-Dichloroethene	50	0	51	102	65-142
1,1,2-Trichloro-1,2,2-trifluoroethane	50	0	42	85	32-186
Acetone	50	0	43	86	50-187
Carbon disulfide	50	0	50	100	61-126
Methyl Acetate	50	0	69	139	60-140
Methylene chloride	50	0	56	112	46-157
trans-1,2-Dichloroethene	50	0	58	117	57-150
Methyl tert-butyl ether	50	0	56	112	78-140
1,1-Dichloroethane	50	0	58	116	67-141
cis-1,2-Dichloroethene	50	0	60	121	57-150
2-Butanone	50	0	55	109	30-162
Chloroform	50	0	55	110	68-140
1,1,1-Trichloroethane	50	0	47	94	78-127
Cyclohexane	50	0	46	92	60-140
Carbon tetrachloride	50	0	41	81	70-136
Benzene	50	0	59	118	71-142
1,2-Dichloroethane	50	0	56	111	74-125
Trichloroethene	50	0	50	101	72-145
Methylcyclohexane	50	0	39	77	60-140
1,2-Dichloropropane	50	0	63	127	78-132
Bromodichloromethane	50	0	53	106	69-136
cis-1,3-Dichloropropene	50	0	58	115	78-131
4-Methyl-2-pentanone	50	0	56	113	46-170
Toluene	50	0	54	107	59-139

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Spike Recovery: 2 out of 48 outside limits

COMMENTS: _____

FORM III SW8260

3A

SYSTEM MONITORING SPIKE RECOVERY

Lab Name: PACE ANALYTICAL Contract:

Lab Code: 10478 Case No.: AECOM- SAS No.: SDG No.: AECOM237

Sample ID LFB042215 Level:(low/med) LOW

Column ID Rtx-624 Column Diam .18

Inst. ID HP5971 Init. Calib. Date(s) 03/31/15 17:19

Analysis Date: 04/22/15 10:51 03/31/15 19:04

trans-1,3-Dichloropropene	50	0	53	105	59-147
1,1,2-Trichloroethane	50	0	61	123*	80-120
Tetrachloroethene	50	0	42	84	79-128
2-Hexanone	50	0	54	108	76-119
Dibromochloromethane	50	0	45	90	45-161
1,2-Dibromoethane	50	0	51	103	75-120
Chlorobenzene	50	0	52	103	60-133
Ethylbenzene	50	0	51	102	58-149
Xylene (total)	150	0	150	103	60-140
Styrene	50	0	52	105	78-128
Bromoform	50	0	41	83	67-124
Isopropylbenzene	50	0	47	93	60-140
1,1,2,2-Tetrachloroethane	50	0	59	118	72-152
1,3-Dichlorobenzene	50	0	46	92	57-162
1,4-Dichlorobenzene	50	0	47	95	57-179
1,2-Dichlorobenzene	50	0	47	95	55-172
1,2-Dibromo-3-chloropropane	50	0	41	82	58-120
1,2,4-Trichlorobenzene	50	0	42	84	69-129

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Spike Recovery: 2 out of 48 outside limits

COMMENTS:

3A

SYSTEM MONITORING SPIKE RECOVERY

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM- SAS No.: _____ SDG No.: AECOM237

Sample ID LFB042315M Level:(low/med) MED

Column ID Rtx-624 Column Diam .18

Inst. ID HP5971

Analysis Date: 04/23/15 11:51

COMPOUND	SPIKE ADDED (µg/Kg)	SAMPLE CONCENTRATION (µg/Kg)	SPIKE CONCENTRATION (µg/Kg)	SPIKE % REC #	QC. LIMITS REC.
Dichlorodifluoromethane	6300	0	1400	22*	50-134
Chloromethane	6300	0	4700	76	33-149
Vinyl chloride	6300	0	4400	70	20-164
Bromomethane	6300	0	1100	18*	58-144
Chloroethane	6300	0	830	13*	33-149
Trichlorofluoromethane	6300	0	740	12*	65-142
1,1-Dichloroethene	6300	0	5300	85	65-142
1,1,2-Trichloro-1,2,2-trifluoroethane	6300	0	3600	58	32-186
Acetone	6300	0	6200	100	50-187
Carbon disulfide	6300	0	3800	60*	61-126
Methyl Acetate	6300	0	5300	85	60-140
Methylene chloride	6300	0	7700	123	46-157
trans-1,2-Dichloroethene	6300	0	6500	104	57-150
Methyl tert-butyl ether	6300	0	7300	116	78-140
1,1-Dichloroethane	6300	0	7400	119	67-141
cis-1,2-Dichloroethene	6300	0	7300	116	57-150
2-Butanone	6300	0	7300	117	30-162
Chloroform	6300	0	6800	109	68-140
1,1,1-Trichloroethane	6300	0	5500	89	78-127
Cyclohexane	6300	0	5700	92	60-140
Carbon tetrachloride	6300	0	4800	77	70-136
Benzene	6300	0	7100	113	71-142
1,2-Dichloroethane	6300	0	7200	115	74-125
Trichloroethene	6300	0	5900	95	72-145
Methylcyclohexane	6300	0	3800	62	60-140
1,2-Dichloropropane	6300	0	8000	128	78-132
Bromodichloromethane	6300	0	6800	110	69-136
cis-1,3-Dichloropropene	6300	0	7600	121	78-131
4-Methyl-2-pentanone	6300	0	6200	100	46-170
Toluene	6300	0	6000	96	59-139

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Spike Recovery: 16 out of 48 outside limits

NN 05/11/2015

COMMENTS: _____

FORM III SW8260

3A

SYSTEM MONITORING SPIKE RECOVERY

Lab Name: PACE ANALYTICAL Contract:

Lab Code: 10478 Case No.: AECOM- SAS No.: SDG No.: AECOM237

Sample ID LFB042315M Level:(low/med) MED

Column ID Rtx-624 Column Diam .18

Inst. ID HP5971

Analysis Date: 04/23/15 11:51

trans-1,3-Dichloropropene	6300	0	7200	115	59-147
1,1,2-Trichloroethane	6300	0	7800	124*	80-120
Tetrachloroethene	6300	0	5100	81	79-128
2-Hexanone	6300	0	5900	94	76-119
Dibromochloromethane	6300	0	6500	103	45-161
1,2-Dibromoethane	6300	0	6400	102	75-120
Chlorobenzene	6300	0	6400	102	60-133
Ethylbenzene	6300	0	6400	103	58-149
Xylene (total)	19000	0	20000	105	60-140
Styrene	6300	0	6700	107	78-128
Bromoform	6300	0	6100	97	67-124
Isopropylbenzene	6300	0	6400	102	60-140
1,1,2,2-Tetrachloroethane	6300	0	7500	120	72-152
1,3-Dichlorobenzene	6300	0	6300	101	57-162
1,4-Dichlorobenzene	6300	0	6400	103	57-179
1,2-Dichlorobenzene	6300	0	6400	102	55-172
1,2-Dibromo-3-chloropropane	6300	0	6200	99	58-120
1,2,4-Trichlorobenzene	6300	0	5500	88	69-129

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

Spike Recovery: 0 out of 48 outside limits

COMMENTS:

FORM III SW8260

4A

EPA SAMPLE NO.

VOLATILE METHOD BLANK SUMMARY

VBLK042015

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Lab File ID: \G31864A.D Lab Sample ID: VBLK042015

Date Analyzed: 04/20/15 Time Analyzed: 8:04

GC Column: Rtx-624 ID: .18 (mm) Heated Purge: (Y/N) N

Instrument ID: HP5972-2

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LFB042015	LFB042015	\G31865A.D	8:25
02	TB	1504C96-006A	5\G31867.D	9:09

COMMENTS: _____

page 1 of 1

FORM IV VOA OLM04.2

4A

EPA SAMPLE NO.

VOLATILE METHOD BLANK SUMMARY

VBLK042215

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Lab File ID: 5\A86059.D Lab Sample ID: VBLK042215

Date Analyzed: 04/22/15 Time Analyzed: 10:30

GC Column: Rtx-624 ID: .18 (mm) Heated Purge: (Y/N) Y

Instrument ID: HP5971

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LFB042215	LFB042215	5\A86060.D	10:51
02	SB-15-5.5-6.0	1504C96-001A	5\A86064.D	12:19
03	SB-16-5.5-6.0	1504C96-002A	5\A86065.D	12:40
04	SB-17-5.0-5.5	1504C96-003A	5\A86066.D	13:01
05	SB-18-5.0-5.5	1504C96-004A	5\A86067.D	13:22
06	SB-19-5.5-6.0	1504C96-005A	5\A86068.D	13:43

COMMENTS: _____

FORM IV VOA OLM04.2

4A

EPA SAMPLE NO.

VOLATILE METHOD BLANK SUMMARY

VBLK042315M

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Lab File ID: 5\A86086.D Lab Sample ID: VBLK042315M

Date Analyzed: 04/23/15 Time Analyzed: 11:03

GC Column: Rtx-624 ID: .18 (mm) Heated Purge: (Y/N) N

Instrument ID: HP5971

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS, AND MSD:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	LFB042315M	LFB042315M	5\A86088.D	11:51
02	SB-15-5.5-6.0DL	1504C96-001ADL	5\A86090.D	12:36
03	SB-16-5.5-6.0DL	1504C96-002ADL	5\A86091.D	12:57
04	SB-17-5.0-5.5DL	1504C96-003ADL	5\A86092.D	13:17
05	SB-18-5.0-5.5DL	1504C96-004ADL	5\A86093.D	13:37
06	SB-19-5.5-6.0DL	1504C96-005ADL	5\A86094.D	13:57

COMMENTS: _____

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Lab File ID: 5\G30827.D BFB Injection Date: 03/04/15

Instrument ID: HP5972-2 BFB Injection Time: 11:25

GC Column: Rtx-624 ID: .18 (mm)

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	17.5
75	30.0 - 60.0% of mass 95	42.6
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	86.9
175	5.0 - 9.0% of mass 174	6.4 (7.4)1
176	95.0 - 101.0% of mass 174	84.8 (97.6)1
177	5.0 - 9.0% of mass 176	5.4 (6.4)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD1.0	VSTD1.0	5\G30831.D	03/04/15	12:56
02	VSTD5.0	VSTD5.0	5\G30832.D	03/04/15	13:18
03	VSTD10.0	VSTD10.0	5\G30833.D	03/04/15	13:39
04	VSTD20.0	VSTD20.0	5\G30834.D	03/04/15	14:00
05	VSTD50	VSTD50	5\G30835.D	03/04/15	14:22
06	VSTD100	VSTD100	5\G30836.D	03/04/15	14:43
07	VSTD200	VSTD200	5\G30837.D	03/04/15	15:05

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Lab File ID: 5\A85623.D BFB Injection Date: 03/31/15

Instrument ID: HP5971 BFB Injection Time: 16:37

GC Column: Rtx-624 ID: .18 (mm)

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.9
75	30.0 - 60.0% of mass 95	40.9
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	84.4
175	5.0 - 9.0% of mass 174	6.2 (7.4)1
176	95.0 - 101.0% of mass 174	83.2 (98.5)1
177	5.0 - 9.0% of mass 176	4.8 (5.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD005	VSTD005	5\A85624.D	03/31/15	17:19
02	VSTD010	VSTD010	5\A85625.D	03/31/15	17:40
03	VSTD020	VSTD020	5\A85626.D	03/31/15	18:01
04	VSTD050	VSTD050	5\A85627.D	03/31/15	18:22
05	VSTD100	VSTD100	5\A85628.D	03/31/15	18:43
06	VSTD200	VSTD200	5\A85629.D	03/31/15	19:04

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Lab File ID: 5\A85717.D BFB Injection Date: 04/03/15

Instrument ID: HP5971 BFB Injection Time: 11:20

GC Column: Rtx-624 ID: .18 (mm)

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.0
75	30.0 - 60.0% of mass 95	39.1
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.1
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	90.6
175	5.0 - 9.0% of mass 174	6.7 (7.4)1
176	95.0 - 101.0% of mass 174	88.3 (97.5)1
177	5.0 - 9.0% of mass 176	6.0 (6.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD001	VSTD001	5\A85720.D	04/03/15	12:58
02	VSTD005	VSTD005	5\A85721.D	04/03/15	13:19
03	VSTD010	VSTD010	5\A85722.D	04/03/15	13:39
04	VSTD020	VSTD020	5\A85723.D	04/03/15	13:59
05	VSTD050	VSTD050	5\A85724.D	04/03/15	14:19
06	VSTD100	VSTD100	5\A85725.D	04/03/15	14:39
07	VSTD200	VSTD200	5\A85726.D	04/03/15	15:00

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Lab File ID: 5\G31862.D BFB Injection Date: 04/20/15

Instrument ID: HP5972-2 BFB Injection Time: 7:17

GC Column: Rtx-624 ID: .18 (mm)

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	26.1
75	30.0 - 60.0% of mass 95	49.7
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.8
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	65.9
175	5.0 - 9.0% of mass 174	4.8 (7.3)1
176	95.0 - 101.0% of mass 174	63.2 (95.8)1
177	5.0 - 9.0% of mass 176	4.2 (6.7)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	\G31863A.D	04/20/15	7:40
02	VBLK042015	VBLK042015	\G31864A.D	04/20/15	8:04
03	LFB042015	LFB042015	\G31865A.D	04/20/15	8:25
04	TB	1504C96-006A	5\G31867.D	04/20/15	9:09

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Lab File ID: \A86058A.D BFB Injection Date: 04/22/15

Instrument ID: HP5971 BFB Injection Time: 9:51

GC Column: Rtx-624 ID: .18 (mm)

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	15.8
75	30.0 - 60.0% of mass 95	37.6
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.2
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	76.0
175	5.0 - 9.0% of mass 174	5.4 (7.1)1
176	95.0 - 101.0% of mass 174	73.0 (96.1)1
177	5.0 - 9.0% of mass 176	5.2 (7.1)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VBLK042215	VBLK042215	5\A86059.D	04/22/15	10:30
02	LFB042215	LFB042215	5\A86060.D	04/22/15	10:51
03	SB-15-5.5-6.0	1504C96-001A	5\A86064.D	04/22/15	12:19
04	SB-16-5.5-6.0	1504C96-002A	5\A86065.D	04/22/15	12:40
05	SB-17-5.0-5.5	1504C96-003A	5\A86066.D	04/22/15	13:01
06	SB-18-5.0-5.5	1504C96-004A	5\A86067.D	04/22/15	13:22
07	SB-19-5.5-6.0	1504C96-005A	5\A86068.D	04/22/15	13:43

5A

VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK

BROMOFLUOROBENZENE (BFB)

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Lab File ID: 5\A86083.D BFB Injection Date: 04/23/15

Instrument ID: HP5971 BFB Injection Time: 9:49

GC Column: Rtx-624 ID: .18 (mm)

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	16.2
75	30.0 - 60.0% of mass 95	37.0
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.7
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	72.5
175	5.0 - 9.0% of mass 174	5.1 (7.0)1
176	95.0 - 101.0% of mass 174	70.1 (96.7)1
177	5.0 - 9.0% of mass 176	4.9 (7.0)2

1-Value is % mass 174 2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01	VSTD050	VSTD050	5\A86084.D	04/23/15	10:14
02	VBLK042315M	VBLK042315M	5\A86086.D	04/23/15	11:03
03	LFB042315M	LFB042315M	5\A86088.D	04/23/15	11:51
04	SB-15-5.5-6.0DL	1504C96-001ADL	5\A86090.D	04/23/15	12:36
05	SB-16-5.5-6.0DL	1504C96-002ADL	5\A86091.D	04/23/15	12:57
06	SB-17-5.0-5.5DL	1504C96-003ADL	5\A86092.D	04/23/15	13:17
07	SB-18-5.0-5.5DL	1504C96-004ADL	5\A86093.D	04/23/15	13:37
08	SB-19-5.5-6.0DL	1504C96-005ADL	5\A86094.D	04/23/15	13:57

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Lab File ID (Standard): \G31863A.D Date Analyzed: 04/20/15

EPA Sample No.(VSTD050##): VSTD050 Time Analyzed: 7:40

Instrument ID: HP5972-2 Heated Purge: (Y/N) N

GC Column: Rtx-624 ID: .18 (mm)

		IS1 AREA #	RT #	IS2 AREA #	RT #	IS3 (CBZ) AREA #	RT #
	12 HOUR STD	93170	3.64	537505	4.36	457905	6.53
	UPPER LIMIT	186340	4.14	1075010	4.86	915810	7.03
	LOWER LIMIT	46585	3.14	268753	3.86	228953	6.03
	EPA SAMPLE						
01	VBLK042015	94661	3.63	537971	4.35	452201	6.53
02	LFB042015	92338	3.63	529503	4.35	453441	6.53
03	TB	93856	3.64	537559	4.36	456301	6.53

IS1 = Bromochloromethane
IS2 = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

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

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Lab File ID (Standard): 5\A86058.D Date Analyzed: 04/22/15

EPA Sample No.(VSTD050##): VSTD050 Time Analyzed: 9:51

Instrument ID: HP5971 Heated Purge: (Y/N) Y

GC Column: Rtx-624 ID: .18 (mm)

		IS1 AREA #	RT #	IS2 AREA #	RT #	IS3 (CBZ) AREA #	RT #
	12 HOUR STD	113551	3.61	790037	4.23	746617	6.28
	UPPER LIMIT	227102	4.11	1580074	4.73	1493234	6.78
	LOWER LIMIT	56776	3.11	395019	3.73	373309	5.78
	EPA SAMPLE						
01	VBLK042215	114436	3.61	793592	4.23	758164	6.28
02	LFB042215	115469	3.62	801492	4.23	745514	6.28
03	SB-15-5.5-6.0	94856	3.62	669668	4.23	497292	6.28
04	SB-16-5.5-6.0	104463	3.63	752171	4.23	599062	6.29
05	SB-17-5.0-5.5	104915	3.62	701153	4.23	537106	6.29
06	SB-18-5.0-5.5	115389	3.62	815650	4.23	746899	6.29
07	SB-19-5.5-6.0	111185	3.62	755213	4.23	646773	6.29

IS1 = Bromochloromethane
IS2 = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

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

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

8A

VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Lab File ID (Standard): 5\A86084.D Date Analyzed: 04/23/15

EPA Sample No.(VSTD050##): VSTD050 Time Analyzed: 10:14

Instrument ID: HP5971 Heated Purge: (Y/N) N

GC Column: Rtx-624 ID: .18 (mm)

		IS1 AREA #	RT #	IS2 AREA #	RT #	IS3 (CBZ) AREA #	RT #
	12 HOUR STD	161013	3.61	993055	4.23	977977	6.28
	UPPER LIMIT	322026	4.11	1986110	4.73	1955954	6.78
	LOWER LIMIT	80507	3.11	496528	3.73	488989	5.78
	EPA SAMPLE						
01	VBLK042315M	154608	3.61	984053	4.22	995083	6.28
02	LFB042315M	156279	3.61	950358	4.22	974179	6.28
03	SB-15-5.5-6.0DL	160457	3.61	1005503	4.23	1044585	6.28
04	SB-16-5.5-6.0DL	162727	3.61	1019623	4.23	1054975	6.28
05	SB-17-5.0-5.5DL	166570	3.61	1037159	4.23	1061898	6.28
06	SB-18-5.0-5.5DL	165571	3.61	1038527	4.23	1065865	6.28
07	SB-19-5.5-6.0DL	158064	3.61	1027992	4.23	1044724	6.28

IS1 = Bromochloromethane
IS2 = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

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

Column used to flag values outside QC limits with an asterisk.
* Values outside of QC limits.

PACE ANALYTICAL

Date: 07-May-15

Test Code: 8260_S_4-2
Test Number: SW8260
Test Name: VOCS IN SOIL
Matrix: Soil **Units:** µg/Kg

METHOD DETECTION / REPORTING LIMITS

Type	Analyte	Synonym	MDL	PQL
A	Dichlorodifluoromethane		0.33	10
A	Chloromethane		0.25	10
A	Vinyl chloride		0.18	10
A	Bromomethane		0.14	10
A	Chloroethane		0.12	10
A	Trichlorofluoromethane		0.17	10
A	1,1-Dichloroethene		0.28	10
A	1,1,2-Trichloro-1,2,2-trifluoroethane		0.26	10
A	Acetone		0.90	10
A	Carbon disulfide		1.2	10
A	Methyl Acetate		1.1	10
A	Methylene chloride		0.30	10
A	trans-1,2-Dichloroethene		1.4	10
A	Methyl tert-butyl ether		1.4	10
A	1,1-Dichloroethane		0.27	10
A	cis-1,2-Dichloroethene		0.13	10
A	2-Butanone		0.29	10
A	Chloroform		0.53	10
A	1,1,1-Trichloroethane		0.16	10
A	Cyclohexane		4.5	10
A	Carbon tetrachloride		0.14	10
A	Benzene		0.080	10
A	1,2-Dichloroethane		0.060	10
A	Trichloroethene		0.13	10
A	Methylcyclohexane		5.4	10
A	1,2-Dichloropropane		0.11	10
A	Bromodichloromethane		0.10	10
A	cis-1,3-Dichloropropene		0.14	10
A	4-Methyl-2-pentanone		0.14	10
A	Toluene		0.13	10
A	trans-1,3-Dichloropropene		0.10	10
A	1,1,2-Trichloroethane		0.23	10
A	Tetrachloroethene		0.26	10
A	2-Hexanone		0.36	10
A	Dibromochloromethane		0.14	10
A	1,2-Dibromoethane		0.35	10
A	Chlorobenzene		0.20	10
A	Ethylbenzene		0.43	10
A	Xylene (total)		0.80	10
A	Styrene		0.32	10
A	Bromoform		0.14	10
A	Isopropylbenzene		5.3	10
A	1,1,2,2-Tetrachloroethane		0.19	10
A	1,3-Dichlorobenzene		0.42	10
A	1,4-Dichlorobenzene		0.39	10
A	1,2-Dichlorobenzene		0.52	10

PACE ANALYTICAL

Date: 07-May-15

Test Code: 8260_S_4-2
Test Number: SW8260
Test Name: VOCS IN SOIL
Matrix: Soil **Units:** µg/Kg

METHOD DETECTION / REPORTING LIMITS

Type	Analyte	Synonym	MDL	PQL
A	1,2-Dibromo-3-chloropropane		0.36	10
A	1,2,4-Trichlorobenzene		1.7	10
I	Bromochloromethane		0	10
I	1,4-Difluorobenzene		0	10
I	Chlorobenzene-d5		0	10
S	Toluene-d8		0	10
S	4-Bromofluorobenzene		0	10
S	1,2-Dichloroethane-d4		0	10
X	1,4-Dioxane		22	250
X	Acrylonitrile		0	10
X	tert-Butyl Alcohol		0	50
X	1,2-Dichloroethene (total)		0.62	10
X	2-Chloroethylvinyl ether		0	10
X	Acrolein		0	20
X	m,p-Xylene		0.80	10
X	o-Xylene		0.35	10
X	Total NAPL		0	500
X	1,2,3-Trichlorobenzene		1.8	10

PACE ANALYTICAL

Date: 07-May-15

Test Code: 8260_W_4-2
Test Number: SW8260
Test Name: VOCS IN WATER
Matrix: Aqueous **Units:** µg/L

METHOD DETECTION / REPORTING LIMITS

Type	Analyte	Synonym	MDL	PQL
A	Dichlorodifluoromethane		0.10	10
A	Chloromethane		0.18	10
A	Vinyl chloride		0.12	10
A	Bromomethane		0.22	10
A	Chloroethane		0.20	10
A	Trichlorofluoromethane		0.14	10
A	1,1-Dichloroethene		0.16	10
A	1,1,2-Trichloro-1,2,2-trifluoroethane		0.76	10
A	Acetone		0.36	10
A	Carbon disulfide		0.54	10
A	Methyl Acetate		0.24	10
A	Methylene chloride		0.17	10
A	trans-1,2-Dichloroethene		0.075	10
A	Methyl tert-butyl ether		0.031	10
A	1,1-Dichloroethane		0.070	10
A	cis-1,2-Dichloroethene		0.15	10
A	2-Butanone		0.77	10
A	Chloroform		0.11	10
A	1,1,1-Trichloroethane		0.060	10
A	Cyclohexane		0.087	10
A	Carbon tetrachloride		0.47	10
A	Benzene		0.074	10
A	1,2-Dichloroethane		0.087	10
A	Trichloroethene		0.080	10
A	Methylcyclohexane		1.3	10
A	1,2-Dichloropropane		0.095	10
A	Bromodichloromethane		0.063	10
A	cis-1,3-Dichloropropene		0.11	10
A	4-Methyl-2-pentanone		0.16	10
A	Toluene		0.077	10
A	trans-1,3-Dichloropropene		0.14	10
A	1,1,2-Trichloroethane		0.10	10
A	Tetrachloroethene		0.38	10
A	2-Hexanone		0.44	10
A	Dibromochloromethane		0.17	10
A	1,2-Dibromoethane		0.085	10
A	Chlorobenzene		0.034	10
A	Ethylbenzene		0.13	10
A	Xylene (total)		0.065	10
A	Styrene		0.12	10
A	Bromoform		0.49	10
A	Isopropylbenzene		0.11	10
A	1,1,2,2-Tetrachloroethane		0.12	10
A	1,3-Dichlorobenzene		0.13	10
A	1,4-Dichlorobenzene		0.11	10
A	1,2-Dichlorobenzene		0.11	10

PACE ANALYTICAL

Date: 07-May-15

Test Code: 8260_W_4-2
Test Number: SW8260
Test Name: VOCS IN WATER
Matrix: Aqueous **Units:** µg/L

METHOD DETECTION / REPORTING LIMITS

Type	Analyte	Synonym	MDL	PQL
A	1,2-Dibromo-3-chloropropane		0.18	10
A	1,2,4-Trichlorobenzene		0.30	10
I	Bromochloromethane		0.074	10
I	1,4-Difluorobenzene		0	10
I	Chlorobenzene-d5		0	10
S	Toluene-d8		1.8	10
S	4-Bromofluorobenzene		1.5	10
S	1,2-Dichloroethane-d4		2.4	10
X	Naphthalene		0.26	10
X	1,4-Dioxane		28	250
X	tert-Butyl Alcohol		0.32	50
X	1,2-Dichloroethene (total)			10
X	2-Chloroethylvinyl ether		0.13	10
X	m,p-Xylene		0.15	10
X	o-Xylene		0.065	10
X	Total NAPL		0	500
X	1,2,3-Trichlorobenzene		0.25	10

Pace Long Island

575 Broad Hollow Road
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II. SAMPLE DATA PACKAGE FOR VOLATILE ORGANICS

A. REPORTS
B. RAW DATA

Pace Long Island

575 Broad Hollow Road
Melville, NY 11747

tel. 631.694.3040
fax. 631.420.8436

QUALIFIERS FOR REPORTING ORGANICS DATA

Value - If the result is a value greater than or equal to the quantification limit, report the value.

U - Indicates compound was analyzed for but not detected. The sample quantitation limit must be corrected for dilution and for percent moisture. For example, 10U for phenol in water if the sample final volume is the protocol-specified final volume. If a 1 to 10 dilution of extract is necessary, the reported limit is 100 U. For a soil sample, the value must also be adjusted for percent moisture. For example, if the sample had 24% moisture and a 1 to 10 dilution factor, the sample quantitation limit for phenol (330 U) would be corrected to:

$$\frac{(300\ U)}{D} \text{ x df where } D = \frac{100\% moisture}{100}$$

and df - dilution factor

$$\text{For example, at 24\% moisture, } D = \frac{100-24}{100} = 0.76$$

$$\frac{(300\ U)}{.76} \text{ x 10 - 4300 U rounded to the appropriate number of significant figures}$$

For semivolatile soil samples, the extract must be concentrated to 0.5 mL, and the sensitivity of the analysis is not compromised by the cleanup procedures. Similarly, pesticide samples subjected to GPC are concentrated to 5.0 mL. Therefore, the CRQL values in Exhibit C will apply to all samples, regardless of cleanup. However, if a sample extract cannot be concentrated to the protocol-specified volume (see Exhibit C), this fact must be accounted for in reporting the sample quantitation limit.

J - Indicates an estimated value. This flag is used either when estimating a concentration for tentatively identified compounds where a 1:1 response is assumed or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the specified quantification limit but greater than zero. (e.g.: If limit of quantification is 10 µg/L and a concentration of 3 µg/L is calculated, report as 3J.) The sample quantitation limit must be adjusted for dilution as discussed for the U flag.

N - Indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the N code is not used.

P - This flag is used for a pesticide/Aroclor target analyte when there is greater than 25% difference for detected concentrations between the two GC columns (see Form X). The lower of the two values is reported of Form I with a "P".

C - This flag applies to pesticide results when the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, do not apply this flag, instead use a Laboratory defined flag, discussed below.

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B - This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible probable blank contamination and warns the data user to take appropriate action. This flag must be used for a TIC as well as for a positively identified target compound.

E - This flag identified compounds whose concentrations exceed the calibration range of the GC/MS instrument for that specific analysis. If one or more compounds have a response greater than full scale, except as noted in Exhibit D, the sample or extract must be diluted and re-analyzed according to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration ranges in the second analysis, then the results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the sample number. NOTE: For total xylenes, where three isomers are quantified as two peaks, the calibration range of each peak should be considered separately, e.g. a diluted analysis is not required for total xylenes unless the concentration of the peak representing the single isomer exceed 200 µg/L or the peak representing the two coeluting isomers on that GC column exceed 400 µg/L. Similarly, if the two 1,2-Dichloroethene isomers coelute, a diluted analysis is not required unless the concentration exceed 400 µg/L.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, as in the "E" flag above, the "DL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample or extract.

A - This flag indicates that a TIC is a suspected aldol-condensation product.

X - Other specific flags may be required to properly define the results. If used, they must be fully described and such description attached to the Sample Data Summary Package and the SDG narrative. Begin by using "X". If more than one flag is required use "Y" and "Z" as needed. If more than five qualifiers are required for a sample result, used the "X" flag to combine several flags as needed. For instance, the "X" flag might combine "A", "B", and "D" flags for some samples. The laboratory defined flags limited to the letters "X", "Y" and "Z".

The combination of flags "BU' or "UB" is expressly prohibited. Blank contaminants are flagged "B" only when they are detected in the sample.

Y Suspected secondary contamination.

X Analyte is suspected column bleed

Z Analyte had a %D greater then 20% in the daily CCV

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CODES FOR MANUAL CORRECTIONS

T: Transcription error

CE: Calculation error

CC: Changed per client request

SC: Sample cancelled

LB: Wrong spot in logbook

MP: Missed peak

MIP: Misintegrated peak

WI: Wrong isomer

TI: Total of isomers

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-15-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-001A

Sample wt/vol: 11.99 (g/mL) g Lab File ID: 5\A86064.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 16 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	1	J
75-35-4	1,1-Dichloroethene	5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5	U
67-64-1	Acetone	5	U
75-15-0	Carbon disulfide	5	U
79-20-9	Methyl Acetate	5	U
75-09-2	Methylene chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-Butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
110-82-7	Cyclohexane	5	U
56-23-5	Carbon tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
108-87-2	Methylcyclohexane	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	130	E
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-15-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-001A

Sample wt/vol: 11.99 (g/mL) g Lab File ID: 5\A86064.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 16 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
1330-20-7	Xylene (total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-15-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-001A

Sample wt/vol: 11.99 (g/mL) g Lab File ID: 5\A86064.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 16 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: (µl) Soil Aliquot Volume: 0 (µL)

CONCENTRATION UNITS:

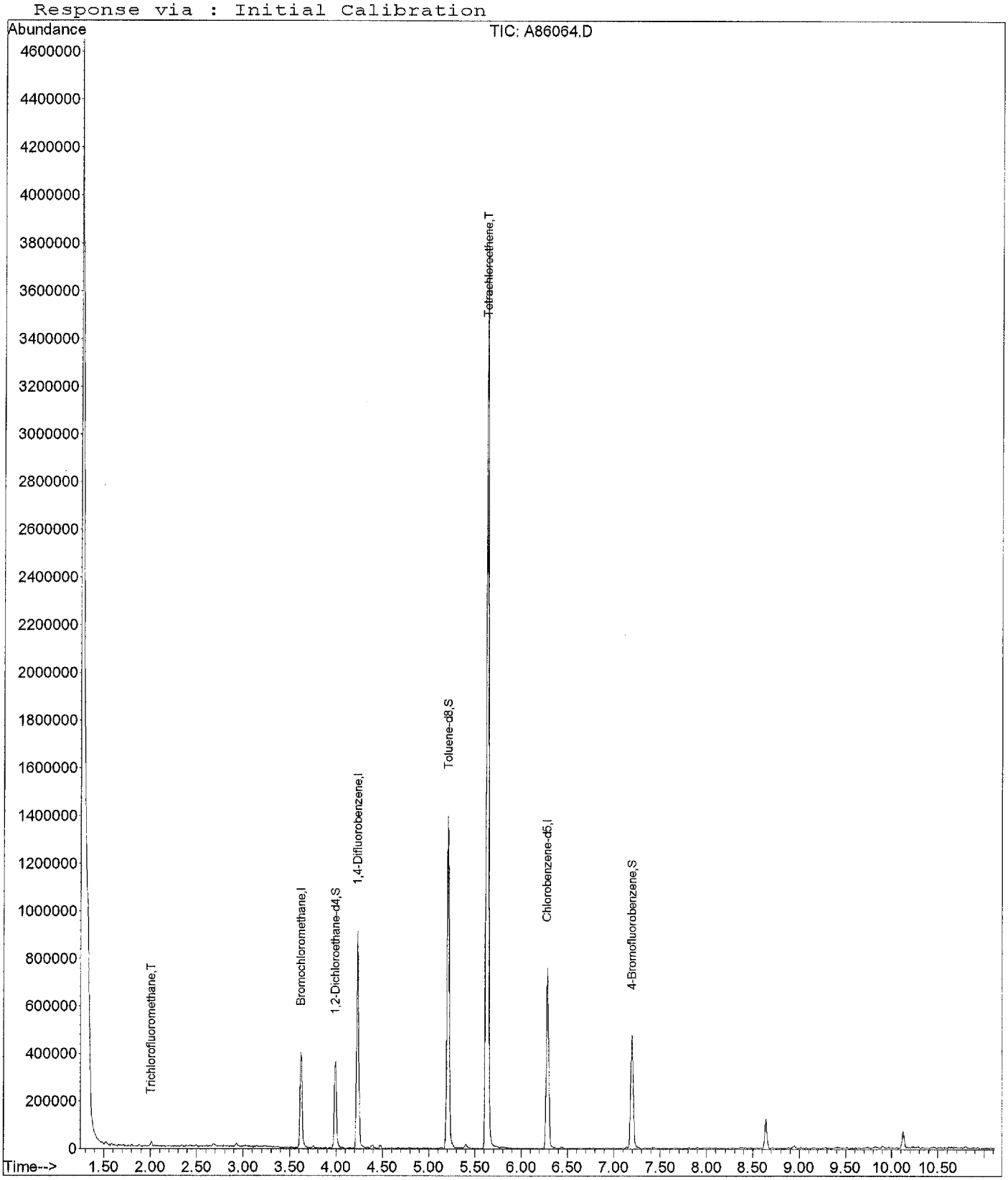
Number TICs found: 1 (µg/L or µg/Kg) µg/Kg

CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q
1. 055429-85-1	Benzeneethanamine, N-((pentafluorop	8.64	4	JN

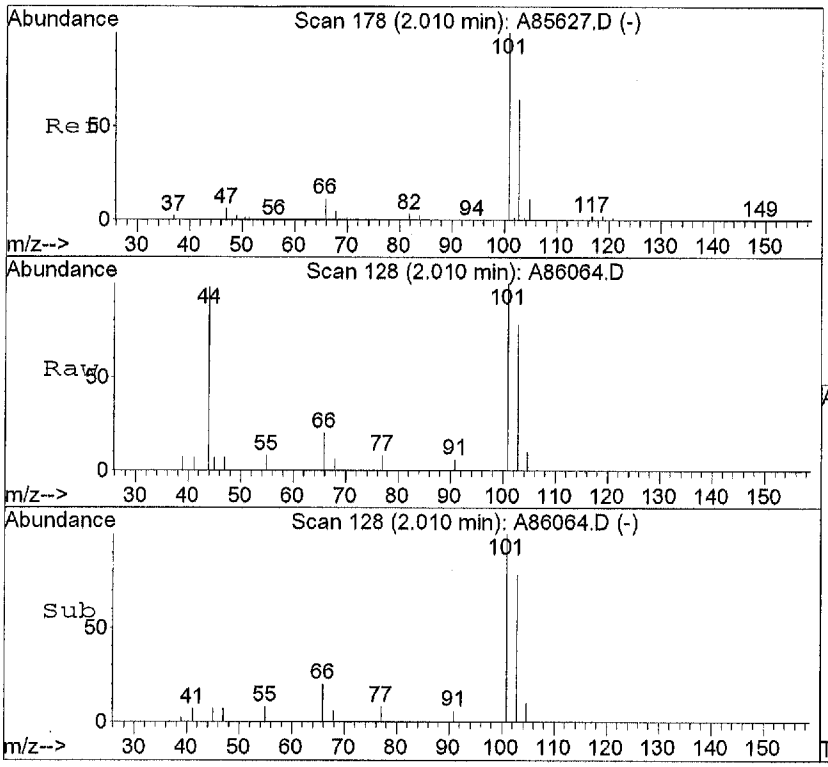
Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86064.D Vial: 13
Acq On : 22 Apr 2015 12:19 Operator: MF
Sample : 1504C96-001A Inst : H5971
Misc : AECOM237,SB-15-5.5-6.0,SOIL,SAMP,,11.99G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 22 13:23 2015 Quant Results File: R6S0331.RES

Method : O:\MS\HP5971\METHODS\2015\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration



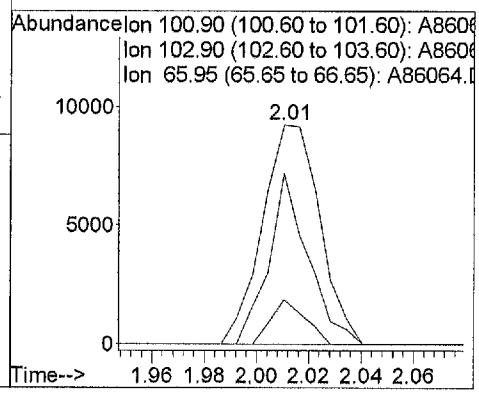
AECOM237 V35

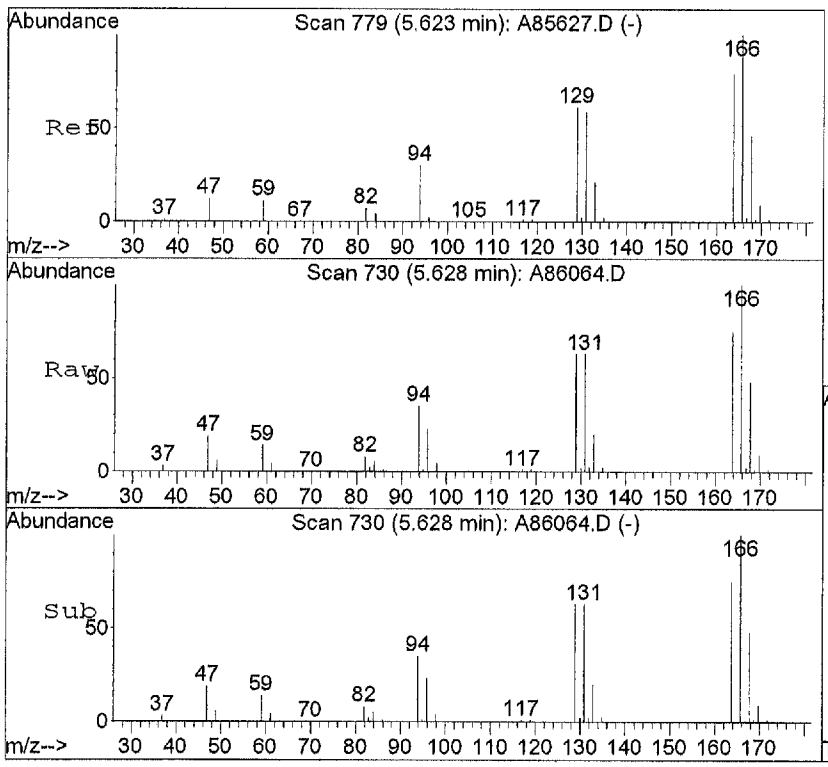


#18
Trichlorofluoromethane
Concen: 2.65 ug/l
RT: 2.01 min Scan# 128
Delta R.T. 0.00 min
Lab File: A86064.D
Acq: 22 Apr 2015 12:19

Tgt Ion:101 Resp: 14118

Ion	Ratio	Lower	Upper
101	100		
103	78.0	43.7	83.7
66	20.2	0.0	31.8

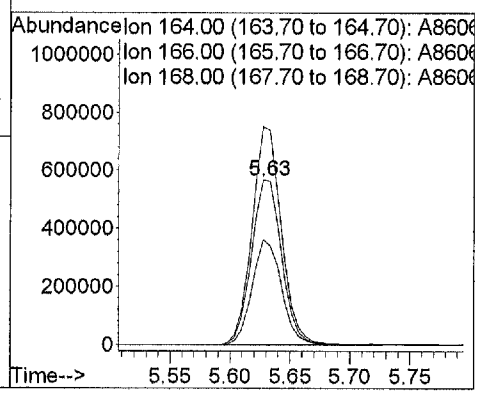




#47
Tetrachloroethene
Concen: 264.69 ug/l
RT: 5.63 min Scan# 730
Delta R.T. 0.00 min
Lab File: A86064.D
Acq: 22 Apr 2015 12:19

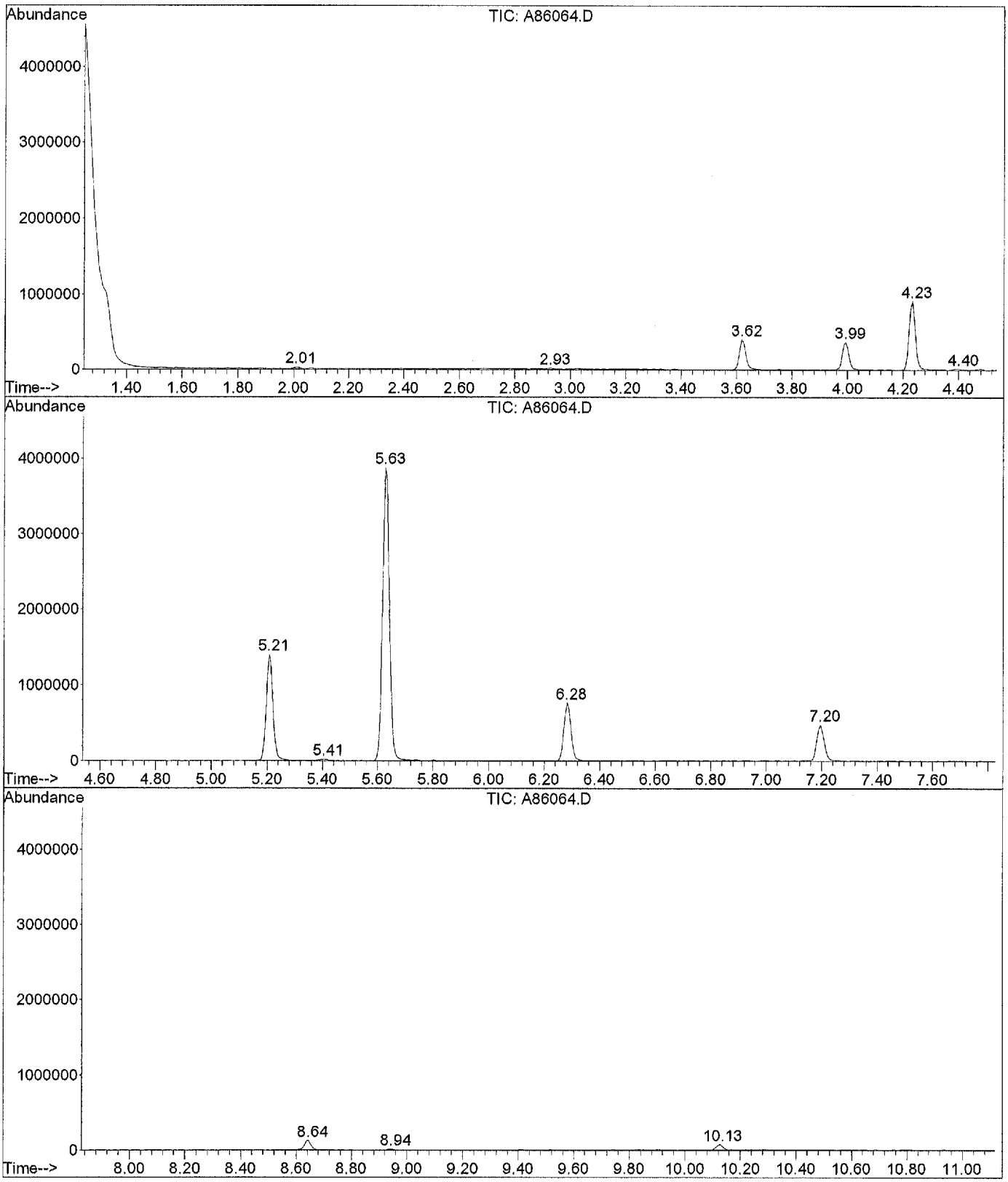
Tgt Ion:164 Resp: 997243

Ion	Ratio	Lower	Upper
164	100		
166	133.0	106.9	146.9
168	63.7	37.8	77.8



LSC Report - Integrated Chromatogram

File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86064.D
Operator : MF
Acquired : 22 Apr 2015 12:19 using AcqMethod R6S0331
Instrument : H5971
Sample Name: 1504C96-001A
Misc Info : AECOM237,SB-15-5.5-6.0,SOIL,SAMP,,11.99G
Vial Number: 13
Quant File :R6S0331.RES (RTE Integrator)



A86064.D R6S0331.M Thu May 07 13:29:48 2015 RPT1

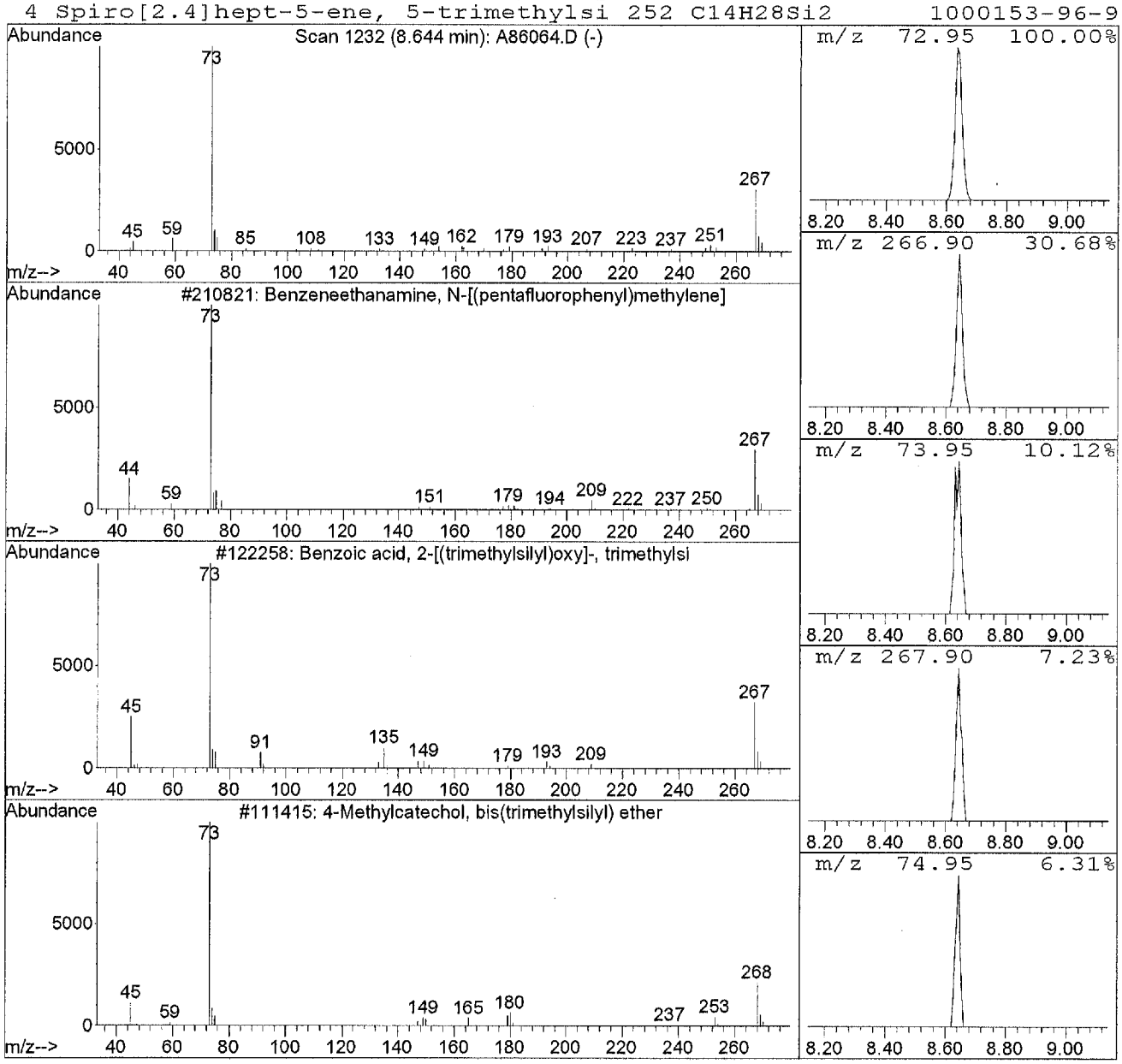
Library Search Compound Report

```
Data File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86064.D Vial: 13
Acq On    : 22 Apr 2015  12:19                          Operator: MF
Sample    : 1504C96-001A                                Inst     : H5971
Misc      : AECOM237,SB-15-5.5-6.0,SOIL,SAMP,,11.99G Multiplr: 1.00
MS Integration Params: LSCINT.P

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title        : 8260S A0104564, A0105567, A0101160, CH3755A
Library      : C:\DATABASE\NIST08.L
*****************************************************************
Peak Number  1  Benzeneethanamine, N-[(pentafl  Concentration Rank  1
```

R.T.	EstConc	Area	Relative to ISTD	R.T.
8.64	7.44 ug/l	203132	Chlorobenzene-d5	6.28

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Benzeneethanamine, N-[(pentafluorop	475	C21H26F5NO2Si2	055429-85-1	39
2	Benzoic acid, 2-[(trimethylsilyl)ox	282	C13H22O3Si2	003789-85-3	38
3	4-Methylcatechol, bis(trimethylsily	268	C13H24O2Si2	1000332-79-9	9
4	Spiro[2.4]hept-5-ene, 5-trimethylsi	252	C14H28Si2	1000153-96-9	9



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86064.D Vial: 13
Acq On : 22 Apr 2015 12:19 Operator: MF
Sample : 1504C96-001A Inst : H5971
Misc : AECOM237,SB-15-5.5-6.0,SOIL,SAMP,,11.99G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 22 13:23 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.62	128	94856	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	669668	50.00	ug/l	0.01
43) Chlorobenzene-d5	6.28	117	497292	50.00	ug/l	0.01
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.99	65	192811	60.36	ug/l	0.01
Spiked Amount 50.000	Range 33 - 150		Recovery = 120.72%			
49) Toluene-d8	5.21	98	920413	70.73	ug/l	0.01
Spiked Amount 50.000	Range 43 - 157		Recovery = 141.46%			
53) 4-Bromofluorobenzene	7.20	95	214770	44.42	ug/l	0.02
Spiked Amount 50.000	Range 34 - 145		Recovery = 88.84%			
Target Compounds						Qvalue
18) Trichlorofluoromethane	2.01	101	14118	2.65	ug/l	81
47) Tetrachloroethene	5.63	164	997243	264.69	ug/l	94

(#) = qualifier out of range (m) = manual integration

Tentatively Identified Compound (LSC) summary

Operator ID: MF Date Acquired: 22 Apr 2015 12:19
Data File: O:\MS\HP5971\DATA\2015\APRIL15\042215\A86064.D
Name: 1504C96-001A
Misc: AECOM237,SB-15-5.5-6.0,SOIL,SAMP,,11.99G
Method: C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title: 8260S A0104564, A0105567, A0101160, CH3755A
Library Searched: C:\DATABASE\NIST08.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
Benzeneethanamine, N	8.64	7.4	ug/l	203132	ISTD03	6.28	1364770	50.0

A86064.D R6S0331.M Thu May 07 13:29:48 2015 RPT1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-15-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-001ADL

Sample wt/vol: 10.5 (g/mL) g Lab File ID: 5\A86090.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 16 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	660	U
74-87-3	Chloromethane	660	U
75-01-4	Vinyl chloride	660	U
74-83-9	Bromomethane	660	U
75-00-3	Chloroethane	660	U
75-69-4	Trichlorofluoromethane	660	U
75-35-4	1,1-Dichloroethene	660	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	660	U
67-64-1	Acetone	660	U
75-15-0	Carbon disulfide	660	U
79-20-9	Methyl Acetate	660	U
75-09-2	Methylene chloride	660	U
156-60-5	trans-1,2-Dichloroethene	660	U
1634-04-4	Methyl tert-butyl ether	660	U
75-34-3	1,1-Dichloroethane	660	U
156-59-2	cis-1,2-Dichloroethene	660	U
78-93-3	2-Butanone	660	U
67-66-3	Chloroform	660	U
71-55-6	1,1,1-Trichloroethane	660	U
110-82-7	Cyclohexane	660	U
56-23-5	Carbon tetrachloride	660	U
71-43-2	Benzene	660	U
107-06-2	1,2-Dichloroethane	660	U
79-01-6	Trichloroethene	660	U
108-87-2	Methylcyclohexane	660	U
78-87-5	1,2-Dichloropropane	660	U
75-27-4	Bromodichloromethane	660	U
10061-01-5	cis-1,3-Dichloropropene	660	U
108-10-1	4-Methyl-2-pentanone	660	U
108-88-3	Toluene	660	U
10061-02-6	trans-1,3-Dichloropropene	660	U
79-00-5	1,1,2-Trichloroethane	660	U
127-18-4	Tetrachloroethene	4700	DZ
591-78-6	2-Hexanone	660	U
124-48-1	Dibromochloromethane	660	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-15-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-001ADL

Sample wt/vol: 10.5 (g/mL) g Lab File ID: 5\A86090.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 16 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	660	U
108-90-7	Chlorobenzene	660	U
100-41-4	Ethylbenzene	660	U
1330-20-7	Xylene (total)	660	U
100-42-5	Styrene	660	U
75-25-2	Bromoform	660	U
98-82-8	Isopropylbenzene	660	U
79-34-5	1,1,2,2-Tetrachloroethane	660	U
541-73-1	1,3-Dichlorobenzene	660	U
106-46-7	1,4-Dichlorobenzene	660	U
95-50-1	1,2-Dichlorobenzene	660	U
96-12-8	1,2-Dibromo-3-chloropropane	660	U
120-82-1	1,2,4-Trichlorobenzene	660	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-15-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-001ADL

Sample wt/vol: 10.5 (g/mL) g Lab File ID: 5\A86090.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 16 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µl) Soil Aliquot Volume: 100 (µL)

CONCENTRATION UNITS:

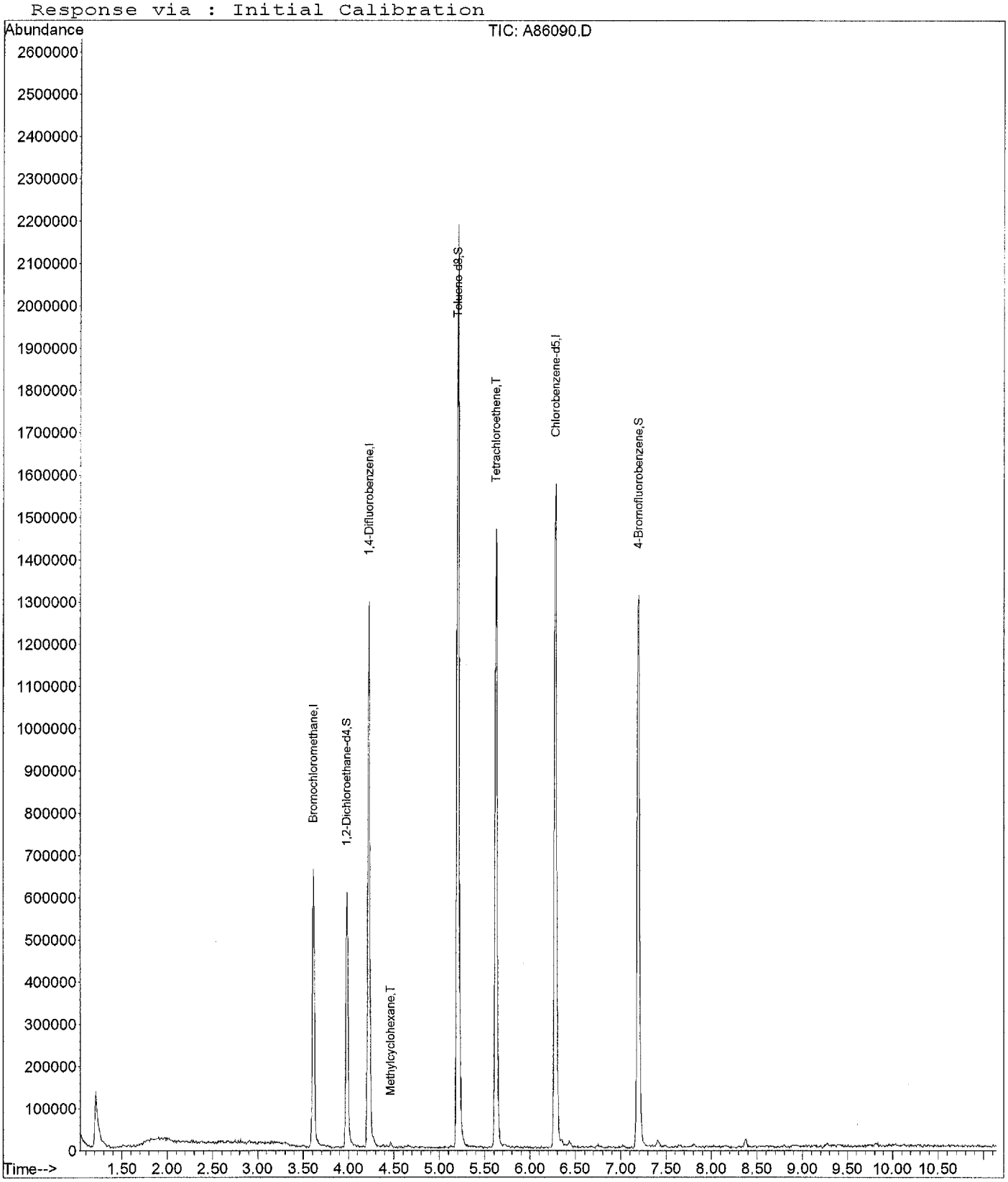
Number TICs found: 0 (µg/L or µg/Kg) µg/Kg

CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q

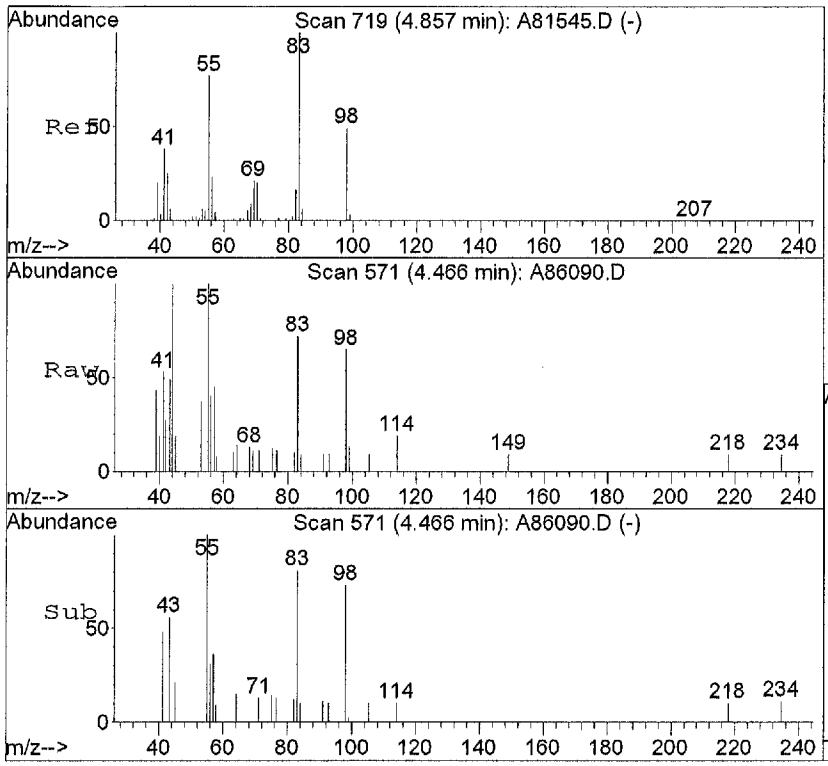
Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86090.D Vial: 10
Acq On : 23 Apr 2015 12:36 Operator: MF
Sample : 1504C96-001A Inst : H5971
Misc : AECOM237,SB-15-5.5-6.0,SOIL,DL,,10.5G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 12:54 2015 Quant Results File: R7W0403.RES

Method : O:\MS\HP5971\METHODS\2015\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration



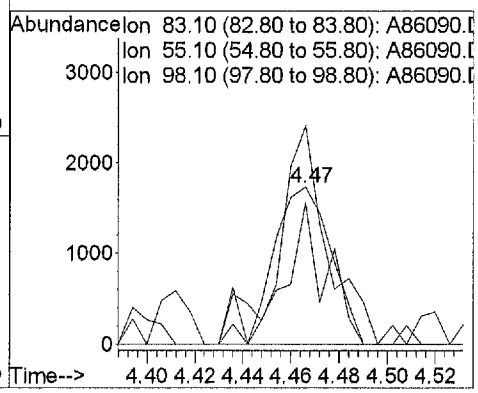
AECOM237 V44

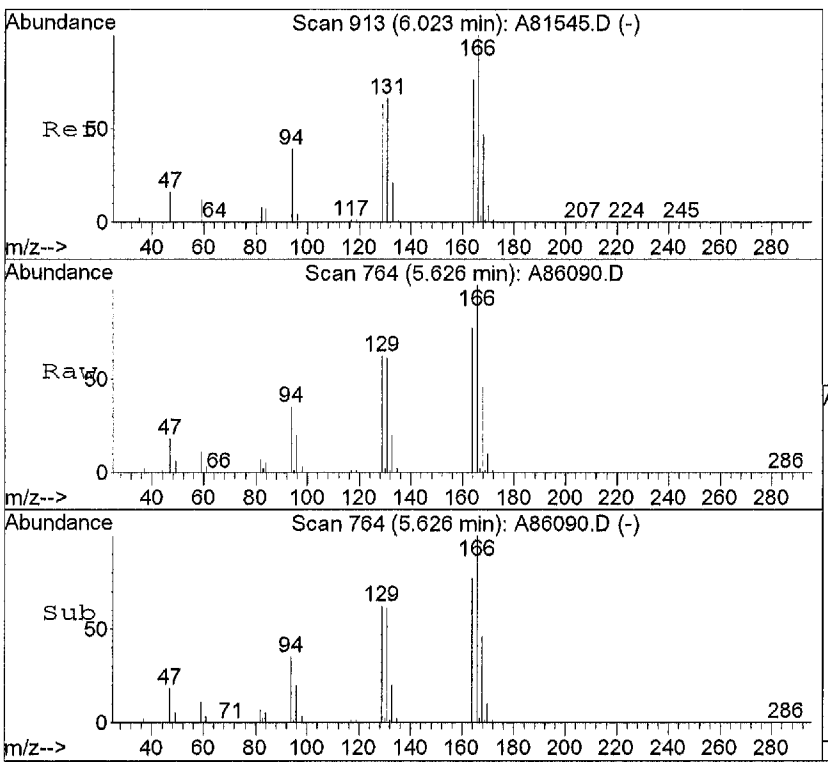


#37
Methylcyclohexane
Concen: 3.94 ug/l
RT: 4.47 min Scan# 571
Delta R.T. -0.00 min
Lab File: A86090.D
Acq: 23 Apr 2015 12:36

Tgt Ion: 83 Resp: 3022

Ion	Ratio	Lower	Upper
83	100		
55	139.6	54.6	94.6#
98	90.2	36.3	76.3#

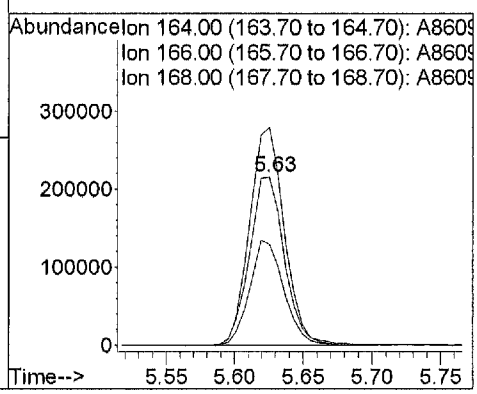




#47
Tetrachloroethene
Concen: 71.25 ug/l
RT: 5.63 min Scan# 764
Delta R.T. 0.01 min
Lab File: A86090.D
Acq: 23 Apr 2015 12:36

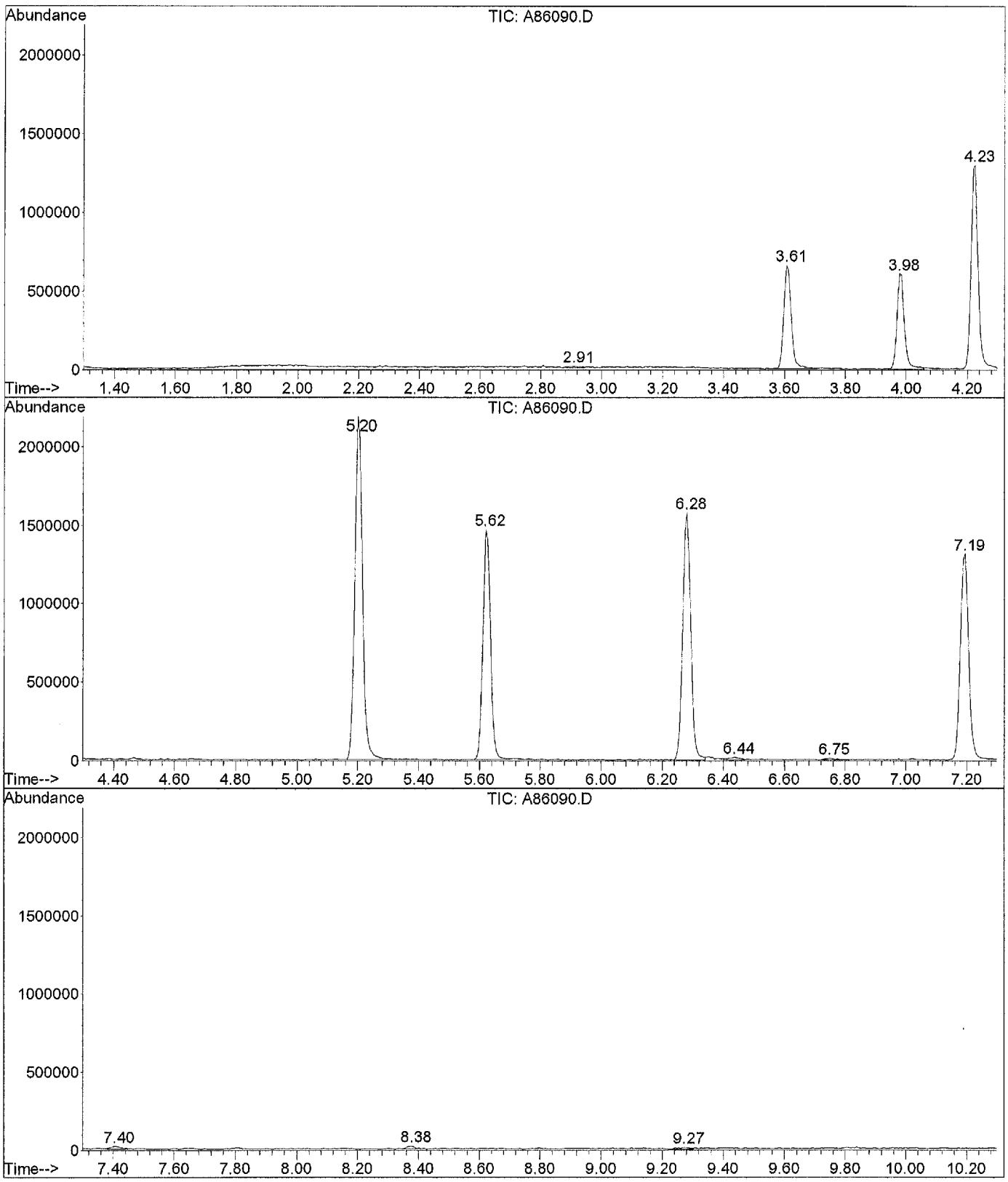
Tgt Ion:164 Resp: 381921

Ion	Ratio	Lower	Upper
164	100		
166	129.7	104.0	144.0
168	60.0	37.0	77.0



LSC Report - Integrated Chromatogram

File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86090.D
Operator : MF
Acquired : 23 Apr 2015 12:36 using AcqMethod R7W0403
Instrument : H5971
Sample Name: 1504C96-001A
Misc Info : AECOM237,SB-15-5.5-6.0,SOIL,DL,,10.5G
Vial Number: 10
Quant File :R7W0403.RES (RTE Integrator)



A86090.D R7W0403.M Thu May 07 13:54:03 2015 RPT1

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86090.D Vial: 10
Acq On : 23 Apr 2015 12:36 Operator: MF
Sample : 1504C96-001A Inst : H5971
Misc : AECOM237,SB-15-5.5-6.0,SOIL,DL,,10.5G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 12:54 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	160457	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	1005503	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	1044585	50.00	ug/l	0.01
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	323627	55.69	ug/l	0.00
Spiked Amount 50.000	Range 70 - 121		Recovery = 111.38%			
49) Toluene-d8	5.20	98	1449670	54.35	ug/l	0.00
Spiked Amount 50.000	Range 84 - 138		Recovery = 108.70%			
53) 4-Bromofluorobenzene	7.19	95	585558	58.69	ug/l	0.00
Spiked Amount 50.000	Range 59 - 113		Recovery = 117.38%#			
Target Compounds						Qvalue
37) Methylcyclohexane	4.47	83	3022	3.94	ug/l #	36
47) Tetrachloroethene	5.63	164	381921	71.25	ug/l	95

(#) = qualifier out of range (m) = manual integration

Tentatively Identified Compound (LSC) summary

Operator ID: MF Date Acquired: 23 Apr 2015 12:36
Data File: O:\MS\HP5971\DATA\2015\APRIL15\042315\A86090.D
Name: 1504C96-001A
Misc: AECOM237,SB-15-5.5-6.0,SOIL,DL,,10.5G
Method: C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title: 8260C CJ4239, CG1098, A087941, A092874, A091556
Library Searched: C:\DATABASE\NIST08.L

TIC	Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc

A86090.D R7W0403.M Thu May 07 13:54:03 2015 RPT1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-16-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-002A

Sample wt/vol: 12.00 (g/mL) g Lab File ID: 5\A86065.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 11 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	2	J
75-35-4	1,1-Dichloroethene	5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5	U
67-64-1	Acetone	4	J
75-15-0	Carbon disulfide	5	U
79-20-9	Methyl Acetate	5	U
75-09-2	Methylene chloride	1	BJ
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-Butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
110-82-7	Cyclohexane	5	U
56-23-5	Carbon tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	2	J
108-87-2	Methylcyclohexane	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	0.5	J
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	730	E
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-16-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-002A

Sample wt/vol: 12.00 (g/mL) g Lab File ID: 5\A86065.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 11 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
1330-20-7	Xylene (total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-16-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-002A

Sample wt/vol: 12.00 (g/mL) g Lab File ID: 5\A86065.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 11 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: (µl) Soil Aliquot Volume: 0 (µL)

CONCENTRATION UNITS:

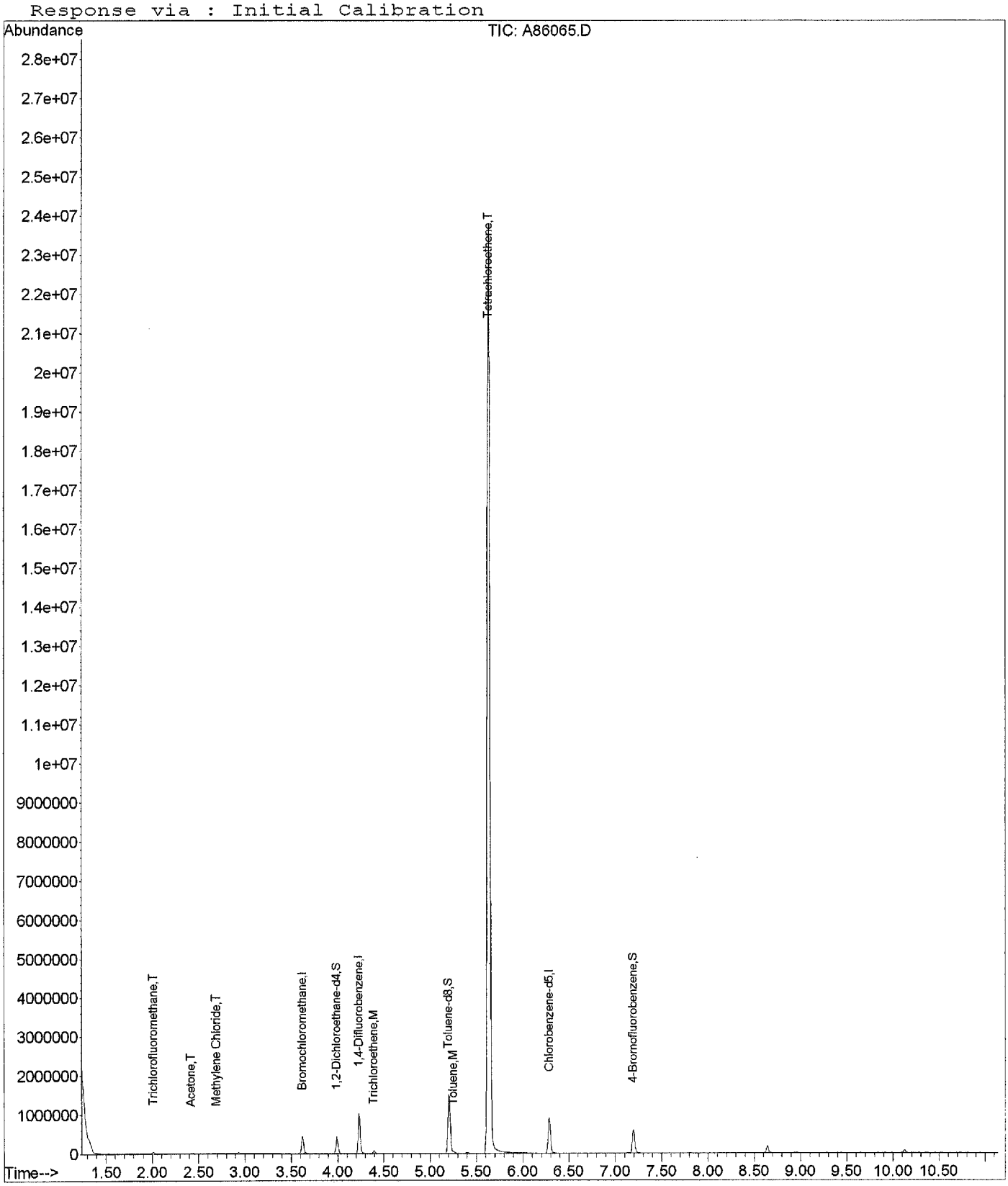
Number TICs found: 1 (µg/L or µg/Kg) µg/Kg

CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q
1. 001000-05-1	Tetrasiloxane, 1,1,3,3,5,5,7,7-octa	8.64	4	JN

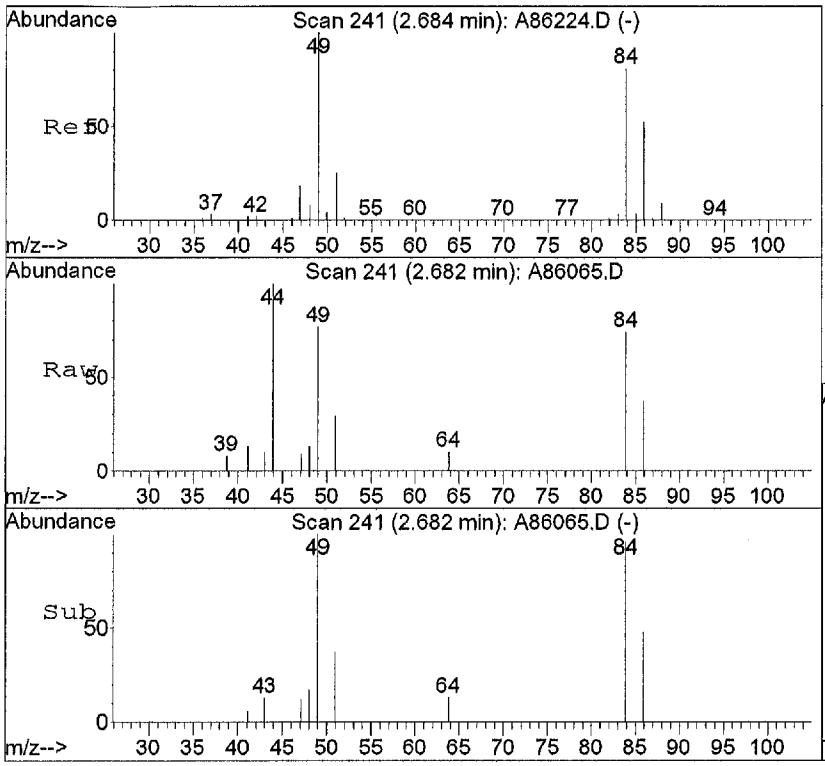
Quantitation Report

Data File : C:\DATA\2015\APRIL15\042215\A86065.D Vial: 14
Acq On : 22 Apr 2015 12:40 Operator: MF
Sample : 1504C96-002A Inst : H5971
Misc : AECOM237,SB-16-5.5-6.0,SOIL,SAMP,,12.00G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 12 19:15 2015 Quant Results File: R6S0331.RES

Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105748, A0104748, CH3755A
Last Update : Thu Apr 30 13:34:30 2015
Response via : Initial Calibration



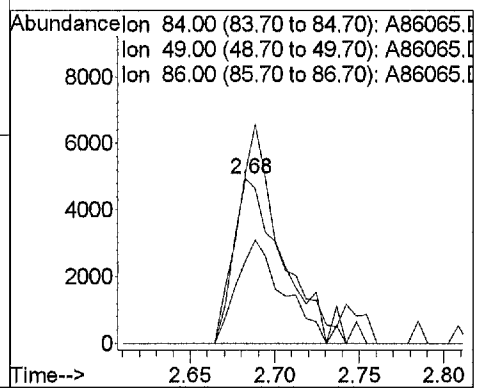
AECOM237 V52

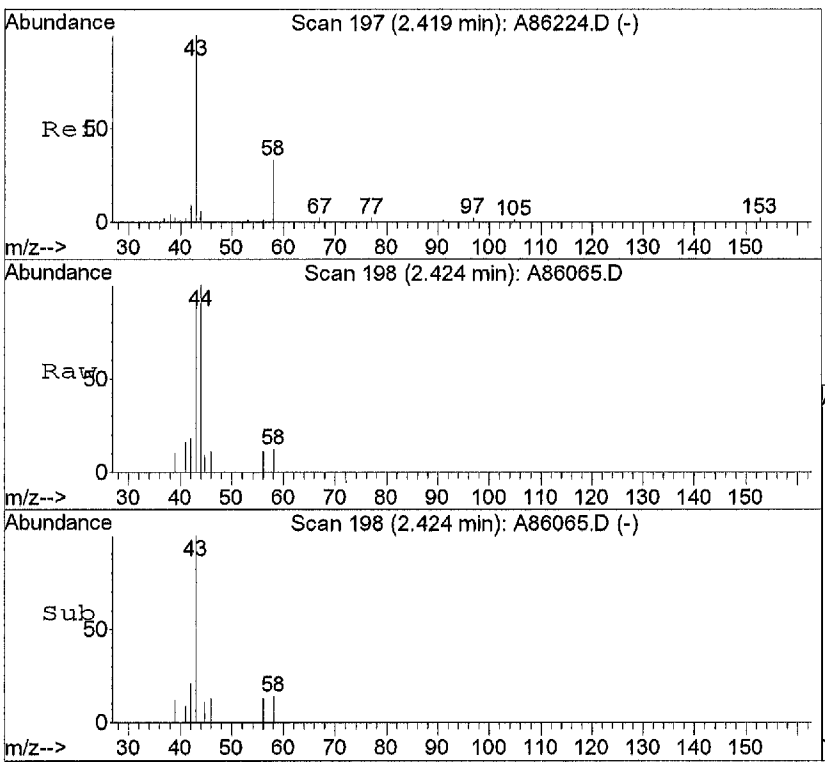


#12
Methylene Chloride
Concen: 2.46 ug/l
RT: 2.68 min Scan# 241
Delta R.T. -0.00 min
Lab File: A86065.D
Acq: 22 Apr 2015 12:40

Tgt Ion: 84 Resp: 10372

Ion	Ratio	Lower	Upper
84	100		
49	104.1	88.5	128.5
86	50.4	47.3	87.3

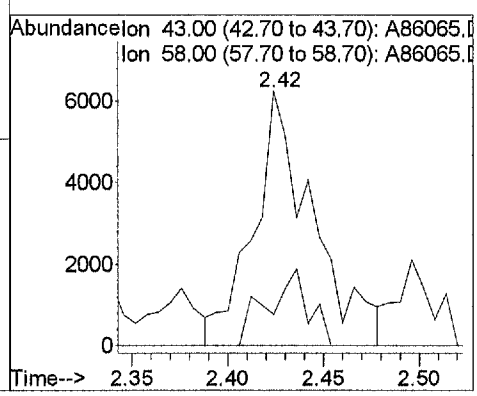


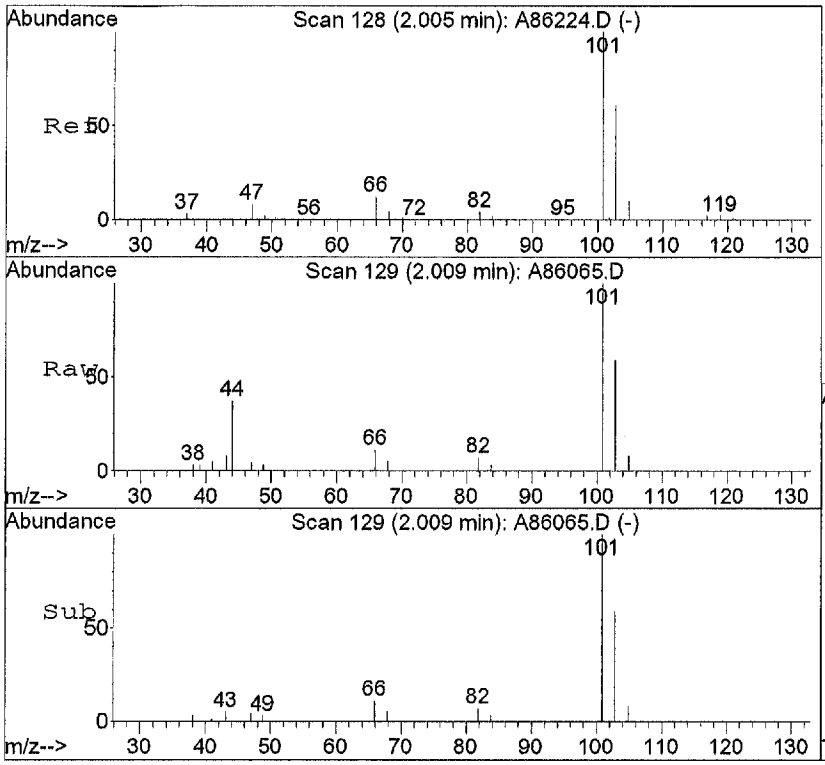


#13
Acetone
Concen: 9.53 ug/l
RT: 2.42 min Scan# 198
Delta R.T. 0.00 min
Lab File: A86065.D
Acq: 22 Apr 2015 12:40

Tgt Ion: 43 Resp: 13385

Ion	Ratio	Lower	Upper
43	100		
58	14.0	13.9	53.9

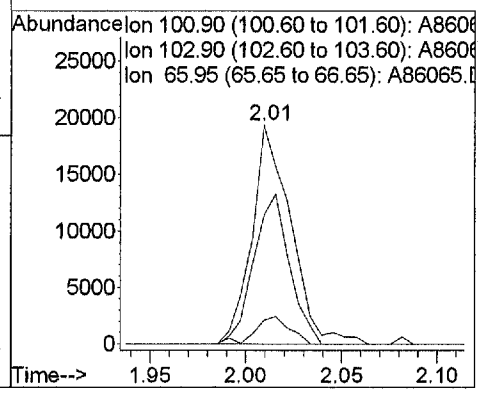


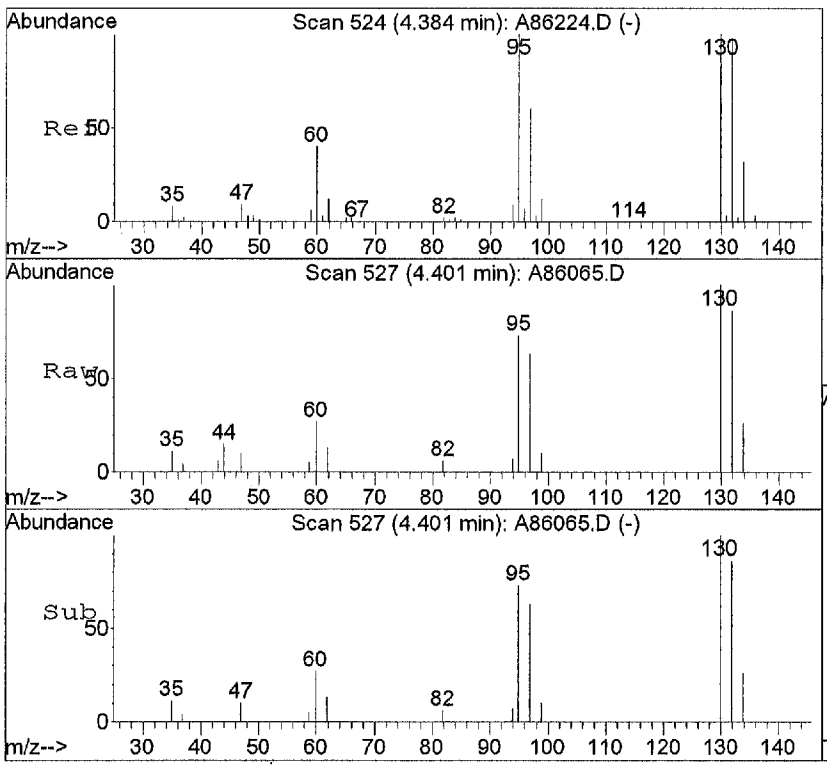


#18
Trichlorofluoromethane
Concen: 4.63 ug/l
RT: 2.01 min Scan# 129
Delta R.T. -0.00 min
Lab File: A86065.D
Acq: 22 Apr 2015 12:40

Tgt Ion:101 Resp: 27193

Ion	Ratio	Lower	Upper
101	100		
103	58.7	43.7	83.7
66	10.8	0.0	31.8

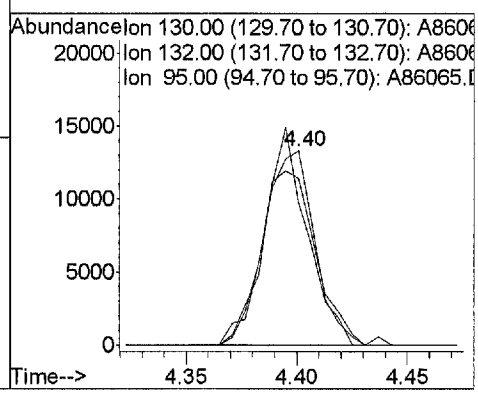


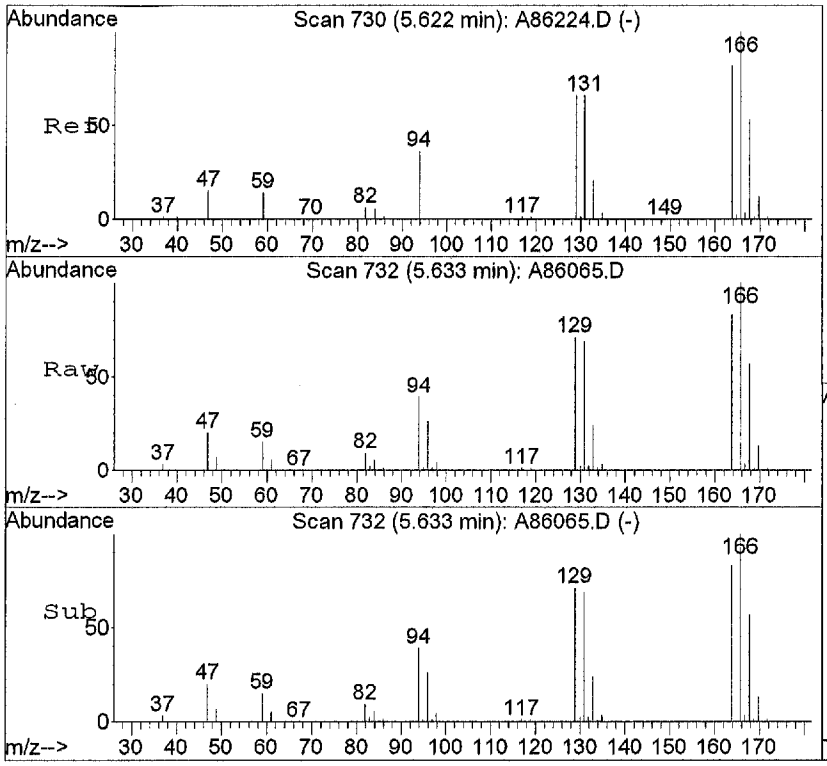


#36
Trichloroethene
Concen: 3.38 ug/l
RT: 4.40 min Scan# 527
Delta R.T. 0.02 min
Lab File: A86065.D
Acq: 22 Apr 2015 12:40

Tgt Ion:130 Resp: 21212

Ion	Ratio	Lower	Upper
130	100		
132	85.8	79.1	119.1
95	73.1	69.5	109.5

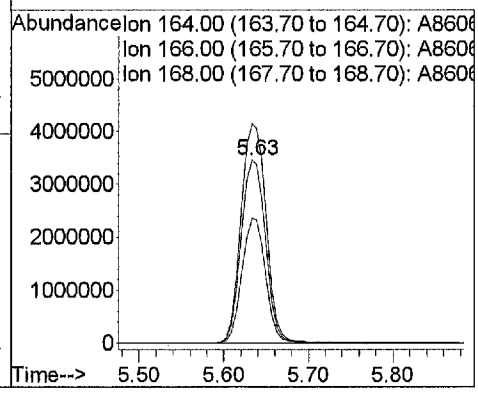


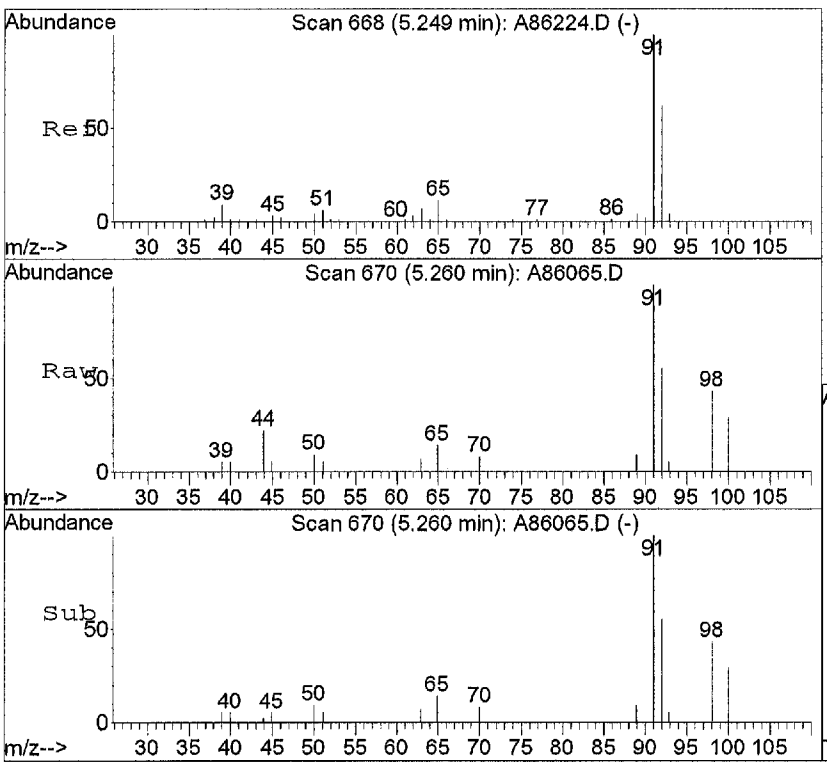


#47
Tetrachloroethene
Concen: 1551.77 ug/l
RT: 5.63 min Scan# 732
Delta R.T. 0.01 min
Lab File: A86065.D
Acq: 22 Apr 2015 12:40

Tgt Ion:164 Resp: 7042880

Ion	Ratio	Lower	Upper
164	100		
166	120.0	106.9	146.9
168	68.2	37.8	77.8

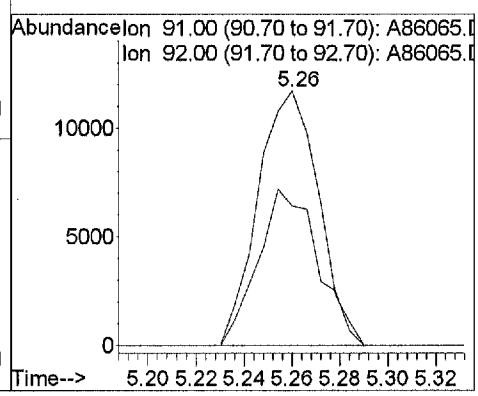




#50
Toluene
Concen: 1.02 ug/l
RT: 5.26 min Scan# 670
Delta R.T. 0.02 min
Lab File: A86065.D
Acq: 22 Apr 2015 12:40

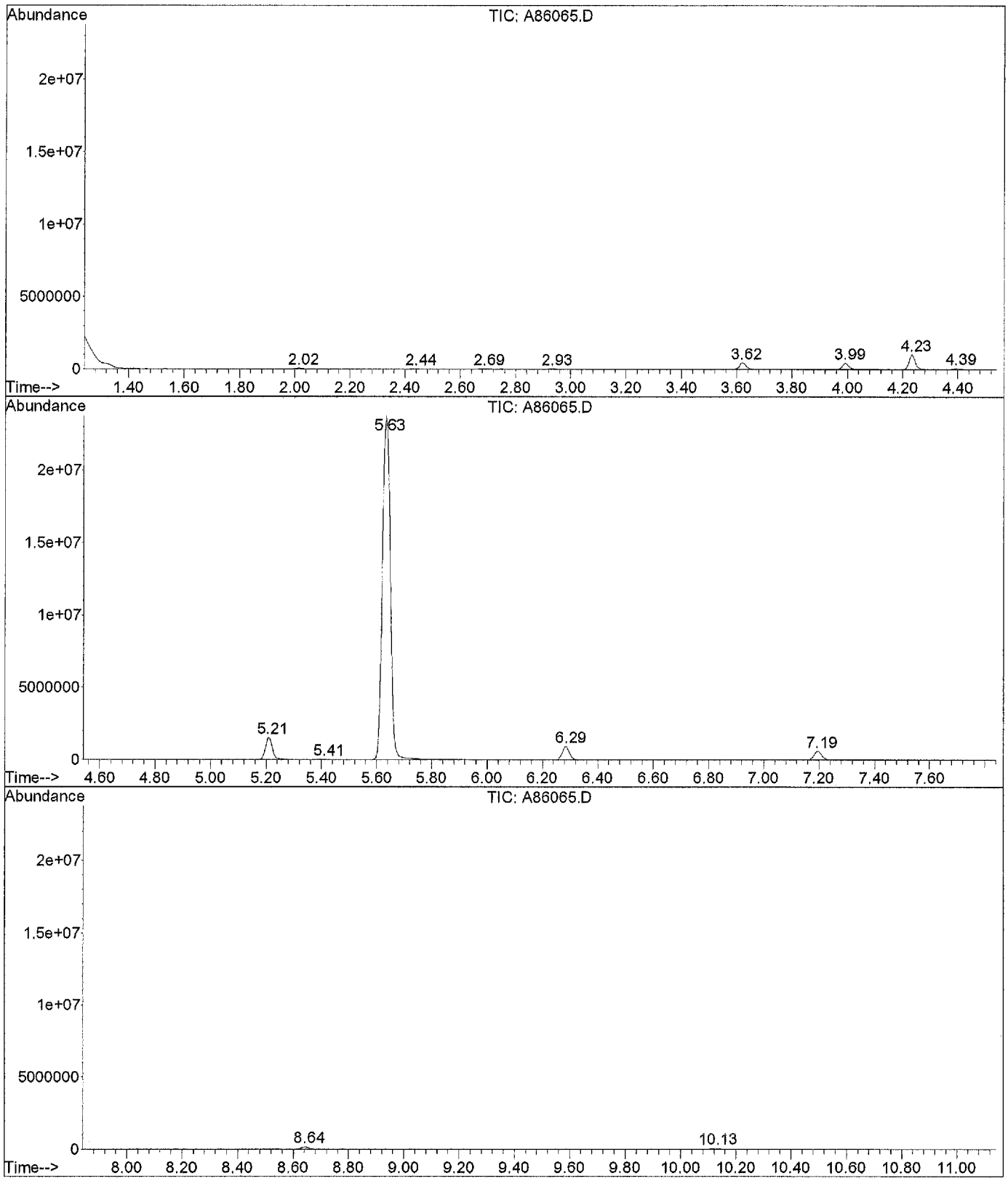
Tgt Ion: 91 Resp: 20576

Ion	Ratio	Lower	Upper
91	100		
92	54.9	41.6	81.6



LSC Report - Integrated Chromatogram

File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86065.D
Operator : MF
Acquired : 22 Apr 2015 12:40 using AcqMethod R6S0331
Instrument : H5971
Sample Name: 1504C96-002A
Misc Info : AECOM237,SB-16-5.5-6.0,SOIL,SAMP,,12.00G
Vial Number: 14
Quant File :R6S0331.RES (RTE Integrator)



A86065.D R6S0331.M Thu May 07 13:30:23 2015 RPT1

Library Search Compound Report

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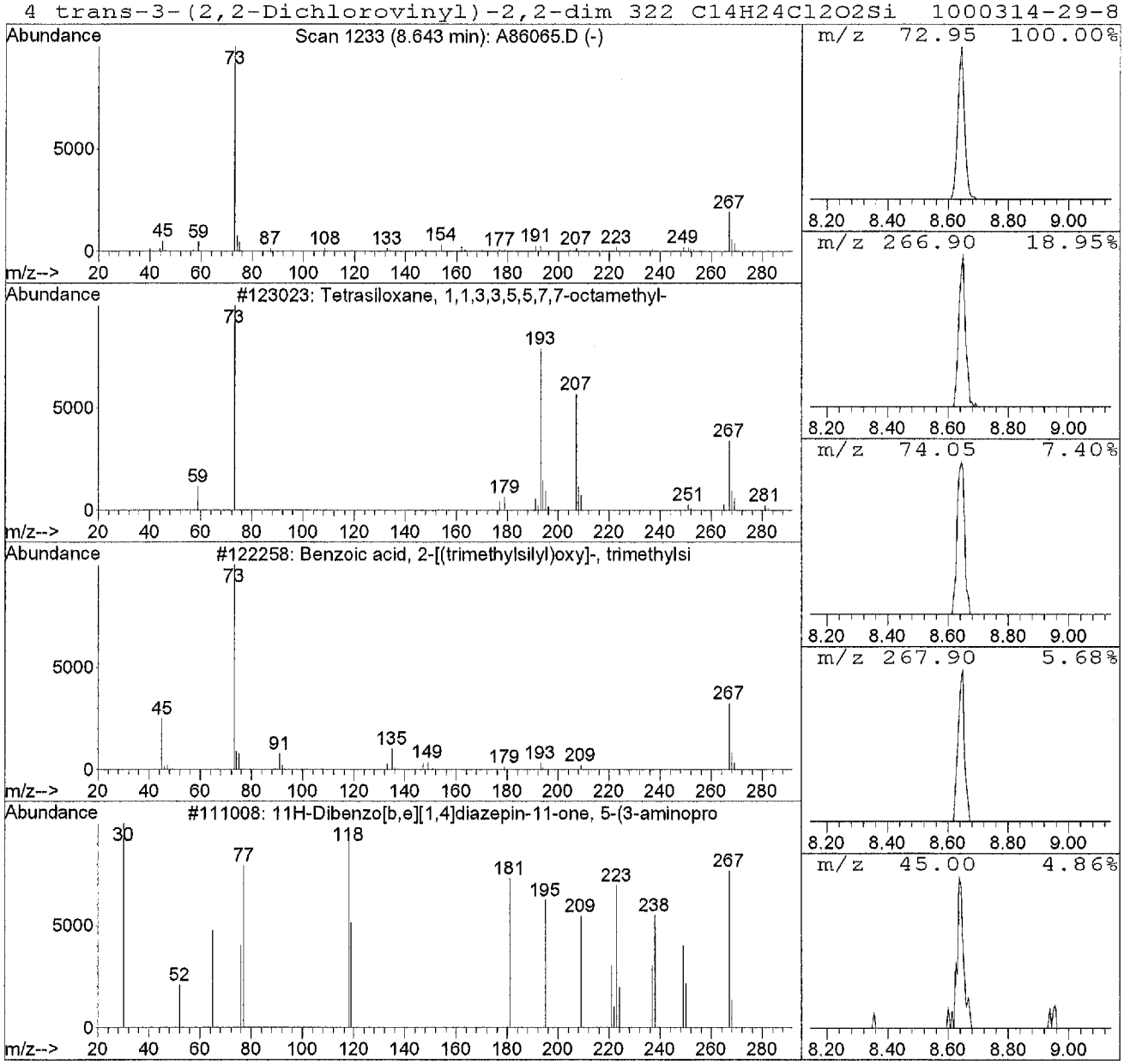
Data File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86065.D Vial: 14
Acq On    : 22 Apr 2015  12:40                             Operator: MF
Sample    : 1504C96-002A                                   Inst    : H5971
Misc      : AECOM237,SB-16-5.5-6.0,SOIL,SAMP,,12.00G Multiplr: 1.00
MS Integration Params: LSCINT.P

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title        : 8260S A0104564, A0105567, A0101160, CH3755A
Library      : C:\DATABASE\NIST08.L
*****************************************************************
Peak Number  1  Tetrasiloxane, 1,1,3,3,5,5,7,7  Concentration Rank  1
```

R.T.	EstConc	Area	Relative to ISTD	R.T.
8.64	8.37 ug/l	276046	Chlorobenzene-d5	6.29

Hit# of 5	Tentative ID	MW	MolForm	CAS#	Qual
1	Tetrasiloxane, 1,1,3,3,5,5,7,7-octa	282	C8H26O3Si4	001000-05-1	33
2	Benzoic acid, 2-[(trimethylsilyl)ox	282	C13H22O3Si2	003789-85-3	17
3	11H-Dibenzo[b,e][1,4]diazepin-11-on	267	C16H17N3O	013450-73-2	9
4	trans-3-(2,2-Dichlorovinyl)-2,2-dim	322	C14H24Cl2O2Si	1000314-29-8	9



AECOM237 V57

Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\042215\A86065.D Vial: 14
Acq On : 22 Apr 2015 12:40 Operator: MF
Sample : 1504C96-002A Inst : H5971
Misc : AECOM237,SB-16-5.5-6.0,SOIL,SAMP,,12.00G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 12 19:15 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.63	128	104463	50.00	ug/l	0.01
28) 1,4-Difluorobenzene	4.23	114	752171	50.00	ug/l	0.01
43) Chlorobenzene-d5	6.29	117	599062	50.00	ug/l	0.02
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.99	65	210413	59.81	ug/l	0.01
Spiked Amount 50.000	Range 33 - 150		Recovery = 119.62%			
49) Toluene-d8	5.21	98	1024153	65.33	ug/l	0.02
Spiked Amount 50.000	Range 43 - 157		Recovery = 130.66%			
53) 4-Bromofluorobenzene	7.19	95	275539	47.31	ug/l	0.02
Spiked Amount 50.000	Range 34 - 145		Recovery = 94.62%			

Target Compounds						Qvalue
12) Methylene Chloride	2.68	84	10372	2.46	ug/l	89
13) Acetone	2.42	43	13385	9.53	ug/l	65
18) Trichlorofluoromethane	2.01	101	27193	4.63	ug/l	94
36) Trichloroethene	4.40	130	21212	3.38	ug/l	85
47) Tetrachloroethene	5.63	164	7042880	1551.77	ug/l	92
50) Toluene	5.26	91	20576	1.02	ug/l	91

(#) = qualifier out of range (m) = manual integration

Tentatively Identified Compound (LSC) summary

Operator ID: MF Date Acquired: 22 Apr 2015 12:40
Data File: O:\MS\HP5971\DATA\2015\APRIL15\042215\A86065.D
Name: 1504C96-002A
Misc: AECOM237,SB-16-5.5-6.0,SOIL,SAMP,,12.00G
Method: C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title: 8260S A0104564, A0105567, A0101160, CH3755A
Library Searched: C:\DATABASE\NIST08.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc
Tetrasiloxane, 1,1,3	8.64	8.4	ug/l	276046	ISTD03	6.29	1649560	50.0

A86065.D R6S0331.M Thu May 07 13:30:24 2015 RPT1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-16-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-002ADL

Sample wt/vol: 11.1 (g/mL) g Lab File ID: 5\A86091.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 11 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	560	U
74-87-3	Chloromethane	560	U
75-01-4	Vinyl chloride	560	U
74-83-9	Bromomethane	560	U
75-00-3	Chloroethane	560	U
75-69-4	Trichlorofluoromethane	560	U
75-35-4	1,1-Dichloroethene	560	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	560	U
67-64-1	Acetone	560	U
75-15-0	Carbon disulfide	560	U
79-20-9	Methyl Acetate	560	U
75-09-2	Methylene chloride	560	U
156-60-5	trans-1,2-Dichloroethene	560	U
1634-04-4	Methyl tert-butyl ether	560	U
75-34-3	1,1-Dichloroethane	560	U
156-59-2	cis-1,2-Dichloroethene	560	U
78-93-3	2-Butanone	59	DJ
67-66-3	Chloroform	560	U
71-55-6	1,1,1-Trichloroethane	560	U
110-82-7	Cyclohexane	560	U
56-23-5	Carbon tetrachloride	560	U
71-43-2	Benzene	560	U
107-06-2	1,2-Dichloroethane	560	U
79-01-6	Trichloroethene	560	U
108-87-2	Methylcyclohexane	560	U
78-87-5	1,2-Dichloropropane	560	U
75-27-4	Bromodichloromethane	560	U
10061-01-5	cis-1,3-Dichloropropene	560	U
108-10-1	4-Methyl-2-pentanone	560	U
108-88-3	Toluene	560	U
10061-02-6	trans-1,3-Dichloropropene	560	U
79-00-5	1,1,2-Trichloroethane	60	DJ
127-18-4	Tetrachloroethene	11000	DZ
591-78-6	2-Hexanone	560	U
124-48-1	Dibromochloromethane	560	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-16-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-002ADL

Sample wt/vol: 11.1 (g/mL) g Lab File ID: 5\A86091.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 11 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	560	U
108-90-7	Chlorobenzene	560	U
100-41-4	Ethylbenzene	560	U
1330-20-7	Xylene (total)	560	U
100-42-5	Styrene	560	U
75-25-2	Bromoform	560	U
98-82-8	Isopropylbenzene	560	U
79-34-5	1,1,2,2-Tetrachloroethane	560	U
541-73-1	1,3-Dichlorobenzene	560	U
106-46-7	1,4-Dichlorobenzene	560	U
95-50-1	1,2-Dichlorobenzene	560	U
96-12-8	1,2-Dibromo-3-chloropropane	560	U
120-82-1	1,2,4-Trichlorobenzene	560	U

1F

EPA SAMPLE NO.

SB-16-5.5-6.0DL

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-002ADL

Sample wt/vol: 11.1 (g/mL) g Lab File ID: 5\A86091.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 11 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µl) Soil Aliquot Volume: 100 (µL)

CONCENTRATION UNITS:

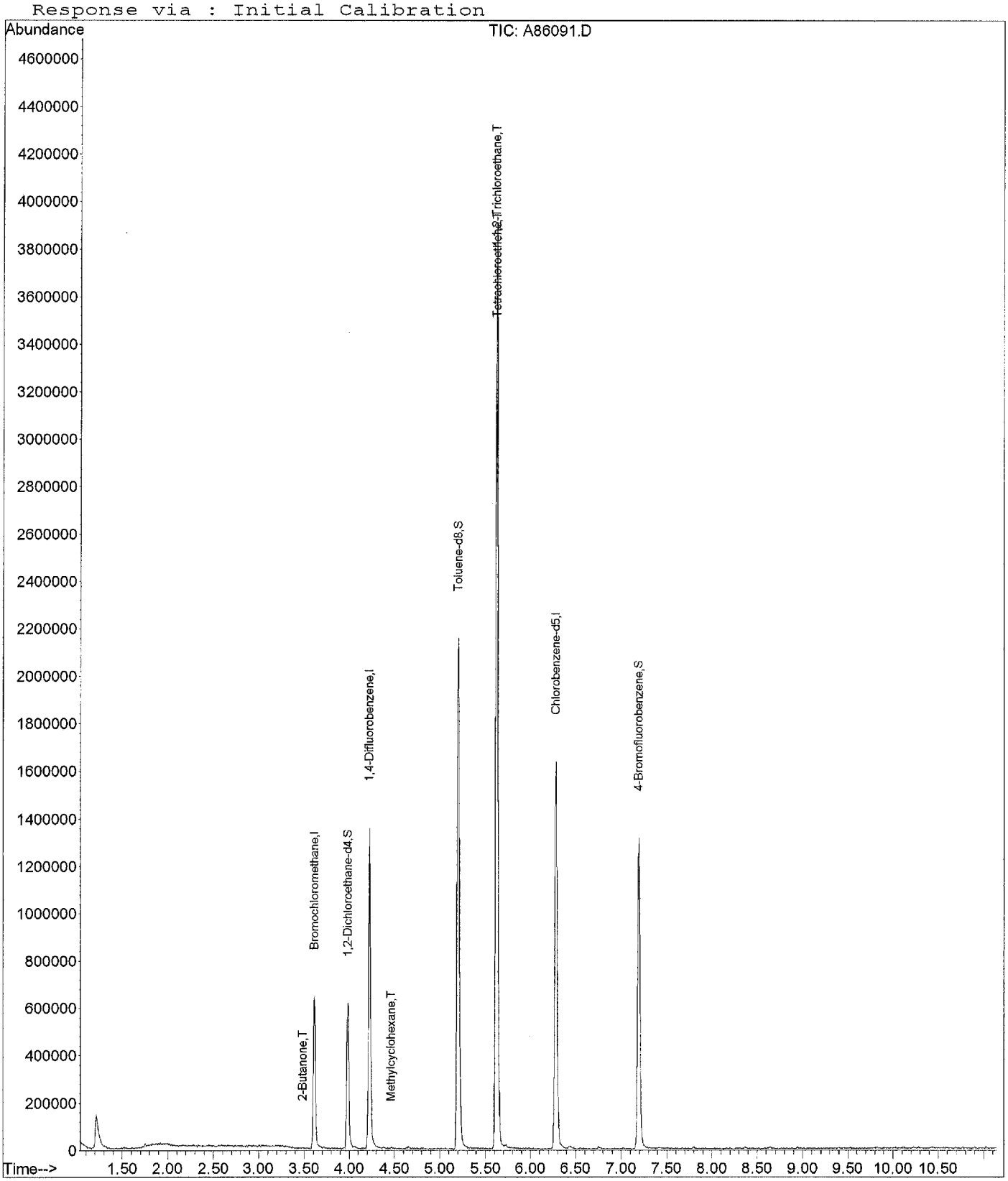
Number TICs found: 0 (µg/L or µg/Kg) µg/Kg

CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q

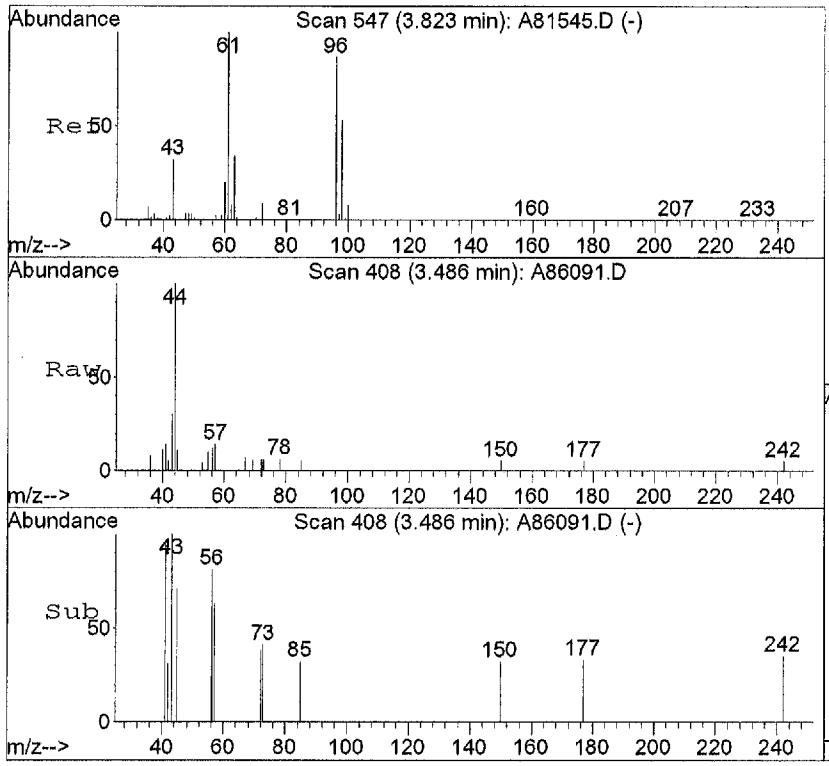
Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86091.D Vial: 11
Acq On : 23 Apr 2015 12:57 Operator: MF
Sample : 1504C96-002A Inst : H5971
Misc : AECOM237,SB-16-5.5-6.0,SOIL,DL,,11.1G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 14:00 2015 Quant Results File: R7W0403.RES

Method : O:\MS\HP5971\METHODS\2015\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration



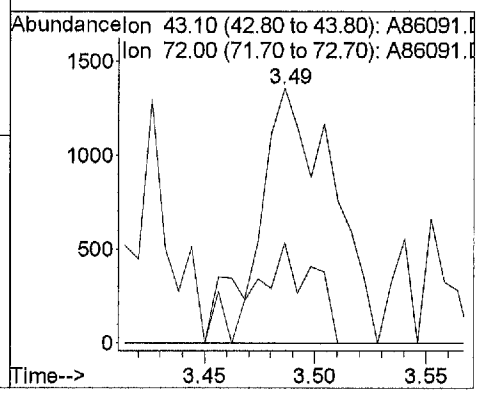
AECOM237 V63

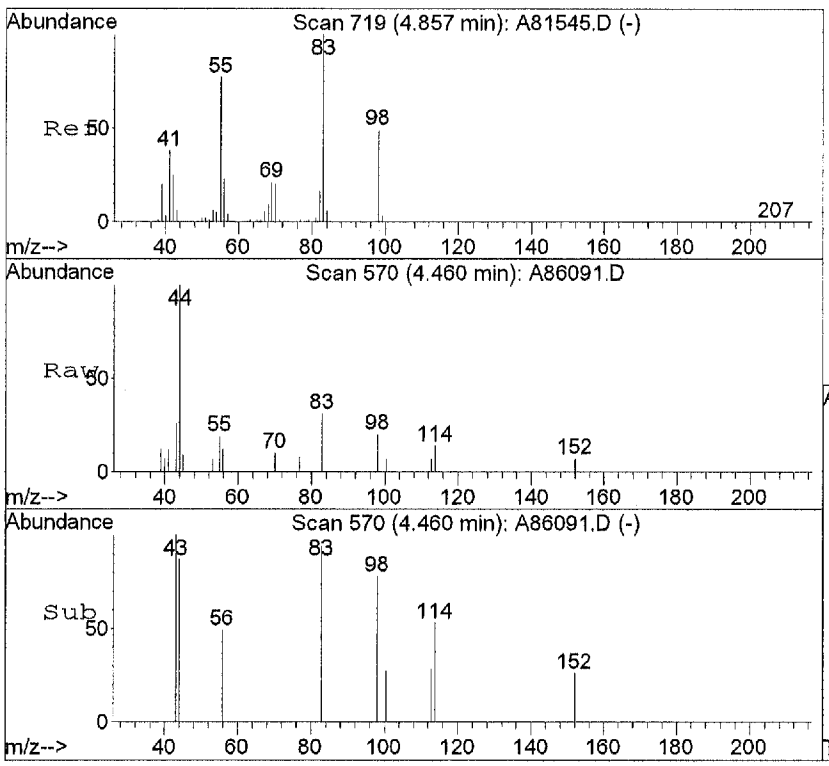


#24
2-Butanone
Concen: 1.05 ug/l
RT: 3.49 min Scan# 408
Delta R.T. 0.02 min
Lab File: A86091.D
Acq: 23 Apr 2015 12:57

Tgt Ion: 43 Resp: 3183

Ion	Ratio	Lower	Upper
43	100		
72	39.4	2.4	42.4

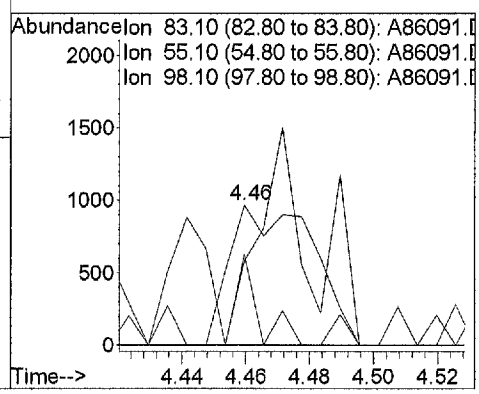


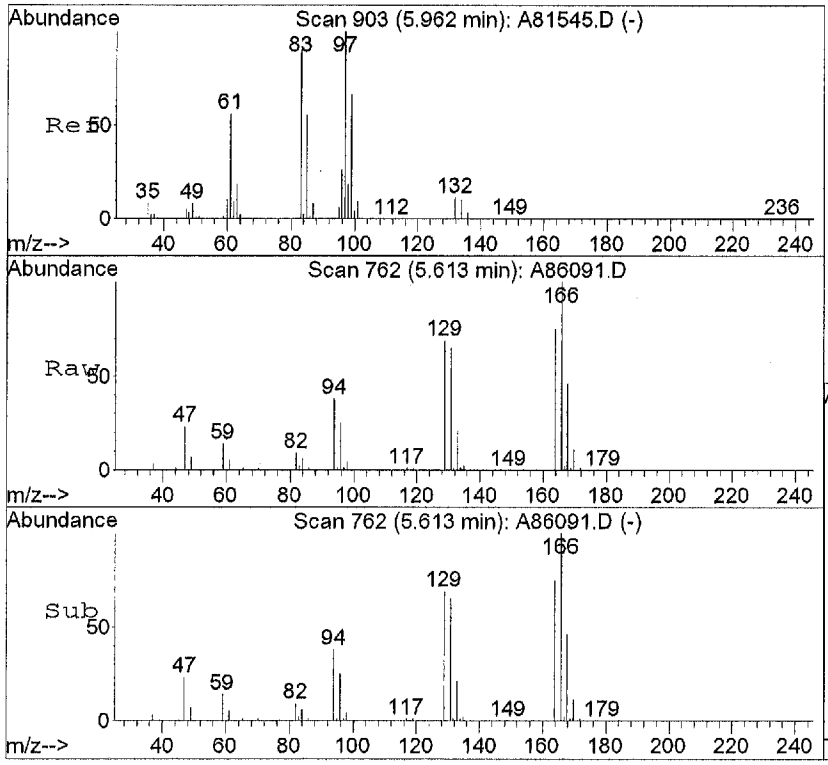


#37
Methylcyclohexane
Concen: 3.79 ug/l
RT: 4.46 min Scan# 570
Delta R.T. -0.01 min
Lab File: A86091.D
Acq: 23 Apr 2015 12:57

Tgt Ion: 83 Resp: 1759

Ion	Ratio	Lower	Upper
83	100		
55	60.2	54.6	94.6
98	64.8	36.3	76.3

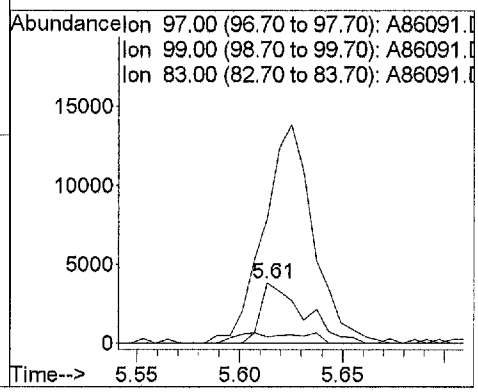


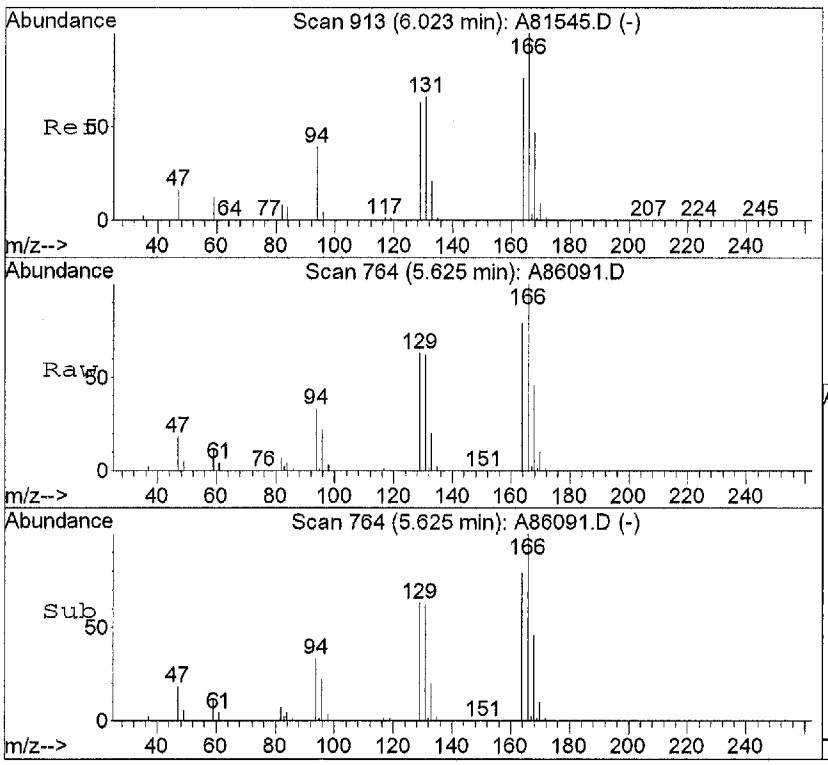


#41
1,1,2-Trichloroethane
Concen: 1.08 ug/l
RT: 5.61 min Scan# 762
Delta R.T. 0.05 min
Lab File: A86091.D
Acq: 23 Apr 2015 12:57

Tgt Ion: 97 Resp: 5894

Ion	Ratio	Lower	Upper
97	100		
99	10.4	46.9	86.9#
83	208.4	58.9	98.9#

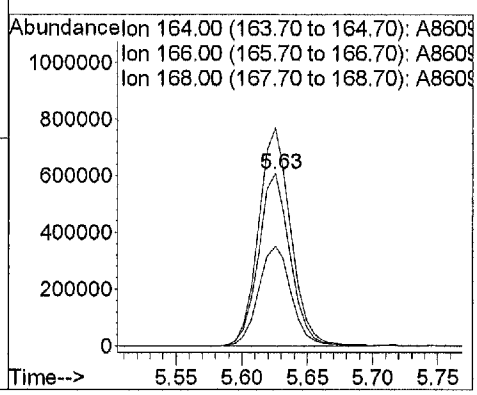




#47
Tetrachloroethene
Concen: 188.19 ug/l
RT: 5.63 min Scan# 764
Delta R.T. 0.01 min
Lab File: A86091.D
Acq: 23 Apr 2015 12:57

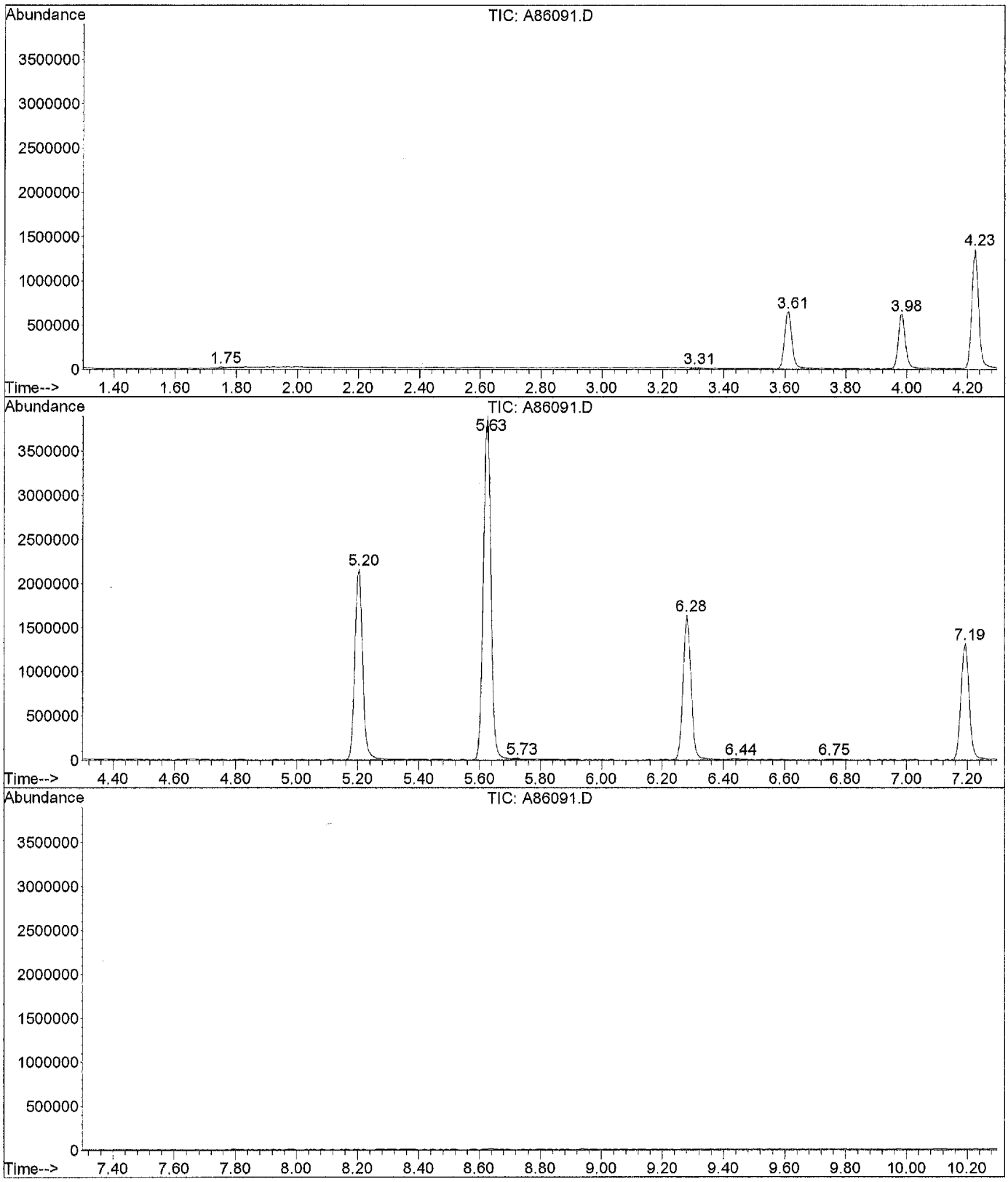
Tgt Ion:164 Resp: 1018754

Ion	Ratio	Lower	Upper
164	100		
166	126.5	104.0	144.0
168	57.9	37.0	77.0



LSC Report - Integrated Chromatogram

File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86091.D
Operator : MF
Acquired : 23 Apr 2015 12:57 using AcqMethod R7W0403
Instrument : H5971
Sample Name: 1504C96-002A
Misc Info : AECOM237,SB-16-5.5-6.0,SOIL,DL,,11.1G
Vial Number: 11
Quant File :R7W0403.RES (RTE Integrator)



A86091.D R7W0403.M Thu May 07 13:54:14 2015 RPT1

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86091.D Vial: 11
Acq On : 23 Apr 2015 12:57 Operator: MF
Sample : 1504C96-002A Inst : H5971
Misc : AECOM237,SB-16-5.5-6.0,SOIL,DL,,11.1G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 14:00 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	162727	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	1019623	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	1054975	50.00	ug/l	0.01
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	324199	55.01	ug/l	0.00
Spiked Amount 50.000	Range 70 - 121		Recovery = 110.02%			
49) Toluene-d8	5.20	98	1481256	54.99	ug/l	0.01
Spiked Amount 50.000	Range 84 - 138		Recovery = 109.98%			
53) 4-Bromofluorobenzene	7.19	95	578350	57.39	ug/l	0.01
Spiked Amount 50.000	Range 59 - 113		Recovery = 114.78%#			
Target Compounds						Qvalue
24) 2-Butanone	3.49	43	3183	1.05	ug/l	65
37) Methylcyclohexane	4.46	83	1759	3.79	ug/l	85
41) 1,1,2-Trichloroethane	5.61	97	5894	1.08	ug/l #	1
47) Tetrachloroethene	5.63	164	1018754	188.19	ug/l	98

(#) = qualifier out of range (m) = manual integration

Tentatively Identified Compound (LSC) summary

Operator ID: MF Date Acquired: 23 Apr 2015 12:57
Data File: O:\MS\HP5971\DATA\2015\APRIL15\042315\A86091.D
Name: 1504C96-002A
Misc: AECOM237,SB-16-5.5-6.0,SOIL,DL,,11.1G
Method: C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title: 8260C CJ4239, CG1098, A087941, A092874, A091556
Library Searched: C:\DATABASE\NIST08.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc

A86091.D R7W0403.M Thu May 07 13:54:14 2015 RPT1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-17-5.0-5.5

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-003A

Sample wt/vol: 10.43 (g/mL) g Lab File ID: 5\A86066.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	6	U
74-87-3	Chloromethane	6	U
75-01-4	Vinyl chloride	6	U
74-83-9	Bromomethane	6	U
75-00-3	Chloroethane	6	U
75-69-4	Trichlorofluoromethane	2	J
75-35-4	1,1-Dichloroethene	6	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6	U
67-64-1	Acetone	6	U
75-15-0	Carbon disulfide	6	U
79-20-9	Methyl Acetate	6	U
75-09-2	Methylene chloride	6	U
156-60-5	trans-1,2-Dichloroethene	6	U
1634-04-4	Methyl tert-butyl ether	6	U
75-34-3	1,1-Dichloroethane	6	U
156-59-2	cis-1,2-Dichloroethene	6	U
78-93-3	2-Butanone	6	U
67-66-3	Chloroform	6	U
71-55-6	1,1,1-Trichloroethane	6	U
110-82-7	Cyclohexane	6	U
56-23-5	Carbon tetrachloride	6	U
71-43-2	Benzene	6	U
107-06-2	1,2-Dichloroethane	6	U
79-01-6	Trichloroethene	5	J
108-87-2	Methylcyclohexane	6	U
78-87-5	1,2-Dichloropropane	6	U
75-27-4	Bromodichloromethane	6	U
10061-01-5	cis-1,3-Dichloropropene	6	U
108-10-1	4-Methyl-2-pentanone	6	U
108-88-3	Toluene	6	U
10061-02-6	trans-1,3-Dichloropropene	6	U
79-00-5	1,1,2-Trichloroethane	6	U
127-18-4	Tetrachloroethene	1200	E
591-78-6	2-Hexanone	6	U
124-48-1	Dibromochloromethane	6	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-17-5.0-5.5

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-003A

Sample wt/vol: 10.43 (g/mL) g Lab File ID: 5\A86066.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	6	U
108-90-7	Chlorobenzene	6	U
100-41-4	Ethylbenzene	6	U
1330-20-7	Xylene (total)	6	U
100-42-5	Styrene	6	U
75-25-2	Bromoform	6	U
98-82-8	Isopropylbenzene	6	U
79-34-5	1,1,2,2-Tetrachloroethane	6	U
541-73-1	1,3-Dichlorobenzene	6	U
106-46-7	1,4-Dichlorobenzene	6	U
95-50-1	1,2-Dichlorobenzene	6	U
96-12-8	1,2-Dibromo-3-chloropropane	6	U
120-82-1	1,2,4-Trichlorobenzene	6	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-17-5.0-5.5

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-003A

Sample wt/vol: 10.43 (g/mL) g Lab File ID: 5\A86066.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: (µl) Soil Aliquot Volume: 0 (µL)

CONCENTRATION UNITS:

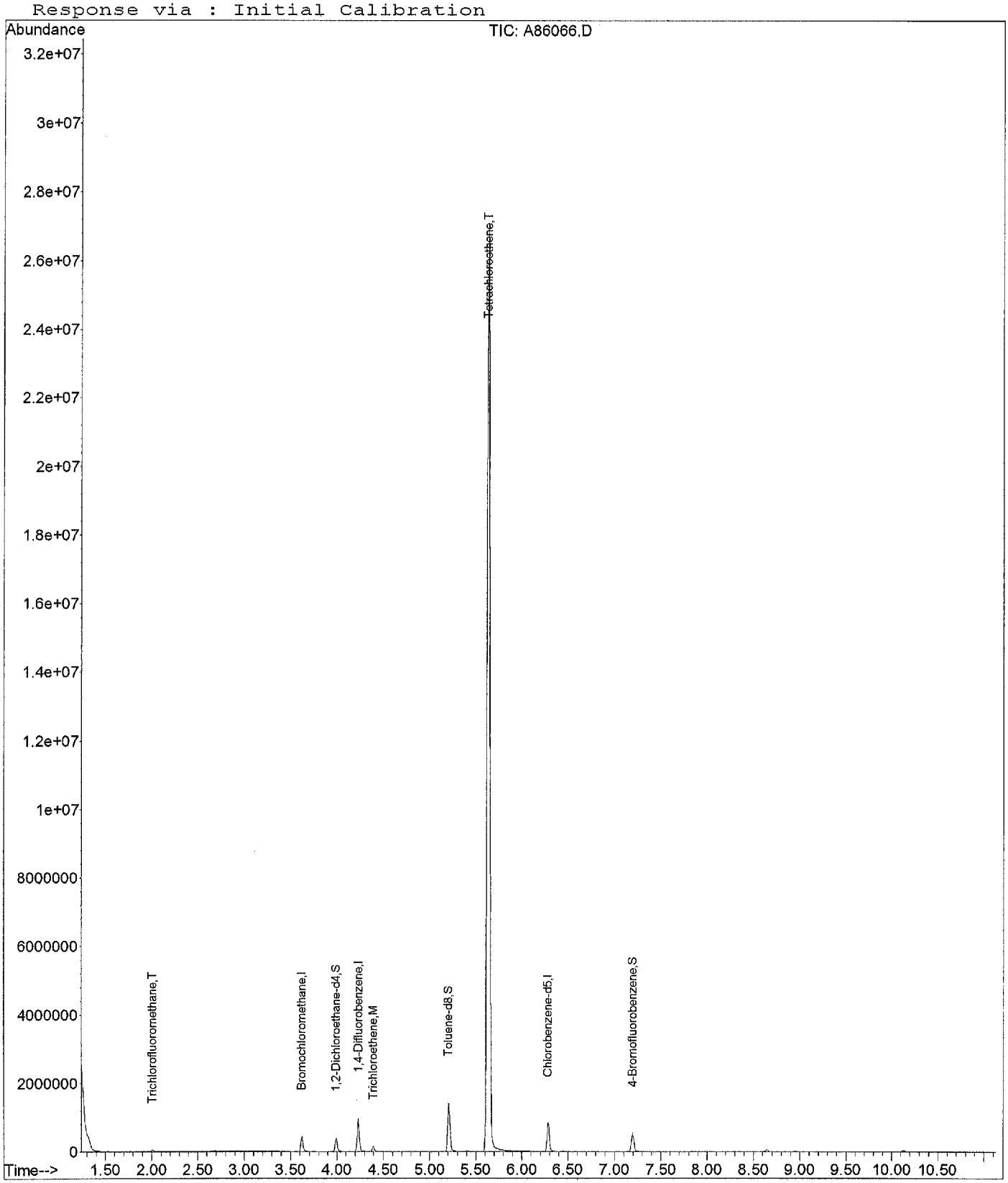
Number TICs found: 0 (µg/L or µg/Kg) µg/Kg

CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q

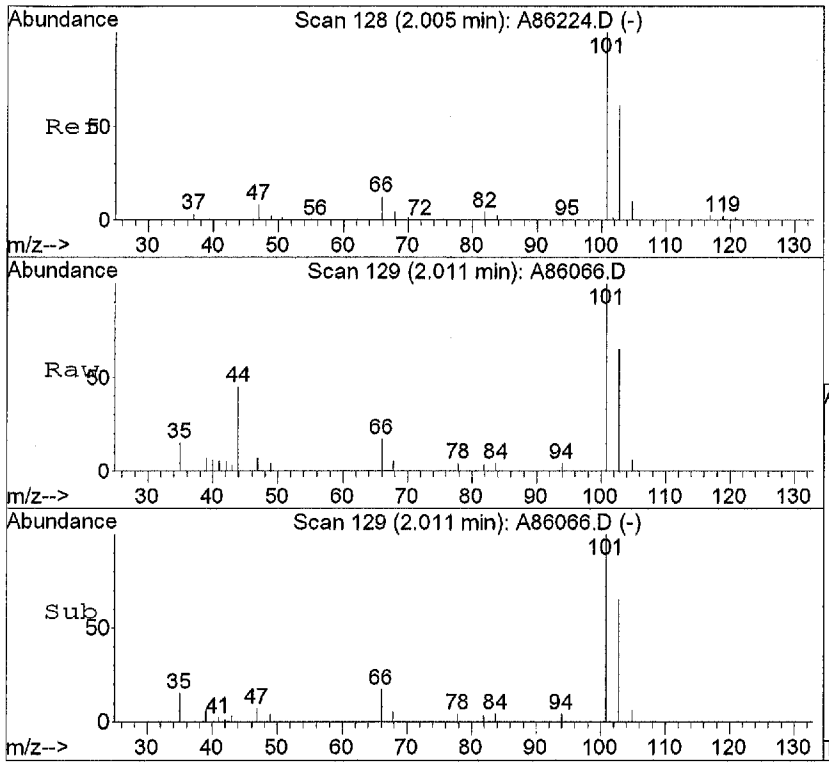
Quantitation Report

Data File : C:\DATA\2015\APRIL15\042215\A86066.D Vial: 15
Acq On : 22 Apr 2015 13:01 Operator: MF
Sample : 1504C96-003A Inst : H5971
Misc : AECOM237,SB-17-5.0-5.5,SOIL,SAMP,,10.43G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 12 19:15 2015 Quant Results File: R6S0331.RES

Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105748, A0104748, CH3755A
Last Update : Thu Apr 30 13:34:30 2015
Response via : Initial Calibration



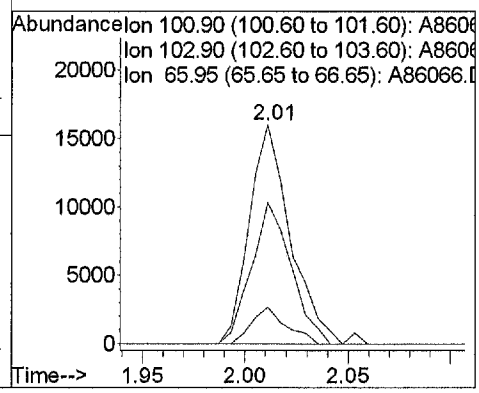
AECOM237 V72

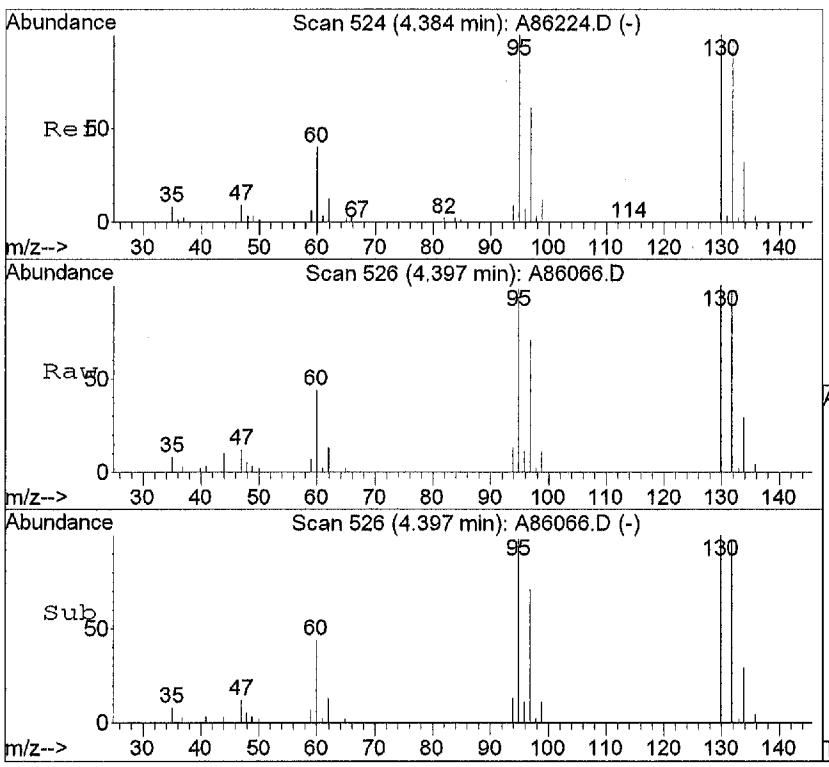


#18
Trichlorofluoromethane
Concen: 3.77 ug/l
RT: 2.01 min Scan# 129
Delta R.T. 0.00 min
Lab File: A86066.D
Acq: 22 Apr 2015 13:01

Tgt Ion:101 Resp: 22263

Ion	Ratio	Lower	Upper
101	100		
103	64.5	43.7	83.7
66	16.6	0.0	31.8

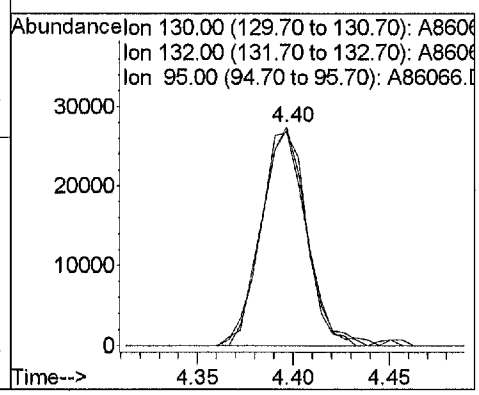




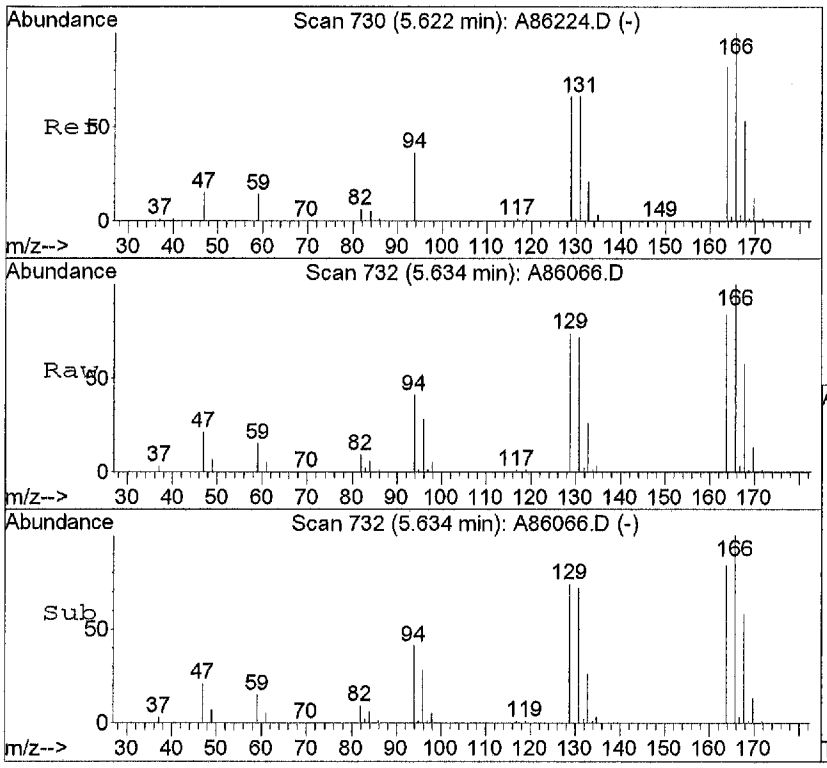
#36
Trichloroethene
Concen: 7.69 ug/l
RT: 4.40 min Scan# 526
Delta R.T. 0.01 min
Lab File: A86066.D
Acq: 22 Apr 2015 13:01

Tgt Ion:130 Resp: 45035

Ion	Ratio	Lower	Upper
130	100		
132	97.3	79.1	119.1
95	98.3	69.5	109.5



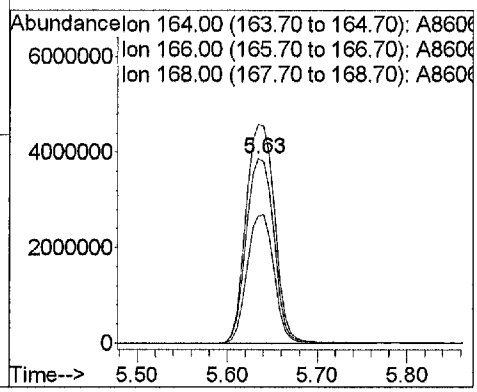
AECOM237 V73



#47
Tetrachloroethene
Concen: 2053.59 ug/l
RT: 5.63 min Scan# 732
Delta R.T. 0.01 min
Lab File: A86066.D
Acq: 22 Apr 2015 13:01

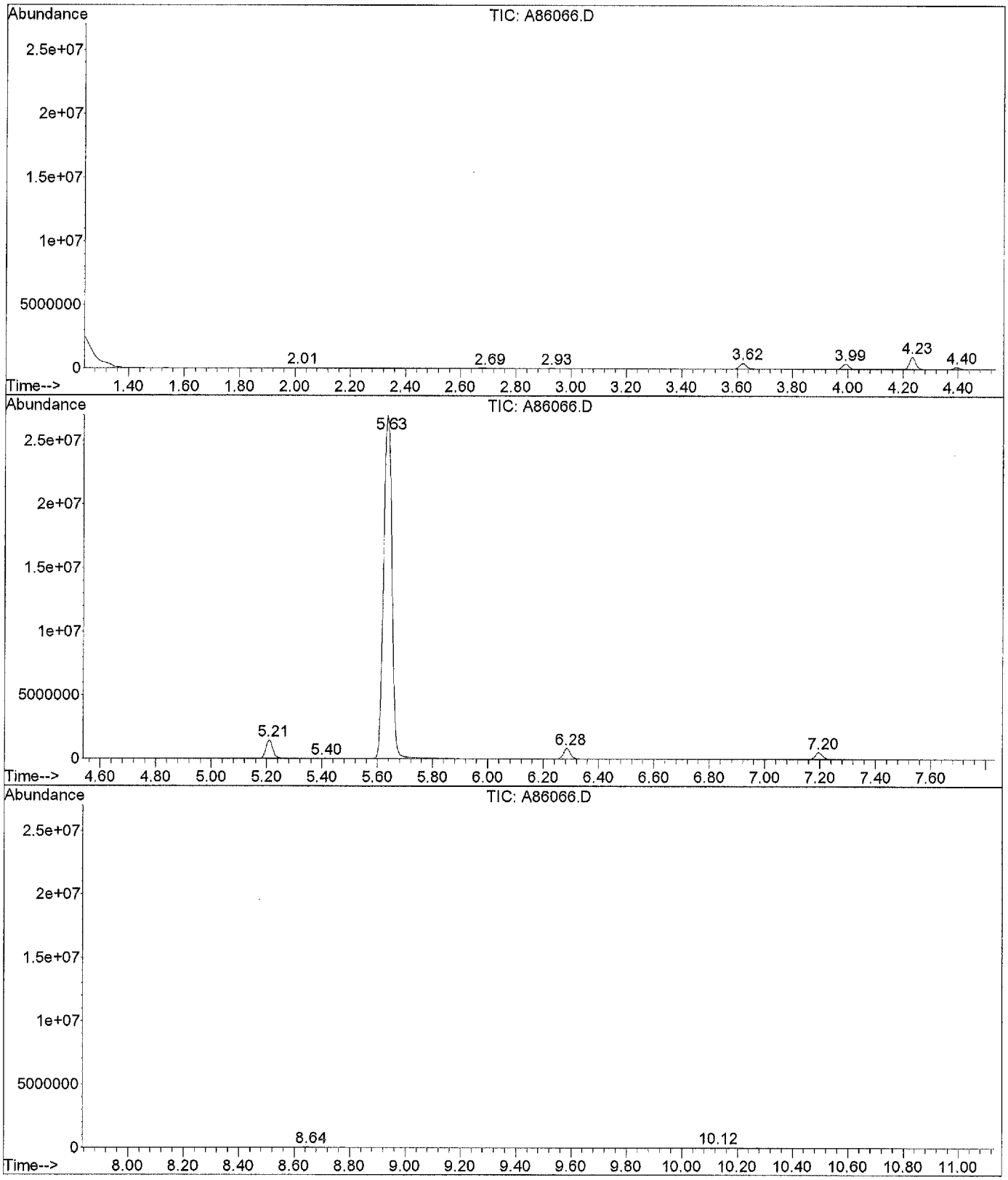
Tgt Ion:164 Resp: 8356524

Ion	Ratio	Lower	Upper
164	100		
166	118.5	106.9	146.9
168	69.0	37.8	77.8



LSC Report - Integrated Chromatogram

File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86066.D
Operator : MF
Acquired : 22 Apr 2015 13:01 using AcqMethod R6S0331
Instrument : H5971
Sample Name: 1504C96-003A
Misc Info : AECOM237,SB-17-5.0-5.5,SOIL,SAMP,,10.43G
Vial Number: 15
Quant File :R6S0331.RES (RTE Integrator)



A86066.D R6S0331.M Thu May 07 13:30:44 2015 RPT1

Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\042215\A86066.D Vial: 15
Acq On : 22 Apr 2015 13:01 Operator: MF
Sample : 1504C96-003A Inst : H5971
Misc : AECOM237,SB-17-5.0-5.5,SOIL,SAMP,,10.43G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 12 19:15 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.62	128	104915	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	701153	50.00	ug/l	0.01
43) Chlorobenzene-d5	6.29	117	537106	50.00	ug/l	0.02
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.99	65	201050	56.90	ug/l	0.01
Spiked Amount 50.000	Range 33 - 150		Recovery = 113.80%			
49) Toluene-d8	5.21	98	958270	68.18	ug/l	0.01
Spiked Amount 50.000	Range 43 - 157		Recovery = 136.36%			
53) 4-Bromofluorobenzene	7.20	95	228310	43.72	ug/l	0.02
Spiked Amount 50.000	Range 34 - 145		Recovery = 87.44%			

Target Compounds						Qvalue
18) Trichlorofluoromethane	2.01	101	22263	3.77	ug/l	97
36) Trichloroethene	4.40	130	45035	7.69	ug/l	95
47) Tetrachloroethene	5.63	164	8356524	2053.59	ug/l	90

(#) = qualifier out of range (m) = manual integration

AECOM237 V76

Tentatively Identified Compound (LSC) summary

Operator ID: MF Date Acquired: 22 Apr 2015 13:01
Data File: O:\MS\HP5971\DATA\2015\APRIL15\042215\A86066.D
Name: 1504C96-003A
Misc: AECOM237,SB-17-5.0-5.5,SOIL,SAMP,,10.43G
Method: C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title: 8260S A0104564, A0105567, A0101160, CH3755A
Library Searched: C:\DATABASE\NIST08.L

TIC	Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc

A86066.D R6S0331.M Thu May 07 13:30:44 2015 RPT1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-17-5.0-5.5DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-003ADL

Sample wt/vol: 12.9 (g/mL) g Lab File ID: 5\A86092.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	590	U
74-87-3	Chloromethane	590	U
75-01-4	Vinyl chloride	590	U
74-83-9	Bromomethane	590	U
75-00-3	Chloroethane	590	U
75-69-4	Trichlorofluoromethane	590	U
75-35-4	1,1-Dichloroethene	590	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	590	U
67-64-1	Acetone	590	U
75-15-0	Carbon disulfide	590	U
79-20-9	Methyl Acetate	590	U
75-09-2	Methylene chloride	590	U
156-60-5	trans-1,2-Dichloroethene	590	U
1634-04-4	Methyl tert-butyl ether	590	U
75-34-3	1,1-Dichloroethane	590	U
156-59-2	cis-1,2-Dichloroethene	590	U
78-93-3	2-Butanone	590	U
67-66-3	Chloroform	590	U
71-55-6	1,1,1-Trichloroethane	590	U
110-82-7	Cyclohexane	590	U
56-23-5	Carbon tetrachloride	590	U
71-43-2	Benzene	590	U
107-06-2	1,2-Dichloroethane	590	U
79-01-6	Trichloroethene	590	U
108-87-2	Methylcyclohexane	590	U
78-87-5	1,2-Dichloropropane	590	U
75-27-4	Bromodichloromethane	590	U
10061-01-5	cis-1,3-Dichloropropene	590	U
108-10-1	4-Methyl-2-pentanone	590	U
108-88-3	Toluene	590	U
10061-02-6	trans-1,3-Dichloropropene	590	U
79-00-5	1,1,2-Trichloroethane	590	U
127-18-4	Tetrachloroethene	5700	DZ
591-78-6	2-Hexanone	590	U
124-48-1	Dibromochloromethane	590	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-17-5.0-5.5DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-003ADL

Sample wt/vol: 12.9 (g/mL) g Lab File ID: 5\A86092.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	590	U
108-90-7	Chlorobenzene	590	U
100-41-4	Ethylbenzene	590	U
1330-20-7	Xylene (total)	590	U
100-42-5	Styrene	590	U
75-25-2	Bromoform	590	U
98-82-8	Isopropylbenzene	590	U
79-34-5	1,1,2,2-Tetrachloroethane	590	U
541-73-1	1,3-Dichlorobenzene	590	U
106-46-7	1,4-Dichlorobenzene	590	U
95-50-1	1,2-Dichlorobenzene	590	U
96-12-8	1,2-Dibromo-3-chloropropane	590	U
120-82-1	1,2,4-Trichlorobenzene	590	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-17-5.0-5.5DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-003ADL

Sample wt/vol: 12.9 (g/mL) g Lab File ID: 5\A86092.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µl) Soil Aliquot Volume: 100 (µL)

CONCENTRATION UNITS:

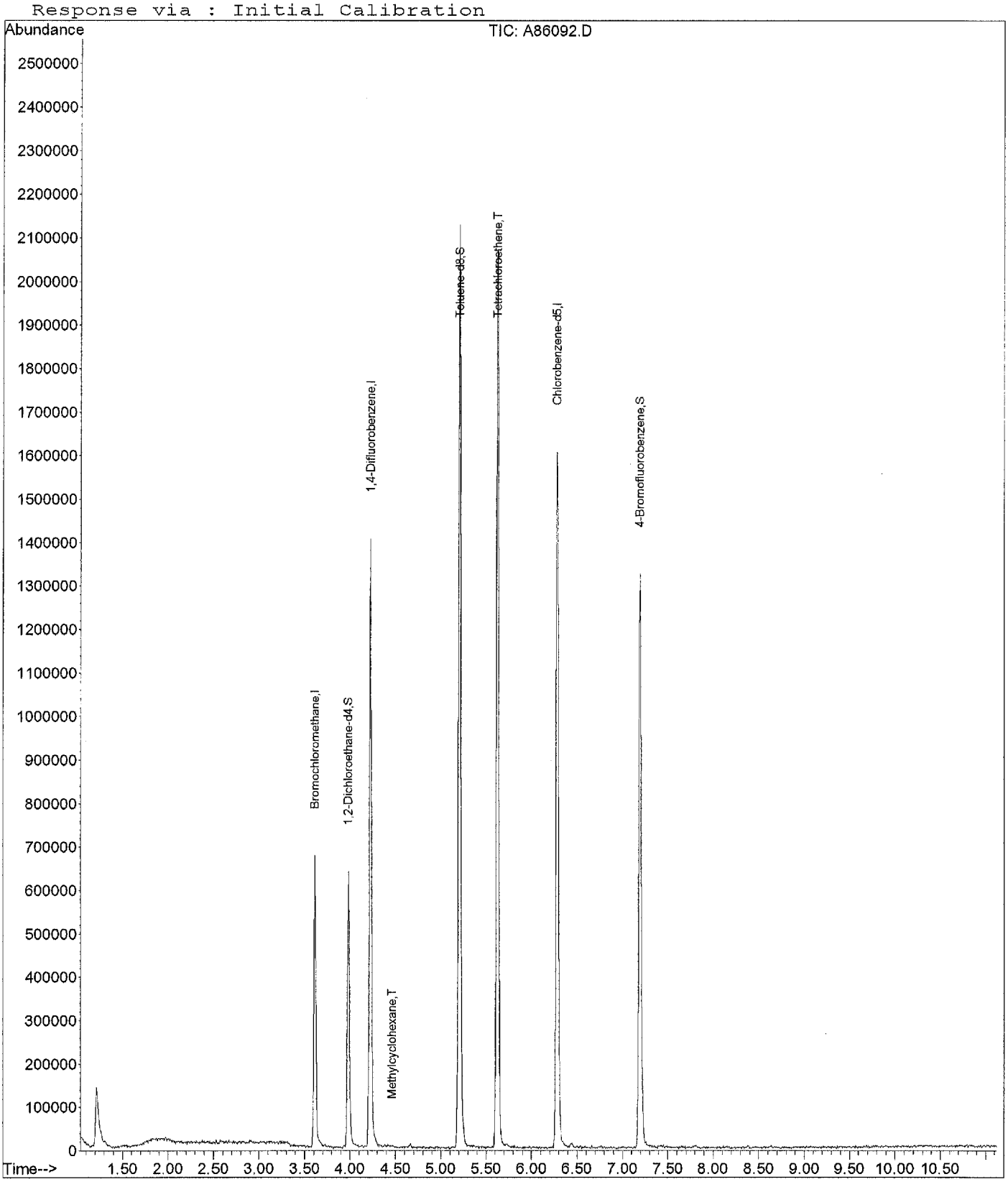
Number TICs found: 0 (µg/L or µg/Kg) µg/Kg

CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q

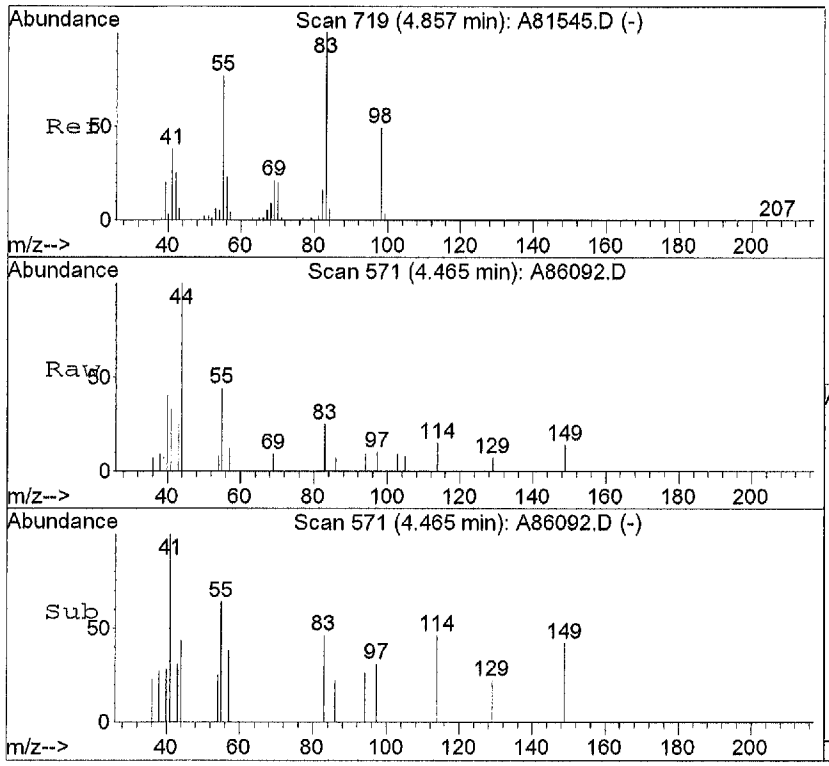
Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86092.D Vial: 12
Acq On : 23 Apr 2015 13:17 Operator: MF
Sample : 1504C96-003A Inst : H5971
Misc : AECOM237,SB-17-5.0-5.5,SOIL,DL,,12.9G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 14:05 2015 Quant Results File: R7W0403.RES

Method : O:\MS\HP5971\METHODS\2015\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration



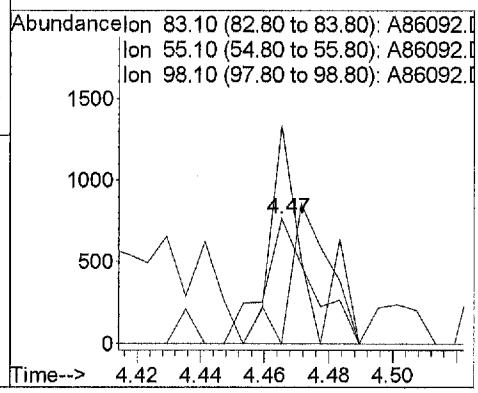
AECOM237 V81

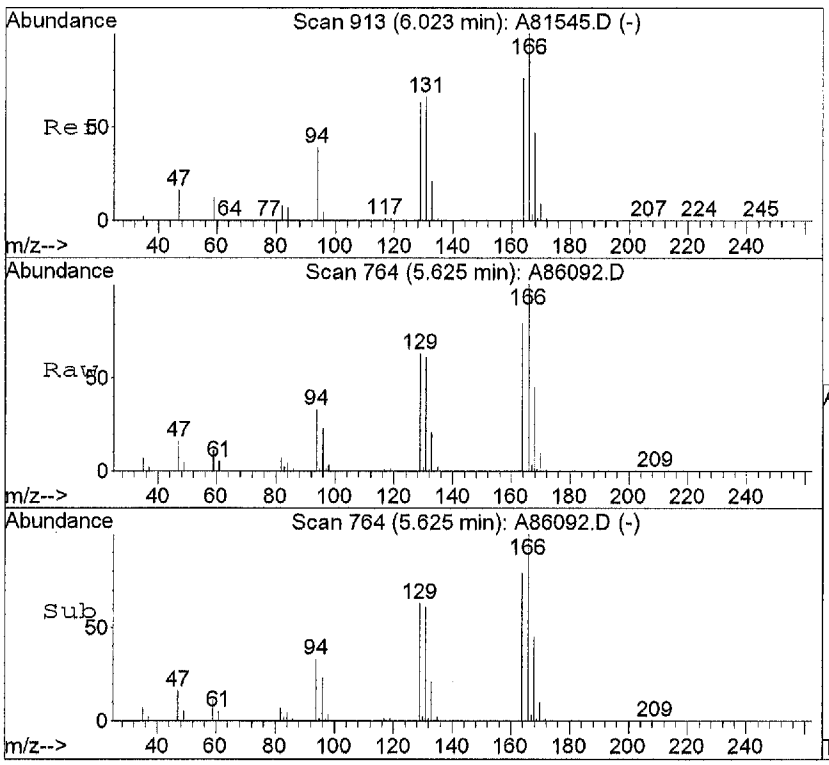


#37
Methylcyclohexane
Concen: 3.68 ug/l
RT: 4.47 min Scan# 571
Delta R.T. -0.00 min
Lab File: A86092.D
Acq: 23 Apr 2015 13:17

Tgt Ion: 83 Resp: 809

Ion	Ratio	Lower	Upper
83	100		
55	146.1	54.6	94.6#
98	0.0	36.3	76.3#

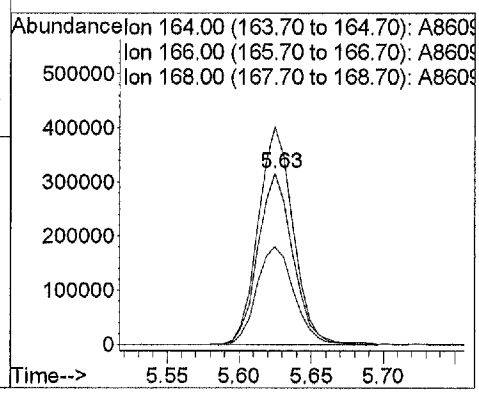




#47
Tetrachloroethene
Concen: 97.06 ug/l
RT: 5.63 min Scan# 764
Delta R.T. 0.01 min
Lab File: A86092.D
Acq: 23 Apr 2015 13:17

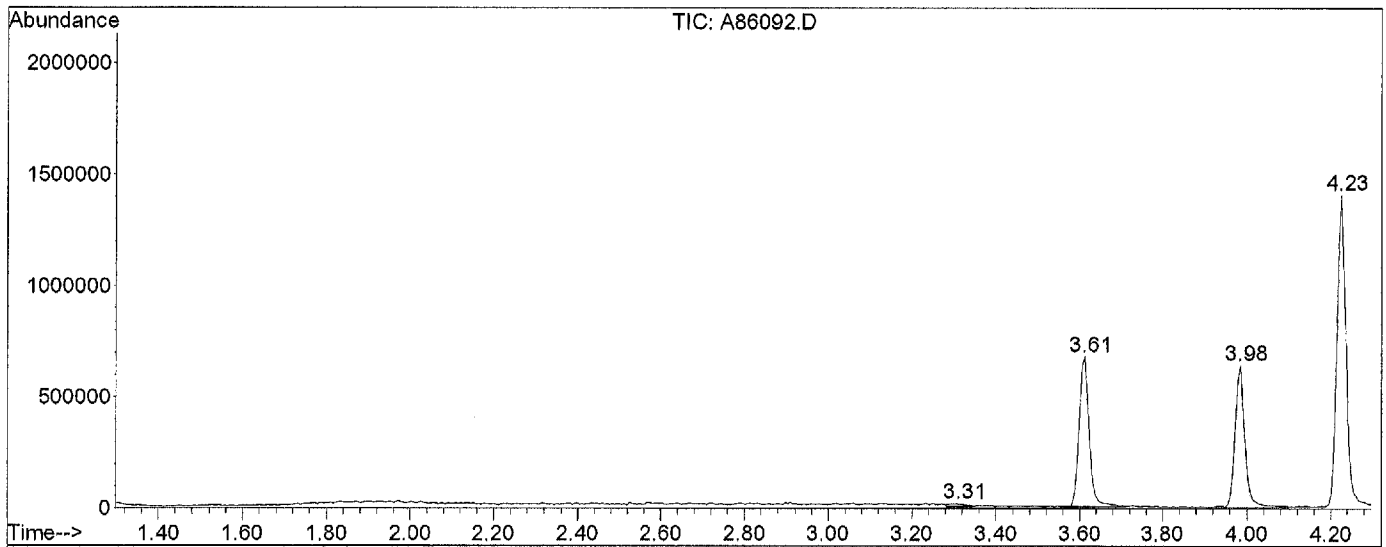
Tgt Ion:164 Resp: 528892

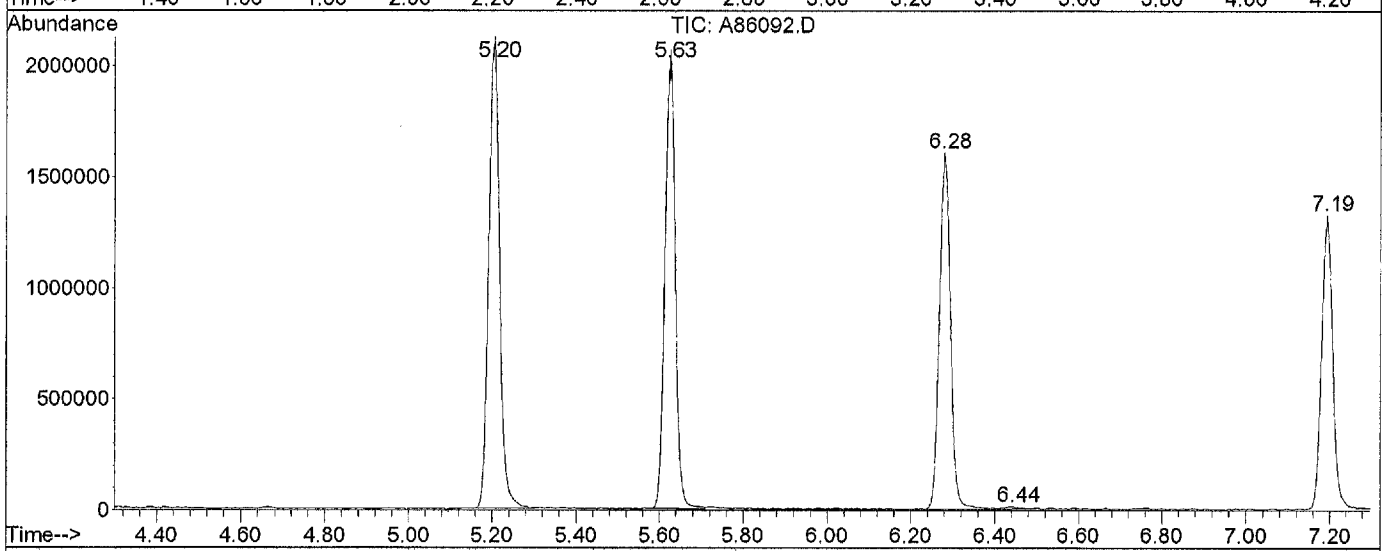
Ion	Ratio	Lower	Upper
164	100		
166	127.4	104.0	144.0
168	56.8	37.0	77.0

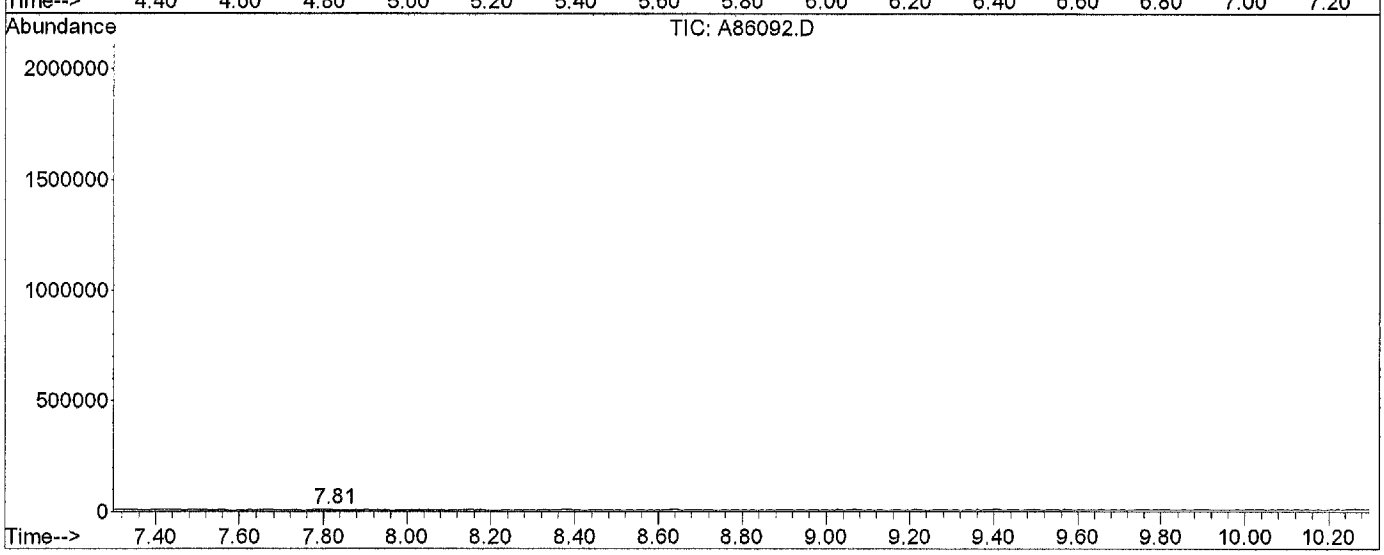


LSC Report - Integrated Chromatogram

File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86092.D
Operator : MF
Acquired : 23 Apr 2015 13:17 using AcqMethod R7W0403
Instrument : H5971
Sample Name: 1504C96-003A
Misc Info : AECOM237,SB-17-5.0-5.5,SOIL,DL,,12.9G
Vial Number: 12
Quant File :R7W0403.RES (RTE Integrator)







A86092.D R7W0403.M Thu May 07 14:00:19 2015 RPT1

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86092.D Vial: 12
Acq On : 23 Apr 2015 13:17 Operator: MF
Sample : 1504C96-003A Inst : H5971
Misc : AECOM237,SB-17-5.0-5.5,SOIL,DL,,12.9G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 14:05 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	166570	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	1037159	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	1061898	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	320308	53.09	ug/l	0.00
Spiked Amount 50.000	Range 70 - 121		Recovery = 106.18%			
49) Toluene-d8	5.20	98	1467805	54.14	ug/l	0.01
Spiked Amount 50.000	Range 84 - 138		Recovery = 108.28%			
53) 4-Bromofluorobenzene	7.19	95	573076	56.50	ug/l	0.01
Spiked Amount 50.000	Range 59 - 113		Recovery = 113.00%			
Target Compounds						Qvalue
37) Methylcyclohexane	4.47	83	809	3.68	ug/l #	19
47) Tetrachloroethene	5.63	164	528892	97.06	ug/l	98

(#) = qualifier out of range (m) = manual integration

Tentatively Identified Compound (LSC) summary

Operator ID: MF Date Acquired: 23 Apr 2015 13:17
Data File: O:\MS\HP5971\DATA\2015\APRIL15\042315\A86092.D
Name: 1504C96-003A
Misc: AECOM237,SB-17-5.0-5.5,SOIL,DL,,12.9G
Method: C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title: 8260C CJ4239, CG1098, A087941, A092874, A091556
Library Searched: C:\DATABASE\NIST08.L

TIC	Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc

A86092.D R7W0403.M Thu May 07 14:00:19 2015 RPT1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-18-5.0-5.5

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-004A

Sample wt/vol: 13.06 (g/mL) g Lab File ID: 5\A86067.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	5	U
75-35-4	1,1-Dichloroethene	5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5	U
67-64-1	Acetone	5	U
75-15-0	Carbon disulfide	5	U
79-20-9	Methyl Acetate	5	U
75-09-2	Methylene chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-Butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
110-82-7	Cyclohexane	5	U
56-23-5	Carbon tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	5	U
108-87-2	Methylcyclohexane	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	160	E
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-18-5.0-5.5

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-004A

Sample wt/vol: 13.06 (g/mL) g Lab File ID: 5\A86067.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
1330-20-7	Xylene (total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-18-5.0-5.5

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-004A

Sample wt/vol: 13.06 (g/mL) g Lab File ID: 5\A86067.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: (µl) Soil Aliquot Volume: 0 (µL)

CONCENTRATION UNITS:

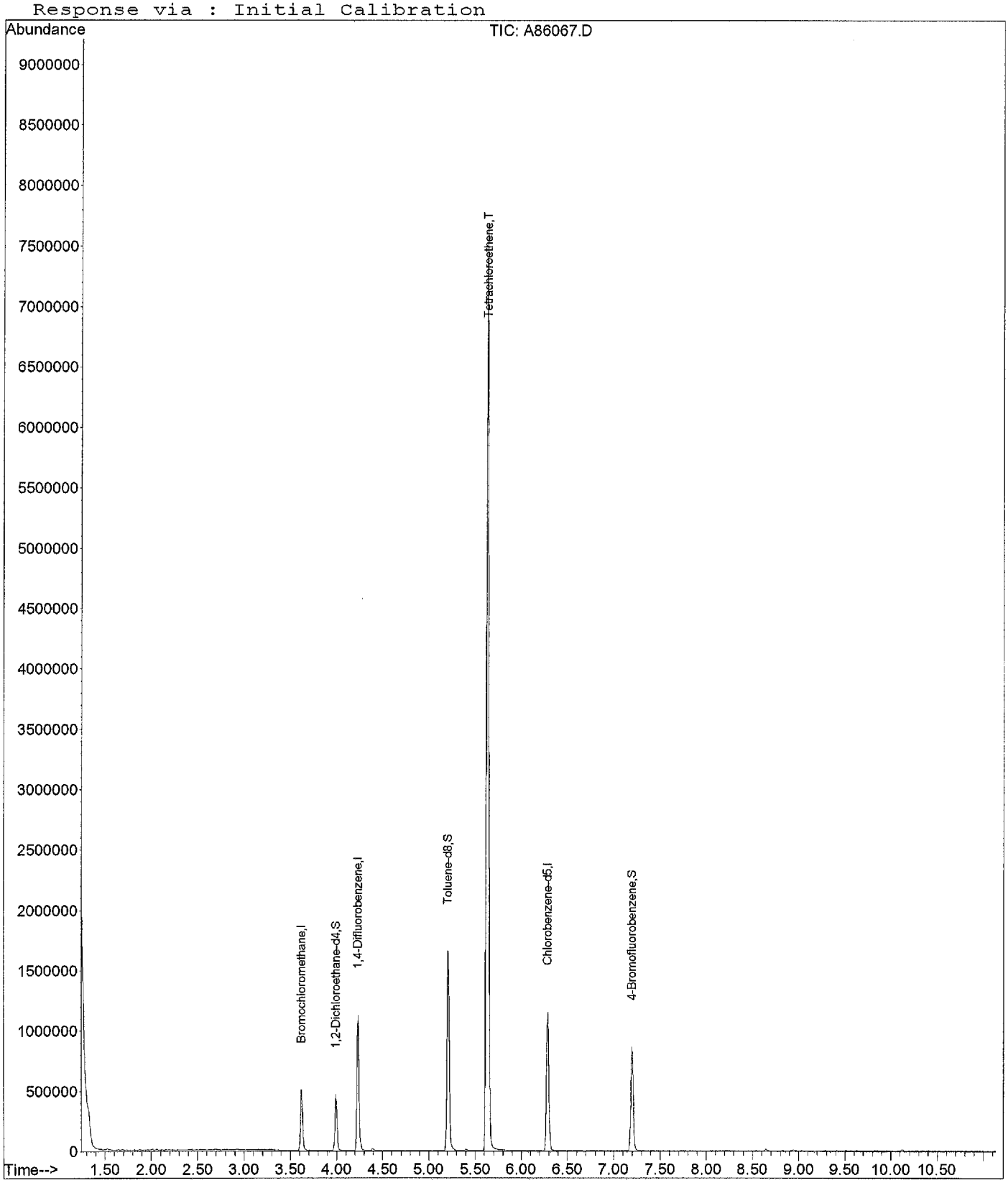
Number TICs found: 0 (µg/L or µg/Kg) µg/Kg

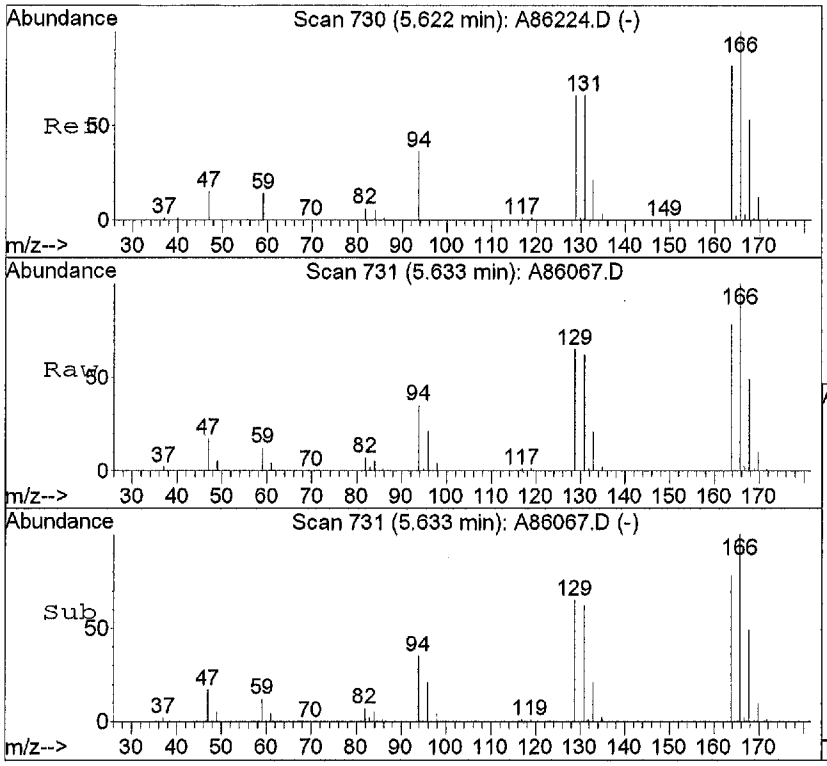
CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q

Quantitation Report

Data File : C:\DATA\2015\APRIL15\042215\A86067.D Vial: 16
Acq On : 22 Apr 2015 13:22 Operator: MF
Sample : 1504C96-004A Inst : H5971
Misc : AECOM237,SB-18-5.0-5.5,SOIL,SAMP,,13.06G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 12 19:16 2015 Quant Results File: R6S0331.RES

Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105748, A0104748, CH3755A
Last Update : Thu Apr 30 13:34:30 2015
Response via : Initial Calibration

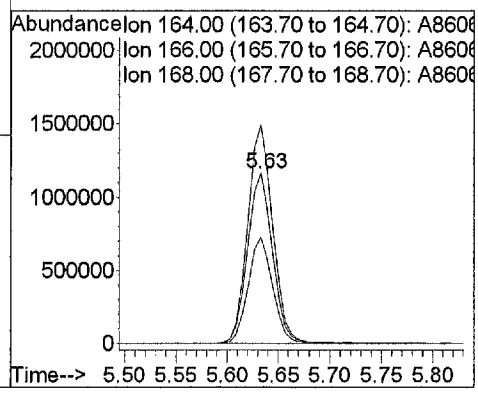




#47
Tetrachloroethene
Concen: 352.05 ug/l
RT: 5.63 min Scan# 731
Delta R.T. 0.01 min
Lab File: A86067.D
Acq: 22 Apr 2015 13:22

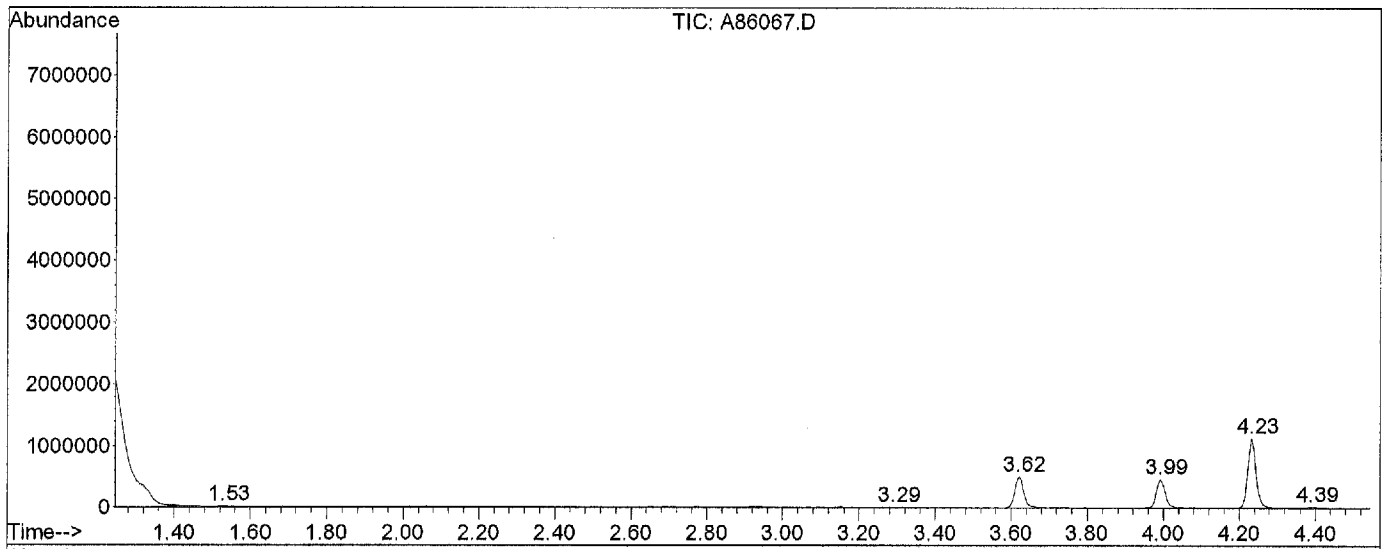
Tgt Ion:164 Resp: 1992104

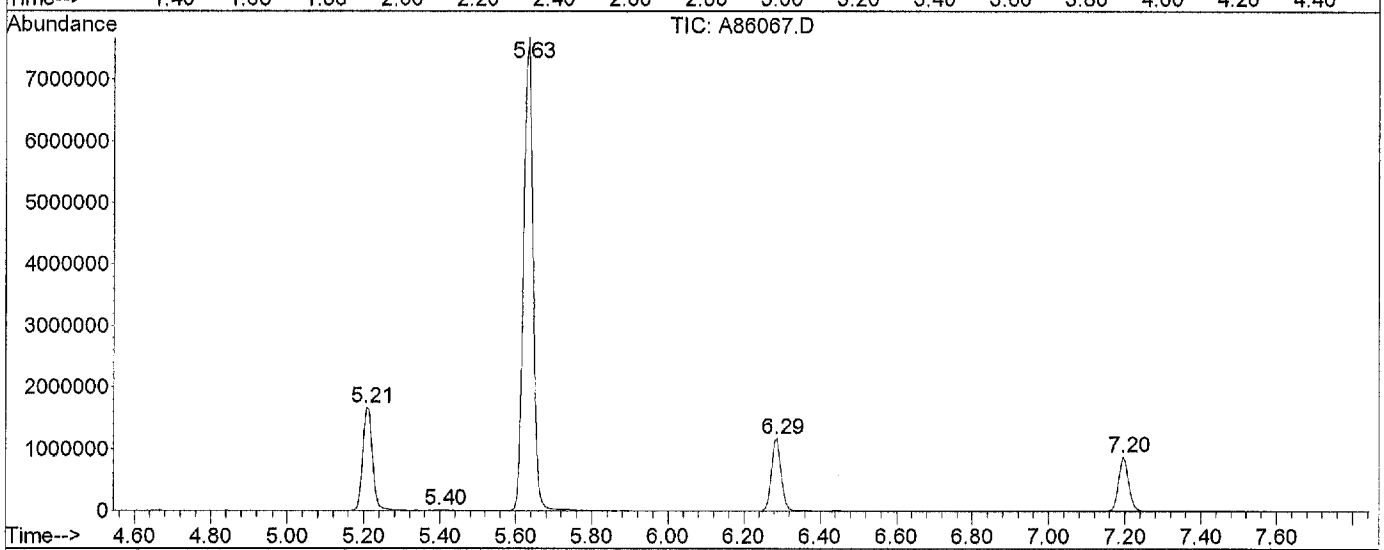
Ion	Ratio	Lower	Upper
164	100		
166	128.5	106.9	146.9
168	62.4	37.8	77.8

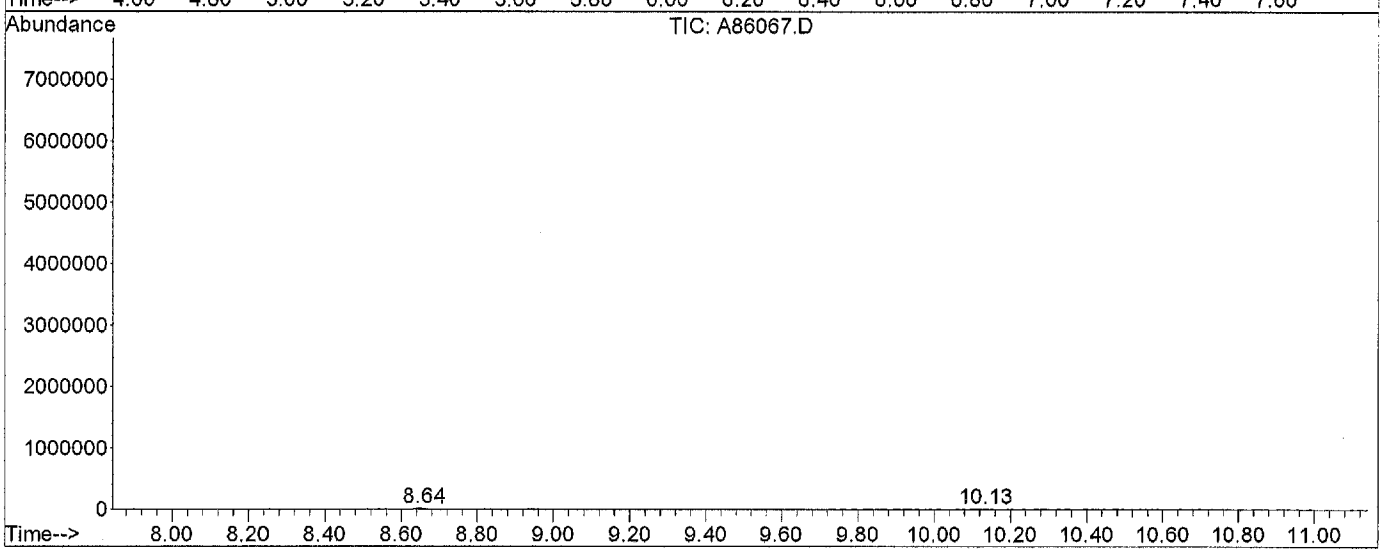


LSC Report - Integrated Chromatogram

File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86067.D
Operator : MF
Acquired : 22 Apr 2015 13:22 using AcqMethod R6S0331
Instrument : H5971
Sample Name: 1504C96-004A
Misc Info : AECOM237,SB-18-5.0-5.5,SOIL,SAMP,,13.06G
Vial Number: 16
Quant File :R6S0331.RES (RTE Integrator)







A86067.D R6S0331.M Thu May 07 13:32:13 2015 RPT1

Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\042215\A86067.D Vial: 16
Acq On : 22 Apr 2015 13:22 Operator: MF
Sample : 1504C96-004A Inst : H5971
Misc : AECOM237,SB-18-5.0-5.5,SOIL,SAMP,,13.06G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 12 19:16 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.62	128	115389	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	815650	50.00	ug/l	0.01
43) Chlorobenzene-d5	6.29	117	746899	50.00	ug/l	0.02
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.99	65	225482	58.03	ug/l	0.01
Spiked Amount 50.000	Range 33 - 150		Recovery = 116.06%			
49) Toluene-d8	5.21	98	1113206	56.96	ug/l	0.01
Spiked Amount 50.000	Range 43 - 157		Recovery = 113.92%			
53) 4-Bromofluorobenzene	7.20	95	378095	52.06	ug/l	0.02
Spiked Amount 50.000	Range 34 - 145		Recovery = 104.12%			
Target Compounds						Qvalue
47) Tetrachloroethene	5.63	164	1992104	352.05	ug/l	97

(#) = qualifier out of range (m) = manual integration

Tentatively Identified Compound (LSC) summary

Operator ID: MF Date Acquired: 22 Apr 2015 13:22
Data File: O:\MS\HP5971\DATA\2015\APRIL15\042215\A86067.D
Name: 1504C96-004A
Misc: AECOM237,SB-18-5.0-5.5,SOIL,SAMP,,13.06G
Method: C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title: 8260S A0104564, A0105567, A0101160, CH3755A
Library Searched: C:\DATABASE\NIST08.L

TIC Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc

A86067.D R6S0331.M Thu May 07 13:32:13 2015 RPT1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-18-5.0-5.5DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-004ADL

Sample wt/vol: 13.3 (g/mL) g Lab File ID: 5\A86093.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	570	U
74-87-3	Chloromethane	570	U
75-01-4	Vinyl chloride	570	U
74-83-9	Bromomethane	570	U
75-00-3	Chloroethane	570	U
75-69-4	Trichlorofluoromethane	570	U
75-35-4	1,1-Dichloroethene	570	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	570	U
67-64-1	Acetone	570	U
75-15-0	Carbon disulfide	570	U
79-20-9	Methyl Acetate	570	U
75-09-2	Methylene chloride	570	U
156-60-5	trans-1,2-Dichloroethene	570	U
1634-04-4	Methyl tert-butyl ether	570	U
75-34-3	1,1-Dichloroethane	570	U
156-59-2	cis-1,2-Dichloroethene	570	U
78-93-3	2-Butanone	570	U
67-66-3	Chloroform	570	U
71-55-6	1,1,1-Trichloroethane	570	U
110-82-7	Cyclohexane	570	U
56-23-5	Carbon tetrachloride	570	U
71-43-2	Benzene	570	U
107-06-2	1,2-Dichloroethane	570	U
79-01-6	Trichloroethene	570	U
108-87-2	Methylcyclohexane	570	U
78-87-5	1,2-Dichloropropane	570	U
75-27-4	Bromodichloromethane	570	U
10061-01-5	cis-1,3-Dichloropropene	570	U
108-10-1	4-Methyl-2-pentanone	570	U
108-88-3	Toluene	570	U
10061-02-6	trans-1,3-Dichloropropene	570	U
79-00-5	1,1,2-Trichloroethane	570	U
127-18-4	Tetrachloroethene	2400	DZ
591-78-6	2-Hexanone	570	U
124-48-1	Dibromochloromethane	570	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-18-5.0-5.5DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-004ADL

Sample wt/vol: 13.3 (g/mL) g Lab File ID: 5\A86093.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	570	U
108-90-7	Chlorobenzene	570	U
100-41-4	Ethylbenzene	570	U
1330-20-7	Xylene (total)	570	U
100-42-5	Styrene	570	U
75-25-2	Bromoform	570	U
98-82-8	Isopropylbenzene	570	U
79-34-5	1,1,2,2-Tetrachloroethane	570	U
541-73-1	1,3-Dichlorobenzene	570	U
106-46-7	1,4-Dichlorobenzene	570	U
95-50-1	1,2-Dichlorobenzene	570	U
96-12-8	1,2-Dibromo-3-chloropropane	570	U
120-82-1	1,2,4-Trichlorobenzene	570	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-18-5.0-5.5DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-004ADL

Sample wt/vol: 13.3 (g/mL) g Lab File ID: 5\A86093.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 19 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µl) Soil Aliquot Volume: 100 (µL)

CONCENTRATION UNITS:

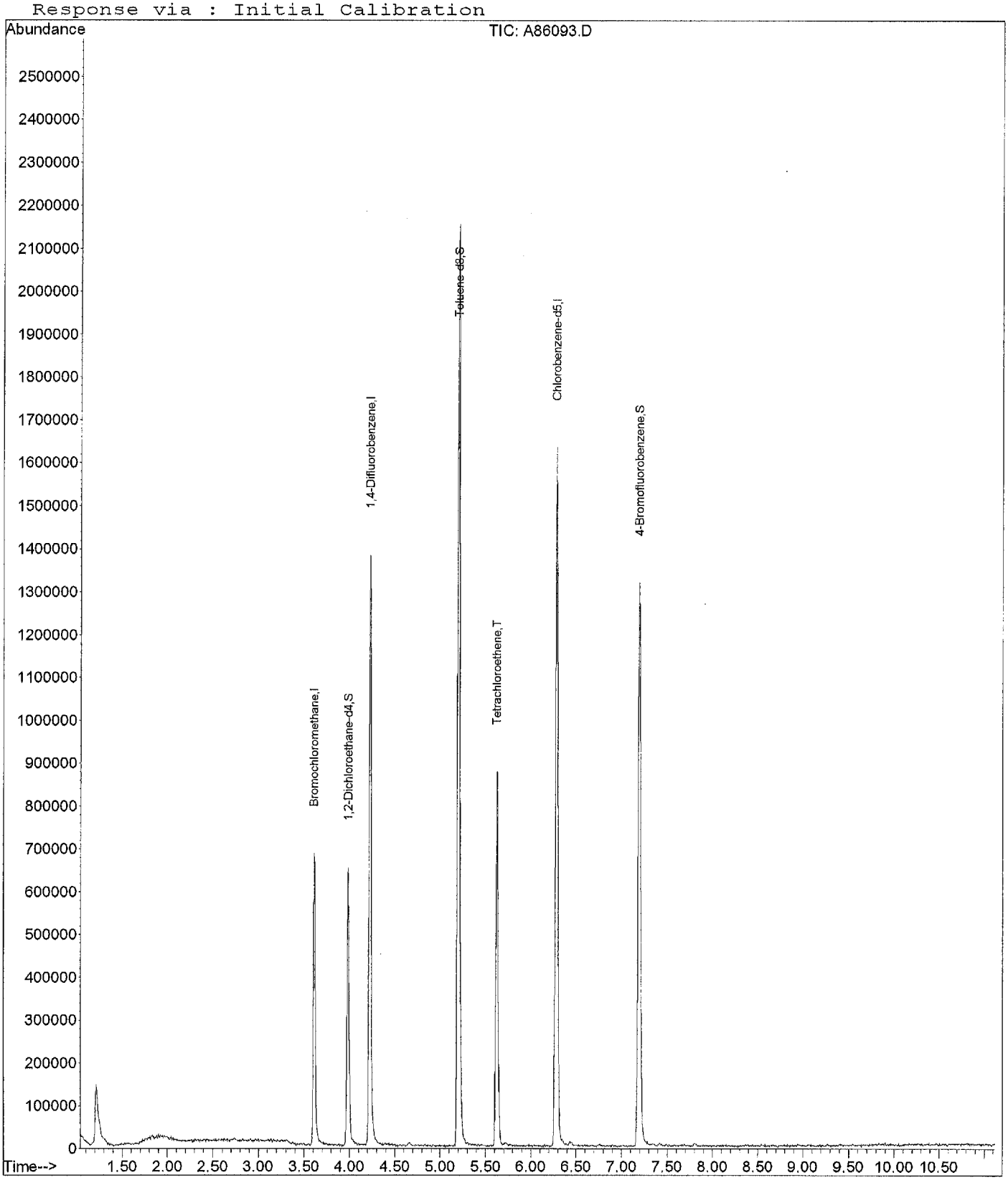
Number TICs found: 0 (µg/L or µg/Kg) µg/Kg

CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q

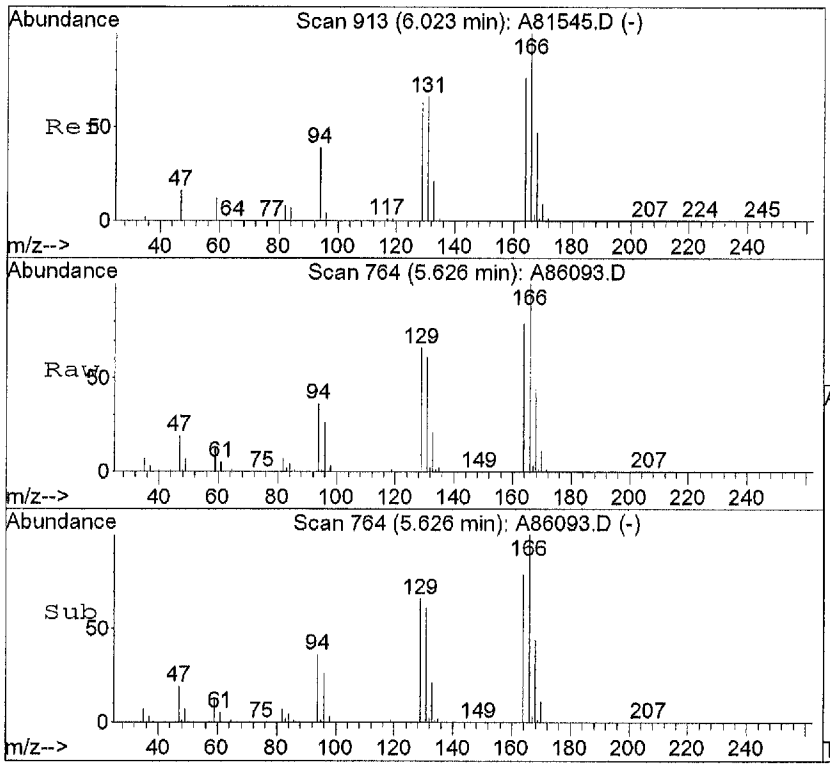
Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86093.D Vial: 13
Acq On : 23 Apr 2015 13:37 Operator: MF
Sample : 1504C96-004A Inst : H5971
Misc : AECOM237,SB-18-5.0-5.5,SOIL,DL,,13.3G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 14:07 2015 Quant Results File: R7W0403.RES

Method : O:\MS\HP5971\METHODS\2015\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration



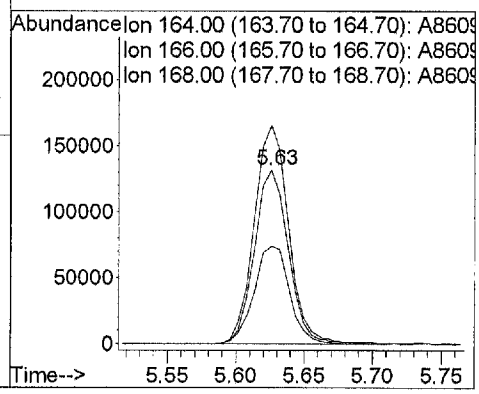
AECOM237 V97



#47
Tetrachloroethene
Concen: 41.66 ug/l
RT: 5.63 min Scan# 764
Delta R.T. 0.01 min
Lab File: A86093.D
Acq: 23 Apr 2015 13:37

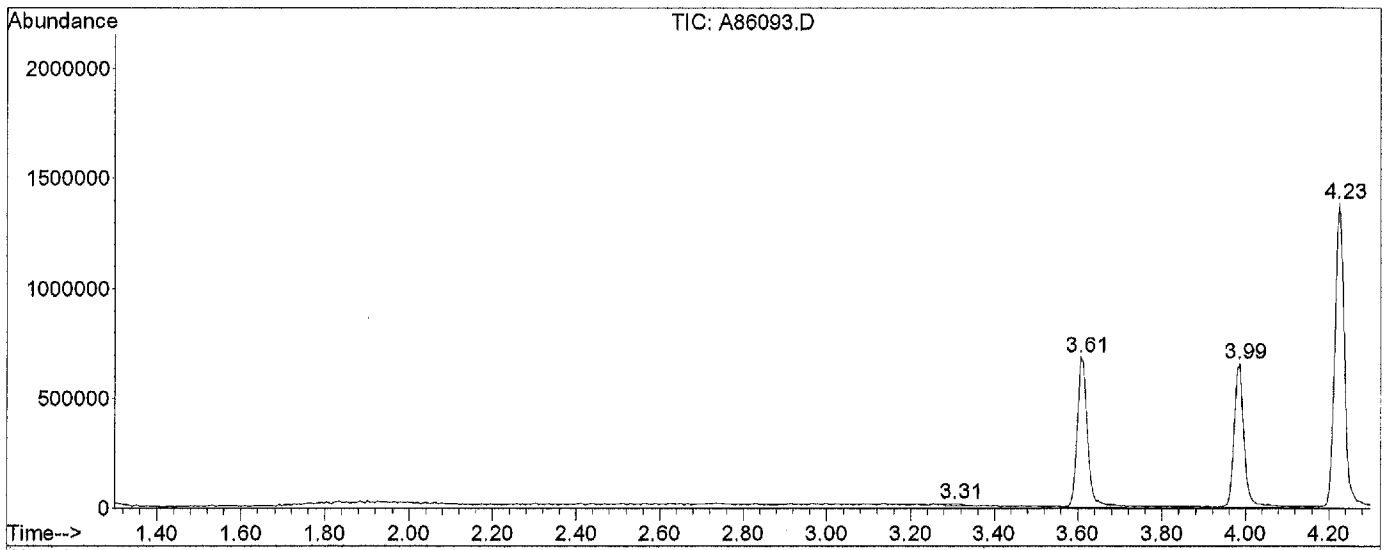
Tgt Ion:164 Resp: 227837

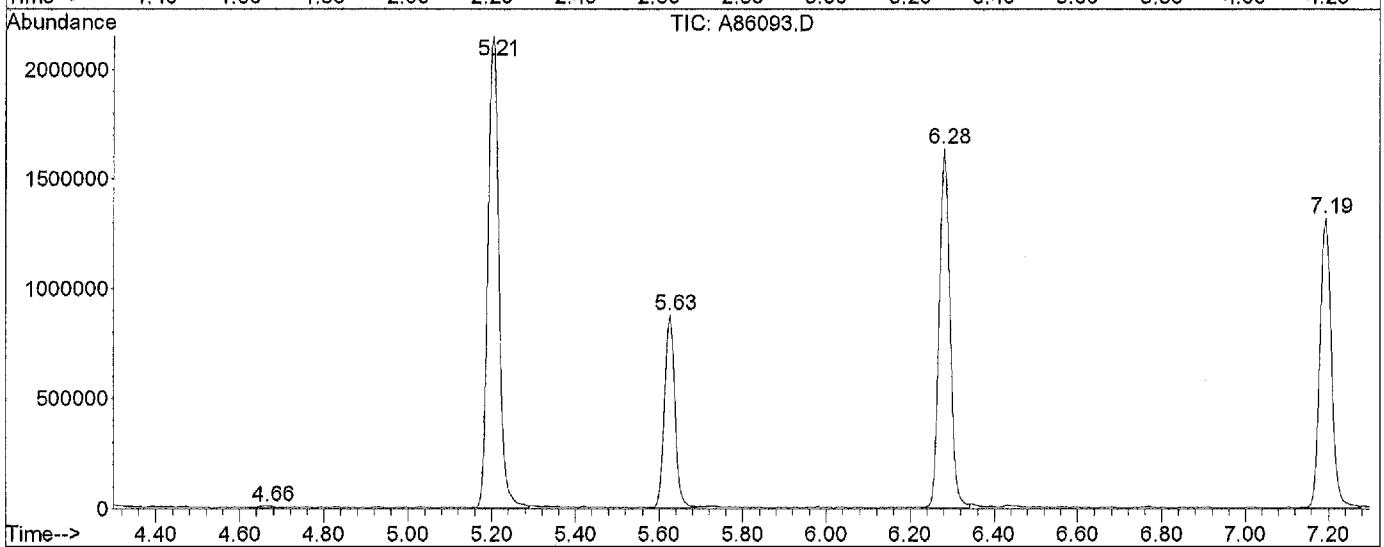
Ion	Ratio	Lower	Upper
164	100		
166	126.0	104.0	144.0
168	56.0	37.0	77.0

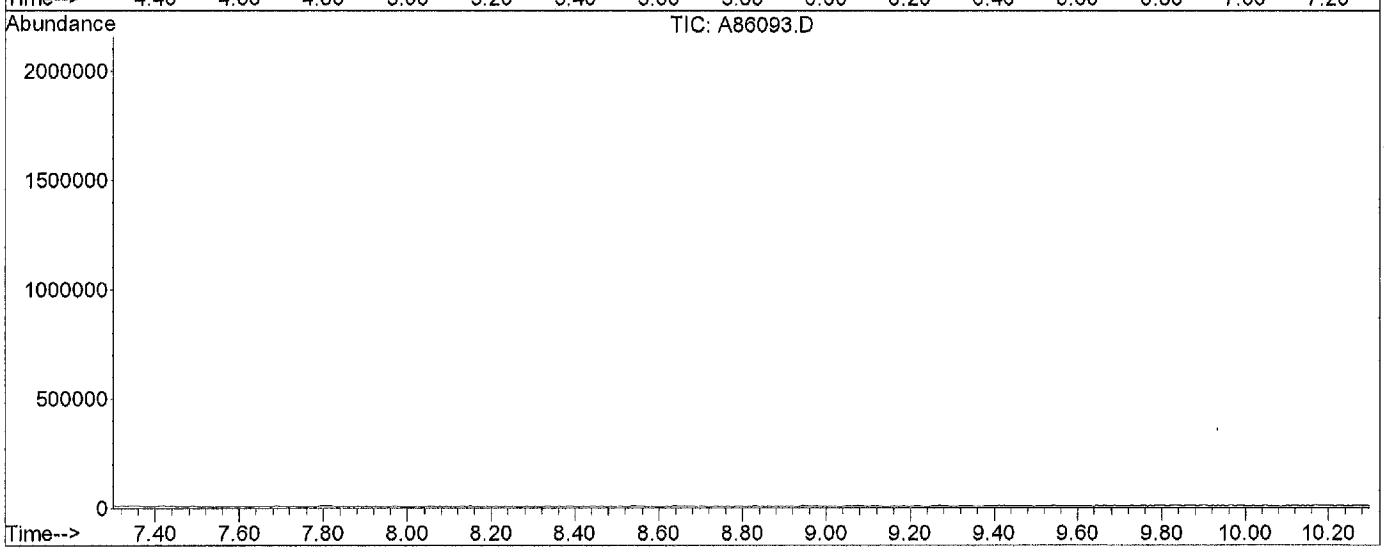


LSC Report - Integrated Chromatogram

File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86093.D
Operator : MF
Acquired : 23 Apr 2015 13:37 using AcqMethod R7W0403
Instrument : H5971
Sample Name: 1504C96-004A
Misc Info : AECOM237,SB-18-5.0-5.5,SOIL,DL,,13.3G
Vial Number: 13
Quant File :R7W0403.RES (RTE Integrator)







A86093.D R7W0403.M Thu May 07 14:01:12 2015 RPT1

Tentatively Identified Compound (LSC) summary

Operator ID: MF Date Acquired: 23 Apr 2015 13:37
Data File: O:\MS\HP5971\DATA\2015\APRIL15\042315\A86093.D
Name: 1504C96-004A
Misc: AECOM237,SB-18-5.0-5.5,SOIL,DL,,13.3G
Method: C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title: 8260C CJ4239, CG1098, A087941, A092874, A091556
Library Searched: C:\DATABASE\NIST08.L

TIC	Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc

A86093.D R7W0403.M Thu May 07 14:01:12 2015 RPT1

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86093.D Vial: 13
Acq On : 23 Apr 2015 13:37 Operator: MF
Sample : 1504C96-004A Inst : H5971
Misc : AECOM237,SB-18-5.0-5.5,SOIL,DL,,13.3G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 14:07 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	165571	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	1038527	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	1065865	50.00	ug/l	0.01
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	345577	57.63	ug/l	0.00
Spiked Amount 50.000	Range 70 - 121		Recovery = 115.26%			
49) Toluene-d8	5.21	98	1509893	55.48	ug/l	0.01
Spiked Amount 50.000	Range 84 - 138		Recovery = 110.96%			
53) 4-Bromofluorobenzene	7.19	95	595816	58.52	ug/l	0.01
Spiked Amount 50.000	Range 59 - 113		Recovery = 117.04%#			
Target Compounds						Qvalue
47) Tetrachloroethene	5.63	164	227837	41.66	ug/l	98

(#) = qualifier out of range (m) = manual integration

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-19-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-005A

Sample wt/vol: 12.13 (g/mL) g Lab File ID: 5\A86068.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 20 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	5	U
74-87-3	Chloromethane	5	U
75-01-4	Vinyl chloride	5	U
74-83-9	Bromomethane	5	U
75-00-3	Chloroethane	5	U
75-69-4	Trichlorofluoromethane	0.7	J
75-35-4	1,1-Dichloroethene	5	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5	U
67-64-1	Acetone	5	U
75-15-0	Carbon disulfide	5	U
79-20-9	Methyl Acetate	5	U
75-09-2	Methylene chloride	5	U
156-60-5	trans-1,2-Dichloroethene	5	U
1634-04-4	Methyl tert-butyl ether	5	U
75-34-3	1,1-Dichloroethane	5	U
156-59-2	cis-1,2-Dichloroethene	5	U
78-93-3	2-Butanone	5	U
67-66-3	Chloroform	5	U
71-55-6	1,1,1-Trichloroethane	5	U
110-82-7	Cyclohexane	5	U
56-23-5	Carbon tetrachloride	5	U
71-43-2	Benzene	5	U
107-06-2	1,2-Dichloroethane	5	U
79-01-6	Trichloroethene	0.8	J
108-87-2	Methylcyclohexane	5	U
78-87-5	1,2-Dichloropropane	5	U
75-27-4	Bromodichloromethane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
108-10-1	4-Methyl-2-pentanone	5	U
108-88-3	Toluene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
79-00-5	1,1,2-Trichloroethane	5	U
127-18-4	Tetrachloroethene	420	E
591-78-6	2-Hexanone	5	U
124-48-1	Dibromochloromethane	5	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-19-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-005A

Sample wt/vol: 12.13 (g/mL) g Lab File ID: 5\A86068.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 20 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
1330-20-7	Xylene (total)	5	U
100-42-5	Styrene	5	U
75-25-2	Bromoform	5	U
98-82-8	Isopropylbenzene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
541-73-1	1,3-Dichlorobenzene	5	U
106-46-7	1,4-Dichlorobenzene	5	U
95-50-1	1,2-Dichlorobenzene	5	U
96-12-8	1,2-Dibromo-3-chloropropane	5	U
120-82-1	1,2,4-Trichlorobenzene	5	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-19-5.5-6.0

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-005A

Sample wt/vol: 12.13 (g/mL) g Lab File ID: 5\A86068.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. 20 Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: (µl) Soil Aliquot Volume: 0 (µL)

CONCENTRATION UNITS:

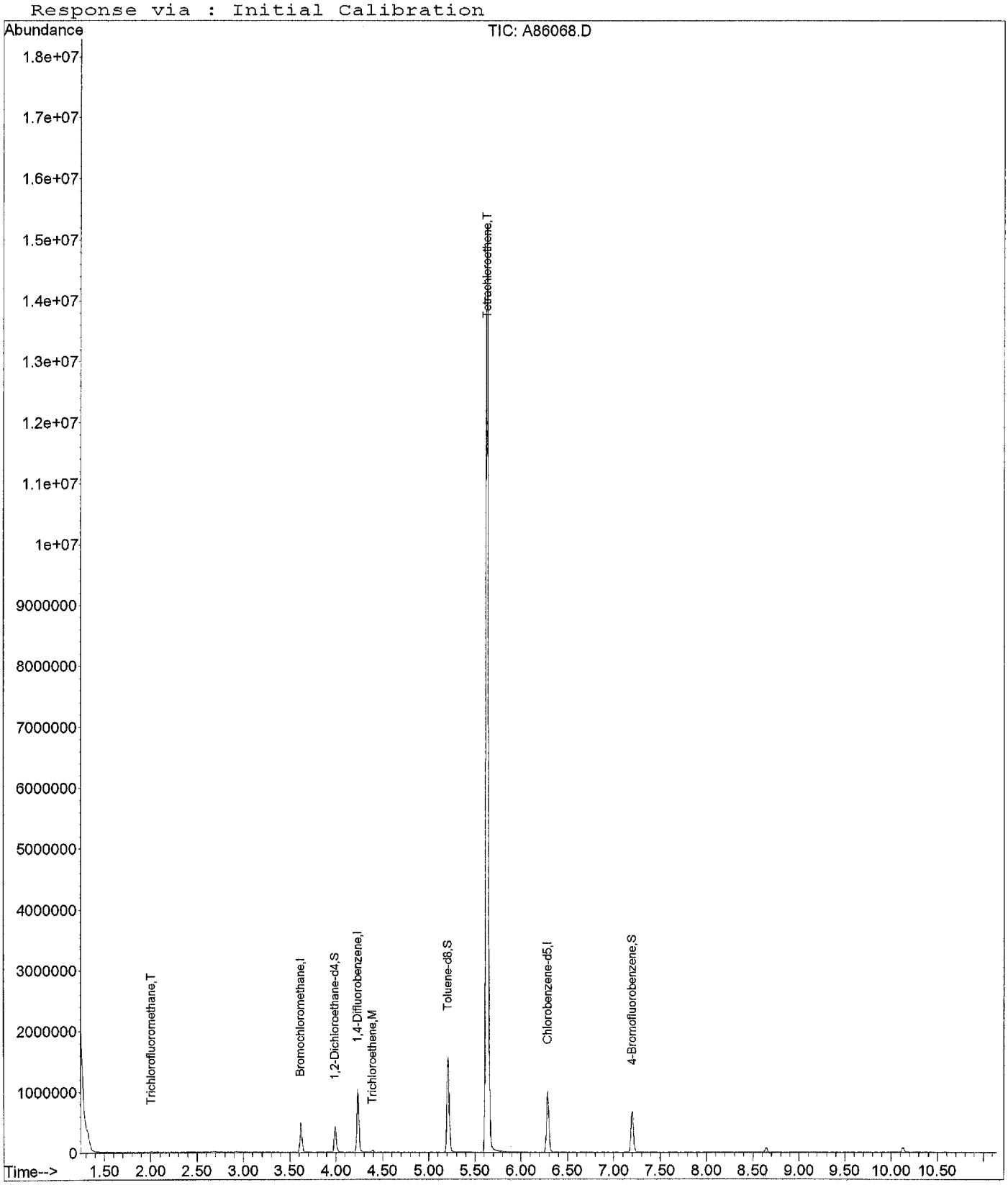
Number TICs found: 0 (µg/L or µg/Kg) µg/Kg

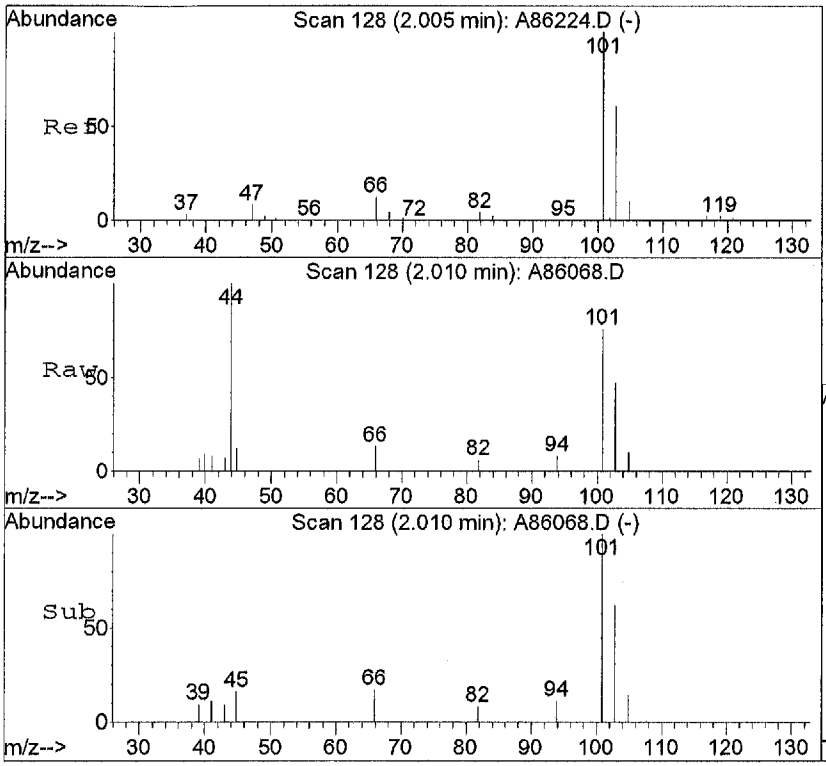
CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q

Quantitation Report

Data File : C:\DATA\2015\APRIL15\042215\A86068.D Vial: 17
Acq On : 22 Apr 2015 13:43 Operator: MF
Sample : 1504C96-005A Inst : H5971
Misc : AECOM237,SB-19-5.5-6.0,SOIL,SAMP,,12.13G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 12 19:16 2015 Quant Results File: R6S0331.RES

Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105748, A0104748, CH3755A
Last Update : Thu Apr 30 13:34:30 2015
Response via : Initial Calibration

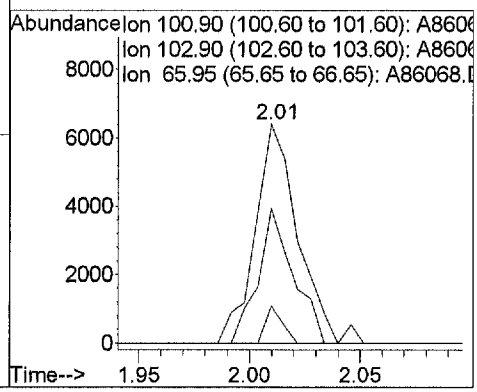


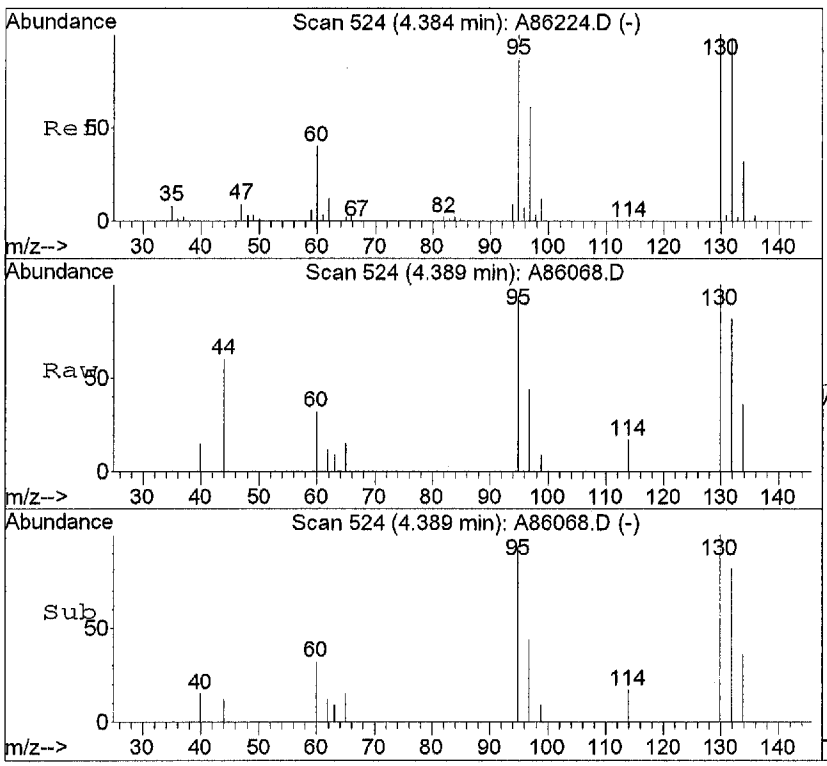


#18
Trichlorofluoromethane
Concen: 1.38 ug/l
RT: 2.01 min Scan# 128
Delta R.T. -0.00 min
Lab File: A86068.D
Acq: 22 Apr 2015 13:43

Tgt Ion:101 Resp: 8659

Ion	Ratio	Lower	Upper
101	100		
103	61.5	43.7	83.7
66	16.8	0.0	31.8

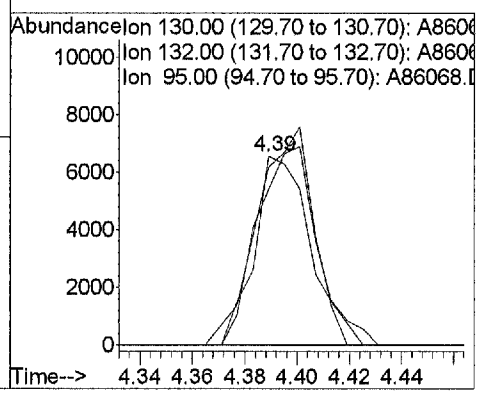


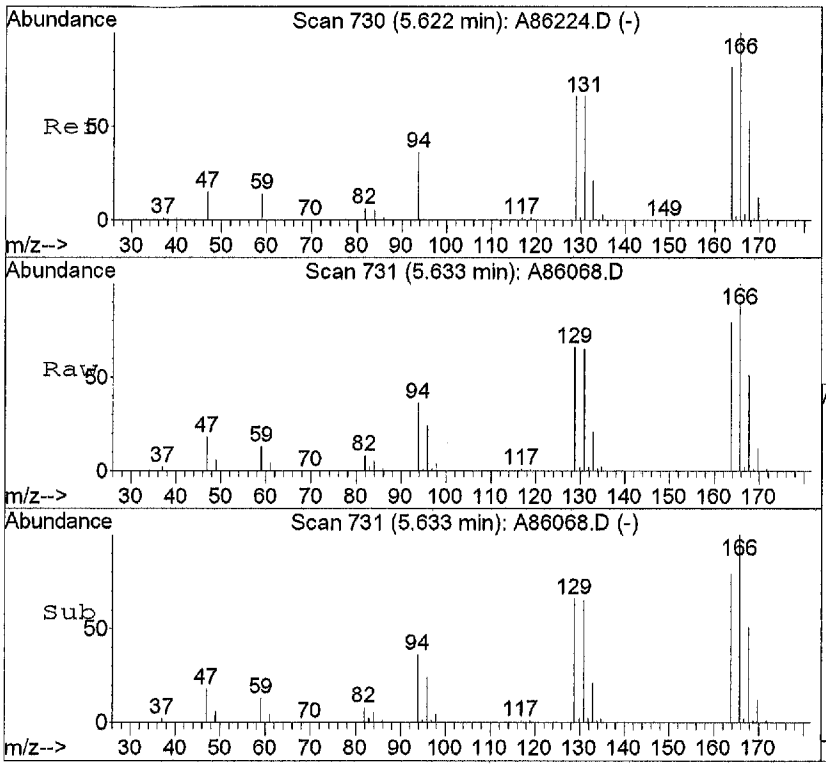


#36
Trichloroethene
Concen: 1.55 ug/l
RT: 4.39 min Scan# 524
Delta R.T. 0.00 min
Lab File: A86068.D
Acq: 22 Apr 2015 13:43

Tgt Ion:130 Resp: 9744

Ion	Ratio	Lower	Upper
130	100		
132	82.4	79.1	119.1
95	94.0	69.5	109.5

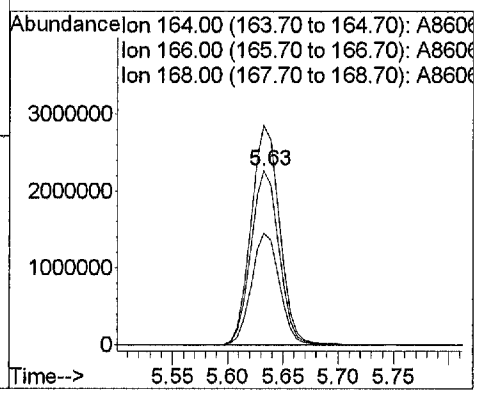




#47
Tetrachloroethene
Concen: 816.23 ug/l
RT: 5.63 min Scan# 731
Delta R.T. 0.01 min
Lab File: A86068.D
Acq: 22 Apr 2015 13:43

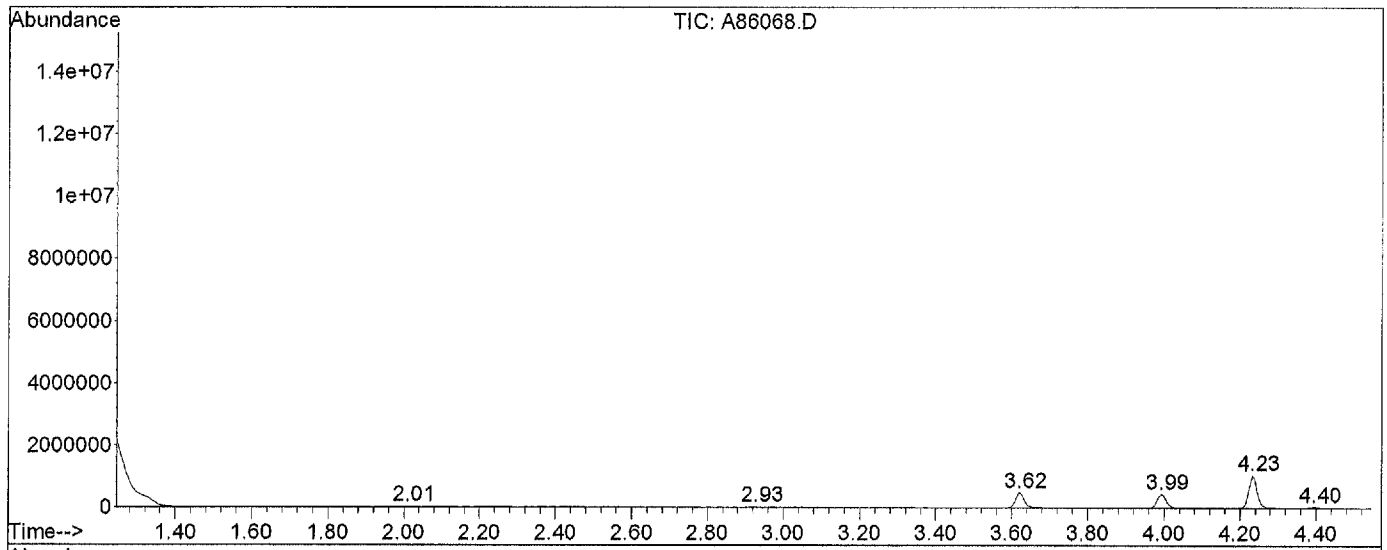
Tgt Ion:164 Resp: 3999572

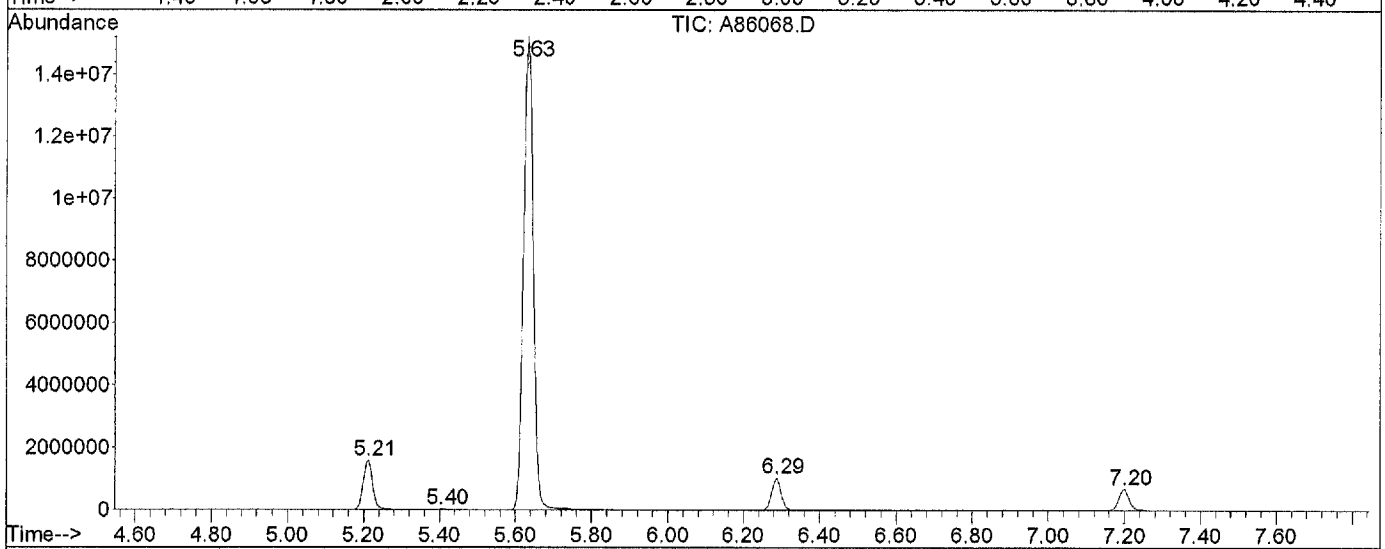
Ion	Ratio	Lower	Upper
164	100		
166	125.8	106.9	146.9
168	63.9	37.8	77.8

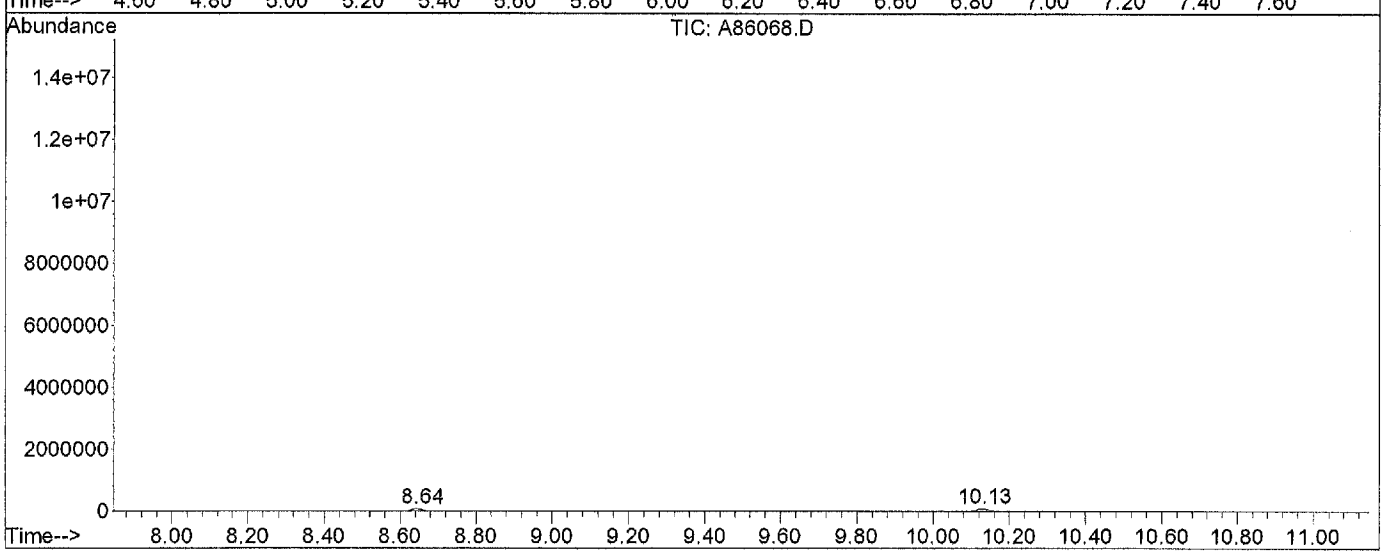


LSC Report - Integrated Chromatogram

File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86068.D
Operator : MF
Acquired : 22 Apr 2015 13:43 using AcqMethod R6S0331
Instrument : H5971
Sample Name: 1504C96-005A
Misc Info : AECOM237,SB-19-5.5-6.0,SOIL,SAMP,,12.13G
Vial Number: 17
Quant File :R6S0331.RES (RTE Integrator)







A86068.D R6S0331.M Thu May 07 13:32:30 2015 RPT1

Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\042215\A86068.D Vial: 17
Acq On : 22 Apr 2015 13:43 Operator: MF
Sample : 1504C96-005A Inst : H5971
Misc : AECOM237,SB-19-5.5-6.0,SOIL,SAMP,,12.13G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: May 12 19:16 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.62	128	111185	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	755213	50.00	ug/l	0.01
43) Chlorobenzene-d5	6.29	117	646773	50.00	ug/l	0.02
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.99	65	224872	60.06	ug/l	0.01
Spiked Amount 50.000	Range 33 - 150		Recovery = 120.12%			
49) Toluene-d8	5.21	98	1045772	61.79	ug/l	0.02
Spiked Amount 50.000	Range 43 - 157		Recovery = 123.58%			
53) 4-Bromofluorobenzene	7.20	95	309764	49.26	ug/l	0.02
Spiked Amount 50.000	Range 34 - 145		Recovery = 98.52%			
Target Compounds						Qvalue
18) Trichlorofluoromethane	2.01	101	8659	1.38	ug/l	96
36) Trichloroethene	4.39	130	9744	1.55	ug/l	89
47) Tetrachloroethene	5.63	164	3999572	816.23	ug/l	97

(#) = qualifier out of range (m) = manual integration

Tentatively Identified Compound (LSC) summary

Operator ID: MF Date Acquired: 22 Apr 2015 13:43
Data File: O:\MS\HP5971\DATA\2015\APRIL15\042215\A86068.D
Name: 1504C96-005A
Misc: AECOM237,SB-19-5.5-6.0,SOIL,SAMP,,12.13G
Method: C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title: 8260S A0104564, A0105567, A0101160, CH3755A
Library Searched: C:\DATABASE\NIST08.L

TIC	Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc

A86068.D R6S0331.M Thu May 07 13:32:30 2015 RPT1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-19-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-005ADL

Sample wt/vol: 13.7 (g/mL) g Lab File ID: 5\A86094.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 20 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	570	U
74-87-3	Chloromethane	570	U
75-01-4	Vinyl chloride	570	U
74-83-9	Bromomethane	570	U
75-00-3	Chloroethane	570	U
75-69-4	Trichlorofluoromethane	570	U
75-35-4	1,1-Dichloroethene	570	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	570	U
67-64-1	Acetone	570	U
75-15-0	Carbon disulfide	570	U
79-20-9	Methyl Acetate	570	U
75-09-2	Methylene chloride	570	U
156-60-5	trans-1,2-Dichloroethene	570	U
1634-04-4	Methyl tert-butyl ether	570	U
75-34-3	1,1-Dichloroethane	570	U
156-59-2	cis-1,2-Dichloroethene	570	U
78-93-3	2-Butanone	570	U
67-66-3	Chloroform	570	U
71-55-6	1,1,1-Trichloroethane	570	U
110-82-7	Cyclohexane	570	U
56-23-5	Carbon tetrachloride	570	U
71-43-2	Benzene	570	U
107-06-2	1,2-Dichloroethane	570	U
79-01-6	Trichloroethene	570	U
108-87-2	Methylcyclohexane	570	U
78-87-5	1,2-Dichloropropane	570	U
75-27-4	Bromodichloromethane	570	U
10061-01-5	cis-1,3-Dichloropropene	570	U
108-10-1	4-Methyl-2-pentanone	570	U
108-88-3	Toluene	570	U
10061-02-6	trans-1,3-Dichloropropene	570	U
79-00-5	1,1,2-Trichloroethane	65	DJ
127-18-4	Tetrachloroethene	10000	DZ
591-78-6	2-Hexanone	570	U
124-48-1	Dibromochloromethane	570	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

SB-19-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-005ADL

Sample wt/vol: 13.7 (g/mL) g Lab File ID: 5\A86094.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 20 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	570	U
108-90-7	Chlorobenzene	570	U
100-41-4	Ethylbenzene	570	U
1330-20-7	Xylene (total)	570	U
100-42-5	Styrene	570	U
75-25-2	Bromoform	570	U
98-82-8	Isopropylbenzene	570	U
79-34-5	1,1,2,2-Tetrachloroethane	570	U
541-73-1	1,3-Dichlorobenzene	570	U
106-46-7	1,4-Dichlorobenzene	570	U
95-50-1	1,2-Dichlorobenzene	570	U
96-12-8	1,2-Dibromo-3-chloropropane	570	U
120-82-1	1,2,4-Trichlorobenzene	570	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

SB-19-5.5-6.0DL

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: 1504C96-005ADL

Sample wt/vol: 13.7 (g/mL) g Lab File ID: 5\A86094.D

Level: (low/med) MED Date Received: 04/16/15

% Moisture: not dec. 20 Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µl) Soil Aliquot Volume: 100 (µL)

CONCENTRATION UNITS:

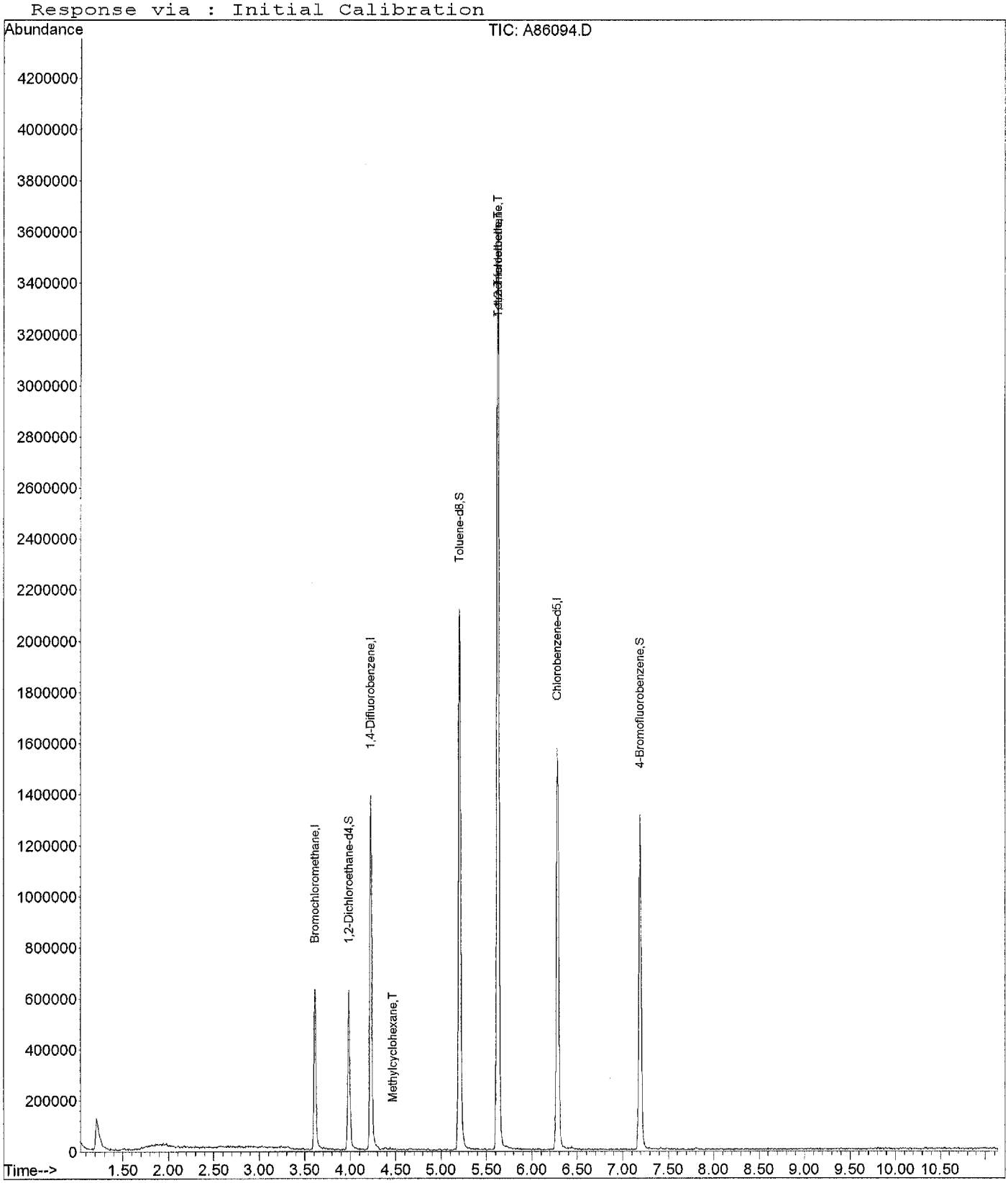
Number TICs found: 0 (µg/L or µg/Kg) µg/Kg

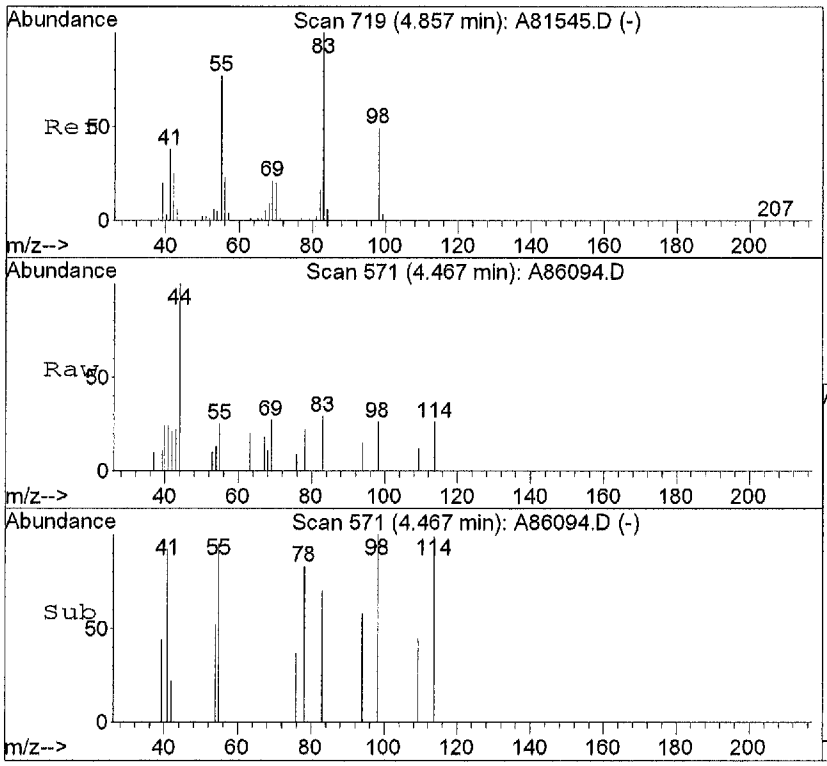
CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86094.D Vial: 14
Acq On : 23 Apr 2015 13:57 Operator: MF
Sample : 1504C96-005A Inst : H5971
Misc : AECOM237,SB-19-5.5-6.0,SOIL,DL,,13.7G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 14:09 2015 Quant Results File: R7W0403.RES

Method : O:\MS\HP5971\METHODS\2015\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration

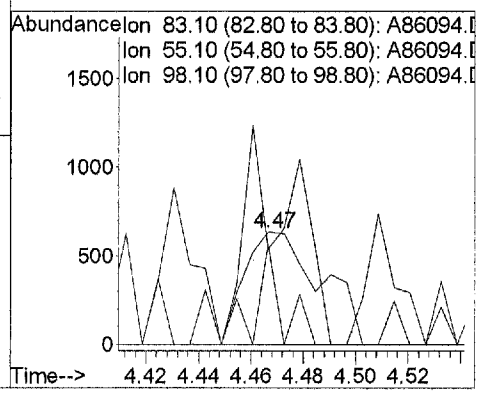


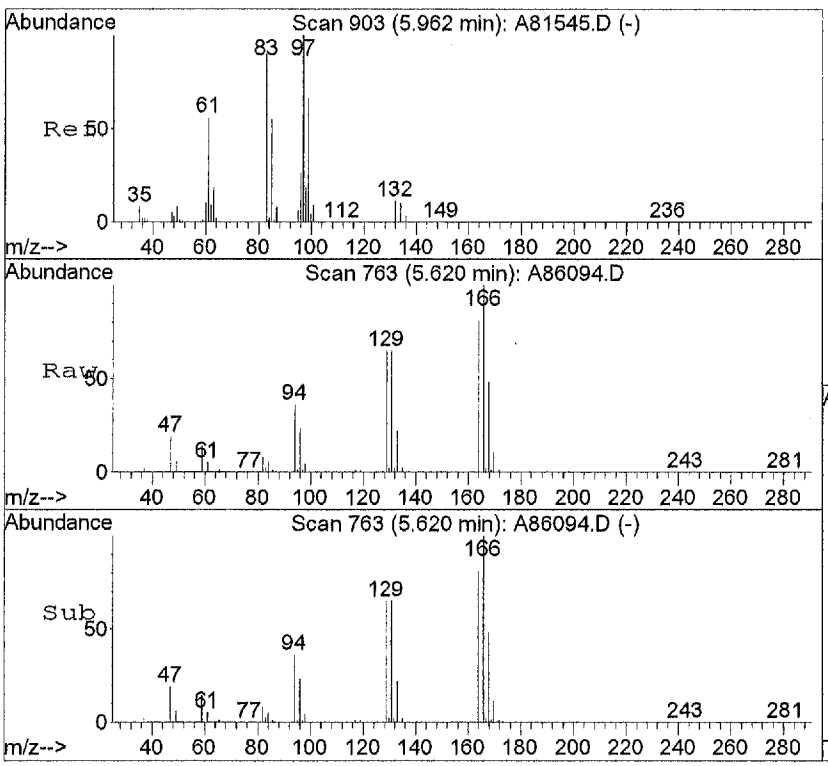


#37
Methylcyclohexane
Concen: 3.73 ug/l
RT: 4.47 min Scan# 571
Delta R.T. 0.00 min
Lab File: A86094.D
Acq: 23 Apr 2015 13:57

Tgt Ion: 83 Resp: 1290

Ion	Ratio	Lower	Upper
83	100		
55	16.9	54.6	94.6#
98	89.4	36.3	76.3#

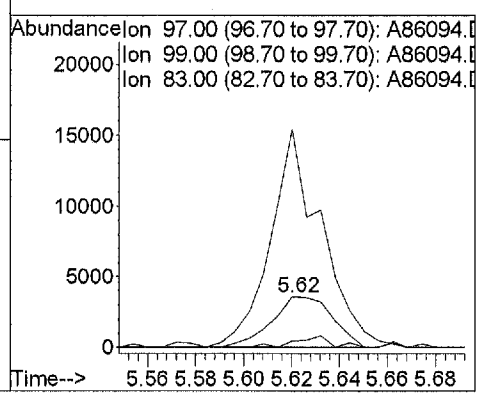


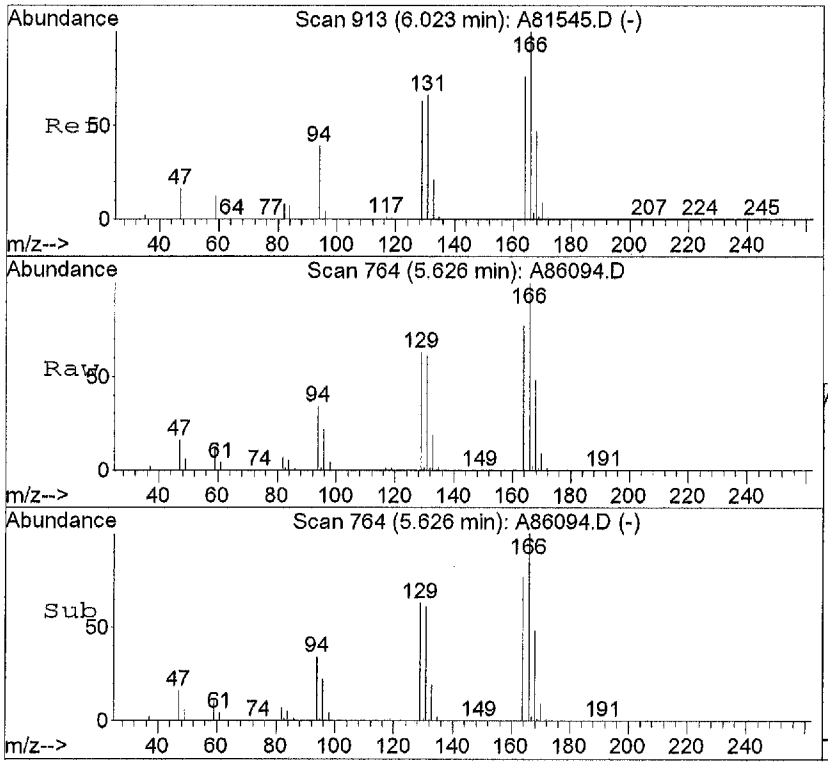


#41
1,1,2-Trichloroethane
Concen: 1.14 ug/l
RT: 5.62 min Scan# 763
Delta R.T. 0.06 min
Lab File: A86094.D
Acq: 23 Apr 2015 13:57

Tgt Ion: 97 Resp: 6237

Ion	Ratio	Lower	Upper
97	100		
99	12.1	46.9	86.9#
83	434.6	58.9	98.9#

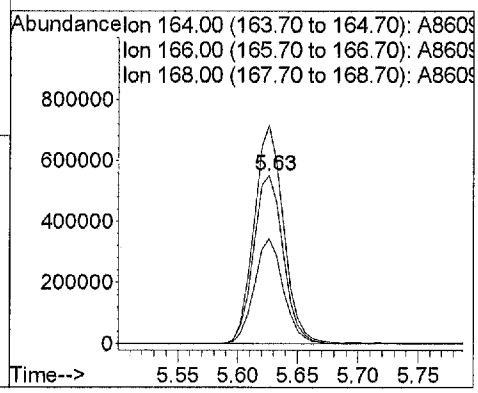




#47
Tetrachloroethene
Concen: 178.90 ug/l
RT: 5.63 min Scan# 764
Delta R.T. 0.01 min
Lab File: A86094.D
Acq: 23 Apr 2015 13:57

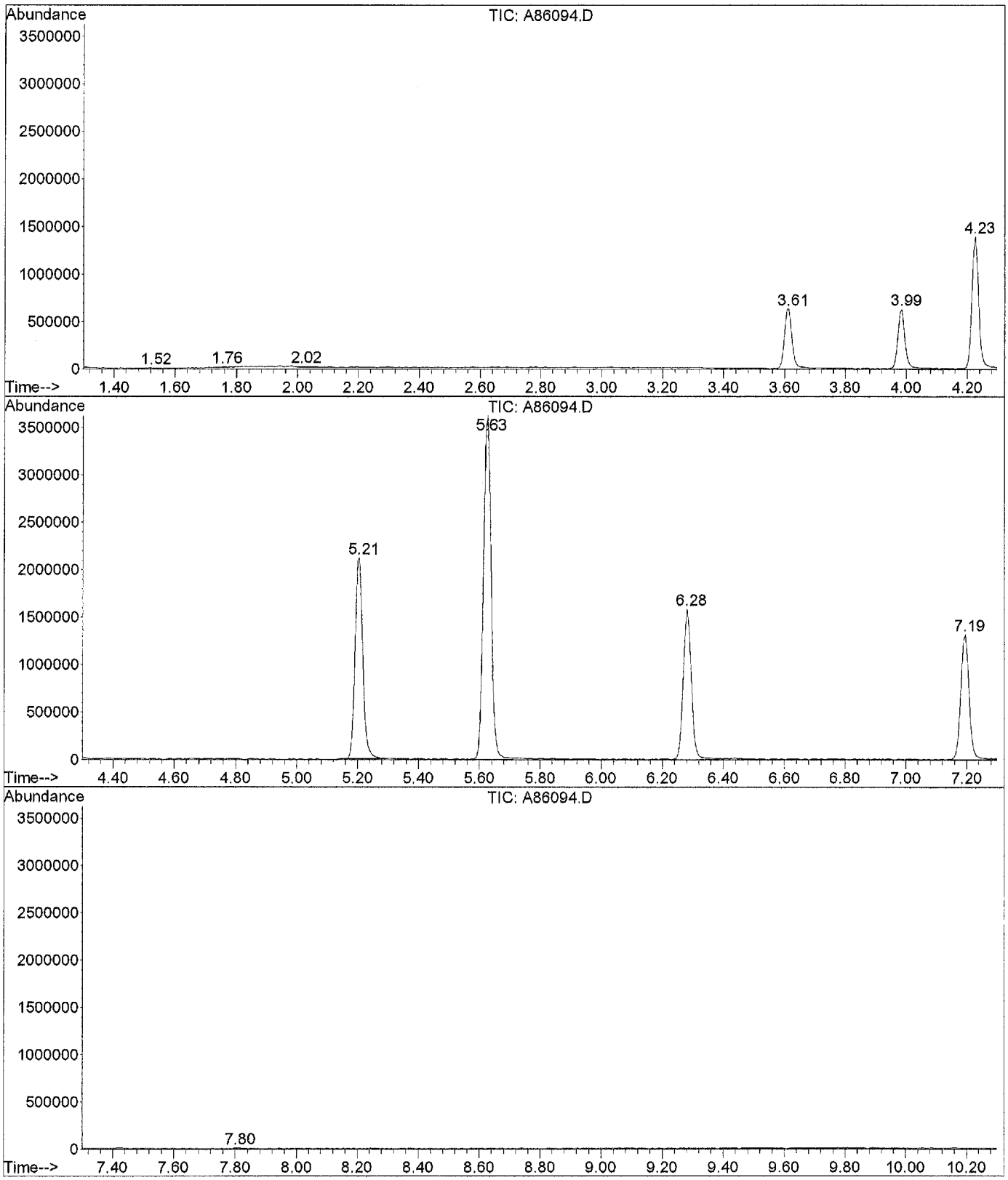
Tgt Ion:164 Resp: 959102

Ion	Ratio	Lower	Upper
164	100		
166	130.3	104.0	144.0
168	62.6	37.0	77.0



LSC Report - Integrated Chromatogram

File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86094.D
Operator : MF
Acquired : 23 Apr 2015 13:57 using AcqMethod R7W0403
Instrument : H5971
Sample Name: 1504C96-005A
Misc Info : AECOM237,SB-19-5.5-6.0,SOIL,DL,,13.7G
Vial Number: 14
Quant File :R7W0403.RES (RTE Integrator)



A86094.D R7W0403.M Thu May 07 14:01:49 2015 RPT1

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86094.D Vial: 14
Acq On : 23 Apr 2015 13:57 Operator: MF
Sample : 1504C96-005A Inst : H5971
Misc : AECOM237,SB-19-5.5-6.0,SOIL,DL,,13.7G Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 14:09 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	158064	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	1027992	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	1044724	50.00	ug/l	0.01
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.99	65	335367	58.58	ug/l	0.00
Spiked Amount 50.000	Range 70 - 121		Recovery = 117.16%			
49) Toluene-d8	5.21	98	1459455	54.71	ug/l	0.01
Spiked Amount 50.000	Range 84 - 138		Recovery = 109.42%			
53) 4-Bromofluorobenzene	7.19	95	590043	59.13	ug/l	0.01
Spiked Amount 50.000	Range 59 - 113		Recovery = 118.26%#			

Target Compounds						Qvalue
37) Methylcyclohexane	4.47	83	1290	3.73	ug/l #	42
41) 1,1,2-Trichloroethane	5.62	97	6237	1.14	ug/l #	1
47) Tetrachloroethene	5.63	164	959102	178.90	ug/l	94

(#) = qualifier out of range (m) = manual integration

Tentatively Identified Compound (LSC) summary

Operator ID: MF Date Acquired: 23 Apr 2015 13:57
Data File: O:\MS\HP5971\DATA\2015\APRIL15\042315\A86094.D
Name: 1504C96-005A
Misc: AECOM237,SB-19-5.5-6.0,SOIL,DL,,13.7G
Method: C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title: 8260C CJ4239, CG1098, A087941, A092874, A091556
Library Searched: C:\DATABASE\NIST08.L

TIC	Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc

A86094.D R7W0403.M Thu May 07 14:01:49 2015 RPT1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) WATER Lab Sample ID: 1504C96-006A

Sample wt/vol: 5 (g/mL) mL Lab File ID: 5\G31867.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. Date Analyzed: 04/20/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene chloride	10	U
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-butyl ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) WATER Lab Sample ID: 1504C96-006A

Sample wt/vol: 5 (g/mL) mL Lab File ID: 5\G31867.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. Date Analyzed: 04/20/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(µg/L or µg/Kg) µg/L	Q
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) WATER Lab Sample ID: 1504C96-006A

Sample wt/vol: 5 (g/mL) mL Lab File ID: 5\G31867.D

Level: (low/med) LOW Date Received: 04/16/15

% Moisture: not dec. Date Analyzed: 04/20/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: (µl) Soil Aliquot Volume: 0 (µL)

CONCENTRATION UNITS:

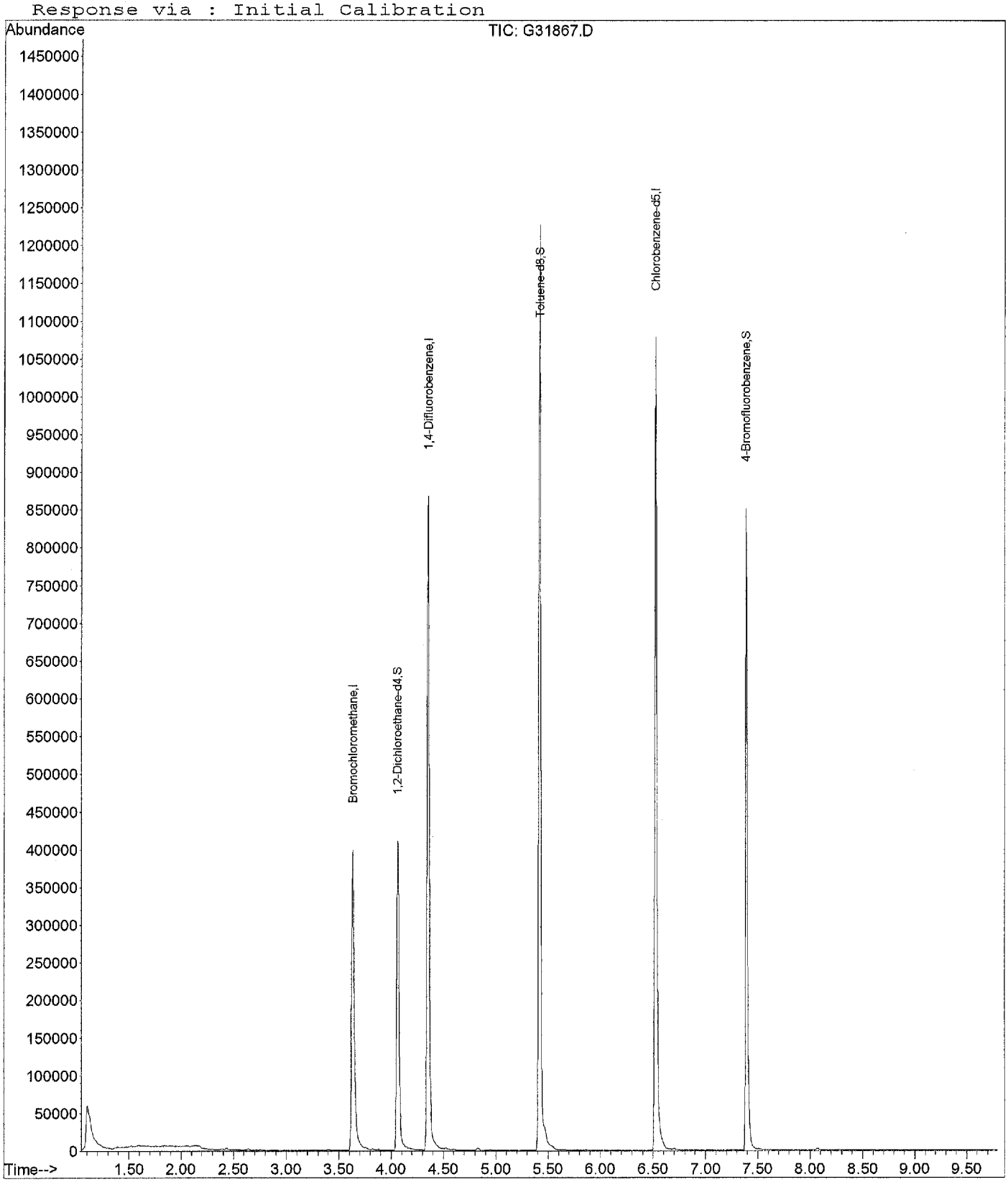
Number TICs found: 0 (µg/L or µg/Kg) µg/L

CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q

Quantitation Report

Data File : O:\MS\HP5972-2\DATA\2015\APR15\042015\G31867.D Vial: 8
Acq On : 20 Apr 2015 9:09 Operator: KGG
Sample : 1504C96-006A Inst : HP5972-2
Misc : AECOM237,TB,H2O,SAMP,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 21 17:04 2015 Quant Results File: R8W0304.RES

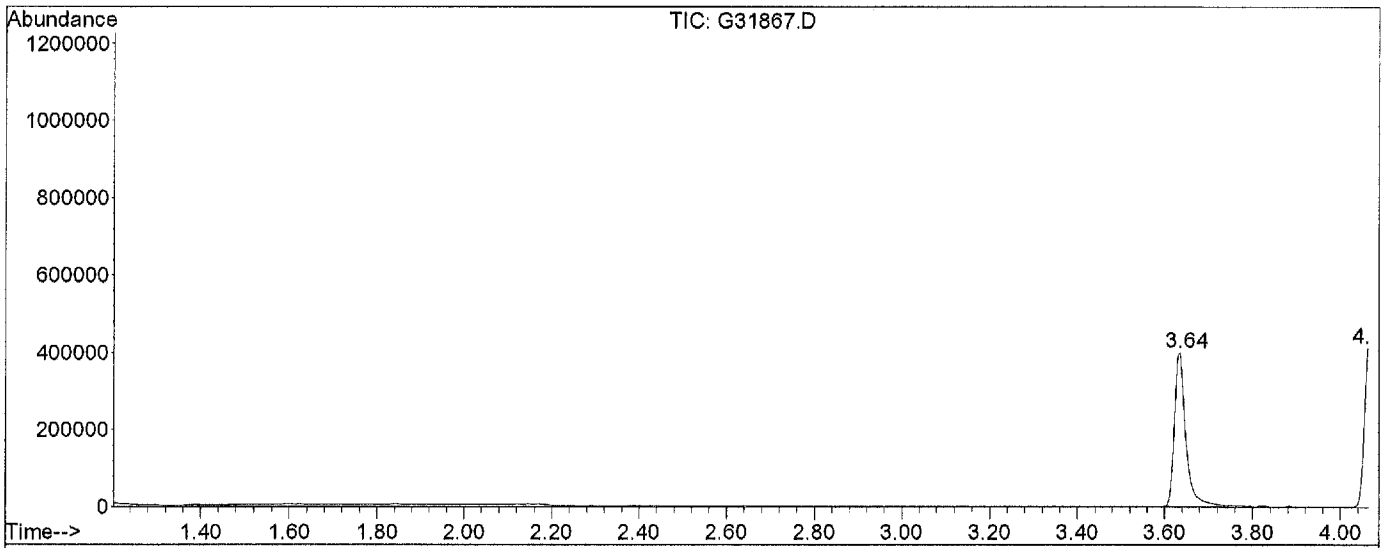
Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration

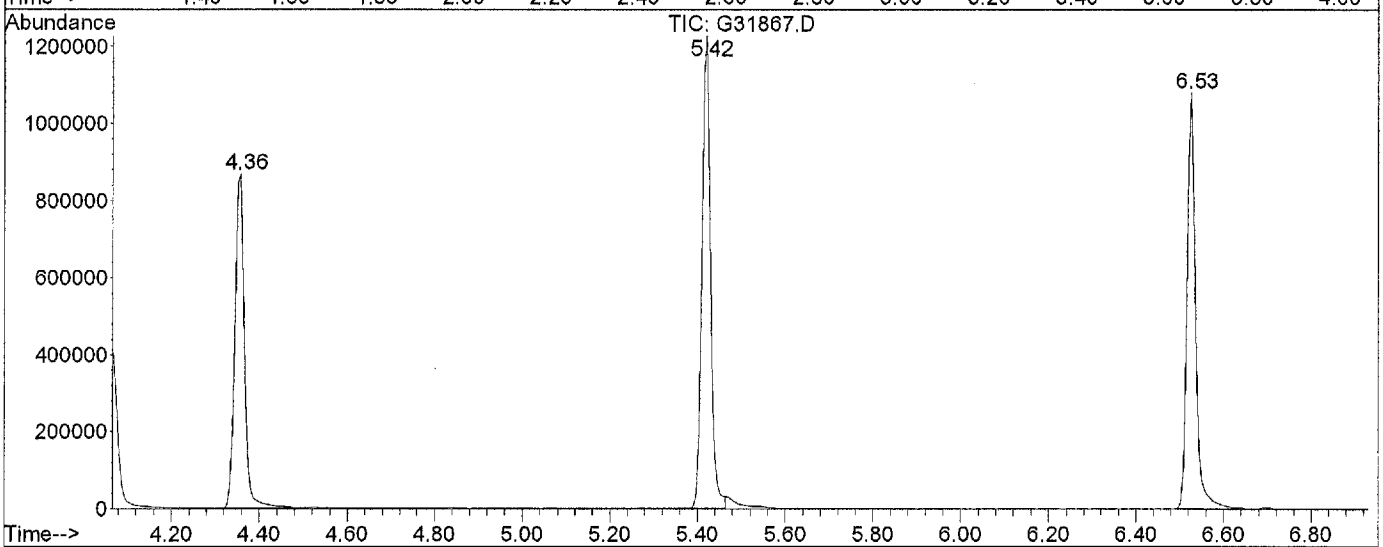


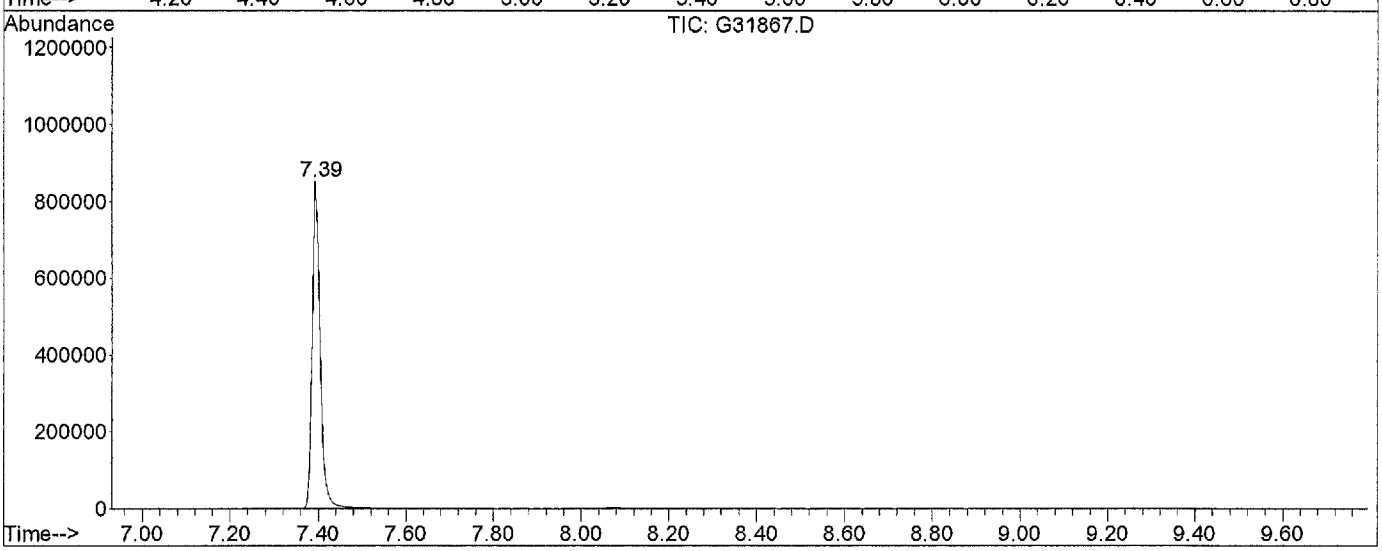
AECOM237 V123

LSC Report - Integrated Chromatogram

File : O:\MS\HP5972-2\DATA\2015\APR15\042015\G31867.D
Operator : KGG
Acquired : 20 Apr 2015 9:09 using AcqMethod R8W0304
Instrument : HP5972-2
Sample Name: 1504C96-006A
Misc Info : AECOM237,TB,H2O,SAMP,,
Vial Number: 8
Quant File :R8W0304.RES (RTE Integrator)







G31867.D R8W0304.M Thu May 07 15:58:35 2015 RPT1

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\APR15\042015\G31867.D Vial: 8
Acq On : 20 Apr 2015 9:09 Operator: KGG
Sample : 1504C96-006A Inst : HP5972-2
Misc : AECOM237,TB,H2O,SAMP,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 21 17:04 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.64	128	93856	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.36	114	537559	50.00	ug/l	0.00
44) Chlorobenzene-d5	6.53	117	456301	50.00	ug/l	0.00
System Monitoring Compounds						
27) 1,2-Dichloroethane-d4	4.06	65	241458	59.56	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 119.12%			
46) Toluene-d8	5.42	98	606752	50.35	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 100.70%			
58) 4-Bromofluorobenzene	7.39	95	216918	50.72	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 101.44%			

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

Tentatively Identified Compound (LSC) summary

Operator ID: KGG Date Acquired: 20 Apr 2015 9:09
Data File: O:\MS\HP5972-2\DATA\2015\APR15\042015\G31867.D
Name: 1504C96-006A
Misc: AECOM237,TB,H2O,SAMP,,
Method: C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title: 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Library Searched: C:\DATABASE\NIST08.L

TIC	Top Hit name	RT	EstConc	Units	Area	IntStd	ISRT	ISArea	ISConc

G31867.D R8W0304.M Thu May 07 15:58:35 2015 RPT1

Pace Long Island

575 Broad Hollow Road
Melville, NY 11747

tel. 631.694.3040
fax. 631.420.8436

III. STANDARD DATA PACKAGE FOR VOLATILE ORGANICS

A. INITIAL CALIBRATION FORM
B. STANDARD GC/MS CHROMATOGRAMS
C. DATA SYSTEM REPORT
D. CONTINUING CALIBRATION FORM
E. STANDARD GC/MS CHROMATOGRAMS
F. DATA SYSTEM REPORT

Form 6

VOCS IN SOIL INITIAL CALIBRATION DATA

Lab Name: PACE ANALYTICAL Contract: PACE ANALYTICAL

Lab Code: 10478 Case No.: AECOM-N SAS No.: SDG No.: AECOM237

Instrument ID: HP5971 Calibration Dates: 3/31/2015 3/31/2015

Heated Purge: (Y/N) Y Calibration Times: 17:19 19:04

GC Column: Rtx-624 ID: .18 (mm)

LAB FILE ID: STD005= A85624.D STD010= A85625.D STD020= A85626.D STD050= A85627.D STD100= A85628.D

STD200= A85629.D

COMPOUND		Level 1	Level 2	Level 3	Level 4	Level 5	Level 6					RRF	% RSD	R^2
Bromochloromethane	*	1	1	1	1	1	1					1.000	0.0	*
Dichlorodifluoromethane	*	1.9067647	2.3242129	2.2969124	2.3023339	2.3818077	2.2136787					2.238	7.6	*
Chloromethane	*	2.4904804	2.4279554	2.6212100	2.4789997	2.5783793	2.4283336					2.504	3.2	*
Vinyl chloride	*	1.965647	2.1353494	2.2213298	2.2285390	2.2601785	2.1657062					2.163	4.9	*
Bromomethane	*	1.2296935	1.2617109	1.3742272	1.3821074	1.4577790	1.4004476					1.351	6.5	*
Chloroethane	*	1.1430975	1.1875559	1.3689308	1.2853236	1.3558364	1.2299193					1.262	7.2	*
Trichlorofluoromethane	*	2.5616048	2.8764028	2.8396876	2.8234593	2.9846555	2.7901124					2.813	5.0	*
1,1-Dichloroethene	*	1.5506921	1.7745059	1.8758683	1.7128336	1.8077705	1.6513924					1.729	6.7	*
1,1,2-Trichloro-1,2,2-trifluoroethane	*	1.5271842	1.9000149	1.8438292	1.8305719	1.9474810	1.8060596					1.809	8.1	*
Acetone	*	0.9454212	0.5337339	0.5296209	0.3732020	0.3484075	0.3173823					0.508	46.0	*
Carbon disulfide	*	5.4948290	6.3737296	6.2146398	6.2035155	6.5271710	5.9243155					6.123	6.0	*
Methyl Acetate	*	0.8394481	0.8368921	0.8788594	0.8000200	0.8406242	0.7963822					0.832	3.7	*
Methylene chloride	*	2.0710944	2.1994488	2.1623528	1.940789	1.9342413	1.8130766					2.020	7.4	*
trans-1,2-Dichloroethene	*	1.7633893	2.1333217	2.1621358	1.9863667	2.1187303	1.9589799					2.020	7.5	*
Methyl tert-butyl ether	*	3.9882235	4.2083789	4.3168696	4.2961301	4.4715182	4.1252220					4.234	4.0	*
1,1-Dichloroethane	*	3.0399483	3.3131393	3.3594971	3.3392230	3.4177568	3.1812073					3.275	4.3	*
1,2-Dichloroethene (total)	*	2.2295283	2.5648442	2.4670493	2.3786887	2.5011805	2.3205005					2.410	5.2	*
cis-1,2-Dichloroethene	*	2.4318235	2.8447049	2.7308504	2.6763364	2.8230424	2.6456627					2.692	5.6	*
2-Butanone	*	1.0806102	0.8639554	0.8057948	0.6914206	0.6974853	0.6874692					0.804	19.1	*
Chloroform	*	3.7321156	4.0815870	4.0599061	4.1543272	4.1675092	3.8489832					4.007	4.4	*
1,1,1-Trichloroethane	*	0.4576478	0.5095530	0.5134422	0.5155429	0.4967205	0.4880803					0.497	4.4	*
Cyclohexane	*	0.4832672	0.5326628	0.6455731	0.5737155	0.5403138	0.5288534					0.551	9.9	*

Form 6

VOCS IN SOIL INITIAL CALIBRATION DATA

Lab Name: PACE ANALYTICAL Contract: PACE ANALYTICAL

Lab Code: 10478 Case No.: AECOM-N SAS No.: SDG No.: AECOM237

Instrument ID: HP5971 Calibration Dates: 3/31/2015 3/31/2015

Heated Purge: (Y/N) Y Calibration Times: 17:19 19:04

GC Column: Rtx-624 ID: .18 (mm)

LAB FILE ID: STD005= A85624.D STD010= A85625.D STD020= A85626.D STD050= A85627.D STD100= A85628.D
STD200= A85629.D

COMPOUND		Level 1	Level 2	Level 3	Level 4	Level 5	Level 6					RRF	% RSD	R^2
Carbon tetrachloride	*	0.4030832	0.4619806	0.466083	0.4718068	0.4638020	0.4692014					0.456	5.7	*
Benzene	*	1.2857470	1.3817240	1.4018322	1.3890304	1.320298	1.2811141					1.343	4.0	*
1,2-Dichloroethane	*	2.1315538	2.4414871	2.4721503	2.4531590	2.5739689	2.3832993					2.409	6.2	*
Trichloroethene	*	0.3713933	0.4116902	0.4420723	0.433333	0.4239275	0.4221253					0.417	5.9	*
Methylcyclohexane	*	0.3981291	0.5865651	0.7007001	0.5677195	0.5787929	0.5474144					0.563	17.3	*
1,2-Dichloropropane	*	0.3310978	0.3437383	0.3437387	0.3443052	0.3367891	0.3259167					0.338	2.3	*
Bromodichloromethane	*	0.4368663	0.4639151	0.4530171	0.4780409	0.4569092	0.4707789					0.460	3.2	*
cis-1,3-Dichloropropene	*	0.5629860	0.5832165	0.5707287	0.5866062	0.5665928	0.574148					0.574	1.6	*
4-Methyl-2-pentanone	*	0.2890063	0.2791557	0.2735074	0.295834	0.2873439	0.2927631					0.286	2.9	*
Toluene	*	1.5291188	1.7885632	1.7262171	1.7802116	1.6847804	1.6068089					1.686	6.0	*
trans-1,3-Dichloropropene	*	0.4745917	0.4558038	0.4669212	0.4721948	0.4639404	0.4752485					0.468	1.6	*
1,1,2-Trichloroethane	*	0.2626128	0.2779169	0.2764767	0.2687978	0.2690964	0.2690874					0.271	2.1	*
Tetrachloroethene	*	0.3029509	0.3775430	0.4088293	0.3959645	0.3970701	0.3905038					0.379	10.2	*
2-Hexanone	*	0.2521219	0.1936134	0.1999836	0.2102372	0.1998105	0.2078845					0.211	10.1	*
Dibromochloromethane	*	0.3182358	0.3748799	0.3634208	0.3722969	0.3750077	0.3765227					0.363	6.2	*
1,2-Dibromoethane	*	0.3225445	0.3355502	0.3166035	0.3427684	0.3503693	0.3415126					0.335	3.9	*
Chlorobenzene	*	1.0484129	1.2448809	1.2315225	1.2166349	1.2032108	1.1804761					1.188	6.0	*
Ethylbenzene	*	0.5298937	0.6320071	0.6550301	0.6553772	0.6358633	0.6065493					0.619	7.6	*
m,p-Xylene	*	0.6680098	0.7873779	0.8551633	0.8208857	0.7891396	0.7342163					0.776	8.5	*
o-Xylene	*	0.6555475	0.7725802	0.8057102	0.8058931	0.7752517	0.750768					0.761	7.3	*
Xylene (total)	*	0.6555475	0.7725802	0.8057102	0.8055772	0.7750295	0.750768					0.761	7.3	*
Styrene	*	1.1557962	1.3649224	1.3358949	1.3775321	1.3195417	1.2484585					1.300	6.5	*

Form 6

VOCS IN SOIL INITIAL CALIBRATION DATA

Lab Name: PACE ANALYTICAL Contract: PACE ANALYTICAL

Lab Code: 10478 Case No.: AECOM-N SAS No.: SDG No.: AECOM237

Instrument ID: HP5971 Calibration Dates: 3/31/2015 3/31/2015

Heated Purge: (Y/N) Y Calibration Times: 17:19 19:04

GC Column: Rtx-624 ID: .18 (mm)

LAB FILE ID: STD005= A85624.D STD010= A85625.D STD020= A85626.D STD050= A85627.D STD100= A85628.D
STD200= A85629.D

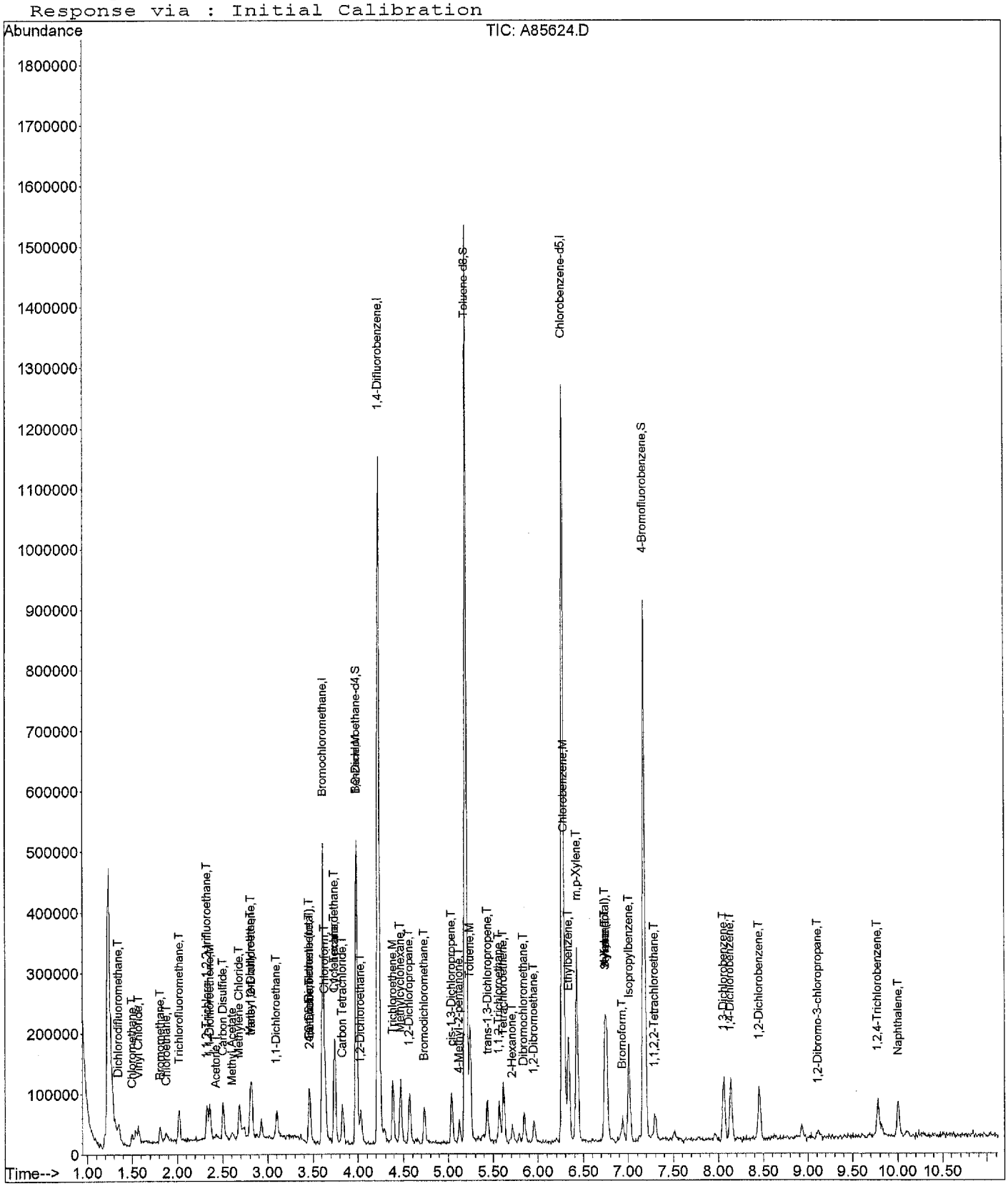
COMPOUND		Level 1	Level 2	Level 3	Level 4	Level 5	Level 6					RRF	% RSD	R^2
Bromoform	*	0.2240501	0.2154808	0.229975	0.2369881	0.2351808	0.2411580					0.230	4.1	*
Isopropylbenzene	*	1.5554685	1.9151479	2.215863	2.047222	1.9982260	1.8670896					1.933	11.4	*
1,1,2,2-Tetrachloroethane	*	0.3274175	0.3808972	0.3630574	0.3795254	0.3692199	0.3651768					0.364	5.3	*
1,3-Dichlorobenzene	*	0.698081	0.8858858	1.0094724	0.9588102	0.9492944	0.9182419					0.903	12.0	*
1,4-Dichlorobenzene	*	0.7281330	0.9132979	0.9823398	0.9795957	0.9601252	0.9256048					0.915	10.5	*
1,2-Dichlorobenzene	*	0.6416538	0.8403597	0.8921009	0.8918455	0.8772963	0.8442047					0.831	11.5	*
1,2-Dibromo-3-chloropropane	*	0.0665421	0.0671734	0.0566242	0.0564289	0.0545475	0.0544721					0.059	10.0	*
1,2,4-Trichlorobenzene	*	0.3434741	0.4948365	0.5980718	0.5440578	0.5478083	0.5334005					0.510	17.3	*
Toluene-d8	*	1.1989913	1.3679667	1.3691603	1.3030562	1.2946895	1.3167197					1.308	4.8	*
4-Bromofluorobenzene	*	0.4601276	0.5255601	0.5034801	0.4751112	0.4635311	0.4890922					0.486	5.2	*
1,2-Dichloroethane-d4	*	1.5518036	1.7651124	1.9273087	1.6501288	1.6475450	1.5608504					1.684	8.4	*

* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85624.D Vial: 2
Acq On : 31 Mar 2015 17:19 Operator: DRL
Sample : VSTD005 Inst : H5971
Misc : ,,,ICAL_5.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 19:49 2015 Quant Results File: R6S0331.RES

Method : O:\MS\HP5971\METHODS\2015\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85624.D Vial: 2
Acq On : 31 Mar 2015 17:19 Operator: DRL
Sample : VSTD005 Inst : H5971
Misc : ,,,ICAL_5.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 19:49 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	133147	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.22	114	859897	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.27	117	785969	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	206618	46.08	ug/l	0.00
Spiked Amount 50.000	Range 33 - 150		Recovery = 92.16%			
49) Toluene-d8	5.20	98	942370	45.82	ug/l	0.00
Spiked Amount 50.000	Range 43 - 157		Recovery = 91.64%			
53) 4-Bromofluorobenzene	7.18	95	361646	47.32	ug/l	0.00
Spiked Amount 50.000	Range 34 - 145		Recovery = 94.64%			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.35	85	25388	4.26	ug/l	95
4) Chloromethane	1.50	50	33160	4.98	ug/l	95
5) Bromomethane	1.81	94	16373	4.55	ug/l	97
6) Vinyl Chloride	1.57	62	26172	4.54	ug/l	96
7) Chloroethane	1.88	64	15220	4.53	ug/l	93
10) Methyl Acetate	2.60	43	11177	4.90	ug/l	97
11) 1,1,2-Trichloro-1,2,2-trif	2.32	101	20334	4.22	ug/l	83
12) Methylene Chloride	2.69	84	27576	5.13	ug/l	92
13) Acetone	2.42	43	12588	9.23	ug/l	91
14) Carbon Disulfide	2.50	76	73162	4.49	ug/l	99
16) 1,1-Dichloroethene	2.36	96	20647	4.48	ug/l	87
17) 1,1-Dichloroethane	3.10	63	40476	4.64	ug/l	99
18) Trichlorofluoromethane	2.02	101	34107	4.55	ug/l	92
20) Methyl tert-butyl ether	2.80	73	53102	4.71	ug/l	97
21) trans-1,2-Dichloroethene	2.82	96	23479 HIP	4.36	ug/l #	87
22) cis-1,2-Dichloroethene	3.46	96	32379	4.52	ug/l	96
23) 1,2-Dichloroethene (total)	3.46	96	59371m	9.24	ug/l	
24) 2-Butanone	3.47	43	14388	6.68	ug/l	84
25) Chloroform	3.64	83	49692	4.66	ug/l	91
27) 1,2-Dichloroethane	4.03	62	28381	4.42	ug/l	96
29) 1,1,1-Trichloroethane	3.75	97	39353	4.61	ug/l	91
30) Cyclohexane	3.74	56	41556	4.40	ug/l	98
31) Carbon Tetrachloride	3.82	117	34661	4.42	ug/l	100
33) Bromodichloromethane	4.73	83	37566	4.75	ug/l	98
34) 1,2-Dichloropropane	4.57	63	28471	4.91	ug/l	90
35) cis-1,3-Dichloropropene	5.04	75	48411	4.90	ug/l	90
36) Trichloroethene	4.38	130	31936 MN 05/06/15	4.45	ug/l	92
37) Methylcyclohexane	4.47	83	34235	3.53	ug/l	87
38) Benzene	3.98	78	110561	4.79	ug/l	97
39) Dibromochloromethane	5.84	129	27365	4.38	ug/l	93
40) trans-1,3-Dichloropropene	5.44	75	40810	5.07	ug/l	96
41) 1,1,2-Trichloroethane	5.57	97	22582	4.85	ug/l	87
42) Bromoform	6.94	173	19266	4.86	ug/l	86
44) 4-Methyl-2-pentanone	5.12	43	22715	5.04	ug/l	96
45) 2-Hexanone	5.71	43	19816	5.96	ug/l	79
46) 1,2-Dibromoethane	5.95	107	25351	4.82	ug/l #	77
47) Tetrachloroethene	5.62	164	23811 HIP	4.00	ug/l #	85
48) 1,1,2,2-Tetrachloroethane	7.29	83	25734m	4.49	ug/l	
50) Toluene	5.24	91	120184	4.53	ug/l	100
51) Chlorobenzene	6.30	112	82402	4.41	ug/l	95
52) Ethylbenzene	6.34	106	41648	4.28	ug/l #	81
54) Styrene	6.76	104	90842	4.44	ug/l	96

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85624.D Vial: 2
Acq On : 31 Mar 2015 17:19 Operator: DRL
Sample : VSTD005 Inst : H5971
Misc : ,,,ICAL_5.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 19:49 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

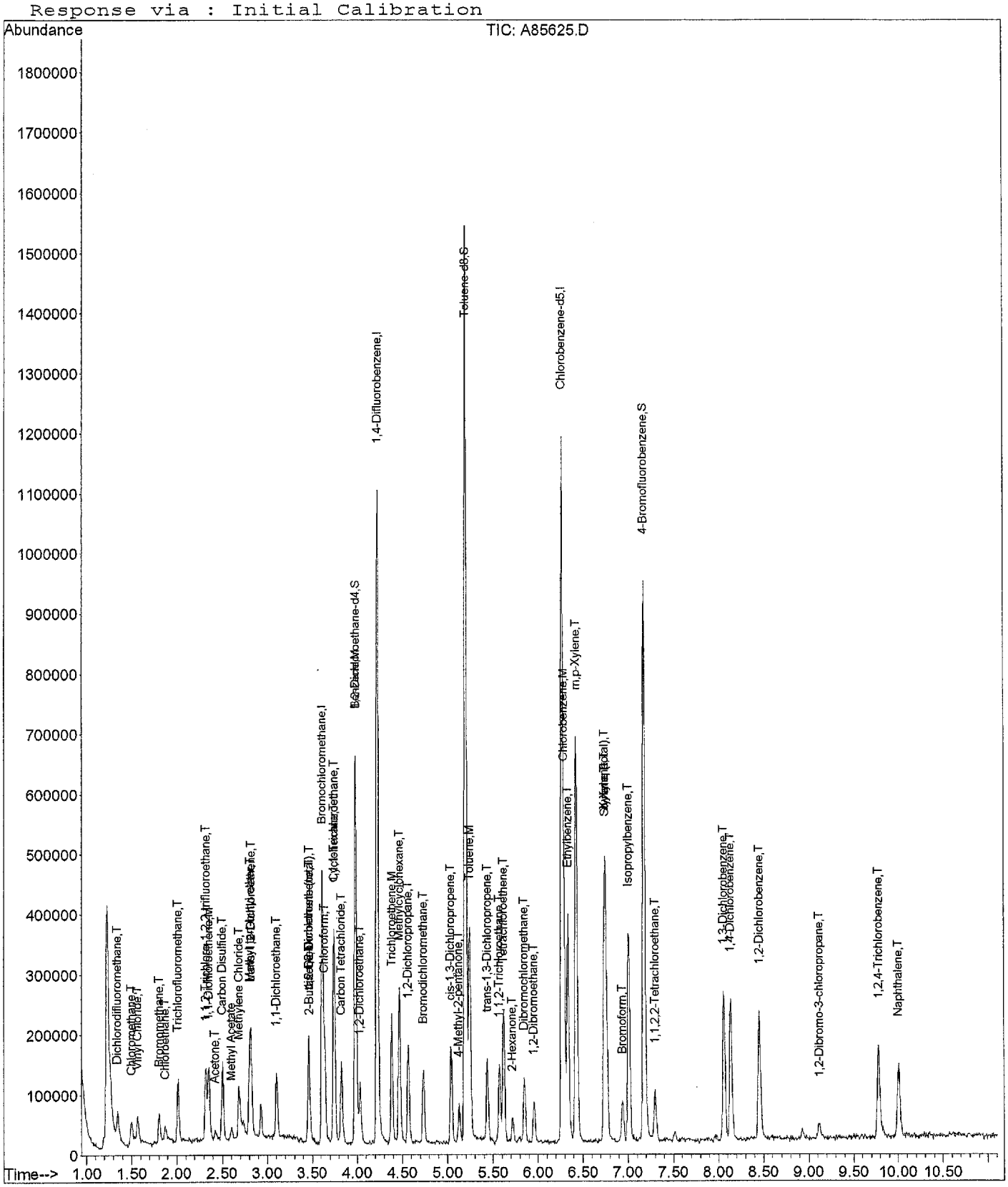
	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
55)	m,p-Xylene	6.43	106	105007	8.61 ug/l		98
56)	o-Xylene	6.74	106	51524	4.31 ug/l		98
57)	Xylene (total)	6.74	106	51524	4.31 ug/l		98
58)	Isopropylbenzene	7.01	105	122255	4.02 ug/l		97
59)	1,3-Dichlorobenzene	8.06	146	54867	3.86 ug/l		97
60)	1,4-Dichlorobenzene	8.13	146	57229	3.96 ug/l		94
61)	1,2-Dichlorobenzene	8.45	146	50432	3.86 ug/l		95
62)	1,2-Dibromo-3-chloropropan	9.12	75	5230	5.61 ug/l	#	72
63)	1,2,4-Trichlorobenzene	9.78	180	26996	3.37 ug/l		97
64)	Naphthalene	10.00	128	58342	4.28 ug/l		97

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85625.D Vial: 3
Acq On : 31 Mar 2015 17:40 Operator: DRL
Sample : VSTD010 Inst : H5971
Misc : ,,,ICAL_10.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 19:57 2015 Quant Results File: R6S0331.RES

Method : O:\MS\HP5971\METHODS\2015\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85625.D Vial: 3
Acq On : 31 Mar 2015 17:40 Operator: DRL
Sample : VSTD010 Inst : H5971
Misc : ,,,ICAL_10.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 19:57 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.62	128	120828	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.22	114	816755	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.27	117	725957	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	213275	52.41	ug/l	0.00
Spiked Amount 50.000	Range 33 - 150		Recovery = 104.82%			
49) Toluene-d8	5.20	98	993085	52.28	ug/l	0.00
Spiked Amount 50.000	Range 43 - 157		Recovery = 104.56%			
53) 4-Bromofluorobenzene	7.18	95	381534	54.05	ug/l	0.00
Spiked Amount 50.000	Range 34 - 145		Recovery = 108.10%			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.35	85	56166	10.39	ug/l	93
4) Chloromethane	1.50	50	58673	9.71	ug/l	100
5) Bromomethane	1.80	94	30490	9.34	ug/l	89
6) Vinyl Chloride	1.57	62	51602	9.87	ug/l	88
7) Chloroethane	1.87	64	28698	9.41	ug/l	94
10) Methyl Acetate	2.60	43	20224	9.77	ug/l	98
11) 1,1,2-Trichloro-1,2,2-trif	2.32	101	45915	10.50	ug/l #	75
12) Methylene Chloride	2.69	84	53151	10.89	ug/l	97
13) Acetone	2.42	43	12898	10.42	ug/l	93
14) Carbon Disulfide	2.50	76	154025	10.41	ug/l	97
16) 1,1-Dichloroethene	2.35	96	42882	10.26	ug/l #	86
17) 1,1-Dichloroethane	3.10	63	80064	10.12	ug/l	93
18) Trichlorofluoromethane	2.01	101	69510	10.23	ug/l	92
20) Methyl tert-butyl ether	2.81	73	101698	9.94	ug/l	98
21) trans-1,2-Dichloroethene	2.82	96	51553	10.56	ug/l	93
22) cis-1,2-Dichloroethene	3.45	96	68744 TIP	10.57	ug/l	92
23) 1,2-Dichloroethene (total)	3.45	96	123962m	21.26	ug/l	
24) 2-Butanone	3.47	43	20878 NW 05/06/15	10.69	ug/l	96
25) Chloroform	3.64	83	98634	10.19	ug/l	93
27) 1,2-Dichloroethane	4.03	62	59000	10.14	ug/l	96
29) 1,1,1-Trichloroethane	3.75	97	83236	10.26	ug/l	96
30) Cyclohexane	3.74	56	87011	9.69	ug/l	97
31) Carbon Tetrachloride	3.83	117	75465	10.13	ug/l	93
33) Bromodichloromethane	4.74	83	75781	10.08	ug/l	99
34) 1,2-Dichloropropane	4.57	63	56150	10.20	ug/l	96
35) cis-1,3-Dichloropropene	5.04	75	95269	10.16	ug/l	92
36) Trichloroethene	4.39	130	67250	9.86	ug/l	96
37) Methylcyclohexane	4.47	83	95816	10.41	ug/l	97
38) Benzene	3.98	78	225706	10.29	ug/l	98
39) Dibromochloromethane	5.85	129	61237	10.32	ug/l	97
40) trans-1,3-Dichloropropene	5.44	75	74456	9.74	ug/l	95
41) 1,1,2-Trichloroethane	5.57	97	45398	10.27	ug/l	89
42) Bromoform	6.94	173	35199	9.35	ug/l	92
44) 4-Methyl-2-pentanone	5.13	43	40531	9.73	ug/l	97
45) 2-Hexanone	5.71	43	28111	9.16	ug/l	87
46) 1,2-Dibromoethane	5.96	107	48719	10.02	ug/l	86
47) Tetrachloroethene	5.62	164	54816	9.97	ug/l	94
48) 1,1,2,2-Tetrachloroethane	7.30	83	55303	10.46	ug/l	91
50) Toluene	5.25	91	259684	10.61	ug/l	98
51) Chlorobenzene	6.30	112	180746	10.48	ug/l	97
52) Ethylbenzene	6.34	106	91762	10.21	ug/l	98
54) Styrene	6.76	104	198175	10.50	ug/l	97

(#) = qualifier out of range (m) = manual integration

AECOM237 V135

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85625.D Vial: 3
Acq On : 31 Mar 2015 17:40 Operator: DRL
Sample : VSTD010 Inst : H5971
Misc : ,,,ICAL_10.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 19:57 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

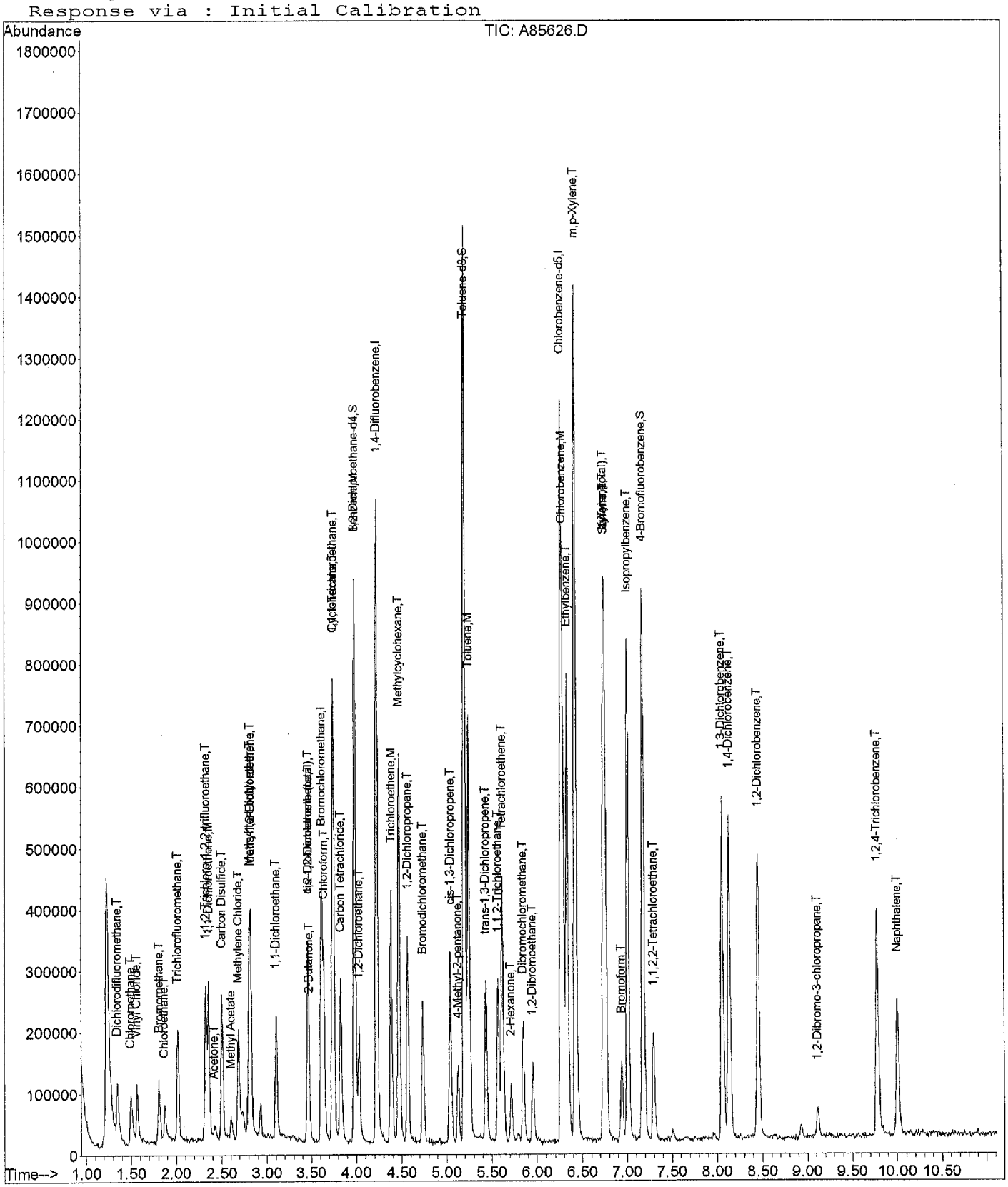
	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
55)	m,p-Xylene	6.43	106	228641	20.30	ug/l	99
56)	o-Xylene	6.74	106	112172	10.15	ug/l	98
57)	Xylene (total)	6.74	106	112172	10.15	ug/l	98
58)	Isopropylbenzene	7.01	105	278063	9.91	ug/l	96
59)	1,3-Dichlorobenzene	8.06	146	128623	9.81	ug/l	95
60)	1,4-Dichlorobenzene	8.14	146	132603	9.94	ug/l	98
61)	1,2-Dichlorobenzene	8.46	146	122013	10.11	ug/l	97
62)	1,2-Dibromo-3-chloropropan	9.12	75	9753	11.33	ug/l	93
63)	1,2,4-Trichlorobenzene	9.78	180	71846	9.70	ug/l	96
64)	Naphthalene	10.01	128	132783	10.54	ug/l	96

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85626.D Vial: 4
Acq On : 31 Mar 2015 18:01 Operator: DRL
Sample : VSTD020 Inst : H5971
Misc : ,,,ICAL_20.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 19:59 2015 Quant Results File: R6S0331.RES

Method : O:\MS\HP5971\METHODS\2015\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85626.D Vial: 4
Acq On : 31 Mar 2015 18:01 Operator: DRL
Sample : VSTD020 Inst : H5971
Misc : ,,,ICAL_20.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 19:59 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.62	128	115172	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.22	114	781422	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.27	117	718509	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	221972	57.23	ug/l	0.00
Spiked Amount 50.000	Range 33 - 150		Recovery = 114.46%			
49) Toluene-d8	5.20	98	983754	52.32	ug/l	0.00
Spiked Amount 50.000	Range 43 - 157		Recovery = 104.64%			
53) 4-Bromofluorobenzene	7.18	95	361755	51.78	ug/l	0.00
Spiked Amount 50.000	Range 34 - 145		Recovery = 103.56%			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.35	85	105816	20.53	ug/l	97
4) Chloromethane	1.50	50	120756	20.97	ug/l	99
5) Bromomethane	1.81	94	63309	20.34	ug/l	96
6) Vinyl Chloride	1.56	62	102334	20.54	ug/l	94
7) Chloroethane	1.87	64	63065	21.70	ug/l	88
10) Methyl Acetate	2.60	43	40488	20.52	ug/l	89
11) 1,1,2-Trichloro-1,2,2-trif	2.33	101	84943	20.38	ug/l	91
12) Methylene Chloride	2.69	84	99617	21.41	ug/l	99
13) Acetone	2.43	43	24399	20.68	ug/l	99
14) Carbon Disulfide	2.50	76	286301	20.30	ug/l	98
16) 1,1-Dichloroethene	2.36	96	86419	21.70	ug/l	91
17) 1,1-Dichloroethane	3.11	63	154768	20.52	ug/l	97
18) Trichlorofluoromethane	2.01	101	130821	20.19	ug/l	92
20) Methyl tert-butyl ether	2.81	73	198873	20.39	ug/l	95
21) trans-1,2-Dichloroethene	2.82	96	99607	21.40	ug/l	94
22) cis-1,2-Dichloroethene	3.46	96	125807 TIP	20.29	ug/l	92
23) 1,2-Dichloroethene (total)	3.46	96	227308m	40.91	ug/l	
24) 2-Butanone	3.48	43	37122 MV 05/06/15	19.94	ug/l	85
25) Chloroform	3.64	83	187035	20.26	ug/l	98
27) 1,2-Dichloroethane	4.03	62	113889	20.53	ug/l	93
29) 1,1,1-Trichloroethane	3.75	97	160486	20.67	ug/l	97
30) Cyclohexane	3.74	56	201786	23.49	ug/l	92
31) Carbon Tetrachloride	3.83	117	145683	20.44	ug/l	97
33) Bromodichloromethane	4.74	83	141599	19.68	ug/l	97
34) 1,2-Dichloropropane	4.57	63	107442	20.40	ug/l	98
35) cis-1,3-Dichloropropene	5.04	75	178392	19.88	ug/l	96
36) Trichloroethene	4.39	130	138178	21.18	ug/l	96
37) Methylcyclohexane	4.47	83	219017	24.88	ug/l	98
38) Benzene	3.98	78	438169	20.87	ug/l	99
39) Dibromochloromethane	5.85	129	113594	20.00	ug/l	95
40) trans-1,3-Dichloropropene	5.43	75	145945	19.95	ug/l	98
41) 1,1,2-Trichloroethane	5.57	97	86418	20.43	ug/l	93
42) Bromoform	6.94	173	71883	19.96	ug/l	94
44) 4-Methyl-2-pentanone	5.13	43	78607	19.07	ug/l	96
45) 2-Hexanone	5.72	43	57476	18.91	ug/l	97
46) 1,2-Dibromoethane	5.96	107	90993	18.91	ug/l	96
47) Tetrachloroethene	5.62	164	117499	21.58	ug/l	99
48) 1,1,2,2-Tetrachloroethane	7.30	83	104344	19.94	ug/l	92
50) Toluene	5.25	91	496121	20.48	ug/l	97
51) Chlorobenzene	6.29	112	353944	20.74	ug/l	98
52) Ethylbenzene	6.34	106	188258	21.16	ug/l	99
54) Styrene	6.76	104	383941	20.55	ug/l	98

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85626.D Vial: 4
Acq On : 31 Mar 2015 18:01 Operator: DRL
Sample : VSTD020 Inst : H5971
Misc : ,,,ICAL_20.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 19:59 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

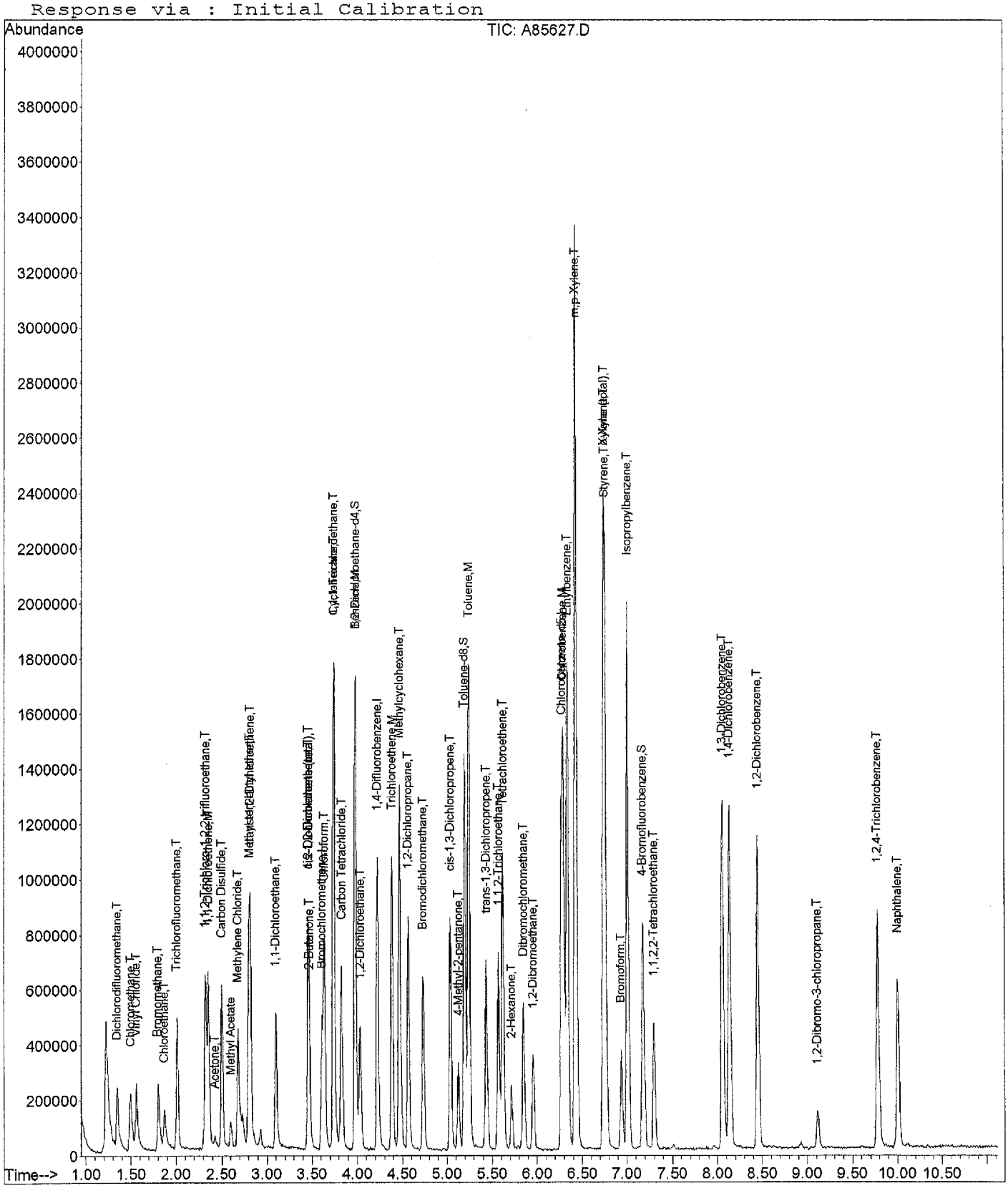
	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
55)	m,p-Xylene	6.43	106	491554	44.09 ug/l	99
56)	o-Xylene	6.74	106	231564	21.18 ug/l	98
57)	Xylene (total)	6.74	106	231564	21.18 ug/l	98
58)	Isopropylbenzene	7.01	105	636847	22.93 ug/l	98
59)	1,3-Dichlorobenzene	8.06	146	290126	22.35 ug/l	98
60)	1,4-Dichlorobenzene	8.14	146	282328	21.39 ug/l	99
61)	1,2-Dichlorobenzene	8.46	146	256393	21.46 ug/l	97
62)	1,2-Dibromo-3-chloropropan	9.12	75	16274	19.10 ug/l	97
63)	1,2,4-Trichlorobenzene	9.78	180	171888	23.44 ug/l	99
64)	Naphthalene	10.01	128	246620	19.78 ug/l	99

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85627.D Vial: 5
Acq On : 31 Mar 2015 18:22 Operator: DRL
Sample : VSTD050 Inst : H5971
Misc : ,,,ICAL_50,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 20:00 2015 Quant Results File: R6S0331.RES

Method : O:\MS\HP5971\METHODS\2015\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85627.D Vial: 5
Acq On : 31 Mar 2015 18:22 Operator: DRL
Sample : VSTD050 Inst : H5971
Misc : ,,,ICAL_50,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 20:00 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.62	128	119927	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.22	114	806703	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.27	117	705879	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	197895	49.00	ug/l	0.00
Spiked Amount 50.000	Range 33 - 150		Recovery = 98.00%			
49) Toluene-d8	5.20	98	919800	49.79	ug/l	0.00
Spiked Amount 50.000	Range 43 - 157		Recovery = 99.58%			
53) 4-Bromofluorobenzene	7.18	95	335371	48.86	ug/l	0.00
Spiked Amount 50.000	Range 34 - 145		Recovery = 97.72%			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.35	85	276112	51.45	ug/l	100
4) Chloromethane	1.49	50	297299	49.57	ug/l	100
5) Bromomethane	1.80	94	165752	51.15	ug/l	100
6) Vinyl Chloride	1.57	62	267262	51.52	ug/l	100
7) Chloroethane	1.87	64	154145	50.93	ug/l	100
10) Methyl Acetate	2.60	43	95944	46.70	ug/l	98
11) 1,1,2-Trichloro-1,2,2-trif	2.32	101	219535	50.59	ug/l	100
12) Methylene Chloride	2.68	84	232753	48.04	ug/l	100
13) Acetone	2.42	43	44757	36.43	ug/l	100
14) Carbon Disulfide	2.50	76	743969	50.66	ug/l	100
16) 1,1-Dichloroethene	2.35	96	205415	49.54	ug/l	100
17) 1,1-Dichloroethane	3.10	63	400463	50.98	ug/l	100
18) Trichlorofluoromethane	2.01	101	338609	50.19	ug/l	100
20) Methyl tert-butyl ether	2.80	73	515222	50.73	ug/l	100
21) trans-1,2-Dichloroethene	2.82	96	238219	49.16	ug/l	100
22) cis-1,2-Dichloroethene	3.46	96	320965 TIP	49.71	ug/l	100
23) 1,2-Dichloroethene (total)	3.46	96	570538m	98.60	ug/l	
24) 2-Butanone	3.48	43	82920 MN 050615	42.77	ug/l	100
25) Chloroform	3.64	83	498216	51.83	ug/l	100
27) 1,2-Dichloroethane	4.04	62	294200	50.92	ug/l	100
29) 1,1,1-Trichloroethane	3.75	97	415890	51.88	ug/l	100
30) Cyclohexane	3.74	56	462818	52.19	ug/l	100
31) Carbon Tetrachloride	3.83	117	380608	51.73	ug/l	100
33) Bromodichloromethane	4.73	83	385637	51.92	ug/l	100
34) 1,2-Dichloropropane	4.56	63	277752	51.07	ug/l	100
35) cis-1,3-Dichloropropene	5.04	75	473217	51.09	ug/l	100
36) Trichloroethene	4.38	130	349571	51.91	ug/l	100
37) Methylcyclohexane	4.47	83	457981	50.40	ug/l	100
38) Benzene	3.98	78	1120535	51.70	ug/l	100
39) Dibromochloromethane	5.85	129	300333	51.22	ug/l	100
40) trans-1,3-Dichloropropene	5.44	75	380921	50.44	ug/l	100
41) 1,1,2-Trichloroethane	5.57	97	216840	49.66	ug/l	100
42) Bromoform	6.94	173	191179	51.41	ug/l	100
44) 4-Methyl-2-pentanone	5.13	43	208823	51.56	ug/l	100
45) 2-Hexanone	5.72	43	148402	49.71	ug/l	100
46) 1,2-Dibromoethane	5.96	107	241953	51.18	ug/l	100
47) Tetrachloroethene	5.62	164	279503	52.26	ug/l	100
48) 1,1,2,2-Tetrachloroethane	7.30	83	267899	52.10	ug/l	100
50) Toluene	5.24	91	1256614	52.80	ug/l	100
51) Chlorobenzene	6.30	112	858797	51.23	ug/l	100
52) Ethylbenzene	6.34	106	462617	52.93	ug/l	100
54) Styrene	6.76	104	972371	52.97	ug/l	100

(#) = qualifier out of range (m) = manual integration

AECOM237 V141

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85627.D Vial: 5
Acq On : 31 Mar 2015 18:22 Operator: DRL
Sample : VSTD050 Inst : H5971
Misc : ,,,ICAL_50,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 20:00 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
55)	m,p-Xylene	6.43	106	1158892	105.80	ug/l	100
56)	o-Xylene	6.75	106	568863	52.95	ug/l	100
57)	Xylene (total)	6.75	106	568640	52.94	ug/l	100
58)	Isopropylbenzene	7.01	105	1445091	52.95	ug/l	100
59)	1,3-Dichlorobenzene	8.06	146	676804	53.07	ug/l	100
60)	1,4-Dichlorobenzene	8.14	146	691476	53.33	ug/l	100
61)	1,2-Dichlorobenzene	8.45	146	629535	53.65	ug/l	100
62)	1,2-Dibromo-3-chloropropan	9.11	75	39832	47.58	ug/l	100
63)	1,2,4-Trichlorobenzene	9.78	180	384039	53.31	ug/l	100
64)	Naphthalene	10.00	128	667526	54.50	ug/l	100

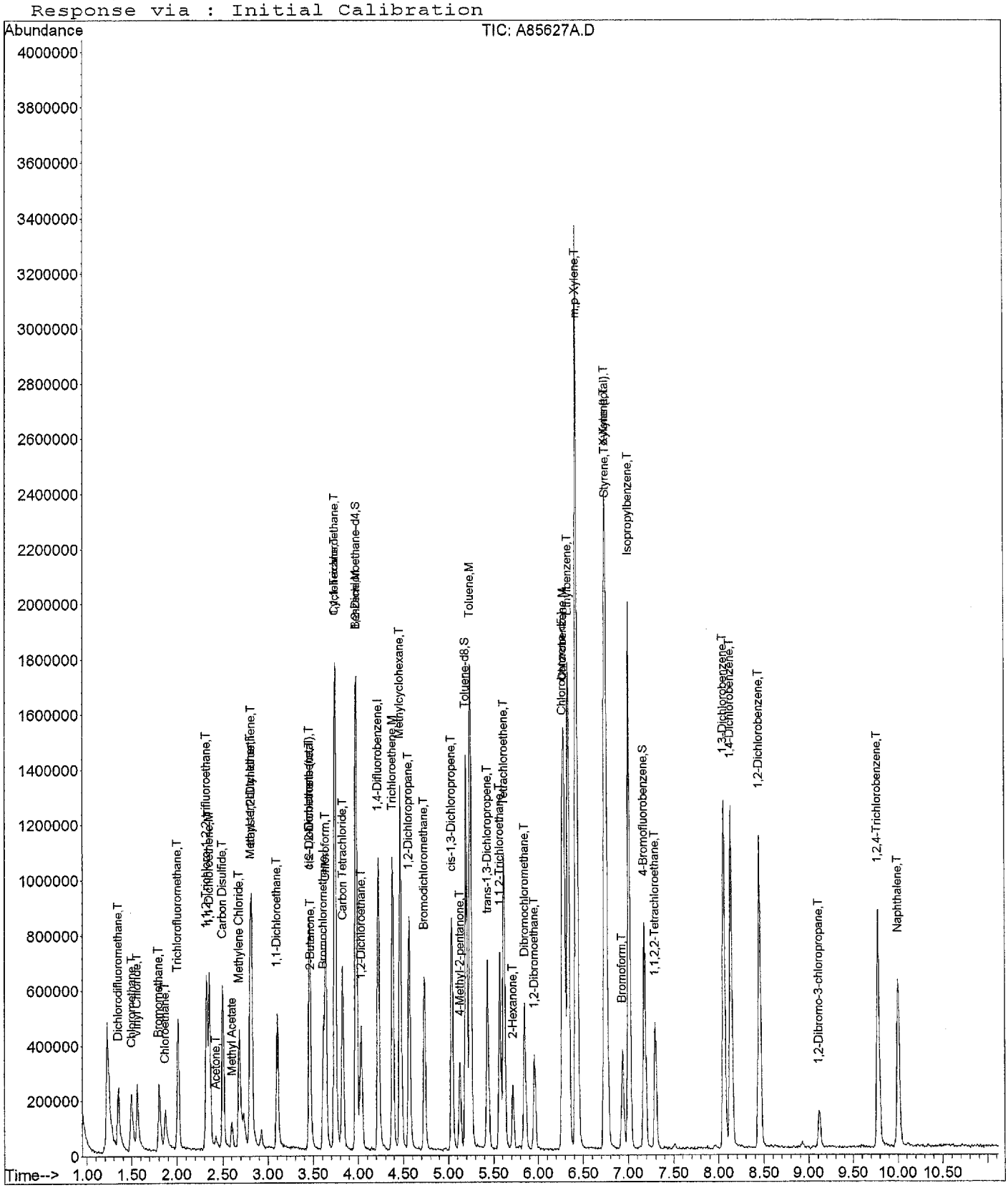
(#) = qualifier out of range (m) = manual integration

AECOM237 V142

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85627A.D Vial: 5
Acq On : 31 Mar 2015 18:22 Operator: DRL
Sample : VSTD050 Inst : H5971
Misc : ,,,CCV,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 20:00 2015 Quant Results File: R6S0331.RES

Method : O:\MS\HP5971\METHODS\2015\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85627A.D Vial: 5
Acq On : 31 Mar 2015 18:22 Operator: DRL
Sample : VSTD050 Inst : H5971
Misc : ,,,CCV,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 20:00 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	3.62	128	119927	50.00 ug/l	0.00
28) 1,4-Difluorobenzene	4.22	114	806703	50.00 ug/l	0.00
43) Chlorobenzene-d5	6.27	117	705879	50.00 ug/l	0.00
System Monitoring Compounds					
26) 1,2-Dichloroethane-d4	3.98	65	197895	49.00 ug/l	0.00
Spiked Amount 50.000	Range 33 - 150		Recovery = 98.00%		
49) Toluene-d8	5.20	98	919800	49.79 ug/l	0.00
Spiked Amount 50.000	Range 43 - 157		Recovery = 99.58%		
53) 4-Bromofluorobenzene	7.18	95	335371	48.86 ug/l	0.00
Spiked Amount 50.000	Range 34 - 145		Recovery = 97.72%		

Target Compounds					Qvalue
3) Dichlorodifluoromethane	1.35	85	276112	51.45 ug/l	100
4) Chloromethane	1.49	50	297299	49.57 ug/l	100
5) Bromomethane	1.80	94	165752	51.15 ug/l	100
6) Vinyl Chloride	1.57	62	267262	51.52 ug/l	100
7) Chloroethane	1.87	64	154145	50.93 ug/l	100
10) Methyl Acetate	2.60	43	95944	46.70 ug/l	98
11) 1,1,2-Trichloro-1,2,2-trif	2.32	101	219535	50.59 ug/l	100
12) Methylene Chloride	2.68	84	232753	48.04 ug/l	100
13) Acetone	2.42	43	44757	36.43 ug/l	100
14) Carbon Disulfide	2.50	76	743969	50.66 ug/l	100
16) 1,1-Dichloroethene	2.35	96	205415	49.54 ug/l	100
17) 1,1-Dichloroethane	3.10	63	400463	50.98 ug/l	100
18) Trichlorofluoromethane	2.01	101	338609	50.19 ug/l	100
20) Methyl tert-butyl ether	2.80	73	515222	50.73 ug/l	100
21) trans-1,2-Dichloroethene	2.82	96	238219	49.16 ug/l	100
22) cis-1,2-Dichloroethene	3.46	96	320965 TIP	49.71 ug/l	100
23) 1,2-Dichloroethene (total)	3.46	96	570538m	98.60 ug/l	
24) 2-Butanone	3.48	43	82920 HP 05/06/15	42.77 ug/l	100
25) Chloroform	3.64	83	498216	51.83 ug/l	100
27) 1,2-Dichloroethane	4.04	62	294200	50.92 ug/l	100
29) 1,1,1-Trichloroethane	3.75	97	415890	51.88 ug/l	100
30) Cyclohexane	3.74	56	462818	52.19 ug/l	100
31) Carbon Tetrachloride	3.83	117	380608	51.73 ug/l	100
33) Bromodichloromethane	4.73	83	385637	51.92 ug/l	100
34) 1,2-Dichloropropane	4.56	63	277752	51.07 ug/l	100
35) cis-1,3-Dichloropropene	5.04	75	473217	51.09 ug/l	100
36) Trichloroethene	4.38	130	349571	51.91 ug/l	100
37) Methylcyclohexane	4.47	83	457981	50.40 ug/l	100
38) Benzene	3.98	78	1120535	51.70 ug/l	100
39) Dibromochloromethane	5.85	129	300333	51.22 ug/l	100
40) trans-1,3-Dichloropropene	5.44	75	380921	50.44 ug/l	100
41) 1,1,2-Trichloroethane	5.57	97	216840	49.66 ug/l	100
42) Bromoform	6.94	173	191179	51.41 ug/l	100
44) 4-Methyl-2-pentanone	5.13	43	208823	51.56 ug/l	100
45) 2-Hexanone	5.72	43	148402	49.71 ug/l	100
46) 1,2-Dibromoethane	5.96	107	241953	51.18 ug/l	100
47) Tetrachloroethene	5.62	164	279503	52.26 ug/l	100
48) 1,1,2,2-Tetrachloroethane	7.30	83	267899	52.10 ug/l	100
50) Toluene	5.24	91	1256614	52.80 ug/l	100
51) Chlorobenzene	6.30	112	858797	51.23 ug/l	100
52) Ethylbenzene	6.34	106	462617	52.93 ug/l	100
54) Styrene	6.76	104	972371	52.97 ug/l	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85627A.D Vial: 5
Acq On : 31 Mar 2015 18:22 Operator: DRL
Sample : VSTD050 Inst : H5971
Misc : ,,,CCV,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 20:00 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
55) m,p-Xylene	6.43	106	1158892	105.80 ug/l	100
56) o-Xylene	6.75	106	568863	52.95 ug/l	100
57) Xylene (total)	6.75	106	568640	52.94 ug/l	100
58) Isopropylbenzene	7.01	105	1445091	52.95 ug/l	100
59) 1,3-Dichlorobenzene	8.06	146	676804	53.07 ug/l	100
60) 1,4-Dichlorobenzene	8.14	146	691476	53.33 ug/l	100
61) 1,2-Dichlorobenzene	8.45	146	629535	53.65 ug/l	100
62) 1,2-Dibromo-3-chloropropan	9.11	75	39832	47.58 ug/l	100
63) 1,2,4-Trichlorobenzene	9.78	180	384039	53.31 ug/l	100
64) Naphthalene	10.00	128	667526	54.50 ug/l	100

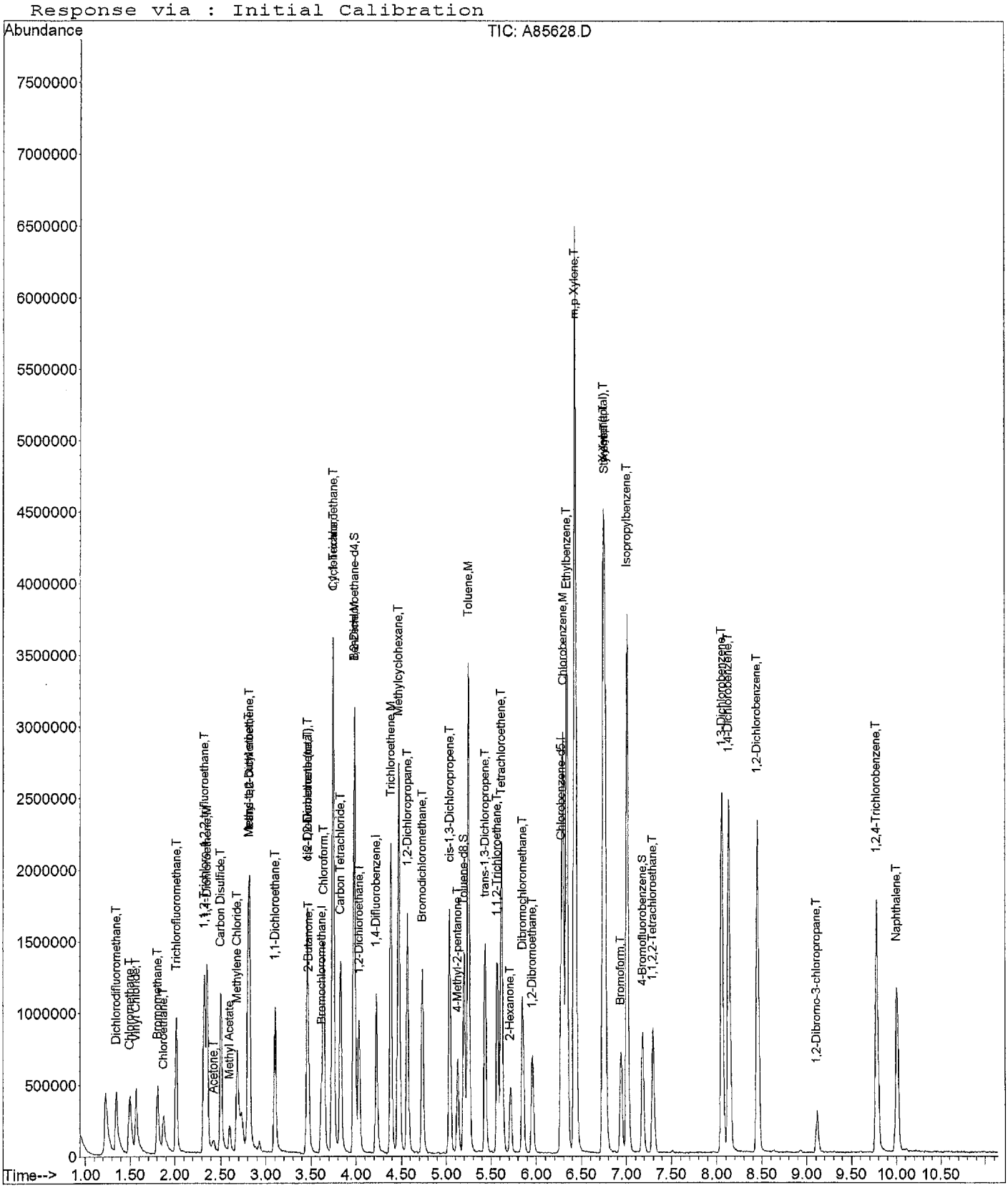
(#) = qualifier out of range (m) = manual integration

AECOM237 V145

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85628.D Vial: 6
Acq On : 31 Mar 2015 18:43 Operator: DRL
Sample : VSTD100 Inst : H5971
Misc : ,,,ICAL_100,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 20:11 2015 Quant Results File: R6S0331.RES

Method : O:\MS\HP5971\METHODS\2015\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85628.D Vial: 6
Acq On : 31 Mar 2015 18:43 Operator: DRL
Sample : VSTD100 Inst : H5971
Misc : ,,,ICAL_100,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 20:11 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.62	128	117110	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.22	114	830931	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.27	117	724644	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	192944	48.92	ug/l	0.00
Spiked Amount 50.000	Range 33 - 150		Recovery = 97.84%			
49) Toluene-d8	5.20	98	938189	49.47	ug/l	0.00
Spiked Amount 50.000	Range 43 - 157		Recovery = 98.94%			
53) 4-Bromofluorobenzene	7.19	95	335895	47.67	ug/l	0.00
Spiked Amount 50.000	Range 34 - 145		Recovery = 95.34%			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.35	85	557867	106.44	ug/l	98
4) Chloromethane	1.50	50	603908	103.12	ug/l	99
5) Bromomethane	1.81	94	341441	107.90	ug/l	97
6) Vinyl Chloride	1.57	62	529379	104.50	ug/l	97
7) Chloroethane	1.87	64	317564	107.45	ug/l	100
10) Methyl Acetate	2.60	43	196891	98.14	ug/l	99
11) 1,1,2-Trichloro-1,2,2-trif	2.32	101	456139	107.64	ug/l	96
12) Methylene Chloride	2.68	84	453038	95.75	ug/l	95
13) Acetone	2.43	43	81604	68.02	ug/l	84
14) Carbon Disulfide	2.50	76	1528794	106.60	ug/l	99
16) 1,1-Dichloroethene	2.35	96	423416	104.57	ug/l #	89
17) 1,1-Dichloroethane	3.10	63	800507	104.35	ug/l	95
18) Trichlorofluoromethane	2.02	101	699066	106.12	ug/l	100
20) Methyl tert-butyl ether	2.80	73	1047319	105.60	ug/l	96
21) trans-1,2-Dichloroethene	2.82	96	496249	104.86	ug/l	96
22) cis-1,2-Dichloroethene	3.46	96	661213 TIP	104.87	ug/l	97
23) 1,2-Dichloroethene (total)	3.46	96	1171653m	207.37	ug/l	
24) 2-Butanone	3.48	43	163365 HC 05/06/15	86.29	ug/l	98
25) Chloroform	3.64	83	976114	104.00	ug/l	97
27) 1,2-Dichloroethane	4.04	62	602875	106.86	ug/l	99
29) 1,1,1-Trichloroethane	3.75	97	825481	99.98	ug/l	99
30) Cyclohexane	3.74	56	897927	98.31	ug/l	93
31) Carbon Tetrachloride	3.83	117	770775	101.71	ug/l	93
33) Bromodichloromethane	4.73	83	759320	99.26	ug/l	97
34) 1,2-Dichloropropane	4.57	63	559697	99.92	ug/l	97
35) cis-1,3-Dichloropropene	5.04	75	941599	98.70	ug/l	98
36) Trichloroethene	4.39	130	704509	101.56	ug/l	97
37) Methylcyclohexane	4.47	83	961874	102.76	ug/l	99
38) Benzene	3.98	78	2194153	98.29	ug/l	99
39) Dibromochloromethane	5.85	129	623211	103.20	ug/l	98
40) trans-1,3-Dichloropropene	5.44	75	771005	99.11	ug/l	98
41) 1,1,2-Trichloroethane	5.58	97	447201	99.42	ug/l	98
42) Bromoform	6.94	173	390838	102.04	ug/l	93
44) 4-Methyl-2-pentanone	5.13	43	416444	100.16	ug/l	96
45) 2-Hexanone	5.71	43	289583	94.49	ug/l	98
46) 1,2-Dibromoethane	5.96	107	507786	104.62	ug/l	94
47) Tetrachloroethene	5.62	164	575469	104.82	ug/l	98
48) 1,1,2,2-Tetrachloroethane	7.30	83	535106	101.37	ug/l	92
50) Toluene	5.24	91	2441732	99.93	ug/l	98
51) Chlorobenzene	6.30	112	1743799	101.32	ug/l	99
52) Ethylbenzene	6.34	106	921549	102.70	ug/l	96
54) Styrene	6.77	104	1912396	101.48	ug/l	98

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85628.D Vial: 6
Acq On : 31 Mar 2015 18:43 Operator: DRL
Sample : VSTD100 Inst : H5971
Misc : ,,,ICAL_100,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 20:11 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

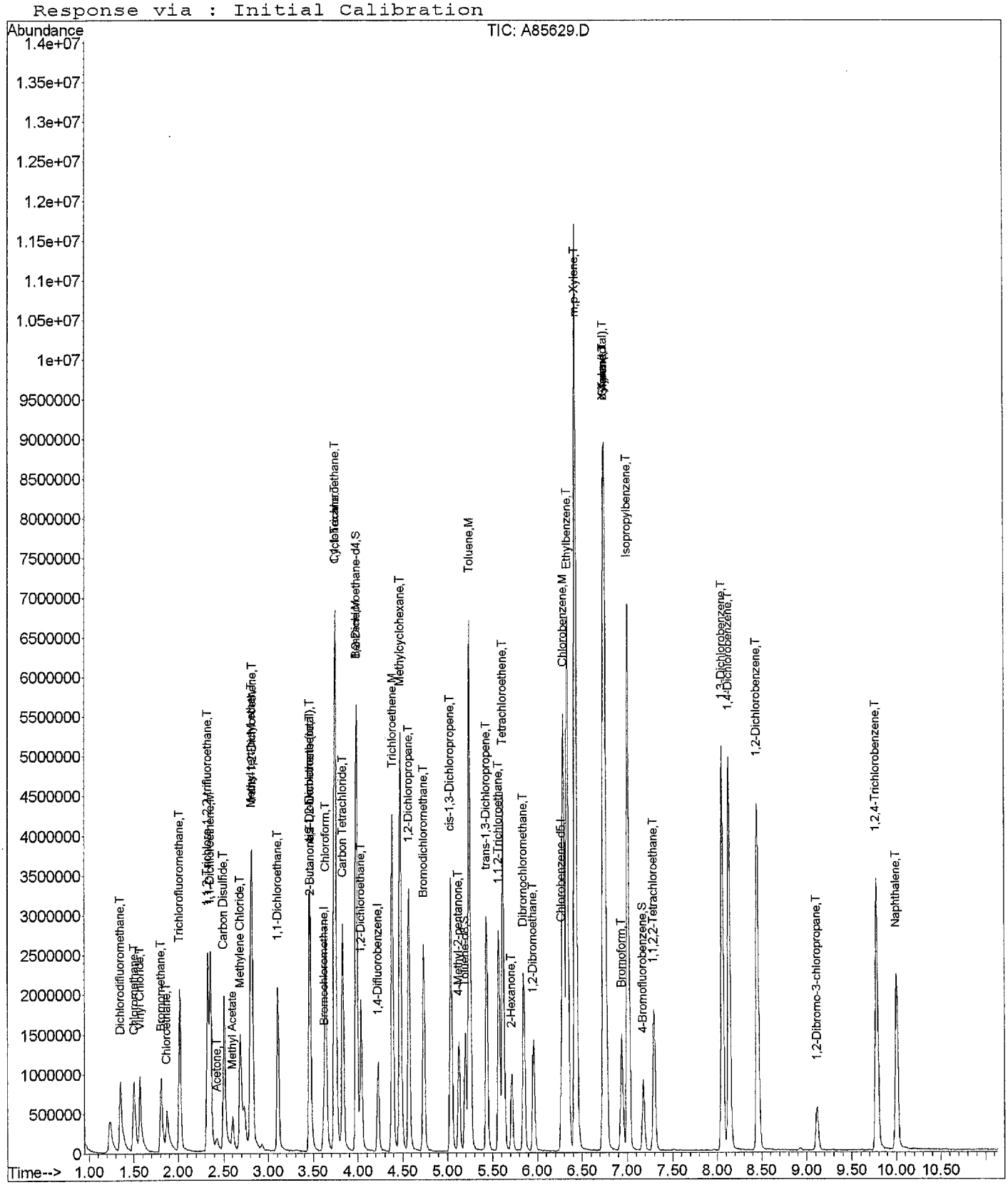
	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
55)	m,p-Xylene	6.43	106	2287381	203.42 ug/l		97
56)	o-Xylene	6.75	106	1123563	101.88 ug/l		98
57)	Xylene (total)	6.75	106	1123241	101.86 ug/l		98
58)	Isopropylbenzene	7.01	105	2896005	103.37 ug/l		98
59)	1,3-Dichlorobenzene	8.06	146	1375801	105.09 ug/l		100
60)	1,4-Dichlorobenzene	8.14	146	1391498	104.54 ug/l		100
61)	1,2-Dichlorobenzene	8.45	146	1271455	105.54 ug/l		95
62)	1,2-Dibromo-3-chloropropan	9.12	75	79055	91.99 ug/l	#	86
63)	1,2,4-Trichlorobenzene	9.78	180	793932	107.36 ug/l		99
64)	Naphthalene	10.01	128	1274058	101.32 ug/l		100

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85629.D Vial: 7
Acq On : 31 Mar 2015 19:04 Operator: DRL
Sample : VSTD200 Inst : H5971
Misc : ,,,ICAL_200,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 20:13 2015 Quant Results File: R6S0331.RES

Method : O:\MS\HP5971\METHODS\2015\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85629.D Vial: 7
Acq On : 31 Mar 2015 19:04 Operator: DRL
Sample : VSTD200 Inst : H5971
Misc : ,,,ICAL_200,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 20:13 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.62	128	127797	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	834372	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.27	117	731126	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.99	65	199472	46.35	ug/l	0.00
Spiked Amount 50.000	Range 33 - 150		Recovery = 92.70%			
49) Toluene-d8	5.20	98	962688	50.32	ug/l	0.00
Spiked Amount 50.000	Range 43 - 157		Recovery = 100.64%			
53) 4-Bromofluorobenzene	7.18	95	357588	50.30	ug/l	0.00
Spiked Amount 50.000	Range 34 - 145		Recovery = 100.60%			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.35	85	1131606	197.86	ug/l	96
4) Chloromethane	1.50	50	1241335	194.24	ug/l	98
5) Bromomethane	1.81	94	715892	207.32	ug/l	97
6) Vinyl Chloride	1.57	62	1107083	200.27	ug/l	97
7) Chloroethane	1.87	64	628720	194.95	ug/l	99
10) Methyl Acetate	2.60	43	407101	185.95	ug/l	100
11) 1,1,2-Trichloro-1,2,2-trif	2.33	101	923236	199.65	ug/l	97
12) Methylene Chloride	2.69	84	926823	179.50	ug/l	97
13) Acetone	2.43	43	162242	123.92	ug/l	89
14) Carbon Disulfide	2.50	76	3028439	193.51	ug/l	99
16) 1,1-Dichloroethene	2.36	96	844172	191.04	ug/l	90
17) 1,1-Dichloroethane	3.10	63	1626195	194.26	ug/l	93
18) Trichlorofluoromethane	2.02	101	1426272	198.40	ug/l	98
20) Methyl tert-butyl ether	2.81	73	2108764	194.84	ug/l	95
21) trans-1,2-Dichloroethene	2.82	96	1001407	193.91	ug/l	93
22) cis-1,2-Dichloroethene	3.46	96	1352431 TIP	196.55	ug/l	97
23) 1,2-Dichloroethene (total)	3.46	96	2372424m	384.77	ug/l	
24) 2-Butanone	3.48	43	351426 HM	170.11	ug/l	97
25) Chloroform	3.64	83	1967554 05/06/15	192.09	ug/l	98
27) 1,2-Dichloroethane	4.03	62	1218314	197.89	ug/l	99
29) 1,1,1-Trichloroethane	3.75	97	1628962	196.48	ug/l	99
30) Cyclohexane	3.74	56	1765042	192.45	ug/l	97
31) Carbon Tetrachloride	3.83	117	1565954	205.79	ug/l	99
33) Bromodichloromethane	4.74	83	1571219	204.54	ug/l	99
34) 1,2-Dichloropropane	4.57	63	1087743	193.38	ug/l	98
35) cis-1,3-Dichloropropene	5.04	75	1916212	200.04	ug/l	99
36) Trichloroethene	4.39	130	1408838	202.25	ug/l	98
37) Methylcyclohexane	4.47	83	1826989	194.39	ug/l	99
38) Benzene	3.98	78	4275703	190.74	ug/l	98
39) Dibromochloromethane	5.85	129	1256640	207.23	ug/l	98
40) trans-1,3-Dichloropropene	5.44	75	1586136	203.05	ug/l	96
41) 1,1,2-Trichloroethane	5.57	97	898076	198.83	ug/l	97
42) Bromoform	6.94	173	804862	209.27	ug/l	97
44) 4-Methyl-2-pentanone	5.13	43	856187	204.10	ug/l	96
45) 2-Hexanone	5.72	43	607959	196.61	ug/l	94
46) 1,2-Dibromoethane	5.96	107	998755	203.95	ug/l	96
47) Tetrachloroethene	5.62	164	1142030	206.17	ug/l	96
48) 1,1,2,2-Tetrachloroethane	7.30	83	1067961	200.52	ug/l	94
50) Toluene	5.25	91	4699119	190.61	ug/l	95
51) Chlorobenzene	6.29	112	3452307	198.81	ug/l	96
52) Ethylbenzene	6.34	106	1773856	195.94	ug/l	91
54) Styrene	6.76	104	3651122	192.02	ug/l	98

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

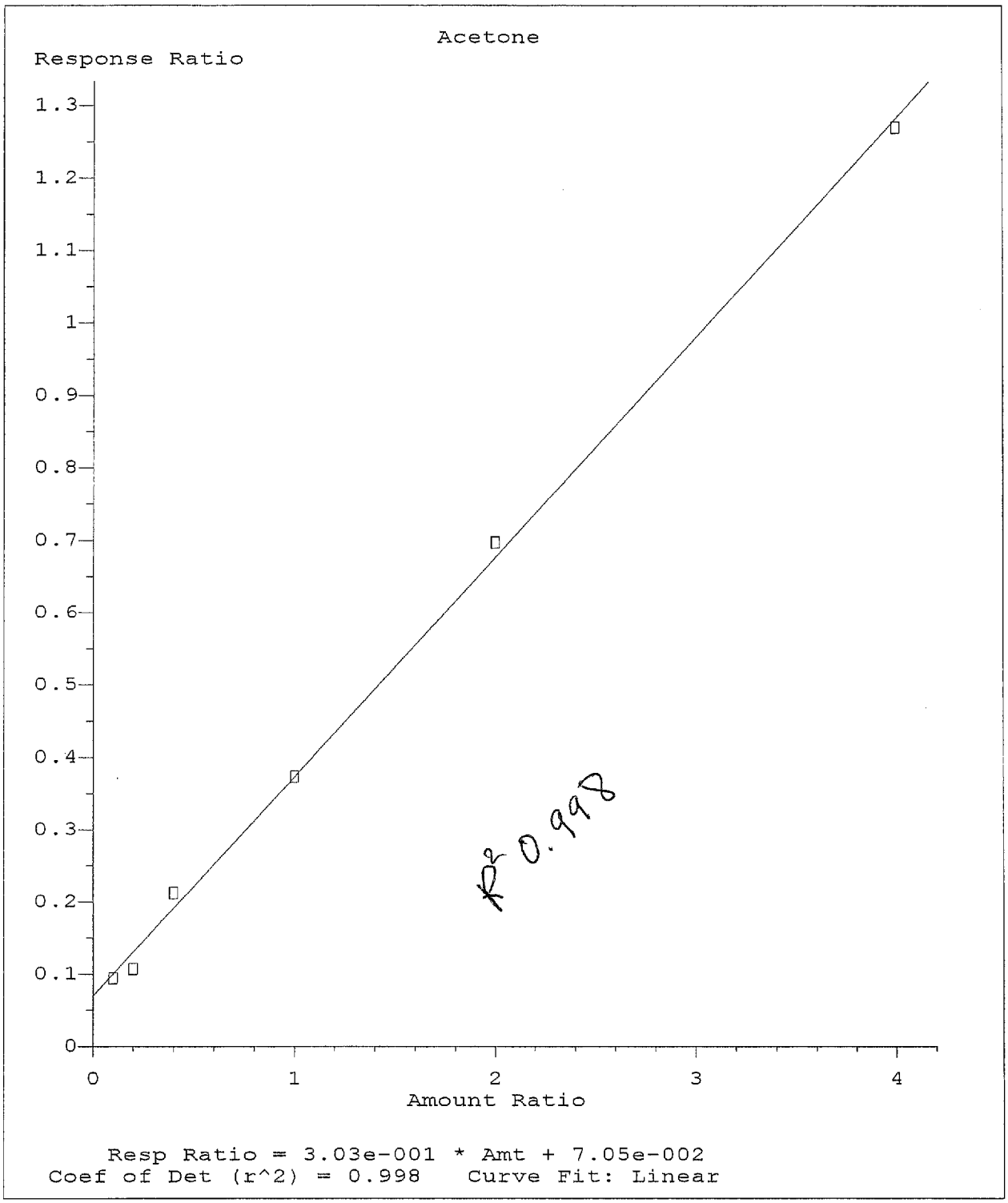
Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85629.D Vial: 7
Acq On : 31 Mar 2015 19:04 Operator: DRL
Sample : VSTD200 Inst : H5971
Misc : ,,,ICAL_200,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 31 20:13 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 19:46:44 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

	Compound	R.T.	QIon	Response	Conc	Unit	Qvalue
55)	m,p-Xylene	6.43	106	4294437	378.52	ug/l	91
56)	o-Xylene	6.75	106	2195624	197.32	ug/l	98
57)	Xylene (total)	6.75	106	2195624	197.34	ug/l	98
58)	Isopropylbenzene	7.02	105	5460311	193.18	ug/l	99
59)	1,3-Dichlorobenzene	8.06	146	2685402	203.31	ug/l	98
60)	1,4-Dichlorobenzene	8.14	146	2706935	201.56	ug/l	98
61)	1,2-Dichlorobenzene	8.45	146	2468880	203.12	ug/l	96
62)	1,2-Dibromo-3-chloropropan	9.11	75	159304	183.72	ug/l	93
63)	1,2,4-Trichlorobenzene	9.78	180	1559932	209.06	ug/l	99
64)	Naphthalene	10.00	128	2491422	196.38	ug/l	100

(#) = qualifier out of range (m) = manual integration

AECOM237 V151



Method Name: O:\MS\HP5971\METHODS\2015\R6S0331.M
Calibration Table Last Updated: Tue Mar 31 20:15:19 2015

Form 6

VOCS IN WATER INITIAL CALIBRATION DATA

Lab Name: PACE ANALYTICAL Contract: PACE ANALYTICAL

Lab Code: 10478 Case No.: AECOM-N SAS No.: SDG No.: AECOM237

Instrument ID: HP5972-2 Calibration Dates: 3/4/2015 3/4/2015

Heated Purge: (Y/N) N Calibration Times: 12:34 15:05

GC Column: Rtx-624 ID: .18 (mm)

LAB FILE ID: TD0.40= G30830. STD1.0= G30831. STD5.0= G30832. TD10.0= G30833. TD20.0= G30834.

VSTD50= G30835. STD100= G30836. STD200= G30837.

COMPOUND		Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8			$\overline{RRF}$	% RSD	R^2
Naphthalene	*	0	0.1006126	0.5067181	0.6458777	0.8285394	1.0770024	0.89751670	1.1838418			0.749	49.2	*
1,4-Dioxane	*	0	0	0.0025842	0.0033419	0.0033157	0.0030454	0.00317809	0.0031856			0.003	9.0	*
Dichlorodifluoromethane	*	0	1.7691614	1.5830296	2.1308515	2.0941885	2.6079747	2.34836872	2.5309227			2.152	17.6	*
Chloromethane	*	0	1.8196249	1.6382043	1.9979031	1.9583228	2.22458	2.03443375	2.2976606			1.996	11.3	*
Vinyl chloride	*	0	1.6554961	1.4612885	1.9907123	1.9254414	2.3612866	2.14583057	2.3312297			1.982	16.9	*
Bromomethane	*	0	0.8010465	0.6864649	0.9751559	0.9936929	1.2154231	1.12781464	1.0101311			0.973	18.6	*
Chloroethane	*	0	0.9867325	0.8898288	1.0949851	1.0700865	1.2449116	1.14152289	1.0985591			1.075	10.5	*
Trichlorofluoromethane	*	0	1.6834225	1.564605	1.9897242	2.0108451	2.4058538	2.24067684	2.2860101			2.026	15.5	*
1,1-Dichloroethene	*	0	1.3463461	1.1852167	1.4557351	1.5145205	1.6134579	1.57055961	1.4497802			1.448	10.0	*
tert-Butyl Alcohol	*	0	0.1819625	0.1838498	0.1936259	0.1953268	0.2106132	0.20126189	0.1937632			0.194	5.0	*
1,1,2-Trichloro-1,2,2-trifluoroethane	*	0	1.2517883	1.2142404	1.4962454	1.5741300	1.6787077	1.63272506	1.5663505			1.488	12.3	*
Acetone	*	0	0	1.1864054	0.8698731	0.7866804	0.7307540	0.67995466	0.6401017			0.816	24.4	*
Carbon disulfide	*	0	5.0551669	4.7718718	5.6264272	5.8997187	6.2362263	6.36499115	5.6194254			5.653	10.3	*
Methyl Acetate	*	0	1.9234915	1.7527142	1.9032694	1.9230790	1.8941856	1.90292524	1.6973953			1.857	5.0	*
Methylene chloride	*	0	1.8710683	1.705464	1.9861562	1.9690360	1.9966772	1.96669985	1.7508002			1.892	6.3	*
trans-1,2-Dichloroethene	*	0	1.6055226	1.5043783	1.8254325	1.8136393	2.0085428	1.86733024	1.6440060			1.753	10.0	*
Methyl tert-butyl ether	*	0	5.0365493	4.7656312	5.7038798	5.6115879	5.9282252	5.52126189	5.0522840			5.374	7.9	*
1,1-Dichloroethane	*	0	2.7157191	2.5568587	3.2577288	3.2541837	3.5672238	3.37313094	3.0543949			3.111	11.6	*
1,2-Dichloroethene (total)	*	0	1.6285496	1.5816428	1.9290686	1.9237658	2.1258005	1.97108217	1.7941704			1.851	10.5	*
cis-1,2-Dichloroethene	*	0	1.6515766	1.5928362	1.9919199	2.0091969	2.2021428	2.06514599	1.9384597			1.922	11.5	*
2-Butanone	*	0	0	0.9462913	1.0128118	1.0573405	1.1537922	1.05896372	1.025085			1.042	6.6	*
Chloroform	*	0	2.6182217	2.3975751	2.9593360	2.9394071	3.2227815	3.05252157	3.068091			2.894	9.9	*

Form 6

VOCS IN WATER INITIAL CALIBRATION DATA

Lab Name: PACE ANALYTICAL Contract: PACE ANALYTICAL

Lab Code: 10478 Case No.: AECOM-N SAS No.: SDG No.: AECOM237

Instrument ID: HP5972-2 Calibration Dates: 3/4/2015 3/4/2015

Heated Purge: (Y/N) N Calibration Times: 12:34 15:05

GC Column: Rtx-624 ID: .18 (mm)

LAB FILE ID: TD0.40= G30830. STD1.0= G30831. STD5.0= G30832. TD10.0= G30833. TD20.0= G30834.

VSTD50= G30835. STD100= G30836. STD200= G30837.

COMPOUND		Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8			$\overline{RRF}$	% RSD	R^2
1,1,1-Trichloroethane	*	0	0.3527747	0.331036	0.4151323	0.4091035	0.4619658	0.42684961	0.3896215			0.398	11.2	*
Cyclohexane	*	0	0.4292925	0.3665224	0.4618552	0.4566023	0.5213971	0.48300301	0.4245242			0.449	10.9	*
Carbon tetrachloride	*	0	0.308484	0.2917815	0.3592561	0.3622553	0.4067635	0.38931737	0.3779032			0.357	11.8	*
2-Chloroethylvinyl ether	*	0	0.1576887	0.1994566	0.2323484	0.2425370	0.2697207	0.25126636	0.2517157			0.229	16.7	*
Benzene	*	0.7923218	1.0550497	0.9845636	1.2175989	1.2036102	1.3254566	1.2307796	1.1728384			1.123	15.2	*
1,2-Dichloroethane	*	0	2.1233857	1.9817339	2.4424732	2.3909723	2.5328771	2.43900686	2.6931423			2.372	10.2	*
Trichloroethene	*	0	0.2886652	0.2666969	0.3266158	0.3314027	0.3716454	0.3554601	0.3460146			0.327	11.4	*
Methylcyclohexane	*	0	0.3051234	0.2696865	0.3530026	0.3512333	0.4022665	0.38325608	0.3632932			0.347	13.1	*
1,2-Dichloropropane	*	0	0.2747059	0.2625751	0.3112574	0.312834	0.3351358	0.31670901	0.3059317			0.303	8.3	*
Bromodichloromethane	*	0	0.3245975	0.3259235	0.4055441	0.4200071	0.4547282	0.43054203	0.4214077			0.398	13.0	*
cis-1,3-Dichloropropene	*	0	0.4317914	0.4242808	0.5103662	0.5414210	0.5833691	0.52042762	0.5307323			0.506	11.5	*
4-Methyl-2-pentanone	*	0	0	0.4575049	0.4334780	0.4709021	0.5149103	0.43492602	0.4633400			0.463	6.4	*
Toluene	*	0	1.8408507	1.465536	1.4873495	1.457033	1.5799434	1.2930217	1.3921089			1.502	11.5	*
trans-1,3-Dichloropropene	*	0	0.3660447	0.381506	0.4678478	0.4708037	0.5222065	0.45863085	0.4847268			0.450	12.5	*
1,1,2-Trichloroethane	*	0	0.2367055	0.2452033	0.2998425	0.2956947	0.3089631	0.27716862	0.2770054			0.277	9.9	*
Tetrachloroethene	*	0	0.2581408	0.2795082	0.2934089	0.2910380	0.3231815	0.28633571	0.2892319			0.289	6.7	*
2-Hexanone	*	0	0.1927043	0.2631202	0.2976836	0.3257375	0.3595003	0.34260662	0.3337856			0.302	19.1	*
Dibromochloromethane	*	0	0.2696219	0.2794338	0.3434144	0.3554084	0.3830442	0.37027441	0.3605938			0.337	13.3	*
1,2-Dibromoethane	*	0	0.3543837	0.3615466	0.3964731	0.4015919	0.4212423	0.39887521	0.3909924			0.389	6.0	*
Chlorobenzene	*	0	0.8652031	0.8340079	1.0068843	1.004464	1.0976173	1.02486195	0.9593185			0.970	9.5	*
Ethylbenzene	*	0	0.4174168	0.3932859	0.4872415	0.4858273	0.5374625	0.49755168	0.4569841			0.468	10.6	*
m,p-Xylene	*	0	0.5169916	0.5125304	0.6228068	0.6129246	0.6405639	0.60641811	0.5181251			0.576	9.9	*

Form 6

VOCS IN WATER INITIAL CALIBRATION DATA

Lab Name: PACE ANALYTICAL Contract: PACE ANALYTICAL

Lab Code: 10478 Case No.: AECOM-N SAS No.: SDG No.: AECOM237

Instrument ID: HP5972-2 Calibration Dates: 3/4/2015 3/4/2015

Heated Purge: (Y/N) N Calibration Times: 12:34 15:05

GC Column: Rtx-624 ID: .18 (mm)

LAB FILE ID: TD0.40= G30830. STD1.0= G30831. STD5.0= G30832. TD10.0= G30833. TD20.0= G30834.

VSTD50= G30835. STD100= G30836. STD200= G30837.

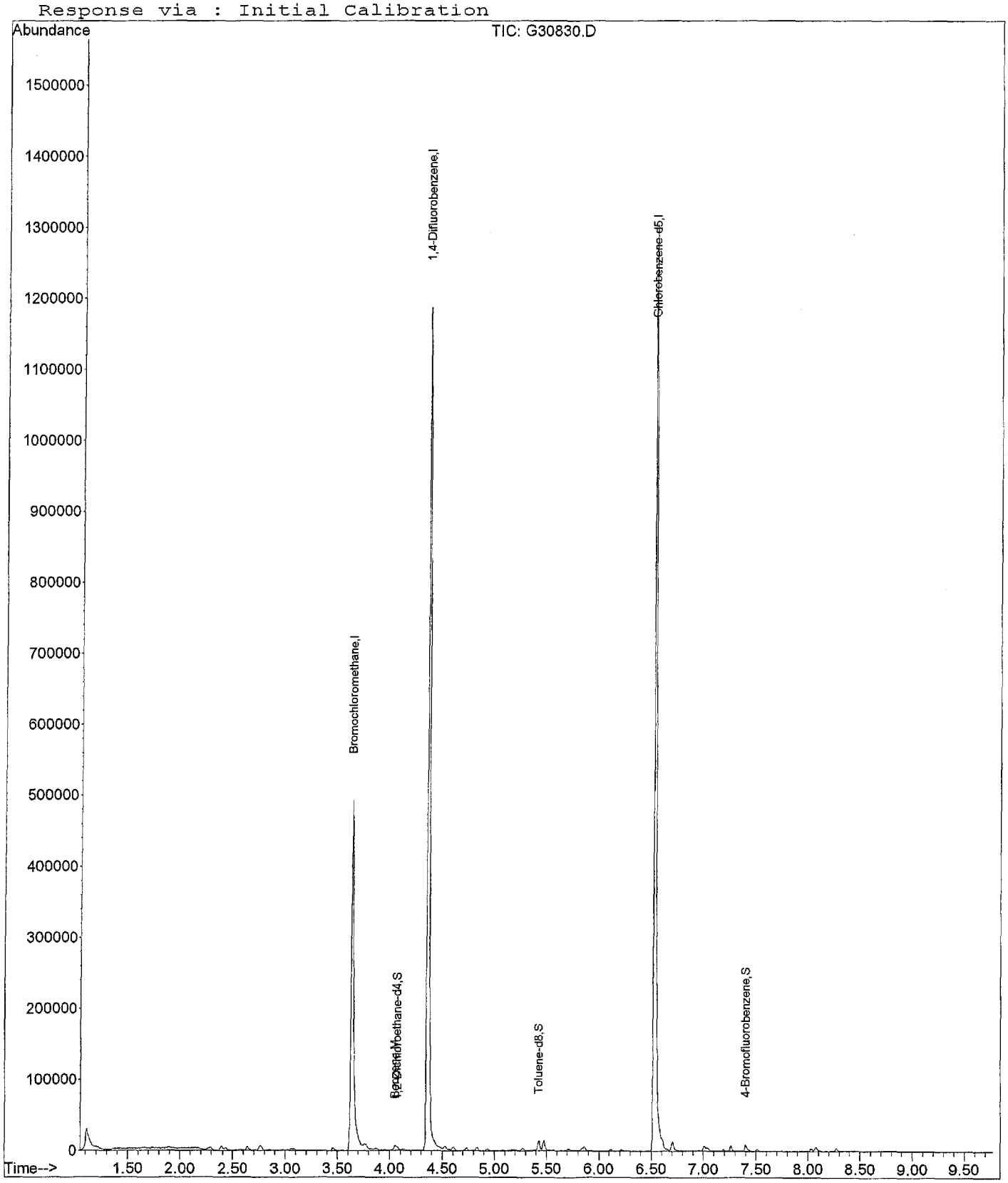
COMPOUND		Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7	Level 8			$\overline{RRF}$	% RSD	R^2
o-Xylene	*	0	0.4828532	0.5537594	0.6102350	0.6175728	0.6460922	0.62495483	0.5597389			0.585	9.6	*
Xylene (total)	*	0	0.4828532	0.5537594	0.6102350	0.6175728	0.6460922	0.62495483	0.5597389			0.585	9.6	*
Styrene	*	0	0.7890609	0.9607923	1.0558679	1.0876953	1.1273376	1.08555234	0.9377267			1.006	11.8	*
Bromoform	*	0	0.1713896	0.1793782	0.2305893	0.2420293	0.2632886	0.25718511	0.2417634			0.227	16.2	*
Isopropylbenzene	*	0	1.1685704	1.2594527	1.3737980	1.2905585	1.5252084	1.42742006	1.2634237			1.330	9.0	*
1,1,2,2-Tetrachloroethane	*	0	0.4022320	0.4436097	0.4234722	0.4498521	0.4816679	0.45946021	0.4081794			0.438	6.5	*
1,3-Dichlorobenzene	*	0	0.4886431	0.6029232	0.5699183	0.6739129	0.7226862	0.63576151	0.6537054			0.621	12.3	*
1,4-Dichlorobenzene	*	0	0.5961380	0.6509023	0.5951676	0.6965517	0.7438449	0.61501561	0.6573759			0.651	8.5	*
1,2,3-Trichlorobenzene	*	0	0.011689	0.1817729	0.2545601	0.2989525	0.3414529	0.31376875	0.3564657			0.251	48.1	*
1,2-Dichlorobenzene	*	0	0.4827440	0.6145724	0.5679219	0.6598146	0.6936521	0.55434027	0.6178017			0.599	11.8	*
1,2-Dibromo-3-chloropropane	*	0	0.0407476	0.0560004	0.0572514	0.0681408	0.073632	0.06763812	0.0778787			0.063	20.1	*
1,2,4-Trichlorobenzene	*	0	0.0359409	0.2249886	0.2664332	0.3339649	0.3885810	0.34695778	0.3880182			0.284	44.0	*
Toluene-d8	*	1.6988853	1.467568	1.2936847	1.296312	1.3218618	1.4051439	1.21878561	1.2392156			1.368	11.5	*
4-Bromofluorobenzene	*	0.6621016	0.5417351	0.4799396	0.4503774	0.4475132	0.4908433	0.45972658	0.4106337			0.493	15.9	*
1,2-Dichloroethane-d4	*	1.974456	2.1787485	1.8266107	2.2134639	2.1560505	2.2892157	2.14067131	2.3128043			2.137	7.6	*

* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

Quantitation Report

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30830.D Vial: 8
Acq On : 4 Mar 2015 12:34 Operator: KGG
Sample : VSTD0.40 Inst : HP5972-2
Misc : ,,,ICAL_0.4,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 28 14:58 2015 Quant Results File: R8W0304.RES

Method : O:\MS\HP5972-2\METHODS\2015\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Sat Mar 28 14:59:23 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30830.D Vial: 8
Acq On : 4 Mar 2015 12:34 Operator: KGG
Sample : VSTD0.40 Inst : HP5972-2
Misc : ,,,ICAL_0.4,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 28 14:58 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Wed Mar 04 15:04:28 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	3.64	128	148332	50.00 ug/l	0.00
28) 1,4-Difluorobenzene	4.36	114	820216	50.00 ug/l	0.00
44) Chlorobenzene-d5	6.53	117	663229	50.00 ug/l	0.00
System Monitoring Compounds					
27) 1,2-Dichloroethane-d4	4.07	65	2343	0.37 ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 0.74%#		
46) Toluene-d8	5.43	98	9014	0.51 ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 1.02%#		
58) 4-Bromofluorobenzene	7.40	95	3513	0.57 ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 1.14%#		
Target Compounds					Qvalue
32) Benzene	4.05	78	5199	0.31 ug/l	94

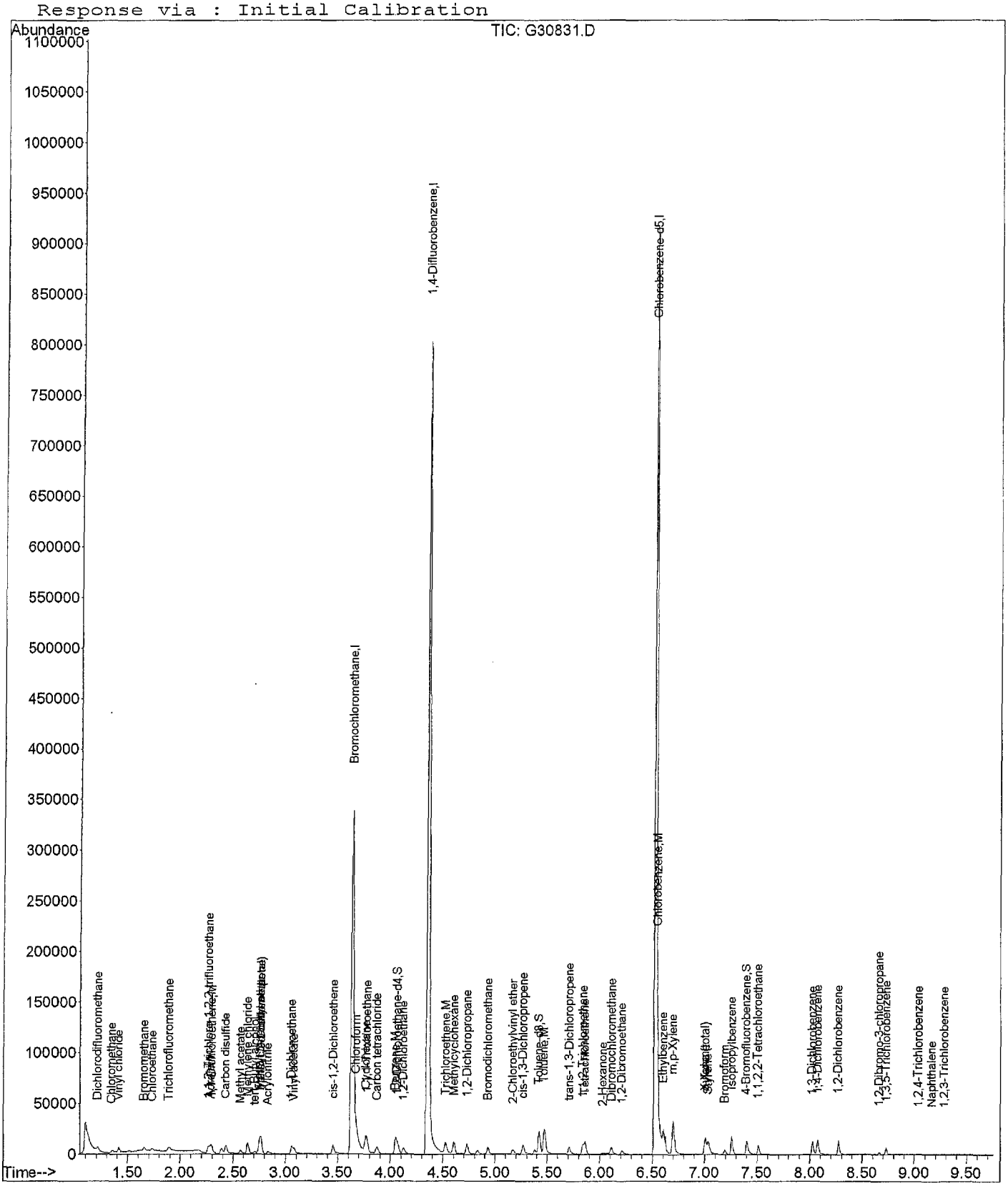
(#) = qualifier out of range (m) = manual integration

AECOM237 V157

Quantitation Report

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30831.D Vial: 9
Acq On : 4 Mar 2015 12:56 Operator: KGG
Sample : VSTD1.0 Inst : HP5972-2
Misc : ,,,ICAL_1.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 5 14:15 2015 Quant Results File: R8W0304.RES

Method : O:\MS\HP5972-2\METHODS\2015\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30831.D Vial: 9
Acq On : 4 Mar 2015 12:56 Operator: KGG
Sample : VSTD1.0 Inst : HP5972-2
Misc : ,,,ICAL_1.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 5 14:15 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:23:44 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.64	128	102054	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.36	114	580257	50.00	ug/l	0.00
44) Chlorobenzene-d5	6.53	117	457696	50.00	ug/l	0.00
System Monitoring Compounds						
27) 1,2-Dichloroethane-d4	4.07	65	4447	1.01	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 2.02%#			
46) Toluene-d8	5.42	98	13434	1.11	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 2.22%#			
58) 4-Bromofluorobenzene	7.40	95	4959	1.16	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 2.32%#			
Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.21	85	3611	1.40	ug/l	96
4) Chloromethane	1.35	50	3714	0.91	ug/l	97
5) Vinyl chloride	1.42	62	3379	0.84	ug/l	98
6) Bromomethane	1.66	94	1635	2.62	ug/l	98
7) Chloroethane	1.73	64	2014	0.92	ug/l	67
8) Trichlorofluoromethane	1.89	101	3436	0.83	ug/l	99
9) 1,1,2-Trichloro-1,2,2-trif	2.27	101	2555	0.84	ug/l	97
10) Acrolein	2.28	56	561	0.72	ug/l #	27
11) Methyl tert-butyl ether	2.76	73	10280	0.94	ug/l	97
12) tert-Butyl alcohol	2.71	59	1857	4.68	ug/l #	69
13) 1,1-Dichloroethene	2.30	96	2748	0.93	ug/l	93
14) Methylene chloride	2.64	84	3819	0.99	ug/l	91
15) trans-1,2-Dichloroethene	2.77	96	3277	0.92	ug/l	96
16) Acrylonitrile	2.83	53	1619	0.98	ug/l	80
17) 1,1-Dichloroethane	3.06	63	5543	0.87	ug/l	95
18) 1,2-Dichloroethene (total)	2.77	96	6648m	1.76	ug/l	
19) cis-1,2-Dichloroethene	3.46	96	3371 TI	0.86	ug/l	96
21) Chloroform	3.68	83	5344	0.90	ug/l #	1
22) Carbon disulfide	2.43	76	10318	0.89	ug/l	99
23) Methyl acetate	2.57	43	3926	1.04	ug/l	92
24) Vinyl acetate	3.08	43	7008 DKL	0.83	ug/l	97
26) 1,2-Dichloroethane	4.13	62	4334	0.90	ug/l	95
29) Cyclohexane	3.76	56	4982 3-9-15	0.96	ug/l	98
30) 1,1,1-Trichloroethane	3.78	97	4094	0.89	ug/l	99
31) Carbon tetrachloride	3.87	117	3580	0.87	ug/l	95
32) Benzene	4.05	78	12244	0.90	ug/l	99
33) Trichloroethene	4.53	130	3350	0.88	ug/l	97
34) Methylcyclohexane	4.61	83	3541	0.88	ug/l	97
35) 1,2-Dichloropropane	4.73	63	3188m MIP	0.91	ug/l	
37) Bromodichloromethane	4.93	83	3767	0.82	ug/l	97
38) 2-Chloroethylvinyl ether	5.16	63	1830	0.69	ug/l	90
39) cis-1,3-Dichloropropene	5.27	75	5011	0.85	ug/l	99
40) 1,1,2-Trichloroethane	5.84	97	2747	0.85	ug/l	97
41) Dibromochloromethane	6.11	129	3129	0.80	ug/l	97
42) trans-1,3-Dichloropropene	5.71	75	4248	0.81	ug/l	95
43) Bromoform	7.20	173	1989	0.76	ug/l	94
47) Toluene	5.47	91	16851	1.23	ug/l	98
48) 2-Hexanone	6.04	43	1764	0.62	ug/l #	48
49) Tetrachloroethene	5.86	164	2363	0.89	ug/l	94
50) 1,2-Dibromoethane	6.21	107	3244	0.91	ug/l	96
51) Chlorobenzene	6.55	112	7920	0.89	ug/l #	63
52) Ethylbenzene	6.61	106	3821	0.89	ug/l	98

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30831.D Vial: 9
Acq On : 4 Mar 2015 12:56 Operator: KGG
Sample : VSTD1.0 Inst : HP5972-2
Misc : ,,,ICAL_1.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 5 14:15 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:23:44 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
53) m,p-Xylene	6.70	106	9465	1.80 ug/l	96
54) o-Xylene	7.01	106	4420	0.83 ug/l	95
55) Xylene (total)	7.01	106	4420	0.83 ug/l	95
56) Styrene	7.03	104	7223	0.78 ug/l	90
57) Isopropylbenzene	7.26	105	10697	0.88 ug/l	97
59) 1,1,2,2-Tetrachloroethane	7.51	83	3682	0.92 ug/l	99
62) 1,3-Dichlorobenzene	8.02	146	4473	0.79 ug/l	97
63) 1,4-Dichlorobenzene	8.08	146	5457	0.92 ug/l	93
64) 1,2-Dichlorobenzene	8.27	146	4419	0.81 ug/l	90
65) 1,2-Dibromo-3-chloropropan	8.66	75	373	0.25 ug/l	91
66) 1,3,5-Trichlorobenzene	8.73	180	1841	0.71 ug/l	99
67) 1,2,4-Trichlorobenzene	9.04	180	329	0.66 ug/l #	72
68) Naphthalene	9.17	128	921	1.21 ug/l	100
69) 1,2,3-Trichlorobenzene	9.29	180	107	0.67 ug/l #	12

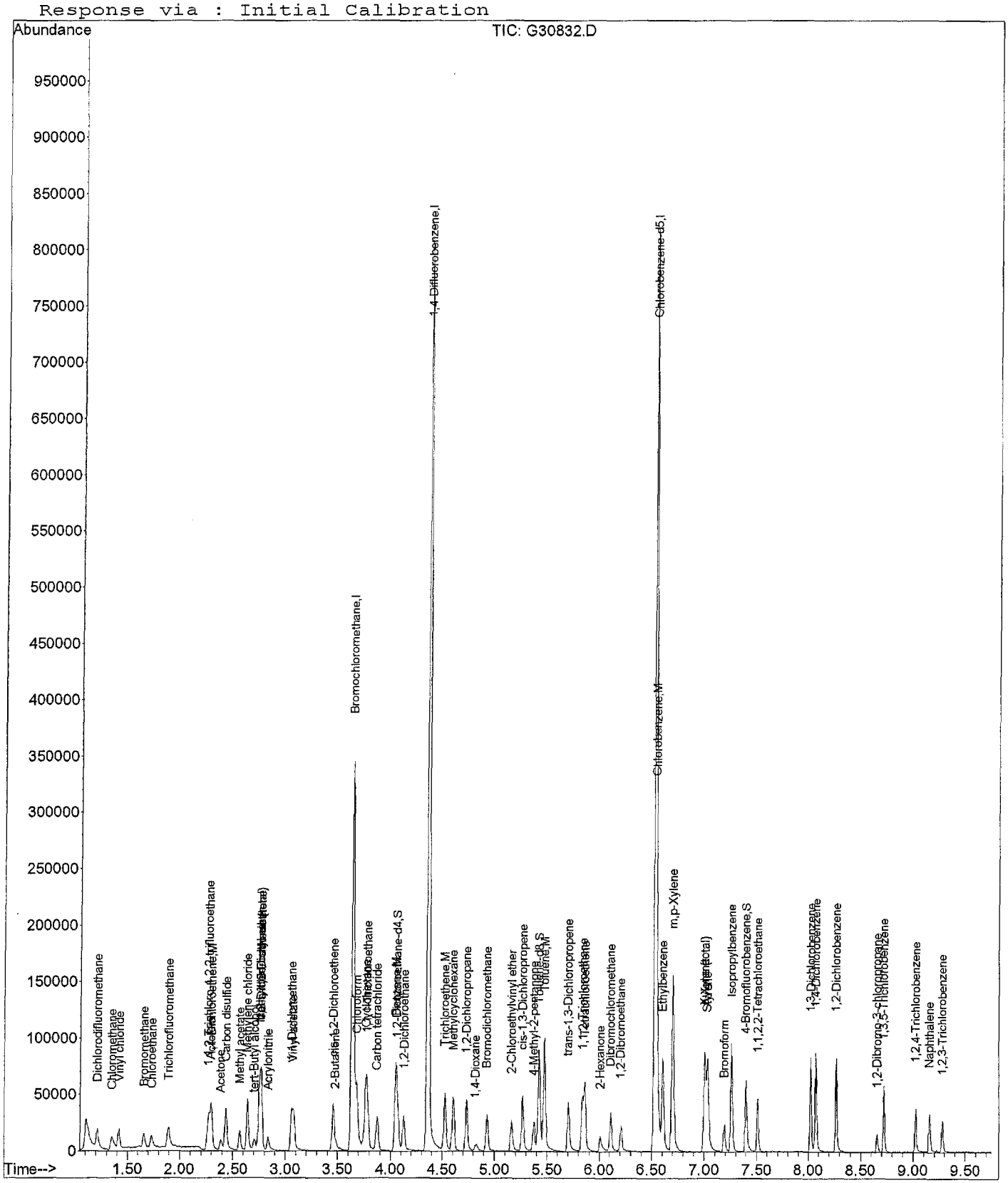
(#) = qualifier out of range (m) = manual integration

AECOM237 V160

Quantitation Report

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30832.D Vial: 10
Acq On : 4 Mar 2015 13:18 Operator: KGG
Sample : VSTD5.0 Inst : HP5972-2
Misc : ,,,ICAL_5.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 20:32 2015 Quant Results File: R8W0304.RES

Method : O:\MS\HP5972-2\METHODS\2015\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30832.D Vial: 10
Acq On : 4 Mar 2015 13:18 Operator: KGG
Sample : VSTD5.0 Inst : HP5972-2
Misc : ,,,ICAL_5.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 20:32 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Wed Mar 04 19:11:30 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	3.64	128	100952	50.00 ug/l	0.00
28) 1,4-Difluorobenzene	4.36	114	565286	50.00 ug/l	0.00
44) Chlorobenzene-d5	6.53	117	405176	50.00 ug/l	0.00
System Monitoring Compounds					
27) 1,2-Dichloroethane-d4	4.07	65	18440	4.23 ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 8.46%#		
46) Toluene-d8	5.43	98	52417	4.90 ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 9.80%#		
58) 4-Bromofluorobenzene	7.40	95	19446	5.12 ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 10.24%#		
Target Compounds					Qvalue
3) Dichlorodifluoromethane	1.21	85	15981	4.92 ug/l	98
4) Chloromethane	1.35	50	16538	4.10 ug/l	99
5) Vinyl chloride	1.42	62	14752	3.69 ug/l	98
6) Bromomethane	1.65	94	6930	4.68 ug/l	94
7) Chloroethane	1.73	64	8983	4.14 ug/l	89
8) Trichlorofluoromethane	1.89	101	15795	3.86 ug/l	98
9) 1,1,2-Trichloro-1,2,2-trif	2.27	101	12258	4.08 ug/l	96
10) Acrolein	2.28	56	3558	4.63 ug/l	89
11) Methyl tert-butyl ether	2.75	73	48110	4.43 ug/l	98
12) tert-Butyl alcohol	2.70	59	9280	23.65 ug/l	98
13) 1,1-Dichloroethene	2.30	96	11965	4.09 ug/l	99
14) Methylene chloride	2.64	84	17217	4.51 ug/l	99
15) trans-1,2-Dichloroethene	2.77	96	15187	4.29 ug/l	96
16) Acrylonitrile	2.84	53	7491	4.59 ug/l	98
17) 1,1-Dichloroethane	3.06	63	25812	4.11 ug/l	98
18) 1,2-Dichloroethene (total)	2.77	96	31934m TT	8.53 ug/l	
19) cis-1,2-Dichloroethene	3.46	96	16080	4.14 ug/l	95
20) Acetone	2.39	43	11977	3.86 ug/l	100
21) Chloroform	3.68	83	24204	4.14 ug/l	95
22) Carbon disulfide	2.43	76	48173 DRL	4.22 ug/l	95
23) Methyl acetate	2.57	43	17694	4.72 ug/l	97
24) Vinyl acetate	3.08	43	35626	4.28 ug/l	97
25) 2-Butanone	3.48	43	9553 3-9-14	4.61 ug/l	96
26) 1,2-Dichloroethane	4.13	62	20006	4.18 ug/l	100
29) Cyclohexane	3.76	56	20719	4.08 ug/l	99
30) 1,1,1-Trichloroethane	3.78	97	18713	4.16 ug/l	97
31) Carbon tetrachloride	3.88	117	16494	4.09 ug/l	97
32) Benzene	4.05	78	55656	4.21 ug/l	99
33) Trichloroethene	4.53	130	15076	4.08 ug/l	98
34) Methylcyclohexane	4.60	83	15245	3.89 ug/l	97
35) 1,2-Dichloropropane	4.74	63	14843	4.34 ug/l	98
36) 1,4-Dioxane	4.82	88	3652m	109.59 ug/l	
37) Bromodichloromethane	4.93	83	18424 MIP	4.10 ug/l	99
38) 2-Chloroethylvinyl ether	5.16	63	11275	4.35 ug/l	96
39) cis-1,3-Dichloropropene	5.27	75	23984	4.19 ug/l	98
40) 1,1,2-Trichloroethane	5.83	97	13861	4.42 ug/l	98
41) Dibromochloromethane	6.11	129	15796	4.14 ug/l	98
42) trans-1,3-Dichloropropene	5.70	75	21566	4.24 ug/l	98
43) Bromoform	7.19	173	10140	3.96 ug/l	98
45) 4-Methyl-2-pentanone	5.37	43	18537	5.08 ug/l	92
47) Toluene	5.47	91	59380	4.88 ug/l	98
48) 2-Hexanone	6.01	43	10661	4.26 ug/l	99

(#) = qualifier out of range (m) = manual integration

AECOM237 V162

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30832.D Vial: 10
Acq On : 4 Mar 2015 13:18 Operator: KGG
Sample : VSTD5.0 Inst : HP5972-2
Misc : ,,,ICAL_5.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 20:32 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Wed Mar 04 19:11:30 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

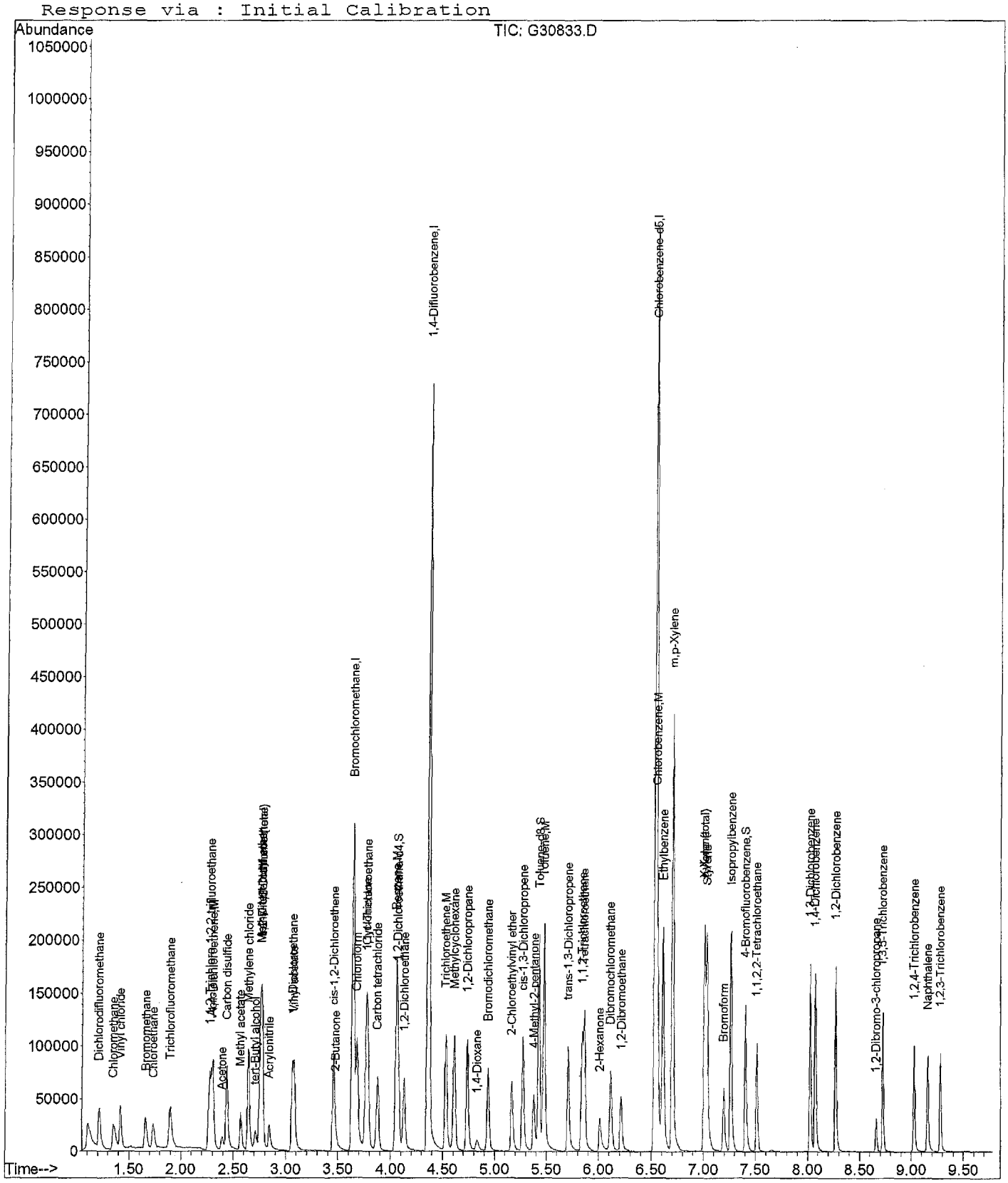
	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
49)	Tetrachloroethene	5.86	164	11325	4.84 ug/l		98
50)	1,2-Dibromoethane	6.21	107	14649	4.64 ug/l		98
51)	Chlorobenzene	6.55	112	33792	4.30 ug/l		95
52)	Ethylbenzene	6.61	106	15935	4.20 ug/l		99
53)	m,p-Xylene	6.70	106	41533	8.90 ug/l		100
54)	o-Xylene	7.01	106	22437	4.73 ug/l		95
55)	Xylene (total)	7.01	106	22437	4.73 ug/l		95
56)	Styrene	7.03	104	38929	4.77 ug/l		92
57)	Isopropylbenzene	7.26	105	51030	4.74 ug/l		100
59)	1,1,2,2-Tetrachloroethane	7.51	83	17974	5.06 ug/l		97
62)	1,3-Dichlorobenzene	8.02	146	24429	4.85 ug/l		99
63)	1,4-Dichlorobenzene	8.07	146	26373	5.00 ug/l		97
64)	1,2-Dichlorobenzene	8.27	146	24901	5.13 ug/l		93
65)	1,2-Dibromo-3-chloropropan	8.66	75	2269	6.45 ug/l	#	70
66)	1,3,5-Trichlorobenzene	8.72	180	13044	4.97 ug/l		99
67)	1,2,4-Trichlorobenzene	9.02	180	9116	5.45 ug/l		96
68)	Naphthalene	9.16	128	20531	7.61 ug/l		100
69)	1,2,3-Trichlorobenzene	9.28	180	7365	5.71 ug/l		100

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30833.D Vial: 11
Acq On : 4 Mar 2015 13:39 Operator: KGG
Sample : VSTD10.0 Inst : HP5972-2
Misc : ,,,ICAL_10.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 20:30 2015 Quant Results File: R8W0304.RES

Method : O:\MS\HP5972-2\METHODS\2015\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30833.D Vial: 11
Acq On : 4 Mar 2015 13:39 Operator: KGG
Sample : VSTD10.0 Inst : HP5972-2
Misc : ,,,ICAL_10.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 20:30 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Wed Mar 04 19:11:30 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.64	128	91088	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.36	114	517305	50.00	ug/l	0.00
44) Chlorobenzene-d5	6.53	117	425754	50.00	ug/l	0.00
System Monitoring Compounds						
27) 1,2-Dichloroethane-d4	4.07	65	40324	10.25	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 20.50%#			
46) Toluene-d8	5.43	98	110382	9.82	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 19.64%#			
58) 4-Bromofluorobenzene	7.40	95	38350	9.61	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 19.22%#			
Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.22	85	38819	10.22	ug/l	98
4) Chloromethane	1.35	50	36397	10.01	ug/l	100
5) Vinyl chloride	1.41	62	36266	10.05	ug/l	99
6) Bromomethane	1.66	94	17765	9.64	ug/l	99
7) Chloroethane	1.73	64	19948	10.18	ug/l	100
8) Trichlorofluoromethane	1.89	101	36248	9.82	ug/l	99
9) 1,1,2-Trichloro-1,2,2-trif	2.27	101	27258	10.06	ug/l	98
10) Acrolein	2.29	56	7242	10.44	ug/l	95
11) Methyl tert-butyl ether	2.75	73	103911	10.61	ug/l	98
12) tert-Butyl alcohol	2.71	59	17637	49.82	ug/l	99
13) 1,1-Dichloroethene	2.30	96	26520	10.05	ug/l	94
14) Methylene chloride	2.64	84	36183	10.50	ug/l	96
15) trans-1,2-Dichloroethene	2.77	96	33255	10.42	ug/l	96
16) Acrylonitrile	2.84	53	15189	10.32	ug/l	98
17) 1,1-Dichloroethane	3.06	63	59348	10.47	ug/l	100
18) 1,2-Dichloroethene (total)	2.77	96	70286m	20.80	ug/l	
19) cis-1,2-Dichloroethene	3.46	96	36288 TI	10.37	ug/l	97
20) Acetone	2.39	43	15847	8.26	ug/l	92
21) Chloroform	3.68	83	53912	10.23	ug/l	98
22) Carbon disulfide	2.44	76	102500	9.95	ug/l	97
23) Methyl acetate	2.57	43	34673	10.25	ug/l	100
24) Vinyl acetate	3.08	43	79079	10.54	ug/l	99
25) 2-Butanone	3.48	43	18451	9.88	ug/l	99
26) 1,2-Dichloroethane	4.13	62	44496	10.30	ug/l	99
29) Cyclohexane	3.76	56	47784	10.29	ug/l	99
30) 1,1,1-Trichloroethane	3.78	97	42950	10.43	ug/l	98
31) Carbon tetrachloride	3.87	117	37169	10.08	ug/l	99
32) Benzene	4.05	78	125974	10.41	ug/l	99
33) Trichloroethene	4.53	130	33792	10.00	ug/l	98
34) Methylcyclohexane	4.61	83	36522	10.18	ug/l	99
35) 1,2-Dichloropropane	4.74	63	32203 MIP	10.28	ug/l	98
36) 1,4-Dioxane	4.82	88	8644m	283.45	ug/l	
37) Bromodichloromethane	4.93	83	41958 DRL	10.20	ug/l	98
38) 2-Chloroethylvinyl ether	5.16	63	24039	10.14	ug/l	99
39) cis-1,3-Dichloropropene	5.27	75	52803 3-4-15	10.09	ug/l	100
40) 1,1,2-Trichloroethane	5.84	97	31022	10.82	ug/l	99
41) Dibromochloromethane	6.11	129	35530	10.18	ug/l	99
42) trans-1,3-Dichloropropene	5.70	75	48404	10.39	ug/l	99
43) Bromoform	7.19	173	23857	10.18	ug/l	99
45) 4-Methyl-2-pentanone	5.38	43	36911	9.63	ug/l	94
47) Toluene	5.48	91	126649	9.90	ug/l	98
48) 2-Hexanone	6.01	43	25348	9.65	ug/l	99

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30833.D Vial: 11
Acq On : 4 Mar 2015 13:39 Operator: KGG
Sample : VSTD10.0 Inst : HP5972-2
Misc : ,,,ICAL_10.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 20:30 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Wed Mar 04 19:11:30 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

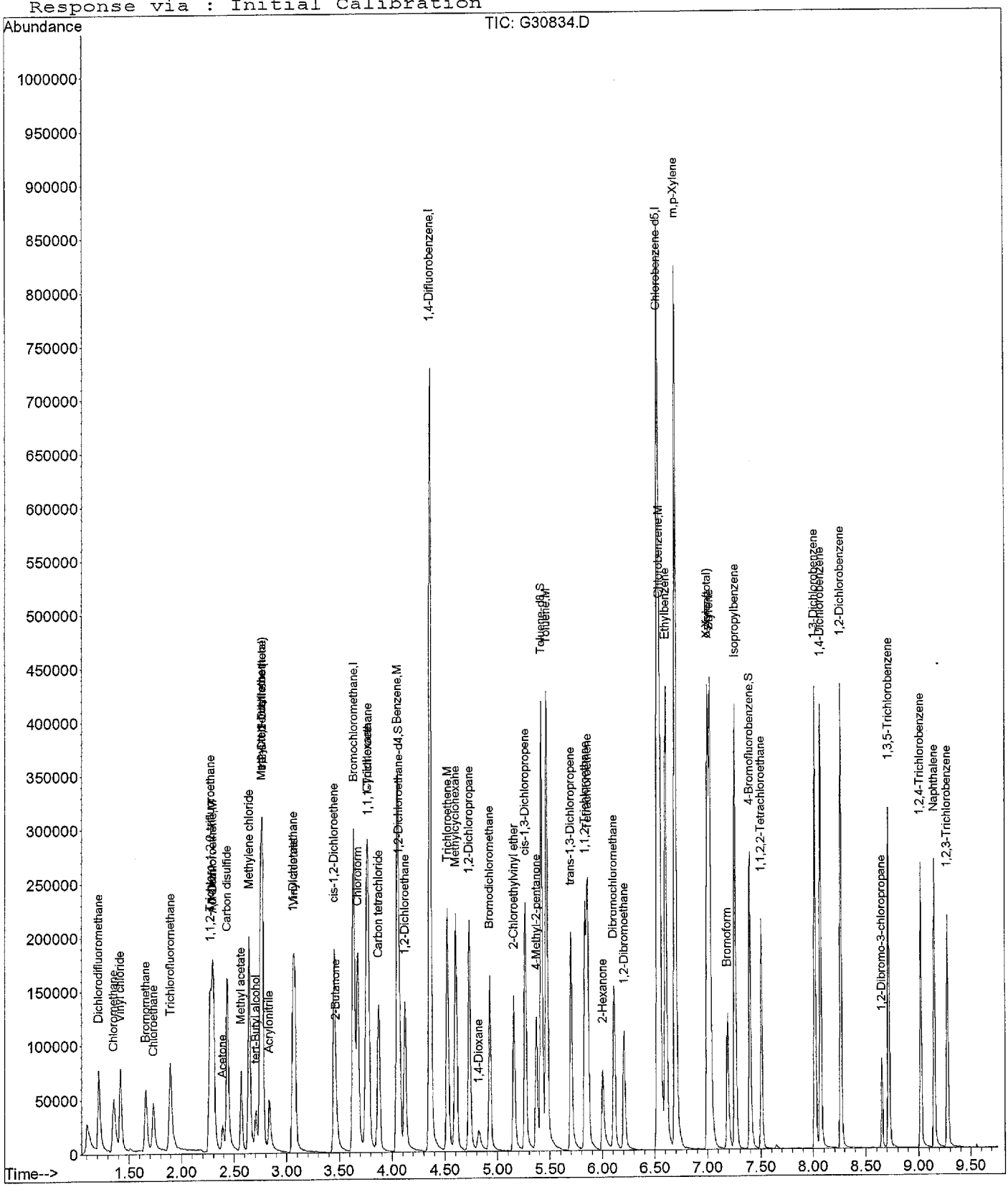
	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
49)	Tetrachloroethene	5.86	164	24984	10.16 ug/l	98
50)	1,2-Dibromoethane	6.21	107	33760	10.18 ug/l	98
51)	Chlorobenzene	6.56	112	85737	10.38 ug/l	98
52)	Ethylbenzene	6.61	106	41489	10.41 ug/l	98
53)	m,p-Xylene	6.70	106	106065	21.63 ug/l	100
54)	o-Xylene	7.01	106	51962	10.43 ug/l	93
55)	Xylene (total)	7.01	106	51962	10.43 ug/l	93
56)	Styrene	7.03	104	89908	10.49 ug/l	89
57)	Isopropylbenzene	7.27	105	116980	10.33 ug/l	99
59)	1,1,2,2-Tetrachloroethane	7.51	83	36059	9.66 ug/l	99
62)	1,3-Dichlorobenzene	8.02	146	48529	9.18 ug/l	100
63)	1,4-Dichlorobenzene	8.08	146	50679	9.15 ug/l	97
64)	1,2-Dichlorobenzene	8.27	146	48359	9.49 ug/l	94
65)	1,2-Dibromo-3-chloropropan	8.65	75	4875	10.24 ug/l	84
66)	1,3,5-Trichlorobenzene	8.72	180	27783	9.18 ug/l	99
67)	1,2,4-Trichlorobenzene	9.03	180	22687	9.43 ug/l	99
68)	Naphthalene	9.16	128	54997	10.97 ug/l	100
69)	1,2,3-Trichlorobenzene	9.28	180	21676	10.30 ug/l	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30834.D Vial: 12
Acq On : 4 Mar 2015 14:00 Operator: KGG
Sample : VSTD20.0 Inst : HP5972-2
Misc : ,,,ICAL_20.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 20:29 2015 Quant Results File: R8W0304.RES

Method : O:\MS\HP5972-2\METHODS\2015\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration



AECOM237 V167

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30834.D Vial: 12
Acq On : 4 Mar 2015 14:00 Operator: KGG
Sample : VSTD20.0 Inst : HP5972-2
Misc : ,,,ICAL_20.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 20:29 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Wed Mar 04 19:11:30 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.64	128	91009	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.36	114	507170	50.00	ug/l	0.00
44) Chlorobenzene-d5	6.53	117	423278	50.00	ug/l	0.00
System Monitoring Compounds						
27) 1,2-Dichloroethane-d4	4.07	65	78488	19.97	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 39.94%#			
46) Toluene-d8	5.42	98	223806	20.02	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 40.04%#			
58) 4-Bromofluorobenzene	7.40	95	75769	19.10	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 38.20%#			
Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.22	85	76236	18.36	ug/l	99
4) Chloromethane	1.36	50	71290	19.62	ug/l	99
5) Vinyl chloride	1.42	62	70093	19.43	ug/l	100
6) Bromomethane	1.66	94	36174	17.69	ug/l	95
7) Chloroethane	1.73	64	38955	19.90	ug/l	95
8) Trichlorofluoromethane	1.90	101	73202	19.85	ug/l	99
9) 1,1,2-Trichloro-1,2,2-trif	2.27	101	57304	21.16	ug/l	97
10) Acrolein	2.29	56	15725	22.68	ug/l	99
11) Methyl tert-butyl ether	2.75	73	204282	20.88	ug/l	98
12) tert-Butyl alcohol	2.71	59	35553	100.51	ug/l	98
13) 1,1-Dichloroethene	2.30	96	55134	20.92	ug/l	92
14) Methylene chloride	2.64	84	71680	20.81	ug/l	97
15) trans-1,2-Dichloroethene	2.77	96	66023	20.70	ug/l	96
16) Acrylonitrile	2.83	53	30049	20.42	ug/l	94
17) 1,1-Dichloroethane	3.06	63	118464	20.92	ug/l	98
18) 1,2-Dichloroethene (total)	2.77	96	140064m TI	41.49	ug/l	
19) cis-1,2-Dichloroethene	3.45	96	73142	20.91	ug/l	100
20) Acetone	2.39	43	28638	19.46	ug/l	96
21) Chloroform	3.68	83	107005	20.31	ug/l	98
22) Carbon disulfide	2.44	76	214771	20.87	ug/l	97
23) Methyl acetate	2.57	43	70007 DRL	20.71	ug/l	98
24) Vinyl acetate	3.07	43	159055 3-9-15	21.21	ug/l	99
25) 2-Butanone	3.48	43	38491	20.63	ug/l	97
26) 1,2-Dichloroethane	4.12	62	87040	20.16	ug/l	99
29) Cyclohexane	3.76	56	92630	20.34	ug/l	99
30) 1,1,1-Trichloroethane	3.78	97	82994	20.55	ug/l	98
31) Carbon tetrachloride	3.87	117	73490	20.32	ug/l	98
32) Benzene	4.05	78	244174	20.57	ug/l	99
33) Trichloroethene	4.53	130	67231	20.29	ug/l	99
34) Methylcyclohexane	4.61	83	71254	20.25	ug/l	98
35) 1,2-Dichloropropane	4.73	63	63464 MIP	20.67	ug/l	97
36) 1,4-Dioxane	4.82	88	16816m	562.44	ug/l	
37) Bromodichloromethane	4.93	83	85206	21.13	ug/l	99
38) 2-Chloroethylvinyl ether	5.16	63	49203	21.16	ug/l	99
39) cis-1,3-Dichloropropene	5.27	75	109837	21.40	ug/l	100
40) 1,1,2-Trichloroethane	5.84	97	59987	21.33	ug/l	99
41) Dibromochloromethane	6.11	129	72101	21.07	ug/l	100
42) trans-1,3-Dichloropropene	5.70	75	95511	20.91	ug/l	100
43) Bromoform	7.19	173	49100	21.37	ug/l	100
45) 4-Methyl-2-pentanone	5.37	43	79729	20.92	ug/l	93
47) Toluene	5.47	91	246692	19.40	ug/l	100
48) 2-Hexanone	6.01	43	55151	21.11	ug/l	99

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30834.D Vial: 12
Acq On : 4 Mar 2015 14:00 Operator: KGG
Sample : VSTD20.0 Inst : HP5972-2
Misc : ,,,ICAL_20.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 20:29 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Wed Mar 04 19:11:30 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

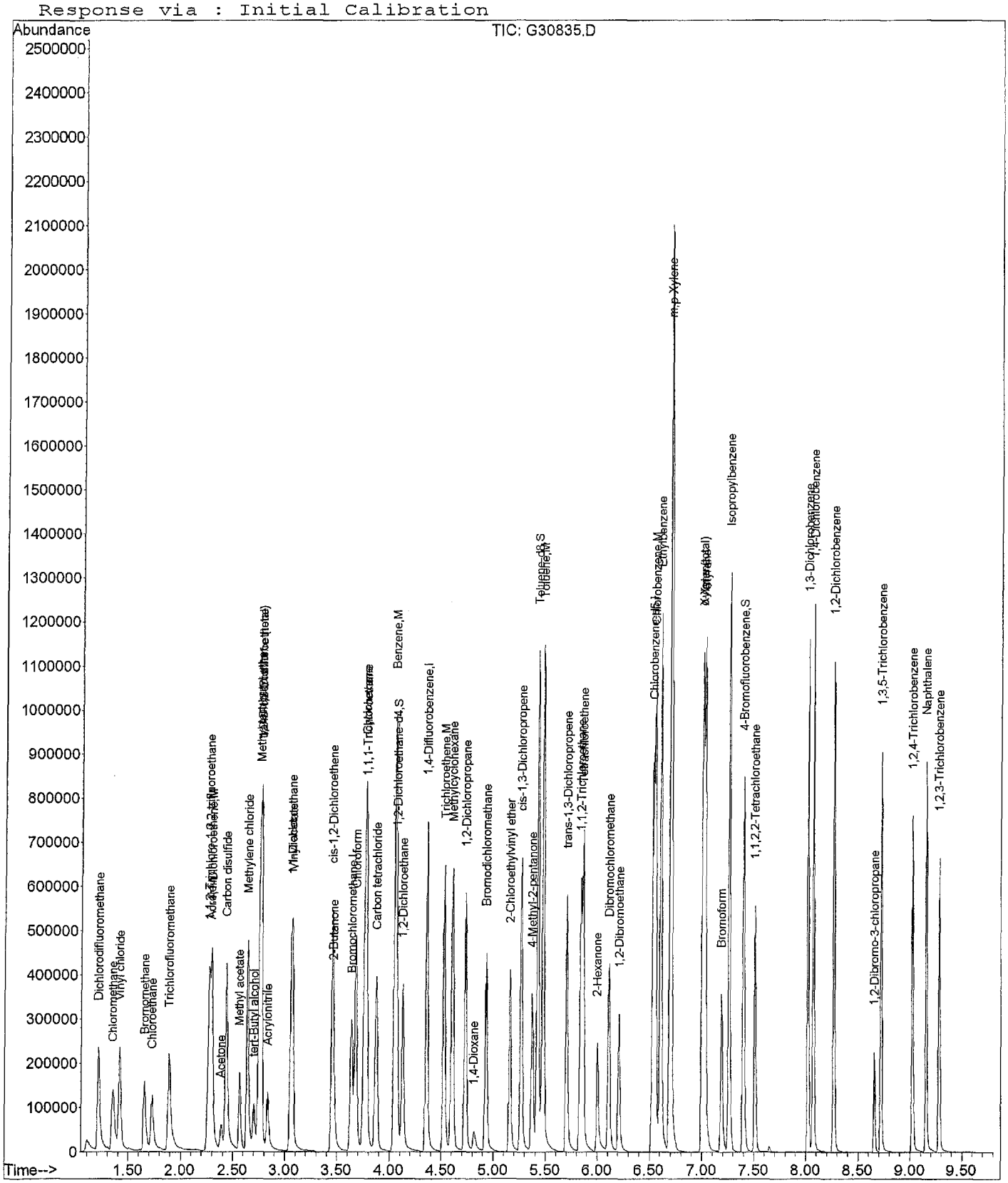
	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
49)	Tetrachloroethene	5.86	164	49276	20.16 ug/l	100
50)	1,2-Dibromoethane	6.21	107	67994	20.63 ug/l	100
51)	Chlorobenzene	6.55	112	170067	20.70 ug/l	100
52)	Ethylbenzene	6.61	106	82256	20.76 ug/l	100
53)	m,p-Xylene	6.70	106	207550	42.58 ug/l	100
54)	o-Xylene	7.00	106	104562	21.11 ug/l	96
55)	Xylene (total)	7.00	106	104562	21.11 ug/l	96
56)	Styrene	7.03	104	184159	21.62 ug/l	91
57)	Isopropylbenzene	7.26	105	218506	19.41 ug/l	99
59)	1,1,2,2-Tetrachloroethane	7.51	83	76165	20.52 ug/l	99
62)	1,3-Dichlorobenzene	8.02	146	114101	21.70 ug/l	99
63)	1,4-Dichlorobenzene	8.07	146	117934	21.41 ug/l	98
64)	1,2-Dichlorobenzene	8.26	146	111714	22.04 ug/l	93
65)	1,2-Dibromo-3-chloropropan	8.65	75	11537	20.47 ug/l	81
66)	1,3,5-Trichlorobenzene	8.72	180	64888	20.37 ug/l	99
67)	1,2,4-Trichlorobenzene	9.02	180	56544	19.81 ug/l	99
68)	Naphthalene	9.15	128	140281	19.64 ug/l	100
69)	1,2,3-Trichlorobenzene	9.28	180	50616	19.95 ug/l	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30835.D Vial: 13
Acq On : 4 Mar 2015 14:22 Operator: KGG
Sample : VSTD50 Inst : HP5972-2
Misc : ,,,ICAL_50,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 20:27 2015 Quant Results File: R8W0304.RES

Method : O:\MS\HP5972-2\METHODS\2015\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30835.D Vial: 13
Acq On : 4 Mar 2015 14:22 Operator: KGG
Sample : VSTD50 Inst : HP5972-2
Misc : ,,,ICAL_50,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 20:27 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Wed Mar 04 19:11:30 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.64	128	91188	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.36	114	515233	50.00	ug/l	0.00
44) Chlorobenzene-d5	6.54	117	428428	50.00	ug/l	0.00
System Monitoring Compounds						
27) 1,2-Dichloroethane-d4	4.07	65	208749	53.00	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 106.00%			
46) Toluene-d8	5.42	98	602003	53.21	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 106.42%			
58) 4-Bromofluorobenzene	7.40	95	210291	52.36	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 104.72%			
Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.21	85	237816	53.36	ug/l	100
4) Chloromethane	1.35	50	202855	55.73	ug/l	99
5) Vinyl chloride	1.42	62	215321	59.58	ug/l	100
6) Bromomethane	1.66	94	110832	51.80	ug/l	97
7) Chloroethane	1.73	64	113521	57.89	ug/l	99
8) Trichlorofluoromethane	1.89	101	219385	59.38	ug/l	100
9) 1,1,2-Trichloro-1,2,2-trif	2.27	101	153078	56.42	ug/l	99
10) Acrolein	2.28	56	38878	55.97	ug/l	98
11) Methyl tert-butyl ether	2.75	73	540583	55.15	ug/l	99
12) tert-Butyl alcohol	2.70	59	96027	270.93	ug/l	97
13) 1,1-Dichloroethene	2.30	96	147128	55.72	ug/l	94
14) Methylene chloride	2.64	84	182073	52.76	ug/l	98
15) trans-1,2-Dichloroethene	2.77	96	183155	57.30	ug/l	96
16) Acrylonitrile	2.83	53	79003	53.59	ug/l	100
17) 1,1-Dichloroethane	3.06	63	325288	57.33	ug/l	99
18) 1,2-Dichloroethene (total)	2.77	96	387695m TI	114.61	ug/l	
19) cis-1,2-Dichloroethene	3.45	96	200809	57.30	ug/l	99
20) Acetone	2.39	43	66636	52.57	ug/l	95
21) Chloroform	3.68	83	293879	55.68	ug/l	98
22) Carbon disulfide	2.43	76	568669	55.15	ug/l	98
23) Methyl acetate	2.56	43	172727 DRL	51.01	ug/l	99
24) Vinyl acetate	3.08	43	415972 3-9-15	55.37	ug/l	99
25) 2-Butanone	3.47	43	105212	56.27	ug/l	96
26) 1,2-Dichloroethane	4.13	62	230968	53.39	ug/l	98
29) Cyclohexane	3.77	56	268641	58.06	ug/l	99
30) 1,1,1-Trichloroethane	3.78	97	238020	58.03	ug/l	100
31) Carbon tetrachloride	3.87	117	209578	57.04	ug/l	100
32) Benzene	4.05	78	682919	56.64	ug/l	100
33) Trichloroethene	4.53	130	191484	56.89	ug/l	99
34) Methylcyclohexane	4.61	83	207261	57.99	ug/l	99
35) 1,2-Dichloropropane	4.73	63	172673 MIP	55.35	ug/l	98
36) 1,4-Dioxane	4.82	88	39227m	1291.47	ug/l	
37) Bromodichloromethane	4.93	83	234291	57.19	ug/l	99
38) 2-Chloroethylvinyl ether	5.16	63	138969	58.83	ug/l	99
39) cis-1,3-Dichloropropene	5.27	75	300571	57.64	ug/l	100
40) 1,1,2-Trichloroethane	5.84	97	159188	55.72	ug/l	99
41) Dibromochloromethane	6.12	129	197357	56.76	ug/l	100
42) trans-1,3-Dichloropropene	5.71	75	269058	57.99	ug/l	99
43) Bromoform	7.19	173	135655	58.12	ug/l	99
45) 4-Methyl-2-pentanone	5.37	43	220602	57.19	ug/l	96
47) Toluene	5.47	91	676892	52.59	ug/l	100
48) 2-Hexanone	6.00	43	154020	58.26	ug/l	100

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30835.D Vial: 13
Acq On : 4 Mar 2015 14:22 Operator: KGG
Sample : VSTD50 Inst : HP5972-2
Misc : ,,,ICAL_50,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 20:27 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Wed Mar 04 19:11:30 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

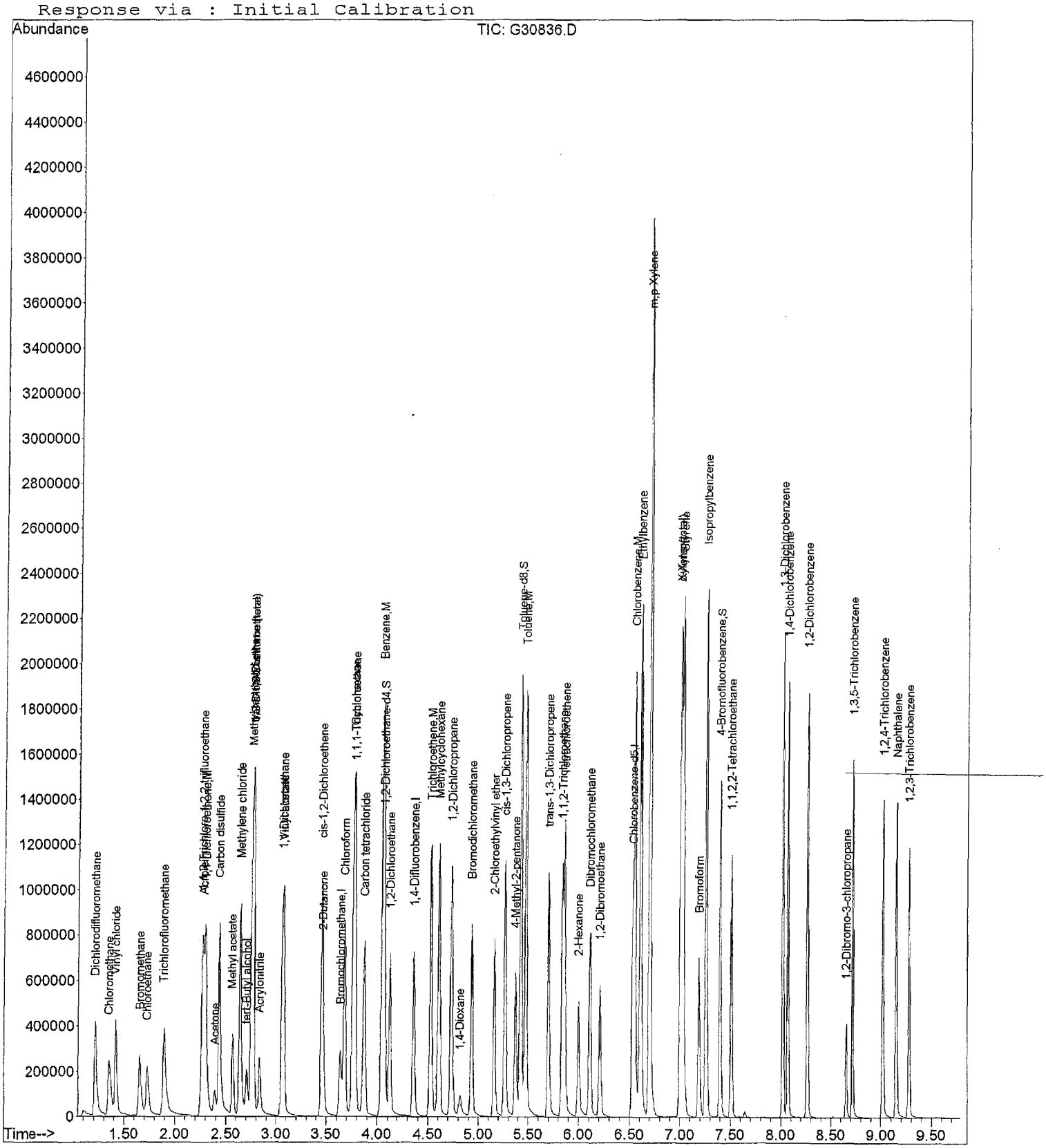
	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
49)	Tetrachloroethene	5.86	164	138460	55.97	ug/l		99
50)	1,2-Dibromoethane	6.21	107	180472	54.10	ug/l		99
51)	Chlorobenzene	6.55	112	470250	56.56	ug/l		99
52)	Ethylbenzene	6.61	106	230264	57.43	ug/l		99
53)	m,p-Xylene	6.70	106	548871	111.25	ug/l		99
54)	o-Xylene	7.01	106	276804	55.22	ug/l		96
55)	Xylene (total)	7.01	106	276804	55.22	ug/l		96
56)	Styrene	7.03	104	482983	56.01	ug/l		91
57)	Isopropylbenzene	7.26	105	653442	57.35	ug/l		99
59)	1,1,2,2-Tetrachloroethane	7.51	83	206360	54.94	ug/l		99
62)	1,3-Dichlorobenzene	8.02	146	309619	58.18	ug/l		99
63)	1,4-Dichlorobenzene	8.07	146	318684	57.16	ug/l		99
64)	1,2-Dichlorobenzene	8.27	146	297180	57.93	ug/l		94
65)	1,2-Dibromo-3-chloropropan	8.66	75	31546	50.51	ug/l	#	79
66)	1,3,5-Trichlorobenzene	8.72	180	175119	52.85	ug/l		99
67)	1,2,4-Trichlorobenzene	9.02	180	166479	52.78	ug/l		98
68)	Naphthalene	9.16	128	461418	51.58	ug/l		100
69)	1,2,3-Trichlorobenzene	9.28	180	146288	51.11	ug/l		99

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30836.D Vial: 14
Acq On : 4 Mar 2015 14:43 Operator: KGG
Sample : VSTD100 Inst : HP5972-2
Misc : ,,,ICAL_100,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 16:49 2015 Quant Results File: R8W0304.RES

Method : O:\MS\HP5972-2\METHODS\2015\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30836.D Vial: 14
Acq On : 4 Mar 2015 14:43 Operator: KGG
Sample : VSTD100 Inst : HP5972-2
Misc : ,,,ICAL_100,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 16:49 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Wed Mar 04 15:44:17 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.64	128	90420	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.36	114	515650	50.00	ug/l	0.00
44) Chlorobenzene-d5	6.53	117	431724	50.00	ug/l	0.00
System Monitoring Compounds						
27) 1,2-Dichloroethane-d4	4.07	65	387119	99.12	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 198.24%#			
46) Toluene-d8	5.42	98	1052358	92.31	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 184.62%#			
58) 4-Bromofluorobenzene	7.39	95	396950	98.09	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 196.18%#			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.21	85	424679	109.12	ug/l	100
4) Chloromethane	1.35	50	367907	101.93	ug/l	100
5) Vinyl chloride	1.42	62	388052	108.29	ug/l	100
6) Bromomethane	1.66	94	203954	115.93	ug/l	97
7) Chloroethane	1.73	64	206433	106.17	ug/l	99
8) Trichlorofluoromethane	1.89	101	405204	110.60	ug/l	100
9) 1,1,2-Trichloro-1,2,2-trif	2.27	101	295262	109.75	ug/l	99
10) Acrolein	2.28	56	72108	104.69	ug/l	99
11) Methyl tert-butyl ether	2.75	73	998465	102.74	ug/l	99
12) tert-Butyl alcohol	2.70	59	181981	517.80	ug/l	98
13) 1,1-Dichloroethene	2.30	96	284020	108.47	ug/l	94
14) Methylene chloride	2.64	84	355658	103.93	ug/l	98
15) trans-1,2-Dichloroethene	2.77	96	337688	106.54	ug/l	97
16) Acrylonitrile	2.83	53	151242	103.47	ug/l	99
17) 1,1-Dichloroethane	3.06	63	609997 TI	108.41	ug/l	100
18) 1,2-Dichloroethene (total)	2.77	96	712901m	212.47	ug/l	
19) cis-1,2-Dichloroethene	3.45	96	373461	107.47	ug/l	98
20) Acetone	2.39	43	122963	57.89	ug/l	96
21) Chloroform	3.68	83	552018	105.48	ug/l	98
22) Carbon disulfide	2.43	76	1151045	112.59	ug/l	97
23) Methyl acetate	2.56	43	344125 DEL	102.49	ug/l	99
24) Vinyl acetate	3.07	43	805599 3-9-15	108.14	ug/l	99
25) 2-Butanone	3.47	43	191503	103.29	ug/l	98
26) 1,2-Dichloroethane	4.12	62	441070	102.83	ug/l	99
29) Cyclohexane	3.76	56	498121	107.57	ug/l	98
30) 1,1,1-Trichloroethane	3.78	97	440210	107.23	ug/l	99
31) Carbon tetrachloride	3.87	117	401503	109.19	ug/l	100
32) Benzene	4.05	78	1269303	105.20	ug/l	99
33) Trichloroethene	4.53	130	366586	108.82	ug/l	98
34) Methylcyclohexane	4.61	83	395252	110.50	ug/l	99
35) 1,2-Dichloropropane	4.73	63	326622	104.62	ug/l	99
36) 1,4-Dioxane	4.82	88	81939m	2708.09	ug/l	
37) Bromodichloromethane	4.93	83	444018 MIP	108.30	ug/l	99
38) 2-Chloroethylvinyl ether	5.16	63	259131	109.60	ug/l	100
39) cis-1,3-Dichloropropene	5.27	75	536717	102.84	ug/l	99
40) 1,1,2-Trichloroethane	5.84	97	285844	99.98	ug/l	99
41) Dibromochloromethane	6.11	129	381864	109.74	ug/l	100
42) trans-1,3-Dichloropropene	5.70	75	472986	101.86	ug/l	100
43) Bromoform	7.19	173	265235	113.54	ug/l	100
45) 4-Methyl-2-pentanone	5.37	43	375536	96.61	ug/l	96
47) Toluene	5.47	91	1116457	86.07	ug/l	100
48) 2-Hexanone	6.00	43	295823	111.04	ug/l	100

(#) = qualifier out of range (m) = manual integration

AECOM237 V174

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30836.D Vial: 14
Acq On : 4 Mar 2015 14:43 Operator: KGG
Sample : VSTD100 Inst : HP5972-2
Misc : ,,,ICAL_100,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 16:49 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Wed Mar 04 15:44:17 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

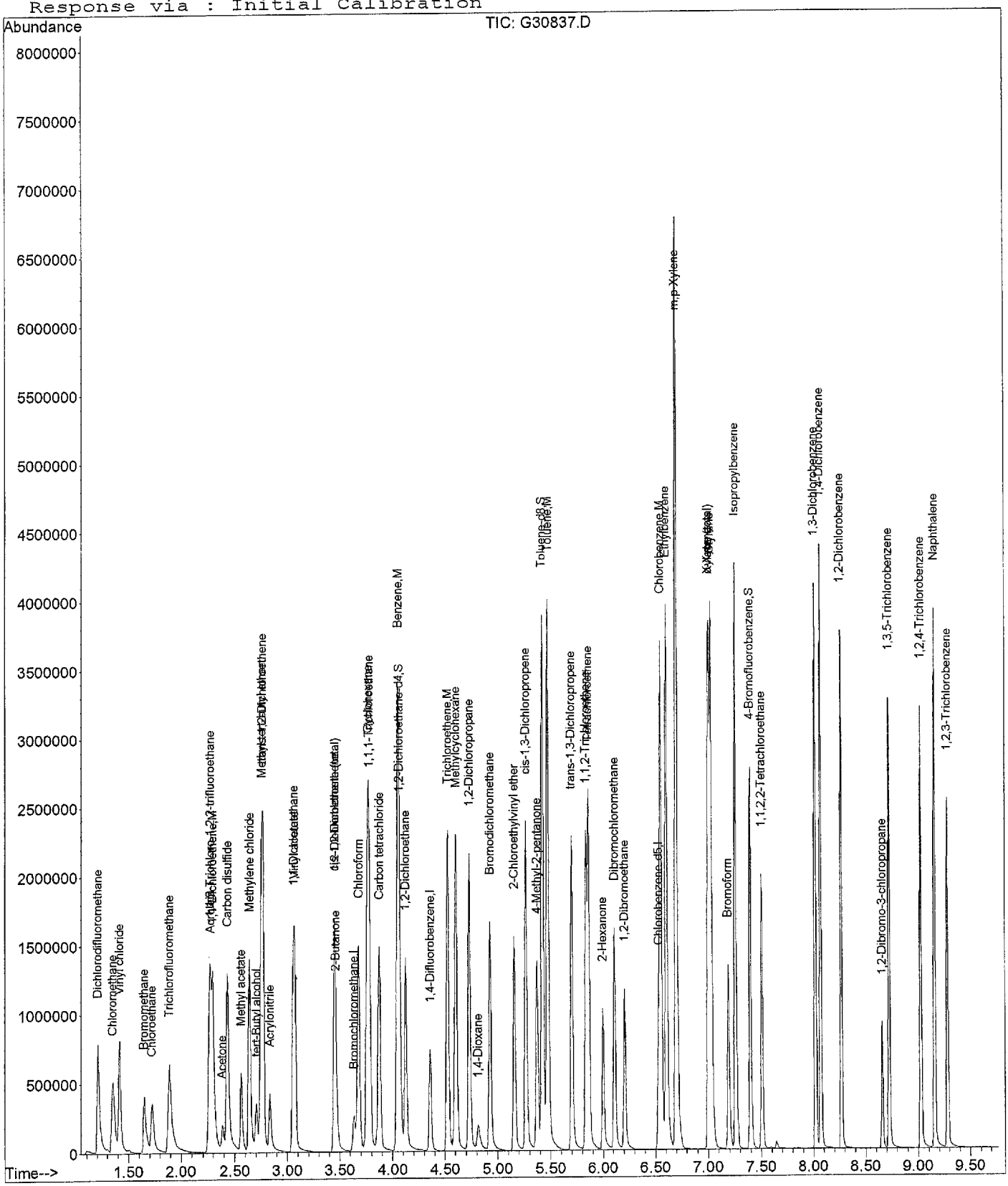
	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
49)	Tetrachloroethene	5.86	164	247236	99.18	ug/l		99
50)	1,2-Dibromoethane	6.21	107	344408	102.46	ug/l		99
51)	Chlorobenzene	6.55	112	884915	105.62	ug/l		98
52)	Ethylbenzene	6.61	106	429610	106.32	ug/l		100
53)	m,p-Xylene	6.70	106	1047221	210.65	ug/l		100
54)	o-Xylene	7.00	106	539616	106.82	ug/l		96
55)	Xylene (total)	7.00	106	539616	106.82	ug/l		96
56)	Styrene	7.03	104	937318	107.88	ug/l		90
57)	Isopropylbenzene	7.26	105	1232503	107.34	ug/l		99
59)	1,1,2,2-Tetrachloroethane	7.51	83	396720	104.82	ug/l		100
62)	1,3-Dichlorobenzene	8.02	146	548947	102.36	ug/l		99
63)	1,4-Dichlorobenzene	8.07	146	531034	94.51	ug/l		99
64)	1,2-Dichlorobenzene	8.26	146	478644	92.59	ug/l		93
65)	1,2-Dibromo-3-chloropropan	8.65	75	58402	107.29	ug/l	#	80
66)	1,3,5-Trichlorobenzene	8.71	180	322625	108.57	ug/l		99
67)	1,2,4-Trichlorobenzene	9.02	180	299580	112.96	ug/l		99
68)	Naphthalene	9.15	128	774959	119.89	ug/l		100
69)	1,2,3-Trichlorobenzene	9.27	180	270923m	124.27	ug/l		

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30837.D Vial: 15
Acq On : 4 Mar 2015 15:05 Operator: KGG
Sample : VSTD200 Inst : HP5972-2
Misc : ,,,ICAL_200,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 16:46 2015 Quant Results File: R8W0304.RES

Method : O:\MS\HP5972-2\METHODS\2015\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration



AECOM237 V176

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30837.D Vial: 15
Acq On : 4 Mar 2015 15:05 Operator: KGG
Sample : VSTD200 Inst : HP5972-2
Misc : ,,,ICAL_200,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 16:46 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Wed Mar 04 15:44:17 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.64	128	80297	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.36	114	520210	50.00	ug/l	0.00
44) Chlorobenzene-d5	6.53	117	433729	50.00	ug/l	0.00
System Monitoring Compounds						
27) 1,2-Dichloroethane-d4	4.07	65	742845	214.18	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 428.36%#			
46) Toluene-d8	5.42	98	2149935	187.71	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 375.42%#			
58) 4-Bromofluorobenzene	7.40	95	712415	175.23	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 350.46%#			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.21	85	812902	235.21	ug/l	100
4) Chloromethane	1.35	50	737981	230.25	ug/l	100
5) Vinyl chloride	1.42	62	748763	235.29	ug/l	100
6) Bromomethane	1.65	94	324442	207.67	ug/l	99
7) Chloroethane	1.72	64	352844	204.34	ug/l	100
8) Trichlorofluoromethane	1.89	101	734239	225.68	ug/l	99
9) 1,1,2-Trichloro-1,2,2-trif	2.27	101	503093	210.57	ug/l	99
10) Acrolein	2.28	56	123378	201.72	ug/l	98
11) Methyl tert-butyl ether	2.75	73	1622733	188.02	ug/l	99
12) tert-Butyl alcohol	2.71	59	311172	997.01	ug/l	98
13) 1,1-Dichloroethene	2.29	96	465652	200.25	ug/l	98
14) Methylene chloride	2.64	84	562336	185.05	ug/l	99
15) trans-1,2-Dichloroethene	2.77	96	528035	187.60	ug/l	98
16) Acrylonitrile	2.83	53	244381	188.27	ug/l	99
17) 1,1-Dichloroethane	3.06	63	981035 TI	196.34	ug/l	100
18) 1,2-Dichloroethene (total)	3.45	96	1152532m	386.80	ug/l	
19) cis-1,2-Dichloroethene	3.45	96	622610	201.75	ug/l	98
20) Acetone	2.38	43	205593	108.99	ug/l	99
21) Chloroform	3.68	83	985434	212.03	ug/l	98
22) Carbon disulfide	2.43	76	1804892	198.80	ug/l	99
23) Methyl acetate	2.56	43	545183 DKL	182.84	ug/l	99
24) Vinyl acetate	3.07	43	1332164 3-9-15	201.36	ug/l	100
25) 2-Butanone	3.47	43	329245	199.97	ug/l	97
26) 1,2-Dichloroethane	4.12	62	865005	227.08	ug/l	99
29) Cyclohexane	3.76	56	883367	189.09	ug/l	99
30) 1,1,1-Trichloroethane	3.78	97	810740	195.76	ug/l	100
31) Carbon tetrachloride	3.87	117	786356	211.99	ug/l	100
32) Benzene	4.05	78	2440489	200.49	ug/l	100
33) Trichloroethene	4.53	130	720001	211.86	ug/l	99
34) Methylcyclohexane	4.61	83	755955	209.49	ug/l	99
35) 1,2-Dichloropropane	4.73	63	636595	202.12	ug/l	100
36) 1,4-Dioxane	4.82	88	165716m	5428.91	ug/l	
37) Bromodichloromethane	4.93	83	876882 MIP	212.01	ug/l	100
38) 2-Chloroethylvinyl ether	5.16	63	523780	219.60	ug/l	99
39) cis-1,3-Dichloropropene	5.27	75	1104369	209.75	ug/l	100
40) 1,1,2-Trichloroethane	5.84	97	576404	199.84	ug/l	99
41) Dibromochloromethane	6.11	129	750338	213.75	ug/l	100
42) trans-1,3-Dichloropropene	5.70	75	1008639	215.31	ug/l	99
43) Bromoform	7.19	173	503071	213.46	ug/l	100
45) 4-Methyl-2-pentanone	5.37	43	803856	205.84	ug/l	97
47) Toluene	5.48	91	2415192	185.33	ug/l	100
48) 2-Hexanone	6.00	43	579090	216.36	ug/l	100

(#) = qualifier out of range (m) = manual integration

AECOM237 V177

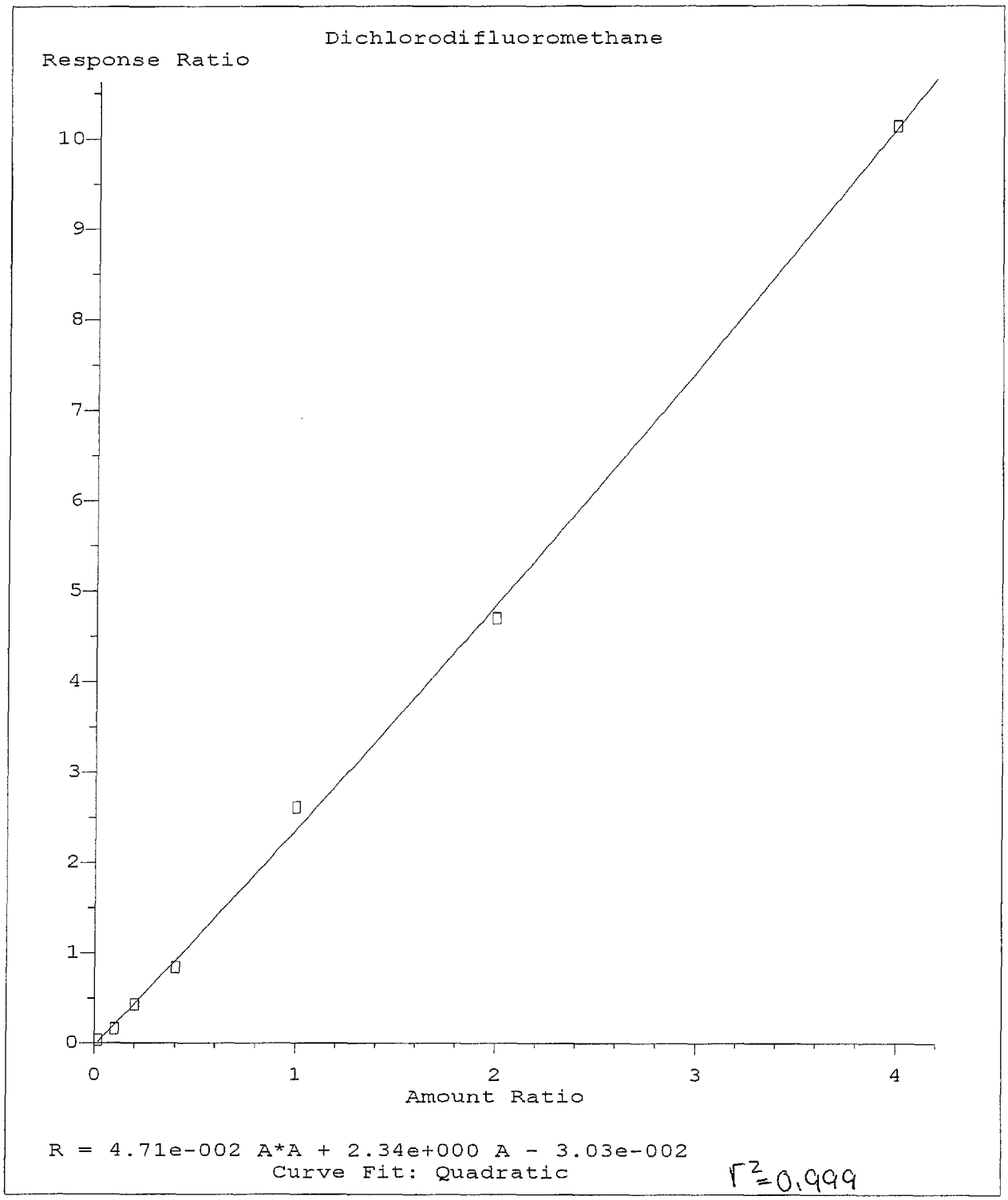
Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30837.D Vial: 15
Acq On : 4 Mar 2015 15:05 Operator: KGG
Sample : VSTD200 Inst : HP5972-2
Misc : ,,,ICAL_200,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Mar 4 16:46 2015 Quant Results File: R8W0304.RES

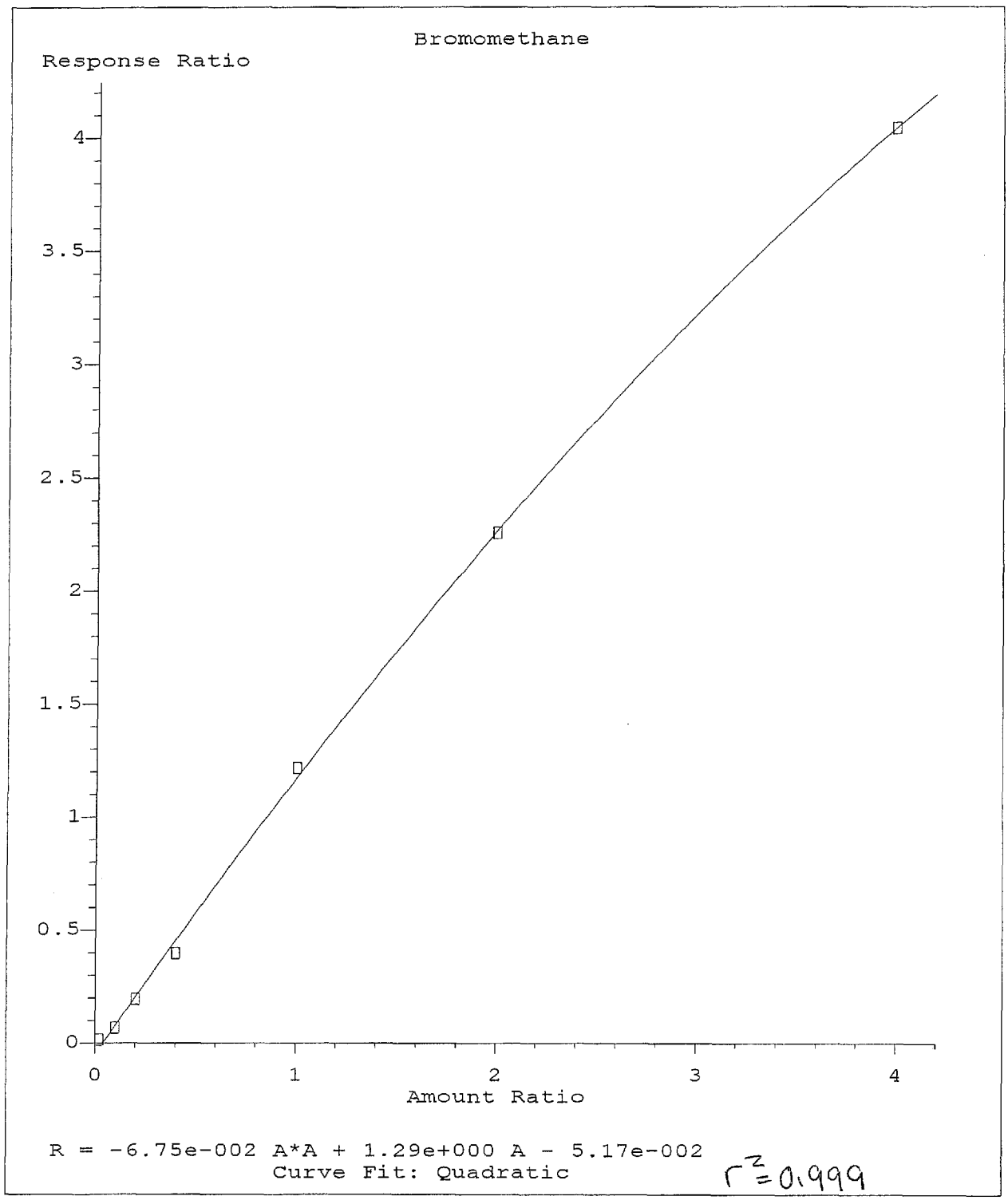
Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Wed Mar 04 15:44:17 2015
Response via : Initial Calibration
DataAcq Meth : R8W0304

	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
49)	Tetrachloroethene	5.86	164	501793	200.37 ug/l		99
50)	1,2-Dibromoethane	6.21	107	678339	200.87 ug/l		100
51)	Chlorobenzene	6.55	112	1664337	197.73 ug/l		99
52)	Ethylbenzene	6.61	106	792829	195.31 ug/l		100
53)	m,p-Xylene	6.70	106	1797807	359.96 ug/l		100
54)	o-Xylene	7.01	106	971100	191.35 ug/l		96
55)	Xylene (total)	7.01	106	971100	191.35 ug/l		96
56)	Styrene	7.03	104	1626877	186.37 ug/l		90
57)	Isopropylbenzene	7.26	105	2191934	190.02 ug/l		99
59)	1,1,2,2-Tetrachloroethane	7.51	83	708157	186.23 ug/l		100
62)	1,3-Dichlorobenzene	8.02	146	1134124	210.51 ug/l		98
63)	1,4-Dichlorobenzene	8.07	146	1140492	202.05 ug/l		99
64)	1,2-Dichlorobenzene	8.27	146	1071834	206.38 ug/l		95
65)	1,2-Dibromo-3-chloropropan	8.65	75	135113	247.07 ug/l	#	78
66)	1,3,5-Trichlorobenzene	8.73	180	683785	229.04 ug/l		99
67)	1,2,4-Trichlorobenzene	9.03	180	673179	252.66 ug/l		100
68)	Naphthalene	9.16	128	2053866	316.29 ug/l		100
69)	1,2,3-Trichlorobenzene	9.29	180	618438	282.37 ug/l		100

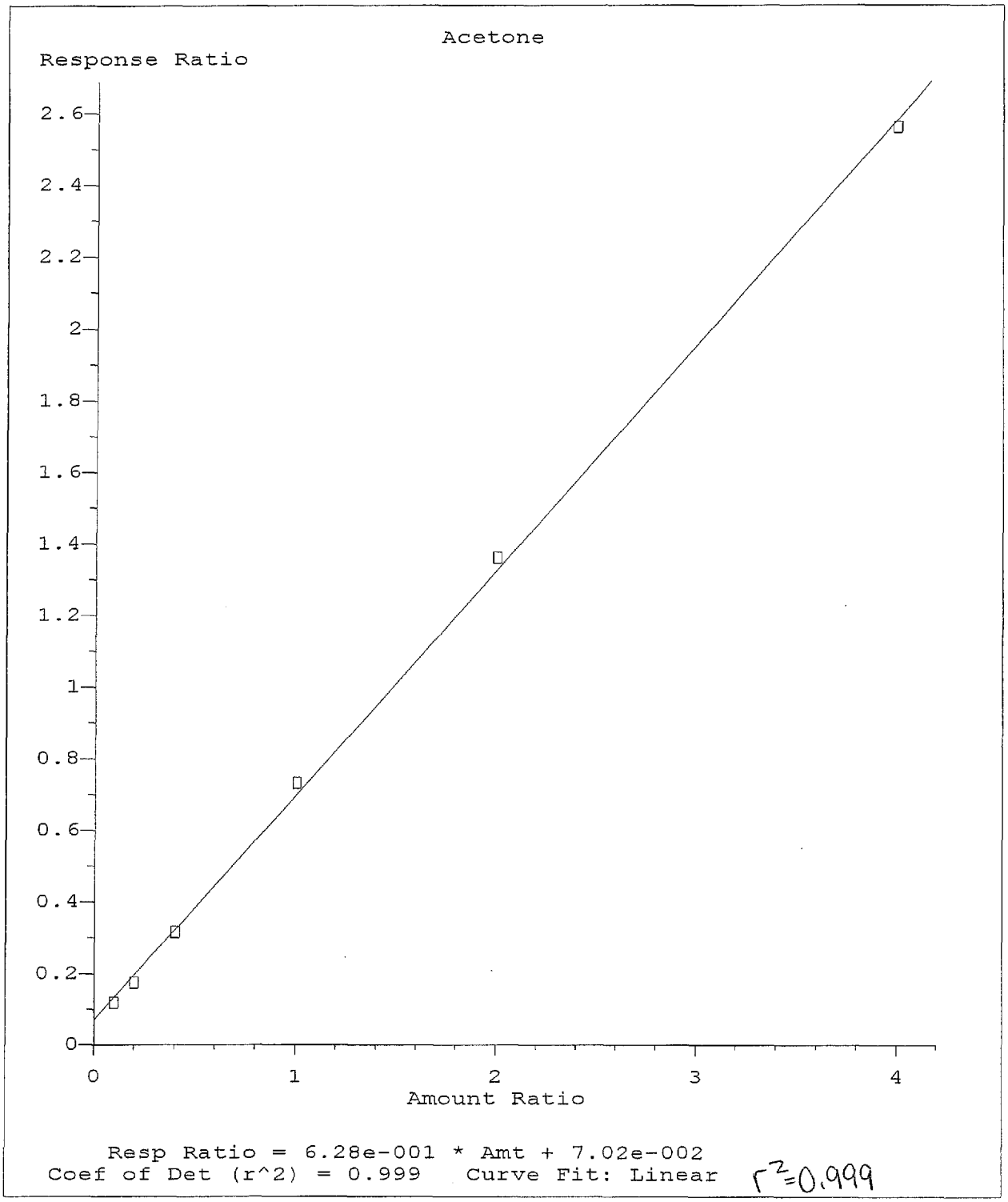
(#) = qualifier out of range (m) = manual integration



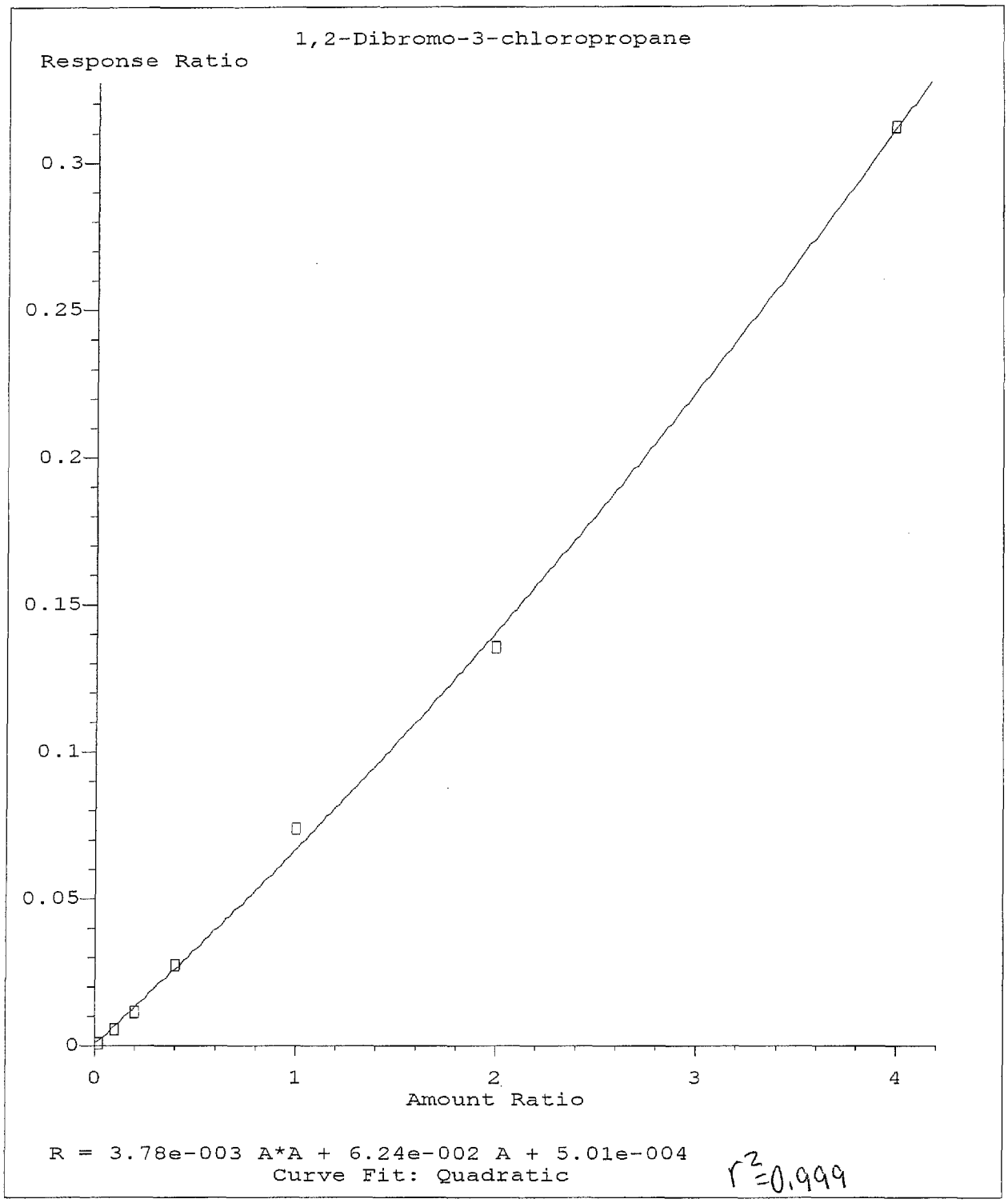
Method Name: O:\MS\HP5972-2\METHODS\2015\R8W0304.M
Calibration Table Last Updated: Thu Mar 05 10:59:15 2015



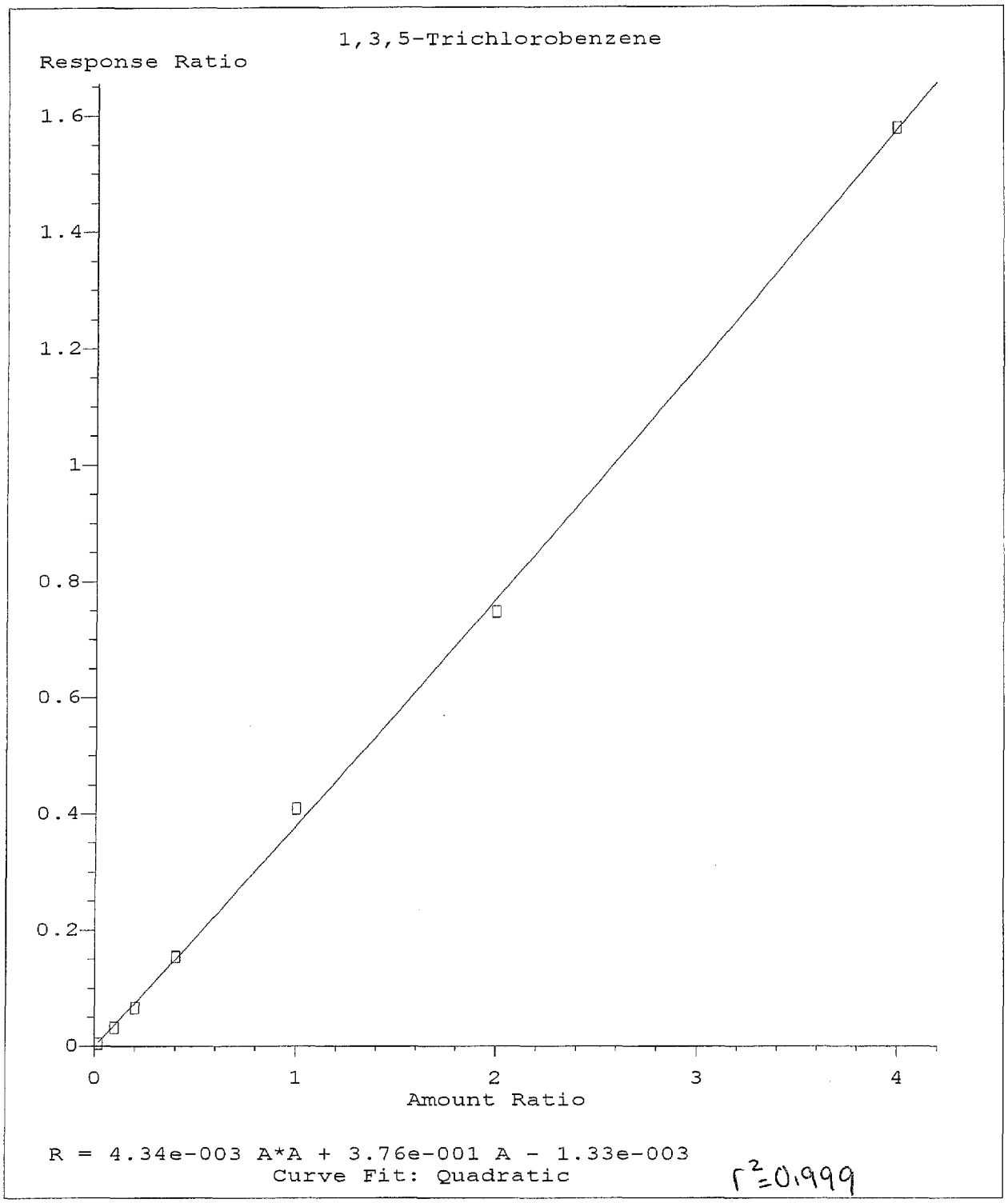
Method Name: O:\MS\HP5972-2\METHODS\2015\R8W0304.M
Calibration Table Last Updated: Thu Mar 05 10:59:15 2015



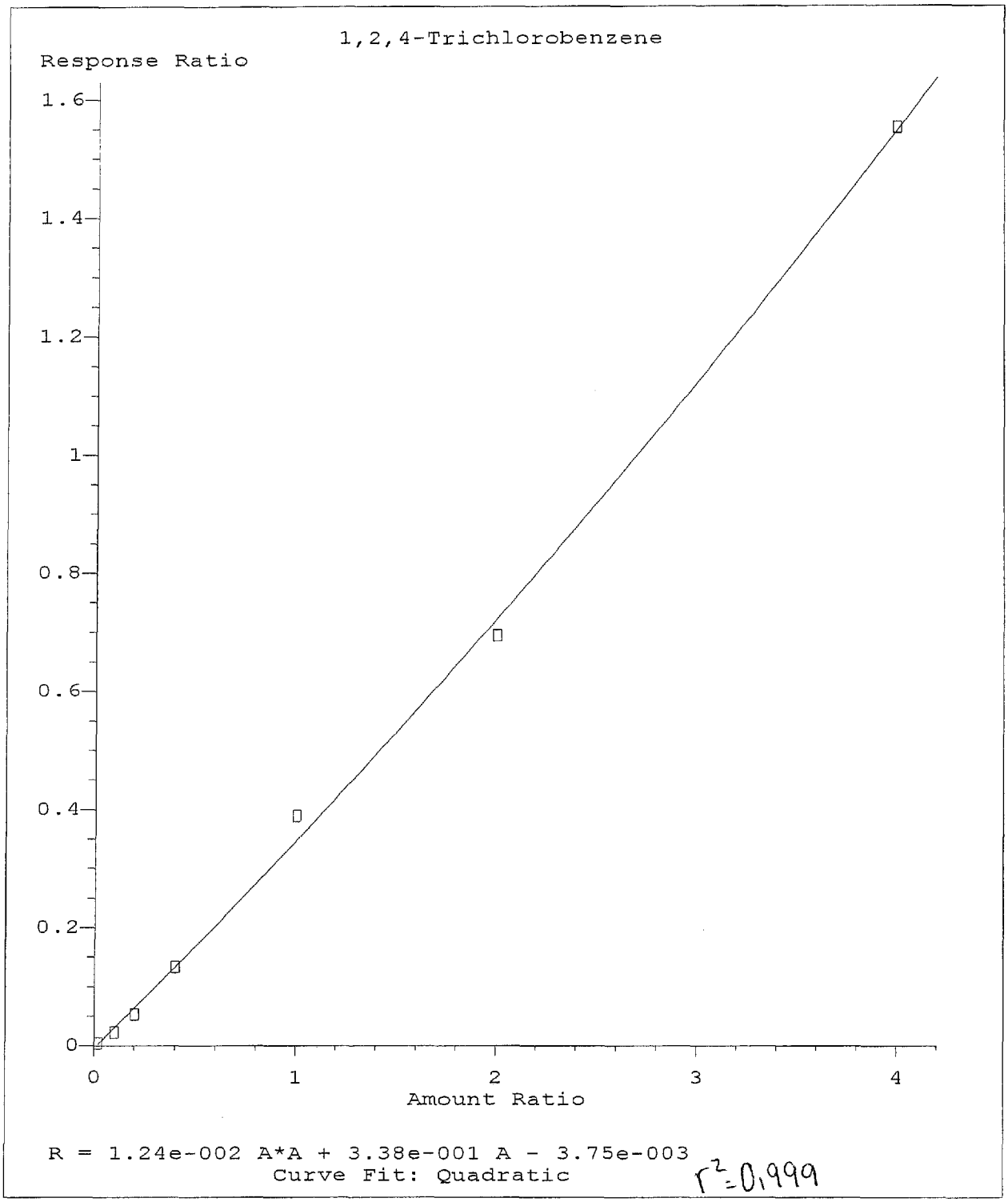
Method Name: O:\MS\HP5972-2\METHODS\2015\R8W0304.M
Calibration Table Last Updated: Thu Mar 05 10:59:15 2015



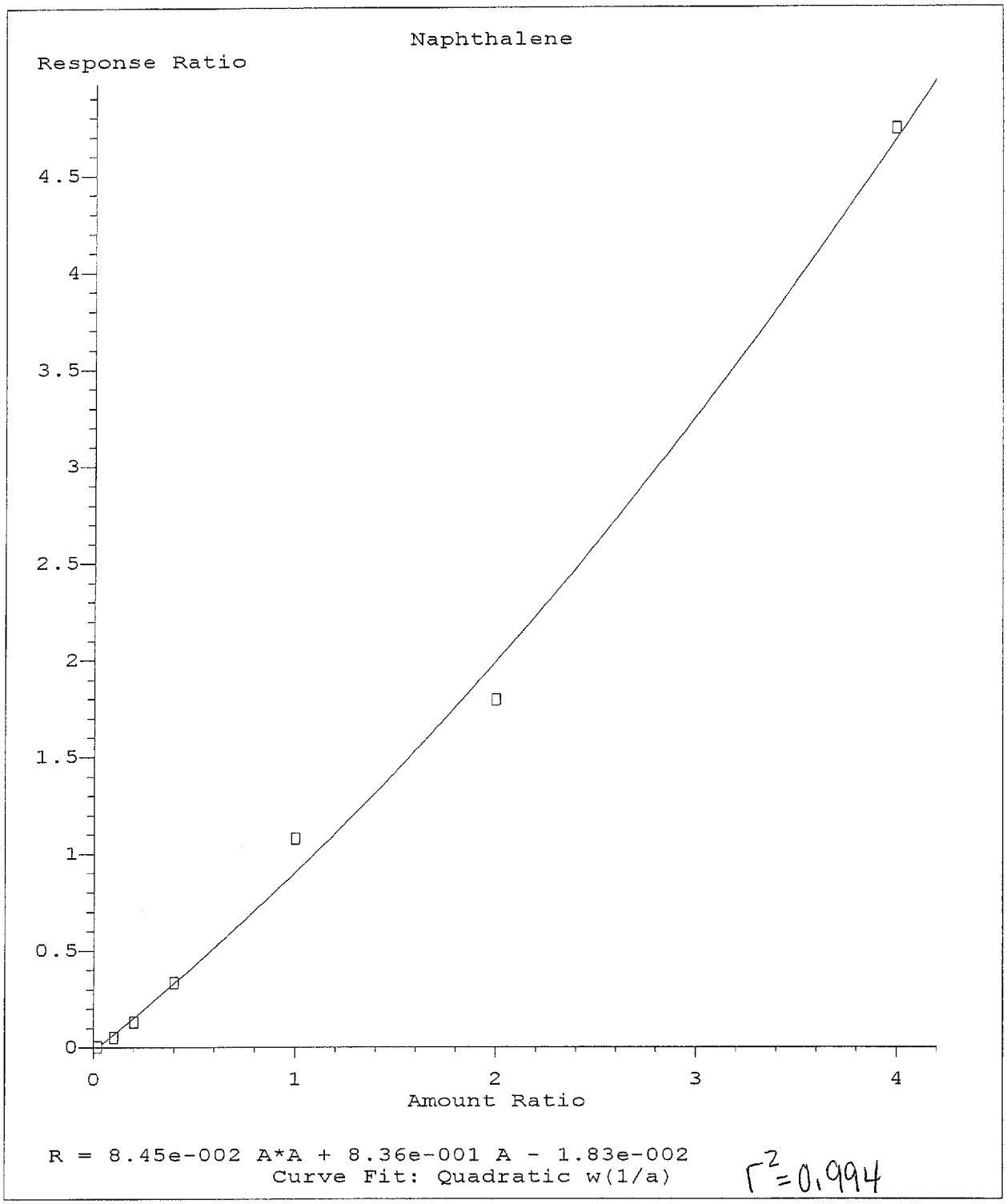
Method Name: O:\MS\HP5972-2\METHODS\2015\R8W0304.M
Calibration Table Last Updated: Thu Mar 05 10:59:15 2015



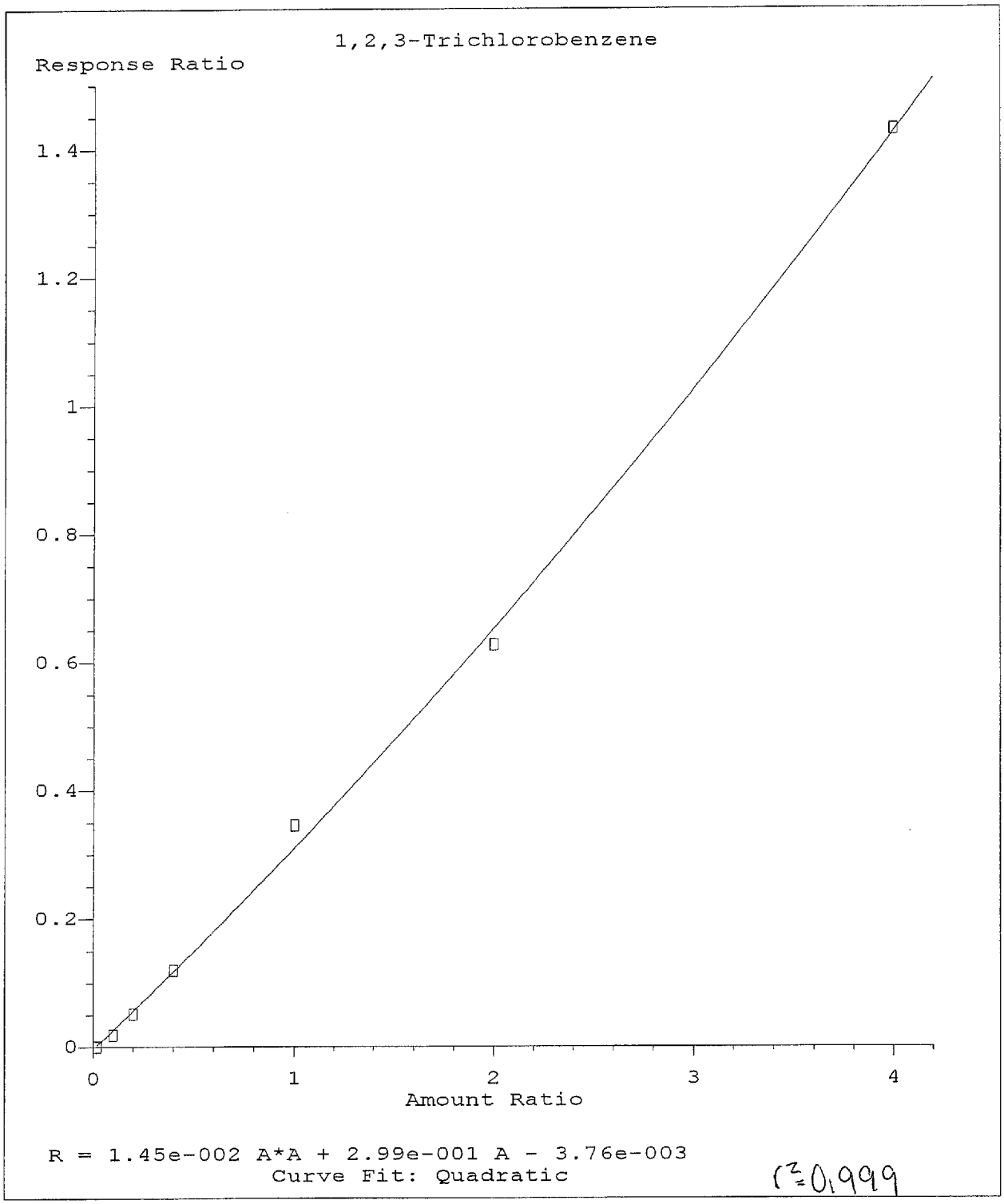
Method Name: O:\MS\HP5972-2\METHODS\2015\R8W0304.M
Calibration Table Last Updated: Thu Mar 05 10:59:15 2015



Method Name: O:\MS\HP5972-2\METHODS\2015\R8W0304.M
Calibration Table Last Updated: Thu Mar 05 10:59:15 2015



Method Name: O:\MS\HP5972-2\METHODS\2015\R8W0304.M
Calibration Table Last Updated: Thu Mar 05 10:59:15 2015



Method Name: O:\MS\HP5972-2\METHODS\2015\R8W0304.M
Calibration Table Last Updated: Thu Mar 05 10:59:15 2015

Form 6

VOCS IN SOIL INITIAL CALIBRATION DATA

Lab Name: PACE ANALYTICAL Contract: PACE ANALYTICAL

Lab Code: 10478 Case No.: AECOM-N SAS No.: SDG No.: AECOM237

Instrument ID: HP5971 Calibration Dates: 4/3/2015 4/3/2015

Heated Purge: (Y/N) N Calibration Times: 12:58 15:00

GC Column: Rtx-624 ID: .18 (mm)

LAB FILE ID: STD005= 15\A85721.D STD010= 15\A85722.D STD020= 15\A85723.D STD050= 15\A85724.D STD100= 15\A85725.D
STD200= 15\A85726.D STD001= 15\A85720.D

COMPOUND		Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7				RRF	% RSD	R^2
Dichlorodifluoromethane	*	1.678038	1.5648154	1.9266734	2.1372256	2.3770036	2.3124994	1.30283079				1.900	21.2	*
Chloromethane	*	1.9994296	1.7125137	1.9744148	2.1059634	2.2250823	2.2279581	2.17862259				2.061	8.9	*
Vinyl chloride	*	1.4109918	1.2191711	1.5203964	1.751097	1.8314198	1.8405383	1.03352917				1.515	20.7	*
Bromomethane	*	0.7641729	0.8938954	1.0301007	1.1659370	1.1990021	1.1979295	0.93893667				1.027	16.5	*
Chloroethane	*	0.823092	0.8153852	0.8701609	0.9783943	1.0077546	1.0155257	0.73527577				0.892	12.3	*
Trichlorofluoromethane	*	1.7327063	1.5307871	1.7574790	2.0217221	2.1959491	2.1541951	1.80249884				1.885	13.0	*
1,1-Dichloroethene	*	1.0776549	0.7913256	0.9852967	1.3501394	1.1899306	1.0476713	1.0956757				1.077	16.0	*
1,1,2-Trichloro-1,2,2-trifluoroethane	*	0.9746675	0.8390945	1.0065484	1.2944576	1.2902675	1.0063622	0.61772149				1.004	23.8	*
Acetone	*	0	0.6057463	0.4431652	0.440611	0.3827546	0.3868144	1.66073488				0.653	76.6	*
Carbon disulfide	*	3.5056605	3.0574251	3.5678077	4.7699191	4.2421193	3.7118307	3.63369989				3.784	14.7	*
Methyl Acetate	*	1.5047781	1.3386607	1.4003603	1.5034187	1.4534002	1.3747440	2.22254946				1.543	19.9	*
Methylene chloride	*	1.5652038	1.1613527	1.3276238	1.4739279	1.3770885	1.2532976	0.65815417				1.260	23.6	*
trans-1,2-Dichloroethene	*	1.3272136	1.0426175	1.2081596	1.4999064	1.3789763	1.2380546	1.52570969				1.317	12.9	*
Methyl tert-butyl ether	*	3.6156967	3.0171462	3.5961562	3.8306518	3.4563066	3.1607732	3.40283428				3.440	8.1	*
1,1-Dichloroethane	*	2.1145237	1.6992041	2.1101654	2.4449888	2.2000514	1.9680351	1.69243210				2.033	13.4	*
1,2-Dichloroethene (total)	*	1.8170494	1.4185450	1.5287541	1.8582877	1.6963272	1.4990482	2.49696755				1.759	20.7	*
cis-1,2-Dichloroethene	*	1.7818325	1.5710391	1.738749	2.1610683	1.9668441	1.7322663	1.97571044				1.847	10.7	*
2-Butanone	*	1.0230941	0.9060464	0.9855957	0.9427493	0.8663786	0.8461495	1.57787284				1.021	24.8	*
Chloroform	*	2.7174896	2.2205668	2.4998570	3.0726414	2.8235751	2.5230829	3.03295014				2.699	11.4	*
1,1,1-Trichloroethane	*	0.3387146	0.2840581	0.3388284	0.4155033	0.3692678	0.3491128	0.30050467				0.342	12.7	*
Cyclohexane	*	0.3118084	0.2684445	0.3415478	0.4150049	0.404269	0.3329555	0.27707564				0.336	17.0	*
Carbon tetrachloride	*	0.2760714	0.2322451	0.2880872	0.3780161	0.3463365	0.3129146	0.25846379				0.299	17.0	*

Form 6

VOCS IN SOIL INITIAL CALIBRATION DATA

Lab Name: PACE ANALYTICAL Contract: PACE ANALYTICAL

Lab Code: 10478 Case No.: AECOM-N SAS No.: SDG No.: AECOM237

Instrument ID: HP5971 Calibration Dates: 4/3/2015 4/3/2015

Heated Purge: (Y/N) N Calibration Times: 12:58 15:00

GC Column: Rtx-624 ID: .18 (mm)

LAB FILE ID: STD005= 15\A85721.D STD010= 15\A85722.D STD020= 15\A85723.D STD050= 15\A85724.D STD100= 15\A85725.D
STD200= 15\A85726.D STD001= 15\A85720.D

COMPOUND		Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7				$\overline{RRF}$	% RSD	R^2
2-Chloroethylvinyl ether	*	0.2364802	0.2121652	0.2317367	0.2532992	0.2274237	0.2239095	0.2359982				0.232	5.5	*
Benzene	*	1.0428935	0.8539335	1.0156484	1.2069808	1.0506500	0.9626031	1.03420551				1.024	10.4	*
1,2-Dichloroethane	*	2.0320907	1.6526746	1.8173606	2.1558098	1.9944702	1.8040141	1.96722457				1.918	8.8	*
Trichloroethene	*	0.2992521	0.2436386	0.2896675	0.3804739	0.3371065	0.3061067	0.30786182				0.309	13.6	*
Methylcyclohexane	*	0.2127752	0.1995275	0.2641946	0.3587263	0.3547502	0.2903501	0.21905047				0.271	24.4	*
1,2-Dichloropropane	*	0.2715733	0.2300529	0.2676098	0.3170801	0.2819187	0.2615566	0.28123593				0.273	9.6	*
Bromodichloromethane	*	0.3495874	0.3068542	0.3464569	0.4191025	0.3784468	0.3579844	0.43477271				0.370	12.0	*
cis-1,3-Dichloropropene	*	0.4624739	0.3938687	0.4367636	0.5372306	0.4881034	0.4573981	0.44523913				0.460	9.7	*
4-Methyl-2-pentanone	*	0.3854958	0.3196883	0.3747882	0.4046863	0.3587243	0.3756011	0.44357386				0.380	10.1	*
Toluene	*	1.2293694	1.0272696	1.1785148	1.4656656	1.2914596	1.1495211	1.71553096				1.294	17.8	*
trans-1,3-Dichloropropene	*	0.403961	0.3522231	0.4042421	0.4701176	0.4118877	0.3946037	0.35012166				0.398	10.2	*
1,1,2-Trichloroethane	*	0.2830900	0.2403846	0.2637171	0.3049003	0.2678854	0.2627747	0.24786599				0.267	8.1	*
Tetrachloroethene	*	0.2271285	0.206862	0.2402574	0.3071184	0.2859560	0.2512713	0.27741730				0.257	13.8	*
2-Hexanone	*	0.2754859	0.2661975	0.2678478	0.2964986	0.2626910	0.2746261	0.46345584				0.301	24.1	*
Dibromochloromethane	*	0.2974492	0.2731659	0.3128621	0.3756651	0.3396405	0.3273568	0.24615808				0.310	13.9	*
1,2-Dibromoethane	*	0.3557273	0.3165463	0.3292758	0.3986358	0.3537927	0.3412844	0.31977669				0.345	8.2	*
Chlorobenzene	*	0.9038115	0.7611130	0.8502076	1.0878155	0.9734731	0.8726627	0.87774540				0.904	11.4	*
Ethylbenzene	*	0.4215007	0.3583376	0.4196268	0.5228520	0.4778956	0.4322106	0.43867682				0.439	11.7	*
m,p-Xylene	*	0.5446552	0.4367117	0.5150015	0.6637415	0.5881327	0.5140832	0.52080018				0.540	13.1	*
o-Xylene	*	0.5124603	0.4556940	0.5294333	0.6730457	0.6061003	0.5321522	0.51007566				0.546	13.1	*
Xylene (total)	*	0.5113374	0.4557349	0.5302012	0.6730457	0.6053246	0.5322426	0.51007566				0.545	13.1	*
Styrene	*	0.9568413	0.8682224	0.9737671	1.2189670	1.0598378	0.9475908	1.01946573				1.006	11.1	*

Form 6

VOCS IN SOIL INITIAL CALIBRATION DATA

Lab Name: PACE ANALYTICAL Contract: PACE ANALYTICAL

Lab Code: 10478 Case No.: AECOM-N SAS No.: SDG No.: AECOM237

Instrument ID: HP5971 Calibration Dates: 4/3/2015 4/3/2015

Heated Purge: (Y/N) N Calibration Times: 12:58 15:00

GC Column: Rtx-624 ID: .18 (mm)

LAB FILE ID: STD005= 15\A85721.D STD010= 15\A85722.D STD020= 15\A85723.D STD050= 15\A85724.D STD100= 15\A85725.D
STD200= 15\A85726.D STD001= 15\A85720.D

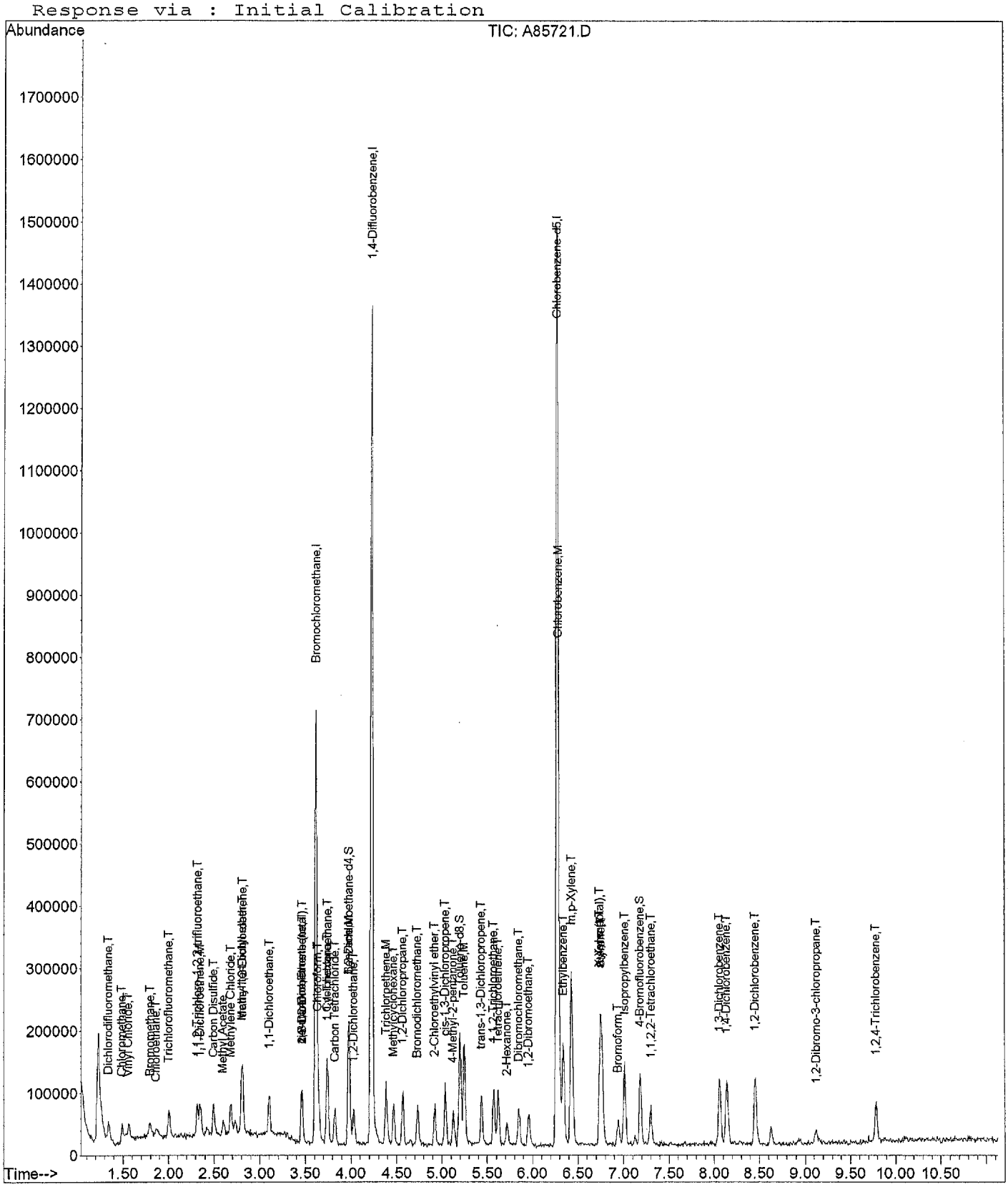
COMPOUND		Level 1	Level 2	Level 3	Level 4	Level 5	Level 6	Level 7				$\overline{RRF}$	% RSD	R^2
Bromoform	*	0.2055542	0.1842192	0.2208136	0.2711288	0.2410049	0.2381337	0.198249				0.223	13.3	*
Isopropylbenzene	*	1.0606548	0.9284214	1.134942	1.4870911	1.3716313	1.1894451	1.21152763				1.198	15.6	*
1,1,2,2-Tetrachloroethane	*	0.3674984	0.3626445	0.3996141	0.4630702	0.3869684	0.3861774	0.41384883				0.397	8.6	*
1,3-Dichlorobenzene	*	0.6035504	0.5227185	0.5978964	0.7864755	0.7167862	0.6654808	0.60287456				0.642	13.7	*
1,4-Dichlorobenzene	*	0.6092554	0.5750292	0.6534511	0.8359444	0.7517635	0.6835950	0.62001420				0.676	13.5	*
1,2-Dichlorobenzene	*	0.6427236	0.5543992	0.6238717	0.7848530	0.7013321	0.644792	0.62025905				0.653	11.1	*
1,2-Dibromo-3-chloropropane	*	0.0659939	0.0529748	0.0602117	0.0720319	0.0595324	0.0637028	0.04392645				0.060	15.3	*
1,2,4-Trichlorobenzene	*	0.2609476	0.2526332	0.2873478	0.430262	0.3875883	0.3736957	0.340785				0.333	20.5	*
Toluene-d8	*	1.2494222	1.0498155	1.2000263	1.3432045	1.29713	1.2352468	1.56166597				1.277	12.2	*
4-Bromofluorobenzene	*	0.4808069	0.4055649	0.4699548	0.522095	0.4991352	0.4880161	0.77412404				0.520	22.6	*
1,2-Dichloroethane-d4	*	2.0455964	1.6214753	1.7285846	1.7383532	1.7983796	1.688453	2.05582705				1.811	9.5	*

* Compounds with required minimum RRF and maximum %RSD values.
All other compounds must meet a minimum RRF of 0.010.

Quantitation Report

Data File : C:\DATA\2015\APRIL15\040315\A85721.D Vial: 8
Acq On : 3 Apr 2015 13:19 Operator: DRL
Sample : VSTD005 Inst : H5971
Misc : ,,,ICAL_5.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:25 2015 Quant Results File: R7W0403.RES

Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\040315\A85721.D Vial: 8
Acq On : 3 Apr 2015 13:19 Operator: DRL
Sample : VSTD005 Inst : H5971
Misc : ,,,ICAL_5.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:25 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 14:53:07 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	185848	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	1087110	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	997365	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	38017	3.45	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 6.90%#			
49) Toluene-d8	5.20	98	124613	4.04	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 8.08%#			
53) 4-Bromofluorobenzene	7.18	95	47954	3.79	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 7.58%#			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.35	85	31186	3.49	ug/l	99
4) Chloromethane	1.49	50	37159	6.05	ug/l	95
5) Bromomethane	1.80	94	14202	3.82	ug/l	88
6) Vinyl Chloride	1.56	62	26223	4.46	ug/l	87
7) Chloroethane	1.86	64	15297	5.53	ug/l	93
10) Methyl Acetate	2.60	43	27966	6.71	ug/l	93
11) 1,1,2-Trichloro-1,2,2-trif	2.31	101	18114	3.59	ug/l	97
12) Methylene Chloride	2.69	84	29089	6.49	ug/l	92
14) Carbon Disulfide	2.50	76	65152	5.56	ug/l	80
16) 1,1-Dichloroethene	2.35	96	20028	3.28	ug/l #	85
17) 1,1-Dichloroethane	3.10	63	39298	2.83	ug/l	99
18) Trichlorofluoromethane	2.00	101	32202	2.97	ug/l	95
20) Methyl tert-butyl ether	2.80	73	67197	4.20	ug/l	99
21) trans-1,2-Dichloroethene	2.82	96	24666	5.32	ug/l #	82
22) cis-1,2-Dichloroethene	3.46	96	33115 MID	3.96	ug/l	99
23) 1,2-Dichloroethene (total)	3.46	96	67539m	10.27	ug/l	
24) 2-Butanone	3.47	43	19014m MP	6.23	ug/l	
25) Chloroform	3.64	83	50504	3.70	ug/l	93
27) 1,2-Dichloroethane	4.03	62	37766	3.17	ug/l	84
29) 1,1,1-Trichloroethane	3.75	97	36822 MW 05/06/15	3.47	ug/l	89
30) Cyclohexane	3.74	56	33897	3.13	ug/l	94
31) Carbon Tetrachloride	3.82	117	30012	3.39	ug/l	87
32) 2-Chloroethylvinyl ether	4.93	63	25708m	4.62	ug/l	
33) Bromodichloromethane	4.74	83	38004 MIP	3.62	ug/l	97
34) 1,2-Dichloropropane	4.57	63	29523	3.82	ug/l	92
35) cis-1,3-Dichloropropene	5.04	75	50276	4.12	ug/l	97
36) Trichloroethene	4.38	130	32532	4.57	ug/l	88
37) Methylcyclohexane	4.47	83	23131	2.51	ug/l	85
38) Benzene	3.98	78	113374	4.56	ug/l	96
39) Dibromochloromethane	5.85	129	32336	3.73	ug/l #	80
40) trans-1,3-Dichloropropene	5.43	75	43915	3.97	ug/l	95
41) 1,1,2-Trichloroethane	5.57	97	30775	4.11	ug/l	96
42) Bromoform	6.94	173	22346	4.12	ug/l	96
44) 4-Methyl-2-pentanone	5.13	43	38448	4.89	ug/l	95
45) 2-Hexanone	5.72	43	27476	4.87	ug/l	82
46) 1,2-Dibromoethane	5.96	107	35479	3.74	ug/l	99
47) Tetrachloroethene	5.61	164	22653	4.12	ug/l	95
48) 1,1,2,2-Tetrachloroethane	7.30	83	36653	3.69	ug/l	93
50) Toluene	5.24	91	122613	3.97	ug/l	95
51) Chlorobenzene	6.29	112	90143	3.93	ug/l	86
52) Ethylbenzene	6.34	106	42039	3.81	ug/l	96
54) Styrene	6.76	104	95432	3.91	ug/l	89

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\040315\A85721.D Vial: 8
Acq On : 3 Apr 2015 13:19 Operator: DRL
Sample : VSTD005 Inst : H5971
Misc : ,,,ICAL_5.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:25 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 14:53:07 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55) m,p-Xylene	6.43	106	108644	7.95	ug/l		95
56) o-Xylene	6.74	106	51111	3.75	ug/l	#	81
57) Xylene (total)	6.74	106	50999	3.74	ug/l	#	81
58) Isopropylbenzene	7.02	105	105786	3.05	ug/l		92
59) 1,3-Dichlorobenzene	8.06	146	60196	4.24	ug/l		99
60) 1,4-Dichlorobenzene	8.13	146	60765	4.07	ug/l		87
61) 1,2-Dichlorobenzene	8.46	146	64103	4.54	ug/l		91
62) 1,2-Dibromo-3-chloropropan	9.12	75	6582	4.54	ug/l	#	48
63) 1,2,4-Trichlorobenzene	9.78	180	26026	4.65	ug/l		83

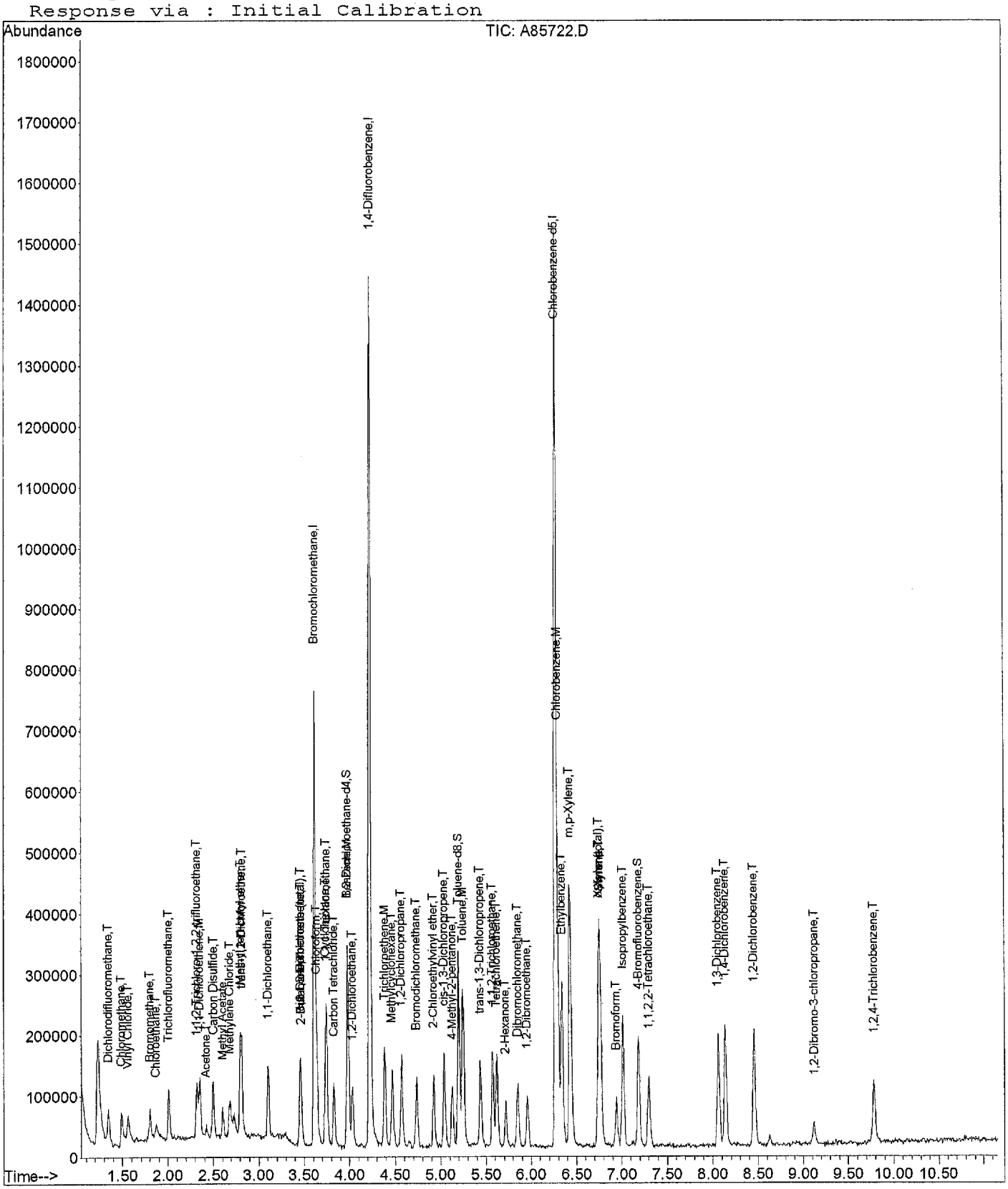
(#) = qualifier out of range (m) = manual integration

AECOM237 V192

Quantitation Report

Data File : C:\DATA\2015\APRIL15\040315\A85722.D Vial: 9
Acq On : 3 Apr 2015 13:39 Operator: DRL
Sample : VSTD010 Inst : H5971
Misc : ,,,ICAL_10.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:13 2015 Quant Results File: R7W0403.RES

Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\040315\A85722.D Vial: 9
Acq On : 3 Apr 2015 13:39 Operator: DRL
Sample : VSTD010 Inst : H5971
Misc : ,,,ICAL_10.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:13 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 14:53:07 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	185581	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.22	114	1097117	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.27	117	978672	50.00	ug/l	0.00

System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	60183	5.47	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 10.94%#			
49) Toluene-d8	5.20	98	205485	6.79	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 13.58%#			
53) 4-Bromofluorobenzene	7.19	95	79383	6.39	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 12.78%#			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.35	85	58080	6.50	ug/l	97
4) Chloromethane	1.49	50	63562	10.36	ug/l	92
5) Bromomethane	1.80	94	33178	8.93	ug/l	89
6) Vinyl Chloride	1.57	62	45251	7.71	ug/l	98
7) Chloroethane	1.87	64	30264	10.96	ug/l	98
10) Methyl Acetate	2.60	43	49686	11.94	ug/l	100
11) 1,1,2-Trichloro-1,2,2-trif	2.32	101	31144	6.19	ug/l	87
12) Methylene Chloride	2.69	84	43105	9.62	ug/l	86
13) Acetone	2.42	43	22483	7.70	ug/l	92
14) Carbon Disulfide	2.50	76	113480	9.70	ug/l	96
16) 1,1-Dichloroethene	2.36	96	29371	5.88	ug/l #	82
17) 1,1-Dichloroethane	3.10	63	63068	4.54	ug/l	99
18) Trichlorofluoromethane	2.01	101	56817	5.24	ug/l	93
20) Methyl tert-butyl ether	2.81	73	111985	7.01	ug/l	94
21) trans-1,2-Dichloroethene	2.82	96	38698	8.36	ug/l	90
22) cis-1,2-Dichloroethene	3.46	96	58311	6.98	ug/l	92
23) 1,2-Dichloroethene (total)	3.46	96	105302m TIP	16.04	ug/l	
24) 2-Butanone	3.47	43	33629	11.04	ug/l	99
25) Chloroform	3.64	83	82419	6.04	ug/l	97
27) 1,2-Dichloroethane	4.03	62	61341 NLV 050615	5.16	ug/l	96
29) 1,1,1-Trichloroethane	3.75	97	62329	5.82	ug/l	96
30) Cyclohexane	3.74	56	58903	5.39	ug/l	93
31) Carbon Tetrachloride	3.83	117	50960	5.70	ug/l	98
32) 2-Chloroethylvinyl ether	4.93	63	46554m	8.29	ug/l	
33) Bromodichloromethane	4.74	83	67331 NIP	6.36	ug/l	92
34) 1,2-Dichloropropane	4.57	63	50479	6.47	ug/l	86
35) cis-1,3-Dichloropropene	5.04	75	86424	7.01	ug/l	95
36) Trichloroethene	4.39	130	53460	7.44	ug/l	92
37) Methylcyclohexane	4.47	83	43781	4.70	ug/l	97
38) Benzene	3.98	78	187373	7.47	ug/l	97
39) Dibromochloromethane	5.85	129	59939	6.86	ug/l #	81
40) trans-1,3-Dichloropropene	5.43	75	77286	6.92	ug/l	98
41) 1,1,2-Trichloroethane	5.57	97	52746	6.99	ug/l	94
42) Bromoform	6.94	173	40422	6.93	ug/l	90
44) 4-Methyl-2-pentanone	5.13	43	62574	8.12	ug/l	94
45) 2-Hexanone	5.72	43	52104	9.42	ug/l	90
46) 1,2-Dibromoethane	5.96	107	61959	6.66	ug/l	92
47) Tetrachloroethene	5.63	164	40490	7.24	ug/l	98
48) 1,1,2,2-Tetrachloroethane	7.30	83	70982	7.28	ug/l	93
50) Toluene	5.25	91	201072	6.63	ug/l	97
51) Chlorobenzene	6.30	112	148976	6.62	ug/l	96
52) Ethylbenzene	6.34	106	70139	6.47	ug/l	96

(#) = qualifier out of range (m) = manual integration

AECOM237 V194

Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\040315\A85722.D Vial: 9
Acq On : 3 Apr 2015 13:39 Operator: DRL
Sample : VSTD010 Inst : H5971
Misc : ,,,ICAL_10.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:13 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 14:53:07 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

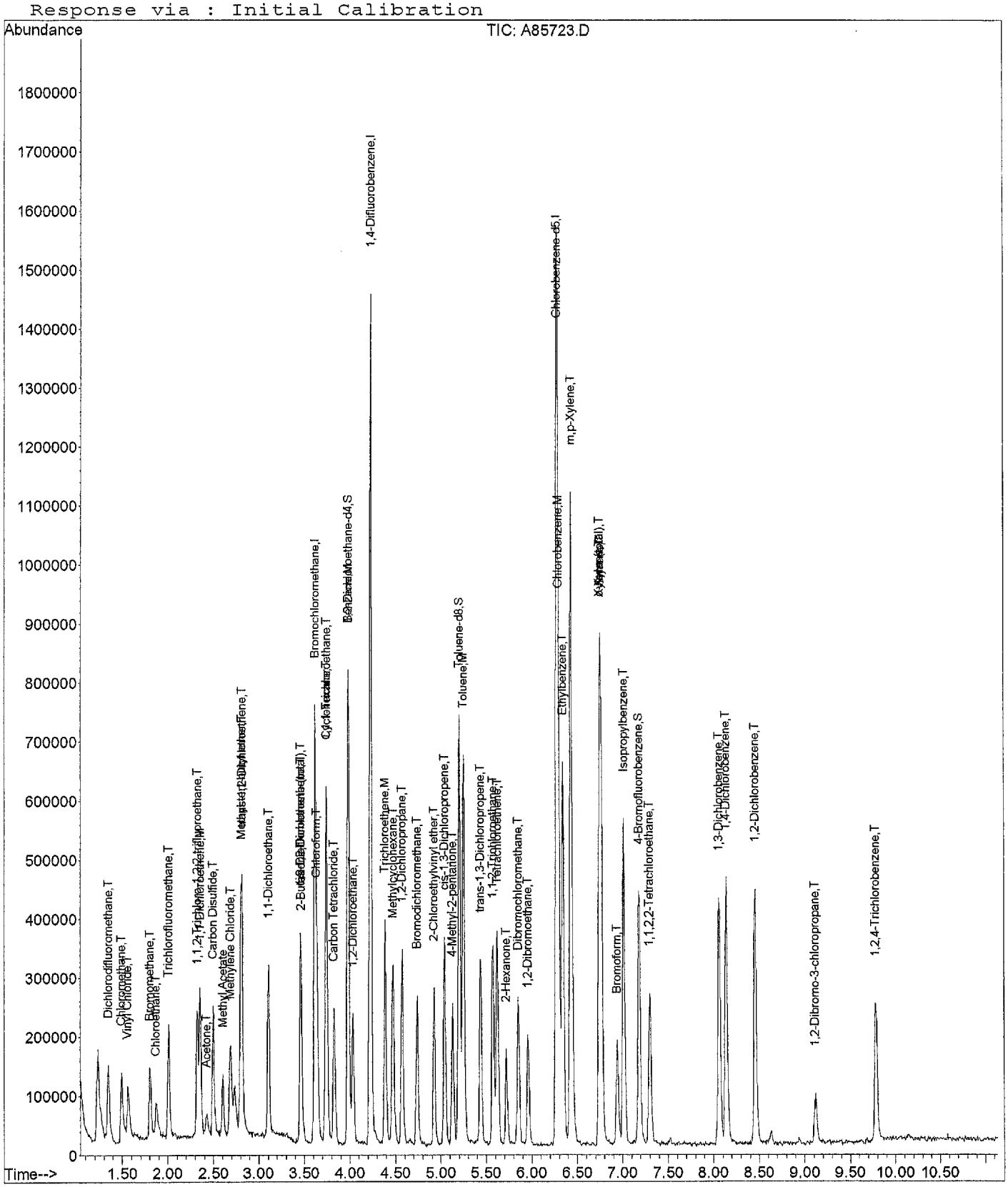
	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
54)	Styrene	6.77	104	169941	7.10	ug/l		97
55)	m,p-Xylene	6.42	106	170959	12.75	ug/l		97
56)	o-Xylene	6.74	106	89195	6.67	ug/l		98
57)	Xylene (total)	6.74	106	89203	6.66	ug/l		98
58)	Isopropylbenzene	7.01	105	181724	5.34	ug/l		99
59)	1,3-Dichlorobenzene	8.07	146	102314	7.35	ug/l		95
60)	1,4-Dichlorobenzene	8.14	146	112553	7.67	ug/l		92
61)	1,2-Dichlorobenzene	8.46	146	108515	7.83	ug/l		94
62)	1,2-Dibromo-3-chloropropan	9.12	75	10369	7.29	ug/l	#	84
63)	1,2,4-Trichlorobenzene	9.78	180	49449	9.01	ug/l		97

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\DATA\2015\APRIL15\040315\A85723.D Vial: 10
Acq On : 3 Apr 2015 13:59 Operator: DRL
Sample : VSTD020 Inst : H5971
Misc : ,,,ICAL_20.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:13 2015 Quant Results File: R7W0403.RES

Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\040315\A85723.D Vial: 10
Acq On : 3 Apr 2015 13:59 Operator: DRL
Sample : VSTD020 Inst : H5971
Misc : ,,,ICAL_20.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:13 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 14:53:07 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	192338	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	1099502	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	1009230	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.99	65	132989	11.66	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 23.32%#			
49) Toluene-d8	5.20	98	484441	15.53	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 31.06%#			
53) 4-Bromofluorobenzene	7.19	95	189717	14.82	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 29.64%#			
Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.35	85	148229	16.01	ug/l	98
4) Chloromethane	1.49	50	151902	23.90	ug/l	90
5) Bromomethane	1.80	94	79251	20.58	ug/l	93
6) Vinyl Chloride	1.57	62	116972	19.23	ug/l	100
7) Chloroethane	1.87	64	66946	23.38	ug/l	89
10) Methyl Acetate	2.61	43	107737m HIP	24.97	ug/l	
11) 1,1,2-Trichloro-1,2,2-trif	2.32	101	77439	14.84	ug/l	95
12) Methylene Chloride	2.69	84	102141	22.00	ug/l	99
13) Acetone	2.42	43	34095 HIV	15.42	ug/l	93
14) Carbon Disulfide	2.50	76	274490 050615	22.63	ug/l	90
16) 1,1-Dichloroethene	2.35	96	75804	17.99	ug/l	91
17) 1,1-Dichloroethane	3.10	63	162346	11.28	ug/l	99
18) Trichlorofluoromethane	2.01	101	135212	12.04	ug/l	95
20) Methyl tert-butyl ether	2.80	73	276671	16.71	ug/l	95
21) trans-1,2-Dichloroethene	2.82	96	92950	19.38	ug/l	90
22) cis-1,2-Dichloroethene	3.46	96	133771 TIP	15.45	ug/l	93
23) 1,2-Dichloroethene (total)	3.46	96	235230m	34.57	ug/l	
24) 2-Butanone	3.47	43	75827	24.01	ug/l	96
25) Chloroform	3.64	83	192327	13.60	ug/l	98
27) 1,2-Dichloroethane	4.04	62	139819	11.34	ug/l	95
29) 1,1,1-Trichloroethane	3.75	97	149017	13.88	ug/l	94
30) Cyclohexane	3.74	56	150213	13.72	ug/l	90
31) Carbon Tetrachloride	3.83	117	126701 HIP	14.13	ug/l	96
32) 2-Chloroethylvinyl ether	4.93	63	101918m	18.10	ug/l	
33) Bromodichloromethane	4.74	83	152372	14.36	ug/l	96
34) 1,2-Dichloropropane	4.57	63	117695	15.04	ug/l	96
35) cis-1,3-Dichloropropene	5.04	75	192089	15.55	ug/l	97
36) Trichloroethene	4.39	130	127396	17.70	ug/l	91
37) Methylcyclohexane	4.47	83	116193	12.46	ug/l	95
38) Benzene	3.98	78	446683	17.77	ug/l	96
39) Dibromochloromethane	5.85	129	137597	15.71	ug/l	94
40) trans-1,3-Dichloropropene	5.44	75	177786	15.89	ug/l	98
41) 1,1,2-Trichloroethane	5.57	97	115983	15.33	ug/l	95
42) Bromoform	6.94	173	97114	15.82	ug/l	96
44) 4-Methyl-2-pentanone	5.13	43	151299	19.03	ug/l	97
45) 2-Hexanone	5.72	43	108128	18.96	ug/l	94
46) 1,2-Dibromoethane	5.96	107	132926	13.85	ug/l	98
47) Tetrachloroethene	5.62	164	96990	16.40	ug/l	98
48) 1,1,2,2-Tetrachloroethane	7.30	83	161321	16.05	ug/l	93
50) Toluene	5.25	91	475757	15.21	ug/l	94
51) Chlorobenzene	6.30	112	343222	14.78	ug/l	98
52) Ethylbenzene	6.34	106	169400	15.15	ug/l	94

(#) = qualifier out of range (m) = manual integration

AECOM237 V197

Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\040315\A85723.D Vial: 10
Acq On : 3 Apr 2015 13:59 Operator: DRL
Sample : VSTD020 Inst : H5971
Misc : ,,,ICAL_20.0,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:13 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 14:53:07 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

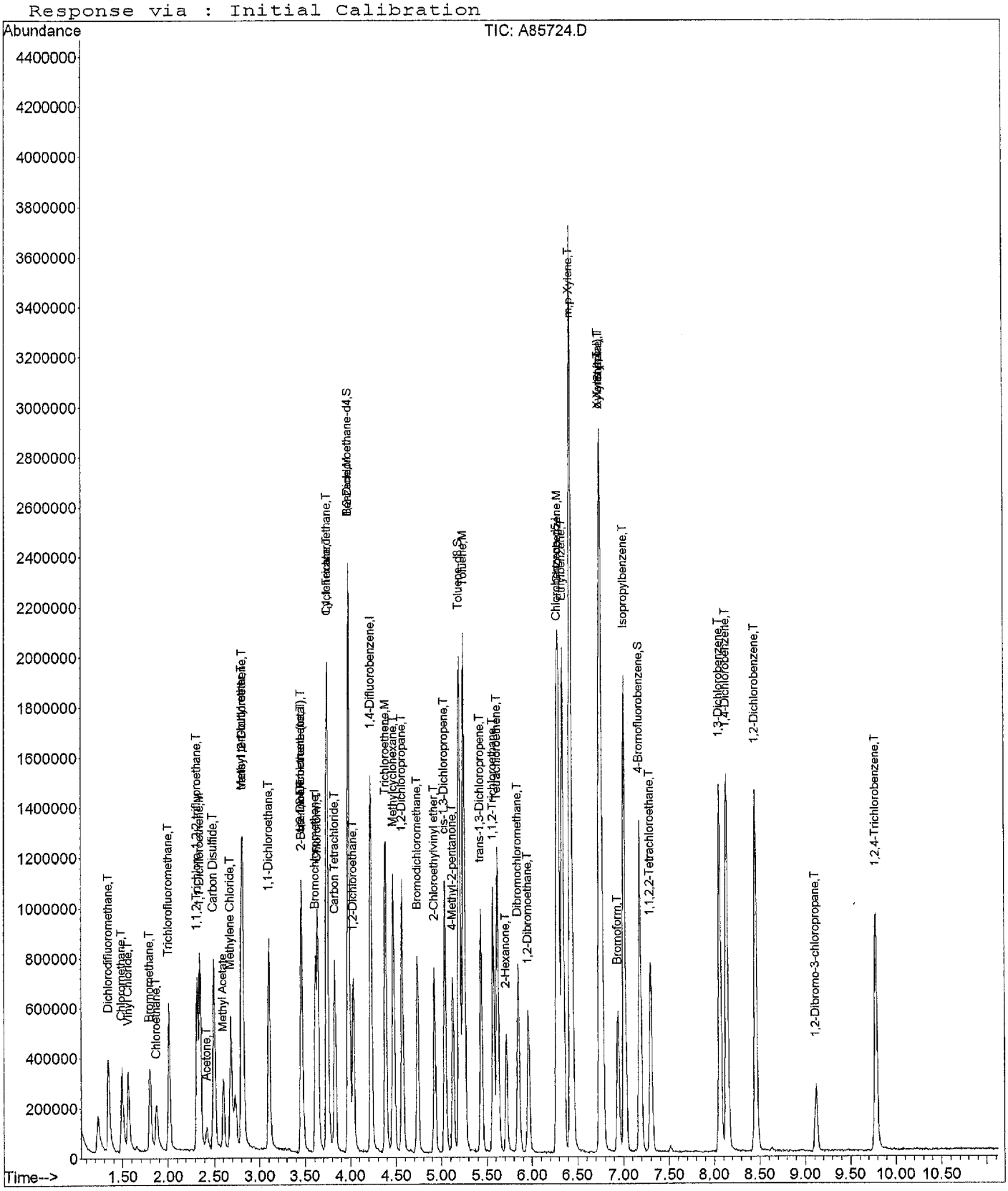
	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
54)	Styrene	6.76	104	393102	15.92 ug/l		98
55)	m,p-Xylene	6.43	106	415804	30.06 ug/l		97
56)	o-Xylene	6.75	106	213728	15.49 ug/l		96
57)	Xylene (total)	6.75	106	214038	15.50 ug/l		96
58)	Isopropylbenzene	7.02	105	458167	13.06 ug/l		97
59)	1,3-Dichlorobenzene	8.06	146	241366	16.81 ug/l		94
60)	1,4-Dichlorobenzene	8.14	146	263793	17.44 ug/l		92
61)	1,2-Dichlorobenzene	8.46	146	251852	17.62 ug/l		95
62)	1,2-Dibromo-3-chloropropan	9.12	75	24307	16.58 ug/l	#	90
63)	1,2,4-Trichlorobenzene	9.78	180	116000	20.49 ug/l		98

(#) = qualifier out of range (m) = manual integration

Quantitation Report

Data File : C:\DATA\2015\APRIL15\040315\A85724.D Vial: 11
Acq On : 3 Apr 2015 14:19 Operator: DRL
Sample : VSTD050 Inst : H5971
Misc : ,,,ICAL_50,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:13 2015 Quant Results File: R7W0403.RES

Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\040315\A85724.D Vial: 11
Acq On : 3 Apr 2015 14:19 Operator: DRL
Sample : VSTD050 Inst : H5971
Misc : ,,,ICAL_50,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:13 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 14:53:07 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	197587	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	1141642	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	1032973	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.99	65	343476	29.32	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 58.64%			
49) Toluene-d8	5.20	98	1387494	43.46	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 86.92%			
53) 4-Bromofluorobenzene	7.18	95	539310	41.15	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 82.30%			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.35	85	422288	44.39	ug/l	100
4) Chloromethane	1.49	50	416111	63.73	ug/l	100
5) Bromomethane	1.80	94	230374	58.23	ug/l	95
6) Vinyl Chloride	1.56	62	345994	55.37	ug/l	100
7) Chloroethane	1.87	64	193318	65.73	ug/l	99
10) Methyl Acetate	2.60	43	297056	67.03	ug/l	100
11) 1,1,2-Trichloro-1,2,2-trif	2.32	101	255768	47.71	ug/l	100
12) Methylene Chloride	2.69	84	291229	61.07	ug/l	100
13) Acetone	2.42	43	87059	51.66	ug/l	100
14) Carbon Disulfide	2.50	76	942474	75.65	ug/l	96
16) 1,1-Dichloroethene	2.35	96	266770	67.10	ug/l	100
17) 1,1-Dichloroethane	3.10	63	483098	32.68	ug/l	99
18) Trichlorofluoromethane	2.01	101	399466	34.64	ug/l	100
20) Methyl tert-butyl ether	2.80	73	756887	44.49	ug/l	99
21) trans-1,2-Dichloroethene	2.82	96	296362	60.15	ug/l	100
22) cis-1,2-Dichloroethene	3.46	96	426999 TIP	48.00	ug/l	100
23) 1,2-Dichloroethene (total)	3.46	96	734347m	105.06	ug/l	
24) 2-Butanone	3.47	43	186275	57.43	ug/l	100
25) Chloroform	3.64	83	607114 MW 050615	41.79	ug/l	100
27) 1,2-Dichloroethane	4.04	62	425960	33.63	ug/l	100
29) 1,1,1-Trichloroethane	3.75	97	474356	42.56	ug/l	100
30) Cyclohexane	3.74	56	473787	41.67	ug/l	98
31) Carbon Tetrachloride	3.83	117	431559	46.37	ug/l	100
32) 2-Chloroethylvinyl ether	4.92	63	289177m	49.47	ug/l	
33) Bromodichloromethane	4.74	83	478465 MIP	43.43	ug/l	100
34) 1,2-Dichloropropane	4.57	63	361992	44.55	ug/l	99
35) cis-1,3-Dichloropropene	5.04	75	613325	47.82	ug/l	100
36) Trichloroethene	4.39	130	434365	58.11	ug/l	100
37) Methylcyclohexane	4.47	83	409537	42.28	ug/l	100
38) Benzene	3.98	78	1377940	52.79	ug/l	100
39) Dibromochloromethane	5.85	129	428875	47.17	ug/l	100
40) trans-1,3-Dichloropropene	5.44	75	536706	46.20	ug/l	99
41) 1,1,2-Trichloroethane	5.57	97	348087	44.31	ug/l	100
42) Bromoform	6.94	173	309532	47.39	ug/l	98
44) 4-Methyl-2-pentanone	5.13	43	418030	51.38	ug/l	100
45) 2-Hexanone	5.72	43	306275	52.46	ug/l	100
46) 1,2-Dibromoethane	5.96	107	411780	41.91	ug/l	94
47) Tetrachloroethene	5.62	164	317245	51.70	ug/l	100
48) 1,1,2,2-Tetrachloroethane	7.30	83	478339	46.49	ug/l	100
50) Toluene	5.25	91	1513993	47.29	ug/l	100
51) Chlorobenzene	6.30	112	1123684	47.28	ug/l	100
52) Ethylbenzene	6.34	106	540092	47.20	ug/l	100

(#) = qualifier out of range (m) = manual integration

AECOM237 V200

Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\040315\A85724.D Vial: 11
Acq On : 3 Apr 2015 14:19 Operator: DRL
Sample : VSTD050 Inst : H5971
Misc : ,,,ICAL_50,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:13 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 14:53:07 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

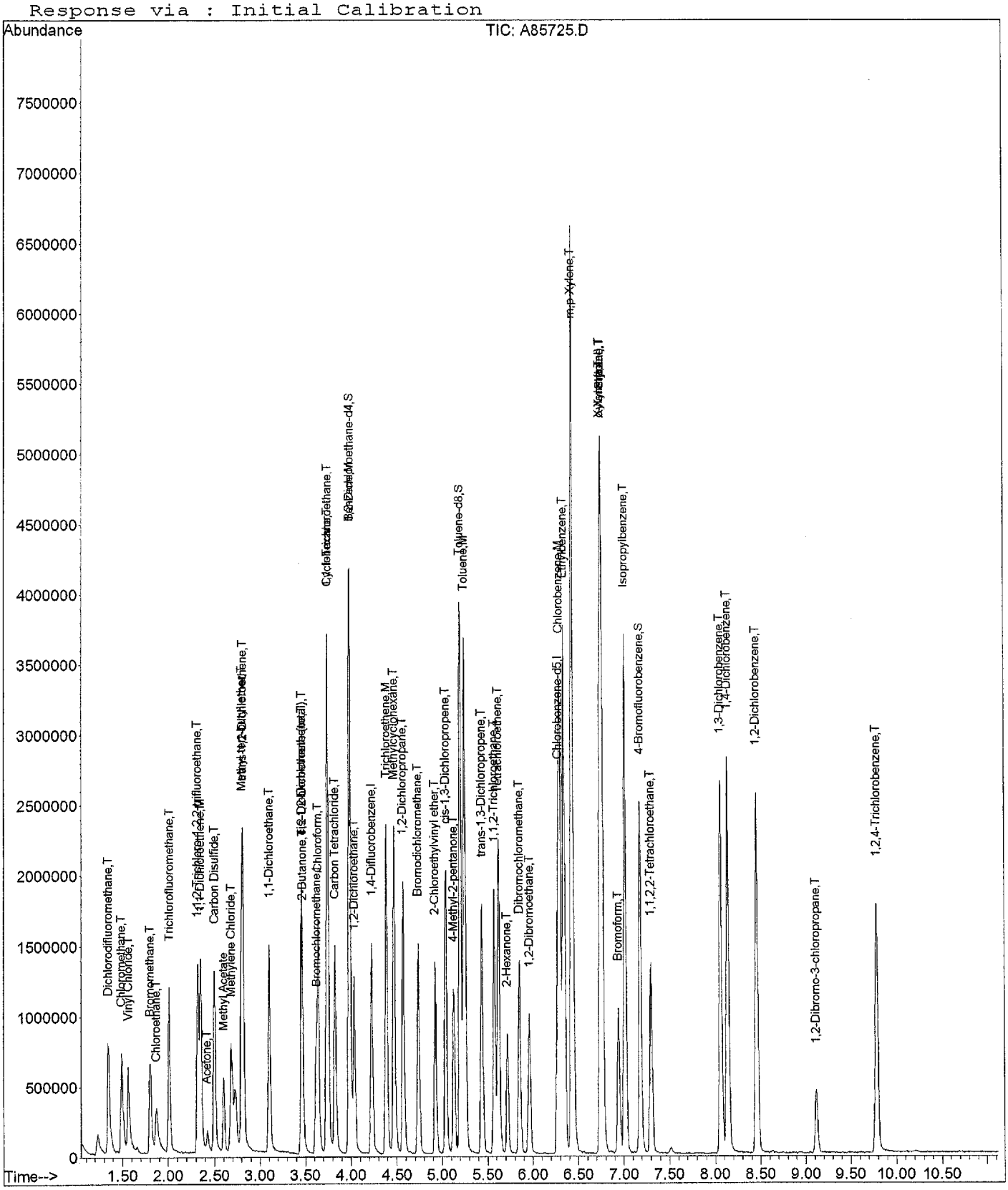
Compound	R.T.	QIon	Response	Conc Unit	Qvalue
54) Styrene	6.76	104	1259160	49.82 ug/l	100
55) m,p-Xylene	6.43	106	1371254	96.87 ug/l	100
56) o-Xylene	6.75	106	695238	49.23 ug/l	100
57) Xylene (total)	6.75	106	695238	49.19 ug/l	100
58) Isopropylbenzene	7.02	105	1536125	42.79 ug/l	100
59) 1,3-Dichlorobenzene	8.06	146	812408	55.29 ug/l	100
60) 1,4-Dichlorobenzene	8.14	146	863508	55.79 ug/l	100
61) 1,2-Dichlorobenzene	8.46	146	810732	55.43 ug/l	100
62) 1,2-Dibromo-3-chloropropan	9.12	75	74407	49.59 ug/l	100
63) 1,2,4-Trichlorobenzene	9.78	180	444449	76.70 ug/l	100

(#) = qualifier out of range (m) = manual integration

AECOM237 V201

Data File : C:\DATA\2015\APRIL15\040315\A85725.D Vial: 12
Acq On : 3 Apr 2015 14:39 Operator: DRL
Sample : VSTD100 Inst : H5971
Misc : ,,,ICAL_100,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:12 2015 Quant Results File: R7W0403.RES

Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration



AECOM237 V202

Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\040315\A85725.D Vial: 12
Acq On : 3 Apr 2015 14:39 Operator: DRL
Sample : VSTD100 Inst : H5971
Misc : ,,,ICAL_100,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:12 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 14:53:07 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.62	128	194400	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	1165547	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	1042961	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.99	65	699210	60.67	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 121.34%			
49) Toluene-d8	5.20	98	2705712	83.93	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 167.86%#			
53) 4-Bromofluorobenzene	7.18	95	1041157	78.69	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 157.38%#			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.35	85	924179	98.75	ug/l	100
4) Chloromethane	1.49	50	865112	134.66	ug/l	99
5) Bromomethane	1.80	94	466172	119.77	ug/l	97
6) Vinyl Chloride	1.56	62	712056	115.82	ug/l	95
7) Chloroethane	1.87	64	391815	135.41	ug/l	100
10) Methyl Acetate	2.60	43	565082	129.60	ug/l	94
11) 1,1,2-Trichloro-1,2,2-trif	2.32	101	501656	95.12	ug/l	97
12) Methylene Chloride	2.69	84	535412	114.11	ug/l	91
13) Acetone	2.42	43	148815	96.37	ug/l	94
14) Carbon Disulfide	2.50	76	1649336	134.56	ug/l	94
16) 1,1-Dichloroethene	2.35	96	462645	119.99	ug/l	98
17) 1,1-Dichloroethane	3.10	63	855380	58.81	ug/l	99
18) Trichlorofluoromethane	2.01	101	853785	75.24	ug/l	99
20) Methyl tert-butyl ether	2.80	73	1343812	80.29	ug/l	96
21) trans-1,2-Dichloroethene	2.82	96	536146	110.61	ug/l	99
22) cis-1,2-Dichloroethene	3.46	96	764709 TIP	87.37	ug/l	98
23) 1,2-Dichloroethene (total)	3.46	96	1319064m	191.81	ug/l	
24) 2-Butanone	3.47	43	336848	105.55	ug/l	93
25) Chloroform	3.64	83	1097806 MV	76.80	ug/l	98
27) 1,2-Dichloroethane	4.03	62	775450 0.5DGS	62.22	ug/l	99
29) 1,1,1-Trichloroethane	3.75	97	860798	75.65	ug/l	100
30) Cyclohexane	3.75	56	942389	81.18	ug/l	100
31) Carbon Tetrachloride	3.83	117	807343	84.96	ug/l	97
32) 2-Chloroethylvinyl ether	4.92	63	530146m	88.83	ug/l	
33) Bromodichloromethane	4.74	83	882195 MIP	78.43	ug/l	99
34) 1,2-Dichloropropane	4.57	63	657179	79.23	ug/l	95
35) cis-1,3-Dichloropropene	5.04	75	1137815	86.89	ug/l	99
36) Trichloroethene	4.39	130	785827	102.98	ug/l	98
37) Methylcyclohexane	4.47	83	826956	83.63	ug/l	98
38) Benzene	3.98	78	2449164	91.90	ug/l	98
39) Dibromochloromethane	5.86	129	791734	85.29	ug/l	97
40) trans-1,3-Dichloropropene	5.44	75	960149	80.95	ug/l	98
41) 1,1,2-Trichloroethane	5.57	97	624466	77.87	ug/l	95
42) Bromoform	6.94	173	561805	83.81	ug/l	93
44) 4-Methyl-2-pentanone	5.13	43	748271	91.09	ug/l	99
45) 2-Hexanone	5.72	43	547953	92.95	ug/l	94
46) 1,2-Dibromoethane	5.96	107	737984	74.39	ug/l	97
47) Tetrachloroethene	5.62	164	596482	95.99	ug/l	98
48) 1,1,2,2-Tetrachloroethane	7.30	83	807186	77.70	ug/l	97
50) Toluene	5.25	91	2693884	83.35	ug/l	98
51) Chlorobenzene	6.30	112	2030589	84.62	ug/l	99
52) Ethylbenzene	6.34	106	996853	86.28	ug/l	98

(#) = qualifier out of range (m) = manual integration

AECOM237 V203

Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\040315\A85725.D Vial: 12
Acq On : 3 Apr 2015 14:39 Operator: DRL
Sample : VSTD100 Inst : H5971
Misc : ,,,ICAL_100,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:12 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 14:53:07 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
54) Styrene	6.76	104	2210739	86.64	ug/l		97
55) m,p-Xylene	6.43	106	2453598	171.67	ug/l		95
56) o-Xylene	6.74	106	1264278	88.67	ug/l		97
57) Xylene (total)	6.74	106	1262660	88.49	ug/l		97
58) Isopropylbenzene	7.02	105	2861116	78.94	ug/l		98
59) 1,3-Dichlorobenzene	8.07	146	1495160	100.78	ug/l		99
60) 1,4-Dichlorobenzene	8.14	146	1568120	100.34	ug/l		99
61) 1,2-Dichlorobenzene	8.46	146	1462924	99.06	ug/l		99
62) 1,2-Dibromo-3-chloropropan	9.12	75	124180	81.97	ug/l	#	82
63) 1,2,4-Trichlorobenzene	9.79	180	808479	138.18	ug/l		97

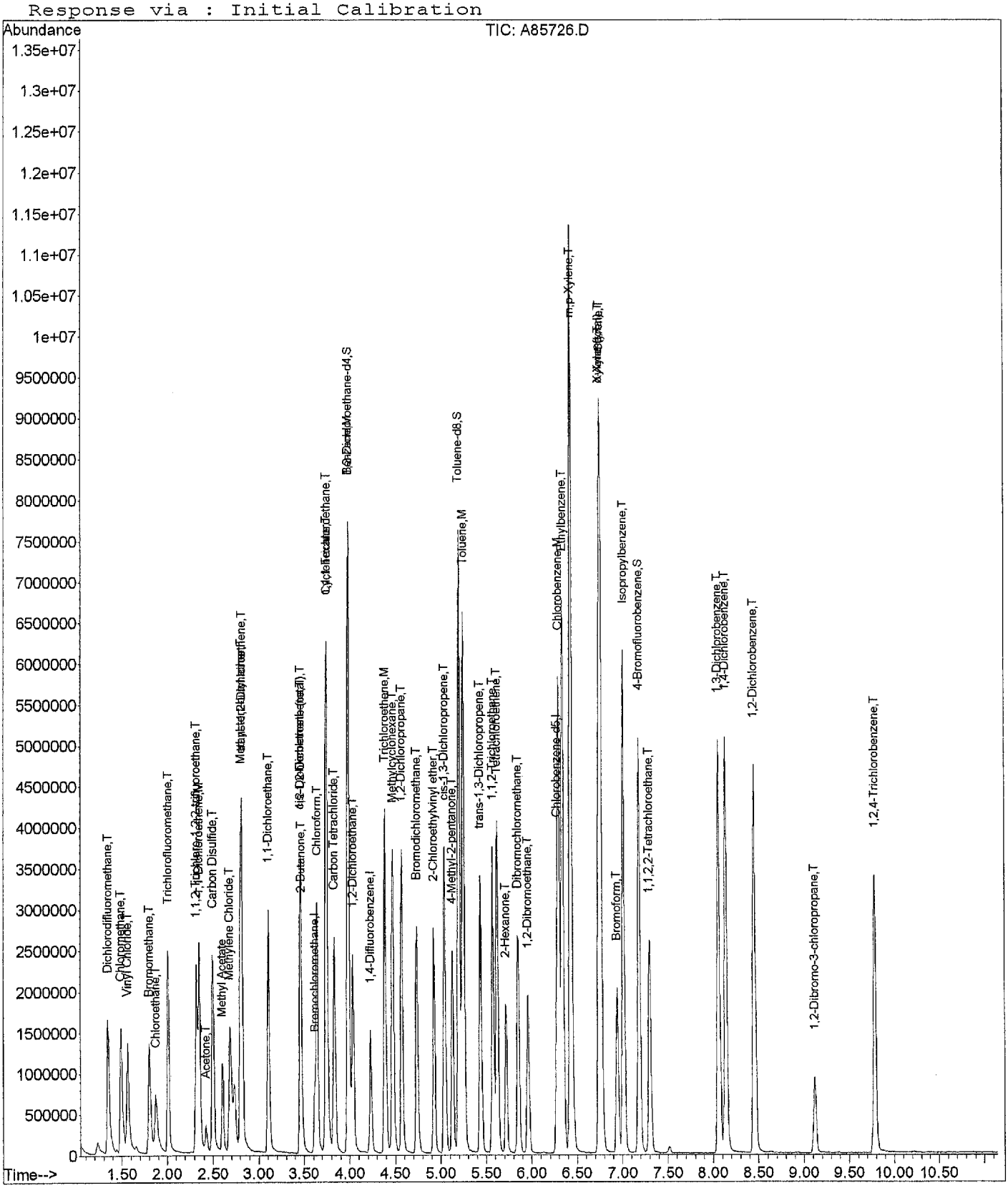
(#) = qualifier out of range (m) = manual integration

AECOM237 V204

Quantitation Report

Data File : C:\DATA\2015\APRIL15\040315\A85726.D Vial: 13
Acq On : 3 Apr 2015 15:00 Operator: DRL
Sample : VSTD200 Inst : H5971
Misc : ,,,ICAL_200,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:12 2015 Quant Results File: R7W0403.RES

Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : C:\DATA\2015\APRIL15\040315\A85726.D Vial: 13
Acq On : 3 Apr 2015 15:00 Operator: DRL
Sample : VSTD200 Inst : H5971
Misc : ,,,ICAL_200,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:12 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 14:53:07 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	206062	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	1164161	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	1043062	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.99	65	1391704	113.92	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 227.84%#			
49) Toluene-d8	5.20	98	5153756	159.85	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 319.70%#			
53) 4-Bromofluorobenzene	7.18	95	2036124	153.87	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 307.74%#			
Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.35	85	1906073	192.13	ug/l	100
4) Chloromethane	1.49	50	1836390	269.68	ug/l	100
5) Bromomethane	1.80	94	987391	239.32	ug/l	99
6) Vinyl Chloride	1.56	62	1517060	232.79	ug/l	97
7) Chloroethane	1.87	64	837045	272.91	ug/l	95
10) Methyl Acetate	2.60	43	1133130	245.18	ug/l	96
11) 1,1,2-Trichloro-1,2,2-trif	2.32	101	829492	148.37	ug/l	93
12) Methylene Chloride	2.69	84	1033028	207.71	ug/l	99
13) Acetone	2.42	43	318831	203.94	ug/l	99
14) Carbon Disulfide	2.50	76	3059469	235.48	ug/l	98
16) 1,1-Dichloroethene	2.35	96	863541	213.00	ug/l	97
17) 1,1-Dichloroethane	3.10	63	1622149	105.21	ug/l	100
18) Trichlorofluoromethane	2.01	101	1775591	147.62	ug/l	98
20) Methyl tert-butyl ether	2.80	73	2605261	146.84	ug/l	99
21) trans-1,2-Dichloroethene	2.82	96	1020464	198.60	ug/l	94
22) cis-1,2-Dichloroethene	3.46	96	1427817 TIP	153.90	ug/l	97
23) 1,2-Dichloroethene (total)	3.46	96	2471175m	339.01	ug/l	
24) 2-Butanone	3.48	43	697437	206.17	ug/l	97
25) Chloroform	3.64	83	2079646 MIN	137.26	ug/l	96
27) 1,2-Dichloroethane	4.03	62	1486955 0.06MIN	112.56	ug/l	97
29) 1,1,1-Trichloroethane	3.75	97	1625694	143.04	ug/l	100
30) Cyclohexane	3.74	56	1550455	133.72	ug/l	99
31) Carbon Tetrachloride	3.83	117	1457132	153.53	ug/l	99
32) 2-Chloroethylvinyl ether	4.92	63	1042667m	174.92	ug/l	
33) Bromodichloromethane	4.74	83	1667006 MIP	148.38	ug/l	97
34) 1,2-Dichloropropane	4.57	63	1217976	147.01	ug/l	98
35) cis-1,3-Dichloropropene	5.04	75	2129940	162.85	ug/l	98
36) Trichloroethene	4.39	130	1425430	187.02	ug/l	98
37) Methylcyclohexane	4.47	83	1352057	136.89	ug/l	99
38) Benzene	3.98	78	4482500	168.40	ug/l	99
39) Dibromochloromethane	5.85	129	1524384	164.41	ug/l	96
40) trans-1,3-Dichloropropene	5.43	75	1837529	155.11	ug/l	95
41) 1,1,2-Trichloroethane	5.57	97	1223648	152.76	ug/l	97
42) Bromoform	6.94	173	1108904	165.07	ug/l	97
44) 4-Methyl-2-pentanone	5.13	43	1567101	190.74	ug/l	98
45) 2-Hexanone	5.72	43	1145808	194.35	ug/l	91
46) 1,2-Dibromoethane	5.96	107	1423923	143.52	ug/l	97
47) Tetrachloroethene	5.62	164	1048366	168.45	ug/l	92
48) 1,1,2,2-Tetrachloroethane	7.30	83	1611228	155.09	ug/l	98
50) Toluene	5.25	91	4796087	148.37	ug/l	96
51) Chlorobenzene	6.30	112	3640965	151.72	ug/l	99
52) Ethylbenzene	6.34	106	1803290	156.07	ug/l	92

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

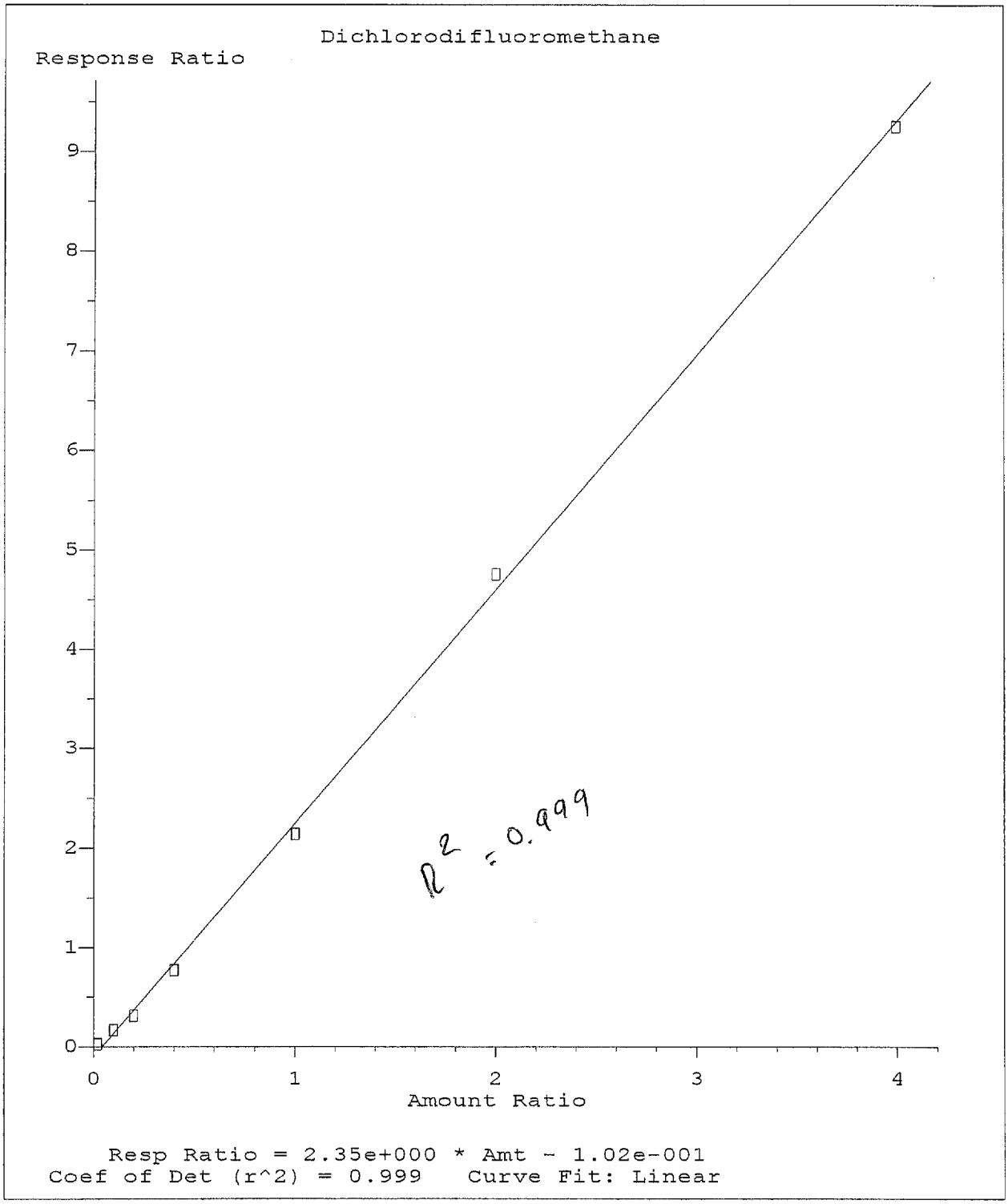
Data File : C:\DATA\2015\APRIL15\040315\A85726.D Vial: 13
Acq On : 3 Apr 2015 15:00 Operator: DRL
Sample : VSTD200 Inst : H5971
Misc : ,,,ICAL_200,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 3 15:12 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 14:53:07 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

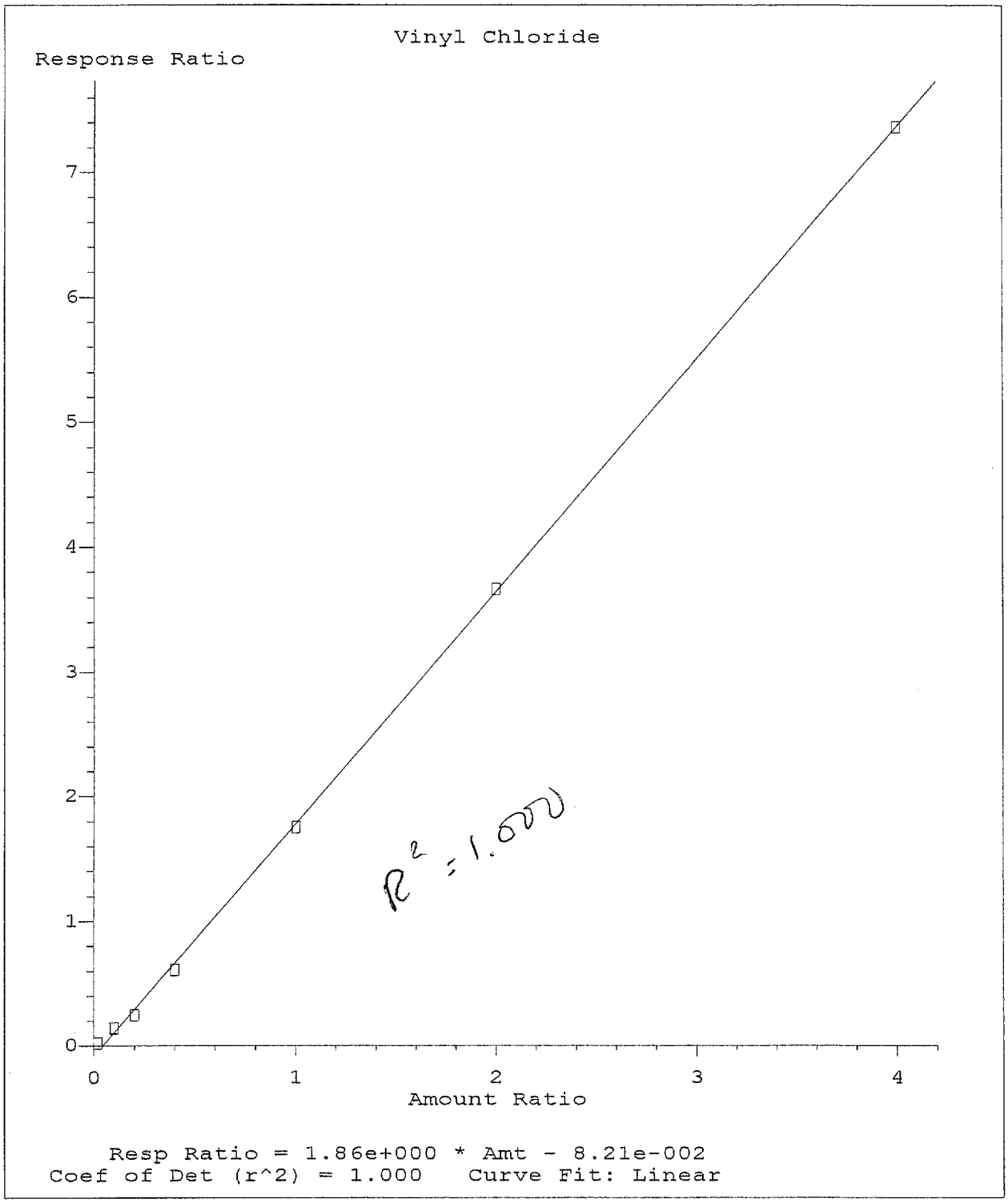
	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
54)	Styrene	6.76	104	3953584	154.92 ug/l	96
55)	m,p-Xylene	6.43	106	4289765	300.11 ug/l	89
56)	o-Xylene	6.75	106	2220271	155.71 ug/l	96
57)	Xylene (total)	6.75	106	2220648	155.61 ug/l	96
58)	Isopropylbenzene	7.02	105	4962660	136.91 ug/l	98
59)	1,3-Dichlorobenzene	8.06	146	2776551	187.13 ug/l	99
60)	1,4-Dichlorobenzene	8.14	146	2852128	182.48 ug/l	97
61)	1,2-Dichlorobenzene	8.46	146	2690232	182.15 ug/l	97
62)	1,2-Dibromo-3-chloropropan	9.12	75	265784	175.42 ug/l	90
63)	1,2,4-Trichlorobenzene	9.79	180	1559151	266.46 ug/l	97

(#) = qualifier out of range (m) = manual integration

AECOM237 V207

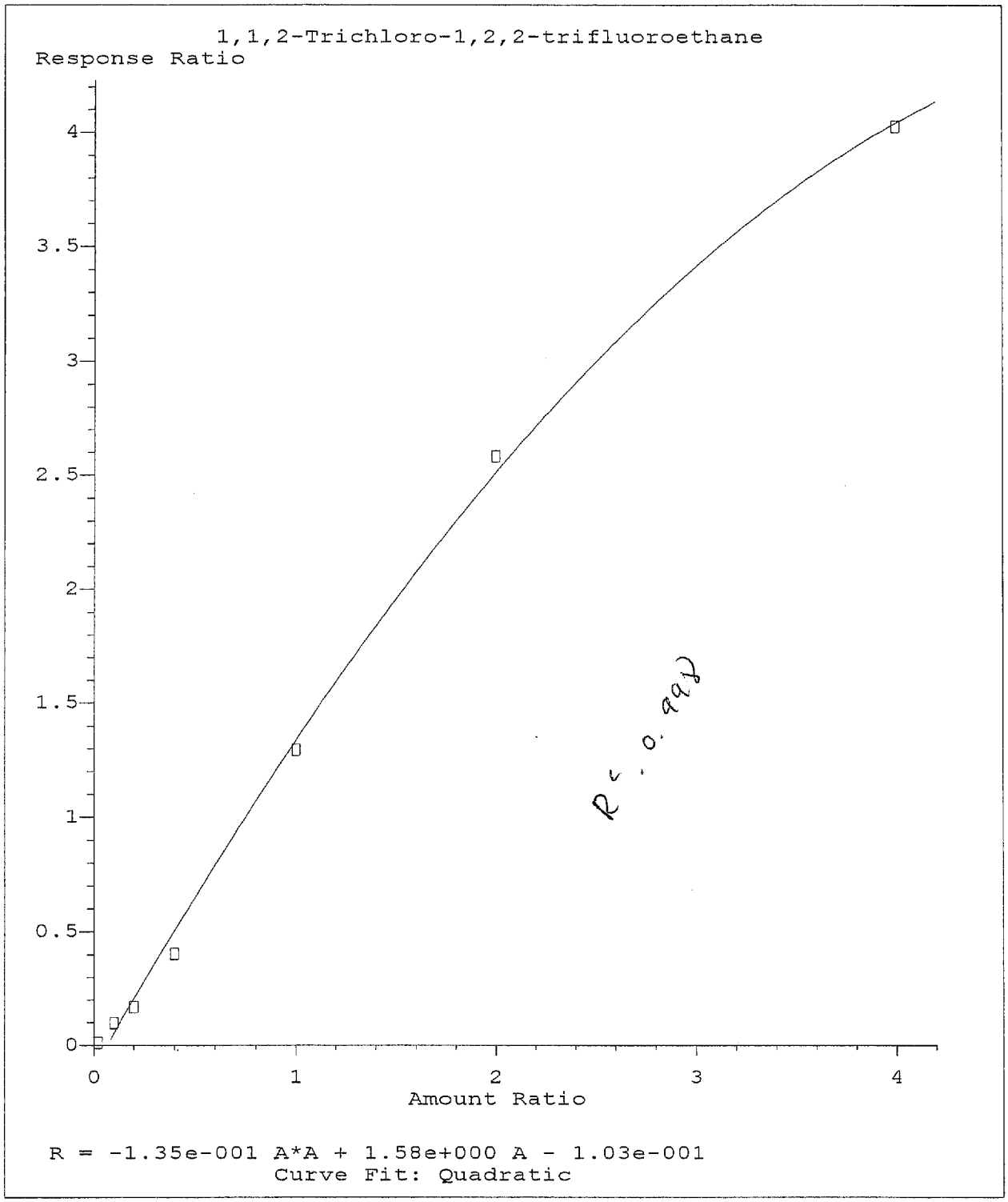


Method Name: O:\MS\HP5971\METHODS\2015\R7W0403.M
Calibration Table Last Updated: Fri Apr 03 15:40:34 2015

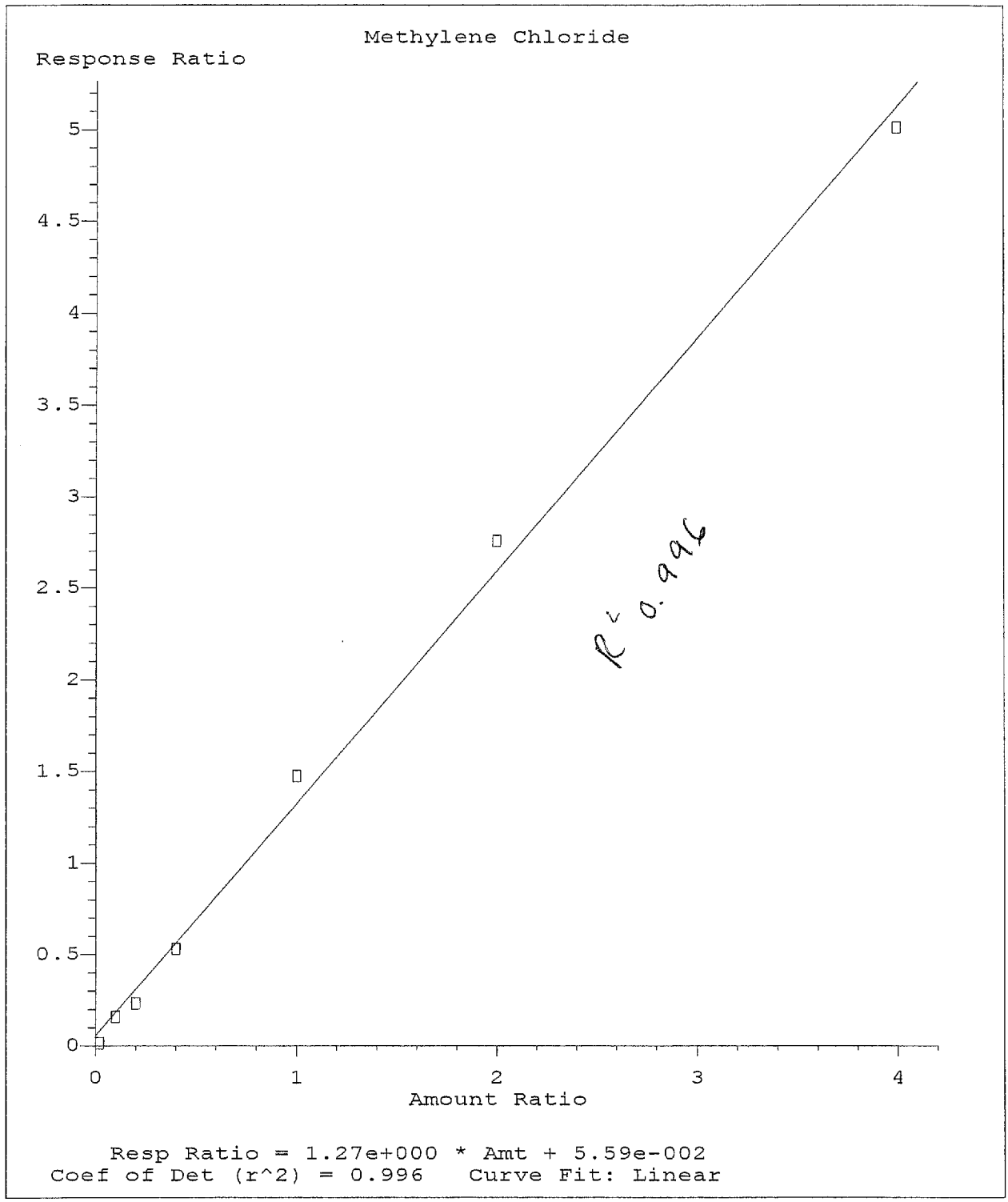


Resp Ratio = 1.86e+000 * Amt - 8.21e-002
Coef of Det (r^2) = 1.000 Curve Fit: Linear

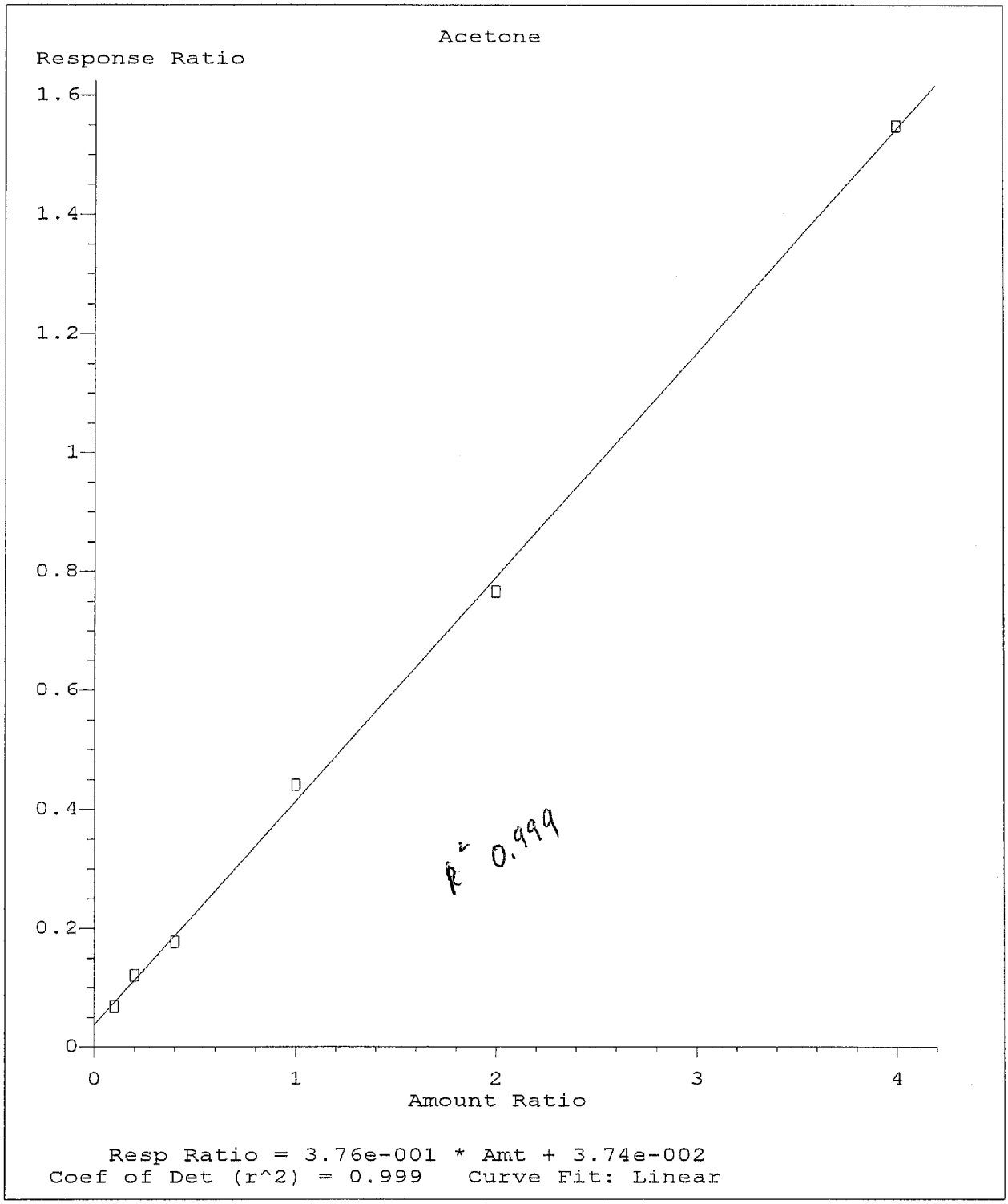
Method Name: O:\MS\HP5971\METHODS\2015\R7W0403.M
Calibration Table Last Updated: Fri Apr 03 15:40:34 2015



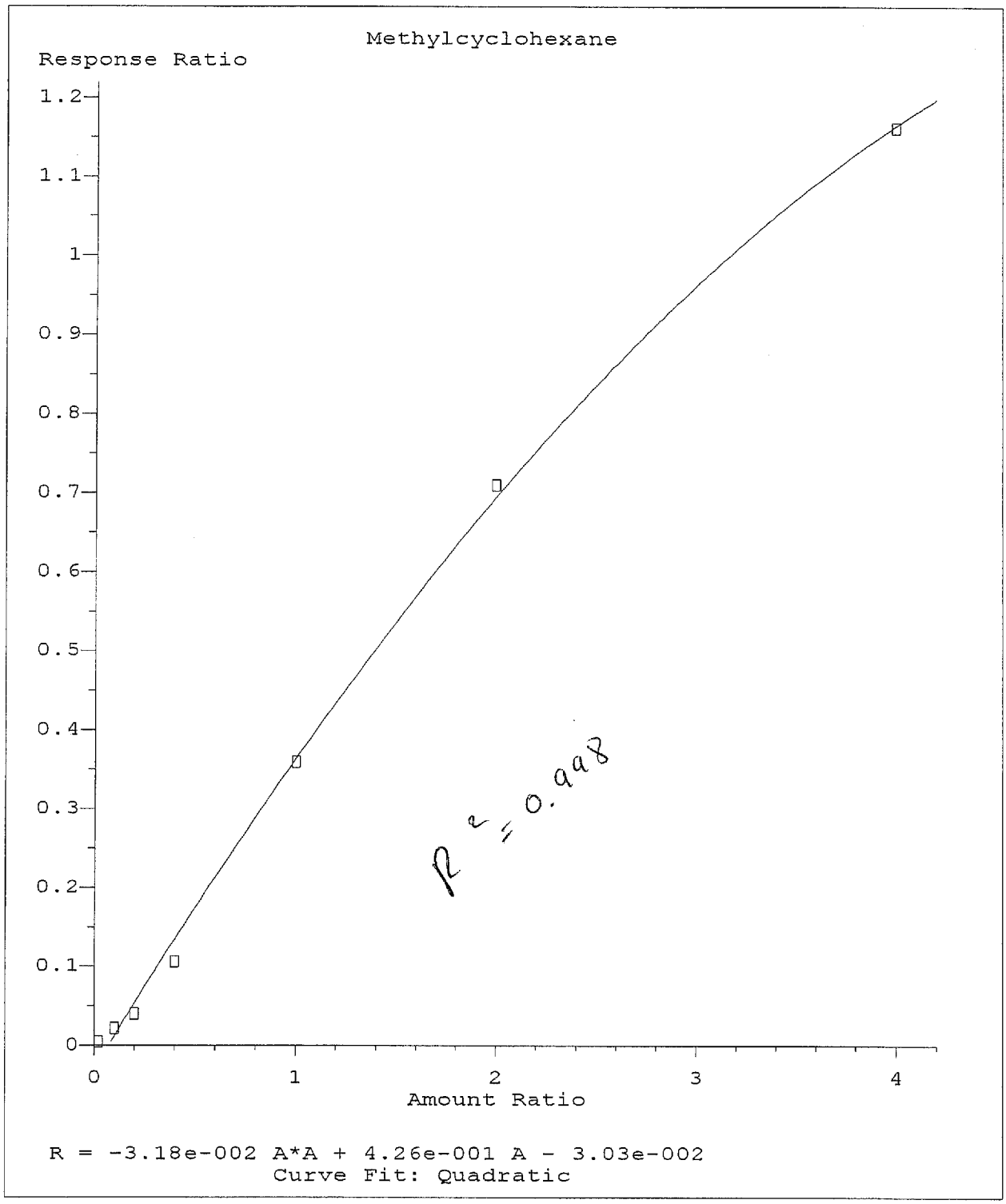
Method Name: O:\MS\HP5971\METHODS\2015\R7W0403.M
Calibration Table Last Updated: Fri Apr 03 15:40:34 2015



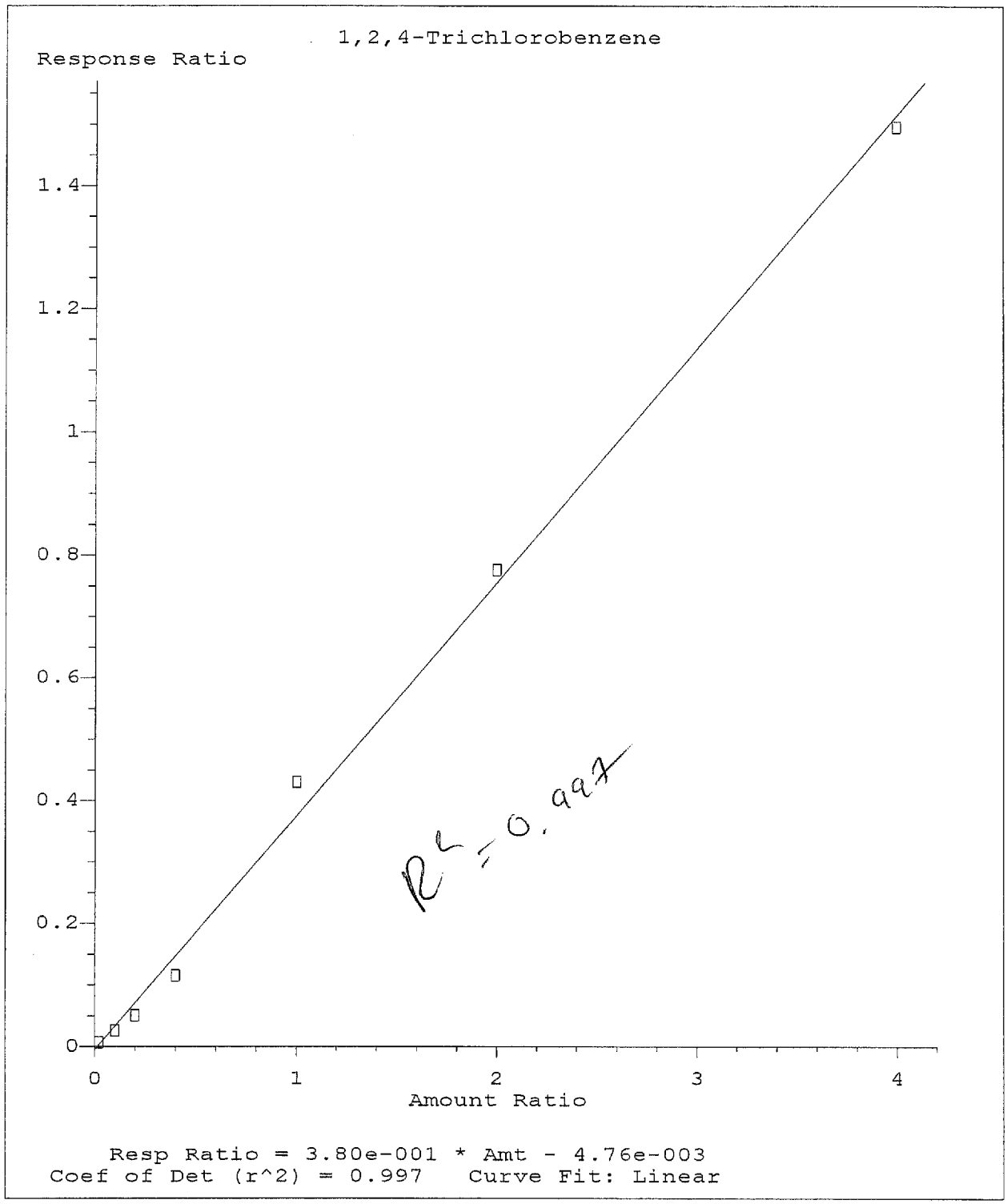
Method Name: O:\MS\HP5971\METHODS\2015\R7W0403.M
Calibration Table Last Updated: Fri Apr 03 15:40:34 2015



Method Name: O:\MS\HP5971\METHODS\2015\R7W0403.M
Calibration Table Last Updated: Fri Apr 03 15:40:34 2015



Method Name: O:\MS\HP5971\METHODS\2015\R7W0403.M
Calibration Table Last Updated: Fri Apr 03 15:40:34 2015



Method Name: O:\MS\HP5971\METHODS\2015\R7W0403.M
Calibration Table Last Updated: Fri Apr 03 15:40:34 2015

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Instrument ID: HP5972-2 Calibration Date: 04/20/15 Time: 7:40

Lab File ID: \G31863A.D Init. Calib. Date(s): 03/04/15 03/04/15

EPA Sample No.(VSTD050##): VSTD050 Init. Calib. Times: 12:56 15:05

Heated Purge: (Y/N) N

GC Column: Rtx-624 ID: .18 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Dichlorodifluoromethane	2.152	0.783	0.100	-63.6	20.0
Chloromethane	1.996	1.717	0.100	-14.0	20.0
Vinyl chloride	1.982	1.764	0.100	-11.0	20.0
Bromomethane	0.973	1.038	0.100	6.7	20.0
Chloroethane	1.075	1.202	0.100	11.8	20.0
Trichlorofluoromethane	2.026	2.367	0.100	16.8	20.0
1,1-Dichloroethene	1.448	1.510	0.100	4.3	20.0
Acetone	0.816	0.556	0.100	-31.8	20.0
Carbon disulfide	5.653	5.586	0.100	-1.2	20.0
Methylene chloride	1.892	1.903	0.100	0.6	20.0
trans-1,2-Dichloroethene	1.753	1.753	0.100	0.0	20.0
Methyl tert-butyl ether	5.374	5.477	0.100	1.9	20.0
1,1-Dichloroethane	3.111	3.771	0.200	21.2	20.0
cis-1,2-Dichloroethene	1.922	1.944	0.100	1.2	20.0
2-Butanone	1.042	0.954	0.100	-8.5	20.0
Chloroform	2.894	3.179	0.200	9.8	20.0
1,1,1-Trichloroethane	0.398	0.449	0.100	12.8	20.0
Carbon tetrachloride	0.357	0.379	0.100	6.3	20.0
Benzene	1.170	1.181	0.500	0.9	20.0
1,2-Dichloroethane	2.372	2.828	0.100	19.2	20.0
Trichloroethene	0.327	0.318	0.200	-2.6	20.0
1,2-Dichloropropane	0.303	0.353	0.100	16.6	20.0
Bromodichloromethane	0.398	0.451	0.200	13.4	20.0
cis-1,3-Dichloropropene	0.506	0.510	0.200	0.8	20.0
4-Methyl-2-pentanone	0.463	0.401	0.100	-13.3	20.0
Toluene	1.502	1.341	0.400	-10.7	20.0
trans-1,3-Dichloropropene	0.450	0.452	0.100	0.4	20.0
1,1,2-Trichloroethane	0.277	0.267	0.100	-3.7	20.0
Tetrachloroethene	0.289	0.222	0.200	-23.1	20.0
2-Hexanone	0.302	0.284	0.100	-6.0	20.0
Dibromochloromethane	0.337	0.319	0.100	-5.5	20.0
Chlorobenzene	0.970	0.873	0.500	-10.0	20.0
Ethylbenzene	0.468	0.420	0.100	-10.3	20.0
Xylene (total)	0.585	0.532		-9.1	20.0
Styrene	1.006	0.906	0.300	-10.0	20.0

All other compounds must meet a minimum RRF of 0.010.

7B

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Instrument ID: HP5972-2 Calibration Date: 04/20/15 Time: 7:40

Lab File ID: \G31863A.D Init. Calib. Date(s): 03/04/15 03/04/15

EPA Sample No.(VSTD050##): VSTD050 Init. Calib. Times: 12:56 15:05

Heated Purge: (Y/N) N

GC Column: Rtx-624 ID: .18 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Bromoform	0.227	0.174	0.100	-23.2	20.0
Isopropylbenzene	1.330	1.190	0.100	-10.5	20.0
1,1,2,2-Tetrachloroethane	0.438	0.405	0.300	-7.6	20.0
1,3-Dichlorobenzene	0.621	0.550	0.600	-11.4	20.0
1,4-Dichlorobenzene	0.651	0.561	0.500	-13.8	20.0
1,2-Dichlorobenzene	0.599	0.528	0.400	-11.8	20.0
1,2,4-Trichlorobenzene	0.284	0.206	0.200	-27.4	20.0

All other compounds must meet a minimum RRF of 0.010.

7B

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Instrument ID: HP5972-2 Calibration Date: 04/20/15 Time: 7:40

Lab File ID: \G31863A.D Init. Calib. Date(s): 03/04/15 03/04/15

EPA Sample No.(VSTD050##): VSTD050 Init. Calib. Times: 12:56 15:05

Heated Purge: (Y/N) N

GC Column: Rtx-624 ID: .18 (mm)

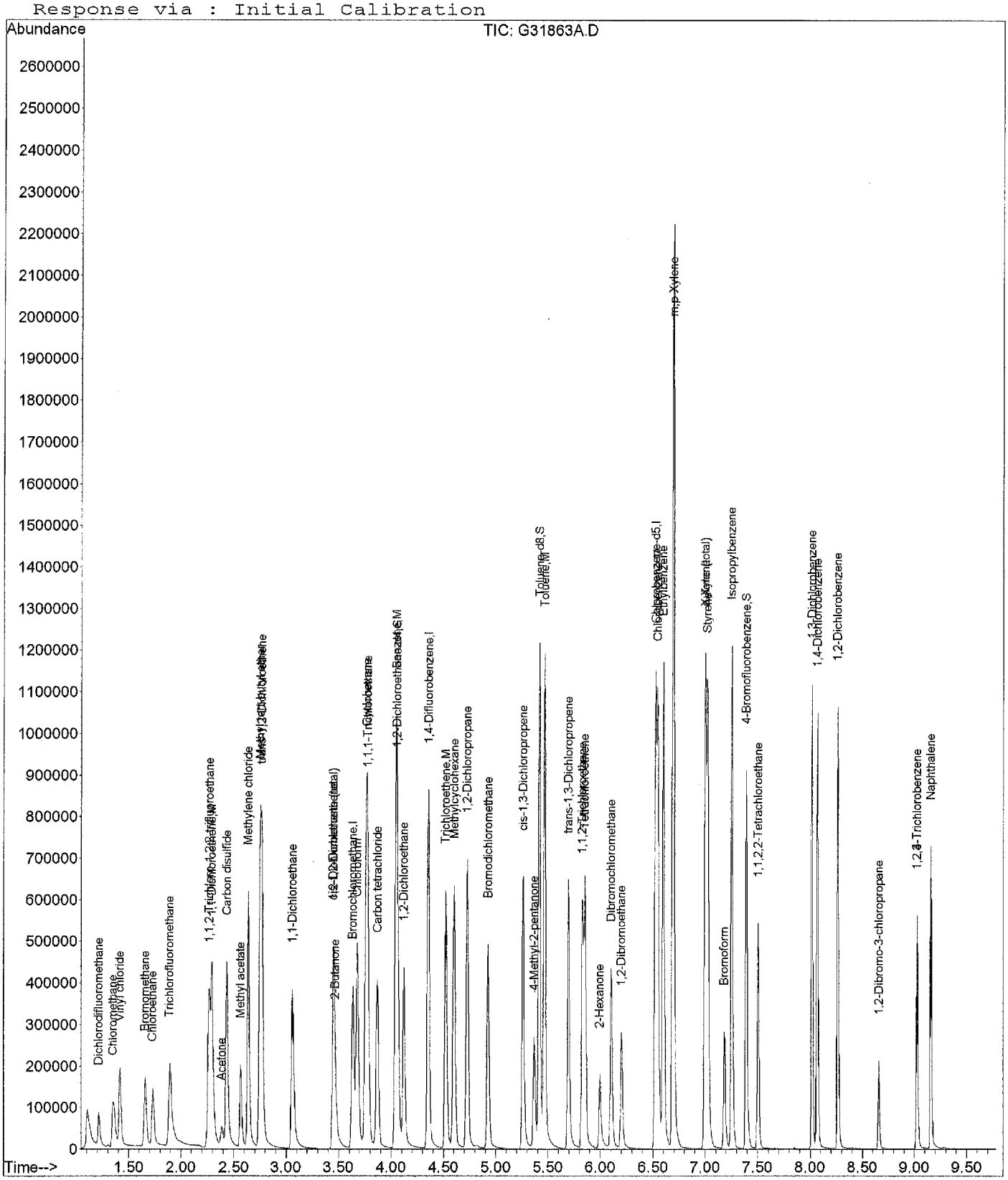
COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Toluene-d8	1.320	1.325		0.4	20.0
4-Bromofluorobenzene	0.469	0.472		0.7	20.0
1,2-Dichloroethane-d4	2.160	2.572		19.1	20.0

All other compounds must meet a minimum RRF of 0.010.

Quantitation Report

Data File : O:\MS\HP5972-2\DATA\2015\APR15\042015\G31863A.D Vial: 4
Acq On : 20 Apr 2015 7:40 Operator: KGG
Sample : VSTD050 Inst : HP5972-2
Misc : ,,,CCV,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 21 13:39 2015 Quant Results File: R8W0304.RES

Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\APR15\042015\G31863A.D Vial: 4
Acq On : 20 Apr 2015 7:40 Operator: KGG
Sample : VSTD050 Inst : HP5972-2
Misc : ,,,CCV,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 21 13:39 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration
DataAcq Meth : C8W0304

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	3.64	128	93170	50.00 ug/l	0.00
28) 1,4-Difluorobenzene	4.36	114	537505	50.00 ug/l	0.00
44) Chlorobenzene-d5	6.53	117	457905	50.00 ug/l	0.00
System Monitoring Compounds					
27) 1,2-Dichloroethane-d4	4.06	65	239633	59.55 ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 119.10%		
46) Toluene-d8	5.42	98	606829	50.18 ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 100.36%		
58) 4-Bromofluorobenzene	7.39	95	216073	50.34 ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 100.68%		

Target Compounds					Qvalue
3) Dichlorodifluoromethane	1.21	85	72944	17.22 ug/l	99
4) Chloromethane	1.35	50	159975	43.02 ug/l	99
5) Vinyl chloride	1.42	62	164341	44.51 ug/l	99
6) Bromomethane	1.66	94	96677	44.16 ug/l	97
7) Chloroethane	1.73	64	111958	55.88 ug/l	99
8) Trichlorofluoromethane	1.89	101	220489	58.41 ug/l	100
9) 1,1,2-Trichloro-1,2,2-trif	2.27	101	144306	52.05 ug/l	93
11) Methyl tert-butyl ether	2.75	73	510253	50.95 ug/l	91
13) 1,1-Dichloroethene	2.30	96	140689	52.14 ug/l #	81
14) Methylene chloride	2.64	84	177342	50.29 ug/l #	69
15) trans-1,2-Dichloroethene	2.77	96	163284	50.00 ug/l #	87
17) 1,1-Dichloroethane	3.06	63	351389	60.61 ug/l	98
18) 1,2-Dichloroethene (total)	3.45	96	181103	52.40 ug/l #	82
19) cis-1,2-Dichloroethene	3.45	96	181103	50.58 ug/l #	82
20) Acetone	2.39	43	51817	38.68 ug/l	99
21) Chloroform	3.68	83	296225	54.93 ug/l	93
22) Carbon disulfide	2.43	76	520444	49.40 ug/l	88
23) Methyl acetate	2.57	43	212935	61.55 ug/l	85
25) 2-Butanone	3.47	43	88910	46.54 ug/l	88
26) 1,2-Dichloroethane	4.12	62	263505	59.62 ug/l	98
29) Cyclohexane	3.76	56	286890	59.43 ug/l	84
30) 1,1,1-Trichloroethane	3.78	97	241297	56.39 ug/l	94
31) Carbon tetrachloride	3.87	117	203623	53.13 ug/l	98
32) Benzene	4.04	78	634791	50.47 ug/l	94
33) Trichloroethene	4.53	130	170785	48.64 ug/l	95
34) Methylcyclohexane	4.60	83	169822	45.55 ug/l #	83
35) 1,2-Dichloropropane	4.73	63	189570	58.25 ug/l	85
37) Bromodichloromethane	4.93	83	242424	56.73 ug/l	96
39) cis-1,3-Dichloropropene	5.26	75	274371	50.43 ug/l #	79
40) 1,1,2-Trichloroethane	5.83	97	143760	48.24 ug/l	96
41) Dibromochloromethane	6.11	129	171354	47.24 ug/l	99
42) trans-1,3-Dichloropropene	5.70	75	242774	50.16 ug/l #	80
43) Bromoform	7.18	173	93753	38.50 ug/l	99
45) 4-Methyl-2-pentanone	5.37	43	183526	44.51 ug/l	83
47) Toluene	5.47	91	613915	44.62 ug/l	98
48) 2-Hexanone	6.00	43	129875	45.96 ug/l	86
49) Tetrachloroethene	5.85	164	101454	38.37 ug/l	93
50) 1,2-Dibromoethane	6.20	107	155894	43.73 ug/l	97
51) Chlorobenzene	6.54	112	399925	45.00 ug/l	95
52) Ethylbenzene	6.60	106	192273	44.86 ug/l #	89
53) m,p-Xylene	6.70	106	487137	92.38 ug/l	91
54) o-Xylene	7.00	106	243742	45.49 ug/l	87

(#) = qualifier out of range (m) = manual integration

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\APR15\042015\G31863A.D Vial: 4
Acq On : 20 Apr 2015 7:40 Operator: KGG
Sample : VSTD050 Inst : HP5972-2
Misc : ,,,CCV,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 21 13:39 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration
DataAcq Meth : C8W0304

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
55) Xylene (total)	7.00	106	243742	45.49 ug/l	87
56) Styrene	7.03	104	414642	44.99 ug/l	85
57) Isopropylbenzene	7.25	105	544862	44.74 ug/l	97
59) 1,1,2,2-Tetrachloroethane	7.51	83	185545	46.22 ug/l	100
62) 1,3-Dichlorobenzene	8.02	146	251724	44.26 ug/l	95
63) 1,4-Dichlorobenzene	8.07	146	257045	43.13 ug/l	93
64) 1,2-Dichlorobenzene	8.26	146	241561	44.06 ug/l	88
65) 1,2-Dibromo-3-chloropropan	8.66	75	29124	47.79 ug/l	91
67) 1,2,4-Trichlorobenzene	9.03	180	94233	30.30 ug/l	95
68) Naphthalene	9.16	128	337020	41.60 ug/l	100
69) 1,2,3-Trichlorobenzene	9.03	180	94233	33.91 ug/l	97

(#) = qualifier out of range (m) = manual integration

AECOM237 V220

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Instrument ID: HP5971 Calibration Date: 04/22/15 Time: 9:51

Lab File ID: 5\A86058.D Init. Calib. Date(s): 03/31/15 03/31/15

EPA Sample No.(VSTD050##): VSTD050 Init. Calib. Times: 17:19 19:04

Heated Purge: (Y/N) Y

GC Column: Rtx-624 ID: .18 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Dichlorodifluoromethane	2.238	1.120	0.100	-49.9	20.0
Chloromethane	2.504	2.354	0.100	-6.0	20.0
Vinyl chloride	2.163	2.051	0.100	-5.2	20.0
Bromomethane	1.351	1.336	0.100	-1.1	20.0
Chloroethane	1.262	1.334	0.100	5.7	20.0
Trichlorofluoromethane	2.813	2.270	0.100	-19.3	20.0
1,1-Dichloroethene	1.729	1.852	0.100	7.1	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	1.809	1.658	0.100	-8.4	20.0
Acetone	0.508	0.400	0.100	-21.3	20.0
Carbon disulfide	6.123	6.363	0.100	3.9	20.0
Methyl Acetate	0.832	1.145	0.100	37.6	20.0
Methylene chloride	2.020	2.367	0.100	17.2	20.0
trans-1,2-Dichloroethene	2.020	2.460	0.100	21.8	20.0
Methyl tert-butyl ether	4.234	4.888	0.100	15.4	20.0
1,1-Dichloroethane	3.275	3.874	0.200	18.3	20.0
cis-1,2-Dichloroethene	2.692	3.366	0.100	25.0	20.0
2-Butanone	0.804	0.973	0.100	21.0	20.0
Chloroform	4.007	4.494	0.200	12.1	20.0
1,1,1-Trichloroethane	0.497	0.472	0.100	-5.0	20.0
Cyclohexane	0.551	0.519	0.100	-5.8	20.0
Carbon tetrachloride	0.456	0.387	0.100	-15.1	20.0
Benzene	1.343	1.611	0.500	19.9	20.0
1,2-Dichloroethane	2.409	2.729	0.100	13.3	20.0
Trichloroethene	0.417	0.430	0.200	3.0	20.0
Methylcyclohexane	0.563	0.464	0.100	-17.6	20.0
1,2-Dichloropropane	0.338	0.422	0.100	25.0	20.0
Bromodichloromethane	0.460	0.493	0.200	7.2	20.0
cis-1,3-Dichloropropene	0.574	0.647	0.200	12.7	20.0
4-Methyl-2-pentanone	0.286	0.322	0.100	12.5	20.0
Toluene	1.686	1.798	0.400	6.6	20.0
trans-1,3-Dichloropropene	0.468	0.493	0.100	5.3	20.0
1,1,2-Trichloroethane	0.271	0.327	0.100	20.8	20.0
Tetrachloroethene	0.379	0.320	0.200	-15.5	20.0
2-Hexanone	0.211	0.232	0.100	10.2	20.0
Dibromochloromethane	0.363	0.340	0.100	-6.4	20.0

All other compounds must meet a minimum RRF of 0.010.

7B

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Instrument ID: HP5971 Calibration Date: 04/22/15 Time: 9:51

Lab File ID: 5\A86058.D Init. Calib. Date(s): 03/31/15 03/31/15

EPA Sample No.(VSTD050##): VSTD050 Init. Calib. Times: 17:19 19:04

Heated Purge: (Y/N) Y

GC Column: Rtx-624 ID: .18 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
1,2-Dibromoethane	0.335	0.333	0.100	-0.6	20.0
Chlorobenzene	1.188	1.210	0.500	1.9	20.0
Ethylbenzene	0.619	0.614	0.100	-0.8	20.0
Xylene (total)	0.761	0.772		1.5	20.0
Styrene	1.300	1.343	0.300	3.3	20.0
Bromoform	0.230	0.192	0.100	-16.7	20.0
Isopropylbenzene	1.933	1.745	0.100	-9.7	20.0
1,1,2,2-Tetrachloroethane	0.364	0.416	0.300	14.2	20.0
1,3-Dichlorobenzene	0.903	0.835	0.600	-7.6	20.0
1,4-Dichlorobenzene	0.915	0.839	0.500	-8.3	20.0
1,2-Dichlorobenzene	0.831	0.752	0.400	-9.5	20.0
1,2-Dibromo-3-chloropropane	0.059	0.052	0.050	-12.3	20.0
1,2,4-Trichlorobenzene	0.510	0.415	0.200	-18.7	20.0

All other compounds must meet a minimum RRF of 0.010.

7B

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Instrument ID: HP5971 Calibration Date: 04/22/15 Time: 9:51

Lab File ID: 5\A86058.D Init. Calib. Date(s): 03/31/15 03/31/15

EPA Sample No.(VSTD050##): VSTD050 Init. Calib. Times: 17:19 19:04

Heated Purge: (Y/N) Y

GC Column: Rtx-624 ID: .18 (mm)

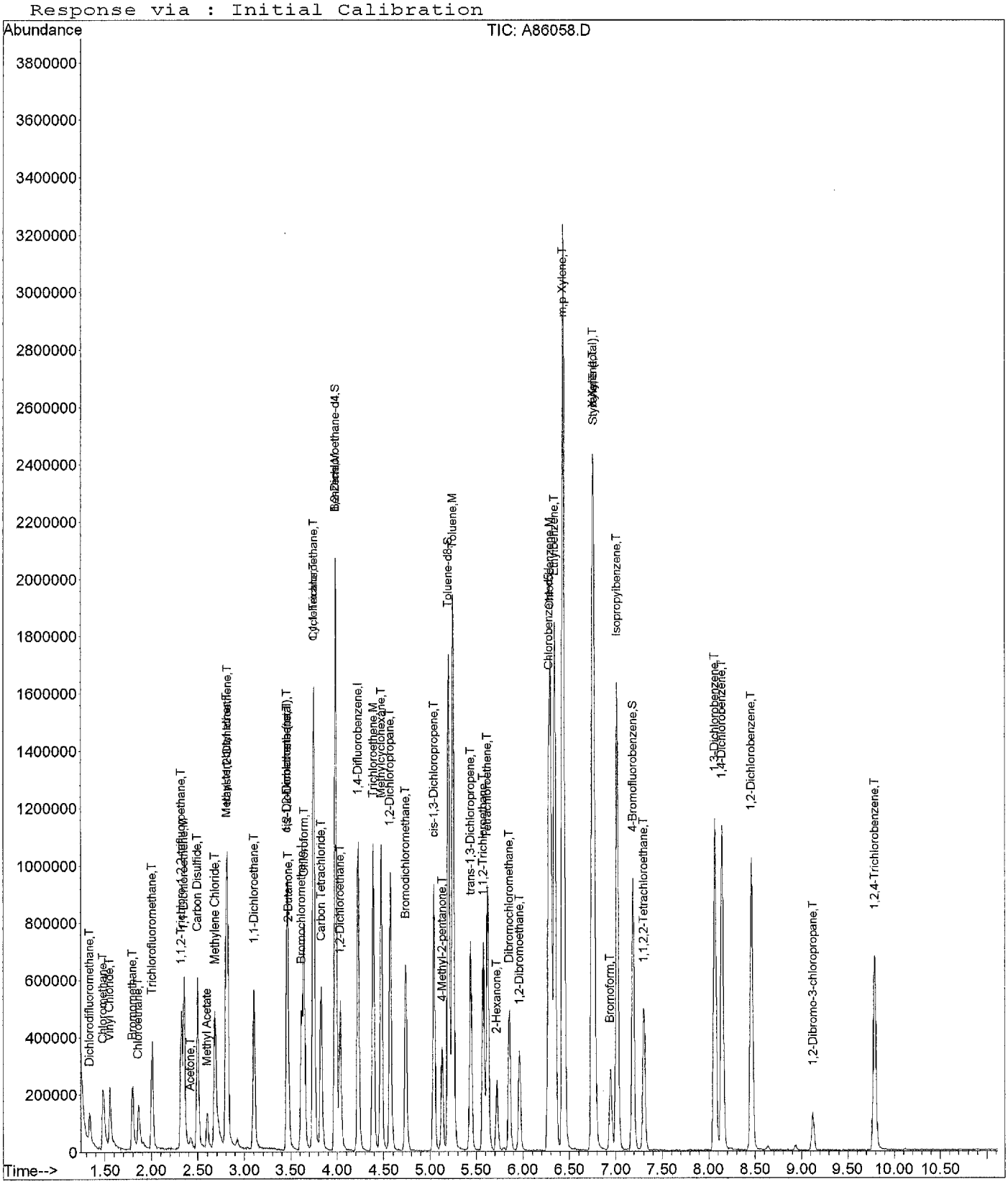
COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Toluene-d8	1.308	1.498		14.5	20.0
4-Bromofluorobenzene	0.486	0.545		12.1	20.0
1,2-Dichloroethane-d4	1.684	1.901		12.9	20.0

All other compounds must meet a minimum RRF of 0.010.

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86058.D Vial: 7
Acq On : 22 Apr 2015 9:51 Operator: MF
Sample : VSTD050 Inst : H5971
Misc : ,,,CCV,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 22 11:05 2015 Quant Results File: R6S0331.RES

Method : O:\MS\HP5971\METHODS\2015\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration



AECOM237 V224

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86058.D Vial: 7
Acq On : 22 Apr 2015 9:51 Operator: MF
Sample : VSTD050 Inst : H5971
Misc : ,,,CCV,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 22 11:05 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	113551	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	790037	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	746617	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.99	65	215835	56.44	ug/l	0.00
Spiked Amount 50.000	Range 33 - 150		Recovery = 112.88%			
49) Toluene-d8	5.20	98	1118288	57.24	ug/l	0.00
Spiked Amount 50.000	Range 43 - 157		Recovery = 114.48%			
53) 4-Bromofluorobenzene	7.19	95	406802	56.04	ug/l	0.01
Spiked Amount 50.000	Range 34 - 145		Recovery = 112.08%			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.34	85	127211	25.03	ug/l	96
4) Chloromethane	1.48	50	267310	47.00	ug/l	100
5) Bromomethane	1.79	94	151649	49.43	ug/l	98
6) Vinyl Chloride	1.55	62	232884	47.41	ug/l	98
7) Chloroethane	1.86	64	151510	52.87	ug/l	95
10) Methyl Acetate	2.60	43	129989	68.79	ug/l	95
11) 1,1,2-Trichloro-1,2,2-trif	2.32	101	188274	45.82	ug/l #	82
12) Methylene Chloride	2.68	84	268818	58.59	ug/l	99
13) Acetone	2.43	43	45384	54.40	ug/l	98
14) Carbon Disulfide	2.50	76	722546	51.96	ug/l	100
16) 1,1-Dichloroethene	2.35	96	210339	53.57	ug/l #	82
17) 1,1-Dichloroethane	3.10	63	439923	59.15	ug/l	98
18) Trichlorofluoromethane	2.01	101	257770	40.35	ug/l	95
20) Methyl tert-butyl ether	2.80	73	555061	57.72	ug/l	100
21) trans-1,2-Dichloroethene	2.82	96	279283	60.86	ug/l	97
22) cis-1,2-Dichloroethene	3.46	96	382232	62.52	ug/l	96
23) 1,2-Dichloroethene (total)	3.46	96	663006m	121.12	ug/l	
24) 2-Butanone	3.48	43	110536	60.50	ug/l	89
25) Chloroform	3.64	83	510317	56.07	ug/l	98
27) 1,2-Dichloroethane	4.04	62	309852	56.63	ug/l	96
29) 1,1,1-Trichloroethane	3.75	97	372711	47.48	ug/l	98
30) Cyclohexane	3.74	56	410395	47.16	ug/l	97
31) Carbon Tetrachloride	3.83	117	305939	42.46	ug/l	95
33) Bromodichloromethane	4.74	83	389404	53.58	ug/l	96
34) 1,2-Dichloropropane	4.57	63	333032	62.43	ug/l	98
35) cis-1,3-Dichloropropene	5.04	75	510773	56.31	ug/l	99
36) Trichloroethene	4.39	130	339627	51.49	ug/l	92
37) Methylcyclohexane	4.47	83	366598	41.19	ug/l	96
38) Benzene	3.98	78	1273023	59.98	ug/l	98
39) Dibromochloromethane	5.86	129	268549	46.77	ug/l	98
40) trans-1,3-Dichloropropene	5.44	75	389605	52.67	ug/l	96
41) 1,1,2-Trichloroethane	5.57	97	258458	60.43	ug/l	99
42) Bromoform	6.94	173	151697	41.66	ug/l	96
44) 4-Methyl-2-pentanone	5.13	43	240153	56.18	ug/l	94
45) 2-Hexanone	5.72	43	173060	55.03	ug/l	94
46) 1,2-Dibromoethane	5.96	107	248700	49.73	ug/l	95
47) Tetrachloroethene	5.62	164	239216	42.29	ug/l	99
48) 1,1,2,2-Tetrachloroethane	7.30	83	310917	57.17	ug/l	88
50) Toluene	5.25	91	1342735	53.34	ug/l	96
51) Chlorobenzene	6.30	112	903620	50.96	ug/l	97
52) Ethylbenzene	6.34	106	458282	49.57	ug/l	93
54) Styrene	6.77	104	1002957	51.65	ug/l	98

(#) = qualifier out of range (m) = manual integration

AECOM237 V225

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86058.D Vial: 7
Acq On : 22 Apr 2015 9:51 Operator: MF
Sample : VSTD050 Inst : H5971
Misc : ,,,CCV,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 22 11:05 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

	Compound	R.T.	QIon	Response	Conc Unit	Qvalue
55)	m,p-Xylene	6.43	106	1165003	100.57 ug/l	98
56)	o-Xylene	6.75	106	576240	50.71 ug/l	95
57)	Xylene (total)	6.75	106	576240	50.72 ug/l	95
58)	Isopropylbenzene	7.02	105	1302474	45.12 ug/l	94
59)	1,3-Dichlorobenzene	8.07	146	623554	46.23 ug/l	99
60)	1,4-Dichlorobenzene	8.15	146	626058	45.83 ug/l	96
61)	1,2-Dichlorobenzene	8.46	146	561215	45.21 ug/l	96
62)	1,2-Dibromo-3-chloropropan	9.12	75	38618	43.61 ug/l	87
63)	1,2,4-Trichlorobenzene	9.79	180	310065	40.69 ug/l	96

(#) = qualifier out of range (m) = manual integration

AECOM237 V226

7A

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Instrument ID: HP5971 Calibration Date: 04/23/15 Time: 10:14

Lab File ID: 5\A86084.D Init. Calib. Date(s): 04/03/15 04/03/15

EPA Sample No.(VSTD050##): VSTD050 Init. Calib. Times: 12:58 15:00

Heated Purge: (Y/N) N

GC Column: Rtx-624 ID: .18 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Dichlorodifluoromethane	1.999	0.593	0.100	-70.3	20.0
Chloromethane	2.041	1.512	0.100	-25.9	20.0
Vinyl chloride	1.596	1.173	0.100	-26.5	20.0
Bromomethane	1.042	0.888	0.100	-14.8	20.0
Chloroethane	0.918	0.851	0.100	-7.3	20.0
Trichlorofluoromethane	1.899	1.340	0.100	-29.4	20.0
1,1-Dichloroethene	1.074	1.086	0.100	1.1	20.0
1,1,2-Trichloro-1,2,2-trifluoroethane	1.069	0.977	0.100	-8.6	20.0
Acetone	0.452	0.373	0.100	-17.4	20.0
Carbon disulfide	3.809	3.661	0.100	-3.9	20.0
Methyl Acetate	1.429	1.311	0.100	-8.3	20.0
Methylene chloride	1.360	1.465	0.100	7.7	20.0
trans-1,2-Dichloroethene	1.282	1.466	0.100	14.3	20.0
Methyl tert-butyl ether	3.446	3.709	0.100	7.6	20.0
1,1-Dichloroethane	2.089	2.420	0.200	15.8	20.0
cis-1,2-Dichloroethene	1.825	2.080	0.100	14.0	20.0
2-Butanone	0.928	1.039	0.100	11.9	20.0
Chloroform	2.643	2.913	0.200	10.2	20.0
1,1,1-Trichloroethane	0.349	0.327	0.100	-6.4	20.0
Cyclohexane	0.346	0.353	0.100	2.1	20.0
Carbon tetrachloride	0.306	0.249	0.100	-18.5	20.0
Benzene	1.022	1.151	0.500	12.6	20.0
1,2-Dichloroethane	1.909	2.116	0.100	10.8	20.0
Trichloroethene	0.309	0.287	0.200	-7.2	20.0
Methylcyclohexane	0.280	0.249	0.100	-11.1	20.0
1,2-Dichloropropane	0.272	0.327	0.100	20.4	20.0
Bromodichloromethane	0.360	0.387	0.200	7.6	20.0
cis-1,3-Dichloropropene	0.463	0.522	0.200	12.8	20.0
4-Methyl-2-pentanone	0.370	0.351	0.100	-5.1	20.0
Toluene	1.224	1.236	0.400	1.0	20.0
trans-1,3-Dichloropropene	0.406	0.427	0.100	5.1	20.0
1,1,2-Trichloroethane	0.270	0.300	0.100	10.9	20.0
Tetrachloroethene	0.253	0.194	0.200	-23.4	20.0
2-Hexanone	0.274	0.246	0.100	-10.2	20.0
Dibromochloromethane	0.321	0.299	0.100	-6.9	20.0

All other compounds must meet a minimum RRF of 0.010.

7B

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Instrument ID: HP5971 Calibration Date: 04/23/15 Time: 10:14

Lab File ID: 5\A86084.D Init. Calib. Date(s): 04/03/15 04/03/15

EPA Sample No.(VSTD050##): VSTD050 Init. Calib. Times: 12:58 15:00

Heated Purge: (Y/N) N

GC Column: Rtx-624 ID: .18 (mm)

COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
1,2-Dibromoethane	0.349	0.330	0.100	-5.5	20.0
Chlorobenzene	0.908	0.825	0.500	-9.2	20.0
Ethylbenzene	0.439	0.388	0.100	-11.6	20.0
Xylene (total)	0.551	0.510		-7.5	20.0
Styrene	1.004	0.936	0.300	-6.8	20.0
Bromoform	0.227	0.198	0.100	-12.7	20.0
Isopropylbenzene	1.195	0.999	0.100	-16.4	20.0
1,1,2,2-Tetrachloroethane	0.394	0.432	0.300	9.6	20.0
1,3-Dichlorobenzene	0.649	0.521	0.600	-19.7	20.0
1,4-Dichlorobenzene	0.685	0.553	0.500	-19.3	20.0
1,2-Dichlorobenzene	0.659	0.532	0.400	-19.2	20.0
1,2-Dibromo-3-chloropropane	0.062	0.055	0.050	-11.9	20.0
1,2,4-Trichlorobenzene	0.332	0.224	0.200	-32.5	20.0

All other compounds must meet a minimum RRF of 0.010.

7B

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Instrument ID: HP5971 Calibration Date: 04/23/15 Time: 10:14

Lab File ID: 5\A86084.D Init. Calib. Date(s): 04/03/15 04/03/15

EPA Sample No.(VSTD050##): VSTD050 Init. Calib. Times: 12:58 15:00

Heated Purge: (Y/N) N

GC Column: Rtx-624 ID: .18 (mm)

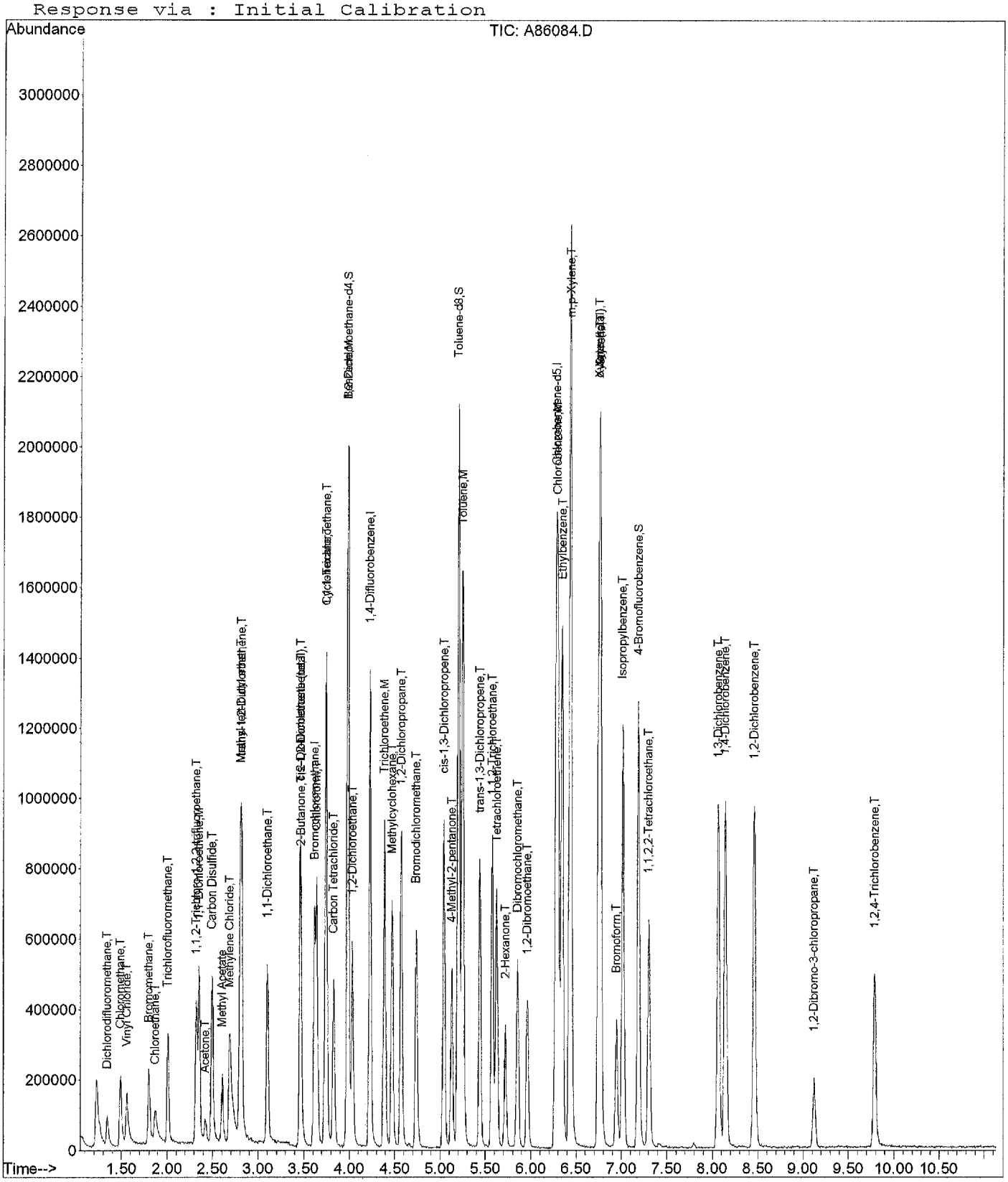
COMPOUND	$\overline{RRF}$	RRF50	MIN RRF	%D	MAX %D
Toluene-d8	1.229	1.466		19.3	20.0
4-Bromofluorobenzene	0.478	0.568		18.9	20.0
1,2-Dichloroethane-d4	1.770	2.074		17.2	20.0

All other compounds must meet a minimum RRF of 0.010.

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86084.D Vial: 4
Acq On : 23 Apr 2015 10:14 Operator: MF
Sample : VSTD050 Inst : H5971
Misc : ,,,CCV,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 10:30 2015 Quant Results File: R7W0403.RES

Method : O:\MS\HP5971\METHODS\2015\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration



AECOM237 V230

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86084.D Vial: 4
Acq On : 23 Apr 2015 10:14 Operator: MF
Sample : VSTD050 Inst : H5971
Misc : ,,,CCV,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 10:30 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	161013	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	993055	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	977977	50.00	ug/l	0.01
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	333927	57.26	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 114.52%			
49) Toluene-d8	5.20	98	1433814	57.42	ug/l	0.01
Spiked Amount 50.000	Range 60 - 135		Recovery = 114.84%			
53) 4-Bromofluorobenzene	7.19	95	555481	59.46	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 118.92%			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.34	85	95411	14.79	ug/l	93
4) Chloromethane	1.49	50	243451	36.69	ug/l	96
5) Bromomethane	1.80	94	142900	43.20	ug/l	99
6) Vinyl Chloride	1.56	62	188934	33.74	ug/l	96
7) Chloroethane	1.88	64	137055	47.70	ug/l	95
10) Methyl Acetate	2.60	43	211114	42.50	ug/l	95
11) 1,1,2-Trichloro-1,2,2-trif	2.32	101	157263	36.54	ug/l	86
12) Methylene Chloride	2.68	84	235866	55.59	ug/l	94
13) Acetone	2.42	43	60109	44.67	ug/l	92
14) Carbon Disulfide	2.50	76	589446	48.37	ug/l	93
16) 1,1-Dichloroethene	2.35	96	174785	50.40	ug/l	90
17) 1,1-Dichloroethane	3.10	63	389591	59.52	ug/l	95
18) Trichlorofluoromethane	2.01	101	215687	35.53	ug/l	97
20) Methyl tert-butyl ether	2.80	73	597241	53.91	ug/l	91
21) trans-1,2-Dichloroethene	2.82	96	236055	55.65	ug/l	93
22) cis-1,2-Dichloroethene	3.46	96	334936	56.32	ug/l	95
23) 1,2-Dichloroethene (total)	3.46	96	574188m	111.29	ug/l	
24) 2-Butanone	3.47	43	167339	55.98	ug/l	99
25) Chloroform	3.64	83	469094	53.98	ug/l	96
27) 1,2-Dichloroethane	4.03	62	340669	55.17	ug/l	97
29) 1,1,1-Trichloroethane	3.75	97	324661	47.76	ug/l	99
30) Cyclohexane	3.74	56	350374	52.52	ug/l	89
31) Carbon Tetrachloride	3.83	117	247398	41.68	ug/l	97
33) Bromodichloromethane	4.74	83	383823	52.17	ug/l	99
34) 1,2-Dichloropropane	4.57	63	324466	59.84	ug/l	91
35) cis-1,3-Dichloropropene	5.04	75	518073	56.69	ug/l	99
36) Trichloroethene	4.39	130	285394	46.48	ug/l	96
37) Methylcyclohexane	4.47	83	246958	34.55	ug/l	92
38) Benzene	3.98	78	1142795	56.20	ug/l	99
39) Dibromochloromethane	5.85	129	297027	48.19	ug/l	93
40) trans-1,3-Dichloropropene	5.44	75	424508	53.68	ug/l	94
41) 1,1,2-Trichloroethane	5.57	97	297761	56.10	ug/l	94
42) Bromoform	6.95	173	196615	44.45	ug/l	90
44) 4-Methyl-2-pentanone	5.13	43	343560	47.49	ug/l	95
45) 2-Hexanone	5.72	43	240651	44.92	ug/l	90
46) 1,2-Dibromoethane	5.96	107	322631	47.81	ug/l	97
47) Tetrachloroethene	5.63	164	190117	37.88	ug/l	97
48) 1,1,2,2-Tetrachloroethane	7.30	83	422285	54.37	ug/l	97
50) Toluene	5.25	91	1208317	47.74	ug/l	99
51) Chlorobenzene	6.30	112	806733	45.63	ug/l	93
52) Ethylbenzene	6.35	106	379805	44.26	ug/l	94
54) Styrene	6.77	104	915185	46.49	ug/l	97

(#) = qualifier out of range (m) = manual integration

AECOM237 V231

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86084.D Vial: 4
Acq On : 23 Apr 2015 10:14 Operator: MF
Sample : VSTD050 Inst : H5971
Misc : ,,,CCV,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 10:30 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

	Compound	R.T.	QIon	Response	Conc	Unit		Qvalue
55)	m,p-Xylene	6.43	106	982917	92.98	ug/l		94
56)	o-Xylene	6.75	106	498908	46.75	ug/l		98
57)	Xylene (total)	6.75	106	498908	46.77	ug/l		98
58)	Isopropylbenzene	7.01	105	977256	41.72	ug/l		97
59)	1,3-Dichlorobenzene	8.06	146	509772	40.58	ug/l		97
60)	1,4-Dichlorobenzene	8.14	146	540949	40.94	ug/l		98
61)	1,2-Dichlorobenzene	8.46	146	520421	40.73	ug/l		96
62)	1,2-Dibromo-3-chloropropan	9.12	75	53690	45.93	ug/l	#	79
63)	1,2,4-Trichlorobenzene	9.79	180	218607	30.06	ug/l		98

(#) = qualifier out of range (m) = manual integration

AECOM237 V232

Pace Long Island

575 Broad Hollow Road
Melville, NY 11747

tel. 631.694.3040
fax. 631.420.8436

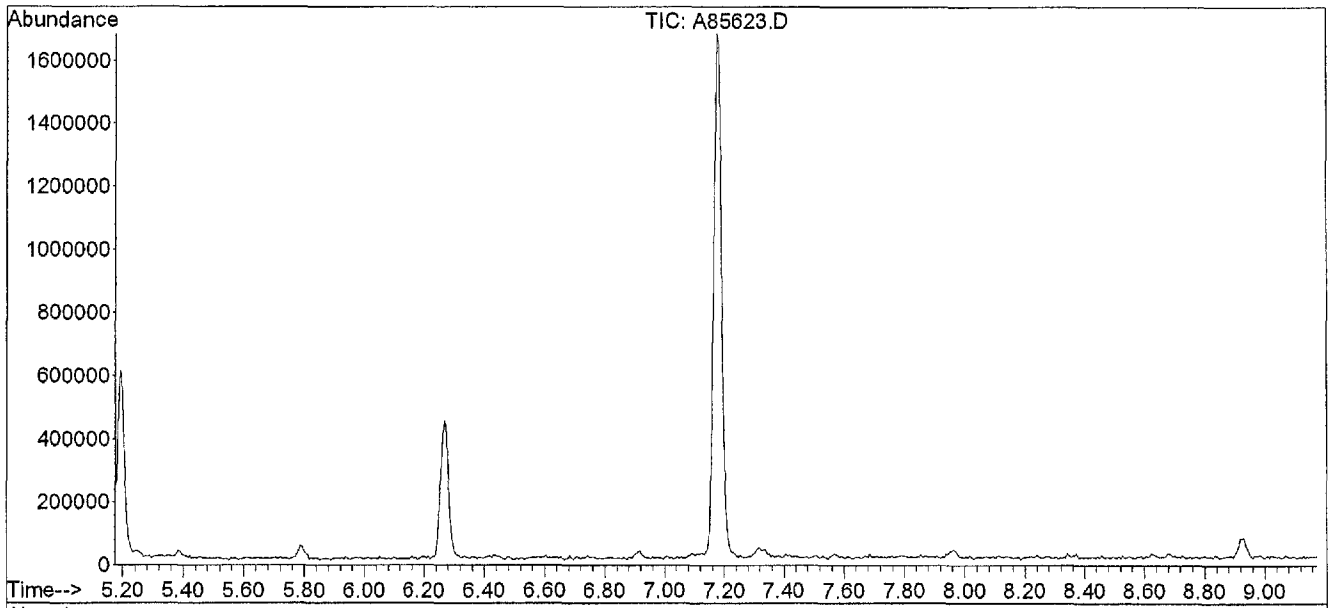
IV. RAW QC DATA PACKAGE FOR VOLATILE ORGANICS

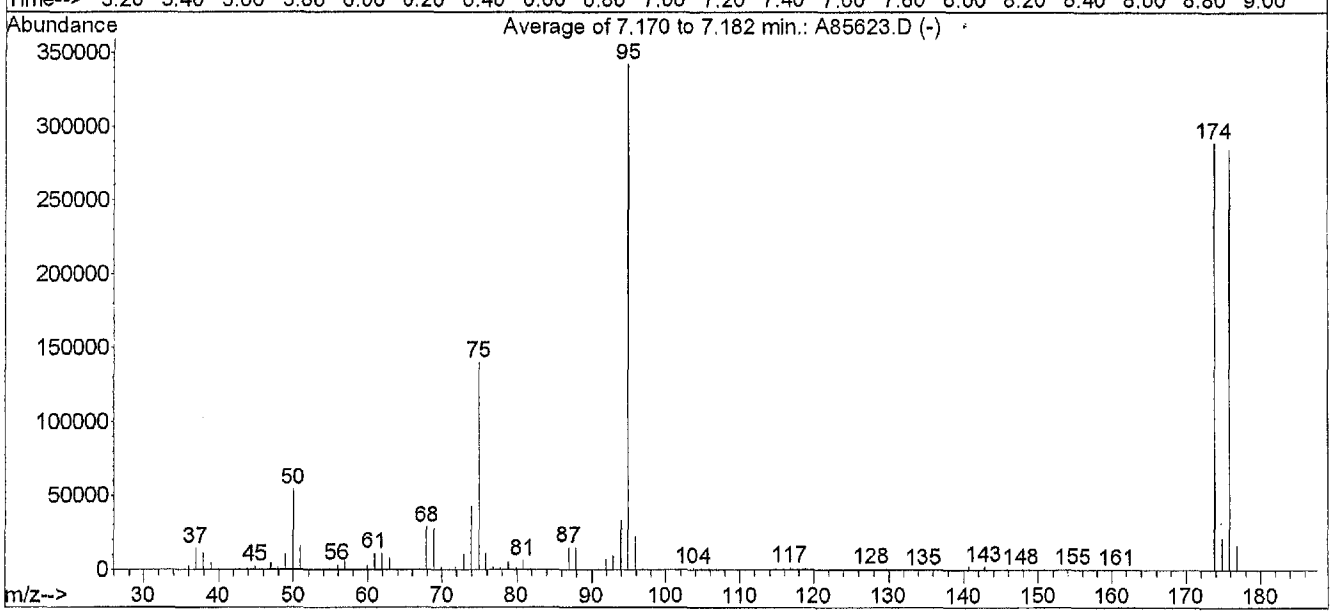
A. TUNING
B. BLANK
C. SPIKE AND SPIKE DUPLICATE*
D. MATRIX SPIKE BLANK*
F. LFB*
G. DUPLICATE*
H. COPY OF CALCULATIONS

*IF REQUIRED

CLPBFB

Data File : O:\MS\HP5971\DATA\2015\MAR15\033115\A85623.D Vial: 1
Acq On : 31 Mar 2015 16:37 Operator: DRL
Sample : 50 NG BFB Inst : H5971
Misc : ,,,TUNE,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Method : O:\MS\HP5971\METHODS\2015\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A





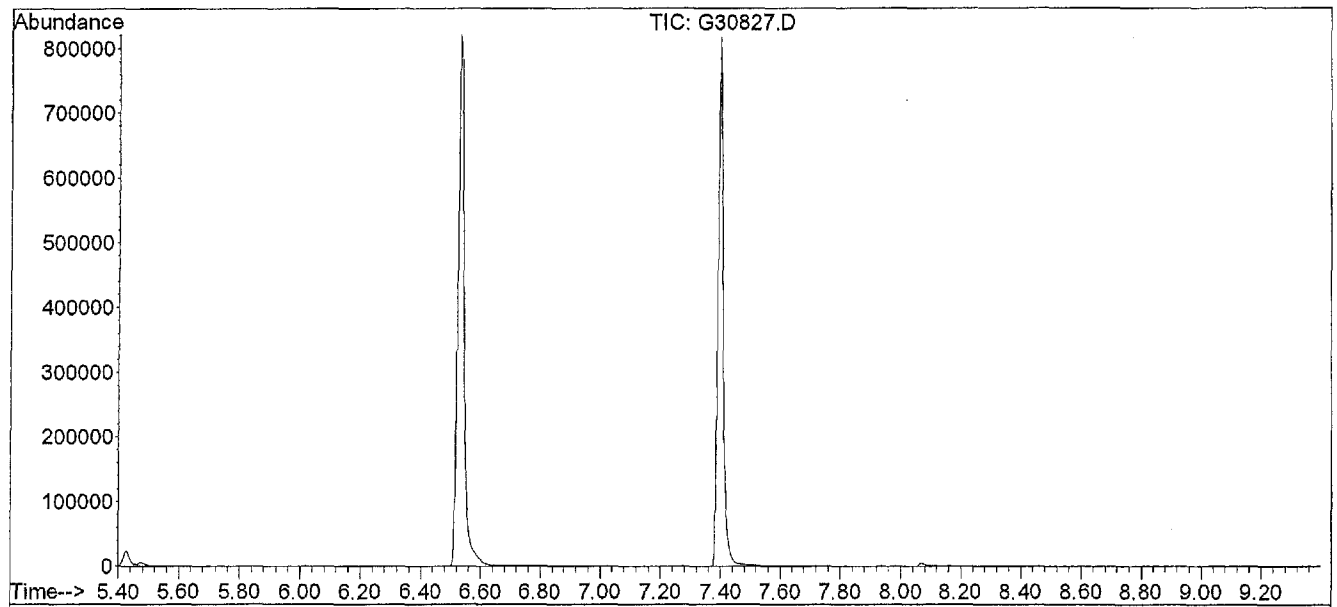
AutoFind: Scans 1037, 1038, 1039; Background Corrected with Scan 1029

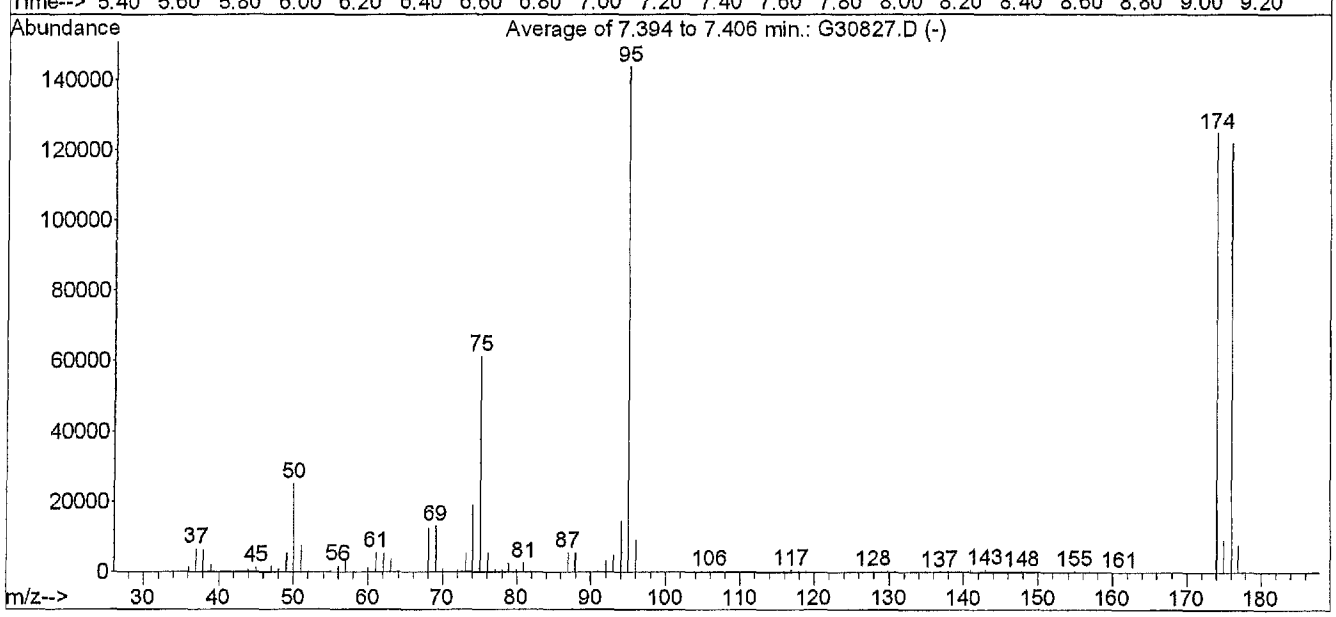
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	15.9	54456	PASS
75	95	30	60	40.9	140163	PASS
95	95	100	100	100.0	342613	PASS
96	95	5	9	6.6	22464	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	100	84.4	289173	PASS
175	174	5	9	7.4	21301	PASS
176	174	95	101	98.5	284885	PASS
177	176	5	9	5.8	16477	PASS

A85623.D R6S0331.M Tue May 05 13:38:36 2015 RPT1

BFB

Data File : O:\MS\HP5972-2\DATA\2015\MAR15\030415\G30827.D Vial: 5
Acq On : 4 Mar 2015 11:25 Operator: KGG
Sample : 50 NG BFB Inst : HP5972-2
Misc : ,,,TUNE,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Method : O:\MS\HP5972-2\METHODS\2015\RP8W0227.M (RTE Integrator)
Title : 8260W CL3405;CJ3703;A0106193;CK0331;A099342





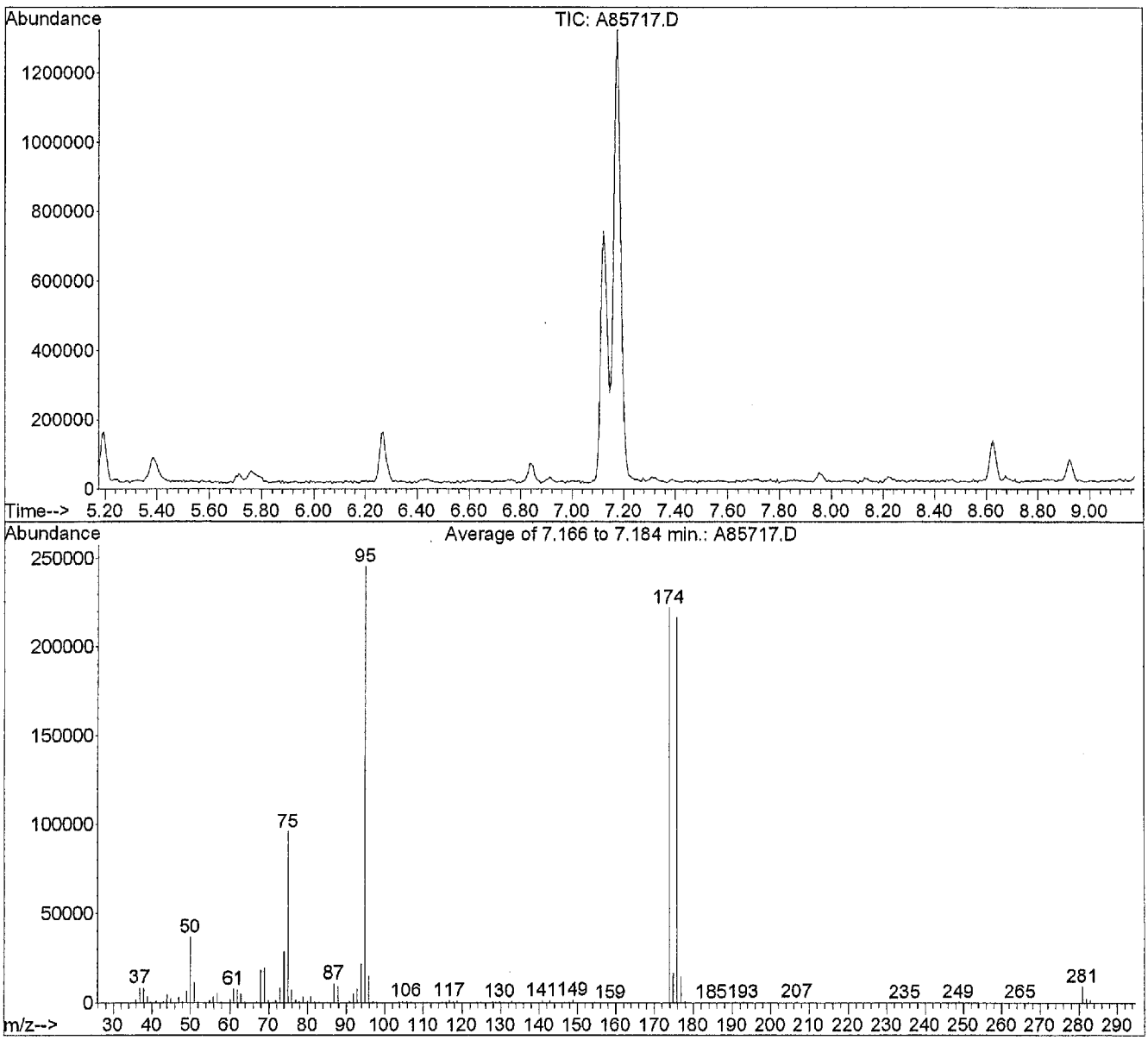
AutoFind: Scans 1058, 1059, 1060; Background Corrected with Scan 1052

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	17.5	25172	PASS
75	95	30	60	42.6	61192	PASS
95	95	100	100	100.0	143747	PASS
96	95	5	9	6.5	9389	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	100	86.9	124888	PASS
175	174	5	9	7.4	9218	PASS
176	174	95	101	97.6	121949	PASS
177	176	5	9	6.4	7768	PASS

G30827.D RP8W0227.M Mon Mar 09 16:44:04 2015 RPT1

CLPBFB

Data File : C:\DATA\2015\APRIL15\040315\A85717.D Vial: 4
Acq On : 3 Apr 2015 11:20 Operator: DRL
Sample : 50 NG BFB Inst : H5971
Misc : ,,,TUNE,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556



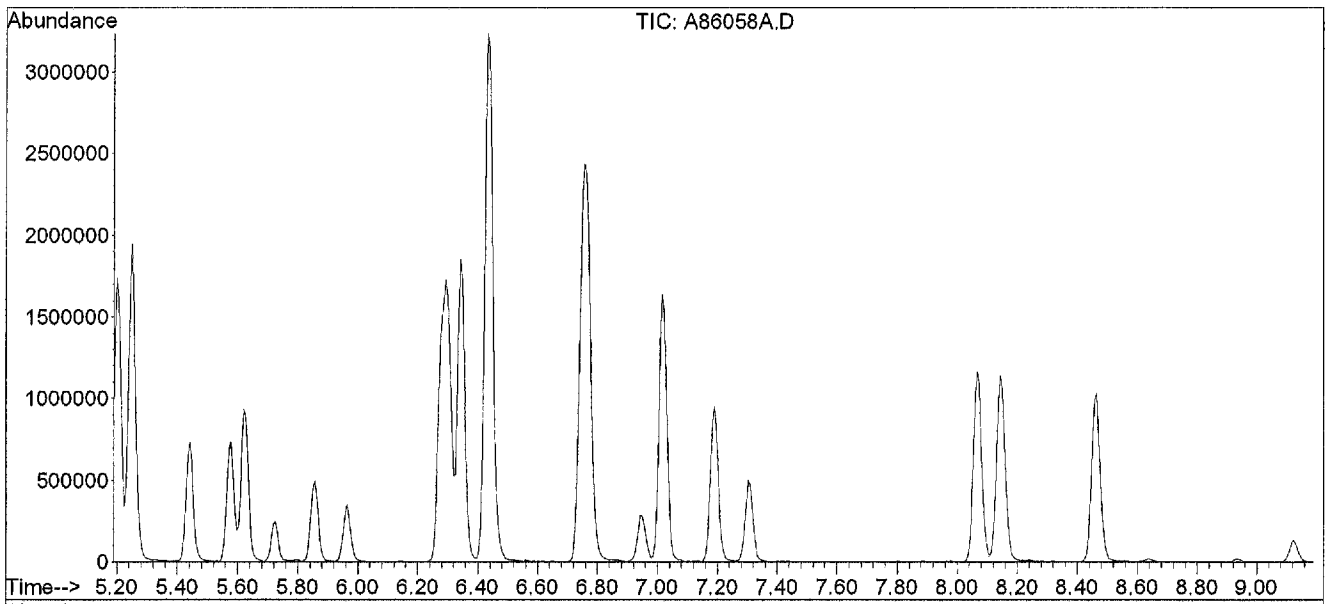
Spectrum Information: Average of 7.166 to 7.184 min.

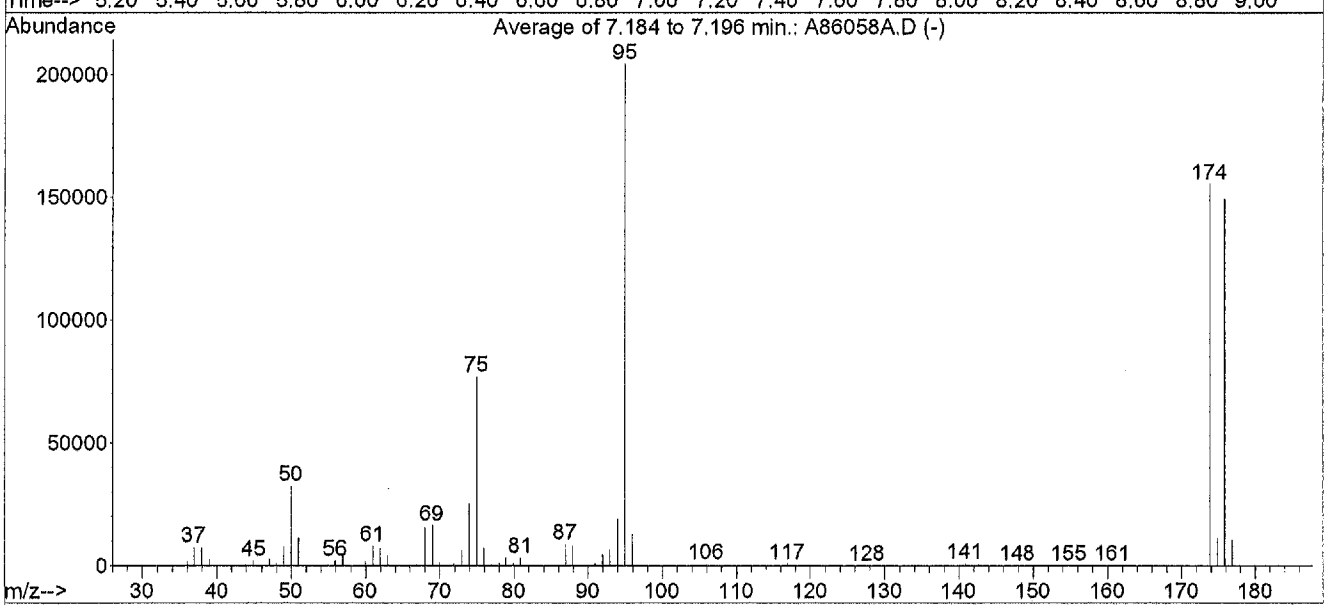
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	15.0	36828	PASS
75	95	30	60	39.1	95856	PASS
95	95	100	100	100.0	245408	PASS
96	95	5	9	6.1	15036	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	100	90.6	222240	PASS
175	174	5	9	7.4	16470	PASS
176	174	95	101	97.5	216768	PASS
177	176	5	9	6.7	14618	PASS

A85717.D R7W0403.M Tue May 05 14:46:20 2015 RPT1

CLPBFB

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86058A.D Vial: 7
Acq On : 22 Apr 2015 9:51 Operator: MF
Sample : BFB 50ng Inst : H5971
Misc : ,,,TUNE,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Method : O:\MS\HP5971\METHODS\2015\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A





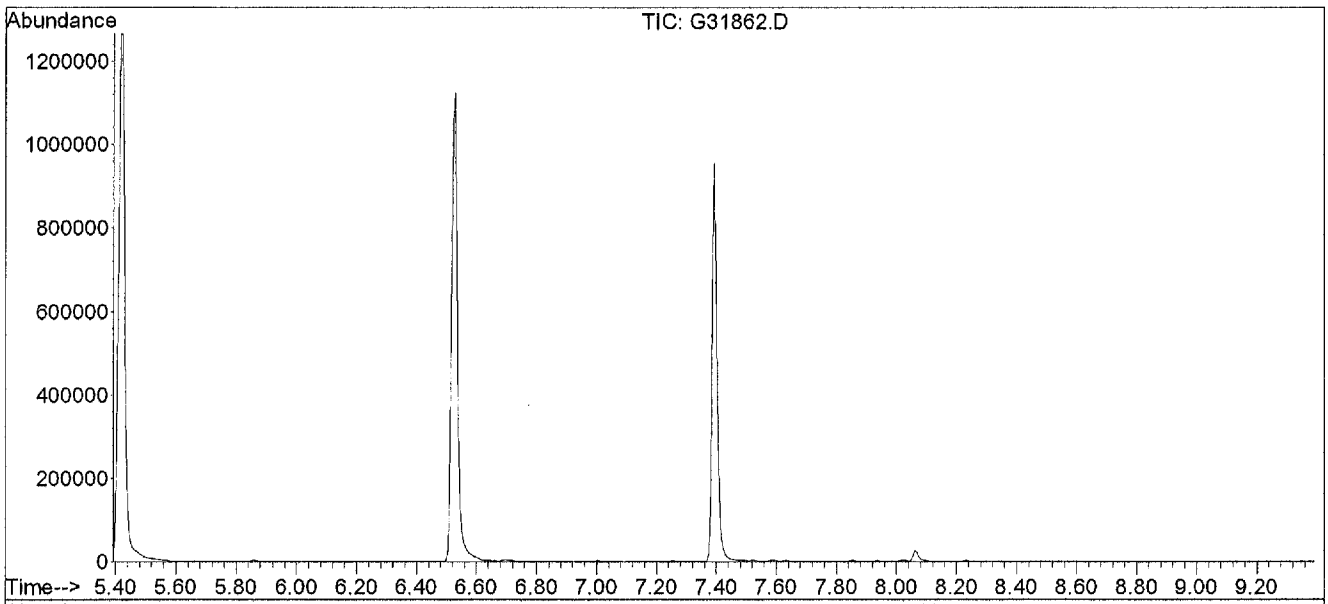
AutoFind: Scans 990, 991, 992; Background Corrected with Scan 981

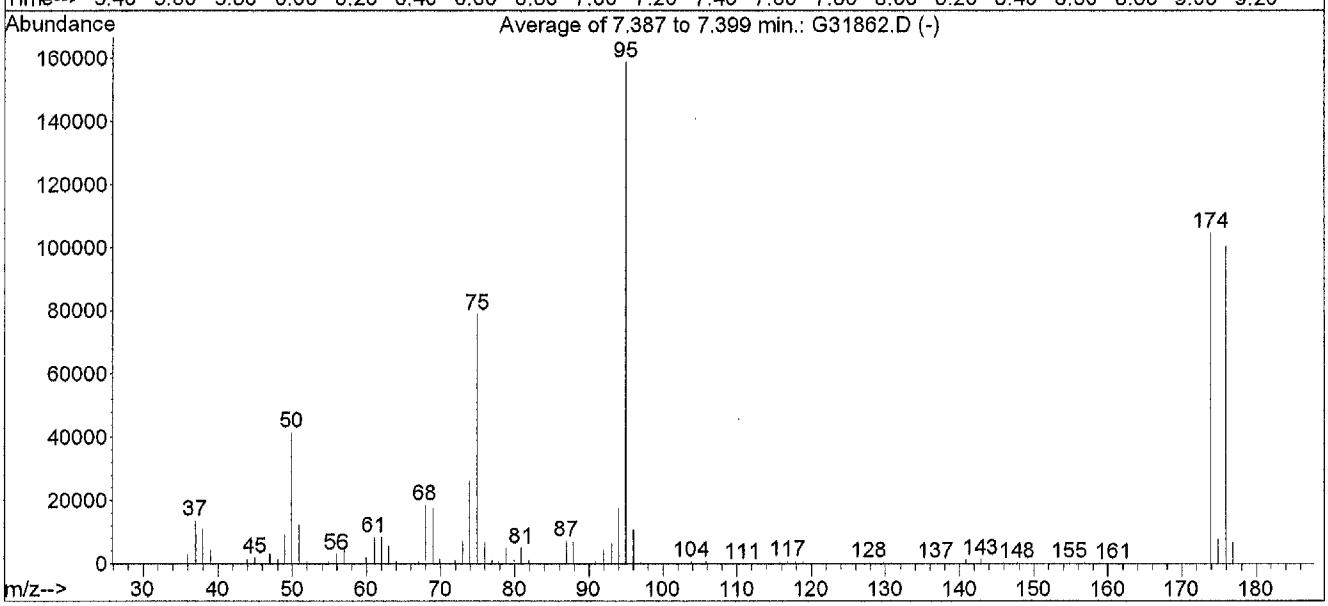
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	15.8	32349	PASS
75	95	30	60	37.6	76877	PASS
95	95	100	100	100.0	204352	PASS
96	95	5	9	6.2	12693	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	100	76.0	155371	PASS
175	174	5	9	7.1	10978	PASS
176	174	95	101	96.1	149248	PASS
177	176	5	9	7.1	10545	PASS

A86058A.D R6S0331.M Thu May 07 13:49:53 2015 RPT1

BFB

Data File : O:\MS\HP5972-2\DATA\2015\APR15\042015\G31862.D Vial: 3
Acq On : 20 Apr 2015 7:17 Operator: KGG
Sample : BFB 50ng Inst : HP5972-2
Misc : ,,,TUNE,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755





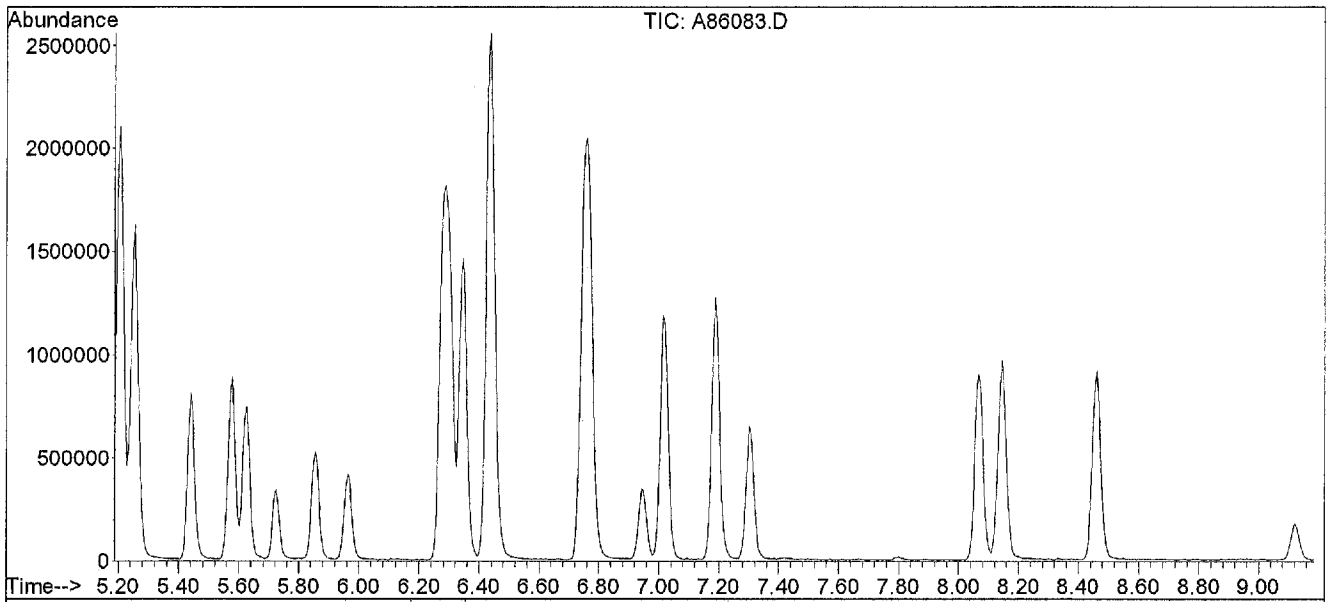
AutoFind: Scans 1057, 1058, 1059; Background Corrected with Scan 1051

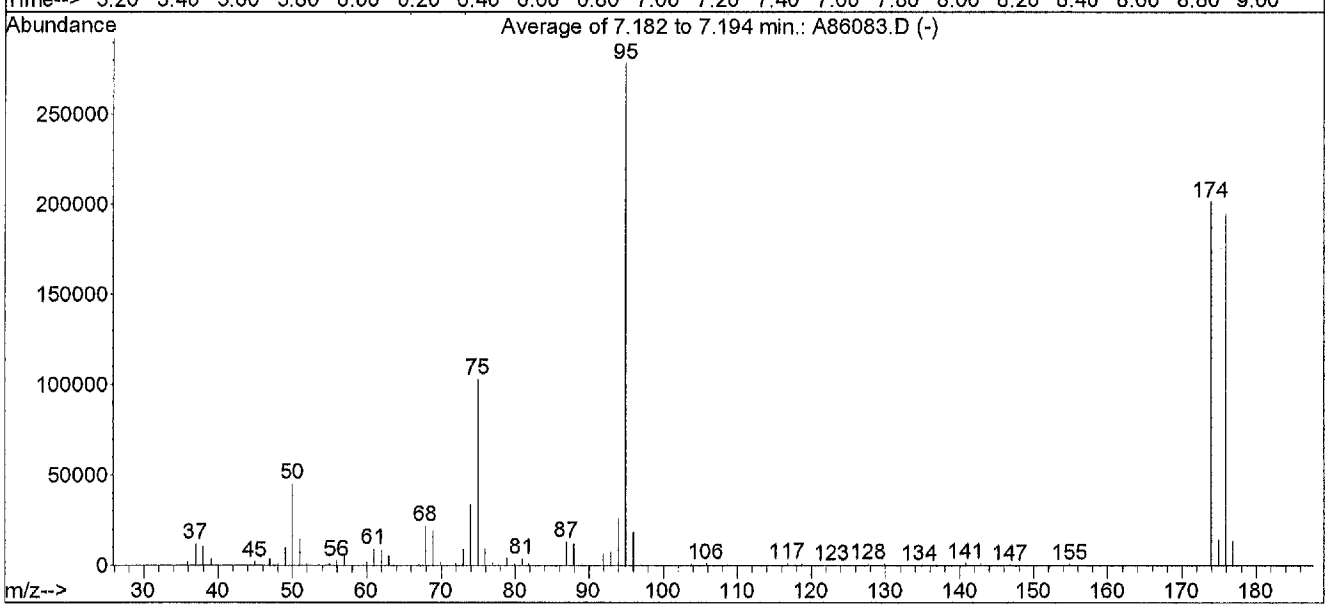
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	26.1	41507	PASS
75	95	30	60	49.7	78877	PASS
95	95	100	100	100.0	158741	PASS
96	95	5	9	6.8	10774	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	100	65.9	104672	PASS
175	174	5	9	7.3	7648	PASS
176	174	95	101	95.8	100277	PASS
177	176	5	9	6.7	6670	PASS

G31862.D R8W0304.M Thu May 07 15:58:53 2015 RPT1

CLPBFB

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86083.D Vial: 3
Acq On : 23 Apr 2015 9:49 Operator: MF
Sample : 50 NG BFB Inst : H5971
Misc : ,,,TUNE,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Method : O:\MS\HP5971\METHODS\2015\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556





AutoFind: Scans 1023, 1024, 1025; Background Corrected with Scan 1015

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	15	40	16.2	45168	PASS
75	95	30	60	37.0	102904	PASS
95	95	100	100	100.0	278421	PASS
96	95	5	9	6.7	18568	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	100	72.5	201792	PASS
175	174	5	9	7.0	14164	PASS
176	174	95	101	96.7	195093	PASS
177	176	5	9	7.0	13644	PASS

A86083.D R7W0403.M Thu May 07 14:05:31 2015 RPT1

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK042015

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) WATER Lab Sample ID: VBLK042015

Sample wt/vol: 5 (g/mL) mL Lab File ID: \G31864A.D

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 04/20/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/L	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene chloride	1	J
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-butyl ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK042015

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) WATER Lab Sample ID: VBLK042015

Sample wt/vol: 5 (g/mL) mL Lab File ID: \G31864A.D

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 04/20/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/L	Q
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK042015

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) WATER Lab Sample ID: VBLK042015

Sample wt/vol: 5 (g/mL) mL Lab File ID: \G31864A.D

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 04/20/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: (µl) Soil Aliquot Volume: 0 (µL)

CONCENTRATION UNITS:

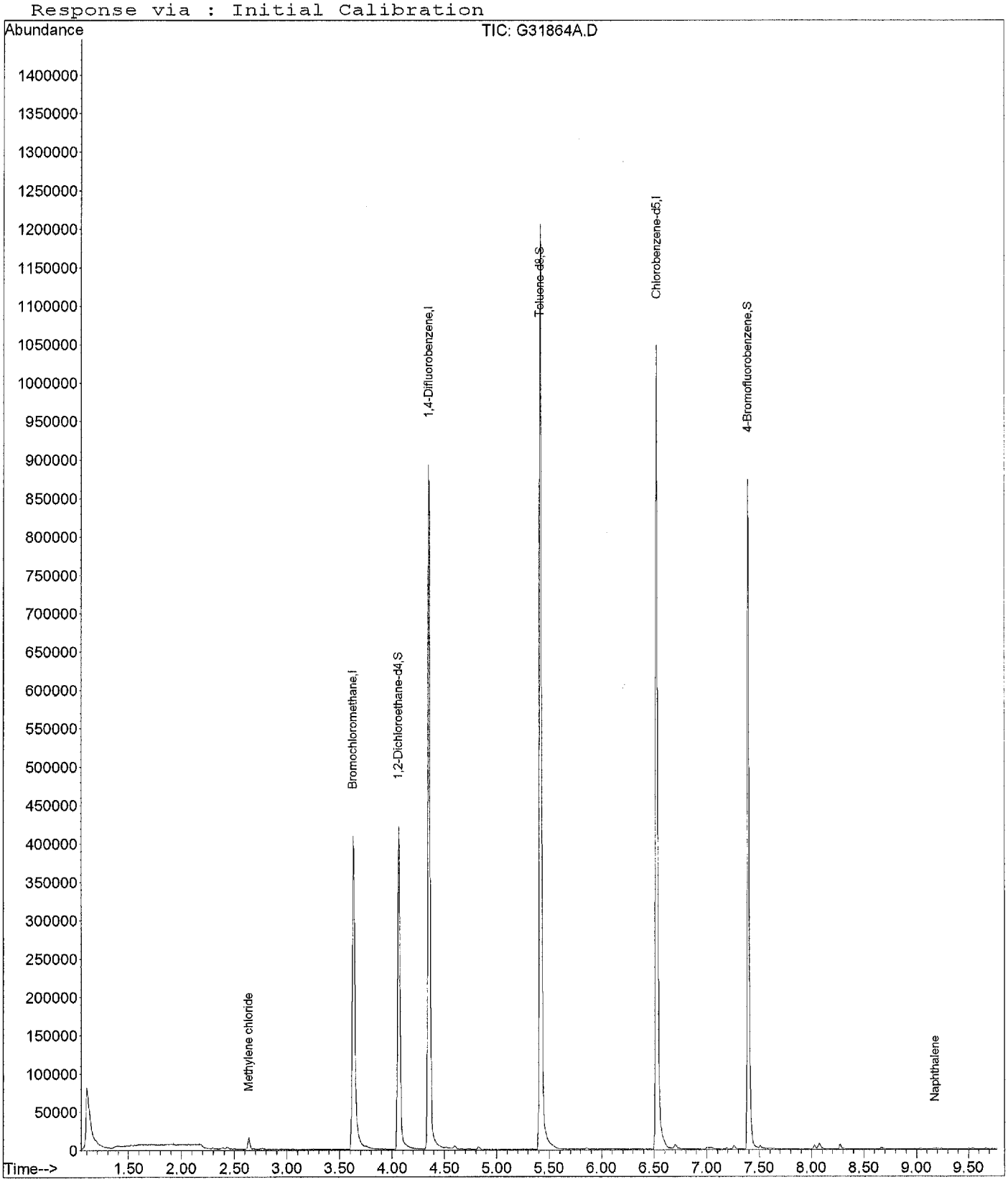
Number TICs found: 0 (µg/L or µg/Kg) µg/L

CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q

Quantitation Report

Data File : O:\MS\HP5972-2\DATA\2015\APR15\042015\G31864A.D Vial: 5
Acq On : 20 Apr 2015 8:04 Operator: KGG
Sample : VBLK042015 Inst : HP5972-2
Misc : ,,,MBLK,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 21 13:43 2015 Quant Results File: R8W0304.RES

Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration



AECOM237 V243

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\APR15\042015\G31864A.D Vial: 5
Acq On : 20 Apr 2015 8:04 Operator: KGG
Sample : VBLK042015 Inst : HP5972-2
Misc : ,,,MBLK,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 21 13:43 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration
DataAcq Meth : C8W0304

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.63	128	94661	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.35	114	537971	50.00	ug/l	0.00
44) Chlorobenzene-d5	6.53	117	452201	50.00	ug/l	0.00
System Monitoring Compounds						
27) 1,2-Dichloroethane-d4	4.06	65	238040	58.22	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 116.44%			
46) Toluene-d8	5.42	98	609133	51.01	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 102.02%			
58) 4-Bromofluorobenzene	7.39	95	217264	51.26	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 102.52%			
Target Compounds						Qvalue
14) Methylene chloride	2.64	84	4201	1.17	ug/l #	65
68) Naphthalene	9.18	128	1433	1.28	ug/l	100

(#) = qualifier out of range (m) = manual integration

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK042215

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: VBLK042215

Sample wt/vol: 5 (g/mL) g Lab File ID: 5\A86059.D

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	10	U
74-87-3	Chloromethane	10	U
75-01-4	Vinyl chloride	10	U
74-83-9	Bromomethane	10	U
75-00-3	Chloroethane	10	U
75-69-4	Trichlorofluoromethane	10	U
75-35-4	1,1-Dichloroethene	10	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	10	U
67-64-1	Acetone	10	U
75-15-0	Carbon disulfide	10	U
79-20-9	Methyl Acetate	10	U
75-09-2	Methylene chloride	2	J
156-60-5	trans-1,2-Dichloroethene	10	U
1634-04-4	Methyl tert-butyl ether	10	U
75-34-3	1,1-Dichloroethane	10	U
156-59-2	cis-1,2-Dichloroethene	10	U
78-93-3	2-Butanone	10	U
67-66-3	Chloroform	10	U
71-55-6	1,1,1-Trichloroethane	10	U
110-82-7	Cyclohexane	10	U
56-23-5	Carbon tetrachloride	10	U
71-43-2	Benzene	10	U
107-06-2	1,2-Dichloroethane	10	U
79-01-6	Trichloroethene	10	U
108-87-2	Methylcyclohexane	10	U
78-87-5	1,2-Dichloropropane	10	U
75-27-4	Bromodichloromethane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
79-00-5	1,1,2-Trichloroethane	10	U
127-18-4	Tetrachloroethene	10	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	10	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK042215

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: VBLK042215

Sample wt/vol: 5 (g/mL) g Lab File ID: 5\A86059.D

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
1330-20-7	Xylene (total)	10	U
100-42-5	Styrene	10	U
75-25-2	Bromoform	10	U
98-82-8	Isopropylbenzene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
95-50-1	1,2-Dichlorobenzene	10	U
96-12-8	1,2-Dibromo-3-chloropropane	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK042215

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: VBLK042215

Sample wt/vol: 5 (g/mL) g Lab File ID: 5\A86059.D

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: (µl) Soil Aliquot Volume: 0 (µL)

CONCENTRATION UNITS:

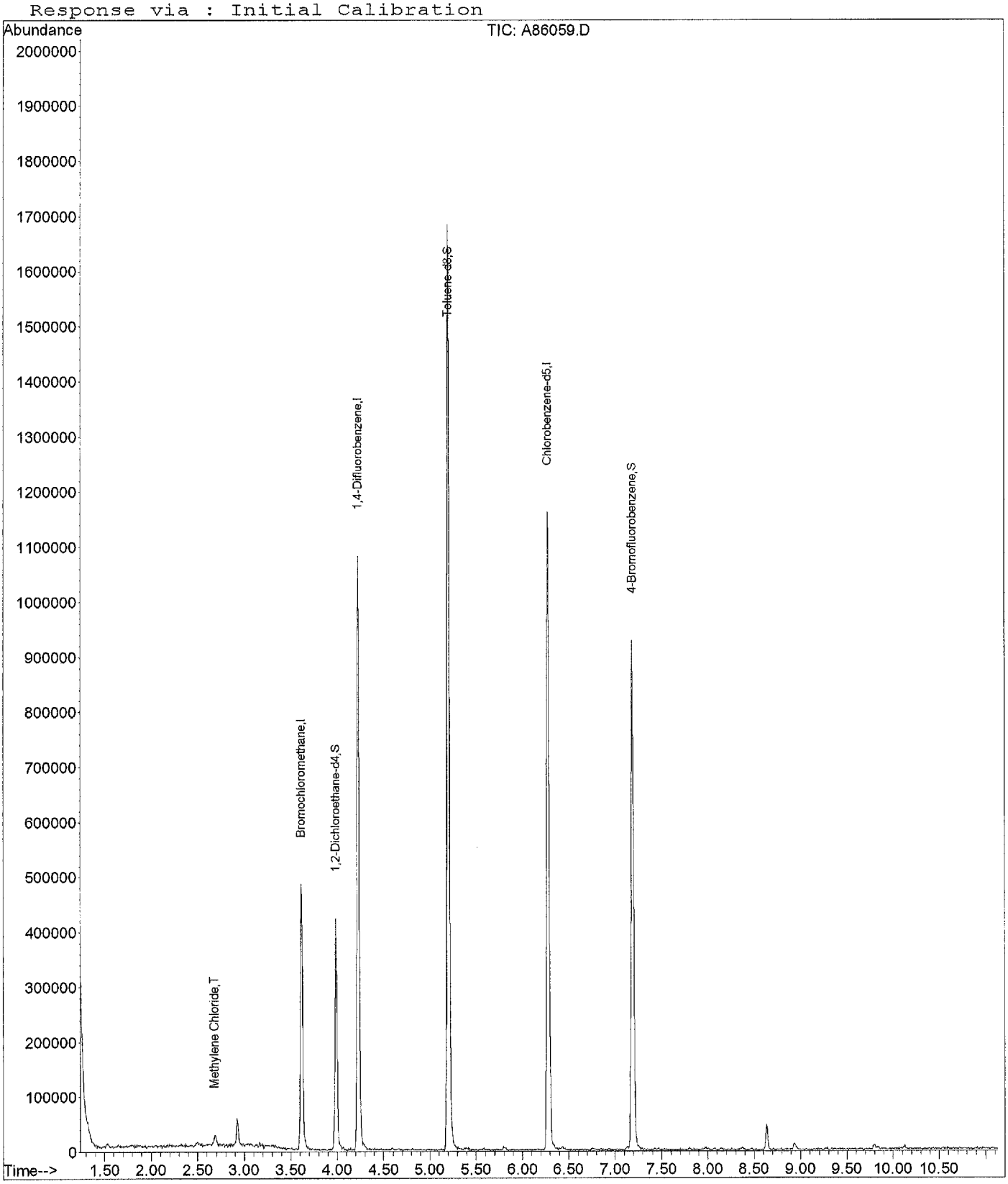
Number TICs found: 0 (µg/L or µg/Kg) µg/Kg

CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86059.D Vial: 8
Acq On : 22 Apr 2015 10:30 Operator: MF
Sample : VBLK042215 Inst : H5971
Misc : ,,,MBLK,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 22 10:43 2015 Quant Results File: R6S0331.RES

Method : O:\MS\HP5971\METHODS\2015\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration



AECOM237 V248

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86059.D Vial: 8
Acq On : 22 Apr 2015 10:30 Operator: MF
Sample : VBLK042215 Inst : H5971
Misc : ,,,MBLK,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 22 10:43 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	3.61	128	114436	50.00 ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	793592	50.00 ug/l	0.00
43) Chlorobenzene-d5	6.28	117	758164	50.00 ug/l	0.00
System Monitoring Compounds					
26) 1,2-Dichloroethane-d4	3.99	65	209479	54.36 ug/l	0.00
Spiked Amount 50.000	Range 33 - 150		Recovery = 108.72%		
49) Toluene-d8	5.20	98	1104059	55.65 ug/l	0.00
Spiked Amount 50.000	Range 43 - 157		Recovery = 111.30%		
53) 4-Bromofluorobenzene	7.19	95	413259	56.06 ug/l	0.01
Spiked Amount 50.000	Range 34 - 145		Recovery = 112.12%		

Target Compounds					Qvalue
12) Methylene Chloride	2.69	84	9178	1.99 ug/l	90

(#) = qualifier out of range (m) = manual integration

AECOM237 V249

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK042315M

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: VBLK042315M

Sample wt/vol: 4 (g/mL) g Lab File ID: 5\A86086.D

Level: (low/med) MED Date Received:

% Moisture: not dec. Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	1300	U
74-87-3	Chloromethane	1300	U
75-01-4	Vinyl chloride	1300	U
74-83-9	Bromomethane	1300	U
75-00-3	Chloroethane	1300	U
75-69-4	Trichlorofluoromethane	1300	U
75-35-4	1,1-Dichloroethene	1300	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1300	U
67-64-1	Acetone	1300	U
75-15-0	Carbon disulfide	1300	U
79-20-9	Methyl Acetate	1300	U
75-09-2	Methylene chloride	1300	U
156-60-5	trans-1,2-Dichloroethene	1300	U
1634-04-4	Methyl tert-butyl ether	1300	U
75-34-3	1,1-Dichloroethane	1300	U
156-59-2	cis-1,2-Dichloroethene	1300	U
78-93-3	2-Butanone	1300	U
67-66-3	Chloroform	1300	U
71-55-6	1,1,1-Trichloroethane	1300	U
110-82-7	Cyclohexane	1300	U
56-23-5	Carbon tetrachloride	1300	U
71-43-2	Benzene	1300	U
107-06-2	1,2-Dichloroethane	1300	U
79-01-6	Trichloroethene	1300	U
108-87-2	Methylcyclohexane	1300	U
78-87-5	1,2-Dichloropropane	1300	U
75-27-4	Bromodichloromethane	1300	U
10061-01-5	cis-1,3-Dichloropropene	1300	U
108-10-1	4-Methyl-2-pentanone	1300	U
108-88-3	Toluene	1300	U
10061-02-6	trans-1,3-Dichloropropene	1300	U
79-00-5	1,1,2-Trichloroethane	1300	U
127-18-4	Tetrachloroethene	1300	U
591-78-6	2-Hexanone	1300	U
124-48-1	Dibromochloromethane	1300	U

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK042315M

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: VBLK042315M

Sample wt/vol: 4 (g/mL) g Lab File ID: 5\A86086.D

Level: (low/med) MED Date Received:

% Moisture: not dec. Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	1300	U
108-90-7	Chlorobenzene	1300	U
100-41-4	Ethylbenzene	1300	U
1330-20-7	Xylene (total)	1300	U
100-42-5	Styrene	1300	U
75-25-2	Bromoform	1300	U
98-82-8	Isopropylbenzene	1300	U
79-34-5	1,1,2,2-Tetrachloroethane	1300	U
541-73-1	1,3-Dichlorobenzene	1300	U
106-46-7	1,4-Dichlorobenzene	1300	U
95-50-1	1,2-Dichlorobenzene	1300	U
96-12-8	1,2-Dibromo-3-chloropropane	1300	U
120-82-1	1,2,4-Trichlorobenzene	1300	U

1F

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK042315M

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: VBLK042315M

Sample wt/vol: 4 (g/mL) g Lab File ID: 5\A86086.D

Level: (low/med) MED Date Received:

% Moisture: not dec. Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µl) Soil Aliquot Volume: 100 (µL)

CONCENTRATION UNITS:

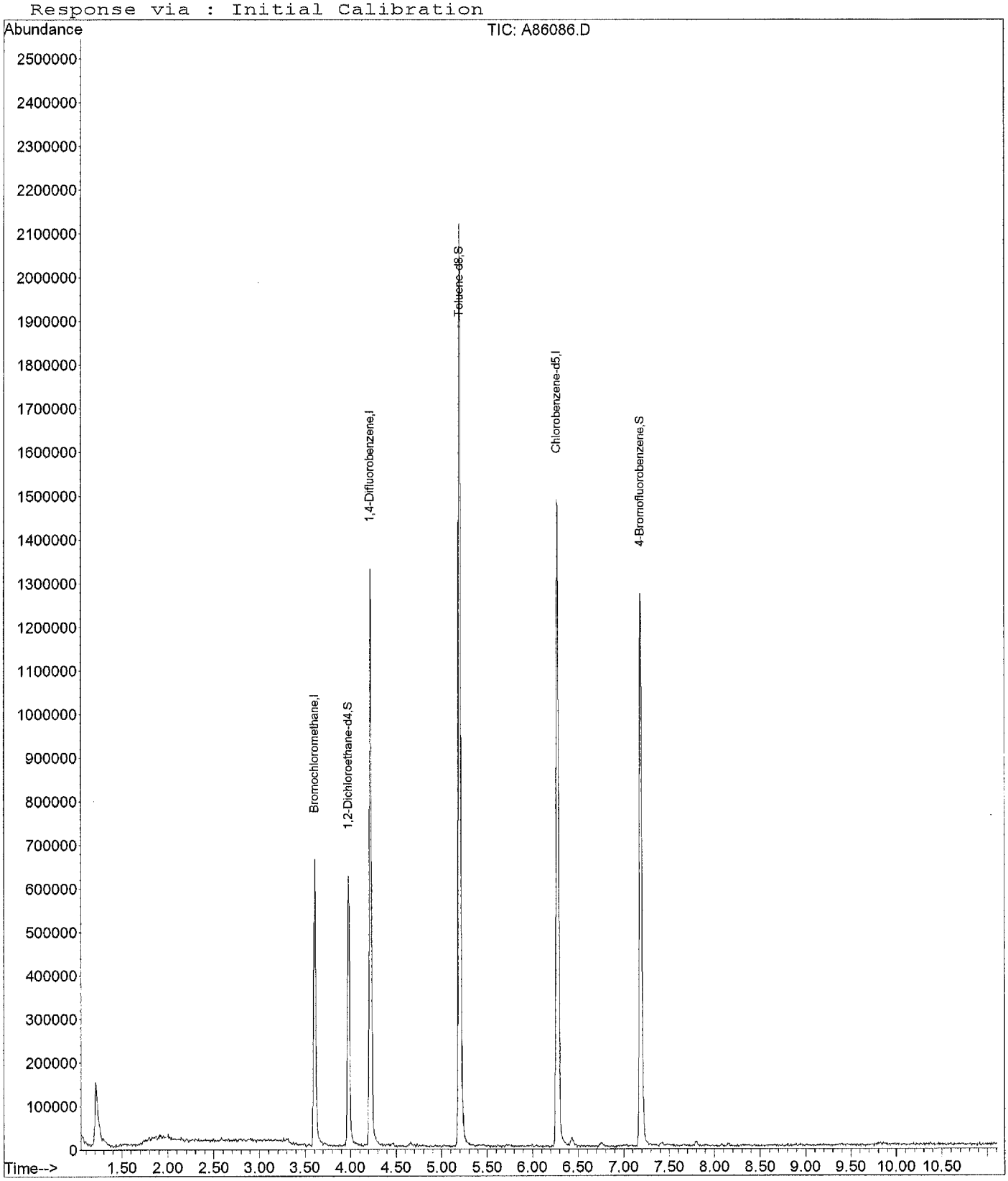
Number TICs found: 0 (µg/L or µg/Kg) µg/Kg

CAS NUMBER	COMPOUND NAME	RT	EST.CONC.	Q

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86086.D Vial: 6
Acq On : 23 Apr 2015 11:03 Operator: MF
Sample : VBLK042315M Inst : H5971
Misc : ,,,MBLK,, MED 4G/10ML, 1ML/50ML Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 12:58 2015 Quant Results File: R7W0403.RES

Method : O:\MS\HP5971\METHODS\2015\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration



AECOM237 V253

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86086.D Vial: 6
Acq On : 23 Apr 2015 11:03 Operator: MF
Sample : VBLK042315M Inst : H5971
Misc : ,,,MBLK,, MED 4G/10ML, 1ML/50ML Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 12:58 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	154608	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.22	114	984053	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	995083	50.00	ug/l	0.00
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	309862	55.33	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 110.66%			
49) Toluene-d8	5.20	98	1394361	54.88	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 109.76%			
53) 4-Bromofluorobenzene	7.19	95	553282	58.21	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 116.42%			

Target Compounds Qvalue

(#) = qualifier out of range (m) = manual integration

AECOM237 V254

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFB042215

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: LFB042215

Sample wt/vol: 5 (g/mL) g Lab File ID: 5\A86060.D

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	22	Z
74-87-3	Chloromethane	47	
75-01-4	Vinyl chloride	45	
74-83-9	Bromomethane	47	
75-00-3	Chloroethane	52	
75-69-4	Trichlorofluoromethane	37	
75-35-4	1,1-Dichloroethene	51	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	42	
67-64-1	Acetone	43	
75-15-0	Carbon disulfide	50	
79-20-9	Methyl Acetate	69	
75-09-2	Methylene chloride	56	B
156-60-5	trans-1,2-Dichloroethene	58	Z
1634-04-4	Methyl tert-butyl ether	56	
75-34-3	1,1-Dichloroethane	58	
156-59-2	cis-1,2-Dichloroethene	60	Z
78-93-3	2-Butanone	55	Z
67-66-3	Chloroform	55	
71-55-6	1,1,1-Trichloroethane	47	
110-82-7	Cyclohexane	46	
56-23-5	Carbon tetrachloride	41	
71-43-2	Benzene	59	
107-06-2	1,2-Dichloroethane	56	
79-01-6	Trichloroethene	50	
108-87-2	Methylcyclohexane	39	
78-87-5	1,2-Dichloropropane	63	Z
75-27-4	Bromodichloromethane	53	
10061-01-5	cis-1,3-Dichloropropene	58	
108-10-1	4-Methyl-2-pentanone	56	
108-88-3	Toluene	54	
10061-02-6	trans-1,3-Dichloropropene	53	
79-00-5	1,1,2-Trichloroethane	61	Z
127-18-4	Tetrachloroethene	42	
591-78-6	2-Hexanone	54	
124-48-1	Dibromochloromethane	45	

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFB042215

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: LFB042215

Sample wt/vol: 5 (g/mL) g Lab File ID: 5\A86060.D

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 04/22/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

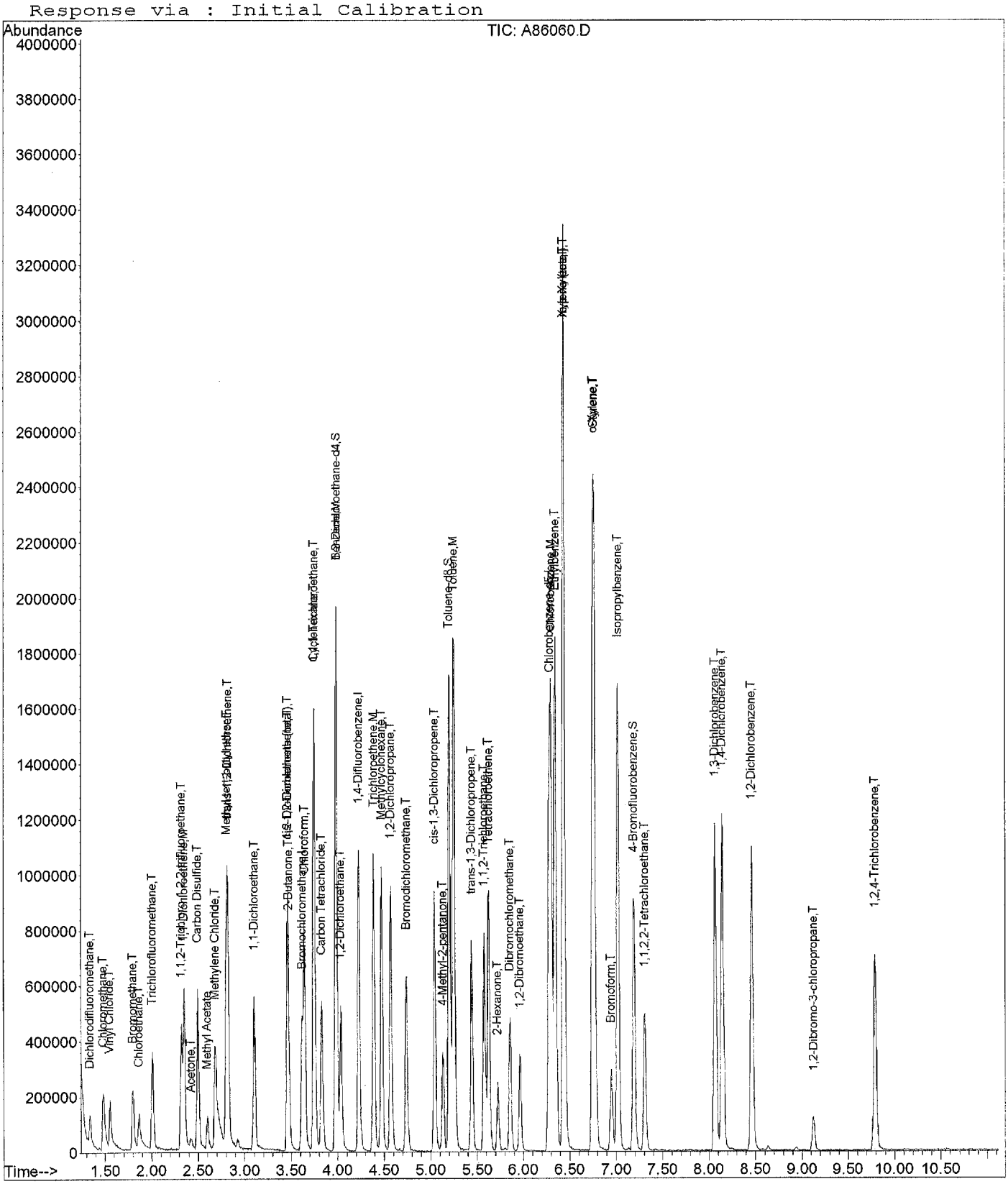
Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	51	
108-90-7	Chlorobenzene	52	
100-41-4	Ethylbenzene	51	
1330-20-7	Xylene (total)	150	
100-42-5	Styrene	52	
75-25-2	Bromoform	41	
98-82-8	Isopropylbenzene	47	
79-34-5	1,1,2,2-Tetrachloroethane	59	
541-73-1	1,3-Dichlorobenzene	46	
106-46-7	1,4-Dichlorobenzene	47	
95-50-1	1,2-Dichlorobenzene	47	
96-12-8	1,2-Dibromo-3-chloropropane	41	
120-82-1	1,2,4-Trichlorobenzene	42	

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86060.D Vial: 9
Acq On : 22 Apr 2015 10:51 Operator: MF
Sample : LFB042215 Inst : H5971
Misc : ,,,LFB,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 22 11:06 2015 Quant Results File: R6S0331.RES

Method : O:\MS\HP5971\METHODS\2015\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration



AECOM237 V257

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86060.D Vial: 9
Acq On : 22 Apr 2015 10:51 Operator: MF
Sample : LFB042215 Inst : H5971
Misc : ,,,LFB,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 22 11:06 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.62	128	115469	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.23	114	801492	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	745514	50.00	ug/l	0.01
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.99	65	211318	54.34	ug/l	0.00
Spiked Amount 50.000	Range 33 - 150		Recovery = 108.68%			
49) Toluene-d8	5.21	98	1129754	57.91	ug/l	0.01
Spiked Amount 50.000	Range 43 - 157		Recovery = 115.82%			
53) 4-Bromofluorobenzene	7.19	95	401061	55.33	ug/l	0.00
Spiked Amount 50.000	Range 34 - 145		Recovery = 110.66%			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.34	85	115914	22.43	ug/l	99
4) Chloromethane	1.48	50	271463	46.94	ug/l	98
5) Bromomethane	1.80	94	147347	47.23	ug/l	98
6) Vinyl Chloride	1.55	62	223111	44.67	ug/l	97
7) Chloroethane	1.87	64	151177	51.88	ug/l	100
10) Methyl Acetate	2.60	43	133169	69.31	ug/l	94
11) 1,1,2-Trichloro-1,2,2-trif	2.32	101	176561	42.26	ug/l #	79
12) Methylene Chloride	2.68	84	260491	55.84	ug/l	92
13) Acetone	2.43	43	38032	42.78	ug/l	96
14) Carbon Disulfide	2.50	76	706914	49.99	ug/l	94
16) 1,1-Dichloroethene	2.35	96	204478	51.21	ug/l #	83
17) 1,1-Dichloroethane	3.10	63	437434	57.83	ug/l	97
18) Trichlorofluoromethane	2.01	101	240797	37.07	ug/l	99
20) Methyl tert-butyl ether	2.80	73	548586	56.10	ug/l	99
21) trans-1,2-Dichloroethene	2.82	96	272430	58.39	ug/l	99
22) cis-1,2-Dichloroethene	3.46	96	375990	60.48	ug/l	99
23) 1,2-Dichloroethene (total)	3.46	96	651921m	117.12	ug/l	
24) 2-Butanone	3.48	43	101313	54.53	ug/l	87
25) Chloroform	3.64	83	507021	54.79	ug/l	98
27) 1,2-Dichloroethane	4.03	62	309119	55.56	ug/l	96
29) 1,1,1-Trichloroethane	3.75	97	372409	46.76	ug/l	96
30) Cyclohexane	3.74	56	407472	46.16	ug/l	99
31) Carbon Tetrachloride	3.83	117	296040	40.50	ug/l	97
33) Bromodichloromethane	4.74	83	389185	52.79	ug/l	96
34) 1,2-Dichloropropane	4.58	63	342985	63.38	ug/l	93
35) cis-1,3-Dichloropropene	5.04	75	529137	57.50	ug/l	97
36) Trichloroethene	4.39	130	336289	50.26	ug/l	95
37) Methylcyclohexane	4.47	83	348274	38.58	ug/l	97
38) Benzene	3.98	78	1268020	58.89	ug/l	99
39) Dibromochloromethane	5.86	129	261012	44.81	ug/l	98
40) trans-1,3-Dichloropropene	5.44	75	394706	52.60	ug/l	98
41) 1,1,2-Trichloroethane	5.58	97	265906	61.29	ug/l	96
42) Bromoform	6.95	173	152810	41.36	ug/l	92
44) 4-Methyl-2-pentanone	5.13	43	240841	56.42	ug/l	96
45) 2-Hexanone	5.72	43	169622	54.02	ug/l	96
46) 1,2-Dibromoethane	5.96	107	256448	51.36	ug/l	100
47) Tetrachloroethene	5.63	164	236398	41.85	ug/l	98
48) 1,1,2,2-Tetrachloroethane	7.31	83	319343	58.80	ug/l	92
50) Toluene	5.25	91	1350824	53.74	ug/l	100
51) Chlorobenzene	6.30	112	911881	51.50	ug/l	94
52) Ethylbenzene	6.35	106	468897	50.79	ug/l	95
54) Styrene	6.77	104	1015010	52.35	ug/l	98

(#) = qualifier out of range (m) = manual integration

AECOM237 V258

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042215\A86060.D Vial: 9
Acq On : 22 Apr 2015 10:51 Operator: MF
Sample : LFB042215 Inst : H5971
Misc : ,,,LFB,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 22 11:06 2015 Quant Results File: R6S0331.RES

Quant Method : C:\HPCHEM\1\METHODS\R6S0331.M (RTE Integrator)
Title : 8260S A0104564, A0105567, A0101160, CH3755A
Last Update : Tue Mar 31 20:15:19 2015
Response via : Initial Calibration
DataAcq Meth : R6S0331

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
55) m,p-Xylene	6.44	106	1168659	101.03 ug/l	96
56) o-Xylene	6.75	106	574266	50.61 ug/l	96
57) Xylene (total)	6.44	106	1747517m	154.04 ug/l	
58) Isopropylbenzene	7.02	105	1345695	46.69 ug/l	94
59) 1,3-Dichlorobenzene	8.07	146	618536	45.92 ug/l	98
60) 1,4-Dichlorobenzene	8.14	146	646329	47.38 ug/l	96
61) 1,2-Dichlorobenzene	8.46	146	585856	47.27 ug/l	98
62) 1,2-Dibromo-3-chloropropan	9.12	75	36035	40.76 ug/l #	90
63) 1,2,4-Trichlorobenzene	9.79	180	320157	42.08 ug/l	96

(#) = qualifier out of range (m) = manual integration

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFB042015

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) WATER Lab Sample ID: LFB042015

Sample wt/vol: 5 (g/mL) mL Lab File ID: \G31865A.D

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 04/20/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CONCENTRATION UNITS:

CAS NO.	COMPOUND	(µg/L or µg/Kg) µg/L	Q
75-71-8	Dichlorodifluoromethane	16	
74-87-3	Chloromethane	40	
75-01-4	Vinyl chloride	42	
74-83-9	Bromomethane	44	
75-00-3	Chloroethane	54	
75-69-4	Trichlorofluoromethane	54	
75-35-4	1,1-Dichloroethene	49	Z
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	49	
67-64-1	Acetone	45	
75-15-0	Carbon disulfide	46	
79-20-9	Methyl Acetate	65	
75-09-2	Methylene chloride	49	B
156-60-5	trans-1,2-Dichloroethene	47	
1634-04-4	Methyl tert-butyl ether	52	
75-34-3	1,1-Dichloroethane	58	
156-59-2	cis-1,2-Dichloroethene	49	
78-93-3	2-Butanone	49	
67-66-3	Chloroform	53	
71-55-6	1,1,1-Trichloroethane	54	
110-82-7	Cyclohexane	56	
56-23-5	Carbon tetrachloride	49	
71-43-2	Benzene	49	
107-06-2	1,2-Dichloroethane	60	
79-01-6	Trichloroethene	47	
108-87-2	Methylcyclohexane	43	
78-87-5	1,2-Dichloropropane	57	
75-27-4	Bromodichloromethane	56	
10061-01-5	cis-1,3-Dichloropropene	49	
108-10-1	4-Methyl-2-pentanone	47	
108-88-3	Toluene	43	
10061-02-6	trans-1,3-Dichloropropene	50	
79-00-5	1,1,2-Trichloroethane	48	
127-18-4	Tetrachloroethene	36	Z
591-78-6	2-Hexanone	49	
124-48-1	Dibromochloromethane	47	

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFB042015

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) WATER Lab Sample ID: LFB042015

Sample wt/vol: 5 (g/mL) mL Lab File ID: \G31865A.D

Level: (low/med) LOW Date Received:

% Moisture: not dec. Date Analyzed: 04/20/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

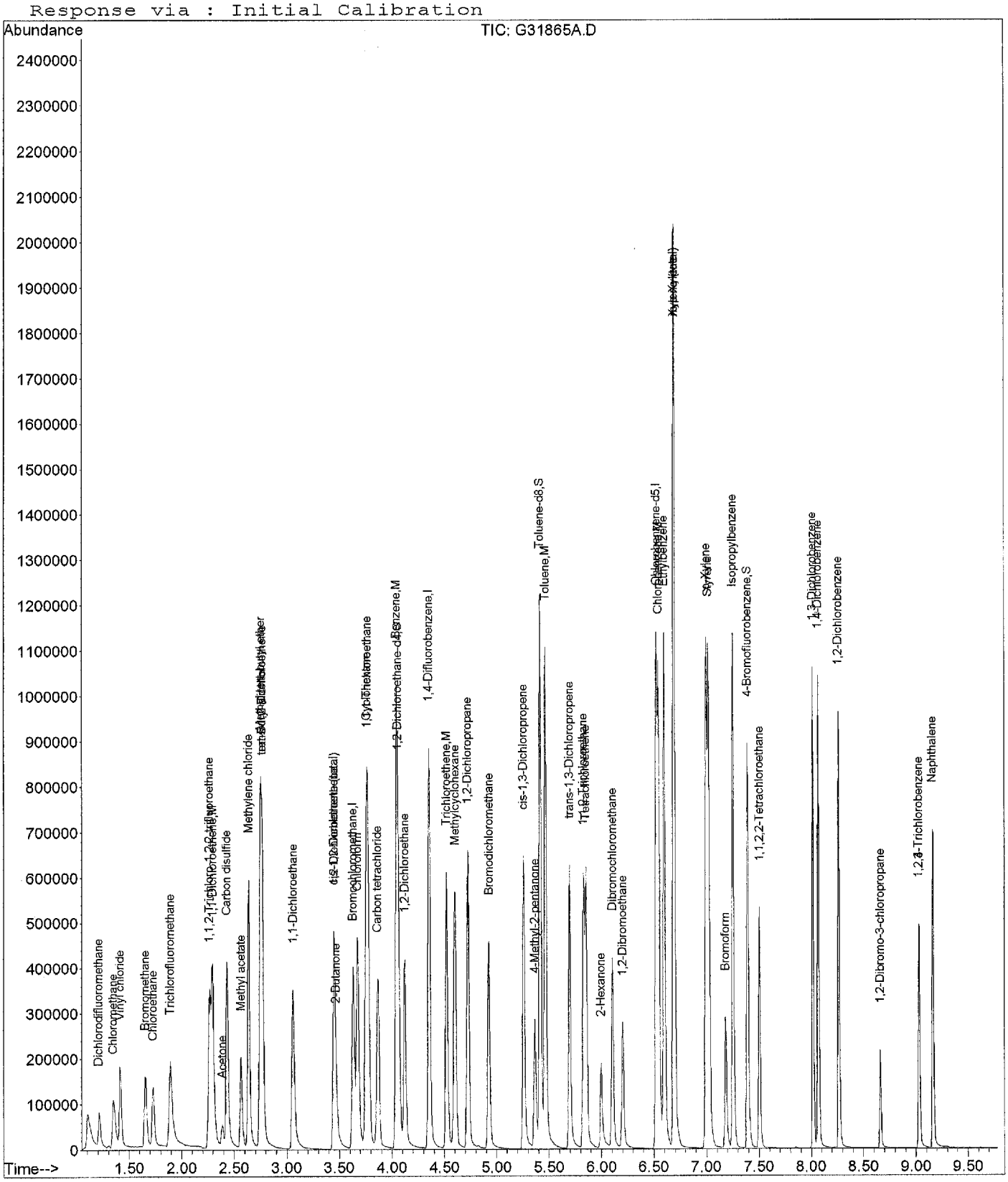
Soil Extract Volume: _____ (µL) Soil Aliquot Volume _____ (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/L	Q
106-93-4	1,2-Dibromoethane	44	
108-90-7	Chlorobenzene	44	
100-41-4	Ethylbenzene	43	
1330-20-7	Xylene (total)	130	
100-42-5	Styrene	44	
75-25-2	Bromoform	39	Z
98-82-8	Isopropylbenzene	42	
79-34-5	1,1,2,2-Tetrachloroethane	47	
541-73-1	1,3-Dichlorobenzene	43	
106-46-7	1,4-Dichlorobenzene	42	
95-50-1	1,2-Dichlorobenzene	43	
96-12-8	1,2-Dibromo-3-chloropropane	50	
120-82-1	1,2,4-Trichlorobenzene	30	

Quantitation Report

Data File : O:\MS\HP5972-2\DATA\2015\APR15\042015\G31865A.D Vial: 6
Acq On : 20 Apr 2015 8:25 Operator: KGG
Sample : LFB042015 Inst : HP5972-2
Misc : ,,,LFB,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 21 16:30 2015 Quant Results File: R8W0304.RES

Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\APR15\042015\G31865A.D Vial: 6
Acq On : 20 Apr 2015 8:25 Operator: KGG
Sample : LFB042015 Inst : HP5972-2
Misc : ,,,LFB,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 21 16:30 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration
DataAcq Meth : C8W0304

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) Bromochloromethane	3.63	128	92338	50.00 ug/l	0.00
28) 1,4-Difluorobenzene	4.35	114	529503	50.00 ug/l	0.00
44) Chlorobenzene-d5	6.53	117	453441	50.00 ug/l	0.00
System Monitoring Compounds					
27) 1,2-Dichloroethane-d4	4.06	65	238564	59.82 ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 119.64%		
46) Toluene-d8	5.42	98	597656	49.91 ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 99.82%		
58) 4-Bromofluorobenzene	7.39	95	214631	50.50 ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 101.00%		

Target Compounds					Qvalue
3) Dichlorodifluoromethane	1.21	85	68681	16.40 ug/l	99
4) Chloromethane	1.35	50	148662	40.33 ug/l	99
5) Vinyl chloride	1.41	62	152623	41.71 ug/l	98
6) Bromomethane	1.65	94	94930	43.75 ug/l	98
7) Chloroethane	1.73	64	106324	53.54 ug/l	100
8) Trichlorofluoromethane	1.89	101	203571	54.41 ug/l	99
9) 1,1,2-Trichloro-1,2,2-trif	2.27	101	134493	48.95 ug/l	93
11) Methyl tert-butyl ether	2.75	73	515078	51.90 ug/l	91
12) tert-Butyl alcohol	2.77	59	9598	26.74 ug/l #	1
13) 1,1-Dichloroethene	2.30	96	131251	49.08 ug/l #	82
14) Methylene chloride	2.64	84	172902	49.48 ug/l #	70
15) trans-1,2-Dichloroethene	2.77	96	151521	46.81 ug/l #	85
17) 1,1-Dichloroethane	3.05	63	334315	58.18 ug/l	98
18) 1,2-Dichloroethene (total)	3.45	96	174749	51.02 ug/l #	82
19) cis-1,2-Dichloroethene	3.45	96	174749	49.24 ug/l #	82
20) Acetone	2.39	43	58802	45.10 ug/l	97
21) Chloroform	3.67	83	285164	53.36 ug/l	93
22) Carbon disulfide	2.43	76	483881	46.35 ug/l	88
23) Methyl acetate	2.57	43	223747	65.25 ug/l	85
25) 2-Butanone	3.47	43	93474	49.37 ug/l	87
26) 1,2-Dichloroethane	4.12	62	263508	60.16 ug/l	99
29) Cyclohexane	3.76	56	268335	56.43 ug/l	82
30) 1,1,1-Trichloroethane	3.77	97	228910	54.30 ug/l	94
31) Carbon tetrachloride	3.87	117	184853	48.96 ug/l	100
32) Benzene	4.05	78	607351	49.02 ug/l	94
33) Trichloroethene	4.52	130	161887	46.80 ug/l	95
34) Methylcyclohexane	4.60	83	156601	42.64 ug/l #	83
35) 1,2-Dichloropropane	4.73	63	182532	56.94 ug/l	86
37) Bromodichloromethane	4.93	83	234172	55.62 ug/l	96
39) cis-1,3-Dichloropropene	5.26	75	263248	49.12 ug/l #	79
40) 1,1,2-Trichloroethane	5.83	97	141233	48.11 ug/l	96
41) Dibromochloromethane	6.11	129	167334	46.83 ug/l	100
42) trans-1,3-Dichloropropene	5.70	75	238533	50.03 ug/l #	81
43) Bromoform	7.18	173	93681	39.05 ug/l	99
45) 4-Methyl-2-pentanone	5.37	43	191040	46.79 ug/l	85
47) Toluene	5.47	91	580537	42.61 ug/l	99
48) 2-Hexanone	6.00	43	136734	48.87 ug/l	87
49) Tetrachloroethene	5.85	164	94038	35.92 ug/l	92
50) 1,2-Dibromoethane	6.20	107	154667	43.81 ug/l	98
51) Chlorobenzene	6.55	112	384104	43.65 ug/l	94
52) Ethylbenzene	6.60	106	183486	43.24 ug/l #	89
53) m,p-Xylene	6.70	106	460036	88.10 ug/l	91

(#) = qualifier out of range (m) = manual integration

AECOM237 V263

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5972-2\DATA\2015\APR15\042015\G31865A.D Vial: 6
Acq On : 20 Apr 2015 8:25 Operator: KGG
Sample : LFB042015 Inst : HP5972-2
Misc : ,,,LFB,, Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 21 16:30 2015 Quant Results File: R8W0304.RES

Quant Method : C:\HPCHEM\1\METHODS\R8W0304.M (RTE Integrator)
Title : 8260CA097663,A0101077,A09737,CJ4239,CG1098,CH3755
Last Update : Thu Mar 05 10:59:15 2015
Response via : Initial Calibration
DataAcq Meth : C8W0304

	Compound	R.T.	QIon	Response	Conc Unit		Qvalue
54)	o-Xylene	7.00	106	231591	43.65 ug/l	#	86
55)	Xylene (total)	6.70	106	691441m	130.32 ug/l		
56)	Styrene	7.02	104	397742	43.58 ug/l		85
57)	Isopropylbenzene	7.25	105	510934	42.37 ug/l		97
59)	1,1,2,2-Tetrachloroethane	7.51	83	187805	47.24 ug/l		99
62)	1,3-Dichlorobenzene	8.02	146	241368	42.85 ug/l		96
63)	1,4-Dichlorobenzene	8.07	146	248167	42.05 ug/l		93
64)	1,2-Dichlorobenzene	8.27	146	233939	43.09 ug/l		88
65)	1,2-Dibromo-3-chloropropan	8.66	75	30546	50.48 ug/l		89
67)	1,2,4-Trichlorobenzene	9.03	180	91661	29.78 ug/l		96
68)	Naphthalene	9.17	128	360836	44.64 ug/l		100
69)	1,2,3-Trichlorobenzene	9.03	180	91661	33.34 ug/l		99

(#) = qualifier out of range (m) = manual integration

AECOM237 V264

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFB042315M

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: LFB042315M

Sample wt/vol: 4 (g/mL) g Lab File ID: 5\A86088.D

Level: (low/med) MED Date Received:

% Moisture: not dec. Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
75-71-8	Dichlorodifluoromethane	1400	
74-87-3	Chloromethane	4700	Z
75-01-4	Vinyl chloride	4400	
74-83-9	Bromomethane	1100	J
75-00-3	Chloroethane	830	J
75-69-4	Trichlorofluoromethane	740	JZ
75-35-4	1,1-Dichloroethene	5300	
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	3600	
67-64-1	Acetone	6200	
75-15-0	Carbon disulfide	3800	
79-20-9	Methyl Acetate	5300	
75-09-2	Methylene chloride	7700	
156-60-5	trans-1,2-Dichloroethene	6500	
1634-04-4	Methyl tert-butyl ether	7300	
75-34-3	1,1-Dichloroethane	7400	
156-59-2	cis-1,2-Dichloroethene	7300	
78-93-3	2-Butanone	7300	
67-66-3	Chloroform	6800	
71-55-6	1,1,1-Trichloroethane	5500	
110-82-7	Cyclohexane	5700	
56-23-5	Carbon tetrachloride	4800	
71-43-2	Benzene	7100	
107-06-2	1,2-Dichloroethane	7200	
79-01-6	Trichloroethene	5900	
108-87-2	Methylcyclohexane	3800	
78-87-5	1,2-Dichloropropane	8000	Z
75-27-4	Bromodichloromethane	6800	
10061-01-5	cis-1,3-Dichloropropene	7600	
108-10-1	4-Methyl-2-pentanone	6200	
108-88-3	Toluene	6000	
10061-02-6	trans-1,3-Dichloropropene	7200	
79-00-5	1,1,2-Trichloroethane	7800	
127-18-4	Tetrachloroethene	5100	Z
591-78-6	2-Hexanone	5900	
124-48-1	Dibromochloromethane	6500	

1B

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

LFB042315M

Lab Name: PACE ANALYTICAL Contract: _____

Lab Code: 10478 Case No.: AECOM-N SAS No.: _____ SDG No.: AECOM237

Matrix: (soil/water) SOIL Lab Sample ID: LFB042315M

Sample wt/vol: 4 (g/mL) g Lab File ID: 5\A86088.D

Level: (low/med) MED Date Received:

% Moisture: not dec. Date Analyzed: 04/23/15

GC Column: Rtx-624 ID: .18 (mm) Dilution Factor: 1.00

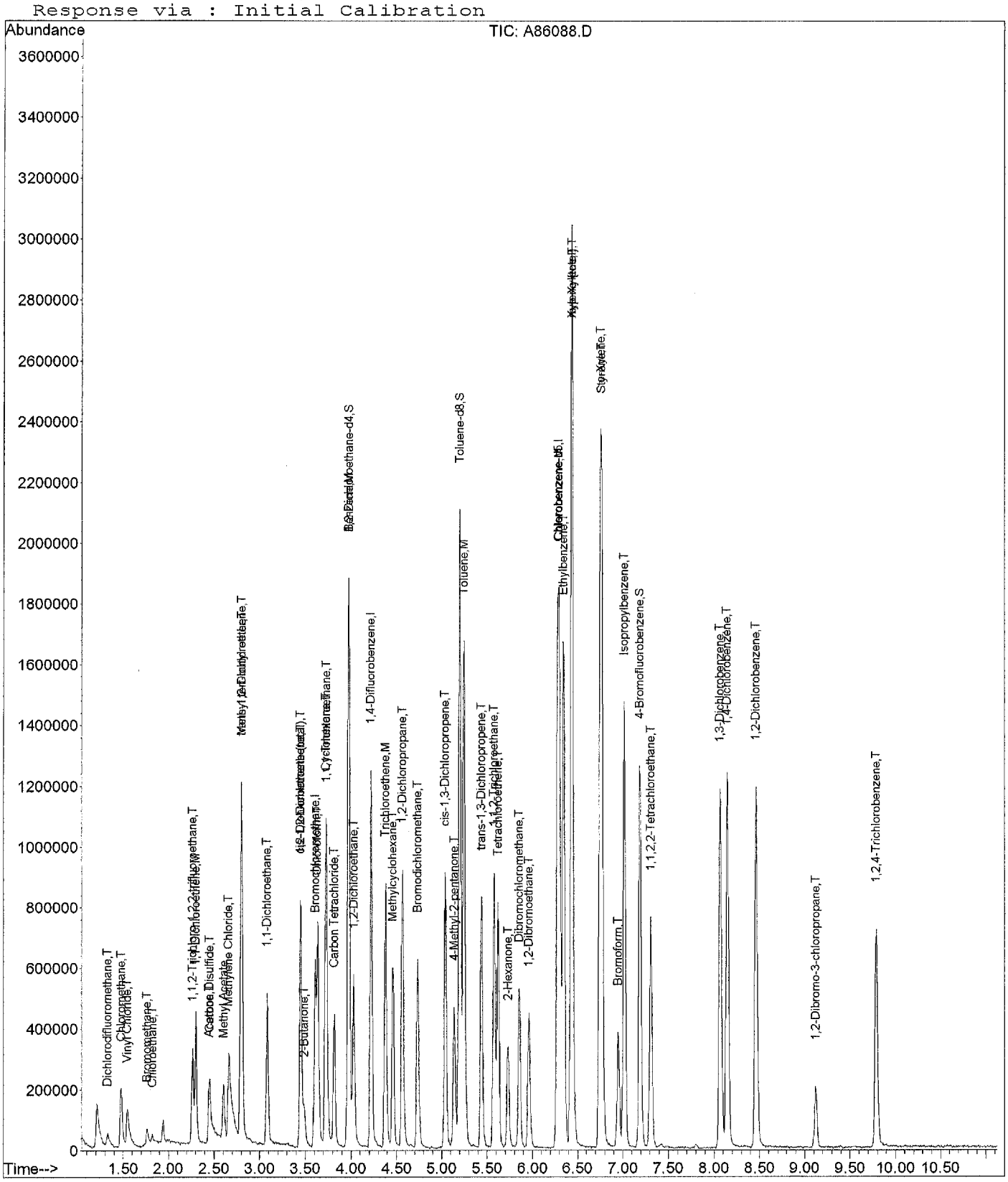
Soil Extract Volume: 10000 (µL) Soil Aliquot Volume 100 (µL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (µg/L or µg/Kg) µg/Kg	Q
106-93-4	1,2-Dibromoethane	6400	
108-90-7	Chlorobenzene	6400	
100-41-4	Ethylbenzene	6400	
1330-20-7	Xylene (total)	20000	
100-42-5	Styrene	6700	
75-25-2	Bromoform	6100	
98-82-8	Isopropylbenzene	6400	
79-34-5	1,1,2,2-Tetrachloroethane	7500	
541-73-1	1,3-Dichlorobenzene	6300	
106-46-7	1,4-Dichlorobenzene	6400	
95-50-1	1,2-Dichlorobenzene	6400	
96-12-8	1,2-Dibromo-3-chloropropane	6200	
120-82-1	1,2,4-Trichlorobenzene	5500	

Quantitation Report

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86088.D Vial: 8
Acq On : 23 Apr 2015 11:51 Operator: MF
Sample : LFB042315M Inst : H5971
Misc : ,,,LFB,, MED 4G/10ML, 1ML/50ML Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 13:03 2015 Quant Results File: R7W0403.RES

Method : O:\MS\HP5971\METHODS\2015\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86088.D Vial: 8
Acq On : 23 Apr 2015 11:51 Operator: MF
Sample : LFB042315M Inst : H5971
Misc : ,,,LFB,, MED 4G/10ML, 1ML/50ML Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 13:03 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane	3.61	128	156279	50.00	ug/l	0.00
28) 1,4-Difluorobenzene	4.22	114	950358	50.00	ug/l	0.00
43) Chlorobenzene-d5	6.28	117	974179	50.00	ug/l	0.01
System Monitoring Compounds						
26) 1,2-Dichloroethane-d4	3.98	65	295992	52.29	ug/l	0.00
Spiked Amount 50.000	Range 53 - 183		Recovery = 104.58%			
49) Toluene-d8	5.20	98	1380875	55.52	ug/l	0.00
Spiked Amount 50.000	Range 60 - 135		Recovery = 111.04%			
53) 4-Bromofluorobenzene	7.19	95	558189	59.99	ug/l	0.00
Spiked Amount 50.000	Range 63 - 140		Recovery = 119.98%			

Target Compounds						Qvalue
3) Dichlorodifluoromethane	1.33	85	64227	10.92	ug/l	100
4) Chloromethane	1.48	50	243244	37.77	ug/l	100
5) Bromomethane	1.77	94	28211	8.79	ug/l	94
6) Vinyl Chloride	1.55	62	189787	34.84	ug/l	96
7) Chloroethane	1.82	64	18560	6.66	ug/l	98
10) Methyl Acetate	2.60	43	205112	42.54	ug/l	96
11) 1,1,2-Trichloro-1,2,2-trif	2.27	101	119580	28.98	ug/l	84
12) Methylene Chloride	2.66	84	252551	61.56	ug/l	93
13) Acetone	2.44	43	64403	49.83	ug/l	99
14) Carbon Disulfide	2.45	76	356220	30.12	ug/l	94
16) 1,1-Dichloroethene	2.30	96	143118	42.52	ug/l	93
17) 1,1-Dichloroethane	3.08	63	378217	59.53	ug/l	95
20) Methyl tert-butyl ether	2.80	73	623602	58.00	ug/l	95
21) trans-1,2-Dichloroethene	2.80	96	214287	52.05	ug/l	99
22) cis-1,2-Dichloroethene	3.45	96	335450	58.11	ug/l	94
23) 1,2-Dichloroethene (total)	3.45	96	550055m	109.77	ug/l	
24) 2-Butanone	3.49	43	169212	58.32	ug/l	96
25) Chloroform	3.63	83	458303	54.34	ug/l	98
27) 1,2-Dichloroethane	4.03	62	344851	57.53	ug/l	100
29) 1,1,1-Trichloroethane	3.74	97	288588	44.36	ug/l	99
30) Cyclohexane	3.73	56	292936	45.89	ug/l	93
31) Carbon Tetrachloride	3.82	117	219384	38.62	ug/l	98
33) Bromodichloromethane	4.74	83	385596	54.76	ug/l	95
34) 1,2-Dichloropropane	4.57	63	331856	63.95	ug/l	95
35) cis-1,3-Dichloropropene	5.04	75	528899	60.47	ug/l	98
36) Trichloroethene	4.38	130	279269	47.53	ug/l	91
37) Methylcyclohexane	4.47	83	208700	30.77	ug/l	96
38) Benzene	3.97	78	1100547	56.55	ug/l	99
39) Dibromochloromethane	5.85	129	305145	51.73	ug/l	95
40) trans-1,3-Dichloropropene	5.44	75	434255	57.38	ug/l	96
41) 1,1,2-Trichloroethane	5.58	97	316099	62.23	ug/l	97
42) Bromoform	6.95	173	205691	48.59	ug/l	93
44) 4-Methyl-2-pentanone	5.14	43	359301	49.86	ug/l	95
45) 2-Hexanone	5.73	43	251333	47.10	ug/l	87
46) 1,2-Dibromoethane	5.96	107	343993	51.17	ug/l	94
47) Tetrachloroethene	5.62	164	201975	40.40	ug/l	97
48) 1,1,2,2-Tetrachloroethane	7.31	83	464126	59.99	ug/l	99
50) Toluene	5.25	91	1208528	47.94	ug/l	97
51) Chlorobenzene	6.30	112	899082	51.06	ug/l	93
52) Ethylbenzene	6.35	106	438994	51.36	ug/l	98
54) Styrene	6.77	104	1046222	53.36	ug/l	97
55) m,p-Xylene	6.44	106	1109257	105.34	ug/l	99

(#) = qualifier out of range (m) = manual integration

AECOM237 V268

Quantitation Report (QT Reviewed)

Data File : O:\MS\HP5971\DATA\2015\APRIL15\042315\A86088.D Vial: 8
Acq On : 23 Apr 2015 11:51 Operator: MF
Sample : LFB042315M Inst : H5971
Misc : ,,,LFB,, MED 4G/10ML, 1ML/50ML Multiplr: 1.00
MS Integration Params: RTEINT.P
Quant Time: Apr 23 13:03 2015 Quant Results File: R7W0403.RES

Quant Method : C:\HPCHEM\1\METHODS\R7W0403.M (RTE Integrator)
Title : 8260C CJ4239, CG1098, A087941, A092874, A091556
Last Update : Fri Apr 03 15:40:34 2015
Response via : Initial Calibration
DataAcq Meth : R7W0403

Compound	R.T.	QIon	Response	Conc Unit	Qvalue
56) o-Xylene	6.75	106	564122	53.07 ug/l	99
57) Xylene (total)	6.44	106	1677625m	157.87 ug/l	
58) Isopropylbenzene	7.02	105	1191874	51.08 ug/l	98
59) 1,3-Dichlorobenzene	8.07	146	631161	50.44 ug/l	97
60) 1,4-Dichlorobenzene	8.14	146	676625	51.40 ug/l	99
61) 1,2-Dichlorobenzene	8.46	146	646492	50.80 ug/l	97
62) 1,2-Dibromo-3-chloropropan	9.12	75	57391	49.28 ug/l #	65
63) 1,2,4-Trichlorobenzene	9.79	180	320087	43.88 ug/l	98

(#) = qualifier out of range (m) = manual integration

Pace Long Island

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Melville, NY 11747

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COMPUTATIONS FOR VOLATILE ORGANICS
PERFORMED BY RTE DATA SYSTEM OF HP

$$CONC = \frac{Ax}{Ais \times RRF} \quad \frac{Is}{W}$$

WHERE:

CONC = Concentration in sample (µg/L or µg/kg)

Ax = Area of characteristic ion of compound

Ais = Area of characteristic ion of internal standard

RRF = Relative response factor as area per (ng) of compound, divided by area per ng of respective internal standard

Is = Amount of internal standard injected (ng)

W = Volume of sample in (mL) or dry weight (g)

Generally the amount of each internal standard injected is 250 ng.

Pace Long Island

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Melville, NY 11747

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V. DOCUMENTATION FOR VOLATILE ORGANICS

A. LOG BOOK PAGES
B. DILUTION LOG*
C. REPORTING ANALYST SIGNATURE PAGE

*IF REQUIRED

Pace Long Island

GC/MS VOLATILE ANALYSIS

	Std. Log Pg.	Prep Date	Sol'n ID	Lot #
CAL	4	2-19-15	Restock cal kit	A0104564 / A0105567 / A0101160
ICV				
MS				
QC CHECK				
SURR.	7	3-31-15	82603MS/SU	
I.S.				
BFB				

INSTRUMENT: HP5971

SCAN: VOA

COLUMN: RTX-624

Balance ID: N/A

pH paper lot #: HC421273

Cl strip lot #: N/A

ANALYST'S SIGNATURE	DATE	RUN #	LAB SAMPLE ID	CLIENT SAMPLE ID	CONTAINER #	INJ TIME	VOL WT	HEAT. PURG. Y/N	METHOD 8260C	pH	Cl	QDEL	IMPORT	TEST CODE	SDG	VIALS # COMMENTS Δ- 030215-5
BBlaguka	3/30/15	A85613	BFB 50NG			2140	5ML	Y	R6S0330							
		14	VSTD005			2203										
		15	VSTD005			2231										
		16	VSTD010			2257										
		17	VSTD020			2318										
		18	VSTD050			2339										
		19	VSTD100			0000										
		20	VSTD200			0021										
		21	VBLK			0042										
		22	ICV050			0103										
BBlaguka	3/31/15	A85623	50 ng BFB			1631	5ML	Y	R6S0331				✓			
		24	VSTD005 *			1719						✓	✓			
		25	VSTD10 *	R6S0331.M #6016		1740						✓	✓			
		26	VSTD020 *			1801						✓	✓			
		27	VSTD050 *			1822						✓	✓			
		28	VSTD100 *			1843						✓	✓			
		29	VSTD200 *			1904						✓	✓			
		30	VBLK			1937										
		31	VBLK033115			2003						✓	✓			

Pace Long Island

GC/MS VOLATILE ANALYSIS

	Std. Log Pg.	Prep Date	Sol'n ID	Lot #
CAL	4	2-19-15	Restek Cal	A0104564 / A0105667 / A0101160
ICV				
MS				
QC CHECK				
SURR.	7	3-31-15	8260B IN/SU	L
I.S.				
BFB				

INSTRUMENT: HP5971
SCAN: VOA
COLUMN: RTX-624

Balance ID: N/A
pH paper lot #: HC421273
Cl strip lot #: N/A

VIALS # 030215-5

ANALYST'S SIGNATURE	DATE	RUN #	LAB SAMPLE ID	CLIENT SAMPLE ID	CONTAINER #	INJ TIME	VOL WT	HEAT. PURG. Y/N	METHOD 8260C	pH	Cl	QDEL	IMPORT	TEST CODE	SDG	COMMENTS
BBLaguda	3/31/15	A85032	LFD3515/ICWSU			2030	SMC	Y	R650331	N/A	N/A	✓	✓			
		33	1503J37-001A		1	2052	5.0					✓	✓			
	BBL 4/1/15	34	1503J51-001A		1	2113	4.39					✓	✓	8260.S.A-2		
		35	1503K09-001A		1	2134	6.01					✓	✓			
		36	-002A		2	2155	5.42					✓	✓			
		37	-003A		2	2216	5.95					✓	✓			
		38	-004A		1	2237	8.29					✓	✓			
		39	-005A		2	2258	10.02					✓	✓			
		40	-006A		1	2319	4.69					✓	✓			
		41	-007A		2	2340	6.69					✓	✓			
		42	-008A		2	0001	6.21					✓	✓			
		43	-009A		2	0022	6.31					✓	✓			
		44	-010A		1	0043	11.10					✓	✓			
		45	-011A		1	0104	9.47					✓	✓			
		46	-012A		1	0125	8.94					✓	✓			
		47	1503L16-001A		1	0146	12.21					✓	✓			MBTEX only
		48	-002A		1	0207	9.67					✓	✓			
		49	-003A		1	0228	11.97					✓	✓			
		50	-004A		1	0249	11.61					✓	✓			

Pace Long Island

GC/MS VOLATILE ANALYSIS

	Std. Log Pg.	Prep Date	Sol'n ID	Lot #
CAL	5/6	2/27/15	ULTRA	CL3405, CL3703, 213121110, 215011021, AD99342
ICV	3	2/12/15	VOAMEOA	AD103959
MS	↓	↓	↓	↓
QC CHECK	↓	↓	↓	↓
SURR.	6	2/27/15	STM262	CL-3717
I.S.	↓	↓	STM341	CL-3797
BFB	↓	↓	STM262	CL-3717

INSTRUMENT: HP5972-2
SCAN: VOA
COLUMN: RTX-624

Balance ID: NA
pH paper lot #: HC4R1273
CI strip lot #: NA

ANALYST'S SIGNATURE	DATE	RUN #	LAB SAMPLE ID	CLIENT SAMPLE ID	CONTAINER #	INJ TIME	VOL WT	HEAT. PURG. Y/N	METHOD ASP8260 624	pH	CI	QDEL	IMPORT	TEST CODE	SDG	COMMENTS
[illegible]	3/3/15	G30816	VBLK		\	1915	5mL	N	CPBW0227	22	NA	✓	\			
↓	↓	17	1503106-004A	TRIPBL 3/2	1	1940	↓	↓	↓	↓	↓	✓	✓	8260W.3608	IRR291	
		18	-001A	6G-1	↓	2001						✓	✓	↓	↓	
		19	-002A	6G-2		2023						✓	✓			
		20	-003A	6G-3		2046						✓	✓			
		21	-003AMS	6G-3MS	2	2107						✓	✓			
		22	-003AMSD	6G-3MSD	3	2128						✓	✓			
[illegible]	3/4/15	G30823	50NG-BFB		NA	0808	5mL	N	RSW0304	NA	NA	\	\			NOT USED
↓	↓	24	VBLK		↓	0830	↓	↓	↓	↓	↓	\	\			
		25	VBLK			0857						\	\			
		26	VSTD0.4			1036						\	\			SURR WRONG - RE
		27	50NG-BFB			1125							✓			
		28	VBLK			1149						\	\			
		29	VBLK			1212						\	\			
		30	VSTD0.40			1234						✓		C24.W6416MP		
		31	VSTD1.0	≠ ICAL		1256						✓	✓	↓		
		32	VSTD5.0	≠ 5956		1318						✓	✓			
		33	VSTD10.0	≠		1339						✓	✓			
↓		34	VSTD20.0	≠	↓	1400	↓	↓	↓	↓	↓	✓	✓	↓		

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GC/MS VOLATILE ANALYSIS

	Std. Log Pg.	Prep Date	Sol'n ID	Lot #
CAL	6	3/4/15	RESTEK CAL KIT	A0101160, A0105567, A0104564, CM-0945, A092589, CL-3755
ICV	5	2/25/15	VOA MEGA	A0107437, EPA-1016, CK-0317, AMN-623
MS	6	3/4/15	RESTEK CAL KIT	A0101160, A0105567, A0104564, CM-0945, A092589, CL-3755
QC CHECK	6	3/4/15	↓	↓
SURR.	6	3/4/15	STM-262	CL-3717
I.S.	6	3/4/15	STM-272	CL-3198
BFB	6	3/4/15	STM-262	CL-3717

INSTRUMENT: HP5972-2

SCAN: VOA

COLUMN: RTX-624

Balance ID: NA

pH paper lot #: HC413032

Cl strip lot #: NA

ANALYST'S SIGNATURE	DATE	RUN #	LAB SAMPLE ID	CLIENT SAMPLE ID	CONTAINER #	INJ TIME	VOL WT	HEAT. PURG. Y/N	METHOD 624	pH	Cl	QDEL	IMPORT	TEST CODE	SDG	COMMENTS
[illegible]	3/4/15	G30835	VSTD50	* ICAL	NA	1422	5mL	N	R8W0304		NA	✓	✓	624.WEXPAND		
		36	VSTD100	* 5456		1443						✓	✓			
		37	VSTD200	*		1505						✓	✓			
		38	VSTD500			1539						✓	✓			
		39	BFB50NG			1817						✓	✓			
		40	ICV050			1840						✓	✓			
		41	VBLK030415			1926						✓	✓			
		42	VBLK030415			2000						✓	✓			
		43	LFB030415			2072				7		✓	✓			
		44	VBLK			2043						✓	✓			
		45	1502478-007A	TRIP BLANK 2/26	1	2104				7		✓	✓	624.WEXPAND	PACE-NY122	
		46	-001A	TS EFF 2/26		2126						✓	✓			
		47	-004A	AIRSTRIPPER		2147						✓	✓			
		48	-002A	BETWEEN LPG-HC		2209						✓	✓			
		49	-003A	BIOREACT/CLAR		2230						✓	✓			DIL 1:20
		50	-003AMS	H2POX DIS 2/26	2	2252						✓	✓			
		51	-006A	INF 2/26	1	2313						✓	✓			DIL 1:50
		52	VBLK			0942										
		53	1502478-008A	H2POX DIS 2/26	1	1003				7		✓	✓		PACE-NY122	

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GC/MS VOLATILE ANALYSIS

	Std. Log Pg.	Prep Date	Sol'n ID	Lot #
CAL	8	4-2-15	Restek Gallet	A0b4564 / A0101160 / A0707100
ICV	↓	↓		↓
MS	↓	↓		↓
QC CHECK	↓	↓		↓
SURR.	12	↓	PRM IN/50	M
I.S.	↓	↓		↓
BFB	↓	↓		↓

INSTRUMENT: HP5971
SCAN: VOA
COLUMN: RTX-624

Balance ID: N/A
pH paper lot #: HC421273
Cl strip lot #: 090814

ANALYST'S SIGNATURE	DATE	RUN #	LAB SAMPLE ID	CLIENT SAMPLE ID	CONTAINER #	INJ TIME	VOL WT	HEAT. PURG. Y/N	METHOD 1624/1666	pH	Cl	QDEL	IMPORT	TEST CODE	SDG	COMMENTS
[illegible]	04/02/15	A85708	1503L37-001A		1	2255	5mL	Y	PRM0402	<2	Ø	✓	✓	1624/1666		@ 1:50
↓	↓	09	1503L38-001A		↓	2318	↓	↓	↓	↓	↓	✓	✓	↓		@ 1:50
↓	↓	10	1503L39-001A		↓	2338	↓	↓	↓	↓	↓	✓	✓	↓		@ 1:50
↓	↓	11	1504163-001A		↓	2358	↓	↓	↓	↓	↓	✓	✓	↓		@ 1:50 DL@ 1:100
↓	↓	12	1503L39-001A DUP		↓	0019	↓	↓	↓	↓	↓	✓	✓	↓		@ 1:50
↓	↓	13	1503L38-001A MS		↓	0041	↓	↓	↓	↓	↓	✓	✓	↓		@ 1:50
[illegible]	04/03/15	A85714	SONG BFB		1	0954		N	R7W0403	<2	Ø	✓		8260		
↓	↓	15	SONG BFB		1	1015		↓	↓	↓	↓	✓		↓		
↓	↓	16	SONG BFB		1	1052		↓	↓	↓	↓			↓		
↓	↓	17	SONG BFB		1	1120		↓	↓	↓	↓			↓		
↓	↓	18	VBLK		1	1143		↓	↓	↓	↓			↓		
↓	↓	19	VBLK		1	1203		↓	↓	↓	↓			↓		
↓	↓	20	VSTD001		1	1258		↓	↓	↓	↓	✓	✓	↓		
↓	↓	21	VSTD005		1	1319		↓	↓	↓	↓	✓	✓	↓		
↓	↓	22	VSTD010		1	1339		↓	↓	↓	↓	✓	✓	↓		
↓	↓	23	VSTD020		1	1359		↓	↓	↓	↓	✓	✓	↓		
↓	↓	24	VSTD050		1	1419		↓	↓	↓	↓	✓	✓	↓		
↓	↓	25	VSTD100		1	1439		↓	↓	↓	↓	✓	✓	↓		
↓	↓	26	VSTD200		1	1500		↓	↓	↓	↓	✓	✓	↓		

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GC/MS VOLATILE ANALYSIS

	Std. Log Pg.	Prep Date	Sol'n ID	Lot #
CAL	4	2/11/15	Restock Gilt	A0104564 / A0105567 / A0101160
ICV	↓	↓		↓
MS	↓	↓		↓
QC CHECK	↓	↓		↓
SURR.	7	3/31/15	8260 3IN/SU	L
I.S.	↓	↓		↓
BFB	↓	↓		↓

INSTRUMENT: HP5971
SCAN: VOA
COLUMN: RTX-624

Balance ID: H2M081
pH paper lot #: HC421273
Cl strip lot #: N/A

ANALYST'S SIGNATURE	DATE	RUN #	LAB SAMPLE ID	CLIENT SAMPLE ID	CONTAINER #	INJ TIME	VOL WT	HEAT. PURG. Y/N	METHOD	pH	Cl	QDEL	IMPORT	TEST CODE	SDG	COMMENTS
[signature]	04/03/15	A85727	VBLK		1	1552		N	R7W0403	<2	θ					
↓	↓	28	ICV050		1	1612		↓		↓	↓					
		29	ICV050			1642										
		30	50NG BFB			1722										
		31	VSTD050		1	1747										
↓	↓	32	VSTD050			1810					↓					
[signature]	04/06/15	A85733	50NG BFB		1	0933			R7W0403		θ	✓	X	8260_w_TCL		
↓	↓	34	50NG BFB		1	0959		↓	↓	↓	↓	✓	X	↓		
		35	50NG BFB		1	1044						✓	X			
		36	50NG BFB		1	1109						✓	X			
		37	50NG BFB		1	1124						✓	X			
		38	50NG BFB		1	1144						✓	✓			
		39	VSTD050		1	1204						✓	X			
		40	VSTD050			1238						✓	✓			
		41	VBLK040615		1	1302						✓	✓			
		42	LFB040615		1	1325						✓	✓			
		43	1504219-001B		1	1351						✓	✓			
		44	1503K99-006A		2	1411						✓	✓	↓		1:200 DL
↓	↓	45	1503K98-010A		2	1431		↓	↓	↓	↓	✓	✓	8260_w_TCL		

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GC/MS VOLATILE ANALYSIS

	Std. Log Pg.	Prep Date	Sol'n ID	Lot #		
CAL	4	2/19/15	Restek (6)Kit	A0104564	A0105567	A0101160
ICV	↓	↓		↓		
MS						
QC CHECK	↓	↓				
SURR.	7	4/14/15	8260INTER	L		
I.S.	↓	↓		↓		
BFB	↓	↓		↓		

INSTRUMENT: HP5971
SCAN: VOA
COLUMN: RTX-624

Balance ID: HJM081
pH paper lot #: HC41303
Cl strip lot #: N/A

ANALYST'S SIGNATURE	DATE	RUN #	LAB SAMPLE ID	CLIENT SAMPLE ID	CONTAINER #	INJ TIME	VOL WT	HEAT. PURG. Y/N	METHOD	pH	Cl	QDEL	IMPORT	TEST CODE	SDG	COMMENTS
Matt Turner	04/21/15	A86050	VSTD050		1	1648	5.0	Y	R650331	N/A	N/A			8260-S-4-2		
↓	↓	51	VSTD050		1	1731	↓	↓	↓	↓	↓			↓		
Matt Turner	04/22/15	A86052	SONC BFB		1	0709	5.0	Y	R650331	N/A	N/A			8260-S-4-2		
		53	SONC BFB ~~VSTD050~~		1	0726										
		54	VSTD050		1	0745										
		55	VSTD050		1	0814										
		56	VSTD050		1	0854										New STD
		57	VSTD050		1	0922										
		58	VSTD050		1	0951						✓				A = Tune file
		59	VBLK042215		1	1030						✓				
		60	LFB042215		1	1051						✓				
		61	1504A66-002A	SS-043837-MA-009	4	1116	↓					✓			CRA815	BULK
		62	1504D51-001A	SS-043837-MA-014	2	1137	6.1					✓				DL needed
		63	1504D51-002A	SS-043837-MA-015	1	1158	5.31					✓			↓	
		64	1504C96-001A	SB-15-5.5-6.0	2	1219	11.99					✓			AECOM237	DL needed
		65	1504C96-002A	SB-16-5.5-6.0	2	1240	12.00					✓				
		66	1504C96-003A	SB-17-5.0-5.5	1	1301	10.43					✓				
		67	1504C96-004A	SB-18-5.0-5.5	1	1322	13.06					✓				
		68	1504C96-005A	SB-19-5.5-6.0	2	1343	12.13	↓	↓	↓	↓	✓			↓	↓

Pace Long Island

GC/MS VOLATILE ANALYSIS

	Std. Log Pg.	Prep Date	Sol'n ID	Lot #		
CAL	4	2/19/15	Restek 61161	A0104564	A0105567	A0101160
ICV	↓			↓		
MS	↓			↓		
QC CHECK	↓			↓		
SURR.	7	4/14/15	8260 IN/SGR	L		
I.S.	↓			↓		
BFB	↓			↓		

INSTRUMENT: HP5971
SCAN: VDA
COLUMN: RTX-624

Balance ID: HA1081
pH paper lot #: HC143032
Cl strip lot #: 090814

ANALYST'S SIGNATURE	DATE	RUN #	LAB SAMPLE ID	CLIENT SAMPLE ID	CONTAINER #	INJ TIME	VOL WT	HEAT. PURG. Y/N	METHOD	pH	Cl	QDEL	IMPORT	TEST CODE	SDG	COMMENTS
Matt [illegible]	04/22/15	A86069	1504D51-001A	SS-043837-MA-014	1	1410	1.0	Y	RGS0331	N/A	N/A	✓		8260-S-4-2	CRA815	DL @ 1:5
↓	↓	70	1504C96-001A	SB-15-5.5-6.0	3	1431	1.0	↓	↓	↓	↓	✓		↓	AECOM237	
		71	1504C96-002A	SB-16-5.5-6.0	3	1452	1.0					✓				
		72	1504C96-003A	SB-17-5.0-5.5	2	1513	0.5					✓				
		73	1504C96-004A	SB-18-5.0-5.5	2	1534	1.0					✓				
		74	1504C96-005A	SB-19-5.5-6.0	3	1555	1.0					✓				
		75	1504E77-001A	OTP 39-N	1	1616	0.5					✓				DL @ 1:10 run at med.
		76	VBLK	~~OTP39~~	1	1711	5.0					✓				
		77	VBLK		1	1736	5.0					✓				
		78	1504D51-001A	SS-043837-MA-014	3	1800	1.0					✓			CRA815	DL @ 1:5
		79	1504D51-002A DUP	SS-043837-MA-015	2	1821	5.48					✓	✓		↓	
↓	↓	80	1504D51-002A MS	↓	3	1842	5.0	↓	↓	↓	↓	✓	✓	↓	↓	
Matt [illegible]	04/23/15	A86081	50NG BFB		1	0843	5.0	N	R7W0403			✓				
↓	↓	82	VSTD050		1	0914	↓	↓	↓			✓				
		83	50NG BFB		1	0949						✓				
		84	VSTD050		1	1014						✓				
		85	VBLK042315		1	1043						✓				
		86	VBLK042315M		1	1103						✓				Medium level Blank
↓	↓	87	LFB042315		1	1128	↓	↓	↓			✓				

Pace Long Island

GC/MS VOLATILE ANALYSIS

	Std. Log Pg.	Prep Date	Sol'n ID	Lot #
CAL	4	2/19/15	Restek Calkit	A0104564 / A0108567 / A0101160
ICV	↓	↓		↓
MS				
QC CHECK	↓	↓		↓
SURR.	7	4/14/15	8260 IN/SUR	L
I.S.	↓	↓		↓
BFB	↓	↓		↓

INSTRUMENT: HP5971
SCAN: VOA
COLUMN: RTX-624

Balance ID: 12M081
pH paper lot #: HC143032
Cl strip lot #: 090814

ANALYST'S SIGNATURE	DATE	RUN #	LAB SAMPLE ID	CLIENT SAMPLE ID	CONTAINER #	INJ TIME	VOL WT	HEAT. PURG. Y/N	METHOD	pH	Cl	QDEL	IMPORT	TEST CODE	SDG	COMMENTS
Matt Stauer	04/23/15	A86088	LFB042315M		1	1151	5.0	N	R7W0403	<2	N/A	✓	✓			Medium level LFB
↓	↓	89	1504D51-001A	SS-043837-AA-014	4	1216	6.45		↓	↓	↓	✓	✓	8260-S-42	CRA815	Medium level DL@1:
		90	1504C96-001A	SB 15-5.5-60	1	1236	10.5					✓	✓	↓	AECOM237	↓
		91	1504C96-002A	SB-16-5.5-60	3	1257	11.1					✓	✓		↓	
		92	1504C96-003A	SB-17-5.0-55	1	1317	12.9					✓	✓			
		93	1504C96-004A	SB-18-5.0-55	3	1337	13.3					✓	✓			
		94	1504C96-005A	SB-19-5.0-55	1	1357	13.7					✓	✓		↓	
		95	1504E77-001A	OTP39-N	1	1417	1.0					✓	✓		PACE-NY156	
		96	1504E77-002A	OTP39-E	1	1438	1.0					✓	✓		↓	
		97	1504E77-003A	OTP39-W	1	1458	1.0					✓	✓			
		98	1504E77-004A	OTP39-BOTTOM	1	1518	1.0					✓	✓			
		99	1504E77-005A	DUP-X	1	1538	1.0					✓	✓			
		100	1504E77-004A MS	OTP39-BOTTOM	2	1559	1.0					✓	✓			
		101	1504E77-004A MSD	OTP39-BOTTOM	3	1619	1.0					✓	✓	↓	↓	↓
		102	VBLK042315		1	1640	5.0					✓	✓	1311-✓		
		103	LFB042315		1	1700	5.0					✓	✓	↓		
		104	VBLKTCLP		1	1727	5.0					✓	✓			
		105	1504C37-001A		1	1747	↓					✓	✓			DL @ 1:1000
↓	↓	106	1504C37-002A		1	1808	↓		↓	↓	↓	✓	✓	↓		

Pace Long Island

575 Broad Hollow Road
Melville, NY 11747

tel. 631.694.3040
fax. 631.420.8436

SDG: AECOM237
SCAN: VOA

This data package was reported by the undersigned. This reporting includes data calculations, manual edits, if necessary, and compilation of raw data. The information presented is true and correct to the best of my knowledge.

Signature: _____

Date: 05/08/2015

Appendix B

Remedial Alternative Cost Estimates

1. Component	APPENDIX A: COST ESTIMATE	2. Date
SUMMARY OF COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 1 - INSTITUTIONAL CONTROLS		60269812	$151

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
SUMMARY OF COSTS				
CAPITAL COSTS				
Total Construction Cost				$130
Contingencies (20%)				$7
Engineering (0%)				$0
Project Management (8%)				$10
Construction Management (0%)				$0
Total Capital Cost				**$147**
Present Worth Capital Costs				**$151**
Annual O&M Costs				
Total Annual O&M Cost				$0
Contingency (5%)				$0
Project Management (8%)				$0
Total Annual O&M Cost				**$0**
Present Worth of O&M Costs (30 year life)				**$0**
Present Worth of Total Costs				**$151**

Guidance Cost Analysis

10. Description of Proposed Construction:

Notes:

1. The escalation factor for construction costs is 3.2% from ENR (January 2015).
2. The discount factor from Circular-94 Dec 2014 ranged from 0.1% (3-year) to 1.3% (30+years).
4. The construction period is assumed to occur in 2015.

1. Component	APPENDIX A: COST ESTIMATE	2. Date
CAPITAL COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 1 - INSTITUTIONAL CONTROLS		60269812	$151

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
COST DETAILS				
CAPITAL COSTS				
Title Search/Property	LS	26	1,000	$26
Attorney Review/Property	LS	26	1,500	$39
Survey/Property	LS	26	2,500	$65
Total Construction Cost				$130
Contingency (5%)				$7
Engineering (0%)				$0
Project Management (8%)				$10
Construction Management (0%)				$0
2015 Construction Costs				**$147**
2016 Construction Costs (3.2% Escalation)				**$152**
Present Worth Construction Costs (0.1% discount)				**$151**

1. Component	APPENDIX A: COST ESTIMATE			2. Date
O&M COSTS				DEC 2015
3. Site		4. Project Title		
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053		CRYSTAL CLEANERS FEASIBILITY STUDY		
5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)	
ALTERNATIVE 1 - INSTITUTIONAL CONTROLS		60269812	$151	

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
O&M COSTS				
None				
Total Annual Cost				$0
Contingency (5%)				$0
Project Management (8%)				$0
Total Annual O&M Cost				$0
Future O&M Costs (2015 to 2045)				**$0**
Present Worth of O&M Costs (0.1 to 1.3% Discounts)				**$0**

1. Component	APPENDIX A: COST ESTIMATE	2. Date
SUMMARY OF COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 2 - MONITORED NATURAL ATTENUATION		60269812	$744

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
SUMMARY OF COSTS				
CAPITAL COSTS				
Total Construction Cost				$144
Contingencies (20%)				$7
Engineering (0%)				$0
Project Management (8%)				$12
Construction Management (0%)				$0
Total Capital Cost				**$163**
Present Worth Capital Costs				**$168**
Annual O&M Costs				
Total Annual O&M Cost				$40
Contingency (5%)				$2
Project Management (8%)				$3
Total Annual O&M Cost				**$45**
Present Worth of O&M Costs (30 year life)				**$576**
Present Worth of Total Costs				**$744**

Guidance Cost Analysis

10. Description of Proposed Construction:

Notes:

1. The escalation factor for construction costs is 2.1% from ENR (July 2015).
2. The discount factor from Circular-94 Mar. 2015 ranged from 0.1% (3-year) to 1.4% (30+years).
3. The construction period is assumed to occur in 2016

1. Component	APPENDIX A: COST ESTIMATE	2. Date
CAPITAL COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 2 - MONITORED NATURAL ATTENUATION		60269812	$744

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
COST DETAILS				
CAPITAL COSTS				
Title Search/Property	LS	26	1,000	$26
Attorney Review/Property	LS	26	1,500	$39
Survey/Property	LS	26	2,500	$65
Install 2 Permanent Wells in Overburden	LS	1	14,200	$14
Total Construction Cost				$144
Contingency (5%)				$7
Engineering (0%)				$0
Project Management (8%)				$12
Construction Management (0%)				$0
2015 Construction Costs				**$163**
2016 Construction Costs (3.2% Escalation)				**$168**
Present Worth Construction Costs (0.1% discount)				**$168**

1. Component	APPENDIX A: COST ESTIMATE		2. Date
O&M COSTS			DEC 2015
3. Site		4. Project Title	
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053		CRYSTAL CLEANERS FEASIBILITY STUDY	
5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 2 - MONITORED NATURAL ATTENUATION		60269812	$744

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
O&M COSTS				
Groundwater Sampling Event	LS	1	24,693	$25
Events -				
2017-2021				
2026				
2031				
2036				
2041				
2046				
Periodic Review Reports	EA	1	15,000	$15
Total Annual Cost				$40
Contingency (5%)				$2
Project Management (8%)				$3
Total Annual O&M Cost				$45
Future O&M Costs (2017 to 2046)				**$678**
Present Worth of O&M Costs (0.1 to 1.3% Discounts)				**$576**

1. Component	APPENDIX A: COST ESTIMATE	2. Date
SUMMARY OF COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 3 - MONITORED NATURAL ATTENUATION WITH SOIL REMOVAL		60269812	$1,150

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
SUMMARY OF COSTS				
CAPITAL COSTS				
Total Construction Cost				$493
Contingencies (20%)				$25
Engineering (0%)				$0
Project Management (8%)				$39
Construction Management (0%)				$0
Total Capital Cost				**$557**
Present Worth Capital Costs				**$574**
Annual O&M Costs				
Total Annual O&M Cost				$40
Contingency (5%)				$2
Project Management (8%)				$3
Total Annual O&M Cost				**$45**
Present Worth of O&M Costs (30 year life)				**$576**
Present Worth of Total Costs				**$1,150**

Guidance Cost Analysis

10. Description of Proposed Construction:

Notes:

1. The escalation factor for construction costs is 3.2% from ENR (January 2015).
2. The discount factor from Circular-94 Dec 2014 ranged from 0.1% (3-year) to 1.3% (30+years).
4. The construction period is assumed to occur in 2015.

1. Component	APPENDIX A: COST ESTIMATE	2. Date
CAPITAL COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 3 - MONITORED NATURAL ATTENUATION WITH SOIL REMOVAL		60269812	$1,150

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
COST DETAILS				
CAPITAL COSTS				
Title Search/Property	LS	26	1,000	$26
Attorney Review/Property	LS	26	1,500	$39
Survey/Property	LS	26	2,500	$65
Utility Markout	LS	1	2,000	$2
Remedial Design	LS	1	10,000	$10
Soil Removal	LS	1	336,545	$337
Install 2 Permanent Wells in Overburden	LS	1	14,200	$14
Total Construction Cost				$493
Contingency (5%)				$25
Engineering (0%)				$0
Project Management (8%)				$39
Construction Management (0%)				$0
2015 Construction Costs				**$557**
2016 Construction Costs (3.2% Escalation)				**$575**
Present Worth Construction Costs (0.1% discount)				**$574**

1. Component	APPENDIX A: COST ESTIMATE			2. Date
O&M COSTS				DEC 2015
3. Site		4. Project Title		
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053		CRYSTAL CLEANERS FEASIBILITY STUDY		
5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)	
ALTERNATIVE 3 - MONITORED NATURAL ATTENUATION WITH SOIL REMOVAL		60269812	$1,150	

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
O&M COSTS				
Groundwater Sampling Event	LS	1	24,693	$25
Events -				
2017-2021				
2026				
2031				
2036				
2041				
2046				
Periodic Review Reports	EA	1	15,000	$15
Total Annual Cost				$40
Contingency (5%)				$2
Project Management (8%)				$3
Total Annual O&M Cost				$45
Future O&M Costs (2017 to 2046)				**$678**
Present Worth of O&M Costs (0.1 to 1.3% Discounts)				**$576**

1. Component	APPENDIX A: COST ESTIMATE	2. Date
SUMMARY OF COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 4 - ISCO >500 ug/L IN OVERBURDEN, MNA, LIMITED ACTION		60269812	$2,067

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
SUMMARY OF COSTS				
CAPITAL COSTS				
Total Construction Cost				$1,060
Contingencies (20%)				$53
Engineering (0%)				$0
Project Management (8%)				$85
Construction Management (0%)				$0
Total Capital Cost				**$1,198**
Present Worth Capital Costs				**$1,235**
Annual O&M Costs				
Total Annual O&M Cost				$108
Contingency (5%)				$5
Project Management (8%)				$9
Total Annual O&M Cost				**$122**
Present Worth of O&M Costs (30 year life)				**$832**
Present Worth of Total Costs				**$2,067**

Guidance Cost Analysis

10. Description of Proposed Construction:

Notes:

1. The escalation factor for construction costs is 3.2% from ENR (January 2015).
2. The discount factor from Circular-94 Dec 2014 ranged from 0.1% (3-year) to 1.3% (30+years).
4. The construction period is assumed to occur in 2015.

1. Component	APPENDIX A: COST ESTIMATE	2. Date
CAPITAL COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 4 - ISCO >500 ug/L IN OVERBURDEN, MNA, LIMITED ACTION		60269812	$2,067

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
COST DETAILS				
CAPITAL COSTS				
Title Search/Property	LS	26	1,000	$26
Attorney Review/Property	LS	26	1,500	$39
Survey/Property	LS	26	2,500	$65
Remedial Design	LS	1	10,000	$10
Soil Removal	LS	1	336,545	$337
Install 2 Permanent Wells in Overburden	LS	1	14,200	$14
Remedial Design and Pilot Study	LS	1	78,200	$78
Initial ISCO Injection - Well Installation	LS	1	78,260	$78
Initial ISCO Injection 2016	LS	1	206,510	$207
Second ISCO Injection 2016	LS	1	206,510	$207
Total Construction Cost				$1,060
Contingency (5%)				$53
Engineering (0%)				$0
Project Management (8%)				$85
Construction Management (0%)				$0
2015 Construction Costs				**$1,198**
2016 Construction Costs (3.2% Escalation)				**$1,236**
Present Worth Construction Costs (0.1% discount)				**$1,235**

1. Component	APPENDIX A: COST ESTIMATE		2. Date
O&M COSTS			DEC 2015
3. Site		4. Project Title	
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053		CRYSTAL CLEANERS FEASIBILITY STUDY	
5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 4 - ISCO >500 ug/L IN OVERBURDEN, MNA, LIMITED ACTION		60269812	$2,067

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
O&M COSTS				
Groundwater Sampling Event	LS	1	24,693	$25
Events -				
2017 and 2018 quarterly				
2019, 2020, 2021 anually				
2026, 2031, 2036, 2041, 2046				
Periodic Review Reports	EA	1	15,000	$15
Well Abandonment (2017)	LS	1	68,620	$69
Total Annual Cost				$108
Contingency (5%)				$5
Project Management (8%)				$9
Total Annual O&M Cost				$122
Future O&M Costs (2017 to 2046)				**$934**
Present Worth of O&M Costs (0.1 to 1.3% Discounts)				**$832**

1. Component	APPENDIX A: COST ESTIMATE	2. Date
SUMMARY OF COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 4b - ISCO+ERD >500 ug/L IN OVERBURDEN, MNA, LIMITED ACTION		60269812	$1,908

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
SUMMARY OF COSTS				
CAPITAL COSTS				
Total Construction Cost				$921
Contingencies (20%)				$46
Engineering (0%)				$0
Project Management (8%)				$74
Construction Management (0%)				$0
Total Capital Cost				**$1,041**
Present Worth Capital Costs				**$1,073**
Annual O&M Costs				
Total Annual O&M Cost				$108
Contingency (5%)				$5
Project Management (8%)				$9
Total Annual O&M Cost				**$122**
Present Worth of O&M Costs (30 year life)				**$834**
Present Worth of Total Costs				**$1,908**

Guidance Cost Analysis

10. Description of Proposed Construction:

Notes:

1. The escalation factor for construction costs is 3.2% from ENR (January 2015).
2. The discount factor from Circular-94 Dec 2014 ranged from 0.1% (3-year) to 1.3% (30+years).
4. The construction period is assumed to occur in 2015.

1. Component	APPENDIX A: COST ESTIMATE	2. Date
CAPITAL COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 4b - ISCO+ERD >500 ug/L IN OVERBURDEN, MNA, LIMITED ACTION		60269812	$1,908

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
COST DETAILS				
CAPITAL COSTS				
Title Search/Property	LS	26	1,000	$26
Attorney Review/Property	LS	26	1,500	$39
Survey/Property	LS	26	2,500	$65
Remedial Design - Soil Removal	LS	1	10,000	$10
Soil Removal	LS	1	336,545	$337
Install 2 Permanent Wells in Overburden	LS	1	14,200	$14
Remedial Design and Pilot Study	LS	1	78,200	$78
Initial ISCO Injection - Well Installation	LS	1	78,260	$78
Initial ISCO Injection (Round 1) - Materials	LS	1	206,510	$207
ERD Second Round of Injections (2016)	LS	1	67,699	$68
Total Construction Cost				$921
Contingency (5%)				$46
Engineering (0%)				$0
Project Management (8%)				$74
Construction Management (0%)				$0
2015 Construction Costs				**$1,041**
2016 Construction Costs (3.2% Escalation)				**$1,075**
Present Worth Construction Costs (0.1% discount)				**$1,073**

1. Component	APPENDIX A: COST ESTIMATE	2. Date
O&M COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 4b - ISCO+ERD >500 ug/L IN OVERBURDEN, MNA, LIMITED ACTION		60269812	$1,908

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
O&M COSTS				
Groundwater Sampling Event	LS	1	24,693	$25
Events -				
2017 and 2018 quarterly				
2019, 2020, 2021 anually				
2026, 2031, 2036, 2041, 2046				
Periodic Review Reports	EA	1	15,000	$15
Well Abandonment (2017)	LS	1	68,620	$69
Total Annual Cost				$108
Contingency (5%)				$5
Project Management (8%)				$9
Total Annual O&M Cost				$122
Future O&M Costs (2015 to 2045)				**$936**
Present Worth of O&M Costs (0.1 to 1.3% Discounts)				**$834**

1. Component	APPENDIX A: COST ESTIMATE	2. Date
SUMMARY OF COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 4c - ZVI+ERD >500 ug/L IN OVERBURDEN, MNA, LIMITED ACTION		60269812	$1,760

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
SUMMARY OF COSTS				
CAPITAL COSTS				
Total Construction Cost				$740
Contingencies (20%)				$37
Engineering (0%)				$0
Project Management (8%)				$59
Construction Management (0%)				$0
Total Capital Cost				**$836**
Present Worth Capital Costs				**$862**
Annual O&M Costs				
Total Annual O&M Cost				$156
Contingency (5%)				$8
Project Management (8%)				$13
Total Annual O&M Cost				**$177**
Present Worth of O&M Costs (30 year life)				**$898**
Present Worth of Total Costs				**$1,760**

Guidance Cost Analysis

10. Description of Proposed Construction:

Notes:

1. The escalation factor for construction costs is 3.2% from ENR (January 2015).
2. The discount factor from Circular-94 Dec 2014 ranged from 0.1% (3-year) to 1.3% (30+years).
4. The construction period is assumed to occur in 2015.

1. Component	APPENDIX A: COST ESTIMATE	2. Date
CAPITAL COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 4c - ZVI+ERD >500 ug/L IN OVERBURDEN, MNA, LIMITED ACTION		60269812	$1,760

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
COST DETAILS				
CAPITAL COSTS				
Title Search/Property	LS	26	1,000	$26
Attorney Review/Property	LS	26	1,500	$39
Survey/Property	LS	26	2,500	$65
Remedial Design - Soil Removal	LS	1	10,000	$10
Soil Removal	LS	1	336,545	$337
Install 2 Permanent Wells in Overburden	LS	1	14,200	$14
Remedial Design and Pilot Study	LS	1	78,200	$78
Initial ZVI+ERD Injection - Well Installation	LS	1	75,260	$75
Initial ZVI+ERD Injection (Round 1) - Materials	LS	1	95,901	$96
Total Construction Cost				$740
Contingency (5%)				$37
Engineering (0%)				$0
Project Management (8%)				$59
Construction Management (0%)				$0
2015 Construction Costs				**$836**
2016 Construction Costs (3.2% Escalation)				**$863**
Present Worth Construction Costs (0.1% discount)				**$862**

1. Component	APPENDIX A: COST ESTIMATE		2. Date
O&M COSTS			DEC 2015
3. Site		4. Project Title	
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053		CRYSTAL CLEANERS FEASIBILITY STUDY	
5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 4c - ZVI+ERD >500 ug/L IN OVERBURDEN, MNA, LIMITED ACTION		60269812	$1,760

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
O&M COSTS				
Groundwater Sampling Event	LS	1	24,693	$25
Events -				
2017 and 2018 quarterly				
2019, 2020, 2021 anually				
2026, 2031, 2036, 2041, 2046				
Periodic Review Reports	EA	1	15,000	$15
ZVI+ERD Second Round of Injections 50% -2019	LS	1	47,950	$48
Well Abandonment (2020)	LS	1	68,620	$69
Total Annual Cost				$156
Contingency (5%)				$8
Project Management (8%)				$13
Total Annual O&M Cost				$177
Future O&M Costs (2017 to 2046)				**$1,001**
Present Worth of O&M Costs (0.1 to 1.3% Discounts)				**$898**

1. Component	APPENDIX A: COST ESTIMATE	2. Date
SUMMARY OF COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 4c - COLLOIDAL ACTIVATED CARBON >500 ug/L IN OVERBURDEN, MNA, LIMITED		60269812	$1,556

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
SUMMARY OF COSTS				
CAPITAL COSTS				
Total Construction Cost				$690
Contingencies (20%)				$35
Engineering (0%)				$0
Project Management (8%)				$55
Construction Management (0%)				$0
Total Capital Cost				**$780**
Present Worth Capital Costs				**$804**
Annual O&M Costs				
Total Annual O&M Cost				$40
Contingency (5%)				$2
Project Management (8%)				$3
Total Annual O&M Cost				**$45**
Present Worth of O&M Costs (30 year life)				**$752**
Present Worth of Total Costs				**$1,556**

Guidance Cost Analysis

10. Description of Proposed Construction:

Notes:

1. The escalation factor for construction costs is 3.2% from ENR (January 2015).
2. The discount factor from Circular-94 Dec 2014 ranged from 0.1% (3-year) to 1.3% (30+years).
4. The construction period is assumed to occur in 2015.

1. Component	APPENDIX A: COST ESTIMATE	2. Date
CAPITAL COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 4d - COLLOIDAL ACTIVATED CARBON >500 ug/L IN OVERBURDEN, MNA, LIMITED		60269812	$1,556

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
COST DETAILS				
CAPITAL COSTS				
Title Search/Property	LS	26	1,000	$26
Attorney Review/Property	LS	26	1,500	$39
Survey/Property	LS	26	2,500	$65
Remedial Design - Soil Removal	LS	1	10,000	$10
Soil Removal	LS	1	336,545	$337
Install 2 Permanent Wells in Overburden	LS	1	14,200	$14
Remedial Design and Pilot Study	LS	1	78,200	$78
Colloidal Activated Carbon Injections - One Time Injection	LS	1	121,449	$121
Total Construction Cost				$690
Contingency (5%)				$35
Engineering (0%)				$0
Project Management (8%)				$55
Construction Management (0%)				$0
2015 Construction Costs				**$780**
2016 Construction Costs (3.2% Escalation)				**$805**
Present Worth Construction Costs (0.1% discount)				**$804**

1. Component	APPENDIX A: COST ESTIMATE			2. Date
O&M COSTS				DEC 2015
3. Site		4. Project Title		
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053		CRYSTAL CLEANERS FEASIBILITY STUDY		
5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)	
ALTERNATIVE 4c - COLLOIDAL ACTIVATED CARBON >500 ug/L IN OVERBURDEN, MNA, LIMITED		60269812	$1,556	

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
O&M COSTS				
Groundwater Sampling Event	LS	1	24,693	$25
Events -				
2017 and 2018 quarterly				
2019, 2020, 2021 anually				
2026, 2031, 2036, 2041, 2046				
Periodic Review Reports	EA	1	15,000	$15
Total Annual Cost				$40
Contingency (5%)				$2
Project Management (8%)				$3
Total Annual O&M Cost				$45
Future O&M Costs (2017 to 2046)				**$854**
Present Worth of O&M Costs (0.1 to 1.3% Discounts)				**$752**

1. Component	APPENDIX A: COST ESTIMATE	2. Date
SUMMARY OF COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 5 - ISCO >500 ug/L IN OVERBURDEN, LIMITED IN BEDROCK, MNA, LIMITED ACTION		60269812	$4,345

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
SUMMARY OF COSTS				
CAPITAL COSTS				
Total Construction Cost				$2,874
Contingencies (20%)				$144
Engineering (0%)				$0
Project Management (8%)				$230
Construction Management (0%)				$0
Total Capital Cost				**$3,248**
Present Worth Capital Costs				**$3,349**
Annual O&M Costs				
Total Annual O&M Cost				$243
Contingency (5%)				$12
Project Management (8%)				$19
Total Annual O&M Cost				**$275**
Present Worth of O&M Costs (30 year life)				**$996**
Present Worth of Total Costs				**$4,345**

Guidance Cost Analysis

10. Description of Proposed Construction:

Notes:

1. The escalation factor for construction costs is 3.2% from ENR (January 2015).
2. The discount factor from Circular-94 Dec 2014 ranged from 0.1% (3-year) to 1.3% (30+years).
4. The construction period is assumed to occur in 2015.

1. Component	APPENDIX A: COST ESTIMATE	2. Date
CAPITAL COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 5 - ISCO >500 ug/L IN OVERBURDEN, LIMITED IN BEDROCK, MNA, LIMITED ACTION		60269812	$4,345

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
COST DETAILS				
CAPITAL COSTS				
Title Search/Property	LS	26	1,000	$26
Attorney Review/Property	LS	26	1,500	$39
Survey/Property	LS	26	2,500	$65
Remedial Design	LS	1	10,000	$10
Soil Removal	LS	1	336,545	$337
Install 2 Permanent Wells in Overburden	LS	1	14,200	$14
Remedial Design and Pilot Study	LS	1	78,200	$78
Initial ISCO Injection - Well Installation - Overburden	LS	1	78,260	$78
Initial ISCO Injection - Materials - Overburden	LS	1	206,510	$207
Initial ISCO Injection - Well Installation - Bedrock	LS	1	723,791	$724
Initial ISCO Injection - Materials - Bedrock	LS	1	545,220	$545
Second Round of Injections - OB 100%	LS	1	206,510	$207
Second Round of Injections - BR 100%	LS	1	545,220	$545
Total Construction Cost				$2,874
Contingency (5%)				$144
Engineering (0%)				$0
Project Management (8%)				$230
Construction Management (0%)				$0
2015 Construction Costs				**$3,248**
2016 Construction Costs (3.2% Escalation)				**$3,352**
Present Worth Construction Costs (0.1% discount)				**$3,349**

1. Component	APPENDIX A: COST ESTIMATE	2. Date
O&M COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 5 - ISCO >500 ug/L IN OVERBURDEN, LIMITED IN BEDROCK, MNA, LIMITED ACTION		60269812	$4,345

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
O&M COSTS				
Groundwater Sampling Event	LS	1	24,693	$25
Events -				
2017 and 2018 quarterly				
2019, 2020, 2021 anually				
2026, 2031, 2036, 2041, 2046				
Periodic Review Reports	EA	1	15,000	$15
Well Abandonment (2018)	LS	1	203,765	$204
Total Annual Cost				$243
Contingency (5%)				$12
Project Management (8%)				$19
Total Annual O&M Cost				$275
Future O&M Costs (2017 to 2046)				**$1,099**
Present Worth of O&M Costs (0.1 to 1.3% Discounts)				**$996**

1. Component	APPENDIX A: COST ESTIMATE	2. Date
SUMMARY OF COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 6 - ISCO >50 ug/L IN OVERBURDEN, LIMITED IN BEDROCK, LIMITED MNA (5 YR)		60269812	$10,406

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
SUMMARY OF COSTS				
CAPITAL COSTS				
Total Construction Cost				$8,140
Contingencies (20%)				$407
Engineering (0%)				$0
Project Management (8%)				$651
Construction Management (0%)				$0
Total Capital Cost				**$9,198**
Present Worth Capital Costs				**$9,483**
Annual O&M Costs				
Total Annual O&M Cost				$471
Contingency (5%)				$24
Project Management (8%)				$38
Total Annual O&M Cost				**$532**
Present Worth of O&M Costs (30 year life)				**$922**
Present Worth of Total Costs				**$10,406**

Guidance Cost Analysis

10. Description of Proposed Construction:

Notes:

1. The escalation factor for construction costs is 3.2% from ENR (January 2015).
2. The discount factor from Circular-94 Dec 2014 ranged from 0.1% (3-year) to 1.3% (30+years).
4. The construction period is assumed to occur in 2015.

1. Component	APPENDIX A: COST ESTIMATE	2. Date
CAPITAL COSTS		DEC 2015

3. Site	4. Project Title
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053	CRYSTAL CLEANERS FEASIBILITY STUDY

5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)
ALTERNATIVE 6 - ISCO >50 ug/L IN OVERBURDEN, LIMITED IN BEDROCK, LIMITED MNA (5 YR)		60269812	$10,406

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
COST DETAILS				
CAPITAL COSTS				
Remedial Design	LS	1	10,000	$10
Soil Removal	LS	1	336,545	$337
Install 2 Permanent Wells in Overburden	LS	1	14,200	$14
Remedial Design and Pilot Study	LS	1	78,200	$78
Initial ISCO Injection - Well Installation - Overburden	LS	1	878,085	$878
Initial ISCO Injection - Materials - Overburden	LS	1	2,504,453	$2,504
Initial ISCO Injection - Well Installation - Bedrock	LS	1	723,791	$724
Initial ISCO Injection - Materials - Bedrock	LS	1	545,220	$545
Second Round of Injections - OB 100%	LS	1	2,504,453	$2,504
Second Round of Injections - BR 100%	LS	1	545,220	$545
Total Construction Cost				$8,140
Contingency (5%)				$407
Engineering (0%)				$0
Project Management (8%)				$651
Construction Management (0%)				$0
2015 Construction Costs				**$9,198**
2016 Construction Costs (3.2% Escalation)				**$9,493**
Present Worth Construction Costs (0.1% discount)				**$9,483**

1. Component	APPENDIX A: COST ESTIMATE			2. Date
O&M COSTS				DEC 2015
3. Site		4. Project Title		
CRYSTAL CLEANERS, CORNING, NY SITE NO. 360053		CRYSTAL CLEANERS FEASIBILITY STUDY		
5. Program Element	6. Category Code	7. Project Number	8. Project Cost ($000)	
ALTERNATIVE 6 - ISCO >50 ug/L IN OVERBURDEN, LIMITED IN BEDROCK, LIMITED MNA (5 YR)		60269812	$10,406	

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST ($000)
O&M COSTS				
Groundwater Sampling Event	LS	1	24,693	$25
Events -				
2017 and 2018 quarterly				
2019, 2020, 2021 anually				
Periodic Review Reports	EA	1	15,000	$15
Well Abandonment (2018)	LS	1	431,165	$431
Total Annual Cost				$471
Contingency (5%)				$24
Project Management (8%)				$38
Total Annual O&M Cost				$532
Future O&M Costs (2017 to 2046)				**$925**
Present Worth of O&M Costs (0.1 to 1.3% Discounts)				**$922**

Appendix C

Remedial Alternative Supporting Information

Site Management Plans	$20,000
Periodic Review Reports	$15,000

Groundwater Sampling Event					$24,693
Items	U/M	Qty	Unit Cost	Cost	
Field Effort	hrs	68	100	$6,800	
Documentation	hrs	100	100	$10,000	
Van rental	day	4	150	$600	
Equipment rental	ls	1	$2,400	$2,400	
VOCs	ls	20	$72	$1,440	
Anions in water	ls	3	$12	$37	
Carbon dioxide	ls	3	$9	$28	
Dissolved oxygen	ls	3	$19	$56	
Dissolved gases	ls	3	$67	$201	
Dissolved iron	ls	3	$9	$28	
Nitrate	ls	3	$11	$34	
Validation of VOCs	ls	25	$18	$450	
Travel & Incidental expenses	ls	1	$600	$600	
GW Disposal	ls	1	$2,020	$2,020	

Notes:

Low flow sampling of 15 wells

15 for voc analyses, 3 for MNA parameters

Three wells sampled per day, 3 day event

2 people, 10 hour days inc. travel

Install 2 Permanent Wells in Overburden				**$14,200**
	Unit	Qty	Rate	Total
Work Plan	LS	1	$5,000	$5,000
Utility Markout	DAY	1	$1,200	$1,200
Driller - Geoprobe	LS	1	$5,000	$5,000
Waste Disposal	LS	1	$1,000	$1,000
Oversight	HR	20	$100	$2,000

Remedial Design				**$10,000**
	Unit	Qty	Rate	Total
Remedial Design	hours	60	125	7500
Permit Preparation	hours	20	125	2500

Soil Removal

Soil Removal				$336,545
	Unit	Qty	Rate	Total
Utility Markout	LS	1	$2,000	$2,000
Equipment Mobilization	LS	1	$2,500	$2,500
Excavation & Handling of Soils	CY	505	$20	$10,100
Community Air Monitoring	Day	2	$1,000	$2,000
Clean Fill Material	CY	505	$15	$7,575
Place & Compact	CY	505	$6	$3,030
Asphalt replacement	SF	770	$50	$38,500
Spot container	ea	34	$900	$30,600
Transportation	ea	34	$1,500	$51,000
Rental of Space for Staging	LS	1	$10,000	$10,000
Additional charges	ea	34	$413	$14,042
Liner	ea	34	$50	$1,700
Roll-off Rental	Day	45	$20	$900
Disposal	ton	757.5	$113	$85,598
Post Excavation Sampling	EA	20	$150	$3,000
Waste Char. Sample	AE	34	$2,000	$68,000
Oversight	HR	60	$100	$6,000

Assuming 15 CY transported per rolloff

Remedial Design and Pilot Test				**$78,200**
ISCO	Unit	Qty	Rate	Total
Pilot Test	Lump Sum	1	50000	50000
Remedial Design	hours	175	120	21000
Permit Preparation	hours	60	120	7200

ISCO INJECTION (ROUND 1) OVERBURDEN >=500 ug/L PCE					**$206,510**
DRILLING AND INJECTION WELL INSTALLATION OVERBURDEN >=500 ug/L PCE					**$78,260**
WELL ABANDONMENT					**$68,620**
ISCO Injection Subcontractor (mobilization)	1	Lump Sum	$10,000	$10,000	
ISCO Injection Subcontractor (labor)	5	days	$2,250	$11,250	
ISCO Injection Subcontractor (equipment)	5	days	$2,025	$10,125	
Oxidant/Chemicals					
40% Permanganate	4,705	gallons	$35.00	$164,670	
ISCO Injection Subcontractor (per diem)	5	days	$525	$2,625	
Oversight	5	days	$1,000	$5,000	
Misc Oversight Materials and PPE	1	Lump Sum	$300	$300	
Injection Oversight Rental Equipment	1	weeks	$250	$250	
Rental Vehicle for Oversight	1	weeks	$175	$175	
Persulfate Field Test Kits	1	Each	$115	$115	
Travel Expenses	1	Allowance	$2,000	$2,000	
Utility Clearance	1	Lump Sum	$1,200	$1,200	
Driller Mobilization/Demobilization	1	Lump Sum	$3,900	$3,900	
Drill Rig and Labor	8	rig-days	$5,000	$40,000	
1.5" Screens for injection wells	48	each	$125	$6,000	
1.5" PVC Riser and materials for injection well	600	LF	$8	$4,800	
Flushmount	24	wells	$175	$4,200	
Drums	24	drums	$65	$1,560	
CAMP Equipment Rental	2	week	$500	$1,000	
Soil Disposal	24	drums	$250	$6,000	
Engineering Oversight	96	hours	$100	$9,600	
Driller Mobilization/Demobilization	1	Lump Sum	$3,300	$3,300	
Drill Rig and Labor	6	rig-days	$5,000	$30,000	
HSA 6.25" for Abandonment	600	each	$16	$9,600	
Grout	600	wells	$4	$2,400	
Drums	48	drums	$65	$3,120	
CAMP Equipment Rental	2	week	$500	$1,000	
Soil Disposal	48	drums	$250	$12,000	
Engineering Oversight	72	hours	$100	$7,200	

ISCO INJECTION (ROUND 1) OVERBURDEN >=500 ug/L PCE					**$206,510**
ERD INJECTION (ROUND 1) OVERBURDEN >=500 ug/L PCE					**$67,699**
DRILLING AND INJECTION WELL INSTALLATION OVERBURDEN >=500 ug/L PCE					**$78,260**
WELL ABANDONMENT					**$68,620**
ISCO Injection Subcontractor (mobilization)	1	Lump Sum	$10,000	$10,000	
ISCO Injection Subcontractor (labor)	5	days	$2,250	$11,250	
ISCO Injection Subcontractor (equipment)	5	days	$2,025	$10,125	
ISCO Injection Subcontractor (per diem)	5	days	$525	$2,625	
Oxidant/Chemicals					
40% Permanganate	4,705	gallons	$35.00	$164,670	
Oversight	5	days	$1,000	$5,000	
Misc Oversight Materials and PPE	1	Lump Sum	$300	$300	
Injection Oversight Rental Equipment	1	weeks	$250	$250	
Rental Vehicle for Oversight	1	weeks	$175	$175	
Persulfate Field Test Kits	1	Each	$115	$115	
Travel Expenses	1	Allowance	$2,000	$2,000	
Lactate Injection Subcontractor (mobilization)	1	Lump Sum	$10,000	$10,000	
Lactate Injection Subcontractor (labor and equ	5	days	$3,000	$15,000	
Oxidant/Chemicals					
Sodium Lactate (60%)	366	gallons	$19.20	$10,526	
Sodium Bicarbonate	604	lbs	$0.70	$423	
Bioaugmentation Culture	18	liters	$450	$8,100	
Bioaugmentation (labor and equipment)	4	days	$2,000	$8,000	
Engineering Oversight	9	days	$1,000	$9,000	
Engineering Oversight	16	hours	$125	$2,000	
Misc Oversight Materials and PPE	1	Lump Sum	$300	$300	
Injection Oversight Rental Equipment	2	weeks	$250	$500	
Rental Vehicle for Oversight	2	weeks	$175	$350	
Travel Expenses	1	Allowance	$3,500	$3,500	
Utility Clearance	1	Lump Sum	$1,200	$1,200	
Driller Mobilization/Demobilization (include De	1	Lump Sum	$3,900	$3,900	
Drill Rig and Labor	8	rig-days	$5,000	$40,000	
1.5" Screens for injection wells	48	each	$125	$6,000	
1.5" PVC Riser and materials for injection well	600	LF	$8	$4,800	
Flushmount	24	wells	$175	$4,200	
Drums	24	drums	$65	$1,560	
CAMP Equipment Rental	2	week	$500	$1,000	
Soil Disposal	24	drums	$250	$6,000	

Alt4b ISCO+ERD

Engineering Oversight	96	hours	$100	$9,600
Driller Mobilization/Demobilization	1	Lump Sum	$3,300	$3,300
Drill Rig and Labor	6	rig-days	$5,000	$30,000
HSA 6.25" for Abandonment	600	each	$16	$9,600
Grout	600	wells	$4	$2,400
Drums	48	drums	$65	$3,120
CAMP Equipment Rental	2	week	$500	$1,000
Soil Disposal	48	drums	$250	$12,000
Engineering Oversight	72	hours	$100	$7,200

ZVI-ERD INJECTION (ROUND 1) OVERBURDEN >=500 ug/L PCE					**$95,901**
DRILLING AND INJECTION WELL INSTALLATION OVERBURDEN >=500 ug/L PCE					**$75,260**
WELL ABANDONMENT					**$68,620**
Injection Subcontractor (mobilization)	1	Lump Sum	$10,000	$10,000	
Lactate Injection Subcontractor (labor and equ	5	days	$3,000	$15,000	
ZVI+Carbon Injection Subcontractor (labor an	0	days	$4,000	$0	
Oxidant/Chemicals					
Sodium Lactate (60%)	366	gallons	$19.20	$10,527	
EHC (Carbon+ZVI)	10,483	lbs	$2.90	$33,901	
Sodium Bicarbonate	603.9	lbs	$0.70	$423	
Bioaugmentation Culture	12	liters	$450	$5,400.00	
Bioaugmentation (labor and equipment)	3	days	$2,000	$6,000	
Engineering Oversight	8	days	$1,000	$8,000	
Engineering Oversight	16	hours	$125	$2,000	
Misc Oversight Materials and PPE	1	Lump Sum	$300	$300	
Injection Oversight Rental Equipment	2	weeks	$250	$500	
Rental Vehicle for Oversight	2	weeks	$175	$350	
Travel Expenses	1	Allowance	$3,500	$3,500	
Utility Clearance	1	Lump Sum	$1,200	$1,200	
Driller Mobilization/Demobilization (include De	1	Lump Sum	$3,900	$3,900	
Drill Rig and Labor	8	rig-days	$5,000	$40,000	
1.5" Screens for injection wells	24	each	$125	$3,000	
1.5" PVC Riser and materials for injection well	600	LF	$8	$4,800	
Flushmount	24	wells	$175	$4,200	
Drums	24	drums	$65	$1,560	
CAMP Equipment Rental	2	week	$500	$1,000	
Soil Disposal	24	drums	$250	$6,000	
Engineering Oversight	96	hours	$100	$9,600	
Driller Mobilization/Demobilization	1	Lump Sum	$3,300	$3,300	
Drill Rig and Labor	6	rig-days	$5,000	$30,000	
HSA 6.25" for Abandonment	600	each	$16	$9,600	
Grout	600	wells	$4	$2,400	
Drums	48	drums	$65	$3,120	
CAMP Equipment Rental	2	week	$500	$1,000	
Soil Disposal	48	drums	$250	$12,000	
Engineering Oversight	72	hours	$100	$7,200	

COLLOIDAL ACTIVATED CARBON INJECTION OVERBURDEN >=500 ug/L PCE **$121,449**

Oxidant/Chemicals

No. Injection Points at 7 ft spacing	110			
Estimated days to complete	11			
Colloidal Activated Carbon (Plume Stop®)	10,800	pounds	$2.25	$24,300
Hydrogen Release Compound (HRC®)	1230	pounds	$7.50	$9,225
Bio-Dechlor Inoculum® Plus	24	liters	$170	$4,080
Tax and Freight	$37,605		18%	$6,769
Oversight	11	days	$1,000	$11,000
CAMP Equipment Rental	3	week	$500	$1,500
Misc Oversight Materials and PPE	1	Lump Sum	$300	$300
Injection Oversight Rental Equipment	3	weeks	$250	$750
Rental Vehicle for Oversight	3	weeks	$175	$525
Travel Expenses	1	Allowance	$2,000	$2,000
Utility Clearance	1	Lump Sum	$1,200	$1,200
Driller Mobilization/Demobilization	1	Lump Sum	$4,800	$4,800
Drill Rig and Labor	11	rig-days	$5,000	$55,000

Direct push injection, no wells installed

Costs for materials are from Regenesis.

In-Situ Remediation Injection Volume and Dosage Calculation - Alternative 4 Overburden

Estimated Injection Quantities Determined for a Targeted Pore Volume

In-Situ Chemical Oxidation Alternatives

Injection Area	Area (sq ft)	Treat-ment Interval (ft bgs)	Average Treat-ment Thickness (ft)	Grid Spacing (ft)	Injection Points [1]	Soil Volume (cu ft)	Pore Volume (gallons)	Injection Volume (gallons)		Injection Volume per Point (gallons)		Estimated Injection Time (days)
DPW & Manning	4,193	10'	10	15	24	41,930	62,731	12,546		523		4.8
Total	**4,193**				**24**	**41,930**	**62,731**	**12,546**				**4.8**

Enhanced Reductive Dechlorination Alternatives

Injection Area	Area (sq ft)	Treat-ment Interval (ft bgs)	Average Treat-ment Thickness (ft)	Grid Spacing (ft)	Injection Points [1]	Soil Volume (cu ft)	Pore Volume (gallons)	Injection Volume (gallons)	Lactate Solution To Be Shipped (60%) (gallons)	Injection Volume per Point (gallons)		Estimated Injection Time (days)
Carbon Substrate Only	4,193	10'	10	15	24	41,930	62,731	6,273	366	262		2.4
		10'	10	15	0	0	0	0				0.0
Total	**4,193**				**24**	**41,930**	**62,731**	**6,273**	**366**			**2.4**

Injection Area	Area (sq ft)	Treatmen t Interval (ft bgs)	Average Treatmen t Thickness (ft)	Grid Spacing (ft)	Injection Points [1]	Soil Volume (cu ft)	Soil Mass (lbs)	EHC Quantity (lbs)
ZVI+Carbon	4,193	10'	10	15	24	41,930	4,193,000	10,483

ISCO + ERD Alternative

Alt4a-c

Injection Area	Area (sq ft)	Treatment Interval (ft bgs)	Average Treatment Thickness (ft)	Grid Spacing (ft)	Injection Points [1]	Soil Volume (cu ft)	Pore Volume (gallons)	Injection Volume (gallons)	Permanganate Quantity (pounds)	Injection Volume per Point (gallons)	Permanganate Dose per Point (pounds)	Estimated Injection Time (days)
ISCO High Dose	4,193	10'	10	15	24	41,930	62,731	12,546	18,466	523	769	4.8
Injection Area	Area (sq ft)	Treat-ment Interval (ft bgs)	Average Treat-ment Thickness (ft)	Grid Spacing (ft)	Injection Points [1]	Soil Volume (cu ft)	Pore Volume (gallons)	Injection Volume (gallons)	Lactate Solution To Be Shipped (60%) (gallons)	Injection Volume per Point (gallons)		Estimated Injection Time (days)
Sodium Lactate	4,193	10'	10	15	24	41,930	62,731	6,273	366	262		2.4
Total								**18,819**				**7.1**

Permanganate - High Dosage	15.0%	by weight
Permanganate - Low Dosage	8.0%	by weight
ISCO Injection Pore Volume Targe	20.0%	

EHC Dosage	0.25%	mass per soil mass
EHC Injection Pore Volume Target	8.00%	
Lactate Dosage	3.5%	V/V
Lactate Injection Pore Volume Tar	10.0%	

Effective Porosity (assumed)	0.2	
Water Density	8.34	
Volume Conversion	7.48	
Soil Density (assumed)	2700	lbs/CY

Assumed Injection Rate	2	gpm
Active Injection Points	4	(ISCO or Carbon Substrate)
Daily Active Injection Hours	5.5	

ISCO INJECTION (ROUND 1) BEDROCK					**$545,220**
DRILLING AND INJECTION WELL INSTALLATION - BEDROCK					**$723,791**
WELL ABANDONMENT					**$203,765**
ISCO Injection Subcontractor (mobilization)	1	Lump Sum	$20,000	$20,000	
ISCO Injection Subcontractor (labor)	12	days	$2,250	$27,000	
ISCO Injection Subcontractor (equipment)	12	days	$2,025	$24,300	
Oxidant/Chemicals					
40% Permanganate	12,912	gallons	$35.00	$451,930	
ISCO Injection Subcontractor (per diem)	12	days	$525	$6,300	
Oversight	12	days	$1,000	$12,000	
Misc Oversight Materials and PPE	1	Lump Sum	$300	$300	
Injection Oversight Rental Equipment	3	weeks	$250	$750	
Rental Vehicle for Oversight	3	weeks	$175	$525	
Persulfate Field Test Kits	1	Each	$115	$115	
Travel Expenses	1	Allowance	$2,000	$2,000	
Utility Clearance	1	Lump Sum	$1,200	$1,200	
Driller Mobilization/Demobilization (include De	1	Lump Sum	$34,000	$34,000	
Hollow Stem Auger 0-50 ft 6"	3555	LF	$16	$56,880	
Rotary Drilling 5.75"	1975	LF	$35	$69,125	
1.5" Screens for injection wells	790	LF	$8	$6,320	
1.5" PVC Riser and materials for injection well	3555	LF	$8	$28,440	
Filter Pack	1106	LF	$6	$6,636	
Grout	5530	LF	$6	$33,180	
Flushmount	79	wells	$175	$13,825	
Drums	79	drums	$65	$5,135	
CAMP Equipment Rental	711	week	$500	$355,500	
Soil Disposal	79	drums	$250	$19,750	
Engineering Oversight	938	hours	$100	$93,800	
Driller Mobilization/Demobilization	1	Lump Sum	$7,425	$7,425	
Drill Rig and Labor	20	rig-days	$5,000	$98,750	
HSA 6.25" for Abandonment	1106	each	$16	$17,696	
Grout	1106	wells	$4	$4,424	
Drums	158	drums	$65	$10,270	
CAMP Equipment Rental	4	week	$500	$2,000	
Soil Disposal	158	drums	$250	$39,500	
Engineering Oversight	237	hours	$100	$23,700	

In-Situ Remediation Injection Volume and Dosage Calculation - Alternative 5 Bedrock

Estimated Injection Quantities Determined for a Targeted Pore Volume

In-Situ Chemical Oxidation Alternatives

Injection Area	Area (sq ft)	Treat-ment Interval (ft bgs)	Average Treat-ment Thickness (ft)	Grid Spacing (ft)	Injection Points [1]	Soil Volume (cu ft)	Pore Volume (gallons)	Injection Volume (gallons)		Injection Volume per Point (gallons)		Estimated Injection Time (days)
DPW & Manning	13,809	25'	25	15	79	345,225	129,123	25,825		327		9.8
Total	**13,809**				**79**	**345,225**	**129,123**	**25,825**				**9.8**

Permanganate - High Dosage	20.0%	by weight
Permanganate - Low Dosage	8.0%	by weight
ISCO Injection Pore Volume Ta	20.0%	

EHC Dosage	0.25%	mass per soil mass
EHC Injection Pore Volume Targe	8.00%	
Lactate Dosage	3.5%	V/V
Lactate Injection Pore Volume Ta	10.0%	

Effective Porosity (assumed)	0.05	
Water Density	8.34	
Volume Conversion	7.48	
Soil Density (assumed)	3000	lbs/CY

Assumed Injection Rate	2	gpm
Active Injection Points	4	(ISCO or Carbon Substrate)
Daily Active Injection Hours	5.5	

ISCO INJECTION (ROUND 1) OVERBURDEN >=50 ug/L PCE					**$2,504,453**
DRILLING AND INJECTION WELL INSTALLATION OVERBURDEN >=50 ug/L PCE					**$878,085**
WELL ABANDONMENT					**$431,165**
ISCO Injection Subcontractor (mobilization)	1	Lump Sum	$20,000	$20,000	
ISCO Injection Subcontractor (labor)	102	days	$2,250	$229,500	
ISCO Injection Subcontractor (equipment)	102	days	$2,025	$206,550	
Oxidant/Chemicals					
40% Permanganate	53,728	gallons	$35.00	$1,880,478	
ISCO Injection Subcontractor (per diem)	102	days	$525	$53,550	
Oversight	102	days	$1,000	$102,000	
Misc Oversight Materials and PPE	1	Lump Sum	$300	$300	
Injection Oversight Rental Equipment	21	weeks	$250	$5,250	
Rental Vehicle for Oversight	21	weeks	$175	$3,675	
Persulfate Field Test Kits	10	Each	$115	$1,150	
Travel Expenses	1	Allowance	$2,000	$2,000	
Utility Clearance	1	Lump Sum	$1,200	$1,200	
Driller Mobilization/Demobilization (include De	1	Lump Sum	$15,300	$15,300	
Drill Rig and Labor	46	rig-days	$5,000	$230,000	
1.5" Screens for injection wells	366	each	$125	$45,750	
1.5" PVC Riser and materials for injection well	600	LF	$8	$4,800	
Flushmount	183	wells	$175	$32,025	
Drums	183	drums	$65	$11,895	
CAMP Equipment Rental	10	week	$500	$5,000	
Soil Disposal	183	drums	$250	$45,750	
Engineering Oversight	552	hours	$100	$55,200	
Driller Mobilization/Demobilization	1	Lump Sum	$15,225	$15,225	
Drill Rig and Labor	46	rig-days	$5,000	$228,750	
HSA 6.25" for Abandonment	600	each	$16	$9,600	
Grout	600	wells	$4	$2,400	
Drums	366	drums	$65	$23,790	
CAMP Equipment Rental	10	week	$500	$5,000	
Soil Disposal	366	drums	$250	$91,500	
Engineering Oversight	549	hours	$100	$54,900	

In-Situ Remediation Injection Volume and Dosage Calculation - Alternative 6 Overburden

Estimated Injection Quantities Determined for a Targeted Pore Volume

In-Situ Chemical Oxidation Alternatives

Injection Area	Area (sq ft)	Treat-ment Interval (ft bgs)	Average Treat-ment Thickness (ft)	Grid Spacing (ft)	Injection Points [1]	Soil Volume (cu ft)	Pore Volume (gallons)	Injection Volume (gallons)		Injection Volume per Point (gallons)		Estimated Injection Time (days)
DPW & Manning	89,780	10'	10	25	183	897,800	1,343,199	268,640		1,468		101.8
Total	**89,780**				**183**	**897,800**	**1,343,199**	**268,640**				**101.8**

Permanganate - Low Dosag	8.0%	by weight
ISCO Injection Pore Volume	20.0%	

EHC Dosage	0.25%	mass per soil mass
EHC Injection Pore Volume Targe	8.00%	
Lactate Dosage	3.5%	V/V
Lactate Injection Pore Volume Ta	10.0%	

Effective Porosity (assumed	0.2	
Water Density	8.34	
Volume Conversion	7.48	
Soil Density (assumed)	2700	lbs/CY

Assumed Injection Rate	2	gpm
Active Injection Points	4	(ISCO or Carbon Substrate)
Daily Active Injection Hours	5.5	