REMEDIAL INVESTIGATION AND FEASIBILITY STUDY REPORT

Shelton C Street Landfill, Shelton, Washington

Prepared for: City of Shelton

Project No. 150074-08 • December 16, 2021 • Final

earth + water

Aspect CONSULTING

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Acronyms

2,3,7,8-TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
Agreed Order	Agreed Order No. DE 12929
AOC	Administrative Order on Consent
AF/yr	acre-feet per year
APH	air-phase hydrocarbons
ARARs	Applicable Relevant and Appropriate Requirements
Aspect	Aspect Consulting, LLC
bgs	below ground surface
BPA	Bonneville Power Administration
BTEX	benzene, toluene, ethylbenzene, and xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
City	City of Shelton
CLARC	Cleanup Levels and Risk Calculation
COCs	contaminants of concern
COPC	contaminant of potential concern
cPAH	carcinogenic polycyclic aromatic hydrocarbons
CSM	conceptual site model
CY	cubic yards
DCA	disproportionate cost analysis
DU	Decision Unit
Ecology	Washington State Department of Ecology
EDB	1,2-dibromoethane
EDC	1,2-dichloroethane
EM	electromagnetic induction
ER	electrical resistivity
EPA	U.S. Environmental Protection Agency
FS	Feasibility Study

IM&M	inspection, maintenance, and monitoring
ISM	incremental sampling methodology
LEL	lower explosive limit
MCL	Maximum Contaminant Level
MFS	Minimum Functional Standards
mg/kg	milligrams per kilogram
ug/L	micrograms per liter
ug/m^3	micrograms per cubic meter
MTBE	methyl tert-butyl ether
MTCA	Model Toxics Control Act
NAVD88	North American Vertical Datum of 1988
NPV	net present value
OSHA	Occupational Safety and Health Administration
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
pg/g	picograms per gram
PID	photoionization detector
ppb	parts per billion
PQL	practical quantitation limits
Qa	Quaternary alluvial deposits
Qc	Quaternary undifferentiated sedimentary deposits
Qgo	Quaternary proglacial or recessional outwash
Qgt	Quaternary glacial till
RAO	remedial action objectives
RCW	Revised Code of Washington
RI	Remedial Investigation
RI Work Plan	Remedial Investigation Work Plan
SEPA	State Environmental Policy Act
SHA	Site Hazard Assessment
SL	Screening Levels

SVOCs	semivolatile organic compounds
TEQ	toxic equivalent concentration
TPH	total petroleum hydrocarbons
USCS	Unified Soil Classification System
VOC	volatile organic compound
WAC	Washington Administrative Code
WISHA	Washington Industrial Safety and Health Act
WSDOT	Washington State Department of Transportation
WWTP	wastewater treatment plant

Executive Summary

This report presents the results of the remedial investigation (RI) and feasibly study (FS) for the Shelton C Street Landfill, a former municipal solid waste landfill, located in Shelton, Washington (herein referred to as the Site; Figure 1). The Site is located on a 16.7-acre parcel owned by the City of Shelton (the Property; Figure 1). The Property is at the west end of West C Street, just west of the overpass across U.S. Highway 101 in Mason County, Washington.

Reporting Under Agreed Order

The RI/FS Report has been prepared for submittal to the Washington State Department of Ecology (Ecology) to meet the requirements of the Model Toxics Control Act Cleanup Regulation (MTCA) and regulations implementing it, Chapter 173-340 of the Washington Administrative Code (WAC 173-430). The RI/FS Report has been prepared in general accordance with the Remedial Investigation Checklist Guidance (Ecology, 2016a) and the Feasibility Study Checklist Guidance (Ecology, 2016b) and the requirements of the Agreed Order No. DE 12929 (Agreed Order) between the City of Shelton (City) and Ecology.

Site History and Remedial Investigation

The Shelton C Street Landfill is an unlined landfill that received municipal solid waste between approximately 1928 and the mid-1980s, consisting of residential solid waste and by-products, research waste, and demolition debris from nearby pulp mills, and sludge from the City's wastewater treatment plant (WWTP). Placement of these materials and spills or releases from associated activities are considered the potential sources of contaminants of potential concern (COPCs) to soil, groundwater, and soil vapor at the Site.

The Site characterization work completed during the RI consisted of a geophysical survey in May 2017, collection and laboratory analysis of surface soil in an area where the WWTP sludge was reportedly disposed of (referred to as the Surface Characterization), installation and sampling of four groundwater monitoring wells beginning in December 2017, performance of a soil gas survey in December 2018, and test pit excavations and sampling to characterize landfill cover soils in February 2020.

The COPCs identified as exceeding the Site Screening Levels (SLs) during the RI site characterization work and posing a potential risk to current or future receptors consist of the following:

- Carcinogenic polycyclic aromatic hydrocarbons (cPAHs), dioxins/furans, and metals (barium, copper, lead, mercury, selenium, silver, and zinc) in surface soil
- Total and dissolved arsenic, iron, and manganese in groundwater
- Acrolein and benzene in soil vapor

Feasibility Study for Potential Cleanup Alternatives

The FS included evaluation of four remedial alternatives developed with consideration of the COPCs listed above and the potential risk to current or future receptors, and met all MTCA criteria. The alternatives consisted of:

- **Alternative 1** – Install a permeable soil cap, implement institutional controls, and conduct long-term monitoring
- **Alternative 2** – Install an impermeable cover system with geomembrane layer and stormwater controls, implement institutional controls, and conduct long-term monitoring
- **Alternative 3** – Remove WWTP sludge, install a permeable soil cap, implement institutional controls, and conduct long—term monitoring
- **Alternative 4** – Conduct full removal of landfill waste

FS alternatives were evaluated against criteria defined by MTCA, including comparative assessment of the environmental benefits and costs of each alternative to determine the alternative that uses permanent solutions to the maximum extent practicable. Based on the results of the FS evaluation, the recommended alternative, Alternative 1, has a reasonable restoration time frame, is the most cost-effective of the four remedial alternatives evaluated, and is identified as the alternative that is permanent to the maximum extent practicable. Alternative 1 includes installation of a permeable soil cap to prevent direct contact with landfill waste and contaminated soil by human and terrestrial receptors. Implementation of institutional controls would prevent future, unrestricted development or any other activities that could create exposure pathways for direct contact with the contaminated soil or landfill waste. An inspection, monitoring, and maintenance (IM&M) program to document and maintain the functional stability of the remedy is included.

1 Introduction

This report presents the results of the remedial investigation (RI) and feasibly study (FS) for the Shelton C Street Landfill, a former municipal solid waste landfill, located in Shelton, Washington (herein referred to as the Site; Figure 1). The Site is located on a 16.7-acre parcel owned by the City of Shelton (the Property; Figure 1). The Property is at the west end of West C Street, just west of the overpass across U.S. Highway 101 in Mason County, Washington. The City of Shelton (City) acquired the Property in 1928 and used a portion of it as a municipal solid waste landfill through the early 1980s for disposal of solid waste generated within the City limits and the surrounding areas.

The RI/FS Report has been prepared to meet the requirements of Agreed Order No. DE 12929 (Agreed Order) between the Washington State Department of Ecology (Ecology) and the City, executed on September 30, 2016. The scope of work for the RI/FS was outlined in the "Remedial Investigation Work Plan, Shelton C Street Landfill" (RI Work Plan; Aspect, 2017) and the "Memorandum regarding Shelton C Street Landfill – Remedial Investigation Work Plan Addendum and Feasibility Study Approach" (Addendum; Aspect, 2018). The draft RI/FS Report was submitted to Ecology in August 2019. Ecology reviewed the draft RI/FS Report and provided comments in a letter dated December 20, 2019 (Ecology, 2019). The final RI/FS Report incorporates Ecology's comments.

The purpose of this RI/FS is to collect and evaluate sufficient information to develop and evaluate cleanup action alternatives to enable selection of a cleanup action for the Site in accordance with Washington Administrative Code (WAC) 173-340-360 through -390. The RI/FS has been completed to meet the requirements of the Model Toxics Control Act (MTCA) Cleanup Regulation and regulations implementing it, Chapter 173-340 WAC.

1.1 Report Organization

This RI/FS report has been organized in accordance with Ecology's RI and FS Checklist Guidance documents (Publications No. 16-09-006 and 16-09-007, respectively) dated May 2016 and includes the following:

- Section 2 provides a definition of the Site and property and presents a summary of the background information, including the environmental setting, historical use of the property/vicinity, and regulatory involvement.
- Section 3 provides the scope of work and results of the RI, including a summary of the historical environmental studies/actions and screening/cleanup levels used to evaluate the soil, groundwater, and soil vapor/landfill gas data collected for the RI to facilitate Site characterization.
- Section 4 presents the Conceptual Site Model (CSM) for the Site, including the sources and nature and extent of concentrations of hazardous substances in soil and groundwater at the Site, and a preliminary assessment of potential receptors and exposure pathways.

- Section 5 presents the proposed cleanup standards for future cleanup at the Site, including cleanup levels and points of compliance for soil and groundwater.
- Section 6 presents the FS, including a summary of cleanup standards, remedial action objectives (RAOs), and applicable laws and regulations; the results of the screening and detailed evaluation of feasible remedial alternatives; and a description of the recommended remedial alternative.

2 Site Description and Background

This section describes the project location and a summary of ownership and operational history, including the documented waste disposal practices and regulatory actions. A significant amount of historical research pertaining to the Shelton C Street Landfill has been completed by others (Aspect, 2017). This section presents a summary of that information.

2.1 Project Location and Description

The Property is currently vacant, undeveloped land, covered by shrub vegetation and trees (Figure 2). The Property is located outside of the city limits, but within the Shelton Urban Growth Area and is zoned Public Institutional, for which permitted uses include government buildings, cultural facilities, churches, public utilities, and parks or open space (Figure 3). A 250-foot-wide strip of land along the eastern edge of the Property is a utility right-of-way that includes transmission towers, overhead electrical transmission lines, and a buried natural gas pipeline (Figure 2). The surface topography indicates a bowl-like depression near the center of the Property that reflects the limits of historical aggregate mining and subsequent landfilling. Portions of a paved access road that was formerly used to access the base of the bowl-like depression remain in place. Public access to the Property is restricted by a locking gate approximately 1,500 feet east of the Property on West C Street and signage indicating restricted access.

The Property is bound to the west and south by active gravel mining operations of the Miles Sand & Gravel Shelton Plant and Pit; to the east by Washington State Department of Transportation (WSDOT) right-of-way and U.S. Highway 101, beyond which is more active mining land owned by Miles Sand & Gravel; and to the north by vacant forest land (Figure 2). The land surrounding the Property is mostly zoned Industrial except to the north where it is zoned Rural Residential (Figure 3).

2.2 Site History

This section describes the Site history through property ownership, landfilling history, and regulatory history. To offer some historical context, Figure 4 provides a series of historical aerial photos that depict the landfill activities between 1965 and 1989. Earlier aerial photographs were not located.

2.2.1 Property Ownership

Before 1928, the Property was privately owned and mined for sand and gravel aggregate. The Property was purchased by the City in May 1928, including both the parcel and a perpetual easement for access. Landfilling activities started the same year the City acquired the property. In July 1931, the City sold the property to Rainier Pulp and Paper Company, but retained the right to continue to use the land as a garbage dump. Rayonier, Incorporated, successor of Rainier Pulp and Paper Company, sold the property back to the City in July 1949, except for a 250-foot-wide strip for which Rayonier granted an easement to Bonneville Power Administration (BPA) in August 1949. An additional transmission line easement, consisting of 62.5 feet on the west side of the BPA easement, was conveyed from the City to the federal government in 1956. In 1972, the City transferred 1.44 acres of property, located on the east side of the BPA easement, to the State of Washington for highway improvements and public rights-of-way.

2.2.2 Landfilling History

The landfill received municipal solid waste between approximately 1928 and the mid-1980s. Early on, waste consolidation practices included open burning and on-property incineration, common for the era. Documented waste streams disposed at the landfill and waste management practices included:

- Between 1931 and 1934, the landfill received by-products from the Rainier Pulp and Paper Company pulp mill in Shelton.
- Between 1931 and 1974, the landfill reportedly received waste from the Rayonier research laboratory, demolition debris from decommissioning of the Rayonier pulp mill, and sludge from a Port of Shelton Imhoff tank (a chamber used for reception and processing of sewage).
- From the mid-1950s to the mid-1960s, an incinerator constructed on the landfill property reportedly burned garbage.
- Between 1951 and 1981, the landfill was reportedly used for disposal of the City's wastewater treatment-plant sludge.
- Between 1976 and 1981, processed sludge from the City's wastewater treatment plant containing fly-ash material was disposed of in the landfill. The light, fly-ash baghouse residue (consisting of one-third unburned or charred wood residue and two-thirds salt) was generated by a wood-burning, boiler power plant at the Simpson Timber Company Shelton timber mill. One report documents that approximately 4.5 million gallons of sludge with a solids content of 30 to 40 percent by weight was disposed of in the landfill between July 1979 and November 1981 (CH2M Hill, 1986).

Additional details pertaining to historical ownership and regulatory activities are summarized below.

2.2.3 Regulatory History

In September 1973, the U.S. Environmental Protection Agency (EPA) notified Ecology of an August 1973 inspection of the 'Shelton dump site' in which they found it to be in violation of "Regulation I, Section 9.01 of the Olympic Air Pollution Control Authority," and requested any information that EPA should consider prior to issuance of a notice of violation to the "Shelton City Dump" (EPA, 1973). A response letter dated October 15, 1973, from Ecology indicated that an implementation schedule was in place, and approved by the Olympic Air Pollution Control Authority, to work towards cessation of open burning at the Shelton dump (Ecology, 1973). The letter further indicated that open burning at the Shelton dump would stop on January 31, 1974, and that a new central sanitary landfill site would begin operation in August 1974. An EPA Land Disposal Site Modification report, dated May 1975, indicates that the Shelton Dump site has been 'eliminated' with 'rats eradicated, burning stopped, water pollution corrected, and site covered' (EPA, 1975).

In May 1986, EPA and Simpson Timber Company announced that dioxin compounds were detected in baghouse ash from a wood-fueled boiler at the Simpson mill power plant during a national EPA study to evaluate dioxin contamination in the environment (EPA, 1986a). A study to determine whether this contamination was present at the Shelton C Street Landfill is detailed below in Section 3.1.

A July 2, 1986, Ecology inspection of the Shelton Dump, C Street indicated that the landfill was still being used for disposal and identified recent dumping of vegetative debris, small quantities of trash and household debris, and disposal of sewage treatment-plant sludge (Ecology, 1986).

EPA issued an Administrative Order on Consent (AOC) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to the Simpson Timber Company, effective September 26, 1986, to investigate potential releases of dioxins and furans to the environment associated with wastewater treatment-plant sludge disposal at three Shelton-area landfills (CH2M Hill, 1986), and to "determine the nature and extent of any threat to the public health or welfare or the environment that may be caused by the release or threatened release of hazardous substances, specifically dioxins and furans…" (EPA, 1986b). One of the specific objectives of the study was to determine the dioxin and furan content of sludge at the Shelton C Street Landfill. A discussion of the activities completed under the AOC is provided in Section 3.1.

On January 4, 1988, the "Correction and Closure Plan: Shelton Landfill Disposal Facility," prepared by Brown and Caldwell, provided recommendations to implement corrective actions and landfill closure (Brown and Caldwell, 1988). Specifically, the plan called for placement of 2 feet of soil cover over sludge soils, request for a variance to allow for Site closure without a groundwater monitoring system, and recommended new and larger signs as additional access control measures. There is no information that indicates whether these recommendations were implemented.

In a June 8, 2004, letter, Ecology notified the City of a pending Site Hazard Assessment (SHA; Ecology, 2004). SHAs are conducted as a preliminary assessment of a site to assign a hazard ranking. Hazard ranking scores range from 1 to 5, where a 1 represents the highest level of risk and a 5 the lowest. These scores are used to help Ecology prioritize cleanup sites to work on. On June 5, 2014, Ecology published the SHA indicating an overall rank of 3, which appears to be based primarily on potential risk to human health through migration of contaminants via groundwater from the landfill to drinking water sources, even though releases to groundwater have not been documented.

2.3 Geology and Hydrogeology

The Site is in a region referred to as the Puget Lowland, characterized by heterogeneous, glacially deposited sediments within a large topographic basin. Geologic maps identify the surface unit at the Site as Quaternary proglacial or recessional outwash (Qgo) deposited during the Vashon Stade of the Fraser Glaciation (Logan, 2003). These materials were encountered during drilling for installation of the Site groundwater monitoring wells and consist of alternating layers of poorly consolidated silty gravels, gravelly sands, and silty sands. Uphill and north of the Site, the surface unit is highly compacted Quaternary glacial till (Qgt), which stratigraphically underlies the Qgo, and was encountered in the boring for installation of monitoring well AMW-3 at approximately 110 feet below ground surface (bgs), at an elevation of approximately 60 feet relative to the North American Vertical datum of 1988 (NAVD88). Southwest of the Site, there are younger alluvial and undifferentiated sedimentary deposits (Qa and Qc, respectively) in the valley containing Goldsborough Creek.

Regionally, the “Final WRIA 14/ Kennedy-Goldsborough Watershed Phase II Hydrogeologic Investigation” indicates that the area contains six main geologic units; three that act as regional groundwater aquifers, and three that act as aquitards (Final WRIA 14; Northwest Land and Water, 2005). Hydrogeologic cross sections created for the Final WRIA 14 report pass near the Property and show Unit A overlying a confining layer of till (Unit B) atop an intermediate aquifer (Unit D), a deep aquitard of fine or silty sand (Unit E), and the deepest, highly permeable aquifer (Unit F) overlying bedrock as deep as 600 feet bgs (Northwest Land and Water, 2005). Static groundwater was observed in on-Site groundwater monitoring wells installed for the RI situated within the recessional outwash at elevations ranging from 64 to 73 feet NAVD88, which correspond to depths ranging from 83 to 108 feet bgs. Based on groundwater level measurements obtained in January 2018, December 2018, April 2019, and July 2019, groundwater levels fluctuated up to 8.5 feet, and the inferred groundwater flow direction toward the south-southeast.

2.4 Future Site Use

Future land use for the Property is uncertain, and the FS assumes development consistent with current zoning and easements. The Property is located outside of the city limits, but within the Shelton Urban Growth Area and is zoned Public Institutional, for which permitted uses include government buildings, cultural facilities, churches, public utilities, and parks or open space.

Land use at neighboring parcels is currently limited to mining activities at the Miles Sand & Gravel pit to the south and west. A large development project is being planned on vacant forest land located directly to the north and northwest of the Property. This project is anticipated to convert 604 acres of currently vacant, vegetated area into a mixed-use commercial, residential, and recreational development.

2.5 Groundwater Use

The shallow aquifers, Units A and D, are the most common groundwater sources of drinking and industrial water supply in the region. These aquifers are high yielding and can deliver water at up to 1,500 gallons per minute (Golder, 2002). Of the private wells in the area, most are sourced out of the shallower Unit A aquifer (Northwest Land and Water, 2005). The City municipal water is sourced from the Shelton Springs and from the Unit F aquifer through two deep wells that are located approximately 1.5 miles northeast of the Site (Northwest Land and Water, 2005). The estimated total groundwater usage for the subbasin that contains Goldsborough Creek and the Site is 22,514 acre-feet per year (AF/yr), of which 18,436 AF/yr is for commercial and industrial uses (Golder, 2002).

A query was made on the Ecology well log database to identify water supply wells that lie within 0.25 miles of the Site. There are four wells on record that lie to the east or southeast of the Site, downgradient from the Site. The nearest to the property is a well owned by Rayonier, likely for industrial usage. It was completed in 1942, reaches 742 feet bgs into the Unit F aquifer, and exhibits flowing or artesian conditions (GeoEngineers, 2013). To the southeast, the second well is owned by Exceptional Foresters for domestic usage. It was drilled in 1984 to a depth of 190 feet bgs, and had a static water level 70 feet bgs at the time of drilling. The third well is owned by Leroy Saboe, presumably for domestic use. It was drilled in 1983 to a depth of 208 feet bgs, and had a static water level at 14 feet bgs. The last well is an industrial supply well owned by Scott Hilburn. It was drilled to 230 feet bgs, and had a static water level at 15 feet bgs at the time of drilling.

3 Field Investigations

This section presents a brief summary of the previous environmental investigation work, details of RI investigation work by Aspect Consulting, LLC (Aspect), and results of the RI investigations.

3.1 Previous Environmental Investigations

Prior to the RI, the only known investigation of the Site was conducted in 1986 following a national EPA study of dioxin/furan-contaminated sites. This study identified the baghouse ash from the Simpson Timber Company’s wood-burning boiler as a source of dioxin.

A 1986 Dioxin Sampling Plan (CH2M Hill, 1986), prepared to meet the requirements of the AOC, indicates that baghouse residue mixed with municipal sludge was discharged into a 100- by 150-foot area of the Shelton C Street Landfill. The Final Dioxin Study Report (CH2M Hill, 1987) documents sampling results, including those collected to “determine the chlorinated dioxin and furan content of the residual sludge at the City of Shelton landfill (the only landfill with uncovered deposits of potentially contaminated sludge).”

Ten surface soil samples, collected from the sludge-disposal area at the landfill, were collected between the ground surface and 4 inches bgs, and composited for laboratory analysis of dioxins and furans. The specific sampling locations within the landfill are not documented. In addition, soil samples from outside of the sludge-disposal area were collected from two vertical intervals (0 to 3 inches bgs and 3 to 6 inches bgs) for analysis of particle-size distribution and organic carbon content.

The results of the investigation are presented in the Final Dioxin Study Report (CH2M Hill, 1987). Based on the particle-size distribution, soils at the Site were classified as gravelly sandy loams to very gravelly sands and contained about 25 percent gravel by volume. The total organic carbon content ranged from 12 to 40 percent, but averaged 35 percent for the gravelly sandy loam that was most prevalent in the samples (CH2M Hill, 1987). The laboratory chemical results detected the principal congener of concern, 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD) at 0.17 parts per billion (ppb) with a total 2,3,7,8-TCDD toxic equivalent concentration (TEQ)[1] of 3.1 ppb (CH2M Hill, 1987).

The EPA Report of Dioxin Study Findings and Announcement of Public Meeting, dated April 13, 1987, discussed these results. The conclusions made by EPA, based on the investigation results, included the following:

- The vertical migration of 2,3,7,8-TCDD was likely limited to 6 inches based on the adsorption capacity of the landfill soils and the expected increased binding capacity over time as organic material decomposes.
- Leaching of 2,3,7,8-TCDD into groundwater was extremely unlikely given the immobility of dioxins/furans and the presence of organic carbon in landfill soils that further decrease potential leaching.

EPA further concluded that there did not appear to be any exposure to dioxins/furans, given the Site conditions, but that potential exposure because of dioxin/furan-containing sludge at the ground surface could not be quantified (EPA, 1987). Dioxin/furan-containing sludge was evaluated during the RI field program by Aspect, as described in Section 3.2.4.2.

3.2 Site Characterization

3.2.1 Contaminants of Potential Concern

Except for some old and limited data for dioxins/furans, as discussed above, prior to the RI, there had been no investigation into the presence of COPCs at the Site. Because of this, a broad list of COPCs was developed for evaluation during the RI. The COPCs were identified in the Final Chemicals of Potential Concern and Screening Levels Technical Memorandum (Aspect, 2016). The list of COPCs comprises three categories:

- Chemicals commonly associated with municipal landfills and/or included in landfill compliance monitoring and closure requirements.
- Chemicals documented to be present.

[1] To evaluate cleanup level compliance for mixtures of dioxins and/or furans, the TEQ is calculated by multiplying each dioxin and furan congener by its corresponding toxicity equivalency factor and then adding the toxic equivalent concentrations of all the congeners to obtain a total toxic equivalent concentration of 2,3,7,8-TCDD (WAC 173-340-708[8][d]).

- Chemicals potentially present based on the reported and/or suspected disposal of waste from demolition and operation of local pulp, paper, and timber mills.

A description of each of these categories, and the specific chemicals associated with them, is provided in the following sections.

3.2.1.1 Landfill Chemicals of Potential Concern

Most waste, by volume, in the Shelton C Street Landfill is assumed to be municipal solid waste, defined by WAC 173-350 as waste consisting of unsegregated garbage, refuse, and similar solid waste materials discarded from residential, commercial, institutional, and industrial sources and community activities. The primary COPCs were those that are either typically associated with municipal solid waste landfills and/or required to demonstrate compliance with state laws and regulations regarding groundwater quality near the landfill. The preliminary COPC groups include the following:

- Metals, including priority pollutant metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, and silver) and geochemical indicator trace metals (calcium, iron, magnesium, manganese, sodium, and zinc)
- Total petroleum hydrocarbons (TPH)
- Volatile organic compounds (VOCs)
- Semivolatile organic compounds (SVOCs), including polycyclic aromatic hydrocarbons (PAHs)
- Pesticides and herbicides
- Other geochemical indicator parameters, including alkalinity, ammonia, chloride, cyanide, nitrate, nitrite, and sulfate

3.2.1.2 Chemicals Documented to be Present

Based on the Site background information compiled and reviewed in scoping for the RI, as summarized above, there was little existing chemical data for the Shelton C Street Landfill before the RI was conducted. The results of limited investigation activities performed in the 1980s identified the presence of dioxins and furans in sludge/surface soil at the Shelton C Street Landfill. Based on this, dioxins and furans were identified as preliminary COPCs for the RI.

3.2.1.3 Chemicals Associated with Mill Waste Disposal and Others

Early in its operation (1931–1934), the landfill reportedly received by-products from the Rayonier (formerly Rainier Pulp and Paper) pulp mill. In addition, as described in detail in the sections above, dioxins and furans are documented to be present in wastewater treatment-plant sludge that contained baghouse ash from the Simpson Timber Company timber mill and placed in the landfill. The Correction and Closure Plan (Brown and Caldwell, 1988) indicated periodic disposal of waste under special permit, including dredge spoils from Oakland Bay, old dock timbers from rework of one of the mill facilities, demolition debris from decommissioning of the Rayonier pulp mill, and residues from cleanup of a hardware store fire. In addition to those chemicals already presented above, the COPCs associated with these miscellaneous waste disposal activities include:

- Polychlorinated biphenyls (PCBs)
- Total sulfide

3.2.2 Potential Exposure Pathways

The Site Screening Levels (SLs) for the RI were developed based on the identification of current and potential future exposure pathways and receptors. Potential future exposure pathways and receptors consider reasonably anticipated future Site use(s). In contrast to the Public Institutional zoning of the Shelton C Street Landfill property, the surrounding properties are primarily zoned Industrial, where current and future surrounding land use is primarily aggregate mining. Public access to the landfill property, and the surrounding aggregate mining properties, is restricted for safety reasons. However, illegal public access of the landfill property for recreational use is evident by the presence of off-road vehicle trails. With this setting and current and potential future Site uses, the following exposure pathways and receptors are applicable:

- Soil/landfill waste leaching to groundwater – Contaminants in soil and landfill waste can leach to groundwater by infiltration of precipitation through contaminated soil and landfill waste or where groundwater is in contact with contaminated soil or landfill waste.
- Ingestion of groundwater – Human receptors have the potential to contact contaminants in groundwater via ingestion. The presence, nature and extent of COPCs in groundwater will be evaluated during the RI to determine whether ingestion of groundwater is a complete pathway.
- Direct contact with soil and landfill waste – Human and terrestrial receptors have the potential to contact contaminants in surface and shallow subsurface soil under current exposure scenarios.
- Soil vapor/landfill gas discharge to ambient air – Soil vapor/landfill gas has the potential to migrate and expose ambient air receptors to volatile contaminants.

Groundwater discharge to surface water in Goldsborough Creek is a potential migration pathway. However, the nearest expression of surface water in Goldsborough Creek to the southeast, which is the presumed downgradient location from the landfill, is approximately 0.4 miles.

3.2.3 Site Screening Levels

This section presents the Site SLs, values that are used to evaluate data collected during the RI to assess the nature and extent of contamination at the Site. The Site SLs were developed based on the current and potential future exposure pathways and receptors, as presented in the previous section, and applicable regulatory criteria. The Site SLs are not cleanup levels, they are intentionally conservative, representing the most stringent of the relevant and appropriate criteria for all potential exposure pathways. The proposed Site-specific cleanup levels are discussed in Section 5.

3.2.3.1 Soil

Landfill waste is heterogeneous and, for purposes of cleanup, assumed to be impacted with regulated hazardous substances. Under MTCA, it is not necessary to investigate the presence, nature, or extent of COPCs in the landfill waste. Ecology recognizes the need to use engineering controls, such as containment, for sites that contain large volumes of materials containing relatively low levels of hazardous substances (WAC 173-340-370[3]), where treatment or removal is impracticable. MTCA allows for containment to be the preferred remedy for historical landfill sites and uses the Minimum Functional Standards (MFS) established in WAC 173-304 as a relevant and appropriate requirement (WAC 173-340-710[7][c]).[2] Therefore, the soil criteria, including the Site SLs and final cleanup levels, apply to soil within the MTCA Site, but outside of the waste footprint of the landfill.

The Site SLs for soil include consideration of the following:

- MTCA Method B cleanup levels from the Ecology Cleanup Levels and Risk Calculation (CLARC) database.
- Ecological Indicator Soil Concentrations for Protection of Terrestrial Plants and Animals.
- Natural Background Soil Metals Concentrations in Washington State (Ecology, 1994).
- Natural Background for Dioxins/Furans in Washington soils (Ecology, 2010).

The Site SLs are the lowest published values of the MTCA Method B cleanup level and the Ecological Indicator Soil Concentration, adjusted upward, if appropriate, when compared to background concentrations and laboratory practical quantitation limits (PQLs), in accordance with MTCA (WAC 173-340-709 and -705[6]). There are no MTCA Method B cleanup levels for TPH, so the MTCA Method A cleanup levels are used. The Site SLs for soil are included in Table 2.

3.2.3.2 Groundwater

The Site SLs for groundwater are based on the protection of drinking water and include the following:

- MTCA Method B groundwater cleanup levels from the Ecology CLARC database.
- Federal and State Maximum Contaminant Levels (MCLs).

The Site SLs are the lowest published values of these criteria, adjusted upward, if appropriate, so that Site SLs are not lower than the laboratory PQLs. There are not MTCA Method B cleanup levels or MCLs for TPH in groundwater, so the MTCA Method A values are used. The Site SLs for groundwater are included in Table 3.

3.2.3.3 Soil Vapor/Landfill Gas

Landfill gas is produced during decomposition of solid waste and typically contains methane and other organic and inorganic gases. MTCA does not provide cleanup levels for methane or landfill gas, but does establish Standard Method B air cleanup levels that do not exceed 10 percent of the lower explosive limit (LEL) of any hazardous substance

[2] When Ecology determines that the closure requirements in WAC 173-304 or WAC 173-351 are legally applicable or relevant and appropriate requirements, the more stringent closure requirements under those laws shall also apply to cleanup actions.

or mix of hazardous substances (WAC 173-340-750[3][b][iii]). The MFS (WAC 173-304) provide air quality and toxic air emissions requirements that may apply to landfill gas at the property, as follows:

- The concentrations of explosive gases cannot exceed 25 percent of the LEL in Site structures.
- The concentration of explosive gases cannot exceed the LEL in the subsurface at or beyond the property boundary.
- The concentration of explosive gases cannot exceed 100 parts per million by volume of hydrocarbons (expressed as methane) in off-Site structures.

The LEL for methane is 5 percent by volume.

The presence of hazardous substances in landfill waste may provide a source of contaminants to soil vapor. Individual contaminant concentrations in soil vapor were compared to MTCA Method B soil gas screening levels. TPH in soil vapor, including air-phase hydrocarbons (APH) and petroleum-associated VOCs, were compared to the generic MTCA Method B TPH screening level for deep soil gas in accordance with Ecology's Implementation Memorandum No. 18 (Ecology, 2018). The Site SLs for volatile COPCs in soil vapor are included in Table 4.

3.2.4 Remedial Investigation Field Program

The scope of work for the RI was developed to address data gaps regarding the nature and extent of contamination to enable selection of cleanup standards, and identification and evaluation of cleanup alternatives. The data gaps identified during preparation of the RI Work Plan (Aspect, 2017) are as follows:

- The hydrogeologic conditions at the Site, including the presence, thickness, and characteristics of aquifers and aquitards, and groundwater flow direction and gradients.
- The lateral and vertical extent of landfill waste.
- The presence, nature, and extent of COPCs in surface and shallow subsurface soil.
- The relationship between groundwater and the landfill waste, and the potential for contaminants to be leaching from landfill waste to groundwater.
- The presence, nature, and extent of COPCs in groundwater.
- The presence, nature, and extent of landfill gas and COPCs in soil gas.

The RI field program components addressing these data gaps consisted of four initial phases of work, including the Geophysical Investigation, Surface Characterization, Groundwater Evaluation, and Landfill Gas Investigation, which were completed in accordance with the RI Work Plan and Addendum (Aspect, 2017 and 2018). The RI Work Plan and Addendum were both approved by Ecology prior to the RI field activities.

Following Ecology's review of the draft RI/FS Report, an additional scope of work was developed to characterize landfill cover soil. Observations of surface conditions during the RI field work indicate that imported cover soils were historically placed over the landfill waste. However, the origin and quality of this soil is unknown. Ecology requested that the landfill cover soil be characterized as part of the RI. Ecology reviewed and approved the scope of work for the landfill soil cover characterization on January 21, 2020.

Each investigation phase is described below in Sections 3.2.2.1 through 3.2.2.4, respectively. The results of the investigations are presented in Section 3.2.3.

3.2.4.1 Geophysical Investigation

A geophysical investigation consisting of an electromagnetic induction (EM) survey, magnetic survey, and electrical resistivity (ER) survey was completed to provide preliminary information regarding the lateral extent and thickness of landfill waste at the Site. The geophysical surveys, including the field data collection occurring on May 17 and 18, 2017, and interpretation, were completed by hydroGEOPHYSICs, Inc., based out of Portland, Oregon.

Electromagnetic induction data was acquired along parallel survey lines over the survey area. Magnetic data was collected using a cesium-vapor magnetometer along parallel survey lines across the survey area. The ER survey was performed using a Supersting^{TM} R8 multichannel electrical resistivity system and 18-inch long electrodes, installed 8 to 10 inches into the ground on 2-foot spacing along multiple transects across the Site.

Information from the survey was used to guide the subsequent phases of the RI field program. The geophysical survey area and the interpreted lateral boundary of landfill waste are shown on Figure 5. The data package and report prepared by hydroGEOPHYSICS, Inc., is included as Appendix A.

3.2.4.2 Surface Characterization

The surface characterization was conducted on July 25 and 26, 2017, to characterize the presence, nature and extent of COPCs in surface and shallow subsurface soil in the vicinity of the reported disposal of sewage treatment-plant sludge containing baghouse residue. The surface characterization utilized incremental sampling methodology (ISM) to determine average concentrations of COPCs within three Decision Units (DUs). Two separate sample types were obtained for characterization of the DUs: 1) a single, standard ISM sample from each DU, comprised of 30 soil sample increments collected from the top 6 inches of soil, was submitted for laboratory processing, subsampling, and analysis of diesel- and oil-range TPH, metals, SVOCs, PCBs, chlorinated pesticides and herbicides, and dioxins/furans; and 2) discrete samples obtained at a frequency of one sample for each 10,000 square feet of DU was submitted for laboratory analysis of volatile TPH and VOCs. Soil samples were submitted to Friedman and Bruya, Inc., in Seattle, Washington, for analysis. Analysis of dioxin/furans was further subcontracted to Frontier Analytical Laboratories in Eldorado Hills, California.

The extents of the DUs, locations of soil sample increments, and locations of discrete soil samples are shown on Figure 5. The RI Work Plan includes a detailed description of the specific sampling, processing, and analytical procedures for the surface characterization. Results of the surface characterization are presented in Section 3.2.5.1.

3.2.4.3 Groundwater Evaluation

The groundwater evaluation consisted of installation of four groundwater monitoring wells (AMW-1 to AMW-4; Figure 5) and three quarters of groundwater sampling to evaluate hydrogeologic conditions and groundwater quality. Well locations were selected based on the results of the geophysical investigation. Wells AMW-1 and AMW-2 are installed to the east and southeast, near the lateral boundary of the landfill waste and provide groundwater quality data cross- to downgradient of the waste. AMW-4 was installed as far south as possible, constrained by the property boundary, and is situated within the extent of the landfill waste. Well AMW-3 is installed west of the landfill waste to evaluate groundwater quality upgradient of the landfill.

The drilling and well construction were conducted by Holocene Drilling, Inc., using a sonic rig between December 11 and 22, 2017. The soil types were observed and classified by an Aspect geologist in accordance with the Unified Soil Classification System (USCS). Field screening of the soil included measurement of volatile organic vapor sin soil using a photoionization detector (PID), conducting water-sheen testing, and observing soil for staining and odors. The borings were advanced to approximate maximum elevations of 57 to 60 feet NAVD88, correlating to depths of approximately 105 to 120 feet bgs. Monitoring wells were installed in each boring with 20 feet of screen constructed between elevations of 80 and 60 feet NAVD88 (+/-3 feet; Table 1) and completed with 8-inch-diameter steel aboveground monuments. All wells were developed following installation, and the top of each well casing, top of each well monument, and ground surface were surveyed by Professional Land Surveyors, Inc. (PLS) to the nearest 0.01 foot. Well construction details and measured groundwater elevations are shown in Table 1, and the well construction logs are included in Appendix B.

Groundwater samples were obtained from each well during four sampling events occurring in January 2018, December 2018, April 2019, and July 2019. Groundwater samples collected during the initial groundwater sampling event in January 2018 were submitted for analysis of the full list of preliminary COPCs, in accordance with the RI Work Plan (Aspect, 2017). Based on the results of the January 2018 groundwater sampling and the surface characterization, select COPC groups were eliminated from the laboratory analytical program for subsequent groundwater sampling events, after consultation with Ecology. The adjusted COPCs list for later groundwater monitoring and sampling events included diesel-range TPH, total and dissolved metals, PAHs, and dioxins/furans (in addition to geochemical parameters), as described in the Addendum (Aspect, 2018). VOCs were later added to the COPCs list for subsequent groundwater sampling events based on discussions with Ecology. All groundwater samples were submitted to Friedman & Bruya, Inc., in Seattle, Washington, for analysis. Analysis of dioxin/furans was further subcontracted to Frontier Analytical Laboratory based in El Dorado Hills, California.

Groundwater elevation contours based on water level data obtained during each of the four sampling events are shown respectively on Figures 8 through 11. Results of the groundwater sampling are discussed in Section 3.2.5.2.

3.2.4.4 Landfill Gas and Soil Gas Investigation

A landfill gas and soil gas investigation was conducted to evaluate the presence, nature, and extent of landfill gas and COPCs in soil gas surrounding the landfill waste. Five temporary soil gas probes (SG-1 to SG-5; Figure 5) were installed at locations where the geophysical investigation suggested landfill waste was present.

On December 19, 2018, Holocene Drilling, Inc., installed each temporary soil gas probe using steel rods driven to approximately 20 feet bgs by a direct-push rig and fitted with 0.25-inch FEP-lined polyethylene tubing. An Aspect field geologist conducted landfill gas monitoring for methane, carbon dioxide, and oxygen at each location prior to obtaining a soil gas sample for laboratory analysis. A soil gas sample was collected from each soil gas probe using a laboratory-supplied and certified, evacuated 1-liter SUMMA cannister fitted with a 150 milliliters-per-minute flow controller and dedicated sampling train. Samples were submitted for analysis of the full list of COPCs for soil gas in accordance with the RI Work Plan. All soil gas samples were submitted to Friedman & Bruya, Inc., in Seattle, Washington. Results of the soil gas sampling and landfill gas monitoring are discussed in Section 3.2.5.3.

3.2.4.5 Cover Soils Characterization

The cover soil characterization was conducted on February 14, 2020, to characterize the cover soil that is overlying the landfill waste in areas outside of the WWTP sludge disposal area. Four test pits (TP-01 to TP-04; Figure 5) were excavated in locations where cover soils are present at ground surface. Test pits were excavated until landfill waste was encountered (generally, 2 to 6 feet bgs) using a track mounted backhoe excavator owned and operated by the City. An Aspect field geologist observed the excavations and classified soil types in accordance with USCS and conducted field screening. Field screening of the soil included measurement of volatile organic vapors in soil using a photoionization detector (PID), conducting water-sheen testing, and observing soil for staining and odors.

One composite soil sample was obtained from each test pit, comprised of three increments of approximately equal volume: one increment collected from a sidewall at a depth of approximately 1 foot bgs, one increment collected from another sidewall at a depth of approximately 1 foot above the landfill waste, and third increment collected from a third sidewall at a depth located between the first two. Increments were combined in a stainless-steel bowl and transferred to laboratory provided sample jars. The soil samples were submitted to Friedman & Bruya, Inc. of Seattle, Washington for laboratory analysis as follows:

- All samples were analyzed for contaminants that are commonly encountered in imported fill, consisting of PAHs, metals, pesticides/herbicides, and diesel- and oil-range TPH.
- One sample, obtained from the test pit located farthest from the WWTP disposal area (test pit TP-03), was analyzed for dioxins/furans.
- One discrete sample, collected from test pit TP-03, was analyzed for gasoline-range TPH and BTEX.

The locations of the test pits are shown on Figure 5. The test pit logs are provided in Appendix B. Results of the sampling are described in Section 3.2.5.4.

3.2.5 Remedial Investigation Results

This section presents the results of the RI field program completed by Aspect between 2017 and 2020. The results are presented by RI phase and further relied upon to update the CSM in Section 4. The exploration locations are shown on Figure 5. The data is provided in Tables 2 through 4. Laboratory reports are included in Appendix C.

3.2.5.1 Surface Soil Characterization Results

A total of three composite soil samples, each comprised of 30 soil sample increments, and 6 discrete soil samples were collected and analyzed to meet the objective of the surface characterization. Soil across the three DUs consisted of cover soil, mainly gravelly, silty sand, or wastewater sludge, a fine-grained, dark grey silt-like material. The results of the surface characterization identified concentrations of cPAHs, dioxin/furans, and metals above the Site SLs in surface soil samples collected from all three DUs, as follows:

- Total cPAHs[3] were detected in the samples collected from all three DUs above the Site SL of 0.14 milligram per kilograms (mg/kg), at concentrations ranging from 0.34 mg/kg to 1.1 mg/kg (Table 2a).
- One chlorinated dibenzo-p-dioxin compound, 2,3,7,8-TCDD, was detected in the samples collected from all three DUs at concentrations ranging from 144 picograms per gram (pg/g) to 828 pg/g, all of which are above the Site SL of 2.0 pg/g (Table 2a). Furthermore, concentrations of total dioxins[2] (ranging from 1,760 pg/g to 12,200 pg/g) and total furans[2] (ranging from 280 pg/g to 2,520 pg/g) were detected in the samples collected from all three DUs above the Site SLs of 2.2 pg/g (Table 2a).
- Concentrations of metals, including barium, copper, lead, mercury, selenium, silver, and zinc, were detected at concentrations exceeding Site SLs in one or more of the DUs (Table 2a).

The remaining COPCs were either not detected above laboratory reporting limits, or were detected at concentrations below the Site SLs, as shown in Tables 2a through 2c.

3.2.5.2 Groundwater Evaluation Results

The data collected from monitoring wells on the Site in 2018 and 2019 indicates that water levels are highest on the northern and western sides of the Site and lowest on the southern side, indicating a general south-southeasterly groundwater flow direction (Figures 8 through 11). The laboratory results indicate that concentrations of COPCs in groundwater were either not detected or were detected below the Site SLs, with the

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[3] Total cPAHs and total dioxin/furans were calculated using the TEQ methodology and the toxicity equivalency factors (TEFs) prescribed in MTCA and WAC 173-340-708(8)(e).

exceptions of arsenic, iron, and manganese in select wells and monitoring events, as described below:

- Total and dissolved arsenic were detected at concentrations above the Site SL of 0.2 ug/L (micrograms per liter) in groundwater samples collected from wells AMW-2, AMW-3, and AMW-4, with concentrations ranging from 0.207 to 0.718 ug/L (Table 3a). These concentrations are below the natural background of 5 ug/L identified in MTCA (see Table 720-1).
- Total and dissolved iron were detected at concentrations above the Site SL of 300 ug/L in groundwater samples collected from all Site monitoring wells, with concentrations ranging from 317 to 5,630 ug/L (Table 3a). For context, the MTCA Method B formula value for iron is 11,200 ug/L.
- Total and dissolved manganese were detected at concentrations above the Site SL of 50 ug/L in groundwater samples collected from all Site monitoring wells, with concentrations ranging from 58.1 to 2,560 ug/L (Table 3a). For context, the MTCA Method B formula value for manganese is 2,240 ug/L.

Groundwater analytical data for the January 2018, December 2018, April 2019, and July 2019 monitoring events are shown on Tables 3a through 3c.

3.2.5.3 Soil Gas/Landfill Gas Results

Monitoring for landfill gas at the five soil gas sample locations showed methane up to 1.3 percent (SG-4), carbon dioxide up to 10.9 percent (SG-1), and oxygen between 7.6 percent (SG-4) and 20.2 percent (SG-2). Carbon sulfide was not identified, and laboratory analysis of soil gas samples did not show concentrations of methane above the laboratory reporting limit of 0.05 percent.

The results of soil gas samples submitted for laboratory analysis were compared against MTCA Method B Deep Soil Gas Screening Levels in accordance with the RI Work Plan (Aspect, 2017). TPH in soil gas were calculated and compared to the generic MTCA Method B total TPH screening level for deep soil gas. In accordance with Ecology's Implementation Memorandum No. 18 (Ecology, 2018), APH and petroleum-associated VOCs (benzene, toluene, ethylbenzene, and xylene [BTEX], 1,2-dibromoethane (EDB), 1,2-dichloroethane (EDC), methyl tert-butyl ether (MTBE) and naphthalene) were totaled, using one-half of the laboratory detection limit for nondetects of BTEX and naphthalene, and zero in place of the laboratory detection limit for nondetects of EDB, EDC, and MTBE. COPCs were generally not detected or were detected below the MTCA Method B Screening Levels, with the following exceptions:

- Acrolein was detected in the soil gas samples collected from probe SG-2 (4.5 micrograms per cubic meter [ug/m^3]) and SG-3 (9.8 ug/m^3) at concentrations above the MTCA Method B Screening Level of 0.914 ug/m^3. Although acrolein was not detected above laboratory reporting limits in soil gas samples collected from probes SG-1, SG-4, and SG-5, the reporting limits exceed the SL, and exceedances of acrolein at these locations cannot be ruled out.
- Benzene was detected in soil gas samples collected from probes SG-1 (62 ug/m^3), SG-4 (220 ug/m^3) and SG-5 (38 ug/m^3) at concentrations above the MTCA Method B Screening Level of 32.1 ug/m^3.

The soil gas data and the MTCA Method B Screening Levels are presented in Table 4.

3.2.5.4 Cover Soil Characterization Results

A total of four composite samples, one from each test pit, and one discrete sample obtained from test pit TP-03 were collected and analyzed to meet the objectives of the cover soil characterization. Cover soils excavated at the test pit locations consisted generally of gravelly, silty sand underlying approximately 6 inches of topsoil. Although some debris was observed in the cover soil, including fragments of brick, asphalt, and ceramics, the cover soil is distinguishable from the landfill waste by soil type and color and was visually determined in the field at the time of the investigation.

Material interpreted to be landfill waste was encountered at depths ranging from 2 to 6 feet bgs in the test pits, and generally consisted of black gravelly silty sand mixed with abundant debris including wood, glass, brick, concrete chunks, and domestic trash. The results of the cover soil characterization identified lead, mercury and dioxins/furans at concentrations above the Site SLs, as follows:

- Concentrations of total dioxins (20.1 pg/g) and total furans (5.37 pg/g) were detected in the soil sample collected from test pit TP-03 above the Site SLs of 2.2 pg/g.
- Lead was detected above the Site SL of 50 mg/kg in the samples collected from test pits TP-01 and TP-02 at concentrations of 153 mg/kg and 62.2 mg/kg, respectively.
- Mercury was detected above the Site SL of 0.1 mg/kg in the samples collected from test pits TP-01 and TP-03 at concentrations of 0.15 mg/kg and 0.14 mg/kg, respectively.

The remaining contaminants were either not detected above laboratory reporting limits, or were detected at concentrations below the Site SLs, as shown on Table 5.

4 Conceptual Site Model

This section presents the CSM, which was originally developed in the RI Work Plan and refined based on the results of the RI. The CSM is the basis for developing technically feasible cleanup alternatives and selecting a final cleanup action. The following sections discuss the components of the CSM, including the sources of the COPCs, the nature and extent of contamination identified, and a preliminary exposure assessment.

4.1 Contaminants and Sources

The Shelton C Street Landfill is an unlined landfill that received solid waste between approximately 1928 and the mid-1980s, consisting of municipal solid waste, wastes from nearby pulp and timber mills, and processed sludge from the City's WWTP that contained fly-ash baghouse residue from the Simpson Timber company Shelton timber mill. Because of its age, the landfill contents are heavily degraded. The COPCs detected at the Site at concentrations exceeding Site SLs are metals (consisting of arsenic, barium, copper, iron, lead, manganese, mercury, selenium, silver, and zinc), cPAHs, dioxins/furans, acrolein, and TPH. The source of COPCs at the Site is the landfill waste, with the following exceptions or clarifications:

- The processed wastewater sludge contains cPAHs, dioxins/furans, and metals at concentrations exceeding the Site SLs.
- Arsenic, iron, and manganese in groundwater are likely secondary contaminants associated with the reduced groundwater conditions typically associated with landfill waste.
- The landfill cover soil contains lead, mercury and dioxin/furans at concentrations exceeding the Site SLs. The source of the cover soils is unknown. Contaminants may have been present in cover soils prior to placement at the Site. Alternatively, the contaminants in cover soils may be a result of the intermixing of cover soils with WWTP sludge and/or landfill waste during past grading activities.

The extent of landfill waste is depicted on Figure 4. Due to its heterogeneous nature, specific contaminant sources within the waste have not been identified, except for the WWTP sludge. However, concentrations of acrolein and benzene reported in soil gas are assumed to originate from waste in the landfill.

4.2 Nature and Extent

4.2.1 Physical Conditions

Historically, the Property was mined for sand and gravel aggregate, resulting in a deep depression that was partially filled with solid waste, including WWTP sludge, and cover soils. The bowl-like depression remains today, with surface elevations within the bowl that are 50 to 80 feet lower than the ground surface surrounding the bowl (Figure 4).

Cover soils were observed across the landfill except in the northwest portion of the landfill, where WWTP sludge is exposed at the surface. The cover soils consist of gravelly, silty sand with minor amounts of municipal solid waste. The processed wastewater sludge is evident as a fine-grained, dark grey silt-like material. Based on the geophysical survey and observations during the cover soil characterization, the thickness of the cover soils is typically 6 to 10 feet, but range from as thin as 2 feet up to 15 feet. Disposal of approximately 4.5 million gallons of WWTP sludge (CH2M Hill, 1986) would result in an average of 4 to 5 feet of sludge in the sludge disposal area. During the surface characterization sampling, sampling locations were excavated to maximum depths of 6 inches, which did not identify the maximum vertical extent of the WWTP sludge in most sampling areas. The WWTP sludge was generally observed to pinch out to thicknesses less than 6 inches near the perimeter of the sludge disposal area shown on Figure 4. The municipal solid waste is approximately 20 to 25 feet thick. Assuming the maximum thicknesses of both cover soil, and landfill waste, the bottom of the waste is located at an approximate elevation of 108 feet NAVD88.

The subsurface conditions observed in explorations completed for the site characterization generally confirmed the geophysical survey findings and encountered cover soils, municipal solid waste, and/or glacial deposits. The glacial deposits consist of recessional outwash, which is comprised of poorly consolidated sand and gravel with varying amounts of silt, overlying glacial till. Approximately 7 feet of cover soils and municipal solid waste were observed in the boring for well AMW-2. Approximately 26 feet of fill was observed in the boring for well AMW-4 and consisted of approximately 9 feet of cover soils overlying approximately 17 feet of municipal solid waste. Glacial deposits were encountered beneath and beyond the extent of the landfill (Figures 6 and 7).

Groundwater is located within the recessional outwash at elevations ranging from 64 to 73 feet NAVD88, which correspond to depths of 83 to 108 feet bgs. This indicates that there is more than 35 feet of separation between the base of the landfill waste and the top of the water table. Based on January 2018, December 2018, April 2019, and July 2019 water level measurements, groundwater levels fluctuated up to 8.5 feet, and the inferred groundwater flow direction is south-southeast.

Subsurface characteristics are shown conceptually on the cross sections presented as Figures 6 and 7. Measured groundwater elevations and inferred groundwater flow directions for each sampling event are shown on Figures 8 through 11.

4.2.2 Soil Quality

Concentrations of dioxins/furans, cPAHs, and metals exceeding Site SLs are contained in wastewater sludge that is present as surface soil in the northwest portion of the landfill (Figure 2). Concentrations of dioxin/furans and cPAHs were generally highest at DU1, in the southwest portion of the sampling area, and lowest at DU3, in the northeast portion of the sampling area (Figure 2). Dioxin/furans and metals (mercury and lead) exceeding the Site SLs are contained in cover soils overlying landfill waste in areas outside of the WWTP sludge disposal area; generally, concentrations in cover soils are all lower than concentrations in the WWTP sludge area and are up to two to three orders of magnitude lower for dioxin/furans. The extents of DU1, DU2, and DU3 and the locations of test pits excavated to characterize cover soils (TP-01 to TP-04) are shown on Figure 5.

4.2.3 Groundwater Quality

Four groundwater sampling events have been completed at the Site to date. Concentrations of primary COPCs have not been detected in groundwater above the Site SLs. Arsenic, iron and manganese, both total and dissolved, have been detected at concentrations exceeding the Site SLs in one or more wells during each sampling event. Although concentrations of total and dissolved arsenic have been detected at concentrations slightly above the Site SL, they are all below the MTCA Method A cleanup level of 5 ug/L for groundwater, which is based on background concentrations in Washington state. Based on these results, arsenic is not considered a contaminant of concern (COC) for the cleanup action. Concentrations of iron and/or manganese have been detected above the Site SLs in groundwater samples collected from all the monitoring wells at the Site and are retained as COCs in groundwater for the cleanup action.

4.2.4 Soil Vapor/Landfill Gas Quality

Concentrations of benzene or acrolein exceeding the SLs were detected in soil gas samples collected from all five of the soil gas probes. The highest concentration of benzene was identified in the southern central portion of the landfill (SG-4), where landfill waste is anticipated to be the thickest based on the geophysical survey results. The lowest concentrations of benzene were reported in soil gas samples collected nearest to the edges of the landfill waste (SG-2 and SG-3; Figure 5). Methane, typically associated with landfill gas, was not encountered during the RI field investigation activities, which indicates little, if any, landfill gas generation.

4.3 Fate and Transport

The Shelton C Street Landfill received municipal solid waste between the late 1920s and the mid-1980s. The waste consisted primarily of residential solid waste, but was reported to also include disposal of by-products, research waste, and demolition debris from nearby pulp mills, and sludge from the City's WWTP. Because of its age, the landfill contents are heavily degraded. The landfill is unlined, and landfill waste is in contact with the surrounding recessional glacial outwash. The base of the landfill waste is situated more than 35 feet above groundwater.

Dioxin/furans, cPAHs, and metals are at the highest concentrations in surface soil at the northwest portion of the landfill, where WWTP sludge was disposed of on the ground surface. Although liquid wastes likely migrated downward through cover soils and/or landfill waste, the lack of significant impacts to groundwater suggest that the downward migration ceased at a depth above the saturated zone.

Similarly, leachate or other secondary products commonly sourced from the landfill waste and containing COPCs may have migrated downward via precipitation percolating from the ground surface downward through cover soils and landfill waste, impacting underlying native soils. The effect of leachate on groundwater is only observed at monitoring well AMW-4, where average concentrations of dissolved chloride and sodium were greater than at other wells.

COPCs exceeding Site SLs in groundwater are limited to arsenic, manganese, and iron; the highest concentrations of manganese, iron, and arsenic in groundwater have been identified in wells located downgradient of the landfill waste. However, the presence of carbon dioxide in landfill gas at concentrations less than 10 percent (due to late-stage decomposition), and the observed concentrations of arsenic, manganese, and iron in groundwater suggest a natural source of these constituents, and not a landfill or leachate source. Based on the geochemical parameters observed, subtle reducing and/or slightly acidic conditions associated with carbon dioxide in landfill gas resulted in dissolution of the naturally occurring constituents from native soils. Manganese and iron are secondary contaminants and screening levels are based on aesthetic criteria. Concentrations of arsenic only slightly exceed the Site SL and are below the state MCL, based on background conditions (see Table 720-1 in MTCA).

The lack of additional COPCs in groundwater above the Site SLs indicates that there is not an ongoing source of contamination from the landfill to groundwater. The geochemical effects on groundwater aesthetics due to carbon dioxide in soil gas are reversible. For these reasons, impacts to downgradient Goldsborough Creek that may result from discharge of groundwater to surface water are expected to be minimal and are not considered a risk to human health.

Acrolein and benzene identified in soil gas are at the highest concentrations in the southeast portion of the landfill. With the exception of benzene identified in soil gas at probe SG-3, concentrations of acrolein or benzene did not vary significantly between the five sample locations, indicating that sources of benzene and acrolein to soil gas are likely distributed throughout the landfill waste and that there is not a significant ongoing source of volatile COPCs to soil gas. Monitoring of landfill gas showed very low to no methane (up to 1.3 percent) and oxygen concentrations approach atmospheric concentrations in some locations, indicating that generation of landfill gas at the Shelton C Street Landfill is minimal, allowing for atmospheric gases to diffuse into the landfill.

4.4 Potential Receptors and Exposure Pathways

Public access to the Property and surrounding properties is restricted for safety reasons; however, illegal public access of the Property for recreational use is evident. With this setting and current and potential future site uses, the following exposure pathways and receptors are applicable and appear complete based on the data:

- Direct contact with soil and/or landfill waste – Human and terrestrial receptors have the potential to contact landfill waste and COPCs in surface and shallow subsurface soil.

Remaining potential exposure pathways and receptors discussed in Section 3.2.2 are not complete.

Groundwater COPCs exceeding Site SLs consist only of iron and manganese, which are secondary contaminants, and arsenic, which has been detected in groundwater at concentrations below the MCL. These exceedances are not considered likely to pose a risk to human or terrestrial receptors. Therefore, the ingestion of groundwater and possible groundwater discharge to surface water in Goldsborough Creek are not complete exposure pathways.

Soil gas COPCs detected at concentrations exceeding the Site SLs consist of benzene and acrolein. However, the inhalation pathway is considered incomplete because: 1) future use of the Site does not include construction of buildings; 2) the soil vapor exceedances were identified in samples obtained from approximately 20 feet below the ground surface, which is an additional 80 feet below the ground surface of surrounding developable properties; and 3) adjoining properties potentially available for future development are located at least 200 feet away from the landfill, and at least 300 feet away from the soil gas sample locations. Therefore, if future use of the adjoining properties were to include construction of buildings, the vertical and lateral separation demonstrated by the data obtained indicates a low risk for vapor intrusion.

4.4.1 Terrestrial Ecological Evaluation

The remedial alternatives developed during the FS (Section 6.3) each include remedial technologies that will result in the Site's exemption from assessment of terrestrial ecological evaluation consistent with WAC 173-340-7491(1)(b), because the landfill waste will be below "physical barriers that will prevent plants or wildlife from being exposed to soil contamination." As described in Sections 6.4, physical barriers are considered during the FS under Alternatives 1 through 3 and include a permeable soil cap with geotextile barrier or an impermeable cover system with geomembrane layer, paired with an institutional control to meet the exemption under WAC 173-340-440. Alternative 4 consists of full removal of all landfill waste, eliminating the need for assessment of terrestrial ecological evaluation.

5 Proposed Cleanup Standards

The proposed cleanup levels and points of compliance for the Site are described in the following sections.

5.1 Cleanup Levels

This section identifies the proposed soil and groundwater cleanup levels for the Site. The cleanup levels proposed for the Site have been developed for those COPCs that were identified at concentrations that exceed Site SLs, and for which there is a current or likely future exposure pathway. The proposed soil cleanup levels are provided in Table 6a and are the most stringent of the cleanup levels protective of human health through the direct contact pathway and protective of ecological receptors. The proposed cleanup levels for groundwater are provided in Table 6b, and are the most stringent of the cleanup levels protective of human health and aquatic organisms.

5.2 Points of Compliance

The point of compliance is the point at which the contaminant- and media-specific cleanup levels shall be met at the Site. MTCA defines a point of compliance as “point or points where cleanup levels established…shall be attained.” This section describes the points of compliance for the Site. The points of compliance are used for development and evaluation of the cleanup alternatives in the FS.

5.2.1 Soil Points of Compliance

In accordance with MTCA, the standard point of compliance for direct contact with soil extends to 15 feet bgs, based on a reasonable maximum depth of excavation and assumed placement of excavated soils at the surface where contact occurs. The conditional point of compliance extends to 6 feet bgs where an institutional control is established. As described in Section 6.4, the cleanup alternatives considered in the FS that pertain to containment of landfill waste incorporate a physical barrier (either a permeable soil cap with geotextile barrier or impermeable cover system with geomembrane layer) over the waste containment area. Under MTCA and landfill regulations, the presence of a physical barrier allows for further reduction of the depth for the point of compliance. The proposed point of compliance for direct contact with soil with installation of a physical barrier is 30 inches.

5.2.2 Groundwater Points of Compliance

Under MTCA, the standard point of compliance for groundwater cleanup levels is throughout the site, regardless of whether groundwater is potable (WAC 173-340-720(8)(b)). Under criteria for municipal solid waste landfills, groundwater monitoring is required near the edge of the landfill waste, which is considered a conditional point of compliance under MTCA, and is placed as close as practicable to the edge of the landfill waste.

At the Site, the existing well network includes cross- and downgradient wells situated as near as practicable to the landfill waste boundary and is considered the conditional point of compliance monitoring well network for the Site:

- Wells AMW-1 and AMW-2 are situated east and southeast of the landfill waste boundary.
- AMW-4 was installed as far south as possible, constrained by the property boundary, and is situated within the landfill waste boundary where approximately 16 feet of landfill waste is present.
- AMW-3 is situated upgradient of the landfill waste, approximately 175 feet west of the landfill waste boundary.

6 Feasibility Study

6.1 Remedial Action Objectives

RAOs are medium-specific or site-specific goals for protecting human health and the environment. They are established based on the nature and extent of contamination, the receptors that are currently and potentially threatened, and the potential for human and environmental exposure. Based on the potential exposure pathways, receptors, and site characterization data obtained to date, the RAO is to prevent direct contact with landfill waste and contaminated soil.

6.2 Potentially Applicable Laws and Regulations

The cleanup action must comply with applicable state and federal laws (WAC 173-40-710[1]). Requirements from state and federal laws that are determined to be legally applicable or relevant and appropriate are collectively referred to as applicable or relevant and appropriate requirements (ARARs). Potentially applicable state and federal laws are discussed below.

Minimum Functional Standards for Solid Waste Handling. These regulations (Chapter 173-304 WAC) provide the minimum requirements for cleanup actions conducted under MTCA at solid waste landfills that stopped receiving waste prior to October 9, 1991. Chapter 173-304 WAC became effective in November 1985, replacing Washington State's first MFS for solid waste landfills, Chapter 173-301 WAC.

Criteria for Municipal Solid Waste Landfills. The 173-351 regulations specify postclosure care activities for municipal solid waste landfills that received waste after October 9, 1991.

MTCA. The MTCA statute (Chapter 70.105D Revised Code of Washington [RCW]) is the primary law that governs cleanup of contaminated sites in the state of Washington

(Ecology, 2013). The MTCA cleanup regulation (Chapter 173-340 WAC) specifies criteria for the evaluation and conduct of a cleanup action. It requires that cleanup actions protect human health and the environment, meet environmental standards in other applicable laws, and provide for monitoring to confirm compliance with cleanup levels.

For cleanup actions involving containment of hazardous substances, MTCA has requirements that must be met for the cleanup action to be considered in compliance with soil cleanup standards. These include implementing a compliance monitoring program that is designed to ensure the long-term integrity of the containment system and applying institutional controls where appropriate to the affected areas (WAC 173-340-440).

SEPA. The State Environmental Policy Act (SEPA; Chapter 197-11 WAC) and the SEPA procedures (Chapter 173-802 WAC) ensure that state and local government officials consider environmental values when making decisions. The SEPA process begins when an application for a permit is submitted to an agency, or an agency proposes to take some official action, such as implementing a Cleanup Action Plan under MTCA. Completion of a SEPA checklist would be required prior to initiating remedial construction activities.

Solid and Hazardous Waste Management. The Washington Dangerous Waste Regulations (Chapter 173-303 WAC) would apply if dangerous wastes are generated, and United States Department of Transportation (USDOT) and WSDOT regulations regarding transport of hazardous materials (49 CFR Parts 171-180) would apply if regulated material is transported off-site as part of the cleanup action. The Washington Solid Waste Handling Standards (Chapter 173-350 WAC) regulate handling, treatment, or off-site disposal of nonhazardous solid waste.

Other:

- Occupational Safety and Health Administration (OSHA) and Washington Industrial Safety and Health Act (WISHA) regulations (29 CFR 1910.120; Chapter 296-62 WAC) governing worker safety during cleanup action execution. Compliance would be achieved through preparation and implementation of site-specific health and safety plan(s) (HASP[s]) with appropriate controls, worker training and certifications, and occupational monitoring.
- City of Shelton Fill and Grade Permit/Erosion Control Permit for grading/excavation and filling.
- Washington State Water Well Construction Regulations (Chapter 173-160 WAC) regulating groundwater well installation and decommissioning as part of the cleanup action.

The Archeological and Historical Preservation Act (16 USCA 496a-1) would be applicable if any subject materials are discovered during grading and excavation activities. A cultural resources assessment and archeological oversight of subsurface disturbing activities may be required elements of the project.

6.3 Remedial Technologies

This section presents the appropriate remedial technologies considered during development of the remedial action alternatives during the FS. In the subsequent section of this report we assemble potential remedial alternatives from the list of viable technologies.

6.3.1 Landfill Capping

Capping would consist of the placement of a permeable soil cap, or an impermeable cover system with geomembrane layer, over locations where landfill waste or contaminated soil is present to provide a physical barrier to direct contact. Capping will achieve the Site RAOs by limiting the current and potential future human and terrestrial ecological exposure to landfill waste and contaminated soil.

A permeable soil cap, compliant with WAC 173-304-460, reduces precipitation infiltration and provides a physical barrier to direct contact with landfill waste and contaminated soil. Design and installation of a permeable soil cap includes consideration for erosion control to ensure that the integrity of the cap is not compromised over time by stormwater runoff. Cap permeability would be designed as at least $1x10^{-6}$ centimeters per second (cm/s) to comply with the requirements for closure of landfills prescribed in WAC 173-304-460. An isolation barrier, such as placement of geotextile, can be incorporated into the design to allow for a reduction in total cap thickness while still meeting the MTCA requirements for the protection of terrestrial ecological receptors.

An impermeable cover system with a geomembrane layer eliminates precipitation infiltration in addition to providing a physical barrier to direct contact with landfill waste and contaminated soil. Design and construction of a drainage layer above the geomembrane and stormwater management system would be required to address stormwater runoff.

6.3.2 Source Removal

Source removal would consist of physical removal and off-Site disposal of some or all the landfill waste and/or contaminated soil. Source removal would meet the Site RAOs by permanently removing the source. Standard excavation techniques would be used for source removal, although the physical setting and large volume of material requiring removal would result in significant implementability issues. The RI data indicates that the wastewater treatment plant-sludge would require handling and disposal as Dangerous Waste per WAC 173-303, while remaining landfill waste and contaminated soil could be handled and disposed of as municipal solid waste.

6.3.3 Institutional Controls

Institutional controls would be implemented to ensure that the constructed remedy provides for permanent protection of human health and the environment. They are not intended to physically alter the conditions at the Site or reduce contamination, but involve administrative or engineered tools including but not limited to:

- Restrictive covenants for the property

- Deed restrictions to limit land use, construction, or soil excavation without approval
- Use restrictions to prevent disturbance of the cap or other controls
- Fencing surrounding the landfill and cap and warning signs

Institutional controls are retained as a component of the remedial action.

6.3.4 Long -Term Monitoring

Long-term compliance monitoring is not a stand-alone technology, but is a required element of any cleanup action conducted under MTCA. Compliance monitoring would be conducted to ensure that the selected remedy meets the cleanup standards, both in the short-term and in the long-term. Monitoring requirements may include the integrity and functional stability of the cap, stormwater management systems, and concentrations of COPCs in Site media.

6.4 Selection and Description of Remedial Alternatives

The following remedial alternatives were selected for evaluation in this FS:

- **Alternative 1** – Install a permeable soil cap, implement institutional controls, and conduct long-term monitoring
- **Alternative 2** – Install an impermeable cover system with geomembrane layer, implement institutional controls, and conduct long-term monitoring
- **Alternative 3** – Remove WWTP sludge, install a permeable soil cap, implement institutional controls, and conduct long-term monitoring
- **Alternative 4** – Conduct full removal of landfill waste

Components of the alternatives are summarized in Table 7. Each alternative is described below, and conceptual design criteria and assumptions are briefly discussed. These criteria and assumptions provide the basis for estimating each alternative’s cost. Costs are evaluated over a 30-year period, in accordance with EPA guidance for FS cost estimating. The cost estimates are order-of-magnitude, with an intended accuracy in the range of -30 percent to +50 percent. Costs are estimated in 2019 dollars, and the net present value (NPV) of future-year costs is calculated using a discount factor of 1.5 percent.[4] The estimated costs of the remedial alternatives are listed in Table 8, and itemized cost estimates are provided in Appendix D.

6.4.1 Alternative 1: Permeable Soil Cap, Institutional Controls, and Monitoring

Alternative 1 includes installation of a permeable soil cap and implementation of institutional controls and an inspection, monitoring, and maintenance (IM&M) program to document and maintain the functional stability of the remedy. The existing cover soils would be graded prior to cap installation to minimize the potential for soil erosion and

[4] The discount factor of 1.5 percent is based on the real interest rate on US Treasury 30-year notes and bonds (per the November 2018 revision of Circular A-94 Appendix C, Office of Management and Budget).

ponding of stormwater. The cap would be installed over the full extent of the landfill (approximately 4.0 acres) to prevent direct contact with landfill waste and contaminated soil by human and terrestrial receptors, and meet specifications described in WAC 173-304-460. The soil cap would consist of a geotextile isolation barrier, a minimum 2-foot thick layer of clean, imported low permeability cover materials, and a 1-foot thick vegetative layer of topsoil seeded with grasses or other shallow-rooted vegetation. It would reduce precipitation infiltration, and stormwater would naturally infiltrate at the edge of the soil cap. A soil gas management system would also not be needed. Institutional controls would include a deed restriction to prevent future, unrestricted development or any other activities that could create exposure pathways for direct contact with the contaminated soil or landfill waste, as well as fencing surrounding the landfill. Signage would also be provided warning of the presence of landfill waste, along with a gate or other physical restriction on the access road. The IM&M program would include the following:

- Annual topographic surveys for at least the first 5 years following construction,[5] to evaluate soil settlement and cap stability.
- Periodic inspection of Site conditions.
- Maintenance of the remedy (e.g., removal of large vegetation from the cap area[6] and filling of eroded areas), performed on an as-needed basis.
- Semiannual groundwater monitoring at the existing well network for iron and manganese concentrations.
- Periodic reporting of IM&M activities to Ecology, including 5-year reviews.

The institutional controls and IM&M program would be required *in perpetuity*.

For cost estimating purposes, an average imported fill thickness of 36 inches was assumed to ensure that a 30-inch minimum thickness is achieved. IM&M program inspections and informal reporting to Ecology are assumed to occur quarterly for the first 3 years following completion of construction, and semiannually thereafter.

6.4.2 Alternative 2: Impermeable Cap, Institutional Controls, and Monitoring

Alternative 2 includes design and installation of an impermeable landfill cover system and stormwater control system to eliminate the infiltration of precipitation through the landfill waste, along with institutional controls and an IM&M program. An impermeable cover system would be designed with a geomembrane layer, drainage layer and vegetation layer. The stormwater control system would consist of a perimeter drainage system to capture stormwater runoff from the cap surface, interflow from a drainage layer, and runoff from the upslope area adjoining the landfill to the north. The institutional controls and IM&M program would be similar to those in Alternative 1.

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[5] An initial topographic survey would also be conducted upon completion of cap construction.

[6] Trees would not be allowed to grow in the capped area, since roots of large trees could extend into the landfill waste and bring it to the surface if a tree is blown over (for example).

However, inspection and maintenance of the stormwater control system would result in increased postconstruction costs relative to Alternative 1.

6.4.3 Alternative 3: Removal of WWTP Sludge, Permeable Soil Cap, Institutional Controls, and Monitoring

Alternative 3 is similar to Alternative 1, but includes removal of the portion of the landfill waste that contains WWTP sludge prior to capping. Since the WWTP sludge is at or near the existing ground surface and has elevated concentrations of dioxins/furans, it represents a disproportionate exposure risk in the event that the cap is compromised. The WWTP sludge would be disposed of in an off-Site landfill in accordance with regulatory requirements. The landfill area would then be graded and covered with a geotextile isolation barrier and permeable soil cap, as in Alternative 1. The institutional controls and IM&M program in Alternative 3 would be essentially the same as in Alternative 1.

For cost estimating purposes, a removal volume of approximately 8,700 cubic yards[7] (CY) and off-Site disposal in a landfill permitted to accept hazardous waste were assumed.

6.4.4 Alternative 4: Full Removal of Contaminated Media

In Alternative 4, all contaminated soil and landfill waste would be excavated and disposed of off-Site in accordance with regulatory requirements. Overexcavation to maintain safe slopes of excavation sidewalls would likely be needed to achieve full removal. Excavation bottom and sidewall sampling would be completed to ensure that soil cleanup levels are achieved. Clean backfill material would then be imported, placed, and compacted to restore preconstruction grades, and the Site would be revegetated. Since no landfill waste or contaminant concentrations above cleanup levels would remain at the Site, institutional controls and an IM&M program would not be needed.

The following assumptions were made in estimating the cost of Alternative 4:

- Approximately 8,700 CY of WWTP sludge would be excavated and disposed of in a landfill permitted to accept hazardous waste.
- Approximately 159,000 CY of other landfill waste and contaminated soil[8] would be excavated and disposed of in a permitted municipal solid waste landfill.

6.5 Evaluation of Remedial Alternatives

The remedial alternatives presented in Section 6.3 are evaluated in this section with respect to MTCA criteria. The evaluation is accomplished in three steps:

- Threshold criteria evaluation (Section 6.4.1)
- Disproportionate cost analysis (DCA; Section 6.4.2)

[7] The volume of WWTP sludge is estimated based on an initial application of 4.5 million gallons of sludge with an average moisture content of 65 percent by weight, and an assumed existing moisture content of 10 percent by weight.

[8] The total volume of landfill waste (including WWTP sludge) and contaminated soil is estimated at approximately 168,000 CY based on a surface area of 4.0 acres and an average thickness of 26 feet.

- Reasonable restoration time-frame evaluation (Section 6.4.3)

6.5.1 Threshold Criteria Evaluation

Cleanup actions selected under MTCA must meet four "threshold" requirements identified in WAC 173-340-360(2)(a) to be accepted by Ecology. All cleanup actions must:

- Protect human health and the environment
- Comply with cleanup standards
- Comply with applicable state and federal laws
- Provide for compliance monitoring

These requirements are evaluated in the following sections.

6.5.1.1 Protection of Human Health and the Environment

Capping of landfill waste and contaminated soils in Alternatives 1 through 3 would protect humans from direct contact exposures, and would also protect terrestrial ecological receptors. Implementation of institutional controls and an IM&M program would ensure that the capping remedy remains protective *in perpetuity*. In Alternative 4, humans and terrestrial ecological receptors at the Site would be protected by removing all contaminated media.

6.5.1.2 Compliance with Cleanup Standards

Alternatives 1 through 3 involve containment of soils with hazardous substance concentrations exceeding cleanup levels at the point of compliance (i.e., less than 15 feet bgs). These containment alternatives would achieve compliance with cleanup standards by meeting the requirements of WAC 173-340-740(6)(f). In Alternative 4, compliance with cleanup standards would be achieved by removing all contaminated media from the Site.

6.5.1.3 Compliance with Applicable State and Federal Laws

The remedial alternatives were specifically developed to comply with the MTCA regulation. Other potentially applicable state and federal laws were identified and discussed in Section 6.2, and were also considered in developing the alternatives. All four alternatives are expected to comply with all ARARs because the required engineering design and agency review process will include steps to ensure compliance. The ARARs may affect implementation, but they do not have a significant effect on whether a remedial alternative is fundamentally viable. The means of compliance with ARARs would be documented in the remedial design, remedial action work plan components, and other preconstruction documentation to be prepared during design.

6.5.1.4 Provisions for Compliance Monitoring

In Alternatives 1 through 3, quality control measures would ensure that the cap is constructed per design requirements, and IM&M would be conducted *in perpetuity* to ensure the long-term protectiveness of the remedy. In Alternative 4, excavation bottom and sidewall sampling would be conducted to ensure that all contaminated media are removed from the Site. In all four alternatives, health and safety protocols outlined in a Site-specific HASP would provide protection monitoring during remedy construction.

The alternatives are all judged to meet the threshold criteria. Therefore, all four are carried forward to the next stage of evaluation.

6.5.2 Disproportionate Cost Analysis

A DCA is conducted to determine whether a cleanup action uses permanent solutions to the maximum extent practicable. This is done by evaluating the relative benefits and costs of remedial alternatives. Seven criteria are considered in the evaluation as specified in WAC173-340-360(3)(f):

- **Protectiveness** is the overall protectiveness of human health and the environment, including the degree to which existing Site risks are reduced, time required to reduce the risks and attain cleanup standards, on-Site and off-Site risks during implementation, and improvement in overall environmental quality.
- **Permanence** is the degree to which the alternative permanently reduces the toxicity, mobility, or volume of hazardous substances, including the adequacy of destroying hazardous substances, the reduction or elimination of hazardous substance releases and sources of releases, the degree of irreversibility of treatment, and the characteristics and quantity of the treatment residuals.
- **Cost** includes the remedy design, construction, and long-term IM&M costs to implement the alternative.
- **Long-term effectiveness** is the degree of certainty that the alternative will successfully and reliably address contamination that exceeds applicable cleanup levels until cleanup levels are attained, the magnitude of the residual risk with the alternative in place, and the effectiveness of controls to manage treatment residue and remaining wastes.
- **Manageability of short-term risks** is the risks to human health and the environment during construction and implementation of the alternative, and the effectiveness of measures that will be taken to manage such risks.
- **Implementability** includes consideration of whether the alternative is technically possible; the availability of necessary off-Site facilities, services, and materials; administrative and regulatory requirements; scheduling, size, and complexity of the alternative; monitoring requirements; access for construction, operations, and monitoring; and integration with existing facility operations and other current or potential remedial actions.
- **Consideration of public concerns** includes concerns from individuals, community groups, local governments, tribes, federal and state agencies, and other interested organizations are addressed by Ecology responding to public comments.

The DCA is based on a comparative evaluation of an alternative's cost against the other six criteria (environmental benefits). Per WAC 173-340-360(3)(e)(i), cost is disproportionate to benefits if the incremental cost of an alternative over that of a lower-cost alternative exceeds the incremental degree of benefits achieved by the alternative over that of the lower-cost alternative.

The DCA is summarized in Table 8. Environmental benefit is quantified by first rating the alternatives with respect to each of the six criteria (excluding cost) discussed above. Rating values are assigned on a scale of 1 to 5, where 1 indicates the criterion is satisfied to a very low degree, and 5 indicates the criterion is satisfied to a very high degree. Since Ecology does not consider the criteria to be of equal importance, each criterion is assigned a "weighting factor." Weighting factors are assigned as follows:[9]

- Overall protectiveness: 30 percent
- Permanence: 20 percent
- Long-term effectiveness: 20 percent
- Short-term effectiveness: 10 percent
- Implementability: 10 percent
- Consideration of public concerns: 10 percent

A MTCA benefits ranking is then obtained for each alternative by multiplying the six rating values by their corresponding weighting factors, and summing the weighted values. Finally, the benefits ranking of each alternative is divided by the alternative's estimated cost to obtain a benefit/cost ratio, which is a relative measure of the cost effectiveness of the alternative.

The relative environmental benefits of the four alternatives are discussed in the following sections.

6.5.2.1 Overall Protectiveness

All four remedial alternatives would be protective of human health and the environment. Installing a permeable soil cap (Alternatives 1 and 3) will eliminate the direct contact exposure pathway and reduce precipitation infiltration and leachate generation. Installing an impermeable cover system (Alternative 2) would not significantly increase the protectiveness of the remedy compared to Alternatives 1 and 3. In Alternatives 1 through 3, risks during remedy implementation are low, but long-term protectiveness relies on the effectiveness of institutional controls and the IM&M program. Compared to Alternatives 1 and 2, Alternative 3 would have marginally higher risks during remedy implementation (associated with WWTP sludge removal), but also marginally greater long-term protectiveness because the exposure threat would be less severe in the event of cap failure (because WWTP sludge has been removed). Alternative 4 would have considerable health and safety risks during remedy implementation due to the sheer scale of the landfill waste removal effort. Long-term protectiveness at the Site would be complete under Alternative 4 (all contamination removed). However, the increased risks during remedy implementation would likely be disproportionate to protectiveness gains in the long-term.

[9] These weighting factors have been used by Ecology to evaluate remedial alternatives at other landfill sites, such as the Cornwall Avenue Landfill in Bellingham (RI/FS dated December 17, 2013).

Based on these considerations, Alternatives 1 through 3 were given a medium overall protectiveness rating (3), and Alternative 4 was given a slightly lower rating (2).

6.5.2.2 Permanence

None of the alternatives permanently reduces the toxicity, mobility, or volume of hazardous substances, so all four were given the lowest rating (1) with respect to this criterion.

6.5.2.3 Long-Term Effectiveness

Alternative 4 was given the highest rating (5) because physical removal of all contaminated media effectively eliminates residual risk at the Site. Alternatives 1 and 2 were given a medium rating (3) because the long-term effectiveness of risk management at the Site relies on effective implementation of institutional controls and the IM&M program *in perpetuity*. Alternative 3 was also given a medium rating (3) because only a small fraction of the waste is removed, and long-term effectiveness still relies on implementation of institutional controls and the IM&M program for containment of the vast majority of wastes that are left in place.

6.5.2.4 Manageability of Short-Term Risks

The short-term risks to human health and the environment during remedy construction and implementation are judged to be very low for Alternatives 1 and 2. Construction work of any type involves some inherent risks. These alternatives include relatively minor construction efforts and, apart from clearing and grading prior to cap installation, there would be little or no disturbance of waste materials, so the potential for worker exposures would be low. The construction area would be fenced to restrict access to authorized personnel only. Construction workers would be trained and certified for performing work at hazardous waste sites, and all work would be conducted in accordance with the requirements of a Site-specific HASP.

Alternative 3 is a significantly larger construction effort that includes excavation and off-Site transport of an estimated 8,700 CY of WWTP sludge to an off-Site landfill. Conventional erosion and sedimentation controls would be implemented to ensure that contaminated materials do not leave the Site except under controlled means (e.g., WWTP sludge transported in covered dump trucks). Nonetheless, the exposure potential to both workers and the general public would be greater than in Alternatives 1 and 2.

Due to the scale of the construction effort and the volume of contaminated media to be excavated and trucked to off-Site landfills, Alternative 4 has the potential for very significant short-term risks.

In light of the above considerations, Alternatives 1 and 2 were given the highest rating (5) for short-term risk manageability. Alternative 3 was rated somewhat lower (4), and Alternative 4 was given a relatively low rating (2).

6.5.2.5 Implementability

All four alternatives would use readily available services/equipment and common earthwork construction techniques. Both construction and long-term IM&M of the soil cap in Alternatives 1 and 3 are highly implementable, and removal of WWTP sludge in Alternative 3 is not expected to have implementability concerns. Alternative 2 is also considered to be readily implementable, with no unusual technical or administrative challenges. However, the impermeable cover system and stormwater management system in Alternative 2 would be somewhat more challenging to construct and maintain than the simple permeable soil cap in Alternatives 1 and 3. In Alternative 4, a huge volume of contaminated media would need to be transported to off-Site landfills, and a similar volume of clean fill would need to be imported.[10] Truck traffic would greatly impact traffic on public roadways over a long construction period, likely resulting in extreme administrative challenges.

In light of the above considerations, Alternatives 1 and 3 were given the highest rating (5) for implementability. Alternative 2 was given a slightly lower rating (4), and Alternative 4 was given the lowest rating (1).

6.5.2.6 Consideration of Public Concerns

The public has not yet had the opportunity to review and comment on the remedial alternatives. Construction noise and the significant increase in truck traffic are anticipated to have the greatest impact on members of the public, particularly those in the immediate vicinity of the Site. No contamination would be removed in Alternatives 1 and 2, but construction impacts would be lowest in those alternatives. Truck traffic would increase significantly in Alternative 3, but public concerns in that regard would likely be tempered by the fact that the most highly impacted waste (the WWTP sludge) would be removed. On the other hand, the huge amount of truck traffic on public roadways in Alternative 4 is anticipated to have significant transportation impacts to the public. On this basis, Alternative 3 was given the highest rating (4), Alternatives 1 and 2 were given a medium rating (3), and Alternative 4 was given the lowest rating (1).

6.5.2.7 Benefits Rankings, Estimated Costs, and Benefit/Cost Ratios

The MTCA benefits rankings, estimated costs, and benefit/cost ratios for the four remedial alternatives are presented at the bottom of Table 8. As previously noted, the MTCA benefits ranking for each alternative is obtained by multiplying the rating values assigned for the six evaluation criteria by their corresponding weighting factors and summing the weighted values. The benefits ranking is highest for Alternatives 1 and 3 (3.00), and only slightly lower for Alternative 2 (2.90). Alternative 4 has a significantly lower benefits ranking (2.20).

The estimated costs for the alternatives range from $2.0 million (Alternative 1) to $32 million (Alternative 4). The benefit/cost ratio, which is a relative measure of cost effectiveness, is obtained by dividing the benefits ranking for each alternative by its estimated cost (in millions of dollars). As listed in Table 8, the calculated benefit/cost ratios range from a low of 0.07 for Alternative 4 to a high of 1.50 for Alternative 1.

6.5.2.8 Disproportionate Cost Analysis Conclusion

Based on the DCA, Alternative 1 has the highest benefit/cost ratio. Therefore, under MTCA, Alternative 1 is identified as the alternative that is permanent to the maximum extent practicable**.**

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[10] Assuming a typical "truck-and-pup" load of 20 CY, some 8,400 trips would be required to truck the estimated 168,000 CY of contaminated media to an off-Site landfill, and another 8,400 trips to import clean fill.

6.5.3 Reasonable Restoration Time Frame Evaluation

MTCA places a preference on remedial alternatives that can achieve Site cleanup in a shorter period of time. Factors to be considered in evaluating whether an alternative provides for a reasonable restoration time frame are listed in WAC 173-340-360(4)(b). In all four alternatives, Site cleanup would be achieved upon completion of remedy construction. Alternative 1 is the simplest of the alternatives to design and construct. Permeable cap design and construction can likely be completed in roughly 1 year, which is considered to be a reasonable restoration time frame.

6.6 Recommendation

Based on the results of the above evaluation, Alternative 1 has a reasonable restoration time frame and is the most cost-effective of the four remedial alternatives evaluated. Therefore, under MTCA, Alternative 1 is identified as the alternative that is permanent to the maximum extent practicable and is the proposed alternative.

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Washington State Department of Ecology (Ecology), 2019, Letter from Andrew Smith, Unit Supervisor UST/Technical Support Unit, Toxics Cleanup Program to Mr. Craig Gregory, Public Works Director, City of Shelton regarding Department of Ecology Comments on Draft Remedial Investigation/Feasibility Study, Shelton C Street Landfill, December 20, 2019.

Limitations

Work for this project was performed for the City of Shelton (Client), and this report was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This report does not represent a legal opinion. No other warranty, expressed or implied, is made.

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Please refer to Appendix E titled "Report Limitations and Guidelines for Use" for additional information governing the use of this report.

TABLES

Table 1. Groundwater Well Data

Project No. 150074, City of Shelton, C Street Landfill, Shelton, WA

		AMW-1	AMW-2	AMW-3	AMW-4
Well Construction Data					
Ecology Tag ID		BKC 045	BKC 047	BKC 048	BKC 046
Ground Surface Elevation (ft NAVD88)		153.48	152.65	170.4	151.23
Top of Monument Elevation (ft NAVD88)		156.76	155.74	173.48	153.96
Casing Stickup Height (ft above ground)		2.42	2.89	2.54	2.45
TOC Elevation (ft NAVD88)		155.9	155.54	172.94	153.68
Total Well Depth (ft bgs)		105	105	120	105
Bottom of Well Elevation (ft NAVD88)		48.48	47.65	50.40	46.23
Top of Screen Elevation (ft NAVD88)		78.48	76.65	80.40	77.23
Bottom of Screen Elevation (ft NAVD88)		58.48	56.65	60.40	57.23
Measured Groundwater Elevations[1]					
1/12/2018	Depth to Water (ft bTOC)	83.07	83.3	100.10	81.22
	Elevation (ft NAVD88)	72.83	72.24	72.84	72.46
12/20/2018	Depth to Water (ft bTOM)	89.13	88.52	104.97	86.56
	Elevation (ft NAVD88)	67.63	67.22	68.51	67.40
4/1/2019	Depth to Water (ft bTOM)	87.65	87.17	104.43	85.19
	Elevation (ft NAVD88)	69.11	68.57	69.05	68.77
7/1/2019	Depth to Water (ft bTOM)	91.53	90.95	107.75	88.98
	Elevation (ft NAVD88)	65.23	64.79	65.73	64.98

Notes:

[1]Depth to groundwater measured relative to the top of the well casings in January 2018, and relative to the top of the well monuments in December 2018, April 2019, and July 2019.

Surveyed elevations by Professional Land Surveyors, Inc., dated January 12, 2018

ft = feet

NAVD88 = North American Vertical Datum of 1988

bgs = below ground surface

bTOC = below top of well casing, measured from the north edge.

bTOM = below top of well monument, measured from the north rim.

Table 2a. Surface Soil Characterization Data - Dioxins/Furans, PAHs, and Metals

Project No. 150074, City of Shelton, C Street Landfill, Shelton, WA

		Decision Unit	DU-1	DU-2	DU-3
		Sample Type	ISM	ISM	ISM
		Sample Location	DU-1	DU-2	DU-3
		Sample ID	ISM-DU1-072617	ISM-DU2-072617	ISM-DU3-072517
		Sample Date	7/26/2017	7/26/2017	7/25/2017
Analyte (by group)	Site-Specific Screening Level	Natural Background Concentrations			
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)					
Non-Carcinogenic PAHs					
1-Methylnaphthalene	34	--	0.05 U	0.05 U	0.1 U
2-Methylnaphthalene	320	--	0.05 U	0.05 U	0.1 U
Acenaphthene	20	--	0.1 U	0.1 U	0.01 U
Acenaphthylene	--	--	0.1 U	0.1 U	0.01 U
Anthracene	24000	--	0.1 U	0.1 U	**0.011**
Benzo(g,h,i)perylene	--	--	**1.7**	**0.59**	**0.39**
Fluoranthene	3200	--	**2.2**	**0.88**	**0.41**
Fluorene	30	--	0.1 U	0.1 U	0.01 U
Naphthalene	1600	--	**0.18**	0.1 U	**0.029**
Phenanthrene	--	--	**1.0**	**0.47**	**0.16**
Pyrene	2400	--	**1.4**	**0.65**	**0.23**
Carcinogenic PAHs (cPAHs)					
Benz(a)anthracene	1.37	--	**0.42**	**0.22**	**0.13**
Benzo(a)pyrene	0.14	--	**0.61**	**0.29**	**0.22**
Benzo(b)fluoranthene	1.37	--	**2.0**	**0.74**	**0.54**
Benzo(k)fluoranthene	13.7	--	**0.49**	**0.20**	**0.15**
Chrysene	137	--	**1.1**	**0.46**	**0.31**
Dibenzo(a,h)anthracene	0.14	--	**0.11**	0.1 U	**0.04**
Indeno(1,2,3-cd)pyrene	1.37	--	**1.3**	**0.45**	**0.32**
Total cPAHs TEQ (ND = 1/2 RDL)	0.14	--	**1.1**	**0.46**	**0.34**
Dioxins/Furans (pg/g)					
Chlorinated dibenzo-p-dixoins (CDDs)					
2,3,7,8-TCDD	2.0	--	**828**	**234**	**144**
1,2,3,7,8-PeCDD	--	--	**5170**	**1100**	**724**
1,2,3,4,7,8-HxCDD	--	--	**9860**	**2180**	**1480**
1,2,3,6,7,8-HxCDD	--	--	**20800**	**4210**	**2920**
1,2,3,7,8,9-HxCDD	--	--	**16600**	**3370**	**2260**
1,2,3,4,6,7,8-HpCDD	--	--	**145000 ***	**31200**	**22000**
OCDD	--	--	**104000 ***	**21900**	**30200**
Dioxin TEQ	2.2	5.2	**12200**	**2630**	**1760**
Chlorinated Dibenzofurans (CDFs)					
2,3,7,8-TCDF	--	--	**2980 F**	**702 F**	**399 F**
1,2,3,7,8-PeCDF	--	--	**2440**	**580**	**345**
2,3,4,7,8-PeCDF	--	--	**4390**	**730**	**371**
1,2,3,4,7,8-HxCDF	--	--	**1670 ***	**347 D,M,J**	**257 D,M,J**
1,2,3,6,7,8-HxCDF	--	--	**2130 D,M,*,J**	**495 D,M,J**	**330 D,M,J**
1,2,3,7,8,9-HxCDF	--	--	**934 ***	**173**	**114**
2,3,4,6,7,8-HxCDF	--	--	**3040 ***	**576**	**389**
1,2,3,4,6,7,8-HpCDF	--	--	**4240**	**780**	**721**
1,2,3,4,7,8,9-HpCDF	--	--	**1030**	**176**	**141**
OCDF	--	--	**1460**	**404**	**1510**
Furan TEQ	2.2	5.2	**2520**	**475**	**280**
Metals (mg/kg)					
Arsenic	7	7	**4.40**	**1.26**	**2.40**
Barium	102	--	**129**	**66.0**	**162**
Cadmium	4	0.77	**1.54**	**0.660**	**1.70**
Chromium (total)	48	48	**21.4 J**	**14.5 J**	**25.5 J**
Copper	50	36	**69.5 J**	**36.7 J**	**80.6 J**
Lead	50	24	**182 R**	**69.6**	**182 R**
Mercury	0.1	0.07	**1.15**	**0.938**	**0.812**
Nickel	30	--	**13.2 J**	**11.5 J**	**24.3 J**
Selenium	0.78	0.78	**0.790**	0.5 U	**0.540**
Silver	2	0.61	**6.55**	**1.65**	**3.62**
Zinc	86	85	**134 J**	**81.9 J**	**355 J**

Notes:

Bold = a detected concentration

Gray shading = a concentration that exceeds the Site-Specific Screening Level.

"--" = not established or not applicable.

U = the analyte was analyzed for, but was considered not detected at the reporting limit or reported value.

J = the analyte was detected above the reported quantitation limit, and the reported concentration was an estimated value.

UJ = the analyte was analyzed for, and the associated quantitation limit was an estimated value.

X = the sample chromatographic pattern does not resemble the fuel standard used for quantitation.

R = the sample results are unusable due to the quality of the data generated because certain criteria were not met.

* = the result is taken from dilution due to high dioxin/furan concentrations in the sample

F = analyte confirmation on secondary column

D = presence of diphenyl ethers

M = maximum possible concentration

mg/kg = milligrams per kilogram

pg/g = picograms per gram

TEQ = Toxicity equivalent quotient. TEQs for total cPAHs and total dioxins/furans were calculated using the methodology and the toxicity equivalency factors (TEFs) prescribed in Washington State Model Toxics Control Act (MTCA) and WAC 173-340-708(8)(e).

TCDD = tetrachloro dibenzo-p-dioxin

PeCDD = entachloro dibenzo-p-dioxin

HxCDD = hexachloro dibenzo-p-dioxin

HpCDD = heptachloro dibenzo-p-dioxin

OCDD = octachloro dibenzo-p-dioxin

TCDF = tetrachloro dibenzofuran

PeCDF = pentachloro dibenzofuran

HxCDF = hexachlorodibenzofuran

HpCDF = heptachloro dibenzofuran

OCDF = octachlorodibenzofuran

Table 2b. Surface Soil Characterization Data - TPH, Pesticides/Herbicides, PCBs, and SVOCs

Project No. 150074, City of Shelton, C Street Landfill, Shelton, WA

Decision Unit		DU-1	DU-2	DU-3
Sample Type		ISM	ISM	ISM
Sample Location		DU-1	DU-2	DU-3
Sample ID		ISM-DU1-072617	ISM-DU2-072617	ISM-DU3-072517
Sample Date		7/26/2017	7/26/2017	7/25/2017
Analyte (by group)	**Site-Specific Screening Levels**			
Petroleum Hydrocarbons (mg/kg)				
Gasoline Range Organics	100	2 U	2 U	**3.5**
Diesel Range Organics	200	50 U	50 U	50 U
Motor Oil Range Organics	2000	250 U	250 U	250 U
Organochlorine Pesticides (mg/kg)				
4,4'-DDD	4.17	0.0111 U	0.0107 U	0.0104 U
4,4'-DDE	2.94	0.0111 U	0.0107 U	0.0104 U
4,4'-DDT	2.94	**0.0163**	**0.0130**	**0.0166**
Aldrin	0.0588	0.0111 U	0.0107 U	0.0104 U
Alpha-BHC	6	0.0111 U	0.0107 U	0.0104 U
Beta-BHC	6	0.0111 U	0.0107 U	0.0104 U
cis-Chlordane	1	0.0111 U	0.0107 U	0.0104 U
Delta-BHC	6	0.0111 U	0.0107 U	0.0104 U
Dieldrin	0.1	0.0111 U	0.0107 U	0.0104 U
Endosulfan I	480	0.0111 U	0.0107 U	0.0104 U
Endosulfan II	480	0.0111 U	0.0107 U	0.0104 U
Endosulfan Sulfate	--	0.0111 U	0.0107 U	0.0104 U
Endrin	0.2	0.0111 U	0.0107 U	0.0104 U
Endrin Aldehyde	--	0.0111 U	0.0107 U	0.0104 U
Endrin ketone	--	0.0111 U	0.0107 U	0.0104 U
gamma-Chlordane	--	0.0111 U	0.0107 U	0.0104 U
Heptachlor	0.222	0.0111 U	0.0107 U	0.0104 U
Heptachlor Epoxide	0.11	0.0111 U	0.0107 U	0.0104 U
Lindane (gamma-BHC)	0.909	0.0111 U	0.0107 U	0.0104 U
Methoxychlor	400	0.0111 U	0.0107 U	0.0104 U
Total DDT/DDD/DDE	0.75	**0.0163**	**0.0130**	**0.0166**
Toxaphene	0.9	0.111 U	0.107 U	0.104 U
Chlorinated Herbicides (mg/kg)				
2,4,5-T	--	56.0 U	53.1 U	52.0 U
2,4,6-Trichlorophenol	10	0.5 U	0.5 U	1 U
2,4-D	--	33.6 U	31.9 U	31.2 U
2,4-DB	640000	28.0 U	26.6 U	26.0 U
3,5-Dichlorobenzoic acid	--	44.8 U	42.5 U	41.6 U
Acifluorfen	--	89.6 U	85.0 U	83.3 U
Bentazone	--	39.2 U	37.2 U	36.4 U
Chloramben	--	22.4 UJ	21.3 UJ	20.8 UJ
Chlorthal-dimethyl	--	33.6 U	31.9 U	31.2 U
Dalapon	2400000	224 U	213 U	208 U
Dicamba	2400000	39.2 U	37.2 U	36.4 U
Dichloroprop	--	28.0 U	26.6 U	26.0 U
Dinoseb	80000	33.6 U	31.9 U	31.2 U
MCPA	--	3140 U	2980 U	2910 U
MCPP	--	4930 U	4680 U	4580 U
Picloram	--	56.0 U	53.1 U	52.0 U
Silvex (2,4,5-TP)	640000	22.4 U	21.3 U	20.8 U
Polychlorinated Biphenyls (mg/kg)				
Aroclor 1016	5.6	0.2 U	0.2 U	0.2 U
Aroclor 1221	--	0.2 U	0.2 U	0.2 U
Aroclor 1232	--	0.2 U	0.2 U	0.2 U
Aroclor 1242	--	0.2 U	0.2 U	0.2 U
Aroclor 1248	--	0.2 U	0.2 U	0.2 U
Aroclor 1254	0.5	0.2 U	0.2 U	0.2 U
Aroclor 1260	0.5	0.2 U	0.2 U	0.2 U
Aroclor 1262	--	0.2 U	0.2 U	0.2 U
Aroclor 1268	--	0.2 U	0.2 U	0.2 U
Sum of Aroclors	0.5	0.2 U	0.2 U	0.2 U

Table 2b. Surface Soil Characterization Data - TPH, Pesticides/Herbicides, PCBs, and SVOCs

Project No. 150074, City of Shelton, C Street Landfill, Shelton, WA

Decision Unit		DU-1	DU-2	DU-3
Sample Type		ISM	ISM	ISM
Sample Location		DU-1	DU-2	DU-3
Sample ID		ISM-DU1-072617	ISM-DU2-072617	ISM-DU3-072517
Sample Date		7/26/2017	7/26/2017	7/25/2017
Analyte (by group)	**Site-Specific Screening Levels**			
Semi-Volatile Organic Compounds (SVOCs) (mg/kg)				
1,2,4-Trichlorobenzene	20	0.05 U	0.05 U	0.1 U
1,2-Dichlorobenzene	7200	0.05 U	0.05 U	0.1 U
1,3-Dichlorobenzene	--	0.05 U	0.05 U	0.1 U
1,4-Dichlorobenzene	20	**0.079**	0.05 U	0.1 U
2,4,5-Trichlorophenol	4	0.5 U	0.5 U	1 U
2,4-Dichlorophenol	240	0.5 U	0.5 U	1 U
2,4-Dimethylphenol	1600	0.5 U	0.5 U	1 U
2,4-Dinitrophenol	20	1.5 U	1.5 U	3 U
2,4-Dinitrotoluene	3.23	0.25 U	0.25 U	0.5 U
2,6-Dinitrotoluene	0.667	0.25 U	0.25 U	0.5 U
2-Chloronaphthalene	--	0.05 U	0.05 U	0.1 U
2-Chlorophenol	400	0.5 U	0.5 U	1 U
2-Methylphenol	4000	0.5 U	0.5 U	1 U
2-Nitroaniline	800	0.25 U	0.25 U	0.5 U
2-Nitrophenol	--	0.5 U	0.5 U	1 U
3 & 4 Methylphenol	--	1 U	1 U	2 U
3-Nitroaniline	--	5 U	5 U	10 U
4,6-Dinitro-2-methylphenol	--	1.5 U	1.5 U	3 U
4-Bromophenyl phenyl ether	--	0.05 U	0.05 U	0.1 U
4-Chloro-3-methylphenol	--	0.5 U	0.5 U	1 U
4-Chloroaniline	--	5 U	5 U	10 U
4-Chlorophenyl phenyl ether	--	0.05 U	0.05 U	0.1 U
4-Nitroaniline	--	5 U	5 U	10 U
4-Nitrophenol	--	1.5 U	1.5 U	3 U
Benzoic acid	320000	2.5 U	2.5 U	5 U
Benzyl alcohol	8000	0.5 U	0.5 U	1 U
Benzyl butyl phthalate	526	0.5 U	0.5 U	1 U
Bis(2-chloro-1-methylethyl) ether	--	0.05 U	0.05 U	0.1 U
Bis(2-chloroethoxy)methane	--	0.05 U	0.05 U	0.1 U
Bis(2-chloroethyl) ether	0.91	0.05 U	0.05 U	0.1 U
Bis(2-ethylhexyl) phthalate	71.4	**2.6 J**	0.8 U	1.6 U
Carbazole	--	0.5 U	0.5 U	1 U
Dibenzofuran	80	**0.12**	0.05 U	0.1 U
Diethyl phthalate	100	0.5 U	0.5 U	1 U
Dimethyl phthalate	200	0.5 U	0.5 U	1 U
Di-n-butyl phthalate	8000	0.5 U	0.5 U	1 U
Di-n-octyl phthalate	800	0.5 U	0.5 U	1 U
Hexachlorobenzene	0.625	0.05 U	0.05 U	0.1 U
Hexachlorobutadiene	13	0.05 U	0.05 U	0.1 U
Hexachlorocyclopentadiene	10	0.15 U	0.15 U	0.3 U
Hexachloroethane	25	0.05 U	0.05 U	0.1 U
Isophorone	1053	0.05 U	0.05 U	0.1 U
Nitrobenzene	40	0.05 U	0.05 U	0.1 U
N-Nitroso-di-n-propylamine	0.14	0.05 U	0.05 U	0.1 U
N-Nitrosodiphenylamine	20	0.05 U	0.05 U	0.1 U
Pentachlorophenol	2.5	0.5 U	0.5 U	1 U
Phenol	30	0.5 U	0.5 U	1 U

Notes:

Bold = a detected concentration

Gray shading = a concentration that exceeds the Site-Specific Screening Level.

"--" = not established or not applicable

U = the analyte was analyzed for, but was considered not detected at the reporting limit or reported value.

J = the analyte was detected above the reported quantitation limit, and the reported concentration was an estimated value.

UJ = the analyte was analyzed for, and the associated quantitation limit was an estimated value.

mg/kg = milligrams per kilogram

Table 2c. Surface Soil Characterization Data - VOCs

Project No.150074, City of Shelton, C Street Landfill, Shelton, WA

Decision Unit		DU-1			DU-2		DU-3	
Sample Type		Discrete	Discrete	Discrete	Discrete	Discrete	Discrete	Discrete
Sample Location		DU1-H3	DU1-G7	DU1-C2	DU2-L2	DU2-L7	DU3-P3	DU3-P7
Sample ID		DU2-G2-072617^	DU2-G7-072617^	DU2-C2-072617^	DU2-L2-072617	DU2-L7-072617	DU3-P3-072617	DU3-P7-072617
Sample Date		7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017	7/26/2017
Analyte (by group)	Site-Specific Screening Levels							
Petroleum Hydrocarbons (mg/kg)								
Gasoline Range Organics	100	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Volatile Organic Compounds (VOCs) (mg/kg)								
1,1,1,2-Tetrachloroethane	38	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1,1-Trichloroethane	160000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1,2,2-Tetrachloroethane	5	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1,2-Trichloroethane	18	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1-Dichloroethane	175	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1-Dichloroethene	4000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,1-Dichloropropene	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2,3-Trichlorobenzene	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,2,3-Trichloropropane	0.03	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2,4-Trichlorobenzene	20	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
1,2,4-Trimethylbenzene	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dibromo-3-chloropropane	1.3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (EDB)	0.5	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichlorobenzene	7200	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloroethane (EDC)	11	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,2-Dichloropropane	28	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,3,5-Trimethylbenzene	800	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,3-Dichlorobenzene	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,3-Dichloropropane	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
1,4-Dichlorobenzene	20	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
2,2-Dichloropropane	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
2-Butanone	48000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Chlorotoluene	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
2-Hexanone	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
4-Chlorotoluene	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
4-Methyl-2-pentanone	6400	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Acetone	72000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzene	18.2	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Bromobenzene	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Bromodichloromethane	16.1	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Bromoform	127	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Bromomethane	112	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon Tetrachloride	14	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chlorobenzene	40	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloroethane	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	32	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Chloromethane	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethene (DCE	160	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
cis-1,3-Dichloropropene	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Dibromochloromethane	11.9	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Dibromomethane	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Dichlorodifluoromethane	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	8000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Hexachlorobutadiene	13	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
Isopropylbenzene	8000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
m,p-Xylenes	16000	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Methyl tert-butyl ether (MTBE	556	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Methylene Chloride	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Naphthalene	1600	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
n-Hexane	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U
n-Propylbenzene	8000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
o-Xylene	16000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
p-Isopropyltoluene	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
sec-Butylbenzene	8000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Styrene	300	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
tert-Butylbenzene	8000	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Tetrachloroethene (PCE)	476	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U	0.025 U
Toluene	200	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	**0.059**	0.05 U
Total Xylenes	16000	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
trans-1,2-Dichloroethene	1600	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
trans-1,3-Dichloropropene	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Trichloroethene (TCE)	12	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U	0.02 U
Trichlorofluoromethane	24000	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Chloride	0.67	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U

Notes:

Bold = a detected concentration

Gray shading = a concentration that exceeds the Site-Specific Screening Level.

^Sample IDs for these samples were misspelled on the chain of custody and lab report dated September 8, 2017, and do not correlate with the actual sample location names indicated in this table and on the attached Figure 1.

"--" indicates not established or not applicable

U = the analyte was analyzed for, but was considered not detected at the reporting limit or reported value.

J = the analyte was detected above the reported quantitation limit, and the reported concentration was an estimated value.

UJ = the analyte was analyzed for, and the associated quantitation limit was an estimated value.

mg/kg = milligrams per kilogram

Table 3a. Groundwater Data - Geochemistry, TPH, and Metals

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-2	AMW-2	AMW-2	AMW-2	AMW-2
		Date	01/12/2018	01/12/2018	12/20/2018	04/01/2019	07/01/2019	07/01/2019	01/12/2018	12/20/2018	12/20/2018	04/01/2019	07/01/2019
		Sample Name	AMW-1-011218	AMW-5-011218	AMW-1-122018	AMW-1-040119	AMW-1-070119	AMW-5-070119	AMW-2-011218	AMW-2-122018	AMW-5-122018	AMW-2-040119	AMW-2-070119
		DTW (feet BTOC)	83.07	83.07	89.13	87.65	91.53	91.53	83.3	88.52	88.52	87.17	90.95
		Water Level Elevation (feet NAVD88)	72.83	72.83	66.77	68.25	64.37	64.37	72.24	67.02	67.02	68.37	64.59
Analyte (by group)	**Units**	**Site-Specific Screening Level**		(Field Duplicate)				(Field Duplicate)			(Field Duplicate)		
Field Parameters													
Temperature	deg C	ne	**10.1**	**10.1**	**10.1**	**10.0**	**11.9**	**11.9**	**10.1**	**9.90**	**9.90**	**10.2**	**11.8**
Specific Conductance	uS/cm	ne	**219.8**	**219.8**	**271.1**	**301.3**	**359.7**	**359.7**	**232.6**	**245.5**	**245.5**	**258.3**	**266.0**
Dissolved Oxygen	mg/L	ne	**2.67**	**2.67**	**5.22**	**5.30**	**0.760**	**0.760**	**0.260**	**0.230**	**0.230**	**3.30**	**3.01**
pH	pH units	ne	**6.81**	**6.81**	**6.45**	**6.22**	**6.28**	**6.28**	**6.91**	**6.83**	**6.83**	**6.47**	**6.47**
Oxidation Reduction Potential	mV	ne	**106.6**	**106.6**	**78.60**	**234.5**	**171.7**	**171.7**	**41.20**	**57.60**	**57.60**	**218.2**	**181.0**
Turbidity	NTU	ne	**2.73**	**2.73**	**4.68**	**4.88**	**12.8**	**12.8**	**1.47**	**0.930**	**0.930**	**4.66**	**15.2**
Geochecmical Indicator Parameters													
Alkalinity, Total	mg/L	ne	**112**	**110**	**129**	**150**	**166**	**176**	**114**	**124**	**121**	**120**	**121**
Ammonia as Nitrogen	mg/L	ne	0.100 U	0.100 U	0.100 U	0.100 UJ	0.100 UJ	0.100 UJ	0.100 U	0.100 U	0.100 U	0.100 UJ	0.100 UJ
Chloride	mg/L	250	**2.28**	**2.28**	**1.54**	**1.48**	**1.71**	**1.71**	**2.10**	**2.78**	**2.78**	**1.88**	**1.89**
Cyanide (total)	mg/L	0.0096	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Dissolved Organic Carbon	mg/L	ne	**18.1**	**17.0**	**2.11**	**2.33**	**5.34**	**5.69**	**21.6**	**12.0**	**12.0**	**5.49**	**6.40**
Nitrate as Nitrogen	mg/L	10	0.200 UJ	0.200 UJ	**2.64 E**	**1.86**	**0.634**	**0.649**	0.500 UJ	0.100 U	0.100 U	**0.235**	**0.576**
Nitrite as Nitrogen	mg/L	1	0.200 UJ	0.200 UJ	0.100 U	0.100 U	0.100 U	0.100 U	0.500 UJ	0.100 U	0.100 U	0.100 U	0.100 U
Sulfate	mg/L	250	**17.4**	**17.3**	**25.6**	**5.70**	**17.6**	**18.1**	**14.9**	**18.2**	**18.2**	**14.7**	**16.6**
Sulfide	mg/L	ne	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Total Petroleum Hydrocarbons													
Gasoline Range Organics	ug/L	1000	100 U	100 U	--	--	--	--	100 U	--	--	--	--
Diesel Range Organics	ug/L	500	50 U	50 U	50 U	50 U	**65 X**	50 U	50 U	50 U	50 U	50 U	**55 X**
Motor Oil Range Organics	ug/L	500	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U
Dissolved Metals													
Arsenic	ug/L	0.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.291**	**0.236**	**0.220**	0.2 U	0.2 U
Barium	ug/L	2000	**3.98**	**4.05**	**5.06**	**3.34**	**4.06**	**4.11**	**4.65**	**2.35**	**2.33**	**2.27**	**2.14**
Cadmium	ug/L	5	0.1 U	0.1 U	1 U	1 U	1 U	1 U	0.1 U	1 U	1 U	1 U	1 U
Calcium	ug/L	ne	**30300**	**31200**	**27100**	**33100**	**24300**	**24500**	**31700**	**35200**	**35500**	**26300**	**16300**
Chromium	ug/L	100	**0.699**	**0.744**	1 U	1 U	1 U	1 U	**0.909**	**1.40**	**1.34**	1 U	1 U
Copper	ug/L	640	**0.670**	**0.651**	5 U	5 U	5 U	5 U	**1.72**	5 U	5 U	5 U	5 U
Iron	ug/L	300	**114**	**111**	**114**	**113**	**114**	**115**	**463**	**231**	**226**	**118**	**127**
Lead	ug/L	15	0.1 U	0.1 U	1 U	1 U	1 U	1 U	0.1 U	1 U	1 U	1 U	1 U
Magnesium	ug/L	ne	**12400**	**12000**	**9780**	**13200**	**8650**	**8540**	**13900**	**14900**	**15000**	**11500**	**7100**
Manganese	ug/L	50	**58.1**	**58.6**	**14.2**	1 U	**24.8**	**24.9**	**1140**	**1880**	**1900**	**433**	**425**
Mercury	ug/L	2	0.1 U	0.1 U	1 U	1 U	1 U	1 U	0.1 U	1 U	1 U	1 U	1 U
Nickel	ug/L	100	**1.63**	**1.64**	**1.11**	**1.33**	**1.63**	**1.63**	**1.73**	**1.49**	**1.51**	**1.13**	**1.07**
Selenium	ug/L	50	0.5 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U
Silver	ug/L	80	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Sodium	ug/L	ne	**4940**	**4940**	**36900**	**8680**	**5910**	**5870**	**5330**	**4870**	**4590**	**5710**	**5140**
Zinc	ug/L	4800	4 U	4 U	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U

Table 3a. Groundwater Data - Geochemistry, TPH, and Metals

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-2	AMW-2	AMW-2	AMW-2	AMW-2
		Date	01/12/2018	01/12/2018	12/20/2018	04/01/2019	07/01/2019	07/01/2019	01/12/2018	12/20/2018	12/20/2018	04/01/2019	07/01/2019
		Sample Name	AMW-1-011218	AMW-5-011218	AMW-1-122018	AMW-1-040119	AMW-1-070119	AMW-5-070119	AMW-2-011218	AMW-2-122018	AMW-5-122018	AMW-2-040119	AMW-2-070119
		DTW (feet BTOC)	83.07	83.07	89.13	87.65	91.53	91.53	83.3	88.52	88.52	87.17	90.95
		Water Level Elevation (feet NAVD88)	72.83	72.83	66.77	68.25	64.37	64.37	72.24	67.02	67.02	68.37	64.59
Analyte (by group)	Units	Site-Specific Screening Level		(Field Duplicate)				(Field Duplicate)			(Field Duplicate)		
Total Metals													
Arsenic	ug/L	0.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	**0.310**	**0.248**	0.2 U	0.2 U	0.2 U
Barium	ug/L	2000	**4.69**	**4.66**	**5.22**	**3.44**	**4.79**	**4.91**	**5.05**	**2.52**	**2.37**	**2.38**	**4.04**
Cadmium	ug/L	5	0.1 U	0.1 U	1 U	1 U	1 U	1 U	0.1 U	1 U	1 U	1 U	1 U
Calcium	ug/L	ne	**30600**	**30100**	**25100**	**32300**	**23800**	**24200**	**30900**	**35600**	**37600**	**28400**	**15700**
Chromium	ug/L	100	**0.933**	**0.952**	**1.09**	1 U	1 U	1 U	**1.17**	**1.48**	**1.55**	1 U	**4.06**
Copper	ug/L	640	**1.08**	**1.06**	5 U	5 U	5 U	5 U	**2.26**	5 U	5 U	5 U	5 U
Iron	ug/L	300	**233**	**234**	**274**	**129**	**348**	**339**	**566**	**279**	**317**	**149**	**463**
Lead	ug/L	15	0.1 U	0.1 U	1 U	1 U	1 U	1 U	0.1 U	1 U	1 U	1 U	1 U
Magnesium	ug/L	ne	**12100**	**12400**	**9080**	**13000**	**8360**	**8420**	**13300**	**15400**	**16400**	**12500**	**6720**
Manganese	ug/L	50	**71.4**	**68.3**	**15.9**	**1.80**	**46.5**	**41.9**	**1250**	**1970**	**1910**	**464**	**759**
Mercury	ug/L	2	0.1 U	0.1 U	1 U	1 U	1 U	1 U	0.1 U	1 U	1 U	1 U	1 U
Nickel	ug/L	100	**1.86**	**1.93**	**1.19**	**1.35**	**2.22**	**2.22**	**1.82**	**1.56**	**1.61**	**1.25**	**5.43**
Selenium	ug/L	50	0.5 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U
Silver	ug/L	80	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Sodium	ug/L	ne	**4820**	**4510**	**38600**	**10100**	**7030**	**7420**	**4600**	**5020**	**5140**	**6040**	**5970**
Zinc	ug/L	4800	4 U	4 U	5 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U

Table 3a. Groundwater Data - Geochemistry, TPH, and Metals

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	AMW-3	AMW-3	AMW-3	AMW-3	AMW-4	AMW-4	AMW-4	AMW-4	AMW-4
		Date	01/12/2018	12/20/2018	04/01/2019	07/01/2019	01/12/2018	12/20/2018	04/01/2019	04/01/2019	07/01/2019
		Sample Name	AMW-3-011218	AMW-3-122018	AMW-3-040119	AMW-3-070119	AMW-4-011218	AMW-4-122018	AMW-4-040119	AMW-5-040119	AMW-4-070119
		DTW (feet BTOC)	100.1	104.97	104.83	107.75	81.22	86.56	85.19	85.19	88.98
		Water Level Elevation (feet NAVD88)	72.84	67.97	68.11	65.19	72.46	67.12	68.49	68.49	64.7
Analyte (by group)	**Units**	**Site-Specific Screening Level**								(Field Duplicate)	
Field Parameters											
Temperature	deg C	ne	**10.3**	**9.80**	**10.6**	**11.9**	**10.3**	**10.1**	**10.5**	**10.5**	**14.1**
Specific Conductance	uS/cm	ne	**252.2**	**465.4**	**770**	**830**	**730**	**504.4**	**900**	**900**	**870**
Dissolved Oxygen	mg/L	ne	**6.25**	**2.71**	**0.980**	**0.270**	**2.52**	**0.420**	**3.13**	**3.13**	**2.81**
pH	pH units	ne	**7.07**	**7.52**	**7.25**	**7.13**	**6.87**	**6.07**	**6.63**	**6.63**	**6.43**
Oxidation Reduction Potential	mV	ne	**146.7**	**68.70**	**204.4**	**173.4**	**191.4**	**116.7**	**224.7**	**224.7**	**213.8**
Turbidity	NTU	ne	**3.89**	**4.31**	**4.60**	**16.4**	**130**	**2.66**	**5.10**	**5.10**	**61.3**
Geochecmical Indicator Parameters											
Alkalinity, Total	mg/L	ne	**138**	**258**	**400**	**453**	**375**	**258**	**410**	**405**	**375**
Ammonia as Nitrogen	mg/L	ne	0.100 U	0.100 U	0.100 UJ	0.100 UJ	0.100 U	0.100 U	0.100 UJ	0.100 UJ	0.100 UJ
Chloride	mg/L	250	**1.91**	**2.24**	**2.61**	**2.89**	**5.46**	**3.92**	**5.12**	**4.99**	**5.44**
Cyanide (total)	mg/L	0.0096	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Dissolved Organic Carbon	mg/L	ne	**15.3**	**3.83**	**5.12**	**5.11**	**54.4**	**3.90**	**2.73**	**2.02**	**2.08**
Nitrate as Nitrogen	mg/L	10	**0.858 J**	**1.47**	**0.258**	**0.106**	**1.39 J**	**0.406**	**1.18**	**1.18**	**1.57**
Nitrite as Nitrogen	mg/L	1	0.100 UJ	0.200 U	0.200 U	0.100 U	1.00 UJ	0.200 U	0.500 U	0.500 U	0.500 U
Sulfate	mg/L	250	**14.0**	**29.3**	**36.8**	**42.2**	**55.7**	**44.9**	**69.4**	**66.2**	**71.4**
Sulfide	mg/L	ne	0.500 U	0.500 U	0.500 U	**1.56**	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Total Petroleum Hydrocarbons											
Gasoline Range Organics	ug/L	1000	100 U	--	--	--	100 U	--	--	--	--
Diesel Range Organics	ug/L	500	50 U	50 U	50 U	50 U	**60 X**	50 U	50 U	50 U	**100 X**
Motor Oil Range Organics	ug/L	500	250 U	250 U	250 U	250 U	250 U	250 U	250 U	250 U	**440**
Dissolved Metals											
Arsenic	ug/L	0.2	0.2 U	0.2 U	0.2 U	0.2 U	**0.240**	**0.230**	**0.319**	**0.278**	**0.236**
Barium	ug/L	2000	**2.40**	**4.58**	**5.75**	**5.26**	**25.3**	**18.6**	**31.4**	**29.2**	**30.8**
Cadmium	ug/L	5	0.1 U	1 U	1 U	1 U	0.1 U	1 U	1 U	1 U	1 U
Calcium	ug/L	ne	**30500**	**64500**	**82200**	**48500**	**67400**	**57800**	**77700**	**76700**	**43400**
Chromium	ug/L	100	**0.860**	1 U	1 U	1 U	**1.72**	**1.02**	**2.42**	**2.26**	**1.14**
Copper	ug/L	640	**0.883**	5 U	5 U	5 U	**2.98**	5 U	5 U	5 U	5 U
Iron	ug/L	300	**128**	**189**	**263**	**220**	**235**	**275**	**240**	**227**	**196**
Lead	ug/L	15	0.1 U	1 U	1 U	1 U	0.1 U	1 U	1 U	1 U	1 U
Magnesium	ug/L	ne	**17700**	**37200**	**50100**	**29700**	**22000**	**17900**	**23600**	**23300**	**13400**
Manganese	ug/L	50	**132**	**404**	**479**	**661**	**307**	**64.9**	**1.03**	1 U	**78.0**
Mercury	ug/L	2	0.1 U	1 U	1 U	1 U	0.1 U	1 U	1 U	1 U	1 U
Nickel	ug/L	100	**1.06**	**1.61**	**2.53**	**2.38**	**3.45**	**2.14**	**2.47**	**2.33**	**2.30**
Selenium	ug/L	50	0.5 U	1 U	1 U	1 U	**0.728**	1 U	1 U	1 U	1 U
Silver	ug/L	80	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Sodium	ug/L	ne	**3870**	**6190**	**8300**	**8190**	**76000**	**45200**	**90200**	**86300**	**61800**
Zinc	ug/L	4800	4 U	5 U	5 U	5 U	4 U	5 U	5 U	5 U	5 U

Table 3a. Groundwater Data - Geochemistry, TPH, and Metals

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	AMW-3	AMW-3	AMW-3	AMW-3	AMW-4	AMW-4	AMW-4	AMW-4	AMW-4
		Date	01/12/2018	12/20/2018	04/01/2019	07/01/2019	01/12/2018	12/20/2018	04/01/2019	04/01/2019	07/01/2019
		Sample Name	AMW-3-011218	AMW-3-122018	AMW-3-040119	AMW-3-070119	AMW-4-011218	AMW-4-122018	AMW-4-040119	AMW-5-040119	AMW-4-070119
		DTW (feet BTOC)	100.1	104.97	104.83	107.75	81.22	86.56	85.19	85.19	88.98
		Water Level Elevation (feet NAVD88)	72.84	67.97	68.11	65.19	72.46	67.12	68.49	68.49	64.7
Analyte (by group)	**Units**	**Site-Specific Screening Level**								(Field Duplicate)	
Total Metals											
Arsenic	ug/L	0.2	0.2 U	0.2 U	0.2 U	**0.207**	**0.665**	**0.225**	**0.344**	**0.339**	**0.718**
Barium	ug/L	2000	**2.86**	**6.91**	**6.37**	**12.1**	**42.7**	**19.6**	**33.8**	**31.0**	**55.2**
Cadmium	ug/L	5	0.1 U	1 U	1 U	1 U	0.1 U	1 U	1 U	1 U	1 U
Calcium	ug/L	ne	**29800**	**66000**	**83200**	**49500**	**75000**	**61000**	**78100**	**77500**	**43700**
Chromium	ug/L	100	**1.06**	**1.12**	1 U	1 U	**7.35**	**2.79**	**3.85**	**3.16**	**9.30**
Copper	ug/L	640	**1.08**	5 U	5 U	5 U	**9.27**	5 U	5 U	5 U	**10.4**
Iron	ug/L	300	**241**	**574**	**289**	**486**	**3250**	**1390**	**1180**	**860**	**5630**
Lead	ug/L	15	0.1 U	1 U	1 U	1 U	**0.334**	1 U	1 U	1 U	1 U
Magnesium	ug/L	ne	**16900**	**38700**	**51000**	**30300**	**23300**	**19200**	**24400**	**23800**	**13800**
Manganese	ug/L	50	**130**	**2560**	**757**	**2350**	**402**	**84**	**31.4 J**	**19.9 J**	**176**
Mercury	ug/L	2	0.1 U	1 U	1 U	1 U	0.1 U	1 U	1 U	1 U	1 U
Nickel	ug/L	100	**1.17**	**2.64**	**2.65**	**3.65**	**7.61**	**3.51**	**3.74**	**3.09**	**9.00**
Selenium	ug/L	50	0.5 U	1 U	1 U	1 U	**0.916**	1 U	1 U	1 U	1 U
Silver	ug/L	80	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Sodium	ug/L	ne	**3730**	**6770**	**9240**	**9840**	**73300**	**47600**	**98800**	**95200**	**60500**
Zinc	ug/L	4800	4 U	5 U	5 U	5 U	**5.46**	5 U	5 U	5 U	**9.83**

Notes:

Bold = a detected concentration

Gray shading indicates a concentration that exceeds the Site-Specific Screening Level

ne = not established or not applicable

"--" = not analyzed.

U = the analyte was analyzed for, but was considered not detected at the reporting limit or reported value.

J = the analyte was detected above the reported quantitation limit, and the reported concentration was an estimated value.

UJ = the analyte was analyzed for, and the associated quantitation limit was an estimated value.

X = the sample chromatographic pattern does not resemble the fuel standard used for quantitation.

E = the analyte result exceeded the calibration range and is considered an estimate.

mg/L = miligrams per liter

ug/L = micrograms per liter

deg C = degrees Celsius

uS/cm = microSiemens per centimeter

mV = millivolts

NTU = Nephelometric Turbidity Units

DTW = depth to water

BTOC = below top of casing

Table 3b. Groundwater Data - PAHs, SVOCs, and VOCs

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-2	AMW-2	AMW-2	AMW-2	AMW-2
		Date	01/12/2018	01/12/2018	12/20/2018	04/01/2019	07/01/2019	07/01/2019	01/12/2018	12/20/2018	12/20/2018	04/01/2019	07/01/2019
		Sample Name	AMW-1-011218	AMW-5-011218	AMW-1-122018	AMW-1-040119	AMW-1-070119	AMW-5-070119	AMW-2-011218	AMW-2-122018	AMW-5-122018	AMW-2-040119	AMW-2-070119
		DTW (feet BTOC)	83.07	83.07	89.13	87.65	91.53	91.53	83.3	88.52	88.52	87.17	90.95
		Water Level Elevation (feet NAVD88)	72.83	72.83	66.77	68.25	64.37	64.37	72.24	67.02	67.02	68.37	64.59
Analyte (by group)	**Units**	**Site-Specific Screening Level**		**(Field Duplicate)**				**(Field Duplicate)**			**(Field Duplicate)**		
Polycyclic Aromatic Hydrocarbons (PAHs)													
Non-Carcinogenic PAHs													
1-Methylnaphthalene	ug/L	1.51	0.01 U	0.01 U	--	--	--	--	0.01 U	--	--	--	--
2-Methylnaphthalene	ug/L	32	0.01 U	0.01 U	--	--	--	--	0.01 U	--	--	--	--
Acenaphthene	ug/L	960	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acenaphthylene	ug/L	ne	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Anthracene	ug/L	4800	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(g,h,i)perylene	ug/L	ne	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Fluoranthene	ug/L	640	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.014**	0.01 U	0.01 U	0.01 U	0.01 U
Fluorene	ug/L	640	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Naphthalene	ug/L	160	**0.036**	**0.035**	0.1 U	0.1 U	0.1 U	0.1 U	**0.037**	0.1 U	**0.14**	0.1 U	0.1 U
Phenanthrene	ug/L	ne	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.021**	0.01 U	0.01 U	0.01 U	0.01 U
Pyrene	ug/L	480	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	**0.018**	0.01 U	0.01 U	0.01 U	0.01 U
Carcinogenic PAHs (cPAHs)													
Benz(a)anthracene	ug/L	0.12	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(a)pyrene	ug/L	0.012	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(b)fluoranthene	ug/L	0.12	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(k)fluoranthene	ug/L	1.2	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chrysene	ug/L	12	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dibenzo(a,h)anthracene	ug/L	0.012	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Indeno(1,2,3-cd)pyrene	ug/L	0.12	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total cPAHs TEQ (ND = 1/2 RDL)	ug/L	0.012	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Semivolatile Organic Compounds (SVOCs)													
4-Nitrophenol	ug/L	ne	0.748 UJ	0.749 UJ	--	--	--	--	0.749 UJ	--	--	--	--
2,4,5-Trichlorophenol	ug/L	800	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
2,4-Dichlorophenol	ug/L	24	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
2,4-Dimethylphenol	ug/L	160	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
2,4-Dinitrophenol	ug/L	32	1.5 U	1.5 U	--	--	--	--	1.5 U	--	--	--	--
2,4-Dinitrotoluene	ug/L	1	0.25 U	0.25 U	--	--	--	--	0.25 U	--	--	--	--
2,6-Dinitrotoluene	ug/L	1	0.25 U	0.25 U	--	--	--	--	0.25 U	--	--	--	--
2-Chloronaphthalene	ug/L	ne	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--
2-Chlorophenol	ug/L	40	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
2-Methylphenol	ug/L	400	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
2-Nitroaniline	ug/L	160	0.25 U	0.25 U	--	--	--	--	0.25 U	--	--	--	--
2-Nitrophenol	ug/L	ne	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
3 & 4 Methylphenol	ug/L	ne	1 U	1 U	--	--	--	--	1 U	--	--	--	--
3-Nitroaniline	ug/L	ne	5 U	5 U	--	--	--	--	5 U	--	--	--	--
4,6-Dinitro-2-methylphenol	ug/L	ne	1.5 U	1.5 U	--	--	--	--	1.5 U	--	--	--	--
4-Bromophenyl phenyl ether	ug/L	ne	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--
4-Chloro-3-methylphenol	ug/L	ne	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--

Table 3b. Groundwater Data - PAHs, SVOCs, and VOCs

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-2	AMW-2	AMW-2	AMW-2	AMW-2
		Date	01/12/2018	01/12/2018	12/20/2018	04/01/2019	07/01/2019	07/01/2019	01/12/2018	12/20/2018	12/20/2018	04/01/2019	07/01/2019
		Sample Name	AMW-1-011218	AMW-5-011218	AMW-1-122018	AMW-1-040119	AMW-1-070119	AMW-5-070119	AMW-2-011218	AMW-2-122018	AMW-5-122018	AMW-2-040119	AMW-2-070119
		DTW (feet BTOC)	83.07	83.07	89.13	87.65	91.53	91.53	83.3	88.52	88.52	87.17	90.95
		Water Level Elevation (feet NAVD88)	72.83	72.83	66.77	68.25	64.37	64.37	72.24	67.02	67.02	68.37	64.59
Analyte (by group)	**Units**	**Site-Specific Screening Level**		(Field Duplicate)				(Field Duplicate)			(Field Duplicate)		
4-Chloroaniline	ug/L	ne	5 U	5 U	--	--	--	--	5 U	--	--	--	--
4-Chlorophenyl phenyl ether	ug/L	ne	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--
4-Nitroaniline	ug/L	ne	5 U	5 U	--	--	--	--	5 U	--	--	--	--
Benzoic acid	ug/L	64000	2.5 U	2.5 U	--	--	--	--	2.5 U	--	--	--	--
Benzyl alcohol	ug/L	800	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
Benzyl butyl phthalate	ug/L	46	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
Bis(2-chloro-1-methylethyl) ether	ug/L	ne	**0.05 J**	**0.052 J**	--	--	--	--	**0.061 J**	--	--	--	--
Bis(2-chloroethoxy)methane	ug/L	ne	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--
Bis(2-chloroethyl) ether	ug/L	1	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--
Bis(2-ethylhexyl) phthalate	ug/L	6	0.8 U	0.8 U	--	--	--	--	0.8 U	--	--	--	--
Carbazole	ug/L	ne	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
Dibenzofuran	ug/L	16	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--
Diethyl phthalate	ug/L	12800	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
Dimethyl phthalate	ug/L	ne	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
Di-n-butyl phthalate	ug/L	1600	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
Di-n-octyl phthalate	ug/L	160	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
Hexachlorobenzene	ug/L	0.0547	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--
Hexachlorobutadiene	ug/L	0.56	0.05 U	0.05 U	0.2 U	0.2 U	0.2 U	0.2 U	0.05 U	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorocyclopentadiene	ug/L	48	0.15 U	0.15 U	--	--	--	--	0.15 U	--	--	--	--
Hexachloroethane	ug/L	1.1	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--
Isophorone	ug/L	46	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--
Nitrobenzene	ug/L	16	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--
N-Nitroso-di-n-propylamine	ug/L	1	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--
N-Nitrosodiphenylamine	ug/L	17.9	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--
Pentachlorophenol	ug/L	10	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
Phenol	ug/L	2400	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--
Volatile Organic Compounds (VOCs)													
1,1,1,2-Tetrachloroethane	ug/L	1.7	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	ug/L	200	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	ug/L	0.22	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane	ug/L	0.77	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane	ug/L	7.68	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	ug/L	7	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	ug/L	ne	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	ug/L	ne	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,2,3-Trichloropropane	ug/L	0.5	0.5 U	0.5 U	0.2 U	0.2 U	0.2 U	0.2 U	0.5 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,4-Trichlorobenzene	ug/L	1.5	0.05 U	0.05 U	1 U	1 U	1 U	1 U	0.05 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	ug/L	ne	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	ug/L	0.5	0.5 U	0.5 U	2 U	2 U	2 U	2 U	0.5 U	2 U	2 U	2 U	2 U
1,2-Dibromoethane (EDB)	ug/L	0.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene	ug/L	600	0.05 U	0.05 U	1 U	1 U	1 U	1 U	0.05 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane (EDC)	ug/L	0.48	0.5 U	0.5 U	0.2 U	0.2 U	0.2 U	0.2 U	0.5 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane	ug/L	1.2	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	ug/L	80	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	ug/L	ne	0.05 U	0.05 U	1 U	1 U	1 U	1 U	0.05 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	ug/L	ne	0.2 U	0.2 U	1 U	1 UJ	1 UJ	1 UJ	0.2 U	1 U	1 U	1 UJ	1 UJ
1,4-Dichlorobenzene	ug/L	8.1	0.05 U	0.05 U	1 U	1 U	1 U	1 U	0.05 U	1 U	1 U	1 U	1 U

Table 3b. Groundwater Data - PAHs, SVOCs, and VOCs

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-2	AMW-2	AMW-2	AMW-2	AMW-2
		Date	01/12/2018	01/12/2018	12/20/2018	04/01/2019	07/01/2019	07/01/2019	01/12/2018	12/20/2018	12/20/2018	04/01/2019	07/01/2019
		Sample Name	AMW-1-011218	AMW-5-011218	AMW-1-122018	AMW-1-040119	AMW-1-070119	AMW-5-070119	AMW-2-011218	AMW-2-122018	AMW-5-122018	AMW-2-040119	AMW-2-070119
		DTW (feet BTOC)	83.07	83.07	89.13	87.65	91.53	91.53	83.3	88.52	88.52	87.17	90.95
		Water Level Elevation (feet NAVD88)	72.83	72.83	66.77	68.25	64.37	64.37	72.24	67.02	67.02	68.37	64.59
Analyte (by group)	**Units**	**Site-Specific Screening Level**		(Field Duplicate)				(Field Duplicate)			(Field Duplicate)		
2,2-Dichloropropane	ug/L	ne	0.5 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U
2-Butanone	ug/L	4800	2 U	2 U	10 U	10 U	10 U	10 U	2 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	ug/L	ne	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
2-Hexanone	ug/L	ne	2 U	2 U	10 U	10 U	10 U	10 U	2 U	10 U	10 U	10 U	10 U
4-Chlorotoluene	ug/L	ne	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
4-Methyl-2-pentanone	ug/L	640	2 U	2 U	10 U	10 U	10 U	10 U	2 U	10 U	10 U	10 U	10 U
Acetone	ug/L	7200	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Benzene	ug/L	0.8	0.2 U	0.2 U	0.35 U	0.35 U	0.35 U	0.35 U	0.2 U	0.35 U	0.35 U	0.35 U	0.35 U
Bromobenzene	ug/L	ne	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Bromodichloromethane	ug/L	0.71	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform	ug/L	5.5	0.5 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U
Bromomethane	ug/L	11.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	ug/L	0.63	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chlorobenzene	ug/L	100	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Chloroethane	ug/L	ne	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	ug/L	1.4	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Chloromethane	ug/L	ne	0.5 U	0.5 U	10 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene (DCE)	ug/L	16	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	ug/L	ne	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromochloromethane	ug/L	0.52	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromomethane	ug/L	ne	0.5 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	ug/L	ne	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	ug/L	700	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Isopropylbenzene	ug/L	800	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
m,p-Xylenes	ug/L	1600	0.4 U	0.4 U	2 U	2 U	2 U	2 U	0.4 U	2 U	2 U	2 U	2 U
Methyl tert-butyl ether (MTBE)	ug/L	24.3	0.5 U	0.5 U	1 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U
Methylene Chloride	ug/L	ne	1 U	1 U	5 U	5 U	5 U	5 U	1 U	5 U	5 U	5 U	5 U
n-Hexane	ug/L	ne	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
n-Propylbenzene	ug/L	800	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
o-Xylene	ug/L	1600	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
p-Isopropyltoluene	ug/L	ne	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
sec-Butylbenzene	ug/L	800	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Styrene	ug/L	100	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	ug/L	800	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Tetrachloroethene (PCE)	ug/L	5	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Toluene	ug/L	640	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Total Xylenes	ug/L	1600	0.4 U	0.4 U	2 U	2 U	2 U	2 U	0.4 U	2 U	2 U	2 U	2 U
trans-1,2-Dichloroethene	ug/L	100	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	ug/L	ne	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethene (TCE)	ug/L	0.54	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane	ug/L	2400	0.2 U	0.2 U	1 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Vinyl Chloride	ug/L	0.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Table 3b. Groundwater Data - PAHs, SVOCs, and VOCs

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	AMW-3	AMW-3	AMW-3	AMW-3	AMW-4	AMW-4	AMW-4	AMW-4	AMW-4
		Date	01/12/2018	12/20/2018	04/01/2019	07/01/2019	01/12/2018	12/20/2018	04/01/2019	04/01/2019	07/01/2019
		Sample Name	AMW-3-011218	AMW-3-122018	AMW-3-040119	AMW-3-070119	AMW-4-011218	AMW-4-122018	AMW-4-040119	AMW-5-040119	AMW-4-070119
		DTW (feet BTOC)	100.1	104.97	104.83	107.75	81.22	86.56	85.19	85.19	88.98
		Water Level Elevation (feet NAVD88)	72.84	67.97	68.11	65.19	72.46	67.12	68.49	68.49	64.7
Analyte (by group)	**Units**	**Site-Specific Screening Level**								(Field Duplicate)	
Polycyclic Aromatic Hydrocarbons (PAHs)											
Non-Carcinogenic PAHs											
1-Methylnaphthalene	ug/L	1.51	0.01 U	--	--	--	0.01 U	--	--	--	--
2-Methylnaphthalene	ug/L	32	0.01 U	--	--	--	0.01 U	--	--	--	--
Acenaphthene	ug/L	960	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Acenaphthylene	ug/L	ne	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Anthracene	ug/L	4800	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(g,h,i)perylene	ug/L	ne	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Fluoranthene	ug/L	640	0.01 U	0.01 U	0.01 U	0.01 U	**0.010**	0.01 U	0.01 U	0.01 U	0.01 U
Fluorene	ug/L	640	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Naphthalene	ug/L	160	**0.093**	0.1 U	0.1 U	**0.15**	**0.053**	0.1 U	0.1 U	0.1 U	0.1 U
Phenanthrene	ug/L	ne	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Pyrene	ug/L	480	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Carcinogenic PAHs (cPAHs)											
Benz(a)anthracene	ug/L	0.12	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(a)pyrene	ug/L	0.012	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(b)fluoranthene	ug/L	0.12	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Benzo(k)fluoranthene	ug/L	1.2	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Chrysene	ug/L	12	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Dibenzo(a,h)anthracene	ug/L	0.012	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Indeno(1,2,3-cd)pyrene	ug/L	0.12	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Total cPAHs TEQ (ND = 1/2 RDL)	ug/L	0.012	nd	nd	nd	nd	nd	nd	nd	nd	nd
Semivolatile Organic Compounds (SVOCs)											
4-Nitrophenol	ug/L	ne	0.749 UJ	--	--	--	0.749 UJ	--	--	--	--
2,4,5-Trichlorophenol	ug/L	800	0.5 U	--	--	--	0.5 U	--	--	--	--
2,4-Dichlorophenol	ug/L	24	0.5 U	--	--	--	0.5 U	--	--	--	--
2,4-Dimethylphenol	ug/L	160	0.5 U	--	--	--	0.5 U	--	--	--	--
2,4-Dinitrophenol	ug/L	32	1.5 U	--	--	--	1.5 U	--	--	--	--
2,4-Dinitrotoluene	ug/L	1	0.25 U	--	--	--	0.25 U	--	--	--	--
2,6-Dinitrotoluene	ug/L	1	0.25 U	--	--	--	0.25 U	--	--	--	--
2-Chloronaphthalene	ug/L	ne	0.05 U	--	--	--	0.05 U	--	--	--	--
2-Chlorophenol	ug/L	40	0.5 U	--	--	--	0.5 U	--	--	--	--
2-Methylphenol	ug/L	400	0.5 U	--	--	--	0.5 U	--	--	--	--
2-Nitroaniline	ug/L	160	0.25 U	--	--	--	0.25 U	--	--	--	--
2-Nitrophenol	ug/L	ne	0.5 U	--	--	--	0.5 U	--	--	--	--
3 & 4 Methylphenol	ug/L	ne	1 U	--	--	--	1 U	--	--	--	--
3-Nitroaniline	ug/L	ne	5 U	--	--	--	5 U	--	--	--	--
4,6-Dinitro-2-methylphenol	ug/L	ne	1.5 U	--	--	--	1.5 U	--	--	--	--
4-Bromophenyl phenyl ether	ug/L	ne	0.05 U	--	--	--	0.05 U	--	--	--	--
4-Chloro-3-methylphenol	ug/L	ne	0.5 U	--	--	--	0.5 U	--	--	--	--

Table 3b. Groundwater Data - PAHs, SVOCs, and VOCs

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	AMW-3	AMW-3	AMW-3	AMW-3	AMW-4	AMW-4	AMW-4	AMW-4	AMW-4
		Date	01/12/2018	12/20/2018	04/01/2019	07/01/2019	01/12/2018	12/20/2018	04/01/2019	04/01/2019	07/01/2019
		Sample Name	AMW-3-011218	AMW-3-122018	AMW-3-040119	AMW-3-070119	AMW-4-011218	AMW-4-122018	AMW-4-040119	AMW-5-040119	AMW-4-070119
		DTW (feet BTOC)	100.1	104.97	104.83	107.75	81.22	86.56	85.19	85.19	88.98
		Water Level Elevation (feet NAVD88)	72.84	67.97	68.11	65.19	72.46	67.12	68.49	68.49	64.7
Analyte (by group)	**Units**	**Site-Specific Screening Level**								(Field Duplicate)	
4-Chloroaniline	ug/L	ne	5 U	--	--	--	5 U	--	--	--	--
4-Chlorophenyl phenyl ether	ug/L	ne	0.05 U	--	--	--	0.05 U	--	--	--	--
4-Nitroaniline	ug/L	ne	5 U	--	--	--	5 U	--	--	--	--
Benzoic acid	ug/L	64000	2.5 U	--	--	--	2.5 U	--	--	--	--
Benzyl alcohol	ug/L	800	0.5 U	--	--	--	0.5 U	--	--	--	--
Benzyl butyl phthalate	ug/L	46	0.5 U	--	--	--	0.5 U	--	--	--	--
Bis(2-chloro-1-methylethyl) ether	ug/L	ne	**0.053 J**	--	--	--	0.05 U	--	--	--	--
Bis(2-chloroethoxy)methane	ug/L	ne	0.05 U	--	--	--	0.05 U	--	--	--	--
Bis(2-chloroethyl) ether	ug/L	1	0.05 U	--	--	--	0.05 U	--	--	--	--
Bis(2-ethylhexyl) phthalate	ug/L	6	0.8 U	--	--	--	0.8 U	--	--	--	--
Carbazole	ug/L	ne	0.5 U	--	--	--	0.5 U	--	--	--	--
Dibenzofuran	ug/L	16	0.05 U	--	--	--	0.05 U	--	--	--	--
Diethyl phthalate	ug/L	12800	0.5 U	--	--	--	0.5 U	--	--	--	--
Dimethyl phthalate	ug/L	ne	0.5 U	--	--	--	0.5 U	--	--	--	--
Di-n-butyl phthalate	ug/L	1600	0.5 U	--	--	--	0.5 U	--	--	--	--
Di-n-octyl phthalate	ug/L	160	0.5 U	--	--	--	0.5 U	--	--	--	--
Hexachlorobenzene	ug/L	0.0547	0.05 U	--	--	--	0.05 U	--	--	--	--
Hexachlorobutadiene	ug/L	0.56	0.05 U	0.2 U	0.2 U	0.2 U	0.05 U	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorocyclopentadiene	ug/L	48	0.15 U	--	--	--	0.15 U	--	--	--	--
Hexachloroethane	ug/L	1.1	0.05 U	--	--	--	0.05 U	--	--	--	--
Isophorone	ug/L	46	0.05 U	--	--	--	0.05 U	--	--	--	--
Nitrobenzene	ug/L	16	0.05 U	--	--	--	0.05 U	--	--	--	--
N-Nitroso-di-n-propylamine	ug/L	1	0.05 U	--	--	--	0.05 U	--	--	--	--
N-Nitrosodiphenylamine	ug/L	17.9	0.05 U	--	--	--	0.05 U	--	--	--	--
Pentachlorophenol	ug/L	10	0.5 U	--	--	--	0.5 U	--	--	--	--
Phenol	ug/L	2400	0.5 U	--	--	--	0.5 U	--	--	--	--
Volatile Organic Compounds (VOCs)											
1,1,1,2-Tetrachloroethane	ug/L	1.7	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	ug/L	200	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	ug/L	0.22	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane	ug/L	0.77	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane	ug/L	7.68	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	ug/L	7	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	ug/L	ne	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	ug/L	ne	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,2,3-Trichloropropane	ug/L	0.5	0.5 U	0.2 U	0.2 U	0.2 U	0.5 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,4-Trichlorobenzene	ug/L	1.5	0.05 U	1 U	1 U	1 U	0.05 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	ug/L	ne	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	ug/L	0.5	0.5 U	2 U	2 U	2 U	0.5 U	2 U	2 U	2 U	2 U
1,2-Dibromoethane (EDB)	ug/L	0.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene	ug/L	600	0.05 U	1 U	1 U	1 U	0.05 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane (EDC)	ug/L	0.48	0.5 U	0.2 U	0.2 U	0.2 U	0.5 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane	ug/L	1.2	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	ug/L	80	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	ug/L	ne	0.05 U	1 U	1 U	1 U	0.05 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	ug/L	ne	0.2 U	1 U	1 UJ	1 UJ	0.2 U	1 U	1 UJ	1 UJ	1 UJ
1,4-Dichlorobenzene	ug/L	8.1	0.05 U	1 U	1 U	1 U	0.05 U	1 U	1 U	1 U	1 U

Table 3b. Groundwater Data - PAHs, SVOCs, and VOCs

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	AMW-3	AMW-3	AMW-3	AMW-3	AMW-4	AMW-4	AMW-4	AMW-4	AMW-4
		Date	01/12/2018	12/20/2018	04/01/2019	07/01/2019	01/12/2018	12/20/2018	04/01/2019	04/01/2019	07/01/2019
		Sample Name	AMW-3-011218	AMW-3-122018	AMW-3-040119	AMW-3-070119	AMW-4-011218	AMW-4-122018	AMW-4-040119	AMW-5-040119	AMW-4-070119
		DTW (feet BTOC)	100.1	104.97	104.83	107.75	81.22	86.56	85.19	85.19	88.98
		Water Level Elevation (feet NAVD88)	72.84	67.97	68.11	65.19	72.46	67.12	68.49	68.49	64.7
Analyte (by group)	**Units**	**Site-Specific Screening Level**								**(Field Duplicate)**	
2,2-Dichloropropane	ug/L	ne	0.5 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U
2-Butanone	ug/L	4800	2 U	10 U	10 U	10 U	2 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	ug/L	ne	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
2-Hexanone	ug/L	ne	2 U	10 U	10 U	10 U	2 U	10 U	10 U	10 U	10 U
4-Chlorotoluene	ug/L	ne	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
4-Methyl-2-pentanone	ug/L	640	2 U	10 U	10 U	10 U	2 U	10 U	10 U	10 U	10 U
Acetone	ug/L	7200	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Benzene	ug/L	0.8	0.2 U	0.35 U	0.35 U	0.35 U	0.2 U	0.35 U	0.35 U	0.35 U	0.35 U
Bromobenzene	ug/L	ne	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Bromodichloromethane	ug/L	0.71	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform	ug/L	5.5	0.5 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U
Bromomethane	ug/L	11.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Tetrachloride	ug/L	0.63	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chlorobenzene	ug/L	100	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Chloroethane	ug/L	ne	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	ug/L	1.4	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Chloromethane	ug/L	ne	0.5 U	10 U	10 U	10 U	0.5 U	10 U	10 U	10 U	10 U
cis-1,2-Dichloroethene (DCE)	ug/L	16	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	ug/L	ne	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromochloromethane	ug/L	0.52	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromomethane	ug/L	ne	0.5 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane	ug/L	ne	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	ug/L	700	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Isopropylbenzene	ug/L	800	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
m,p-Xylenes	ug/L	1600	0.4 U	2 U	2 U	2 U	0.4 U	2 U	2 U	2 U	2 U
Methyl tert-butyl ether (MTBE)	ug/L	24.3	0.5 U	1 U	1 U	1 U	0.5 U	1 U	1 U	1 U	1 U
Methylene Chloride	ug/L	ne	1 U	5 U	5 U	5 U	1 U	5 U	5 U	5 U	5 U
n-Hexane	ug/L	ne	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
n-Propylbenzene	ug/L	800	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
o-Xylene	ug/L	1600	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
p-Isopropyltoluene	ug/L	ne	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
sec-Butylbenzene	ug/L	800	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Styrene	ug/L	100	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	ug/L	800	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Tetrachloroethene (PCE)	ug/L	5	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Toluene	ug/L	640	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Total Xylenes	ug/L	1600	0.4 U	2 U	2 U	2 U	0.4 U	2 U	2 U	2 U	2 U
trans-1,2-Dichloroethene	ug/L	100	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	ug/L	ne	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichloroethene (TCE)	ug/L	0.54	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane	ug/L	2400	0.2 U	1 U	1 U	1 U	0.2 U	1 U	1 U	1 U	1 U
Vinyl Chloride	ug/L	0.2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Notes:

Bold = a detected concentration
Gray shading = a concentration that exceeds the Site-Specific Screening Level
ne = indicates not established or not applicable
U = the analyte was analyzed for, but was considered not detected at the reporting limit or reported value.
J = the analyte was detected above the reported quantitation limit, and the reported concentration was an estimated value.
UJ = the analyte was analyzed for, and the associated quantitation limit was an estimated value.
X = the sample chromatographic pattern does not resemble the fuel standard used for quantitation.

"--" = not analyzed.
DTW = depth to water
BTOC = below top of casing
nd = not detected
ug/L = micrograms per liter

Table 3c. Groundwater Data - Dioxins/Furans, Pesticides/Herbicides, and PCBs

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-2	AMW-2	AMW-2	AMW-2	AMW-2
		Date	01/12/2018	01/12/2018	12/20/2018	04/01/2019	07/01/2019	07/01/2019	01/12/2018	12/20/2018	12/20/2018	04/01/2019	07/01/2019
		Sample Name	AMW-1-011218	AMW-5-011218	AMW-1-122018	AMW-1-040119	AMW-1-070119	AMW-5-070119	AMW-2-011218	AMW-2-122018	AMW-5-122018	AMW-2-040119	AMW-2-070119
		DTW (feet BTOC)	83.07	83.07	89.13	87.65	91.53	91.53	83.3	88.52	88.52	87.17	90.95
		Water Level Elevation (feet NAVD88)	72.83	72.83	66.77	68.25	64.37	64.37	72.24	67.02	67.02	68.37	64.59
Analyte (by group)	Units	Site-Specific Screening Level		(Field Duplicate)				(Field Duplicate)			(Field Duplicate)		
Dioxins/Furans													
Chlorinated di-benzi-p-dioxins (CDDs)													
2,3,7,8-TCDD	pg/L	30	0.510 U	0.795 U	1.13 U	1.2 U	0.967 U	0.977 U	0.692 U	1.06 U	0.790 U	1.61 U	0.931 U
1,2,3,7,8-PeCDD	pg/L	ne	1.02 U	1.36 U	1.74 U	1.96 U	1.43 U	1.84 U	1.64 U	1.98 U	1.71 U	3.89 U	1.51 U
1,2,3,4,7,8-HxCDD	pg/L	ne	1.36 U	1.90 U	2.05 U	3.54 U	1.38 U	1.88 U	1.87 U	2.92 U	2.34 U	3.69 U	2.13 U
1,2,3,6,7,8-HxCDD	pg/L	ne	1.45 U	1.93 U	1.89 U	3.87 U	1.44 U	1.96 U	1.88 U	3.13 U	2.63 U	3.88 U	2.31 U
1,2,3,7,8,9-HxCDD	pg/L	ne	1.36 U	1.85 U	1.84 U	3.49 U	1.32 U	1.8 U	1.82 U	2.83 U	2.32 U	3.56 U	2.08 U
1,2,3,4,6,7,8-HpCDD	pg/L	ne	2.29 U	2.62 U	3.62 U	3.76 U	2.7 U	3.28 U	3.18 U	3.60 U	3.98 U	4.06 U	4.18 U
OCDD	pg/L	ne	5.81 U	5.81 U	4.66 U	4.82 U	6.31 U	5.6 U	**22.2 J**	**11.4 J**	**10.6 J**	6.91 U	**19.7 J**
Total CDD TEQ (ND = 1/2 RDL)	pg/L	30	nd	nd	nd	nd	nd	nd	**1.47 J**	**1.99 J**	**1.64 J**	nd	**1.57 J**
Chlorinated dibenzofurans (CDFs)													
2,3,7,8-TCDF	pg/L	ne	0.499 U	0.883 U	0.797 U	1.45 U	0.803 U	0.914 U	0.856 U	0.988 U	0.965 U	2.03 U	0.811 U
1,2,3,7,8-PeCDF	pg/L	ne	0.656 U	1.06 U	1.75 U	2.22 U	0.86 U	1.1 U	0.781 U	2.17 U	1.51 U	3.04 U	0.961 U
2,3,4,7,8-PeCDF	pg/L	ne	0.688 U	1.04 U	1.82 U	2.26 U	0.805 U	1.11 U	0.842 U	2.33 U	1.58 U	2.91 U	0.875 U
1,2,3,4,7,8-HxCDF	pg/L	ne	0.819 U	0.827 U	1.99 U	1.57 U	0.767 U	1.01 U	1.23 U	1.92 U	1.56 U	1.79 U	0.857 U
1,2,3,6,7,8-HxCDF	pg/L	ne	0.845 U	0.867 U	2.11 U	1.58 U	0.875 U	1.11 U	1.24 U	1.95 U	1.63 U	1.96 U	1.01 U
1,2,3,7,8,9-HxCDF	pg/L	ne	1.14 U	1.21 U	2.31 U	2.17 U	1.07 U	1.34 U	1.71 U	2.18 U	1.65 U	2.58 U	1.25 U
2,3,4,6,7,8-HxCDF	pg/L	ne	0.873 U	0.901 U	2.62 U	1.73 U	0.899 U	1.13 U	1.41 U	2.91 U	2.26 U	2.01 U	0.998 U
1,2,3,4,6,7,8-HpCDF	pg/L	ne	0.929 U	1.43 U	2.65 U	1.96 U	1.14 U	1.53 U	1.52 U	2.74 U	2.15 U	1.76 U	1.5 U
1,2,3,4,7,8,9-HpCDF	pg/L	ne	1.23 U	1.92 U	2.36 U	2.59 U	1.41 U	1.65 U	2.16 U	3.42 U	2.68 U	2.42 U	1.63 U
OCDF	pg/L	ne	1.48 U	2.29 U	3.30 U	4.97 U	2.1 U	2.78 U	3.22 U	4.86 U	4.33 U	5 U	3.35 U
Total CDF TEQ (ND = 1/2 RDL)	pg/L	30	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Organochlorine Pesticides													
4,4'-DDD	ug/L	0.365	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
4,4'-DDE	ug/L	0.257	0.025 U	0.025 U	--	--	--	--	0.025 U	--	--	--	--
4,4'-DDT	ug/L	0.257	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Aldrin	ug/L	0.005	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Alpha-BHC	ug/L	ne	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Beta-BHC	ug/L	ne	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
cis-Chlordane	ug/L	ne	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Delta-BHC	ug/L	ne	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Dieldrin	ug/L	0.0055	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Endosulfan I	ug/L	96	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Endosulfan II	ug/L	96	0.025 U	0.025 U	--	--	--	--	0.025 U	--	--	--	--
Endosulfan Sulfate	ug/L	ne	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Endrin	ug/L	2	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Endrin Aldehyde	ug/L	ne	0.025 U	0.025 U	--	--	--	--	0.025 U	--	--	--	--
Endrin ketone	ug/L	ne	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Heptachlor	ug/L	0.0194	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Heptachlor Epoxide	ug/L	0.005	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Lindane	ug/L	0.0795	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Methoxychlor	ug/L	40	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--
Toxaphene	ug/L	0.0795	0.25 U	0.25 U	--	--	--	--	0.25 U	--	--	--	--
trans-Chlordane	ug/L	0.25	0.005 U	0.005 U	--	--	--	--	0.005 U	--	--	--	--

Table 3c. Groundwater Data - Dioxins/Furans, Pesticides/Herbicides, and PCBs

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-1	AMW-2	AMW-2	AMW-2	AMW-2	AMW-2
		Date	01/12/2018	01/12/2018	12/20/2018	04/01/2019	07/01/2019	07/01/2019	01/12/2018	12/20/2018	12/20/2018	04/01/2019	07/01/2019
		Sample Name	AMW-1-011218	AMW-5-011218	AMW-1-122018	AMW-1-040119	AMW-1-070119	AMW-5-070119	AMW-2-011218	AMW-2-122018	AMW-5-122018	AMW-2-040119	AMW-2-070119
		DTW (feet BTOC)	83.07	83.07	89.13	87.65	91.53	91.53	83.3	88.52	88.52	87.17	90.95
		Water Level Elevation (feet NAVD88)	72.83	72.83	66.77	68.25	64.37	64.37	72.24	67.02	67.02	68.37	64.59
Analyte (by group)	**Units**	**Site-Specific Screening Level**		(Field Duplicate)				(Field Duplicate)			(Field Duplicate)		
Chlorinated Herbicides													
3,5-Dichlorobenzoic acid	ug/L	ne	4.99 U	5.00 U	--	--	--	--	4.99 U	--	--	--	--
Acifluorfen	ug/L	ne	4.24 U	4.25 U	--	--	--	--	4.24 U	--	--	--	--
Bentazone	ug/L	ne	2.69 U	2.70 U	--	--	--	--	2.70 U	--	--	--	--
Chloramben	ug/L	ne	1.20 U	1.20 U	--	--	--	--	1.20 U	--	--	--	--
Chlorthal-dimethyl	ug/L	ne	0.848 U	0.849 U	--	--	--	--	0.849 U	--	--	--	--
Picloram	ug/L	ne	0.499 U	0.500 U	--	--	--	--	0.499 U	--	--	--	--
2,4,5-T	ug/L	ne	0.997 U	0.999 U	--	--	--	--	0.998 U	--	--	--	--
2,4-D	ug/L	ne	1.99 U	2.00 U	--	--	--	--	2.00 U	--	--	--	--
2,4-DB	ug/L	128	2.99 U	3.00 U	--	--	--	--	2.99 U	--	--	--	--
Dalapon	ug/L	200	3.99 UJ	4.00 UJ	--	--	--	--	3.99 UJ	--	--	--	--
Dicamba	ug/L	480	4.49 U	4.50 U	--	--	--	--	4.49 U	--	--	--	--
Dichloroprop	ug/L	ne	0.997 U	0.999 U	--	--	--	--	0.998 U	--	--	--	--
Dinoseb	ug/L	7	3.74 U	3.75 U	--	--	--	--	3.74 U	--	--	--	--
MCPA	ug/L	ne	9.97 U	9.99 U	--	--	--	--	9.98 U	--	--	--	--
MCPP	ug/L	ne	9.97 U	9.99 U	--	--	--	--	9.98 U	--	--	--	--
Silvex	ug/L	50	0.598 U	0.600 U	--	--	--	--	0.599 U	--	--	--	--
Polychlorinated Biphenols (PCBs)													
Aroclor 1016	ug/L	1.1	0.025 U	0.025 U	--	--	--	--	0.025 U	--	--	--	--
Aroclor 1221	ug/L	ne	0.025 U	0.025 U	--	--	--	--	0.025 U	--	--	--	--
Aroclor 1232	ug/L	ne	0.025 U	0.025 U	--	--	--	--	0.025 U	--	--	--	--
Aroclor 1242	ug/L	ne	0.025 U	0.025 U	--	--	--	--	0.025 U	--	--	--	--
Aroclor 1248	ug/L	ne	0.025 U	0.025 U	--	--	--	--	0.025 U	--	--	--	--
Aroclor 1254	ug/L	0.044	0.025 U	0.025 U	--	--	--	--	0.025 U	--	--	--	--
Aroclor 1260	ug/L	0.044	0.025 U	0.025 U	--	--	--	--	0.025 U	--	--	--	--
Aroclor 1262	ug/L	ne	0.025 U	0.025 U	--	--	--	--	0.025 U	--	--	--	--
Aroclor 1268	ug/L	ne	0.025 U	0.025 U	--	--	--	--	0.025 U	--	--	--	--
Total PCBs (Sum of Aroclors)	ug/L	0.044	0.025 U	0.025 U	--	--	--	--	0.025 U	--	--	--	--

Table 3c. Groundwater Data - Dioxins/Furans, Pesticides/Herbicides, and PCBs

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	**AMW-3**	**AMW-3**	**AMW-3**	**AMW-3**	**AMW-4**	**AMW-4**	**AMW-4**	**AMW-4**
		Date	**01/12/2018**	**12/20/2018**	**04/01/2019**	**07/01/2019**	**01/12/2018**	**12/20/2018**	**04/01/2019**	**07/01/2019**
		Sample Name	**AMW-3-011218**	**AMW-3-122018**	**AMW-3-040119**	**AMW-3-070119**	**AMW-4-011218**	**AMW-4-122018**	**AMW-4-040119**	**AMW-4-070119**
		DTW (feet BTOC)	**100.1**	**104.97**	**104.83**	**107.75**	**81.22**	**86.56**	**85.19**	**88.98**
		Water Level Elevation (feet NAVD88)	**72.84**	**67.97**	**68.11**	**65.19**	**72.46**	**67.12**	**68.49**	**64.7**
Analyte (by group)	**Units**	**Site-Specific Screening Level**								
Dioxins/Furans										
Chlorinated di-benzi-p-dioxins (CDDs)										
2,3,7,8-TCDD	pg/L	30	0.665 U	0.952 U	2.36 U	0.901 U	0.585 U	0.914 U	1.98 U	0.962 U
1,2,3,7,8-PeCDD	pg/L	ne	0.959 U	1.82 U	3.39 U	1.87 U	1.07 U	1.46 U	3.37 U	1.53 U
1,2,3,4,7,8-HxCDD	pg/L	ne	2.06 U	2.49 U	4.84 U	1.39 U	2.03 U	1.83 U	3.82 U	1.65 U
1,2,3,6,7,8-HxCDD	pg/L	ne	2.00 U	2.61 U	4.56 U	1.43 U	1.92 U	2.02 U	3.86 U	1.74 U
1,2,3,7,8,9-HxCDD	pg/L	ne	1.97 U	2.39 U	4.42 U	1.32 U	1.91 U	1.80 U	3.61 U	1.58 U
1,2,3,4,6,7,8-HpCDD	pg/L	ne	2.62 U	3.27 U	5.08 U	3.09 U	**2.08 J**	3.29 U	3.81 U	4.44 U
OCDD	pg/L	ne	4.61 U	**5.61 J**	5.52 U	5.23 U	**15.5 J**	**10.6 J**	**11.2 J**	**17.9 J**
Total CDD TEQ (ND = 1/2 RDL)	pg/L	30	nd	**1.78 J**	nd	nd	**1.15 J**	**1.49 J**	**3.26 J**	**1.52 J**
Chlorinated dibenzofurans (CDFs)										
2,3,7,8-TCDF	pg/L	ne	0.704 U	0.702 U	2.18 U	0.842 U	0.643 U	0.893 U	2.1 U	0.748 U
1,2,3,7,8-PeCDF	pg/L	ne	0.899 U	1.50 U	2.84 U	0.901 U	1.21 U	1.32 U	2.5 U	1.09 U
2,3,4,7,8-PeCDF	pg/L	ne	0.903 U	1.49 U	2.78 U	0.883 U	1.23 U	1.42 U	2.37 U	1.05 U
1,2,3,4,7,8-HxCDF	pg/L	ne	0.810 U	1.76 U	2.1 U	0.86 U	0.989 U	1.30 U	1.68 U	0.915 U
1,2,3,6,7,8-HxCDF	pg/L	ne	0.825 U	1.85 U	2.11 U	1.01 U	1.04 U	1.29 U	1.8 U	1.02 U
1,2,3,7,8,9-HxCDF	pg/L	ne	1.20 U	1.95 U	2.87 U	1.26 U	1.44 U	1.32 U	2.44 U	1.24 U
2,3,4,6,7,8-HxCDF	pg/L	ne	0.901 U	2.28 U	2.19 U	0.998 U	1.10 U	1.82 U	1.89 U	1.05 U
1,2,3,4,6,7,8-HpCDF	pg/L	ne	1.26 U	1.88 U	2 U	0.977 U	0.860 U	1.93 U	1.88 U	1.26 U
1,2,3,4,7,8,9-HpCDF	pg/L	ne	1.78 U	2.60 U	2.68 U	1.27 U	1.18 U	2.48 U	2.55 U	1.5 U
OCDF	pg/L	ne	2.14 U	3.59 U	5.54 U	2.24 U	2.63 U	3.46 U	4.6 U	2.88 U
Total CDF TEQ (ND = 1/2 RDL)	pg/L	30	nd	nd	nd	nd	nd	nd	nd	nd
Organochlorine Pesticides										
4,4'-DDD	ug/L	0.365	0.005 U	--	--	--	0.005 U	--	--	--
4,4'-DDE	ug/L	0.257	0.025 U	--	--	--	0.025 U	--	--	--
4,4'-DDT	ug/L	0.257	0.005 U	--	--	--	0.005 U	--	--	--
Aldrin	ug/L	0.005	0.005 U	--	--	--	0.005 U	--	--	--
Alpha-BHC	ug/L	ne	0.005 U	--	--	--	0.005 U	--	--	--
Beta-BHC	ug/L	ne	0.005 U	--	--	--	0.005 U	--	--	--
cis-Chlordane	ug/L	ne	0.005 U	--	--	--	0.005 U	--	--	--
Delta-BHC	ug/L	ne	0.005 U	--	--	--	0.005 U	--	--	--
Dieldrin	ug/L	0.0055	0.005 U	--	--	--	0.005 U	--	--	--
Endosulfan I	ug/L	96	0.005 U	--	--	--	0.005 U	--	--	--
Endosulfan II	ug/L	96	0.025 U	--	--	--	0.025 U	--	--	--
Endosulfan Sulfate	ug/L	ne	0.005 U	--	--	--	0.005 U	--	--	--
Endrin	ug/L	2	0.005 U	--	--	--	0.005 U	--	--	--
Endrin Aldehyde	ug/L	ne	0.025 U	--	--	--	0.025 U	--	--	--
Endrin ketone	ug/L	ne	0.005 U	--	--	--	0.005 U	--	--	--
Heptachlor	ug/L	0.0194	0.005 U	--	--	--	0.005 U	--	--	--
Heptachlor Epoxide	ug/L	0.005	0.005 U	--	--	--	0.005 U	--	--	--
Lindane	ug/L	0.0795	0.005 U	--	--	--	0.005 U	--	--	--
Methoxychlor	ug/L	40	0.005 U	--	--	--	0.005 U	--	--	--
Toxaphene	ug/L	0.0795	0.25 U	--	--	--	0.25 U	--	--	--
trans-Chlordane	ug/L	0.25	0.005 U	--	--	--	0.005 U	--	--	--

Table 3c. Groundwater Data - Dioxins/Furans, Pesticides/Herbicides, and PCBs

Project No. 150074, C Street Landfill, Shelton, Washington

		Sample Location	AMW-3	AMW-3	AMW-3	AMW-3	AMW-4	AMW-4	AMW-4	AMW-4
		Date	01/12/2018	12/20/2018	04/01/2019	07/01/2019	01/12/2018	12/20/2018	04/01/2019	07/01/2019
		Sample Name	AMW-3-011218	AMW-3-122018	AMW-3-040119	AMW-3-070119	AMW-4-011218	AMW-4-122018	AMW-4-040119	AMW-4-070119
		DTW (feet BTOC)	100.1	104.97	104.83	107.75	81.22	86.56	85.19	88.98
		Water Level Elevation (feet NAVD88)	72.84	67.97	68.11	65.19	72.46	67.12	68.49	64.7
Analyte (by group)	**Units**	**Site-Specific Screening Level**								
Chlorinated Herbicides										
3,5-Dichlorobenzoic acid	ug/L	ne	4.99 U	--	--	--	5.00 U	--	--	--
Acifluorfen	ug/L	ne	4.25 U	--	--	--	4.25 U	--	--	--
Bentazone	ug/L	ne	2.70 U	--	--	--	2.70 U	--	--	--
Chloramben	ug/L	ne	1.20 U	--	--	--	1.20 U	--	--	--
Chlorthal-dimethyl	ug/L	ne	0.849 U	--	--	--	0.849 U	--	--	--
Picloram	ug/L	ne	0.499 U	--	--	--	0.500 U	--	--	--
2,4,5-T	ug/L	ne	0.999 U	--	--	--	0.999 U	--	--	--
2,4-D	ug/L	ne	2.00 U	--	--	--	2.00 U	--	--	--
2,4-DB	ug/L	128	3.00 U	--	--	--	3.00 U	--	--	--
Dalapon	ug/L	200	4.00 UJ	--	--	--	4.00 UJ	--	--	--
Dicamba	ug/L	480	4.49 U	--	--	--	4.50 U	--	--	--
Dichloroprop	ug/L	ne	0.999 U	--	--	--	0.999 U	--	--	--
Dinoseb	ug/L	7	3.75 U	--	--	--	3.75 U	--	--	--
MCPA	ug/L	ne	9.99 U	--	--	--	9.99 U	--	--	--
MCPP	ug/L	ne	9.99 U	--	--	--	9.99 U	--	--	--
Silvex	ug/L	50	0.599 U	--	--	--	0.599 U	--	--	--
Polychlorinated Biphenols (PCBs)										
Aroclor 1016	ug/L	1.1	0.025 U	--	--	--	0.025 U	--	--	--
Aroclor 1221	ug/L	ne	0.025 U	--	--	--	0.025 U	--	--	--
Aroclor 1232	ug/L	ne	0.025 U	--	--	--	0.025 U	--	--	--
Aroclor 1242	ug/L	ne	0.025 U	--	--	--	0.025 U	--	--	--
Aroclor 1248	ug/L	ne	0.025 U	--	--	--	0.025 U	--	--	--
Aroclor 1254	ug/L	0.044	0.025 U	--	--	--	0.025 U	--	--	--
Aroclor 1260	ug/L	0.044	0.025 U	--	--	--	0.025 U	--	--	--
Aroclor 1262	ug/L	ne	0.025 U	--	--	--	0.025 U	--	--	--
Aroclor 1268	ug/L	ne	0.025 U	--	--	--	0.025 U	--	--	--
Total PCBs (Sum of Aroclors)	ug/L	0.044	0.025 U	--	--	--	0.025 U	--	--	--

Notes:

Bold = a detected concentration.

Gray shading = a concentration that exceeds the Site-Specific Screening Level.

ne = indicates not established or not applicable.

U = the analyte was analyzed for, but was considered not detected at the reporting limit or reported value.

J = the analyte was detected above the reported quantitation limit, and the reported concentration was an estimated value.

UJ = the analyte was analyzed for, and the associated quantitation limit was an estimated value.

X = the sample chromatographic pattern does not resemble the fuel standard used for quantitation.

-- = not analyzed.

TEQ = Toxicity equivalent quotient. TEQs for total cPAHs and total dioxins/furans were calculated using the methodology and the toxicity equivalency factors (TEFs) prescribed in Washington State Model Toxics Control Act (MTCA) and WAC 173-340-708(8)(e).

TCDD = tetrachloro dibenzo-p-dioxin
PeCDD = entachloro dibenzo-p-dioxin
HxCDD = hexachloro dibenzo-p-dioxin
HpCDD = heptachloro dibenzo-p-dioxin
OCDD = octachloro dibenzo-p-dioxin
TCDF = tetrachloro dibenzofuran
PeCDF = pentachloro dibenzofuran
HxCDF = hexachlorodibenzofuran
HpCDF = heptachloro dibenzofuran
OCDF = octachlorodibenzofuran
DTW = depth to water
BTOC = below top of casing
pg/L = picograms per liter
ug/L = micrograms per liter

Table 4. Soil Gas Data
Project No. 150074, C Street Landfill, Shelton, Washington

Compound	Units	Soil Gas Screening Levels	SG-1	SG-2	SG-3	SG-4	SG-5
		Sample Date	12/19/2018	12/19/2018	12/19/2018	12/19/2018	12/19/2018
		Sample Name	SG-1-121918	SG-2-121918	SG-3-121918	SG-4-121918	SG-5-121918
FIELD DATA							
Methane	%	N/A	0.10	0	0	1.3	0.10
Carbon Dioxide	%	N/A	10.9	3.2	3.7	3.2	7.4
Oxygen	%	N/A	10.3	20.2	16.0	7.60	9.80
Hydrogen Sulfide	%	N/A	0	0	0	0	0
LABORATORY ANALYTICAL DATA							
Methane							
Methane	%	N/A	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Petroleum Hydrocarbons							
Air-Phase Hydrocarbons							
C5 - C8 Aliphatic Hydrocarbons	ug/m3	270000	**6300**	**410**	**910**	**23000 E**	**540**
C9 - C10 Aromatic Hydrocarbons	ug/m3	18000	190 U	40 U	37 U	360 U	37 U
C9 - C12 Aliphatic Hydrocarbons	ug/m3	14000	**330**	**110**	**550**	**1200**	**250**
Petroleum-Associated Volatile Organic Compounds							
Benzene	ug/m3	32.1	**62**	**7.3**	**26**	**220**	**38**
Toluene	ug/m3	229000	**19**	**9.9**	**26**	**160**	**34**
Ethylbenzene	ug/m3	45700	**4.9**	**5.0**	**4.9**	**15**	**8.0**
Xylenes	ug/m3	ne	**8.8**	**33**	**12**	**44**	**16**
1,2-Dibromoethane (EDB)	ug/m3	0.417	0.58 U	0.12 U	0.12 U	1.1 U	0.12 U
1,2-Dichloroethane (EDC)	ug/m3	9.62	0.3 U	0.065 U	**0.27**	0.59 U	0.061 U
Methyl tert-butyl ether (MTBE)	ug/m3	962	14 U	2.9 U	2.7 U	26 U	2.7 U
Naphthalene	ug/m3	7.35	3.9 U	0.84 U	0.79 U	7.7 U	0.79 U
Total Petroleum Hydrocarbons[1]	ug/m3	14,000[2]	**180**	**43**	**76**	**580**	**99**
Volatile Organic Compounds (VOCs)							
1,1,1-Trichloroethane	ug/m3	229000	4.1 U	0.87 U	0.82 U	8 U	0.82 U
1,1,2,2-Tetrachloroethane	ug/m3	4.31	1 U	0.22 U	0.21 U	2 U	0.21 U
1,1,2-Trichloroethane	ug/m3	15.6	0.82 U	0.17 U	0.16 U	1.6 U	0.16 U
1,1,2-Trichlorotrifluoroethane	ug/m3	1370000	5.7 U	1.2 U	1.1 U	11 U	1.1 U
1,1-Dichloroethane	ug/m3	156	3 U	0.65 U	0.61 U	5.9 U	**0.87**
1,1-Dichloroethene	ug/m3	9140	3 U	0.63 U	0.59 U	5.8 U	**1.3**
1,2,4-Trichlorobenzene	ug/m3	91.4	5.6 U	1.2 U	1.1 U	11 U	1.1 U
1,2,4-Trimethylbenzene	ug/m3	320	18 U	3.9 U	3.7 U	36 U	3.7 U
1,2-Dichlorobenzene	ug/m3	9140	4.5 U	0.96 U	0.9 U	8.8 U	0.9 U
1,2-Dichloropropane	ug/m3	25	1.7 U	0.37 U	0.35 U	3.4 U	0.35 U
1,3,5-Trimethylbenzene	ug/m3	ne	18 U	3.9 U	3.7 U	36 U	3.7 U
1,3-Butadiene	ug/m3	8.33	0.17 U	0.035 U	0.033 U	0.32 U	0.033 U
1,3-Dichlorobenzene	ug/m3	ne	4.5 U	0.96 U	0.9 U	8.8 U	0.9 U
1,4-Dichlorobenzene	ug/m3	22.7	1.8 U	0.38 U	0.36 U	3.5 U	0.36 U
1,4-Dioxane	ug/m3	ne	2.7 U	0.58 U	0.54 U	5.3 U	0.54 U
1-Propene	ug/m3	ne	**560 E**	**76 E**	**230 E**	**5500 E**	**380 E**
2,2,4-Trimethylpentane	ug/m3	ne	35 U	7.5 U	7 U	68 U	7 U
2-Butanone	ug/m3	229000	22 U	**23**	**37**	**180**	4.4 U
2-Chlorotoluene	ug/m3	ne	39 U	8.3 U	7.8 U	76 U	7.8 U
2-Hexanone	ug/m3	ne	31 U	6.6 U	6.1 U	60 U	6.1 U
4-Ethyltoluene	ug/m3	ne	18 U	3.9 U	3.7 U	36 U	3.7 U
4-Methyl-2-pentanone	ug/m3	137000	31 U	6.6 U	6.1 U	60 U	6.1 U
Acetone	ug/m3	ne	36 U	**140 E**	**200 E**	**410**	7.1 U
Acrolein	ug/m3	0.914	6.9 U	**4.5**	**9.8**	13 U	1.4 U
Allyl Chloride	ug/m3	ne	9.4 U	2 U	1.9 U	18 U	1.9 U
alpha-Chlorotoluene	ug/m3	5.1	0.39 U	0.083 U	0.078 U	0.76 U	**0.085**
Bromodichloromethane	ug/m3	6.76	0.5 U	0.11 U	0.1 U	0.98 U	0.1 U
Bromoform	ug/m3	227	16 U	3.3 U	3.1 U	30 U	3.1 U
Bromomethane	ug/m3	229	12 U	2.5 U	2.3 U	23 U	2.3 U
Butane	ug/m3	ne	**2100 E**	**81**	**150 E**	**4200 E**	**300 E**
Carbon Disulfide	ug/m3	32000	47 U	10 U	9.3 U	**230**	9.3 U
Carbon Tetrachloride	ug/m3	41.7	4.7 U	1 U	**1.8**	9.2 U	0.94 U
Chlorobenzene	ug/m3	2290	3.5 U	0.74 U	0.69 U	6.7 U	**0.70**
Chloroethane	ug/m3	457000	20 U	4.2 U	4 U	39 U	4 U
Chloroform	ug/m3	10.9	0.37 U	**0.17**	**0.94**	0.71 U	0.073 U
Chloromethane	ug/m3	4110	15 U	3.3 U	3.1 U	30 U	3.1 U
cis-1,2-Dichloroethene (DCE)	ug/m3	ne	3 U	0.63 U	0.59 U	5.8 U	**3.5**
cis-1,3-Dichloropropene	ug/m3	ne	3.4 U	0.73 U	0.68 U	6.6 U	0.68 U
Cyclohexane	ug/m3	ne	52 U	**17**	**26**	**170**	10 U
Dibromochloromethane	ug/m3	9.26	0.64 U	0.14 U	0.13 U	1.2 U	0.13 U
Dichlorodifluoromethane	ug/m3	4570	**7.8**	**3.8**	**30**	**13**	**31**
Ethanol	ug/m3	ne	**760 E**	12 U	11 U	110 U	11 U
Ethyl acetate	ug/m3	ne	54 U	12 U	11 U	110 U	11 U
Freon 114	ug/m3	ne	**15**	**1.2**	**33**	**17**	**180**
Heptane	ug/m3	ne	**230**	**16**	**30**	**1100**	**8.2**
Hexachlorobutadiene	ug/m3	11.4	1.6 U	0.34 U	0.32 U	3.1 U	0.32 U
Isopropyl Alcohol	ug/m3	ne	65 UJ	14 UJ	13 UJ	130 UJ	13 UJ
Isopropylbenzene	ug/m3	18300	18 U	3.9 U	3.7 U	36 U	3.7 U
m,p-Xylenes	ug/m3	ne	**8.8**	**24**	**9.1**	**32**	**12**
Methyl Methacrylate	ug/m3	32000	31 U	6.6 U	6.1 U	60 U	6.1 U
Methylene Chloride	ug/m3	25000	650 U	140 U	130 U	1300 U	130 U
n-Hexane	ug/m3	32000	**790 E**	**27**	**51**	**1900 E**	**20**

Table 4. Soil Gas Data

Project No. 150074, C Street Landfill, Shelton, Washington

Compound	Units	Sample Location / Sample Date / Sample Name / Soil Gas Screening Levels	SG-1 12/19/2018 SG-1-121918	SG-2 12/19/2018 SG-2-121918	SG-3 12/19/2018 SG-3-121918	SG-4 12/19/2018 SG-4-121918	SG-5 12/19/2018 SG-5-121918
Nonane	ug/m3	ne	39 U	8.4 U	**16**	**170**	7.9 U
n-Propylbenzene	ug/m3	ne	18 U	3.9 U	3.7 U	36 U	3.7 U
o-Xylene	ug/m3	4570	3.3 U	**8.8**	**2.9**	**12**	**4.0**
Pentane	ug/m3	ne	**1800 E**	**44**	**77**	**3100 E**	**61**
Styrene	ug/m3	45700	6.4 U	1.4 U	1.3 U	12 U	1.3 U
t-Butyl alcohol (TBA)	ug/m3	ne	91 U	19 U	18 U	180 U	18 U
Tetrachloroethene (PCE)	ug/m3	962	**120**	**100**	**67**	99 U	**14**
Tetrahydrofuran	ug/m3	ne	2.2 U	0.47 U	0.44 U	4.3 U	0.44 U
trans-1,2-Dichloroethene	ug/m3	ne	3 U	0.63 U	0.59 U	5.8 U	0.59 U
trans-1,3-Dichloropropene	ug/m3	ne	3.4 U	0.73 U	0.68 U	6.6 U	0.68 U
Trichloroethene (TCE)	ug/m3	37	**8.4**	0.43 U	0.4 U	**5.7**	**4.3**
Trichlorofluoromethane	ug/m3	32000	17 U	3.6 U	**5.3**	33 U	3.4 U
Vinyl Acetate	ug/m3	9140	53 U	11 U	11 U	100 U	11 U
Vinyl Bromide	ug/m3	ne	3.3 U	0.7 U	0.66 U	6.4 U	0.66 U
Vinyl Chloride	ug/m3	28	1.9 U	0.41 U	0.38 U	**20**	**2.2**

Notes:

Bold = detected concentrations of compounds

Gray shading = concentrations of compounds that exceed the Screening Level

E = reported concentration exceeds the calibration range

N/A = not applicable

ne = not established

U = concentrations of the compound not detected above the stated laboratory reporting limit.

UJ = concentrations of the compound not detected above the standard reporting limit, the concentration is an estimate.

ug/m3 = micrograms per cubic meter

[1]Calculated total petroleum hydrocarbon concentration using one-half of the laboratory detection limit for nondetects of air phase hydrocarbons and benzene, ethylbenzene, toluene, and xylenes, and zero in place of the laboratory detection limit for nondetects of EDC, EDB, and MTBE.

[2]Generic MTCA Method B subslab soil gas screening level per Washington State Department of Ecology Implementation Memo #18.

Table 5. Cover Soil Characterization Data

Project No. 150074, City of Shelton, C Street Landfill, Shelton, WA

		Sample Location Sample Date Sample ID Sample Type	TP-01 02/14/2020 TP-01-021420 Composite	TP-02 02/14/2020 TP-02-021420 Composite	TP-03 02/14/2020 TP-03-021420 Composite	TP-03 02/14/2020 TP-03-1.0 Discrete	TP-04 02/14/2020 TP-04-021420 Composite
Analyte (by group)	**Site-Specific Screening Level**	**Natural Background Concentrations**					
Polycyclic Aromatic Hydrocarbons (PAHs) (mg/kg)							
Non-Carcinogenic PAHs							
Acenaphthene	20	--	0.05 U	0.05 U	0.05 U	--	0.05 U
Acenaphthylene	--	--	0.05 U	0.05 U	0.05 U	--	0.05 U
Anthracene	24000	--	0.05 U	0.05 U	0.05 U	--	0.05 U
Benzo(g,h,i)perylene	--	--	0.05 U	0.05 U	0.05 U	--	0.05 U
Fluoranthene	3200	--	**0.086**	**0.085**	0.05 U	--	**0.083**
Fluorene	30	--	0.05 U	0.05 U	0.05 U	--	0.05 U
Naphthalene	1600	--	0.05 U	0.05 U	0.05 U	--	0.05 U
Phenanthrene	--	--	0.05 U	0.05 U	0.05 U	--	0.05 U
Pyrene	2400	--	**0.086**	**0.086**	0.05 U	--	**0.069**
Carcinogenic PAHs (cPAHs)							
Benz(a)anthracene	1.37	--	**0.056**	0.05 U	0.05 U	--	0.05 U
Benzo(a)pyrene	0.14	--	**0.080**	0.05 U	0.05 U	--	0.05 U
Benzo(b)fluoranthene	1.37	--	**0.080**	**0.050**	0.05 U	--	0.05 U
Benzo(k)fluoranthene	13.7	--	0.05 U	0.05 U	0.05 U	--	0.05 U
Chrysene	137	--	**0.070**	**0.051**	0.05 U	--	0.05 U
Dibenzo(a,h)anthracene	0.14	--	0.05 U	0.05 U	0.05 U	--	0.05 U
Indeno(1,2,3-cd)pyrene	1.37	--	**0.053**	0.05 U	0.05 U	--	0.05 U
Total cPAHs TEQ (ND = 1/2 RI	0.14	--	**0.10**	**0.041**	0.04 U	--	0.04 U
Dioxins/Furans (pg/g)							
Chlorinated dibenzo-p-dioxins (CDDs)							
2,3,7,8-TCDD	2	--	--	--	**1.92**	--	--
1,2,3,7,8-PeCDD	--	--	--	--	**9.32**	--	--
1,2,3,4,7,8-HxCDD	--	--	--	--	**13.0**	--	--
1,2,3,6,7,8-HxCDD	--	--	--	--	**26.0**	--	--
1,2,3,7,8,9-HxCDD	--	--	--	--	**18.7**	--	--
1,2,3,4,6,7,8-HpCDD	--	--	--	--	**265**	--	--
OCDD	--	--	--	--	**1550**	--	--
Dioxin TEQ	2.2	5.2	--	--	**20.1**	--	--
Chlorinated Dibenzofurans (CDFs)							
2,3,7,8-TCDF	--	--	--	--	**4.67**	--	--
1,2,3,7,8-PeCDF	--	--	--	--	**4.29**	--	--
2,3,4,7,8-PeCDF	--	--	--	--	**7.56**	--	--
1,2,3,4,7,8-HxCDF	--	--	--	--	**6.37**	--	--
1,2,3,6,7,8-HxCDF	--	--	--	--	**4.99**	--	--
1,2,3,7,8,9-HxCDF	--	--	--	--	**1.73 J**	--	--
2,3,4,6,7,8-HxCDF	--	--	--	--	**6.13**	--	--
1,2,3,4,6,7,8-HpCDF	--	--	--	--	**50.3**	--	--
1,2,3,4,7,8,9-HpCDF	--	--	--	--	**3.59**	--	--
OCDF	--	--	--	--	**147**	--	--
Furan TEQ	2.2	5.2	--	--	**5.37**	--	--
Metals (mg/kg)							
Arsenic	7	7	**3.08**	**3.02**	**2.45**	--	**2.50**
Cadmium	4	0.77	**1.16**	1 U	1 U	--	1 U
Chromium	48	48	**32.4**	**34.5**	**35.7**	--	**33.7**
Lead	50	24	**153**	**62.2**	**29.5**	--	**33.9**
Mercury	0.1	0.07	**0.15**	0.1 U	**0.14**	--	0.1 U
Petroleum Hydrocarbons (mg/kg)							
Gasoline Range Organics	100	--	--	--	--	5 U	--
Diesel Range Organics	200	--	50 U	50 U	50 U	--	50 U
Motor Oil Range Organics	2000	--	250 U	**460**	250 U	--	250 U
BTEX (mg/kg)							
Benzene	18.2	--	--	--	--	0.02 U	--
Toluene	200	--	--	--	--	0.02 U	--
Ethylbenzene	8000	--	--	--	--	0.02 U	--
Total Xylenes	16000	--	--	--	--	0.06 U	--

Table 5. Cover Soil Characterization Data

Project No. 150074, City of Shelton, C Street Landfill, Shelton, WA

		Sample Location	TP-01	TP-02	TP-03	TP-03	TP-04
		Sample Date	02/14/2020	02/14/2020	02/14/2020	02/14/2020	02/14/2020
		Sample ID	TP-01-021420	TP-02-021420	TP-03-021420	TP-03-1.0	TP-04-021420
		Sample Type	Composite	Composite	Composite	Discrete	Composite
Analyte (by group)	**Site-Specific Screening Level**	**Natural Background Concentrations**					
Chlorinated Herbicides (mg/kg)							
3,5-Dichlorobenzoic acid	--	--	46.2 U	47.7 U	47.5 U	--	47.3 U
Acifluorfen	--	--	92.3 UJ	95.4 UJ	95.0 UJ	--	94.6 UJ
Bentazone	--	--	40.4 U	41.7 U	41.6 U	--	41.4 U
Chloramben	--	--	23.1 U	23.8 U	23.7 U	--	23.7 U
Chlorthal-dimethyl	--	--	34.6 U	35.8 U	35.6 U	--	35.5 U
Picloram	--	--	57.7 UJ	59.6 UJ	59.4 UJ	--	59.1 UJ
2,4,5-T	--	--	57.7 U	59.6 U	59.4 U	--	59.1 U
2,4-D	--	--	34.6 U	35.8 U	35.6 U	--	35.5 U
2,4-DB	640000	--	28.8 U	29.8 U	29.7 U	--	29.6 U
Dalapon	2400000	--	231 UJ	238 UJ	237 UJ	--	237 UJ
Dicamba	2400000	--	40.4 U	41.7 U	41.6 U	--	41.4 U
Dichloroprop	--	--	28.8 U	29.8 U	29.7 U	--	29.6 U
Dinoseb	80000	--	34.6 U	35.8 U	35.6 U	--	35.5 U
MCPA	--	--	3230 U	3340 U	3320 U	--	3310 U
MCPP	--	--	5080 U	5250 U	5220 U	--	5200 U
Silvex	640000	--	23.1 U	23.8 U	23.7 U	--	23.7 U
Organochlorine Pesticides (mg/kg)							
4,4'-DDD	4.17	--	0.01 U	0.01 U	0.01 U	--	0.01 UJ
4,4'-DDE	2.94	--	0.01 U	0.01 U	0.01 U	--	0.01 UJ
4,4'-DDT	2.94	--	**0.037 J**	0.01 UJ	0.01 UJ	--	0.01 UJ
Aldrin	0.0588	--	0.01 U	0.01 U	0.01 U	--	0.01 UJ
Alpha-BHC	6	--	0.01 U	0.01 U	0.01 U	--	0.01 UJ
Beta-BHC	6	--	0.01 U	0.01 U	0.01 U	--	0.01 UJ
cis-Chlordane	1	--	**0.011**	0.01 U	**0.012**	--	0.01 UJ
Delta-BHC	6	--	0.01 U	0.01 U	0.01 U	--	0.01 UJ
Dieldrin	0.1	--	**0.011**	0.01 U	0.01 U	--	0.01 UJ
Endosulfan I	480	--	0.01 U	0.01 U	0.01 U	--	0.01 UJ
Endosulfan II	480	--	0.01 U	0.01 U	0.01 U	--	0.01 UJ
Endosulfan Sulfate	--	--	0.01 U	0.01 U	0.01 U	--	0.01 UJ
Endrin	0.2	--	0.01 UJ	0.01 UJ	0.01 UJ	--	0.01 UJ
Endrin Aldehyde	--	--	0.01 U	0.01 U	0.01 U	--	0.01 UJ
Endrin ketone	--	--	0.01 UJ	0.01 UJ	0.01 UJ	--	0.01 UJ
Heptachlor	0.222	--	0.01 UJ	0.01 UJ	0.01 UJ	--	0.01 UJ
Heptachlor Epoxide	0.11	--	**0.027 J**	0.01 U	0.01 U	--	0.01 UJ
Lindane	0.909	--	0.01 U	0.01 U	0.01 U	--	0.01 UJ
Methoxychlor	400	--	0.01 UJ	0.01 UJ	0.01 UJ	--	0.01 UJ
Toxaphene	0.9	--	1 UJ	1 UJ	1 UJ	--	1 UJ
trans-Chlordane	1	--	**0.011**	0.01 U	0.01 U	--	0.01 UJ

Notes:

Bold = a detected concentration

Gray shading = a concentration that exceeds the Site-Specific Screening Level.

"--" = not established or not applicable.

U = the analyte was analyzed for, but was considered not detected at the reporting limit or reported value.

J = the analyte was detected above the reported quantitation limit, and the reported concentration was an estimated value.

UJ = the analyte was analyzed for, and the associated quantitation limit was an estimated value.

mg/kg = milligrams per kilogram

pg/g = picograms per gram

TEQ = Toxicity equivalent quotient. TEQs for total cPAHs and total dioxins/furans were calculated using the methodology and the toxicity equivalency factors (TEFs) prescribed in Washington State Model Toxics Control Act (MTCA) and WAC 173-340-708(8)(e).

TCDD = tetrachloro dibenzo-p-dioxin

PeCDD = entachloro dibenzo-p-dioxin

HxCDD = hexachloro dibenzo-p-dioxin

HpCDD = heptachloro dibenzo-p-dioxin

OCDD = octachloro dibenzo-p-dioxin

TCDF = tetrachloro dibenzofuran

PeCDF = pentachloro dibenzofuran

HxCDF = hexachlorodibenzofuran

HpCDF = heptachloro dibenzofuran

OCDF = octachlorodibenzofuran

Table 6a. Proposed Site Cleanup Levels for Soil

Project No. 150074, Shelton C Street Landfill Remediation, Shelton, WA

	Applicable Criteria					
	Human Direct	Protective of Ecological Receptors[2]				
Analyte (by group)	MTCA Method B[1]	Plants	Soil biota	Wildlife	Natural Background Concentration	Proposed Site Cleanup Level
Dioxins/Furans (ng/kg)[3,4]						
tetrachlorodibenzo-p-dioxin (tcdd); 2,3,7,8-	12.8	--	--	2.0	--	2.0
chlorinated dibenzo-p-dioxins (PCDDs), total	--	--	--	2.0	2.2	2.2
chlorinated dibenzofurans (PCDFs), total	--	--	--	2.0	2.2	2.2
Metals (mg/kg)[5]						
barium	16,000	500		102		102
copper	3,200	100	50	217	36	50
lead	--	50	500	118	24	50
mercury	--	0.30	0.10	5.50	0.07	0.10
selenium	400	1	70	0.30	0.78	0.78
silver	400	2	--	--	0.61	2
zinc	24,000	86	200	360	85	86
Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs; mg/kg)						
benzo[a]anthracene	1.37	--	--	--	--	1.37
benzo[a]pyrene	0.14	--	--	12	--	0.14
benzo[b]fluoranthene	1.37	--	--	--	--	1.37
benzo[k]fluoranthene	13.7	--	--	--	--	13.7
chrysene	137	--	--	--	--	137
dibenzo[a,h]anthracene	0.14	--	--	--	--	0.14
indeno[1,2,3-cd]pyrene	1.37	--	--	--	--	1.37
total cPAHs TEQ	0.14	--	--	--	--	0.14

Notes

"--" = no applicable criteria.

mg/kg = milligrams per kilogram
Ecology = Washington State Department of Ecology
[1]Model Toxics Control Act Cleanup Regulation (MTCA), Chapter 173-340 of the Washington Administrative Code, Method B standard formula values.
[2]Ecological Indicator Soil Concentrations for Protection of Terrestrial Plants and Animals, MTCA 173-340-7493, Table 749-3.
[3]Natural Background for Dioxins/Furans in WA Soils, Ecology Technical Memorandum #8, August 9, 2010.
[4]Dioxins, Furans, and Dioxin-Like PCB Congeners, Addressing Non-Detects and Establishing PQLs for Ecological Risk Assessments in Soil, Ecology Implementation Memorandum #11, July 22, 2015.
[6]Background metals concentrations from Ecology Natural Background Soil Metals Concentrations in Washington State, October 1994. Puget Sound region values used where established, statewide values used otherwise.

Table 6b. Proposed Site Cleanup Levels for Groundwater

Project No. 150074, Shelton C Street Landfill Remediation, Shelton, WA

	Applicable Groundwater Criteria				Applicable Surface Water Criteria		
	Protection of Human Health				Protection of Surface Water[5]		
Analyte (by group)	MTCA Method B[1]	Federal MCL[2]	WA State MCL[3]	Groundwater Quality WAC 173-200	Aquatic Fresh/Chronic (CWA 304)	Human Health Fresh/Chronic (CWA 304)	Proposed Site Cleanup Level
Secondary Contaminants (µg/L)							
Iron	11,200	--	300	300	1,000	300	300
Manganese	2,240	--	50	50	--	50	50

Notes

µg/L = micrograms per liter

"--" = no applicable criteria.

[1]Model Toxics Control Act Cleanup Regulation (MTCA), Chapter 173-340 of the Washington Administrative Code (WAC), Method B standard formula values.

[2]U.S. Environmental Protection Agency Maximum Contaminant Levels (MCLs), 40CFR 141.

[3]Washington State maximum contaminant levels (MCLs), WAC 246-290-310

[4]Water Quality Standards for Groundwaters of the State of Washington, Groundwater Quality Criteria for Secondary Contaminants, WAC 173-200.

[5]Surface water criteria established under the Clean Water Action (CWA)

Table 7. Components of Remedial Alternatives

Project No. 150074, City of Shelton, C Street Landfill, Shelton, WA

Remedial Alternative Components	Remedial Alternative			
	Alternative 1 Permeable Soil Cap, Institutional Controls, and Monitoring	**Alternative 2** Impermeable Cap, Institutional Controls, and Monitoring	**Alternative 3** Removal of WWTP Sludge, Permeable Soil Cap, Institutional Controls, and Monitoring	**Alternative 4** Full Removal of Contaminated Media
Install permeable soil cap	X		X	
Install impermeable soil cap with stormwater control system		X		
Remove WWTP sludge and dispose of off site			X	
Remove all contaminated soil and landfill waste and dispose of off site				X
Implement institutional controls and IM&M program to ensure remedy protectiveness *in perpetuity*	X	X	X	

Notes:

IM&M = inspection, monitoring, and maintenance

WWTP = wastewater treatment plant

Table 8. Disproportionate Cost Analysis
Project No. 150074, City of Shelton, C Street Landfill, Shelton, WA

		Remedial Alternatives that Meet the Threshold Criteria			
		Alternative 1 − Permeable Soil Cap, Institutional Controls, and Monitoring	**Alternative 2 −** Impermeable Cap, Institutional Controls, and Monitoring	**Alternative 3 −** Removal of WWTP Sludge, Permeable Soil Cap, Institutional Controls, and Monitoring	**Alternative 4 −** Full Removal of Contaminated Media
Criteria to Evaluate Use of Permanent Solutions to the Maximum Extent Practicable	Protectiveness (30% weighting factor)	Risks during remedy implementation are low, but long-term protectiveness relies on the effectiveness of institutional controls and the IM&M program (3).	This alternatives is considered to have the same protectiveness as Alternative 1 (3).	Compared to Alternatives 1 and 2, the marginally higher risks associated with WWTP sludge removal during remedy implementation are balanced by marginally greater long-term protectiveness (3).	The considerable short-term risks associated with full removal of contaminated media make this alternative less protective than Alternatives 1 through 3 (2).
	Permanence (20% weighting factor)	Waste toxicity, mobility, and volume are not reduced in this alternative (1).	Waste toxicity, mobility, and volume are not reduced in this alternative (1).	Waste toxicity, mobility, and volume are not reduced in this alternative (1).	Waste toxicity, mobility, and volume are not reduced in this alternative (1).
	Long-Term Effectiveness (20% weighting factor)	The long-term effectiveness of this alternative relies on the effectiveness of institutional controls and the IM&M program (3).	This alternative is considered to have the same long-term effectiveness as Alternative 1 (3).	This alternative is considered to have the same long-term effectiveness as Alternative 1 because, while WWTP sludge is removed, institutional controls and cap maintenance are still required (3).	This alternative is highly effective in the long-term because all contaminated media are removed from the site (5).
	Manageability of Short-Term Risks (10% weighting factor)	Since wastes would remain in place, short-term risks are low and easily managed in this alternative (5).	This alternative is considered to have the same short-term risk management as Alternative 1 (5).	Short-term risks are somewhat higher than in Alternatives 1 and 2 due to the potential for exposure during excavation and transport of WWTP sludge (4).	Contaminant exposure risks as well as risks associated with large earthmoving projects would be much more significant compared to Alternatives 1 through 3 (2).
	Implementability (10% weighting factor)	This alternative is highly implementable (5).	The impermeable cap and stormwater management system in this alternative would be somewhat more difficult to construct and maintain than the soil cap in Alternative 1 (4).	The implementability of this alternative is similar to Alternative 1 (removal of the WWTP sludge would be highly implementable) (5).	Due to the huge volume of contaminated media to be transported on public roadways in this alternative, implementation would likely encounter extreme administrative challenges (1).
	Public Concerns (10% weighting factor)	Leaving waste in place may generate concerns, particularly among nearby property owners (3).	Public concerns are expected to be similar to Alternative 1 (3).	Somewhat less likely than Alternatives 1 and 2 to generate public concerns because the most highly contaminated waste is removed with relatively modest construction-related impacts (4).	Concerns regarding truck traffic and other construction-related impacts would likely overwhelm any perceived benefits of waste excavation and offsite disposal (1).
MTCA Benefits Ranking(2)		3.00	2.90	3.00	2.20
Estimated Cost(3)		$2,000,000	$2,600,000	$5,300,000	$32,000,000
Benefit/Cost Ratio(4)		**1.50**	**1.12**	**0.57**	**0.07**

Notes:

1) A numeric scale of 1 to 5 is used to rate the alternatives with respect to the criteria to evaluate use of permanent solutions to the maximum extent practicable, as follows:
   - 1 - meets criterion to a very low degree
   - 2 - meets criterion to a low degree
   - 3 - meets criterion to a moderate degree
   - 4 - meets criterion to a high degree
   - 5 - meets criterion to a very high degree

2) The MTCA benefits ranking is obtained by multiplying the rating for each criterion by its weighting factor, and summing the results for the six criteria.

3) Costs are estimated in 2019 dollars. The costs shown are rounded to two significant figures. Itemized estimates are provided in Appendix F.

4) The benefit/cost ratio is obtained by dividing the alternative's MTCA benefits ranking by its estimated cost (in $million).

IM&M = inspection, monitoring, and maintenance

WWTP = wastewater treatment plant

FIGURES

Site Vicinity Map

RIFS
Shelton C Street Landfill
Shelton, Washington

Aspect CONSULTING	DEC-2019	BY: CEB / RAP	FIGURE NO.
	PROJECT NO. 150074	REVISED BY: ALC / RAP	1

Basemap Layer Credits || Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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Note: All site feature locations are approximate. Topographic contours from PLS Survey October 2017. Aerial imagery from June 2017 Digital Globe Imagery.

Current Site Features

RIFS
Shelton C Street Landfill
Shelton, Washington

Aspect CONSULTING

DEC-2019	BY: CEB / RAP	FIGURE NO.
PROJECT NO. 150074	REVISED BY: ALC / RAP	2

Basemap Layer Credits || Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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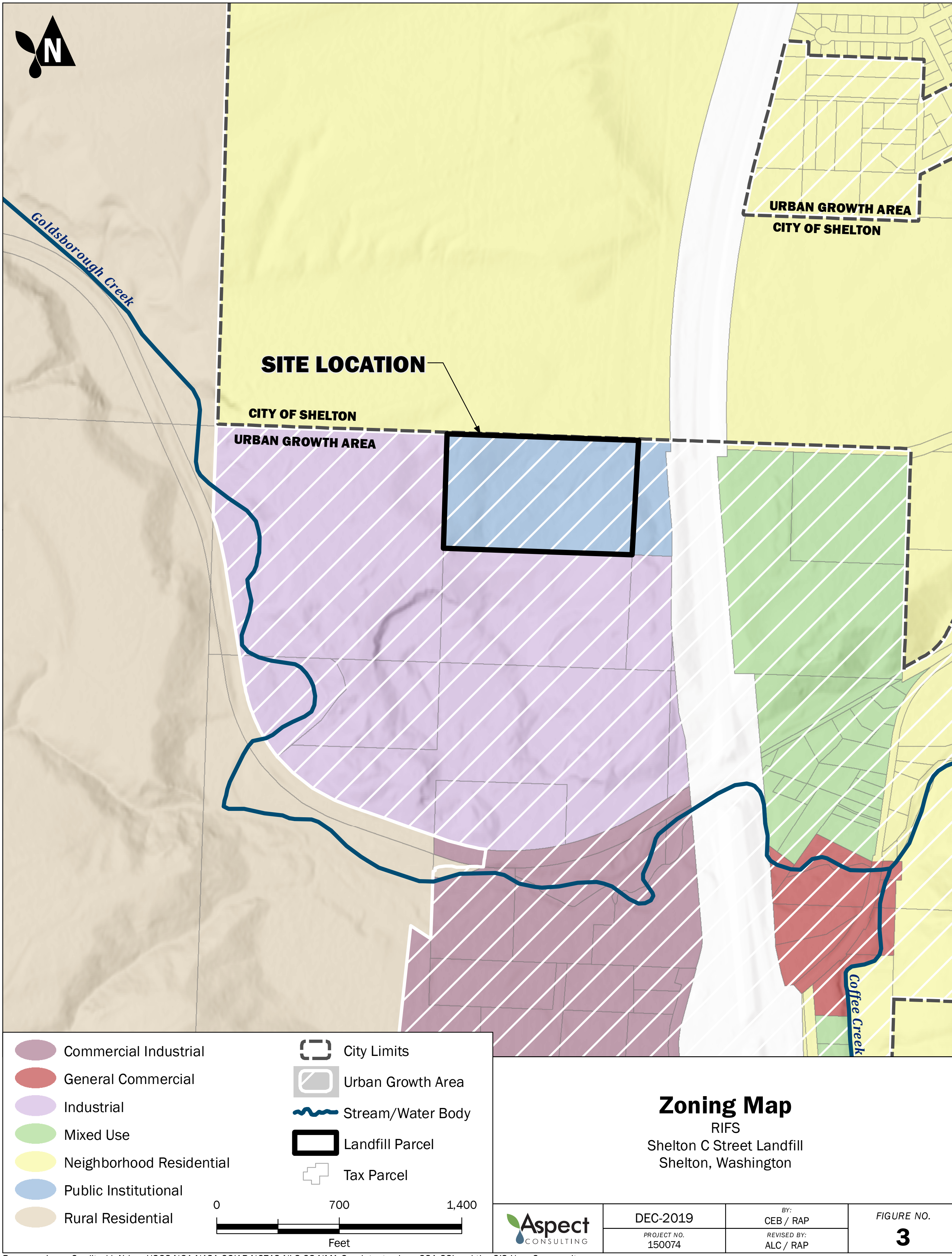


Zoning Map

RIFS
Shelton C Street Landfill
Shelton, Washington

Aspect CONSULTING

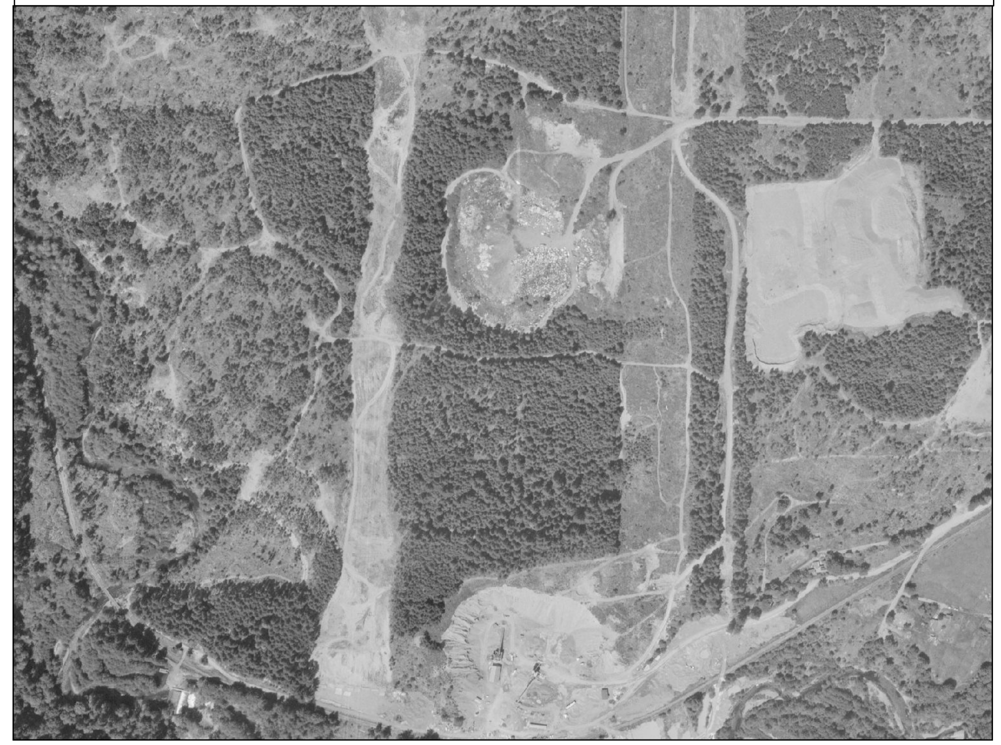
DEC-2019	BY: CEB / RAP	FIGURE NO.
PROJECT NO. 150074	REVISED BY: ALC / RAP	3

GIS Path: T:\projects_8\Shelton C Street Landfill\Delivered\RIFS\03 Zoning Map.mxd || Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet || Date Saved: 12/16/2019 || User: trullen || Print Date: 12/16/2019

Basemap Layer Credits || Airbus,USGS,NGA,NASA,CGIAR,NCEAS,NLS,OS,NMA,Geodatastyrelsen,GSA,GSI and the GIS User Community

1965

1972

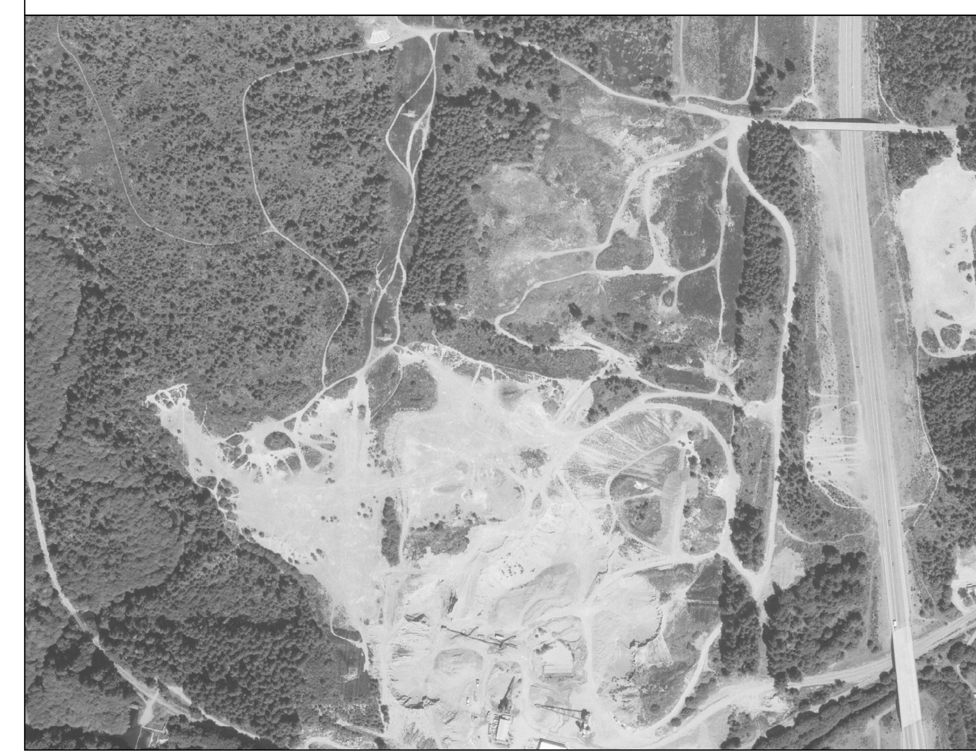


1975

1981

1985

1989



Aerial photo source: Washington Department of Natural Resources

Aerial Photos 1965-1989

RIFS
Shelton C Street Landfill
Shelton, Washington

Aspect CONSULTING	DEC-2019	BY: CEB / RAP	FIGURE NO. 4
	PROJECT NO. 150074	REVISED BY: - - -	

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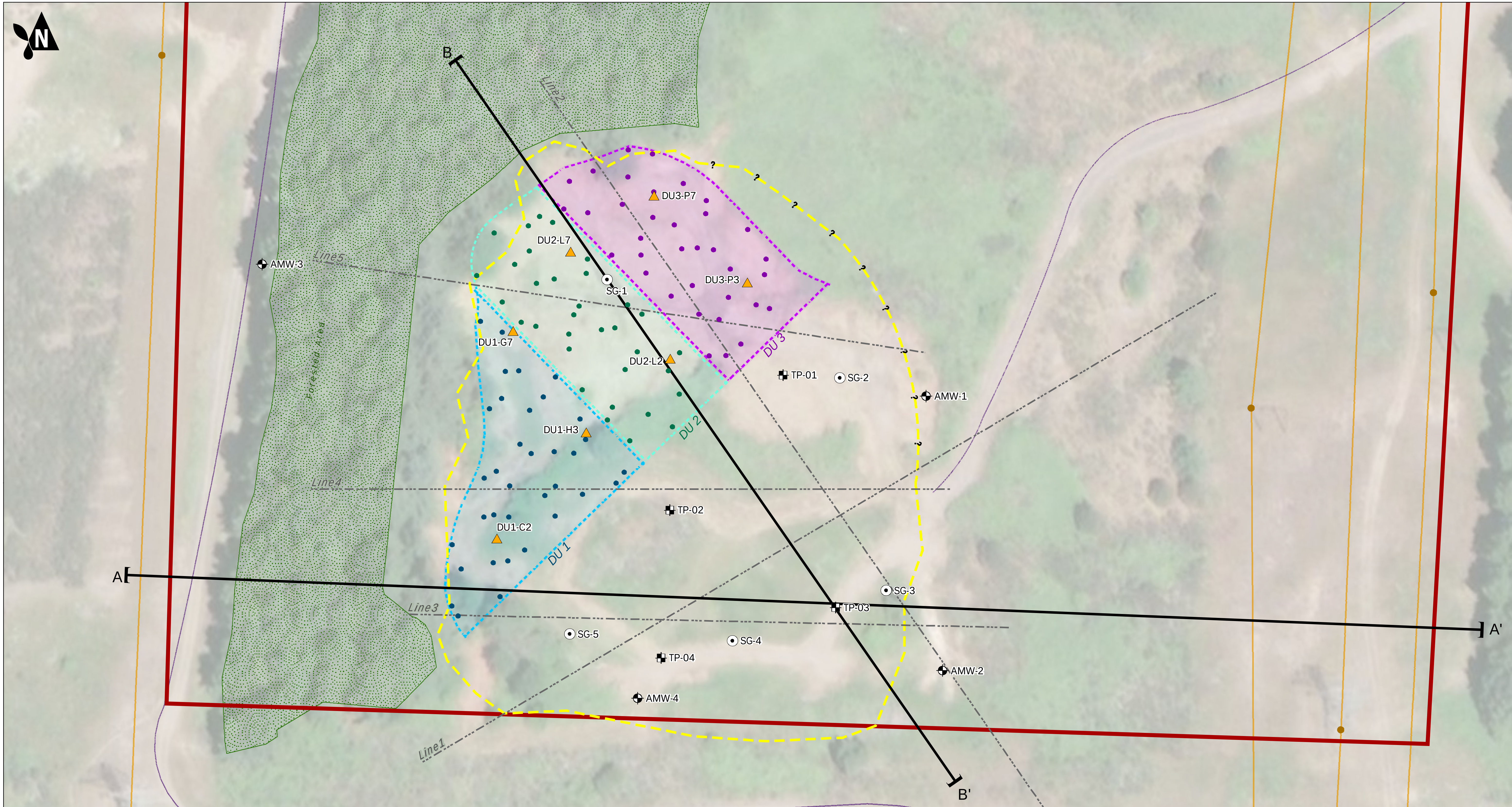

Surface Soil Characterization (Aspect, 2017)

- Discrete VOC Sampling Location

ISM Increment Soil Sample Location

- Sample ISM-DU1-072617 Increment
- Sample ISM-DU2-072617 Increment
- Sample ISM-DU3-072617 Increment
- Decision Unit 1 (DU1)
- Decision Unit 2 (DU2)
- Decision Unit 3 (DU3)

Note: Aerial imagery from June 2017 Digital Globe Imagery.

Geophysical Survey Results (HGI, 2017)

- Electrical Resistivity Line
- Estimated Extent of Landfill Waste

0 80 160

Feet

Site Features

- Monitoring Well
- Temporary Soil Gas Probe
- Test Pit for Characterization Landfill Cap Material
- Landfill Parcel
- Cross Section
- Forested Area
- Access Road
- Transmission Tower
- Transmission Line

Site Characterization Plan

RIFS
Shelton C Street Landfill
Shelton, Washington

Aspect CONSULTING

DEC-2019	BY: ALC / RAP	FIGURE NO.
PROJECT NO. 150074	REVISED BY: - - -	5

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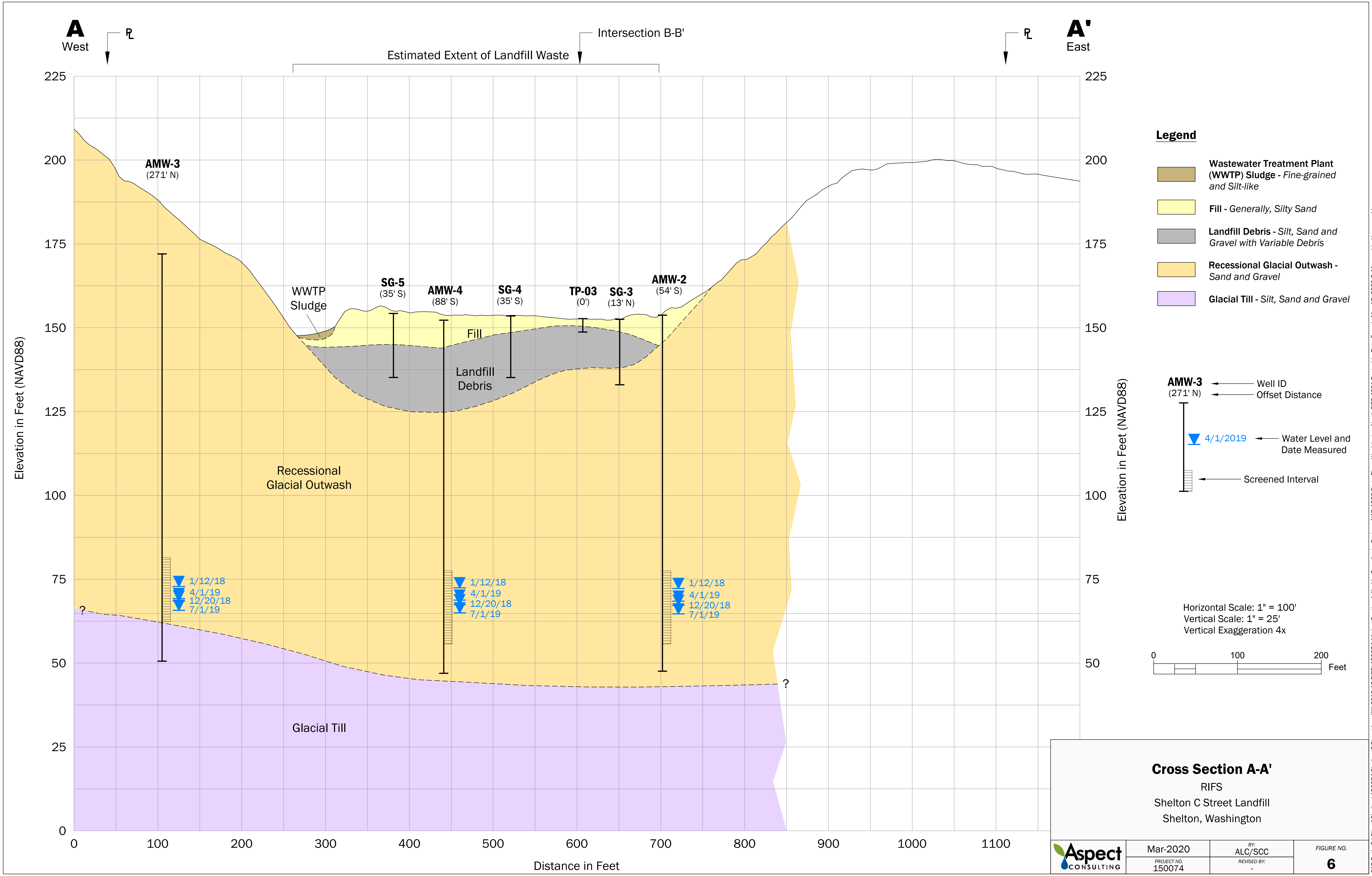
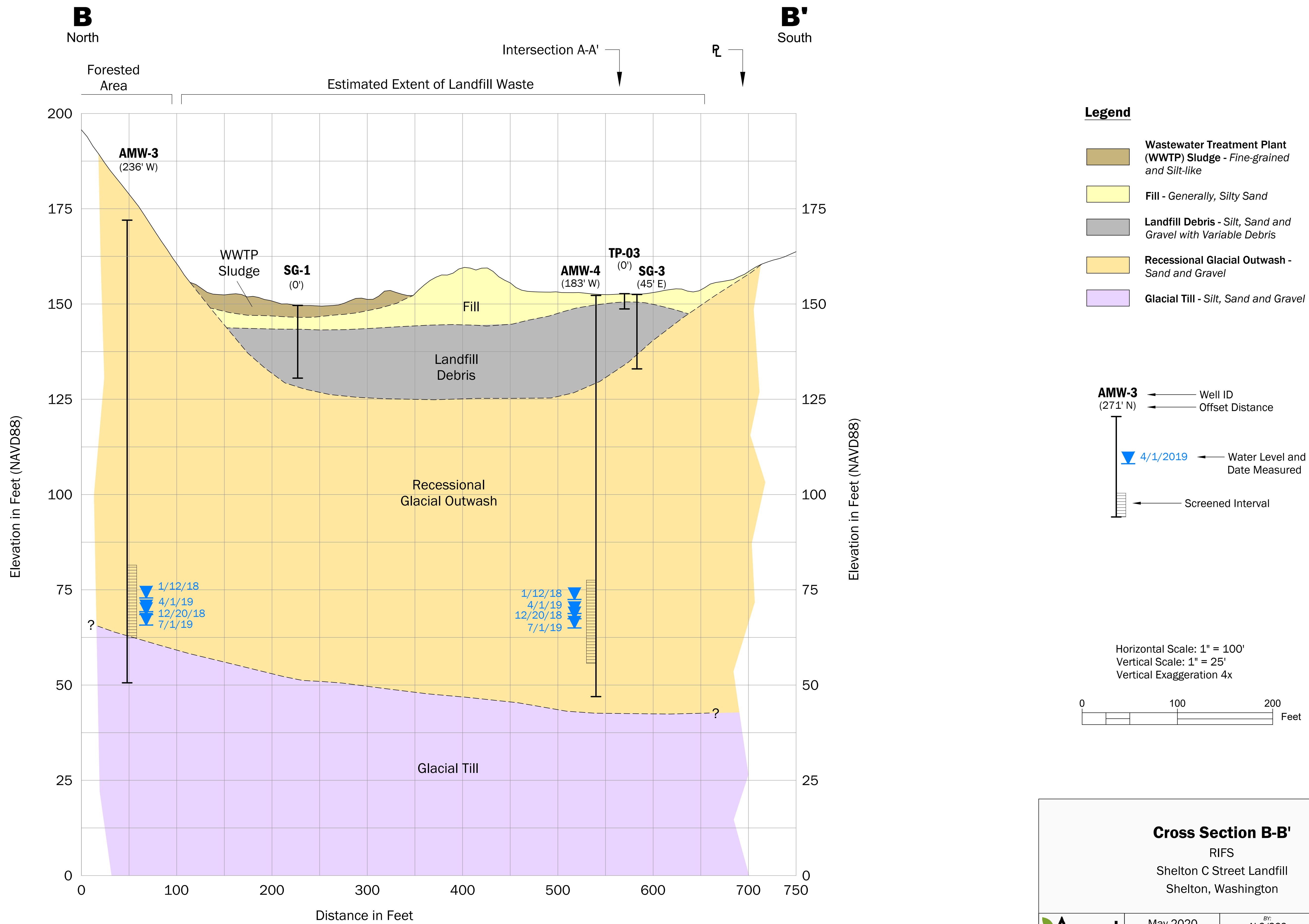


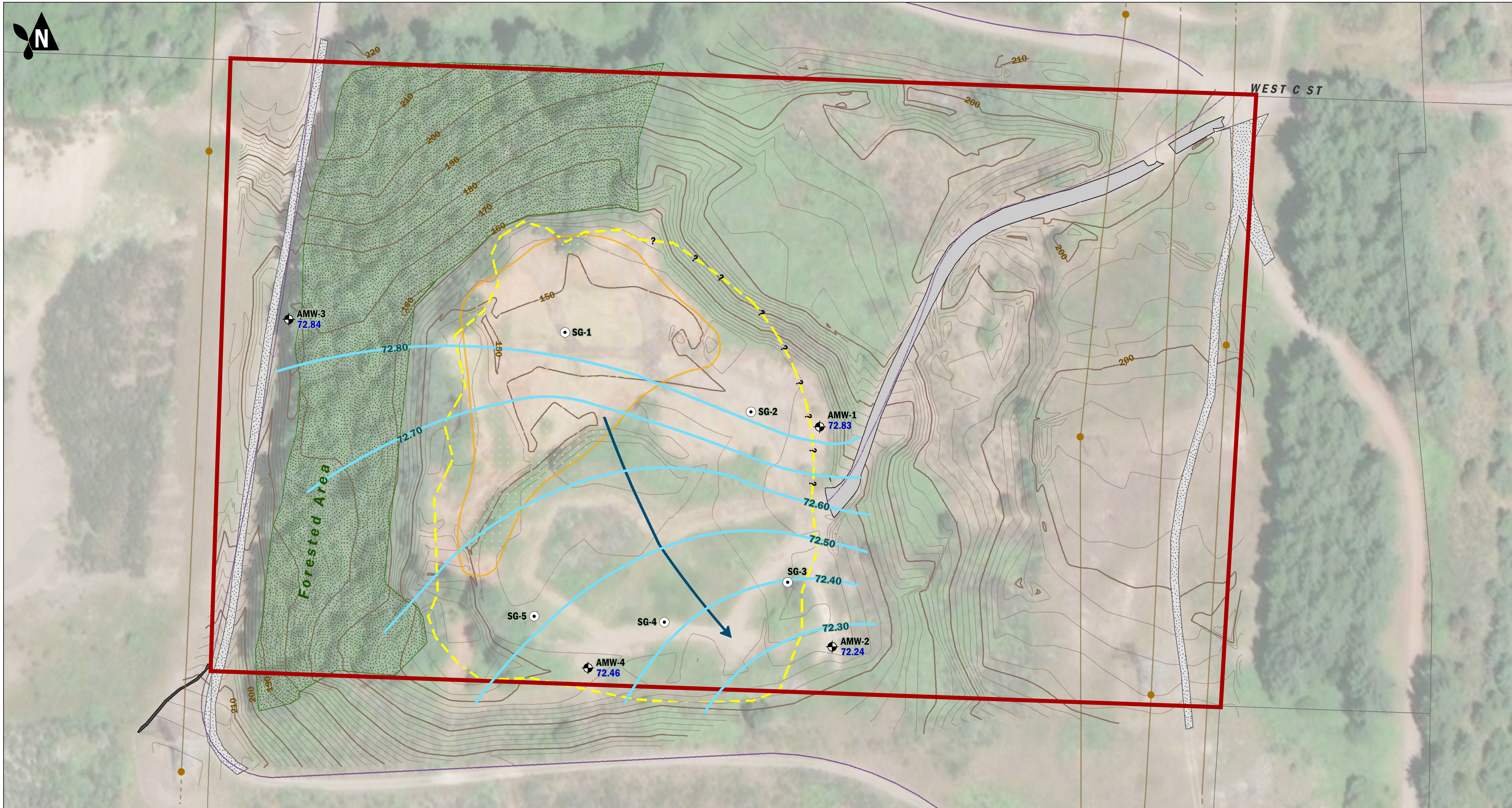
A
West
A'
East
PL
Intersection B-B'
Estimated Extent of Landfill Waste
Elevation in Feet (NAVD88)
Distance in Feet
225
200
175
150
125
100
75
50
25
0
0
100
200
300
400
500
600
700
800
900
1000
1100
AMW-3
(271' N)
SG-5
(35' S)
AMW-4
(88' S)
SG-4
(35' S)
TP-03
(0')
SG-3
(13' N)
AMW-2
(54' S)
WWTP Sludge
Fill
Landfill Debris
Recessional Glacial Outwash
Glacial Till
1/12/18
4/1/19
12/20/18
7/1/19
?
Legend
Wastewater Treatment Plant (WWTP) Sludge - Fine-grained and Silt-like
Fill - Generally, Silty Sand
Landfill Debris - Silt, Sand and Gravel with Variable Debris
Recessional Glacial Outwash - Sand and Gravel
Glacial Till - Silt, Sand and Gravel
Well ID
Offset Distance
4/1/2019
Water Level and Date Measured
Screened Interval
Horizontal Scale: 1" = 100'
Vertical Scale: 1" = 25'
Vertical Exaggeration 4x
Feet
Cross Section A-A'
RIFS
Shelton C Street Landfill
Shelton, Washington
Aspect CONSULTING
Mar-2020
PROJECT NO.
150074
BY:
ALC/SCC
REVISED BY:
-
FIGURE NO.
6
CAD Path: Q:\City of Shelton\150074 Shelton C Street Landfill\2019-12 RIFS\150074-AA.dwg Section A-A' || Coordinate System: NAD 1983 State Plane Washington North FIPS 4601 Feet || Date Saved: Mar 17, 2020 2:41pm || User: scudd



Cross Section B-B'
RIFS
Shelton C Street Landfill
Shelton, Washington

Aspect CONSULTING

May-2020	BY: ALC/SCC	FIGURE NO.	
PROJECT NO. 150074	REVISED BY: -	7	



Well Name AMW-1
Groundwater Elevation (ft NAVD88) 72.83

Monitoring Well

Temporary Soil Gas Probe

Groundwater Elevation Contour (ft NAVD88)

Inferred Groundwater Flow Direction

Estimated Extent of Landfill Waste

1986 Sludge Disposal Area

Landfill Parcel

Forested Area

Transmission Tower

Transmission Line

Access Road

Asphalt Road

Concrete Block Wall

Gravel Road

Tax Parcel

0 100 200
Feet

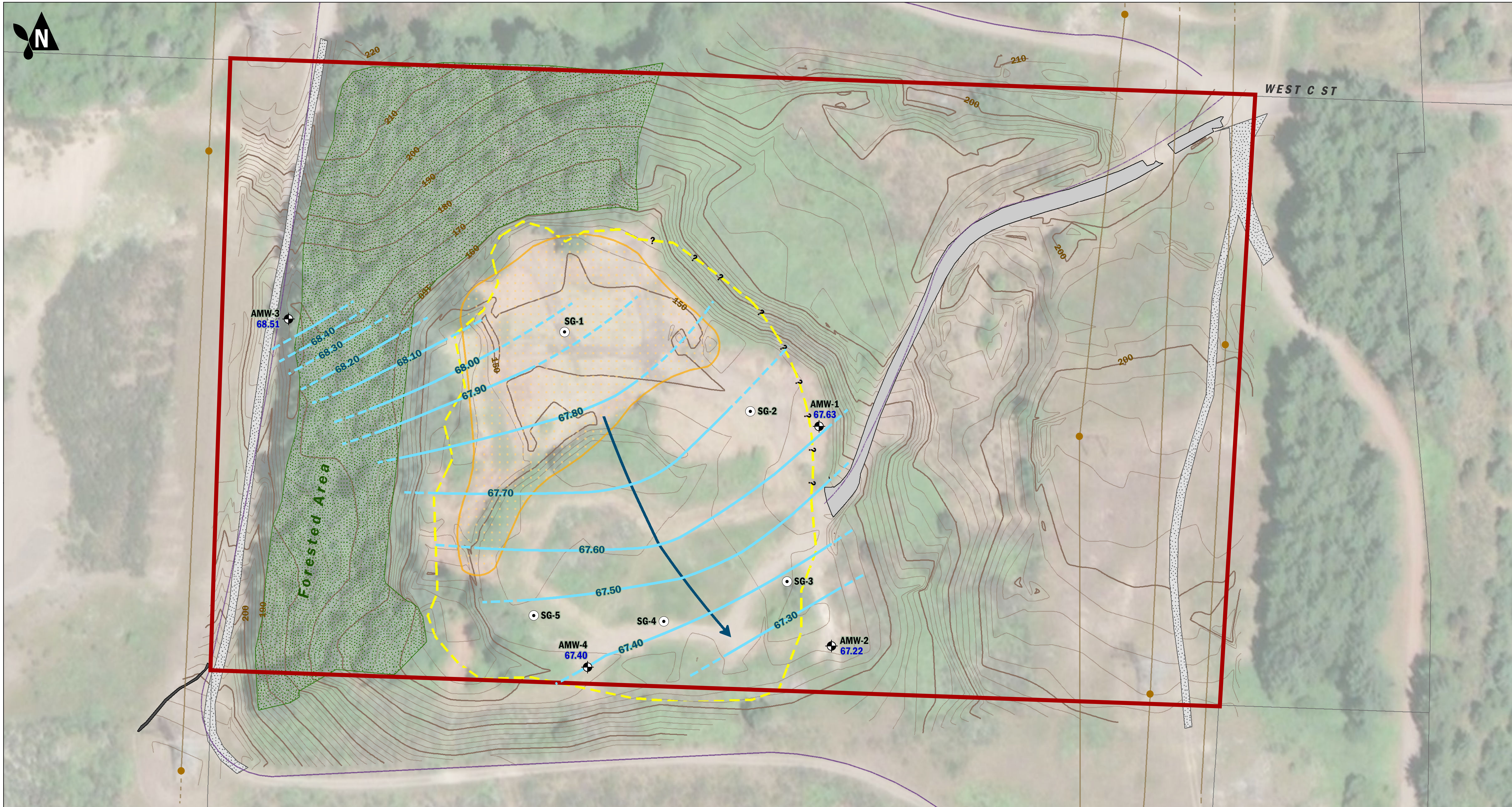
Note: All site feature locations are approximate. Topographic contours from PLS Survey October 2017. Aerial imagery from June 2017 Digital Globe Imagery.

Groundwater Potentiometric Map
January 12th, 2018

RIFS
Shelton C Street Landfill
Shelton, Washington

Aspect CONSULTING	DEC-2019	BY: ALC / RAP	FIGURE NO.
	PROJECT NO. 150074	REVISED BY: - - -	8

GIS Path: T:\projects_8\Shelton C Street Landfill\Delivered\RIFS\08 Groundwater Contours - Jan 2018.mxd || Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet || Date Saved: 12/16/2019 || User: trulien || Print Date: 12/16/2019



Well Name AMW-1
Groundwater Elevation (ft NAVD88) 67.63

- Monitoring Well
- Temporary Soil Gas Probe
- Groundwater Elevation Contour (ft NAVD88)
- Inferred Groundwater Flow Direction
- Estimated Extent of Landfill Waste
- 1986 Sludge Disposal Area
- Landfill Parcel
- Forested Area
- Transmission Tower
- Transmission Line
- Access Road
- Asphalt Road
- Concrete Block Wall
- Gravel Road
- Tax Parcel

0 100 200
Feet

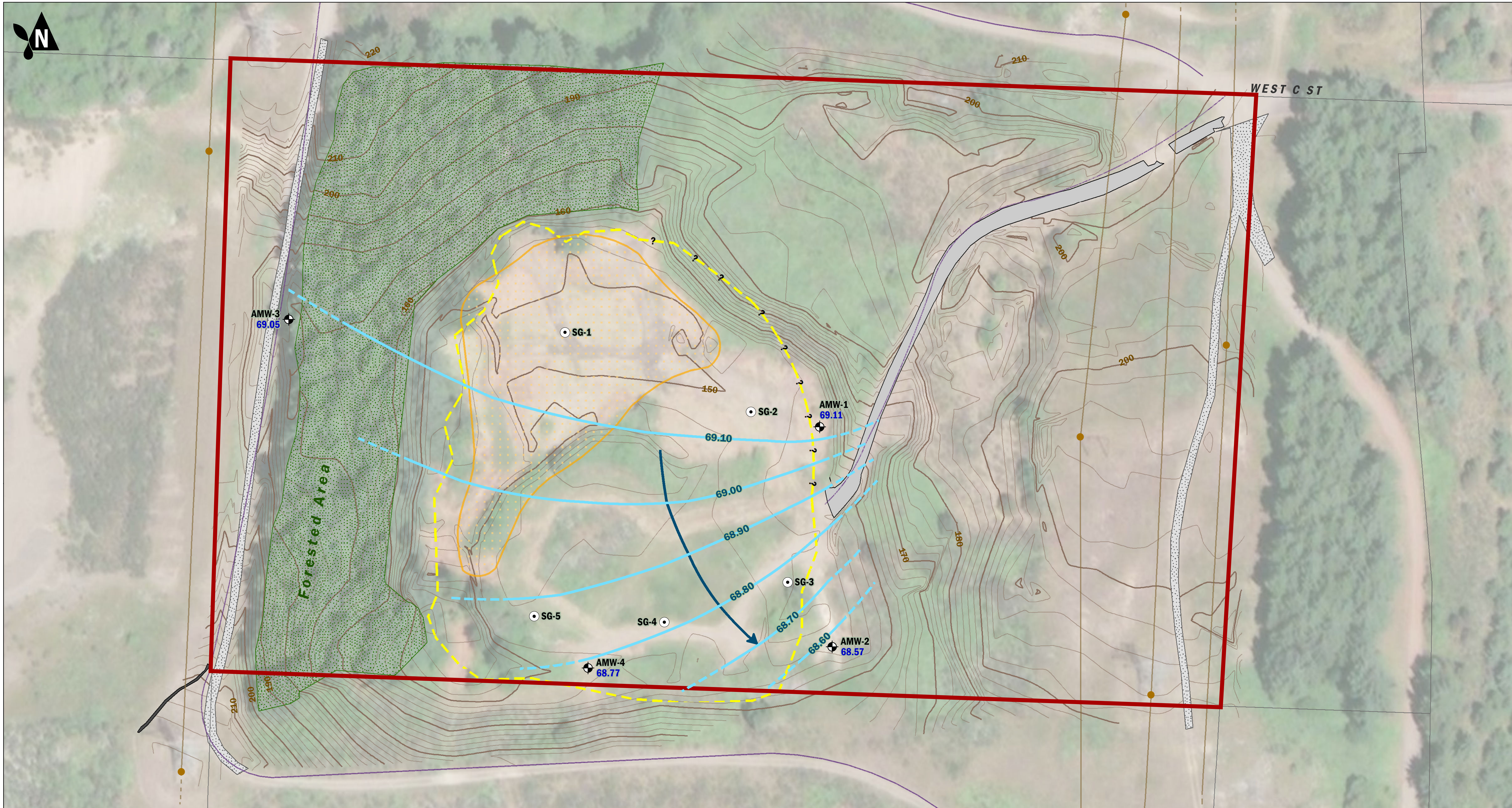
Note: All site feature locations are approximate. Topographic contours from PLS Survey October 2017. Aerial imagery from June 2017 Digital Globe Imagery.

Basemap Layer Credits || Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Groundwater Potentiometric Map
December 20th, 2018

RIFS
Shelton C Street Landfill
Shelton, Washington

Aspect Consulting	DEC-2019	BY: ALC / RAP	FIGURE NO.
	PROJECT NO. 150074	REVISED BY: - - -	9



Well Name AMW-1
Groundwater Elevation (ft NAVD88) 69.11

- Monitoring Well
- Temporary Soil Gas Probe
- Groundwater Elevation Contour (ft NAVD88)
- Inferred Groundwater Flow Direction
- Estimated Extent of Landfill Waste
- 1986 Sludge Disposal Area
- Landfill Parcel
- Forested Area
- Transmission Tower
- Transmission Line
- Access Road
- Asphalt Road
- Concrete Block Wall
- Gravel Road
- Tax Parcel

0 100 200
Feet

Note: All site feature locations are approximate. Topographic contours from PLS Survey October 2017. Aerial imagery from June 2017 Digital Globe Imagery.

Basemap Layer Credits || Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Groundwater Potentiometric Map
April 1st, 2019

RIFS
Shelton C Street Landfill
Shelton, Washington

Aspect CONSULTING	DEC-2019	BY: ALC / RAP	FIGURE NO.
	PROJECT NO. 150074	REVISED BY: - - -	10

GIS Path: T:\projects_8\Shelton C Street Landfill\Delivered\RIFS\10 Groundwater Contours - Apr 2019.mxd || Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet || Date Saved: 12/16/2019 || User: tsalen || Print Date: 12/16/2019

Well Name AMW-1
Groundwater Elevation (ft NAVD88) 69.11

- Monitoring Well
- Temporary Soil Gas Probe
- Groundwater Elevation Contour (ft NAVD88)
- Inferred Groundwater Flow Direction
- Estimated Extent of Landfill Waste
- 1986 Sludge Disposal Area
- Landfill Parcel
- Forested Area
- Transmission Tower
- Transmission Line
- Access Road
- Asphalt Road
- Concrete Block Wall
- Gravel Road
- Tax Parcel

0 100 200
Feet

Note: All site feature locations are approximate. Topographic contours from PLS Survey October 2017. Aerial imagery from June 2017 Digital Globe Imagery.

Groundwater Potentiometric Map
July 1st, 2019

RIFS
Shelton C Street Landfill
Shelton, Washington

Aspect Consulting	DEC-2019	BY: ALC / RAP	FIGURE NO.
	PROJECT NO. 150074	REVISED BY: KEB / WEG	11

APPENDIX A

Geophysical Survey Report

RPT-2017-024, Rev. 0

Geophysical Survey of the C Street Landfill, Shelton, WA

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M. Levitt

K. Rucker

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2302 N. Forbes Blvd, Tucson, A□ 85□45 □SA

Date Published

August 201□

Prepared for:

Aspect Consulting LLC

TABLE OF CONTENTS

LIST OF FIGURES

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

In May 201□, hydro□EOPH□SICS, Inc. (H□I) performed a multi-method geophysical survey at a closed landfill in Shelton, WA. This survey effort was completed to determine the lateral extents and thickness of buried waste and the depth of cover material over the waste at the location of the former C Street Landfill. A combined electromagnetic (EM) and magnetic (Mag) survey over the entire accessible landfill area, as well as five lines of two-dimensional (2D) Electrical Resistivity Tomography (ERT) were completed.

1.2 SCOPE

The scope of this project includes using EM, Mag, and ERT to characterize the subsurface at the survey site. The ground conductivity portion of the EM measurement provides a good indication of the lateral limits of covered or closed landfill, presented in a georeferenced 2D plan view of the electrical properties of the subsurface. The magnetic measurements are highly sensitive to ferrous metals in the landfill, providing a high-resolution plan view map of the distribution of ferrous metallic wastes within the landfills. The electrical resistivity imaging method results in 2D cross sections of the electrical properties of the subsurface materials, allowing the depth, thickness, and lateral limits of the conductive wastes to be estimated, together with an estimate of the thickness of the cover material.

1.3 OBJECTIVE

The objective of this multi-method geophysical survey was to non-invasively determine the extent and thickness of buried waste and the depth of cover material over the waste by mapping the electrical properties of the subsurface. This is based on the theory that, generally, the products of the decomposition of municipal solid waste are conductive, and as these mix with precipitation and/or groundwater flow, the resulting bulk electrical properties of the wastes are likely to be highly conductive compared to typical background native geological materials. The landfill is also expected to contain metallic debris which when imaged using magnetic gradiometry should display contrast to undisturbed materials outside the landfill boundaries.

2.0 BACKGROUND

2.1 SITE LOCATION

The C Street Landfill is located in the city of Shelton, WA, □SA. Figure 1 shows the general location of the geophysical survey site.

The C Street Landfill is located at west end of C Street on the west side of the overpass over Highway 101. The landfill operated during the years 1928-1984, with an unknown total of estimated waste and is located in a depression in the ground formed by an old gravel quarry.

Figure 1. General Survey Location.

Aerial imagery □ □oogle Earth 2016

3.0 METHODOLOGY

3.1 SURVEY AREA AND LOGISTICS

EM □ Mag data were acquired between 5/1□/1□ and 5/18/1□ at high-resolution sampling with rapid acquisition using a walking system. Data were recorded continuously along survey lines to produce the coverage shown in Figure 2. The total area covered was approximately 8.3 acres. The survey area had steep topography around the edges of the depression and heavy vegetation throughout.

Because of this heavy vegetation, we were unable to cover the entire proposed survey area with the EM and Mag. The planned parallel line spacing of 15 feet was also modified due to the dense vegetation. Instead, the instrument operators selected surveying routes where available access allowed. Sufficient survey coverage over the assumed landfill area was achieved despite the vegetation in most areas, however, towards the northeast, we were unable to get full coverage beyond the landfill boundary. Figure 3 is an example photograph showing the dense vegetation that dominated the side besides the central cleared area.

Resistivity data, were acquired between 5/19/1□ and 5/20/1□, and consisted of five lines of data with two being approximately 81□ feet long each, and three others being approximately 542 feet long, totaling approximately 3,260 feet of total line coverage. The locations of the survey lines are shown in Figure 2 (pink lines). Table 1 lists specific parameters for the resistivity survey lines.

Prior to commencement of the geophysical survey, a general assumption existed on the location of the boundary of the landfill. This information is posted on Figure 2 as the red line, with extents as provided by Aspect Consulting LLC.

Table 1. Resistivity Line Parameters.

Line #	Date of Acquisition	Electrode Spacing (feet)	Length (feet)	Line Orientation	Start Position (Easting, Northing) UTM - meters	End Position (Easting, Northing) UTM - meters
1	5/20/1□	10	81□	SW-NE	489820.8, 5228954	490025, 5229082
2	5/20/1□	10	81□	NW-SE	489846.4, 5229133	489986.□, 5228942
3	5/21/1□	10	542	E-W	4899□3.1, 5228993	489816.1, 5228992
4	5/21/1□	10	542	E-W	48995□, 5229029	489□89.9, 5229024
5	5/21/1□	10	542	E-W	489949.1, 5229065	489□88.□, 5229084

Figure 2. Detailed Survey Coverage Map.

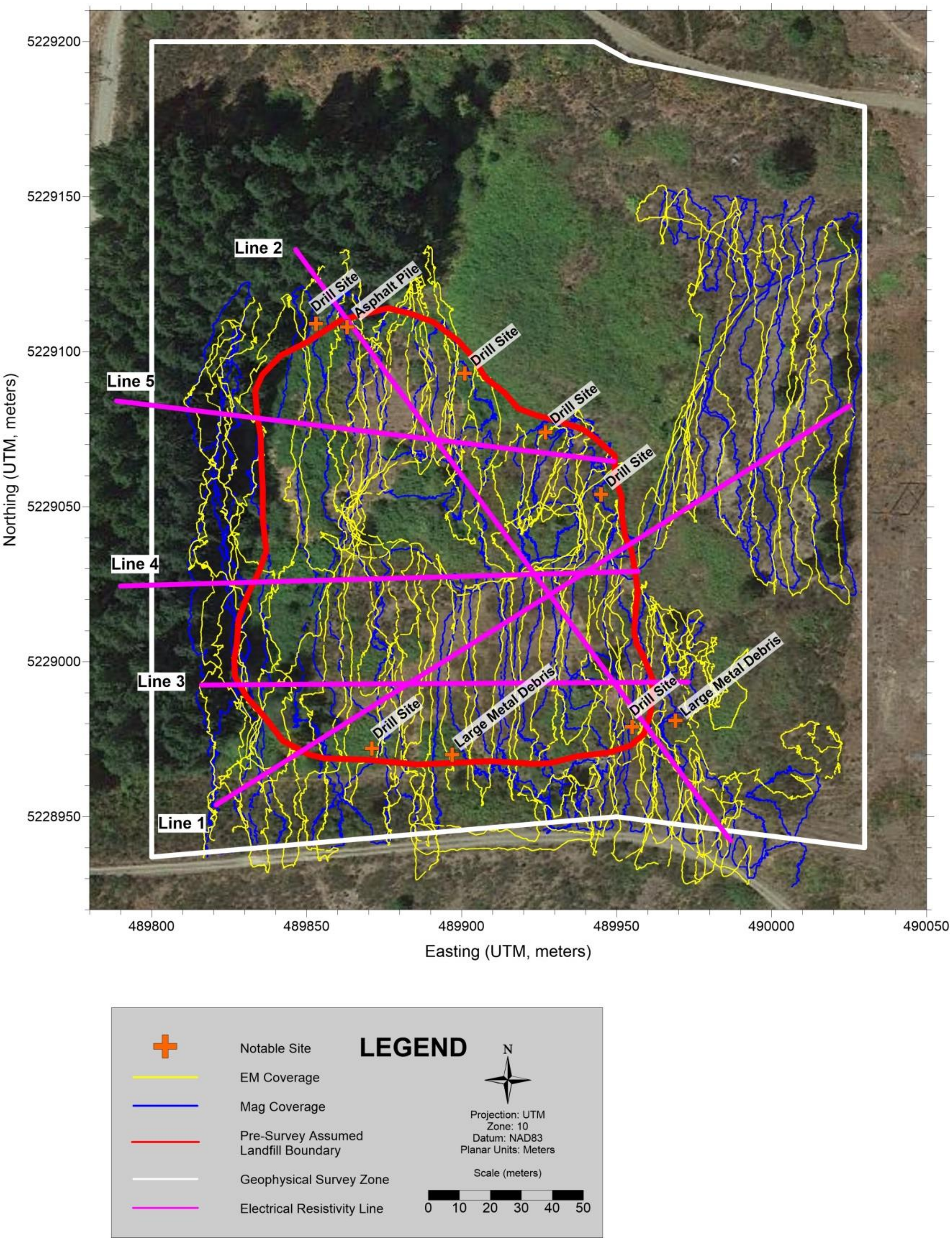


Figure 3. Example of Dense Vegetation Cover across the Proposed Survey Area.

3.2 EQUIPMENT

3.2.1.1 Magnetic Gradiometry

A □eometrics, Inc. □-859 cesium vapor magnetometer with integrated WAAS/E□NOS enabled Tallysman™ GPS was used to provide magnetic data for the project. The magnetometer and □PS system were mounted on a non-magnetic backpack, with a waist mounted console used to control data collection parameters and record the total magnetic field data. The instrument is commercially available and was designed to provide detection of subsurface ferrous metals by mapping distortions to the measured localized magnetic field. The magnetometer console contains a serial input and necessary firmware that is used to interface with and store □PS data.

Interchangeable low voltage 12V dc gel cell batteries are used to power the magnetometer console. A daily inspection is completed by the qualified operator to ensure all components are in satisfactory working condition. Quality assurance tests, including a visual inspection and an instrument check survey line were performed at the beginning and end of each day and each time the instrument power was cycled.

To perform the diurnal correction, a □eometrics, Inc. □-85□ proton precession magnetometer was used as a base station to provide a continuous record of changes in the Earth's magnetic field to correct the collected total magnetic field survey data.

A daily inspection is completed by the qualified operator to ensure all components are in satisfactory working condition. Quality assurance tests including a visual inspection, a function test, a static response test, a vibration test, and a dynamic response test were performed daily.

3.2.1.2 Electromagnetic Induction

The □EM-2[□] electromagnetic instrument (□eophex Ltd, Raleigh, NC) was used to provide electromagnetic (EM) data. The electromagnetic system is used to detect variations in subsurface soil moisture, soil conductivity, and the presence of subsurface infrastructure (utilities, pipes, tanks, etc.). The □EM-2 consists of a sensor housing (the "ski"), and the electronics console. The console includes the data acquisition, rechargeable battery, and data storage hardware. Accessories include a battery charger, carrying straps, a download cable, a brief field guide, and manual. The console contains one DB9 serial connector for downloading data to a PC using the manufacturer-supplied Win□EM software, and another DB9 serial connector that accepts and records a □PS data stream. The □PS time and location are appended to each electromagnetic data point. The instrument is commercially available and is widely used within the geophysical arena.

A daily inspection is completed by the qualified operator to ensure all components are in satisfactory working condition. Quality assurance tests including a visual inspection, a function test, a static response test, a vibration test, and a dynamic response test were performed daily.

3.2.2 Resistivity

Data were collected using a Supersting™ R8 multichannel electrical resistivity system (Advanced □eosciences, Inc. (A□I), Austin, T□) and associated cables, electrodes, and battery power supply. The Supersting™ R8 meter is commonly used in surface geophysical projects and has proven itself to be reliable for long-term, continuous acquisition. The stainless steel electrodes were laid out along lines with a constant electrode spacing of approximately 10 feet (3 meters). Multi-electrode systems allow for automatic switching through preprogrammed combinations of seven electrode measurements.

[□] □EM-2 is a registered trademark of □eophex, Ltd.

3.2.2.1 Handheld GPS

Positional data for the resistivity lines were acquired via a handheld □armin □PS unit. Topographical data were incorporated into the 2D resistivity inversion modeling routines.

3.3 DATA CONTROL AND PROCESSING

3.3.1 Quality Control

All data were given a preliminary assessment for quality control (QC) in the field to assure quality of data before progressing the survey. Following onsite QC, all data were transferred to the H□I server for storage and detailed data processing and analysis. Each line or sequence of acquisition was recorded with a separate file name. Data quality was inspected and data files were saved to designated folders on the server. Raw data files were retained in an unaltered format as data editing and processing was initiated. Daily notes on survey configuration, location, equipment used, environmental conditions, proximal infrastructure or other obstacles, and any other useful information were recorded during data acquisition and were saved to the H□I Tucson server. The server was backed up nightly and backup tapes were stored at an offsite location on a weekly and monthly basis.

3.3.1.1 Total Field Magnetics

Time, date, and magnetic data were stored within a data logger and downloaded to a laptop PC for processing. Magnetic data were processed using MA□MAPPER software. The raw data are downloaded to a computer and then the □PS data are integrated with the magnetic data to provide sub-meter accuracy. There are several options that are employed to remove any spikes in the data set from anomalous data points. In addition, data are corrected for diurnal changes by normalizing to a local base magnetometer. Data are reviewed on a daily basis with emphasis on making sure the data quality is good. As the survey progressed, each new day was added into the existing data base to ensure coherency among the whole dataset. There are typical offsets from one day to the next and to ensure that the whole dataset was on the same datum we collected calibration lines at several times during the day; in the morning, and at about every 3 hours when there was a battery change. Each dataset collected was corrected to the first day's calibration line using a calculated correction factor.

3.3.1.2 Electromagnetic Induction

Multiple frequencies were acquired for the electromagnetic data and each were processed and analyzed. Both in-phase and quadrature data were acquired at 3 frequencies ranging from 5 kHz to 20 kHz. These electromagnetic data were processed using the Win□EM Software as provided by the manufacturer and an electrical conductivity value was calculated. The EM conductivity and EM in-phase data were selected for final processing and presentation. The EM conductivity data is more sensitive to soil conductivity (electrical properties) changes, while the EM in-phase data is more sensitive to metal in the subsurface. For the purposes of this survey, all frequencies were reviewed and there was virtually no difference in the interpretation of the datasets, so only the 10 kHz data are presented. A similar process to the mag dataset is used to integrate the GPS and correct each dataset against the calibration line.

3.3.1.3 EM & Mag Plotting

The EM and Mag data were gridded and color contoured in Surfer (Golden Software, Inc.). The combined EM and Mag datasets, after being compensated for the calibration set, were combined into one master file. The Kriging gridding algorithm was used within the Surfer software. This algorithm is good for large datasets and honors the actual raw data very well without adding in artificial character to the datasets.

3.3.2 Resistivity Data Processing

The geophysical data for the resistivity survey, including measured voltage, current, measurement (repeat) error, and electrode position, were recorded digitally with the AGI SuperSting R8 resistivity meter. Quality control both in-field and in-office was performed throughout the survey to ensure acceptable data quality. Data were assessed and data removal was performed based on quality standards and degree of noise/other erroneous data. Edited data were inverted and the results plotted for final presentation and analysis.

The raw data were evaluated for measurement noise. Those data that appeared to be extremely noisy and fell outside the normal range of accepted conditions were manually removed within an initial Excel spreadsheet analysis. Examples of conditions that would cause data to be removed include, negative or very low voltages, high-calculated apparent resistivity, extremely low current, and high repeat measurement error. Secondary data removal occurred for some of the lines via the RMS error filter built in to the RES2DINVx64 software. RMS error filter runs were performed removing no greater than 5% of the data, and were initiated to bring the final RMS value down to 5% or below based on model convergence standards (see section 3.3.2.1 for more details).

3.3.2.1 2D Resistivity Inversion

RES2DINVx64 software (Geotomo, Inc.) was used for inverting individual lines in two dimensions. RES2DINV is a commercial resistivity inversion software package available to the public from www.geoelectrical.com. An input file was created from the initial edited resistivity data and inversion parameters were chosen to maximize the likelihood of convergence. It is important to note that up to this point, no resistivity data values had been manipulated or changed, such as smoothing routines or box filters. Noisy data had only been removed from the general population.

The inversion process followed a set of stages that utilized consistent inversion parameters to maintain consistency between each model. Inversion parameter choices included the starting model, the inversion routine (robust or smooth), the constraint defining the value of smoothing and various routine halting criteria that automatically determined when an inversion was complete. Convergence of the inversion was judged whether the model achieved an RMS of less than 5 within three to five iterations.

Additional data editing was performed for some of the lines using the RMS error filter with RES2DINVx64. This option provides a secondary means of removing bad data points from the data set; the RES2D program displays the distribution of the percentage difference between the logarithms of the observed and calculated apparent resistivity values in the form of a bar chart. It is expected the "bad" data points will have relatively large "errors", for example above 100 percent. Points with large errors can be removed and a new input file is created omitting these points based on the cut-off error limit selected. The data are then re-run through the inversion routine, and named with the naming convention (i, ii) to denote the filter trial number.

3.3.2.2 2D Resistivity Plotting

The inverted data were output from RES2DINV into a . data file and were gridded and color contoured in Surfer (olden Software, Inc.). Where relevant, intersecting features were plotted on the resistivity section to assist in data analysis. Qualified in-house inversion experts subjected each profile to a final review.

4.0 RESULTS

4.1 EM & MAG

The analysis of the EM Mag results is based on the anticipated contrast in electrical properties between the conductive (low resistivity) landfill materials and the more resistive natural background materials. enerally, the products of the decomposition of waste are conductive, and as these mix with precipitation and surface water inflitration, the resulting bulk electrical properties of the wastes are likely to be highly conductive compared to typical natural background materials. Metal waste within the landfill will also be electrically conductive and generally magnetic. The electromagnetic and magnetic survey methods result in high-resolution 2D plan view maps of the electrical properties of the subsurface materials, allowing the lateral limits of the landfill to be estimated.

The magnetic measurements are highly sensitive to ferrous metals in the landfill. This can provide a high-resolution map of the distribution of metallic wastes within the landfills. The EM conductivity measurements would be expected to be more susceptible to moisture content and other conductive materials (clays, leachate, etc.), with the moisture in contact with waste materials of the landfill expected to be of increased conductivity.

Figure 4 shows the results of the EM conductivity (sensitive to bulk conductivity changes) and Mag (sensitive to ferrous metal only) survey for the whole survey site. Magnetic data are plotted as total magnetic field, measured in nanotesla (nT). Red and purple hues indicate highest anomalous areas, while yellow are more representative of background values or areas where fill material is thicker and landfill waste is beyond detection limits. The data show heterogeneity throughout the survey site, generally within the assumed landfill boundaries.

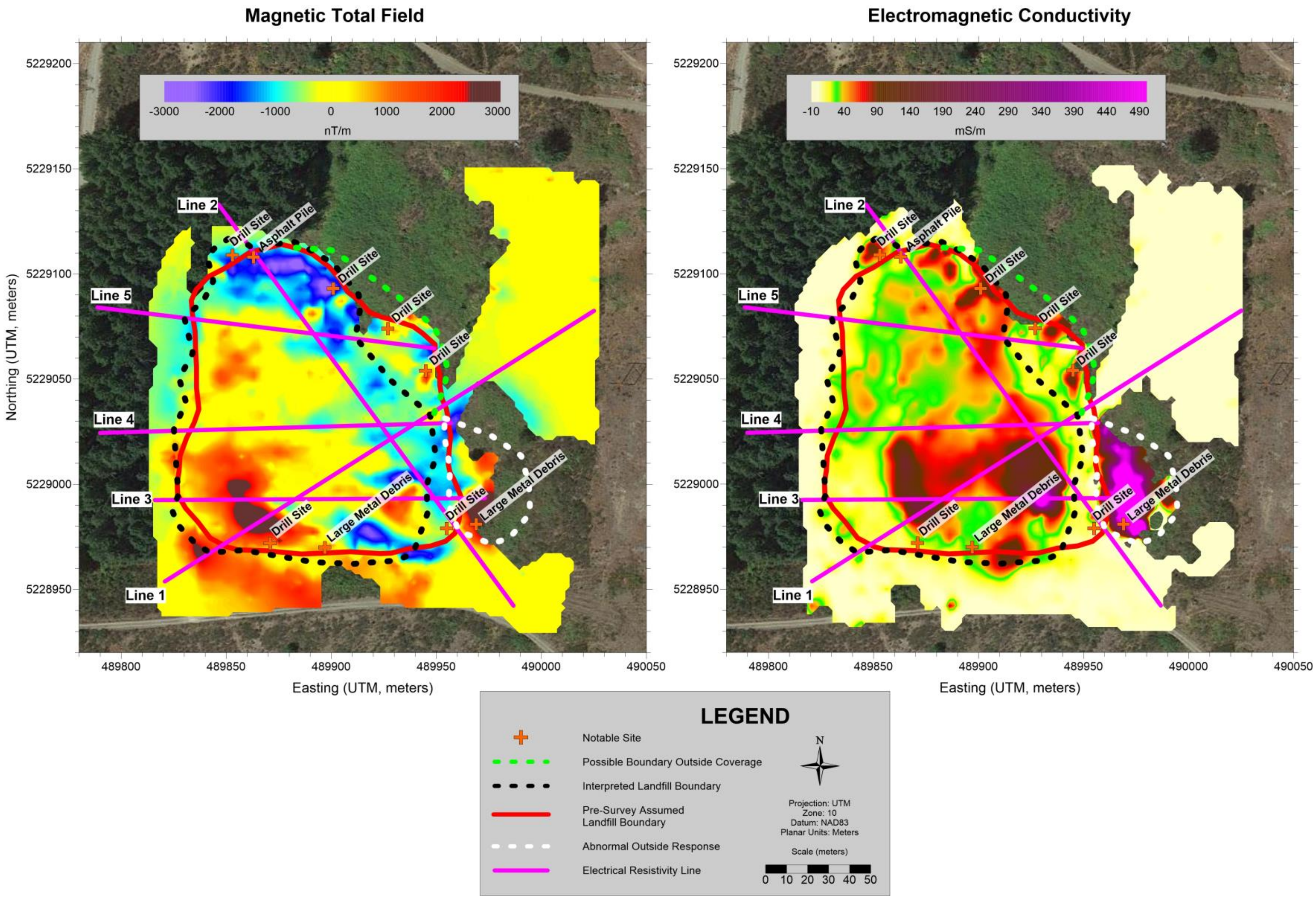
The results of the EM survey are plotted as 10 kHz conductivity data in millisiemens per meter (mS/m). In the EM conductivity results, purple and green hues indicate anomalous areas, yellow hues represent background values. The data show heterogeneity throughout the survey site, generally within the assumed landfill boundaries.

enerally speaking, the magnetic response patterns are in congruence with the EM results. Data for the complete survey site, as well as the results of the resistivity transects, are discussed in detail in the following sections.

The inverse model results for the electrical resistivity survey lines are presented as two-dimensional (2D) profiles. Common color contouring scales are used for all of the lines to provide the ability to compare anomalies from line to line. Electrically conductive (low resistivity) subsurface regions are represented by cool hues (purple to blue) and electrically resistive regions are represented by warm hues (olive to red).

The objective of the survey is to geophysically characterize heterogeneities in the subsurface that can indicate contrasts in electrical conductivity or metallic content. As such, within the resistivity profiles, the zones of lower resistivity (higher conductivity) would be assumed to be within the landfill, while contrasting higher resistivity would be expected to persist in the outer undisturbed materials.

Figure 4. Contoured Electromagnetics and Magnetics Map.



The results of the EM and Mag surveys have been interpreted to provide a potential waste boundary to delineate the spatial extent of the landfill, shown with a black dashed perimeter line in Figure 4. In general, the interpreted western and southern landfill boundary shows a good agreement to the pre-survey assumed landfill boundary (shown as the red polygon). There are a number of areas along these two boundaries where the interpreted landfill boundary (black dashed line) extends beyond the assumed boundary by approximately 20-30 feet. The EM results display a very distinct change along these two boundaries, with very homogeneous low conductivity values reflecting the native geological materials outside of the interpreted landfill area. In contrast, while the western boundary of the Mag displays a similar sharp boundary to more homogeneous background values, the area outside the southern boundary appears to display somewhat more heterogeneity in places. This appears as a broad positive Mag response (red tones) and could be a response to the underlying geology. The northern boundary displays a good agreement between the interpreted and assumed boundaries, apart from a significant EM and Mag response on the northwest corner. The response extends the interpreted boundary of the landfill by approximately 40 feet in this area. The northeastern side of the landfill was an area of limited coverage due to the hill slope and associated dense vegetation, which made access extremely difficult outside of our coverage area. Consequently, there is a significant portion of this area where the EM and Mag results do not display a distinct change to the homogeneous background values, as observed on the western boundary for example. Therefore, we have indicated two potential interpreted boundaries along this side of the landfill; the dashed black line of the interpreted landfill boundary and a green dashed line indicating the potential boundary outside the geophysical coverage based on the limited indications that background values were reached along this boundary area. For example, there in the region to the northwest of the access road into the landfill (where the eastern end of Line 5 is located) the EM and Mag results would appear to indicate a transition to background values, which is also corroborated in the electrical resistivity results of Line 5. However, on the eastern limit of the EM and Mag coverage we observe several responses that would indicate waste materials are still present in the subsurface. These responses are on the coverage limit of the electrical resistivity Line 5 and so it is difficult to be certain if this is a return to landfill waste material in the subsurface or an isolated response to surface features (rubble or debris piles or metallic objects on the ground surface).

The interpreted landfill boundary on the eastern side of the landfill, to the south of the access road into the landfill, would suggest the boundary shifts to the west by 20-40 feet based on the EM results. The Mag results still display some heterogeneity in this region, possibly again a response to the underlying native geology, since the electrical resistivity results from Line 3 corroborate the EM results. There is a very significant response in the EM and Mag results to the east of this area, indicated by the white dashed line in Figure 4. Based on field observations this would appear to be a near-surface response to a debris pile and surface metallic objects on the ground. This would correlate to the abnormally large responses observed in both the EM and Mag values. The EM coverage to the north and east of the large response manages to capture the return to background values on the eastern edge of this feature, highlighting the lateral limits of this response.

As stated, the EM results are in general congruence with the Mag results, with high amplitude anomalies in the EM conductivity correlating with high amplitude anomalies in the Mag results. The majority of the high amplitude responses tend to be associated with the southern half of the landfill, potentially indicating thicker waste material depths or a greater degree of decomposition. Higher concentrations of decomposition products and leachates are expected in areas with increased ferrous metal content. Another smaller region associated with high amplitude responses in the EM and Mag results is located on the northeast edge of the landfill. Again this could indicate thicker waste material depths or a higher degree of decomposition potential, with increased ferrous metal content.

4.2 RESISTIVITY RESULTS

4.2.1 Line 1

Figure 5 shows the resistivity profile for Line 1 (upper profile), which ran approximately southwest to northeast across the southern portion of the landfill. Line 1 spanned the pre-survey assumed extent of the landfill and extended into the native geology on either side of the landfill.

The landfill wastes typically present as a conductive target (purple and blue colors), therefore between approximately 95 to 490 feet along the line, the depth of the waste is estimated to be on average approximately 30 feet (the interpreted base of the waste material is highlighted by the black dashed line in

Figure 5), and the thickness of the cover is around 8 to 10 feet based on the more resistive near-surface layer (olive and brown colors). This extent of waste material correlates well to the pre-survey assumed landfill boundaries, indicated by the yellow triangles in Figure 5.

Between approximately 160 to 2□5 feet along the line the depth of the conductive waste feature appears to increase to approximately 45 feet, with a waste material thickness of approximately 35 feet. Below this thickening of the waste material layer there appears to be a reduction in the resistivity of the underlying native geological materials (indicated by the resistive red colors). This thickening of the highly conductive material could be attributable to thicker waste and-or infiltration of waste decomposition products into the underlying native geological formation.

The cover material appears to increase in thickness between approximately 95 and 150 feet along the line, which correlates to a decrease in the EM Conductivity value in the EM results of Figure 4. This would be expected since as the thickness of the more resistive cover material increases, the EM instrument, which has a limited investigation depth, would be sensitive to a decreasing amount of the conductive waste materials. Therefore, while the EM results may indicate an absence of waste material in this region, based on the conductivity value, the electrical resistivity confirms that the waste layer is present but has a thicker cover material layer.

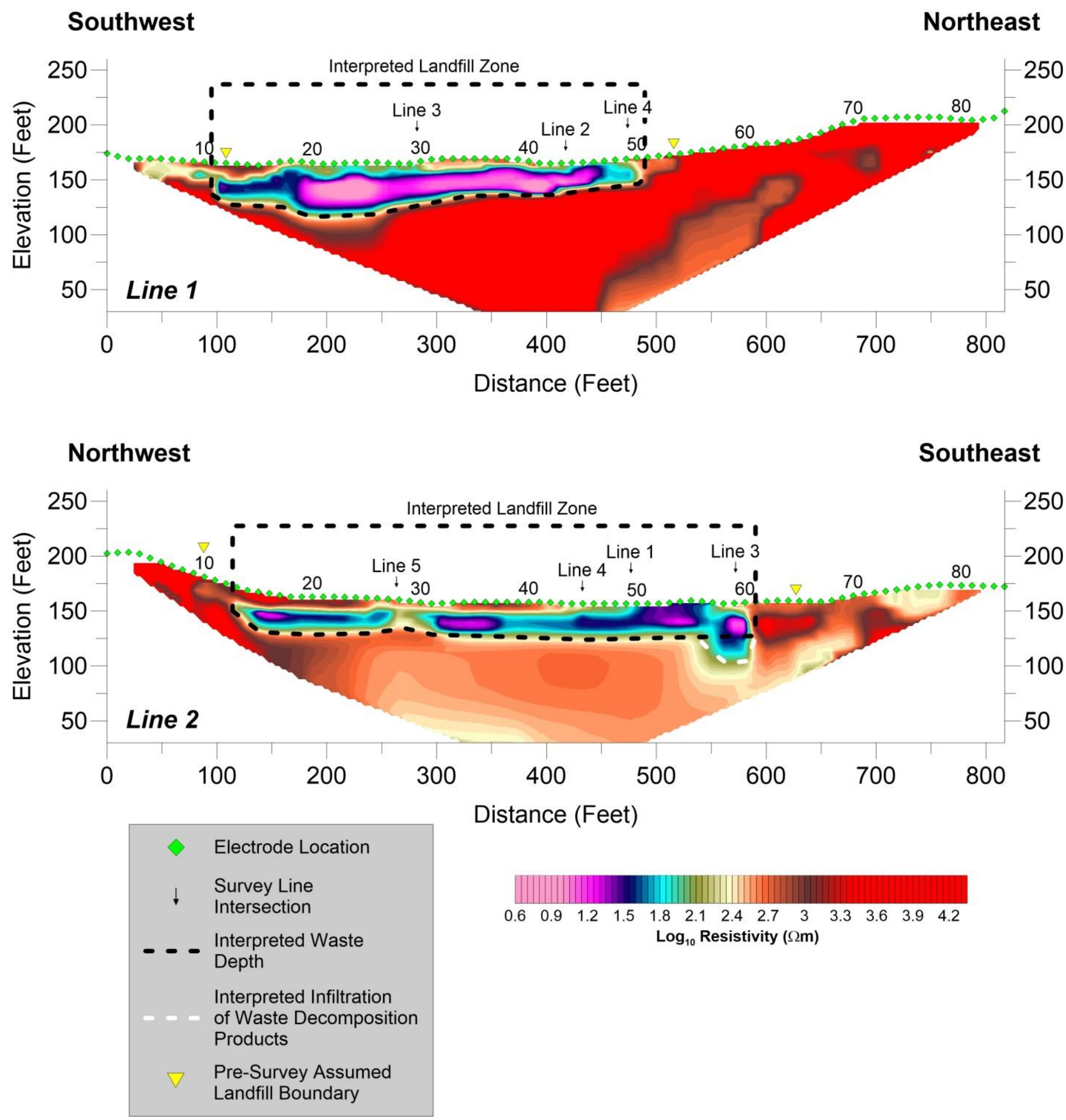
4.2.2 Line 2

Figure 5 shows the resistivity profile for Line 2 (lower profile), which ran approximately northwest to southeast across the northeast portion of the landfill. Line 2 spanned the pre-survey assumed extent of the landfill and extended into the native geology on either side of the landfill.

Again the landfill wastes are represented by the highly conductive target between approximately 115 and 590 feet along the line (the interpreted base of the waste material is highlighted by the back dashed line in Figure 6). In general, there appears to be a thin approximately □ feet thick cover material layer, overlying a highly conductive layer, representing the waste materials, approximately 22 feet in thickness, both of which appear consistent across the line. This extent of waste material correlates well to the pre-survey assumed landfill boundary on the northwest end of the line, indicated by the yellow triangles in Figure 5. There is a degree of discrepancy on the southeast end of the line, where the pre-survey assumed boundary extends approximately 35 feet beyond the interpreted boundary.

Between approximately 265 and 285 feet along the line the model results appear to indicate the waste material layer becomes more resistive. This may be the result of more resistive waste materials being placed in the landfill in this region, or a cell division within the landfill separated by more resistive natural materials. The cover material thickness appears to significantly decrease between approximately 4□5 and 550 feet along the line, with the model results indicate highly conductive material at the ground surface. This may reflect the cover material being very thin in this region, or the cover material contains a higher degree of finer materials (increased clay content for example). Between approximately 540 to 590 feet along the line the depth of the conductive waste feature appears to increase to approximately 50 feet, with a waste material thickness of approximately 45 feet. This thickening of the highly conductive material could be attributable to thicker waste and-or infiltration of waste decomposition products into the underlying native geological formation.

Figure 5. Lines 1 and 2 Electrical Resistivity Model Results.



4.2.3 Line 3

Figure 6 shows the electrical resistivity profile for Line 3 (lower profile), which ran approximately west to east across the southern portion of the landfill. Line 3 spanned the pre-survey assumed extent of the landfill and extended into the native geology on either side of the landfill.

Again the landfill wastes are represented by the highly conductive target between approximately □5 and 440 feet along the line (the interpreted base of the waste material is highlighted by the back dashed line in Figure 6). This extent of waste material displays a degree of discrepancy to the pre-survey assumed landfill boundary; with the pre-survey assumed boundary extending approximately 35 feet beyond the interpreted boundary on each end of the line.

There appears to be some variability in the thickness of the waste material and overlying cover material layers across this line. Between approximately □5 and 120 feet along the line the thickness of the cover material decreases, from approximately 15 to 10 feet. This again correlates well to the low conductivity region observed in this area of the landfill in the EM results, and discussed previously for the Line 1 results section. The waste material layer rapidly increases in thickness, from approximately □ to 40 feet. Beyond 120 feet along the line, the depth to the base of the waste material remains constant, at approximately 40 feet below ground surface (bgs), although the thickness of the waste layer increases due to a decreasing cover material layer thickness. The waste material reaches a maximum thickness of approximately 35 feet, between approximately 140 and 1□5 feet along the line, where the cover material reduces to approximately 2 to 3 feet thickness. In general beyond 225 feet along the line, there appears to be a thin approximately 8 feet thick cover material layer, overlying the highly conductive layer, representing the waste materials, approximately 18 feet in thickness. Between approximately 205 to 285 feet along the line the conductive waste feature appears to increase significantly, extending down to the depth limit of the model between approximately 250 and 300 feet along the line. This thickening of the highly conductive material could be attributable to thicker waste and-or infiltration of waste decomposition products into the underlying native geological formation.

The conductive layer appears predominantly highly conductive in nature, indicated by the pink and purple colors. This could be responses to the waste materials having a increased decomposition potential, which has produced significant quantities of decomposition products. The waste material layer in the southern portion of the landfill, covered by the majority of Lines 1 and 3, presents on average as more conductive than other regions of the landfill. This could reflect a difference in the waste materials across the landfill and their potential for decomposition.

4.2.4 Line 4

Figure 6 shows the electrical resistivity profile for Line 4 (middle profile), which ran approximately west to east across the central portion of the landfill. Line 4 spanned the pre-survey assumed extent of the landfill and extended into the native geology on either side of the landfill.

Again the landfill wastes are represented by the highly conductive target between approximately 130 and 490 feet along the line (the interpreted base of the waste material is highlighted by the back dashed line in Figure 6). This extent of waste material correlates well to the pre-survey assumed landfill boundary on the west end of the line, indicated by the yellow triangles in Figure 6. There is a degree of discrepancy on the east end of the line, where the pre-survey assumed boundary extends approximately 45 feet beyond the interpreted boundary.

There appears to be some variability in the thickness of the waste material and overlying cover material layers across this line. Between approximately 130 and 250 feet along the line the thickness of the cover material decreases, from approximately 10 to 6 feet. This again correlates well to the low conductivity region observed in this area of the landfill in the EM results, which has been discussed previously. The waste material layer increases in thickness, from approximately 30 to 35 feet, as the cover material layer thickness appears to decrease. The depth to the base of the waste material appears to displays little variation across the line, although it is difficult to be certain as there is a broad response to a potential conductive "plume" apparent between approximately 1□5 and 3□5 feet along the line. This extends to the depth limit of the model results between approximately 250 and 350 feet along the line, with the majority of this plume feature associated with the highly conductive regions of the waste material layer. This is similar to the deep response noted on Line 3 (showing good continuity), but with a slightly shallower, broader feature. This thickening of the highly conductive material could be attributable to thicker waste and-or infiltration of waste decomposition products into the underlying native geological formation.

Beyond approximately 250 feet along the line, the thickness of the waste material layer decrease gradually from approximately 35 to 18 feet. Since the base of the waste materials remains constant across this section of the line, at approximately 28 feet (bgs), the cover material layer increases in thickness, from approximately 6 to 9 feet between 250 and 490 feet along the line. There is a section, between approximately 415 and 445 feet along the line, where the conductive layer appears to approach the ground surface. This may reflect the cover material being very thin in this region, or the cover material contains a higher degree of finer materials (increased clay content for example).

4.2.5 Line 5

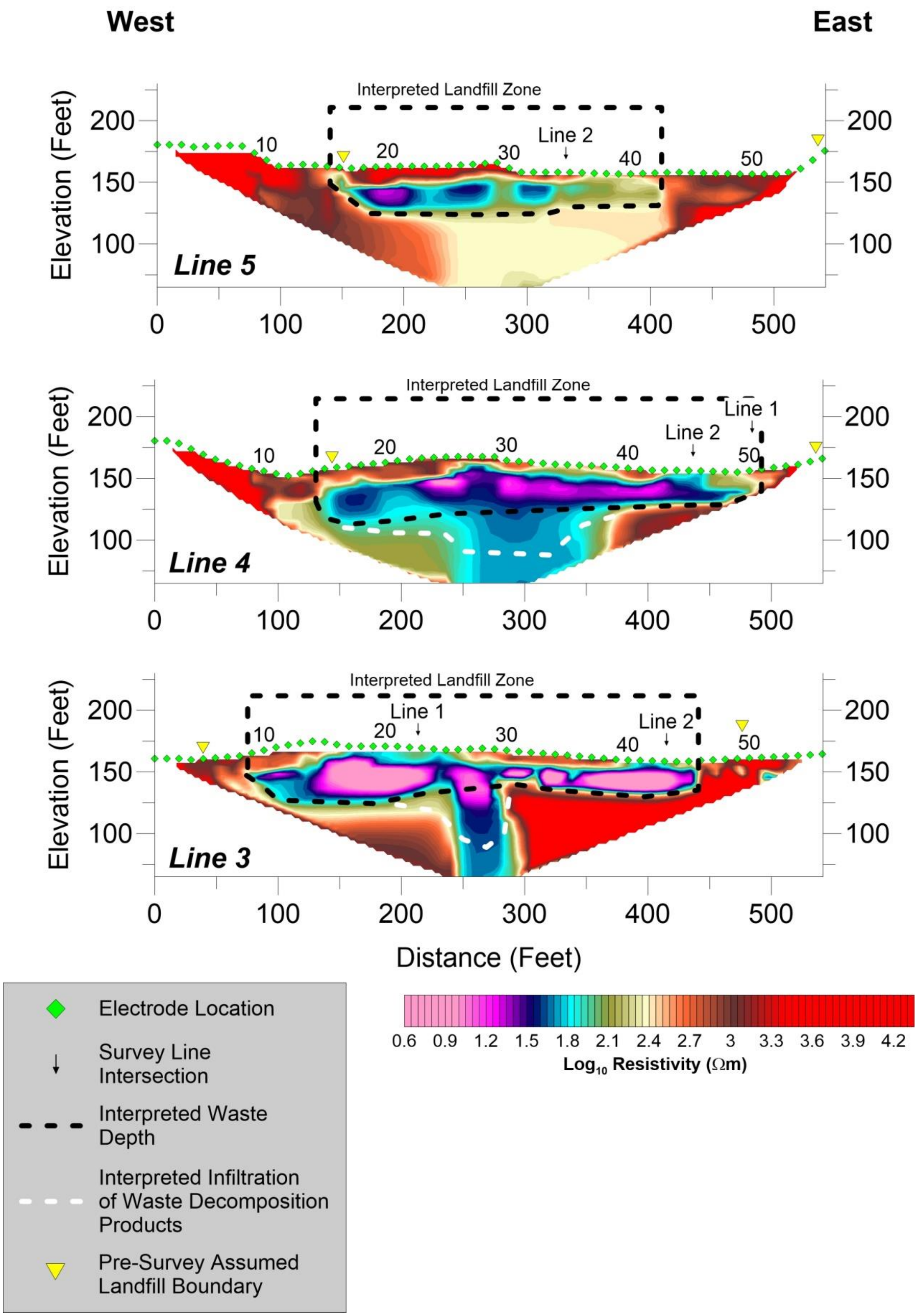
Figure 6 shows the electrical resistivity profile for Line 5 (upper profile), which ran approximately west to east across the northern portion of the landfill. Line 5 spanned the pre-survey assumed extent of the landfill and extended into the native geology on either side of the landfill.

Again the landfill wastes are represented by the highly conductive target between approximately 140 and 410 feet along the line, the depth of the waste is estimated to be on average approximately 26 feet (the interpreted base of the waste material is highlighted by the black dashed line in

Figure 5), and the thickness of the cover is around □to 10 feet based on the more resistive near-surface layer (olive and brown colors). This extent of waste material correlates well to the pre-survey assumed landfill boundary on the west end of the line, indicated by the yellow triangles in Figure 6. There is a degree of discrepancy on the east end of the line, where the pre-survey assumed boundary extends approximately 125 feet beyond the interpreted boundary.

The cover material layer appears to thicken on the west end of the interpreted landfill zone, with a maximum thickness of approximately 14 feet between approximately 140 and 180 feet along the line. This increase in thickness again correlates well to the low conductivity region observed in this area of the landfill in the EM results, which has been discussed previously. While there is no significant increase in conductivity below the waste layer similar to those observed on electrical resistivity lines 2, 3, and 4, we do observed a general decrease in the resistivity of the underlying materials (indicated by the yellow colors between approximately 250 and 350 feet along the line). This could indicate infiltration of waste decomposition products to a lesser degree and-or with less conductivity relative to other areas of the landfill. In general, the conductivity associated with the waste material layer in the northern portion of the landfill area tends to be lower, possibly indicating less decomposition of wastes.

Figure 6. Lines 3-5 Electrical Resistivity Results.



5.0 CONCLUSIONS

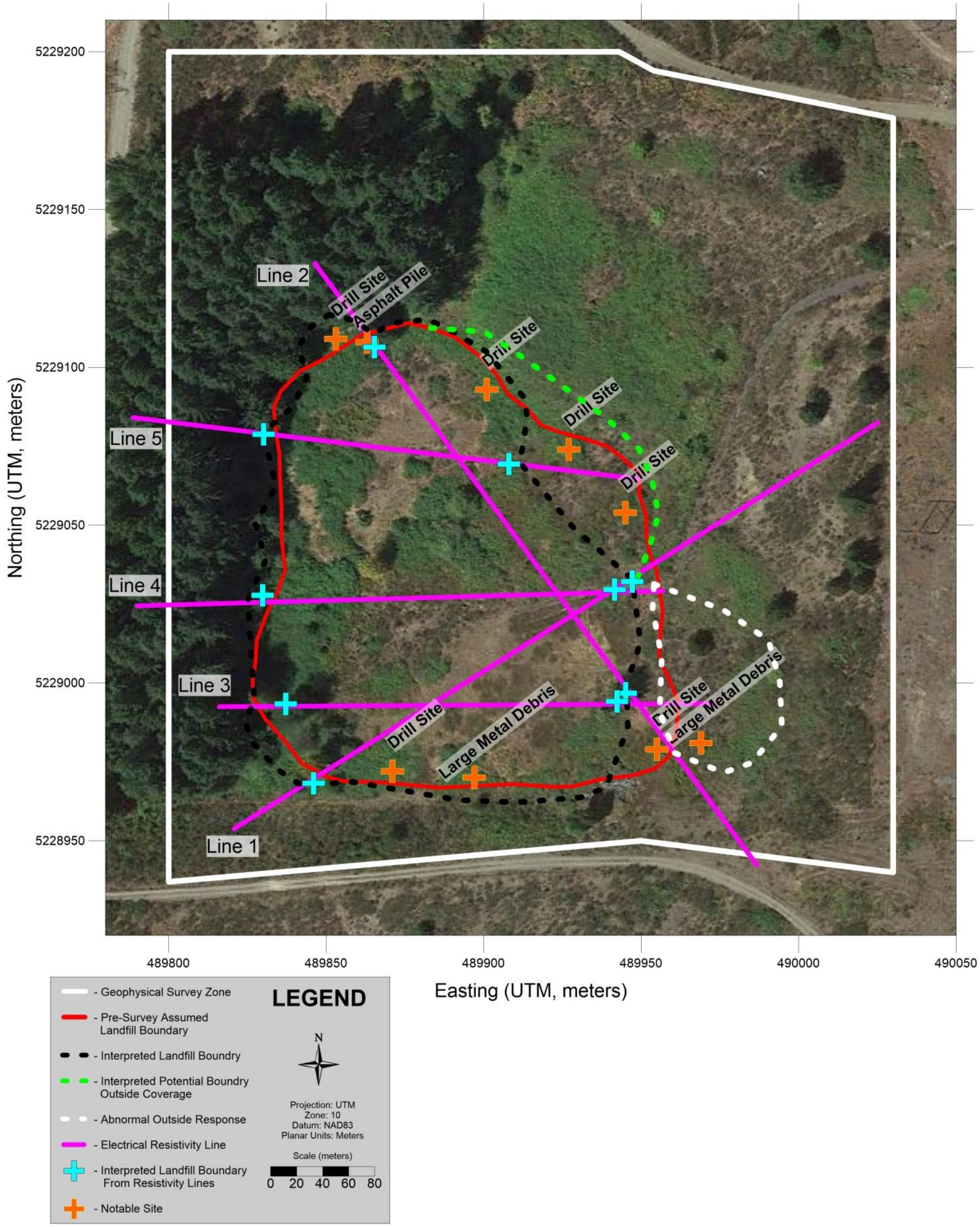
A multi-method geophysical survey was performed at the C Street Landfill near, Shelton, WA, □SA, in May of 201□. The survey was performed to determine the lateral extents and thickness of landfill waste and the thickness of the cover material. Combined electromagnetic and magnetic surveys over the entire accessible landfill area, as well as five lines of 2D electrical resistivity were completed. The EM and Mag measurements provided an indication of the lateral limits of covered landfill (Figures 4 and □). The electrical resistivity imaging method confirmed these boundary results and allowed the depth and thickness of the conductive wastes and the thickness of the cover material to be estimated (Figures 5, 6, and □).

Based on the theory that the products of the decomposition of municipal solid waste will be conductive compared to background geological materials, and that areas with metallic debris will display increased magnetic gradient contrast to undisturbed materials outside the landfill boundaries, the following observations have been made using the acquired geophysical data□

- The EM and Mag data were acquired at reasonably high spatial resolution throughout the survey site, and showed good agreement for distribution of anomalous data that would indicate the presence of landfill waste material. The anomalous data for both methods mainly occur within the boundary of the landfill boundary that was assumed prior to geophysical surveying. The data outside of this assumed boundary mostly show little anomalous data, indicating background conditions have been mapped effectively. Combined analysis of the EM, Mag, and Resistivity results would tend to suggest the western and southern portions of the assumed landfill boundary would increase by 20 to 30 feet in some portions as indicated by the black dashed line in Figure 4. However, the south eastern corner would appear to recede by up to 60 feet in places from the pre survey assumed boundary, and likewise portions of the northeast would recede by as much as 90 feet in places.
- The resistivity data provided additional imaging to support the lateral extents determined using the EM and Mag data, and the resistivity interpretation was favored in the north and northeastern areas where EM and MA□ coverage was limited.

The resistivity profile results estimated the thickness of the waste to be approximately 20-35 feet at the locations of the resistivity survey lines, with cover thickness estimated on average to be 6-10 feet. Highly conductive regions were observed towards the central portions of resistivity lines 1, 3, and 4 and to some degree line 5, where the magnitude and character of the anomaly are indicative of infiltration of waste decomposition products into the native geological formations extending to the bottom of the techniques imaging depth.

Figure 7. Summary of the Interpreted Boundaries for the C-Street Landfill Geophysical Survey.



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Rucker, D.F., Levitt, M.T., Greenwood, W.□., 2009. Three-dimensional electrical resistivity model of a nuclear waste disposal site. Journal of Applied Geophysics 69, 150-164.

Rucker, D.F., □.E. Noonan, and W.□ Greenwood, 2011. Electrical resistivity in support of geologic mapping along the Panama Canal. Engineering Geology 11□(1-2)□121-133.

Sasaki, □., 1989, Two-dimensional joint inversion of magnetotelluric and dipole-dipole resistivity data, Geophysics, 54, 254-262.

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APPENDIX A

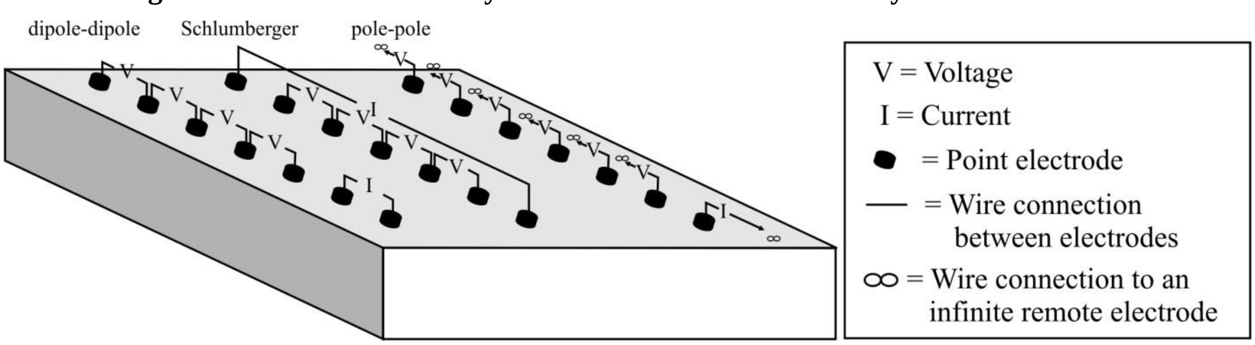
Description of Electrical Resistivity

7.0 DESCRIPTION OF ELECTRICAL RESISTIVITY

Electrical resistivity is a volumetric property that describes the resistance of electrical current flow within a medium (Rucker et al., 2011; Telford et al., 1990). Direct electrical current is propagated in rocks and minerals by electronic or electrolytic means. Electronic conduction occurs in minerals where free electrons are available, such as the electrical current flow through metal. Electrolytic conduction, on the other hand, relies on the dissociation of ionic species within a pore space. With electrolytic conduction, the movement of electrons varies with the mobility, concentration, and the degree of dissociation of the ions.

Mechanistically, the resistivity method uses electric current (I) that is transmitted into the earth through one pair of electrodes (transmitting dipole) that are in contact with the soil. The resultant voltage potential (V) is then measured across another pair of electrodes (receiving dipole). Numerous electrodes can be deployed along a transect (which may be anywhere from feet to miles in length), or within a grid. Figure 8. Possible Arrays for Use in Electrical Resistivity Characterization. shows examples of electrode layouts for surveying. The figure shows transects with a variety of array types (dipole-dipole, Schlumberger, pole-pole). A complete set of measurements occurs when each electrode (or adjacent electrode pair) passes current, while all other adjacent electrode pairs are utilized for voltage measurements. Modern equipment automatically switches the transmitting and receiving electrode pairs through a single multi-core cable connection. Rucker et al. (2009) describe in more detail the methodology for efficiently conducting an electrical resistivity survey.

Figure 8. Possible Arrays for Use in Electrical Resistivity Characterization.



The modern application of the resistivity method uses numerical modeling and inversion theory to estimate the electrical resistivity distribution of the subsurface given the known quantities of electrical current, measured voltage, and electrode positions. A common resistivity inverse method incorporated in commercially available codes is the regularized least squares optimization method (Sasaki, 1989; Loke, et al., 2003). The objective function within the optimization aims to minimize the difference between measured and modeled potentials (subject to certain constraints, such as the type and degree of spatial smoothing or regularization) and the optimization is conducted iteratively due to the nonlinear nature of the model that describes the potential distribution. The relationship between the subsurface resistivity (ρ) and the measured voltage is given by the following equation (from Dey and Morrison, 19□9)□

$$-\nabla \cdot \left[\frac{1}{\rho(x,y,z)} \nabla V(x,y,z) \right] = \left(\frac{I}{U} \right) \delta(x - x_s)\,\delta(y - y_s)\,\delta(z - z_s) \qquad (1)$$

where I is the current applied over an elemental volume □ specified at a point (x_s, y_s, z_s) by the Dirac delta function.

Equation (1) is solved many times over the volume of the earth by iteratively updating the resistivity model values using either the L_2-norm smoothness-constrained least squares method, which aims to minimize the square of the misfit between the measured and modeled data (de □root-Hedlin □ Constable, 1990; Ellis □ Oldenburg, 1994)□

$$\left(J_i^T J_i + \lambda_i W^T W \right) \Delta r_i = J_i^T g_i - \lambda_i W^T W r_{i-1} \qquad (2)$$

or the L_1-norm that minimizes the sum of the absolute value of the misfit□

$$\left(J_i^T R_d J_i + \lambda_i W^T R_m W \right) \Delta r_i = J_i^T R_d g_i - \lambda_i W^T R_m W r_{i-1} \qquad (3)$$

where g is the data misfit vector containing the difference between the measured and modeled data, □is the □acobian matrix of partial derivatives, W is a roughness filter, R_d and R_m are the weighting matrices to equate model misfit and model roughness, Δr_i is the change in model parameters for the i^{th} iteration, r_i is the model parameters for the previous iteration, and λ_i □the damping factor.

APPENDIX B

Description of Electromagnetic Induction and Magnetic Methods

8.0 DESCRIPTION OF EM & MAG

8.1 MAGNETOMETRY

Magnetometry is the study of the Earth's magnetic field and is the oldest branch of geophysics. The Earth's field is composed of three main parts:

1. Main field is internal (i.e., from a source within the Earth that varies slowly in time and space)

2. Secondary field is external to the Earth and varies rapidly in time

3. Small internal fields constant in time and space are caused by local magnetic anomalies in the near-surface crust.

Of interest to the geophysicist are the localized anomalies. These anomalies are either caused by magnetic minerals, mainly magnetite or pyrrhotite, or buried steel and are the result of contrasts in the magnetic susceptibility (k) with respect to the background sediments. The average values for k are typically less than 1 for sedimentary formations and upwards to 20,000 for magnetite minerals.

The magnetic field is measured with a magnetometer. Magnetometers permit rapid, non-contact surveys to locate buried metallic objects and features. A one person portable field unit can be used virtually anywhere a person can walk; although, they may be sensitive to local interferences, such as fences and overhead wires. Airborne magnetometers are towed by aircraft and are used to measure regional anomalies. Field-portable magnetometers maybe single- or dual-sensor. Single-sensor magnetometers measure total field. Dual-sensor magnetometers are called gradiometers and measure gradient of the magnetic field.

Magnetic surveys are typically conducted with two separate magnetometers. The first magnetometer is used as a base station to record the Earth's primary field and the diurnally changing secondary field. The second magnetometer is used as a rover to measure the spatial variation of the Earth's field and may include various components (e.g., inclination, declination, and total intensity). By removing the temporal variation and perhaps the static value of the base station from that of the rover, one is left with a residual magnetic field that is the result of local spatial variations only. The rover magnetometer is moved along a predetermined linear grid laid out at the site. Readings are virtually continuous and results can be monitored in the field as the survey proceeds.

The shortcoming with most magnetometers is that they only record the total magnetic field (**F**) and not the separate components of the vector field. This shortcoming can make the interpretation of magnetic anomalies difficult, especially since the strength of the field between the magnetometer and target is reduced as a function of the inverse of distance between the magnetometer and target, cubed. Additional complications can include the inclination and declination of the Earth's field, the presence of any remnant magnetization associated with the target, and the shape of the target.

8.2 ELECTROMAGNETIC INDUCTION

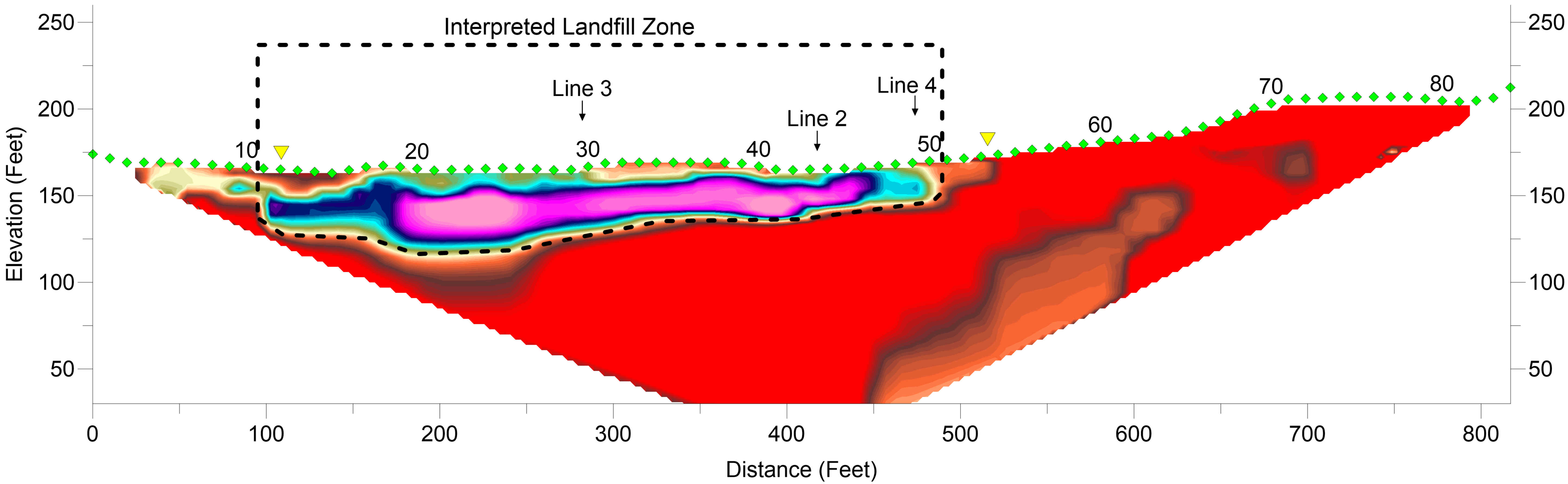
EM data is typically collected using portable ground conductivity instrumentation. Basically, a transmitting coil induces an electromagnetic field and a receiving coil at a fixed separation usually measures the amplitudes of the in-phase and quadrature components of the magnetic field. Various instruments have different coil spacings and operating frequencies. Spacing and frequency effect depth of signal penetration. Both single frequency and multi-frequency instruments have been developed for commercial use.

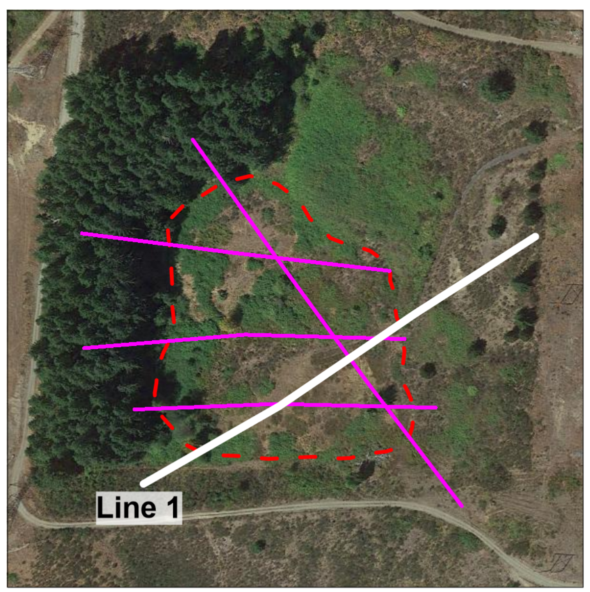
Earth materials have the capacity to transmit electrical currents over a wide range. Earth conductivity is a function of soil type, porosity, permeability, and dissolved salts. Terrain conductivity methods seek to identify various Earth materials by measuring their electrical characteristics and interpreting results in terms of those characteristics. EM techniques are used to measure Earth conductivities of various soil, rock, and water components at individual survey areas employing portable, rapid, non-invasive equipment operating at various frequencies depending on range and depth desired.

The recorded electromagnetic field is separated into two sub-components□in-phase and conductivity (also referred to as quadrature). The in-phase component is the most sensitive to metallic objects and is measured in parts per million (ppm). The conductivity component is sensitive to soil condition variations and is measured in log Siemens per meter (log S/m) using the □EM-2 instrument.

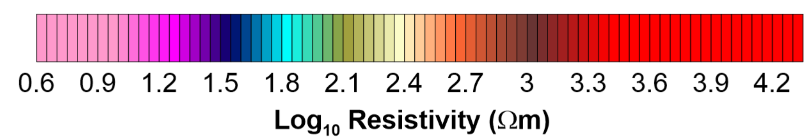
The EM method was chosen due to the capability of mapping changes in soil conductivity that are caused by changes in soil moisture, disruption, other conductivity changes caused by physical property contrasts, the ability to detect metallic objects (i.e., ferrous and non-ferrous), and the relatively rapid rate of data acquisition.

C Street Landfill Geophysical Survey
Electrical Resistivity Results - Line 1





- Electrode Location
- Survey Line Intersection
- Interpreted Waste Depth
- Interpreted Infiltration of Waste Decomposition Products
- Pre-Survey Assumed Landfill Boundary



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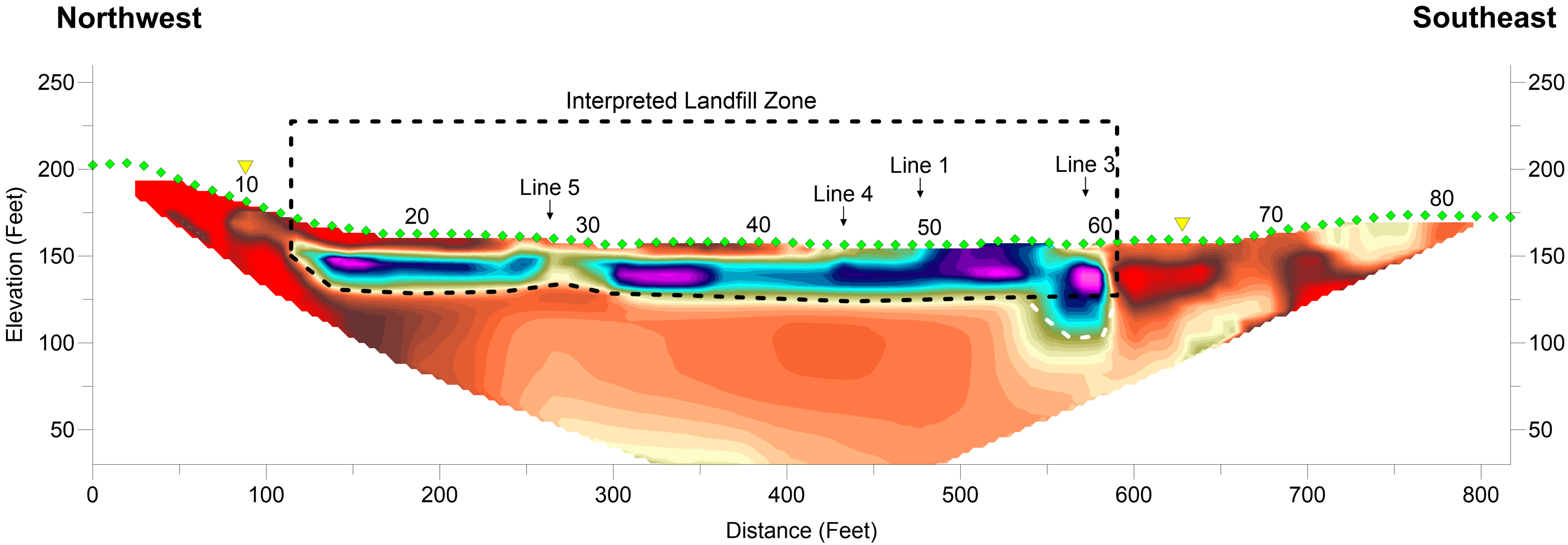
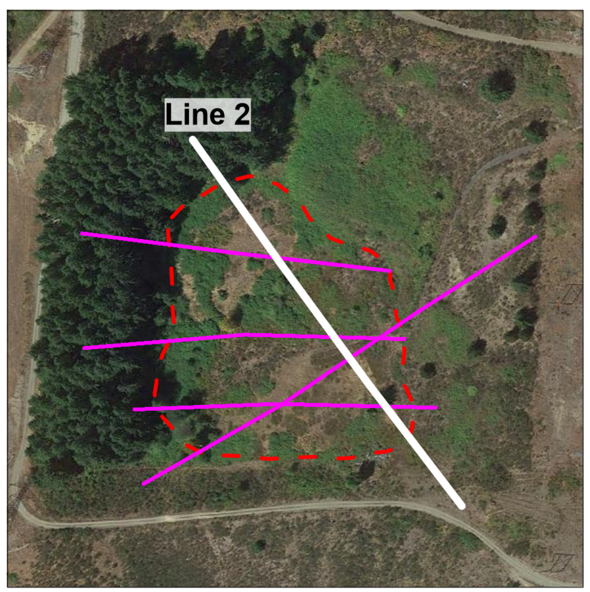
C Street Landfill Geophysical Survey

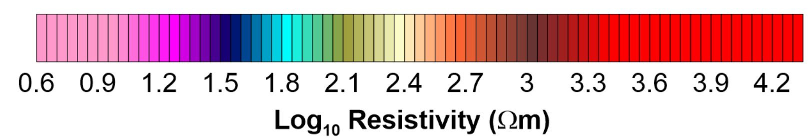
Date: May.2017	Fig.: RESISTIVITY LINE 1

C Street Landfill Geophysical Survey
Electrical Resistivity Results - Line 2





◆	Electrode Location
↓	Survey Line Intersection
- - - -	Interpreted Waste Depth
- - - -	Interpreted Infiltration of Waste Decomposition Products
▽	Pre-Survey Assumed Landfill Boundary



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C Street Landfill Geophysical Survey

Date: May.2017

Fig.: RESISTIVITY LINE 2

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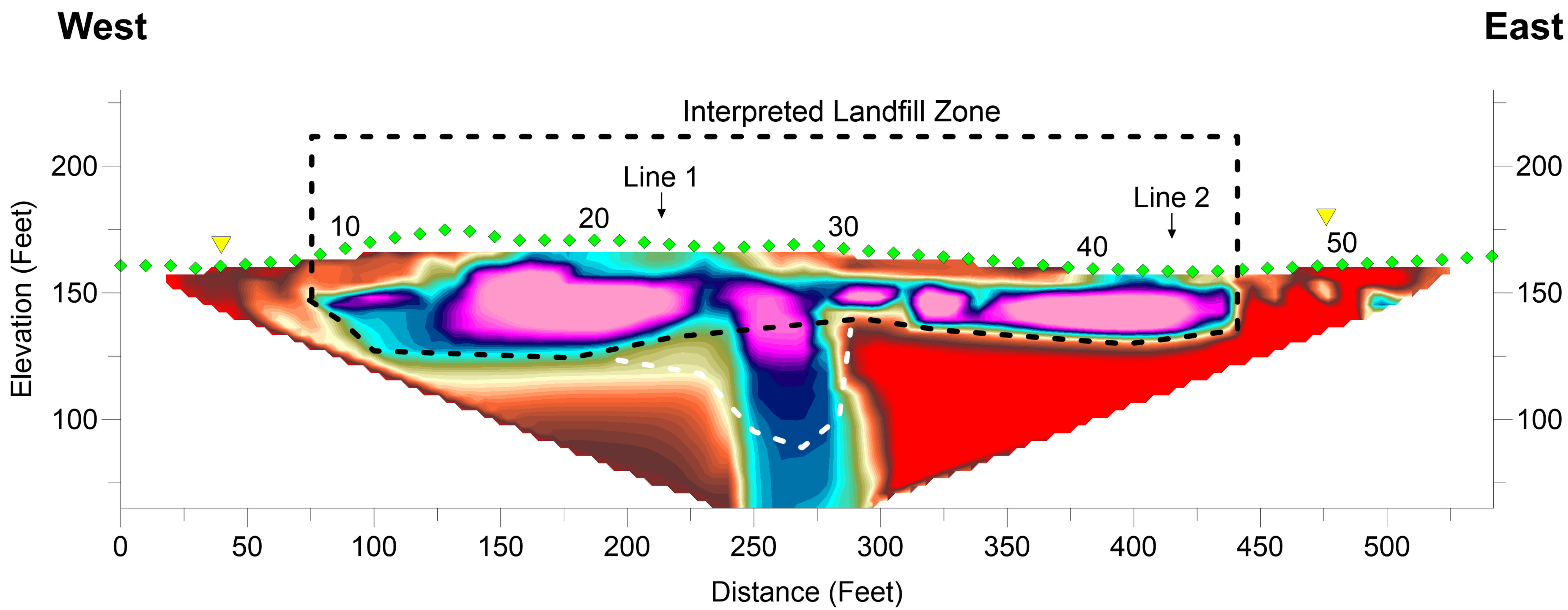
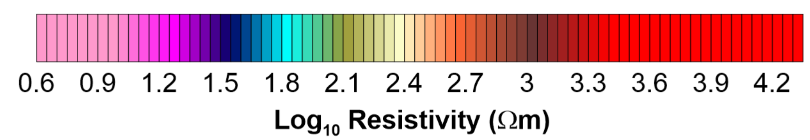
2302 North Forbes Blvd. Tucson, Arizona 85745 (520) 647-3315

C Street Landfill Geophysical Survey
Electrical Resistivity Results - Line 3



- Electrode Location
- Survey Line Intersection
- Interpreted Waste Depth
- Interpreted Infiltration of Waste Decomposition Products
- Pre-Survey Assumed Landfill Boundary



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C Street Landfill Geophysical Survey

Date: May.2017

Fig.: RESISTIVITY LINE 3

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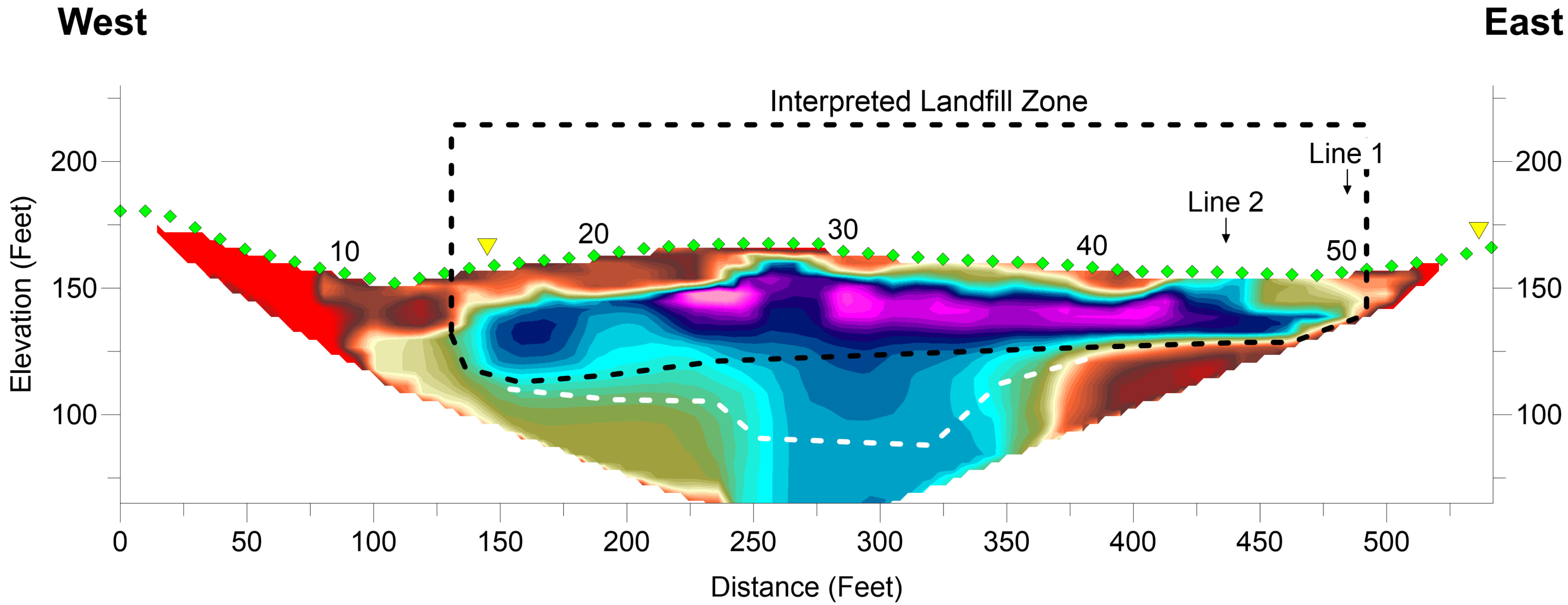
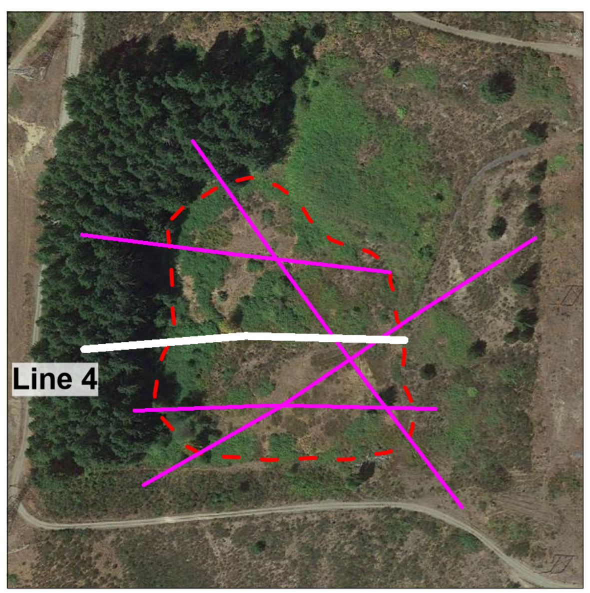
08/30/17 13:46:21

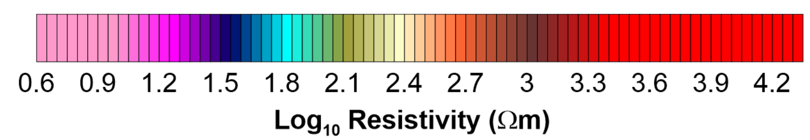
2302 North Forbes Blvd. Tucson, Arizona 85745 (520) 647-3315

C Street Landfill Geophysical Survey
Electrical Resistivity Results - Line 4





- Electrode Location
- Survey Line Intersection
- Interpreted Waste Depth
- Interpreted Infiltration of Waste Decomposition Products
- Pre-Survey Assumed Landfill Boundary



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C Street Landfill Geophysical Survey

Date: May.2017	**Fig.: RESISTIVITY LINE 4**

APPENDIX B

Exploration Logs

Coarse-Grained Soils - More than 50% (1) Retained on No. 200 Sieve	Gravels - More than 50% (1) of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines (5)	GW	Well-graded gravel and gravel with sand, little to no fines
			GP	Poorly-graded gravel and gravel with sand, little to no fines
		≥15% Fines (5)	GM	Silty gravel and silty gravel with sand
			GC	Clayey gravel and clayey gravel with sand
	Sands - 50% (1) or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines (5)	SW	Well-graded sand and sand with gravel, little to no fines
			SP	Poorly-graded sand and sand with gravel, little to no fines
		≥15% Fines (5)	SM	Silty sand and silty sand with gravel
			SC	Clayey sand and clayey sand with gravel
Fine-Grained Soils - 50% (1) or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50		ML	Silt, sandy silt, gravelly silt, silt with sand or gravel
			CL	Clay of low to medium plasticity; silty, sandy, or gravelly clay, lean clay
			OL	Organic clay or silt of low plasticity
	Silts and Clays Liquid Limit 50 or More		MH	Elastic silt, clayey silt, silt with micaceous or diatomaceous fine sand or silt
			CH	Clay of high plasticity, sandy or gravelly clay, fat clay with sand or gravel
			OH	Organic clay or silt of medium to high plasticity
Highly Organic Soils			PT	Peat, muck and other highly organic soils

Terms Describing Relative Density and Consistency

	Density	SPT (2) blows/foot
Coarse-Grained Soils	Very Loose	0 to 4
	Loose	4 to 10
	Medium Dense	10 to 30
	Dense	30 to 50
	Very Dense	>50
	Consistency	**SPT (2) blows/foot**
Fine-Grained Soils	Very Soft	0 to 2
	Soft	2 to 4
	Medium Stiff	4 to 8
	Stiff	8 to 15
	Very Stiff	15 to 30
	Hard	>30

Test Symbols

- FC = Fines Content
- G = Grain Size
- M = Moisture Content
- A = Atterberg Limits
- C = Consolidation
- DD = Dry Density
- K = Permeability
- Str = Shear Strength
- Env = Environmental
- PiD = Photoionization Detector

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

(3) Estimated Percentage

Percentage by Weight	Modifier
<5	Trace
5 to 15	Slightly (sandy, silty, clayey, gravelly)
15 to 30	Sandy, silty, clayey, gravelly)
30 to 49	Very (sandy, silty, clayey, gravelly)

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch

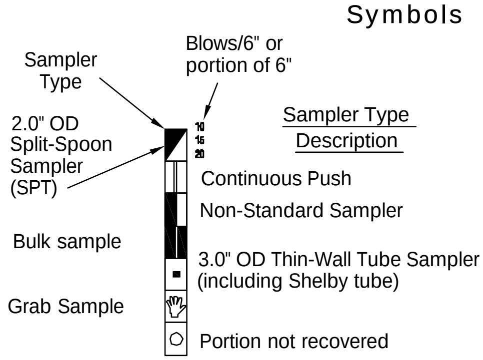
Slightly Moist - Perceptible moisture

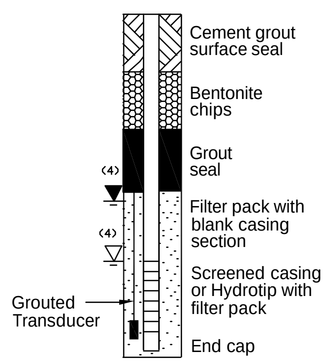
Moist - Damp but no visible water

Very Moist - Water visible but not free draining

Wet - Visible free water, usually from below water table

Symbols





(1) Percentage by dry weight

(2) (SPT) Standard Penetration Test (ASTM D-1586)

(3) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)

(4) Depth of groundwater

∇ ATD = At time of drilling

▼ Static water level (date)

(5) Combined USCS symbols used for fines between 5% and 15% as estimated in General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)

BGS = below ground surface

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

Aspect CONSULTING

Exploration Log Key

DATE:	PROJECT NO.
DESIGNED BY:	
DRAWN BY:	FIGURE NO.
REVISED BY:	B-1

Q:_ACAD Standards\Standard Details\Exploration Log Key B1.dwg

Aspect CONSULTING	Shelton C Street Landfill - 150074		Monitoring Well Log	
	Project Address & Site Specific Location		*Coordinates (SPN NAD83 ft)*	*Exploration Number*
	Shelton, WA, NE corner of landfill		E:986256.0 N:697079	**AMW-1**
Contractor	*Equipment*	*Sampling Method*	*Ground Surface (GS) Elev. (NAVD88)*	Ecology Well Tag No. BKC 045
Holocene	Geoprobe 8140LC	Continuous core 10" outer, 6" inner casing	153.48'	
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*	*Top of Casing Elev. (NAVD88)*	*Depth to Water (Below GS)*
Zach Bailey	Sonic	12/11/2017 to 12/12/2017	155.9'	85' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	155	Steel aboveground monument with protective bollards						
0		Capped in concrete					**RECESSIONAL GLACIAL OUTWASH** Moist, brown, sandy, silty GRAVEL (GM); fine to coarse gravel, fine to coarse sand, no odor, no landfill waste	0
	150				PID= 0.3 Sheen= None			
5								5
					PID= 0.6 Sheen= Slight			
	145						Moist, brown, gravelly, silty SAND (SM); fine to coarse sand, fine gravel, no odor, no landfill waste	
10		Sealed with bentonite grout			PID= 0.4 Sheen= None			10
	140				PID= 0.3 Sheen= None			
15								15
					PID= 0.2 Sheen= Slight			
	135						Moist, red-brown, silty SAND (SM); fine to medium sand, no odor, no landfill waste	
20					PID= 0.6 Sheen= None		Moist, brown, gravelly, silty SAND (SM); fine to coarse sand, fine gravel, no odor, no landfill waste	20

Legend

Sample Method
- No Soil Sample Recovery
- Continuous core 6" ID

Water Level
- ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-1

Aspect Consulting	Shelton C Street Landfill - 150074		Monitoring Well Log	
	Project Address & Site Specific Location Shelton, WA, NE corner of landfill		*Coordinates (SPN NAD83 ft)* E:986256.0 N:697079	*Exploration Number* **AMW-1**
Contractor Holocene	*Equipment* Geoprobe 8140LC	*Sampling Method* Continuous core 10" outer, 6" inner casing	*Ground Surface (GS) Elev. (NAVD88)* 153.48'	Ecology Well Tag No. BKC 045
Operator Zach Bailey	*Exploration Method(s)* Sonic	*Work Start/Completion Dates* 12/11/2017 to 12/12/2017	*Top of Casing Elev. (NAVD88)* 155.9'	*Depth to Water (Below GS)* 85' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Moist, brown, gravelly, silty SAND (SM); fine to coarse sand, fine gravel, no odor, no landfill waste (continued)	
	130				PID= 2.4 Sheen= None			
25								25
					PID= 0.3 Sheen= None			
							Moist, brown, gravelly SAND (SW); fine to coarse sand, fine to coarse gravel, no odor, no landfill waste	
	125							
					PID= 0.2 Sheen= None			
30								30
							Moist, brown, gravelly, slightly silty SAND (SW-SM); fine to coarse sand, fine to coarse gravel, no odor, no landfill waste	
					PID= 3.7 Sheen= None			
	120							
					PID= 0.7 Sheen= None			
35		Sealed with bentonite grout						35
					PID= 3.0 Sheen= None			
	115							
					PID= 3.3 Sheen= None			
40								40
					PID= 2.7 Sheen= None			
	110							
					PID= 0.2 Sheen= None			
45							Moist, brown, gravelly silty SAND (SM); fine to coarse sand, fine gravel, no odor, no landfill waste	45

Legend

Sample Method
- No Soil Sample Recovery
- Continuous core 6" ID

Water Level
- Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-1

Aspect CONSULTING	Shelton C Street Landfill - 150074		Monitoring Well Log	
	Project Address & Site Specific Location		*Coordinates (SPN NAD83 ft)*	*Exploration Number*
	Shelton, WA, NE corner of landfill		E:986256.0 N:697079	**AMW-1**
Contractor	*Equipment*	*Sampling Method*	*Ground Surface (GS) Elev. (NAVD88)*	Ecology Well Tag No.
Holocene	Geoprobe 8140LC	Continuous core 10" outer, 6" inner casing	153.48'	BKC 045
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*	*Top of Casing Elev. (NAVD88)*	*Depth to Water (Below GS)*
Zach Bailey	Sonic	12/11/2017 to 12/12/2017	155.9'	85' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Moist, brown, gravelly silty SAND (SM); fine to coarse sand, fine gravel, no odor, no landfill waste (continued)	
	105				PID= 1.1 Sheen= None			
50								50
					PID= 1.2 Sheen= None			
	100							
55								55
					PID= 1.0 Sheen= Slight		Wet, brown, sandy, silty GRAVEL (GM); fine to coarse gravel, medium to coarse sand, no odor, no landfill waste	
	95				PID= 0.1 Sheen= None			
							Moist, brown, gravelly, silty SAND (SM); fine to medium sand, fine gravel, appears dense, no odor, no landfill waste	
60		3/8" hydrated bentonite chips					Moist, brown, gravelly, sandy, SILT (ML); fine sand, fine to coarse gravel, no odor, no landfill waste	60
					PID= 0.4 Sheen= Slight			
	90							
65					PID= 0.8 Sheen= None		Moist, brown, slightly sandy, silty GRAVEL (GM) interbedded with sandy, gravelly, SILT (ML); fine to coarse gravel, fine and coarse sand, no odor, no landfill waste	65
	85				PID= 1.8 Sheen= None			
70								70

Legend

Sample Method
- No Soil Sample Recovery
- Continuous core 6" ID

Water Level
- ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-1

Aspect CONSULTING	Shelton C Street Landfill - 150074			Monitoring Well Log	
	Project Address & Site Specific Location: Shelton, WA, NE corner of landfill			Coordinates (SPN NAD83 ft): E:986256.0 N:697079	Exploration Number: AMW-1
Contractor: Holocene	Equipment: Geoprobe 8140LC	Sampling Method: Continuous core 10" outer, 6" inner casing		Ground Surface (GS) Elev. (NAVD88): 153.48'	Ecology Well Tag No. BKC 045
Operator: Zach Bailey	Exploration Method(s): Sonic	Work Start/Completion Dates: 12/11/2017 to 12/12/2017		Top of Casing Elev. (NAVD88): 155.9'	Depth to Water (Below GS): 85' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	80				PID= 0.8 Sheen= Slight		Moist, brown, gravelly, silty SAND (SM) interbedded with sandy, silty GRAVEL (GM); fine to medium sand, fine to coarse gravel, no odor, no landfill waste	
75							Moist, brown, gravelly, slightly silty SAND (SP-SM); fine to medium sand, fine gravel, trace coarse gravel, no odor, no landfill waste	75
	75				PID= 0.1 Sheen= None		Moist, brown, gravelly, sandy SILT (ML); fine sand, fine to coarse gravel, no odor, no landfill waste	
					PID= 0.1 Sheen= None			
80		10/20 silica sand filter pack					Moist, brown, slightly gravelly, slightly silty SAND (SP-SM); fine to medium sand, fine gravel, no odor, no landfill waste	80
							Dry, brown, gravelly, sandy, SILT (ML); fine to coarse sand, fine gravel, no odor, no landfill waste	
	70				PID= 0.1 Sheen= None		Moist to very moist, brown, gravelly, silty SAND (SM); fine to medium sand, trace coarse sand, fine gravel, no odor, no landfill waste	
85		∇ 12/12/2017					Dry to moist, gravelly, sandy, SILT (ML); fine to coarse sand, fine gravel, no odor, no landfill waste	85
					PID= 0.0 Sheen= None		Very moist to wet, brown, slightly gravelly, slightly silty SAND (SW-SM); fine to coarse sand, fine to coarse gravel, no odor, no landfill waste	
	65				PID= 0.0 Sheen= None			
90		Schedule 40 PVC 0.020" slotted screen	○				Very moist to wet, brown, gravelly, silty SAND (SM); fine to medium sand, fine gravel, no odor, no landfill waste	90
					PID= 0.2 Sheen= None		Very moist to wet, brown, slightly gravelly, slightly silty SAND (SP-SM); fine to medium sand, fine gravel, no odor, no landfill waste	
	60				PID= 0.0 Sheen= None			
95							Very moist to wet, brown-gray, slightly silty SAND (SW-SM); fine to coarse sand, trace fine gravel, no odor, no landfill waste	95

Legend

Sample Method: ○ No Soil Sample Recovery; ▯ Continuous core 6" ID

Water Level: ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-1

Aspect CONSULTING	Shelton C Street Landfill - 150074		Monitoring Well Log	
	Project Address & Site Specific Location		*Coordinates (SPN NAD83 ft)*	*Exploration Number*
	Shelton, WA, NE corner of landfill		E:986256.0 N:697079	**AMW-1**
Contractor	*Equipment*	*Sampling Method*	*Ground Surface (GS) Elev. (NAVD88)*	Ecology Well Tag No. BKC 045
Holocene	Geoprobe 8140LC	Continuous core 10" outer, 6" inner casing	153.48'	
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*	*Top of Casing Elev. (NAVD88)*	*Depth to Water (Below GS)*
Zach Bailey	Sonic	12/11/2017 to 12/12/2017	155.9'	85' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Very moist to wet, brown-gray, slightly silty SAND (SW-SM); fine to coarse sand, trace fine gravel, no odor, no landfill waste (continued)	
	55				PID= 0.0 Sheen= None			
100		Slough						100
					PID= 0.0 Sheen= None			
	50							
105					PID= 0.0 Sheen= None		Bottom of exploration at 105 ft. bgs.	105
	45							
110								110
	40							
115								115
	35							
120								120

Legend

Sample Method
- No Soil Sample Recovery
- Continuous core 6" ID

Water Level
- Water Level ATD

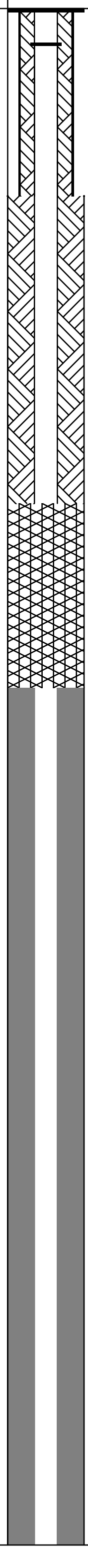
See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-1

Sheet 5 of 5

Aspect CONSULTING	Shelton C Street Landfill - 150074		Monitoring Well Log	
	Project Address & Site Specific Location		*Coordinates (SPN NAD83 ft)*	*Exploration Number*
	Shelton, WA, SE corner of landfill		E:986269.2 N:696844	**AMW-2**
Contractor	*Equipment*	*Sampling Method*	*Ground Surface (GS) Elev. (NAVD88)*	Ecology Well Tag No.
Holocene	Geoprobe 8140LC	Continuous core 10" outer, 6" inner casing	152.65'	BKC 047
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*	*Top of Casing Elev. (NAVD88)*	*Depth to Water (Below GS)*
Zach Bailey	Sonic	12/18/2017 to 12/19/2017	155.54'	85' (ATD)



Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	155	Steel aboveground monument with protective bollards						
0		Capped in concrete					**FILL** Moist, dark brown, gravelly, silty SAND (SM); fine to medium sand; abundant organics, metal, plastic, and woody fragments, organic odor	0
	150				PID= 0.3 Sheen= Slight			
5		3/8" hydrated bentonite chips			PID= 0.1 Sheen= Organic			5
	145				PID= 0.1 Sheen= None		**RECESSIONAL GLACIAL OUTWASH** Moist, brown-gray, gravelly, slightly silty SAND (SP-SM); medium to coarse sand, fine gravel, trace coarse gravel and cobbles, no odor, no landfill waste	
10							Moist, brown, gravelly, slightly silty SAND (SP-SM); fine to coarse sand, fine gravel, no odor, no landfill waste	10
							Moist, brown, slightly sandy, slightly silty GRAVEL (GW-GM); fine to coarse gravel, medium to coarse sand, trace cobbles, no odor, no landfill waste	
	140				PID= 0.1 Sheen= Slight		Moist, brown, gravelly, silty SAND (SM); fine to coarse sand, fine gravel, no odor, no landfill waste	
15		Sealed with bentonite grout						15
	135				PID= 0.1 Sheen= Slight			
20					PID= 0.1 Sheen= Slight			20

Legend

Sample Method: Continuous core 6" ID

Water Level: ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-2

Aspect Consulting	Shelton C Street Landfill - 150074		Monitoring Well Log	
	Project Address & Site Specific Location: Shelton, WA, SE corner of landfill		Coordinates (SPN NAD83 ft): E:986269.2 N:696844	Exploration Number: AMW-2
Contractor: Holocene	Equipment: Geoprobe 8140LC	Sampling Method: Continuous core 10" outer, 6" inner casing	Ground Surface (GS) Elev. (NAVD88): 152.65'	Ecology Well Tag No. BKC 047
Operator: Zach Bailey	Exploration Method(s): Sonic	Work Start/Completion Dates: 12/18/2017 to 12/19/2017	Top of Casing Elev. (NAVD88): 155.54'	Depth to Water (Below GS): 85' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	130				PID= 0.1 Sheen= None	SM	Moist, brown, gravelly, silty SAND (SM); fine to coarse sand, fine gravel, no odor, no landfill waste (continued)	
25								25
	125				PID= 0.1 Sheen= None			
						GW-GM	Moist, brown, sandy, slightly silty GRAVEL (GW-GM); fine to coarse gravel, trace cobbles, medium to coarse sand, no odor, no landfill waste	
30						SP-SM	Moist, brown, gravelly, slightly silty SAND (SP-SM); fine to coarse sand, fine to coarse gravel, trace cobbles, no odor, no landfill waste	30
	120				PID= 0.4 Sheen= None			
35		Sealed with bentonite grout				GW-GM	Moist, brown, sandy, slightly silty GRAVEL (GW-GM); fine to coarse gravel, fine to medium sand, no odor, no landfill waste	35
	115				PID= 0.2 Sheen= Slight			
40								40
	110				PID= 0.1 Sheen= None			
45								45
					PID= 0.1			

Legend

Sample Method: Continuous core 6" ID

Water Level: Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-2

Shelton C Street Landfill - 150074		Monitoring Well Log	
Project Address & Site Specific Location Shelton, WA, SE corner of landfill		*Coordinates (SPN NAD83 ft)* E:986269.2 N:696844	*Exploration Number* **AMW-2**
Contractor Holocene	*Equipment* Geoprobe 8140LC	*Sampling Method* Continuous core 10" outer, 6" inner casing	*Ground Surface (GS) Elev. (NAVD88)* 152.65'	Ecology Well Tag No. BKC 047
Operator Zach Bailey	*Exploration Method(s)* Sonic	*Work Start/Completion Dates* 12/18/2017 to 12/19/2017	*Top of Casing Elev. (NAVD88)* 155.54'	*Depth to Water (Below GS)* 85' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	105				Sheen= None		Moist, brown, slightly gravelly, slightly silty SAND (SP-SM) interbedded with moist, brown, gravelly, slightly silty SAND (SW-SM); fine to medium sand, fine to coarse gravel, trace cobbles, no odor, no landfill waste (continued)	
50					PID= 0.1 Sheen= None			50
	100				PID= 0.1 Sheen= None			
55							Moist, brown, gravelly, slightly silty SAND (SW-SM); fine to coarse sand, fine to coarse gravel, no odor, no landfill waste	55
	95				PID= 0.2 Sheen= None			
60		Sealed with bentonite grout						60
	90				PID= 0.2 Sheen= None			
65								65
	85	3/8" hydrated bentonite chips						
70					PID= 0.3 Sheen= Slight		Moist, brown, slightly gravelly, silty SAND (SM); fine to coarse sand, fine to coarse gravel, no odor, no landfill waste	70
							Moist, brown, gravelly, slightly silty SAND (SW-SM); fine to coarse sand, fine gravel, trace coarse gravel, no odor, no landfill waste	

Legend

Sample Method: Continuous core 6" ID

Water Level: Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-2

Aspect CONSULTING	Shelton C Street Landfill - 150074			Monitoring Well Log	
	Project Address & Site Specific Location: Shelton, WA, SE corner of landfill			Coordinates (SPN NAD83 ft): E:986269.2 N:696844	Exploration Number: **AMW-2**
Contractor: Holocene	Equipment: Geoprobe 8140LC	Sampling Method: Continuous core 10" outer, 6" inner casing		Ground Surface (GS) Elev. (NAVD88): 152.65'	Ecology Well Tag No. BKC 047
Operator: Zach Bailey	Exploration Method(s): Sonic	Work Start/Completion Dates: 12/18/2017 to 12/19/2017		Top of Casing Elev. (NAVD88): 155.54'	Depth to Water (Below GS): 85' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	80						Moist, brown, gravelly, slightly silty SAND (SW-SM); fine to coarse sand, fine gravel, trace coarse gravel, no odor, no landfill waste (continued)	
					PID= 0.2 Sheen= None			
75							Moist, brown, slightly silty SAND (SP-SM); fine to medium sand, trace fine to coarse gravel, trace cobbles, no odor, no landfill waste	75
					PID= 0.2 Sheen= None			
	75							
					PID= 0.3 Sheen= None			
80		10/20 silica sand filter pack						80
					PID= 0.2 Sheen= None			
							Moist, brown, sandy, silty GRAVEL (GM); fine to coarse gravel, fine to coarse sand, no odor, no landfill waste	
	70							
							Very moist to wet, brown, slightly silty SAND (SP-SM); fine to medium sand, trace fine to coarse gravel, no odor, no landfill waste	
85		∇ 12/18/2017		AMW-2-85	PID= 0.2 Sheen= None			85
	65							
					PID= 0.2 Sheen= None			
90		Schedule 40 PVC 0.020" slotted screen						90
					PID= 0.2 Sheen= None			
	60							
95								95

Legend

Sample Method: Continuous core 6" ID

Water Level: ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-2

Aspect CONSULTING	Shelton C Street Landfill - 150074		Monitoring Well Log	
	Project Address & Site Specific Location		*Coordinates (SPN NAD83 ft)*	*Exploration Number*
	Shelton, WA, SE corner of landfill		E:986269.2 N:696844	**AMW-2**

Contractor	*Equipment*	*Sampling Method*	*Ground Surface (GS) Elev. (NAVD88)*	
Holocene	Geoprobe 8140LC	Continuous core 10" outer, 6" inner casing	152.65'	Ecology Well Tag No. BKC 047
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*	*Top of Casing Elev. (NAVD88)*	*Depth to Water (Below GS)*
Zach Bailey	Sonic	12/18/2017 to 12/19/2017	155.54'	85' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
	55				PID= 0.3 Sheen= None		Very moist, brown, gravelly, slightly silty SAND (SW-SM); fine to coarse sand, fine gravel, trace coarse gravel, no odor, no landfill waste	
100								100
					PID= 0.2 Sheen= None			
	50							
105				AMW-2-105	PID= 0.3 Sheen= None		Bottom of exploration at 105 ft. bgs.	105
	45							
110								110
	40							
115								115
	35							
120								120

Legend

Sample Method: Continuous core 6" ID

Water Level: Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-2

Sheet 5 of 5

OLD STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\SHELTON C STREET LANDFILL - 150074.GPJ June 6, 2019

Aspect CONSULTING	Shelton C Street Landfill - 150074	Monitoring Well Log	
	Project Address & Site Specific Location	*Coordinates (SPN NAD83 ft)*	*Exploration Number*
	Shelton, WA, Along W side road	E:985687.2 N:697194	**AMW-3**

Contractor	*Equipment*	*Sampling Method*	*Ground Surface (GS) Elev. (NAVD88)*	Ecology Well Tag No.
Holocene	Geoprobe 8140LC	Continuous core 10" outer, 6" inner casing	170.4'	BKC 048
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*	*Top of Casing Elev. (NAVD88)*	*Depth to Water (Below GS)*
Zach Bailey	Sonic	12/20/2017 to 12/22/2017	172.94'	100' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		Steel aboveground monument with protective bollards						
0	170	Capped in concrete					**RECESSIONAL GLACIAL OUTWASH** Moist, brown, sandy, silty GRAVEL (GM); fine to coarse gravel, fine to coarse sand, trace cobbles, abundant organics, no odor, no landfill waste	0
					PID= 0.1 Sheen= Slight		Moist, red-brown, sandy, SILT (ML); fine gravel, fine to medium sand, organic odor, no landfill waste	
5	165	3/8" hydrated bentonite chips			PID= 0.6 Sheen= Slight		Moist, red-brown, silty SAND (SM); fine to medium sand, trace cobbles, trace woody debris, organic odor, no landfill waste	5
10	160						Moist, brown, sandy, cobbley, silty GRAVEL (GM); fine to coarse gravel, fine to coarse sand, no odor, no landfill waste	10
15	155	Sealed with bentonite grout			PID= 0.5 Sheen= Slight		Moist, brown, gravelly, silty SAND (SM); fine to coarse sand, fine to coarse gravel, trace cobbles, no odor, no landfill waste	15
					PID= 0.3 Sheen= None		Moist, red-brown, gravelly, silty SAND (SM); fine to coarse sand, fine to coarse gravel, trace cobbles, no odor, no landfill waste	
20	150							20

Legend

Sample Method: No Soil Sample Recovery; Continuous core 6" ID

Water Level: Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-3

Shelton C Street Landfill - 150074		Monitoring Well Log	
Project Address & Site Specific Location: Shelton, WA, Along W side road		Coordinates (SPN NAD83 ft): E:985687.2 N:697194	Exploration Number: AMW-3

Contractor	Equipment	Sampling Method	Ground Surface (GS) Elev. (NAVD88)	Ecology Well Tag No.
Holocene	Geoprobe 8140LC	Continuous core 10" outer, 6" inner casing	170.4'	BKC 048

Operator	Exploration Method(s)	Work Start/Completion Dates	Top of Casing Elev. (NAVD88)	Depth to Water (Below GS)
Zach Bailey	Sonic	12/20/2017 to 12/22/2017	172.94'	100' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
					PID= 0.1 Sheen= None		Very moist, brown, sandy, silty GRAVEL (GM) interbedded with very moist, brown, gravelly, silty SAND (SM); fine gravel, fine to coarse sand, no odor, no landfill waste (continued)	
25	145							25
					PID= 0.1 Sheen= None			
							Coarse gravel	
30	140							30
					PID= 0.1 Sheen= None			
							Trace cobbles	
35	135	Sealed with bentonite grout						35
40	130				PID= 0.1 Sheen= None			40
					PID= 0.0 Sheen= None			
45	125							45
					PID= 0.0 Sheen= None			

Legend

Sample Method:
- No Soil Sample Recovery
- Continuous core 6" ID

Water Level:
- ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-3

Aspect Consulting	Shelton C Street Landfill - 150074			Monitoring Well Log	
	Project Address & Site Specific Location			*Coordinates (SPN NAD83 ft)*	*Exploration Number*
	Shelton, WA, Along W side road			E:985687.2 N:697194	**AMW-3**
Contractor	*Equipment*	*Sampling Method*		*Ground Surface (GS) Elev. (NAVD88)*	Ecology Well Tag No. BKC 048
Holocene	Geoprobe 8140LC	Continuous core 10" outer, 6" inner casing		170.4'	
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*		*Top of Casing Elev. (NAVD88)*	*Depth to Water (Below GS)*
Zach Bailey	Sonic	12/20/2017 to 12/22/2017		172.94'	100' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Description	Depth (ft)
						Very moist, brown, sandy, silty GRAVEL (GM) interbedded with very moist, brown, gravelly, silty SAND (SM); fine gravel, fine to coarse sand, no odor, no landfill waste (continued)	
50	120						50
					PID= 0.0 Sheen= None		
55	115						55
					PID= 0.0 Sheen= None		
60	110	Sealed with bentonite grout					60
					PID= 0.2 Sheen= None		
65	105				PID= 0.0 Sheen= None	Moist, brown, gravelly, slightly silty SAND (SP-SM); medium to coarse sand, fine gravel, no odor, no landfill waste	65
					PID= 0.0 Sheen= None		
70	100						70
						Moist, brown, gravelly, silty SAND (SM); fine to coarse sand, fine to coarse gravel, no odor, no landfill waste	

Legend

Sample Method
- No Soil Sample Recovery
- Continuous core 6" ID

Water Level
- Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-3

Aspect CONSULTING	Shelton C Street Landfill - 150074		Monitoring Well Log	
	Project Address & Site Specific Location Shelton, WA, Along W side road		*Coordinates (SPN NAD83 ft)* E:985687.2 N:697194	*Exploration Number* **AMW-3**
Contractor Holocene	*Equipment* Geoprobe 8140LC	*Sampling Method* Continuous core 10" outer, 6" inner casing	*Ground Surface (GS) Elev. (NAVD88)* 170.4'	Ecology Well Tag No. BKC 048
Operator Zach Bailey	*Exploration Method(s)* Sonic	*Work Start/Completion Dates* 12/20/2017 to 12/22/2017	*Top of Casing Elev. (NAVD88)* 172.94'	*Depth to Water (Below GS)* 100' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							Moist, brown, gravelly, silty SAND (SM); fine to coarse sand, fine to coarse gravel, no odor, no landfill waste (continued)	
					PID= 0.0 Sheen= None			
		Sealed with bentonite grout						
75	95						Moist, brown, slightly gravelly, slightly silty SAND (SP-SM); medium to coarse sand, fine gravel, trace coarse gravel, no odor, no landfill waste	75
					PID= 0.0 Sheen= None			
80	90	3/8" hydrated bentonite chips						80
					PID= 0.0 Sheen= Slight			
85	85						Becomes very moist	85
					PID= 0.0 Sheen= None		Moist, brown, sandy, silty GRAVEL (GM); fine to coarse gravel, medium to coarse sand, no odor, no landfill waste	
90	80							90
					PID= 0.1 Sheen= None			
		10/20 silica sand filter pack					Very moist to wet, sandy, slightly silty GRAVEL (GW-GM); fine to coarse gravel, medium to coarse sand, no odor, no landfill waste	
95	75						Moist, brown, gravelly, silty SAND (SM); fine to medium sand, fine to coarse gravel, no odor, no landfill waste	95

Legend

Sample Method:
- No Soil Sample Recovery
- Continuous core 6" ID

Water Level:
- Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-3

Aspect CONSULTING	Shelton C Street Landfill - 150074		Monitoring Well Log	
	Project Address & Site Specific Location: Shelton, WA, Along W side road		Coordinates (SPN NAD83 ft): E:985687.2 N:697194	Exploration Number: **AMW-3**
Contractor: Holocene	Equipment: Geoprobe 8140LC	Sampling Method: Continuous core 10" outer, 6" inner casing	Ground Surface (GS) Elev. (NAVD88): 170.4'	Ecology Well Tag No. BKC 048
Operator: Zach Bailey	Exploration Method(s): Sonic	Work Start/Completion Dates: 12/20/2017 to 12/22/2017	Top of Casing Elev. (NAVD88): 172.94'	Depth to Water (Below GS): 100' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
					PID= 0.3 Sheen= None		Moist, brown, gravelly, silty SAND (SM); fine to medium sand, fine to coarse gravel, no odor, no landfill waste (continued)	
100	70	∇ 12/21/2017			PID= 0.1 Sheen= None		Wet, brown, sandy, silty GRAVEL (GM); fine gravel, trace coarse gravel, coarse sand, no odor, no landfill waste	100
		Schedule 40 PVC 0.020" slotted screen						
105	65							105
							Wet, brown, silty SAND (SM); fine sand, trace fine to coarse gravel, exhibits rapid dilatency, no odor, no landfill waste	
					PID= 0.0 Sheen= None		Wet, brown, gravelly, silty SAND (SM); fine to coarse sand, fine gravel, no odor, no landfill waste	
110	60						Moist, gray, SILT (ML); trace 2mm fine sand beds, no odor, no landfill waste	110
					PID= 0.0 Sheen= None			
115	55						Moist, brown, silty SAND (SM); fine sand, no odor, no landfill waste	115
		Slough						
120	50				PID= 0.1 Sheen= None		Bottom of exploration at 120 ft. bgs.	120

Legend

Sample Method:
- No Soil Sample Recovery
- Continuous core 6" ID

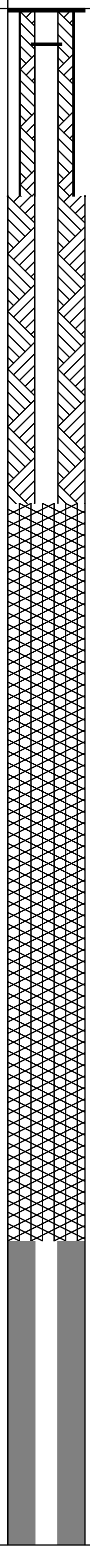
Water Level:
- ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-3

Aspect CONSULTING	Shelton C Street Landfill - 150074		Monitoring Well Log	
	Project Address & Site Specific Location: Shelton, WA, SW corner of landfill		Coordinates (SPN NAD83 ft): E:986008.0 N:696820	Exploration Number: **AMW-4**
Contractor: Holocene	Equipment: Geoprobe 8140LC	Sampling Method: Continuous core 10" outer, 6" inner casing	Ground Surface (GS) Elev. (NAVD88): 151.23'	Ecology Well Tag No. BKC 046
Operator: Zach Bailey	Exploration Method(s): Sonic	Work Start/Completion Dates: 12/14/2017 to 12/15/2017	Top of Casing Elev. (NAVD88): 153.68'	Depth to Water (Below GS): 82' (ATD)



Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
		Steel aboveground monument with protective bollards						
0							**FILL** Moist, dark brown, gravelly, silty SAND (SM); fine sand, fine to coarse gravel, abundant organics, trace glass and plastics, organic odor	0
	150	Capped in concrete						
					PID= 0.2 Sheen= None			
5					PID= 0.1 Sheen= Slight		Becomes black	5
							6 inches Asphalt	
	145						Moist, brown, gravelly, silty SAND (SM); medium to coarse sand, fine gravel, no odor, no landfill waste	
					PID= 0.3 Sheen= Slight			
					PID= 0.2 Sheen= Slight			
10		3/8" hydrated bentonite chips					Moist to very moist, black, gravelly, silty SAND (SM); medium to coarse sand, fine to coarse gravel, abundant wood fragments, glass, and brick fragments, organic odor	10
	140							
					PID= 0.0 Sheen= Slight			
							Moist, red-black, silty SAND (SM); abundant wood fragments, glass, metal, and brick fragments, organic odor	
15					PID= 0.0 Sheen= Slight		3 inch interbed of white powdery substance	15
	135							
					PID= 0.5 Sheen= Slight			
							Moist, brick red, silty SAND (SM); glass fragments, pulverized brick, no odor	
20		Sealed with bentonite grout			PID= 0.3 Sheen= None			20
	130							

Legend

Sample Method
- No Soil Sample Recovery
- Continuous core 6" ID

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-4

Aspect CONSULTING	Shelton C Street Landfill - 150074		Monitoring Well Log	
	Project Address & Site Specific Location		*Coordinates (SPN NAD83 ft)*	*Exploration Number*
	Shelton, WA, SW corner of landfill		E:986008.0 N:696820	**AMW-4**
Contractor	*Equipment*	*Sampling Method*	*Ground Surface (GS) Elev. (NAVD88)*	
Holocene	Geoprobe 8140LC	Continuous core 10" outer, 6" inner casing	151.23'	Ecology Well Tag No. BKC 046
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*	*Top of Casing Elev. (NAVD88)*	*Depth to Water (Below GS)*
Zach Bailey	Sonic	12/14/2017 to 12/15/2017	153.68'	82' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description
					PID= 0.0 Sheen= None		Moist, brick red, silty SAND (SM); glass fragments, pulverized brick, no odor (continued)
25							Becomes brown
	125						**RECESSIONAL GLACIAL OUTWASH** Moist, brown, slightly gravelly, slightly silty SAND (SW-SM); fine to coarse sand, fine gravel, no odor, no landfill waste
					PID= 0.2 Sheen= None		
30							
	120						
					PID= 0.2 Sheen= None		
							Trace coarse gravel
35		Sealed with bentonite grout			PID= 0.1 Sheen= None		
	115						
40					PID= 0.1 Sheen= None		
	110						
					PID= 0.1 Sheen= None		
45							Moist, light brown, gravelly, silty SAND (SM); fine to coarse sand, fine to coarse gravel, no odor, no landfill waste
	105						

Legend

Sample Method
- No Soil Sample Recovery
- Continuous core 6" ID

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-4

Monitoring Well Log

Shelton C Street Landfill - 150074

Project Address & Site Specific Location	Coordinates (SPN NAD83 ft)	Exploration Number
Shelton, WA, SW corner of landfill	E:986008.0 N:696820	**AMW-4**

Contractor	Equipment	Sampling Method	Ground Surface (GS) Elev. (NAVD88)	Ecology Well Tag No.
Holocene	Geoprobe 8140LC	Continuous core 10" outer, 6" inner casing	151.23'	BKC 046

Operator	Exploration Method(s)	Work Start/Completion Dates	Top of Casing Elev. (NAVD88)	Depth to Water (Below GS)
Zach Bailey	Sonic	12/14/2017 to 12/15/2017	153.68'	82' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Field Tests	Description
		Sealed with bentonite grout	PID= 0.1 Sheen= None	Moist, light brown, gravelly, silty SAND (SM); fine to coarse sand, fine to coarse gravel, no odor, no landfill waste (continued)
50	100		PID= 0.1 Sheen= None	Moist, brown, silty SAND (SM); fine to medium sand, trace fine gravel, no odor, no landfill waste
			PID= 0.2 Sheen= None	Moist, brown, gravelly, silty SAND (SM); fine to coarse sand, fine to coarse gravel, no odor, no landfill debris
55	95			Moist, brown, slightly silty SAND (SW-SM); fine to coarse sand, trace fine gravel, no odor, no landfill waste
			PID= 0.2 Sheen= None	Moist, brown, silty SAND (SM); fine to medium sand, no odor, no landfill waste
60		3/8" hydrated bentonite chips	PID= 0.1 Sheen= None	
	90			Moist, brown, slightly gravelly, slightly silty SAND (SW-SM); fine to coarse sand, fine gravel, no odor, no landfill waste
65	85		PID= 0.1 Sheen= Slight	
			PID= 0.2 Sheen= None	Moist, brown, slightly gravelly, silty SAND (SM); fine to medium sand, fine gravel, no odor, no landfill waste
70	80		PID= 0.1	Moist, brown, slightly silty SAND (SP-SM); fine sand, no odor, no landfill waste

Legend

Sample Method: No Soil Sample Recovery; Continuous core 6" ID

Water Level: ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-4

Aspect CONSULTING	Shelton C Street Landfill - 150074			Monitoring Well Log	
	Project Address & Site Specific Location: Shelton, WA, SW corner of landfill			Coordinates (SPN NAD83 ft): E:986008.0 N:696820	Exploration Number: **AMW-4**
Contractor: Holocene	Equipment: Geoprobe 8140LC	Sampling Method: Continuous core 10" outer, 6" inner casing		Ground Surface (GS) Elev. (NAVD88): 151.23'	Ecology Well Tag No. BKC 046
Operator: Zach Bailey	Exploration Method(s): Sonic	Work Start/Completion Dates: 12/14/2017 to 12/15/2017		Top of Casing Elev. (NAVD88): 153.68'	Depth to Water (Below GS): 82' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
					Sheen= Slight		Moist, brown, slightly silty SAND (SP-SM); fine sand, no odor, no landfill waste (continued)	
					PID= 1.0 Sheen= None		Moist, brown, gravelly, silty SAND (SM); fine to medium sand, fine gravel, appears consolidated, no odor, no landfill waste	
75	75				PID= 0.9 Sheen= None		Moist, brown, sandy SILT (ML); fine to medium sand, no odor, no landfill waste	75
80	70	10/20 silica sand filter pack; ▽ 12/15/2017			PID= 0.1 Sheen= None		Very moist, brown, gravelly, silty SAND (SM); fine to coarse sand, fine gravel, no odor, no landfill waste. Becomes wet	80
85	65				PID= 0.1 Sheen= None		Wet, brown, silty SAND (SM); fine to medium sand, trace coarse gravel, no odor, no landfill waste	85
90	60	Schedule 40 PVC 0.020" slotted screen			PID= 0.1 Sheen= None			90
					PID= 0.1 Sheen= None		Wet, brown, sandy, silty GRAVEL (GM); fine gravel, trace coarse gravel, coarse sand, no odor, no landfill waste	
95	55						Wet, brown, sandy GRAVEL (GW); fine to coarse gravel, coarse sand, no odor, no landfill waste	95

Legend

Sample Method: No Soil Sample Recovery; Continuous core 6" ID

Water Level: ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-4

Shelton C Street Landfill - 150074		Monitoring Well Log	
Project Address & Site Specific Location Shelton, WA, SW corner of landfill		*Coordinates (SPN NAD83 ft)* E:986008.0 N:696820	*Exploration Number* **AMW-4**

Contractor	*Equipment*	*Sampling Method*	*Ground Surface (GS) Elev. (NAVD88)*	Ecology Well Tag No.
Holocene	Geoprobe 8140LC	Continuous core 10" outer, 6" inner casing	151.23'	BKC 046
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*	*Top of Casing Elev. (NAVD88)*	*Depth to Water (Below GS)*
Zach Bailey	Sonic	12/14/2017 to 12/15/2017	153.68'	82' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
					PID= 0.1 Sheen= None		Wet, brown, sandy GRAVEL (GW); fine to coarse gravel, coarse sand, no odor, no landfill waste (continued)	
100	50	Slough						100
					PID= 0.1 Sheen= None			
105	45						Bottom of exploration at 105 ft. bgs.	105
110	40							110
115	35							115
120	30							120

Legend

Sample Method
- No Soil Sample Recovery
- Continuous core 6" ID

Water Level
- ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: KB
Approved by: ALC 6/6/2019

Exploration Log AMW-4

Major Divisions		Fines	Symbol	Group Names
Coarse-Grained Soils - More than 50%1 Retained on No. 200 Sieve	Gravels - More than 50%[1] of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines	**GW**	Well-graded GRAVEL Well-graded GRAVEL WITH SAND
			GP	Poorly-graded GRAVEL Poorly-graded GRAVEL WITH SAND
		≥15% Fines	**GM**	SILTY GRAVEL SILTY GRAVEL WITH SAND
			GC	CLAYEY GRAVEL CLAYEY GRAVEL WITH SAND
	Sands - 50%[1] or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines	**SW**	Well-graded SAND Well-graded SAND WITH GRAVEL
			SP	Poorly-graded SAND Poorly-graded SAND WITH GRAVEL
		≥15% Fines	**SM**	SILTY SAND SILTY SAND WITH GRAVEL
			SC	CLAYEY SAND CLAYEY SAND WITH GRAVEL
Fine-Grained Soils - 50%1 or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50%		**ML**	SILT SANDY or GRAVELLY SILT SILT WITH SAND SILT WITH GRAVEL
			CL	LEAN CLAY SANDY or GRAVELLY LEAN CLAY LEAN CLAY WITH SAND LEAN CLAY WITH GRAVEL
			OL	ORGANIC SILT SANDY or GRAVELLY ORGANIC SILT ORGANIC SILT WITH SAND ORGANIC SILT WITH GRAVEL
	Silts and Clays Liquid Limit 50% or More		**MH**	ELASTIC SILT SANDY or GRAVELLY ELASTIC SILT ELASTIC SILT WITH SAND ELASTIC SILT WITH GRAVEL
			CH	FAT CLAY SANDY or GRAVELLY FAT CLAY FAT CLAY WITH SAND FAT CLAY WITH GRAVEL
			OH	ORGANIC CLAY SANDY or GRAVELLY ORGANIC CLAY ORGANIC CLAY WITH SAND ORGANIC CLAY WITH GRAVEL
Highly Organic Soils			**PT**	PEAT and other mostly organic soils

"WITH SILT" or "WITH CLAY" means 5 to 15% silt and clay, denoted by a "-" in the group name; e.g., SP-SM • "SILTY" or "CLAYEY" means >15% silt and clay • "WITH SAND" or "WITH GRAVEL" means 15 to 30% sand and gravel. • "SANDY" or "GRAVELLY" means >30% sand and gravel. • "Well-graded" means approximately equal amounts of fine to coarse grain sizes • "Poorly graded" means unequal amounts of grain sizes • Group names separated by "/" means soil contains layers of the two soil types; e.g., SM/ML.

Soils were described and identified in the field in general accordance with the methods described in ASTM D2488. Where indicated in the log, soils were classified using ASTM D2487 or other laboratory tests as appropriate. Refer to the report accompanying these exploration logs for details.

1. Estimated or measured percentage by dry weight
2. (SPT) Standard Penetration Test (ASTM D1586)
3. Determined by SPT, DCPT (ASTM STP399) or other field methods. See report text for details.

GEOTECHNICAL LAB TESTS

MC	=	Natural Moisture Content
GS	=	Grain Size Distribution
FC	=	Fines Content (% < 0.075 mm)
GH	=	Hydrometer Test
AL	=	Atterberg Limits
C	=	Consolidation Test
Str	=	Strength Test
OC	=	Organic Content (% Loss by Ignition)
Comp	=	Proctor Test
K	=	Hydraulic Conductivity Test
SG	=	Specific Gravity Test

CHEMICAL LAB TESTS

Organic Chemicals

BTEX	=	Benzene, Toluene, Ethylbenzene, Xylenes
TPH-Dx	=	Diesel and Oil-Range Petroleum Hydrocarbons
TPH-G	=	Gasoline-Range Petroleum Hydrocarbons
VOCs	=	Volatile Organic Compounds
SVOCs	=	Semi-Volatile Organic Compounds
PAHs	=	Polycyclic Aromatic Hydrocarbon Compounds
PCBs	=	Polychlorinated Biphenyls

Metals

RCRA8	=	As, Ba, Cd, Cr, Pb, Hg, Se, Ag, (d = dissolved, t = total)
MTCA5	=	As, Cd, Cr, Hg, Pb (d = dissolved, t = total)
PP-13	=	Ag, As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Tl, Zn (d=dissolved, t=total)

FIELD TESTS

PID	=	Photoionization Detector
Sheen	=	Oil Sheen Test
SPT[2]	=	Standard Penetration Test
NSPT	=	Non-Standard Penetration Test
DCPT	=	Dynamic Cone Penetration Test

COMPONENT DEFINITIONS

Descriptive Term		*Size Range and Sieve Number*
Boulders	=	Larger than 12 inches
Cobbles	=	3 inches to 12 inches
Coarse Gravel	=	3 inches to 3/4 inches
Fine Gravel	=	3/4 inches to No. 4 (4.75 mm)
Coarse Sand	=	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	=	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	=	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	=	Smaller than No. 200 (0.075 mm)

ESTIMATED[1] PERCENTAGE

% by Weight		*Modifier*	*% by Weight*		*Modifier*
<1	=	Subtrace	15 to 25	=	Little
1 to <5	=	Trace	30 to 45	=	Some
5 to 10	=	Few	>50	=	Mostly

MOISTURE CONTENT

Dry	=	Absence of moisture, dusty, dry to the touch
Slightly Moist	=	Perceptible moisture
Moist	=	Damp but no visible water
Very Moist	=	Water visible but not free draining
Wet	=	Visible free water, usually from below water table

RELATIVE DENSITY

Non-Cohesive or Coarse-Grained Soils

Density[3]		*SPT[2] Blows/Foot*	*Penetration with 1/2" Diameter Rod*
Very Loose	=	0 to 4	≥ 2'
Loose	=	5 to 10	1' to 2'
Medium Dense	=	11 to 30	3" to 1'
Dense	=	31 to 50	1" to 3"
Very Dense	=	> 50	< 1"

CONSISTENCY

Cohesive or Fine-Grained Soils

Consistency[3]		*SPT[2] Blows/Foot*	*Manual Test*
Very Soft	=	0 to 1	Penetrated >1" easily by thumb. Extrudes between thumb & fingers.
Soft	=	2 to 4	Penetrated 1/4" to 1" easily by thumb. Easily molded.
Medium Stiff	=	5 to 8	Penetrated >1/4" with effort by thumb. Molded with strong pressure.
Stiff	=	9 to 15	Indented ~1/4" with effort by thumb.
Very Stiff	=	16 to 30	Indented easily by thumbnail.
Hard	=	> 30	Indented with difficulty by thumbnail.

GEOLOGIC CONTACTS

Observed and Distinct

Observed and Gradual

Inferred

Aspect CONSULTING

Exploration Log Key

AI Path: Q:_ACAD Standards\FIELD REFERENCE\MASTERS\Exploration Log Key-2018.ai // user: jinman // last saved: 09/26/2018

Aspect CONSULTING	Shelton C Street Landfill - 150074		Environmental Exploration Log	
	Project Address & Site Specific Location: Shelton, WA, W of SG-2		Coordinates (Lat,Lon WGS84): 47.215, -123.133 (est)	Exploration Number: **TP-01**
Contractor: City of Shelton	Equipment: Excavator	Sampling Method: Grab	Ground Surface (GS) Elev.: NA	
Operator: Daniel	Exploration Method(s): Trackhoe	Work Start/Completion Dates: 2/14/2020	Top of Casing Elev.: NA	Depth to Water (Below GS): No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							FILL Moist, brown Topsoil; with roots, no landfill waste present, no odor	
							Moist, brown, slightly silty SAND (SW-SM); coarse to medium sand coarse, subrounded gravel; no landfill waste present, no odor	
			Grab	TP-01-021420*	PID= 0.0 Sheen= No Sheen			
1								1
		Excavation backfilled with spoils						
2								2
			Grab	TP-01-021420*	PID= 0.0 Sheen= No Sheen			
3							Wet, black, slightly silty SAND (SW-SM); coarse to medium sand; no landfill waste present, no odor	3
			Grab	TP-01-021420*	PID= 0.0 Sheen= No Sheen			
							LANDFILL WASTE Moist to very moist, black, gravelly, silty SAND (SM); medium to coarse sand, fine to coarse gravel; abundant wood fragments, glass, and brick fragments, organic-like odor	
4								4

*Composite sample TP-01-021420 consists of equal amounts of soil collected from the indicated depths.
Bottom of exploration at 4 ft. bgs.

Legend

Sample Method: Grab sample

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: BBC
Approved by: ALC 5/21/2020

Exploration Log TP-01

Shelton C Street Landfill - 150074		Environmental Exploration Log	
Project Address & Site Specific Location		*Coordinates (Lat,Lon WGS84)*	*Exploration Number*
Shelton, WA, Between SG-2 and SG-5		47.215, -123.134 (est)	**TP-02**

Contractor	*Equipment*	*Sampling Method*	*Ground Surface (GS) Elev.*
City of Shelton	Excavator	Grab	NA
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*	*Top of Casing Elev.*	*Depth to Water (Below GS)*
Daniel	Trackhoe	2/14/2020	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Description	Depth (ft)
			Grab	TP-02-021420*	PID= 0.0 Sheen= No Sheen	**FILL** Moist, brown Topsoil; with roots and chunks of asphalt; no landfill waste present, no odor	
						Moist, brown, slightly silty SAND (SW-SM); coarse to medium sand, coarse, subrounded gravel; no landfill waste present, no odor	
1							1
2							2
3		Excavation backfilled with spoils					3
4							4
5			Grab	TP-02-021420*	PID= 0.0 Sheen= No Sheen		5
						Very moist, black, slightly silty SAND (SW-SM); coarse to medium sand, ceramic fragments present; no landfill waste present, no odor	
6			Grab	TP-02-021420*	PID= 0.0 Sheen= No Sheen		6
						LANDFILL WASTE Moist to very moist, black, gravelly, silty SAND (SM); medium to coarse sand, fine to coarse gravel; abundant wood fragments, glass, and brick fragments, organic-like odor	
7						*Composite sample TP-02-021420 consists of equal amounts of soil collected from the indicated depths. Bottom of exploration at 6.5 ft. bgs.	7

Legend

Sample Method: Grab sample

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: BBC
Approved by: ALC 5/21/2020

Exploration Log TP-02

Sheet 1 of 1

Aspect CONSULTING

Shelton C Street Landfill - 150074		Environmental Exploration Log	
Project Address & Site Specific Location Shelton, WA, Between SG-3 and SG-4		*Coordinates (Lat,Lon WGS84)* 47.214, -123.133 (est)	*Exploration Number* **TP-03**

Contractor	*Equipment*	*Sampling Method*	*Ground Surface (GS) Elev.*	
City of Shelton	Excavator	Grab	NA	
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*	*Top of Casing Elev.*	*Depth to Water (Below GS)*
Daniel	Trackhoe	2/14/2020	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							FILL Moist, brown Topsoil; with roots, no landfill waste present, no odor	
			Grab	TP-03-021420*	PID= 0.0 Sheen= No Sheen		Moist, brown, slightly silty SAND (SW-SM); coarse to medium sand, coarse, subrounded gravel; brick and ceramic fragments present, no landfill waste present, no odor	
1			Grab	TP-03-021420* TP-03-1.0	PID= 0.0 Sheen= No Sheen			1
2		Excavation backfilled with spoils	Grab	TP-03-021420*	PID= 0.0 Sheen= No Sheen		**LANDFILL WASTE** Moist to very moist, black, gravelly, silty SAND (SM); medium to coarse sand, fine to coarse gravel; abundant wood fragments, glass, and brick fragments, organic-like odor	2
3								3
4								4

*Composite sample TP-03-021420 consists of equal amounts of soil collected from the indicated depths.
Bottom of exploration at 4.3 ft. bgs.

Legend

Sample Method: Grab sample

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: BBC
Approved by: ALC 5/21/2020

Exploration Log TP-03

Sheet 1 of 1

Aspect CONSULTING	Shelton C Street Landfill - 150074		Environmental Exploration Log	
	Project Address & Site Specific Location		*Coordinates (Lat,Lon WGS84)*	*Exploration Number*
	Shelton, WA, NE of AMW-4		47.214, -123.134 (est)	**TP-04**
Contractor	*Equipment*	*Sampling Method*	*Ground Surface (GS) Elev.*	
City of Shelton	Excavator	Grab	NA	
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*	*Top of Casing Elev.*	*Depth to Water (Below GS)*
Daniel	Trackhoe	2/14/2020	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Analytical Sample Number & Lab Test(s)	Field Tests	Material Type	Description	Depth (ft)
							FILL Moist, brown Topsoil; with roots, no landfill waste present, no odor	
							Moist, brown, slightly silty SAND (SW-SM); coarse to medium sand, fine to coarse, subrounded gravel; chunks of ashpalt, woody debris, some cobbles, no landfill waste present, no odor	
1			Grab	TP-04-021420*	PID= 0.0 Sheen= No Sheen			1
2			Grab	TP-04-021420*	PID= 0.0 Sheen= No Sheen			2
		Excavation backfilled with spoils						
3								3
			Grab	TP-04-021420*	PID= 0.0 Sheen= No Sheen			
4							**LANDFILL WASTE** Moist to very moist, black, gravelly, silty SAND (SM); medium to coarse sand, fine to coarse gravel; abundant wood fragments, glass, and brick fragments, organic-like odor	4
5								5
							*Composite sample TP-04-021420 consists of equal amounts of soil collected from the indicated depths. Bottom of exploration at 5 ft. bgs.	

Legend

Sample Method: Grab sample

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: BBC
Approved by: ALC 5/21/2020

Exploration Log TP-04

Sheet 1 of 1

OLD STANDARD EXPLORATION LOG TEMPLATE \\BISERVER1.ASPECT.LOCAL\PROJECTS\GINTW\PROJECTS\SHELTON C STREET LANDFILL - 150074.GPJ May 21, 2020

APPENDIX C

Laboratory Reports

Soil Results

August 15, 2017

Mr. Michael Erdahl
Friedman and Bruya, Inc.
3012 16th Ave. W
Seattle, WA 98119

Dear Mr. Erdahl,

The following results are associated with Frontier Analytical Laboratory project **10830**. This corresponds to your project number **707388** and purchase order number **F-27**. Three soil samples were received at Frontier Analytical Laboratory on 8/2/2017. These samples were extracted and analyzed by EPA Method 8290 for tetra through octa chlorinated dibenzo dioxins and furans. The Toxic Equivalency (TEQ) for your samples have been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Freidman and Bruya, Inc. requested a turnaround time of fifteen business days for project **10830**.

Please note that due to high concentrations of hexa dioxin, hepta dioxins, octa dioxin and hexa furans, the extract from sample 10830-003-SA (Friedman and Bruya, Inc. Sample ID: ISM-DU1-072617) was diluted and reanalyzed. The results taken from the analysis of the diluted extracts have been identified with a "*" qualifier on the corresponding sample data sheet.

The following report consists of an Analytical Data section and a Sample Receipt section. The Analytical Data section contains our sample tracking log and the analytical results. The Sample Receipt section contains your chain of custody, our sample login form and a sample photo. The enclosed results and electronic data deliverable (EDD) are specifically for the samples referenced in this report only. These results meet all NELAP requirements and shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP certificate number is **4041**, our State of California ELAP certificate number is **2934** and our State of Washington certificate number is **C844**. This report along with the associated electronic data deliverable (EDD) has been emailed to you as a portable document format (PDF) file. A hardcopy will not be sent to you unless specifically requested.

If you have any questions regarding project **10830**, please feel free to contact me at (916) 934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,

Thomas C. Crabtree

Thomas C. Crabtree
Director

FRONTIER
ANALYTICAL LABORATORY

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: **10830**

Received on: **08/02/2017** Project Due: **08/24/2017** Storage: **R2**

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
10830-001-SA	2	707388	ISM-DU3-072517	EPA 8290 D/F	Soil	07/25/2017	02:07 pm	08/24/2017
10830-002-SA	2	707388	ISM-DU2-072617	EPA 8290 D/F	Soil	07/26/2017	12:32 pm	08/25/2017
10830-003-SA	2	707388	ISM-DU1-072617	EPA 8290 D/F	Soil	07/26/2017	03:00 pm	08/25/2017

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com

EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 10830-001-MB	Date Extracted: 08-07-2017	ICal: pcddfal3-5-3-17-7pt	Acquired: 08-10-2017
Client ID: Method Blank	Date Received: NA	GC Column: DB5MS	2005 WHO TEQ: 0.0
Matrix: Soil	Amount: 5.00 g	Units: pg/g	Basis: Dry Weight
Batch No: X4198			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.137		-	0.0315				
1,2,3,7,8-PeCDD	ND	0.284		-	0.0468				
1,2,3,4,7,8-HxCDD	ND	0.425		-	0.0503				
1,2,3,6,7,8-HxCDD	ND	0.436		-	0.0490	Total TCDD	ND	0.137	
1,2,3,7,8,9-HxCDD	ND	0.403		-	0.0488	Total PeCDD	ND	0.284	
1,2,3,4,6,7,8-HpCDD	ND	0.652		-	0.0541	Total HxCDD	ND	0.436	
OCDD	ND	1.22		-	0.0888	Total HpCDD	ND	0.652	
2,3,7,8-TCDF	ND	0.188		-	0.0243				
1,2,3,7,8-PeCDF	ND	0.290		-	0.0285				
2,3,4,7,8-PeCDF	ND	0.328		-	0.0298				
1,2,3,4,7,8-HxCDF	ND	0.279		-	0.0255				
1,2,3,6,7,8-HxCDF	ND	0.283		-	0.0253				
2,3,4,6,7,8-HxCDF	ND	0.295		-	0.0279				
1,2,3,7,8,9-HxCDF	ND	0.365		-	0.0367	Total TCDF	ND	0.188	
1,2,3,4,6,7,8-HpCDF	ND	0.408		-	0.0321	Total PeCDF	ND	0.328	
1,2,3,4,7,8,9-HpCDF	ND	0.528		-	0.0396	Total HxCDF	ND	0.365	
OCDF	ND	0.626		-	0.0843	Total HpCDF	ND	0.528	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	90.7	40.0 - 135	
13C-1,2,3,7,8-PeCDD	84.9	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	93.5	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	96.3	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	92.2	40.0 - 135	
13C-OCDD	85.5	40.0 - 135	
13C-2,3,7,8-TCDF	92.0	40.0 - 135	
13C-1,2,3,7,8-PeCDF	81.0	40.0 - 135	
13C-2,3,4,7,8-PeCDF	78.1	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	94.2	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	96.5	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	94.1	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	96.6	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	93.0	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	97.4	40.0 - 135	
13C-OCDF	86.8	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	94.7	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________

Date: 8/14/2017

Reviewed By: ____________

Date: 8/14/2017

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 10830-001-OPR
Client ID: OPR
Matrix: Soil
Batch No: X4198

Date Extracted: 08-07-2017
Date Received: NA
Amount: 5.00 g

ICal: pcddfal3-5-3-17-7pt
GC Column: DB5MS
Units: ng/ml

Acquired: 08-10-2017
2005 WHO TEQ: NA

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	10.7	7.00 - 13.0	
1,2,3,7,8-PeCDD	50.5	35.0 - 65.0	
1,2,3,4,7,8-HxCDD	50.8	35.0 - 65.0	
1,2,3,6,7,8-HxCDD	51.3	35.0 - 65.0	
1,2,3,7,8,9-HxCDD	50.0	35.0 - 65.0	
1,2,3,4,6,7,8-HpCDD	52.6	35.0 - 65.0	
OCDD	108	70.0 - 130	
2,3,7,8-TCDF	10.8	7.00 - 13.0	
1,2,3,7,8-PeCDF	52.4	35.0 - 65.0	
2,3,4,7,8-PeCDF	53.4	35.0 - 65.0	
1,2,3,4,7,8-HxCDF	51.7	35.0 - 65.0	
1,2,3,6,7,8-HxCDF	54.2	35.0 - 65.0	
2,3,4,6,7,8-HxCDF	51.8	35.0 - 65.0	
1,2,3,7,8,9-HxCDF	52.6	35.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	52.7	35.0 - 65.0	
1,2,3,4,7,8,9-HpCDF	53.0	35.0 - 65.0	
OCDF	109	70.0 - 130	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	95.9	40.0 - 135	
13C-1,2,3,7,8-PeCDD	88.3	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	96.1	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	99.7	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	92.8	40.0 - 135	
13C-OCDD	87.2	40.0 - 135	
13C-2,3,7,8-TCDF	96.2	40.0 - 135	
13C-1,2,3,7,8-PeCDF	84.1	40.0 - 135	
13C-2,3,4,7,8-PeCDF	81.4	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	99.7	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	98.9	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	98.5	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	100	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	94.4	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	99.8	40.0 - 135	
13C-OCDF	89.9	40.0 - 135	

Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	103	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________________

Date: 8/14/2017

Reviewed By: ____________________

Date: 8/14/2017

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 10830-001-SA	Date Extracted: 08-07-2017	ICal: pcddfal3-5-3-17-7pt	Acquired: 08-10-2017
Client ID: ISM-DU3-072517	Date Received: 08-02-2017	GC Column: DB5MS	2005 WHO TEQ: 2040
Matrix: Soil	Amount: 5.03 g	Units: pg/g	Basis: Dry Weight
Batch No: X4198	% Solids: 95.00		

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	144	-		144	0.0315				
1,2,3,7,8-PeCDD	724	-		724	0.0468				
1,2,3,4,7,8-HxCDD	1480	-		148	0.0503				
1,2,3,6,7,8-HxCDD	2920	-		292	0.0490	Total TCDD	104000	-	
1,2,3,7,8,9-HxCDD	2260	-		226	0.0488	Total PeCDD	121000	-	
1,2,3,4,6,7,8-HpCDD	22000	-		220	0.0541	Total HxCDD	142000	-	
OCDD	30200	-		9.06	0.0888	Total HpCDD	36300	-	
2,3,7,8-TCDF	399	-	F	39.9	0.0243				
1,2,3,7,8-PeCDF	345	-		10.4	0.0285				
2,3,4,7,8-PeCDF	371	-		111	0.0298				
1,2,3,4,7,8-HxCDF	257	-	D,M	25.7	0.0255				
1,2,3,6,7,8-HxCDF	330	-	D,M	33.0	0.0253				
2,3,4,6,7,8-HxCDF	389	-		38.9	0.0279				
1,2,3,7,8,9-HxCDF	114	-		11.4	0.0367	Total TCDF	9020	-	D,M
1,2,3,4,6,7,8-HpCDF	721	-		7.21	0.0321	Total PeCDF	5970	-	D,M
1,2,3,4,7,8,9-HpCDF	141	-		1.41	0.0396	Total HxCDF	3310	-	D,M
OCDF	1510	-		0.453	0.0843	Total HpCDF	1970	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	93.2	40.0 - 135	
13C-1,2,3,7,8-PeCDD	89.9	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	97.3	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	98.3	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	113	40.0 - 135	
13C-OCDD	114	40.0 - 135	
13C-2,3,7,8-TCDF	103	40.0 - 135	
13C-1,2,3,7,8-PeCDF	101	40.0 - 135	
13C-2,3,4,7,8-PeCDF	86.7	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	104	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	103	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	93.4	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	97.7	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	94.6	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	104	40.0 - 135	
13C-OCDF	101	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	94.7	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________

Date: 8/14/2017

Reviewed By: ____________

Date: 8/14/2017

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 10830-002-SA	Date Extracted: 08-07-2017	ICal: pcddfal3-5-3-17-7pt	Acquired: 08-10-2017
Client ID: ISM-DU2-072617	Date Received: 08-02-2017	GC Column: DB5MS	2005 WHO TEQ: 3100
Matrix: Soil	Amount: 5.04 g	Units: pg/g	Basis: Dry Weight
Batch No: X4198	% Solids: 92.45		

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	234	-		234	0.0315				
1,2,3,7,8-PeCDD	1100	-		1100	0.0468				
1,2,3,4,7,8-HxCDD	2180	-		218	0.0503				
1,2,3,6,7,8-HxCDD	4210	-		421	0.0490	Total TCDD	152000	-	
1,2,3,7,8,9-HxCDD	3370	-		337	0.0488	Total PeCDD	181000	-	
1,2,3,4,6,7,8-HpCDD	31200	-		312	0.0541	Total HxCDD	203000	-	
OCDD	21900	-		6.57	0.0888	Total HpCDD	51200	-	
2,3,7,8-TCDF	702	-	F	70.2	0.0243				
1,2,3,7,8-PeCDF	580	-		17.4	0.0285				
2,3,4,7,8-PeCDF	730	-		219	0.0298				
1,2,3,4,7,8-HxCDF	347	-	D,M	34.7	0.0255				
1,2,3,6,7,8-HxCDF	495	-	D,M	49.5	0.0253				
2,3,4,6,7,8-HxCDF	576	-		57.6	0.0279				
1,2,3,7,8,9-HxCDF	173	-		17.3	0.0367	Total TCDF	15800	-	D,M
1,2,3,4,6,7,8-HpCDF	780	-		7.80	0.0321	Total PeCDF	9710	-	D,M
1,2,3,4,7,8,9-HpCDF	176	-		1.76	0.0396	Total HxCDF	4690	-	D,M
OCDF	404	-		0.121	0.0843	Total HpCDF	1590	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	90.3	40.0 - 135	
13C-1,2,3,7,8-PeCDD	87.0	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	92.9	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	95.8	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	109	40.0 - 135	
13C-OCDD	101	40.0 - 135	
13C-2,3,7,8-TCDF	95.5	40.0 - 135	
13C-1,2,3,7,8-PeCDF	97.1	40.0 - 135	
13C-2,3,4,7,8-PeCDF	85.7	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	102	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	98.2	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	89.4	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	94.8	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	91.0	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	100	40.0 - 135	
13C-OCDF	93.4	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	91.8	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
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F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ________ Reviewed By: ________

Date: 8/14/2017 Date: 8/14/2017

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 10830-003-SA	Date Extracted: 08-07-2017	ICal: pcddfal3-5-3-17-7pt	Acquired: 08-10-2017
Client ID: ISM-DU1-072617	Date Received: 08-02-2017	GC Column: DB5MS	2005 WHO TEQ: 14700
Matrix: Soil	Amount: 5.02 g	Units: pg/g	Basis: Dry Weight
Batch No: X4198	% Solids: 86.87		

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	828	-		828	0.0315				
1,2,3,7,8-PeCDD	5170	-		5170	0.0468				
1,2,3,4,7,8-HxCDD	9860	-		986	0.0503				
1,2,3,6,7,8-HxCDD	20800	-		2080	0.0490	Total TCDD	459000	-	
1,2,3,7,8,9-HxCDD	16600	-		1660	0.0488	Total PeCDD	669000	-	
1,2,3,4,6,7,8-HpCDD	145000	-	*	1450	0.0541	Total HxCDD	902000	-	*
OCDD	104000	-	*	31.2	0.0888	Total HpCDD	238000	-	*
2,3,7,8-TCDF	2980	-	F	298	0.0243				
1,2,3,7,8-PeCDF	2440	-		73.2	0.0285				
2,3,4,7,8-PeCDF	4390	-		1320	0.0298				
1,2,3,4,7,8-HxCDF	1670	-	*	167	0.0255				
1,2,3,6,7,8-HxCDF	2130	-	D,M,*	213	0.0253				
2,3,4,6,7,8-HxCDF	3040	-	*	304	0.0279				
1,2,3,7,8,9-HxCDF	934	-	*	93.4	0.0367	Total TCDF	66500	-	D,M
1,2,3,4,6,7,8-HpCDF	4240	-		42.4	0.0321	Total PeCDF	45200	-	D,M
1,2,3,4,7,8,9-HpCDF	1030	-		10.3	0.0396	Total HxCDF	22300	-	D,M,*
OCDF	1460	-		0.438	0.0843	Total HpCDF	8300	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	95.2	40.0 - 135	
13C-1,2,3,7,8-PeCDD	92.4	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	97.3	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	90.5	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	114	40.0 - 135	*
13C-OCDD	109	40.0 - 135	*
13C-2,3,7,8-TCDF	99.8	40.0 - 135	
13C-1,2,3,7,8-PeCDF	102	40.0 - 135	
13C-2,3,4,7,8-PeCDF	90.3	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	110	40.0 - 135	*
13C-1,2,3,6,7,8-HxCDF	116	40.0 - 135	*
13C-2,3,4,6,7,8-HxCDF	91.4	40.0 - 135	*
13C-1,2,3,7,8,9-HxCDF	94.1	40.0 - 135	*
13C-1,2,3,4,6,7,8-HpCDF	94.0	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	98.1	40.0 - 135	
13C-OCDF	98.1	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	99.8	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
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F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: [signature]

Date: 8/14/2017

Reviewed By: [signature]

Date: 8/14/2017

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SUBCONTRACT SAMPLE CHAIN OF CUSTODY

10830
00C

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER	Frontier
PROJECT NAME/NO. 707388	PO # F-27
REMARKS Please Email Results	

Page # 1 of 1

TURNAROUND TIME
☒ Standard (2 Weeks) 21-TAT
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M	Chlorinated Pesticides	Chlorinated Herbicides	Dioxins/Furans	Notes
ISM-DU3-072517	3	7/25/17	1407	Soil	3										X	10g in each VOA Vial.
ISM-DU2-072617	3	7/26/17	1232	↓	3										X	
ISM-DU1-072617	.	↓	1500	↓	3										X	

Michael to Kathy - EPA Method 8290 D/F 15-TAT. KZ.

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Michael Erdahl	Friedman and Bruya	8/1/17	Noon
Received by: Kathy Zipp	Kathy Zipp	Frontier Analytical	8/2/17	930
Relinquished by:				
Received by:				

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: **10830**

Client:	Friedman & Bruya, Inc.
Client Project ID:	707388
Date Received:	08/02/2017
Time Received:	09:30 am
Received By:	KZ
Logged In By:	KZ
# of Samples Received:	3
Duplicates:	6
Storage Location:	R2

Method of Delivery:	Fed-Ex
Tracking Number:	809992619396
Shipping Container Received Intact	Yes
Custody seals(s) present?	Yes
Custody seals(s) intact?	Yes
Sample Arrival Temperature (C)	0
Cooling Method	Blue Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	Yes
Test aqueous sample for residual Chlorine	No
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	No
pH Range of Aqueous Sample	N/A

Anomalies or additional comments:

Please note that the samples were received in clear glass jars. NELAP requires samples be received in amber glass bottles or jars. Although this anomaly will not affect your results, we are required by NELAP to make a note of it. We will proceed with analysis unless directed otherwise by you.

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com


Will call with instructions
ANALYSES REQUESTED
Sample ID
Lab ID
Date Sampled
Time Sampled
Matrix
# of jars
Dioxins/Furans
EPH
VPH
Nitrate
Sulfate
Alkalinity
TOC-9060M
ISM-DU3-072517
ISM-DU2-072617
ISM-DU1-072617
7/25/17
7/26/17
1407
1232
1500
Soil
3
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044
COMPANY
DATE
TIME
Friedman and Bruya
Frontier Analytical
707388
Frontier Analytical Laboratory
10830-002-SA
Client ID:ISM-DU2-072617
10830-003-
Client ID:ISM-DU1-072617
Storage: R2
ISM-DU3-072517
2017/08/02

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

September 8, 2017

Ali Cochrance, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Ms Cochrane:

Included are the additional results from the testing of material submitted on July 27, 2017 from the Shelton C Street Landfill, PO 150074, F&BI 707388 project. There are 9 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Carla Brock
ASP0908R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 27, 2017 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Shelton C Street Landfill, PO 150074, F&BI 707388 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
707388 -01	ISM-DU3-072517
707388 -02	ISM-DU2-072617
707388 -03	ISM-DU1-072617
707388 -04	DU3-P7-072617
707388 -05	DU3-P3-072617
707388 -06	DU2-L2-072617
707388 -07	DU2-L7-072617
707388 -08	DU2-G7-072617
707388 -09	DU2-G2-072617
707388 -10	DU1-C2-072617
707388 -11	Trip Blank

Several compounds in the 6020A matrix spike exceeded the acceptance criteria. The laboratory control sample met the acceptance criteria, therefore the results were likely due to matrix effect.

All other quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 6020A

Client ID:	ISM-DU3-072517	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/29/17	Lab ID:	707388-01
Date Analyzed:	08/30/17	Data File:	707388-01 rr.045
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.40
Barium	162
Cadmium	1.70
Chromium	25.5
Copper	80.6
Lead	172 ve
Mercury	0.812
Nickel	24.3
Selenium	0.540
Silver	3.62
Zinc	355

Analysis For Total Metals By EPA Method 6020A

Client ID:	ISM-DU3-072517	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/29/17	Lab ID:	707388-01 x2
Date Analyzed:	08/30/17	Data File:	707388-01 x2.043
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	182

Analysis For Total Metals By EPA Method 6020A

Client ID:	ISM-DU2-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/29/17	Lab ID:	707388-02
Date Analyzed:	08/30/17	Data File:	707388-02 rr.046
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	1.26
Barium	66.0
Cadmium	0.660
Chromium	14.5
Copper	36.7
Lead	69.6
Mercury	0.938
Nickel	11.5
Selenium	<0.5
Silver	1.65
Zinc	81.9

Analysis For Total Metals By EPA Method 6020A

Client ID:	ISM-DU1-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/29/17	Lab ID:	707388-03
Date Analyzed:	08/30/17	Data File:	707388-03 rr.047
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	4.40
Barium	129
Cadmium	1.54
Chromium	21.4
Copper	69.5
Lead	164 ve
Mercury	1.15
Nickel	13.2
Selenium	0.790
Silver	6.55
Zinc	134

Analysis For Total Metals By EPA Method 6020A

Client ID:	ISM-DU1-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/29/17	Lab ID:	707388-03 x2
Date Analyzed:	08/30/17	Data File:	707388-03 x2.044
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Lead	182

Analysis For Total Metals By EPA Method 6020A

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/29/17	Lab ID:	I7-461 mb 1/0.2
Date Analyzed:	08/29/17	Data File:	I7-461 mb 1/0.2.061
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<0.2
Barium	<0.2
Cadmium	<0.2
Chromium	<0.5
Copper	<0.2
Lead	<0.2
Mercury	<0.2
Nickel	<0.2
Selenium	<0.5
Silver	<0.2
Zinc	<1

Date of Report: 09/08/17
Date Received: 07/27/17
Project: Shelton C Street Landfill, PO 150074, F&BI 707388

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL METALS USING EPA METHOD 6020A

Laboratory Code: 708425-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	0.340	83	87	75-125	5
Barium	mg/kg (ppm)	50	6.83	86	92	75-125	7
Cadmium	mg/kg (ppm)	10	<0.2	87	93	75-125	7
Chromium	mg/kg (ppm)	50	11.4	69 vo	77	75-125	11
Copper	mg/kg (ppm)	50	6.15	74 vo	79	75-125	7
Lead	mg/kg (ppm)	50	0.959	80	87	75-125	8
Mercury	mg/kg (ppm	5	<0.2	79	91	75-125	14
Nickel	mg/kg (ppm)	25	19.6	69 vo	79	75-125	14
Selenium	mg/kg (ppm)	5	<0.5	88	92	75-125	4
Silver	mg/kg (ppm)	10	<0.2	78	82	75-125	5
Zinc	mg/kg (ppm)	50	13.1	71 vo	78	75-125	9

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	96	80-120
Barium	mg/kg (ppm)	50	106	80-120
Cadmium	mg/kg (ppm)	10	102	80-120
Chromium	mg/kg (ppm)	50	97	80-120
Copper	mg/kg (ppm)	50	102	80-120
Lead	mg/kg (ppm)	50	99	80-120
Mercury	mg/kg (ppm)	5	97	80-120
Nickel	mg/kg (ppm)	25	104	80-120
Selenium	mg/kg (ppm)	5	101	80-120
Silver	mg/kg (ppm)	10	95	80-120
Zinc	mg/kg (ppm)	50	99	80-120

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 707388
Work Order Number: 1708018

August 15, 2017

Attention Michael Erdahl:

Fremont Analytical, Inc. received 3 sample(s) on 8/1/2017 for the analyses presented in the following report.

Herbicides by EPA Method 8151A
Organochlorine Pesticides by EPA Method 8081

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

DoD/ELAP Certification #L17-135, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

Date: *08/15/2017*

CLIENT:	Friedman & Bruya
Project:	707388
Work Order:	1708018

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1708018-001	ISM-DU3-072517	07/25/2017 2:07 PM	08/01/2017 12:19 PM
1708018-002	ISM-DU2-072617	07/26/2017 12:32 PM	08/01/2017 12:19 PM
1708018-003	ISM-DU1-072617	07/26/2017 3:00 PM	08/01/2017 12:19 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Fremont Analytical

Case Narrative

WO#: **1708018**

Date: **8/15/2017**

CLIENT: Friedman & Bruya

Project: 707388

WorkOrder Narrative:
I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Client provided percent moisture for dry-weight correction.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **1708018**
Date Reported: **8/15/2017**

Client: Friedman & Bruya
Project: 707388
Lab ID: 1708018-001
Client Sample ID: ISM-DU3-072517
Collection Date: 7/25/2017 2:07:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Organochlorine Pesticides by EPA Method 8081				Batch ID: 17824		Analyst: SG
Toxaphene	ND	0.104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Alpha BHC	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Beta BHC	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Gamma BHC (Lindane)	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Delta BHC	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Heptachlor	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Aldrin	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Heptachlor epoxide	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
gamma-Chlordane	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Endosulfan I	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
alpha-Chlordane	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Dieldrin	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
4,4´-DDE	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Endrin	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Endosulfan II	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
4,4´-DDD	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Endrin aldehyde	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Endosulfan sulfate	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
4,4´-DDT	0.0166	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Endrin ketone	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Methoxychlor	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Surr: Decachlorobiphenyl	127	17.8 - 157		%Rec	1	8/7/2017 7:04:35 PM
Surr: Tetrachloro-m-xylene	125	11 - 150		%Rec	1	8/7/2017 7:04:35 PM
Herbicides by EPA Method 8151A				Batch ID: 17825		Analyst: BT
Dicamba	ND	36.4		µg/Kg-dry	1	8/10/2017 2:54:45 AM
2,4-D	ND	31.2		µg/Kg-dry	1	8/10/2017 2:54:45 AM
2,4-DP	ND	26.0		µg/Kg-dry	1	8/10/2017 2:54:45 AM
2,4,5-TP (Silvex)	ND	20.8		µg/Kg-dry	1	8/10/2017 2:54:45 AM
2,4,5-T	ND	52.0		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Dinoseb	ND	31.2		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Dalapon	ND	208		µg/Kg-dry	1	8/10/2017 2:54:45 AM
2,4-DB	ND	26.0		µg/Kg-dry	1	8/10/2017 2:54:45 AM
MCPP	ND	4,580		µg/Kg-dry	1	8/10/2017 2:54:45 AM
MCPA	ND	2,910		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Picloram	ND	52.0		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Bentazon	ND	36.4		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Chloramben	ND	20.8		µg/Kg-dry	1	8/10/2017 2:54:45 AM

Analytical Report

Work Order: **1708018**
Date Reported: **8/15/2017**

Client: Friedman & Bruya
Project: 707388
Lab ID: 1708018-001
Client Sample ID: **ISM-DU3-072517**

Collection Date: 7/25/2017 2:07:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 17825		Analyst: BT
Acifluorfen	ND	83.3		µg/Kg-dry	1	8/10/2017 2:54:45 AM
3,5-Dichlorobenzoic acid	ND	41.6		µg/Kg-dry	1	8/10/2017 2:54:45 AM
4-Nitrophenol	ND	31.2		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Dacthal (DCPA)	ND	31.2		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Surr: 2,4-Dichlorophenylacetic acid	44.6	20.1 - 168		%Rec	1	8/10/2017 2:54:45 AM

Analytical Report

Work Order: **1708018**
Date Reported: **8/15/2017**

Client: Friedman & Bruya
Collection Date: 7/26/2017 12:32:00 PM
Project: 707388
Lab ID: 1708018-002
Matrix: Soil
Client Sample ID: ISM-DU2-072617

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Organochlorine Pesticides by EPA Method 8081				Batch ID: 17824		Analyst: SG
Toxaphene	ND	0.107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Alpha BHC	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Beta BHC	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Gamma BHC (Lindane)	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Delta BHC	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Heptachlor	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Aldrin	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Heptachlor epoxide	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
gamma-Chlordane	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Endosulfan I	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
alpha-Chlordane	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Dieldrin	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
4,4´-DDE	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Endrin	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Endosulfan II	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
4,4´-DDD	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Endrin aldehyde	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Endosulfan sulfate	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
4,4´-DDT	0.0130	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Endrin ketone	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Methoxychlor	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Surr: Decachlorobiphenyl	143	17.8 - 157		%Rec	1	8/7/2017 7:14:34 PM
Surr: Tetrachloro-m-xylene	130	11 - 150		%Rec	1	8/7/2017 7:14:34 PM
Herbicides by EPA Method 8151A				Batch ID: 17825		Analyst: BT
Dicamba	ND	37.2		µg/Kg-dry	1	8/10/2017 3:15:56 AM
2,4-D	ND	31.9		µg/Kg-dry	1	8/10/2017 3:15:56 AM
2,4-DP	ND	26.6		µg/Kg-dry	1	8/10/2017 3:15:56 AM
2,4,5-TP (Silvex)	ND	21.3		µg/Kg-dry	1	8/10/2017 3:15:56 AM
2,4,5-T	ND	53.1		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Dinoseb	ND	31.9		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Dalapon	ND	213		µg/Kg-dry	1	8/10/2017 3:15:56 AM
2,4-DB	ND	26.6		µg/Kg-dry	1	8/10/2017 3:15:56 AM
MCPP	ND	4,680		µg/Kg-dry	1	8/10/2017 3:15:56 AM
MCPA	ND	2,980		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Picloram	ND	53.1		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Bentazon	ND	37.2		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Chloramben	ND	21.3		µg/Kg-dry	1	8/10/2017 3:15:56 AM

Analytical Report

Work Order: **1708018**
Date Reported: **8/15/2017**

Client: Friedman & Bruya
Project: 707388
Lab ID: 1708018-002
Client Sample ID: **ISM-DU2-072617**

Collection Date: 7/26/2017 12:32:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 17825		Analyst: BT
Acifluorfen	ND	85.0		µg/Kg-dry	1	8/10/2017 3:15:56 AM
3,5-Dichlorobenzoic acid	ND	42.5		µg/Kg-dry	1	8/10/2017 3:15:56 AM
4-Nitrophenol	ND	31.9		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Dacthal (DCPA)	ND	31.9		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Surr: 2,4-Dichlorophenylacetic acid	51.3	20.1 - 168		%Rec	1	8/10/2017 3:15:56 AM

Original

Analytical Report

Fremont Analytical

Work Order: **1708018**
Date Reported: **8/15/2017**

Client: Friedman & Bruya
Project: 707388
Lab ID: 1708018-003
Client Sample ID: **ISM-DU1-072617**

Collection Date: 7/26/2017 3:00:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Organochlorine Pesticides by EPA Method 8081				Batch ID: 17824		Analyst: SG
Toxaphene	ND	0.111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Alpha BHC	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Beta BHC	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Gamma BHC (Lindane)	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Delta BHC	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Heptachlor	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Aldrin	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Heptachlor epoxide	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
gamma-Chlordane	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Endosulfan I	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
alpha-Chlordane	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Dieldrin	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
4,4´-DDE	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Endrin	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Endosulfan II	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
4,4´-DDD	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Endrin aldehyde	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Endosulfan sulfate	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
4,4´-DDT	0.0163	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Endrin ketone	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Methoxychlor	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Surr: Decachlorobiphenyl	8.48	17.8 - 157	S	%Rec	1	8/7/2017 7:24:35 PM
Surr: Tetrachloro-m-xylene	13.8	11 - 150		%Rec	1	8/7/2017 7:24:35 PM

NOTES:
S - Outlying surrogate recovery(ies) observed. All other laboratory and field samples recovered within range.

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 17825		Analyst: BT
Dicamba	ND	39.2		µg/Kg-dry	1	8/10/2017 3:37:12 AM
2,4-D	ND	33.6		µg/Kg-dry	1	8/10/2017 3:37:12 AM
2,4-DP	ND	28.0		µg/Kg-dry	1	8/10/2017 3:37:12 AM
2,4,5-TP (Silvex)	ND	22.4		µg/Kg-dry	1	8/10/2017 3:37:12 AM
2,4,5-T	ND	56.0		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Dinoseb	ND	33.6		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Dalapon	ND	224		µg/Kg-dry	1	8/10/2017 3:37:12 AM
2,4-DB	ND	28.0		µg/Kg-dry	1	8/10/2017 3:37:12 AM
MCPP	ND	4,930		µg/Kg-dry	1	8/10/2017 3:37:12 AM
MCPA	ND	3,140		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Picloram	ND	56.0		µg/Kg-dry	1	8/10/2017 3:37:12 AM

Client: Friedman & Bruya
Collection Date: 7/26/2017 3:00:00 PM
Project: 707388
Lab ID: 1708018-003
Matrix: Soil
Client Sample ID: **ISM-DU1-072617**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 17825		Analyst: BT
Bentazon	ND	39.2		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Chloramben	ND	22.4		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Acifluorfen	ND	89.6		µg/Kg-dry	1	8/10/2017 3:37:12 AM
3,5-Dichlorobenzoic acid	ND	44.8		µg/Kg-dry	1	8/10/2017 3:37:12 AM
4-Nitrophenol	ND	33.6		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Dacthal (DCPA)	ND	33.6		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Surr: 2,4-Dichlorophenylacetic acid	56.8	20.1 - 168		%Rec	1	8/10/2017 3:37:12 AM

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID **MB-17825**	SampType: **MBLK**			Units: **µg/Kg**		Prep Date: **8/4/2017**		RunNo: **37948**			
Client ID: **MBLKS**	Batch ID: **17825**					Analysis Date: **8/9/2017**		SeqNo: **729321**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	ND	35.0									
2,4-D	ND	30.0									
2,4-DP	ND	25.0									
2,4,5-TP (Silvex)	ND	20.0									
2,4,5-T	ND	50.0									
Dinoseb	ND	30.0									
Dalapon	ND	200									
2,4-DB	ND	25.0									
MCPP	ND	4,400									
MCPA	ND	2,800									
Picloram	ND	50.0									
Bentazon	ND	35.0									
Chloramben	ND	20.0									
Acifluorfen	ND	80.0									
3,5-Dichlorobenzoic acid	ND	40.0									
4-Nitrophenol	ND	30.0									
Dacthal (DCPA)	ND	30.0									
Surr: 2,4-Dichlorophenylacetic acid	716		1,000		71.6	20.1	168				

Sample ID **LCS-17825**	SampType: **LCS**			Units: **µg/Kg**		Prep Date: **8/4/2017**		RunNo: **37948**			
Client ID: **LCSS**	Batch ID: **17825**					Analysis Date: **8/9/2017**		SeqNo: **729322**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	160	35.0	200.0	0	80.2	24.7	141				
2,4-D	179	30.0	200.0	0	89.6	22.4	130				
2,4-DP	166	25.0	200.0	0	83.2	26.4	130				
2,4,5-TP (Silvex)	180	20.0	200.0	0	90.0	21.2	138				
2,4,5-T	165	50.0	200.0	0	82.6	22.8	144				
Dinoseb	140	30.0	200.0	0	69.8	5	165				
Dalapon	930	200	1,000	0	93.0	18.4	162				

Fremont Analytical

Date: *8/15/2017*

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID **LCS-17825** SampType: **LCS** Units: **µg/Kg** Prep Date: **8/4/2017** RunNo: **37948**
Client ID: **LCSS** Batch ID: **17825** Analysis Date: **8/9/2017** SeqNo: **729322**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-DB	190	25.0	200.0	0	94.8	5	164				
MCPP	826	4,400	1,000	0	82.6	22.2	157				
MCPA	883	2,800	1,000	0	88.3	47.4	128				
Picloram	171	50.0	200.0	0	85.7	5	175				
Bentazon	122	35.0	200.0	0	61.0	7.59	162				
Chloramben	64.5	20.0	200.0	0	32.3	5	147				
Acifluorfen	196	80.0	200.0	0	97.9	5	163				
3,5-Dichlorobenzoic acid	160	40.0	200.0	0	79.9	18.7	139				
4-Nitrophenol	146	30.0	200.0	0	73.0	5	163				
Dacthal (DCPA)	120	30.0	200.0	0	60.2	5	164				
Surr: 2,4-Dichlorophenylacetic acid	786		1,000		78.6	20.1	168				

Sample ID **1707301-001ADUP** SampType: **DUP** Units: **µg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37948**
Client ID: **BATCH** Batch ID: **17825** Analysis Date: **8/10/2017** SeqNo: **729336**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	ND	32.6						0		30	
2,4-D	ND	27.9						0		30	
2,4-DP	ND	23.3						0		30	
2,4,5-TP (Silvex)	ND	18.6						0		30	
2,4,5-T	ND	46.5						0		30	
Dinoseb	ND	27.9						0		30	
Dalapon	ND	186						0		30	
2,4-DB	ND	23.3						0		30	
MCPP	ND	4,090						0		30	
MCPA	ND	2,610						0		30	
Picloram	ND	46.5						0		30	
Bentazon	ND	32.6						0		30	
Chloramben	ND	18.6						0		30	
Acifluorfen	ND	74.5						0		30	

Date: *8/15/2017*

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID **1707301-001ADUP** SampType: **DUP** Units: **µg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37948**
Client ID: **BATCH** Batch ID: **17825** Analysis Date: **8/10/2017** SeqNo: **729336**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
3,5-Dichlorobenzoic acid	ND	37.2						0		30	
4-Nitrophenol	ND	27.9						0		30	
Dacthal (DCPA)	ND	27.9						0		30	
Surr: 2,4-Dichlorophenylacetic acid	451		930.7		48.4	20.1	168		0		

Sample ID **1707301-001AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37948**
Client ID: **BATCH** Batch ID: **17825** Analysis Date: **8/10/2017** SeqNo: **729337**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	154	35.7	204.3	0	75.6	31.9	118				
2,4-D	173	30.6	204.3	0	84.8	12.4	134				
2,4-DP	164	25.5	204.3	0	80.2	27.2	129				
2,4,5-TP (Silvex)	178	20.4	204.3	0	87.3	28.6	134				
2,4,5-T	153	51.1	204.3	0	74.7	13.1	147				
Dinoseb	208	30.6	204.3	0	102	10	179				
Dalapon	865	204	1,021	0	84.7	24.9	139				
2,4-DB	191	25.5	204.3	0	93.6	50.2	152				
MCPP	795	4,490	1,021	0	77.8	37.8	140				
MCPA	867	2,860	1,021	0	84.9	13.7	147				
Picloram	309	51.1	204.3	0	151	5	153				
Bentazon	153	35.7	204.3	0	75.1	15	140				
Chloramben	126	20.4	204.3	0	61.6	5	162				
Acifluorfen	251	81.7	204.3	0	123	15	140				
3,5-Dichlorobenzoic acid	157	40.9	204.3	0	77.0	10	164				
4-Nitrophenol	52.9	30.6	204.3	0	25.9	44.8	125				S
Dacthal (DCPA)	133	30.6	204.3	0	64.9	5	132				
Surr: 2,4-Dichlorophenylacetic acid	735		1,021		72.0	20.1	168				

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Fremont Analytical

Date: *8/15/2017*

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID **1707301-001AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37948**
Client ID: **BATCH** Batch ID: **17825** Analysis Date: **8/10/2017** SeqNo: **729338**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	142	34.5	196.9	0	72.1	31.9	118	154.3	8.30	30	
2,4-D	161	29.5	196.9	0	81.6	12.4	134	173.1	7.42	30	
2,4-DP	146	24.6	196.9	0	73.9	27.2	129	163.8	11.8	30	
2,4,5-TP (Silvex)	159	19.7	196.9	0	81.0	28.6	134	178.3	11.1	30	
2,4,5-T	166	49.2	196.9	0	84.5	13.1	147	152.6	8.60	30	
Dinoseb	187	29.5	196.9	0	95.1	10	179	207.6	10.3	30	
Dalapon	875	197	984.5	0	88.9	24.9	139	864.6	1.18	30	
2,4-DB	175	24.6	196.9	0	88.9	50.2	152	191.3	8.80	30	
MCPP	789	4,330	984.5	0	80.1	37.8	140	0		30	
MCPA	867	2,760	984.5	0	88.0	13.7	147	0		30	
Picloram	270	49.2	196.9	0	137	5	153	308.9	13.5	30	
Bentazon	133	34.5	196.9	0	67.5	15	140	153.4	14.4	30	
Chloramben	81.5	19.7	196.9	0	41.4	5	162	125.8	42.7	30	R
Acifluorfen	200	78.8	196.9	0	102	15	140	251.4	22.8	30	
3,5-Dichlorobenzoic acid	146	39.4	196.9	0	74.0	10	164	157.3	7.61	30	
4-Nitrophenol	55.9	29.5	196.9	0	28.4	44.8	125	52.91	5.56	30	S
Dacthal (DCPA)	114	29.5	196.9	0	58.1	5	132	132.5	14.7	30	
Surr: 2,4-Dichlorophenylacetic acid	691		984.5		70.2	20.1	168		0		

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.
R - High RPD observed, spike recovery is within range.

Fremont Analytical

Date: *8/15/2017*

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **TOX CCV A 17824**	SampType: **CCV**			Units: **mg/L**		Prep Date: **8/7/2017**		RunNo: **37836**			
Client ID: **CCV**	Batch ID: **17824**					Analysis Date: **8/7/2017**		SeqNo: **727576**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toxaphene	930	0.100	1,000	0	93.0	80	120				

Sample ID **MB-17824**	SampType: **MBLK**			Units: **mg/Kg**		Prep Date: **8/4/2017**		RunNo: **37836**			
Client ID: **MBLKS**	Batch ID: **17824**					Analysis Date: **8/7/2017**		SeqNo: **727577**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toxaphene	ND	0.100									
Alpha BHC	ND	0.0100									
Beta BHC	ND	0.0100									
Gamma BHC (Lindane)	ND	0.0100									
Delta BHC	ND	0.0100									
Heptachlor	ND	0.0100									
Aldrin	ND	0.0100									
Heptachlor epoxide	ND	0.0100									
gamma-Chlordane	ND	0.0100									
Endosulfan I	ND	0.0100									
alpha-Chlordane	ND	0.0100									
Dieldrin	ND	0.0100									
4,4´-DDE	ND	0.0100									
Endrin	ND	0.0100									
Endosulfan II	ND	0.0100									
4,4´-DDD	ND	0.0100									
Endrin aldehyde	ND	0.0100									
Endosulfan sulfate	ND	0.0100									
4,4´-DDT	ND	0.0100									
Endrin ketone	ND	0.0100									
Methoxychlor	ND	0.0100									
Surr: Decachlorobiphenyl	0.0480		0.05000		95.9	17.8	157				
Surr: Tetrachloro-m-xylene	0.0469		0.05000		93.9	11	150				

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **LCS-17824** | SampType: **LCS** | Units: **mg/Kg** | Prep Date: **8/4/2017** | RunNo: **37836**
Client ID: **LCSS** | Batch ID: **17824** | Analysis Date: **8/7/2017** | SeqNo: **727578**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alpha BHC	0.195	0.0100	0.2000	0	97.7	54.2	139				
Beta BHC	0.183	0.0100	0.2000	0	91.7	56.5	142				
Gamma BHC (Lindane)	0.195	0.0100	0.2000	0	97.5	55.5	142				
Delta BHC	0.193	0.0100	0.2000	0	96.6	47.4	157				
Heptachlor	0.209	0.0100	0.2000	0	105	50.9	153				
Aldrin	0.174	0.0100	0.2000	0	87.0	43.7	147				
Heptachlor epoxide	0.180	0.0100	0.2000	0	90.0	56.2	137				
gamma-Chlordane	0.172	0.0100	0.2000	0	86.1	58.5	136				
Endosulfan I	0.177	0.0100	0.2000	0	88.4	60	132				
alpha-Chlordane	0.173	0.0100	0.2000	0	86.6	46.1	140				
Dieldrin	0.177	0.0100	0.2000	0	88.6	61.2	133				
4,4´-DDE	0.187	0.0100	0.2000	0	93.4	55.4	142				
Endrin	0.181	0.0100	0.2000	0	90.4	56.5	143				
Endosulfan II	0.175	0.0100	0.2000	0	87.7	62	143				
4,4´-DDD	0.177	0.0100	0.2000	0	88.5	53.3	145				
Endrin aldehyde	0.168	0.0100	0.2000	0	83.8	39.5	153				
Endosulfan sulfate	0.181	0.0100	0.2000	0	90.3	53.8	148				
4,4´-DDT	0.208	0.0100	0.2000	0	104	48.2	152				
Endrin ketone	0.189	0.0100	0.2000	0	94.5	28.5	162				
Methoxychlor	0.222	0.0100	0.2000	0	111	34.6	159				
Surr: Decachlorobiphenyl	0.0516		0.05000		103	17.8	157				
Surr: Tetrachloro-m-xylene	0.0524		0.05000		105	11	150				

Sample ID **1707301-001ADUP** | SampType: **DUP** | Units: **mg/Kg-dry** | Prep Date: **8/4/2017** | RunNo: **37836**
Client ID: **BATCH** | Batch ID: **17824** | Analysis Date: **8/7/2017** | SeqNo: **727580**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toxaphene	ND	0.101						0		30	
Alpha BHC	ND	0.0101						0		30	
Beta BHC	ND	0.0101						0		30	

Fremont Analytical

Date: *8/15/2017*

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **1707301-001ADUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37836**
Client ID: **BATCH** Batch ID: **17824** Analysis Date: **8/7/2017** SeqNo: **727580**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gamma BHC (Lindane)	ND	0.0101						0		30	
Delta BHC	ND	0.0101						0		30	
Heptachlor	ND	0.0101						0		30	
Aldrin	ND	0.0101						0		30	
Heptachlor epoxide	ND	0.0101						0		30	
gamma-Chlordane	ND	0.0101						0		30	
Endosulfan I	ND	0.0101						0		30	
alpha-Chlordane	ND	0.0101						0		30	
Dieldrin	ND	0.0101						0		30	
4,4´-DDE	ND	0.0101						0		30	
Endrin	ND	0.0101						0		30	
Endosulfan II	ND	0.0101						0		30	
4,4´-DDD	ND	0.0101						0		30	
Endrin aldehyde	ND	0.0101						0		30	
Endosulfan sulfate	ND	0.0101						0		30	
4,4´-DDT	ND	0.0101						0		30	
Endrin ketone	ND	0.0101						0		30	
Methoxychlor	ND	0.0101						0		30	
Surr: Decachlorobiphenyl	0.0471		0.05057		93.2	17.8	157		0		
Surr: Tetrachloro-m-xylene	0.0469		0.05057		92.8	11	150		0		

Sample ID **1707301-001AMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37836**
Client ID: **BATCH** Batch ID: **17824** Analysis Date: **8/7/2017** SeqNo: **727581**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alpha BHC	0.135	0.00929	0.1858	0	72.5	49.1	158				
Beta BHC	0.129	0.00929	0.1858	0	69.4	30.1	161				
Gamma BHC (Lindane)	0.136	0.00929	0.1858	0	73.2	40.5	158				
Delta BHC	0.136	0.00929	0.1858	0	73.0	31.5	153				
Heptachlor	0.147	0.00929	0.1858	0	79.0	37.9	156				

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **1707301-001AMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37836**
Client ID: **BATCH** Batch ID: **17824** Analysis Date: **8/7/2017** SeqNo: **727581**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldrin	0.121	0.00929	0.1858	0	64.9	41.9	130				
Heptachlor epoxide	0.128	0.00929	0.1858	0	68.9	41	161				
gamma-Chlordane	0.124	0.00929	0.1858	0	66.5	40.9	132				
Endosulfan I	0.126	0.00929	0.1858	0	68.0	44.7	162				
alpha-Chlordane	0.125	0.00929	0.1858	0	67.2	41.4	132				
Dieldrin	0.128	0.00929	0.1858	0	69.0	43.9	155				
4,4´-DDE	0.136	0.00929	0.1858	0	73.1	34	166				
Endrin	0.134	0.00929	0.1858	0	72.1	50.5	166				
Endosulfan II	0.134	0.00929	0.1858	0	72.3	37.9	154				
4,4´-DDD	0.135	0.00929	0.1858	0	72.4	38.9	144				
Endrin aldehyde	0.125	0.00929	0.1858	0	67.5	38.3	156				
Endosulfan sulfate	0.135	0.00929	0.1858	0	72.7	25.2	144				
4,4´-DDT	0.163	0.00929	0.1858	0	87.7	38.4	160				
Endrin ketone	0.148	0.00929	0.1858	0	79.8	40.2	119				
Methoxychlor	0.185	0.00929	0.1858	0	99.5	43.4	178				
Surr: Decachlorobiphenyl	0.0441		0.04645		94.9	17.8	157				
Surr: Tetrachloro-m-xylene	0.0372		0.04645		80.1	11	150				

Sample ID **1707301-001AMSD** SampType: **MSD** Units: **mg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37836**
Client ID: **BATCH** Batch ID: **17824** Analysis Date: **8/7/2017** SeqNo: **727582**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alpha BHC	0.140	0.00954	0.1907	0	73.3	49.1	158	0.1347	3.73	30	
Beta BHC	0.130	0.00954	0.1907	0	68.1	30.1	161	0.1289	0.700	30	
Gamma BHC (Lindane)	0.140	0.00954	0.1907	0	73.4	40.5	158	0.1360	2.85	30	
Delta BHC	0.135	0.00954	0.1907	0	70.5	31.5	153	0.1357	0.890	30	
Heptachlor	0.153	0.00954	0.1907	0	80.1	37.9	156	0.1468	3.97	30	
Aldrin	0.124	0.00954	0.1907	0	65.2	41.9	130	0.1206	3.10	30	
Heptachlor epoxide	0.130	0.00954	0.1907	0	68.3	41	161	0.1280	1.81	30	
gamma-Chlordane	0.125	0.00954	0.1907	0	65.4	40.9	132	0.1235	0.975	30	

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **1707301-001AMSD** SampType: **MSD** Units: **mg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37836**
Client ID: **BATCH** Batch ID: **17824** Analysis Date: **8/7/2017** SeqNo: **727582**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Endosulfan I	0.127	0.00954	0.1907	0	66.4	44.7	162	0.1264	0.211	30	
alpha-Chlordane	0.126	0.00954	0.1907	0	66.0	41.4	132	0.1248	0.909	30	
Dieldrin	0.127	0.00954	0.1907	0	66.6	43.9	155	0.1282	0.926	30	
4,4´-DDE	0.135	0.00954	0.1907	0	70.6	34	166	0.1358	0.768	30	
Endrin	0.131	0.00954	0.1907	0	68.5	50.5	166	0.1341	2.50	30	
Endosulfan II	0.126	0.00954	0.1907	0	65.9	37.9	154	0.1344	6.61	30	
4,4´-DDD	0.128	0.00954	0.1907	0	67.2	38.9	144	0.1345	4.88	30	
Endrin aldehyde	0.109	0.00954	0.1907	0	57.1	38.3	156	0.1254	14.1	30	
Endosulfan sulfate	0.122	0.00954	0.1907	0	63.8	25.2	144	0.1351	10.5	30	
4,4´-DDT	0.154	0.00954	0.1907	0	81.0	38.4	160	0.1630	5.34	30	
Endrin ketone	0.133	0.00954	0.1907	0	69.7	40.2	119	0.1483	11.0	30	
Methoxychlor	0.168	0.00954	0.1907	0	88.0	43.4	178	0.1849	9.64	30	
Surr: Decachlorobiphenyl	0.0354		0.04769		74.3	17.8	157		0		
Surr: Tetrachloro-m-xylene	0.0372		0.04769		78.1	11	150		0		

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1708018**
Logged by:	**Clare Griggs**	Date Received:	**8/1/2017 12:19:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C*	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: Date

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler	4.6
Sample	2.7

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY 1708018

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER	
Fremont	
PROJECT NAME/NO.	PO #
707388	F-26
REMARKS	
Please Email Results	

TURNAROUND TIME
- ☐ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M	Chlorinated Pesticides	Chlorinated Herbicides	Dioxins/Furans	Notes
						ANALYSES REQUESTED										
ISM-DU3-072517		7/25/17	1407	Soil	3								X	X		10g in each vial
ISM-DU2-072617		7/26/17	1232	↓	3								X	X		↓
ISM-DU1-072617		↓	1500	↓	3								X	X		↓
																Dry weight will
																be forwarded
																upon completion

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman and Bruya	8/1/17	Noon
Received by:				
Relinquished by:				
Received by:			8/1/17	1219

707388

SAMPLE CHAIN OF CUSTODY

ME 07-27-17 [redacted]

B14 / VS2 / VW1

Page # 1 of 1

Report To Ali Cochrane & Carla Brock

Company Aspect Consulting

Address

City, State, ZIP Seattle Office

Phone ______ Email ______

SAMPLERS (signature) Kat Beck

PROJECT NAME	PO #
Shelton C Street Landfill	150074
REMARKS	INVOICE TO Accts Payable

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Archive Samples
☐ Other

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	~~ISM~~ PCBs	Dioxins/furans	chlorinated pesticides	herbicides	METALS	Notes
ISM-DU3-072517	01	7/25/17	1407	soil	1		X	X			X		X	X	X	X	✓	✓ - per AC 08/23/17
ISM-DU2-072617	02	7/26/17	1232	soil	1		X	X			X		X	X	X	X	✓	
ISM-DU1-072617	03	7/26/17	1500	soil	1		X	X			X		X	X	X	X	✓	
DU3-P7-072617	04 A-D		1605		4			X		X								
DU3-P3-072617	05		1556		4			X		X								
DU2-L2-072617	06		1545		4			X		X								
DU2-L7-072617	07		1539		4			X		X								
DU2-G7-072617	08		1527		4			X		X								
DU2-G2-072617	09		1517		4			X		X								Samples received at 3 °C
~~DU2~~ DU1-C2-072617	10		1503		4			X		X								Trip Blank added in lab
Trip Blank	11																	

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Kat Beck	Kristin Beck	Aspect	7/27/17	
Received by:	Eric Vasquez	FedEx	7-27-17	840am
Relinquished by:				
Received by: Dave	David	F+BI	7-27-17	9:45

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

August 16, 2017

Ali Cochrane, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Ms Cochrane:

Included are the results from the testing of material submitted on July 27, 2017 from the Shelton C Street Landfill, PO 150074, F&BI 707388 project. There are 33 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Carla Brock
ASP0816R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on July 27, 2017 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Shelton C Street Landfill, PO 150074, F&BI 707388 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
707388 -01	ISM-DU3-072517
707388 -02	ISM-DU2-072617
707388 -03	ISM-DU1-072617
707388 -04	DU3-P7-072617
707388 -05	DU3-P3-072617
707388 -06	DU2-L2-072617
707388 -07	DU2-L7-072617
707388 -08	DU2-G7-072617
707388 -09	DU2-G2-072617
707388 -10	DU1-C2-072617
707388 -11	Trip Blank

Samples ISM-DU3-072517, ISM-DU2-072617, and ISM-DU1-072617 were sent to Fremont Analytical for chlorinated pesticide and herbicide analyses. In addition, the samples were sent to Frontier Analytical for dioxin and furan analysis. The report from Fremont Analytical is enclosed. The report generated by Frontier will be forwarded to your office upon receipt.

Bis(2-ethylhexyl) phthalate was detected in sample ISM-DU1-072617. Bis(2-ethylhexyl) phthalate is a common laboratory and field contaminant and the data were flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/16/17
Date Received: 07/27/17
Project: Shelton C Street Landfill, PO 150074, F&BI 707388
Date Extracted: 07/28/17 and 08/07/17
Date Analyzed: 07/28/17 and 08/07/17

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
USING METHOD NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
ISM-DU3-072517 707388-01	3.5	90
ISM-DU2-072617 707388-02	<2	92
ISM-DU1-072617 707388-03	<2	91
DU3-P7-072617 707388-04	<2	87
DU3-P3-072617 707388-05	<2	90
DU2-L2-072617 707388-06	<2	87
DU2-L7-072617 707388-07	<2	89
DU2-G7-072617 707388-08	<2	87
DU2-G2-072617 707388-09	<2	86

Date of Report: 08/16/17
Date Received: 07/27/17
Project: Shelton C Street Landfill, PO 150074, F&BI 707388
Date Extracted: 07/28/17 and 08/07/17
Date Analyzed: 07/28/17 and 08/07/17

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
USING METHOD NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
DU1-C2-072617 707388-10	<2	89
Method Blank 07-1517 MB2	<2	89
Method Blank 07-1623 MB	<2	94

Date of Report: 08/16/17
Date Received: 07/27/17
Project: Shelton C Street Landfill, PO 150074, F&BI 707388
Date Extracted: 08/01/17
Date Analyzed: 08/01/17

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 48-168)
ISM-DU3-072517 707388-01	<50	<250	112
ISM-DU2-072617 707388-02	<50	<250	109
ISM-DU1-072617 707388-03	<50	<250	113
Method Blank 07-1640 MB	<50	<250	99

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	DU3-P7-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	07/27/17	Lab ID:	707388-04
Date Analyzed:	07/28/17	Data File:	072742.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	62	142
Toluene-d8	99	55	145
4-Bromofluorobenzene	102	65	139

Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5
Chloromethane	<0.5
Vinyl chloride	<0.05
Bromomethane	<0.5
Chloroethane	<0.5
Trichlorofluoromethane	<0.5
Acetone	<0.5
1,1-Dichloroethene	<0.05
Hexane	<0.25
Methylene chloride	<0.5
Methyl t-butyl ether (MTBE)	<0.05
trans-1,2-Dichloroethene	<0.05
1,1-Dichloroethane	<0.05
2,2-Dichloropropane	<0.05
cis-1,2-Dichloroethene	<0.05
Chloroform	<0.05
2-Butanone (MEK)	<0.5
1,2-Dichloroethane (EDC)	<0.05
1,1,1-Trichloroethane	<0.05
1,1-Dichloropropene	<0.05
Carbon tetrachloride	<0.05
Benzene	<0.03
Trichloroethene	<0.02
1,2-Dichloropropane	<0.05
Bromodichloromethane	<0.05
Dibromomethane	<0.05
4-Methyl-2-pentanone	<0.5
cis-1,3-Dichloropropene	<0.05
Toluene	<0.05
trans-1,3-Dichloropropene	<0.05
1,1,2-Trichloroethane	<0.05
2-Hexanone	<0.5

Compounds:	Concentration mg/kg (ppm)
1,3-Dichloropropane	<0.05
Tetrachloroethene	<0.025
Dibromochloromethane	<0.05
1,2-Dibromoethane (EDB)	<0.05
Chlorobenzene	<0.05
Ethylbenzene	<0.05
1,1,1,2-Tetrachloroethane	<0.05
m,p-Xylene	<0.1
o-Xylene	<0.05
Styrene	<0.05
Isopropylbenzene	<0.05
Bromoform	<0.05
n-Propylbenzene	<0.05
Bromobenzene	<0.05
1,3,5-Trimethylbenzene	<0.05
1,1,2,2-Tetrachloroethane	<0.05
1,2,3-Trichloropropane	<0.05
2-Chlorotoluene	<0.05
4-Chlorotoluene	<0.05
tert-Butylbenzene	<0.05
1,2,4-Trimethylbenzene	<0.05
sec-Butylbenzene	<0.05
p-Isopropyltoluene	<0.05
1,3-Dichlorobenzene	<0.05
1,4-Dichlorobenzene	<0.05
1,2-Dichlorobenzene	<0.05
1,2-Dibromo-3-chloropropane	<0.5
1,2,4-Trichlorobenzene	<0.25
Hexachlorobutadiene	<0.25
Naphthalene	<0.05
1,2,3-Trichlorobenzene	<0.25

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	DU3-P3-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	07/27/17	Lab ID:	707388-05
Date Analyzed:	07/28/17	Data File:	072743.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	62	142
Toluene-d8	99	55	145
4-Bromofluorobenzene	101	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	0.059	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	DU2-L2-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	07/27/17	Lab ID:	707388-06
Date Analyzed:	07/28/17	Data File:	072744.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	62	142
Toluene-d8	99	55	145
4-Bromofluorobenzene	103	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	DU2-L7-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	07/27/17	Lab ID:	707388-07
Date Analyzed:	07/28/17	Data File:	072745.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	62	142
Toluene-d8	99	55	145
4-Bromofluorobenzene	102	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	DU2-G7-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	07/27/17	Lab ID:	707388-08
Date Analyzed:	07/28/17	Data File:	072746.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	62	142
Toluene-d8	99	55	145
4-Bromofluorobenzene	101	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	DU2-G2-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	07/27/17	Lab ID:	707388-09
Date Analyzed:	07/28/17	Data File:	072747.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	62	142
Toluene-d8	100	55	145
4-Bromofluorobenzene	102	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	DU1-C2-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	07/27/17	Lab ID:	707388-10
Date Analyzed:	07/28/17	Data File:	072748.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	104	62	142
Toluene-d8	100	55	145
4-Bromofluorobenzene	102	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	07/27/17	Lab ID:	07-1548 mb2
Date Analyzed:	07/27/17	Data File:	072705.D
Matrix:	Soil	Instrument:	GCMS4
Units:	mg/kg (ppm) Dry Weight	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	62	142
Toluene-d8	98	55	145
4-Bromofluorobenzene	101	65	139

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Dichlorodifluoromethane	<0.5	1,3-Dichloropropane	<0.05
Chloromethane	<0.5	Tetrachloroethene	<0.025
Vinyl chloride	<0.05	Dibromochloromethane	<0.05
Bromomethane	<0.5	1,2-Dibromoethane (EDB)	<0.05
Chloroethane	<0.5	Chlorobenzene	<0.05
Trichlorofluoromethane	<0.5	Ethylbenzene	<0.05
Acetone	<0.5	1,1,1,2-Tetrachloroethane	<0.05
1,1-Dichloroethene	<0.05	m,p-Xylene	<0.1
Hexane	<0.25	o-Xylene	<0.05
Methylene chloride	<0.5	Styrene	<0.05
Methyl t-butyl ether (MTBE)	<0.05	Isopropylbenzene	<0.05
trans-1,2-Dichloroethene	<0.05	Bromoform	<0.05
1,1-Dichloroethane	<0.05	n-Propylbenzene	<0.05
2,2-Dichloropropane	<0.05	Bromobenzene	<0.05
cis-1,2-Dichloroethene	<0.05	1,3,5-Trimethylbenzene	<0.05
Chloroform	<0.05	1,1,2,2-Tetrachloroethane	<0.05
2-Butanone (MEK)	<0.5	1,2,3-Trichloropropane	<0.05
1,2-Dichloroethane (EDC)	<0.05	2-Chlorotoluene	<0.05
1,1,1-Trichloroethane	<0.05	4-Chlorotoluene	<0.05
1,1-Dichloropropene	<0.05	tert-Butylbenzene	<0.05
Carbon tetrachloride	<0.05	1,2,4-Trimethylbenzene	<0.05
Benzene	<0.03	sec-Butylbenzene	<0.05
Trichloroethene	<0.02	p-Isopropyltoluene	<0.05
1,2-Dichloropropane	<0.05	1,3-Dichlorobenzene	<0.05
Bromodichloromethane	<0.05	1,4-Dichlorobenzene	<0.05
Dibromomethane	<0.05	1,2-Dichlorobenzene	<0.05
4-Methyl-2-pentanone	<0.5	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.05	1,2,4-Trichlorobenzene	<0.25
Toluene	<0.05	Hexachlorobutadiene	<0.25
trans-1,3-Dichloropropene	<0.05	Naphthalene	<0.05
1,1,2-Trichloroethane	<0.05	1,2,3-Trichlorobenzene	<0.25
2-Hexanone	<0.5		

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	ISM-DU3-072517	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/03/17	Lab ID:	707388-01 1/10
Date Analyzed:	08/04/17	Data File:	080406.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	63 d	56	115
Phenol-d6	67 d	54	113
Nitrobenzene-d5	75 d	31	164
2-Fluorobiphenyl	86 d	47	133
2,4,6-Tribromophenol	52 d	35	141
Terphenyl-d14	93 d	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<1	Hexachlorocyclopentadiene	<0.3
Bis(2-chloroethyl) ether	<0.1	2,4,6-Trichlorophenol	<1
2-Chlorophenol	<1	2,4,5-Trichlorophenol	<1
1,3-Dichlorobenzene	<0.1	2-Chloronaphthalene	<0.1
1,4-Dichlorobenzene	<0.1	2-Nitroaniline	<0.5
1,2-Dichlorobenzene	<0.1	Dimethyl phthalate	<1
Benzyl alcohol	<1	2,6-Dinitrotoluene	<0.5
2,2'-Oxybis(1-chloropropane)	<0.1	3-Nitroaniline	<10
2-Methylphenol	<1	2,4-Dinitrophenol	<3
Hexachloroethane	<0.1	Dibenzofuran	<0.1
N-Nitroso-di-n-propylamine	<0.1	2,4-Dinitrotoluene	<0.5
3-Methylphenol + 4-Methylphenol	<2	4-Nitrophenol	<3
Nitrobenzene	<0.1	Diethyl phthalate	<1
Isophorone	<0.1	4-Chlorophenyl phenyl ether	<0.1
2-Nitrophenol	<1	N-Nitrosodiphenylamine	<0.1
2,4-Dimethylphenol	<1	4-Nitroaniline	<10
Benzoic acid	<5	4,6-Dinitro-2-methylphenol	<3
Bis(2-chloroethoxy)methane	<0.1	4-Bromophenyl phenyl ether	<0.1
2,4-Dichlorophenol	<1	Hexachlorobenzene	<0.1
1,2,4-Trichlorobenzene	<0.1	Pentachlorophenol	<1
Hexachlorobutadiene	<0.1	Carbazole	<1
4-Chloroaniline	<10	Di-n-butyl phthalate	<1
4-Chloro-3-methylphenol	<1	Benzyl butyl phthalate	<1
2-Methylnaphthalene	<0.1	Bis(2-ethylhexyl) phthalate	<1.6
1-Methylnaphthalene	<0.1	Di-n-octyl phthalate	<1

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	ISM-DU2-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/03/17	Lab ID:	707388-02 1/5
Date Analyzed:	08/04/17	Data File:	080413.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	91	56	115
Phenol-d6	89	54	113
Nitrobenzene-d5	98	31	164
2-Fluorobiphenyl	100	47	133
2,4,6-Tribromophenol	91	35	141
Terphenyl-d14	102	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.5	Hexachlorocyclopentadiene	<0.15
Bis(2-chloroethyl) ether	<0.05	2,4,6-Trichlorophenol	<0.5
2-Chlorophenol	<0.5	2,4,5-Trichlorophenol	<0.5
1,3-Dichlorobenzene	<0.05	2-Chloronaphthalene	<0.05
1,4-Dichlorobenzene	<0.05	2-Nitroaniline	<0.25
1,2-Dichlorobenzene	<0.05	Dimethyl phthalate	<0.5
Benzyl alcohol	<0.5	2,6-Dinitrotoluene	<0.25
2,2'-Oxybis(1-chloropropane)	<0.05	3-Nitroaniline	<5
2-Methylphenol	<0.5	2,4-Dinitrophenol	<1.5
Hexachloroethane	<0.05	Dibenzofuran	<0.05
N-Nitroso-di-n-propylamine	<0.05	2,4-Dinitrotoluene	<0.25
3-Methylphenol + 4-Methylphenol	<1	4-Nitrophenol	<1.5
Nitrobenzene	<0.05	Diethyl phthalate	<0.5
Isophorone	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Nitrophenol	<0.5	N-Nitrosodiphenylamine	<0.05
2,4-Dimethylphenol	<0.5	4-Nitroaniline	<5
Benzoic acid	<2.5	4,6-Dinitro-2-methylphenol	<1.5
Bis(2-chloroethoxy)methane	<0.05	4-Bromophenyl phenyl ether	<0.05
2,4-Dichlorophenol	<0.5	Hexachlorobenzene	<0.05
1,2,4-Trichlorobenzene	<0.05	Pentachlorophenol	<0.5
Hexachlorobutadiene	<0.05	Carbazole	<0.5
4-Chloroaniline	<5	Di-n-butyl phthalate	<0.5
4-Chloro-3-methylphenol	<0.5	Benzyl butyl phthalate	<0.5
2-Methylnaphthalene	<0.05	Bis(2-ethylhexyl) phthalate	<0.8
1-Methylnaphthalene	<0.05	Di-n-octyl phthalate	<0.5

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	ISM-DU1-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/03/17	Lab ID:	707388-03 1/5
Date Analyzed:	08/04/17	Data File:	080414.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	89	56	115
Phenol-d6	88	54	113
Nitrobenzene-d5	100	31	164
2-Fluorobiphenyl	99	47	133
2,4,6-Tribromophenol	98	35	141
Terphenyl-d14	108	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.5	Hexachlorocyclopentadiene	<0.15
Bis(2-chloroethyl) ether	<0.05	2,4,6-Trichlorophenol	<0.5
2-Chlorophenol	<0.5	2,4,5-Trichlorophenol	<0.5
1,3-Dichlorobenzene	<0.05	2-Chloronaphthalene	<0.05
1,4-Dichlorobenzene	0.079	2-Nitroaniline	<0.25
1,2-Dichlorobenzene	<0.05	Dimethyl phthalate	<0.5
Benzyl alcohol	<0.5	2,6-Dinitrotoluene	<0.25
2,2'-Oxybis(1-chloropropane)	<0.05	3-Nitroaniline	<5
2-Methylphenol	<0.5	2,4-Dinitrophenol	<1.5
Hexachloroethane	<0.05	Dibenzofuran	0.12
N-Nitroso-di-n-propylamine	<0.05	2,4-Dinitrotoluene	<0.25
3-Methylphenol + 4-Methylphenol	<1	4-Nitrophenol	<1.5
Nitrobenzene	<0.05	Diethyl phthalate	<0.5
Isophorone	<0.05	4-Chlorophenyl phenyl ether	<0.05
2-Nitrophenol	<0.5	N-Nitrosodiphenylamine	<0.05
2,4-Dimethylphenol	<0.5	4-Nitroaniline	<5
Benzoic acid	<2.5	4,6-Dinitro-2-methylphenol	<1.5
Bis(2-chloroethoxy)methane	<0.05	4-Bromophenyl phenyl ether	<0.05
2,4-Dichlorophenol	<0.5	Hexachlorobenzene	<0.05
1,2,4-Trichlorobenzene	<0.05	Pentachlorophenol	<0.5
Hexachlorobutadiene	<0.05	Carbazole	<0.5
4-Chloroaniline	<5	Di-n-butyl phthalate	<0.5
4-Chloro-3-methylphenol	<0.5	Benzyl butyl phthalate	<0.5
2-Methylnaphthalene	<0.05	Bis(2-ethylhexyl) phthalate	2.6 fc
1-Methylnaphthalene	<0.05	Di-n-octyl phthalate	<0.5

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/03/17	Lab ID:	07-1648 mb
Date Analyzed:	08/04/17	Data File:	080405.D
Matrix:	Soil	Instrument:	GCMS8
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	96	56	115
Phenol-d6	98	54	113
Nitrobenzene-d5	98	31	164
2-Fluorobiphenyl	100	47	133
2,4,6-Tribromophenol	90	35	141
Terphenyl-d14	114	24	188

Compounds:	Concentration mg/kg (ppm)	Compounds:	Concentration mg/kg (ppm)
Phenol	<0.1	Hexachlorocyclopentadiene	<0.03
Bis(2-chloroethyl) ether	<0.01	2,4,6-Trichlorophenol	<0.1
2-Chlorophenol	<0.1	2,4,5-Trichlorophenol	<0.1
1,3-Dichlorobenzene	<0.01	2-Chloronaphthalene	<0.01
1,4-Dichlorobenzene	<0.01	2-Nitroaniline	<0.05
1,2-Dichlorobenzene	<0.01	Dimethyl phthalate	<0.1
Benzyl alcohol	<0.1	2,6-Dinitrotoluene	<0.05
2,2'-Oxybis(1-chloropropane)	<0.01	3-Nitroaniline	<1
2-Methylphenol	<0.1	2,4-Dinitrophenol	<0.3
Hexachloroethane	<0.01	Dibenzofuran	<0.01
N-Nitroso-di-n-propylamine	<0.01	2,4-Dinitrotoluene	<0.05
3-Methylphenol + 4-Methylphenol	<0.2	4-Nitrophenol	<0.3
Nitrobenzene	<0.01	Diethyl phthalate	<0.1
Isophorone	<0.01	4-Chlorophenyl phenyl ether	<0.01
2-Nitrophenol	<0.1	N-Nitrosodiphenylamine	<0.01
2,4-Dimethylphenol	<0.1	4-Nitroaniline	<1
Benzoic acid	<0.5	4,6-Dinitro-2-methylphenol	<0.3
Bis(2-chloroethoxy)methane	<0.01	4-Bromophenyl phenyl ether	<0.01
2,4-Dichlorophenol	<0.1	Hexachlorobenzene	<0.01
1,2,4-Trichlorobenzene	<0.01	Pentachlorophenol	<0.1
Hexachlorobutadiene	<0.01	Carbazole	<0.1
4-Chloroaniline	<1	Di-n-butyl phthalate	<0.1
4-Chloro-3-methylphenol	<0.1	Benzyl butyl phthalate	<0.1
2-Methylnaphthalene	<0.01	Bis(2-ethylhexyl) phthalate	<0.16
1-Methylnaphthalene	<0.01	Di-n-octyl phthalate	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	ISM-DU3-072517	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/03/17	Lab ID:	707388-01 1/5
Date Analyzed:	08/03/17	Data File:	080310.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	78	31	163
Benzo(a)anthracene-d12	93	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.029
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.16
Anthracene	0.011
Fluoranthene	0.41
Pyrene	0.23
Benz(a)anthracene	0.13
Chrysene	0.31
Benzo(a)pyrene	0.22
Benzo(b)fluoranthene	0.54
Benzo(k)fluoranthene	0.15
Indeno(1,2,3-cd)pyrene	0.32
Dibenz(a,h)anthracene	0.040
Benzo(g,h,i)perylene	0.39

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	ISM-DU2-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/03/17	Lab ID:	707388-02 1/50
Date Analyzed:	08/03/17	Data File:	080308.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	113 d	31	163
Benzo(a)anthracene-d12	100 d	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.1
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	0.47
Anthracene	<0.1
Fluoranthene	0.88
Pyrene	0.65
Benz(a)anthracene	0.22
Chrysene	0.46
Benzo(a)pyrene	0.29
Benzo(b)fluoranthene	0.74
Benzo(k)fluoranthene	0.20
Indeno(1,2,3-cd)pyrene	0.45
Dibenz(a,h)anthracene	<0.1
Benzo(g,h,i)perylene	0.59

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	ISM-DU1-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/03/17	Lab ID:	707388-03 1/50
Date Analyzed:	08/03/17	Data File:	080309.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	114 d	31	163
Benzo(a)anthracene-d12	100 d	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	0.18
Acenaphthylene	<0.1
Acenaphthene	<0.1
Fluorene	<0.1
Phenanthrene	1.0
Anthracene	<0.1
Fluoranthene	2.2
Pyrene	1.4
Benz(a)anthracene	0.42
Chrysene	1.1
Benzo(a)pyrene	0.61
Benzo(b)fluoranthene	2.0
Benzo(k)fluoranthene	0.49
Indeno(1,2,3-cd)pyrene	1.3
Dibenz(a,h)anthracene	0.11
Benzo(g,h,i)perylene	1.7

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/03/17	Lab ID:	07-1647 mb 1/5
Date Analyzed:	08/03/17	Data File:	080305.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	76	31	163
Benzo(a)anthracene-d12	90	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	ISM-DU3-072517	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/01/17	Lab ID:	707388-01 1/50
Date Analyzed:	08/01/17	Data File:	080124.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	105 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	<0.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	<0.2
Aroclor 1262	<0.2
Aroclor 1268	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	ISM-DU2-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/01/17	Lab ID:	707388-02 1/50
Date Analyzed:	08/01/17	Data File:	080125.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	80 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	<0.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	<0.2
Aroclor 1262	<0.2
Aroclor 1268	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	ISM-DU1-072617	Client:	Aspect Consulting, LLC
Date Received:	07/27/17	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/01/17	Lab ID:	707388-03 1/50
Date Analyzed:	08/01/17	Data File:	080126.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	105 d	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.2
Aroclor 1232	<0.2
Aroclor 1016	<0.2
Aroclor 1242	<0.2
Aroclor 1248	<0.2
Aroclor 1254	<0.2
Aroclor 1260	<0.2
Aroclor 1262	<0.2
Aroclor 1268	<0.2

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C Street Landfill, PO 150074
Date Extracted:	08/01/17	Lab ID:	07-1603 mb 1/5
Date Analyzed:	08/01/17	Data File:	080112.D
Matrix:	Soil	Instrument:	GC7
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	80	29	154

Compounds:	Concentration mg/kg (ppm)
Aroclor 1221	<0.02
Aroclor 1232	<0.02
Aroclor 1016	<0.02
Aroclor 1242	<0.02
Aroclor 1248	<0.02
Aroclor 1254	<0.02
Aroclor 1260	<0.02
Aroclor 1262	<0.02
Aroclor 1268	<0.02

Date of Report: 08/16/17
Date Received: 07/27/17
Project: Shelton C Street Landfill, PO 150074, F&BI 707388

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 707375-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Gasoline	mg/kg (ppm)	<2	2	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	mg/kg (ppm)	20	85	61-153

Date of Report: 08/16/17
Date Received: 07/27/17
Project: Shelton C Street Landfill, PO 150074, F&BI 707388

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 708024-01 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Gasoline	mg/kg (ppm)	3	3	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	mg/kg (ppm)	20	85	61-153

Date of Report: 08/16/17
Date Received: 07/27/17
Project: Shelton C Street Landfill, PO 150074, F&BI 707388

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 708018-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	92	90	73-135	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	94	74-139

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/16/17
Date Received: 07/27/17
Project: Shelton C Street Landfill, PO 150074, F&BI 707388

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 707356-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	mg/kg (ppm)	2.5	<0.5	22	20	10-142	10
Chloromethane	mg/kg (ppm)	2.5	<0.5	50	49	10-126	2
Vinyl chloride	mg/kg (ppm)	2.5	<0.05	48	46	10-138	4
Bromomethane	mg/kg (ppm)	2.5	<0.5	61	62	10-163	2
Chloroethane	mg/kg (ppm)	2.5	<0.5	60	60	10-176	0
Trichlorofluoromethane	mg/kg (ppm)	2.5	<0.5	53	50	10-176	6
Acetone	mg/kg (ppm)	12.5	<0.5	92	89	10-163	3
1,1-Dichloroethene	mg/kg (ppm)	2.5	<0.05	65	62	10-160	5
Hexane	mg/kg (ppm)	2.5	<0.25	49	45	10-137	9
Methylene chloride	mg/kg (ppm)	2.5	<0.5	79	81	10-156	2
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	<0.05	85	83	21-145	2
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	74	73	14-137	1
1,1-Dichloroethane	mg/kg (ppm)	2.5	<0.05	80	79	19-140	1
2,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	86	83	10-158	4
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	<0.05	81	80	25-135	1
Chloroform	mg/kg (ppm)	2.5	<0.05	81	79	21-145	2
2-Butanone (MEK)	mg/kg (ppm)	12.5	<0.5	96	90	19-147	6
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	<0.05	83	81	12-160	2
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	<0.05	80	78	10-156	3
1,1-Dichloropropene	mg/kg (ppm)	2.5	<0.05	78	77	17-140	1
Carbon tetrachloride	mg/kg (ppm)	2.5	<0.05	78	77	9-164	1
Benzene	mg/kg (ppm)	2.5	<0.03	81	80	29-129	1
Trichloroethene	mg/kg (ppm)	2.5	<0.02	78	79	21-139	1
1,2-Dichloropropane	mg/kg (ppm)	2.5	<0.05	84	84	30-135	0
Bromodichloromethane	mg/kg (ppm)	2.5	<0.05	84	84	23-155	0
Dibromomethane	mg/kg (ppm)	2.5	<0.05	83	81	23-145	2
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	<0.5	94	92	24-155	2
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	88	87	28-144	1
Toluene	mg/kg (ppm)	2.5	<0.05	81	81	35-130	0
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	<0.05	88	89	26-149	1
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	<0.05	85	85	10-205	0
2-Hexanone	mg/kg (ppm)	12.5	<0.5	93	92	15-166	1
1,3-Dichloropropane	mg/kg (ppm)	2.5	<0.05	87	88	31-137	1
Tetrachloroethene	mg/kg (ppm)	2.5	<0.025	82	80	20-133	2
Dibromochloromethane	mg/kg (ppm)	2.5	<0.05	86	87	28-150	1
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	<0.05	86	86	28-142	0
Chlorobenzene	mg/kg (ppm)	2.5	<0.05	81	82	32-129	1
Ethylbenzene	mg/kg (ppm)	2.5	<0.05	84	85	32-137	1
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	86	89	31-143	3
m,p-Xylene	mg/kg (ppm)	5	<0.1	83	84	34-136	1
o-Xylene	mg/kg (ppm)	2.5	<0.05	84	86	33-134	2
Styrene	mg/kg (ppm)	2.5	<0.05	86	88	35-137	2
Isopropylbenzene	mg/kg (ppm)	2.5	<0.05	84	86	31-142	2
Bromoform	mg/kg (ppm)	2.5	<0.05	88	87	21-156	1
n-Propylbenzene	mg/kg (ppm)	2.5	<0.05	85	83	23-146	2
Bromobenzene	mg/kg (ppm)	2.5	<0.05	85	84	34-130	1
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	85	84	18-149	1
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	<0.05	91	90	28-140	1
1,2,3-Trichloropropane	mg/kg(ppm)	2.5	<0.05	86	84	25-144	2
2-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	84	83	31-134	1
4-Chlorotoluene	mg/kg (ppm)	2.5	<0.05	85	84	31-136	1
tert-Butylbenzene	mg/kg (ppm)	2.5	<0.05	86	85	30-137	1
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	<0.05	85	84	10-182	1
sec-Butylbenzene	mg/kg (ppm)	2.5	<0.05	87	86	23-145	1
p-Isopropyltoluene	mg/kg (ppm)	2.5	<0.05	85	83	21-149	2
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	84	84	30-131	0
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	82	82	29-129	0
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	<0.05	82	83	31-132	1
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	<0.5	84	84	11-161	0
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	80	80	22-142	0
Hexachlorobutadiene	mg/kg (ppm)	2.5	<0.25	83	84	10-142	1
Naphthalene	mg/kg (ppm)	2.5	<0.05	81	81	14-157	0
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	<0.25	81	80	20-144	1

Date of Report: 08/16/17
Date Received: 07/27/17
Project: Shelton C Street Landfill, PO 150074, F&BI 707388

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Dichlorodifluoromethane	mg/kg (ppm)	2.5	67	10-146
Chloromethane	mg/kg (ppm)	2.5	81	27-133
Vinyl chloride	mg/kg (ppm)	2.5	86	22-139
Bromomethane	mg/kg (ppm)	2.5	87	38-114
Chloroethane	mg/kg (ppm)	2.5	90	10-163
Trichlorofluoromethane	mg/kg (ppm)	2.5	95	10-196
Acetone	mg/kg (ppm)	12.5	112	52-141
1,1-Dichloroethene	mg/kg (ppm)	2.5	101	47-128
Hexane	mg/kg (ppm)	2.5	104	43-142
Methylene chloride	mg/kg (ppm)	2.5	106	42-132
Methyl t-butyl ether (MTBE)	mg/kg (ppm)	2.5	105	60-123
trans-1,2-Dichloroethene	mg/kg (ppm)	2.5	104	67-127
1,1-Dichloroethane	mg/kg (ppm)	2.5	107	68-115
2,2-Dichloropropane	mg/kg (ppm)	2.5	113	52-170
cis-1,2-Dichloroethene	mg/kg (ppm)	2.5	107	72-113
Chloroform	mg/kg (ppm)	2.5	104	66-120
2-Butanone (MEK)	mg/kg (ppm)	12.5	115	57-123
1,2-Dichloroethane (EDC)	mg/kg (ppm)	2.5	107	56-135
1,1,1-Trichloroethane	mg/kg (ppm)	2.5	106	62-131
1,1-Dichloropropene	mg/kg (ppm)	2.5	106	69-128
Carbon tetrachloride	mg/kg (ppm)	2.5	107	60-139
Benzene	mg/kg (ppm)	2.5	107	68-114
Trichloroethene	mg/kg (ppm)	2.5	103	64-117
1,2-Dichloropropane	mg/kg (ppm)	2.5	108	72-127
Bromodichloromethane	mg/kg (ppm)	2.5	108	72-130
Dibromomethane	mg/kg (ppm)	2.5	105	70-120
4-Methyl-2-pentanone	mg/kg (ppm)	12.5	110	45-145
cis-1,3-Dichloropropene	mg/kg (ppm)	2.5	111	75-136
Toluene	mg/kg (ppm)	2.5	105	66-126
trans-1,3-Dichloropropene	mg/kg (ppm)	2.5	113	72-132
1,1,2-Trichloroethane	mg/kg (ppm)	2.5	106	75-113
2-Hexanone	mg/kg (ppm)	12.5	109	33-152
1,3-Dichloropropane	mg/kg (ppm)	2.5	110	72-130
Tetrachloroethene	mg/kg (ppm)	2.5	109	72-114
Dibromochloromethane	mg/kg (ppm)	2.5	112	74-125
1,2-Dibromoethane (EDB)	mg/kg (ppm)	2.5	110	74-132
Chlorobenzene	mg/kg (ppm)	2.5	105	76-111
Ethylbenzene	mg/kg (ppm)	2.5	107	64-123
1,1,1,2-Tetrachloroethane	mg/kg (ppm)	2.5	110	69-135
m,p-Xylene	mg/kg (ppm)	5	106	78-122
o-Xylene	mg/kg (ppm)	2.5	109	77-124
Styrene	mg/kg (ppm)	2.5	110	74-126
Isopropylbenzene	mg/kg (ppm)	2.5	107	76-127
Bromoform	mg/kg (ppm)	2.5	113	56-132
n-Propylbenzene	mg/kg (ppm)	2.5	107	74-124
Bromobenzene	mg/kg (ppm)	2.5	107	72-122
1,3,5-Trimethylbenzene	mg/kg (ppm)	2.5	107	76-126
1,1,2,2-Tetrachloroethane	mg/kg (ppm)	2.5	109	56-143
1,2,3-Trichloropropane	mg/kg (ppm)	2.5	105	61-137
2-Chlorotoluene	mg/kg (ppm)	2.5	105	74-121
4-Chlorotoluene	mg/kg (ppm)	2.5	107	75-122
tert-Butylbenzene	mg/kg (ppm)	2.5	107	73-130
1,2,4-Trimethylbenzene	mg/kg (ppm)	2.5	107	76-125
sec-Butylbenzene	mg/kg (ppm)	2.5	108	71-130
p-Isopropyltoluene	mg/kg (ppm)	2.5	106	70-132
1,3-Dichlorobenzene	mg/kg (ppm)	2.5	108	75-121
1,4-Dichlorobenzene	mg/kg (ppm)	2.5	105	74-117
1,2-Dichlorobenzene	mg/kg (ppm)	2.5	106	76-121
1,2-Dibromo-3-chloropropane	mg/kg (ppm)	2.5	104	58-138
1,2,4-Trichlorobenzene	mg/kg (ppm)	2.5	106	64-135
Hexachlorobutadiene	mg/kg (ppm)	2.5	108	50-153
Naphthalene	mg/kg (ppm)	2.5	105	63-140
1,2,3-Trichlorobenzene	mg/kg (ppm)	2.5	106	63-138

Date of Report: 08/16/17
Date Received: 07/27/17
Project: Shelton C Street Landfill, PO 150074, F&BI 707388

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Phenol	mg/kg (ppm)	0.33	96	91	51-119	5
Bis(2-chloroethyl) ether	mg/kg (ppm)	0.33	86	80	60-112	7
2-Chlorophenol	mg/kg (ppm)	0.33	88	83	59-114	6
1,3-Dichlorobenzene	mg/kg (ppm)	0.33	82	75	62-113	9
1,4-Dichlorobenzene	mg/kg (ppm)	0.33	83	76	61-114	9
1,2-Dichlorobenzene	mg/kg (ppm)	0.33	84	77	61-113	9
Benzyl alcohol	mg/kg (ppm)	0.33	92	86	50-119	7
2,2'-Oxybis(1-chloropropane)	mg/kg (ppm)	0.33	91	85	59-113	7
2-Methylphenol	mg/kg (ppm)	0.33	87	80	58-115	8
Hexachloroethane	mg/kg (ppm)	0.33	85	75	63-114	12
N-Nitroso-di-n-propylamine	mg/kg (ppm)	0.33	90	83	62-114	8
3-Methylphenol + 4-Methylphenol	mg/kg (ppm)	0.33	89	84	54-120	6
Nitrobenzene	mg/kg (ppm)	0.33	88	82	59-114	7
Isophorone	mg/kg (ppm)	0.33	94	88	61-113	7
2-Nitrophenol	mg/kg (ppm)	0.33	85	82	59-114	4
2,4-Dimethylphenol	mg/kg (ppm)	0.33	67	55	54-107	20
Benzoic acid	mg/kg (ppm)	0.5	76	69	43-150	10
Bis(2-chloroethoxy)methane	mg/kg (ppm)	0.33	88	85	60-114	3
2,4-Dichlorophenol	mg/kg (ppm)	0.33	92	86	57-118	7
1,2,4-Trichlorobenzene	mg/kg (ppm)	0.33	85	79	56-112	7
Hexachlorobutadiene	mg/kg (ppm)	0.33	85	79	60-116	7
4-Chloroaniline	mg/kg (ppm)	0.66	67	70	10-126	4
4-Chloro-3-methylphenol	mg/kg (ppm)	0.33	91	85	59-115	7
2-Methylnaphthalene	mg/kg (ppm)	0.33	90	84	60-115	7
1-Methylnaphthalene	mg/kg (ppm)	0.33	88	83	70-130	6
Hexachlorocyclopentadiene	mg/kg (ppm)	0.33	102	94	41-107	8
2,4,6-Trichlorophenol	mg/kg (ppm)	0.33	87	82	47-119	6
2,4,5-Trichlorophenol	mg/kg (ppm)	0.33	91	88	61-121	3
2-Chloronaphthalene	mg/kg (ppm)	0.33	88	83	58-114	6
2-Nitroaniline	mg/kg (ppm)	0.33	90	87	55-119	3
Dimethyl phthalate	mg/kg (ppm)	0.33	88	86	58-116	2
2,6-Dinitrotoluene	mg/kg (ppm)	0.33	88	87	57-119	1
3-Nitroaniline	mg/kg (ppm)	0.66	84	84	10-143	0
2,4-Dinitrophenol	mg/kg (ppm)	0.33	84	79	40-122	6
Dibenzofuran	mg/kg (ppm)	0.33	90	86	56-115	5
2,4-Dinitrotoluene	mg/kg (ppm)	0.33	90	86	53-126	5
4-Nitrophenol	mg/kg (ppm)	0.33	94	90	40-124	4
Diethyl phthalate	mg/kg (ppm)	0.33	82	80	57-116	2
4-Chlorophenyl phenyl ether	mg/kg (ppm)	0.33	90	86	54-119	5
N-Nitrosodiphenylamine	mg/kg (ppm)	0.33	85	81	54-113	5
4-Nitroaniline	mg/kg (ppm)	0.66	93	89	47-109	4
4,6-Dinitro-2-methylphenol	mg/kg (ppm)	0.33	81	77	55-147	5
4-Bromophenyl phenyl ether	mg/kg (ppm)	0.33	85	83	56-116	2
Hexachlorobenzene	mg/kg (ppm)	0.33	89	86	57-115	3
Pentachlorophenol	mg/kg (ppm)	0.33	81	76	45-123	6
Carbazole	mg/kg (ppm)	0.33	99	97	57-116	2
Di-n-butyl phthalate	mg/kg (ppm)	0.33	98	97	56-118	1
Benzyl butyl phthalate	mg/kg (ppm)	0.33	85	82	56-122	4
Bis(2-ethylhexyl) phthalate	mg/kg (ppm)	0.33	90	84	56-155	7
Di-n-octyl phthalate	mg/kg (ppm)	0.33	83	76	58-120	9

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 08/16/17
Date Received: 07/27/17
Project: Shelton C Street Landfill, PO 150074, F&BI 707388

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: 707388-01 1/5 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Acceptance Criteria
Naphthalene	mg/kg (ppm)	0.17	0.028	92	44-129
Acenaphthylene	mg/kg (ppm)	0.17	<0.01	93	52-121
Acenaphthene	mg/kg (ppm)	0.17	<0.01	93	51-123
Fluorene	mg/kg (ppm)	0.17	<0.01	93	37-137
Phenanthrene	mg/kg (ppm)	0.17	0.15	106 b	34-141
Anthracene	mg/kg (ppm)	0.17	0.011	88	32-124
Fluoranthene	mg/kg (ppm)	0.17	0.39	134 b	16-160
Pyrene	mg/kg (ppm)	0.17	0.22	160 b	10-180
Benz(a)anthracene	mg/kg (ppm)	0.17	0.12	123 b	23-144
Chrysene	mg/kg (ppm)	0.17	0.30	123 b	32-149
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	0.52	146 b	23-176
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	0.14	100 b	42-139
Benzo(a)pyrene	mg/kg (ppm)	0.17	0.21	112 b	21-163
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	0.31	90 b	23-170
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	0.039	75 b	31-146
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	0.37	96 b	37-133

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	93	93	58-121	0
Acenaphthylene	mg/kg (ppm)	0.17	96	95	54-121	1
Acenaphthene	mg/kg (ppm)	0.17	96	96	54-123	1
Fluorene	mg/kg (ppm)	0.17	99	99	56-127	0
Phenanthrene	mg/kg (ppm)	0.17	96	96	55-122	0
Anthracene	mg/kg (ppm)	0.17	95	95	50-120	1
Fluoranthene	mg/kg (ppm)	0.17	98	96	54-129	2
Pyrene	mg/kg (ppm)	0.17	103	101	53-127	2
Benz(a)anthracene	mg/kg (ppm)	0.17	99	95	51-115	4
Chrysene	mg/kg (ppm)	0.17	103	97	55-129	5
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	96	97	56-123	0
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	102	100	54-131	2
Benzo(a)pyrene	mg/kg (ppm)	0.17	91	90	51-118	1
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	91	93	49-148	3
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	88	92	50-141	5
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	90	91	52-131	1

Date of Report: 08/16/17
Date Received: 07/27/17
Project: Shelton C Street Landfill, PO 150074, F&BI 707388

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES FOR
POLYCHLORINATED BIPHENYLS AS
AROCLOR 1016/1260 BY EPA METHOD 8082A**

Laboratory Code: 707433-01 1/50 (Matrix Spike) 1/50

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Control Limits
Aroclor 1016	mg/kg (ppm)	4.2	<0.2	80	50-150
Aroclor 1260	mg/kg (ppm)	4.2	<0.2	84	50-150

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	mg/kg (ppm)	4.2	83	85	55-130	2
Aroclor 1260	mg/kg (ppm)	4.2	86	84	58-133	2

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

3600 Fremont Ave. N.
Seattle, WA 98103
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info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 707388
Work Order Number: 1708018

August 15, 2017

Attention Michael Erdahl:

Fremont Analytical, Inc. received 3 sample(s) on 8/1/2017 for the analyses presented in the following report.

Herbicides by EPA Method 8151A

Organochlorine Pesticides by EPA Method 8081

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

DoD/ELAP Certification #L17-135, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

Date: *08/15/2017*

CLIENT:	Friedman & Bruya
Project:	707388
Work Order:	1708018

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1708018-001	ISM-DU3-072517	07/25/2017 2:07 PM	08/01/2017 12:19 PM
1708018-002	ISM-DU2-072617	07/26/2017 12:32 PM	08/01/2017 12:19 PM
1708018-003	ISM-DU1-072617	07/26/2017 3:00 PM	08/01/2017 12:19 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1708018**

Date: **8/15/2017**

CLIENT: Friedman & Bruya

Project: 707388

WorkOrder Narrative:

I. SAMPLE RECEIPT:

Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Client provided percent moisture for dry-weight correction.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **1708018**
Date Reported: **8/15/2017**

Client: Friedman & Bruya **Collection Date:** 7/25/2017 2:07:00 PM
Project: 707388
Lab ID: 1708018-001 **Matrix:** Soil
Client Sample ID: ISM-DU3-072517

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Organochlorine Pesticides by EPA Method 8081				Batch ID: 17824		Analyst: SG
Toxaphene	ND	0.104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Alpha BHC	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Beta BHC	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Gamma BHC (Lindane)	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Delta BHC	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Heptachlor	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Aldrin	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Heptachlor epoxide	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
gamma-Chlordane	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Endosulfan I	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
alpha-Chlordane	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Dieldrin	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
4,4´-DDE	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Endrin	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Endosulfan II	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
4,4´-DDD	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Endrin aldehyde	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Endosulfan sulfate	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
4,4´-DDT	0.0166	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Endrin ketone	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Methoxychlor	ND	0.0104		mg/Kg-dry	1	8/7/2017 7:04:35 PM
Surr: Decachlorobiphenyl	127	17.8 - 157		%Rec	1	8/7/2017 7:04:35 PM
Surr: Tetrachloro-m-xylene	125	11 - 150		%Rec	1	8/7/2017 7:04:35 PM
Herbicides by EPA Method 8151A				Batch ID: 17825		Analyst: BT
Dicamba	ND	36.4		µg/Kg-dry	1	8/10/2017 2:54:45 AM
2,4-D	ND	31.2		µg/Kg-dry	1	8/10/2017 2:54:45 AM
2,4-DP	ND	26.0		µg/Kg-dry	1	8/10/2017 2:54:45 AM
2,4,5-TP (Silvex)	ND	20.8		µg/Kg-dry	1	8/10/2017 2:54:45 AM
2,4,5-T	ND	52.0		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Dinoseb	ND	31.2		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Dalapon	ND	208		µg/Kg-dry	1	8/10/2017 2:54:45 AM
2,4-DB	ND	26.0		µg/Kg-dry	1	8/10/2017 2:54:45 AM
MCPP	ND	4,580		µg/Kg-dry	1	8/10/2017 2:54:45 AM
MCPA	ND	2,910		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Picloram	ND	52.0		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Bentazon	ND	36.4		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Chloramben	ND	20.8		µg/Kg-dry	1	8/10/2017 2:54:45 AM

Analytical Report

Work Order: **1708018**
Date Reported: **8/15/2017**

Client: Friedman & Bruya
Project: 707388
Lab ID: 1708018-001
Client Sample ID: **ISM-DU3-072517**

Collection Date: 7/25/2017 2:07:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 17825		Analyst: BT
Acifluorfen	ND	83.3		µg/Kg-dry	1	8/10/2017 2:54:45 AM
3,5-Dichlorobenzoic acid	ND	41.6		µg/Kg-dry	1	8/10/2017 2:54:45 AM
4-Nitrophenol	ND	31.2		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Dacthal (DCPA)	ND	31.2		µg/Kg-dry	1	8/10/2017 2:54:45 AM
Surr: 2,4-Dichlorophenylacetic acid	44.6	20.1 - 168		%Rec	1	8/10/2017 2:54:45 AM

Fremont Analytical

Analytical Report

Work Order: **1708018**
Date Reported: **8/15/2017**

Client: Friedman & Bruya
Project: 707388
Lab ID: 1708018-002
Client Sample ID: ISM-DU2-072617

Collection Date: 7/26/2017 12:32:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Organochlorine Pesticides by EPA Method 8081				Batch ID: 17824		Analyst: SG
Toxaphene	ND	0.107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Alpha BHC	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Beta BHC	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Gamma BHC (Lindane)	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Delta BHC	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Heptachlor	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Aldrin	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Heptachlor epoxide	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
gamma-Chlordane	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Endosulfan I	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
alpha-Chlordane	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Dieldrin	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
4,4´-DDE	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Endrin	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Endosulfan II	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
4,4´-DDD	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Endrin aldehyde	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Endosulfan sulfate	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
4,4´-DDT	0.0130	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Endrin ketone	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Methoxychlor	ND	0.0107		mg/Kg-dry	1	8/7/2017 7:14:34 PM
Surr: Decachlorobiphenyl	143	17.8 - 157		%Rec	1	8/7/2017 7:14:34 PM
Surr: Tetrachloro-m-xylene	130	11 - 150		%Rec	1	8/7/2017 7:14:34 PM
Herbicides by EPA Method 8151A				Batch ID: 17825		Analyst: BT
Dicamba	ND	37.2		µg/Kg-dry	1	8/10/2017 3:15:56 AM
2,4-D	ND	31.9		µg/Kg-dry	1	8/10/2017 3:15:56 AM
2,4-DP	ND	26.6		µg/Kg-dry	1	8/10/2017 3:15:56 AM
2,4,5-TP (Silvex)	ND	21.3		µg/Kg-dry	1	8/10/2017 3:15:56 AM
2,4,5-T	ND	53.1		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Dinoseb	ND	31.9		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Dalapon	ND	213		µg/Kg-dry	1	8/10/2017 3:15:56 AM
2,4-DB	ND	26.6		µg/Kg-dry	1	8/10/2017 3:15:56 AM
MCPP	ND	4,680		µg/Kg-dry	1	8/10/2017 3:15:56 AM
MCPA	ND	2,980		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Picloram	ND	53.1		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Bentazon	ND	37.2		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Chloramben	ND	21.3		µg/Kg-dry	1	8/10/2017 3:15:56 AM

Analytical Report

Work Order: **1708018**
Date Reported: **8/15/2017**

Client: Friedman & Bruya
Project: 707388
Lab ID: 1708018-002
Client Sample ID: **ISM-DU2-072617**
Collection Date: 7/26/2017 12:32:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 17825		Analyst: BT
Acifluorfen	ND	85.0		µg/Kg-dry	1	8/10/2017 3:15:56 AM
3,5-Dichlorobenzoic acid	ND	42.5		µg/Kg-dry	1	8/10/2017 3:15:56 AM
4-Nitrophenol	ND	31.9		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Dacthal (DCPA)	ND	31.9		µg/Kg-dry	1	8/10/2017 3:15:56 AM
Surr: 2,4-Dichlorophenylacetic acid	51.3	20.1 - 168		%Rec	1	8/10/2017 3:15:56 AM

Analytical Report

Work Order: **1708018**
Date Reported: **8/15/2017**

Client: Friedman & Bruya
Project: 707388
Lab ID: 1708018-003
Client Sample ID: **ISM-DU1-072617**

Collection Date: 7/26/2017 3:00:00 PM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Organochlorine Pesticides by EPA Method 8081				Batch ID: 17824		Analyst: SG
Toxaphene	ND	0.111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Alpha BHC	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Beta BHC	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Gamma BHC (Lindane)	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Delta BHC	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Heptachlor	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Aldrin	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Heptachlor epoxide	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
gamma-Chlordane	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Endosulfan I	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
alpha-Chlordane	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Dieldrin	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
4,4´-DDE	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Endrin	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Endosulfan II	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
4,4´-DDD	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Endrin aldehyde	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Endosulfan sulfate	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
4,4´-DDT	0.0163	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Endrin ketone	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Methoxychlor	ND	0.0111		mg/Kg-dry	1	8/7/2017 7:24:35 PM
Surr: Decachlorobiphenyl	8.48	17.8 - 157	S	%Rec	1	8/7/2017 7:24:35 PM
Surr: Tetrachloro-m-xylene	13.8	11 - 150		%Rec	1	8/7/2017 7:24:35 PM

NOTES:
S - Outlying surrogate recovery(ies) observed. All other laboratory and field samples recovered within range.

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 17825		Analyst: BT
Dicamba	ND	39.2		µg/Kg-dry	1	8/10/2017 3:37:12 AM
2,4-D	ND	33.6		µg/Kg-dry	1	8/10/2017 3:37:12 AM
2,4-DP	ND	28.0		µg/Kg-dry	1	8/10/2017 3:37:12 AM
2,4,5-TP (Silvex)	ND	22.4		µg/Kg-dry	1	8/10/2017 3:37:12 AM
2,4,5-T	ND	56.0		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Dinoseb	ND	33.6		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Dalapon	ND	224		µg/Kg-dry	1	8/10/2017 3:37:12 AM
2,4-DB	ND	28.0		µg/Kg-dry	1	8/10/2017 3:37:12 AM
MCPP	ND	4,930		µg/Kg-dry	1	8/10/2017 3:37:12 AM
MCPA	ND	3,140		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Picloram	ND	56.0		µg/Kg-dry	1	8/10/2017 3:37:12 AM

Analytical Report

Work Order: **1708018**
Date Reported: **8/15/2017**

Client: Friedman & Bruya
Collection Date: 7/26/2017 3:00:00 PM
Project: 707388
Lab ID: 1708018-003
Matrix: Soil
Client Sample ID: ISM-DU1-072617

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 17825		Analyst: BT
Bentazon	ND	39.2		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Chloramben	ND	22.4		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Acifluorfen	ND	89.6		µg/Kg-dry	1	8/10/2017 3:37:12 AM
3,5-Dichlorobenzoic acid	ND	44.8		µg/Kg-dry	1	8/10/2017 3:37:12 AM
4-Nitrophenol	ND	33.6		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Dacthal (DCPA)	ND	33.6		µg/Kg-dry	1	8/10/2017 3:37:12 AM
Surr: 2,4-Dichlorophenylacetic acid	56.8	20.1 - 168		%Rec	1	8/10/2017 3:37:12 AM

Fremont Analytical

Date: *8/15/2017*

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID **MB-17825**	SampType: **MBLK**			Units: **µg/Kg**		Prep Date: **8/4/2017**		RunNo: **37948**			
Client ID: **MBLKS**	Batch ID: **17825**					Analysis Date: **8/9/2017**		SeqNo: **729321**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	ND	35.0									
2,4-D	ND	30.0									
2,4-DP	ND	25.0									
2,4,5-TP (Silvex)	ND	20.0									
2,4,5-T	ND	50.0									
Dinoseb	ND	30.0									
Dalapon	ND	200									
2,4-DB	ND	25.0									
MCPP	ND	4,400									
MCPA	ND	2,800									
Picloram	ND	50.0									
Bentazon	ND	35.0									
Chloramben	ND	20.0									
Acifluorfen	ND	80.0									
3,5-Dichlorobenzoic acid	ND	40.0									
4-Nitrophenol	ND	30.0									
Dacthal (DCPA)	ND	30.0									
Surr: 2,4-Dichlorophenylacetic acid	716		1,000		71.6	20.1	168				

Sample ID **LCS-17825**	SampType: **LCS**			Units: **µg/Kg**		Prep Date: **8/4/2017**		RunNo: **37948**			
Client ID: **LCSS**	Batch ID: **17825**					Analysis Date: **8/9/2017**		SeqNo: **729322**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	160	35.0	200.0	0	80.2	24.7	141				
2,4-D	179	30.0	200.0	0	89.6	22.4	130				
2,4-DP	166	25.0	200.0	0	83.2	26.4	130				
2,4,5-TP (Silvex)	180	20.0	200.0	0	90.0	21.2	138				
2,4,5-T	165	50.0	200.0	0	82.6	22.8	144				
Dinoseb	140	30.0	200.0	0	69.8	5	165				
Dalapon	930	200	1,000	0	93.0	18.4	162				

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID **LCS-17825** SampType: **LCS** Units: **µg/Kg** Prep Date: **8/4/2017** RunNo: **37948**
Client ID: **LCSS** Batch ID: **17825** Analysis Date: **8/9/2017** SeqNo: **729322**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-DB	190	25.0	200.0	0	94.8	5	164				
MCPP	826	4,400	1,000	0	82.6	22.2	157				
MCPA	883	2,800	1,000	0	88.3	47.4	128				
Picloram	171	50.0	200.0	0	85.7	5	175				
Bentazon	122	35.0	200.0	0	61.0	7.59	162				
Chloramben	64.5	20.0	200.0	0	32.3	5	147				
Acifluorfen	196	80.0	200.0	0	97.9	5	163				
3,5-Dichlorobenzoic acid	160	40.0	200.0	0	79.9	18.7	139				
4-Nitrophenol	146	30.0	200.0	0	73.0	5	163				
Dacthal (DCPA)	120	30.0	200.0	0	60.2	5	164				
Surr: 2,4-Dichlorophenylacetic acid	786		1,000		78.6	20.1	168				

Sample ID **1707301-001ADUP** SampType: **DUP** Units: **µg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37948**
Client ID: **BATCH** Batch ID: **17825** Analysis Date: **8/10/2017** SeqNo: **729336**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	ND	32.6						0		30	
2,4-D	ND	27.9						0		30	
2,4-DP	ND	23.3						0		30	
2,4,5-TP (Silvex)	ND	18.6						0		30	
2,4,5-T	ND	46.5						0		30	
Dinoseb	ND	27.9						0		30	
Dalapon	ND	186						0		30	
2,4-DB	ND	23.3						0		30	
MCPP	ND	4,090						0		30	
MCPA	ND	2,610						0		30	
Picloram	ND	46.5						0		30	
Bentazon	ND	32.6						0		30	
Chloramben	ND	18.6						0		30	
Acifluorfen	ND	74.5						0		30	

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID **1707301-001ADUP** SampType: **DUP** Units: **µg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37948**
Client ID: **BATCH** Batch ID: **17825** Analysis Date: **8/10/2017** SeqNo: **729336**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
3,5-Dichlorobenzoic acid	ND	37.2						0		30	
4-Nitrophenol	ND	27.9						0		30	
Dacthal (DCPA)	ND	27.9						0		30	
Surr: 2,4-Dichlorophenylacetic acid	451		930.7		48.4	20.1	168		0		

Sample ID **1707301-001AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37948**
Client ID: **BATCH** Batch ID: **17825** Analysis Date: **8/10/2017** SeqNo: **729337**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	154	35.7	204.3	0	75.6	31.9	118				
2,4-D	173	30.6	204.3	0	84.8	12.4	134				
2,4-DP	164	25.5	204.3	0	80.2	27.2	129				
2,4,5-TP (Silvex)	178	20.4	204.3	0	87.3	28.6	134				
2,4,5-T	153	51.1	204.3	0	74.7	13.1	147				
Dinoseb	208	30.6	204.3	0	102	10	179				
Dalapon	865	204	1,021	0	84.7	24.9	139				
2,4-DB	191	25.5	204.3	0	93.6	50.2	152				
MCPP	795	4,490	1,021	0	77.8	37.8	140				
MCPA	867	2,860	1,021	0	84.9	13.7	147				
Picloram	309	51.1	204.3	0	151	5	153				
Bentazon	153	35.7	204.3	0	75.1	15	140				
Chloramben	126	20.4	204.3	0	61.6	5	162				
Acifluorfen	251	81.7	204.3	0	123	15	140				
3,5-Dichlorobenzoic acid	157	40.9	204.3	0	77.0	10	164				
4-Nitrophenol	52.9	30.6	204.3	0	25.9	44.8	125				S
Dacthal (DCPA)	133	30.6	204.3	0	64.9	5	132				
Surr: 2,4-Dichlorophenylacetic acid	735		1,021		72.0	20.1	168				

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Date: *8/15/2017*

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID **1707301-001AMSD**	SampType: **MSD**	Units: **µg/Kg-dry**	Prep Date: **8/4/2017**	RunNo: **37948**
Client ID: **BATCH**	Batch ID: **17825**		Analysis Date: **8/10/2017**	SeqNo: **729338**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	142	34.5	196.9	0	72.1	31.9	118	154.3	8.30	30	
2,4-D	161	29.5	196.9	0	81.6	12.4	134	173.1	7.42	30	
2,4-DP	146	24.6	196.9	0	73.9	27.2	129	163.8	11.8	30	
2,4,5-TP (Silvex)	159	19.7	196.9	0	81.0	28.6	134	178.3	11.1	30	
2,4,5-T	166	49.2	196.9	0	84.5	13.1	147	152.6	8.60	30	
Dinoseb	187	29.5	196.9	0	95.1	10	179	207.6	10.3	30	
Dalapon	875	197	984.5	0	88.9	24.9	139	864.6	1.18	30	
2,4-DB	175	24.6	196.9	0	88.9	50.2	152	191.3	8.80	30	
MCPP	789	4,330	984.5	0	80.1	37.8	140	0		30	
MCPA	867	2,760	984.5	0	88.0	13.7	147	0		30	
Picloram	270	49.2	196.9	0	137	5	153	308.9	13.5	30	
Bentazon	133	34.5	196.9	0	67.5	15	140	153.4	14.4	30	
Chloramben	81.5	19.7	196.9	0	41.4	5	162	125.8	42.7	30	R
Acifluorfen	200	78.8	196.9	0	102	15	140	251.4	22.8	30	
3,5-Dichlorobenzoic acid	146	39.4	196.9	0	74.0	10	164	157.3	7.61	30	
4-Nitrophenol	55.9	29.5	196.9	0	28.4	44.8	125	52.91	5.56	30	S
Dacthal (DCPA)	114	29.5	196.9	0	58.1	5	132	132.5	14.7	30	
Surr: 2,4-Dichlorophenylacetic acid	691		984.5		70.2	20.1	168		0		

NOTES:

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

R - High RPD observed, spike recovery is within range.

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **TOX CCV A 17824** SampType: **CCV** Units: **mg/L** Prep Date: **8/7/2017** RunNo: **37836**
Client ID: **CCV** Batch ID: **17824** Analysis Date: **8/7/2017** SeqNo: **727576**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toxaphene	930	0.100	1,000	0	93.0	80	120				

Sample ID **MB-17824** SampType: **MBLK** Units: **mg/Kg** Prep Date: **8/4/2017** RunNo: **37836**
Client ID: **MBLKS** Batch ID: **17824** Analysis Date: **8/7/2017** SeqNo: **727577**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Toxaphene	ND	0.100									
Alpha BHC	ND	0.0100									
Beta BHC	ND	0.0100									
Gamma BHC (Lindane)	ND	0.0100									
Delta BHC	ND	0.0100									
Heptachlor	ND	0.0100									
Aldrin	ND	0.0100									
Heptachlor epoxide	ND	0.0100									
gamma-Chlordane	ND	0.0100									
Endosulfan I	ND	0.0100									
alpha-Chlordane	ND	0.0100									
Dieldrin	ND	0.0100									
4,4´-DDE	ND	0.0100									
Endrin	ND	0.0100									
Endosulfan II	ND	0.0100									
4,4´-DDD	ND	0.0100									
Endrin aldehyde	ND	0.0100									
Endosulfan sulfate	ND	0.0100									
4,4´-DDT	ND	0.0100									
Endrin ketone	ND	0.0100									
Methoxychlor	ND	0.0100									
Surr: Decachlorobiphenyl	0.0480		0.05000		95.9	17.8	157				
Surr: Tetrachloro-m-xylene	0.0469		0.05000		93.9	11	150				

Date: *8/15/2017*

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **LCS-17824**	SampType: **LCS**			Units: **mg/Kg**		Prep Date: **8/4/2017**		RunNo: **37836**			
Client ID: **LCSS**	Batch ID: **17824**					Analysis Date: **8/7/2017**		SeqNo: **727578**			
Analyte	**Result**	**RL**	**SPK value**	**SPK Ref Val**	**%REC**	**LowLimit**	**HighLimit**	**RPD Ref Val**	**%RPD**	**RPDLimit**	**Qual**
Alpha BHC	0.195	0.0100	0.2000	0	97.7	54.2	139				
Beta BHC	0.183	0.0100	0.2000	0	91.7	56.5	142				
Gamma BHC (Lindane)	0.195	0.0100	0.2000	0	97.5	55.5	142				
Delta BHC	0.193	0.0100	0.2000	0	96.6	47.4	157				
Heptachlor	0.209	0.0100	0.2000	0	105	50.9	153				
Aldrin	0.174	0.0100	0.2000	0	87.0	43.7	147				
Heptachlor epoxide	0.180	0.0100	0.2000	0	90.0	56.2	137				
gamma-Chlordane	0.172	0.0100	0.2000	0	86.1	58.5	136				
Endosulfan I	0.177	0.0100	0.2000	0	88.4	60	132				
alpha-Chlordane	0.173	0.0100	0.2000	0	86.6	46.1	140				
Dieldrin	0.177	0.0100	0.2000	0	88.6	61.2	133				
4,4´-DDE	0.187	0.0100	0.2000	0	93.4	55.4	142				
Endrin	0.181	0.0100	0.2000	0	90.4	56.5	143				
Endosulfan II	0.175	0.0100	0.2000	0	87.7	62	143				
4,4´-DDD	0.177	0.0100	0.2000	0	88.5	53.3	145				
Endrin aldehyde	0.168	0.0100	0.2000	0	83.8	39.5	153				
Endosulfan sulfate	0.181	0.0100	0.2000	0	90.3	53.8	148				
4,4´-DDT	0.208	0.0100	0.2000	0	104	48.2	152				
Endrin ketone	0.189	0.0100	0.2000	0	94.5	28.5	162				
Methoxychlor	0.222	0.0100	0.2000	0	111	34.6	159				
Surr: Decachlorobiphenyl	0.0516		0.05000		103	17.8	157				
Surr: Tetrachloro-m-xylene	0.0524		0.05000		105	11	150				

Sample ID **1707301-001ADUP**	SampType: **DUP**			Units: **mg/Kg-dry**		Prep Date: **8/4/2017**		RunNo: **37836**			
Client ID: **BATCH**	Batch ID: **17824**					Analysis Date: **8/7/2017**		SeqNo: **727580**			
Analyte	**Result**	**RL**	**SPK value**	**SPK Ref Val**	**%REC**	**LowLimit**	**HighLimit**	**RPD Ref Val**	**%RPD**	**RPDLimit**	**Qual**
Toxaphene	ND	0.101						0		30	
Alpha BHC	ND	0.0101						0		30	
Beta BHC	ND	0.0101						0		30	

Date: *8/15/2017*

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **1707301-001ADUP** SampType: **DUP** Units: **mg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37836**
Client ID: **BATCH** Batch ID: **17824** Analysis Date: **8/7/2017** SeqNo: **727580**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gamma BHC (Lindane)	ND	0.0101						0		30	
Delta BHC	ND	0.0101						0		30	
Heptachlor	ND	0.0101						0		30	
Aldrin	ND	0.0101						0		30	
Heptachlor epoxide	ND	0.0101						0		30	
gamma-Chlordane	ND	0.0101						0		30	
Endosulfan I	ND	0.0101						0		30	
alpha-Chlordane	ND	0.0101						0		30	
Dieldrin	ND	0.0101						0		30	
4,4´-DDE	ND	0.0101						0		30	
Endrin	ND	0.0101						0		30	
Endosulfan II	ND	0.0101						0		30	
4,4´-DDD	ND	0.0101						0		30	
Endrin aldehyde	ND	0.0101						0		30	
Endosulfan sulfate	ND	0.0101						0		30	
4,4´-DDT	ND	0.0101						0		30	
Endrin ketone	ND	0.0101						0		30	
Methoxychlor	ND	0.0101						0		30	
Surr: Decachlorobiphenyl	0.0471		0.05057		93.2	17.8	157		0		
Surr: Tetrachloro-m-xylene	0.0469		0.05057		92.8	11	150		0		

Sample ID **1707301-001AMS** SampType: **MS** Units: **mg/Kg-dry** Prep Date: **8/4/2017** RunNo: **37836**
Client ID: **BATCH** Batch ID: **17824** Analysis Date: **8/7/2017** SeqNo: **727581**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alpha BHC	0.135	0.00929	0.1858	0	72.5	49.1	158				
Beta BHC	0.129	0.00929	0.1858	0	69.4	30.1	161				
Gamma BHC (Lindane)	0.136	0.00929	0.1858	0	73.2	40.5	158				
Delta BHC	0.136	0.00929	0.1858	0	73.0	31.5	153				
Heptachlor	0.147	0.00929	0.1858	0	79.0	37.9	156				

Date: *8/15/2017*

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **1707301-001AMS**	SampType: **MS**	Units: **mg/Kg-dry**	Prep Date: **8/4/2017**	RunNo: **37836**
Client ID: **BATCH**	Batch ID: **17824**		Analysis Date: **8/7/2017**	SeqNo: **727581**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Aldrin	0.121	0.00929	0.1858	0	64.9	41.9	130				
Heptachlor epoxide	0.128	0.00929	0.1858	0	68.9	41	161				
gamma-Chlordane	0.124	0.00929	0.1858	0	66.5	40.9	132				
Endosulfan I	0.126	0.00929	0.1858	0	68.0	44.7	162				
alpha-Chlordane	0.125	0.00929	0.1858	0	67.2	41.4	132				
Dieldrin	0.128	0.00929	0.1858	0	69.0	43.9	155				
4,4´-DDE	0.136	0.00929	0.1858	0	73.1	34	166				
Endrin	0.134	0.00929	0.1858	0	72.1	50.5	166				
Endosulfan II	0.134	0.00929	0.1858	0	72.3	37.9	154				
4,4´-DDD	0.135	0.00929	0.1858	0	72.4	38.9	144				
Endrin aldehyde	0.125	0.00929	0.1858	0	67.5	38.3	156				
Endosulfan sulfate	0.135	0.00929	0.1858	0	72.7	25.2	144				
4,4´-DDT	0.163	0.00929	0.1858	0	87.7	38.4	160				
Endrin ketone	0.148	0.00929	0.1858	0	79.8	40.2	119				
Methoxychlor	0.185	0.00929	0.1858	0	99.5	43.4	178				
Surr: Decachlorobiphenyl	0.0441		0.04645		94.9	17.8	157				
Surr: Tetrachloro-m-xylene	0.0372		0.04645		80.1	11	150				

Sample ID **1707301-001AMSD**	SampType: **MSD**	Units: **mg/Kg-dry**	Prep Date: **8/4/2017**	RunNo: **37836**
Client ID: **BATCH**	Batch ID: **17824**		Analysis Date: **8/7/2017**	SeqNo: **727582**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alpha BHC	0.140	0.00954	0.1907	0	73.3	49.1	158	0.1347	3.73	30	
Beta BHC	0.130	0.00954	0.1907	0	68.1	30.1	161	0.1289	0.700	30	
Gamma BHC (Lindane)	0.140	0.00954	0.1907	0	73.4	40.5	158	0.1360	2.85	30	
Delta BHC	0.135	0.00954	0.1907	0	70.5	31.5	153	0.1357	0.890	30	
Heptachlor	0.153	0.00954	0.1907	0	80.1	37.9	156	0.1468	3.97	30	
Aldrin	0.124	0.00954	0.1907	0	65.2	41.9	130	0.1206	3.10	30	
Heptachlor epoxide	0.130	0.00954	0.1907	0	68.3	41	161	0.1280	1.81	30	
gamma-Chlordane	0.125	0.00954	0.1907	0	65.4	40.9	132	0.1235	0.975	30	

Date: *8/15/2017*

Work Order: 1708018
CLIENT: Friedman & Bruya
Project: 707388

QC SUMMARY REPORT

Organochlorine Pesticides by EPA Method 8081

Sample ID **1707301-001AMSD**	SampType: **MSD**			Units: **mg/Kg-dry**		Prep Date: **8/4/2017**			RunNo: **37836**		
Client ID: **BATCH**	Batch ID: **17824**					Analysis Date: **8/7/2017**			SeqNo: **727582**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Endosulfan I	0.127	0.00954	0.1907	0	66.4	44.7	162	0.1264	0.211	30	
alpha-Chlordane	0.126	0.00954	0.1907	0	66.0	41.4	132	0.1248	0.909	30	
Dieldrin	0.127	0.00954	0.1907	0	66.6	43.9	155	0.1282	0.926	30	
4,4´-DDE	0.135	0.00954	0.1907	0	70.6	34	166	0.1358	0.768	30	
Endrin	0.131	0.00954	0.1907	0	68.5	50.5	166	0.1341	2.50	30	
Endosulfan II	0.126	0.00954	0.1907	0	65.9	37.9	154	0.1344	6.61	30	
4,4´-DDD	0.128	0.00954	0.1907	0	67.2	38.9	144	0.1345	4.88	30	
Endrin aldehyde	0.109	0.00954	0.1907	0	57.1	38.3	156	0.1254	14.1	30	
Endosulfan sulfate	0.122	0.00954	0.1907	0	63.8	25.2	144	0.1351	10.5	30	
4,4´-DDT	0.154	0.00954	0.1907	0	81.0	38.4	160	0.1630	5.34	30	
Endrin ketone	0.133	0.00954	0.1907	0	69.7	40.2	119	0.1483	11.0	30	
Methoxychlor	0.168	0.00954	0.1907	0	88.0	43.4	178	0.1849	9.64	30	
Surr: Decachlorobiphenyl	0.0354		0.04769		74.3	17.8	157		0		
Surr: Tetrachloro-m-xylene	0.0372		0.04769		78.1	11	150		0		

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1708018**
Logged by:	**Clare Griggs**	Date Received:	**8/1/2017 12:19:00 PM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☐	Not Required ☑
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C*	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: ______ Date ______

By Whom: ______ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: ______

Client Instructions: ______

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler	4.6
Sample	2.7

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY 1708018

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont	
PROJECT NAME/NO. 707388	PO # F-26
REMARKS Please Email Results	

Page # 1 of 1

TURNAROUND TIME
- ☐ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M	Chlorinated Pesticides	Chlorinated Herbicides	Dioxins/Furans	Notes
ISM-DU3-072517		7/25/17	1407	Soil	3								X	X		10g in each vial
ISM-DU2-072617		7/26/17	1232	↓	3								X	X		↓
ISM-DU1-072617		↓	1500	↓	3								X	X		↓
																Dry weight will
																be forwarded
																upon completion

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Michael Erdahl	Friedman and Bruya	8/1/17	Noon
Received by:				
Relinquished by:				
Received by: [signature]			8/1/17	1219

#07388 [redacted]

SAMPLE CHAIN OF CUSTODY

ME 07-27-17 [redacted] BI4 / VS2 / VW1

Page # 1 of 1

Report To: Ali Cochrane & Carla Brock

Company: Aspect Consulting

Address:

City, State, ZIP: Seattle Office

Phone: Email:

SAMPLERS (signature)	Kst Beck
PROJECT NAME	PO #
Shelton C Street Landfill	150074
REMARKS	INVOICE TO
	Accts Payable

TURNAROUND TIME
☒ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Archive Samples
☐ Other

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	~~ISM~~ PCBs	Dioxins/furans	chlorinated pesticides	herbicides	Notes
ISM-DU3-072517	01	7/25/17	1407	soil	1		X	X			X		X	X	X	X	
ISM-DU2-072617	02	7/26/17	1232	soil	1		X	X			X		X	X	X	X	
ISM-DU1-072617	03	7/26/17	1500	soil	1		X	X			X		X	X	X	X	
DU3-P7-072617	04 A-D		1605		4			X		X							
DU3-P3-072617	05		1556		4			X		X							
DU2-L2-072617	06		1545		4			X		X							
DU2-L7-072617	07		1539		4			X		X							
DU2-G7-072617	08		1527		4			X		X							
DU2-G2-072617	09		1517		4			X		X							Samples received at 3 °C
~~DU3~~ DU1-C2-072617	10		1503		4			X		X							Trip Blank added in lab
Trip Blank	11																

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Kst Beck	Kristin Beck	Aspect	7/27/17	
Received by: [signature]	Eric Vasquez	FedEx	7-27-17	840am
Relinquished by:				
Received by: [signature]	DD VD	F+BI	7-27-17	9:45

Soil Gas Results

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

January 8, 2019

Carla Brock, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

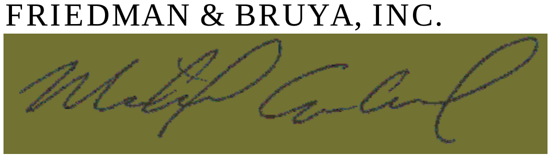
Dear Ms Brock:

Included are the results from the testing of material submitted on December 21, 2018 from the Shelton C St. Landfill 150074, F&BI 812315 project. There are 17 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Data Aspect, Kristin Beck
ASP0108R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on December 21, 2018 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Shelton C St. Landfill 150074, F&BI 812315 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
812315 -01	SG-1-121918
812315 -02	SG-2-121918
812315 -03	SG-3-121918
812315 -04	SG-4-121918
812315 -05	SG-5-121918
812315 -06	Ambient-121918

Samples SG-1-121918, SG-2-121918, SG-3-121918, SG-4-121918, and SG-5-121918 were sent to Fremont Analytical for methane analysis. The report is enclosed.

Several analytes exceeded the calibration range. The data were flagged accordingly.

2-Propanol the TO-15 laboratory control sample failed the acceptance criteria. The data were flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	SG-1-121918	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St. Landfill 150074, F&BI 812315
Date Collected:	12/19/18	Lab ID:	812315-01 1/7.5
Date Analyzed:	01/03/19	Data File:	010228.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS/BAT

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	79	70	130

Compounds:	Concentration ug/m3
APH EC5-8 aliphatics	6,300
APH EC9-12 aliphatics	330
APH EC9-10 aromatics	<190

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	SG-2-121918	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St. Landfill 150074, F&BI 812315
Date Collected:	12/19/18	Lab ID:	812315-02 1/1.6
Date Analyzed:	01/03/19	Data File:	010225.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS/BAT

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	90	70	130

Compounds:	Concentration ug/m3
APH EC5-8 aliphatics	410
APH EC9-12 aliphatics	110
APH EC9-10 aromatics	<40

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	SG-3-121918	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St. Landfill 150074, F&BI 812315
Date Collected:	12/19/18	Lab ID:	812315-03 1/1.5
Date Analyzed:	01/03/19	Data File:	010226.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS/BAT

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	84	70	130

Compounds:	Concentration ug/m3
APH EC5-8 aliphatics	910
APH EC9-12 aliphatics	550
APH EC9-10 aromatics	<37

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	SG-4-121918	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St. Landfill 150074, F&BI 812315
Date Collected:	12/19/18	Lab ID:	812315-04 1/14.6
Date Analyzed:	01/03/19	Data File:	010229.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS/BAT

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	83	70	130

Compounds:	Concentration ug/m3
APH EC5-8 aliphatics	23,000 ve
APH EC9-12 aliphatics	1,200
APH EC9-10 aromatics	<360

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	SG-5-121918	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St. Landfill 150074, F&BI 812315
Date Collected:	12/19/18	Lab ID:	812315-05 1/1.5
Date Analyzed:	01/03/19	Data File:	010227.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS/BAT

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	94	70	130

Compounds:	Concentration ug/m3
APH EC5-8 aliphatics	540
APH EC9-12 aliphatics	250
APH EC9-10 aromatics	<37

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C St. Landfill 150074, F&BI 812315
Date Collected:	Not Applicable	Lab ID:	09-004 mb
Date Analyzed:	01/02/19	Data File:	010208.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS/BAT

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	81	70	130

Compounds:	Concentration ug/m3
APH EC5-8 aliphatics	<46
APH EC9-12 aliphatics	<35
APH EC9-10 aromatics	<25

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	SG-1-121918	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St. Landfill 150074, F&BI 812315
Date Collected:	12/19/18	Lab ID:	812315-01 1/7.5
Date Analyzed:	01/03/19	Data File:	010228.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS/BAT

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	86	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	ug/m3	ppbv
Propene	560 ve	330 ve	1,2-Dichloropropane	<1.7	<0.37
Dichlorodifluoromethane	7.8	1.6	1,4-Dioxane	<2.7	<0.75
Chloromethane	<15	<7.5	2,2,4-Trimethylpentane	<35	<7.5
F-114	15	2.2	Methyl methacrylate	<31	<7.5
Vinyl chloride	<1.9	<0.75	Heptane	230	57
1,3-Butadiene	<0.17	<0.075	Bromodichloromethane	<0.5	<0.075
Butane	2,100 ve	870 ve	Trichloroethene	8.4	1.6
Bromomethane	<12	<3	cis-1,3-Dichloropropene	<3.4	<0.75
Chloroethane	<20	<7.5	4-Methyl-2-pentanone	<31	<7.5
Vinyl bromide	<3.3	<0.75	trans-1,3-Dichloropropene	<3.4	<0.75
Ethanol	760 ve	400 ve	Toluene	19	5.2
Acrolein	<6.9	<3	1,1,2-Trichloroethane	<0.82	<0.15
Pentane	1,800 ve	620 ve	2-Hexanone	<31	<7.5
Trichlorofluoromethane	<17	<3	Tetrachloroethene	120	17
Acetone	<36	<15	Dibromochloromethane	<0.64	<0.075
2-Propanol	<65 jl	<26 jl	1,2-Dibromoethane (EDB)	<0.58	<0.075
1,1-Dichloroethene	<3	<0.75	Chlorobenzene	<3.5	<0.75
trans-1,2-Dichloroethene	<3	<0.75	Ethylbenzene	4.9	1.1
Methylene chloride	<650	<190	1,1,2,2-Tetrachloroethane	<1	<0.15
t-Butyl alcohol (TBA)	<91	<30	Nonane	<39	<7.5
3-Chloropropene	<9.4	<3	Isopropylbenzene	<18	<3.7
CFC-113	<5.7	<0.75	2-Chlorotoluene	<39	<7.5
Carbon disulfide	<47	<15	Propylbenzene	<18	<3.7
Methyl t-butyl ether (MTBE)	<14	<3.7	4-Ethyltoluene	<18	<3.7
Vinyl acetate	<53	<15	m,p-Xylene	8.8	2.0
1,1-Dichloroethane	<3	<0.75	o-Xylene	<3.3	<0.75
cis-1,2-Dichloroethene	<3	<0.75	Styrene	<6.4	<1.5
Hexane	790 ve	220 ve	Bromoform	<16	<1.5
Chloroform	<0.37	<0.075	Benzyl chloride	<0.39	<0.075
Ethyl acetate	<54	<15	1,3,5-Trimethylbenzene	<18	<3.7
Tetrahydrofuran	<2.2	<0.75	1,2,4-Trimethylbenzene	<18	<3.7
2-Butanone (MEK)	<22	<7.5	1,3-Dichlorobenzene	<4.5	<0.75
1,2-Dichloroethane (EDC)	<0.3	<0.075	1,4-Dichlorobenzene	<1.8	<0.3
1,1,1-Trichloroethane	<4.1	<0.75	1,2-Dichlorobenzene	<4.5	<0.75
Carbon tetrachloride	<4.7	<0.75	1,2,4-Trichlorobenzene	<5.6	<0.75
Benzene	62	19	Naphthalene	<3.9	<0.75
Cyclohexane	<52	<15	Hexachlorobutadiene	<1.6	<0.15

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	SG-2-121918	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St. Landfill 150074, F&BI 812315
Date Collected:	12/19/18	Lab ID:	812315-02 1/1.6
Date Analyzed:	01/03/19	Data File:	010225.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS/BAT

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	97	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	ug/m3	ppbv
Propene	76 ve	44 ve	1,2-Dichloropropane	<0.37	<0.08
Dichlorodifluoromethane	3.8	0.76	1,4-Dioxane	<0.58	<0.16
Chloromethane	<3.3	<1.6	2,2,4-Trimethylpentane	<7.5	<1.6
F-114	1.2	0.17	Methyl methacrylate	<6.6	<1.6
Vinyl chloride	<0.41	<0.16	Heptane	16	3.9
1,3-Butadiene	<0.035	<0.016	Bromodichloromethane	<0.11	<0.016
Butane	81	34	Trichloroethene	<0.43	<0.08
Bromomethane	<2.5	<0.64	cis-1,3-Dichloropropene	<0.73	<0.16
Chloroethane	<4.2	<1.6	4-Methyl-2-pentanone	<6.6	<1.6
Vinyl bromide	<0.7	<0.16	trans-1,3-Dichloropropene	<0.73	<0.16
Ethanol	<12	<6.4	Toluene	9.9	2.6
Acrolein	4.5	2.0	1,1,2-Trichloroethane	<0.17	<0.032
Pentane	44	15	2-Hexanone	<6.6	<1.6
Trichlorofluoromethane	<3.6	<0.64	Tetrachloroethene	100	15
Acetone	140 ve	58 ve	Dibromochloromethane	<0.14	<0.016
2-Propanol	<14 jl	<5.6 jl	1,2-Dibromoethane (EDB)	<0.12	<0.016
1,1-Dichloroethene	<0.63	<0.16	Chlorobenzene	<0.74	<0.16
trans-1,2-Dichloroethene	<0.63	<0.16	Ethylbenzene	5.0	1.1
Methylene chloride	<140	<40	1,1,2,2-Tetrachloroethane	<0.22	<0.032
t-Butyl alcohol (TBA)	<19	<6.4	Nonane	<8.4	<1.6
3-Chloropropene	<2	<0.64	Isopropylbenzene	<3.9	<0.8
CFC-113	<1.2	<0.16	2-Chlorotoluene	<8.3	<1.6
Carbon disulfide	<10	<3.2	Propylbenzene	<3.9	<0.8
Methyl t-butyl ether (MTBE)	<2.9	<0.8	4-Ethyltoluene	<3.9	<0.8
Vinyl acetate	<11	<3.2	m,p-Xylene	24	5.4
1,1-Dichloroethane	<0.65	<0.16	o-Xylene	8.8	2.0
cis-1,2-Dichloroethene	<0.63	<0.16	Styrene	<1.4	<0.32
Hexane	27	7.7	Bromoform	<3.3	<0.32
Chloroform	0.17	0.035	Benzyl chloride	<0.083	<0.016
Ethyl acetate	<12	<3.2	1,3,5-Trimethylbenzene	<3.9	<0.8
Tetrahydrofuran	<0.47	<0.16	1,2,4-Trimethylbenzene	<3.9	<0.8
2-Butanone (MEK)	23	7.8	1,3-Dichlorobenzene	<0.96	<0.16
1,2-Dichloroethane (EDC)	<0.065	<0.016	1,4-Dichlorobenzene	<0.38	<0.064
1,1,1-Trichloroethane	<0.87	<0.16	1,2-Dichlorobenzene	<0.96	<0.16
Carbon tetrachloride	<1	<0.16	1,2,4-Trichlorobenzene	<1.2	<0.16
Benzene	7.3	2.3	Naphthalene	<0.84	<0.16
Cyclohexane	17	4.8	Hexachlorobutadiene	<0.34	<0.032

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	SG-3-121918	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St. Landfill 150074, F&BI 812315
Date Collected:	12/19/18	Lab ID:	812315-03 1/1.5
Date Analyzed:	01/03/19	Data File:	010226.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS/BAT

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	92	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	ug/m3	ppbv
Propene	230 ve	130 ve	1,2-Dichloropropane	<0.35	<0.075
Dichlorodifluoromethane	30	6.1	1,4-Dioxane	<0.54	<0.15
Chloromethane	<3.1	<1.5	2,2,4-Trimethylpentane	<7	<1.5
F-114	33	4.7	Methyl methacrylate	<6.1	<1.5
Vinyl chloride	<0.38	<0.15	Heptane	30	7.2
1,3-Butadiene	<0.033	<0.015	Bromodichloromethane	<0.1	<0.015
Butane	150 ve	65 ve	Trichloroethene	<0.4	<0.075
Bromomethane	<2.3	<0.6	cis-1,3-Dichloropropene	<0.68	<0.15
Chloroethane	<4	<1.5	4-Methyl-2-pentanone	<6.1	<1.5
Vinyl bromide	<0.66	<0.15	trans-1,3-Dichloropropene	<0.68	<0.15
Ethanol	<11	<6	Toluene	26	6.9
Acrolein	9.8	4.3	1,1,2-Trichloroethane	<0.16	<0.03
Pentane	77	26	2-Hexanone	<6.1	<1.5
Trichlorofluoromethane	5.3	0.94	Tetrachloroethene	67	9.9
Acetone	200 ve	84 ve	Dibromochloromethane	<0.13	<0.015
2-Propanol	<13 jl	<5.2 jl	1,2-Dibromoethane (EDB)	<0.12	<0.015
1,1-Dichloroethene	<0.59	<0.15	Chlorobenzene	<0.69	<0.15
trans-1,2-Dichloroethene	<0.59	<0.15	Ethylbenzene	4.9	1.1
Methylene chloride	<130	<37	1,1,2,2-Tetrachloroethane	<0.21	<0.03
t-Butyl alcohol (TBA)	<18	<6	Nonane	16	3.0
3-Chloropropene	<1.9	<0.6	Isopropylbenzene	<3.7	<0.75
CFC-113	<1.1	<0.15	2-Chlorotoluene	<7.8	<1.5
Carbon disulfide	<9.3	<3	Propylbenzene	<3.7	<0.75
Methyl t-butyl ether (MTBE)	<2.7	<0.75	4-Ethyltoluene	<3.7	<0.75
Vinyl acetate	<11	<3	m,p-Xylene	9.1	2.1
1,1-Dichloroethane	<0.61	<0.15	o-Xylene	2.9	0.67
cis-1,2-Dichloroethene	<0.59	<0.15	Styrene	<1.3	<0.3
Hexane	51	15	Bromoform	<3.1	<0.3
Chloroform	0.94	0.19	Benzyl chloride	<0.078	<0.015
Ethyl acetate	<11	<3	1,3,5-Trimethylbenzene	<3.7	<0.75
Tetrahydrofuran	<0.44	<0.15	1,2,4-Trimethylbenzene	<3.7	<0.75
2-Butanone (MEK)	37	13	1,3-Dichlorobenzene	<0.9	<0.15
1,2-Dichloroethane (EDC)	0.27	0.067	1,4-Dichlorobenzene	<0.36	<0.06
1,1,1-Trichloroethane	<0.82	<0.15	1,2-Dichlorobenzene	<0.9	<0.15
Carbon tetrachloride	1.8	0.28	1,2,4-Trichlorobenzene	<1.1	<0.15
Benzene	26	8.1	Naphthalene	<0.79	<0.15
Cyclohexane	26	7.7	Hexachlorobutadiene	<0.32	<0.03

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	SG-4-121918	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St. Landfill 150074, F&BI 812315
Date Collected:	12/19/18	Lab ID:	812315-04 1/14.6
Date Analyzed:	01/03/19	Data File:	010229.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS/BAT

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	90	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	ug/m3	ppbv
Propene	5,500 ve	3,200 ve	1,2-Dichloropropane	<3.4	<0.73
Dichlorodifluoromethane	13	2.7	1,4-Dioxane	<5.3	<1.5
Chloromethane	<30	<15	2,2,4-Trimethylpentane	<68	<15
F-114	17	2.5	Methyl methacrylate	<60	<15
Vinyl chloride	20	8.0	Heptane	1,100	270
1,3-Butadiene	<0.32	<0.15	Bromodichloromethane	<0.98	<0.15
Butane	4,200 ve	1,800 ve	Trichloroethene	5.7	1.1
Bromomethane	<23	<5.8	cis-1,3-Dichloropropene	<6.6	<1.5
Chloroethane	<39	<15	4-Methyl-2-pentanone	<60	<15
Vinyl bromide	<6.4	<1.5	trans-1,3-Dichloropropene	<6.6	<1.5
Ethanol	<110	<58	Toluene	160	44
Acrolein	<13	<5.8	1,1,2-Trichloroethane	<1.6	<0.29
Pentane	3,100 ve	1,100 ve	2-Hexanone	<60	<15
Trichlorofluoromethane	<33	<5.8	Tetrachloroethene	<99	<15
Acetone	410	170	Dibromochloromethane	<1.2	<0.15
2-Propanol	<130 jl	<51 jl	1,2-Dibromoethane (EDB)	<1.1	<0.15
1,1-Dichloroethene	<5.8	<1.5	Chlorobenzene	<6.7	<1.5
trans-1,2-Dichloroethene	<5.8	<1.5	Ethylbenzene	15	3.5
Methylene chloride	<1,300	<360	1,1,2,2-Tetrachloroethane	<2	<0.29
t-Butyl alcohol (TBA)	<180	<58	Nonane	170	32
3-Chloropropene	<18	<5.8	Isopropylbenzene	<36	<7.3
CFC-113	<11	<1.5	2-Chlorotoluene	<76	<15
Carbon disulfide	230	73	Propylbenzene	<36	<7.3
Methyl t-butyl ether (MTBE)	<26	<7.3	4-Ethyltoluene	<36	<7.3
Vinyl acetate	<100	<29	m,p-Xylene	32	7.4
1,1-Dichloroethane	<5.9	<1.5	o-Xylene	12	2.7
cis-1,2-Dichloroethene	<5.8	<1.5	Styrene	<12	<2.9
Hexane	1,900 ve	540 ve	Bromoform	<30	<2.9
Chloroform	<0.71	<0.15	Benzyl chloride	<0.76	<0.15
Ethyl acetate	<110	<29	1,3,5-Trimethylbenzene	<36	<7.3
Tetrahydrofuran	<4.3	<1.5	1,2,4-Trimethylbenzene	<36	<7.3
2-Butanone (MEK)	180	60	1,3-Dichlorobenzene	<8.8	<1.5
1,2-Dichloroethane (EDC)	<0.59	<0.15	1,4-Dichlorobenzene	<3.5	<0.58
1,1,1-Trichloroethane	<8	<1.5	1,2-Dichlorobenzene	<8.8	<1.5
Carbon tetrachloride	<9.2	<1.5	1,2,4-Trichlorobenzene	<11	<1.5
Benzene	220	69	Naphthalene	<7.7	<1.5
Cyclohexane	170	50	Hexachlorobutadiene	<3.1	<0.29

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	SG-5-121918	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St. Landfill 150074, F&BI 812315
Date Collected:	12/19/18	Lab ID:	812315-05 1/1.5
Date Analyzed:	01/03/19	Data File:	010227.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS/BAT

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	102	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	ug/m3	ppbv
Propene	380 ve	220 ve	1,2-Dichloropropane	<0.35	<0.075
Dichlorodifluoromethane	31	6.3	1,4-Dioxane	<0.54	<0.15
Chloromethane	<3.1	<1.5	2,2,4-Trimethylpentane	<7	<1.5
F-114	180	26	Methyl methacrylate	<6.1	<1.5
Vinyl chloride	2.2	0.85	Heptane	8.2	2.0
1,3-Butadiene	<0.033	<0.015	Bromodichloromethane	<0.1	<0.015
Butane	300 ve	130 ve	Trichloroethene	4.3	0.79
Bromomethane	<2.3	<0.6	cis-1,3-Dichloropropene	<0.68	<0.15
Chloroethane	<4	<1.5	4-Methyl-2-pentanone	<6.1	<1.5
Vinyl bromide	<0.66	<0.15	trans-1,3-Dichloropropene	<0.68	<0.15
Ethanol	<11	<6	Toluene	34	9.1
Acrolein	<1.4	<0.6	1,1,2-Trichloroethane	<0.16	<0.03
Pentane	61	21	2-Hexanone	<6.1	<1.5
Trichlorofluoromethane	<3.4	<0.6	Tetrachloroethene	14	2.0
Acetone	<7.1	<3	Dibromochloromethane	<0.13	<0.015
2-Propanol	<13 jl	<5.2 jl	1,2-Dibromoethane (EDB)	<0.12	<0.015
1,1-Dichloroethene	1.3	0.34	Chlorobenzene	0.70	0.15
trans-1,2-Dichloroethene	<0.59	<0.15	Ethylbenzene	8.0	1.8
Methylene chloride	<130	<37	1,1,2,2-Tetrachloroethane	<0.21	<0.03
t-Butyl alcohol (TBA)	<18	<6	Nonane	<7.9	<1.5
3-Chloropropene	<1.9	<0.6	Isopropylbenzene	<3.7	<0.75
CFC-113	<1.1	<0.15	2-Chlorotoluene	<7.8	<1.5
Carbon disulfide	<9.3	<3	Propylbenzene	<3.7	<0.75
Methyl t-butyl ether (MTBE)	<2.7	<0.75	4-Ethyltoluene	<3.7	<0.75
Vinyl acetate	<11	<3	m,p-Xylene	12	2.7
1,1-Dichloroethane	0.87	0.21	o-Xylene	4.0	0.93
cis-1,2-Dichloroethene	3.5	0.88	Styrene	<1.3	<0.3
Hexane	20	5.6	Bromoform	<3.1	<0.3
Chloroform	<0.073	<0.015	Benzyl chloride	0.085 fb	0.016 fb
Ethyl acetate	<11	<3	1,3,5-Trimethylbenzene	<3.7	<0.75
Tetrahydrofuran	<0.44	<0.15	1,2,4-Trimethylbenzene	<3.7	<0.75
2-Butanone (MEK)	<4.4	<1.5	1,3-Dichlorobenzene	<0.9	<0.15
1,2-Dichloroethane (EDC)	<0.061	<0.015	1,4-Dichlorobenzene	<0.36	<0.06
1,1,1-Trichloroethane	<0.82	<0.15	1,2-Dichlorobenzene	<0.9	<0.15
Carbon tetrachloride	<0.94	<0.15	1,2,4-Trichlorobenzene	<1.1	<0.15
Benzene	38	12	Naphthalene	<0.79	<0.15
Cyclohexane	<10	<3	Hexachlorobutadiene	<0.32	<0.03

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C St. Landfill 150074, F&BI 812315
Date Collected:	Not Applicable	Lab ID:	09-004 mb
Date Analyzed:	01/02/19	Data File:	010208.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	MS/BAT

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	88	70	130

Compounds:	Concentration ug/m3	ppbv	Compounds:	Concentration ug/m3	ppbv
Propene	<0.69	<0.4	1,2-Dichloropropane	<0.23	<0.05
Dichlorodifluoromethane	<0.49	<0.1	1,4-Dioxane	<0.36	<0.1
Chloromethane	<2.1	<1	2,2,4-Trimethylpentane	<4.7	<1
F-114	<0.7	<0.1	Methyl methacrylate	<4.1	<1
Vinyl chloride	<0.26	<0.1	Heptane	<4.1	<1
1,3-Butadiene	<0.022	<0.01	Bromodichloromethane	<0.067	<0.01
Butane	<2.4	<1	Trichloroethene	<0.27	<0.05
Bromomethane	<1.6	<0.4	cis-1,3-Dichloropropene	<0.45	<0.1
Chloroethane	<2.6	<1	4-Methyl-2-pentanone	<4.1	<1
Vinyl bromide	<0.44	<0.1	trans-1,3-Dichloropropene	<0.45	<0.1
Ethanol	<7.5	<4	Toluene	<0.38	<0.1
Acrolein	<0.92	<0.4	1,1,2-Trichloroethane	<0.11	<0.02
Pentane	<3	<1	2-Hexanone	<4.1	<1
Trichlorofluoromethane	<2.2	<0.4	Tetrachloroethene	<6.8	<1
Acetone	<4.8	<2	Dibromochloromethane	<0.085	<0.01
2-Propanol	<8.6 jl	<3.5 jl	1,2-Dibromoethane (EDB)	<0.077	<0.01
1,1-Dichloroethene	<0.4	<0.1	Chlorobenzene	<0.46	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1	Ethylbenzene	<0.43	<0.1
Methylene chloride	<87	<25	1,1,2,2-Tetrachloroethane	<0.14	<0.02
t-Butyl alcohol (TBA)	<12	<4	Nonane	<5.2	<1
3-Chloropropene	<1.3	<0.4	Isopropylbenzene	<2.5	<0.5
CFC-113	<0.77	<0.1	2-Chlorotoluene	<5.2	<1
Carbon disulfide	<6.2	<2	Propylbenzene	<2.5	<0.5
Methyl t-butyl ether (MTBE)	<1.8	<0.5	4-Ethyltoluene	<2.5	<0.5
Vinyl acetate	<7	<2	m,p-Xylene	<0.87	<0.2
1,1-Dichloroethane	<0.4	<0.1	o-Xylene	<0.43	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1	Styrene	<0.85	<0.2
Hexane	<3.5	<1	Bromoform	<2.1	<0.2
Chloroform	<0.049	<0.01	Benzyl chloride	<0.052	<0.01
Ethyl acetate	<7.2	<2	1,3,5-Trimethylbenzene	<2.5	<0.5
Tetrahydrofuran	<0.29	<0.1	1,2,4-Trimethylbenzene	<2.5	<0.5
2-Butanone (MEK)	<2.9	<1	1,3-Dichlorobenzene	<0.6	<0.1
1,2-Dichloroethane (EDC)	<0.04	<0.01	1,4-Dichlorobenzene	<0.24	<0.04
1,1,1-Trichloroethane	<0.55	<0.1	1,2-Dichlorobenzene	<0.6	<0.1
Carbon tetrachloride	<0.63	<0.1	1,2,4-Trichlorobenzene	<0.74	<0.1
Benzene	<0.32	<0.1	Naphthalene	<0.52	<0.1
Cyclohexane	<6.9	<2	Hexachlorobutadiene	<0.21	<0.02

Date of Report: 01/08/19
Date Received: 12/21/18
Project: Shelton C St. Landfill 150074, F&BI 812315

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD MA-APH

Laboratory Code: 812391-03 1/1.6 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
APH EC5-8 aliphatics	ug/m3	430	420	2
APH EC9-12 aliphatics	ug/m3	140	150	7
APH EC9-10 aromatics	ug/m3	<40	<40	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
APH EC5-8 aliphatics	ug/m3	45	73	70-130
APH EC9-12 aliphatics	ug/m3	45	92	70-130
APH EC9-10 aromatics	ug/m3	45	86	70-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/08/19
Date Received: 12/21/18
Project: Shelton C St. Landfill 150074, F&BI 812315

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD TO-15

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Propene	ppbv	5	83	70-130
Dichlorodifluoromethane	ppbv	5	95	70-130
Chloromethane	ppbv	5	85	70-130
F-114	ppbv	5	111	70-130
Vinyl chloride	ppbv	5	94	70-130
1,3-Butadiene	ppbv	5	94	70-130
Butane	ppbv	5	90	70-130
Bromomethane	ppbv	5	113	70-130
Chloroethane	ppbv	5	99	70-130
Vinyl Bromide	ppbv	5	108	70-130
Ethanol	ppbv	5	81	70-130
Acrolein	ppbv	5	97	70-130
Pentane	ppbv	5	82	70-130
Trichlorofluoromethane	ppbv	5	101	70-130
Acetone	ppbv	5	94	70-130
2-Propanol	ppbv	5	35 vo	70-130
1,1-Dichloroethene	ppbv	5	105	70-130
trans-1,2-Dichloroethene	ppbv	5	108	70-130
Methylene chloride	ppbv	5	121	70-130
t-Butyl alcohol (TBA)	ppbv	5	101	70-130
3-Chloropropene	ppbv	5	89	70-130
CFC-113	ppbv	5	108	70-130
Carbon disulfide	ppbv	5	95	70-130
Methyl t-butyl ether (MTBE)	ppbv	5	108	70-130
Vinyl acetate	ppbv	5	97	70-130
1,1-Dichloroethane	ppbv	5	102	70-130
cis-1,2-Dichloroethene	ppbv	5	108	70-130
Hexane	ppbv	5	112	70-130
Chloroform	ppbv	5	108	70-130
Ethyl acetate	ppbv	5	94	70-130
Tetrahydrofuran	ppbv	5	91	70-130
2-Butanone (MEK)	ppbv	5	104	70-130
1,2-Dichloroethane (EDC)	ppbv	5	101	70-130
1,1,1-Trichloroethane	ppbv	5	114	70-130
Carbon tetrachloride	ppbv	5	113	70-130
Benzene	ppbv	5	107	70-130
Cyclohexane	ppbv	5	110	70-130
1,2-Dichloropropane	ppbv	5	80	70-130
1,4-Dioxane	ppbv	5	89	70-130
2,2,4-Trimethylpentane	ppbv	5	87	70-130
Methyl methacrylate	ppbv	5	79	70-130

Date of Report: 01/08/19
Date Received: 12/21/18
Project: Shelton C St. Landfill 150074, F&BI 812315

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD TO-15

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Heptane	ppbv	5	79	70-130
Bromodichloromethane	ppbv	5	88	70-130
Trichloroethene	ppbv	5	91	70-130
cis-1,3-Dichloropropene	ppbv	5	88	70-130
4-Methyl-2-pentanone	ppbv	5	98	70-130
trans-1,3-Dichloropropene	ppbv	5	86	70-130
Toluene	ppbv	5	95	70-130
1,1,2-Trichloroethane	ppbv	5	87	70-130
2-Hexanone	ppbv	5	84	70-130
Tetrachloroethene	ppbv	5	101	70-130
Dibromochloromethane	ppbv	5	100	70-130
1,2-Dibromoethane (EDB)	ppbv	5	95	70-130
Chlorobenzene	ppbv	5	89	70-130
Ethylbenzene	ppbv	5	94	70-130
1,1,2,2-Tetrachloroethane	ppbv	5	92	70-130
Nonane	ppbv	5	88	70-130
Isopropylbenzene	ppbv	5	97	70-130
2-Chlorotoluene	ppbv	5	102	70-130
Propylbenzene	ppbv	5	96	70-130
4-Ethyltoluene	ppbv	5	99	70-130
m,p-Xylene	ppbv	10	98	70-130
o-Xylene	ppbv	5	97	70-130
Styrene	ppbv	5	101	70-130
Bromoform	ppbv	5	112	70-130
Benzyl chloride	ppbv	5	96	70-130
1,3,5-Trimethylbenzene	ppbv	5	99	70-130
1,2,4-Trimethylbenzene	ppbv	5	98	70-130
1,3-Dichlorobenzene	ppbv	5	102	70-130
1,4-Dichlorobenzene	ppbv	5	100	70-130
1,2-Dichlorobenzene	ppbv	5	103	70-130
1,2,4-Trichlorobenzene	ppbv	5	99	70-130
Naphthalene	ppbv	5	101	70-130
Hexachlorobutadiene	ppbv	5	106	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 812315
Work Order Number: 1812326

December 27, 2018

Attention Michael Erdahl:

Fremont Analytical, Inc. received 5 sample(s) on 12/21/2018 for the analyses presented in the following report.

Major Gases by EPA Method 3C

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

DoD/ELAP Certification #L17-135, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

Date: *12/27/2018*

CLIENT:	Friedman & Bruya
Project:	812315
Work Order:	1812326

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1812326-001	SG-1-121918	12/19/2018 11:32 AM	12/21/2018 9:36 AM
1812326-002	SG-2-121918	12/19/2018 10:41 AM	12/21/2018 9:36 AM
1812326-003	SG-3-121918	12/19/2018 2:50 PM	12/21/2018 9:36 AM
1812326-004	SG-4-121918	12/19/2018 1:24 PM	12/21/2018 9:36 AM
1812326-005	SG-5-121918	12/19/2018 12:32 PM	12/21/2018 9:36 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1812326**

Date: **12/27/2018**

CLIENT: Friedman & Bruya

Project: 812315

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Samples are reported as a %.

The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Fremont Analytical

Analytical Report

Work Order: **1812326**
Date Reported: **12/27/2018**

CLIENT: Friedman & Bruya
Project: 812315

Lab ID: 1812326-001 **Collection Date:** 12/19/2018 11:32:00 AM
Client Sample ID: **SG-1-121918** **Matrix:** Air

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Major Gases by EPA Method 3C				Batch ID: R48577		Analyst: AD
Methane	ND	0.0500		%	1	12/21/2018 12:40:00 PM

Lab ID: 1812326-002 **Collection Date:** 12/19/2018 10:41:00 AM
Client Sample ID: **SG-2-121918** **Matrix:** Air

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Major Gases by EPA Method 3C				Batch ID: R48577		Analyst: AD
Methane	ND	0.0500		%	1	12/21/2018 12:55:00 PM

Lab ID: 1812326-003 **Collection Date:** 12/19/2018 2:50:00 PM
Client Sample ID: **SG-3-121918** **Matrix:** Air

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Major Gases by EPA Method 3C				Batch ID: R48577		Analyst: AD
Methane	ND	0.0500		%	1	12/21/2018 1:18:00 PM

CLIENT: Friedman & Bruya
Project: 812315

Lab ID: 1812326-004 | **Collection Date:** 12/19/2018 1:24:00 PM
Client Sample ID: **SG-4-121918** | **Matrix:** Air

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Major Gases by EPA Method 3C				Batch ID: R48577		Analyst: AD
Methane	ND	0.0500		%	1	12/21/2018 2:26:00 PM

Lab ID: 1812326-005 | **Collection Date:** 12/19/2018 12:32:00 PM
Client Sample ID: **SG-5-121918** | **Matrix:** Air

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Major Gases by EPA Method 3C				Batch ID: R48577		Analyst: AD
Methane	ND	0.0500		%	1	12/21/2018 2:55:00 PM

Fremont Analytical

Date: *12/27/2018*

Work Order: 1812326
CLIENT: Friedman & Bruya
Project: 812315

QC SUMMARY REPORT

Major Gases by EPA Method 3C

Sample ID **LCS-R48577**	SampType: **LCS**			Units: **%**		Prep Date: **12/21/2018**		RunNo: **48577**			
Client ID: **LCSW**	Batch ID: **R48577**					Analysis Date: **12/21/2018**		SeqNo: **952155**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	100	0.0500	100.0	0	100	70	130				

Sample ID **1812276-001BREP**	SampType: **REP**			Units: **%**		Prep Date: **12/21/2018**		RunNo: **48577**			
Client ID: **BATCH**	Batch ID: **R48577**					Analysis Date: **12/21/2018**		SeqNo: **952149**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Methane	98.1	0.0500						98.11	0.0339	30	

Fremont Analytical

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1812326**
Logged by:	**Brianna Barnes**	Date Received:	**12/21/2018 9:36:00 AM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

3.	Coolers are present?	Yes ☐	No ☑	NA ☐
		Air samples.		
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☑	Not Required ☐
6.	Was an attempt made to cool the samples?	Yes ☐	No ☐	NA ☑
7.	Were all items received at a temperature of >0°C to 10.0°C*	Yes ☐	No ☐	NA ☑
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified:		Date	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

19. Additional remarks:

Item Information

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

18123266

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER FREMONT

PROJECT NAME/NO.	PO #
812315	A-671

REMARKS

Please Email Results

TURNAROUND TIME
☑ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Total Organic Carbon	COD	BOD	Chloride	Sulfate	Sulfide	Methane			Notes
SG-1-121918		12/19/18	1132	A	1							✓			
SG-2-121918		|	1041	A	1							✓			
SG-3-121918		|	1450	A	1							✓			
SG-4-121918		|	1324	A	1							✓			
SG-5-121918		|	1232	A	1							✓			

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Michael Erdahl	Friedman & Bruya	12/21/18	0843
Received by: [signature]	Nicole Greene	FAI	12/21/18	~~0943~~ NG 12/21 0936
Relinquished by:				
Received by:				

812315

SAMPLE CHAIN OF CUSTODY

ME 12-21-18

Page # 1 of 1

Report To ~~Carla Brock~~ & Kristin Beck
Company Aspect Consulting
Address 710 2nd Ave, Suite 550
City, State, ZIP Seattle, WA 98104
Phone ______ Email ______

SAMPLERS (signature) Kristin Beck	
PROJECT NAME	PO #
Shelton C St. Landfill	150074
REPORTING LEVEL ☐ Indoor Air ☐ Deep Soil Gas ☐ Sub Slab/Soil Gas ☐ SVE/Grab	INVOICE TO Accts payable

TURNAROUND TIME
☒ Standard
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☒ Dispose after 30 days
☐ Archive Samples
☐ Other

ANALYSIS REQUESTED

Sample Name	Lab ID	Canister ID	Flow Contr. ID	Date Sampled	Field Initial Press. (Hg)	Field Initial Time	Field Final Press. (Hg)	Field Final Time	TO-15 Full Scan	APH ~~TO-15 BTEXN~~	TO-15 cVOCs	Methane	Notes (X) -per KB 12/21/18 ME
SG-1-121918	01 A-B	3677	02	12/19/18	30	1132	5	1145	X	(X)		X	PID= 0.0 ppm
SG-2-121918	02	3669	17		30	1041	5	1047	X	(X)		X	PID= 6.3 ppm
SG-3-121918	03	3260	108		30	1450	5	1455	X	(X)		X	PID= 11.6 ppm
SG-4-121918	04	3254	101		30	1324	5	1328	X	(X)		X	PID= 0.0 ppm
SG-5-121918	05	3378	111		30	1232	5	1240	X	(X)		X	PID= 4.5 ppm
Ambient-121918	06	3476	07		30	1500	5	1505					Please hold

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Kristin Beck	Kristin Beck	Aspect	12/21/18	0640
Received by: S. Obom	S. Obom	FOB, Inc	12/21/18	0640
Relinquished by:				
Received by:		Samples received at 18 °C		

Groundwater Results

FRONTIER ANALYTICAL LABORATORY

NELAP ACCREDITED TNI LABORATORY

anuary 31, 2018

Mr. Michael Erdahl
Friedman and Bruya, Inc.
3012 16th Ave. W
Seattle, WA 98119

Dear Mr. Erdahl,

The following results are associated with Frontier Analytical Laboratory project **11211**. This corresponds to your project number **801176** and purchase order number **A-233**. Five aqueous samples were received at Frontier Analytical Laboratory (FAL) on 1/16/2018 in good condition. These samples were extracted and analyzed by EPA Method 1613 for tetra through octa chlorinated dibenzo dioxins and furans. The Toxic Equivalency (TEQ) for your samples has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Freidman and Bruya, Inc. requested a turnaround time of fifteen business days for project **11211**.

The following Level IV report consists of an Analytical Data section, a Sample Receipt section, a Laboratory Raw Data section, and an Instrument Raw Data section. The Analytical Data section contains our project-sample tracking log and the analytical results. The Sample Receipt section contains your original chain of custody, our sample login form and a sample photo. The Laboratory Raw Data section contains our project request sheet, a percent solids sheet, an extraction bench sheet and the cleanup bench sheet. The instrument raw data section contains three sub-sections; the sample results section, the initial calibration section and the continuing/ending calibration section. The sample results sub-section consists of the quantitation summary forms with chromatograms for all samples and QC. The initial calibration sub-section consists of the individual quantitation summary forms and chromatograms for each point of the initial calibration curve as well as an overall quantitation summary form of the initial calibration curve. The continuing/ending calibration sub-section consists of the quantitation summary forms and chromatograms for all beginning and ending calibration injections associated with the samples and QC. The Level IV data package on compact disk has been sent to you via OnTrac. The enclosed results are specifically for the samples referenced in this report only. These results meet all National Environmental Laboratory Accreditation Program (NELAP) requirements and shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP Certificate number is 4041. Our State of California ELAP certificate number is **2934.**

If you have any questions regarding project **11211**, please feel free to contact me at (916) 934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,

Thomas C. Crabtree

Thomas C. Crabtree
Director

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: **11211**

Received on: **01/16/2018** Project Due: **02/07/2018** Storage: **R2**

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
11211-001-SA	0	801176	AMW-3-011218	EPA 1613 D/F	Aqueous	01/12/2018	10:15 am	01/14/2019
11211-002-SA	0	801176	AMW-4-011218	EPA 1613 D/F	Aqueous	01/12/2018	12:15 pm	01/14/2019
11211-003-SA	0	801176	AMW-2-011218	EPA 1613 D/F	Aqueous	01/12/2018	01:50 pm	01/14/2019
11211-004-SA	0	801176	AMW-1-011218	EPA 1613 D/F	Aqueous	01/12/2018	03:30 pm	01/14/2019
11211-005-SA	0	801176	AMW-5-011218	EPA 1613 D/F	Aqueous	01/12/2018	05:00 pm	01/14/2019

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com

EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 11211-001-MB	Date Extracted: 01-25-2018	ICal: PCDDFAL3-12-22-17	Acquired: 01-26-2018
Client ID: Method Blank	Date Received: NA	GC Column: DB5MS	2005 WHO TEQ: 0.0
Matrix: Aqueous	Amount: 1.000 L	Units: pg/L	
Batch No: X4385			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.588		-	0.209				
1,2,3,7,8-PeCDD	ND	0.892		-	0.231				
1,2,3,4,7,8-HxCDD	ND	1.75		-	0.305				
1,2,3,6,7,8-HxCDD	ND	1.75		-	0.319	Total TCDD	ND	0.588	
1,2,3,7,8,9-HxCDD	ND	1.70		-	0.306	Total PeCDD	ND	0.892	
1,2,3,4,6,7,8-HpCDD	ND	2.03		-	0.408	Total HxCDD	ND	1.75	
OCDD	ND	4.95		-	1.01	Total HpCDD	ND	2.03	
2,3,7,8-TCDF	ND	0.699		-	0.196				
1,2,3,7,8-PeCDF	ND	0.889		-	0.271				
2,3,4,7,8-PeCDF	ND	0.937		-	0.303				
1,2,3,4,7,8-HxCDF	ND	0.940		-	0.251				
1,2,3,6,7,8-HxCDF	ND	0.986		-	0.260				
2,3,4,6,7,8-HxCDF	ND	1.02		-	0.279				
1,2,3,7,8,9-HxCDF	ND	1.38		-	0.332	Total TCDF	ND	0.699	
1,2,3,4,6,7,8-HpCDF	ND	1.30		-	0.324	Total PeCDF	ND	0.937	
1,2,3,4,7,8,9-HpCDF	ND	1.81		-	0.401	Total HxCDF	ND	1.38	
OCDF	ND	2.61		-	0.619	Total HpCDF	ND	1.81	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	84.9	25.0 - 164	
13C-1,2,3,7,8-PeCDD	76.6	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	79.0	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	76.7	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	72.8	23.0 - 140	
13C-OCDD	68.7	17.0 - 157	
13C-2,3,7,8-TCDF	84.7	24.0 - 169	
13C-1,2,3,7,8-PeCDF	75.6	24.0 - 185	
13C-2,3,4,7,8-PeCDF	74.4	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	81.9	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	78.4	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	79.4	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	70.3	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	72.3	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	70.4	26.0 - 138	
13C-OCDF	64.6	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	87.3	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst:

Date: 1/30/2018

Reviewed By:

Date: 1/30/2018

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 11211-001-OPR	Date Extracted: 01-25-2018	ICal: PCDDFAL3-12-22-17	Acquired: 01-26-2018
Client ID: OPR	Date Received: NA	GC Column: DB5MS	2005 WHO TEQ: NA
Matrix: Aqueous	Amount: 1.000 L	Units: ng/ml	
Batch No: X4385			

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	10.5	6.70 - 15.8	
1,2,3,7,8-PeCDD	50.2	35.0 - 71.0	
1,2,3,4,7,8-HxCDD	51.9	35.0 - 82.0	
1,2,3,6,7,8-HxCDD	50.9	38.0 - 67.0	
1,2,3,7,8,9-HxCDD	51.4	32.0 - 81.0	
1,2,3,4,6,7,8-HpCDD	51.6	35.0 - 70.0	
OCDD	99.2	78.0 - 144	
2,3,7,8-TCDF	11.2	7.50 - 15.8	
1,2,3,7,8-PeCDF	52.5	40.0 - 67.0	
2,3,4,7,8-PeCDF	53.7	34.0 - 80.0	
1,2,3,4,7,8-HxCDF	50.4	36.0 - 67.0	
1,2,3,6,7,8-HxCDF	51.5	42.0 - 65.0	
2,3,4,6,7,8-HxCDF	51.5	35.0 - 78.0	
1,2,3,7,8,9-HxCDF	50.2	39.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	50.3	41.0 - 61.0	
1,2,3,4,7,8,9-HpCDF	51.1	39.0 - 69.0	
OCDF	99.6	63.0 - 170	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	91.6	20.0 - 175	
13C-1,2,3,7,8-PeCDD	73.8	21.0 - 227	
13C-1,2,3,4,7,8-HxCDD	73.6	21.0 - 193	
13C-1,2,3,6,7,8-HxCDD	70.8	25.0 - 163	
13C-1,2,3,4,6,7,8-HpCDD	63.9	26.0 - 166	
13C-OCDD	63.2	13.0 - 198	
13C-2,3,7,8-TCDF	94.8	22.0 - 152	
13C-1,2,3,7,8-PeCDF	76.6	21.0 - 192	
13C-2,3,4,7,8-PeCDF	76.5	13.0 - 328	
13C-1,2,3,4,7,8-HxCDF	77.0	19.0 - 202	
13C-1,2,3,6,7,8-HxCDF	70.1	21.0 - 159	
13C-2,3,4,6,7,8-HxCDF	75.1	22.0 - 176	
13C-1,2,3,7,8,9-HxCDF	67.9	17.0 - 205	
13C-1,2,3,4,6,7,8-HpCDF	67.1	21.0 - 158	
13C-1,2,3,4,7,8,9-HpCDF	65.1	20.0 - 186	
13C-OCDF	57.8	13.0 - 198	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	94.8	31.0 - 191	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ______________

Date: 1/30/2018

Reviewed By: ______________

Date: 1/30/2018

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 11211-001-SA
Client ID: AMW-3-011218
Matrix: Aqueous
Batch No: X4385

Date Extracted: 01-25-2018
Date Received: 01-16-2018
Amount: 0.879 L

ICal: PCDDFAL3-12-22-17
GC Column: DB5MS
Units: pg/L

Acquired: 01-27-2018
2005 WHO TEQ: 0.0

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.665		-	0.209				
1,2,3,7,8-PeCDD	ND	0.959		-	0.231				
1,2,3,4,7,8-HxCDD	ND	2.06		-	0.305				
1,2,3,6,7,8-HxCDD	ND	2.00		-	0.319	Total TCDD	ND	0.665	
1,2,3,7,8,9-HxCDD	ND	1.97		-	0.306	Total PeCDD	ND	0.959	
1,2,3,4,6,7,8-HpCDD	ND	2.62		-	0.408	Total HxCDD	ND	2.06	
OCDD	ND	4.61		-	1.01	Total HpCDD	ND	2.62	
2,3,7,8-TCDF	ND	0.704		-	0.196				
1,2,3,7,8-PeCDF	ND	0.899		-	0.271				
2,3,4,7,8-PeCDF	ND	0.903		-	0.303				
1,2,3,4,7,8-HxCDF	ND	0.810		-	0.251				
1,2,3,6,7,8-HxCDF	ND	0.825		-	0.260				
2,3,4,6,7,8-HxCDF	ND	0.901		-	0.279				
1,2,3,7,8,9-HxCDF	ND	1.20		-	0.332	Total TCDF	ND	0.704	
1,2,3,4,6,7,8-HpCDF	ND	1.26		-	0.324	Total PeCDF	ND	0.903	
1,2,3,4,7,8,9-HpCDF	ND	1.78		-	0.401	Total HxCDF	ND	1.20	
OCDF	ND	2.14		-	0.619	Total HpCDF	ND	1.78	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	82.3	25.0 - 164	
13C-1,2,3,7,8-PeCDD	77.2	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	73.7	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	74.9	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	72.7	23.0 - 140	
13C-OCDD	70.0	17.0 - 157	
13C-2,3,7,8-TCDF	76.4	24.0 - 169	
13C-1,2,3,7,8-PeCDF	72.0	24.0 - 185	
13C-2,3,4,7,8-PeCDF	72.7	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	79.0	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	78.2	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	76.0	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	70.3	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	74.0	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	69.4	26.0 - 138	
13C-OCDF	66.5	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	88.9	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ______

Date: 1/30/2018

Reviewed By: ______

Date: 1/30/2018

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 11211-002-SA	Date Extracted: 01-25-2018	ICal: PCDDFAL3-12-22-17	Acquired: 01-27-2018
Client ID: AMW-4-011218	Date Received: 01-16-2018	GC Column: DB5MS	2005 WHO TEQ: 0.0255
Matrix: Aqueous	Amount: 0.960 L	Units: pg/L	
Batch No: X4385			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.585		-	0.209				
1,2,3,7,8-PeCDD	ND	1.07		-	0.231				
1,2,3,4,7,8-HxCDD	ND	2.03		-	0.305				
1,2,3,6,7,8-HxCDD	ND	1.92		-	0.319	Total TCDD	ND	0.585	
1,2,3,7,8,9-HxCDD	ND	1.91		-	0.306	Total PeCDD	ND	1.07	
1,2,3,4,6,7,8-HpCDD	2.08	-	J	0.0208	0.408	Total HxCDD	ND	2.03	
OCDD	15.5	-	J	0.00465	1.01	Total HpCDD	4.87	-	J
2,3,7,8-TCDF	ND	0.643		-	0.196				
1,2,3,7,8-PeCDF	ND	1.21		-	0.271				
2,3,4,7,8-PeCDF	ND	1.23		-	0.303				
1,2,3,4,7,8-HxCDF	ND	0.989		-	0.251				
1,2,3,6,7,8-HxCDF	ND	1.04		-	0.260				
2,3,4,6,7,8-HxCDF	ND	1.10		-	0.279				
1,2,3,7,8,9-HxCDF	ND	1.44		-	0.332	Total TCDF	ND	0.643	
1,2,3,4,6,7,8-HpCDF	ND	0.860		-	0.324	Total PeCDF	ND	1.23	
1,2,3,4,7,8,9-HpCDF	ND	1.18		-	0.401	Total HxCDF	ND	1.44	
OCDF	ND	2.63		-	0.619	Total HpCDF	ND	1.18	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	86.7	25.0 - 164	
13C-1,2,3,7,8-PeCDD	81.2	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	75.2	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	76.8	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	74.3	23.0 - 140	
13C-OCDD	69.0	17.0 - 157	
13C-2,3,7,8-TCDF	80.6	24.0 - 169	
13C-1,2,3,7,8-PeCDF	77.7	24.0 - 185	
13C-2,3,4,7,8-PeCDF	77.7	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	81.7	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	78.8	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	79.7	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	73.2	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	73.7	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	71.5	26.0 - 138	
13C-OCDF	63.6	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	85.6	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ______

Date: 1/30/2018

Reviewed By: ______

Date: 1/30/2018

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 11211-003-SA	Date Extracted: 01-25-2018	ICal: PCDDFAL3-12-22-17	Acquired: 01-27-2018
Client ID: AMW-2-011218	Date Received: 01-16-2018	GC Column: DB5MS	2005 WHO TEQ: 0.00666
Matrix: Aqueous	Amount: 0.903 L	Units: pg/L	
Batch No: X4385			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.692		-	0.209				
1,2,3,7,8-PeCDD	ND	1.64		-	0.231				
1,2,3,4,7,8-HxCDD	ND	1.87		-	0.305				
1,2,3,6,7,8-HxCDD	ND	1.88		-	0.319	Total TCDD	ND	0.692	
1,2,3,7,8,9-HxCDD	ND	1.82		-	0.306	Total PeCDD	ND	1.64	
1,2,3,4,6,7,8-HpCDD	ND	3.18		-	0.408	Total HxCDD	ND	1.88	
OCDD	22.2	-	J	0.00666	1.01	Total HpCDD	ND	3.18	
2,3,7,8-TCDF	ND	0.856		-	0.196				
1,2,3,7,8-PeCDF	ND	0.781		-	0.271				
2,3,4,7,8-PeCDF	ND	0.842		-	0.303				
1,2,3,4,7,8-HxCDF	ND	1.23		-	0.251				
1,2,3,6,7,8-HxCDF	ND	1.24		-	0.260				
2,3,4,6,7,8-HxCDF	ND	1.41		-	0.279				
1,2,3,7,8,9-HxCDF	ND	1.71		-	0.332	Total TCDF	ND	0.856	
1,2,3,4,6,7,8-HpCDF	ND	1.52		-	0.324	Total PeCDF	ND	0.842	
1,2,3,4,7,8,9-HpCDF	ND	2.16		-	0.401	Total HxCDF	ND	1.71	
OCDF	ND	3.22		-	0.619	Total HpCDF	ND	2.16	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	60.4	25.0 - 164	
13C-1,2,3,7,8-PeCDD	56.9	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	58.1	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	56.5	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	56.3	23.0 - 140	
13C-OCDD	55.5	17.0 - 157	
13C-2,3,7,8-TCDF	56.8	24.0 - 169	
13C-1,2,3,7,8-PeCDF	55.5	24.0 - 185	
13C-2,3,4,7,8-PeCDF	51.9	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	61.1	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	59.0	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	56.6	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	54.0	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	56.6	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	53.8	26.0 - 138	
13C-OCDF	50.2	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	80.0	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ______

Date: 1/30/2018

Reviewed By: ______

Date: 1/30/2018

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 11211-004-SA
Client ID: AMW-1-011218
Matrix: Aqueous
Batch No: X4385

Date Extracted: 01-25-2018
Date Received: 01-16-2018
Amount: 0.958 L

ICal: PCDDFAL3-12-22-17
GC Column: DB5MS
Units: pg/L

Acquired: 01-27-2018
2005 WHO TEQ: 0.0

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.510		-	0.209				
1,2,3,7,8-PeCDD	ND	1.02		-	0.231				
1,2,3,4,7,8-HxCDD	ND	1.36		-	0.305				
1,2,3,6,7,8-HxCDD	ND	1.45		-	0.319	Total TCDD	ND	0.510	
1,2,3,7,8,9-HxCDD	ND	1.36		-	0.306	Total PeCDD	ND	1.02	
1,2,3,4,6,7,8-HpCDD	ND	2.29		-	0.408	Total HxCDD	ND	1.45	
OCDD	ND	5.81		-	1.01	Total HpCDD	ND	2.29	
2,3,7,8-TCDF	ND	0.499		-	0.196				
1,2,3,7,8-PeCDF	ND	0.656		-	0.271				
2,3,4,7,8-PeCDF	ND	0.688		-	0.303				
1,2,3,4,7,8-HxCDF	ND	0.819		-	0.251				
1,2,3,6,7,8-HxCDF	ND	0.845		-	0.260				
2,3,4,6,7,8-HxCDF	ND	0.873		-	0.279				
1,2,3,7,8,9-HxCDF	ND	1.14		-	0.332	Total TCDF	ND	0.499	
1,2,3,4,6,7,8-HpCDF	ND	0.929		-	0.324	Total PeCDF	ND	0.688	
1,2,3,4,7,8,9-HpCDF	ND	1.23		-	0.401	Total HxCDF	ND	1.14	
OCDF	ND	1.48		-	0.619	Total HpCDF	ND	1.23	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	92.9	25.0 - 164	
13C-1,2,3,7,8-PeCDD	86.1	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	86.6	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	86.0	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	86.9	23.0 - 140	
13C-OCDD	79.0	17.0 - 157	
13C-2,3,7,8-TCDF	91.5	24.0 - 169	
13C-1,2,3,7,8-PeCDF	87.1	24.0 - 185	
13C-2,3,4,7,8-PeCDF	85.9	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	91.5	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	88.9	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	89.2	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	84.5	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	83.0	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	84.6	26.0 - 138	
13C-OCDF	74.1	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	94.9	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: [signature]

Date: 1/30/2018

Reviewed By: [signature]

Date: 1/30/2018

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 11211-005-SA	Date Extracted: 01-25-2018	ICal: PCDDFAL3-12-22-17	Acquired: 01-27-2018
Client ID: AMW-5-011218	Date Received: 01-16-2018	GC Column: DB5MS	2005 WHO TEQ: 0.0
Matrix: Aqueous	Amount: 0.940 L	Units: pg/L	
Batch No: X4385			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.795		-	0.209				
1,2,3,7,8-PeCDD	ND	1.36		-	0.231				
1,2,3,4,7,8-HxCDD	ND	1.90		-	0.305				
1,2,3,6,7,8-HxCDD	ND	1.93		-	0.319	Total TCDD	ND	0.795	
1,2,3,7,8,9-HxCDD	ND	1.85		-	0.306	Total PeCDD	ND	1.36	
1,2,3,4,6,7,8-HpCDD	ND	2.62		-	0.408	Total HxCDD	ND	1.93	
OCDD	ND	5.81		-	1.01	Total HpCDD	ND	2.62	
2,3,7,8-TCDF	ND	0.883		-	0.196				
1,2,3,7,8-PeCDF	ND	1.06		-	0.271				
2,3,4,7,8-PeCDF	ND	1.04		-	0.303				
1,2,3,4,7,8-HxCDF	ND	0.827		-	0.251				
1,2,3,6,7,8-HxCDF	ND	0.867		-	0.260				
2,3,4,6,7,8-HxCDF	ND	0.901		-	0.279				
1,2,3,7,8,9-HxCDF	ND	1.21		-	0.332	Total TCDF	ND	0.883	
1,2,3,4,6,7,8-HpCDF	ND	1.43		-	0.324	Total PeCDF	ND	1.06	
1,2,3,4,7,8,9-HpCDF	ND	1.92		-	0.401	Total HxCDF	ND	1.21	
OCDF	ND	2.29		-	0.619	Total HpCDF	ND	1.92	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	80.0	25.0 - 164	
13C-1,2,3,7,8-PeCDD	77.6	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	73.2	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	71.3	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	68.0	23.0 - 140	
13C-OCDD	62.6	17.0 - 157	
13C-2,3,7,8-TCDF	78.4	24.0 - 169	
13C-1,2,3,7,8-PeCDF	74.7	24.0 - 185	
13C-2,3,4,7,8-PeCDF	76.1	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	77.9	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	74.8	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	76.2	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	67.8	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	67.9	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	67.0	26.0 - 138	
13C-OCDF	59.6	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	86.4	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ______________ Reviewed By: ______________

Date: 1/30/2018 Date: 1/30/2018

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SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Frontier

PROJECT NAME/NO.	PO #
801176	A-233

REMARKS

Please Email Results

11211
1°C

Page # 1 of 1

TURNAROUND TIME
- [x] Standard ~~(2 Weeks)~~
- [ ] RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	1613 Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M				Notes
AMW-3-011218		1/12/18	1015	water		X										
AMW-4-011218		↓	1215	↓		X										
AMW-2-011218		↓	1350	↓		X										
AMW-1-011218		↓	1530	↓		X										
AMW-5-011218		↓	1700	↓		X										

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman and Bruya	1/15/18	11:34
Received by:	Kathy Zipp	Frontier	1.16.18	1105
Relinquished by:				
Received by:				

FRONTIER ANALYTICAL LABORATORY

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: **11211**

Client:	Friedman & Bruya, Inc.
Client Project ID:	801176
Date Received:	01/16/2018
Time Received:	11:05 am
Received By:	KZ
Logged In By:	KZ
# of Samples Received:	5
Duplicates:	0
Storage Location:	R2

Method of Delivery:	Fed-Ex
Tracking Number:	809992619570
Shipping Container Received Intact	Yes
Custody seals(s) present?	No
Custody seals(s) intact?	No
Sample Arrival Temperature (C)	1
Cooling Method	Blue Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	Yes
Test aqueous sample for residual Chlorine	Yes
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	Yes
pH Range of Aqueous Sample	Between 4 and 9
Anomalies or additional comments:	

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SUBCONTRACT SAMPLE CHAIN OF CUSTODY
Send Report To Michael Erdahl
Company Friedman and Bruya, Inc.
Address 3012 16th Ave W
SUBCONTRACTER Frontier
PROJECT NAME/NO. 801176
PO # A-233
REMARKS
TURNAROUND TIME
Frontier Analytical Laboratory
11211-001-SA
Client ID:AMW-3-011218
Storage: R2 (01 of 01)
FRIEDMAN & BRUYA, INC.
Client: aspect
Sample ID: AMW-3-011218
Date Sampled: 1/12/18
Time: 1015
Project: 150074
Analysis Request:
Preservative:
11211-002-SA
Client ID: AMW-4-011218
Sample ID: AMW-4-011218
Time: 1215
11211-003-SA
Client ID: AMW-2-011218
Sample ID: AMW-2-011218
Time: 1350
11211-004-SA
Client ID:AMW-1-011218
Sample ID: AMW-1-011218
Time: 1530
11211-005-SA
Client ID: AMW-5-011218
Sample ID: AMW5-011218
Time: 1700
2018/01/16

Frontier Analytical Laboratory

PROJECT REQUEST SHEET

Project #: 11211 Sample #: 1 - 5 Client Manager: BS

Client: Friedman & Bruya, Inc. Hold Time: 01/14/2019

Matrix: Aqueous Extraction Batch: 4385 Due Date: 02/07/2018

Method: EPA 1613 D/F Storage: R2

SOP: SOPs: EP2A Rev.14 IP2A Rev.16

COMMENTS/INSTRUCTIONS: —no caps—

Sample	Full Weight (g)	Empty Weight (g)
11211-001-0001-SA	1370.32g	490.90g
11211-002-0001-SA	1454.77g	494.81g
11211-003-0001-SA	1397.90g	494.68g
11211-004-0001-SA	1451.97g	493.88g
11211-005-0001-SA	1433.88g	494.33g

Results: 11211

Extract/s located in box: Nugget

Standards: 11157

Instrument:
DB5 Feb3
DB225 ____
DB1 ____
Other ____

L4 data package

Frontier Analytical Laboratory
Percent Solids

FAL Project: 11211

Sample ID	Chemist	Date	Wet Sample Weight (g)	Dry Sample Weight (g)	% Solids	10g Equiv	Wet Wt Oven Temp	Dry Wt Oven Temp	Boat Wt (gms)
11211-001-0001-SA	RP	1.25.18	4.29g	0.00g	0.00%	NA	106°c	108°c	1.08g
11211-002-0001-SA			4.51g	0.00g	0.00%				1.10g
11211-003-0001-SA			5.37g	0.01g	0.19%				1.09g
11211-004-0001-SA			4.71g	0.00g	0.00%				1.08g
11211-005-0001-SA			3.07g	0.00g	0.00%				1.12g

% Solids Summary:

Non-Filtered Determination

1. Place an aliquot of sample into a pre-weighed aluminum weighing boat. Use approximately two to ten grams for solid samples, approximately 10 mL for aqueous samples.
2. Record the weight.
3. Dry sample overnight at approximately 110 C.

Filtered Determination

1. Pre-weigh a glass fiber filter of appropriate pore size and pressure filter a sample aliquot (200-1000mL) through it.
2. Air dry the filter and record the dry weight.

% Solids calculation

% solids = aliquot after drying/aliquot before drying x 100

- Samples containing one percent solids or less are prepared as aqueous samples.
- Samples containing greater than one percent solids prepared as solid samples.

Frontier Analytical Laboratory
EXTRACTION SHEET

Project #: 11211 Extraction Date: 2018-01-25 Extraction Chemist: RR

Method/Analysis: EPA 1613 D/F

Procedure: SPE/SOX Solvent: Toluene

Sample ID	Wet wt. (g/L)	Dry wt. (g/L)	IS Amt: 10.0uL ID: 171128A Vial: 2 Chemist/Witness/Date	NS Amt: 10.0uL ID: 171128B Vial: 1 Chemist/Witness/Date	CSS Amt: 10.0uL ID: 171128C Vial: 2 Chemist/Witness/Date
11157 04385-001-0001-MB					
04385-001-0001-OPR					
11211-001-0001-SA	0.879L	NA	RR KC 1·25·18	NA	RR KC 1·26·18
11211-002-0001-SA	0.960L				
11211-003-0001-SA	0.903L				
11211-004-0001-SA	0.958L				
11211-005-0001-SA	0.940L				

AX-21 Charcoal Cleaned	160609	Acetone	56288	Acid Alumina	A0370183	Hexane	57114
Methanol	171476	Methylene Chloride (DCM)	57230	Silica Gel	TA2051534	Sodium Hydroxide 1N	164777
Sodium Sulfate	17D135205	Sulfuric Acid	166942	Tetradecane	170531	Toluene	57173
Water	57095	C-18 Empore Discs	320922D	Cyclohexane	56242		

Comments:

Frontier Analytical Laboratory
CLEANUP SHEET

Project #: 11211

Method/Analysis: EPA 1613 D/F

Splits: 0 Split Date: N/A Final Volume: 20.0uL

Sample ID	Cleanup 1 MSG-AA Chemist/Date	Cleanup 2 NA Chemist/Date	Cleanup 3 NA Chemist/Date	RS Amt: 10.0uL ID: 171128D Vial: 3 Chemist/Witness/Date
1157 004385-001-0001-MB				
04385-001-0001-OPR				
11211-001-0001-SA	RR 1-26-18	NA	NA	RR KC 1-26-18
11211-002-0001-SA				
11211-003-0001-SA				
11211-004-0001-SA				
11211-005-0001-SA				

AX-21 Charcoal Cleaned	160609	Acetone	56288	Acid Alumina	A0370183	Hexane	57114
Methanol	171476	Methylene Chloride (DCM)	57230	Silica Gel	TA2051534	Sodium Hydroxide 1N	164777
Sodium Sulfate	17D135205	Sulfuric Acid	166942	Tetradecane	170531	Toluene	57173
Water	57095	C-18 Empore Discs	320922D	Cyclohexane	56242		

Comments:

FAL ID: 04385-001-0001-MB Filename: 26JAN18M Sam:3 Acquired: 26-JAN-18 15:21:27 ICal: PCDDFAL3-12-22-17
Client ID: Method Blank ConCal: ST012618M1 EndCal: ST012618M2
Results: 11153-3RX GC Column: DB5MS Amount: 1.000 NATO 1989 Tox: 0.00
Instrument ID: FAL3 WHO 1998 Tox: 0.00 WHO 2005 Tox: 0.00

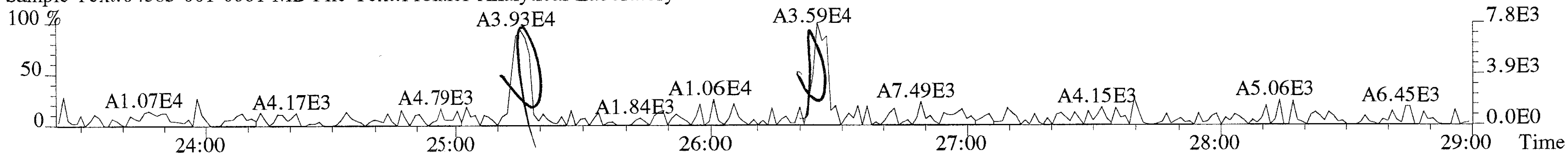
Name	Resp	RA	RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	DL
2,3,7,8-TCDD	*	* n	NotFnd	1.06	*		2.50	847	748	0.588
1,2,3,7,8-PeCDD	*	* n	NotFnd	1.00	*		2.50	822	711	0.892
1,2,3,4,7,8-HxCDD	*	* n	NotFnd	1.07	*		2.50	1260	1100	1.75
1,2,3,6,7,8-HxCDD	*	* n	NotFnd	1.08	*		2.50	1260	1100	1.75
1,2,3,7,8,9-HxCDD	*	* n	NotFnd	1.11	*		2.50	1260	1100	1.70
1,2,3,4,6,7,8-HpCDD	*	* n	NotFnd	0.99	*		2.50	1270	711	2.03
OCDD	*	* n	NotFnd	1.11	*		2.50	1590	1710	4.95
2,3,7,8-TCDF	*	* n	NotFnd	1.03	*		2.50	1050	1510	0.699
1,2,3,7,8-PeCDF	*	* n	NotFnd	0.95	*		2.50	805	1390	0.889
2,3,4,7,8-PeCDF	*	* n	NotFnd	0.79	*		2.50	805	1390	0.937
1,2,3,4,7,8-HxCDF	*	* n	NotFnd	1.20	*		2.50	1020	937	0.940
1,2,3,6,7,8-HxCDF	*	* n	NotFnd	1.10	*		2.50	1020	937	0.986
2,3,4,6,7,8-HxCDF	*	* n	NotFnd	1.08	*		2.50	1020	937	1.02
1,2,3,7,8,9-HxCDF	*	* n	NotFnd	1.15	*		2.50	1020	937	1.38
1,2,3,4,6,7,8-HpCDF	*	* n	NotFnd	1.23	*		2.50	887	1050	1.30
1,2,3,4,7,8,9-HpCDF	*	* n	NotFnd	1.23	*		2.50	887	1050	1.81
OCDF	*	* n	NotFnd	0.90	*		2.50	1090	886	2.61

Name	Resp	RA	RT	RRF	Conc	Rec
13C-2,3,7,8-TCDD	6.07e+07	0.82 y	27:09	1.02	1700	84.9
13C-1,2,3,7,8-PeCDD	4.71e+07	1.54 y	32:59	0.88	1530	76.6
13C-1,2,3,4,7,8-HxCDD	3.63e+07	1.26 y	38:19	0.85	1580	79.0
13C-1,2,3,6,7,8-HxCDD	3.88e+07	1.22 y	38:29	0.94	1530	76.7
13C-1,2,3,4,6,7,8-HpCDD	3.54e+07	1.06 y	43:52	0.90	1460	72.8
13C-OCDD	5.19e+07	0.92 y	49:18	0.70	2750	68.7
13C-2,3,7,8-TCDF	8.04e+07	0.83 y	26:25	0.93	1690	84.7
13C-1,2,3,7,8-PeCDF	6.67e+07	1.51 y	31:14	0.87	1510	75.6
13C-2,3,4,7,8-PeCDF	7.51e+07	1.55 y	32:36	0.99	1490	74.4
13C-1,2,3,4,7,8-HxCDF	4.81e+07	0.56 y	36:55	1.09	1640	81.9
13C-1,2,3,6,7,8-HxCDF	5.67e+07	0.56 y	37:07	1.35	1570	78.4
13C-2,3,4,6,7,8-HxCDF	5.26e+07	0.56 y	38:05	1.23	1590	79.4
13C-1,2,3,7,8,9-HxCDF	4.32e+07	0.54 y	39:33	1.14	1410	70.3
13C-1,2,3,4,6,7,8-HpCDF	3.79e+07	0.50 y	41:57	0.97	1450	72.3
13C-1,2,3,4,7,8,9-HpCDF	3.09e+07	0.49 y	44:50	0.82	1410	70.4
13C-OCDF	7.38e+07	0.95 y	49:43	1.06	2580	64.6
37Cl-2,3,7,8-TCDD	2.23e+07		27:10	0.91	698	87.3
13C-1,2,3,4-TCDD	6.99e+07	0.82 y	26:32	-	192	
13C-1,2,3,4-TCDF	1.02e+08	0.80 y	25:15	-	196	
13C-1,2,3,7,8,9-HxCDD	5.38e+07	1.22 y	38:55	-	176	

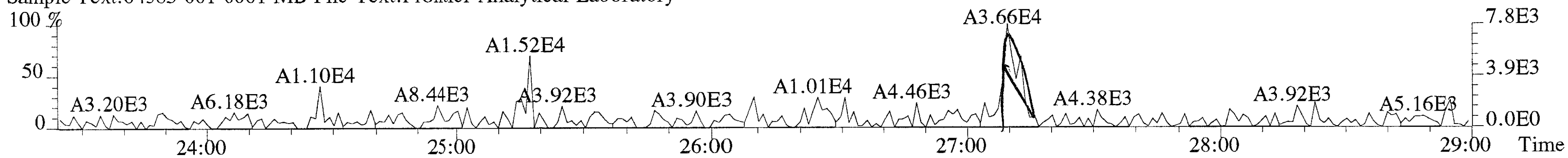
Name	Resp	RT	RRF	Conc	Fac	Noise-1	Noise-2	DL		#Hom
Total Tetra-Dioxins	*	NotFnd	1.06	*	2.50	847	748	0.588		0
Total Penta-Dioxins	*	NotFnd	1.00	*	2.50	822	711	0.892		0
Total Hexa-Dioxins	*	NotFnd	1.09	*	2.50	1260	1100	1.75		0
Total Hepta-Dioxins	*	NotFnd	0.99	*	2.50	1270	711	2.03		0
Total Tetra-Furans	*	NotFnd	1.03	*	2.50	1050	1510	0.699		0
1st Fn. Tot Penta-Furans	*	NotFnd	0.86	*	2.50	805	1390	0.937	PeCDF	0
Total Penta-Furans	*	NotFnd	0.86	*	2.50	805	1390	0.937	*	0
Total Hexa-Furans	*	NotFnd	1.13	*	2.50	1020	937	1.38		0
Total Hepta-Furans	*	NotFnd	1.23	*	2.50	887	1050	1.81		0

Analyst: [signature] Date: 1/29/18

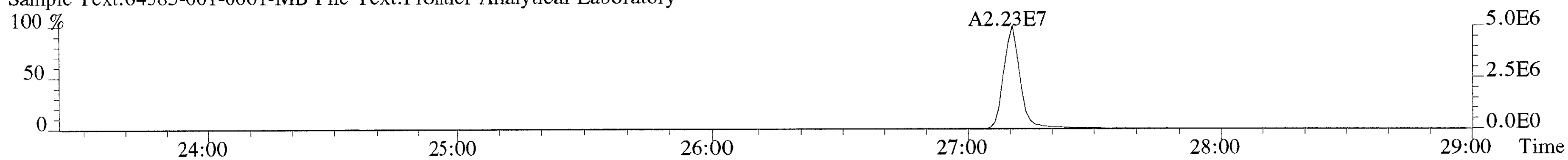
File:26JAN18M #1-381 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
327.8847 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
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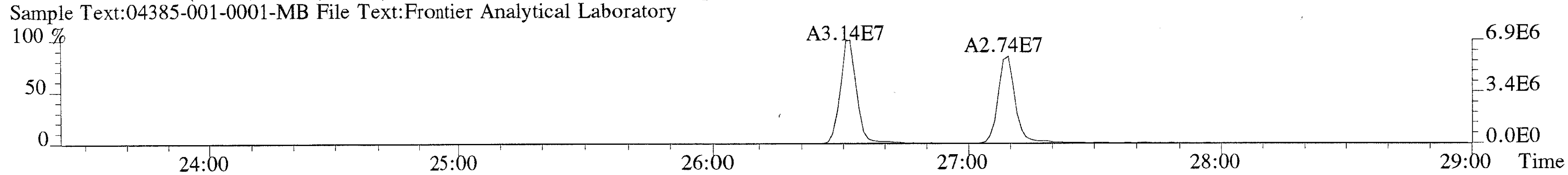

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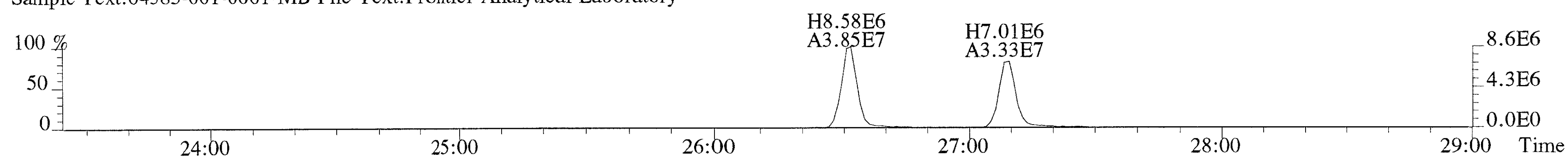

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355.8546 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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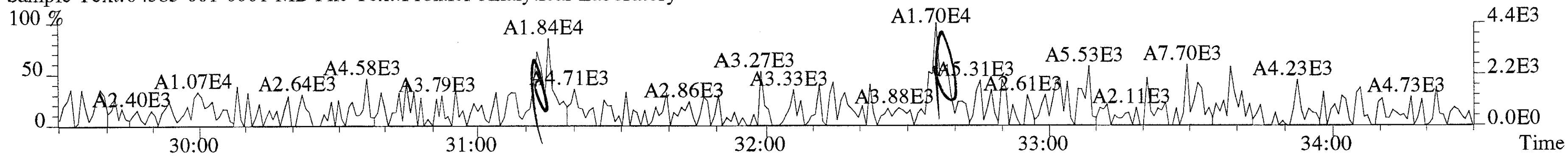

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357.8517 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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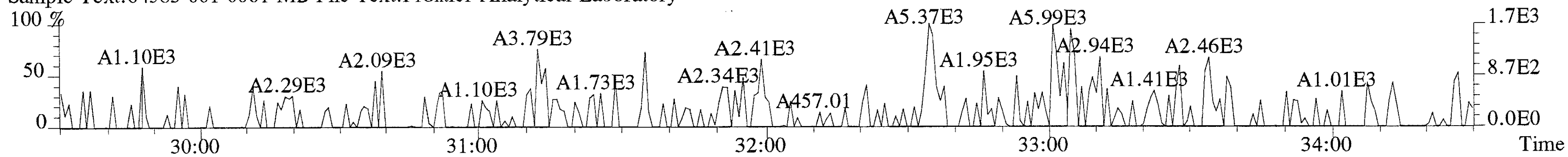

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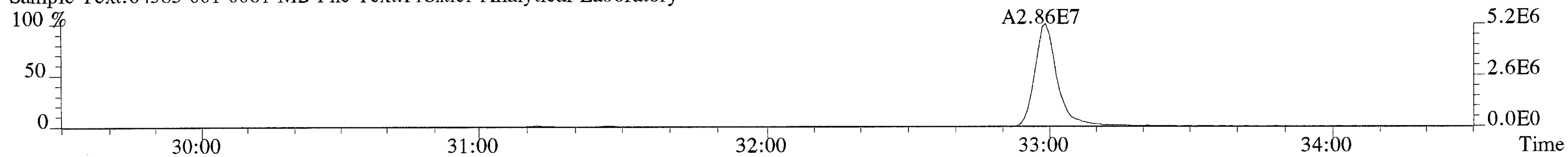
367.8949 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



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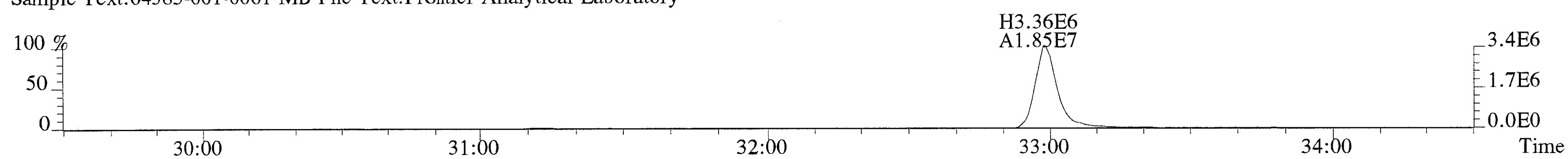

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366.9792 S:3 F:2 Exp:PCDD
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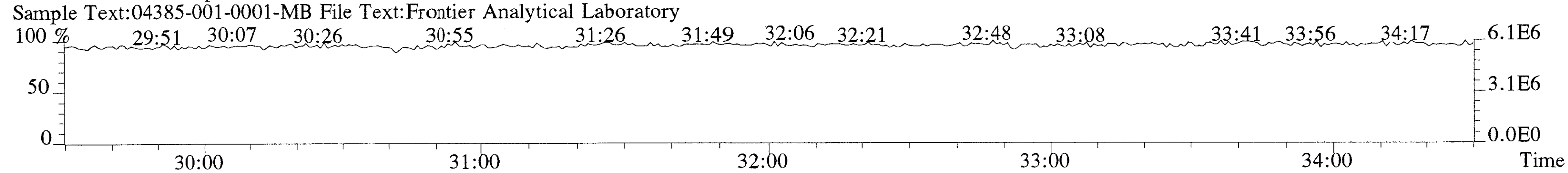

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389.8156 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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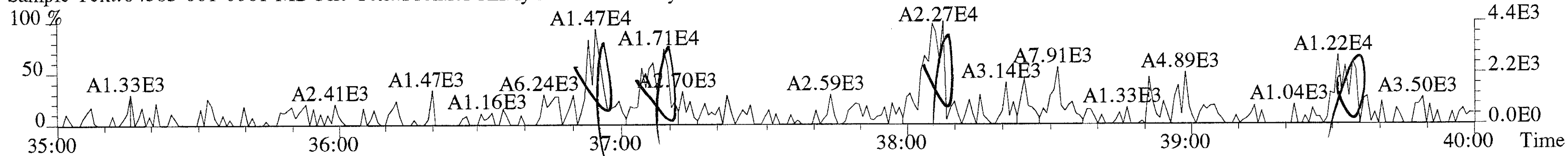

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391.8127 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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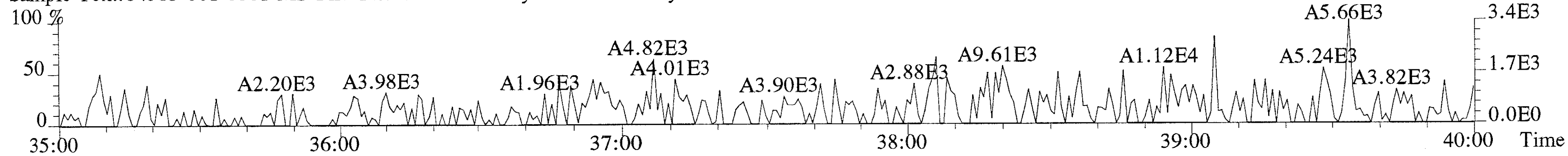

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401.8559 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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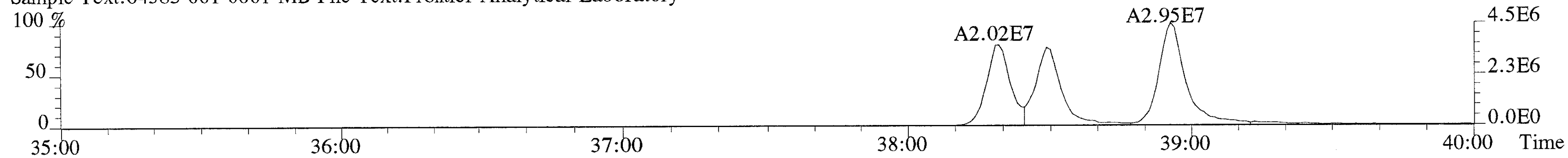

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403.8530 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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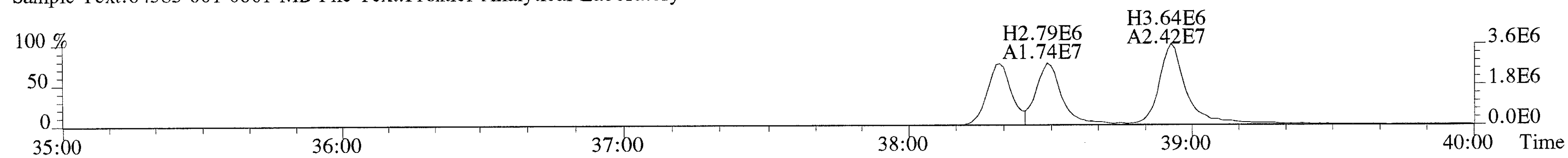

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380.9760 S:3 F:3 Exp:PCDD
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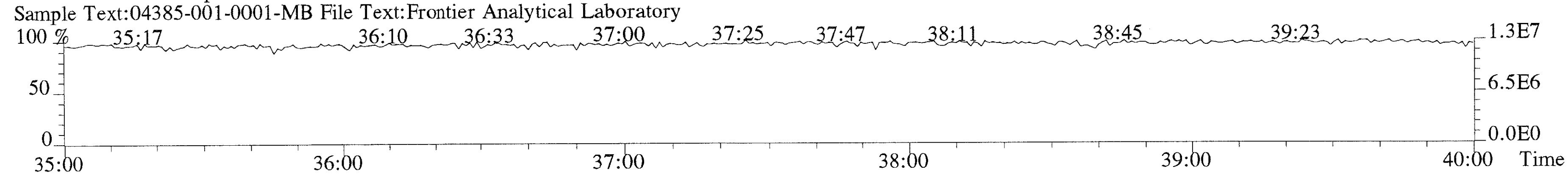

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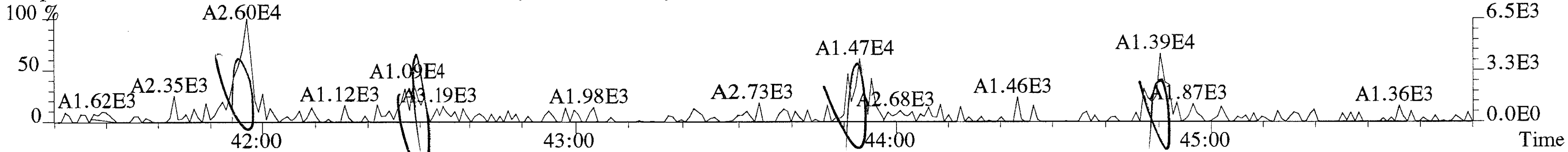
423.7767 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



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425.7737 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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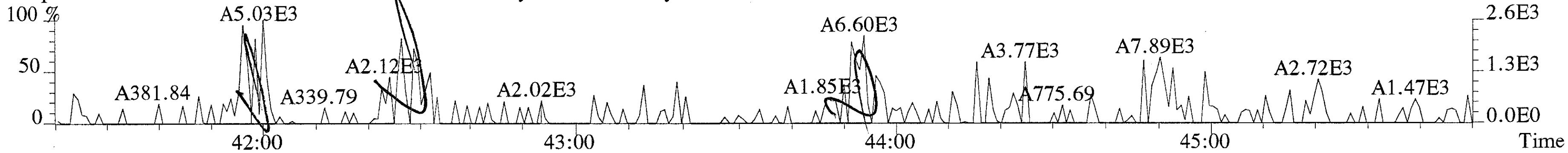

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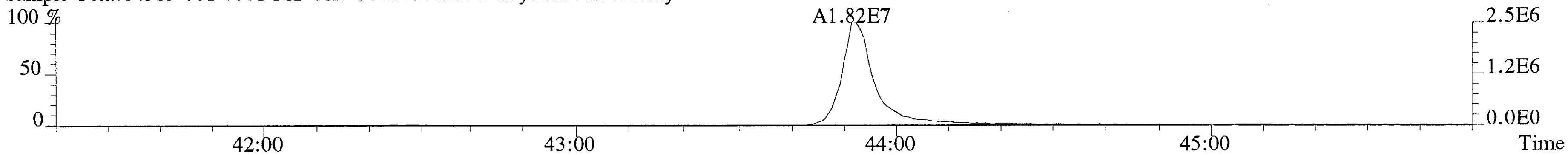
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



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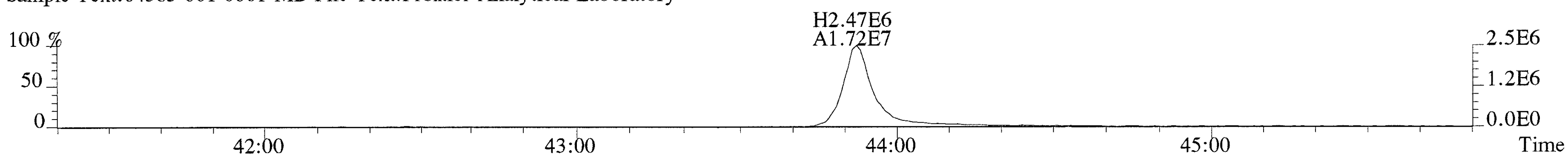
437.8140 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
430.9728 S:3 F:4 Exp:PCDD
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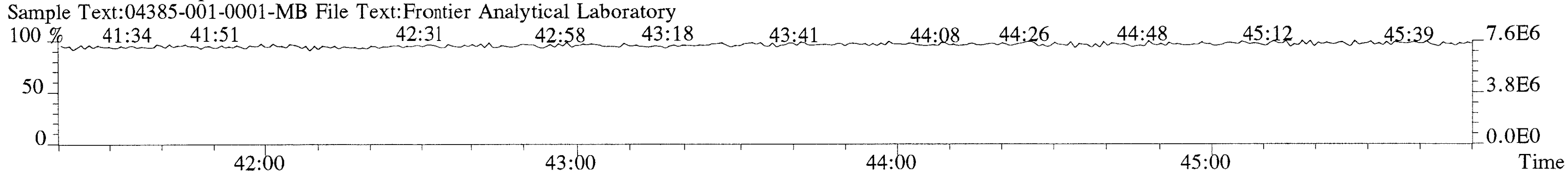

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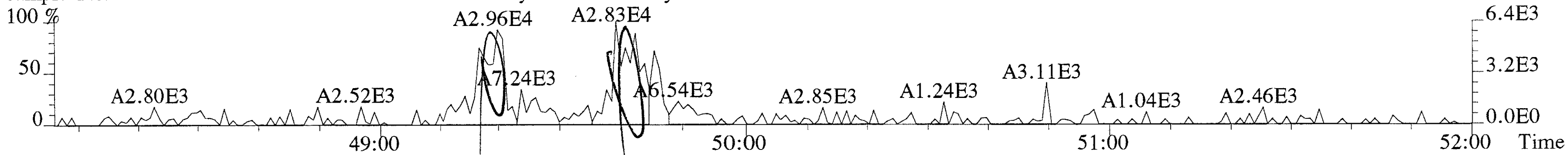
457.7377 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-360 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
459.7348 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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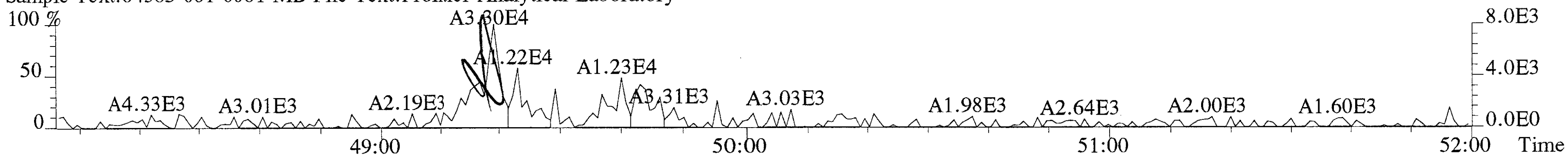

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469.7780 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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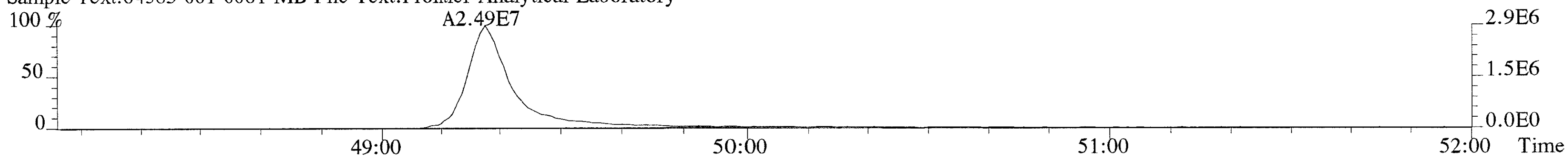

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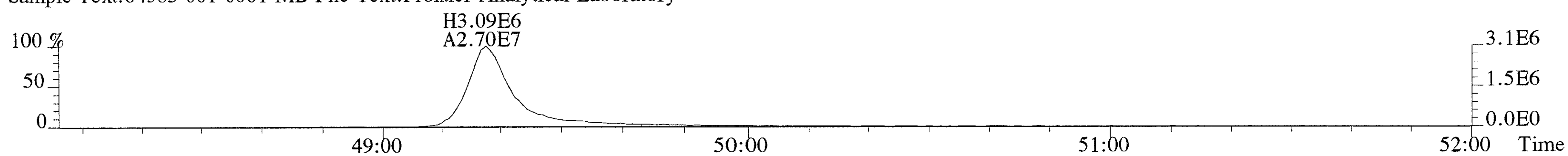

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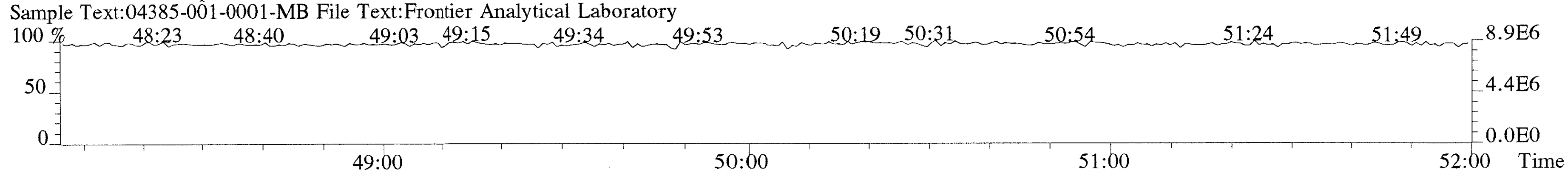

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303.9016 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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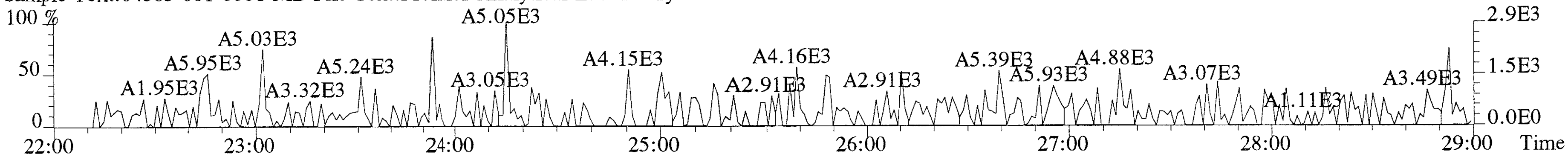

File:26JAN18M #1-381 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
305.8987 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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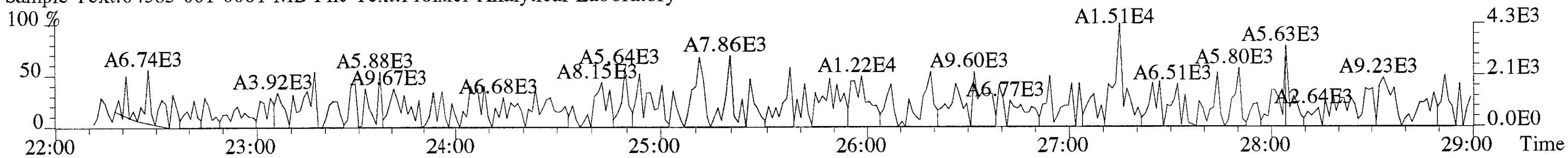

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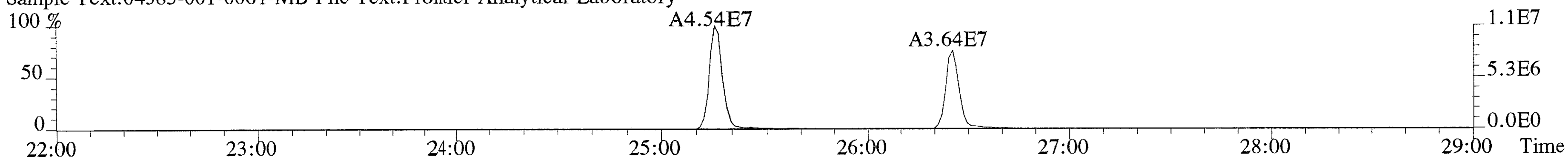
315.9419 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



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317.9389 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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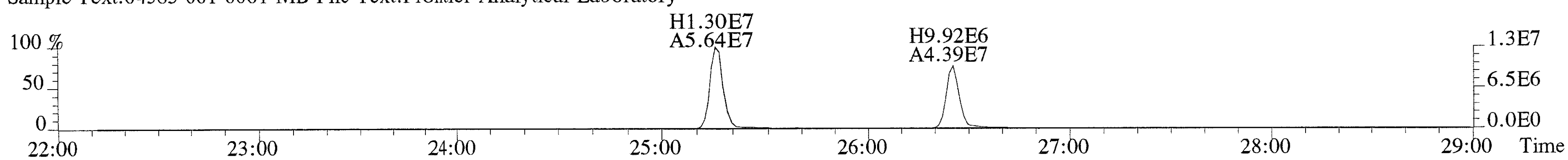

File:26JAN18M #1-381 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
375.8364 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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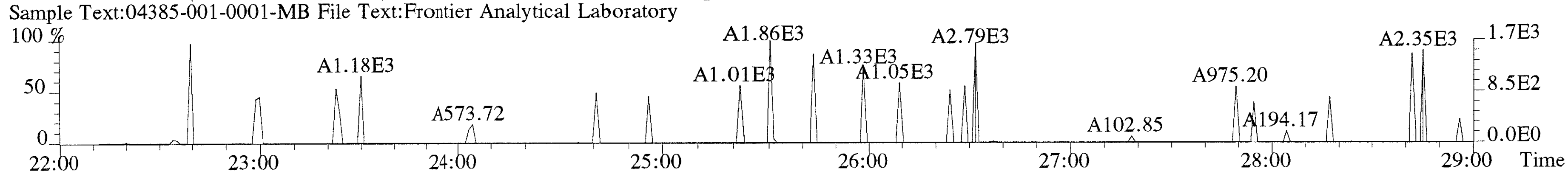
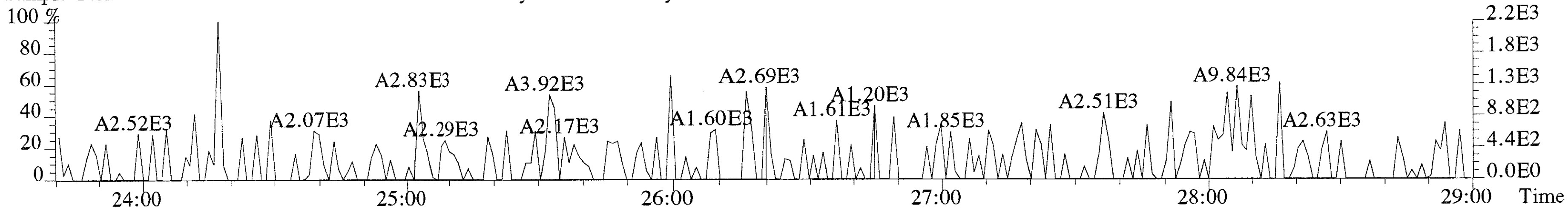


File:26JAN18M #1-381 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



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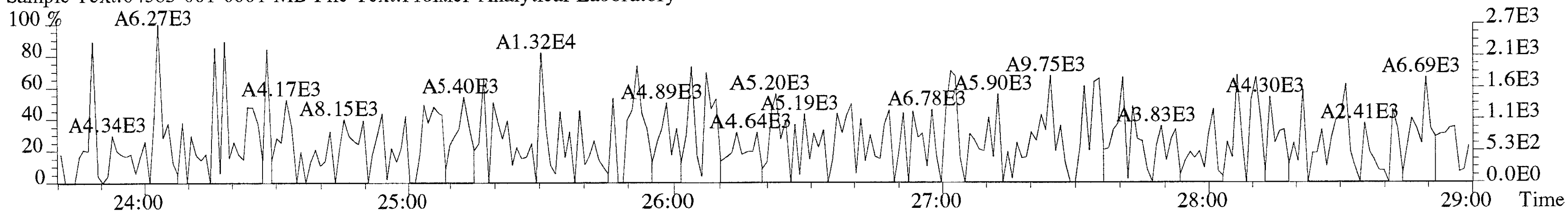
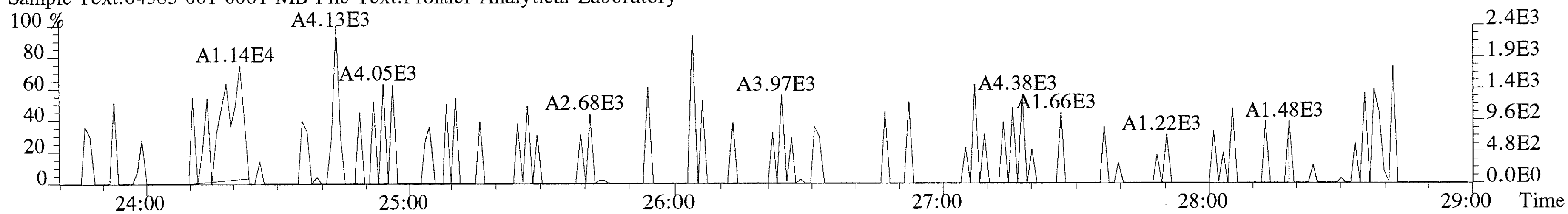
341.8568 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
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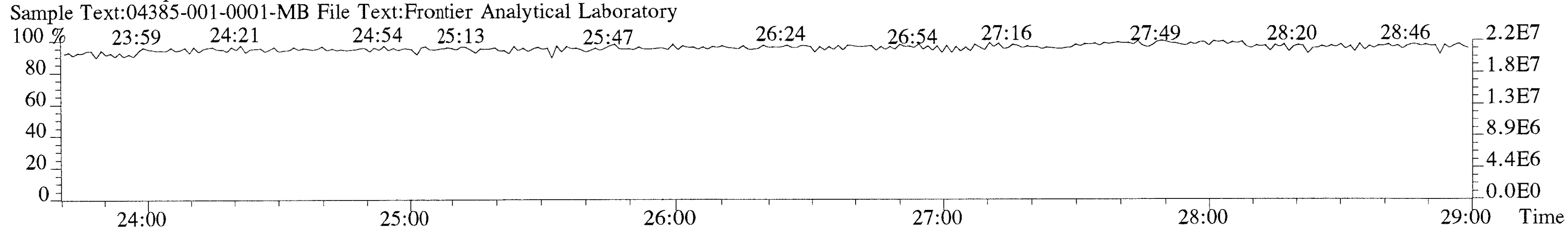
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-424 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
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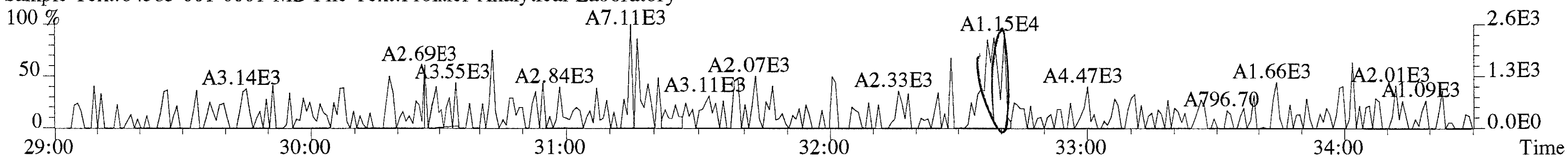

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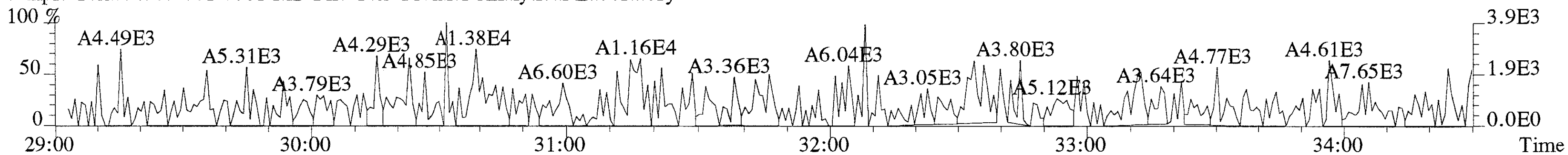
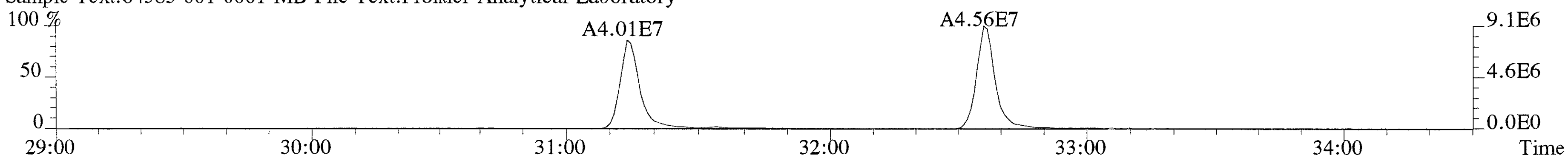
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-424 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



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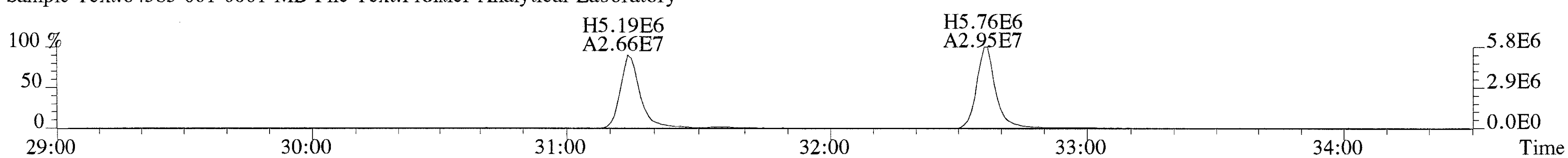
353.8970 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



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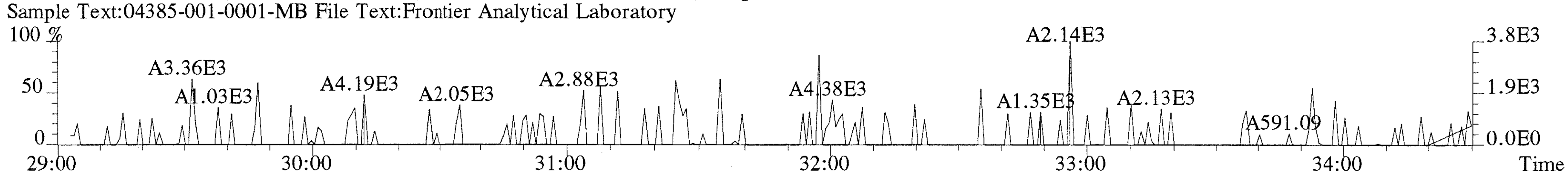
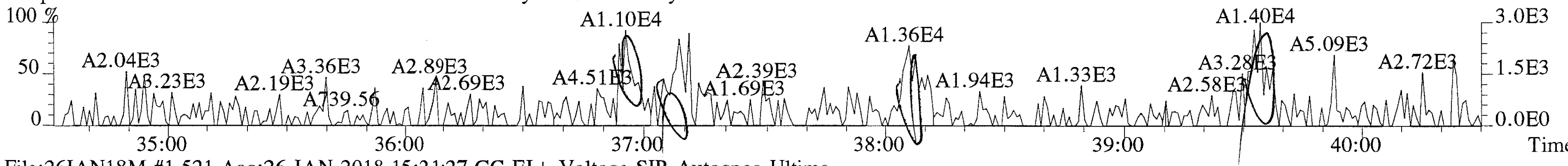
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
373.8207 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



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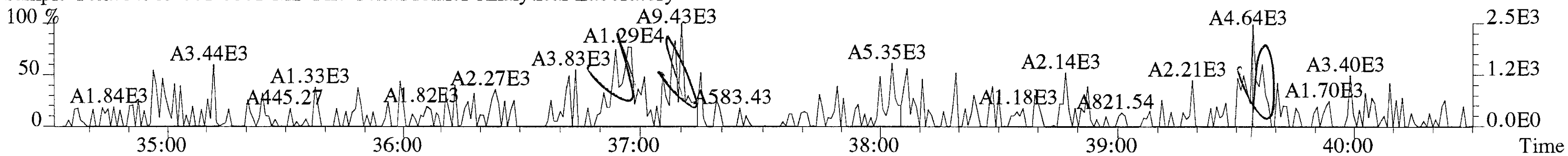
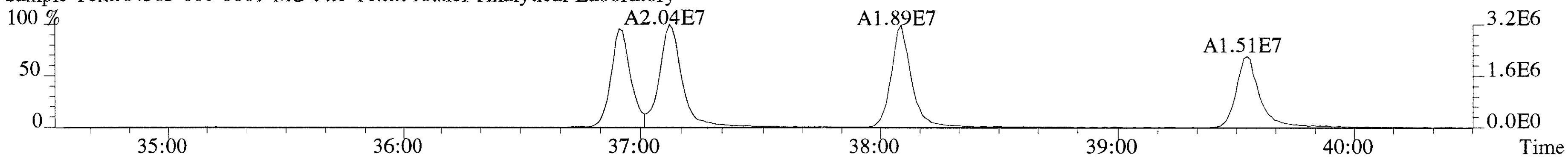
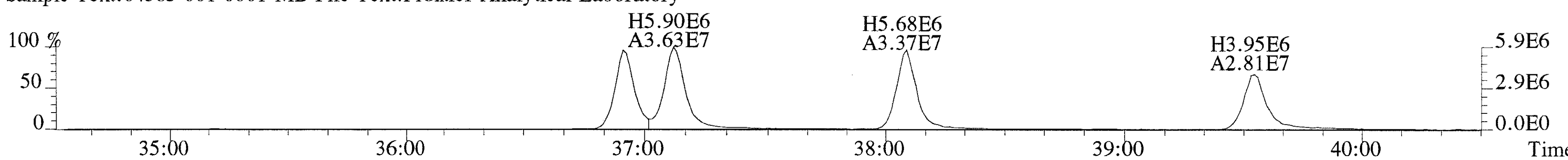
375.8178 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



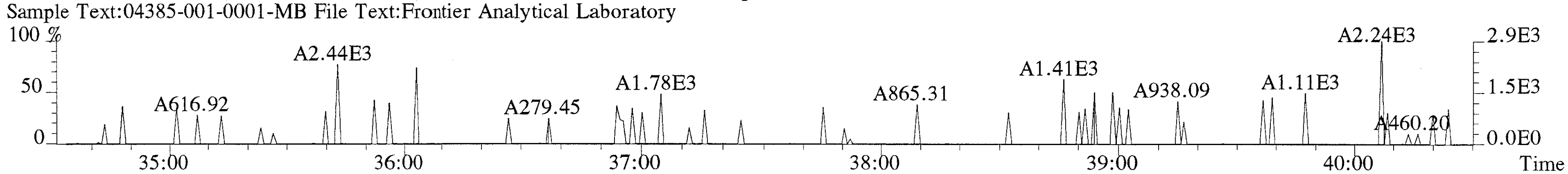
File:26JAN18M #1-521 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



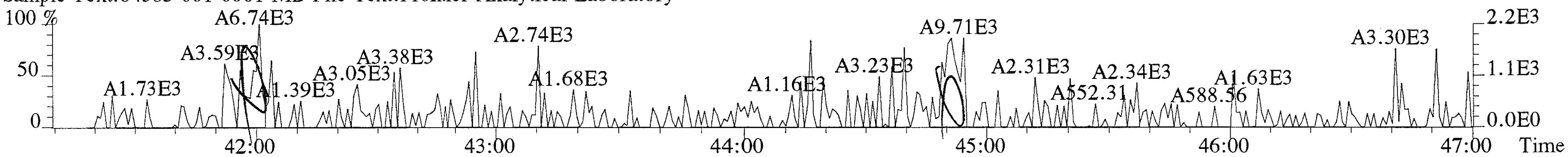
File:26JAN18M #1-521 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
385.8610 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



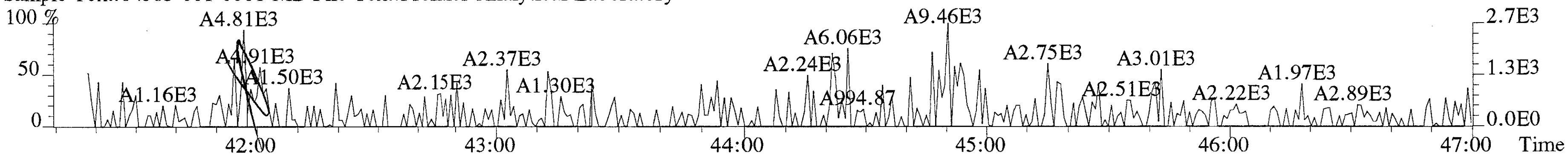
File:26JAN18M #1-521 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
445.7555 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



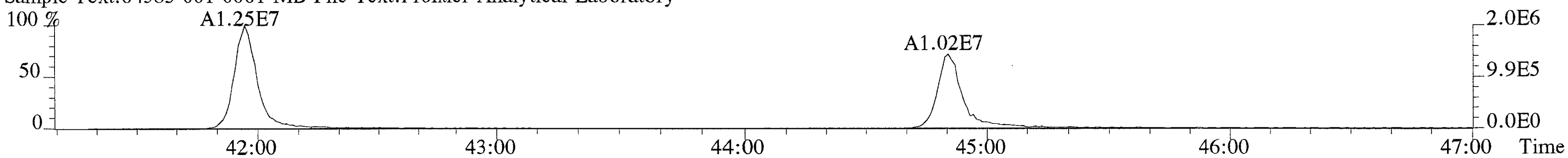
File:26JAN18M #1-521 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
409.7788 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
417.8253 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



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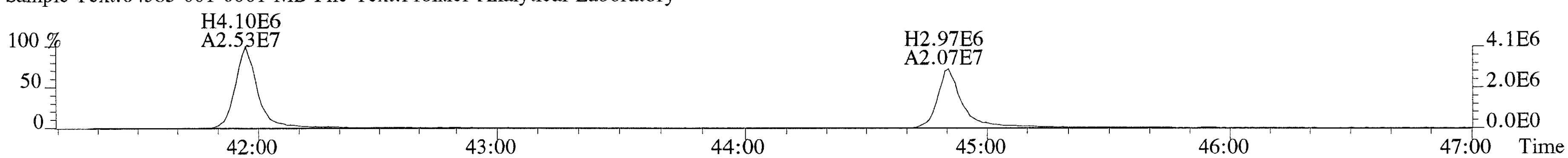
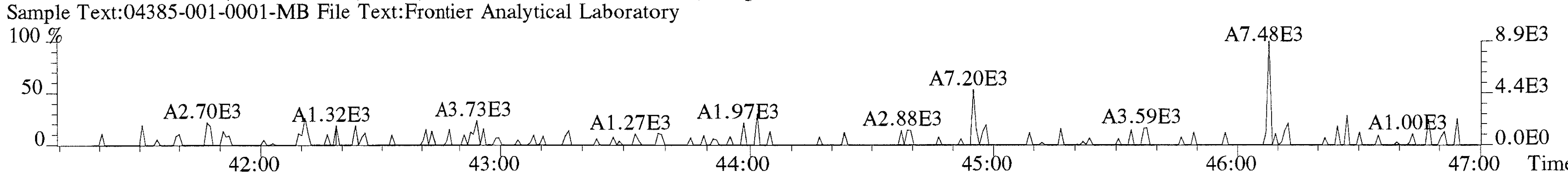
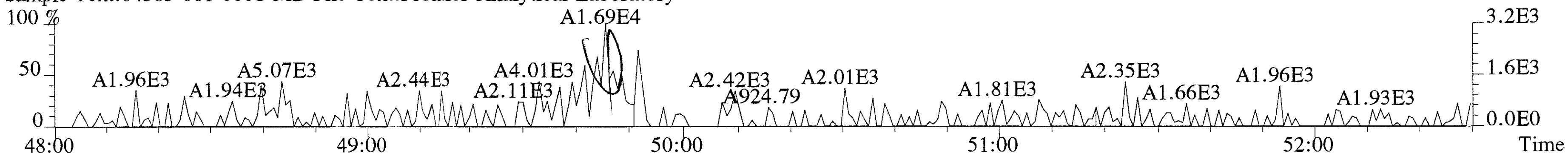
419.8220 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



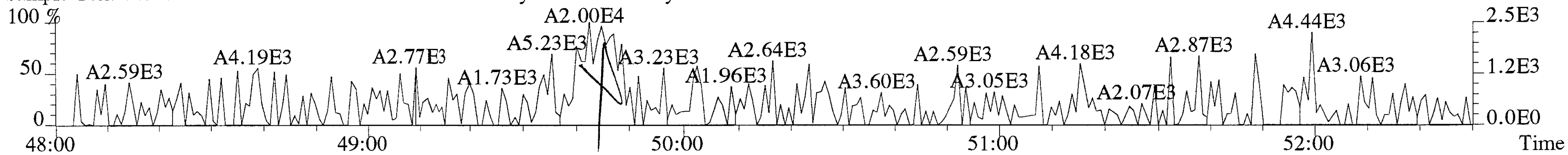
File:26JAN18M #1-521 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



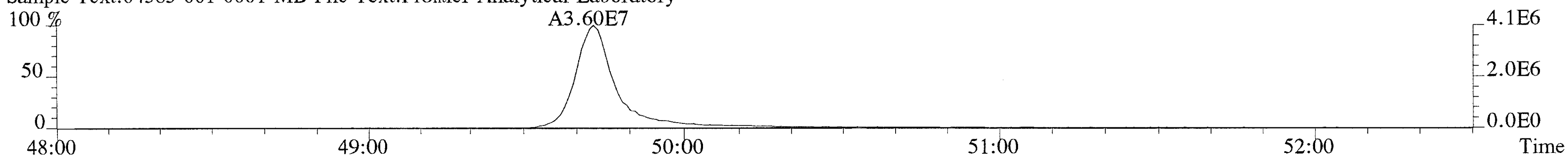
File:26JAN18M #1-360 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



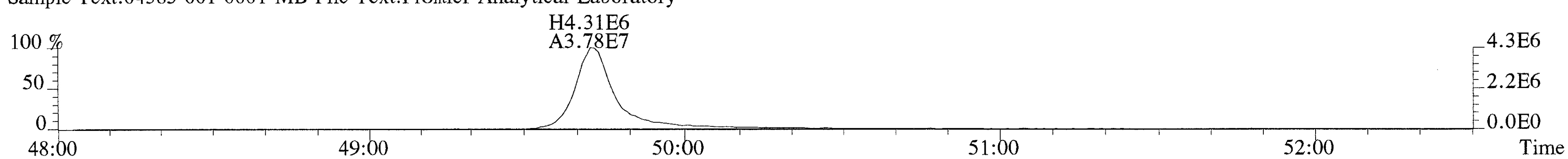
File:26JAN18M #1-360 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
443.7398 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



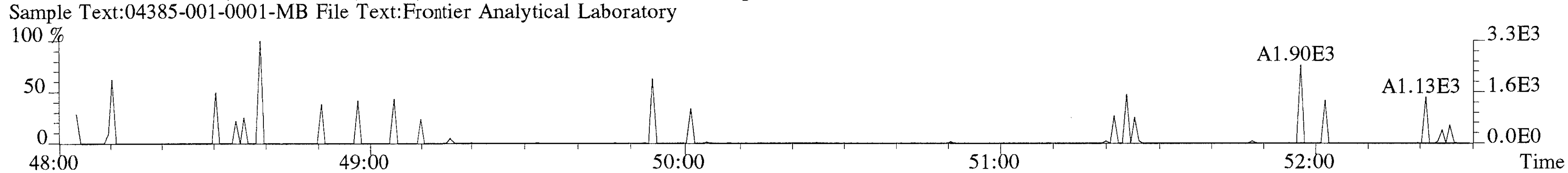
File:26JAN18M #1-360 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-360 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



File:26JAN18M #1-360 Acq:26-JAN-2018 15:21:27 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-MB File Text:Frontier Analytical Laboratory



4385-001-0001-OPR

USEPA - ITD

FORM 8A
PCDD/PCDF ONGOING PRECISION AND RECOVERY (OPR)

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:

Matrix (aqueous/solid/leachate): Aqueous   OPR Data Filename: 26JAN18M   Sam:2

Ext. Date: 1/25/18   Shift: Day   Analysis Date: 26-JAN-18   14:26:32

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT.

	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	OPR CONC. LIMITS (1) (ng/mL)
NATIVE ANALYTES			
2,3,7,8-TCDD	10	10.5	6.70 - 15.8
1,2,3,7,8-PeCDD	50	50.2	35.0 - 71.0
1,2,3,4,7,8-HxCDD	50	51.9	35.0 - 82.0
1,2,3,6,7,8-HxCDD	50	50.9	38.0 - 67.0
1,2,3,7,8,9-HxCDD	50	51.4	32.0 - 81.0
1,2,3,4,6,7,8-HpCDD	50	51.6	35.0 - 70.0
OCDD	100	99.2	78.0 - 144
2,3,7,8-TCDF	10	11.2	7.50 - 15.8
1,2,3,7,8-PeCDF	50	52.5	40.0 - 67.0
2,3,4,7,8-PeCDF	50	53.7	34.0 - 80.0
1,2,3,4,7,8-HxCDF	50	50.4	36.0 - 67.0
1,2,3,6,7,8-HxCDF	50	51.5	42.0 - 65.0
2,3,4,6,7,8-HxCDF	50	51.5	35.0 - 78.0
1,2,3,7,8,9-HxCDF	50	50.2	39.0 - 65.0
1,2,3,4,6,7,8-HpCDF	50	50.3	41.0 - 61.0
1,2,3,4,7,8,9-HpCDF	50	51.1	39.0 - 69.0
OCDF	100	99.6	63.0 - 170

(1) Contract-required concentration limits for OPR as specified in Table 6, Method 1613

Analyst: ____ Date: 1/29/18

USEPA - ITD

FORM 8B

PCDD/PCDF ONGOING PRECISION AND RECOVERY (OPR)

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:

Matrix (aqueous/solid/leachate): Aqueous   OPR Data Filename: 26JAN18M   Sam:2

Ext. Date: 1/25/18   Shift: Day   Analysis Date: 26-JAN-18   14:26:32

ALL CONCENTRATIONS REPORTED ON THIS FORM ARE CONCENTRATIONS IN EXTRACT.

	SPIKE CONC. (ng/mL)	CONC. FOUND (ng/mL)	OPR CONC. LIMITS (1) (ng/mL)
LABELED COMPOUNDS			
13C-2,3,7,8-TCDD	100	91.6	20.0 - 175
13C-1,2,3,7,8-PeCDD	100	73.8	21.0 - 227
13C-1,2,3,4,7,8-HxCDD	100	73.6	21.0 - 193
13C-1,2,3,6,7,8-HxCDD	100	70.8	25.0 - 163
13C-1,2,3,4,6,7,8-HpCDD	100	63.9	26.0 - 166
13C-OCDD	200	126	26.0 - 397
13C-2,3,7,8-TCDF	100	94.8	22.0 - 152
13C-1,2,3,7,8-PeCDF	100	76.6	21.0 - 192
13C-2,3,4,7,8-PeCDF	100	76.5	13.0 - 328
13C-1,2,3,4,7,8-HxCDF	100	77.0	19.0 - 202
13C-1,2,3,6,7,8-HxCDF	100	70.1	21.0 - 159
13C-2,3,4,6,7,8-HxCDF	100	75.1	22.0 - 176
13C-1,2,3,7,8,9-HxCDF	100	67.9	17.0 - 205
13C-1,2,3,4,6,7,8-HpCDF	100	67.1	21.0 - 158
13C-1,2,3,4,7,8,9-HpCDF	100	65.1	20.0 - 186
13C-OCDF	200	116	26.0 - 397
CLEANUP STANDARD			
37Cl-2,3,7,8-TCDD	40	37.9	12.4 - 76.4

(1) Contract-required concentration limits for OPR as specified in Table 6, Method 1613
Labeled compound concentration limits are based on required percent recovery of 25%-150%.

Analyst: [signature]   Date: 1/29/18

FAL ID: 04385-001-0001-OPR Filename: 26JAN18M Sam:2 Acquired: 26-JAN-18 14:26:32 ICal: PCDDFAL3-12-22-17
Client ID: OPR ConCal: ST012618M1 EndCal: ST012618M2
Results: 11211 GC Golumn: DB5MS Amount: 1.000 NATO 1989 Tox: 104
Instrument ID: FAL3 WHO 1998 Tox: 129 WHO 2005 Tox: 117

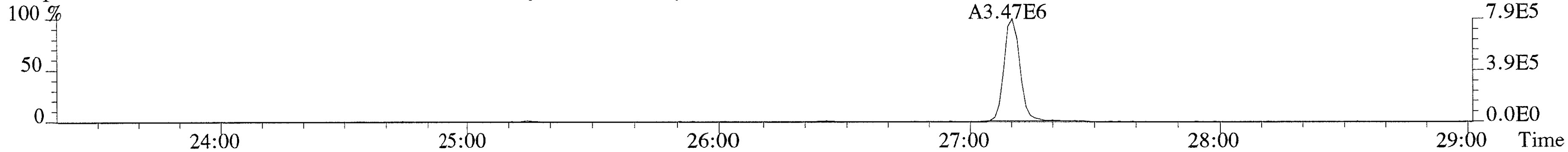
Name	Resp	RA		RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	DL
2,3,7,8-TCDD	7.84e+06	0.80	y	27:10	1.06	10.5		2.50	-	-	*
1,2,3,7,8-PeCDD	2.45e+07	1.46	y	32:60	1.00	50.2		2.50	-	-	*
1,2,3,4,7,8-HxCDD	2.04e+07	1.28	y	38:20	1.07	51.9		2.50	-	-	*
1,2,3,6,7,8-HxCDD	2.14e+07	1.22	y	38:30	1.08	50.9		2.50	-	-	*
1,2,3,7,8,9-HxCDD	2.16e+07	1.25	y	38:56	1.11	51.4		2.50	-	-	*
1,2,3,4,6,7,8-HpCDD	1.72e+07	0.96	y	43:53	0.99	51.6		2.50	-	-	*
OCDD	2.86e+07	0.94	y	49:18	1.11	99.2		2.50	-	-	*
2,3,7,8-TCDF	1.08e+07	0.72	y	26:26	1.03	11.2		2.50	-	-	*
1,2,3,7,8-PeCDF	3.50e+07	1.48	y	31:15	0.95	52.5		2.50	-	-	*
2,3,4,7,8-PeCDF	3.41e+07	1.48	y	32:36	0.79	53.7		2.50	-	-	*
1,2,3,4,7,8-HxCDF	2.96e+07	1.23	y	36:56	1.20	50.4		2.50	-	-	*
1,2,3,6,7,8-HxCDF	3.11e+07	1.19	y	37:08	1.10	51.5		2.50	-	-	*
2,3,4,6,7,8-HxCDF	3.01e+07	1.22	y	38:06	1.08	51.5		2.50	-	-	*
1,2,3,7,8,9-HxCDF	2.60e+07	1.23	y	39:32	1.15	50.2		2.50	-	-	*
1,2,3,4,6,7,8-HpCDF	2.37e+07	1.01	y	41:57	1.23	50.3		2.50	-	-	*
1,2,3,4,7,8,9-HpCDF	1.95e+07	1.02	y	44:51	1.23	51.1		2.50	-	-	*
OCDF	3.23e+07	0.92	y	49:43	0.90	99.6		2.50	-	-	*

Name	Resp	RA		RT	RRF	Conc	Rec
13C-2,3,7,8-TCDD	7.04e+07	0.82	y	27:08	1.02	91.6	91.6
13C-1,2,3,7,8-PeCDD	4.88e+07	1.53	y	32:59	0.88	73.8	73.8
13C-1,2,3,4,7,8-HxCDD	3.67e+07	1.27	y	38:18	0.85	73.6	73.6
13C-1,2,3,6,7,8-HxCDD	3.88e+07	1.20	y	38:29	0.94	70.8	70.8
13C-1,2,3,4,6,7,8-HpCDD	3.37e+07	1.07	y	43:51	0.90	63.9	63.9
13C-OCDD	5.18e+07	0.92	y	49:17	0.70	126	63.2
13C-2,3,7,8-TCDF	9.38e+07	0.82	y	26:25	0.93	94.8	94.8
13C-1,2,3,7,8-PeCDF	7.04e+07	1.54	y	31:14	0.87	76.6	76.6
13C-2,3,4,7,8-PeCDF	8.04e+07	1.54	y	32:36	0.99	76.5	76.5
13C-1,2,3,4,7,8-HxCDF	4.91e+07	0.55	y	36:54	1.09	77.0	77.0
13C-1,2,3,6,7,8-HxCDF	5.51e+07	0.57	y	37:07	1.35	70.1	70.1
13C-2,3,4,6,7,8-HxCDF	5.40e+07	0.55	y	38:04	1.23	75.1	75.1
13C-1,2,3,7,8,9-HxCDF	4.53e+07	0.56	y	39:32	1.14	67.9	67.9
13C-1,2,3,4,6,7,8-HpCDF	3.81e+07	0.48	y	41:56	0.97	67.1	67.1
13C-1,2,3,4,7,8,9-HpCDF	3.10e+07	0.48	y	44:49	0.82	65.1	65.1
13C-OCDF	7.17e+07	0.94	y	49:42	1.06	116	57.8
37Cl-2,3,7,8-TCDD	2.61e+07			27:10	0.91	37.9	94.8
13C-1,2,3,4-TCDD	7.52e+07	0.82	y	26:30	-	207	
13C-1,2,3,4-TCDF	1.06e+08	0.79	y	25:15	-	204	
13C-1,2,3,7,8,9-HxCDD	5.84e+07	1.24	y	38:54	-	190	

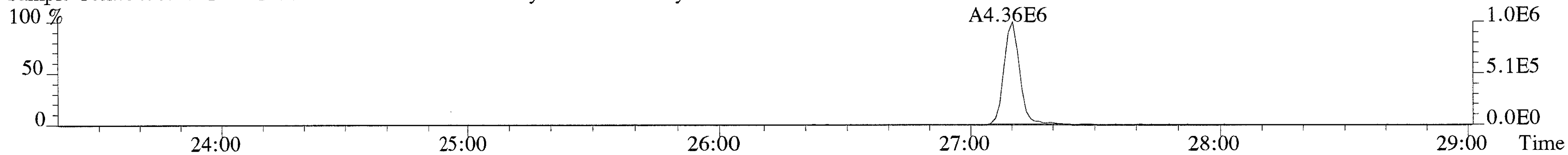
Name	Resp	RT	RRF	Conc	Fac	Noise-1	Noise-2	DL		#Hom
Total Tetra-Dioxins	8.05e+06	22:56	1.06	10.8	2.50	-	-	*		18
Total Penta-Dioxins	2.48e+07	31:14	1.00	50.9	2.50	-	-	*		10
Total Hexa-Dioxins	6.42e+07	36:54	1.09	156	2.50	-	-	*		22
Total Hepta-Dioxins	1.81e+07	42:14	0.99	54.4	2.50	-	-	*		33
Total Tetra-Furans	1.12e+07	22:53	1.03	11.7	2.50	-	-	*		25
1st Fn. Tot Penta-Furans	1.01e+05	22:49	0.86	0.156	2.50	-	-	*	PeCDF	17
Total Penta-Furans	7.06e+07	29:59	0.86	109	2.50	-	-	*	109	17
Total Hexa-Furans	1.18e+08	34:58	1.13	205	2.50	-	-	*		27
Total Hepta-Furans	4.45e+07	41:57	1.23	105	2.50	-	-	*		35

Analyst: [signature] Date: 1/29/18

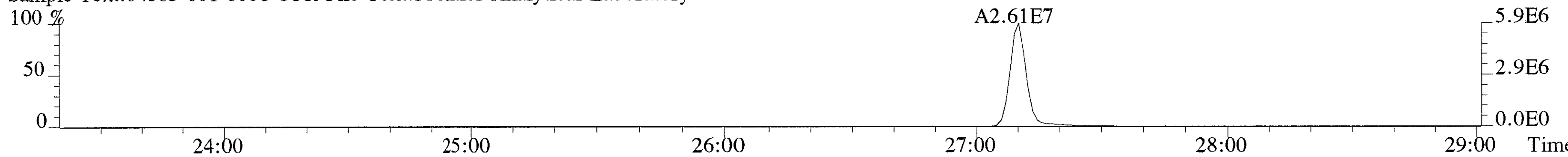
File:26JAN18M #1-381 Acq:26-JAN-1918 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



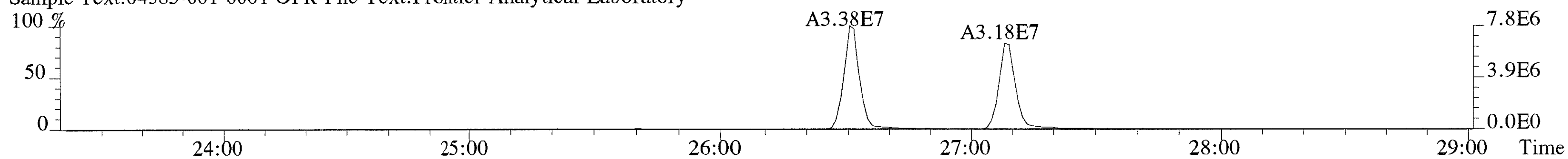
File:26JAN18M #1-381 Acq:26-JAN-1918 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



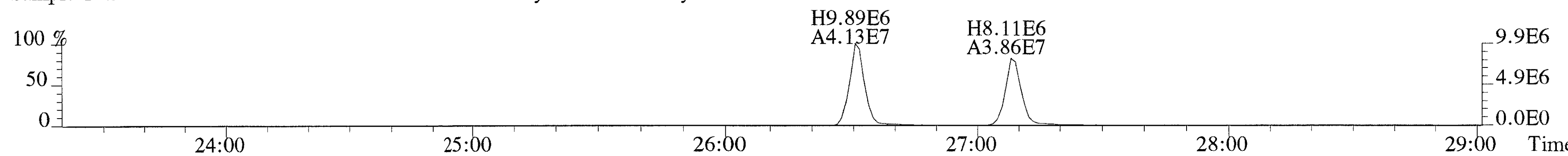
File:26JAN18M #1-381 Acq:26-JAN-1918 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
327.8847 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



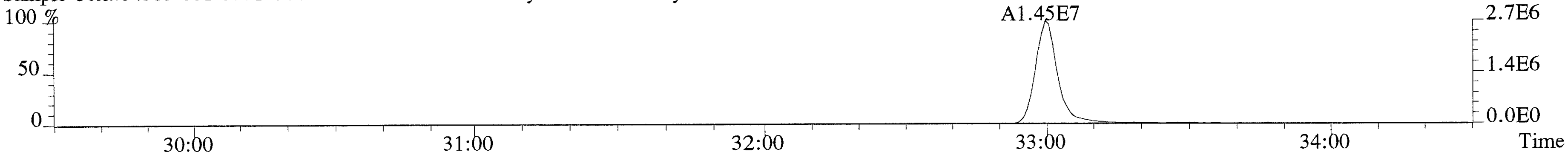
File:26JAN18M #1-381 Acq:26-JAN-1918 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
331.9368 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



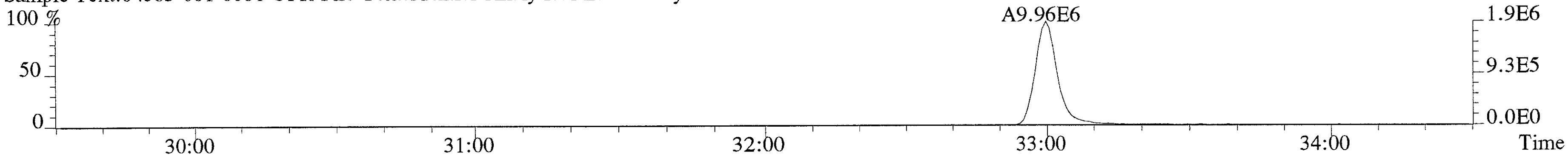
File:26JAN18M #1-381 Acq:26-JAN-1918 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
333.9339 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



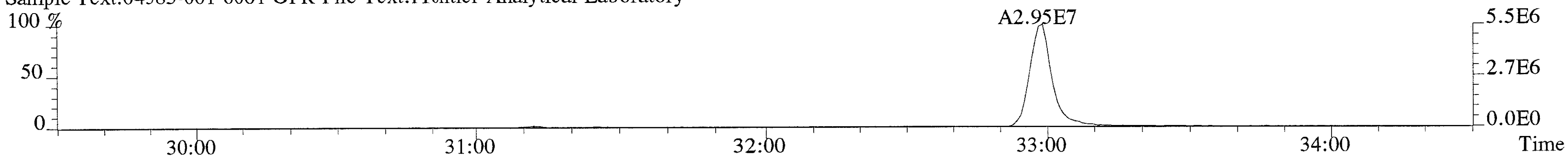
File:26JAN18M #1-424 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
355.8546 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



File:26JAN18M #1-424 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
357.8517 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



File:26JAN18M #1-424 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
367.8949 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



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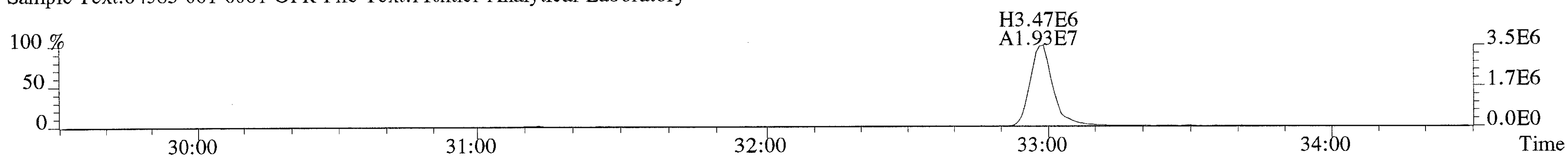
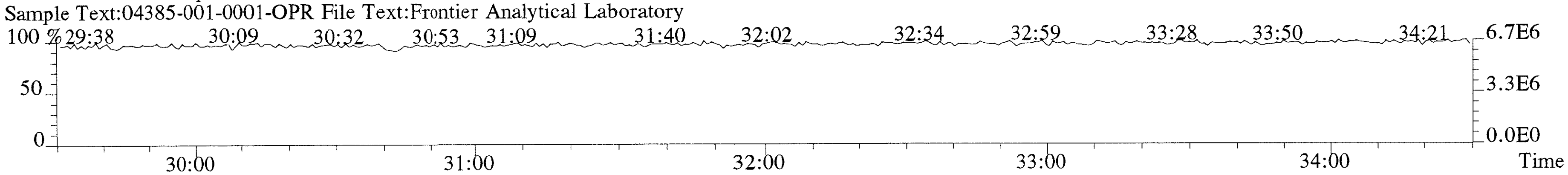
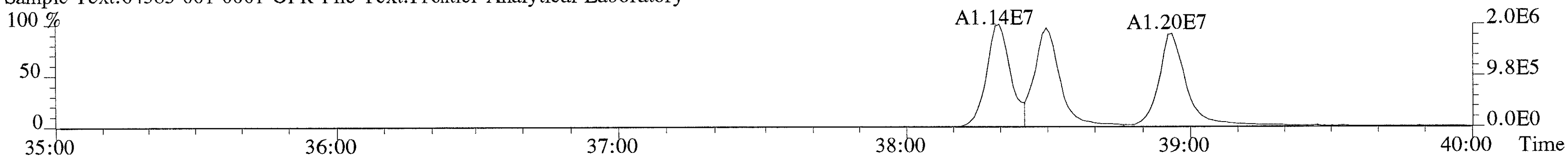
369.8919 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



File:26JAN18M #1-424 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
366.9792 S:2 F:2 Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
389.8156 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



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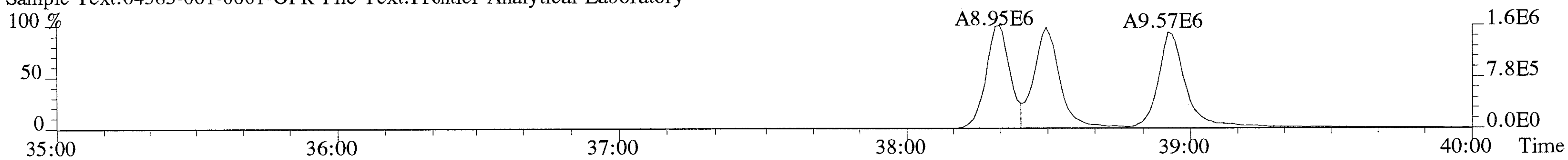
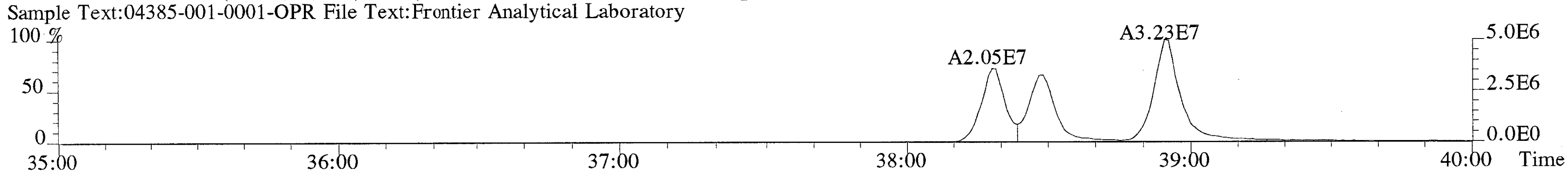
391.8127 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
401.8559 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



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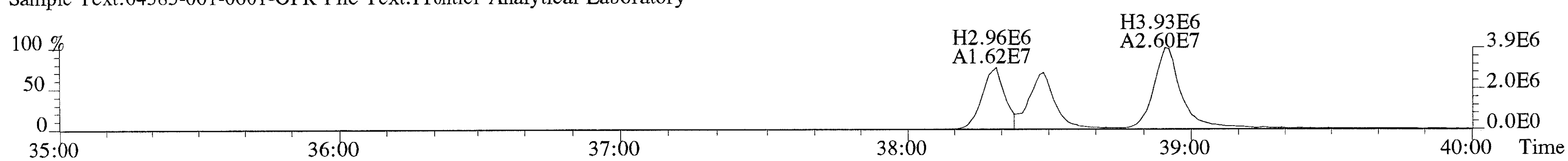
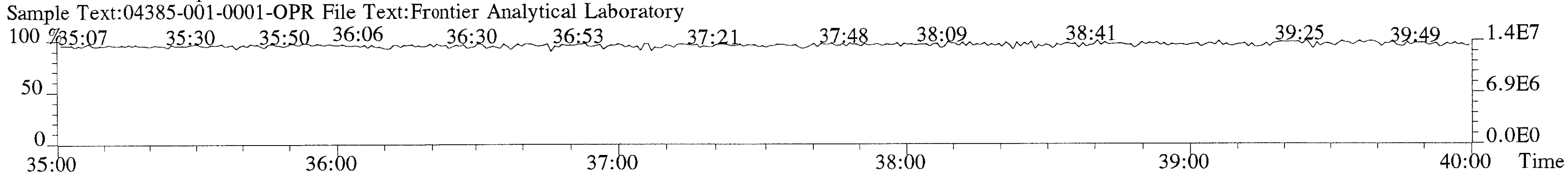
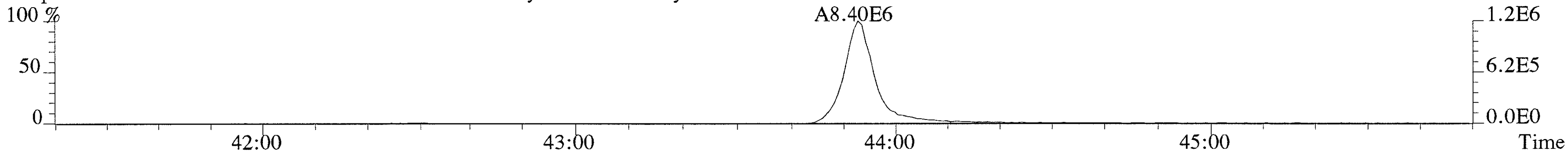
403.8530 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



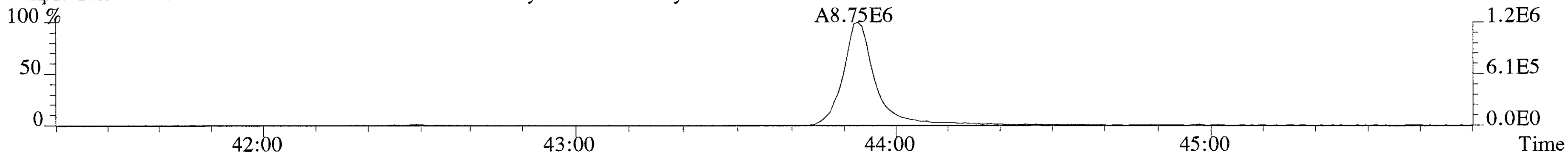
File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
380.9760 S:2 F:3 Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



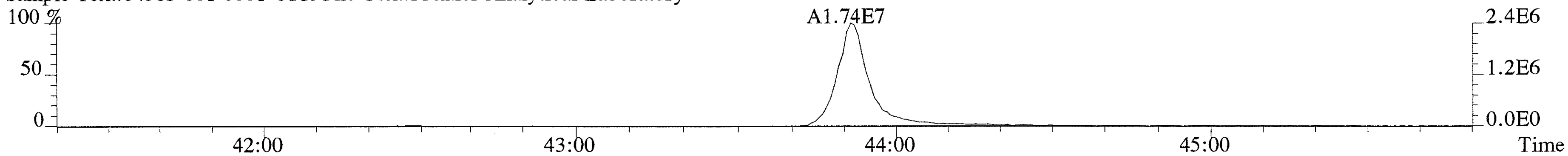
File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
423.7767 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



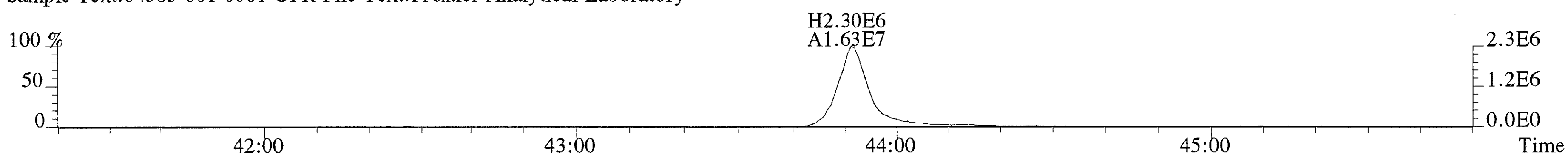
File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
425.7737 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



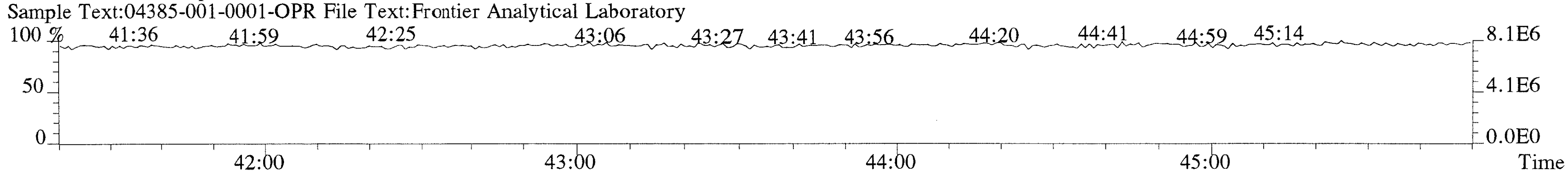
File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
435.8169 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



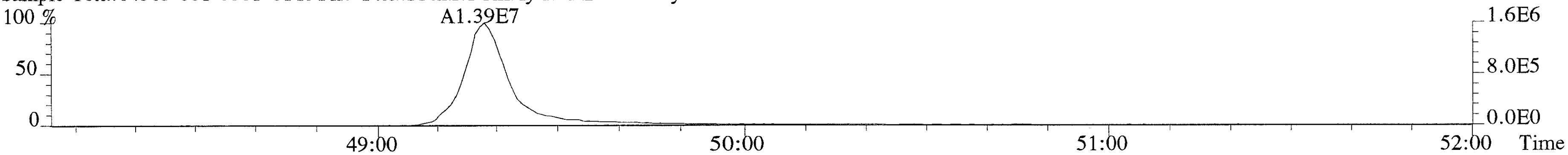
File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
437.8140 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



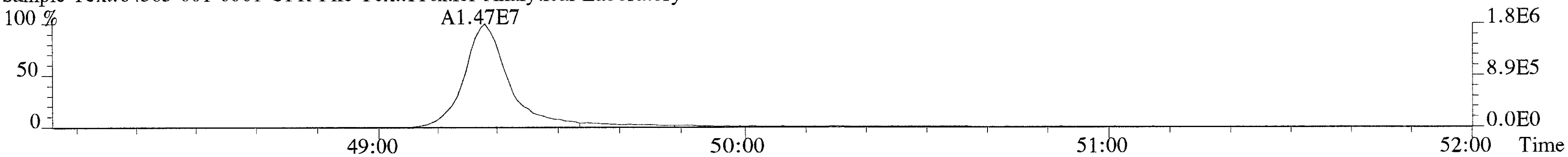
File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
430.9728 S:2 F:4 Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



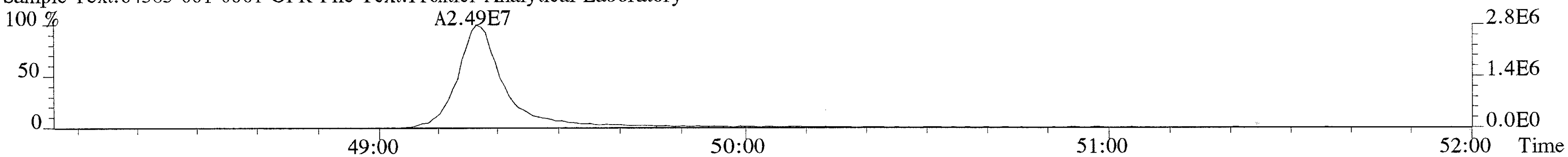
File:26JAN18M #1-361 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
457.7377 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



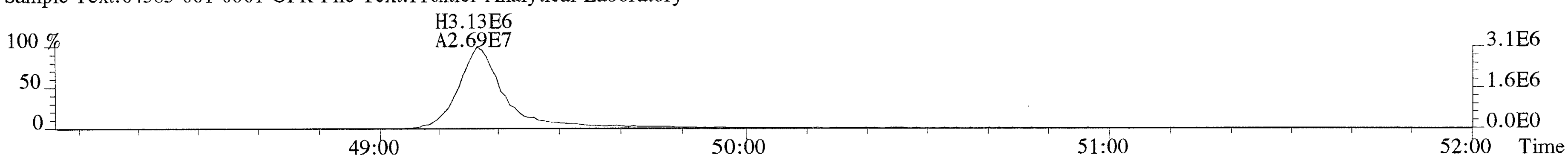
File:26JAN18M #1-361 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
459.7348 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



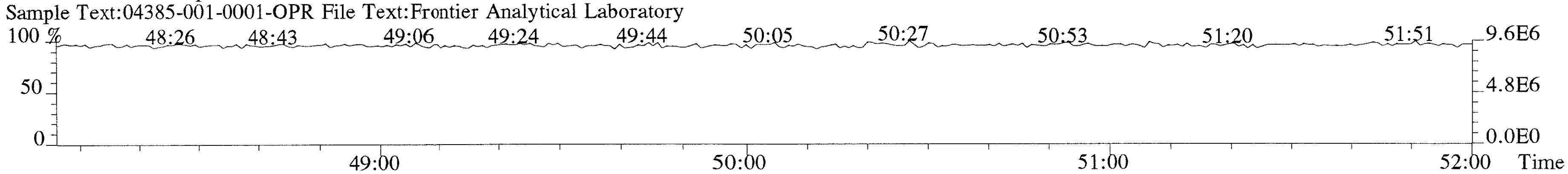
File:26JAN18M #1-361 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
469.7780 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



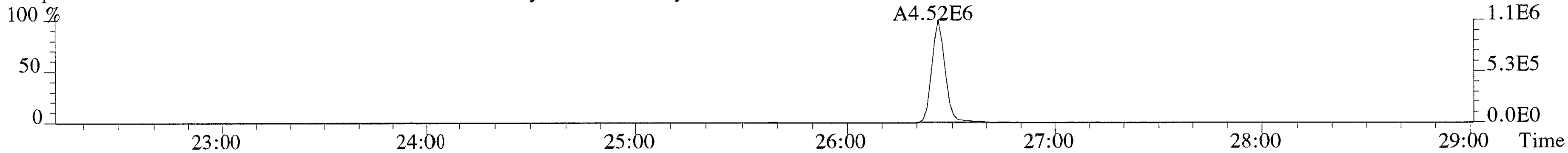
File:26JAN18M #1-361 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
471.7750 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



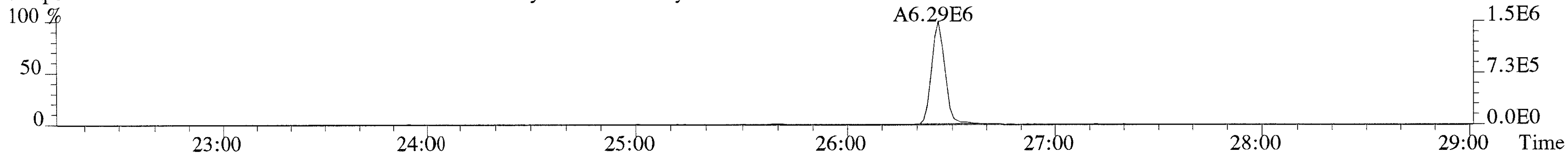
File:26JAN18M #1-361 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
454.9728 S:2 F:5 Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



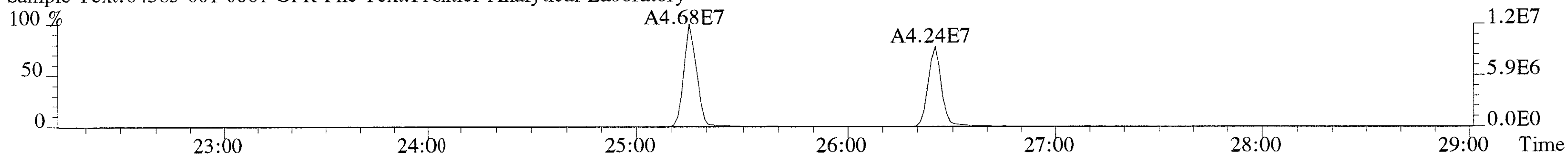
File:26JAN18M #1-381 Acq:26-JAN-1918 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
303.9016 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



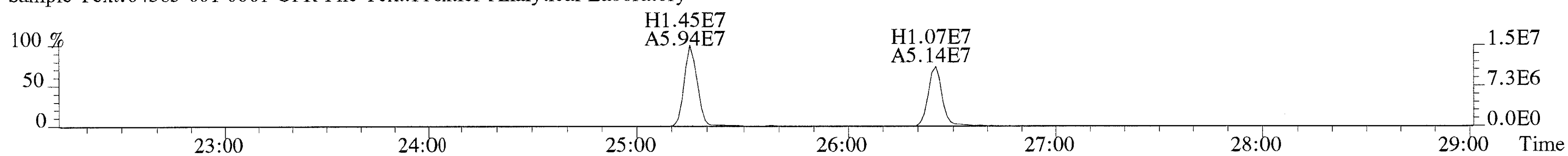
File:26JAN18M #1-381 Acq:26-JAN-1918 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
305.8987 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



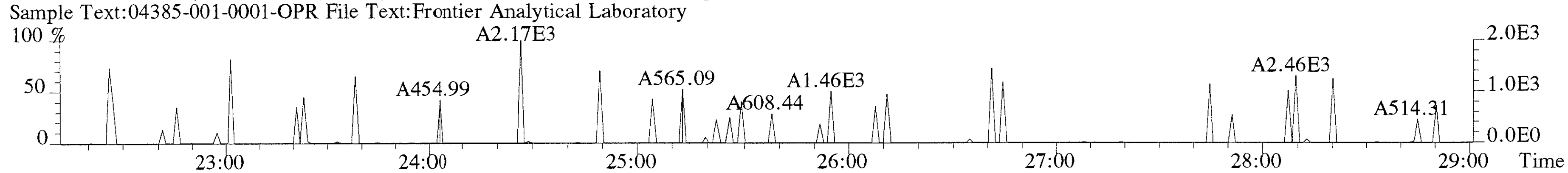
File:26JAN18M #1-381 Acq:26-JAN-1918 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
315.9419 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



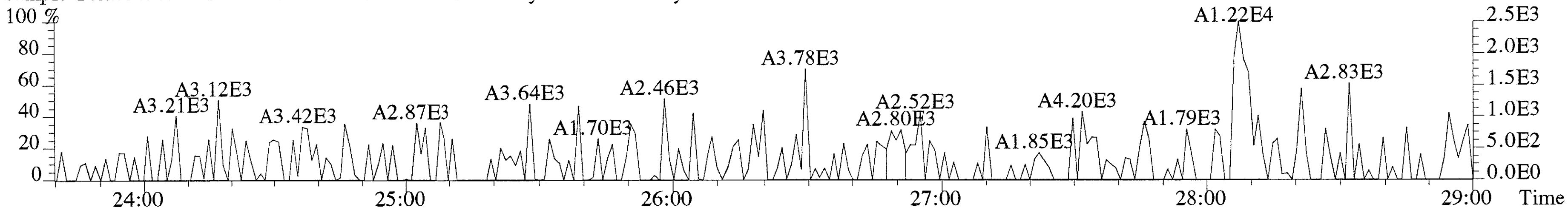
File:26JAN18M #1-381 Acq:26-JAN-1918 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
317.9389 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



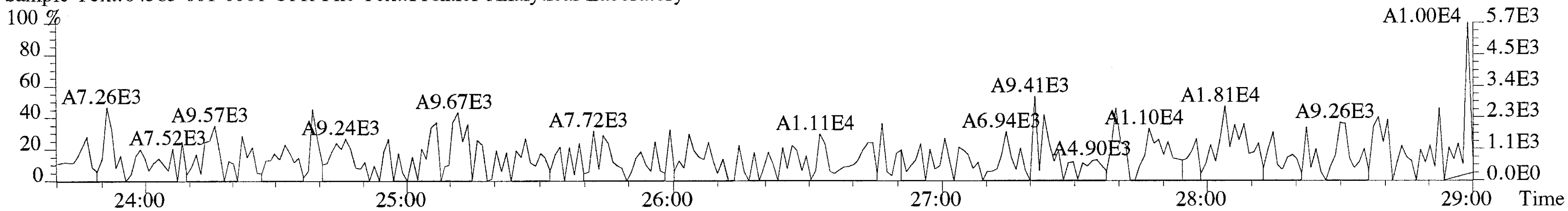
File:26JAN18M #1-381 Acq:26-JAN-1918 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
375.8364 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



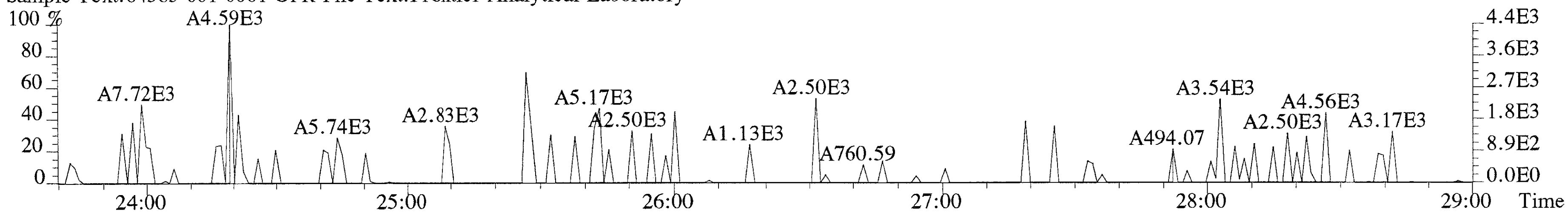
File:26JAN18M #1-381 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



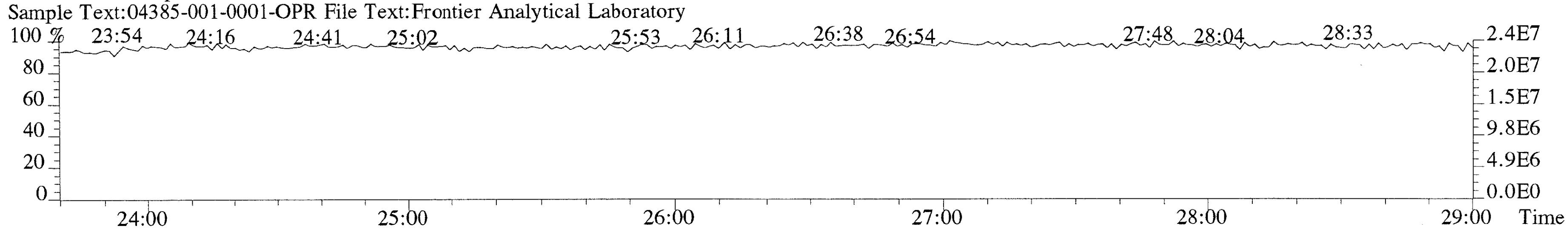
File:26JAN18M #1-381 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



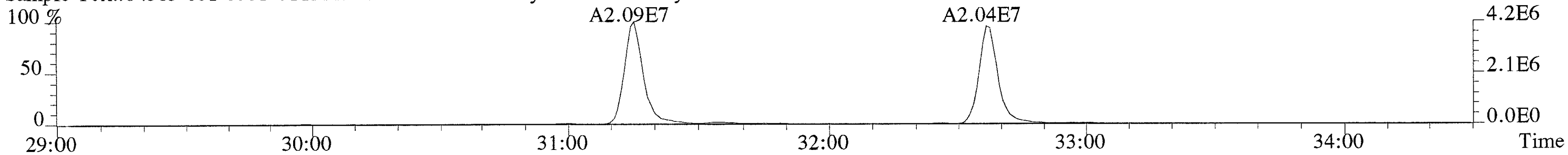
File:26JAN18M #1-381 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



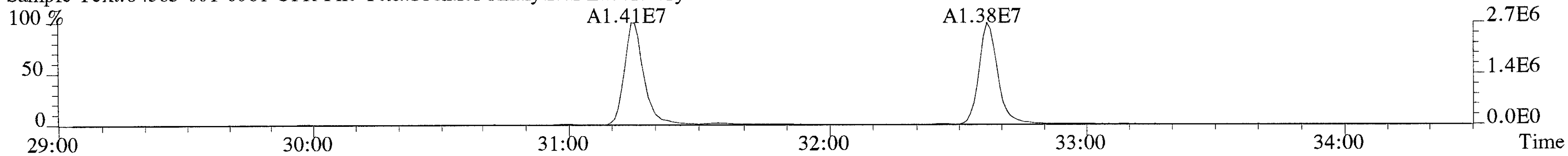
File:26JAN18M #1-381 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
330.9792 S:2 Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



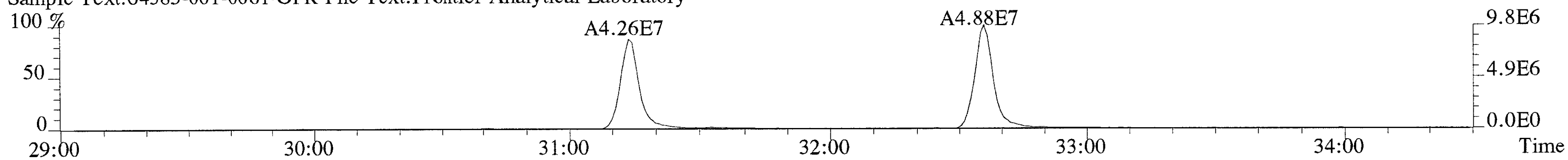
File:26JAN18M #1-424 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



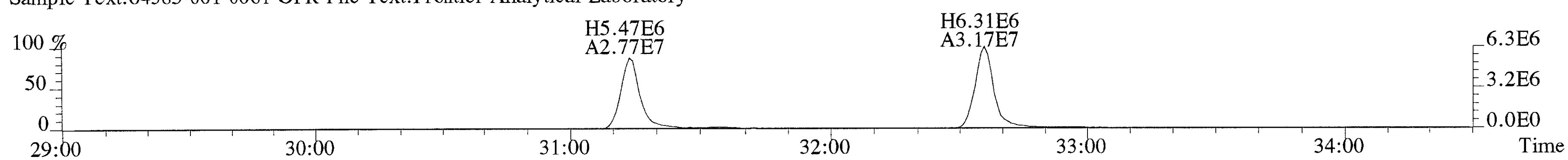
File:26JAN18M #1-424 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



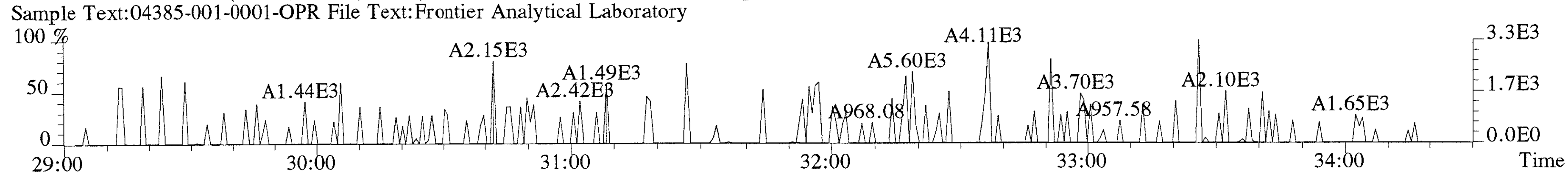
File:26JAN18M #1-424 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



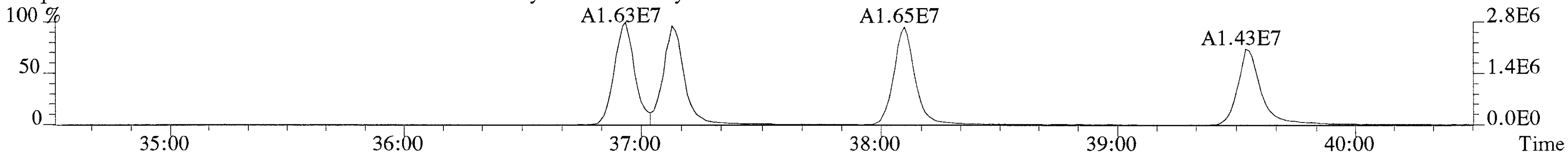
File:26JAN18M #1-424 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
353.8970 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



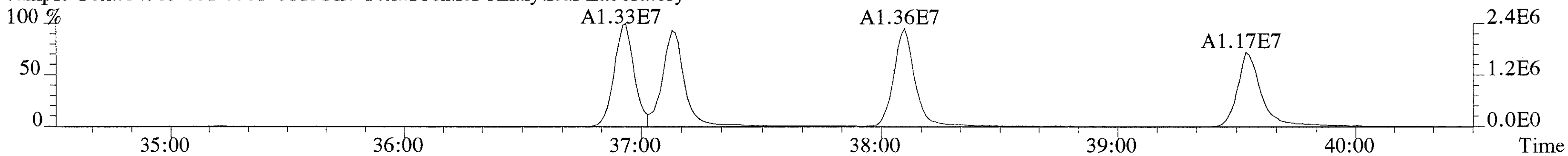
File:26JAN18M #1-424 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



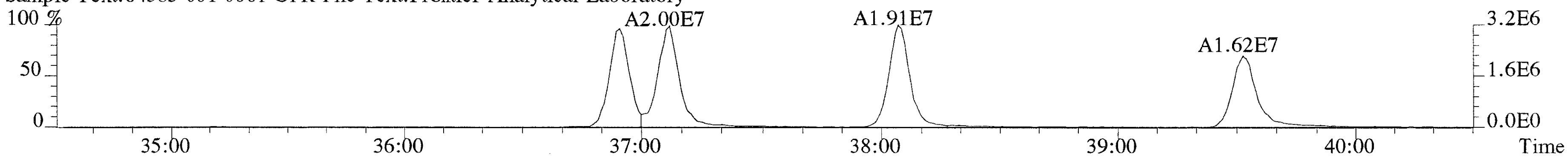
File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
373.8207 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



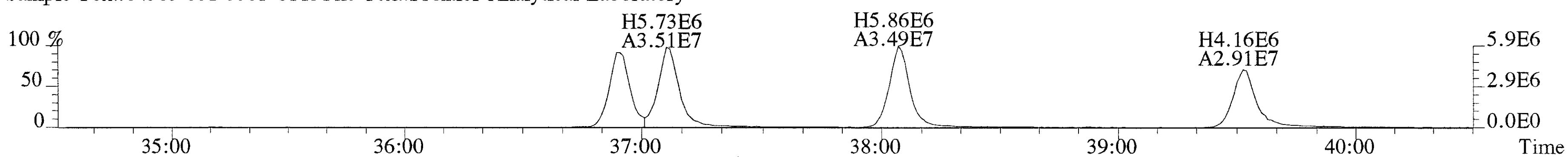
File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
375.8178 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



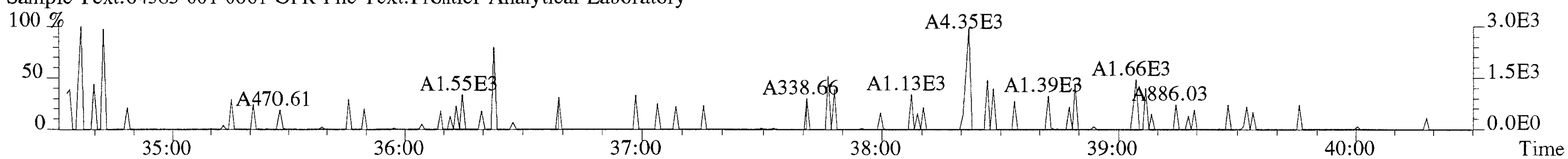
File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



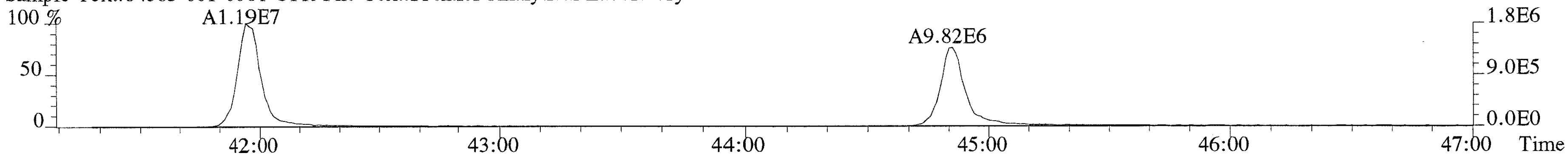
File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
385.8610 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



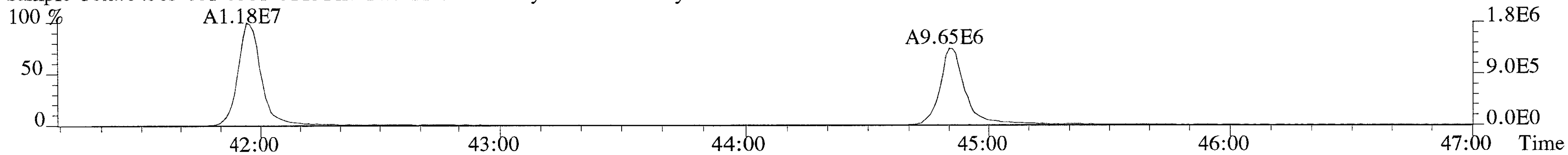
File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
445.7555 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
409.7788 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



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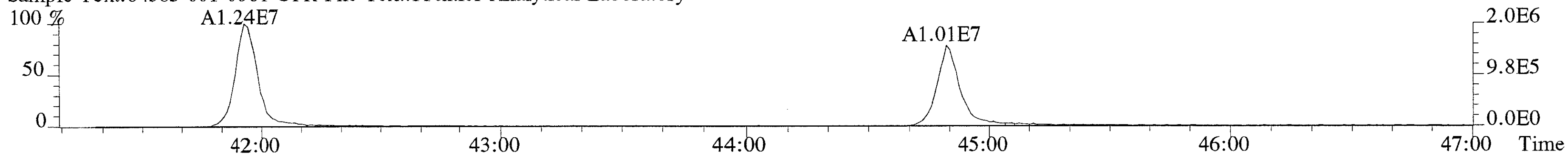
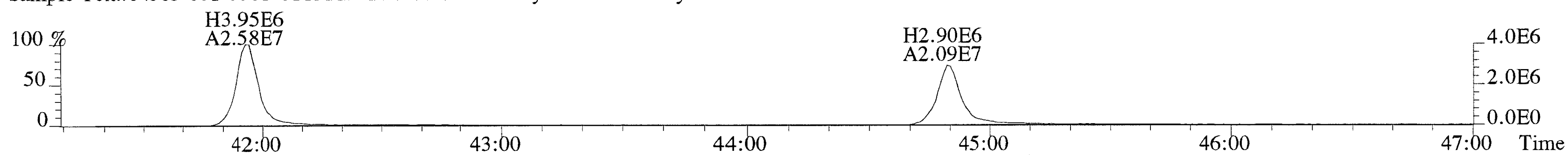
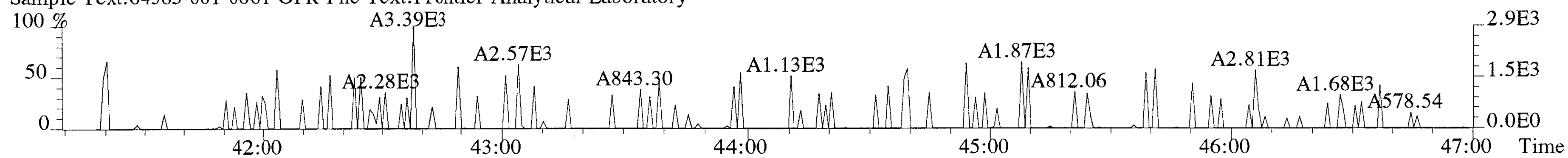
417.8253 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



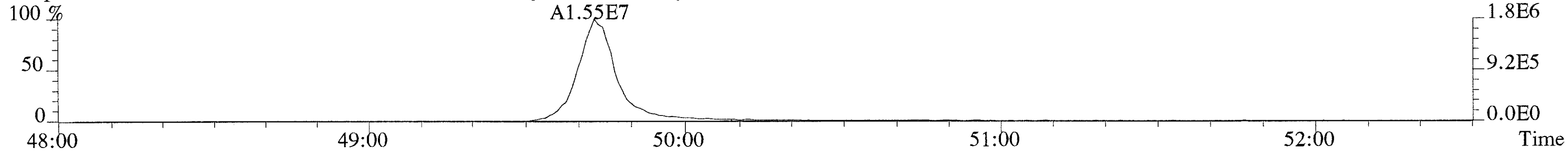
File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
419.8220 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



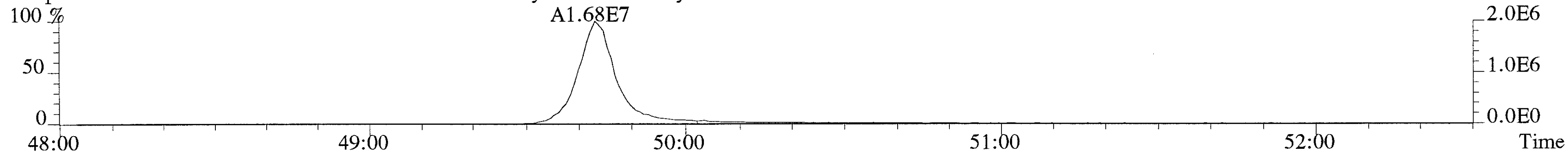
File:26JAN18M #1-521 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



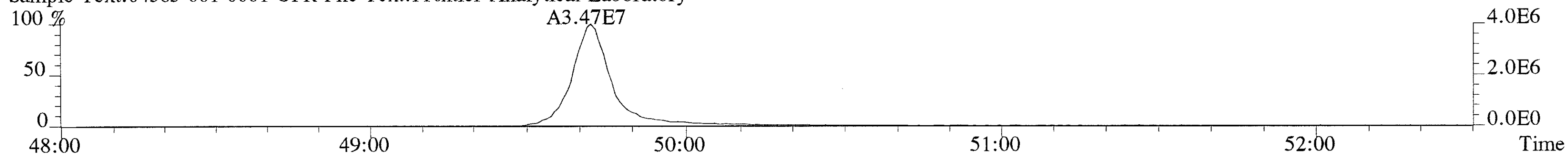
File:26JAN18M #1-361 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



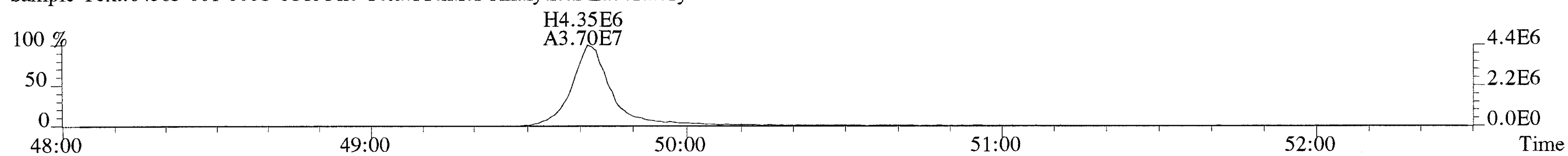
File:26JAN18M #1-361 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
443.7398 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



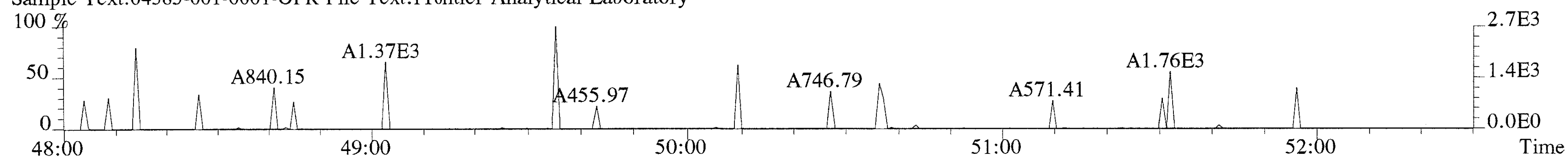
File:26JAN18M #1-361 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:26-JAN-2018 14:26:32 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:04385-001-0001-OPR File Text:Frontier Analytical Laboratory



FAL ID: 11211-001-0001-SA   Filename: 26JAN18M   Sam:15   Acquired: 27-JAN-18 02:19:42   ICal: PCDDFAL3-12-22-17
Client ID: AMW-3-011218   ConCal: ST012618M2   EndCal: ST012618M3
Results: 11211   GC Column: DB5MS   Amount: 0.8790   NATO 1989 Tox: 0.00
Instrument ID: FAL3   WHO 1998 Tox: 0.00   WHO 2005 Tox: 0.00

Name	Resp	RA	RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	DL
2,3,7,8-TCDD	*	* n	NotFnd	1.06	*		2.50	660	659	0.665
1,2,3,7,8-PeCDD	*	* n	NotFnd	1.00	*		2.50	677	500	0.959
1,2,3,4,7,8-HxCDD	*	* n	NotFnd	1.07	*		2.50	932	1090	2.06
1,2,3,6,7,8-HxCDD	*	* n	NotFnd	1.08	*		2.50	932	1090	2.00
1,2,3,7,8,9-HxCDD	*	* n	NotFnd	1.11	*		2.50	932	1090	1.97
1,2,3,4,6,7,8-HpCDD	*	* n	NotFnd	0.99	*		2.50	1220	736	2.62
OCDD	*	* n	NotFnd	1.11	*		2.50	964	1310	4.61
2,3,7,8-TCDF	*	* n	NotFnd	1.03	*		2.50	697	916	0.704
1,2,3,7,8-PeCDF	*	* n	NotFnd	0.95	*		2.50	576	891	0.899
2,3,4,7,8-PeCDF	*	* n	NotFnd	0.79	*		2.50	576	891	0.903
1,2,3,4,7,8-HxCDF	*	* n	NotFnd	1.20	*		2.50	715	541	0.810
1,2,3,6,7,8-HxCDF	*	* n	NotFnd	1.10	*		2.50	715	541	0.825
2,3,4,6,7,8-HxCDF	*	* n	NotFnd	1.08	*		2.50	715	541	0.901
1,2,3,7,8,9-HxCDF	*	* n	NotFnd	1.15	*		2.50	715	541	1.20
1,2,3,4,6,7,8-HpCDF	*	* n	NotFnd	1.23	*		2.50	776	623	1.26
1,2,3,4,7,8,9-HpCDF	*	* n	NotFnd	1.23	*		2.50	776	623	1.78
OCDF	*	* n	NotFnd	0.90	*		2.50	340	918	2.14

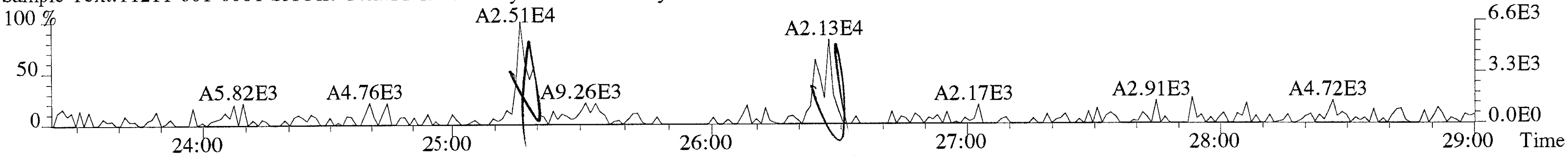
Name	Resp	RA	RT	RRF	Conc	Rec
13C-2,3,7,8-TCDD	4.83e+07	0.83 y	27:10	1.02	1870	82.3
13C-1,2,3,7,8-PeCDD	3.90e+07	1.52 y	32:60	0.88	1760	77.2
13C-1,2,3,4,7,8-HxCDD	3.00e+07	1.25 y	38:20	0.85	1680	73.7
13C-1,2,3,6,7,8-HxCDD	3.36e+07	1.24 y	38:31	0.94	1700	74.9
13C-1,2,3,4,6,7,8-HpCDD	3.13e+07	1.05 y	43:54	0.90	1660	72.7
13C-OCDD	4.69e+07	0.93 y	49:19	0.70	3180	70.0
13C-2,3,7,8-TCDF	5.83e+07	0.81 y	26:26	0.93	1740	76.4
13C-1,2,3,7,8-PeCDF	5.10e+07	1.52 y	31:15	0.87	1640	72.0
13C-2,3,4,7,8-PeCDF	5.89e+07	1.53 y	32:37	0.99	1650	72.7
13C-1,2,3,4,7,8-HxCDF	4.12e+07	0.54 y	36:56	1.09	1800	79.0
13C-1,2,3,6,7,8-HxCDF	5.02e+07	0.57 y	37:09	1.35	1780	78.2
13C-2,3,4,6,7,8-HxCDF	4.46e+07	0.57 y	38:06	1.23	1730	76.0
13C-1,2,3,7,8,9-HxCDF	3.83e+07	0.55 y	39:34	1.14	1600	70.3
13C-1,2,3,4,6,7,8-HpCDF	3.44e+07	0.50 y	41:58	0.97	1680	74.0
13C-1,2,3,4,7,8,9-HpCDF	2.70e+07	0.50 y	44:51	0.82	1580	69.4
13C-OCDF	6.74e+07	0.95 y	49:44	1.06	3030	66.5
37Cl-2,3,7,8-TCDD	1.87e+07		27:11	0.91	809	88.9

Name	Resp	RA	RT	RRF	Conc
13C-1,2,3,4-TCDD	5.75e+07	0.82 y	26:32	-	180
13C-1,2,3,4-TCDF	8.18e+07	0.80 y	25:17	-	179
13C-1,2,3,7,8,9-HxCDD	4.77e+07	1.22 y	38:56	-	177

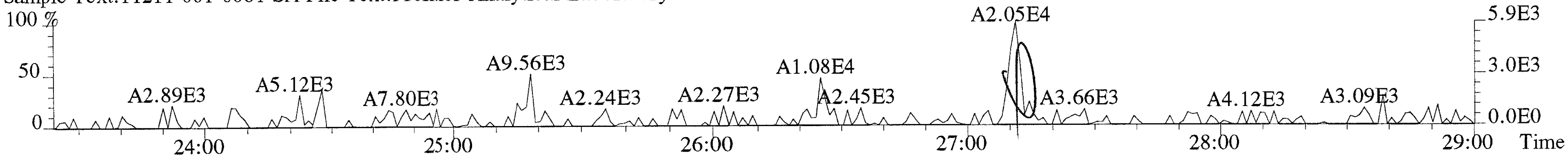
Name	Resp	RT	RRF	Conc	Fac	Noise-1	Noise-2	DL		#Hom
Total Tetra-Dioxins	*	NotFnd	1.06	*	2.50	660	659	0.665		0
Total Penta-Dioxins	*	NotFnd	1.00	*	2.50	677	500	0.959		0
Total Hexa-Dioxins	*	NotFnd	1.09	*	2.50	932	1090	2.06		0
Total Hepta-Dioxins	*	NotFnd	0.99	*	2.50	1220	736	2.62		0
Total Tetra-Furans	*	NotFnd	1.03	*	2.50	697	916	0.704		0
1st Fn. Tot Penta-Furans	*	NotFnd	0.86	*	2.50	576	891	0.903	PeCDF	0
Total Penta-Furans	*	NotFnd	0.86	*	2.50	576	891	0.903	*	0
Total Hexa-Furans	*	NotFnd	1.13	*	2.50	715	541	1.20		0
Total Hepta-Furans	*	NotFnd	1.23	*	2.50	776	623	1.78		0

Analyst: [signature]   Date: 1/29/18

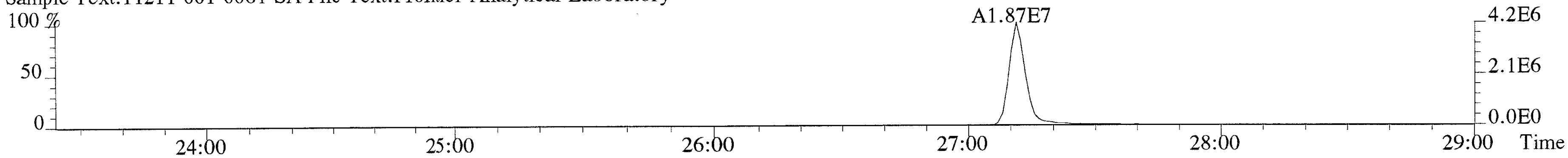
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:15 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



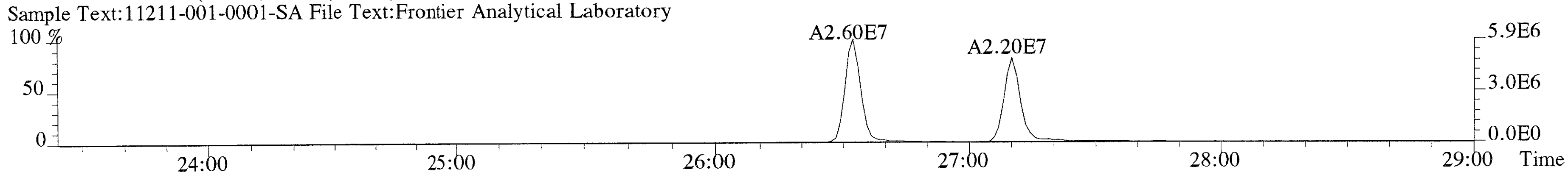
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:15 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



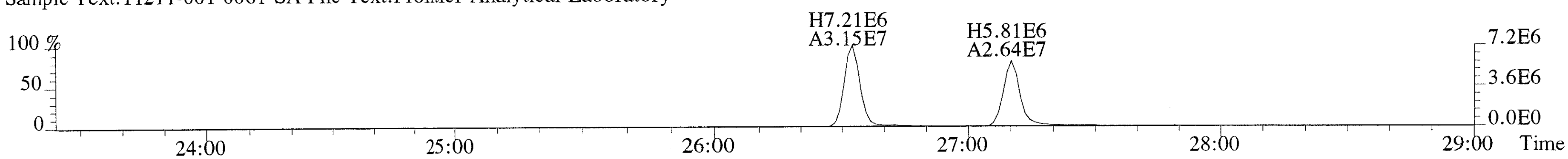
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
327.8847 S:15 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



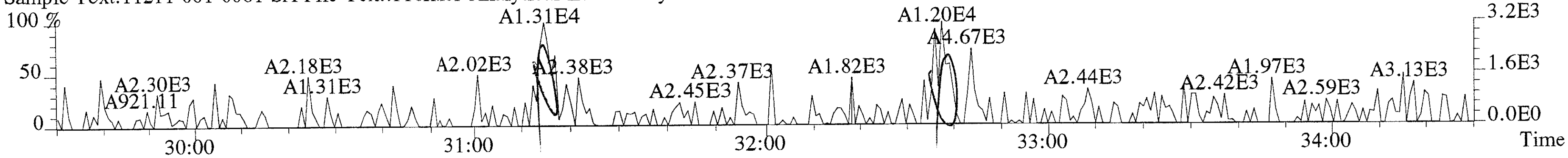
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
331.9368 S:15 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



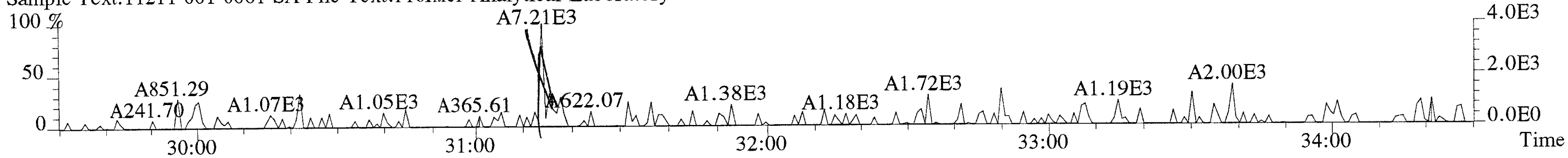
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
333.9339 S:15 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



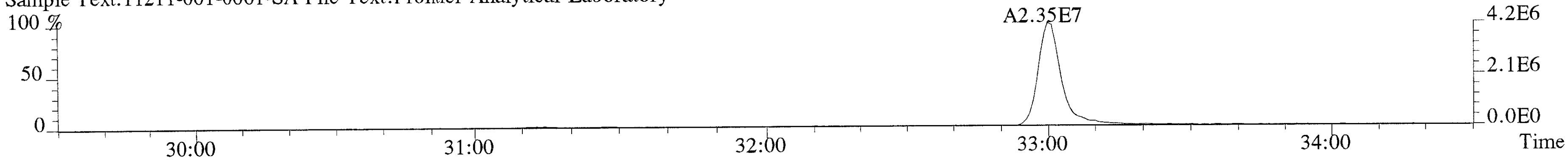
File:26JAN18M #1-423 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
355.8546 S:15 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



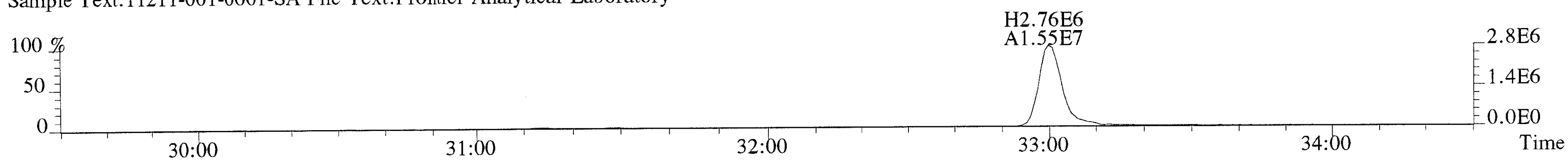
File:26JAN18M #1-423 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
357.8517 S:15 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



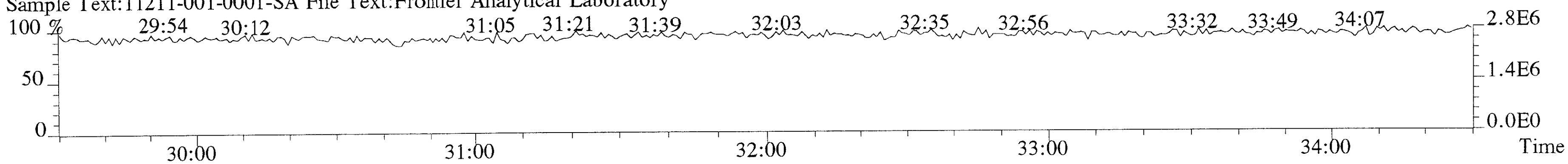
File:26JAN18M #1-423 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
367.8949 S:15 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



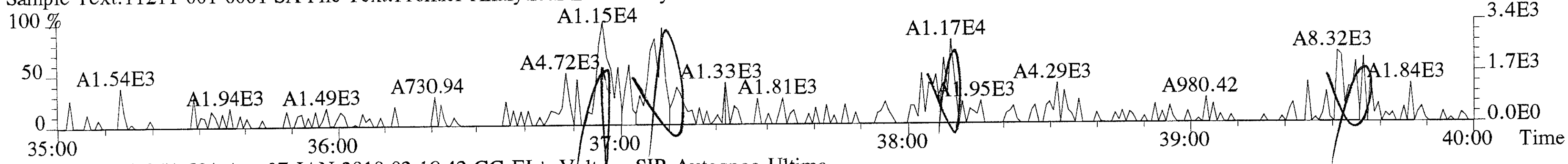
File:26JAN18M #1-423 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
369.8919 S:15 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



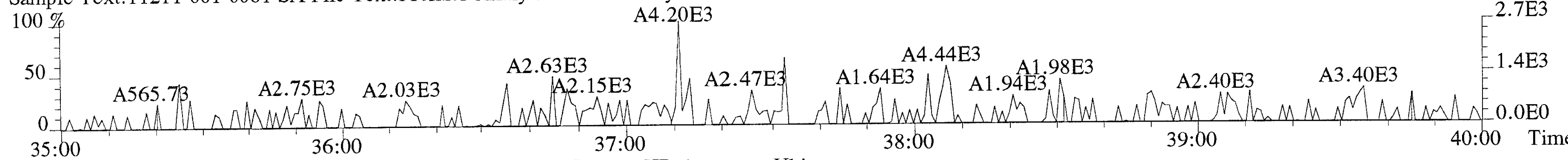
File:26JAN18M #1-423 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
366.9792 S:15 F:2 Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



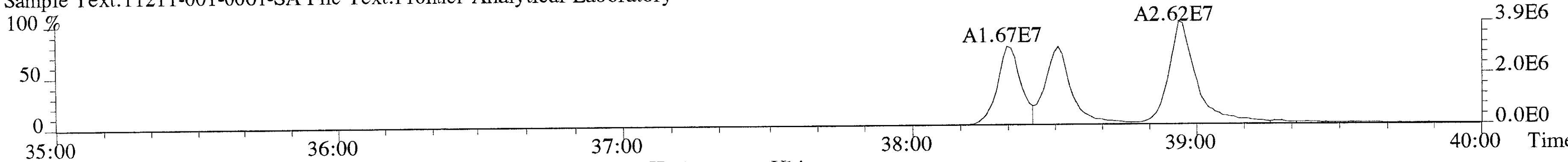
File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
389.8156 S:15 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



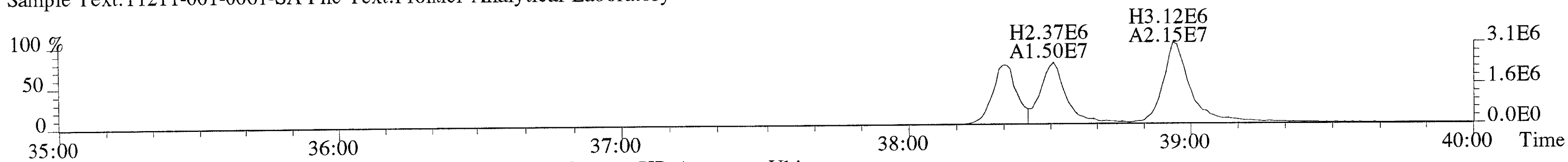
File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
391.8127 S:15 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



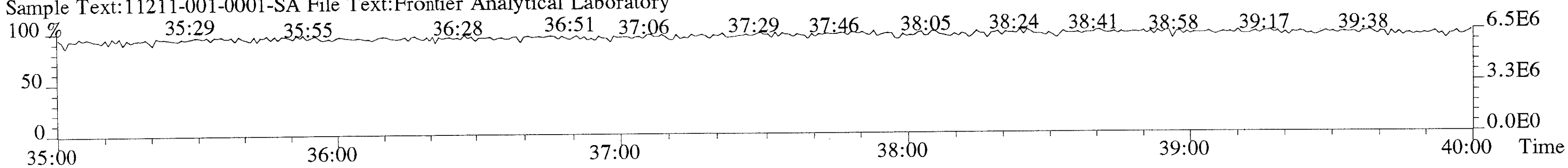
File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
401.8559 S:15 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



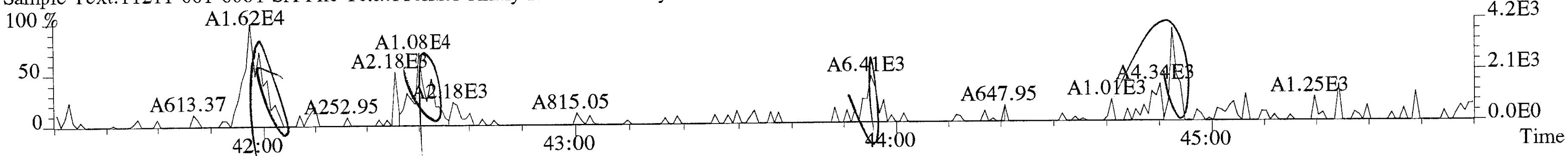
File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
403.8530 S:15 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



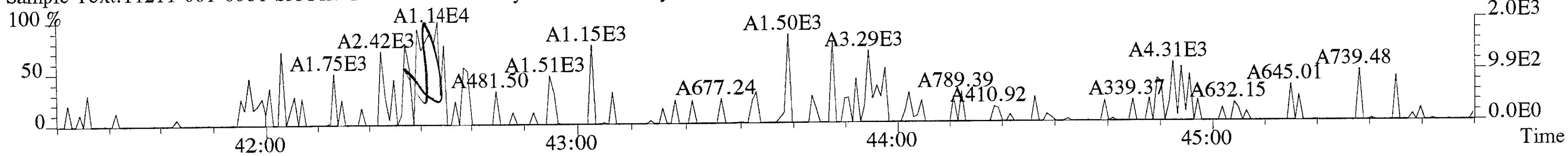
File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
380.9760 S:15 F:3 Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



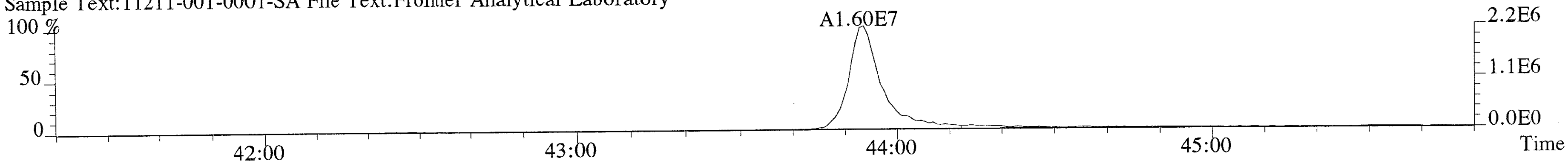
File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
423.7767 S:15 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
425.7737 S:15 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
435.8169 S:15 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



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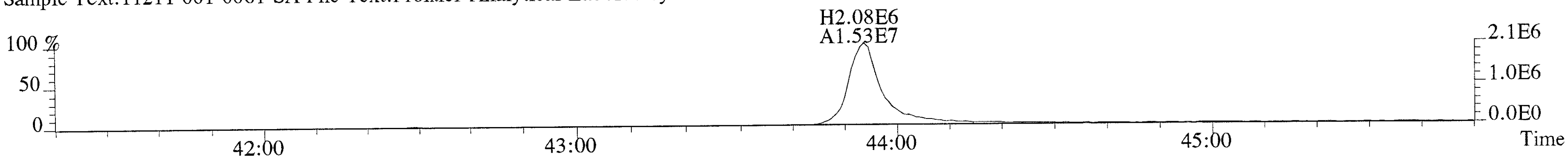
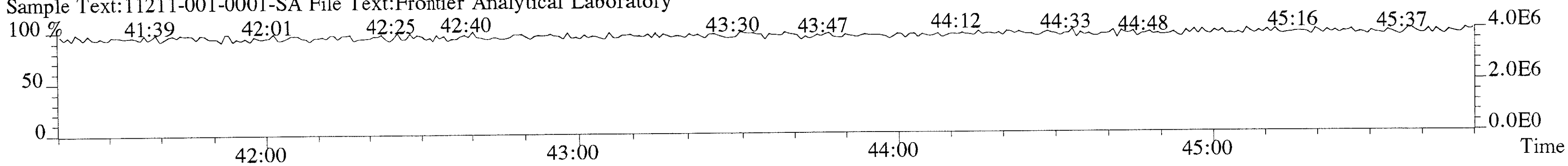
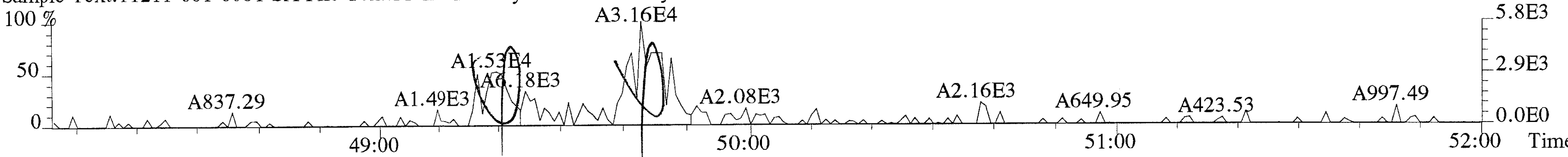
437.8140 S:15 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
430.9728 S:15 F:4 Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
457.7377 S:15 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



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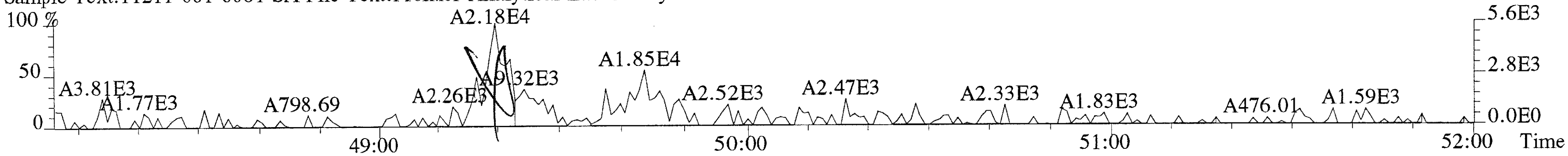
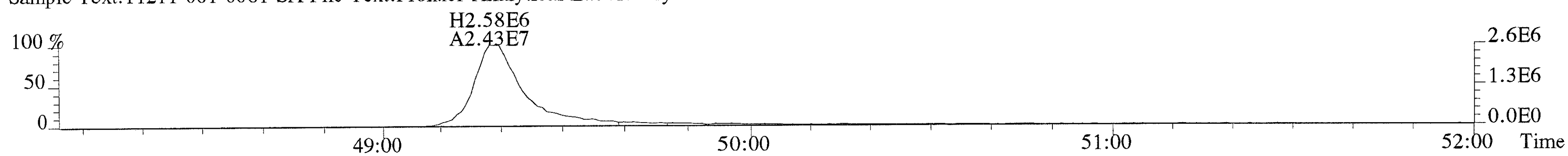
459.7348 S:15 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
469.7780 S:15 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory

File:26JAN18M #1-361 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
471.7750 S:15 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
454.9728 S:15 F:5 Exp:PCDD
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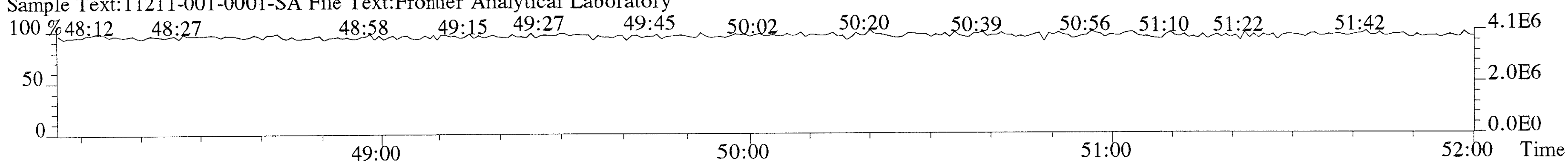
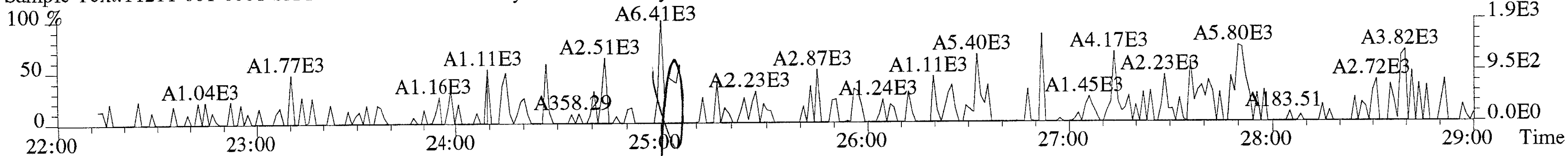
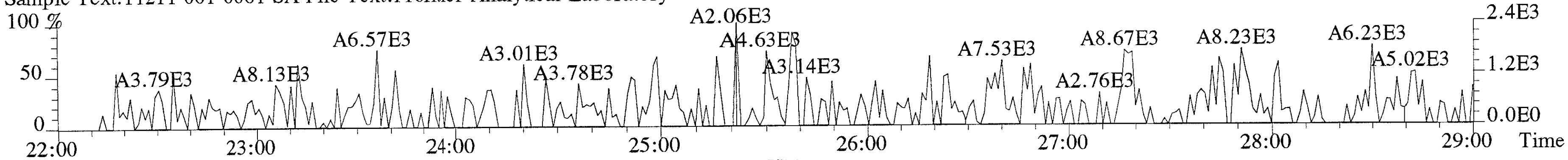


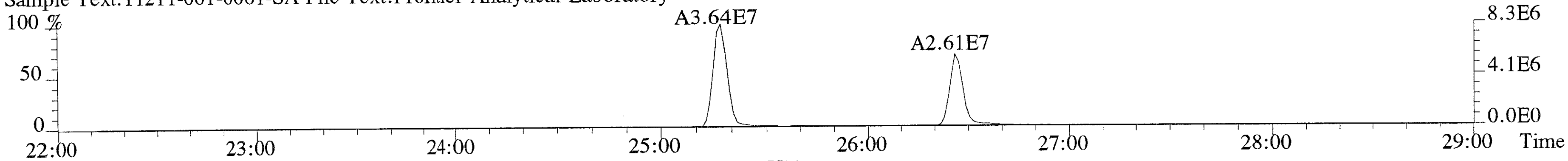
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
303.9016 S:15 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



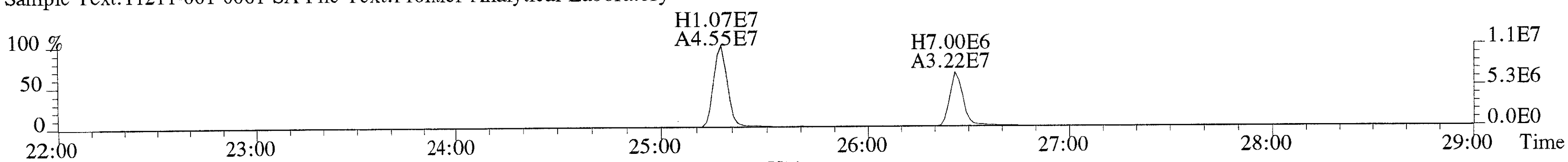
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
305.8987 S:15 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



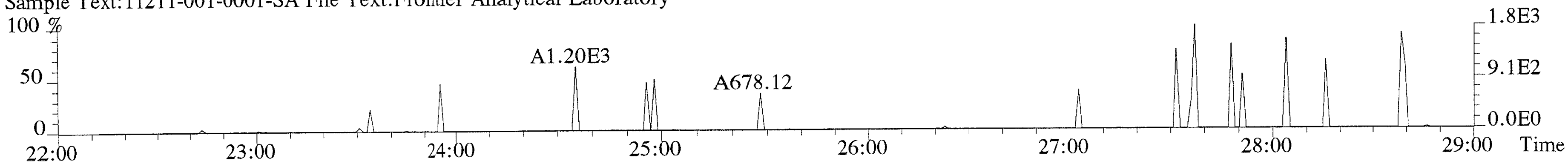
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
315.9419 S:15 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



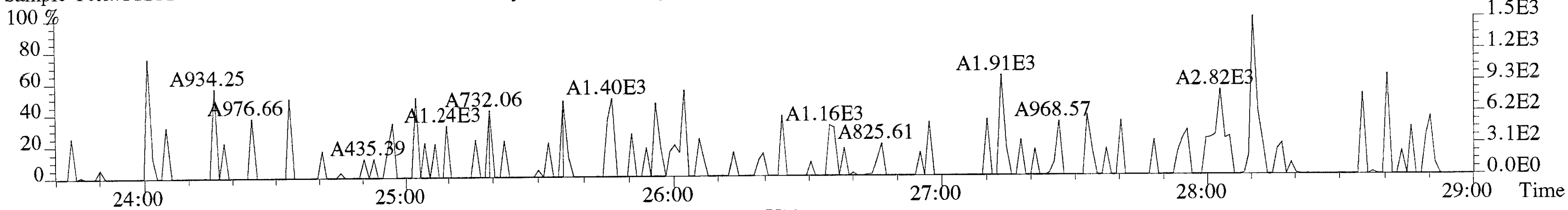
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
317.9389 S:15 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



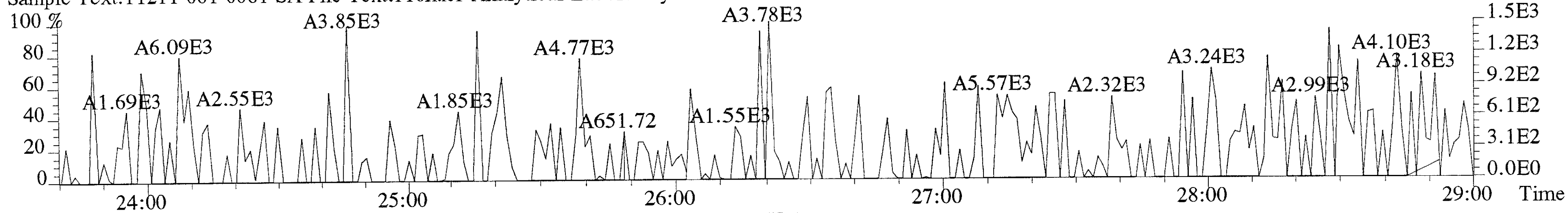
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
375.8364 S:15 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



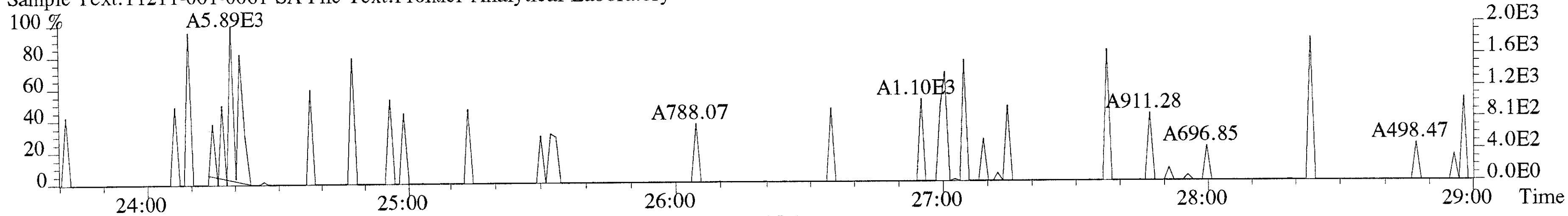
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:15 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



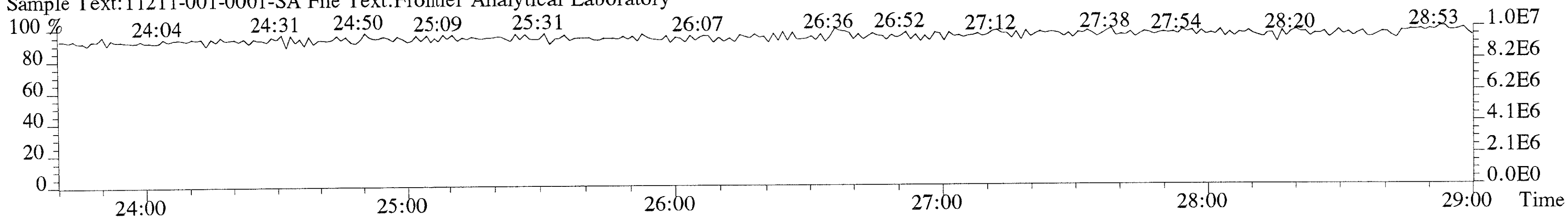
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:15 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



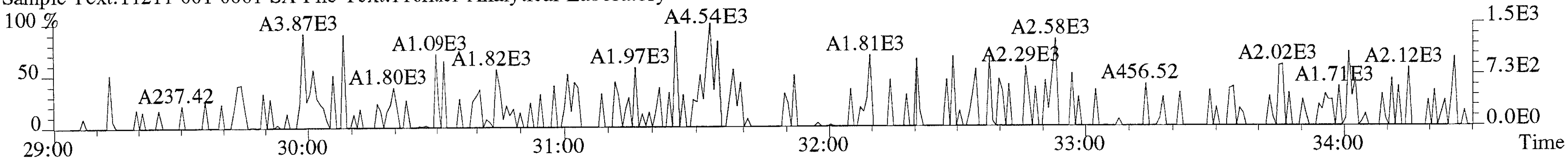
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:15 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



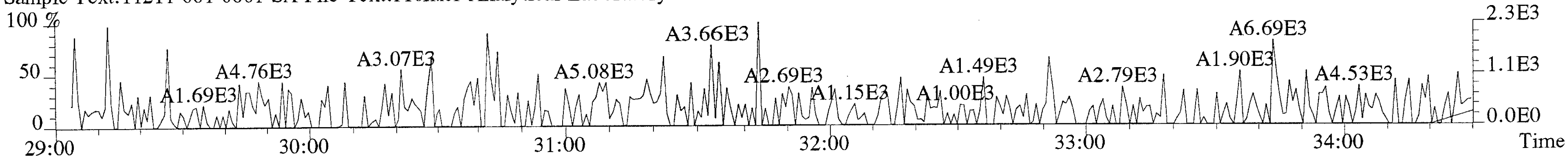
File:26JAN18M #1-381 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
330.9792 S:15 Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



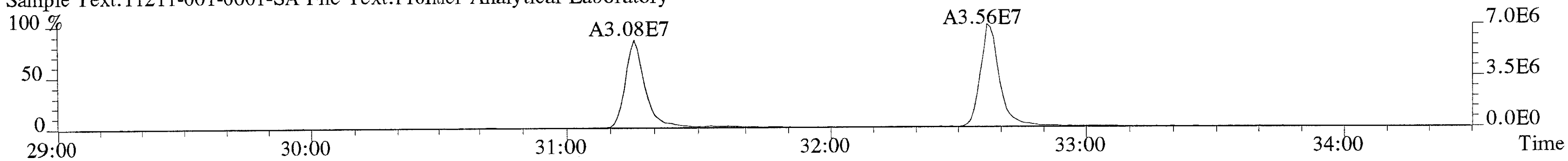
File:26JAN18M #1-423 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:15 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



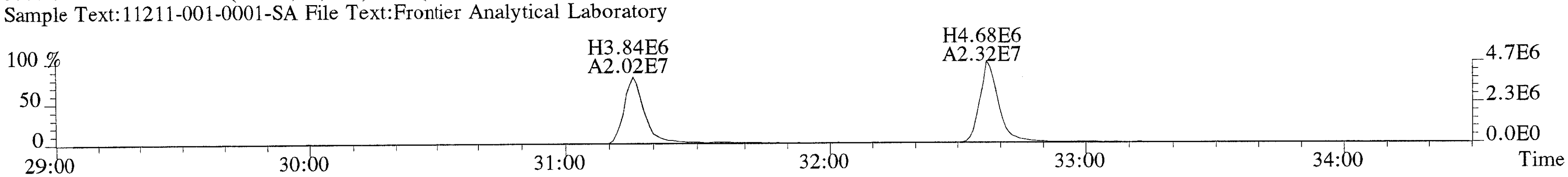
File:26JAN18M #1-423 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:15 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



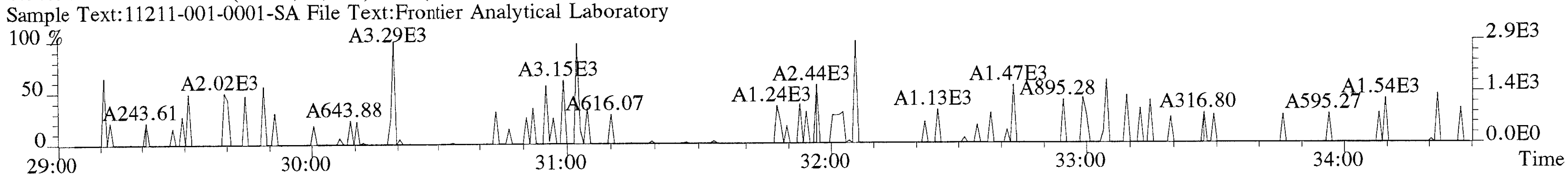
File:26JAN18M #1-423 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:15 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



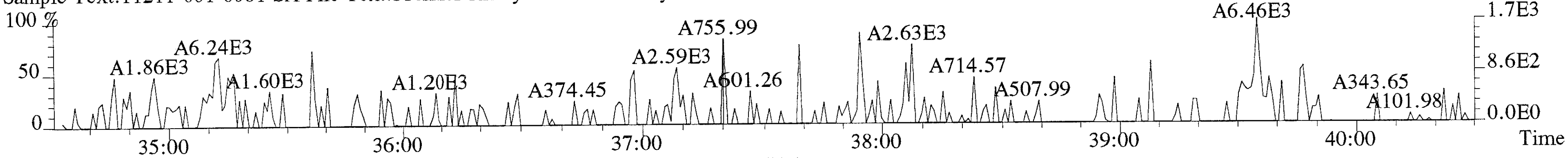
File:26JAN18M #1-423 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
353.8970 S:15 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



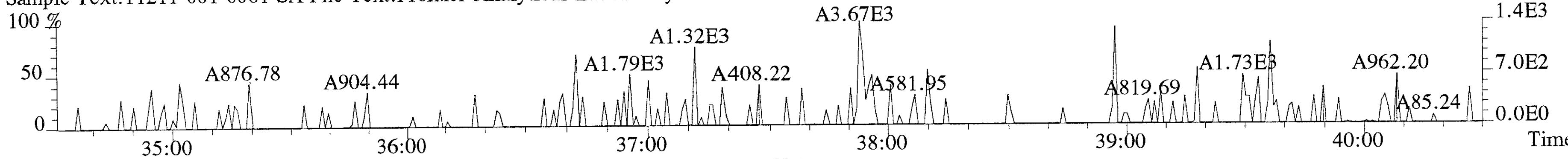
File:26JAN18M #1-423 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:15 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



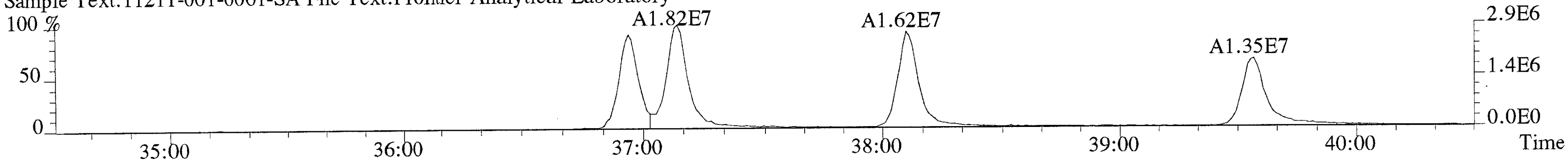
File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
373.8207 S:15 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
375.8178 S:15 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:15 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



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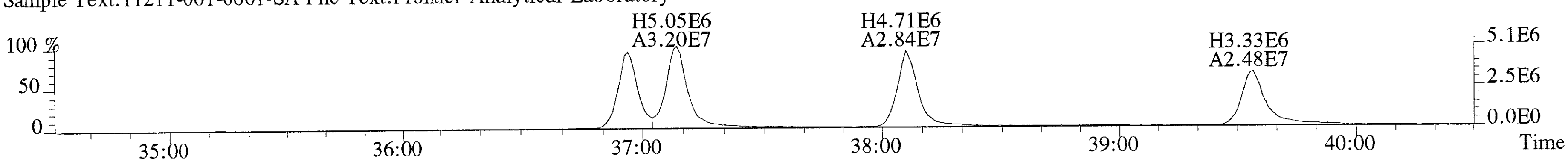
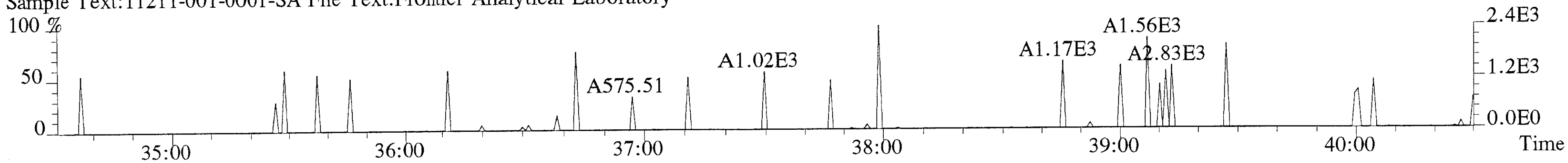
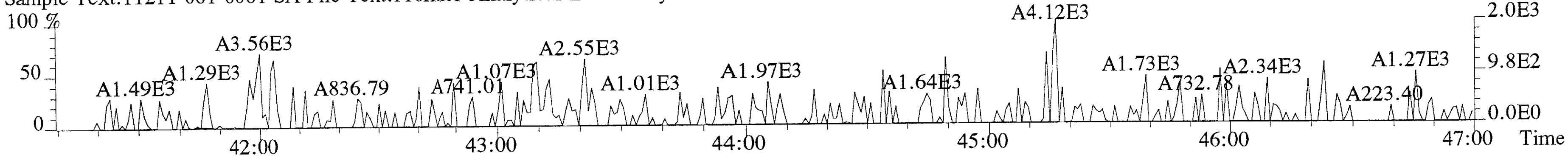
385.8610 S:15 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



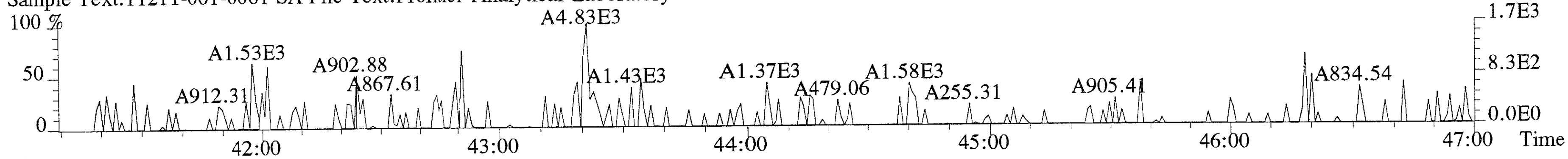
File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
445.7555 S:15 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



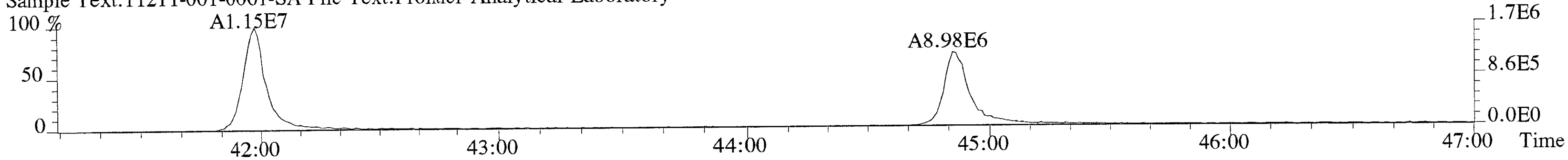
File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:15 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



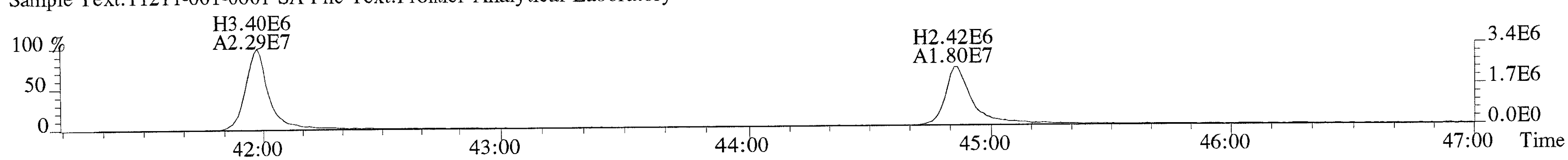
File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
409.7788 S:15 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



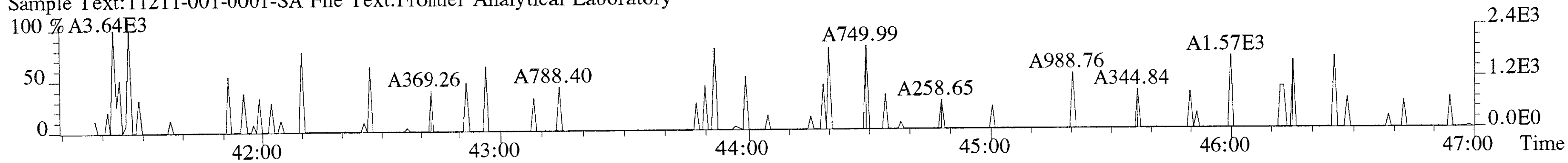
File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
417.8253 S:15 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



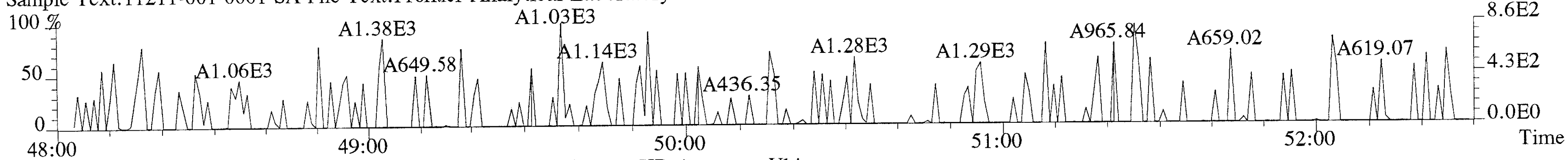
File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
419.8220 S:15 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:15 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:15 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



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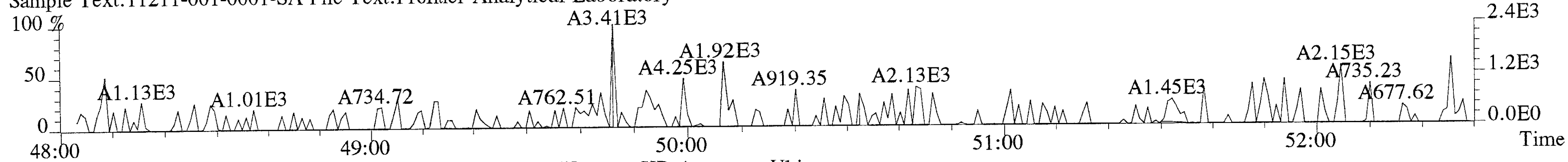
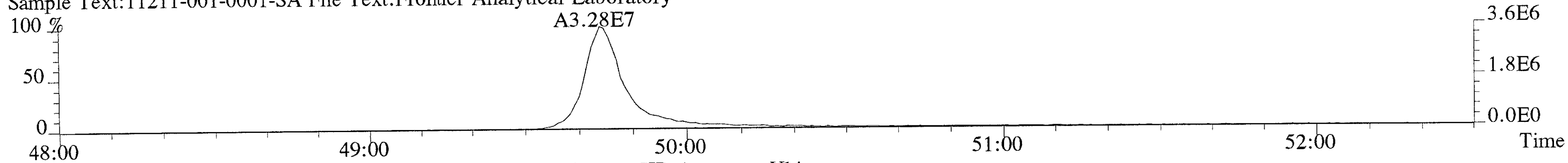
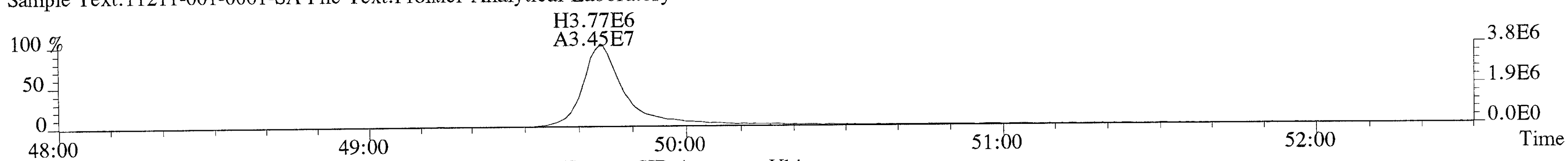
443.7398 S:15 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



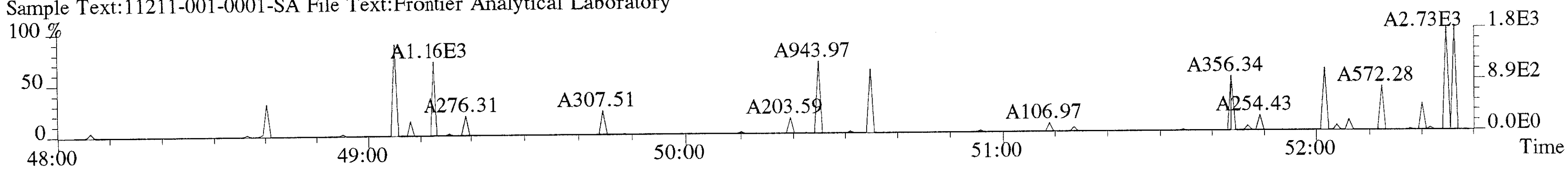
File:26JAN18M #1-361 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:15 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:15 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:27-JAN-2018 02:19:42 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:15 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-001-0001-SA File Text:Frontier Analytical Laboratory



FAL ID: 11211-002-0001-SA Filename: 26JAN18M Sam:16 Acquired: 27-JAN-18 03:14:35 ICal: PCDDFAL3-12-22-17
Client ID: AMW-4-011218 ConCal: ST012618M2 EndCal: ST012618M3
Results: 11157X GC Column: DB5MS Amount: 0.9600 NATO 1989 Tox: 0.0362
Instrument ID: FAL3 WHO 1998 Tox: 0.0223 WHO 2005 Tox: ~~0.0254~~ .0255 1/30/18

Name	Resp	RA	RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	DL
2,3,7,8-TCDD	*	* n	NotFnd	1.06	*		2.50	833	502	0.585
1,2,3,7,8-PeCDD	*	* n	NotFnd	1.00	*		2.50	907	678	1.07
1,2,3,4,7,8-HxCDD	*	* n	NotFnd	1.07	*		2.50	1330	1130	2.03
1,2,3,6,7,8-HxCDD	*	* n	NotFnd	1.08	*		2.50	1330	1130	1.92
1,2,3,7,8,9-HxCDD	*	* n	NotFnd	1.11	*		2.50	1330	1130	1.91
1,2,3,4,6,7,8-HpCDD	3.35e+04	0.99 y	43:56	0.99	2.08	J	2.50	-	-	*
OCDD	2.03e+05	0.92 y	49:20	1.11	15.5	J	2.50	-	-	*
2,3,7,8-TCDF	*	* n	NotFnd	1.03	*		2.50	691	1060	0.643
1,2,3,7,8-PeCDF	*	* n	NotFnd	0.95	*		2.50	1340	959	1.21
2,3,4,7,8-PeCDF	*	* n	NotFnd	0.79	*		2.50	1340	959	1.23
1,2,3,4,7,8-HxCDF	*	* n	NotFnd	1.20	*		2.50	983	985	0.989
1,2,3,6,7,8-HxCDF	*	* n	NotFnd	1.10	*		2.50	983	985	1.04
2,3,4,6,7,8-HxCDF	*	* n	NotFnd	1.08	*		2.50	983	985	1.10
1,2,3,7,8,9-HxCDF	*	* n	NotFnd	1.15	*		2.50	983	985	1.44
1,2,3,4,6,7,8-HpCDF	*	* n	NotFnd	1.23	*		2.50	595	574	0.860
1,2,3,4,7,8,9-HpCDF	*	* n	NotFnd	1.23	*		2.50	595	574	1.18
OCDF	*	* n	NotFnd	0.90	*		2.50	934	877	2.63
										Rec
13C-2,3,7,8-TCDD	5.19e+07	0.81 y	27:10	1.02	1810					86.7
13C-1,2,3,7,8-PeCDD	4.18e+07	1.53 y	33:00	0.88	1690					81.2
13C-1,2,3,4,7,8-HxCDD	3.26e+07	1.24 y	38:21	0.85	1570					75.2
13C-1,2,3,6,7,8-HxCDD	3.66e+07	1.23 y	38:30	0.94	1600					76.8
13C-1,2,3,4,6,7,8-HpCDD	3.40e+07	1.04 y	43:53	0.90	1550					74.3
13C-OCDD	4.92e+07	0.88 y	49:19	0.70	2880					69.0
13C-2,3,7,8-TCDF	6.19e+07	0.80 y	26:26	0.93	1680					80.6
13C-1,2,3,7,8-PeCDF	5.54e+07	1.52 y	31:16	0.87	1620					77.7
13C-2,3,4,7,8-PeCDF	6.33e+07	1.56 y	32:38	0.99	1620					77.7
13C-1,2,3,4,7,8-HxCDF	4.53e+07	0.55 y	36:57	1.09	1700					81.7
13C-1,2,3,6,7,8-HxCDF	5.38e+07	0.55 y	37:08	1.35	1640					78.8
13C-2,3,4,6,7,8-HxCDF	4.97e+07	0.55 y	38:06	1.23	1660					79.7
13C-1,2,3,7,8,9-HxCDF	4.24e+07	0.54 y	39:34	1.14	1530					73.2
13C-1,2,3,4,6,7,8-HpCDF	3.64e+07	0.50 y	41:58	0.97	1540					73.7
13C-1,2,3,4,7,8,9-HpCDF	2.96e+07	0.49 y	44:51	0.82	1490					71.5
13C-OCDF	6.86e+07	0.94 y	49:44	1.06	2650					63.6
37Cl-2,3,7,8-TCDD	1.83e+07		27:11	0.91	713					85.6
13C-1,2,3,4-TCDD	5.86e+07	0.82 y	26:33	-	168					
13C-1,2,3,4-TCDF	8.23e+07	0.81 y	25:17	-	165					
13C-1,2,3,7,8,9-HxCDD	5.07e+07	1.22 y	38:57	-	172					

Name	Resp	RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	DL		#Hom
Total Tetra-Dioxins	*	NotFnd	1.06	*		2.50	833	502	0.585		0
Total Penta-Dioxins	*	NotFnd	1.00	*		2.50	907	678	1.07		0
Total Hexa-Dioxins	*	NotFnd	1.09	*		2.50	1330	1130	2.03		0
Total Hepta-Dioxins	7.86e+04	42:29	0.99	4.87	J	2.50	-	-	*		2
Total Tetra-Furans	*	NotFnd	1.03	*		2.50	691	1060	0.643		0
1st Fn. Tot Penta-Furans	*	NotFnd	0.86	*		2.50	1340	959	1.23	PeCDF	0
Total Penta-Furans	*	NotFnd	0.86	*		2.50	1340	959	1.23	0.00	0
Total Hexa-Furans	*	NotFnd	1.13	*		2.50	983	985	1.44		0
Total Hepta-Furans	*	NotFnd	1.23	*		2.50	595	574	1.18		0

Analyst: [signature] Date: 1/29/18

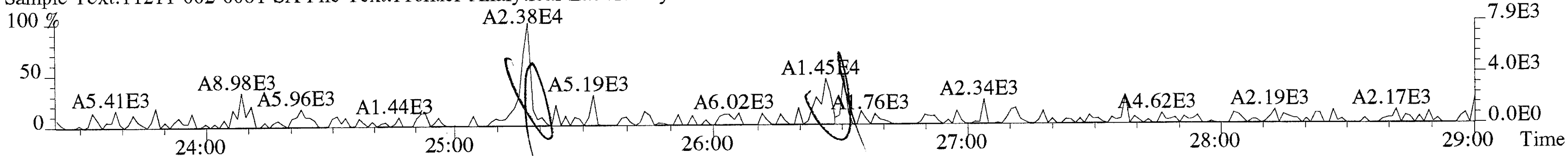
Totals class: Total Hepta-Dioxins Entry #: 41

Run: 21 File: 26JAN18M S: 16 I: 1 F: 4
Acquired: 27-JAN-18 03:14:35

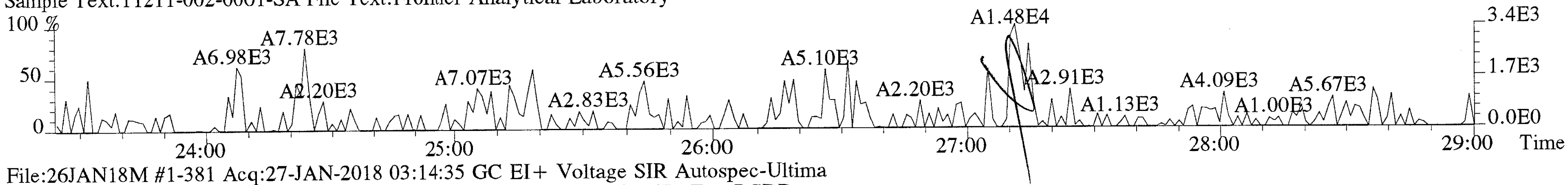
Total Concentration: 4.87 Unnamed Concentration: 2.798

RT	ml Resp	m2 Resp	RA		Resp	Concentration	Name
42:29	2.29e+04	2.23e+04	1.03	y	4.51e+04	2.80	
43:56	1.66e+04	1.69e+04	0.99	y	3.35e+04	2.08	1,2,3,4,6,7,8-HpCDD

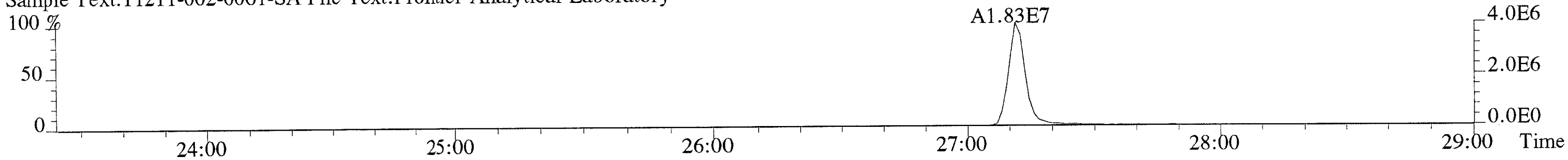
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:16 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



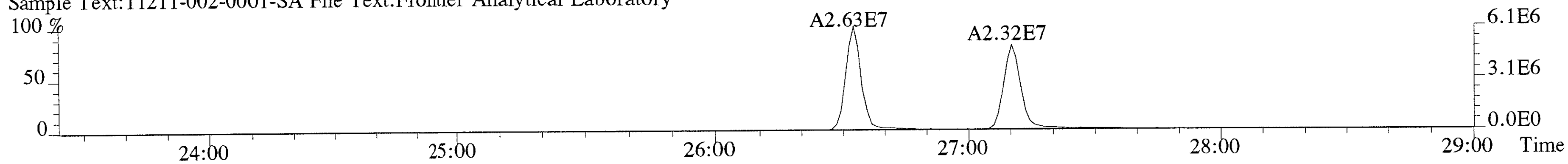
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:16 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



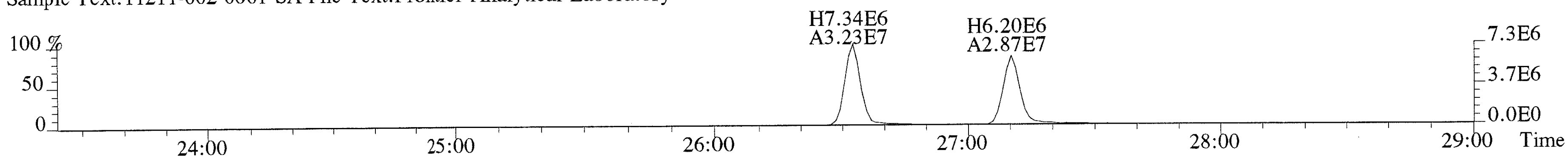
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
327.8847 S:16 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



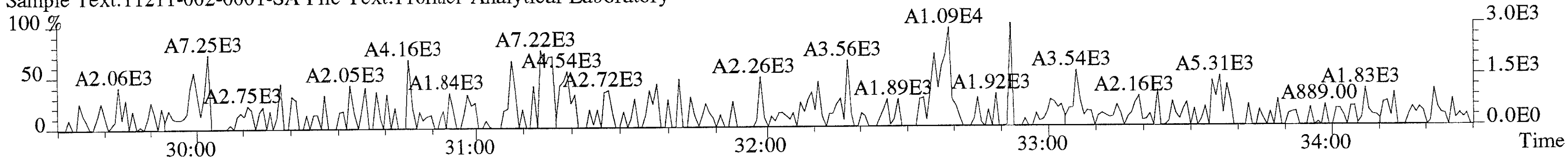
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
331.9368 S:16 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



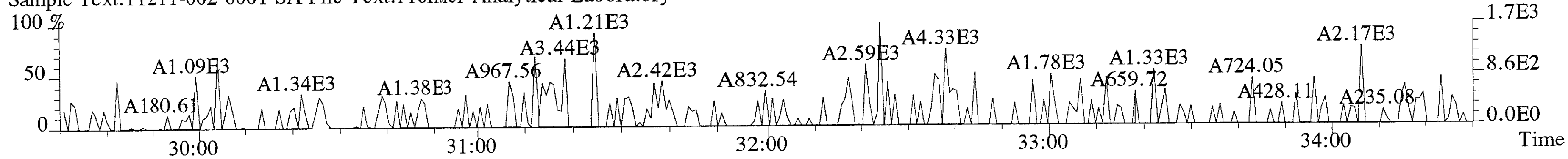
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
333.9339 S:16 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



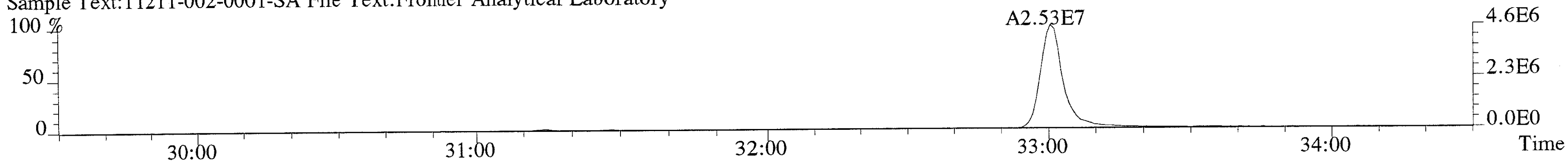
File:26JAN18M #1-424 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
355.8546 S:16 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



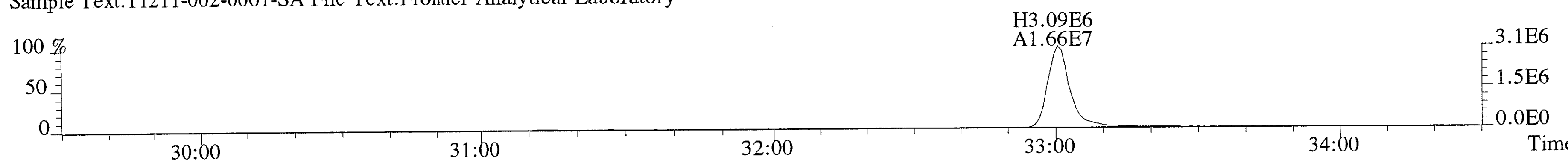
File:26JAN18M #1-424 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
357.8517 S:16 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



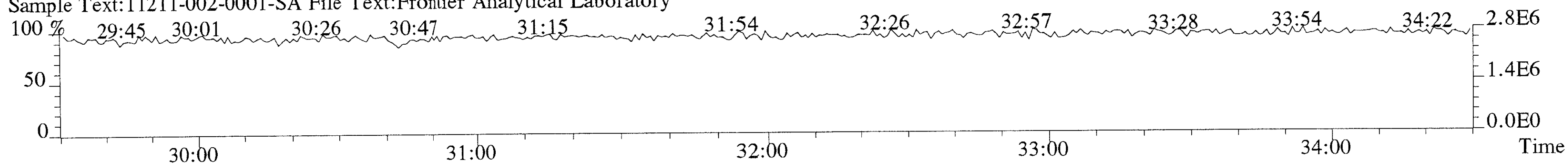
File:26JAN18M #1-424 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
367.8949 S:16 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



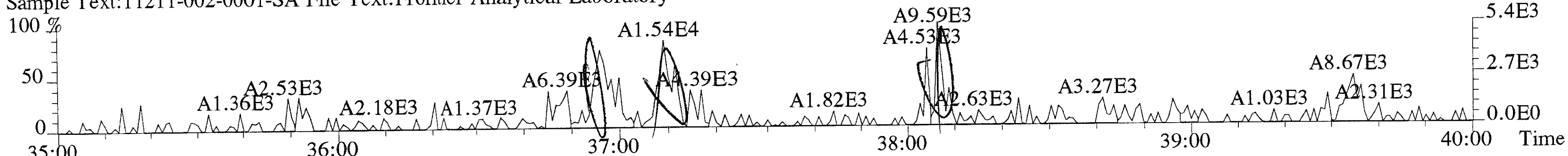
File:26JAN18M #1-424 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
369.8919 S:16 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



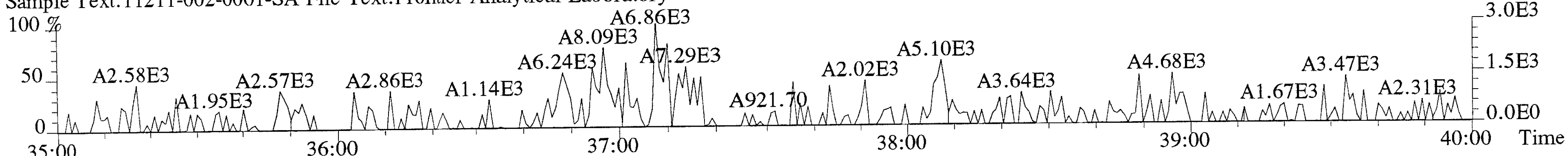
File:26JAN18M #1-424 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
366.9792 S:16 F:2 Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



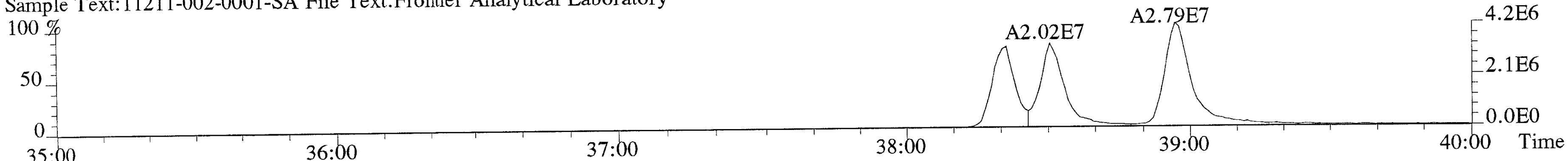
File:26JAN18M #1-520 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
389.8156 S:16 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



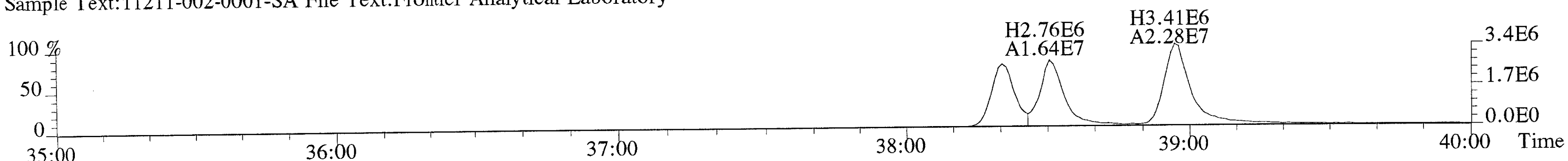
File:26JAN18M #1-520 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
391.8127 S:16 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



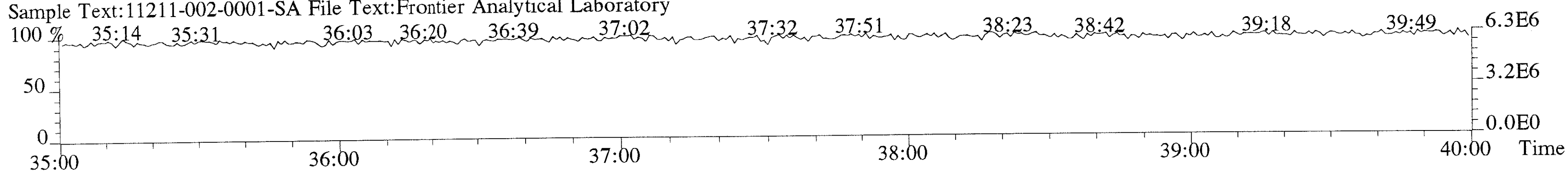
File:26JAN18M #1-520 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
401.8559 S:16 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



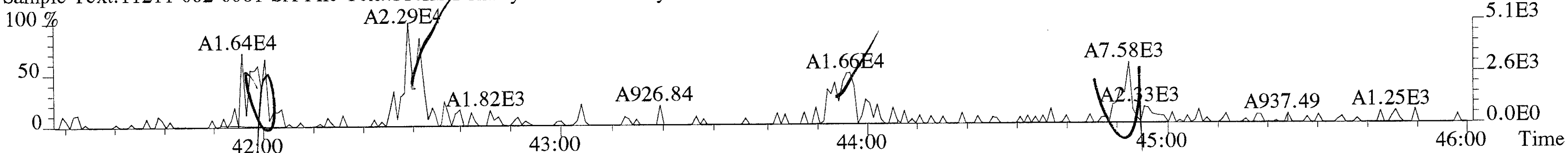
File:26JAN18M #1-520 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
403.8530 S:16 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



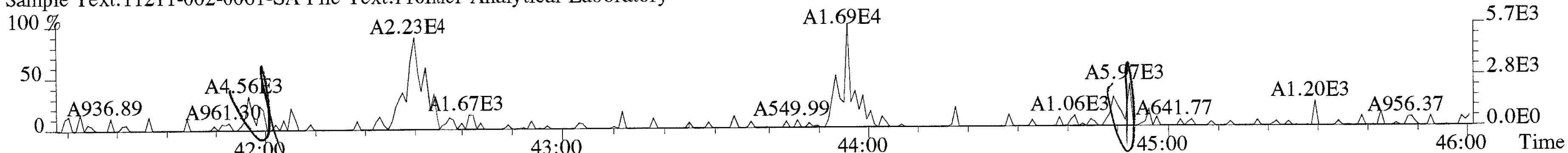
File:26JAN18M #1-520 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
380.9760 S:16 F:3 Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



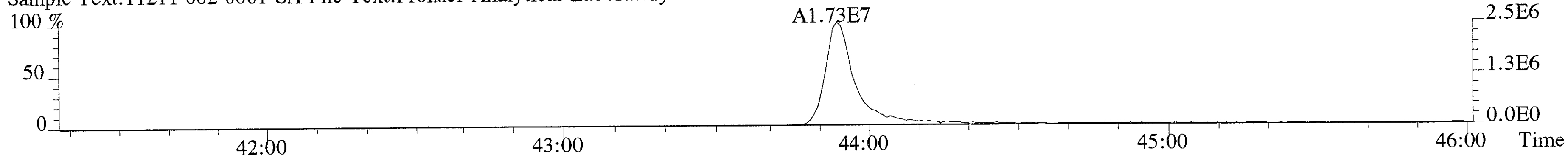
File:26JAN18M #1-521 Acq:27-JAN-1918 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
423.7767 S:16 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-1918 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
425.7737 S:16 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-1918 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
435.8169 S:16 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-1918 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
437.8140 S:16 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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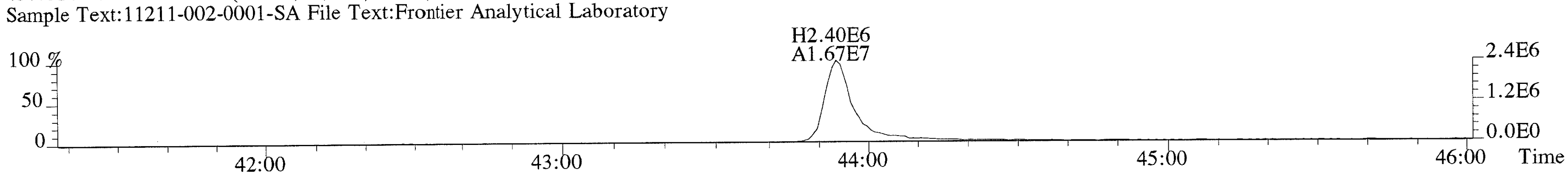
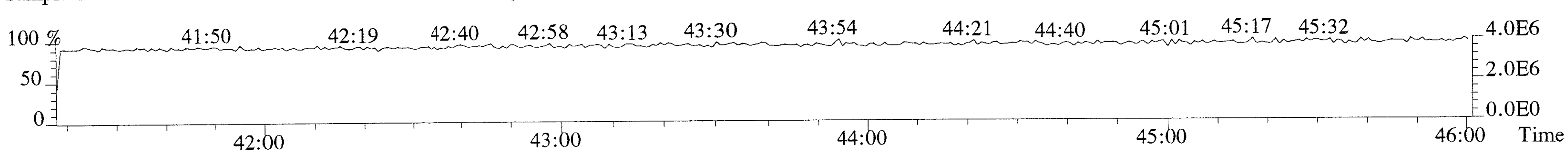
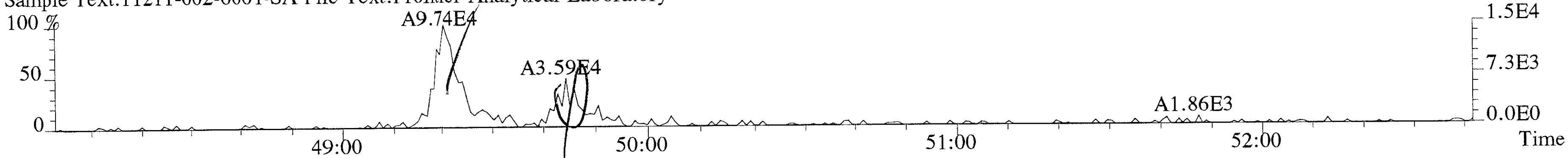


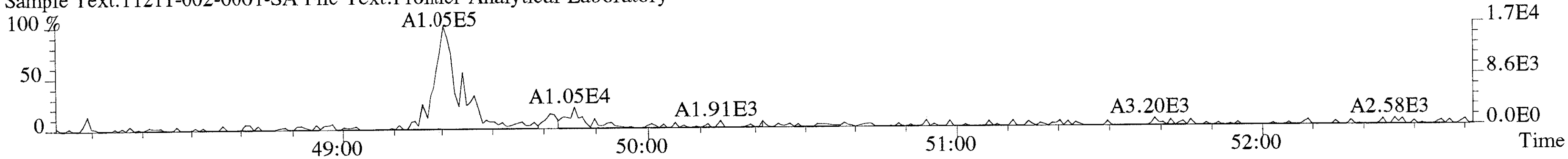
File:26JAN18M #1-521 Acq:27-JAN-1918 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
430.9728 S:16 F:4 Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



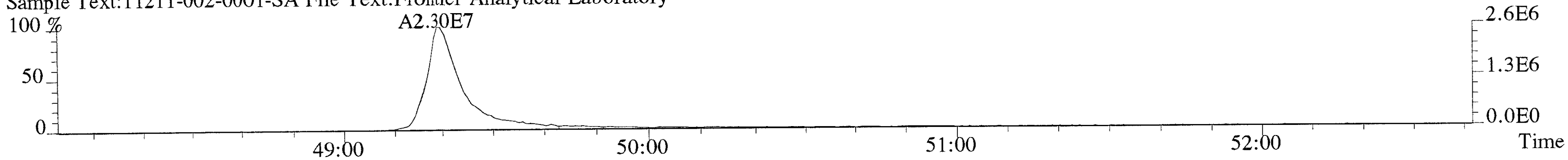
File:26JAN18M #1-361 Acq:27-JAN-1918 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
457.7377 S:16 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:27-JAN-1918 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
459.7348 S:16 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:27-JAN-1918 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
469.7780 S:16 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



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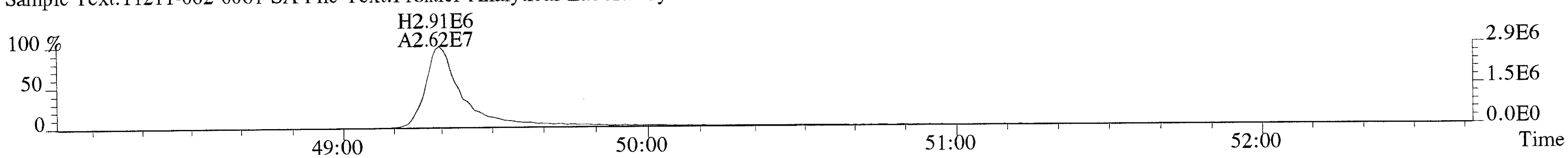
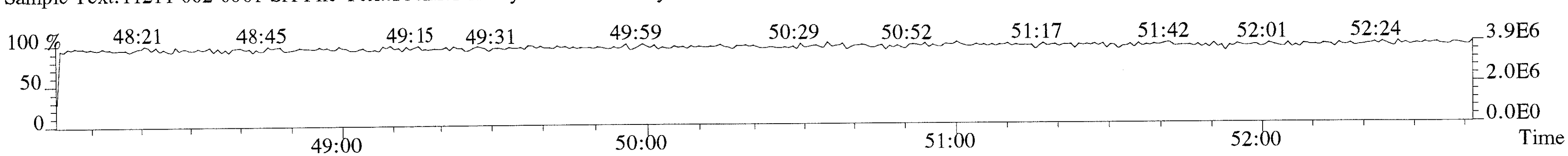
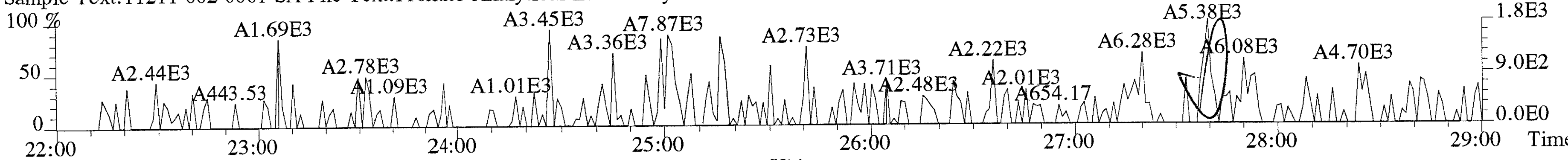
471.7750 S:16 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



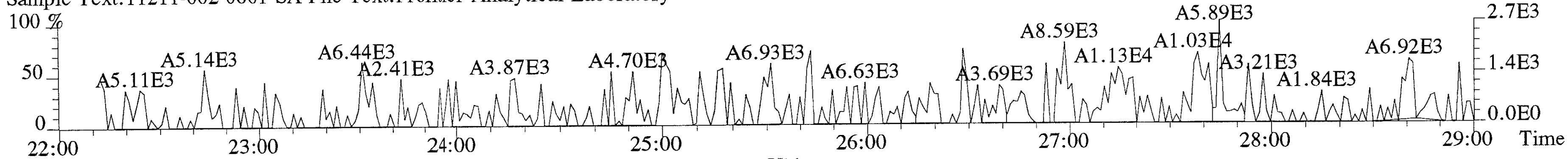
File:26JAN18M #1-361 Acq:27-JAN-1918 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
454.9728 S:16 F:5 Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



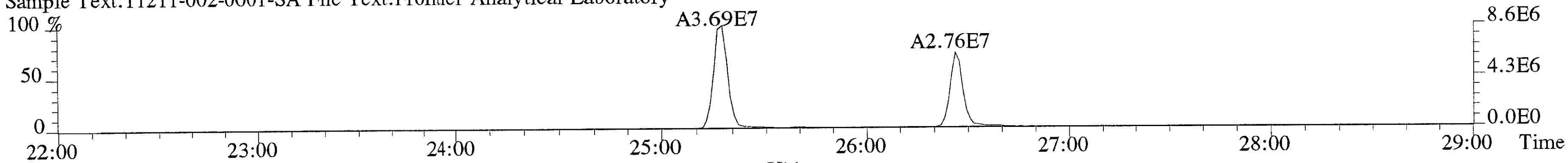
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
303.9016 S:16 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



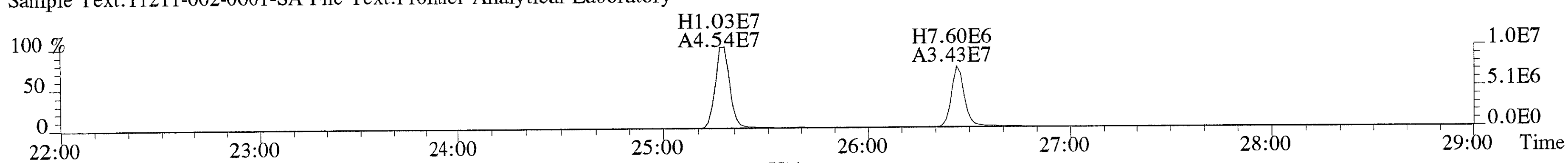
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
305.8987 S:16 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



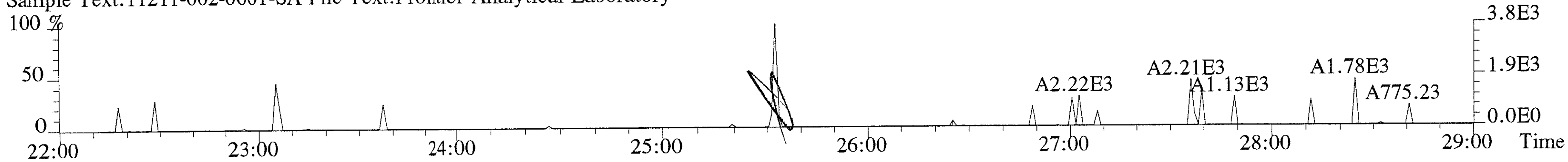
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
315.9419 S:16 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



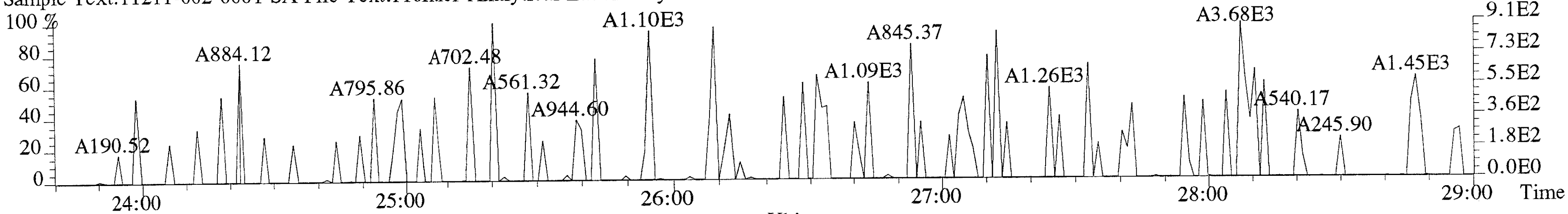
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
317.9389 S:16 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



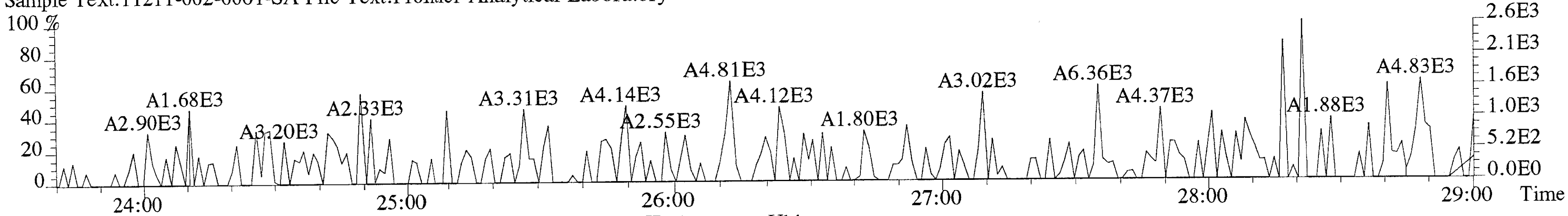
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
375.8364 S:16 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



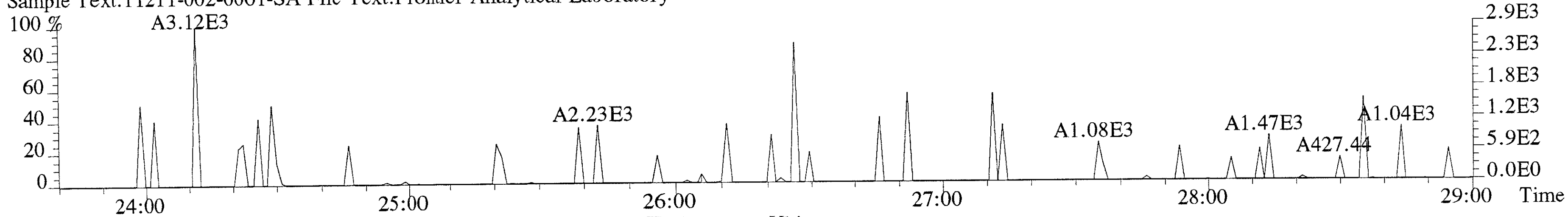
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:16 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



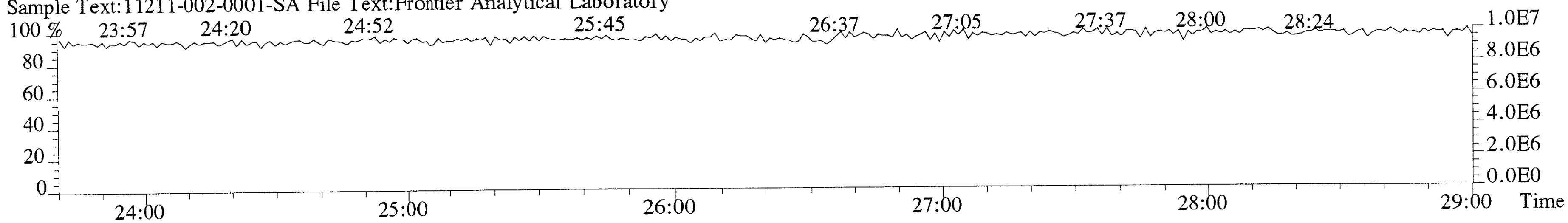
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:16 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



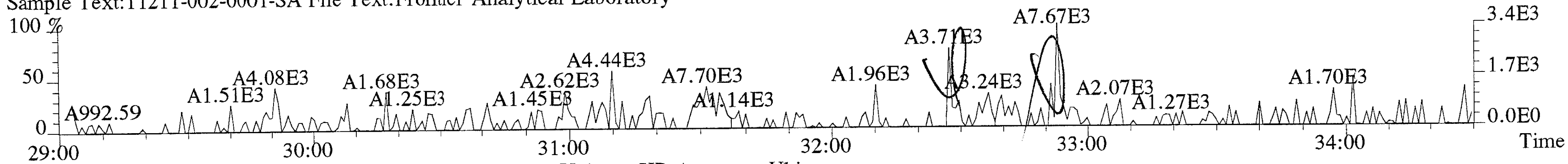
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:16 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



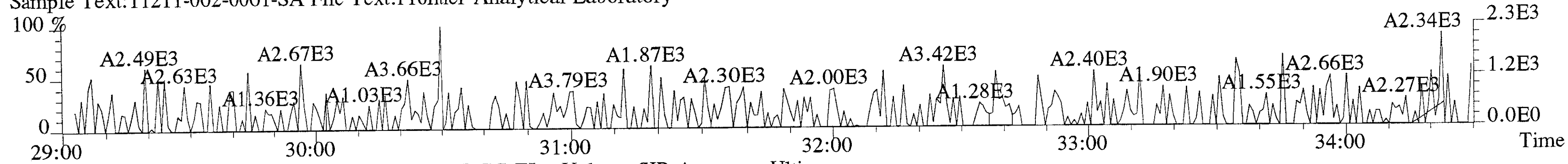
File:26JAN18M #1-381 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
330.9792 S:16 Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



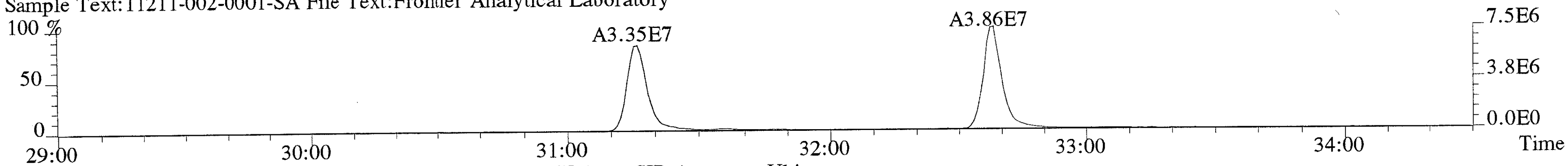
File:26JAN18M #1-424 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:16 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



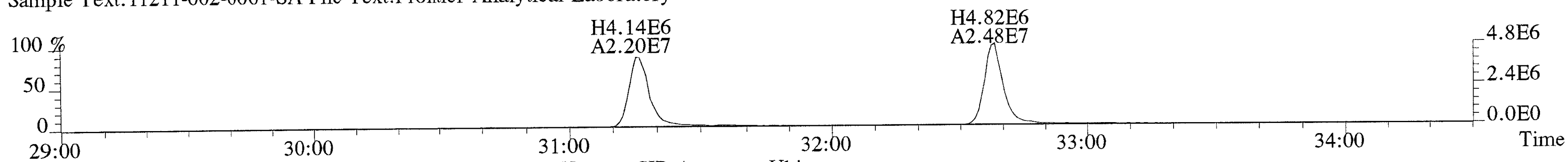
File:26JAN18M #1-424 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:16 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



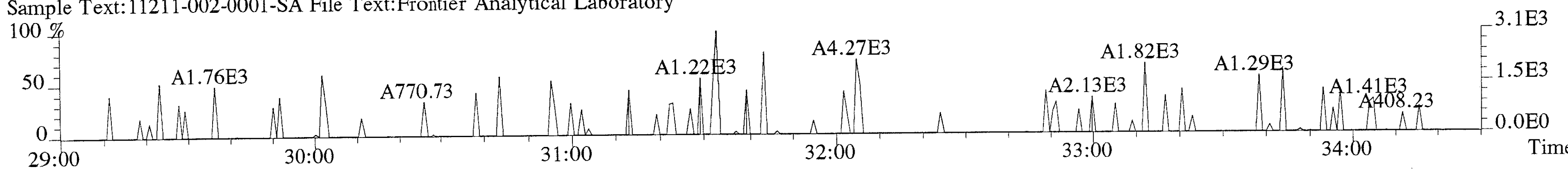
File:26JAN18M #1-424 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:16 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



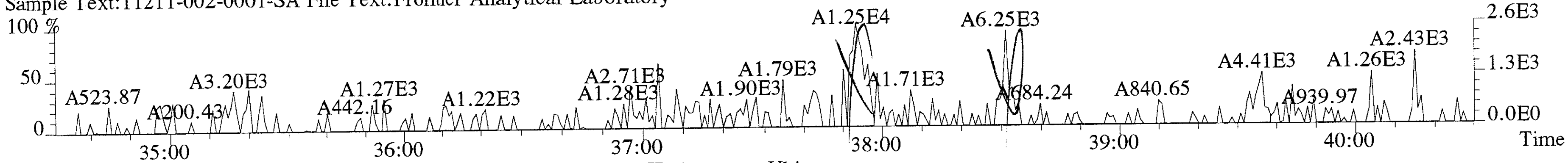
File:26JAN18M #1-424 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
353.8970 S:16 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



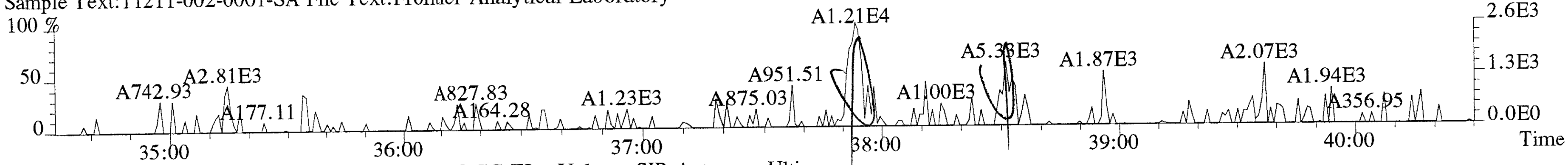
File:26JAN18M #1-424 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:16 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



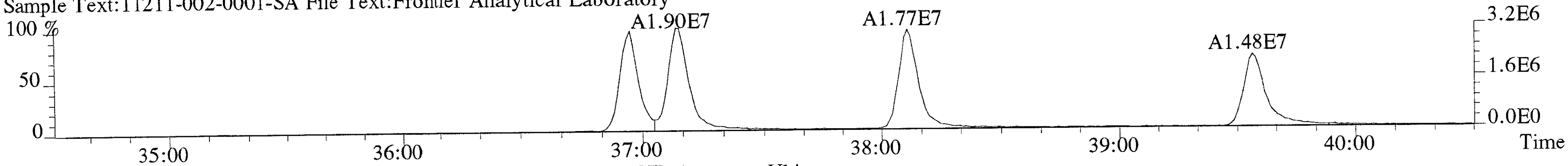
File:26JAN18M #1-520 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
373.8207 S:16 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



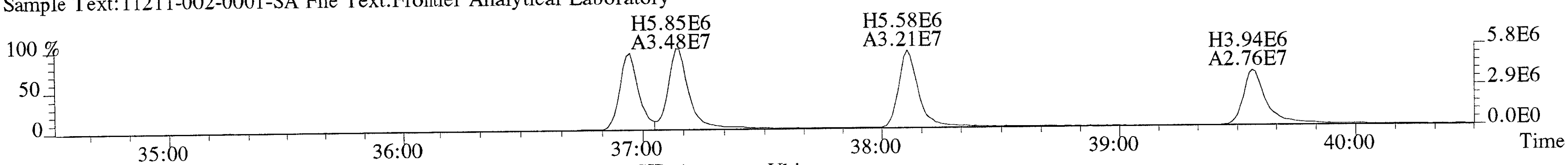
File:26JAN18M #1-520 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
375.8178 S:16 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



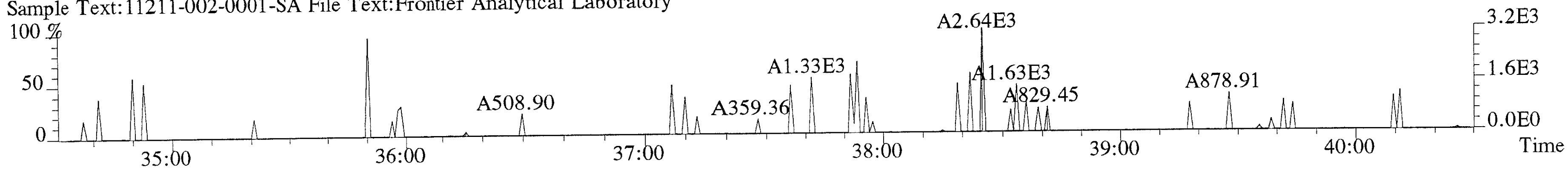
File:26JAN18M #1-520 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:16 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



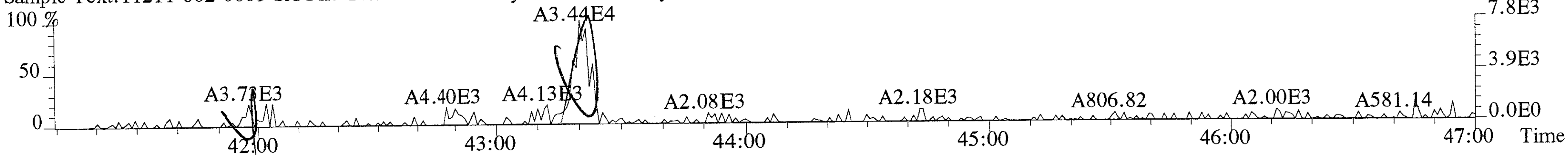
File:26JAN18M #1-520 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
385.8610 S:16 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



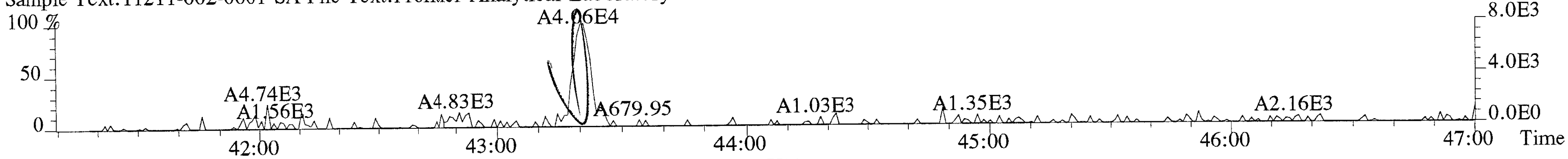
File:26JAN18M #1-520 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
445.7555 S:16 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



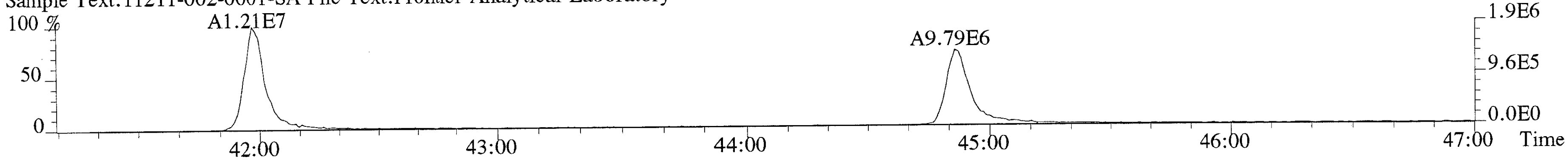
File:26JAN18M #1-521 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:16 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



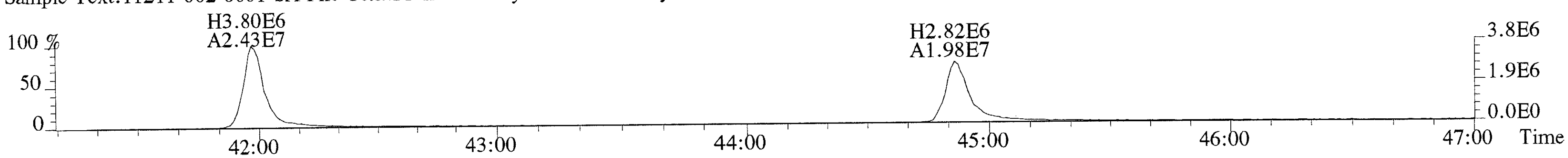
File:26JAN18M #1-521 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
409.7788 S:16 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



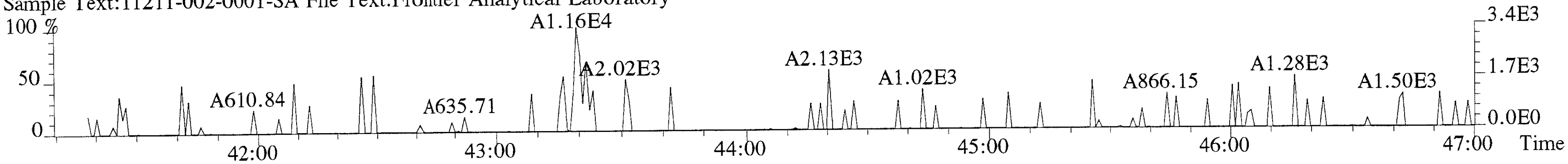
File:26JAN18M #1-521 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
417.8253 S:16 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



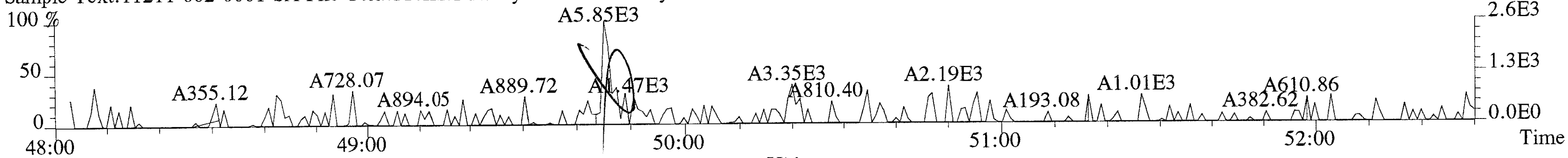
File:26JAN18M #1-521 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
419.8220 S:16 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



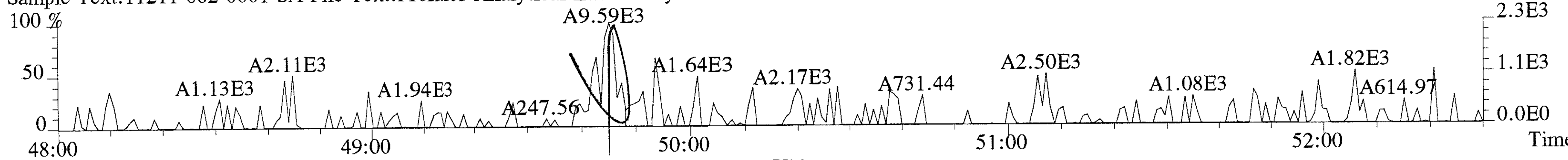
File:26JAN18M #1-521 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:16 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:16 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory

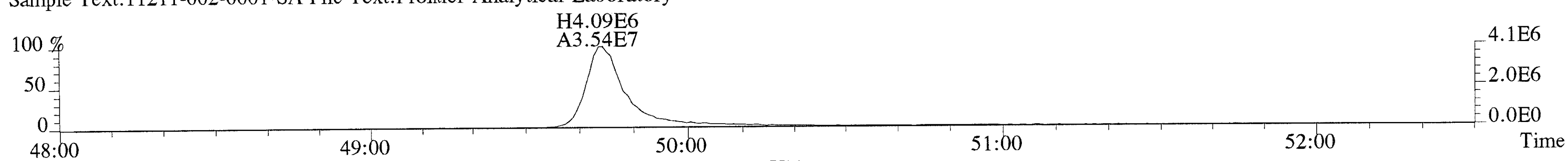


File:26JAN18M #1-361 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
443.7398 S:16 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory

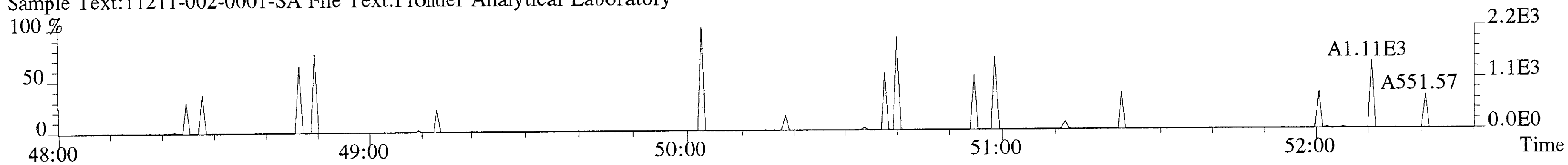


File:26JAN18M #1-361 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:16 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory

File:26JAN18M #1-361 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:16 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:27-JAN-2018 03:14:35 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:16 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-002-0001-SA File Text:Frontier Analytical Laboratory



FAL ID: 11211-003-0001-SA Filename: 26JAN18M Sam:17 Acquired: 27-JAN-18 04:09:25 ICal: PCDDFAL3-12-22-17
Client ID: AMW-2-011218 ConCal: ST012618M2 EndCal: ST012618M3
Results: 11157X GC Column: DB5MS Amount: 0.9030 NATO 1989 Tox: 0.0222
Instrument ID: FAL3 WHO 1998 Tox: 0.00222 WHO 2005 Tox: ~~0.00665~~ ,00666 1/30/18

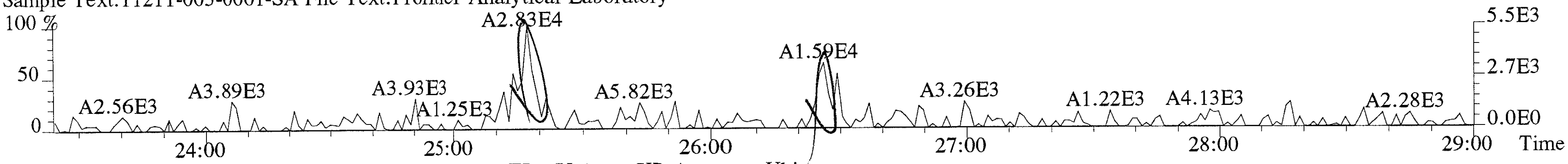
Name	Resp	RA	RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	DL
2,3,7,8-TCDD	*	* n	NotFnd	1.06	*		2.50	537	448	0.692
1,2,3,7,8-PeCDD	*	* n	NotFnd	1.00	*		2.50	911	605	1.64
1,2,3,4,7,8-HxCDD	*	* n	NotFnd	1.07	*		2.50	904	671	1.87
1,2,3,6,7,8-HxCDD	*	* n	NotFnd	1.08	*		2.50	904	671	1.88
1,2,3,7,8,9-HxCDD	*	* n	NotFnd	1.11	*		2.50	904	671	1.82
1,2,3,4,6,7,8-HpCDD	*	* n	NotFnd	0.99	*		2.50	983	1100	3.18
OCDD	2.06e+05	0.96 y	49:20	1.11	22.2	J	2.50	-	-	*
2,3,7,8-TCDF	*	* n	NotFnd	1.03	*		2.50	789	677	0.856
1,2,3,7,8-PeCDF	*	* n	NotFnd	0.95	*		2.50	318	644	0.781
2,3,4,7,8-PeCDF	*	* n	NotFnd	0.79	*		2.50	318	644	0.842
1,2,3,4,7,8-HxCDF	*	* n	NotFnd	1.20	*		2.50	752	820	1.23
1,2,3,6,7,8-HxCDF	*	* n	NotFnd	1.10	*		2.50	752	820	1.24
2,3,4,6,7,8-HxCDF	*	* n	NotFnd	1.08	*		2.50	752	820	1.41
1,2,3,7,8,9-HxCDF	*	* n	NotFnd	1.15	*		2.50	752	820	1.71
1,2,3,4,6,7,8-HpCDF	*	* n	NotFnd	1.23	*		2.50	866	554	1.52
1,2,3,4,7,8,9-HpCDF	*	* n	NotFnd	1.23	*		2.50	866	554	2.16
OCDF	*	* n	NotFnd	0.90	*		2.50	779	757	3.22

Name	Resp	RA	RT	RRF	Conc	Rec
13C-2,3,7,8-TCDD	3.45e+07	0.81 y	27:10	1.02	1340	60.4
13C-1,2,3,7,8-PeCDD	2.80e+07	1.51 y	33:01	0.88	1260	56.9
13C-1,2,3,4,7,8-HxCDD	2.36e+07	1.24 y	38:21	0.85	1290	58.1
13C-1,2,3,6,7,8-HxCDD	2.52e+07	1.20 y	38:31	0.94	1250	56.5
13C-1,2,3,4,6,7,8-HpCDD	2.41e+07	1.08 y	43:54	0.90	1250	56.3
13C-OCDD	3.71e+07	0.89 y	49:19	0.70	2460	55.5
13C-2,3,7,8-TCDF	4.23e+07	0.83 y	26:26	0.93	1260	56.8
13C-1,2,3,7,8-PeCDF	3.84e+07	1.54 y	31:15	0.87	1230	55.5
13C-2,3,4,7,8-PeCDF	4.11e+07	1.54 y	32:37	0.99	1150	51.9
13C-1,2,3,4,7,8-HxCDF	3.18e+07	0.57 y	36:56	1.09	1350	61.1
13C-1,2,3,6,7,8-HxCDF	3.78e+07	0.54 y	37:09	1.35	1310	59.0
13C-2,3,4,6,7,8-HxCDF	3.31e+07	0.57 y	38:07	1.23	1250	56.6
13C-1,2,3,7,8,9-HxCDF	2.94e+07	0.55 y	39:34	1.14	1200	54.0
13C-1,2,3,4,6,7,8-HpCDF	2.62e+07	0.49 y	41:58	0.97	1250	56.6
13C-1,2,3,4,7,8,9-HpCDF	2.09e+07	0.48 y	44:52	0.82	1190	53.8
13C-OCDF	5.07e+07	0.94 y	49:44	1.06	2220	50.2
37Cl-2,3,7,8-TCDD	1.64e+07		27:11	0.91	709	80.0
13C-1,2,3,4-TCDD	5.60e+07	0.81 y	26:32	-	171	
13C-1,2,3,4-TCDF	7.99e+07	0.81 y	25:17	-	170	
13C-1,2,3,7,8,9-HxCDD	4.75e+07	1.23 y	38:57	-	172	

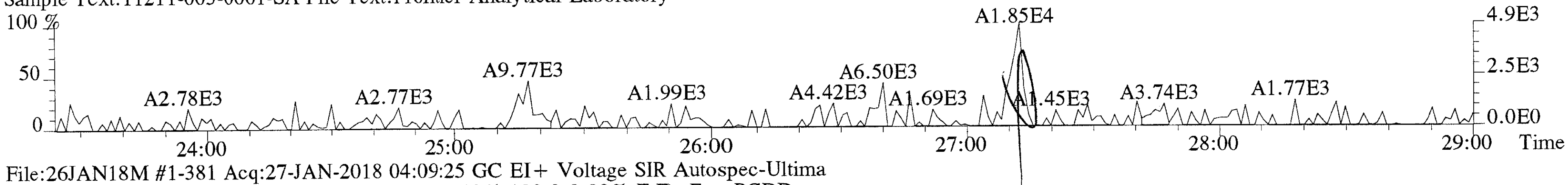
Name	Resp	RT	RRF	Conc	Fac	Noise-1	Noise-2	DL		#Hom
Total Tetra-Dioxins	*	NotFnd	1.06	*	2.50	537	448	0.692		0
Total Penta-Dioxins	*	NotFnd	1.00	*	2.50	911	605	1.64		0
Total Hexa-Dioxins	*	NotFnd	1.09	*	2.50	904	671	1.88		0
Total Hepta-Dioxins	*	NotFnd	0.99	*	2.50	983	1100	3.18		0
Total Tetra-Furans	*	NotFnd	1.03	*	2.50	789	677	0.856		0
1st Fn. Tot Penta-Furans	*	NotFnd	0.86	*	2.50	318	661	0.842	PeCDF	0
Total Penta-Furans	*	NotFnd	0.86	*	2.50	318	661	0.842	0.00	0
Total Hexa-Furans	*	NotFnd	1.13	*	2.50	752	820	1.71		0
Total Hepta-Furans	*	NotFnd	1.23	*	2.50	866	554	2.16		0

Analyst: [signature] Date: 1/29/18

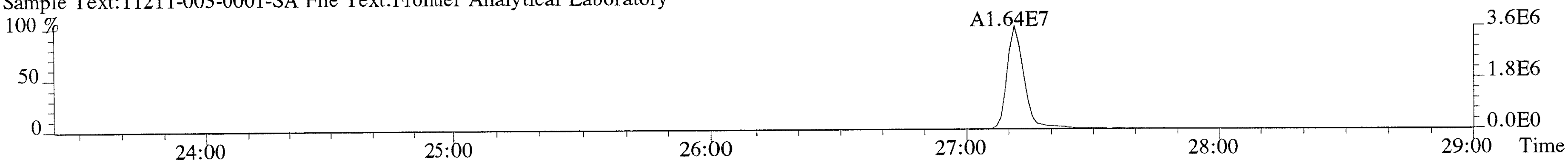
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:17 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



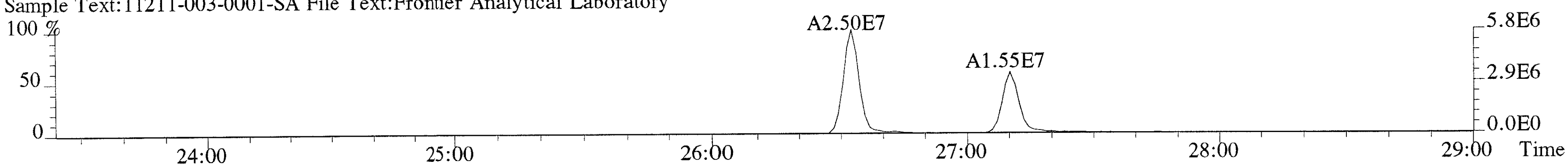
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:17 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



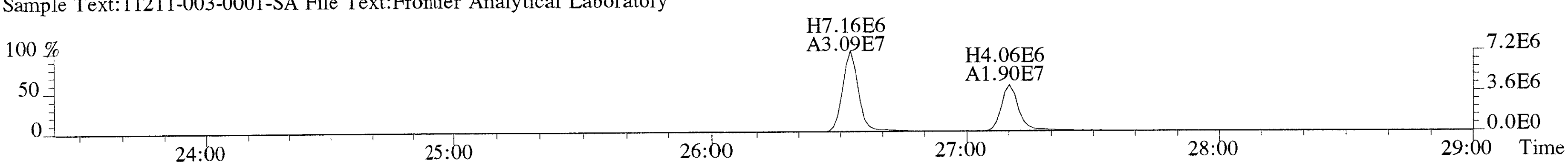
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
327.8847 S:17 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



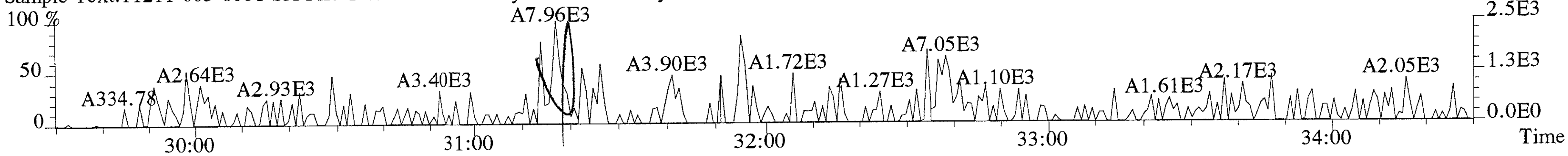
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
331.9368 S:17 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



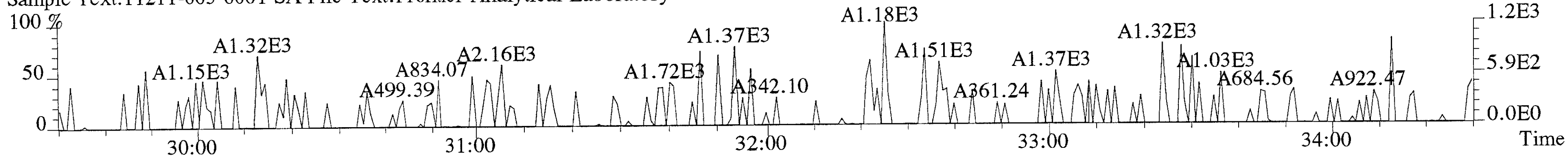
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
333.9339 S:17 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



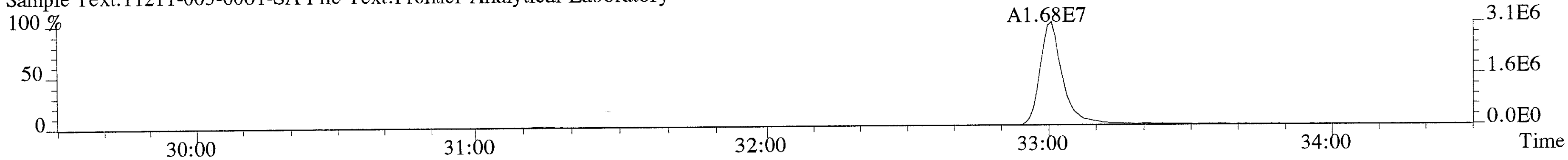
File:26JAN18M #1-423 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
355.8546 S:17 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



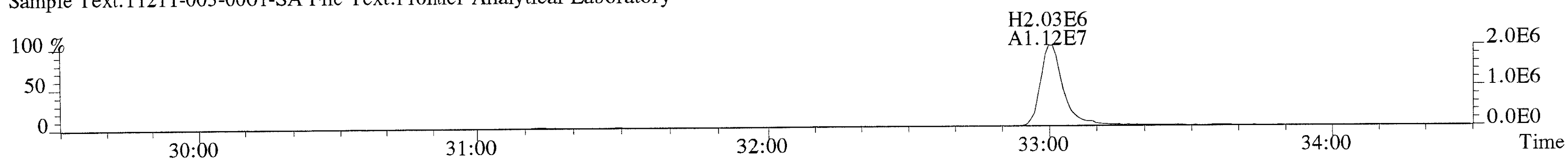
File:26JAN18M #1-423 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
357.8517 S:17 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



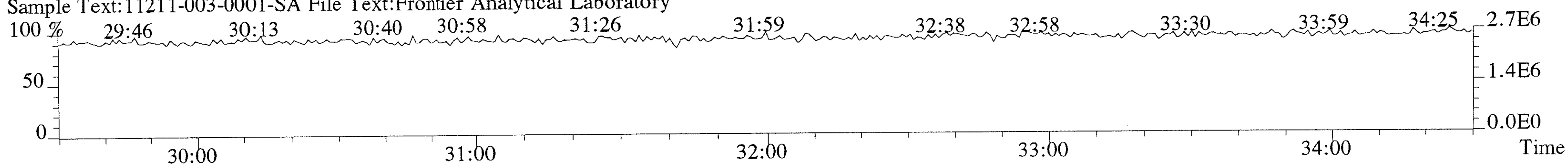
File:26JAN18M #1-423 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
367.8949 S:17 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



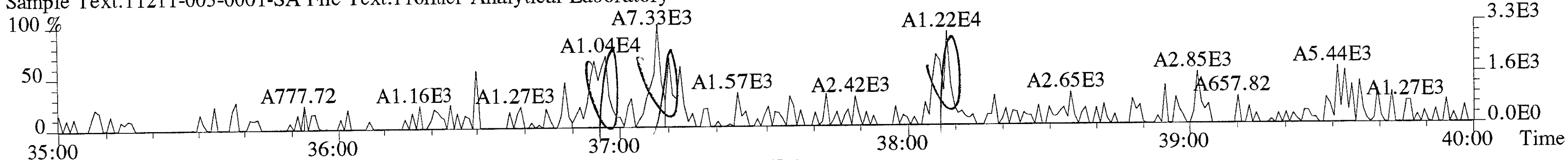
File:26JAN18M #1-423 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
369.8919 S:17 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



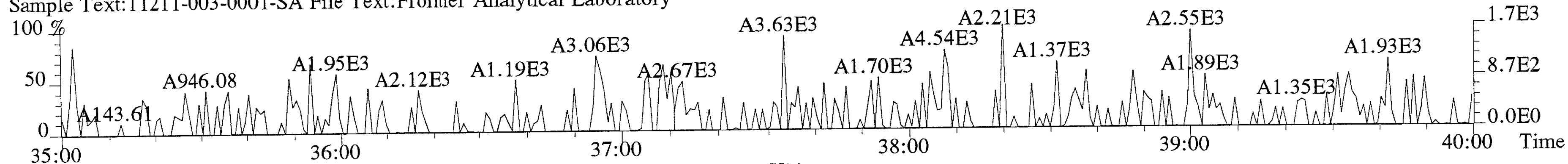
File:26JAN18M #1-423 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
366.9792 S:17 F:2 Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



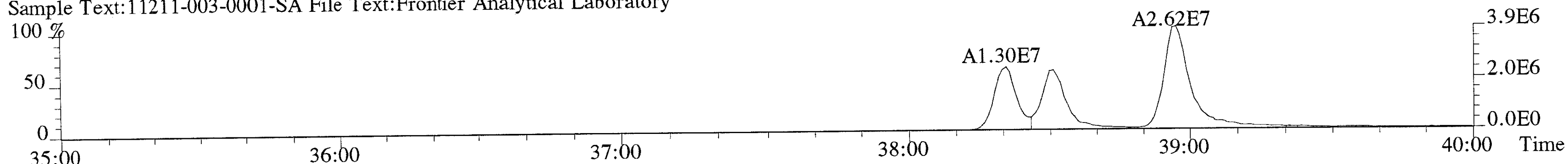
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
389.8156 S:17 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



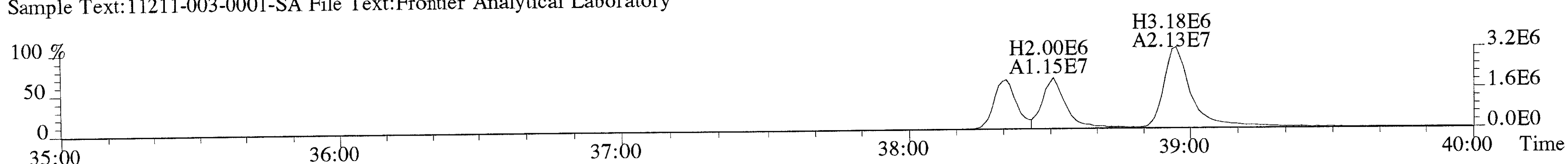
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
391.8127 S:17 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



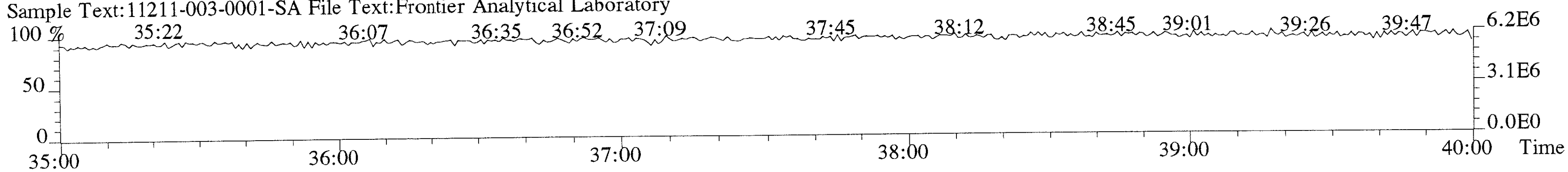
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
401.8559 S:17 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



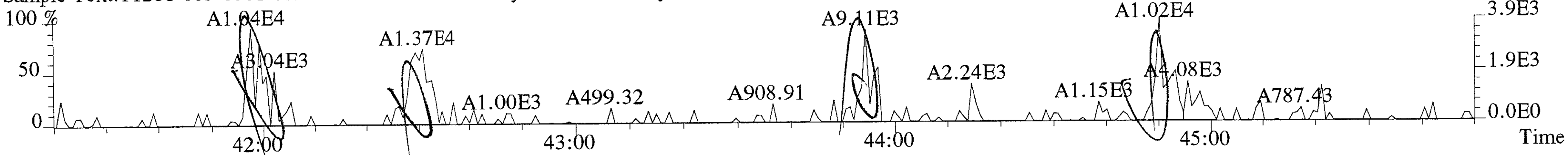
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
403.8530 S:17 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



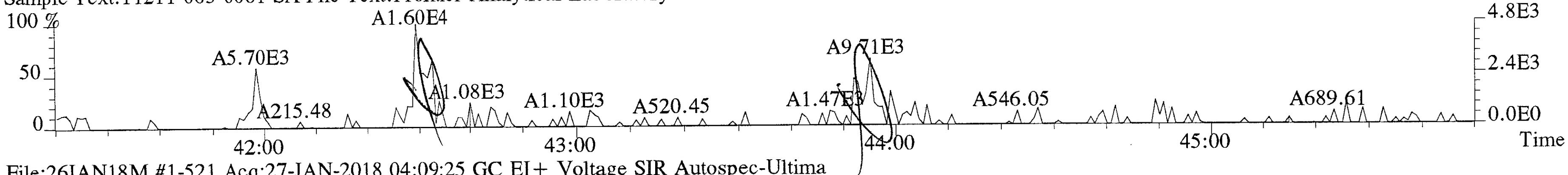
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
380.9760 S:17 F:3 Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



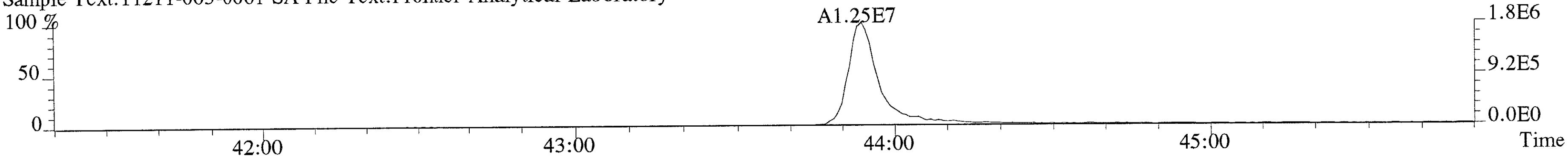
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
423.7767 S:17 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



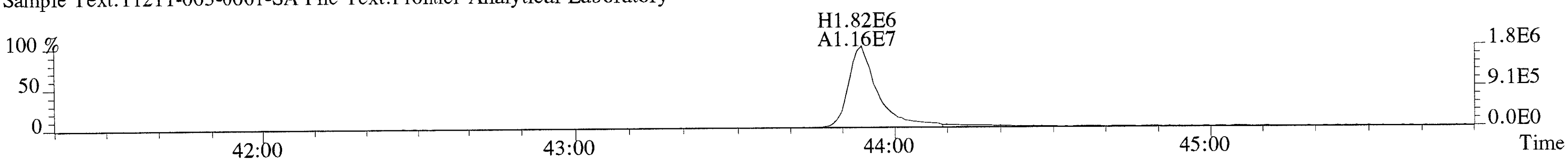
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
425.7737 S:17 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



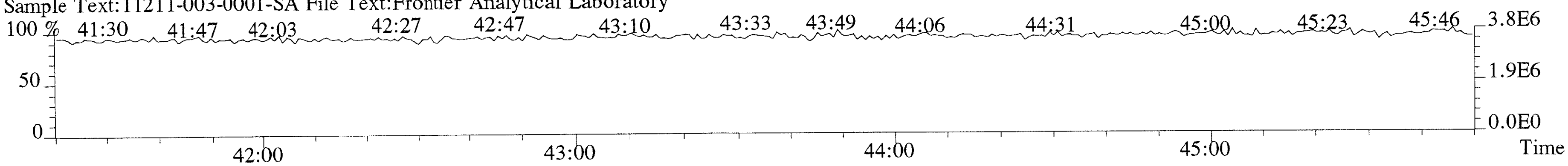
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
435.8169 S:17 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



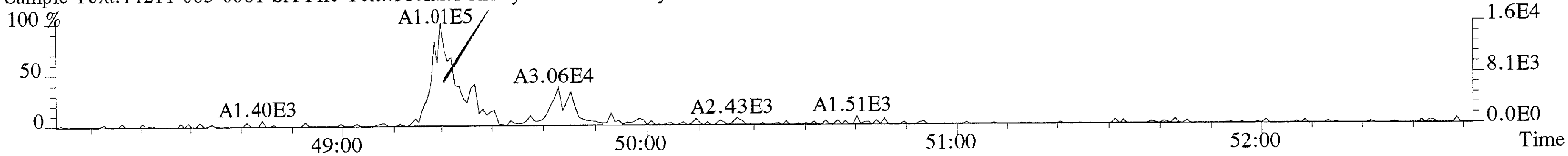
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
437.8140 S:17 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



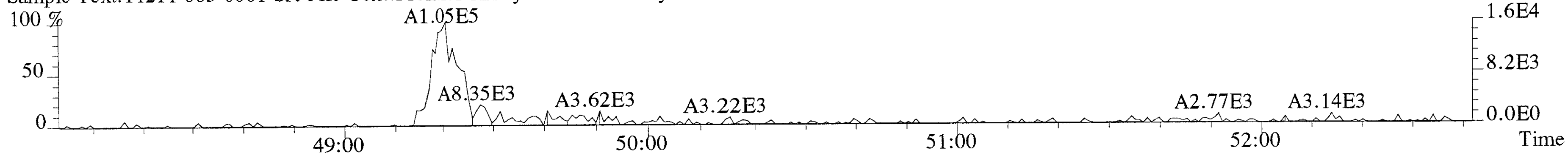
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
430.9728 S:17 F:4 Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



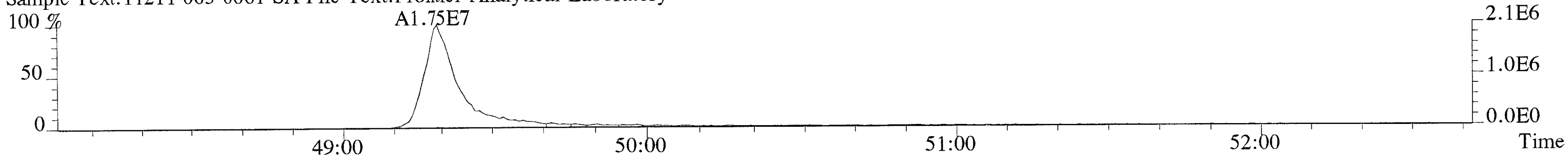
File:26JAN18M #1-361 Acq:27-JAN-1918 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
457.7377 S:17 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



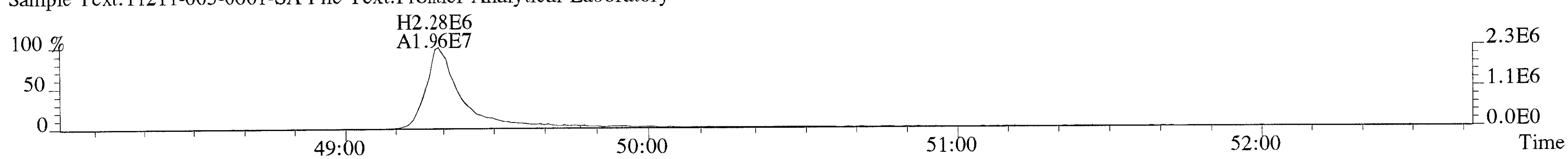
File:26JAN18M #1-361 Acq:27-JAN-1918 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
459.7348 S:17 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



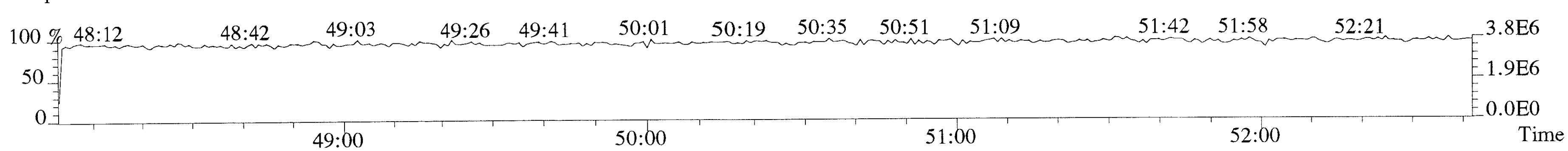
File:26JAN18M #1-361 Acq:27-JAN-1918 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
469.7780 S:17 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



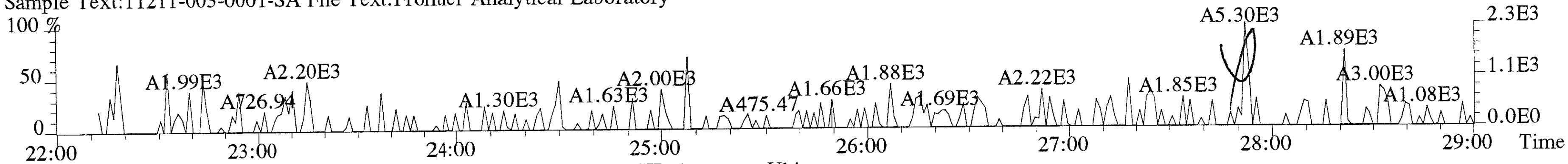
File:26JAN18M #1-361 Acq:27-JAN-1918 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
471.7750 S:17 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



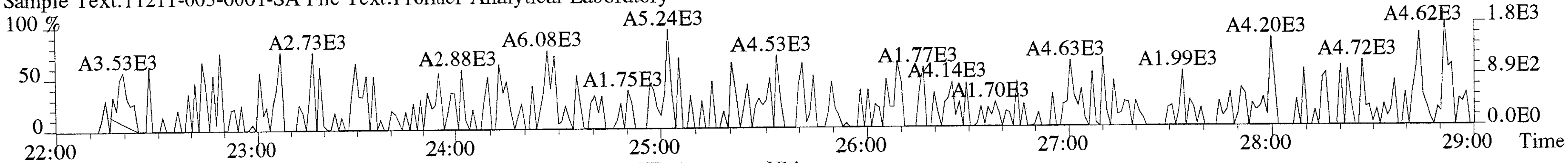
File:26JAN18M #1-361 Acq:27-JAN-1918 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
454.9728 S:17 F:5 Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



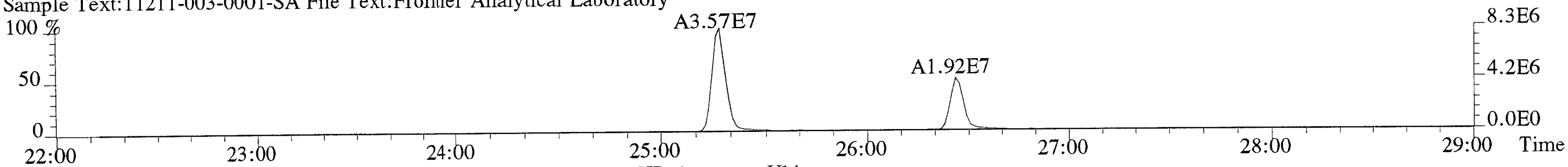
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
303.9016 S:17 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



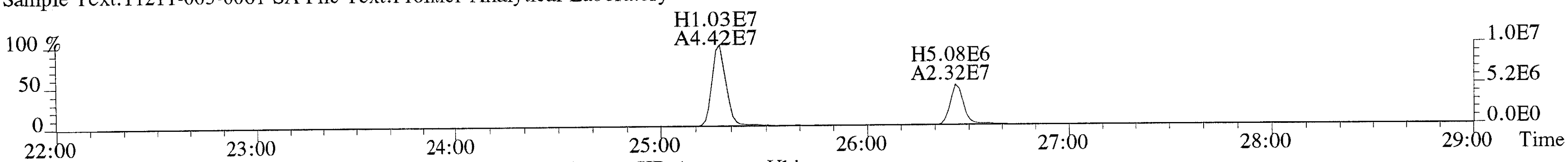
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
305.8987 S:17 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



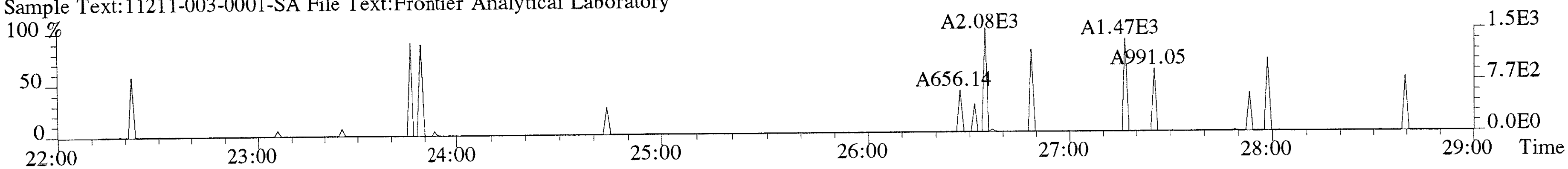
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
315.9419 S:17 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



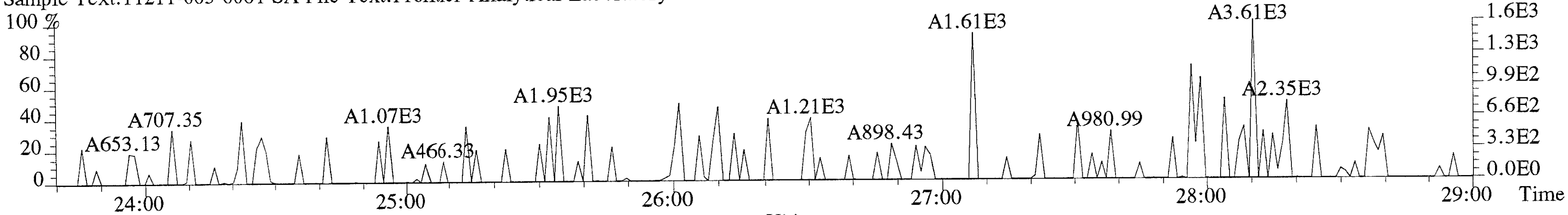
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
317.9389 S:17 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



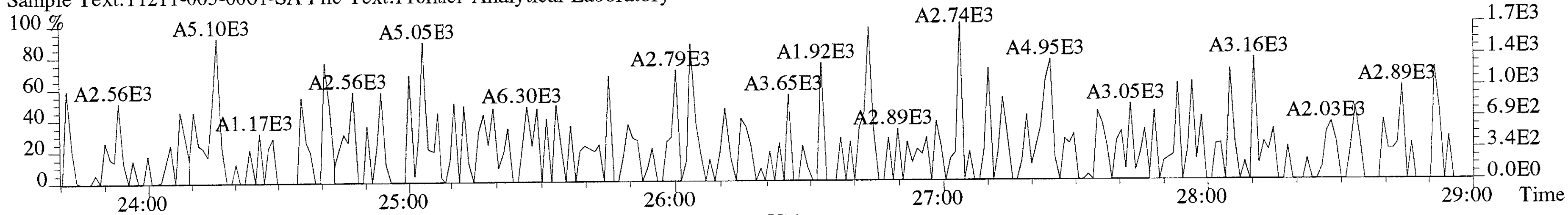
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
375.8364 S:17 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



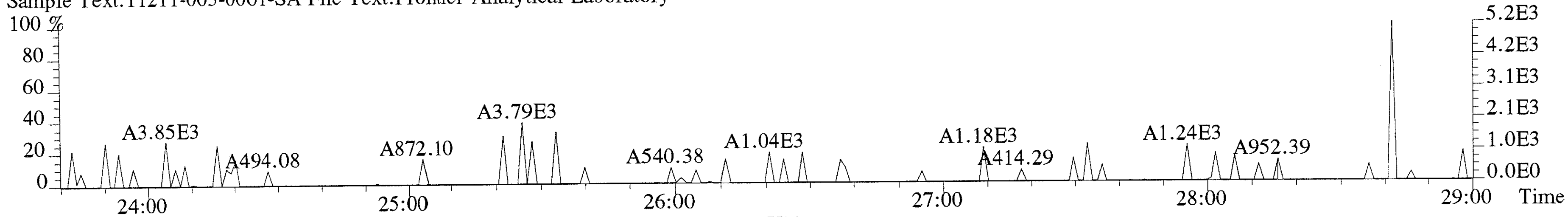
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:17 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



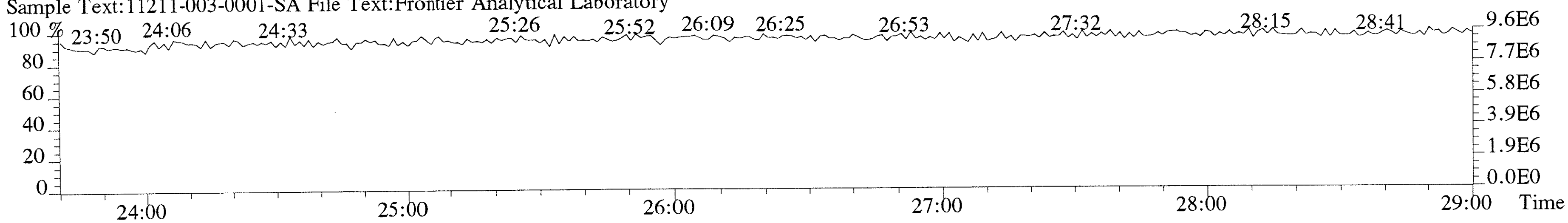
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:17 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



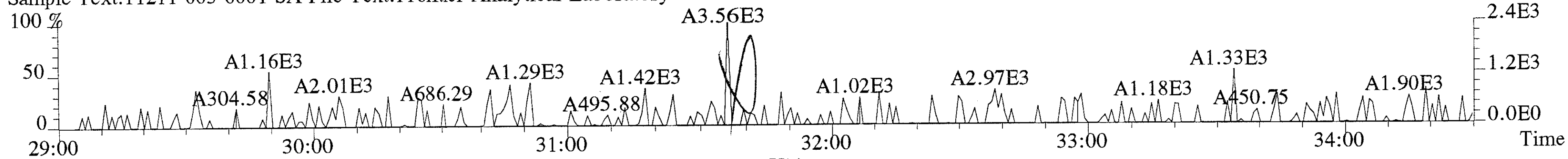
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:17 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



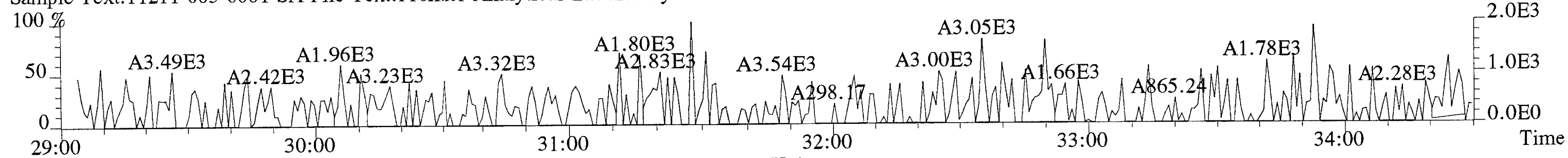
File:26JAN18M #1-381 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
330.9792 S:17 Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



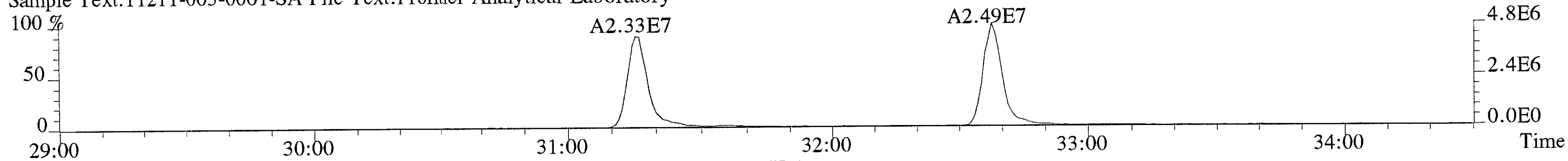
File:26JAN18M #1-423 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:17 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



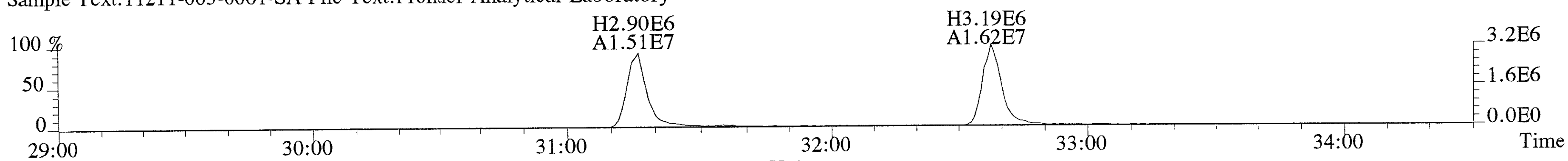
File:26JAN18M #1-423 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:17 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



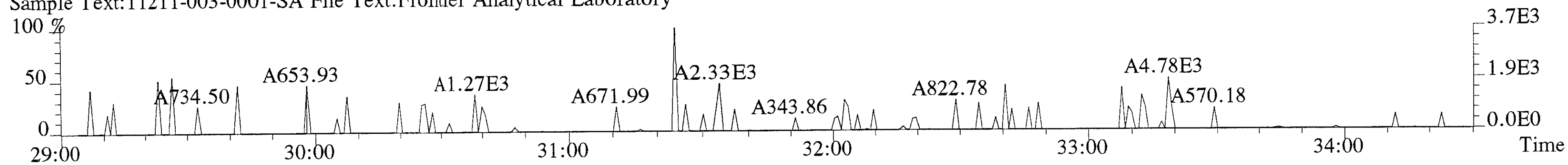
File:26JAN18M #1-423 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:17 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



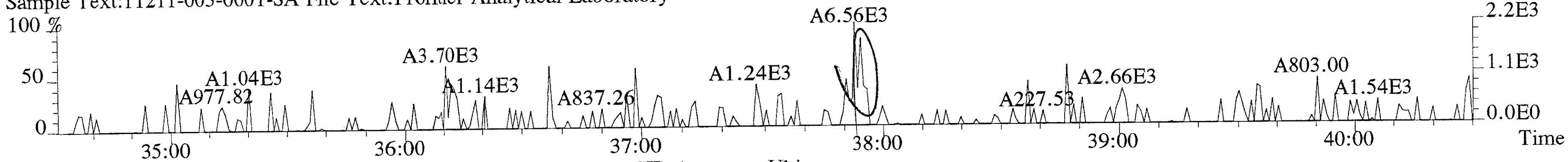
File:26JAN18M #1-423 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
353.8970 S:17 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



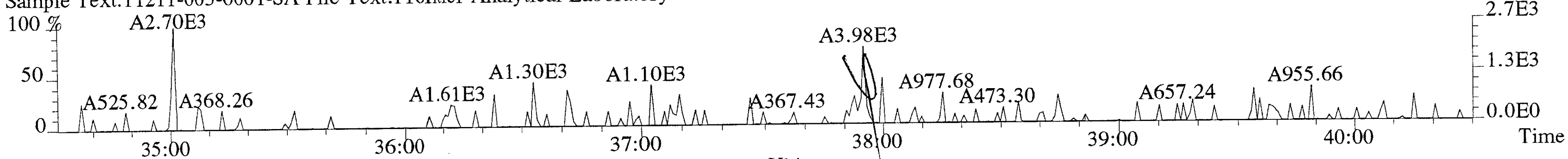
File:26JAN18M #1-423 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:17 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



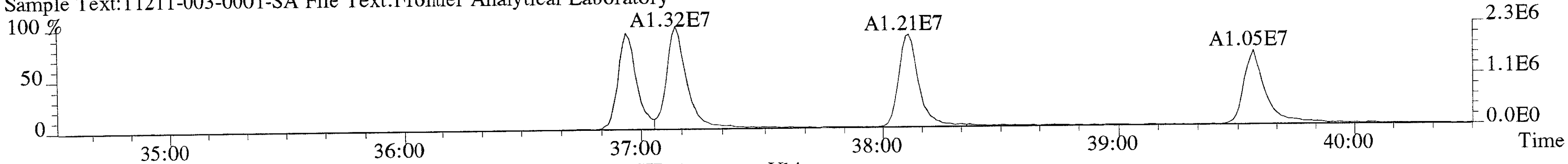
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
373.8207 S:17 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



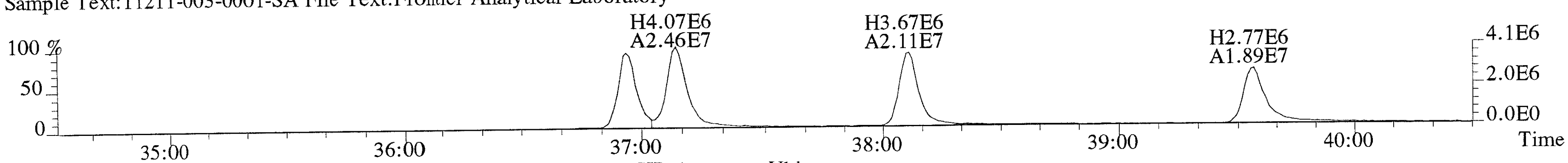
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
375.8178 S:17 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



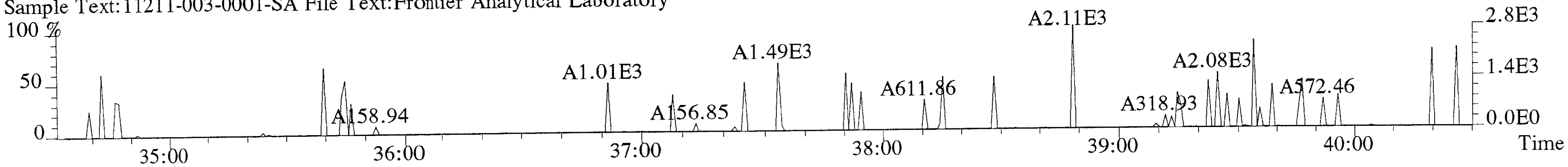
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:17 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



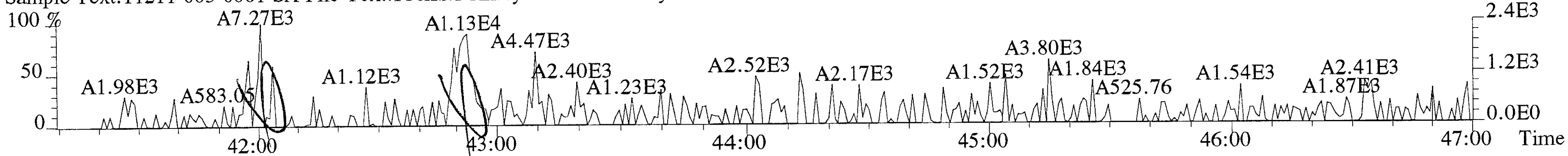
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
385.8610 S:17 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



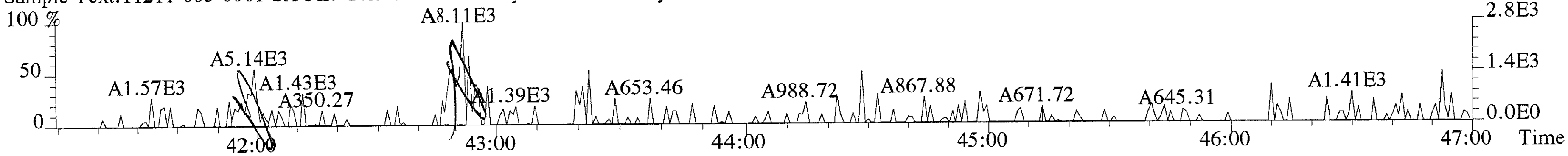
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
445.7555 S:17 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



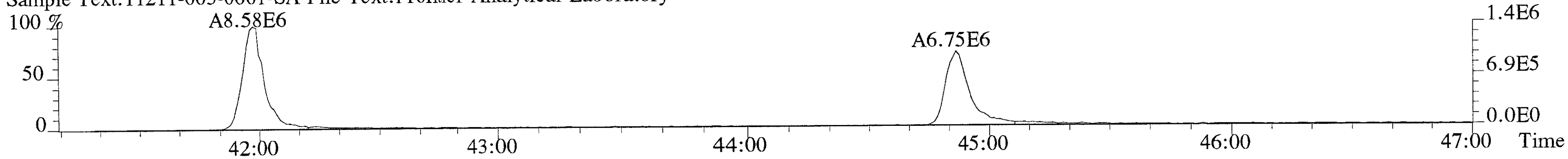
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:17 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



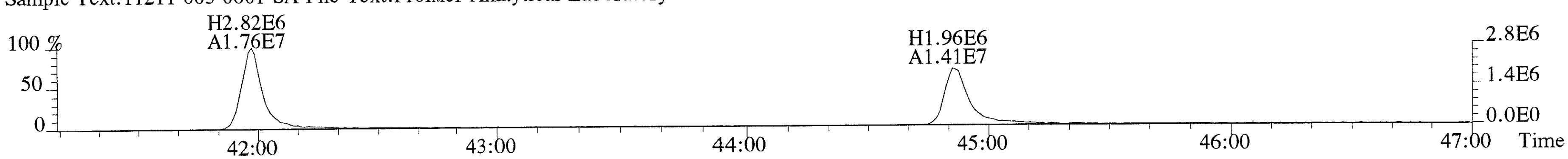
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
409.7788 S:17 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



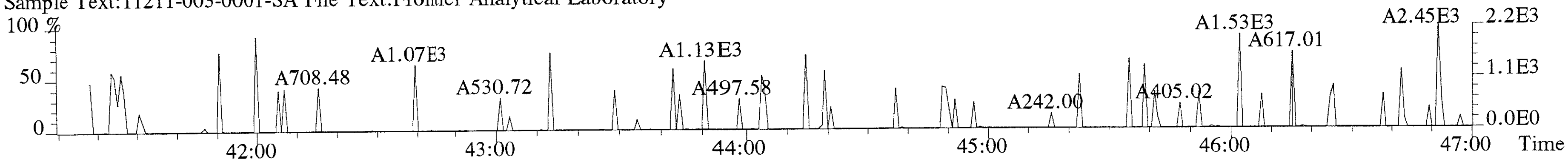
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
417.8253 S:17 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



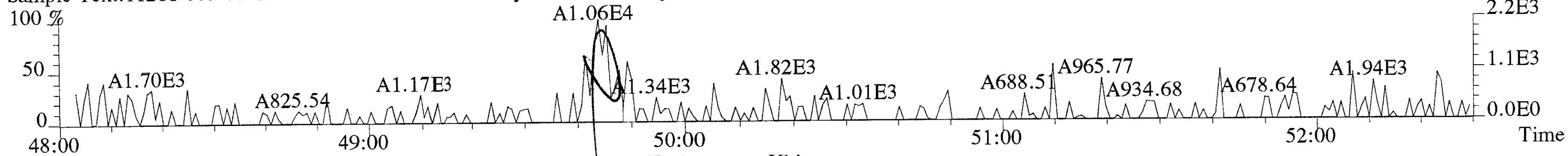
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
419.8220 S:17 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



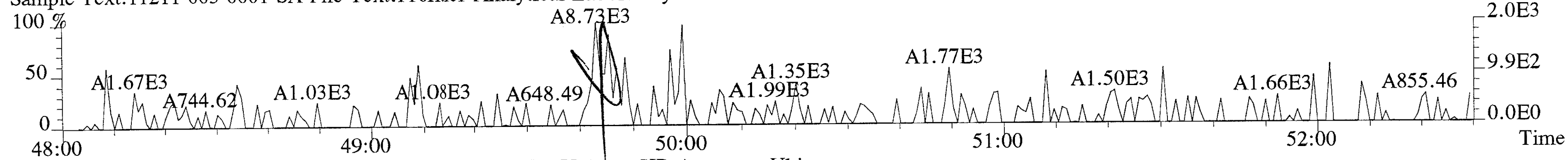
File:26JAN18M #1-521 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:17 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:17 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory

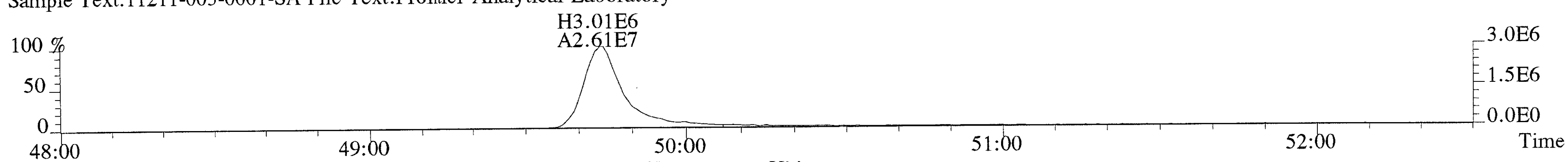


File:26JAN18M #1-361 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
443.7398 S:17 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory

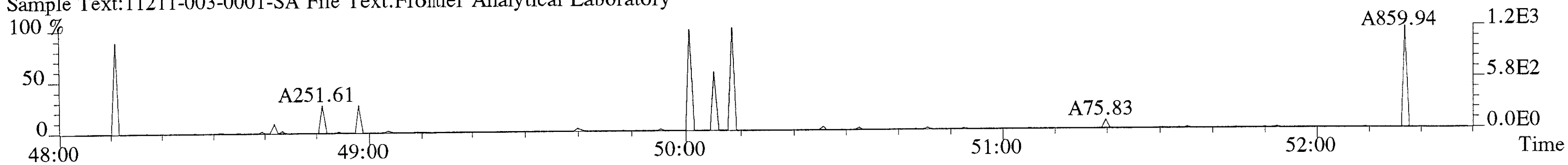


File:26JAN18M #1-361 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:17 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory

File:26JAN18M #1-361 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:17 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:27-JAN-2018 04:09:25 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:17 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-003-0001-SA File Text:Frontier Analytical Laboratory



FAL ID: 11211-004-0001-SA Filename: 26JAN18M Sam:18 Acquired: 27-JAN-18 05:04:16 ICal: PCDDFAL3-12-22-17
Client ID: AMW-1-011218 ConCal: ST012618M2 EndCal: ST012618M3
Results: 11211 GC Column: DB5MS Amount: 0.9580 NATO 1989 Tox: 0.00
Instrument ID: FAL3 WHO 1998 Tox: 0.00 WHO 2005 Tox: 0.00

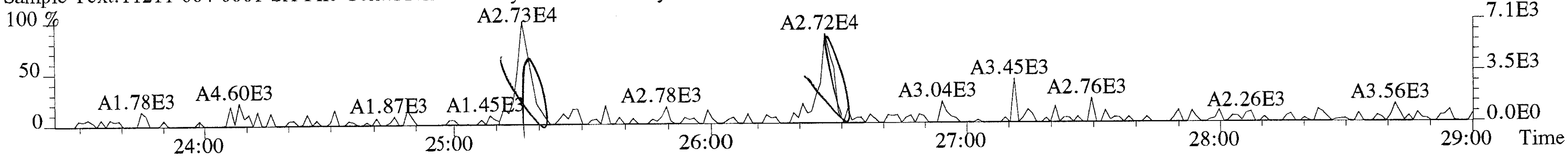
Name	Resp	RA	RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	DL
2,3,7,8-TCDD	*	* n	NotFnd	1.06	*		2.50	664	604	0.510
1,2,3,7,8-PeCDD	*	* n	NotFnd	1.00	*		2.50	878	782	1.02
1,2,3,4,7,8-HxCDD	*	* n	NotFnd	1.07	*		2.50	1050	979	1.36
1,2,3,6,7,8-HxCDD	*	* n	NotFnd	1.08	*		2.50	1050	979	1.45
1,2,3,7,8,9-HxCDD	*	* n	NotFnd	1.11	*		2.50	1050	979	1.36
1,2,3,4,6,7,8-HpCDD	*	* n	NotFnd	0.99	*		2.50	1090	1330	2.29
OCDD	*	* n	NotFnd	1.11	*		2.50	1810	2090	5.81
2,3,7,8-TCDF	*	* n	NotFnd	1.03	*		2.50	701	814	0.499
1,2,3,7,8-PeCDF	*	* n	NotFnd	0.95	*		2.50	588	843	0.656
2,3,4,7,8-PeCDF	*	* n	NotFnd	0.79	*		2.50	588	843	0.688
1,2,3,4,7,8-HxCDF	*	* n	NotFnd	1.20	*		2.50	830	945	0.819
1,2,3,6,7,8-HxCDF	*	* n	NotFnd	1.10	*		2.50	830	945	0.845
2,3,4,6,7,8-HxCDF	*	* n	NotFnd	1.08	*		2.50	830	945	0.873
1,2,3,7,8,9-HxCDF	*	* n	NotFnd	1.15	*		2.50	830	945	1.14
1,2,3,4,6,7,8-HpCDF	*	* n	NotFnd	1.23	*		2.50	885	525	0.929
1,2,3,4,7,8,9-HpCDF	*	* n	NotFnd	1.23	*		2.50	885	525	1.23
OCDF	*	* n	NotFnd	0.90	*		2.50	605	553	1.48

Name	Resp	RA	RT	RRF	Conc	Rec
13C-2,3,7,8-TCDD	5.62e+07	0.82 y	27:10	1.02	1940	92.9
13C-1,2,3,7,8-PeCDD	4.48e+07	1.54 y	32:60	0.88	1800	86.1
13C-1,2,3,4,7,8-HxCDD	3.73e+07	1.23 y	38:20	0.85	1810	86.6
13C-1,2,3,6,7,8-HxCDD	4.08e+07	1.24 y	38:30	0.94	1800	86.0
13C-1,2,3,4,6,7,8-HpCDD	3.96e+07	1.07 y	43:53	0.90	1810	86.9
13C-OCDD	5.60e+07	0.89 y	49:19	0.70	3300	79.0
13C-2,3,7,8-TCDF	7.02e+07	0.81 y	26:26	0.93	1910	91.5
13C-1,2,3,7,8-PeCDF	6.21e+07	1.53 y	31:15	0.87	1820	87.1
13C-2,3,4,7,8-PeCDF	7.00e+07	1.53 y	32:37	0.99	1790	85.9
13C-1,2,3,4,7,8-HxCDF	5.05e+07	0.55 y	36:56	1.09	1910	91.5
13C-1,2,3,6,7,8-HxCDF	6.03e+07	0.55 y	37:08	1.35	1860	88.9
13C-2,3,4,6,7,8-HxCDF	5.54e+07	0.56 y	38:06	1.23	1860	89.2
13C-1,2,3,7,8,9-HxCDF	4.87e+07	0.54 y	39:33	1.14	1760	84.5
13C-1,2,3,4,6,7,8-HpCDF	4.08e+07	0.48 y	41:58	0.97	1730	83.0
13C-1,2,3,4,7,8,9-HpCDF	3.49e+07	0.48 y	44:52	0.82	1770	84.6
13C-OCDF	7.94e+07	0.93 y	49:44	1.06	3090	74.1
37Cl-2,3,7,8-TCDD	2.05e+07		27:11	0.91	793	94.9
13C-1,2,3,4-TCDD	5.92e+07	0.82 y	26:32	-	170	
13C-1,2,3,4-TCDF	8.23e+07	0.80 y	25:17	-	165	
13C-1,2,3,7,8,9-HxCDD	5.05e+07	1.26 y	38:57	-	172	

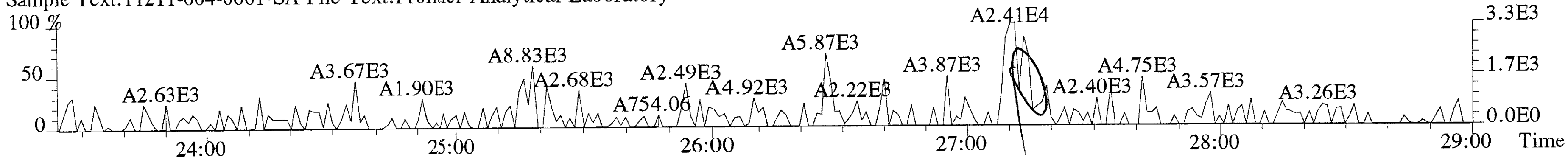
Name	Resp	RT	RRF	Conc	Fac	Noise-1	Noise-2	DL	#Hom
Total Tetra-Dioxins	*	NotFnd	1.06	*	2.50	664	604	0.510	0
Total Penta-Dioxins	*	NotFnd	1.00	*	2.50	878	782	1.02	0
Total Hexa-Dioxins	*	NotFnd	1.09	*	2.50	1050	979	1.45	0
Total Hepta-Dioxins	*	NotFnd	0.99	*	2.50	1090	1330	2.29	0
Total Tetra-Furans	*	NotFnd	1.03	*	2.50	701	814	0.499	0
1st Fn. Tot Penta-Furans	*	NotFnd	0.86	*	2.50	588	843	0.688 PeCDF	0
Total Penta-Furans	*	NotFnd	0.86	*	2.50	588	843	0.688 *	0
Total Hexa-Furans	*	NotFnd	1.13	*	2.50	830	945	1.14	0
Total Hepta-Furans	*	NotFnd	1.23	*	2.50	885	525	1.23	0

Analyst: [signature] Date: 1/29/18

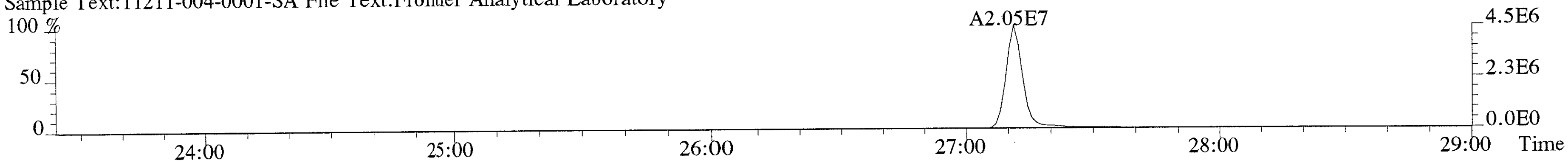
File:26JAN18M #1-381 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:18 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



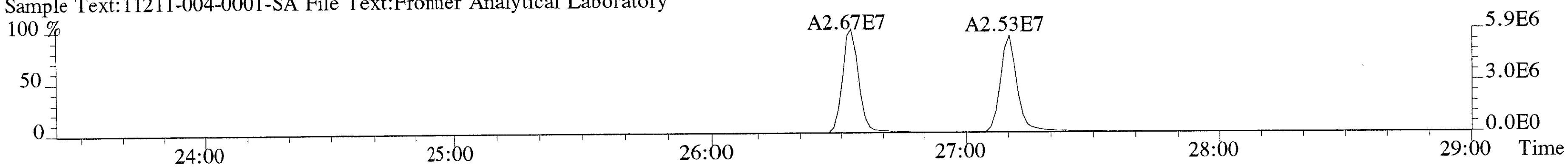
File:26JAN18M #1-381 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:18 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



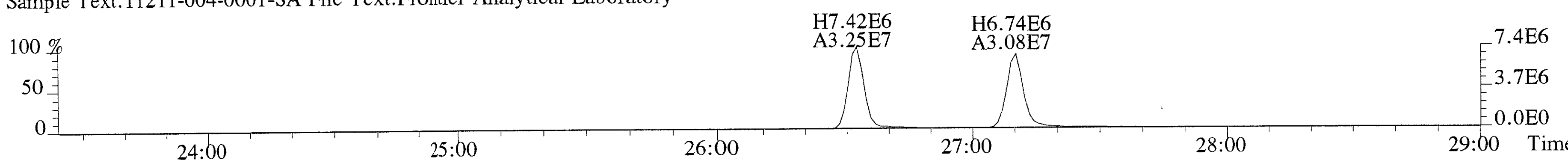
File:26JAN18M #1-381 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
327.8847 S:18 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



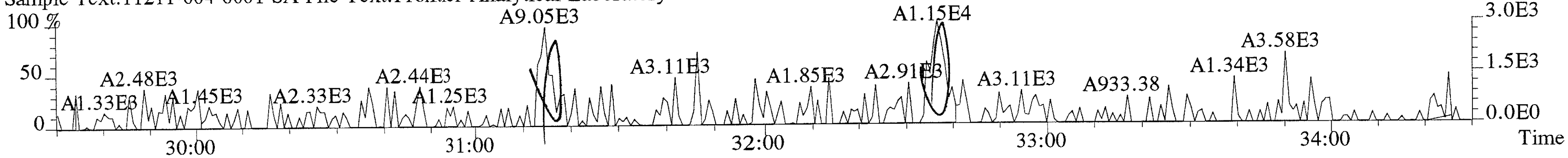
File:26JAN18M #1-381 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
331.9368 S:18 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



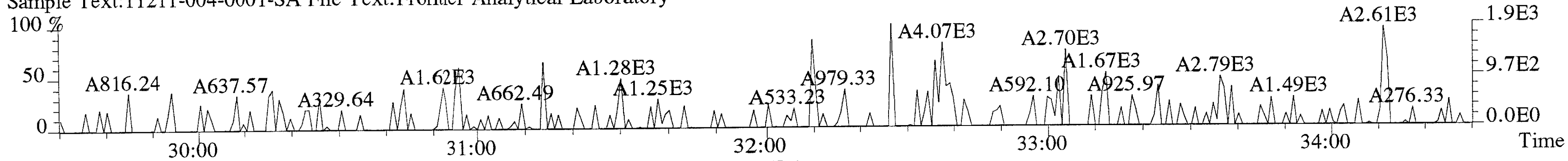
File:26JAN18M #1-381 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
333.9339 S:18 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



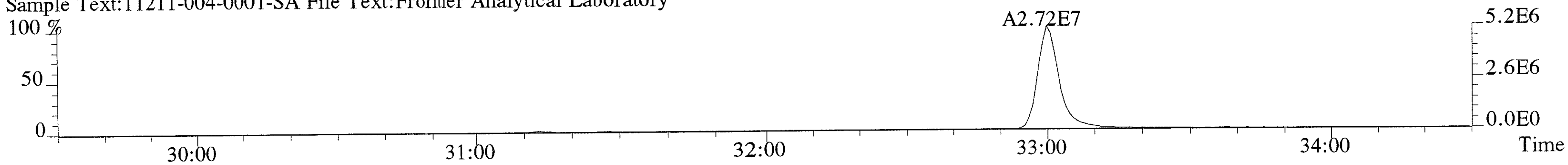
File:26JAN18M #1-423 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
355.8546 S:18 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



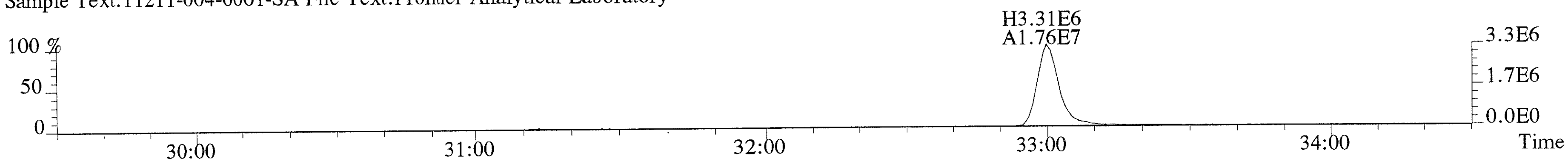
File:26JAN18M #1-423 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
357.8517 S:18 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



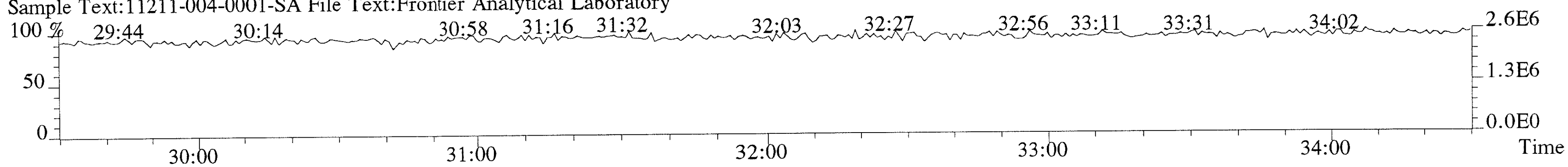
File:26JAN18M #1-423 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
367.8949 S:18 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



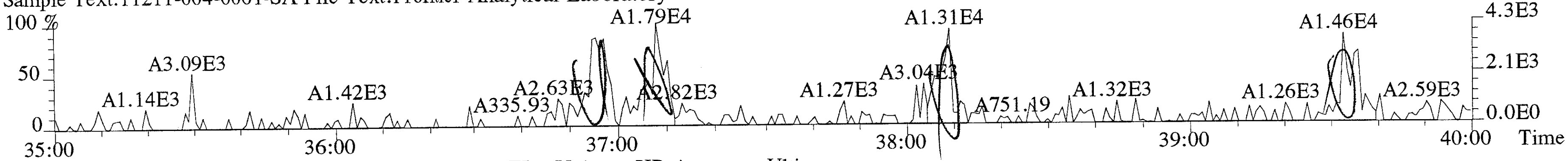
File:26JAN18M #1-423 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
369.8919 S:18 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-423 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
366.9792 S:18 F:2 Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
389.8156 S:18 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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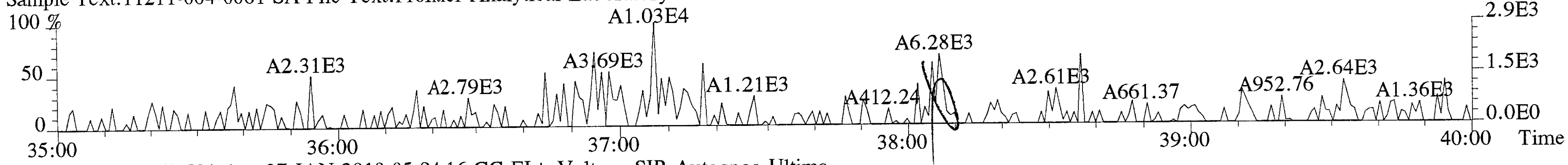
391.8127 S:18 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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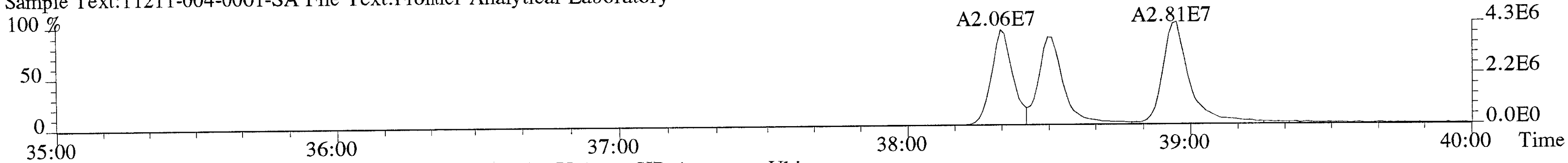
401.8559 S:18 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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403.8530 S:18 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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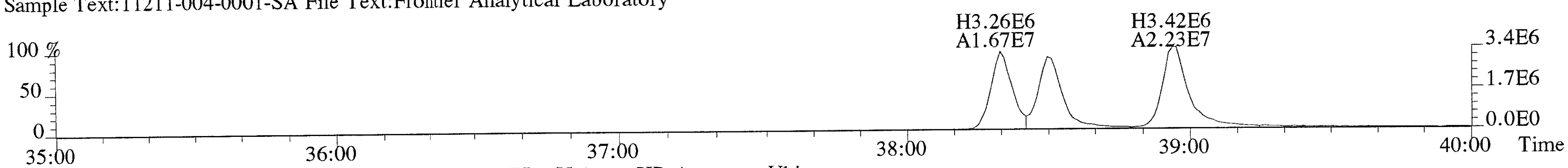

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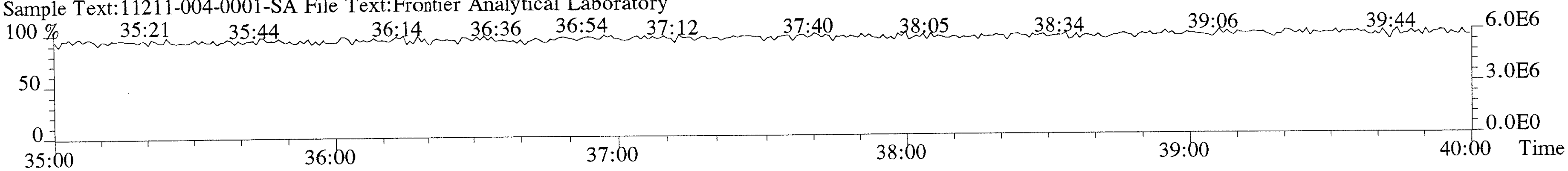
380.9760 S:18 F:3 Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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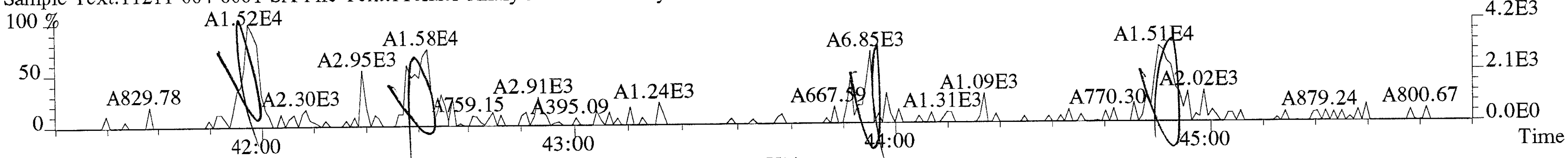
423.7767 S:18 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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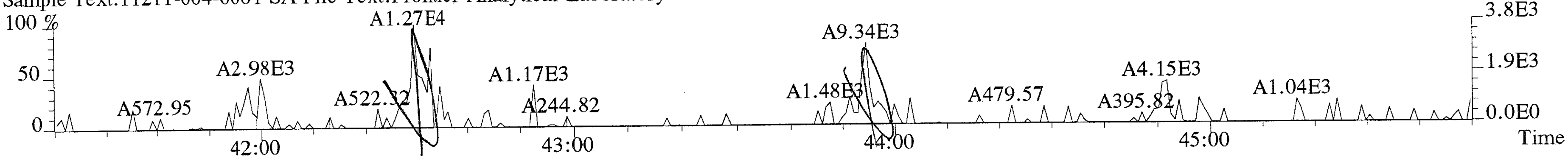
425.7737 S:18 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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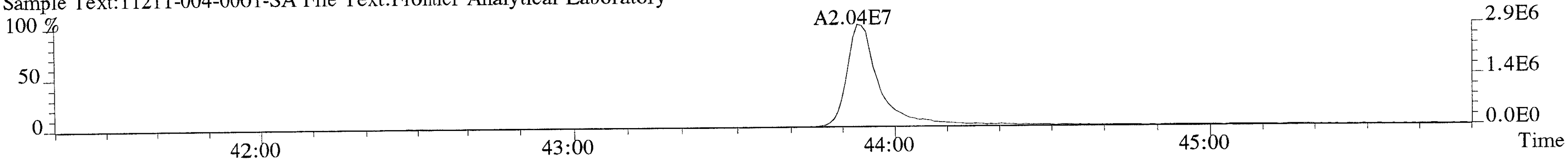
435.8169 S:18 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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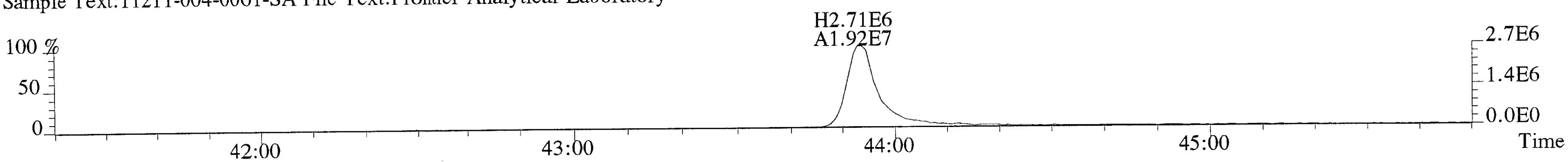
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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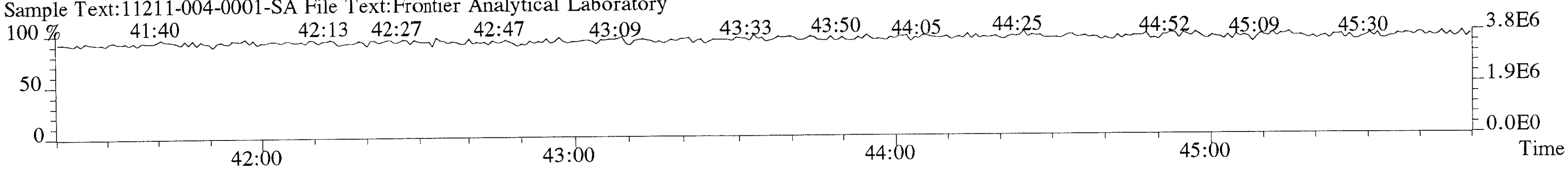
430.9728 S:18 F:4 Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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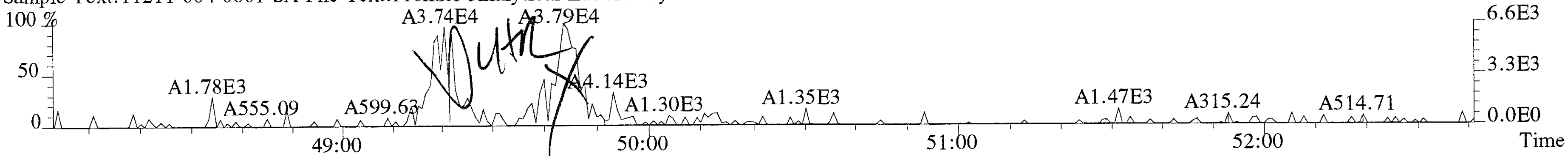
457.7377 S:18 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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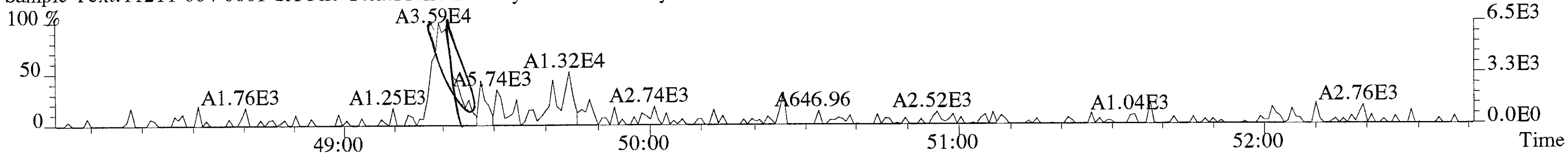
459.7348 S:18 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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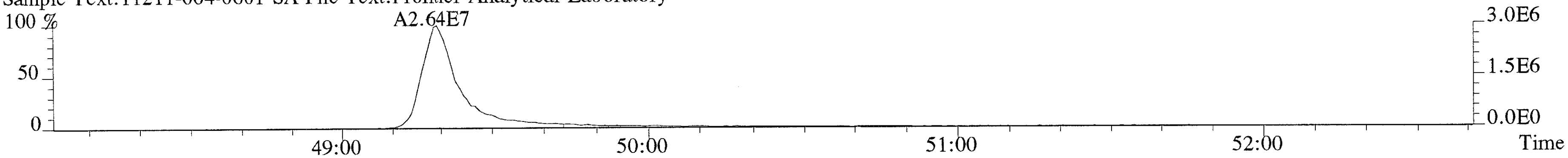
469.7780 S:18 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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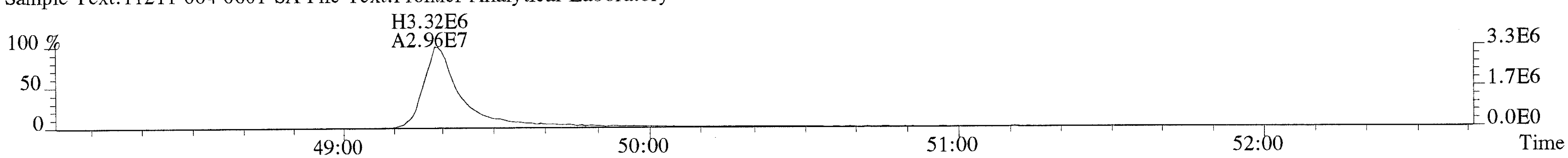
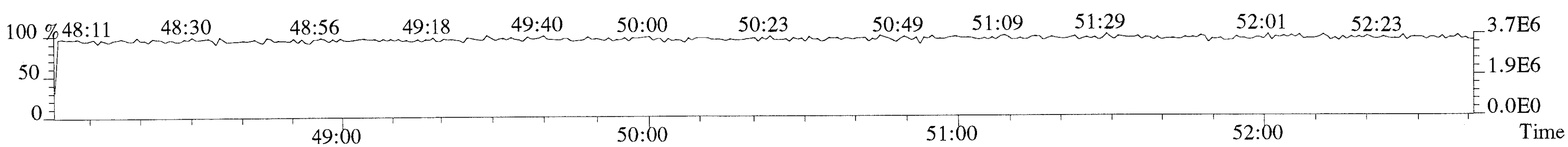
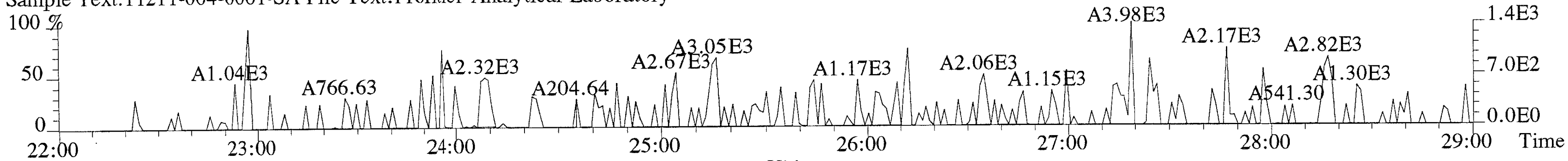


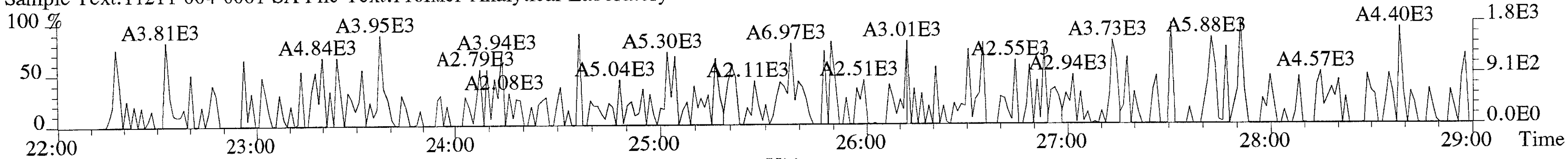
File:26JAN18M #1-360 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
454.9728 S:18 F:5 Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
303.9016 S:18 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
305.8987 S:18 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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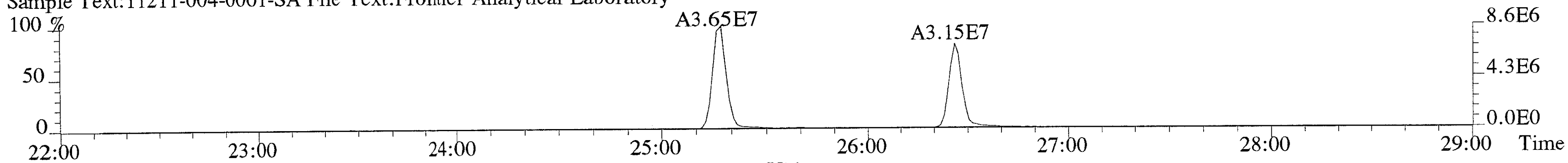
315.9419 S:18 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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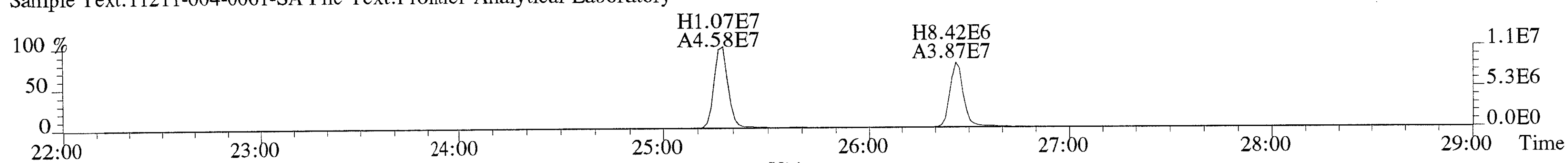
317.9389 S:18 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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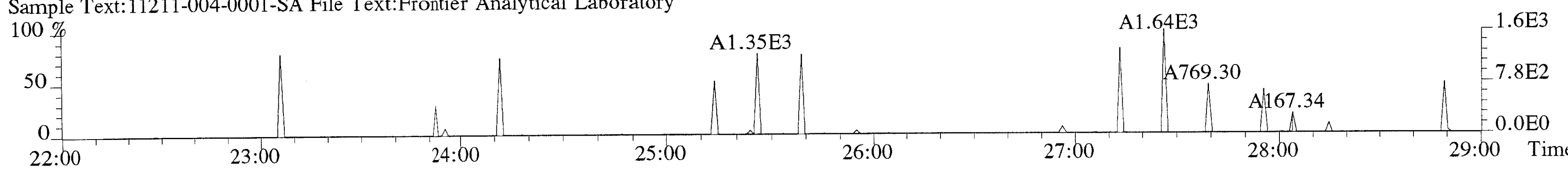
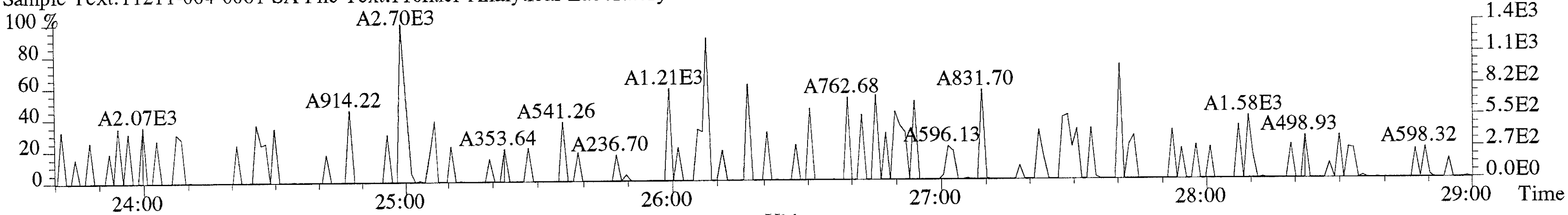
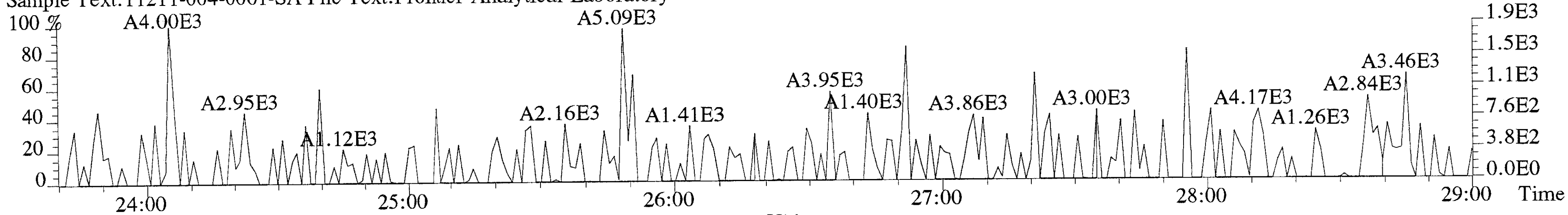
375.8364 S:18 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:18 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:18 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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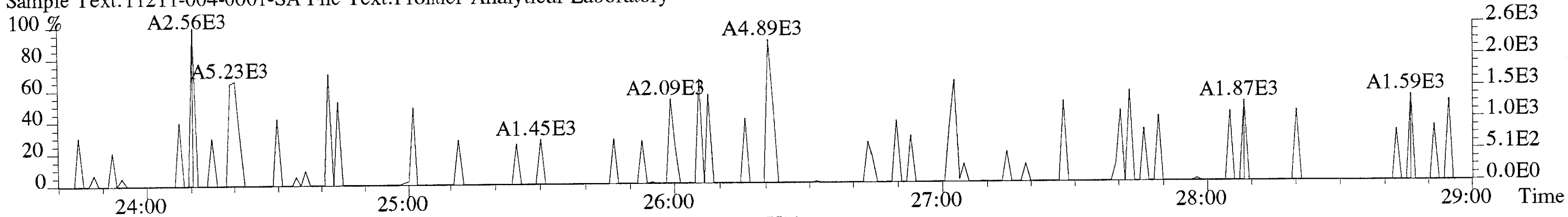
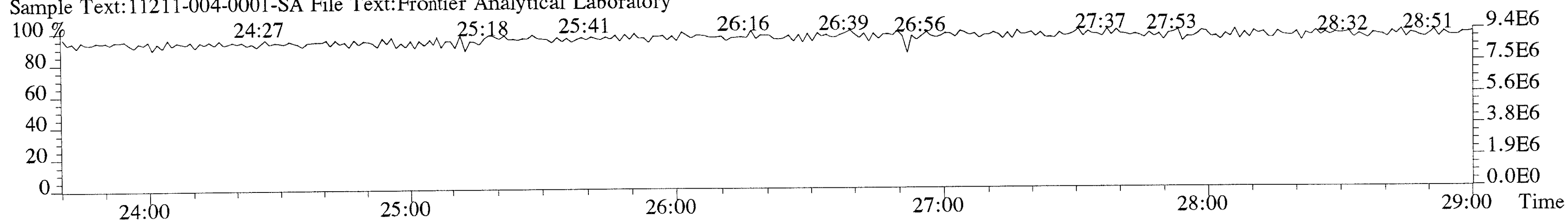
409.7974 S:18 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
330.9792 S:18 Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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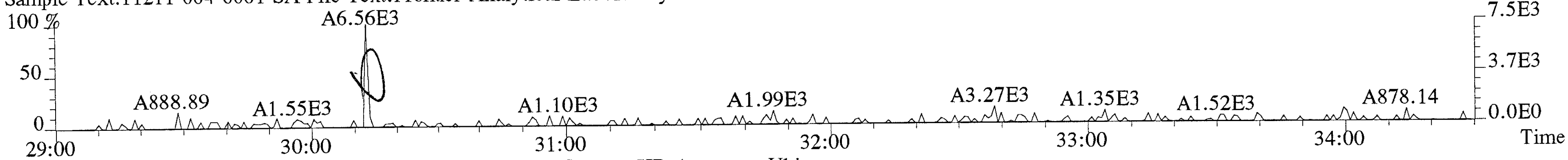
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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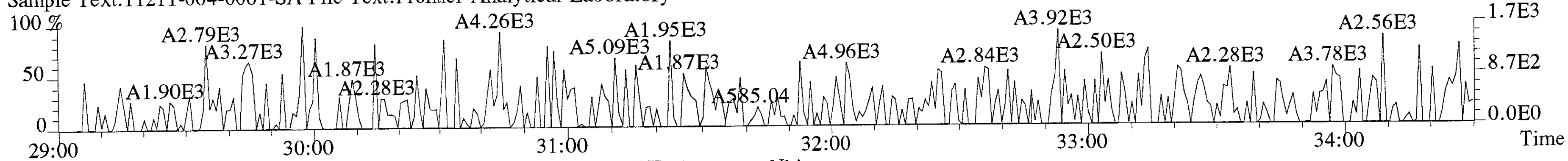
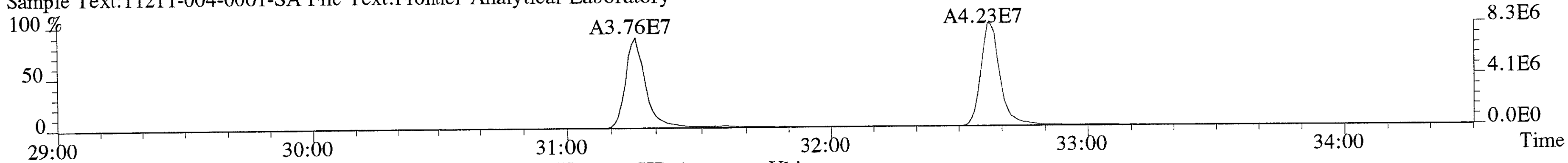
341.8568 S:18 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-423 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:18 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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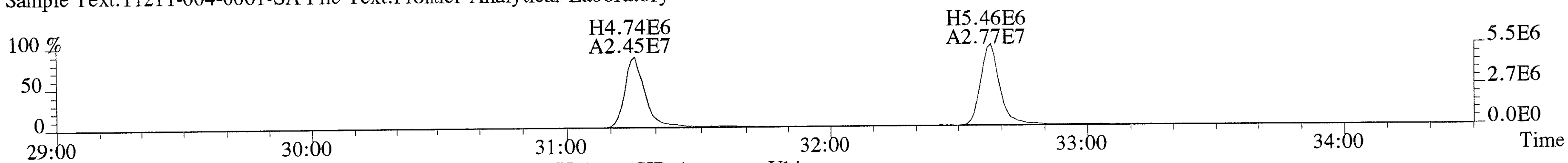
353.8970 S:18 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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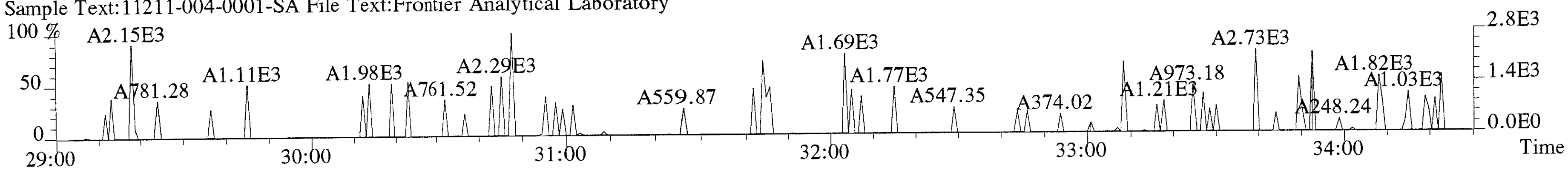
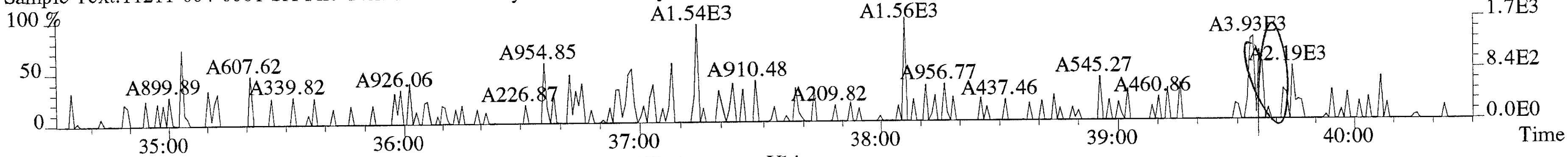
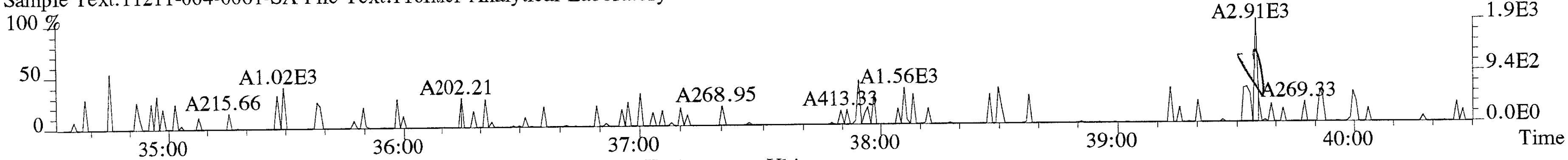
409.7974 S:18 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



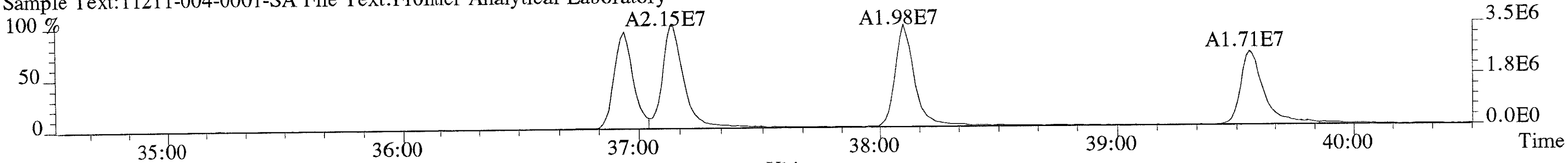
File:26JAN18M #1-521 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
373.8207 S:18 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



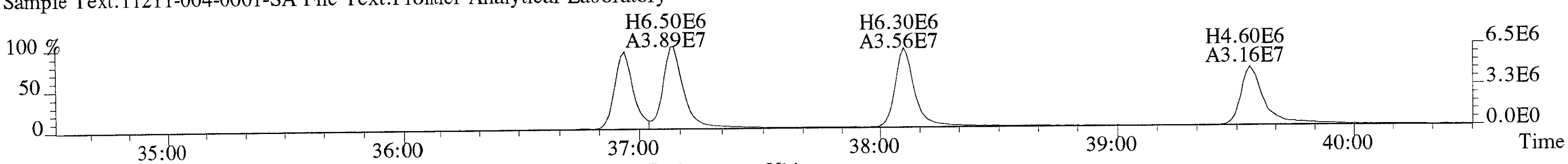
File:26JAN18M #1-521 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
375.8178 S:18 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



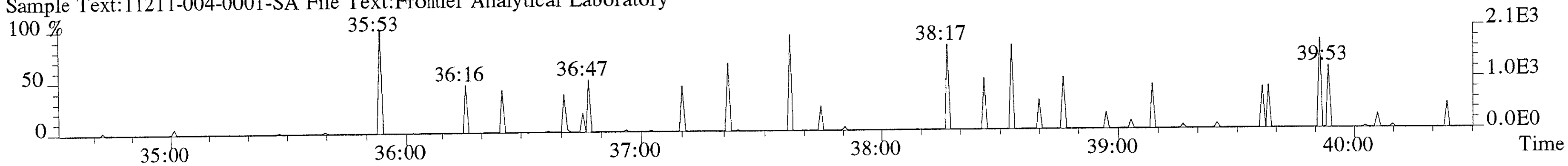
File:26JAN18M #1-521 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:18 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



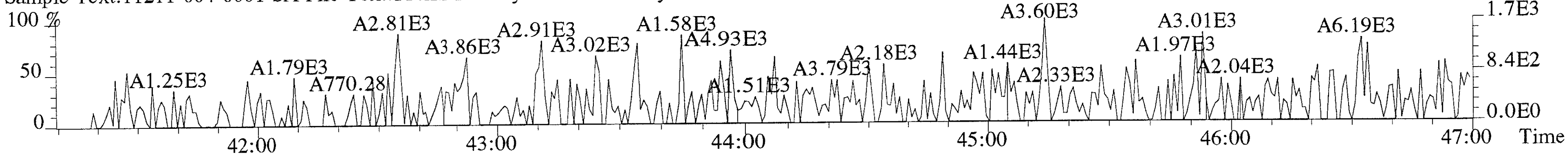
File:26JAN18M #1-521 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
385.8610 S:18 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
445.7555 S:18 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:18 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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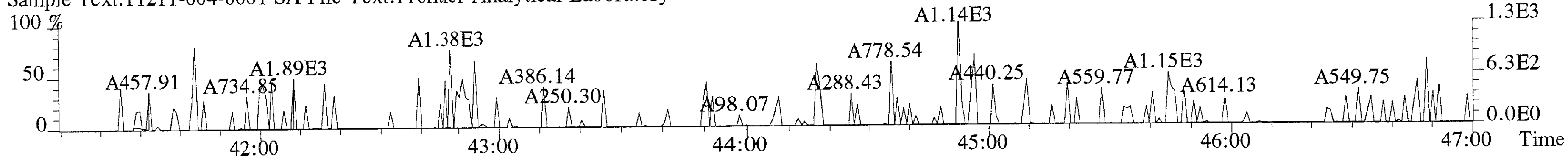
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



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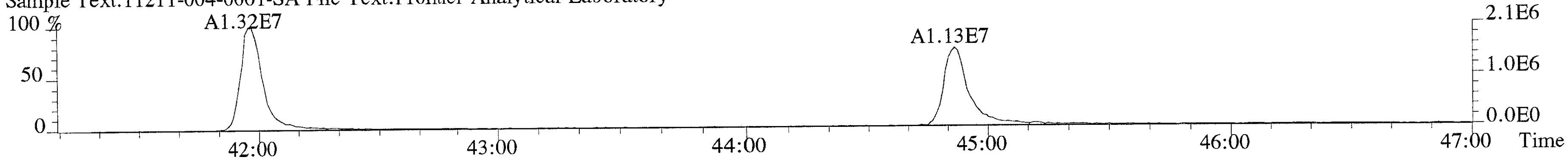
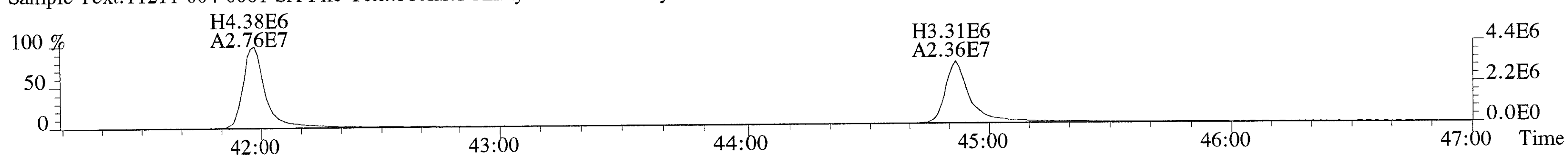
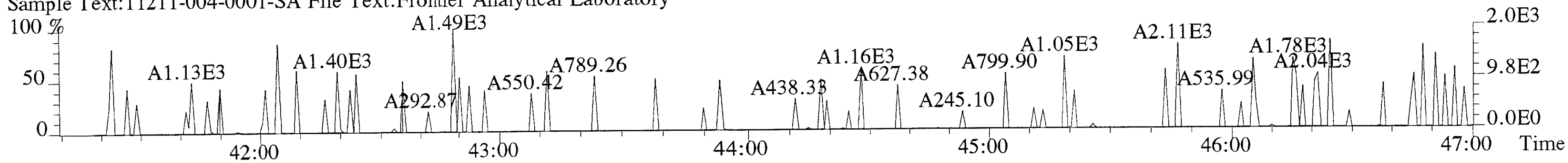


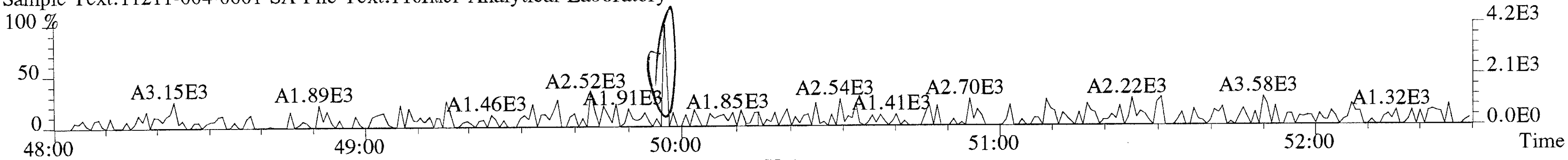
File:26JAN18M #1-521 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
419.8220 S:18 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



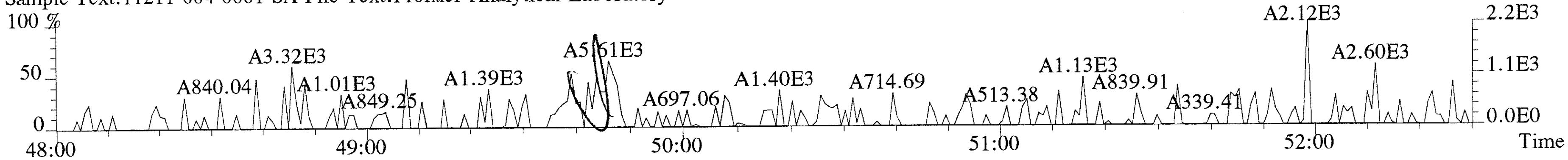
File:26JAN18M #1-521 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:18 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



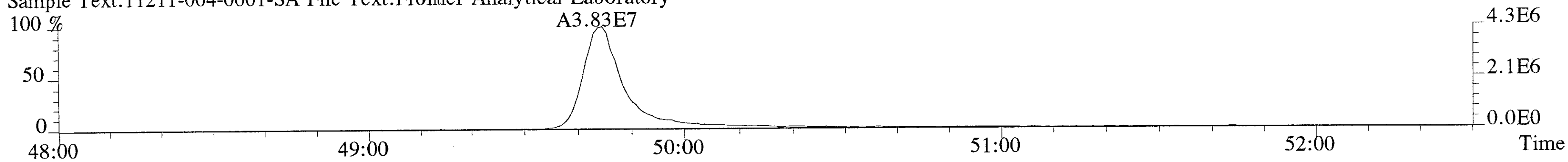
File:26JAN18M #1-360 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:18 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



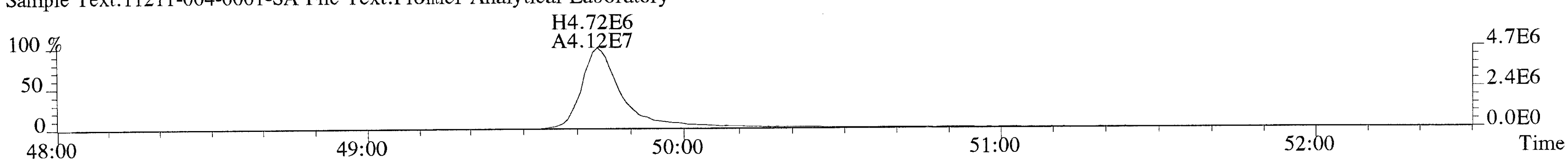
File:26JAN18M #1-360 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
443.7398 S:18 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



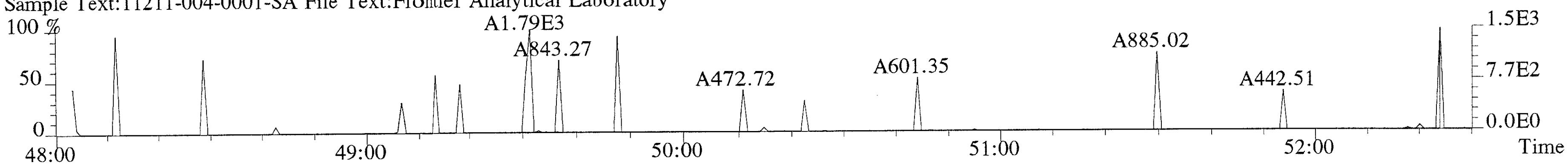
File:26JAN18M #1-360 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:18 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-360 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:18 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-360 Acq:27-JAN-2018 05:04:16 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:18 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-004-0001-SA File Text:Frontier Analytical Laboratory



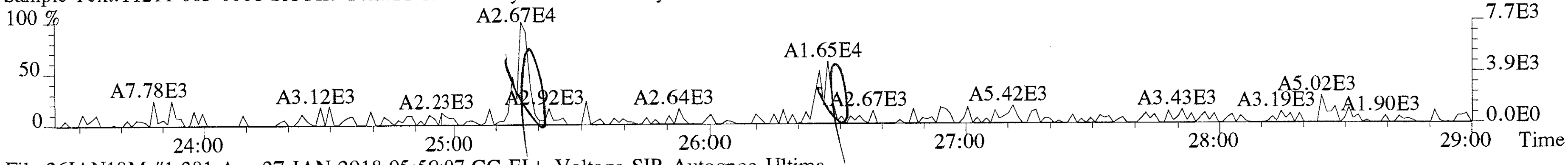
FAL ID: 11211-005-0001-SA Filename: 26JAN18M Sam:19 Acquired: 27-JAN-18 05:59:07 ICal: PCDDFAL3-12-22-17
Client ID: AMW-5-011218 ConCal: ST012618M2 EndCal: ST012618M3
Results: 11211 GC Column: DB5MS Amount: 0.9400 NATO 1989 Tox: 0.00
Instrument ID: FAL3 WHO 1998 Tox: 0.00 WHO 2005 Tox: 0.00

Name	Resp	RA	RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	DL
2,3,7,8-TCDD	*	* n	NotFnd	1.06	*		2.50	815	586	0.795
1,2,3,7,8-PeCDD	*	* n	NotFnd	1.00	*		2.50	1040	586	1.36
1,2,3,4,7,8-HxCDD	*	* n	NotFnd	1.07	*		2.50	1060	807	1.90
1,2,3,6,7,8-HxCDD	*	* n	NotFnd	1.08	*		2.50	1060	807	1.93
1,2,3,7,8,9-HxCDD	*	* n	NotFnd	1.11	*		2.50	1060	807	1.85
1,2,3,4,6,7,8-HpCDD	*	* n	NotFnd	0.99	*		2.50	708	1170	2.62
OCDD	*	* n	NotFnd	1.11	*		2.50	1370	1270	5.81
2,3,7,8-TCDF	*	* n	NotFnd	1.03	*		2.50	751	1150	0.883
1,2,3,7,8-PeCDF	*	* n	NotFnd	0.95	*		2.50	674	975	1.06
2,3,4,7,8-PeCDF	*	* n	NotFnd	0.79	*		2.50	674	975	1.04
1,2,3,4,7,8-HxCDF	*	* n	NotFnd	1.20	*		2.50	850	416	0.827
1,2,3,6,7,8-HxCDF	*	* n	NotFnd	1.10	*		2.50	850	416	0.867
2,3,4,6,7,8-HxCDF	*	* n	NotFnd	1.08	*		2.50	850	416	0.901
1,2,3,7,8,9-HxCDF	*	* n	NotFnd	1.15	*		2.50	850	416	1.21
1,2,3,4,6,7,8-HpCDF	*	* n	NotFnd	1.23	*		2.50	999	514	1.43
1,2,3,4,7,8,9-HpCDF	*	* n	NotFnd	1.23	*		2.50	999	514	1.92
OCDF	*	* n	NotFnd	0.90	*		2.50	650	555	2.29
										Rec
13C-2,3,7,8-TCDD	4.28e+07	0.81 y	27:09	1.02	1700					80.0
13C-1,2,3,7,8-PeCDD	3.57e+07	1.55 y	32:60	0.88	1650					77.6
13C-1,2,3,4,7,8-HxCDD	2.77e+07	1.24 y	38:20	0.85	1560					73.2
13C-1,2,3,6,7,8-HxCDD	2.98e+07	1.24 y	38:30	0.94	1520					71.3
13C-1,2,3,4,6,7,8-HpCDD	2.72e+07	1.05 y	43:53	0.90	1450					68.0
13C-OCDD	3.91e+07	0.96 y	49:19	0.70	2670					62.6
13C-2,3,7,8-TCDF	5.25e+07	0.84 y	26:26	0.93	1670					78.4
13C-1,2,3,7,8-PeCDF	4.65e+07	1.50 y	31:15	0.87	1590					74.7
13C-2,3,4,7,8-PeCDF	5.41e+07	1.53 y	32:37	0.99	1620					76.1
13C-1,2,3,4,7,8-HxCDF	3.78e+07	0.56 y	36:56	1.09	1660					77.9
13C-1,2,3,6,7,8-HxCDF	4.47e+07	0.55 y	37:08	1.35	1590					74.8
13C-2,3,4,6,7,8-HxCDF	4.16e+07	0.55 y	38:06	1.23	1620					76.2
13C-1,2,3,7,8,9-HxCDF	3.44e+07	0.56 y	39:33	1.14	1440					67.8
13C-1,2,3,4,6,7,8-HpCDF	2.93e+07	0.49 y	41:57	0.97	1440					67.9
13C-1,2,3,4,7,8,9-HpCDF	2.43e+07	0.50 y	44:51	0.82	1430					67.0
13C-OCDF	5.62e+07	0.95 y	49:44	1.06	2530					59.6
37Cl-2,3,7,8-TCDD	1.66e+07		27:11	0.91	736					86.4
13C-1,2,3,4-TCDD	5.24e+07	0.82 y	26:31	-	153					
13C-1,2,3,4-TCDF	7.18e+07	0.82 y	25:16	-	147					
13C-1,2,3,7,8,9-HxCDD	4.44e+07	1.21 y	38:56	-	154					

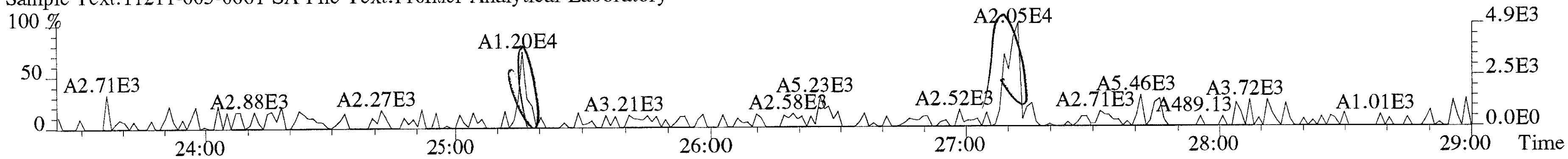
Name	Resp	RT	RRF	Conc	Fac	Noise-1	Noise-2	DL		#Hom
Total Tetra-Dioxins	*	NotFnd	1.06	*	2.50	815	586	0.795		0
Total Penta-Dioxins	*	NotFnd	1.00	*	2.50	1040	580	1.36		0
Total Hexa-Dioxins	*	NotFnd	1.09	*	2.50	1060	807	1.93		0
Total Hepta-Dioxins	*	NotFnd	0.99	*	2.50	708	1170	2.62		0
Total Tetra-Furans	*	NotFnd	1.03	*	2.50	751	1150	0.883		0
1st Fn. Tot Penta-Furans	*	NotFnd	0.86	*	2.50	674	975	1.06	PeCDF	0
Total Penta-Furans	*	NotFnd	0.86	*	2.50	674	975	1.06	*	0
Total Hexa-Furans	*	NotFnd	1.13	*	2.50	850	416	1.21		0
Total Hepta-Furans	*	NotFnd	1.23	*	2.50	999	514	1.92		0

Analyst: [signature] Date: 1/29/18

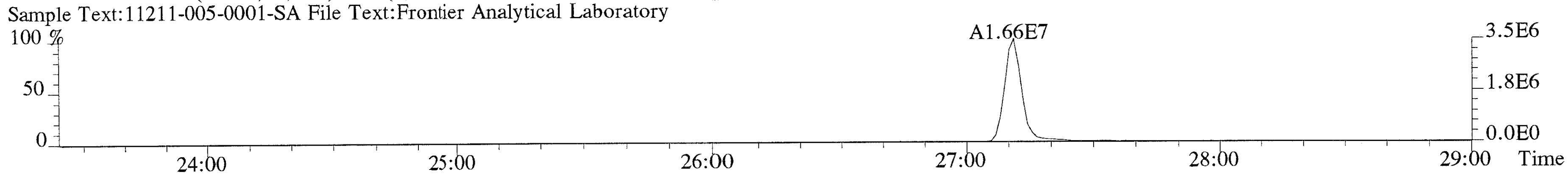
File:26JAN18M #1-381 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:19 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



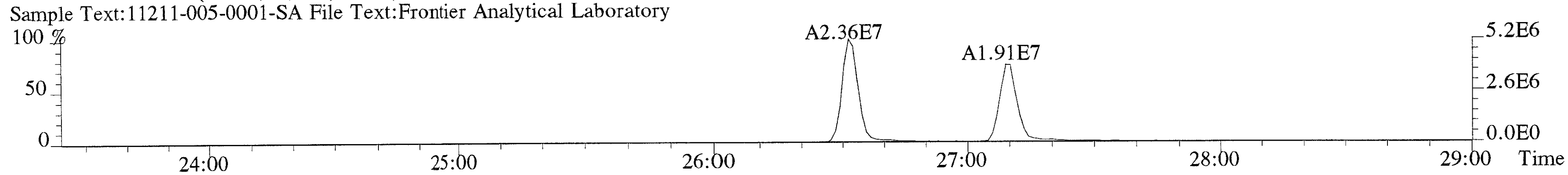
File:26JAN18M #1-381 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:19 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



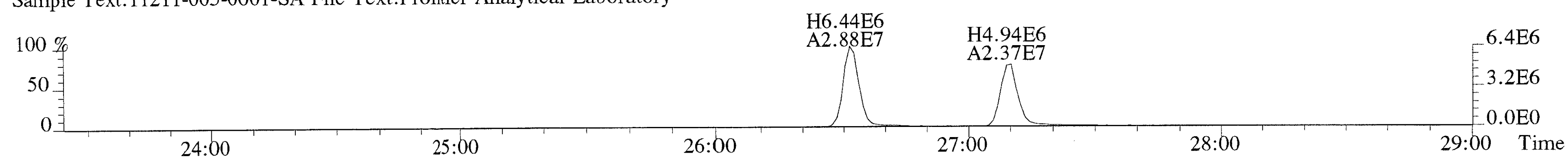
File:26JAN18M #1-381 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
327.8847 S:19 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



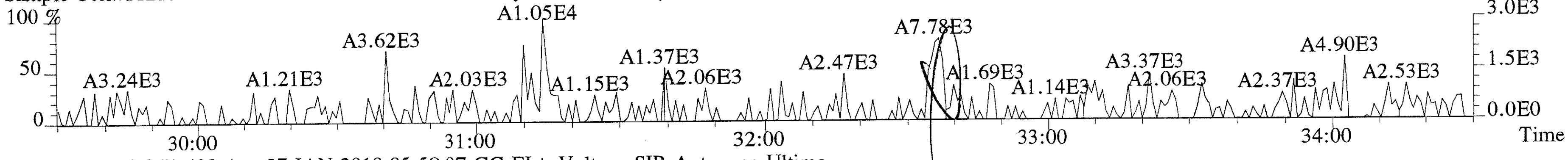
File:26JAN18M #1-381 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
331.9368 S:19 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



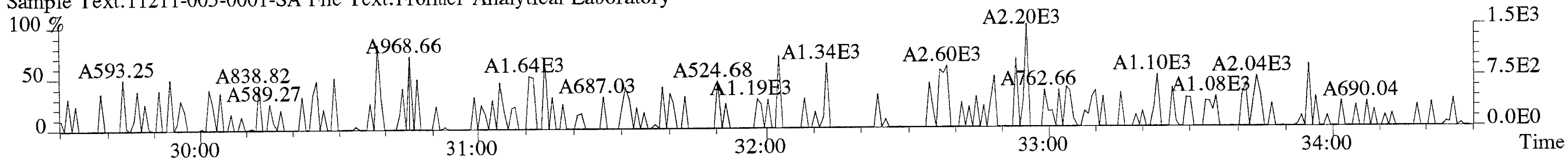
File:26JAN18M #1-381 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
333.9339 S:19 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



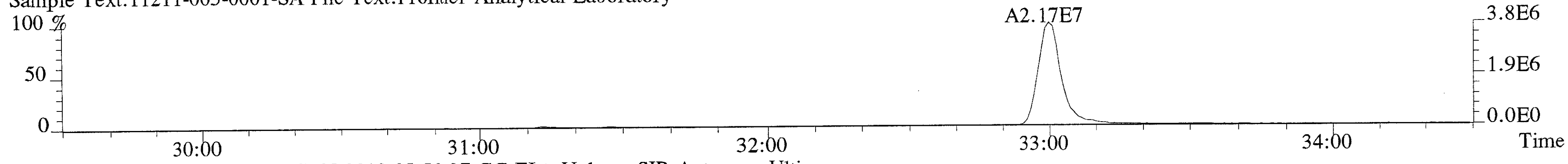
File:26JAN18M #1-423 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
355.8546 S:19 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



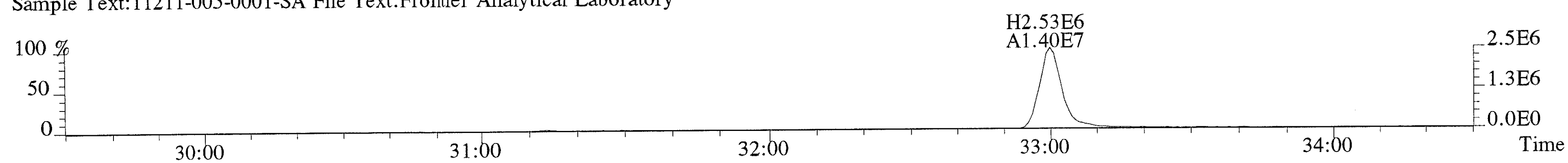
File:26JAN18M #1-423 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
357.8517 S:19 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



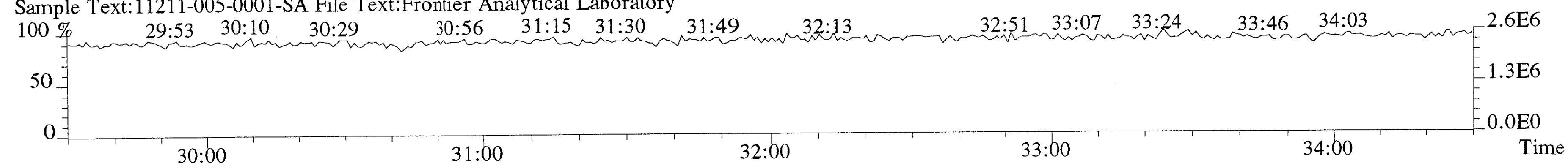
File:26JAN18M #1-423 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
367.8949 S:19 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



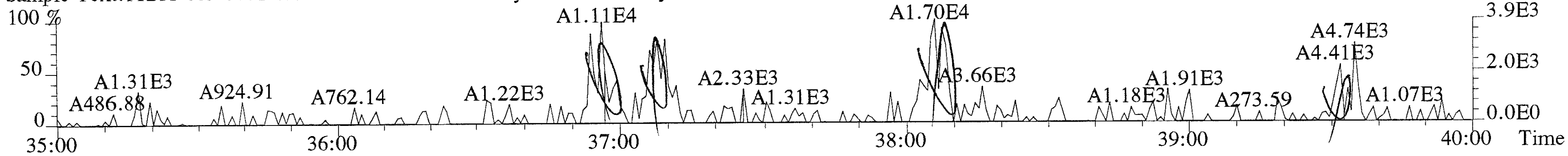
File:26JAN18M #1-423 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
369.8919 S:19 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



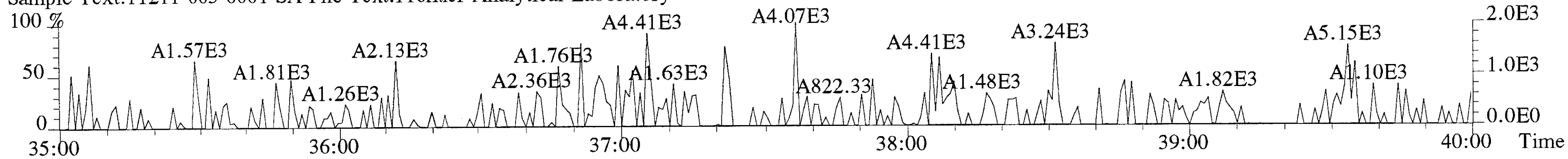
File:26JAN18M #1-423 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
366.9792 S:19 F:2 Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



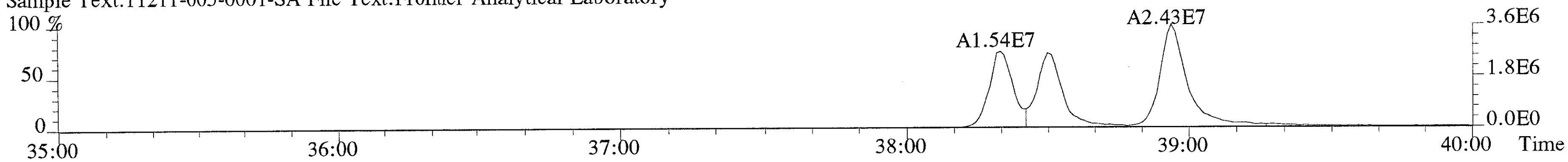
File:26JAN18M #1-521 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
389.8156 S:19 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



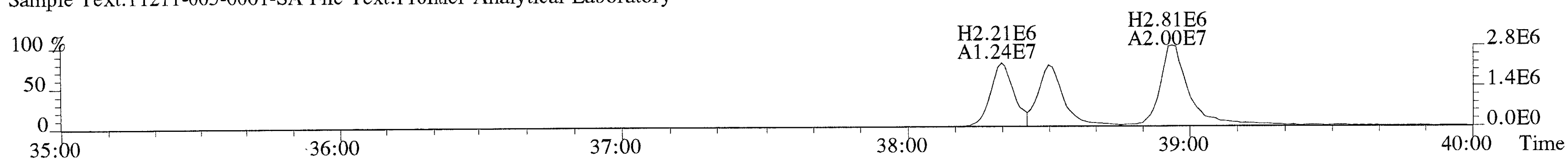
File:26JAN18M #1-521 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
391.8127 S:19 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



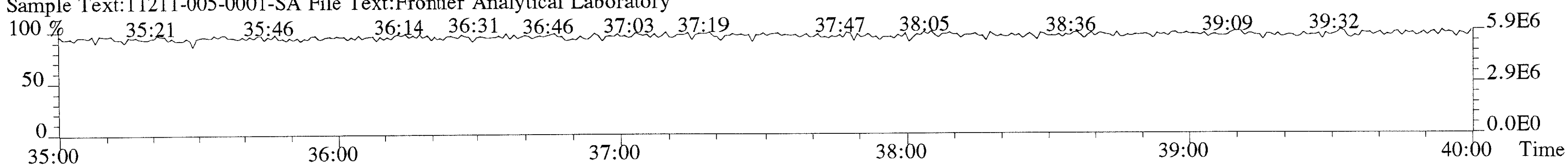
File:26JAN18M #1-521 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
401.8559 S:19 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



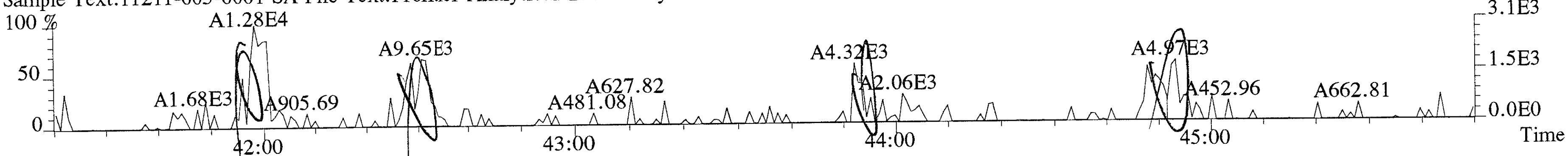
File:26JAN18M #1-521 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
403.8530 S:19 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



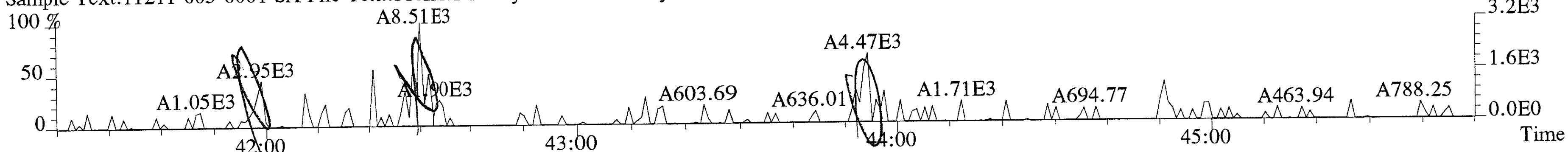
File:26JAN18M #1-521 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
380.9760 S:19 F:3 Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



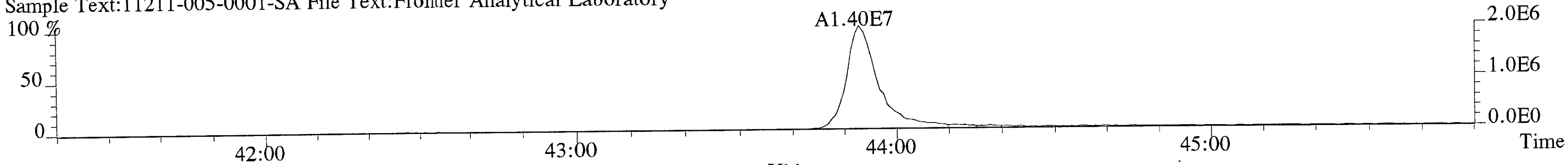
File:26JAN18M #1-521 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
423.7767 S:19 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



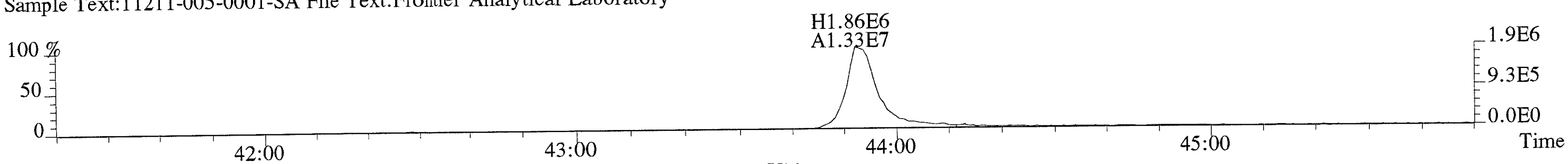
File:26JAN18M #1-521 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
425.7737 S:19 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



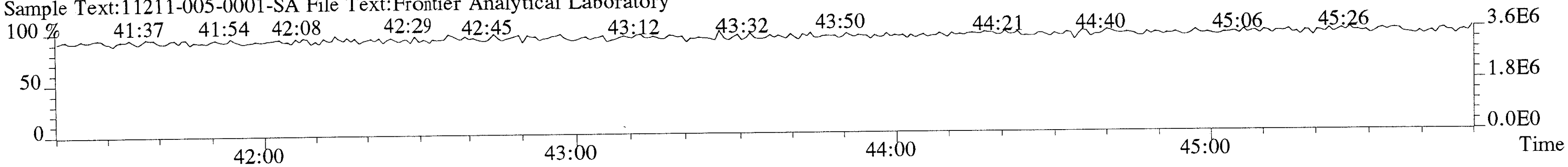
File:26JAN18M #1-521 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
435.8169 S:19 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



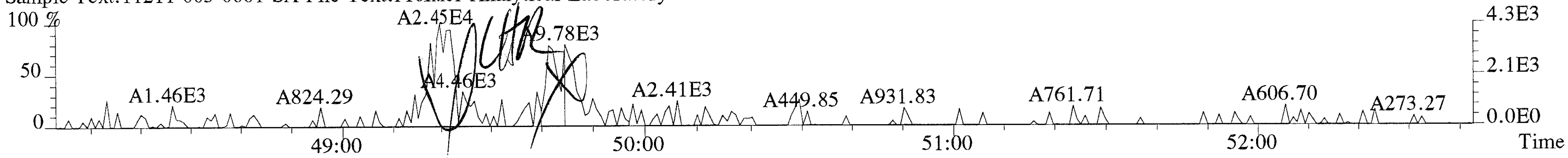
File:26JAN18M #1-521 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
437.8140 S:19 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
430.9728 S:19 F:4 Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-362 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
457.7377 S:19 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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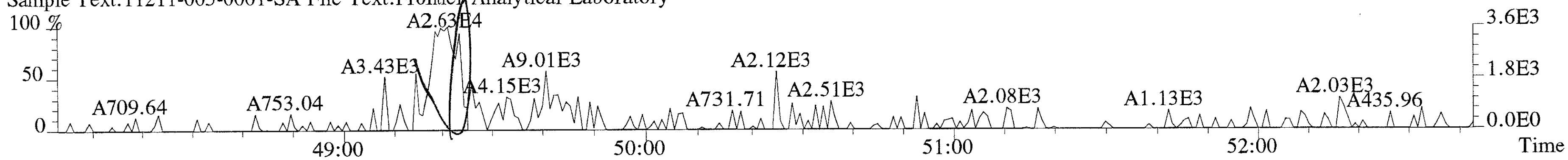
459.7348 S:19 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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469.7780 S:19 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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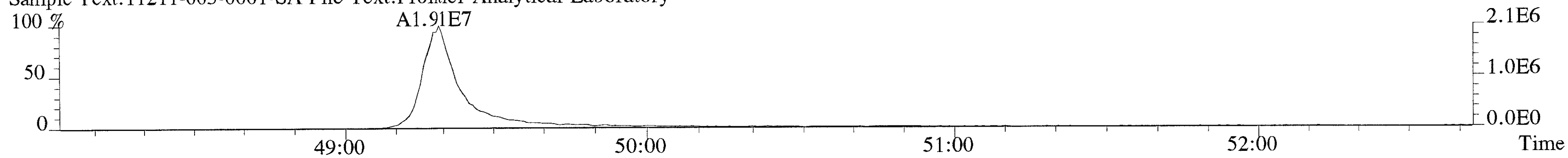

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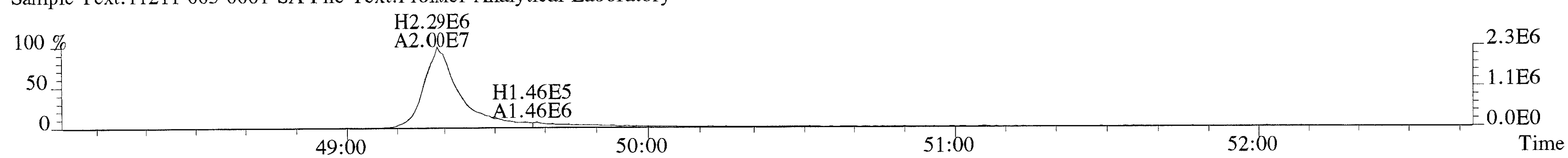

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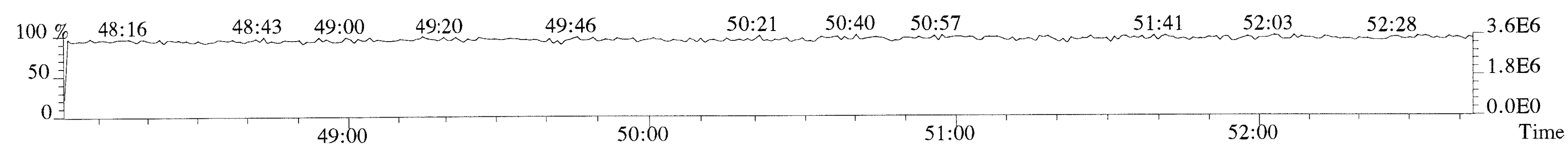
454.9728 S:19 F:5 Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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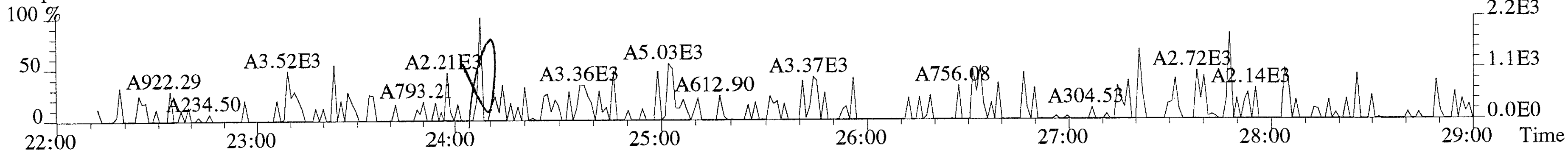
303.9016 S:19 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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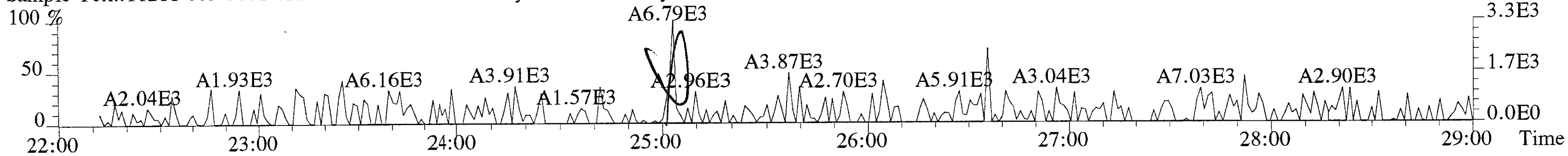
305.8987 S:19 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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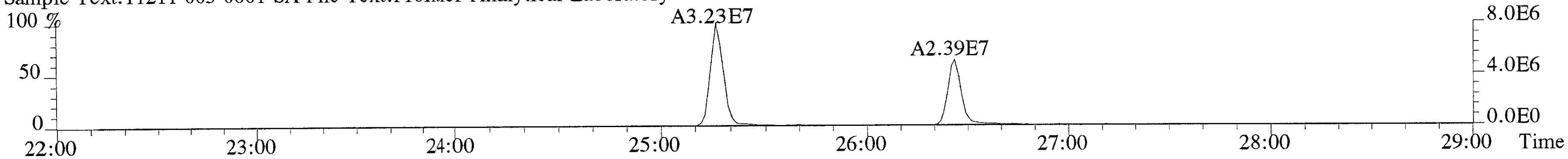
315.9419 S:19 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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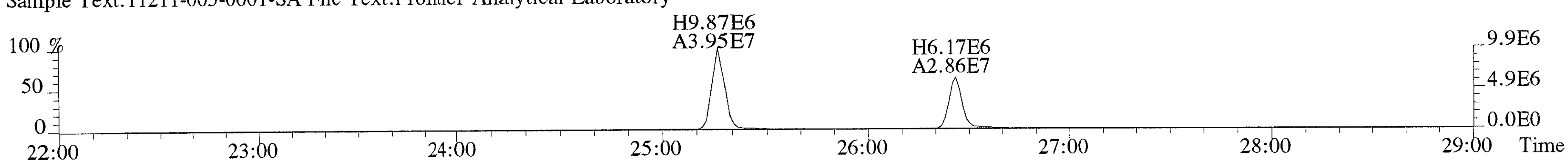
317.9389 S:19 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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375.8364 S:19 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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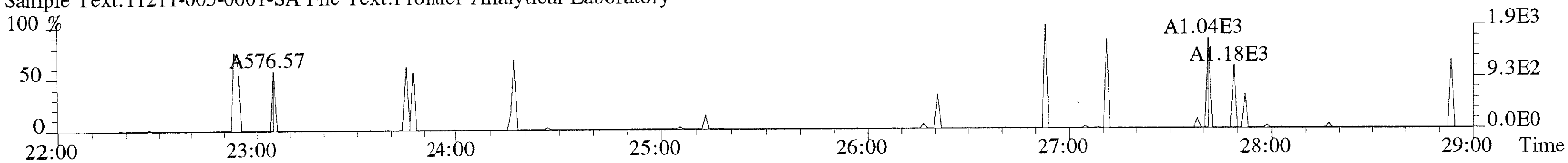

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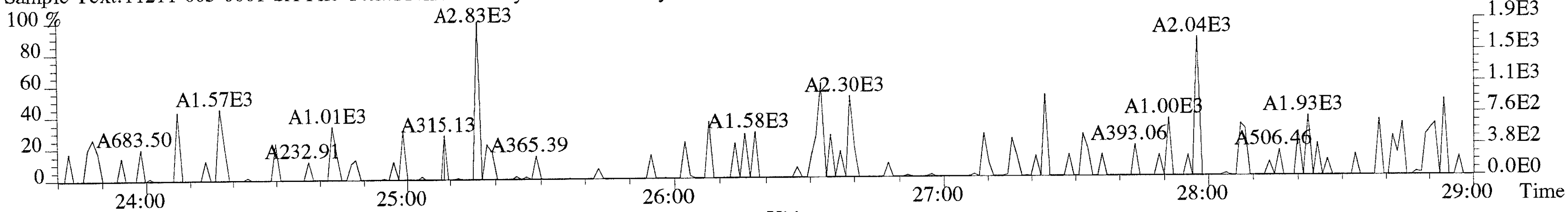
339.8597 S:19 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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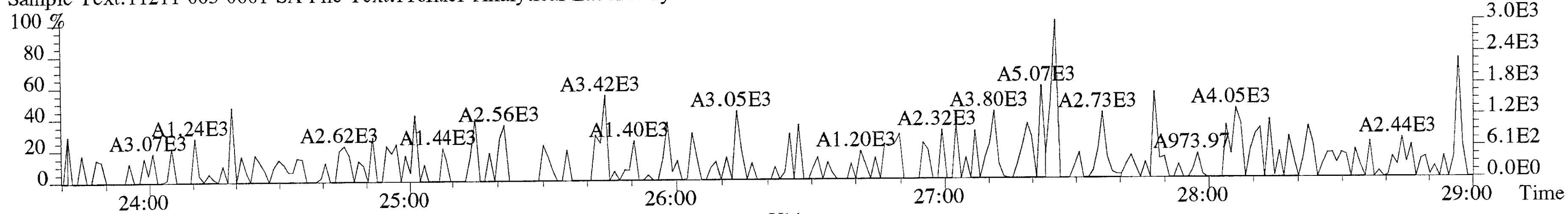
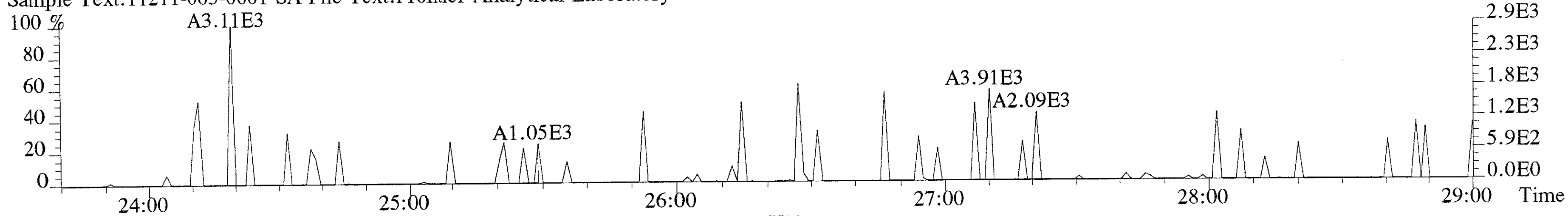
341.8568 S:19 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:19 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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330.9792 S:19 Exp:PCDD
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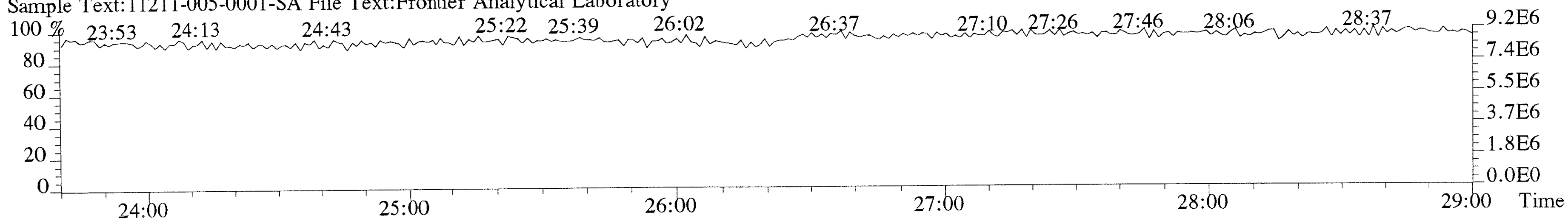

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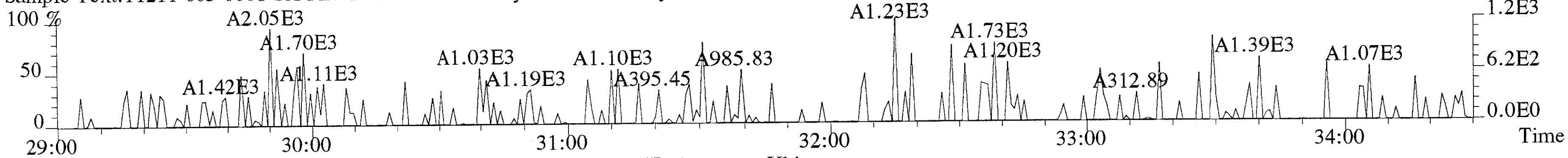

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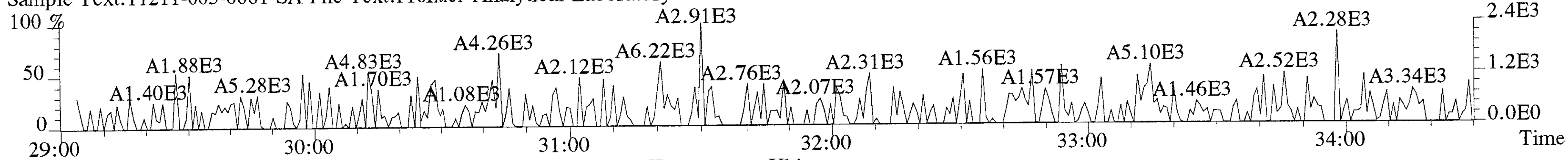
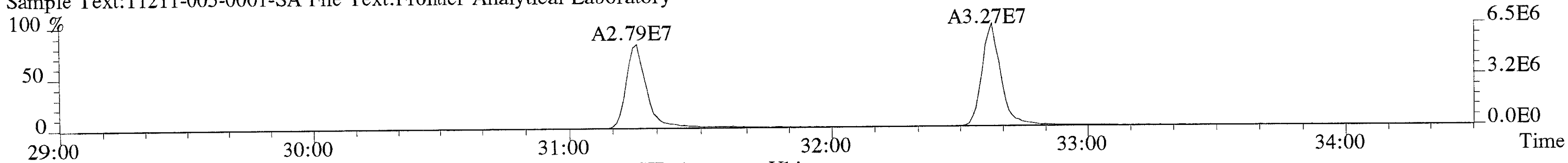


File:26JAN18M #1-423 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:19 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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353.8970 S:19 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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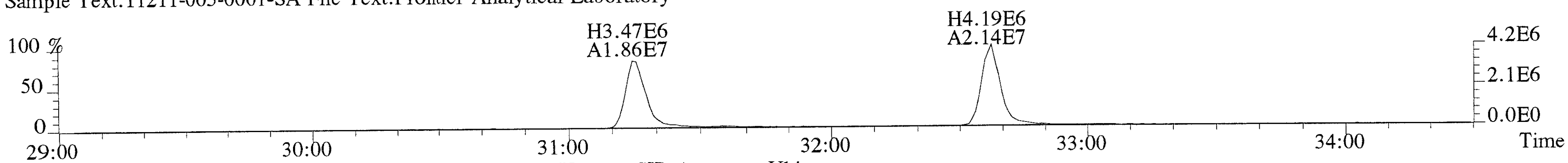

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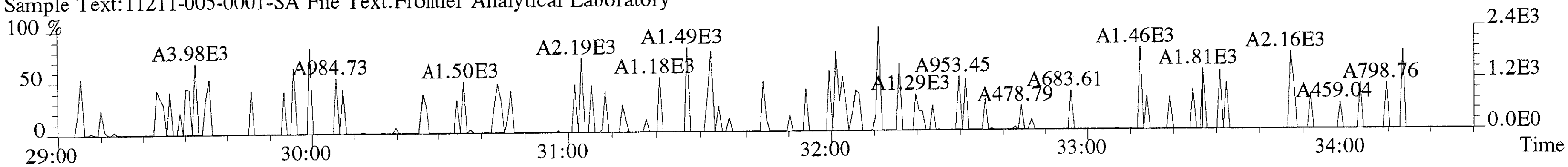
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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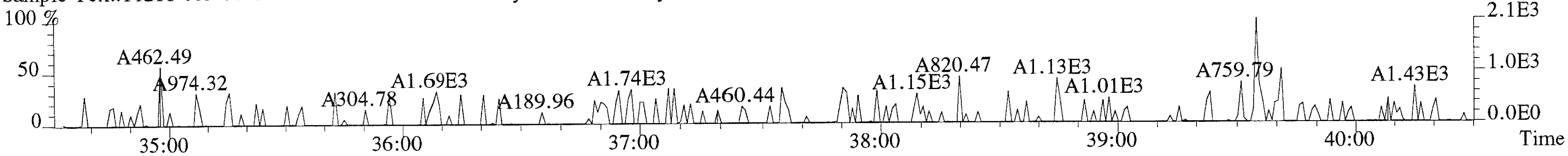
373.8207 S:19 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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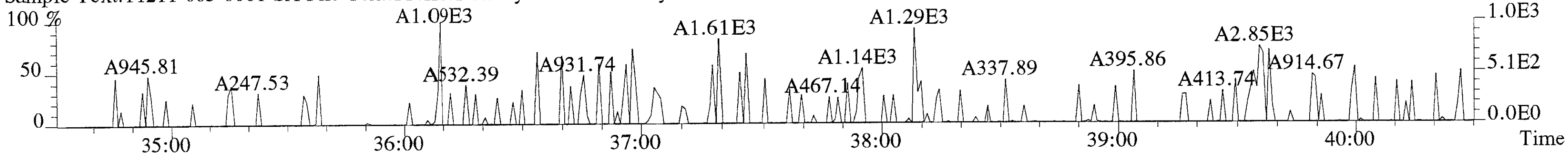
375.8178 S:19 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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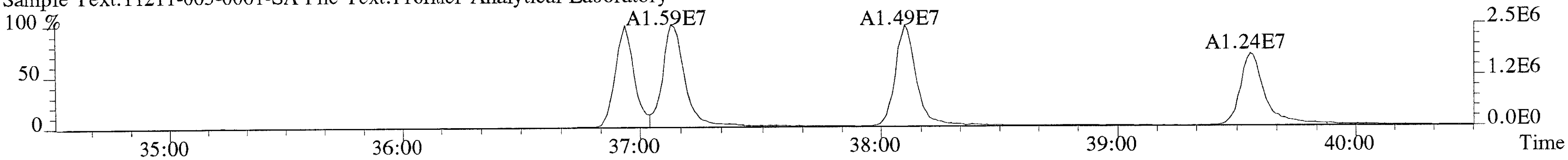
383.8639 S:19 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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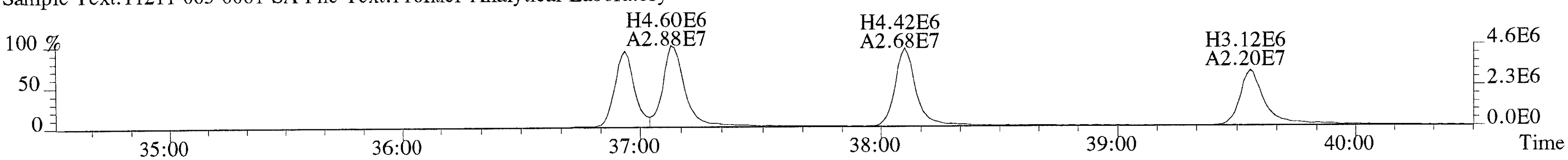

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445.7555 S:19 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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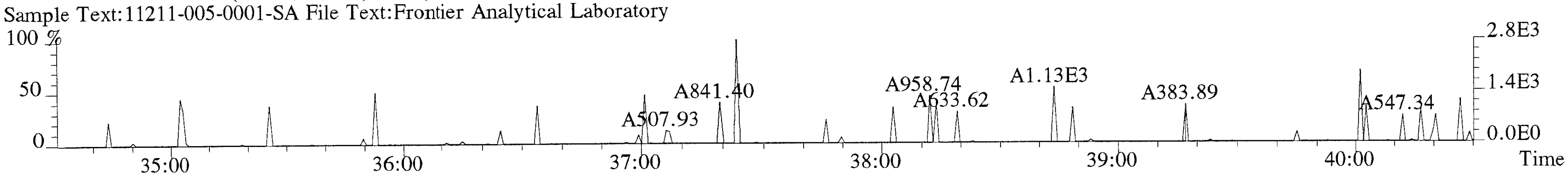

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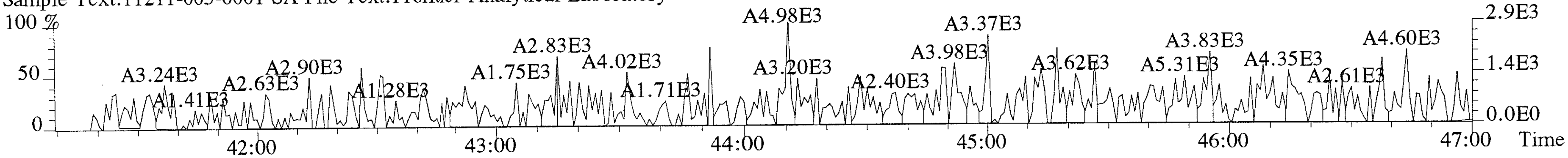
407.7818 S:19 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



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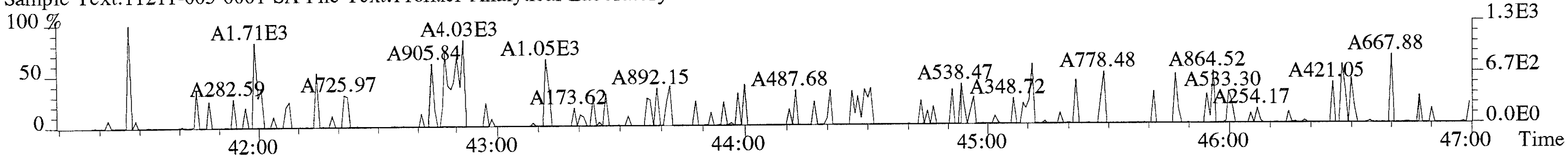

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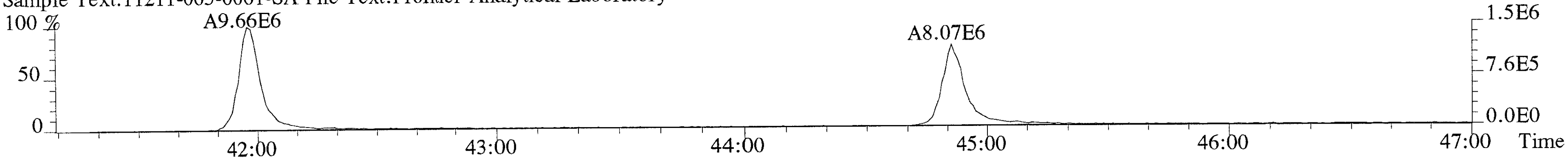

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419.8220 S:19 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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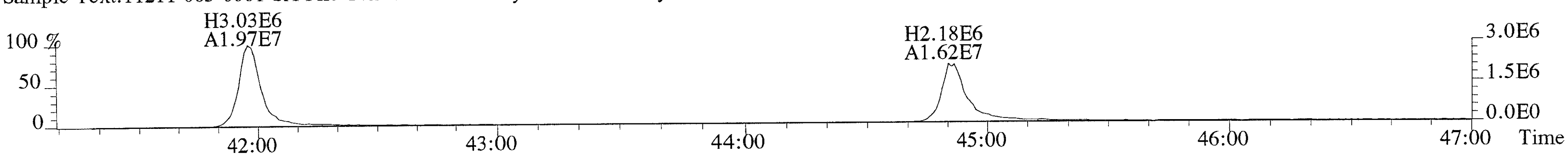

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479.7165 S:19 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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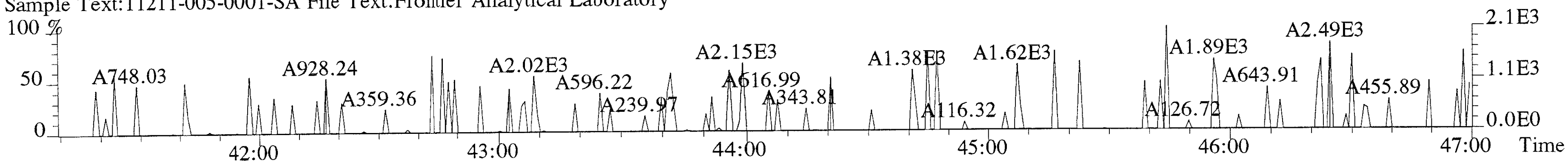

File:26JAN18M #1-362 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:19 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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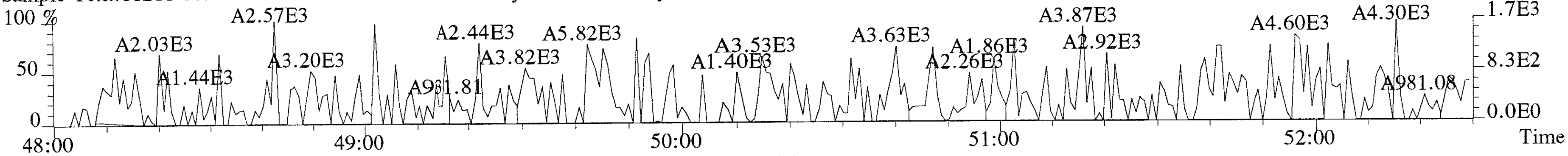

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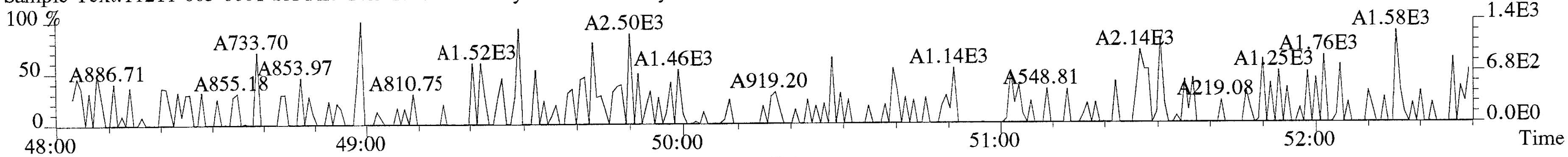

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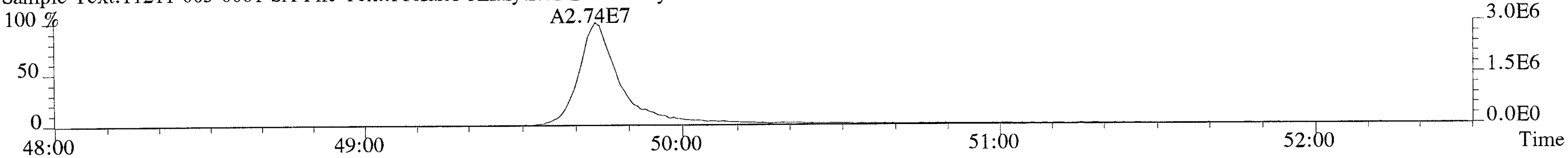

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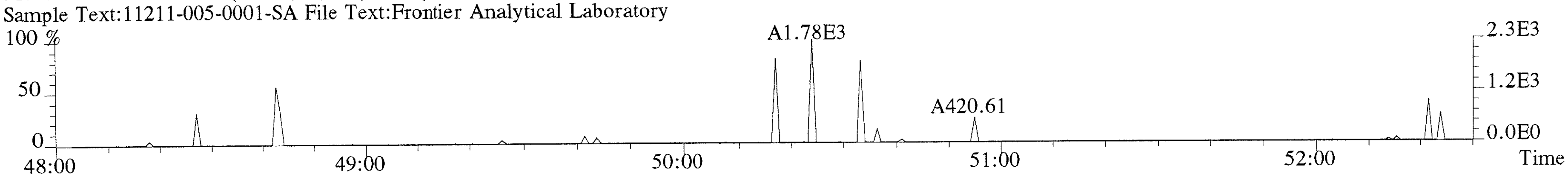
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory

File:26JAN18M #1-362 Acq:27-JAN-2018 05:59:07 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:19 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:11211-005-0001-SA File Text:Frontier Analytical Laboratory



Frontier Analytical Laboratory

Data Filename: 22DEC17M

Analyte: Cal: PCDDFAL3-12-22-17

Name	RRF	S. D.	%RSD	S1 RRF#1	S2 RRF#2	S3 RRF#3	S4 RRF#4	S5 RRF#5	S6 RRF#6
2,3,7,8-TCDD	1.06	0.0823	7.77 %	1.12	1.01	1.04	1.19	1.01	0.98
1,2,3,7,8-PeCDD	1.00	0.0185	1.85 %	1.03	0.98	0.99	1.01	0.99	1.00
1,2,3,4,7,8-HxCDD	1.07	0.0238	2.22 %	1.11	1.08	1.07	1.07	1.06	1.04
1,2,3,6,7,8-HxCDD	1.08	0.0107	0.986 %	1.09	1.07	1.10	1.09	1.08	1.08
1,2,3,7,8,9-HxCDD	1.11	0.0369	3.32 %	1.17	1.10	1.11	1.11	1.12	1.05
1,2,3,4,6,7,8-HpCDD	0.99	0.0291	2.94 %	1.04	0.95	0.97	0.99	1.00	0.98
OCDD	1.11	0.0211	1.90 %	1.14	1.09	1.08	1.13	1.11	1.10
2,3,7,8-TCDF	1.03	0.0682	6.65 %	1.16	1.02	0.99	1.04	0.97	0.98
1,2,3,7,8-PeCDF	0.95	0.0275	2.90 %	0.98	0.91	0.92	0.97	0.95	0.95
2,3,4,7,8-PeCDF	0.79	0.0263	3.33 %	0.83	0.76	0.76	0.80	0.79	0.80
1,2,3,4,7,8-HxCDF	1.20	0.0282	2.35 %	1.22	1.17	1.16	1.21	1.22	1.21
1,2,3,6,7,8-HxCDF	1.10	0.0354	3.22 %	1.11	1.03	1.08	1.11	1.12	1.12
2,3,4,6,7,8-HxCDF	1.08	0.0222	2.05 %	1.08	1.04	1.08	1.09	1.10	1.10
1,2,3,7,8,9-HxCDF	1.15	0.0336	2.93 %	1.17	1.08	1.14	1.15	1.16	1.18
1,2,3,4,6,7,8-HpCDF	1.23	0.0346	2.80 %	1.25	1.19	1.19	1.24	1.27	1.26
1,2,3,4,7,8,9-HpCDF	1.23	0.0471	3.83 %	1.28	1.16	1.20	1.22	1.28	1.24
OCDF	0.90	0.0229	2.54 %	0.91	0.86	0.89	0.92	0.93	0.91
13C-2,3,7,8-TCDD	1.02	0.0298	2.92 %	1.05	1.05	1.02	0.98	0.99	1.04
13C-1,2,3,7,8-PeCDD	0.88	0.0275	3.13 %	0.88	0.89	0.88	0.83	0.90	0.90
13C-1,2,3,4,7,8-HxCDD	0.85	0.0326	3.82 %	0.86	0.85	0.83	0.82	0.85	0.91
13C-1,2,3,6,7,8-HxCDD	0.94	0.0316	3.36 %	0.91	0.91	0.92	0.98	0.97	0.96
13C-1,2,3,4,6,7,8-HpCDD	0.90	0.0260	2.88 %	0.92	0.91	0.88	0.92	0.86	0.92
13C-OCDD	0.70	0.0360	5.12 %	0.70	0.68	0.68	0.72	0.67	0.76
13C-2,3,7,8-TCDF	0.93	0.0403	4.33 %	0.99	0.94	0.95	0.92	0.87	0.92
13C-1,2,3,7,8-PeCDF	0.87	0.0245	2.83 %	0.90	0.86	0.87	0.84	0.85	0.89
13C-2,3,4,7,8-PeCDF	0.99	0.0325	3.28 %	1.02	0.99	1.03	0.95	0.96	1.00
13C-1,2,3,4,7,8-HxCDF	1.09	0.0333	3.04 %	1.08	1.07	1.07	1.08	1.11	1.15
13C-1,2,3,6,7,8-HxCDF	1.35	0.0657	4.88 %	1.26	1.30	1.30	1.38	1.41	1.41
13C-2,3,4,6,7,8-HxCDF	1.23	0.0371	3.02 %	1.19	1.20	1.20	1.25	1.26	1.28
13C-1,2,3,7,8,9-HxCDF	1.14	0.0429	3.75 %	1.08	1.12	1.12	1.18	1.17	1.19
13C-1,2,3,4,6,7,8-HpCDF	0.97	0.0400	4.10 %	0.95	0.93	0.94	1.03	0.97	1.02
13C-1,2,3,4,7,8,9-HpCDF	0.82	0.0269	3.29 %	0.82	0.80	0.81	0.82	0.78	0.86
13C-OCDF	1.06	0.0805	7.57 %	1.00	0.99	1.02	1.12	1.05	1.19
37Cl-2,3,7,8-TCDD	0.91	0.0881	9.64 %	1.01	1.03	0.91	0.82	0.82	0.89
13C-1,2,3,4-TCDD	-	-	- %	-	-	-	-	-	-
13C-1,2,3,4-TCDF	-	-	- %	-	-	-	-	-	-
13C-1,2,3,7,8,9-HxCDD	-	-	- %	-	-	-	-	-	-
Total Tetra-Dioxins	1.06	0.0823	7.77 %	1.12	1.01	1.04	1.19	1.01	0.98
Total Penta-Dioxins	1.00	0.0185	1.85 %	1.03	0.98	0.99	1.01	0.99	1.00
Total Hexa-Dioxins	1.09	0.0208	1.91 %	1.12	1.08	1.09	1.09	1.09	1.06
Total Hepta-Dioxins	0.99	0.0291	2.94 %	1.04	0.95	0.97	0.99	1.00	0.98
Total Tetra-Furans	1.03	0.0682	6.65 %	1.16	1.02	0.99	1.04	0.97	0.98
1st Fn. Tot Penta-Furans	0.86	0.0269	3.12 %	0.90	0.83	0.84	0.88	0.87	0.87
Total Penta-Furans	0.86	0.0269	3.12 %	0.90	0.83	0.84	0.88	0.87	0.87
Total Hexa-Furans	1.13	0.0286	2.53 %	1.14	1.08	1.11	1.14	1.15	1.15
Total Hepta-Furans	1.23	0.0392	3.18 %	1.26	1.18	1.19	1.23	1.28	1.25

Analyst: [signature] Date: 12/26/17

Run #1 Filename 22DEC17M S: 1 Acquired: 22-DEC-17 10:18:22 Cal: PCDDFAL3-12-22-17
Client ID: ST122217M0 Analyte: FAL ID: 1613 CS0 171128G

	Typ	Name	Amount	Resp	RA	RT	RF	RRF	
1	Unk	2,3,7,8-TCDD	0.25	1.18e+05	0.87 y	27:16	-	1.12	y
2	Unk	1,2,3,7,8-PeCDD	1.25	4.51e+05	1.57 y	33:06	-	1.03	y
3	Unk	1,2,3,4,7,8-HxCDD	1.25	4.15e+05	1.37 y	38:28	-	1.11	y
4	Unk	1,2,3,6,7,8-HxCDD	1.25	4.29e+05	1.19 y	38:37	-	1.09	y
5	Unk	1,2,3,7,8,9-HxCDD	1.25	4.49e+05	1.28 y	39:04	-	1.17	y
6	Unk	1,2,3,4,6,7,8-HpCDD	1.25	4.16e+05	1.09 y	44:01	-	1.04	y
7	Unk	OCDD	2.50	6.97e+05	0.90 y	49:29	-	1.14	y
8	Unk	2,3,7,8-TCDF	0.25	1.59e+05	0.68 y	26:33	-	1.16	y
9	Unk	1,2,3,7,8-PeCDF	1.25	6.10e+05	1.56 y	31:21	-	0.978	y
10	Unk	2,3,4,7,8-PeCDF	1.25	5.85e+05	1.47 y	32:44	-	0.827	y
11	Unk	1,2,3,4,7,8-HxCDF	1.25	5.72e+05	1.35 y	37:03	-	1.22	y
12	Unk	1,2,3,6,7,8-HxCDF	1.25	6.07e+05	1.22 y	37:16	-	1.11	y
13	Unk	2,3,4,6,7,8-HxCDF	1.25	5.61e+05	1.23 y	38:14	-	1.08	y
14	Unk	1,2,3,7,8,9-HxCDF	1.25	5.50e+05	1.35 y	39:41	-	1.17	y
15	Unk	1,2,3,4,6,7,8-HpCDF	1.25	5.19e+05	1.01 y	42:06	-	1.25	y
16	Unk	1,2,3,4,7,8,9-HpCDF	1.25	4.55e+05	1.03 y	44:60	-	1.28	y
17	Unk	OCDF	2.50	7.90e+05	0.89 y	49:54	-	0.906	y
18	IS/RT	13C-2,3,7,8-TCDD	100.00	4.21e+07	0.80 y	27:15	-	1.05	y
19	IS	13C-1,2,3,7,8-PeCDD	100.00	3.51e+07	1.60 y	33:05	-	0.877	y
20	IS	13C-1,2,3,4,7,8-HxCDD	100.00	2.99e+07	1.26 y	38:26	-	0.861	y
21	IS	13C-1,2,3,6,7,8-HxCDD	100.00	3.15e+07	1.28 y	38:36	-	0.906	y
22	IS	13C-1,2,3,4,6,7,8-HpCDD	100.00	3.21e+07	1.03 y	43:60	-	0.924	y
23	IS	13C-OCDD	200.00	4.90e+07	0.91 y	49:28	-	0.704	y
24	IS	13C-2,3,7,8-TCDF	100.00	5.48e+07	0.80 y	26:32	-	0.990	y
25	IS	13C-1,2,3,7,8-PeCDF	100.00	4.99e+07	1.59 y	31:21	-	0.901	y
26	IS	13C-2,3,4,7,8-PeCDF	100.00	5.65e+07	1.58 y	32:43	-	1.02	y
27	IS	13C-1,2,3,4,7,8-HxCDF	100.00	3.75e+07	0.52 y	37:02	-	1.08	y
28	IS	13C-1,2,3,6,7,8-HxCDF	100.00	4.39e+07	0.54 y	37:14	-	1.26	y
29	IS	13C-2,3,4,6,7,8-HxCDF	100.00	4.14e+07	0.53 y	38:13	-	1.19	y
30	IS	13C-1,2,3,7,8,9-HxCDF	100.00	3.77e+07	0.53 y	39:40	-	1.08	y
31	IS	13C-1,2,3,4,6,7,8-HpCDF	100.00	3.31e+07	0.45 y	42:05	-	0.953	y
32	IS	13C-1,2,3,4,7,8,9-HpCDF	100.00	2.85e+07	0.44 y	44:59	-	0.819	y
33	IS	13C-OCDF	200.00	6.97e+07	0.91 y	49:52	-	1.00	y
34	C/Up	37Cl-2,3,7,8-TCDD	0.25	1.01e+05		27:16	-	1.01	y
35	RS	13C-1,2,3,4-TCDD	100.00	4.00e+07	0.81 y	26:37	4.00e+05	-	n
36	RS	13C-1,2,3,4-TCDF	100.00	5.54e+07	0.79 y	25:22	5.54e+05	-	n
37	RS/RT	13C-1,2,3,7,8,9-HxCDD	100.00	3.48e+07	1.25 y	39:02	3.48e+05	-	n
38	Tot	Total Tetra-Dioxins	0.00	-	- n	-	-	1.12	y
39	Tot	Total Penta-Dioxins	0.00	-	- n	-	-	1.03	y
40	Tot	Total Hexa-Dioxins	0.00	-	- n	-	-	1.12	y
41	Tot	Total Hepta-Dioxins	0.00	-	- n	-	-	1.04	y
42	Tot	Total Tetra-Furans	0.00	-	- n	-	-	1.16	y
43	Tot	1st Fn. Tot Penta-Furans	0.00	-	- n	-	-	0.898	y
44	Tot	Total Penta-Furans	0.00	-	- n	-	-	0.898	y
45	Tot	Total Hexa-Furans	0.00	-	- n	-	-	1.14	y
46	Tot	Total Hepta-Furans	0.00	-	- n	-	-	1.26	y

Analyst: J Date: 12/21/17

Run #2   Filename 22DEC17M   S: 2   Acquired: 22-DEC-17 11:13:13   Cal: PCDDFAL3-12-22-17
Client ID: ST122217M1   Analyte: FAL ID: 1613 CS1 171128H

	Typ	Name	Amount	Resp	RA		RT	RF	RRF	
1	Unk	2,3,7,8-TCDD	0.50	2.38e+05	0.76	y	27:15	-	1.01	y
2	Unk	1,2,3,7,8-PeCDD	2.50	9.77e+05	1.53	y	33:06	-	0.976	y
3	Unk	1,2,3,4,7,8-HxCDD	2.50	8.80e+05	1.29	y	38:26	-	1.08	y
4	Unk	1,2,3,6,7,8-HxCDD	2.50	9.37e+05	1.24	y	38:37	-	1.07	y
5	Unk	1,2,3,7,8,9-HxCDD	2.50	9.35e+05	1.33	y	39:04	-	1.10	y
6	Unk	1,2,3,4,6,7,8-HpCDD	2.50	8.34e+05	0.99	y	44:00	-	0.951	y
7	Unk	OCDD	5.00	1.44e+06	0.87	y	49:28	-	1.09	y
8	Unk	2,3,7,8-TCDF	0.50	3.07e+05	0.66	y	26:32	-	1.02	y
9	Unk	1,2,3,7,8-PeCDF	2.50	1.24e+06	1.59	y	31:21	-	0.905	y
10	Unk	2,3,4,7,8-PeCDF	2.50	1.20e+06	1.57	y	32:43	-	0.758	y
11	Unk	1,2,3,4,7,8-HxCDF	2.50	1.20e+06	1.26	y	37:02	-	1.17	y
12	Unk	1,2,3,6,7,8-HxCDF	2.50	1.30e+06	1.18	y	37:15	-	1.03	y
13	Unk	2,3,4,6,7,8-HxCDF	2.50	1.21e+06	1.28	y	38:13	-	1.04	y
14	Unk	1,2,3,7,8,9-HxCDF	2.50	1.17e+06	1.23	y	39:41	-	1.08	y
15	Unk	1,2,3,4,6,7,8-HpCDF	2.50	1.08e+06	1.01	y	42:05	-	1.19	y
16	Unk	1,2,3,4,7,8,9-HpCDF	2.50	8.93e+05	1.08	y	44:59	-	1.16	y
17	Unk	OCDF	5.00	1.65e+06	0.89	y	49:54	-	0.863	y
18	IS/RT	13C-2,3,7,8-TCDD	100.00	4.72e+07	0.79	y	27:14	-	1.05	y
19	IS	13C-1,2,3,7,8-PeCDD	100.00	4.00e+07	1.60	y	33:04	-	0.887	y
20	IS	13C-1,2,3,4,7,8-HxCDD	100.00	3.26e+07	1.32	y	38:25	-	0.846	y
21	IS	13C-1,2,3,6,7,8-HxCDD	100.00	3.51e+07	1.24	y	38:35	-	0.911	y
22	IS	13C-1,2,3,4,6,7,8-HpCDD	100.00	3.51e+07	1.01	y	43:60	-	0.909	y
23	IS	13C-OCDD	200.00	5.25e+07	0.90	y	49:27	-	0.680	y
24	IS	13C-2,3,7,8-TCDF	100.00	6.05e+07	0.80	y	26:31	-	0.944	y
25	IS	13C-1,2,3,7,8-PeCDF	100.00	5.50e+07	1.59	y	31:20	-	0.858	y
26	IS	13C-2,3,4,7,8-PeCDF	100.00	6.33e+07	1.60	y	32:42	-	0.987	y
27	IS	13C-1,2,3,4,7,8-HxCDF	100.00	4.13e+07	0.52	y	37:01	-	1.07	y
28	IS	13C-1,2,3,6,7,8-HxCDF	100.00	5.03e+07	0.53	y	37:14	-	1.30	y
29	IS	13C-2,3,4,6,7,8-HxCDF	100.00	4.64e+07	0.51	y	38:12	-	1.20	y
30	IS	13C-1,2,3,7,8,9-HxCDF	100.00	4.31e+07	0.53	y	39:40	-	1.12	y
31	IS	13C-1,2,3,4,6,7,8-HpCDF	100.00	3.60e+07	0.45	y	42:04	-	0.934	y
32	IS	13C-1,2,3,4,7,8,9-HpCDF	100.00	3.09e+07	0.43	y	44:58	-	0.800	y
33	IS	13C-OCDF	200.00	7.62e+07	0.89	y	49:52	-	0.988	y
34	C/Up	37Cl-2,3,7,8-TCDD	0.50	2.32e+05			27:15	-	1.03	y
35	RS	13C-1,2,3,4-TCDD	100.00	4.51e+07	0.81	y	26:37	4.51e+05	-	n
36	RS	13C-1,2,3,4-TCDF	100.00	6.41e+07	0.79	y	25:21	6.41e+05	-	n
37	RS/RT	13C-1,2,3,7,8,9-HxCDD	100.00	3.86e+07	1.30	y	39:02	3.86e+05	-	n
38	Tot	Total Tetra-Dioxins	0.00	-	-	n	-	-	1.01	y
39	Tot	Total Penta-Dioxins	0.00	-	-	n	-	-	0.976	y
40	Tot	Total Hexa-Dioxins	0.00	-	-	n	-	-	1.08	y
41	Tot	Total Hepta-Dioxins	0.00	-	-	n	-	-	0.951	y
42	Tot	Total Tetra-Furans	0.00	-	-	n	-	-	1.02	y
43	Tot	1st Fn. Tot Penta-Furans	0.00	-	-	n	-	-	0.826	y
44	Tot	Total Penta-Furans	0.00	-	-	n	-	-	0.826	y
45	Tot	Total Hexa-Furans	0.00	-	-	n	-	-	1.08	y
46	Tot	Total Hepta-Furans	0.00	-	-	n	-	-	1.18	y

Analyst: [signature]   Date: 12/26/17

Run #3 Filename 22DEC17M S: 3 Acquired: 22-DEC-17 12:08:04 Cal: PCDDFAL3-12-22-17
Client ID: ST122217M2 Analyte: FAL ID: 1613 CS2 171128I

	Typ	Name	Amount	Resp	RA	RT	RF	RRF	
1	Unk	2,3,7,8-TCDD	2.00	8.71e+05	0.78 y	27:14	-	1.04	y
2	Unk	1,2,3,7,8-PeCDD	10.00	3.60e+06	1.55 y	33:06	-	0.992	y
3	Unk	1,2,3,4,7,8-HxCDD	10.00	3.14e+06	1.23 y	38:26	-	1.07	y
4	Unk	1,2,3,6,7,8-HxCDD	10.00	3.56e+06	1.31 y	38:36	-	1.10	y
5	Unk	1,2,3,7,8,9-HxCDD	10.00	3.42e+06	1.24 y	39:03	-	1.11	y
6	Unk	1,2,3,4,6,7,8-HpCDD	10.00	2.99e+06	1.00 y	44:00	-	0.966	y
7	Unk	OCDD	20.00	5.20e+06	0.87 y	49:27	-	1.08	y
8	Unk	2,3,7,8-TCDF	2.00	1.07e+06	0.67 y	26:31	-	0.992	y
9	Unk	1,2,3,7,8-PeCDF	10.00	4.58e+06	1.57 y	31:21	-	0.925	y
10	Unk	2,3,4,7,8-PeCDF	10.00	4.44e+06	1.58 y	32:43	-	0.761	y
11	Unk	1,2,3,4,7,8-HxCDF	10.00	4.36e+06	1.24 y	37:02	-	1.16	y
12	Unk	1,2,3,6,7,8-HxCDF	10.00	4.99e+06	1.26 y	37:15	-	1.08	y
13	Unk	2,3,4,6,7,8-HxCDF	10.00	4.57e+06	1.25 y	38:13	-	1.08	y
14	Unk	1,2,3,7,8,9-HxCDF	10.00	4.48e+06	1.24 y	39:41	-	1.14	y
15	Unk	1,2,3,4,6,7,8-HpCDF	10.00	3.96e+06	1.03 y	42:05	-	1.19	y
16	Unk	1,2,3,4,7,8,9-HpCDF	10.00	3.44e+06	1.03 y	44:59	-	1.20	y
17	Unk	OCDF	20.00	6.45e+06	0.89 y	49:53	-	0.895	y
18	IS/RT	13C-2,3,7,8-TCDD	100.00	4.19e+07	0.80 y	27:13	-	1.02	y
19	IS	13C-1,2,3,7,8-PeCDD	100.00	3.63e+07	1.61 y	33:04	-	0.884	y
20	IS	13C-1,2,3,4,7,8-HxCDD	100.00	2.92e+07	1.29 y	38:24	-	0.828	y
21	IS	13C-1,2,3,6,7,8-HxCDD	100.00	3.25e+07	1.25 y	38:34	-	0.920	y
22	IS	13C-1,2,3,4,6,7,8-HpCDD	100.00	3.10e+07	1.04 y	43:59	-	0.877	y
23	IS	13C-OCDD	200.00	4.80e+07	0.89 y	49:27	-	0.680	y
24	IS	13C-2,3,7,8-TCDF	100.00	5.41e+07	0.79 y	26:30	-	0.951	y
25	IS	13C-1,2,3,7,8-PeCDF	100.00	4.96e+07	1.59 y	31:20	-	0.871	y
26	IS	13C-2,3,4,7,8-PeCDF	100.00	5.84e+07	1.58 y	32:42	-	1.03	y
27	IS	13C-1,2,3,4,7,8-HxCDF	100.00	3.77e+07	0.53 y	37:01	-	1.07	y
28	IS	13C-1,2,3,6,7,8-HxCDF	100.00	4.60e+07	0.53 y	37:13	-	1.30	y
29	IS	13C-2,3,4,6,7,8-HxCDF	100.00	4.25e+07	0.53 y	38:12	-	1.20	y
30	IS	13C-1,2,3,7,8,9-HxCDF	100.00	3.94e+07	0.53 y	39:39	-	1.12	y
31	IS	13C-1,2,3,4,6,7,8-HpCDF	100.00	3.32e+07	0.46 y	42:04	-	0.941	y
32	IS	13C-1,2,3,4,7,8,9-HpCDF	100.00	2.87e+07	0.45 y	44:57	-	0.812	y
33	IS	13C-OCDF	200.00	7.21e+07	0.90 y	49:52	-	1.02	y
34	C/Up	37Cl-2,3,7,8-TCDD	2.00	7.49e+05		27:15	-	0.912	y
35	RS	13C-1,2,3,4-TCDD	100.00	4.11e+07	0.80 y	26:36	4.11e+05	-	n
36	RS	13C-1,2,3,4-TCDF	100.00	5.69e+07	0.78 y	25:20	5.69e+05	-	n
37	RS/RT	13C-1,2,3,7,8,9-HxCDD	100.00	3.53e+07	1.25 y	39:01	3.53e+05	-	n
38	Tot	Total Tetra-Dioxins	0.00	-	- n	-	-	1.04	y
39	Tot	Total Penta-Dioxins	0.00	-	- n	-	-	0.992	y
40	Tot	Total Hexa-Dioxins	0.00	-	- n	-	-	1.09	y
41	Tot	Total Hepta-Dioxins	0.00	-	- n	-	-	0.966	y
42	Tot	Total Tetra-Furans	0.00	-	- n	-	-	0.992	y
43	Tot	1st Fn. Tot Penta-Furans	0.00	-	- n	-	-	0.836	y
44	Tot	Total Penta-Furans	0.00	-	- n	-	-	0.836	y
45	Tot	Total Hexa-Furans	0.00	-	- n	-	-	1.11	y
46	Tot	Total Hepta-Furans	0.00	-	- n	-	-	1.19	y

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Analyst: [signature] Date: 12/26/17

Run #4 Filename 22DEC17M S: 4 Acquired: 22-DEC-17 13:02:55 Cal: PCDDFAL3-12-22-17
Client ID: ST122217M3 Analyte: FAL ID: 1613 CS3 171128J

	Typ	Name	Amount	Resp	RA		RT	RF	RRF	
1	Unk	2,3,7,8-TCDD	10.00	3.60e+06	0.77	y	27:14	-	1.19	y
2	Unk	1,2,3,7,8-PeCDD	50.00	1.29e+07	1.53	y	33:06	-	1.01	y
3	Unk	1,2,3,4,7,8-HxCDD	50.00	1.05e+07	1.26	y	38:26	-	1.07	y
4	Unk	1,2,3,6,7,8-HxCDD	50.00	1.27e+07	1.26	y	38:37	-	1.09	y
5	Unk	1,2,3,7,8,9-HxCDD	50.00	1.20e+07	1.27	y	39:03	-	1.11	y
6	Unk	1,2,3,4,6,7,8-HpCDD	50.00	1.08e+07	0.99	y	44:00	-	0.989	y
7	Unk	OCDD	100.00	1.95e+07	0.85	y	49:28	-	1.13	y
8	Unk	2,3,7,8-TCDF	10.00	4.16e+06	0.69	y	26:31	-	1.04	y
9	Unk	1,2,3,7,8-PeCDF	50.00	1.77e+07	1.57	y	31:20	-	0.972	y
10	Unk	2,3,4,7,8-PeCDF	50.00	1.66e+07	1.57	y	32:43	-	0.800	y
11	Unk	1,2,3,4,7,8-HxCDF	50.00	1.56e+07	1.24	y	37:03	-	1.21	y
12	Unk	1,2,3,6,7,8-HxCDF	50.00	1.82e+07	1.27	y	37:15	-	1.11	y
13	Unk	2,3,4,6,7,8-HxCDF	50.00	1.62e+07	1.24	y	38:13	-	1.09	y
14	Unk	1,2,3,7,8,9-HxCDF	50.00	1.62e+07	1.23	y	39:41	-	1.15	y
15	Unk	1,2,3,4,6,7,8-HpCDF	50.00	1.51e+07	0.99	y	42:05	-	1.24	y
16	Unk	1,2,3,4,7,8,9-HpCDF	50.00	1.19e+07	1.03	y	44:59	-	1.22	y
17	Unk	OCDF	100.00	2.45e+07	0.90	y	49:53	-	0.915	y
18	IS/RT	13C-2,3,7,8-TCDD	100.00	3.02e+07	0.80	y	27:13	-	0.982	y
19	IS	13C-1,2,3,7,8-PeCDD	100.00	2.54e+07	1.61	y	33:04	-	0.826	y
20	IS	13C-1,2,3,4,7,8-HxCDD	100.00	1.96e+07	1.23	y	38:25	-	0.823	y
21	IS	13C-1,2,3,6,7,8-HxCDD	100.00	2.33e+07	1.30	y	38:35	-	0.980	y
22	IS	13C-1,2,3,4,6,7,8-HpCDD	100.00	2.19e+07	1.06	y	43:59	-	0.919	y
23	IS	13C-OCDD	200.00	3.44e+07	0.94	y	49:27	-	0.722	y
24	IS	13C-2,3,7,8-TCDF	100.00	4.02e+07	0.79	y	26:30	-	0.920	y
25	IS	13C-1,2,3,7,8-PeCDF	100.00	3.65e+07	1.57	y	31:20	-	0.835	y
26	IS	13C-2,3,4,7,8-PeCDF	100.00	4.15e+07	1.60	y	32:42	-	0.949	y
27	IS	13C-1,2,3,4,7,8-HxCDF	100.00	2.58e+07	0.54	y	37:01	-	1.08	y
28	IS	13C-1,2,3,6,7,8-HxCDF	100.00	3.29e+07	0.55	y	37:13	-	1.38	y
29	IS	13C-2,3,4,6,7,8-HxCDF	100.00	2.97e+07	0.53	y	38:12	-	1.25	y
30	IS	13C-1,2,3,7,8,9-HxCDF	100.00	2.81e+07	0.54	y	39:39	-	1.18	y
31	IS	13C-1,2,3,4,6,7,8-HpCDF	100.00	2.44e+07	0.45	y	42:04	-	1.03	y
32	IS	13C-1,2,3,4,7,8,9-HpCDF	100.00	1.96e+07	0.45	y	44:58	-	0.823	y
33	IS	13C-OCDF	200.00	5.35e+07	0.89	y	49:52	-	1.12	y
34	C/Up	37Cl-2,3,7,8-TCDD	10.00	2.54e+06			27:14	-	0.825	y
35	RS	13C-1,2,3,4-TCDD	100.00	3.07e+07	0.80	y	26:36	3.07e+05	-	n
36	RS	13C-1,2,3,4-TCDF	100.00	4.37e+07	0.79	y	25:19	4.37e+05	-	n
37	RS/RT	13C-1,2,3,7,8,9-HxCDD	100.00	2.38e+07	1.26	y	39:02	2.38e+05	-	n
38	Tot	Total Tetra-Dioxins	0.00	-	-	n	-	-	1.19	y
39	Tot	Total Penta-Dioxins	0.00	-	-	n	-	-	1.01	y
40	Tot	Total Hexa-Dioxins	0.00	-	-	n	-	-	1.09	y
41	Tot	Total Hepta-Dioxins	0.00	-	-	n	-	-	0.989	y
42	Tot	Total Tetra-Furans	0.00	-	-	n	-	-	1.04	y
43	Tot	1st Fn. Tot Penta-Furans	0.00	-	-	n	-	-	0.880	y
44	Tot	Total Penta-Furans	0.00	-	-	n	-	-	0.880	y
45	Tot	Total Hexa-Furans	0.00	-	-	n	-	-	1.14	y
46	Tot	Total Hepta-Furans	0.00	-	-	n	-	-	1.23	y

Analyst: ______ Date: 12/26/17

Run #5 Filename 22DEC17M S: 5 Acquired: 22-DEC-17 13:57:46 Cal: PCDDFAL3-12-22-17
Client ID: ST122217M4 Analyte: FAL ID: 1613 CS4 171128K

	Typ	Name	Amount	Resp	RA		RT	RF	RRF	
1	Unk	2,3,7,8-TCDD	40.00	1.25e+07	0.81	y	27:14	-	1.01	y
2	Unk	1,2,3,7,8-PeCDD	200.00	5.58e+07	1.56	y	33:05	-	0.991	y
3	Unk	1,2,3,4,7,8-HxCDD	200.00	4.64e+07	1.32	y	38:26	-	1.06	y
4	Unk	1,2,3,6,7,8-HxCDD	200.00	5.38e+07	1.24	y	38:36	-	1.08	y
5	Unk	1,2,3,7,8,9-HxCDD	200.00	5.27e+07	1.26	y	39:03	-	1.12	y
6	Unk	1,2,3,4,6,7,8-HpCDD	200.00	4.46e+07	1.00	y	44:00	-	0.999	y
7	Unk	OCDD	400.00	7.66e+07	0.89	y	49:27	-	1.11	y
8	Unk	2,3,7,8-TCDF	40.00	1.58e+07	0.73	y	26:31	-	0.973	y
9	Unk	1,2,3,7,8-PeCDF	200.00	7.50e+07	1.56	y	31:20	-	0.948	y
10	Unk	2,3,4,7,8-PeCDF	200.00	7.09e+07	1.56	y	32:43	-	0.794	y
11	Unk	1,2,3,4,7,8-HxCDF	200.00	6.98e+07	1.25	y	37:02	-	1.22	y
12	Unk	1,2,3,6,7,8-HxCDF	200.00	8.21e+07	1.22	y	37:14	-	1.12	y
13	Unk	2,3,4,6,7,8-HxCDF	200.00	7.18e+07	1.22	y	38:13	-	1.10	y
14	Unk	1,2,3,7,8,9-HxCDF	200.00	7.03e+07	1.24	y	39:40	-	1.16	y
15	Unk	1,2,3,4,6,7,8-HpCDF	200.00	6.38e+07	1.03	y	42:04	-	1.27	y
16	Unk	1,2,3,4,7,8,9-HpCDF	200.00	5.17e+07	1.03	y	44:58	-	1.28	y
17	Unk	OCDF	400.00	1.00e+08	0.91	y	49:53	-	0.930	y
18	IS/RT	13C-2,3,7,8-TCDD	100.00	3.11e+07	0.80	y	27:13	-	0.991	y
19	IS	13C-1,2,3,7,8-PeCDD	100.00	2.82e+07	1.61	y	33:04	-	0.896	y
20	IS	13C-1,2,3,4,7,8-HxCDD	100.00	2.20e+07	1.26	y	38:24	-	0.851	y
21	IS	13C-1,2,3,6,7,8-HxCDD	100.00	2.50e+07	1.27	y	38:35	-	0.968	y
22	IS	13C-1,2,3,4,6,7,8-HpCDD	100.00	2.23e+07	1.03	y	43:59	-	0.864	y
23	IS	13C-OCDD	200.00	3.44e+07	0.90	y	49:27	-	0.666	y
24	IS	13C-2,3,7,8-TCDF	100.00	4.06e+07	0.78	y	26:30	-	0.868	y
25	IS	13C-1,2,3,7,8-PeCDF	100.00	3.96e+07	1.57	y	31:20	-	0.846	y
26	IS	13C-2,3,4,7,8-PeCDF	100.00	4.47e+07	1.59	y	32:42	-	0.956	y
27	IS	13C-1,2,3,4,7,8-HxCDF	100.00	2.86e+07	0.52	y	37:01	-	1.11	y
28	IS	13C-1,2,3,6,7,8-HxCDF	100.00	3.65e+07	0.52	y	37:13	-	1.41	y
29	IS	13C-2,3,4,6,7,8-HxCDF	100.00	3.25e+07	0.54	y	38:12	-	1.26	y
30	IS	13C-1,2,3,7,8,9-HxCDF	100.00	3.02e+07	0.53	y	39:39	-	1.17	y
31	IS	13C-1,2,3,4,6,7,8-HpCDF	100.00	2.50e+07	0.45	y	42:04	-	0.971	y
32	IS	13C-1,2,3,4,7,8,9-HpCDF	100.00	2.02e+07	0.48	y	44:57	-	0.784	y
33	IS	13C-OCDF	200.00	5.39e+07	0.89	y	49:52	-	1.05	y
34	C/Up	37Cl-2,3,7,8-TCDD	40.00	1.03e+07			27:14	-	0.821	y
35	RS	13C-1,2,3,4-TCDD	100.00	3.14e+07	0.81	y	26:36	3.14e+05	-	n
36	RS	13C-1,2,3,4-TCDF	100.00	4.67e+07	0.80	y	25:20	4.67e+05	-	n
37	RS/RT	13C-1,2,3,7,8,9-HxCDD	100.00	2.58e+07	1.23	y	39:02	2.58e+05	-	n
38	Tot	Total Tetra-Dioxins	0.00	-	-	n	-	-	1.01	y
39	Tot	Total Penta-Dioxins	0.00	-	-	n	-	-	0.991	y
40	Tot	Total Hexa-Dioxins	0.00	-	-	n	-	-	1.09	y
41	Tot	Total Hepta-Dioxins	0.00	-	-	n	-	-	0.999	y
42	Tot	Total Tetra-Furans	0.00	-	-	n	-	-	0.973	y
43	Tot	1st Fn. Tot Penta-Furans	0.00	-	-	n	-	-	0.866	y
44	Tot	Total Penta-Furans	0.00	-	-	n	-	-	0.866	y
45	Tot	Total Hexa-Furans	0.00	-	-	n	-	-	1.15	y
46	Tot	Total Hepta-Furans	0.00	-	-	n	-	-	1.28	y

Analyst: [signature] Date: 12/26/17

Run #6 Filename 22DEC17M S: 6 Acquired: 22-DEC-17 14:52:37 Cal: PCDDFAL3-12-22-17
Client ID: ST122217M5 Analyte: FAL ID: 1613 CS5 171128L

	Typ	Name	Amount	Resp	RA		RT	RF	RRF	
1	Unk	2,3,7,8-TCDD	200.00	6.08e+07	0.78	y	27:13	-	0.983	y
2	Unk	1,2,3,7,8-PeCDD	1000.00	2.68e+08	1.57	y	33:05	-	1.000	y
3	Unk	1,2,3,4,7,8-HxCDD	1000.00	2.42e+08	1.28	y	38:25	-	1.04	y
4	Unk	1,2,3,6,7,8-HxCDD	1000.00	2.63e+08	1.28	y	38:36	-	1.08	y
5	Unk	1,2,3,7,8,9-HxCDD	1000.00	2.51e+08	1.27	y	39:02	-	1.05	y
6	Unk	1,2,3,4,6,7,8-HpCDD	1000.00	2.32e+08	0.99	y	43:60	-	0.984	y
7	Unk	OCDD	2000.00	4.30e+08	0.89	y	49:28	-	1.10	y
8	Unk	2,3,7,8-TCDF	200.00	8.09e+07	0.72	y	26:30	-	0.982	y
9	Unk	1,2,3,7,8-PeCDF	1000.00	3.76e+08	1.55	y	31:20	-	0.951	y
10	Unk	2,3,4,7,8-PeCDF	1000.00	3.58e+08	1.55	y	32:42	-	0.797	y
11	Unk	1,2,3,4,7,8-HxCDF	1000.00	3.57e+08	1.25	y	37:01	-	1.21	y
12	Unk	1,2,3,6,7,8-HxCDF	1000.00	4.06e+08	1.25	y	37:14	-	1.12	y
13	Unk	2,3,4,6,7,8-HxCDF	1000.00	3.59e+08	1.25	y	38:12	-	1.10	y
14	Unk	1,2,3,7,8,9-HxCDF	1000.00	3.57e+08	1.26	y	39:40	-	1.18	y
15	Unk	1,2,3,4,6,7,8-HpCDF	1000.00	3.27e+08	1.02	y	42:04	-	1.26	y
16	Unk	1,2,3,4,7,8,9-HpCDF	1000.00	2.73e+08	1.02	y	44:58	-	1.24	y
17	Unk	OCDF	2000.00	5.57e+08	0.91	y	49:53	-	0.913	y
18	IS/RT	13C-2,3,7,8-TCDD	100.00	3.10e+07	0.81	y	27:12	-	1.04	y
19	IS	13C-1,2,3,7,8-PeCDD	100.00	2.68e+07	1.61	y	33:03	-	0.904	y
20	IS	13C-1,2,3,4,7,8-HxCDD	100.00	2.33e+07	1.28	y	38:24	-	0.914	y
21	IS	13C-1,2,3,6,7,8-HxCDD	100.00	2.44e+07	1.26	y	38:35	-	0.955	y
22	IS	13C-1,2,3,4,6,7,8-HpCDD	100.00	2.36e+07	1.07	y	43:59	-	0.924	y
23	IS	13C-OCDD	200.00	3.90e+07	0.91	y	49:27	-	0.763	y
24	IS	13C-2,3,7,8-TCDF	100.00	4.12e+07	0.79	y	26:28	-	0.923	y
25	IS	13C-1,2,3,7,8-PeCDF	100.00	3.95e+07	1.57	y	31:19	-	0.885	y
26	IS	13C-2,3,4,7,8-PeCDF	100.00	4.48e+07	1.58	y	32:41	-	1.00	y
27	IS	13C-1,2,3,4,7,8-HxCDF	100.00	2.94e+07	0.53	y	37:01	-	1.15	y
28	IS	13C-1,2,3,6,7,8-HxCDF	100.00	3.61e+07	0.53	y	37:13	-	1.41	y
29	IS	13C-2,3,4,6,7,8-HxCDF	100.00	3.27e+07	0.53	y	38:11	-	1.28	y
30	IS	13C-1,2,3,7,8,9-HxCDF	100.00	3.03e+07	0.52	y	39:38	-	1.19	y
31	IS	13C-1,2,3,4,6,7,8-HpCDF	100.00	2.60e+07	0.46	y	42:04	-	1.02	y
32	IS	13C-1,2,3,4,7,8,9-HpCDF	100.00	2.20e+07	0.44	y	44:57	-	0.864	y
33	IS	13C-OCDF	200.00	6.10e+07	0.92	y	49:52	-	1.19	y
34	C/Up	37Cl-2,3,7,8-TCDD	200.00	5.29e+07			27:13	-	0.891	y
35	RS	13C-1,2,3,4-TCDD	100.00	2.97e+07	0.83	y	26:35	2.97e+05	-	n
36	RS	13C-1,2,3,4-TCDF	100.00	4.46e+07	0.79	y	25:19	4.46e+05	-	n
37	RS/RT	13C-1,2,3,7,8,9-HxCDD	100.00	2.55e+07	1.27	y	39:01	2.55e+05	-	n
38	Tot	Total Tetra-Dioxins	0.00	-	-	n	-	-	0.983	y
39	Tot	Total Penta-Dioxins	0.00	-	-	n	-	-	1.000	y
40	Tot	Total Hexa-Dioxins	0.00	-	-	n	-	-	1.06	y
41	Tot	Total Hepta-Dioxins	0.00	-	-	n	-	-	0.984	y
42	Tot	Total Tetra-Furans	0.00	-	-	n	-	-	0.982	y
43	Tot	1st Fn. Tot Penta-Furans	0.00	-	-	n	-	-	0.869	y
44	Tot	Total Penta-Furans	0.00	-	-	n	-	-	0.869	y
45	Tot	Total Hexa-Furans	0.00	-	-	n	-	-	1.15	y
46	Tot	Total Hepta-Furans	0.00	-	-	n	-	-	1.25	y

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Analyst: [signature] Date: 12/26/17

USEPA - ITD

FORM 3A

PCDD/PCDF INITIAL CALIBRATION RELATIVE RESPONSES

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:

Initial Calibration Date: 12/22/17

Instrument ID: FAL3   GC Column ID: DB5MS

CS0 Data Filename: 22DEC17M S1   CS3 Data Filename: 22DEC17M S4

CS1 Data Filename: 22DEC17M S2   CS4 Data Filename: 22DEC17M S5

CS2 Data Filename: 22DEC17M S3   CS5 Data Filename: 22DEC17M S6

	RELATIVE RESPONSE (RR)						MEAN RR	Cv (%RSD)
NATIVE ANALYTES	CS1	CS2	CS3	CS4	CS5	CS6		
2,3,7,8-TCDD	1.12	1.01	1.04	1.19	1.01	0.98	1.06	7.77
1,2,3,7,8-PeCDD	1.03	0.98	0.99	1.01	0.99	1.00	1.00	1.85
1,2,3,4,7,8-HxCDD	1.11	1.08	1.07	1.07	1.06	1.04	1.07	2.22
1,2,3,6,7,8-HxCDD	1.09	1.07	1.10	1.09	1.08	1.08	1.08	0.986
1,2,3,7,8,9-HxCDD	1.17	1.10	1.11	1.11	1.12	1.05	1.11	3.32
1,2,3,4,6,7,8-HpCDD	1.04	0.95	0.97	0.99	1.00	0.98	0.99	2.94
OCDD	1.14	1.09	1.08	1.13	1.11	1.10	1.11	1.90
2,3,7,8-TCDF	1.16	1.02	0.99	1.04	0.97	0.98	1.03	6.65
1,2,3,7,8-PeCDF	0.98	0.91	0.92	0.97	0.95	0.95	0.95	2.90
2,3,4,7,8-PeCDF	0.83	0.76	0.76	0.80	0.79	0.80	0.79	3.33
1,2,3,4,7,8-HxCDF	1.22	1.17	1.16	1.21	1.22	1.21	1.20	2.35
1,2,3,6,7,8-HxCDF	1.11	1.03	1.08	1.11	1.12	1.12	1.10	3.22
2,3,4,6,7,8-HxCDF	1.08	1.04	1.08	1.09	1.10	1.10	1.08	2.05
1,2,3,7,8,9-HxCDF	1.17	1.08	1.14	1.15	1.16	1.18	1.15	2.93
1,2,3,4,6,7,8-HpCDF	1.25	1.19	1.19	1.24	1.27	1.26	1.23	2.80
1,2,3,4,7,8,9-HpCDF	1.28	1.16	1.20	1.22	1.28	1.24	1.23	3.83
OCDF	0.91	0.86	0.89	0.92	0.93	0.91	0.90	2.54

Analyst: ______   Date: 12/26/17

USEPA - ITD

FORM 3B

PCDD/PCDF INITIAL CALIBRATION RELATIVE RESPONSES

Lab Name: Frontier Analytical Laboratory Episode No.:

Contract No.: SAS No.:

Initial Calibration Date: 12/22/17

Instrument ID: FAL3 GC Column ID: DB5MS

CS0 Data Filename: 22DEC17M S1 CS4 Data Filename: 22DEC17M S4

CS1 Data Filename: 22DEC17M S2 CS4 Data Filename: 22DEC17M S5

CS2 Data Filename: 22DEC17M S3 CS5 Data Filename: 22DEC17M S6

	RELATIVE RESPONSE (RR)						MEAN RR	Cv (%RSD)
	CS1	CS2	CS3	CS4	CS5	CS6		
LABELED COMPOUNDS								
13C-2,3,7,8-TCDD	1.05	1.05	1.02	0.98	0.99	1.04	1.02	2.92
13C-1,2,3,7,8-PeCDD	0.88	0.89	0.88	0.83	0.90	0.90	0.88	3.13
13C-1,2,3,4,7,8-HxCDD	0.86	0.85	0.83	0.82	0.85	0.91	0.85	3.82
13C-1,2,3,6,7,8-HxCDD	0.91	0.91	0.92	0.98	0.97	0.96	0.94	3.36
13C-1,2,3,4,6,7,8-HpCDD	0.92	0.91	0.88	0.92	0.86	0.92	0.90	2.88
13C-OCDD	0.70	0.68	0.68	0.72	0.67	0.76	0.70	5.12
13C-2,3,7,8-TCDF	0.99	0.94	0.95	0.92	0.87	0.92	0.93	4.33
13C-1,2,3,7,8-PeCDF	0.90	0.86	0.87	0.84	0.85	0.89	0.87	2.83
13C-2,3,4,7,8-PeCDF	1.02	0.99	1.03	0.95	0.96	1.00	0.99	3.28
13C-1,2,3,4,7,8-HxCDF	1.08	1.07	1.07	1.08	1.11	1.15	1.09	3.04
13C-1,2,3,6,7,8-HxCDF	1.26	1.30	1.30	1.38	1.41	1.41	1.35	4.88
13C-2,3,4,6,7,8-HxCDF	1.19	1.20	1.20	1.25	1.26	1.28	1.23	3.02
13C-1,2,3,7,8,9-HxCDF	1.08	1.12	1.12	1.18	1.17	1.19	1.14	3.75
13C-1,2,3,4,6,7,8-HpCDF	0.95	0.93	0.94	1.03	0.97	1.02	0.97	4.10
13C-1,2,3,4,7,8,9-HpCDF	0.82	0.80	0.81	0.82	0.78	0.86	0.82	3.29
13C-OCDF	1.00	0.99	1.02	1.12	1.05	1.19	1.06	7.57
CLEANUP STANDARD								
37Cl-2,3,7,8-TCDD	1.01	1.03	0.91	0.82	0.82	0.89	0.91	9.64

Analyst: ______ Date: 12/26/17

USEPA - ITD

FORM 3C

PCDD/PCDF INITIAL CALIBRATION ION ABUNDANCE RATIOS

Lab Name: Frontier Analytical Laboratory Episode No.:

Contract No.: SAS No.:

Initial Calibration Date: 12/22/17

Instrument ID: FAL3 GC Column ID: DB5MS

CS0 Data Filename: 22DEC17M S1 CS3 Data Filename: 22DEC17M S4

CS1 Data Filename: 22DEC17M S2 CS4 Data Filename: 22DEC17M S5

CS2 Data Filename: 22DEC17M S3 CS5 Data Filename: 22DEC17M S6

NATIVE ANALYTES	M/Z'S FORMING RATIO	ION ABUNDANCE RATIOS CS1	CS2	CS3	CS4	CS5	CS6	QC LIMITS
2,3,7,8-TCDD	M/M+2	0.87	0.76	0.78	0.77	0.81	0.78	0.65-0.89
1,2,3,7,8-PeCDD	M+2/M+4	1.57	1.53	1.55	1.53	1.56	1.57	1.32-1.78
1,2,3,4,7,8-HxCDD	M+2/M+4	1.37	1.29	1.23	1.26	1.32	1.28	1.05-1.43
1,2,3,6,7,8-HxCDD	M+2/M+4	1.19	1.24	1.31	1.26	1.24	1.28	1.05-1.43
1,2,3,7,8,9-HxCDD	M+2/M+4	1.28	1.33	1.24	1.27	1.26	1.27	1.05-1.43
1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.09	0.99	1.00	0.99	1.00	0.99	0.88-1.20
OCDD	M+2/M+4	0.90	0.87	0.87	0.85	0.89	0.89	0.76-1.02
2,3,7,8-TCDF	M/M+2	0.68	0.66	0.67	0.69	0.73	0.72	0.65-0.89
1,2,3,7,8-PeCDF	M+2/M+4	1.56	1.59	1.57	1.57	1.56	1.55	1.32-1.78
2,3,4,7,8-PeCDF	M+2/M+4	1.47	1.57	1.58	1.57	1.56	1.55	1.32-1.78
1,2,3,4,7,8-HxCDF	M+2/M+4	1.35	1.26	1.24	1.24	1.25	1.25	1.05-1.43
1,2,3,6,7,8-HxCDF	M+2/M+4	1.22	1.18	1.26	1.27	1.22	1.25	1.05-1.43
2,3,4,6,7,8-HxCDF	M+2/M+4	1.23	1.28	1.25	1.24	1.22	1.25	1.05-1.43
1,2,3,7,8,9-HxCDF	M+2/M+4	1.35	1.23	1.24	1.23	1.24	1.26	1.05-1.43
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.01	1.01	1.03	0.99	1.03	1.02	0.88-1.20
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.03	1.08	1.03	1.03	1.03	1.02	0.88-1.20
OCDF	M+2/M+4	0.89	0.89	0.89	0.90	0.91	0.91	0.76-1.02

Analyst: Date: 12/26/17

USEPA - ITD

FORM 3D
PCDD/PCDF INITIAL CALIBRATION ION ABUNDANCE RATIOS

Lab Name: Frontier Analytical Laboratory Episode No.:

Contract No.: SAS No.:

Initial Calibration Date: 12/22/17

Instrument ID: FAL3 GC Column ID: DB5MS

CS0 Data Filename: 22DEC17M S1 CS3 Data Filename: 22DEC17M S4

CS1 Data Filename: 22DEC17M S2 CS4 Data Filename: 22DEC17M S5

CS2 Data Filename: 22DEC17M S3 CS5 Data Filename: 22DEC17M S6

LABELED COMPOUNDS	M/Z'S FORMING RATIO	ION ABUNDANCE RATIOS CS1	CS2	CS3	CS4	CS5	CS6	QC LIMITS
13C-2,3,7,8-TCDD	M/M+2	0.80	0.79	0.80	0.80	0.80	0.81	0.65-0.89
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.60	1.60	1.61	1.61	1.61	1.61	1.32-1.78
13C-1,2,3,4,7,8-HxCDD	M+2/M+4	1.26	1.32	1.29	1.23	1.26	1.28	1.05-1.43
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.28	1.24	1.25	1.30	1.27	1.26	1.05-1.43
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.03	1.01	1.04	1.06	1.03	1.07	0.88-1.20
13C-OCDD	M+2/M+4	0.91	0.90	0.89	0.94	0.90	0.91	0.76-1.02
13C-2,3,7,8-TCDF	M/M+2	0.80	0.80	0.79	0.79	0.78	0.79	0.65-0.89
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.59	1.59	1.59	1.57	1.57	1.57	1.32-1.78
13C-2,3,4,7,8-PeCDF	M+2/M+4	1.58	1.60	1.58	1.60	1.59	1.58	1.32-1.78
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.52	0.52	0.53	0.54	0.52	0.53	0.43-0.59
13C-1,2,3,6,7,8-HxCDF	M/M+2	0.54	0.53	0.53	0.55	0.52	0.53	0.43-0.59
13C-2,3,4,6,7,8-HxCDF	M/M+2	0.53	0.51	0.53	0.53	0.54	0.53	0.43-0.59
13C-1,2,3,7,8,9-HxCDF	M/M+2	0.53	0.53	0.53	0.54	0.53	0.52	0.43-0.59
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.45	0.45	0.46	0.45	0.45	0.46	0.37-0.51
13C-1,2,3,4,7,8,9-HpCDF	M/M+2	0.44	0.43	0.45	0.45	0.48	0.44	0.37-0.51
13C-OCDF	M+2/M+4	0.91	0.89	0.90	0.89	0.89	0.92	0.76-1.02

Analyst: [signature] Date: 12/26/17

USEPA - ITD

FORM 4A
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:

Initial Calibration Date: 12/22/17

Instrument ID: FAL3   GC Column ID: DB5MS

VER Data Filename: 22DEC17M Sam:4   Analysis Date: 22-DEC-17 13:02:55

NATIVE ANALYTES	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
2,3,7,8-TCDD	M/M+2	0.77	0.65-0.89	y	11.3	7.80 - 12.9
1,2,3,7,8-PeCDD	M+2/M+4	1.53	1.32-1.78	y	50.7	39.0 - 65.0
1,2,3,4,7,8-HxCDD	M+2/M+4	1.26	1.05-1.43	y	50.0	39.0 - 64.0
1,2,3,6,7,8-HxCDD	M+2/M+4	1.26	1.05-1.43	y	50.3	39.0 - 64.0
1,2,3,7,8,9-HxCDD	M+2/M+4	1.27	1.05-1.43	y	50.1	41.0 - 61.0
1,2,3,4,6,7,8-HpCDD	M+2/M+4	0.99	0.88-1.20	y	50.1	43.0 - 58.0
OCDD	M+2/M+4	0.85	0.76-1.02	y	102	79.0 - 126
2,3,7,8-TCDF	M/M+2	0.69	0.65-0.89	y	10.1	8.40 - 12.0
1,2,3,7,8-PeCDF	M+2/M+4	1.57	1.32-1.78	y	51.3	41.0 - 60.0
2,3,4,7,8-PeCDF	M+2/M+4	1.57	1.32-1.78	y	50.7	41.0 - 60.0
1,2,3,4,7,8-HxCDF	M+2/M+4	1.24	1.05-1.43	y	50.4	45.0 - 56.0
1,2,3,6,7,8-HxCDF	M+2/M+4	1.27	1.05-1.43	y	50.6	44.0 - 57.0
2,3,4,6,7,8-HxCDF	M+2/M+4	1.24	1.05-1.43	y	50.5	44.0 - 57.0
1,2,3,7,8,9-HxCDF	M+2/M+4	1.23	1.05-1.43	y	50.2	45.0 - 56.0
1,2,3,4,6,7,8-HpCDF	M+2/M+4	0.99	0.88-1.20	y	50.2	45.0 - 55.0
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.03	0.88-1.20	y	49.6	43.0 - 58.0
OCDF	M+2/M+4	0.90	0.76-1.02	y	101	63.0 - 159

(1) See Table 8, Method 1613, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 9, Method 1613.

(3) Contract-required concentration range as specified in Table 6, Method 1613.

Analyst: [signature]   Date: 12/26/17

USEPA - ITD

FORM 4B
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:

Initial Calibration Date: 12/22/17

Instrument ID: FAL3   GC Column ID: DB5MS

VER Data Filename: 22DEC17M   Sam:4   Analysis Date: 22-DEC-17 13:02:55

LABELED COMPOUNDS	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
13C-2,3,7,8-TCDD	M/M+2	0.80	0.65-0.89	y	96.1	82.0 - 121
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.61	1.32-1.78	y	94.0	62.0 - 160
13C-1,2,3,4,7,8-HxCDD	M+2/M+4	1.23	1.05-1.43	y	96.4	85.0 - 117
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.30	1.05-1.43	y	104	85.0 - 118
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.06	0.88-1.20	y	102	72.0 - 138
13C-OCDD	M+2/M+4	0.94	0.76-1.02	y	206	96.0 - 415
13C-2,3,7,8-TCDF	M/M+2	0.79	0.65-0.89	y	98.7	71.0 - 140
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.57	1.32-1.78	y	96.5	76.0 - 130
13C-2,3,4,7,8-PeCDF	M+2/M+4	1.60	1.32-1.78	y	95.8	77.0 - 130
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.54	0.43-0.59	y	99.0	76.0 - 131
13C-1,2,3,6,7,8-HxCDF	M/M+2	0.55	0.43-0.59	y	103	70.0 - 143
13C-2,3,4,6,7,8-HxCDF	M/M+2	0.53	0.43-0.59	y	101	73.0 - 137
13C-1,2,3,7,8,9-HxCDF	M/M+2	0.54	0.43-0.59	y	103	74.0 - 135
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.45	0.37-0.51	y	105	78.0 - 129
13C-1,2,3,4,7,8,9-HpCDF	M/M+2	0.45	0.37-0.51	y	101	77.0 - 129
13C-OCDF	M+2/M+4	0.89	0.76-1.02	y	212	96.0 - 415
CLEANUP STANDARD (4)						
37Cl-2,3,7,8-TCDD					9.03	7.90 - 12.7

(1) See Table 8, Method 1613, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 9, Method 1613.

(3) Contract-required concentration range as specified in Table 6, Method 1613.

(4) No ion abundance ratio; report concentration found.

Analyst: [signature]   Date: 12/26/17

FORM 5

PCDD/PCDF RT WINDOW AND ISOMER SPECIFICITY STANDARDS

Lab Name: Frontier Analytical Laboratory Episode No.:

Contract No.: SAS No.:

Instrument ID: FAL3 Initial Calibration Date: 12/22/17

RT Window Data Filename: 22DEC17M Sam:4 Analysis Date: 22-DEC-17 Time: 13:02:55

DB-5 IS Data Filename: 22DEC17M Sam:4 Analysis Date: 22-DEC-17 Time: 13:02:55

DB-225 IS Date Filename: Analysis Date: Time:

DB-5 RT WINDOW DEFINING STANDARDS RESULTS

ISOMERS	ABSOLUTE RT	ISOMERS	ABSOLUTE RT
1,3,6,8-TCDD (F)	24:10	1,3,6,8-TCDF (F)	22:49
1,2,8,9-TCDD (L)	28:11	1,2,8,9-TCDF (L)	28:28
1,2,4,7,9-PeCDD (F)	30:03	1,3,4,6,8-PeCDF (F)	28:11
1,2,3,8,9-PeCDD (L)	33:41	1,2,3,8,9-PeCDF (L)	34:08
1,2,4,6,7,9-HxCDD (F)	35:55	1,2,3,4,6,8-HxCDF (F)	35:03
1,2,3,7,8,9-HxCDD (L)	39:03	1,2,3,7,8,9-HxCDF (L)	39:41
1,2,3,4,6,7,9-HpCDD (F)	42:36	1,2,3,4,6,7,8-HpCDF (F)	42:05
1,2,3,4,6,7,8-HpCDD (L)	44:00	1,2,3,4,7,8,9-HpCDF (L)	44:59

(F) = First eluting isomer (DB-5); (L) = Last eluting isomer (DB-5)

ISOMER SPECIFICITY (IS) TEST STANDARD RESULTS

% VALLEY HEIGHT BETWEEN COMPARED PEAKS (1)

<25%

(1) To meet contract requirement, %Valley Height Between Compared Peaks shall not exceed 25% (section 15.4.2.2, Method 1613).

Analyst: &

Date: 12/24/17

USEPA - ITD

FORM 6A

PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:   Init. Cal. Date: 12/22/17

Instrument ID: FAL3   GC Column ID: DB5MS

Analysis Date: 22-DEC-17 13:02:55   CS3 or VER Data Filename: 22DEC17M   Sam:4

NATIVE ANALYTES	RETENTION TIME REFERENCE	RRT	RRT QC LIMITS (1)
2,3,7,8-TCDD	13C-2,3,7,8-TCDD	1.001	0.999-1.002
2,3,7,8-TCDF	13C-2,3,7,8-TCDF	1.001	0.999-1.003
1,2,3,7,8-PeCDD	13C-1,2,3,7,8-PeCDD	1.001	0.999-1.002
1,2,3,7,8-PeCDF	13C-1,2,3,7,8-PeCDF	1.000	0.999-1.002
2,3,4,7,8-PeCDF	13C-2,3,4,7,8-PeCDF	1.001	0.999-1.002
LABELED COMPOUNDS			
37Cl-2,3,7,8-TCDD	13C-1,2,3,4-TCDD	1.024	0.989-1.052
13C-2,3,7,8-TCDD		1.024	0.976-1.043
13C-2,3,7,8-TCDF		0.997	0.923-1.103
13C-1,2,3,7,8-PeCDD		1.244	1.000-1.567
13C-1,2,3,7,8-PeCDF		1.178	1.000-1.425
13C-2,3,4,7,8-PeCDF		1.229	1.011-1.526

(1) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1613.

Analyst: [signature]   Date: 12/26/17

USEPA - ITD

FORM 6B
PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:   Init. Cal. Date: 12/22/17

Instrument ID: FAL3   GC Column ID: DB5MS

Analysis Date: 22-DEC-17 13:02:55   CS3 or VER Data Filename: 22DEC17M   Sam:4

NATIVE ANALYTES	RETENTION TIME REFERENCE	RRT	RRT QC LIMITS (1)
1,2,3,4,7,8-HxCDD	13C-1,2,3,4,7,8-HxCDD	1.001	0.999-1.001
1,2,3,6,7,8-HxCDD	13C-1,2,3,6,7,8-HxCDD	1.001	0.999-1.003
1,2,3,7,8,9-HxCDD	13C-1,2,3,6,7,8-HxCDD	1.012	1.000-1.019
1,2,3,4,7,8-HxCDF	13C-1,2,3,4,7,8-HxCDF	1.001	0.999-1.001
1,2,3,6,7,8-HxCDF	13C-1,2,3,6,7,8-HxCDF	1.001	0.999-1.003
2,3,4,6,7,8-HxCDF	13C-2,3,4,6,7,8-HxCDF	1.000	0.999-1.001
1,2,3,7,8,9-HxCDF	13C-1,2,3,7,8,9-HxCDF	1.001	0.999-1.001
1,2,3,4,6,7,8-HpCDD	13C-1,2,3,4,6,7,8-HpCDD	1.001	0.999-1.001
1,2,3,4,6,7,8-HpCDF	13C-1,2,3,4,6,7,8-HpCDF	1.000	0.999-1.001
1,2,3,4,7,8,9-HpCDF	13C-1,2,3,4,7,8,9-HpCDF	1.000	0.999-1.001
OCDD	13C-OCDD	1.001	0.999-1.001
OCDF	13C-OCDF	1.000	0.999-1.001
LABELED COMPOUNDS			
13C-1,2,3,4,7,8-HxCDD	13C-1,2,3,7,8,9-HxCDD	0.984	0.977-1.000
13C-1,2,3,6,7,8-HxCDD		0.988	0.981-1.003
13C-1,2,3,4,7,8-HxCDF		0.948	0.944-0.970
13C-1,2,3,6,7,8-HxCDF		0.953	0.949-0.975
13C-2,3,4,6,7,8-HxCDF		0.979	0.959-1.021
13C-1,2,3,7,8,9-HxCDF		1.016	0.977-1.047
13C-1,2,3,4,6,7,8-HpCDD		1.127	1.086-1.130
13C-1,2,3,4,6,7,8-HpCDF		1.078	1.043-1.085
13C-1,2,3,4,7,8,9-HpCDF		1.152	1.057-1.156
13C-OCDD		1.267	1.032-1.311
13C-OCDF		1.278	1.000-1.311

(1) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1613.

Analyst: ____ Date: 12/26/17

FAL ID: ST122217M3 Filename: 22DEC17M Sam:4 Acquired: 22-DEC-17 13:02:55 ICal: PCDDFAL3-12-22-17
Client ID: 1613 CS3 171128J ConCal: NA EndCal: NA
Results: GC Golumn: DB5MS Amount: 1.000 NATO 1989 Tox: 102
Instrument ID: FAL3 WHO 1998 Tox: 128 WHO 2005 Tox: 116

Name	Resp	RA	RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	Rec	DL
2,3,7,8-TCDD	3.60e+06	0.77 y	27:14	1.06	11.3		2.50	-	-		*
1,2,3,7,8-PeCDD	1.29e+07	1.53 y	33:06	1.00	50.7		2.50	-	-		*
1,2,3,4,7,8-HxCDD	1.05e+07	1.26 y	38:26	1.07	50.0		2.50	-	-		*
1,2,3,6,7,8-HxCDD	1.27e+07	1.26 y	38:37	1.08	50.3		2.50	-	-		*
1,2,3,7,8,9-HxCDD	1.20e+07	1.27 y	39:03	1.11	50.1		2.50	-	-		*
1,2,3,4,6,7,8-HpCDD	1.08e+07	0.99 y	44:00	0.99	50.1		2.50	-	-		*
OCDD	1.95e+07	0.85 y	49:28	1.11	102		2.50	-	-		*
2,3,7,8-TCDF	4.16e+06	0.69 y	26:31	1.03	10.1		2.50	-	-		*
1,2,3,7,8-PeCDF	1.77e+07	1.57 y	31:20	0.95	51.3		2.50	-	-		*
2,3,4,7,8-PeCDF	1.66e+07	1.57 y	32:43	0.79	50.7		2.50	-	-		*
1,2,3,4,7,8-HxCDF	1.56e+07	1.24 y	37:03	1.20	50.4		2.50	-	-		*
1,2,3,6,7,8-HxCDF	1.82e+07	1.27 y	37:15	1.10	50.6		2.50	-	-		*
2,3,4,6,7,8-HxCDF	1.62e+07	1.24 y	38:13	1.08	50.5		2.50	-	-		*
1,2,3,7,8,9-HxCDF	1.62e+07	1.23 y	39:41	1.15	50.2		2.50	-	-		*
1,2,3,4,6,7,8-HpCDF	1.51e+07	0.99 y	42:05	1.23	50.2		2.50	-	-		*
1,2,3,4,7,8,9-HpCDF	1.19e+07	1.03 y	44:59	1.23	49.6		2.50	-	-		*
OCDF	2.45e+07	0.90 y	49:53	0.90	101		2.50	-	-		*
13C-2,3,7,8-TCDD	3.02e+07	0.80 y	27:13	1.02	96.1					96.1	
13C-1,2,3,7,8-PeCDD	2.54e+07	1.61 y	33:04	0.88	94.0					94.0	
13C-1,2,3,4,7,8-HxCDD	1.96e+07	1.23 y	38:25	0.85	96.4					96.4	
13C-1,2,3,6,7,8-HxCDD	2.33e+07	1.30 y	38:35	0.94	104					104	
13C-1,2,3,4,6,7,8-HpCDD	2.19e+07	1.06 y	43:59	0.90	102					102	
13C-OCDD	3.44e+07	0.94 y	49:27	0.70	206					103	
13C-2,3,7,8-TCDF	4.02e+07	0.79 y	26:30	0.93	98.7					98.7	
13C-1,2,3,7,8-PeCDF	3.65e+07	1.57 y	31:20	0.87	96.5					96.5	
13C-2,3,4,7,8-PeCDF	4.15e+07	1.60 y	32:42	0.99	95.8					95.8	
13C-1,2,3,4,7,8-HxCDF	2.58e+07	0.54 y	37:01	1.09	99.0					99.0	
13C-1,2,3,6,7,8-HxCDF	3.29e+07	0.55 y	37:13	1.35	103					103	
13C-2,3,4,6,7,8-HxCDF	2.97e+07	0.53 y	38:12	1.23	101					101	
13C-1,2,3,7,8,9-HxCDF	2.81e+07	0.54 y	39:39	1.14	103					103	
13C-1,2,3,4,6,7,8-HpCDF	2.44e+07	0.45 y	42:04	0.97	105					105	
13C-1,2,3,4,7,8,9-HpCDF	1.96e+07	0.45 y	44:58	0.82	101					101	
13C-OCDF	5.35e+07	0.89 y	49:52	1.06	212					106	
37Cl-2,3,7,8-TCDD	2.54e+06		27:14	0.91	9.03					90.3	
13C-1,2,3,4-TCDD	3.07e+07	0.80 y	26:36	-	84.6						
13C-1,2,3,4-TCDF	4.37e+07	0.79 y	25:19	-	84.2						
13C-1,2,3,7,8,9-HxCDD	2.38e+07	1.26 y	39:02	-	77.7						

Name	Resp	RT	RRF	Conc	Fac	Noise-1	Noise-2	DL		#Hom
Total Tetra-Dioxins	1.61e+07	22:54	1.06	50.3	2.50	-	-	*		19
Total Penta-Dioxins	3.95e+07	30:03	1.00	155	2.50	-	-	*		16
Total Hexa-Dioxins	5.02e+07	35:55	1.09	215	2.50	-	-	*		29
Total Hepta-Dioxins	2.39e+07	42:36	0.99	111	2.50	-	-	*		33
Total Tetra-Furans	1.87e+07	22:49	1.03	45.3	2.50	-	-	*		23
1st Fn. Tot Penta-Furans	2.29e+07	28:11	0.86	68.2	2.50	-	-	*	PeCDF	4
Total Penta-Furans	5.05e+07	30:01	0.86	150	2.50	-	-	*	218	14
Total Hexa-Furans	8.38e+07	35:03	1.13	255	2.50	-	-	*		21
Total Hepta-Furans	2.82e+07	42:05	1.23	104	2.50	-	-	*		32

Analyst: [signature] Date: 12/26/17

Frontier Analytical Laboratory - Acquisition Log

Run Name:22DEC17M Instrument: FAL3 GC: DB5MS Experiment:PCDD

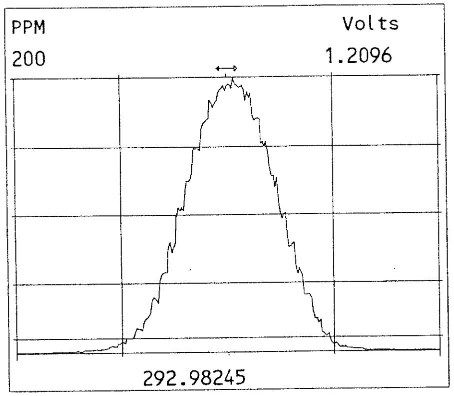
Data File	S	FAL ID	Client ID	Acquired	ConCal	EndCal	Analyst
22DEC17M	1	ST122217M0	1613 CS0 171128G	22-DEC-17 10:18:22	NA	NA	TC
22DEC17M	2	ST122217M1	1613 CS1 171128H	22-DEC-17 11:13:13	NA	NA	TC
22DEC17M	3	ST122217M2	1613 CS2 171128I	22-DEC-17 12:08:04	NA	NA	TC
22DEC17M	4	ST122217M3	1613 CS3 171128J	22-DEC-17 13:02:55	NA	NA	TC
22DEC17M	5	ST122217M4	1613 CS4 171128K	22-DEC-17 13:57:46	NA	NA	TC
22DEC17M	6	ST122217M5	1613 CS5 171128L	22-DEC-17 14:52:37	NA	NA	TC
22DEC17M	7	ST122217M6	1613 CS6 171128M	22-DEC-17 15:47:28	NA	NA	TC
22DEC17M	8	SB122217M1	Solvent Blank	22-DEC-17 16:42:20	NA	NA	TC
22DEC17M	9	SB122217M2	Solvent Blank	22-DEC-17 17:37:10	NA	NA	TC
22DEC17M	10	SS122217M1	2nd Source 171128N	22-DEC-17 18:32:00	NA	NA	TC
22DEC17M	11	ST122217M7	1613 CS3 171128J	22-DEC-17 19:26:52	NA	NA	TC

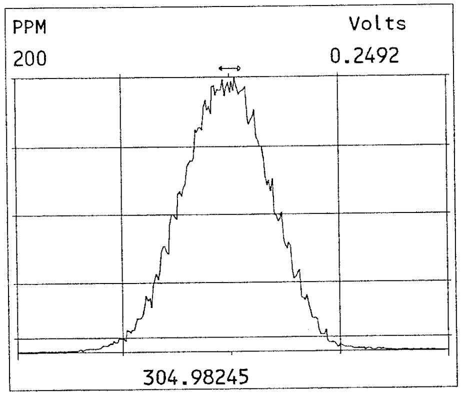
& 12/24/17

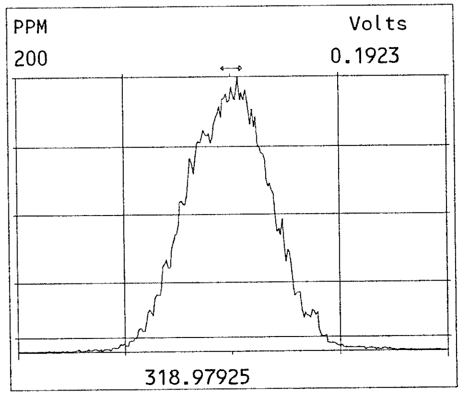
Data Backed Up:________________

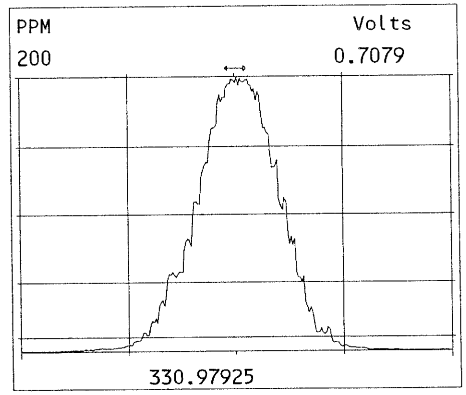
Date:______________________

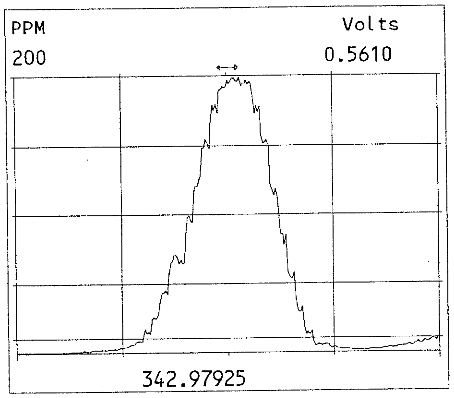
Peak Locate Examination:22-DEC-2017:10:16 File:22DEC17M
Experiment:PCDD Function:1 Reference:PFK

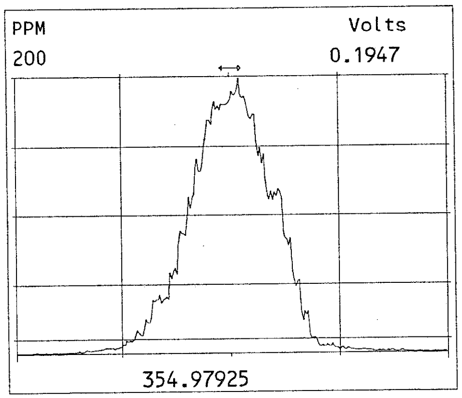


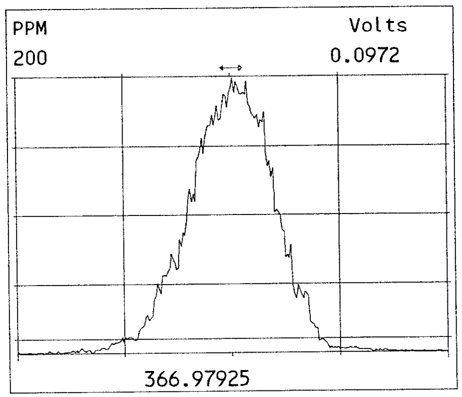


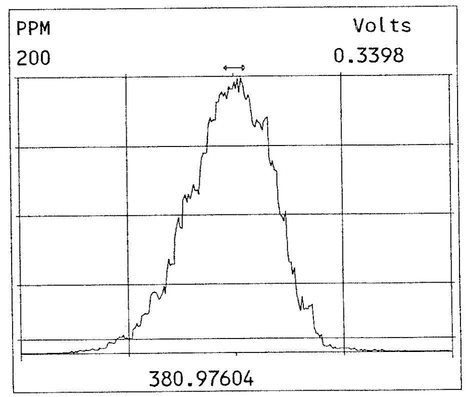


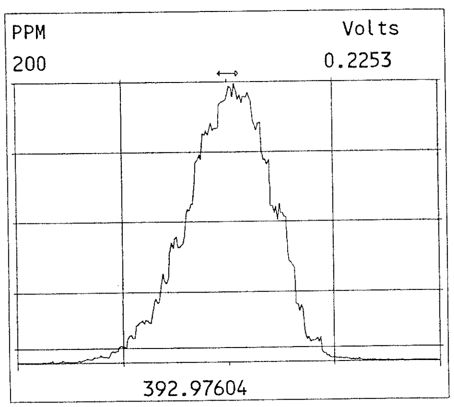


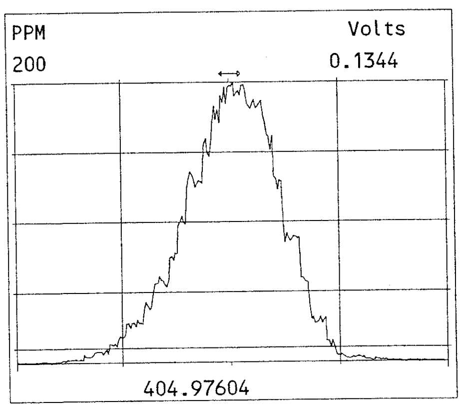


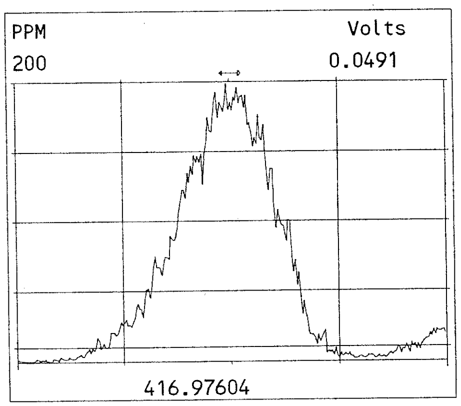




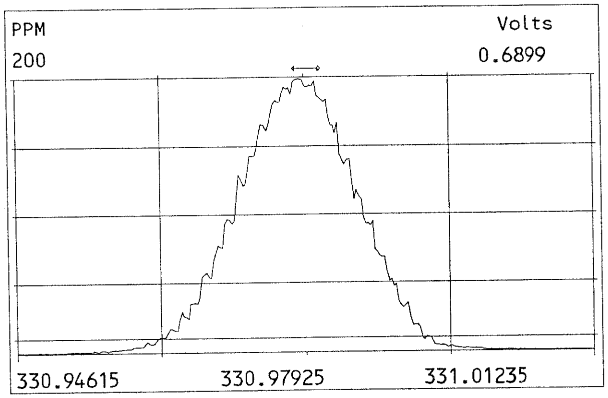


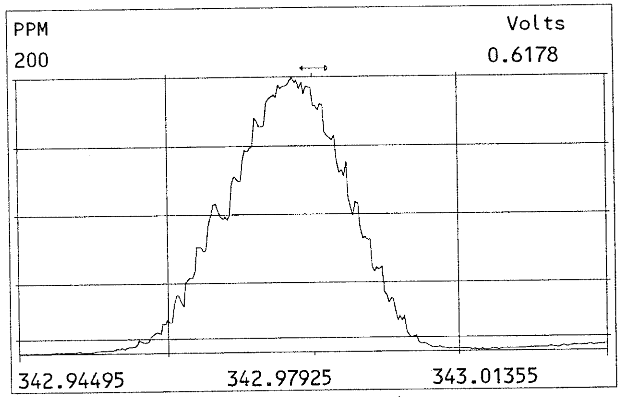


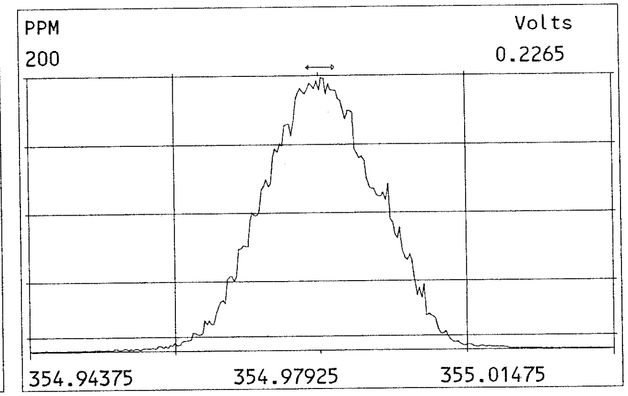


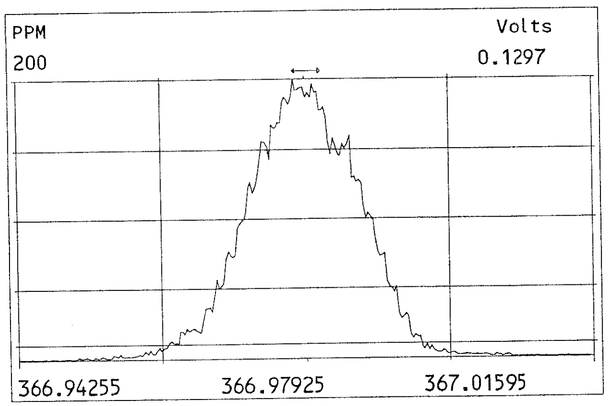


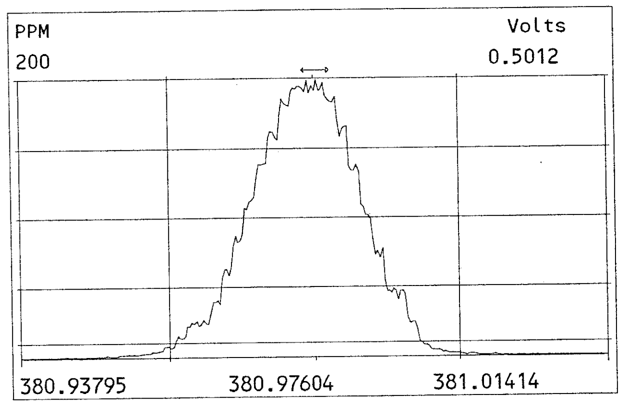
Peak Locate Examination:22-DEC-2017:10:17 File:22DEC17M
Experiment:PCDD Function:2 Reference:PFK

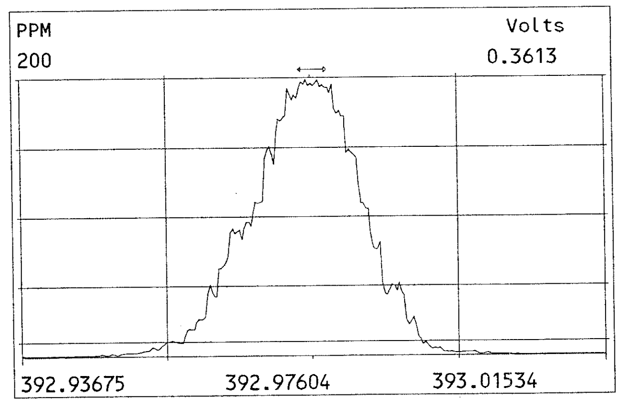


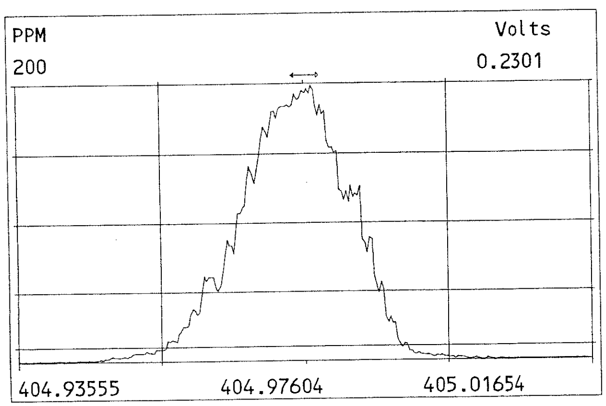


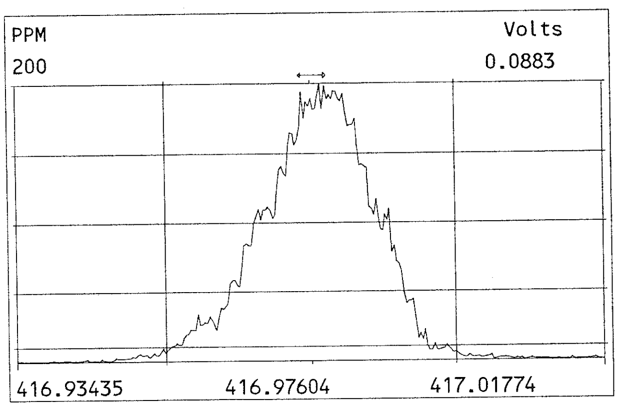




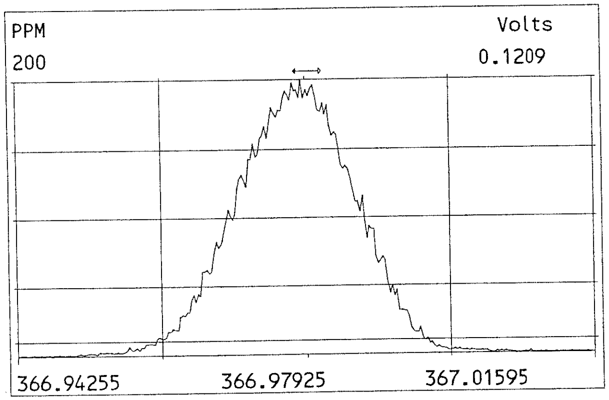


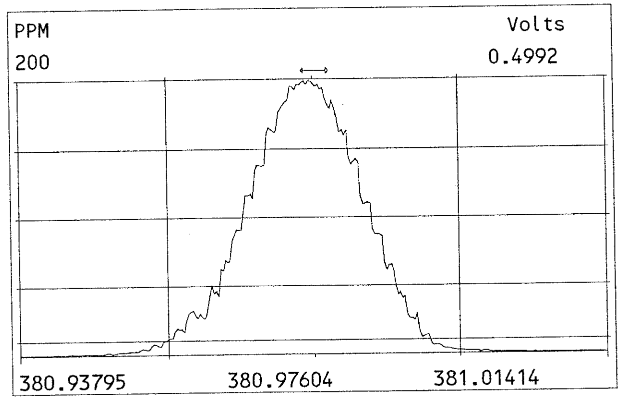


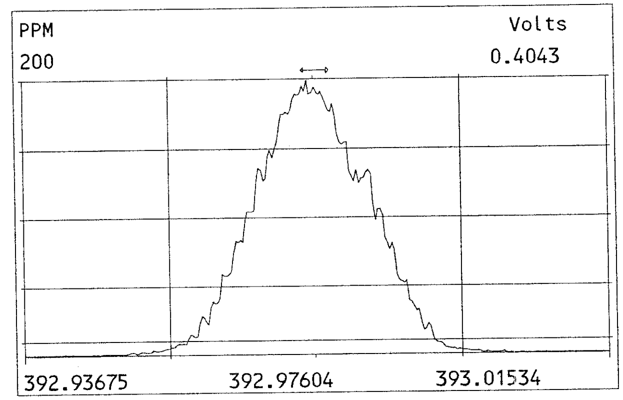


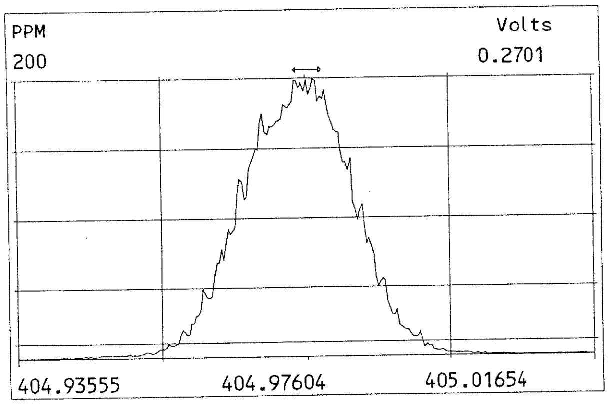


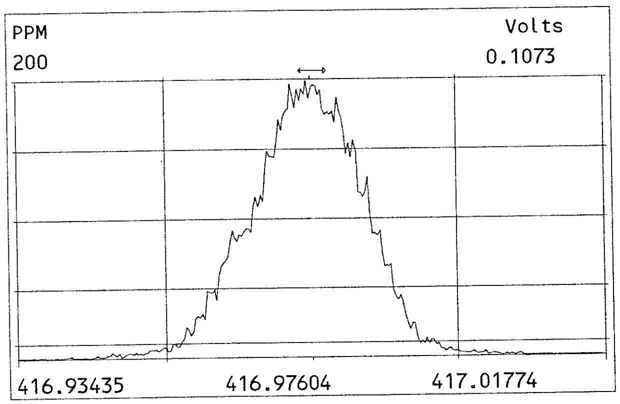
Peak Locate Examination:22-DEC-2017:10:17 File:22DEC17M
Experiment:PCDD Function:3 Reference:PFK

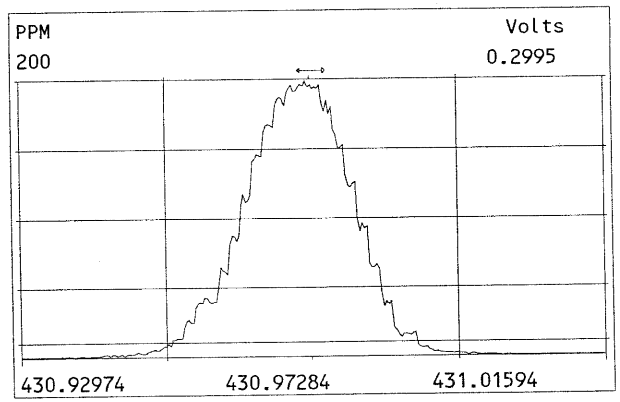


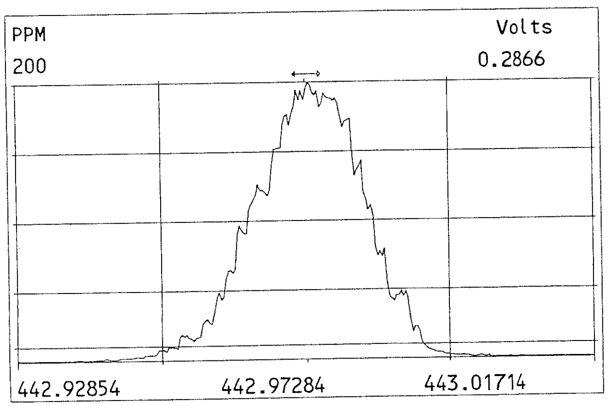


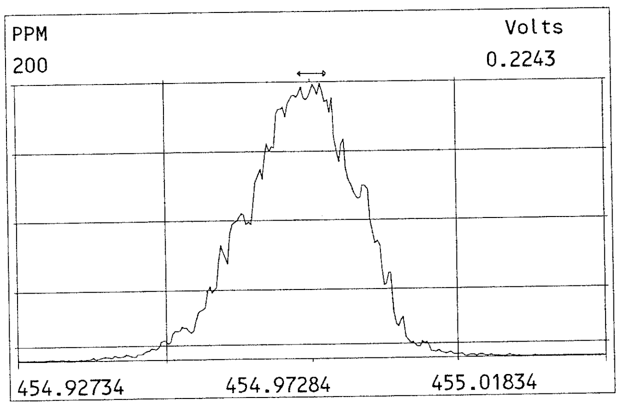












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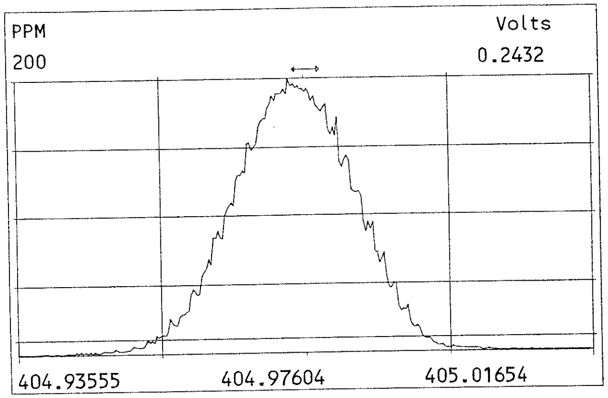
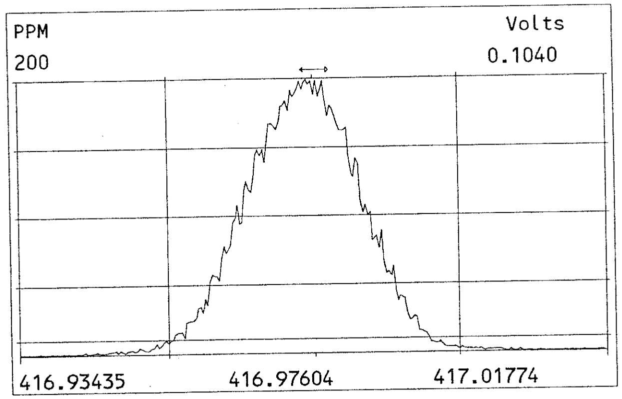
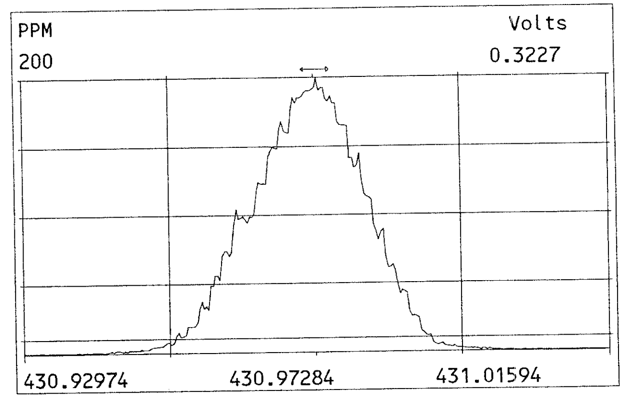
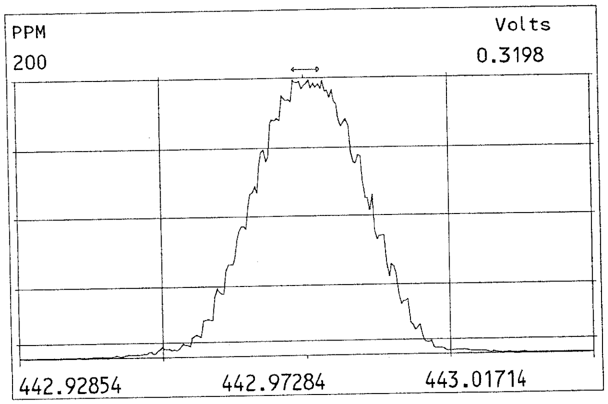
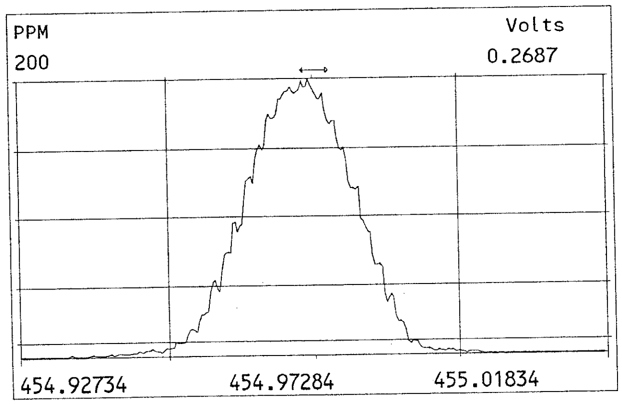
Experiment:PCDD Function:4 Reference:PFK

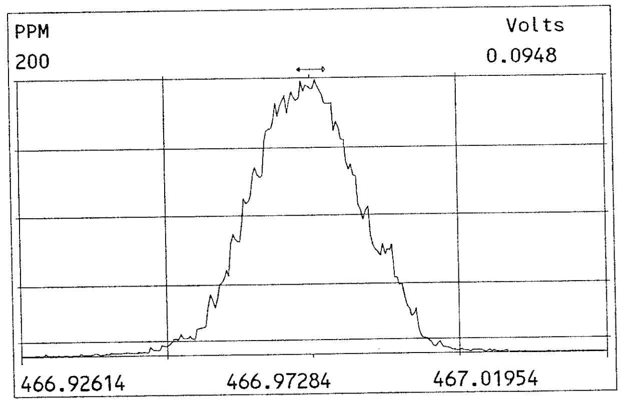


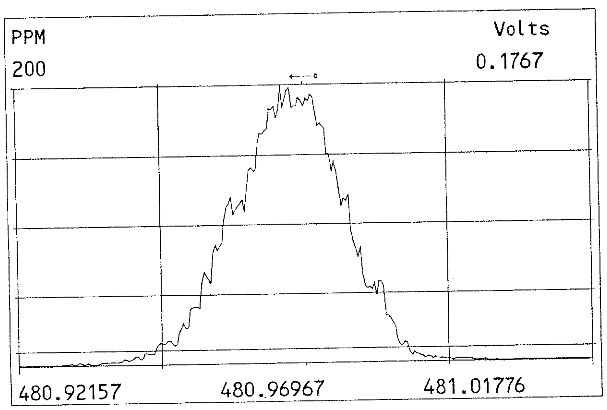




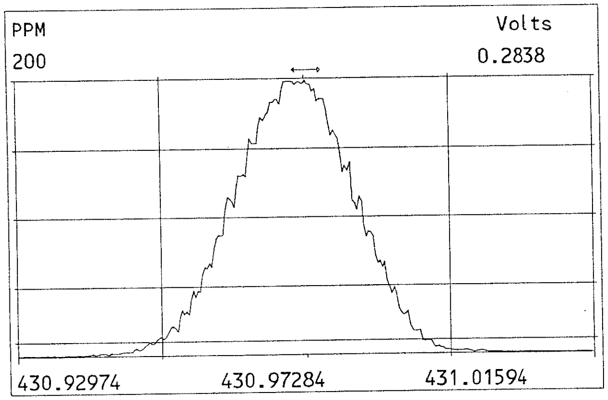


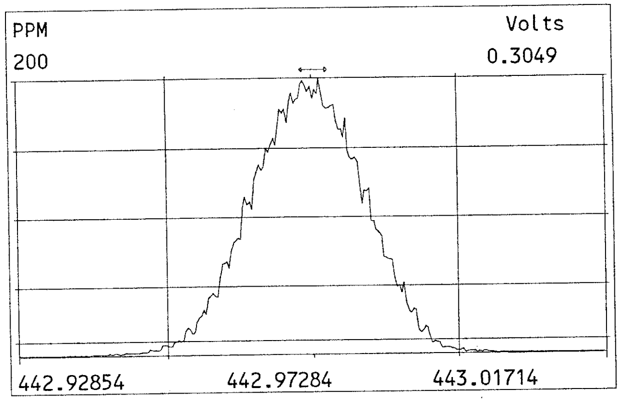


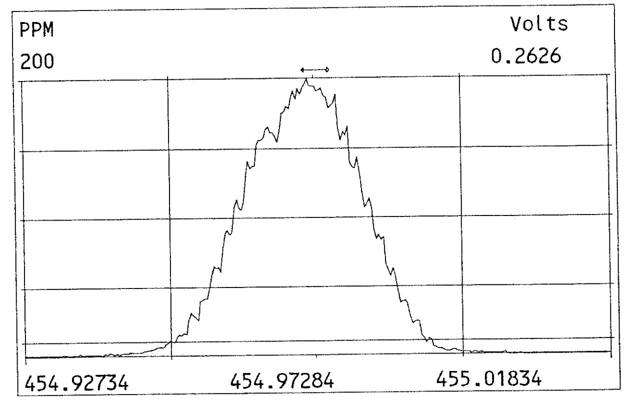


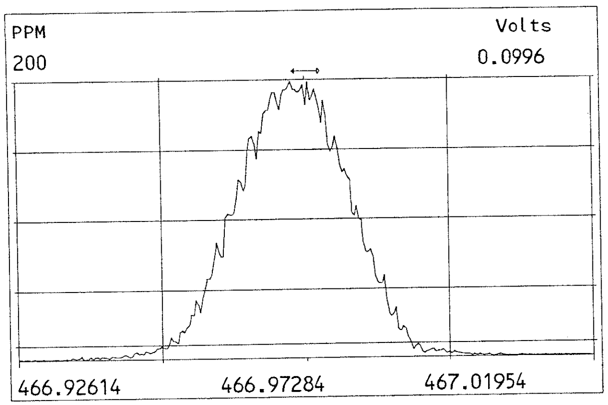


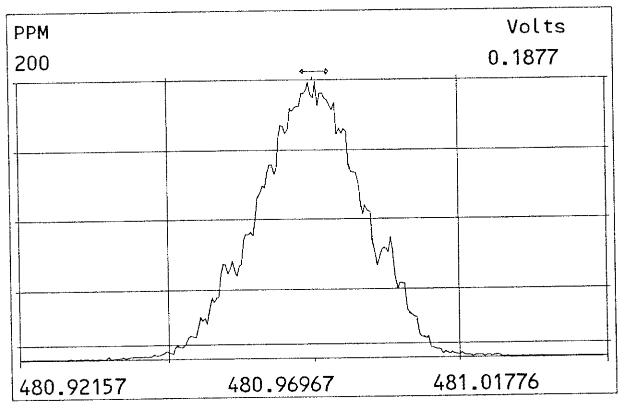
Peak Locate Examination:22-DEC-2017:10:18 File:22DEC17M
Experiment:PCDD Function:5 Reference:PFK

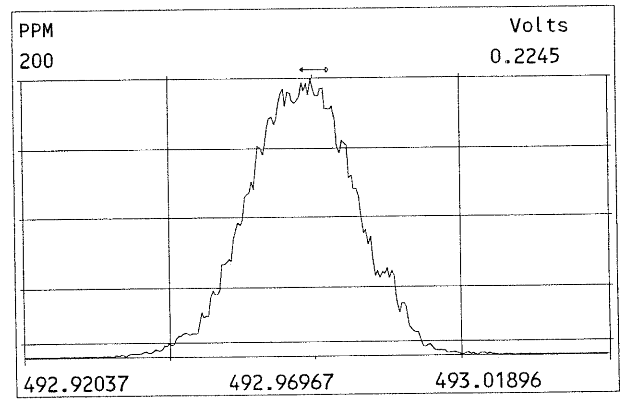


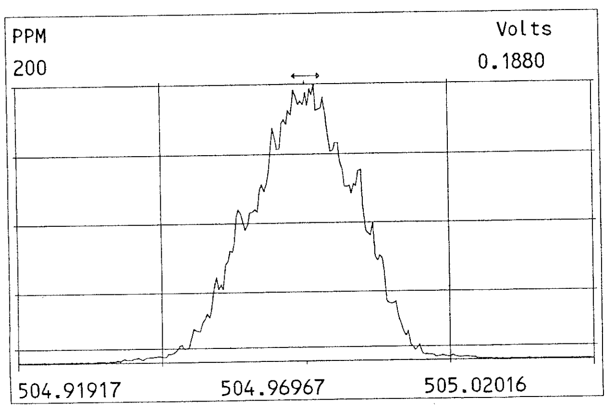


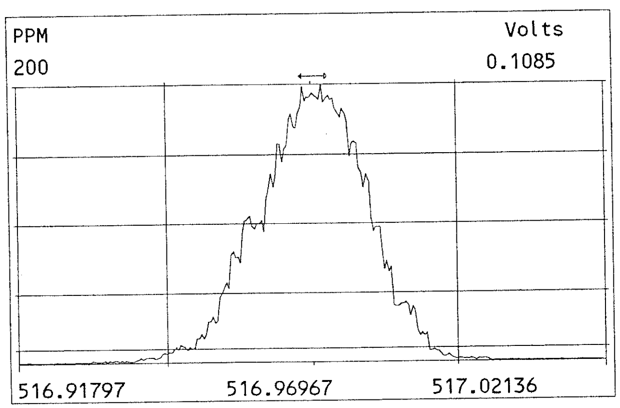












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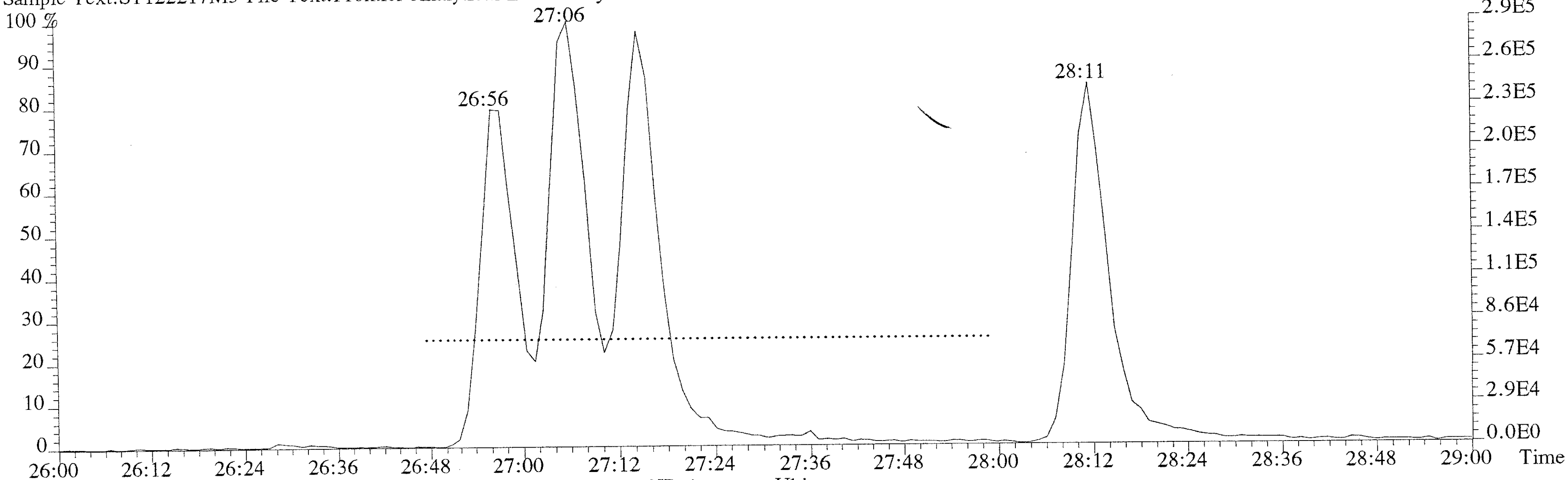

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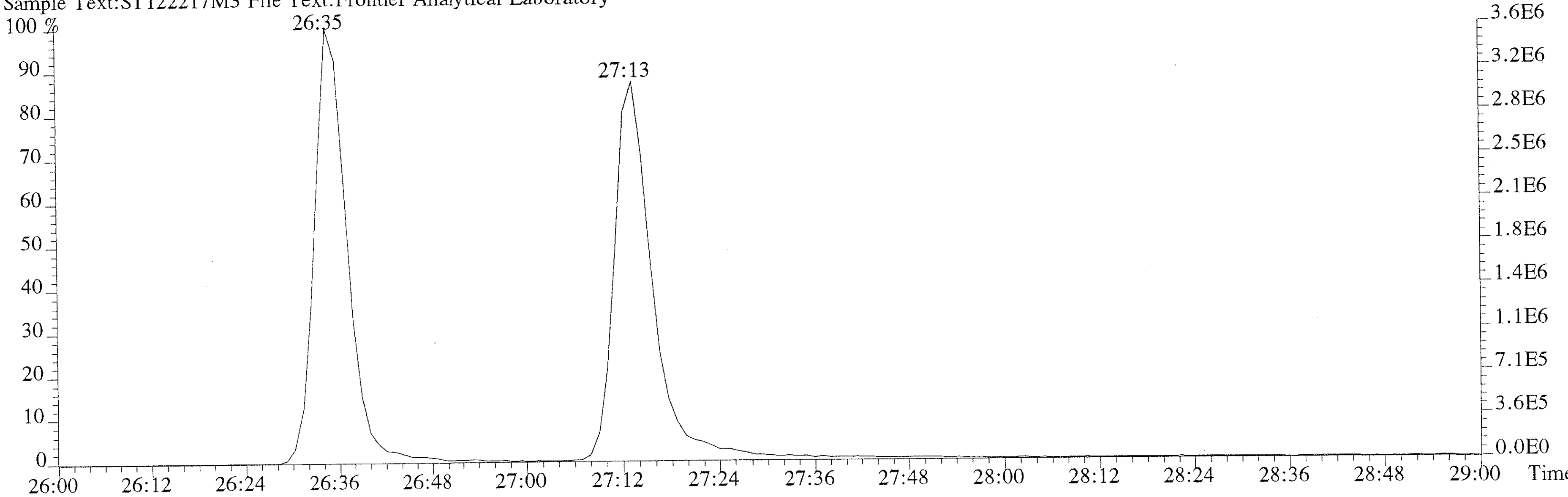

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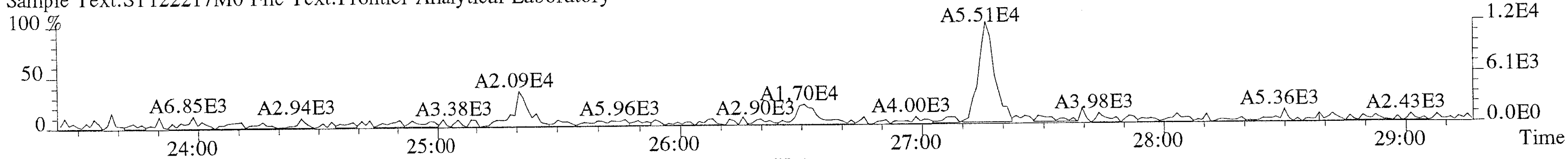
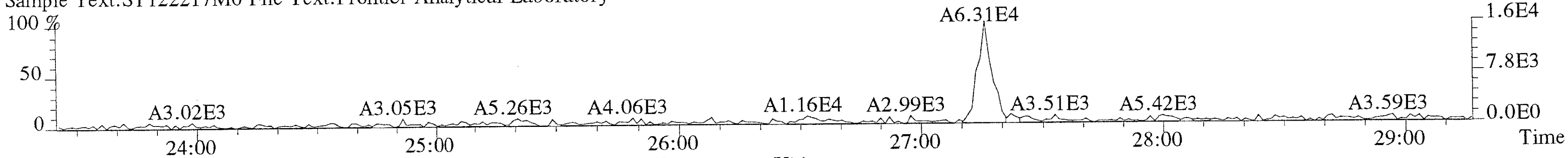
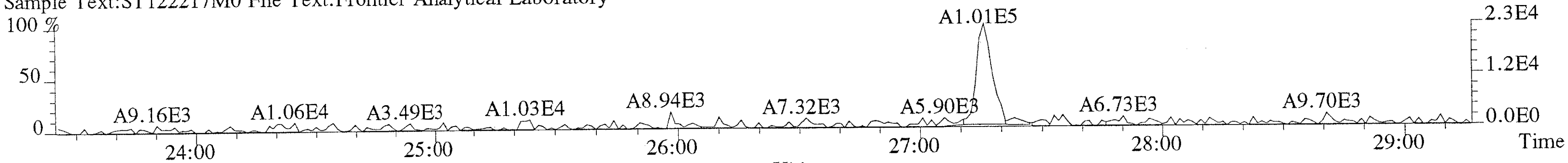
319.8965 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-399 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
321.8936 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-399 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
327.8847 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



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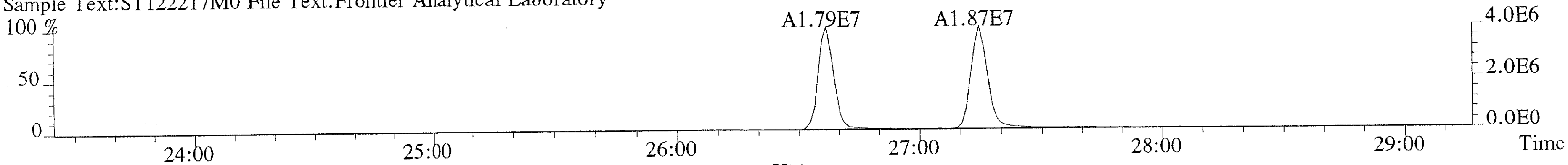
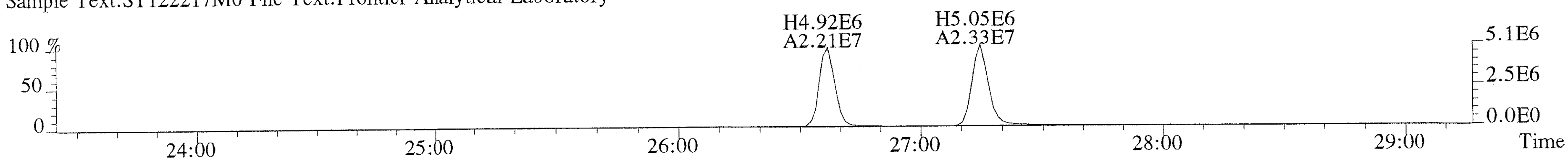
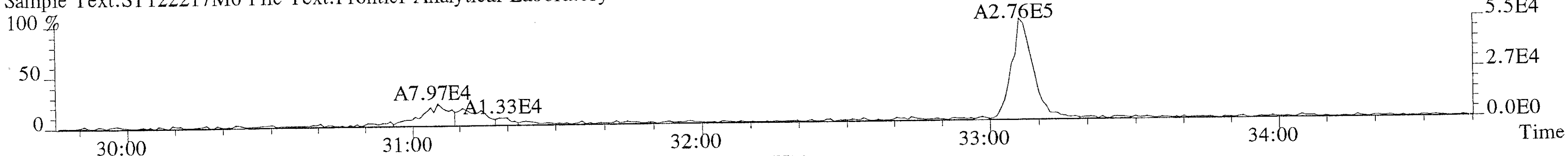
331.9368 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



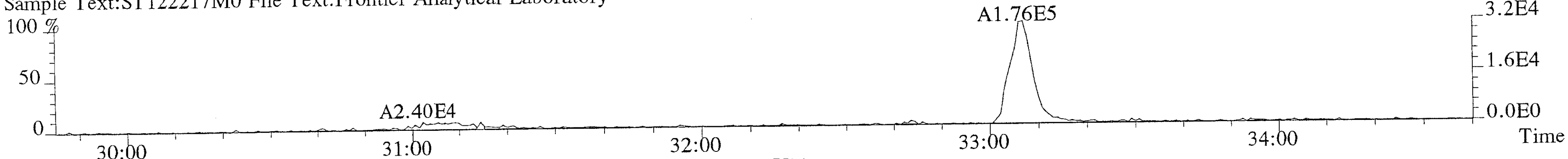
File:22DEC17M #1-399 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
333.9339 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



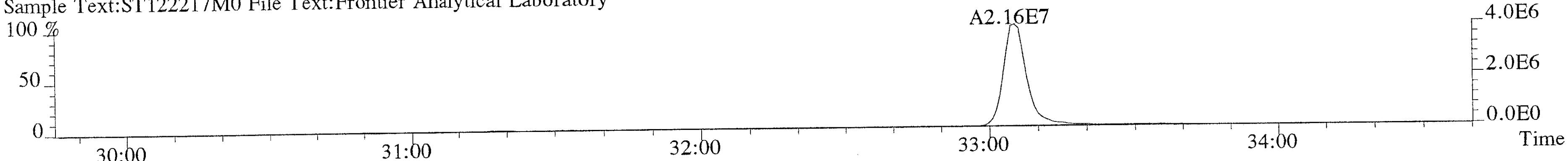
File:22DEC17M #1-411 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
355.8546 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



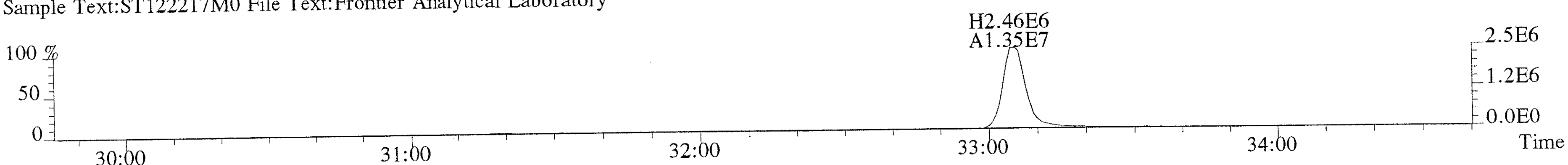
File:22DEC17M #1-411 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
357.8517 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



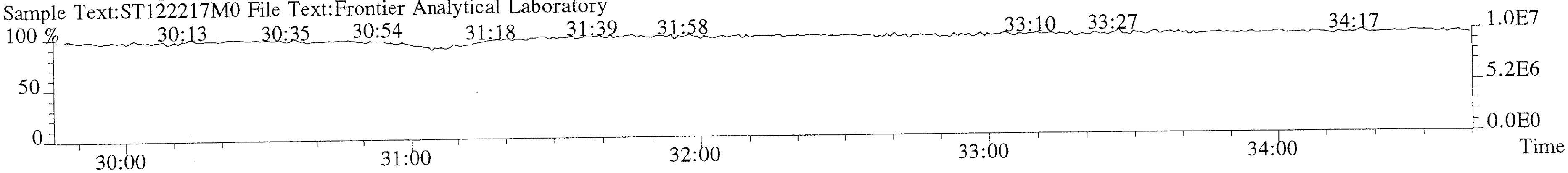
File:22DEC17M #1-411 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
367.8949 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



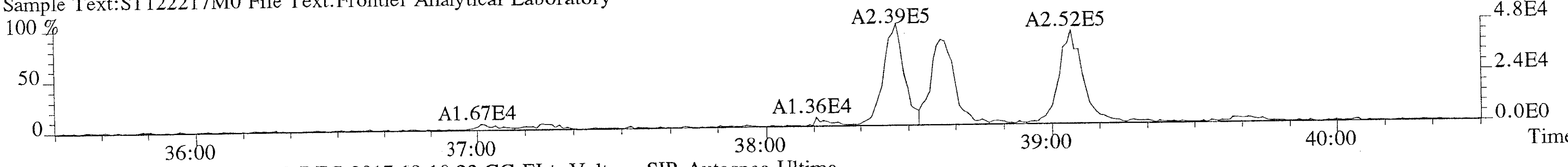
File:22DEC17M #1-411 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
369.8919 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



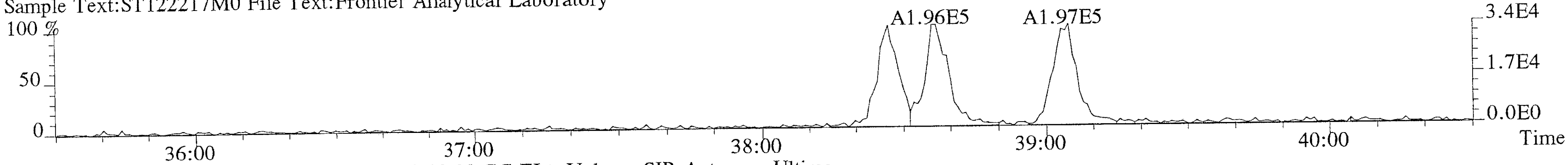
File:22DEC17M #1-411 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
366.9792 F:2 Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



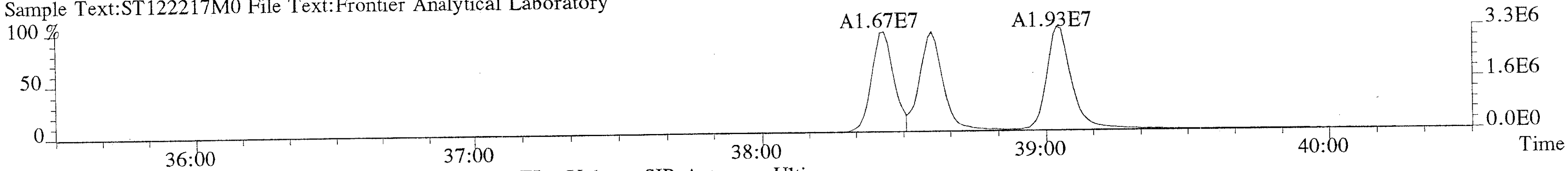
File:22DEC17M #1-495 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
389.8156 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



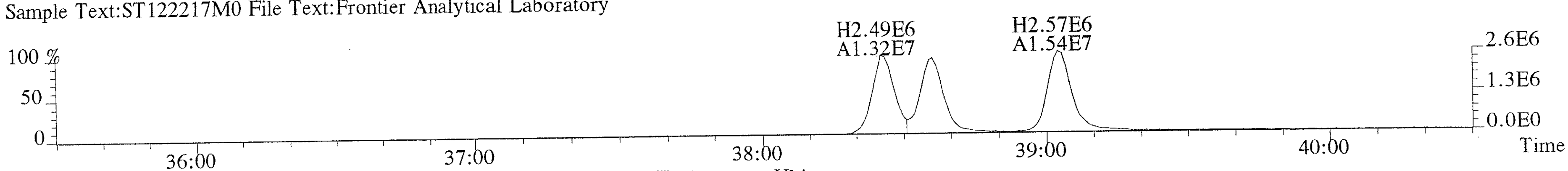
File:22DEC17M #1-495 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
391.8127 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



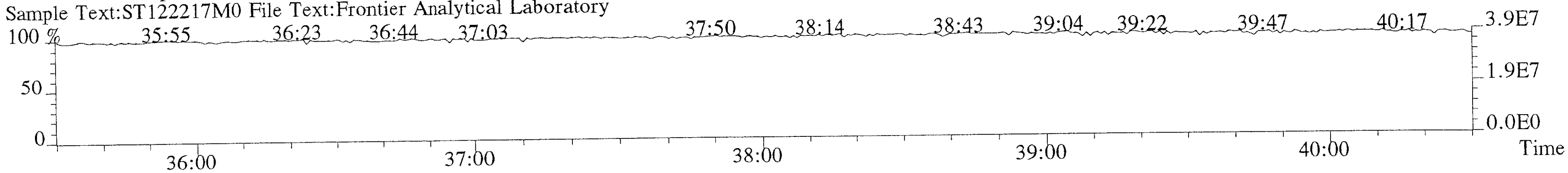
File:22DEC17M #1-495 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
401.8559 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



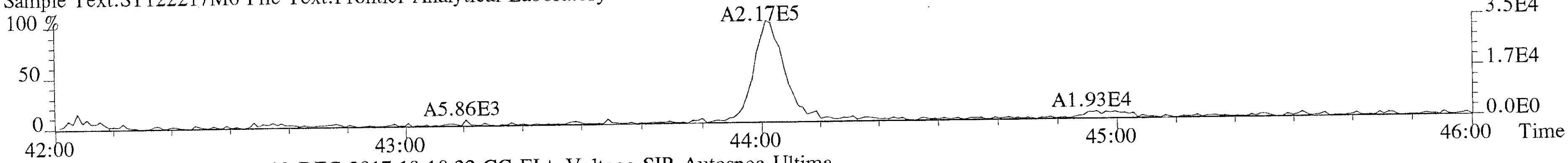
File:22DEC17M #1-495 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
403.8530 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



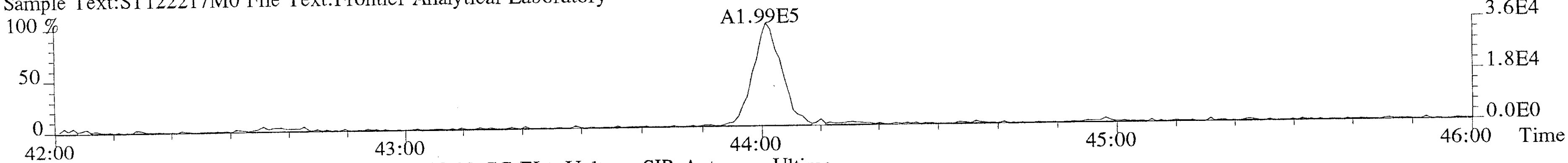
File:22DEC17M #1-495 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
380.9760 F:3 Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



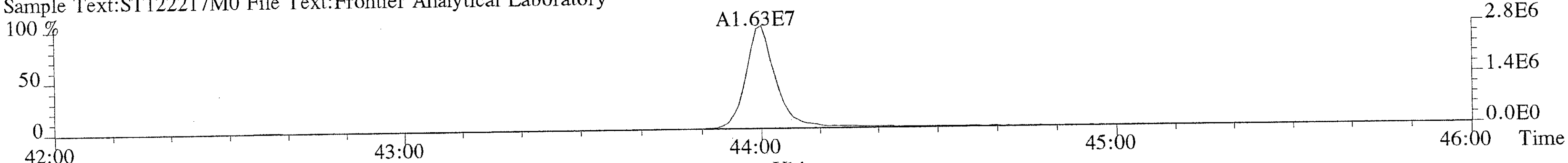
File:22DEC17M #1-520 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
423.7767 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



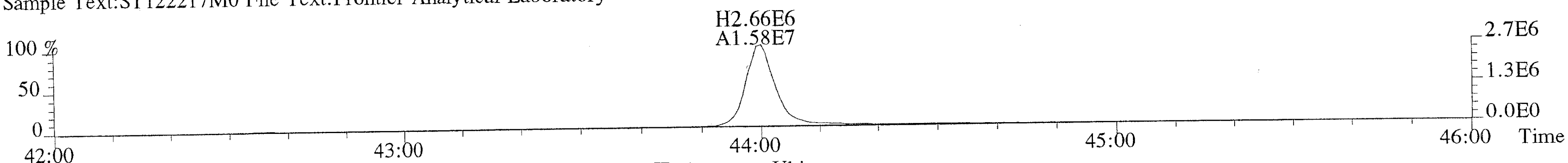
File:22DEC17M #1-520 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
425.7737 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



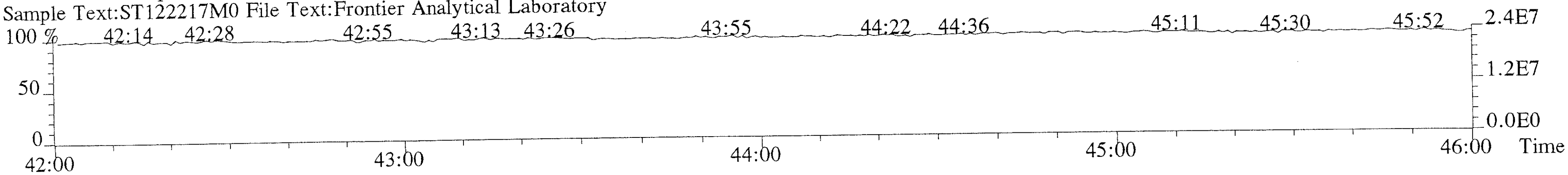
File:22DEC17M #1-520 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
435.8169 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



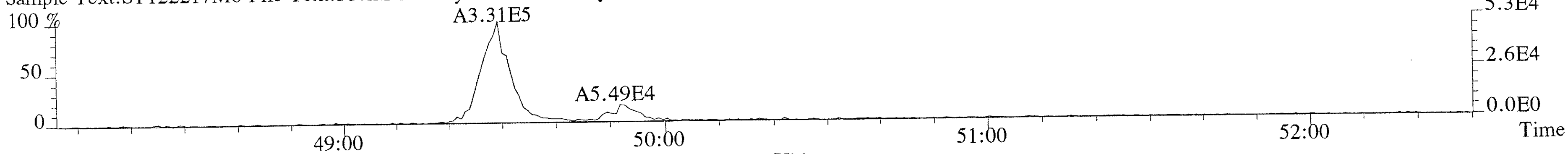
File:22DEC17M #1-520 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
437.8140 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



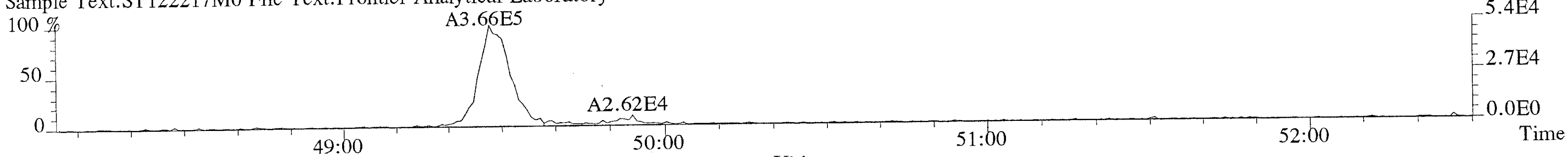
File:22DEC17M #1-520 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
430.9728 F:4 Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



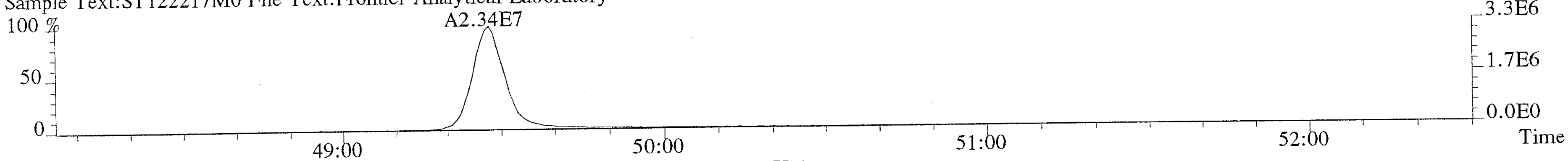
File:22DEC17M #1-361 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
457.7377 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



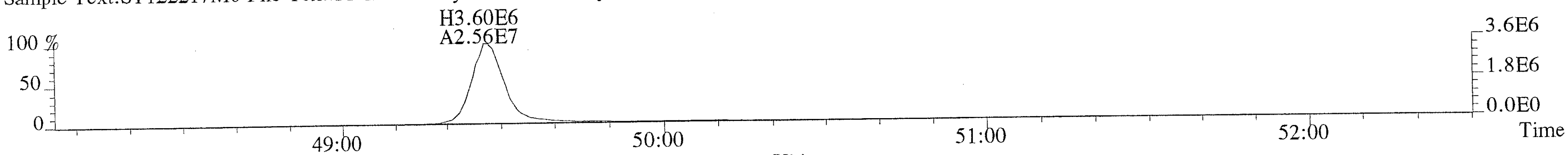
File:22DEC17M #1-361 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
459.7348 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



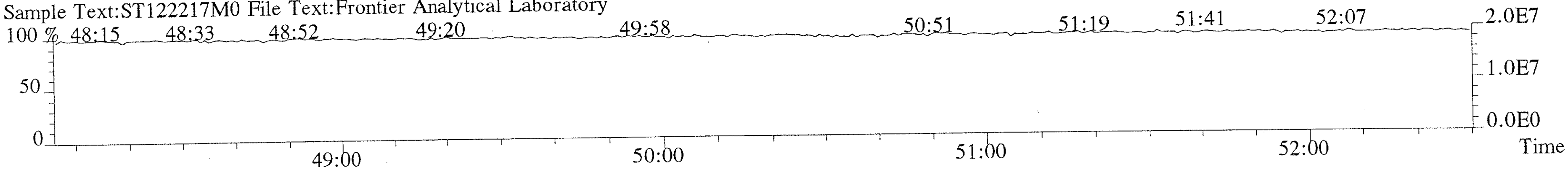
File:22DEC17M #1-361 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
469.7780 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



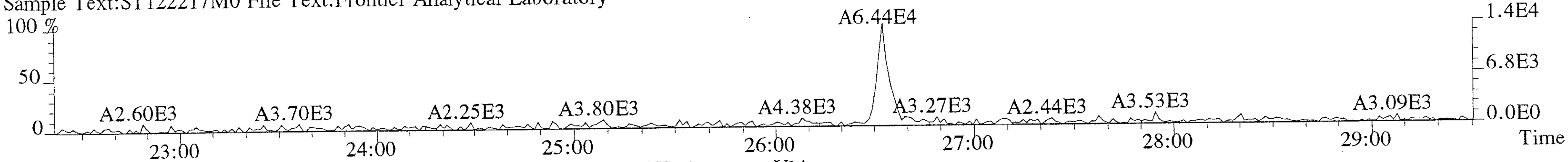
File:22DEC17M #1-361 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
471.7750 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



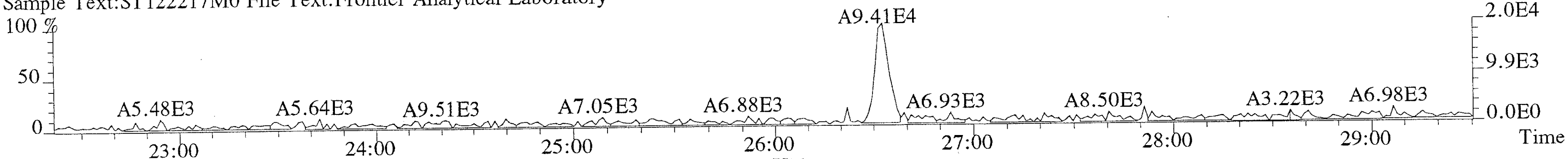
File:22DEC17M #1-361 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
454.9728 F:5 Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



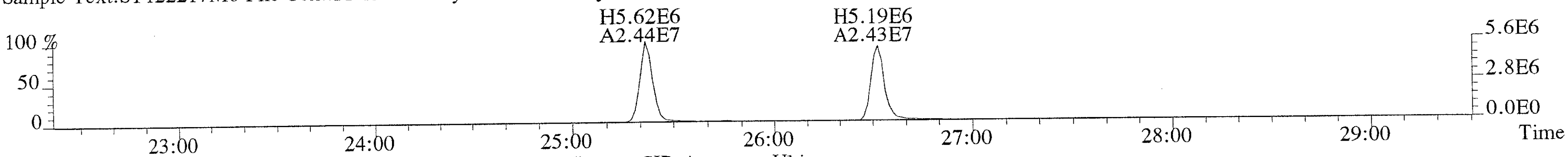
File:22DEC17M #1-399 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
303.9016 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



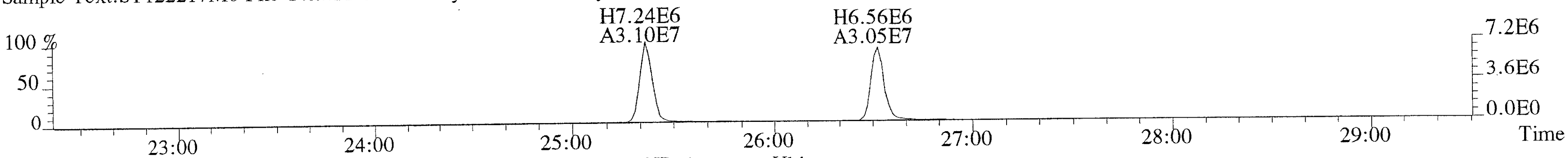
File:22DEC17M #1-399 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
305.8987 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



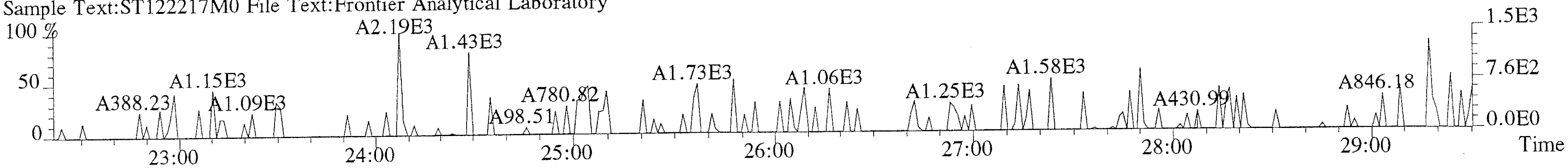
File:22DEC17M #1-399 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
315.9419 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



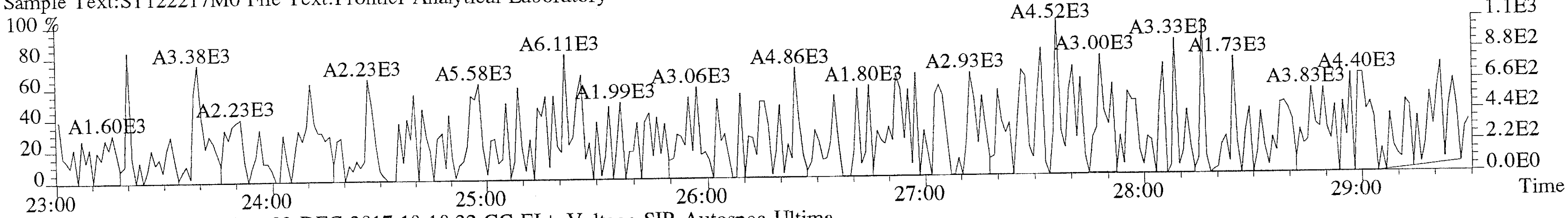
File:22DEC17M #1-399 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
317.9389 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



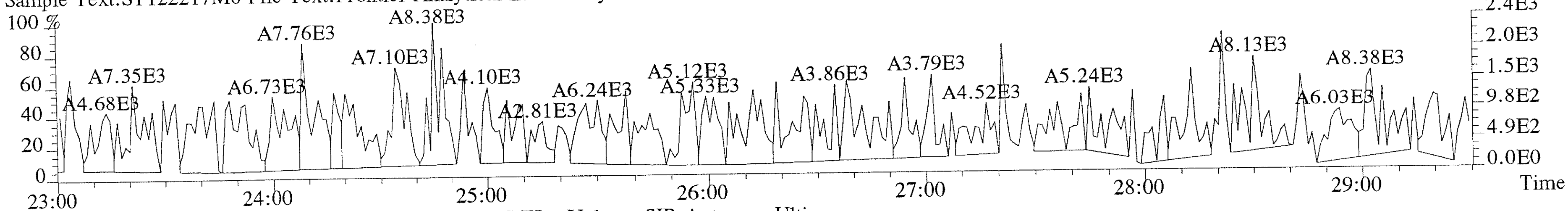
File:22DEC17M #1-399 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
375.8364 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



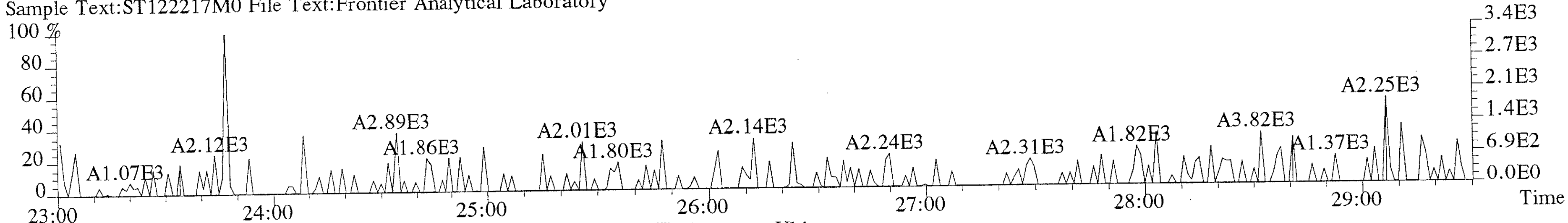
File:22DEC17M #1-399 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
339.8597 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



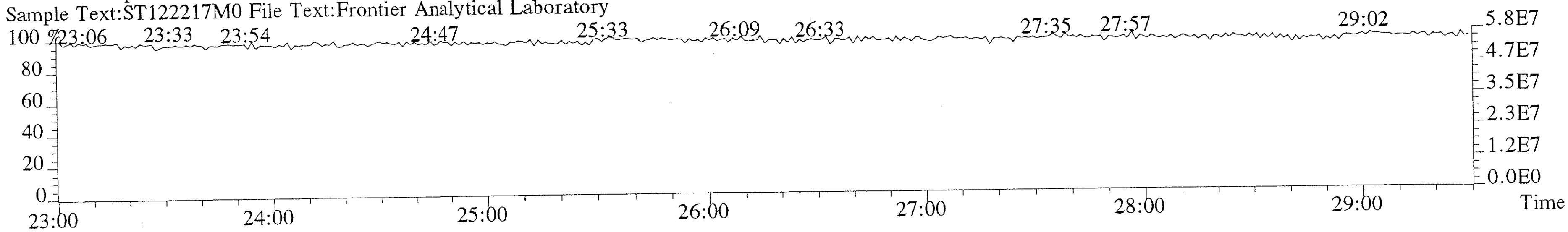
File:22DEC17M #1-399 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
341.8568 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



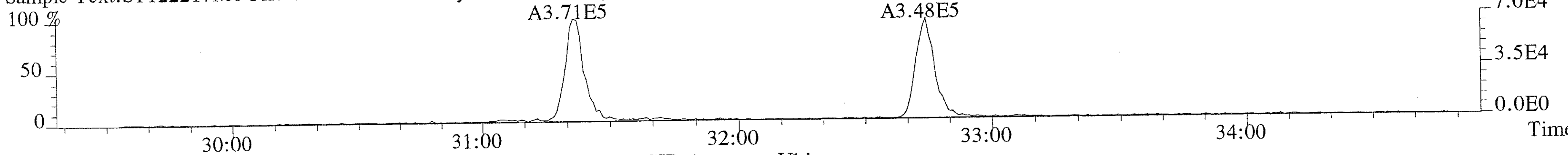
File:22DEC17M #1-399 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
409.7974 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



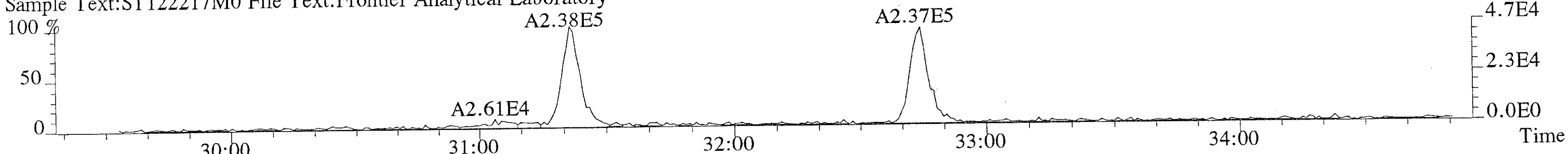
File:22DEC17M #1-399 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
330.9792 Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



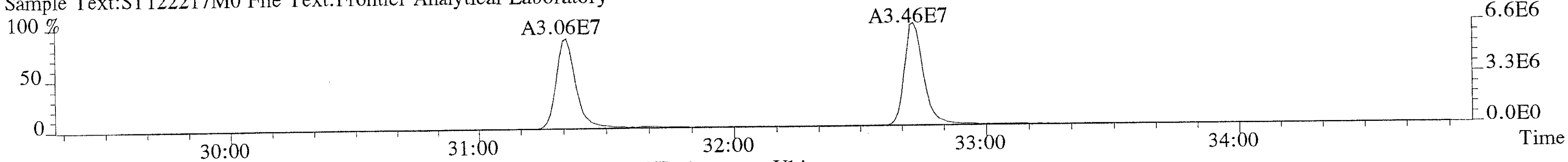
File:22DEC17M #1-411 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
339.8597 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



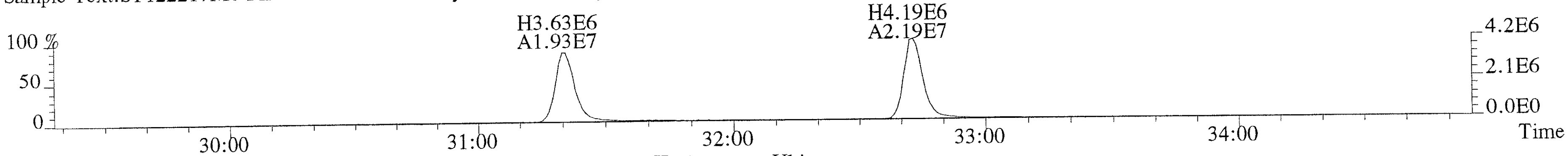
File:22DEC17M #1-411 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
341.8568 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



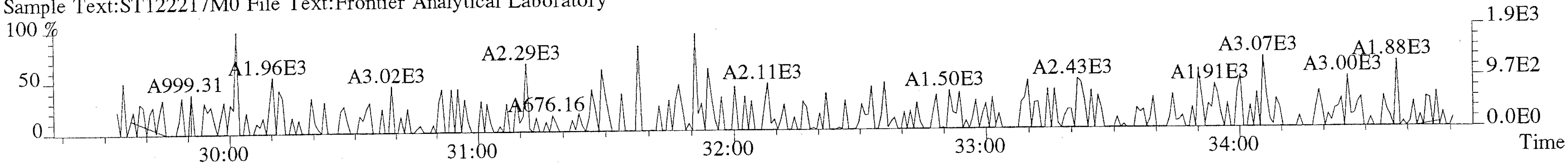
File:22DEC17M #1-411 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
351.9000 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



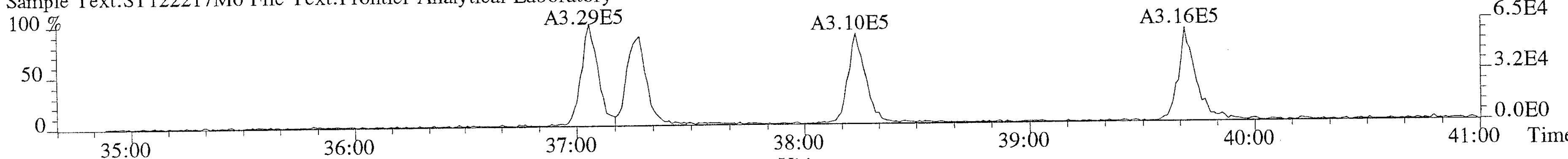
File:22DEC17M #1-411 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
353.8970 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



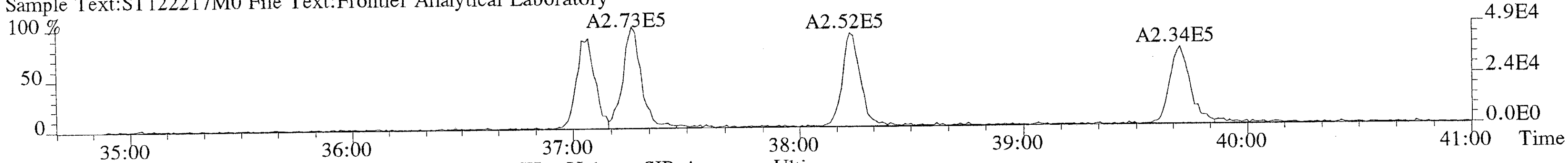
File:22DEC17M #1-411 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
409.7974 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



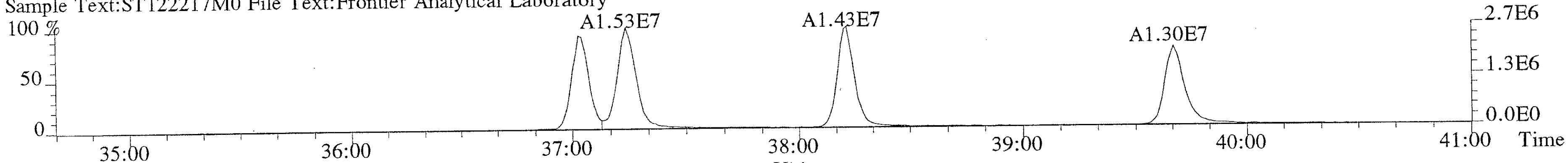
File:22DEC17M #1-495 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
373.8207 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



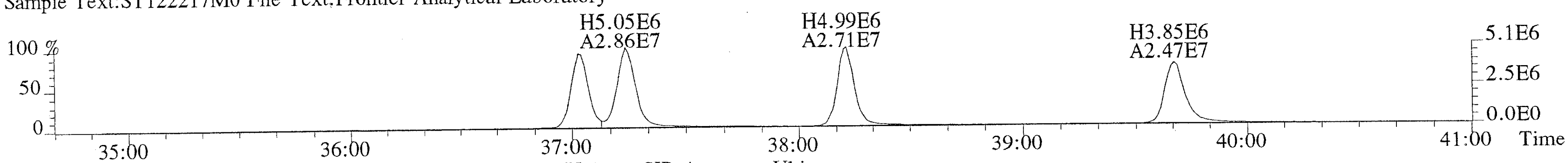
File:22DEC17M #1-495 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
375.8178 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



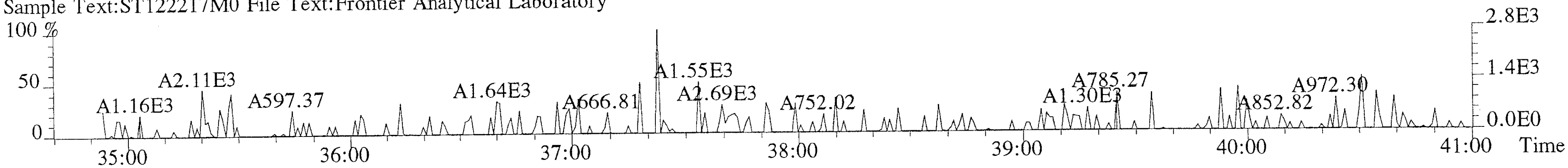
File:22DEC17M #1-495 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
383.8639 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



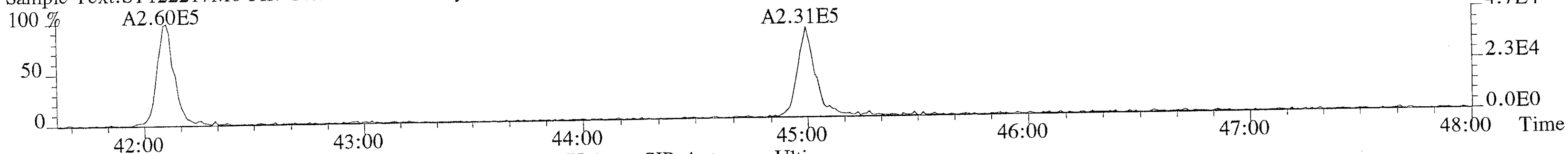
File:22DEC17M #1-495 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
385.8610 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



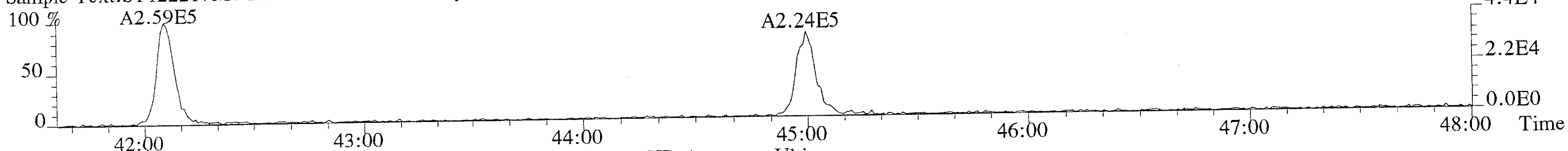
File:22DEC17M #1-495 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
445.7555 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



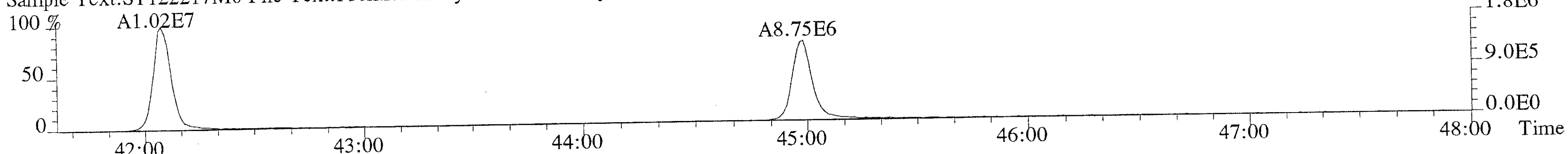
File:22DEC17M #1-520 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
407.7818 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



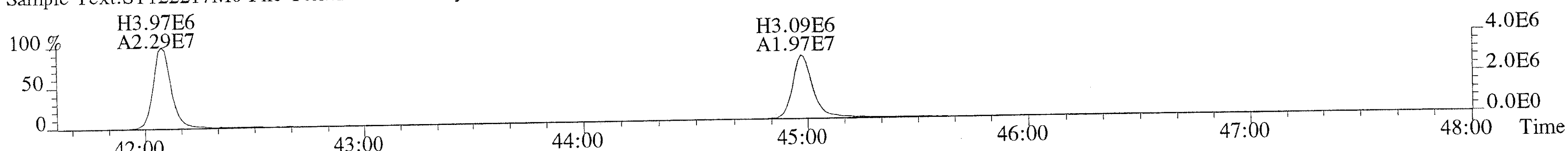
File:22DEC17M #1-520 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
409.7788 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



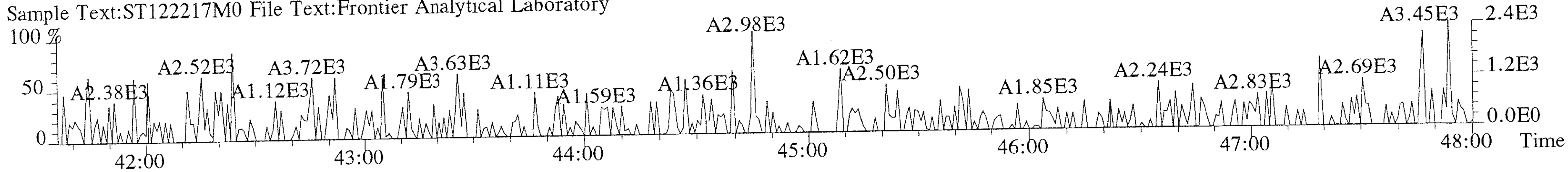
File:22DEC17M #1-520 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
417.8253 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



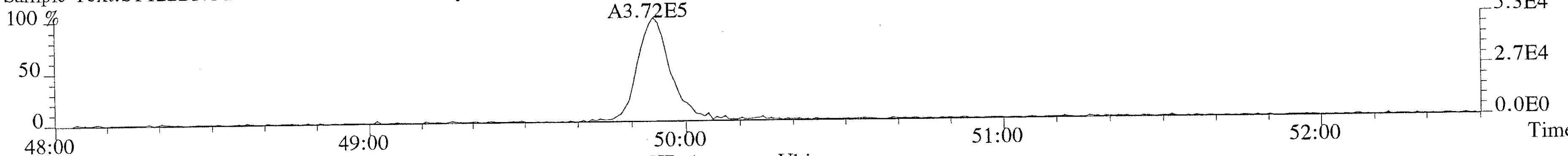
File:22DEC17M #1-520 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
419.8220 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



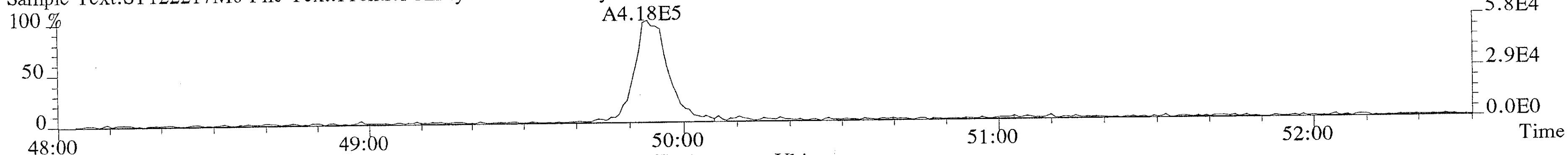
File:22DEC17M #1-520 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
479.7165 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



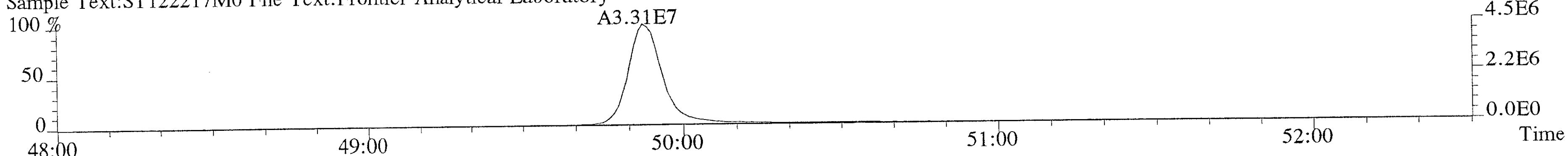
File:22DEC17M #1-361 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
441.7428 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



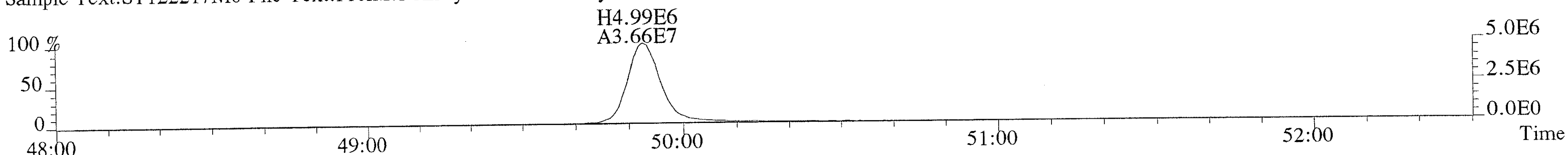
File:22DEC17M #1-361 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
443.7398 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



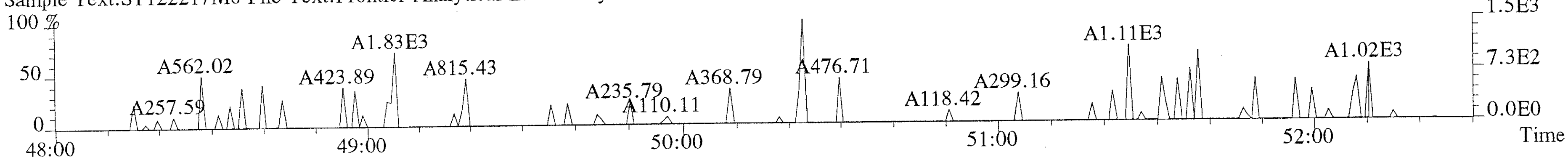
File:22DEC17M #1-361 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
453.7831 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



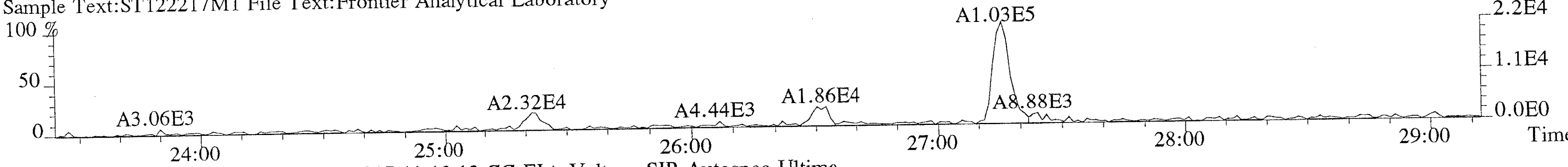
File:22DEC17M #1-361 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
455.7801 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



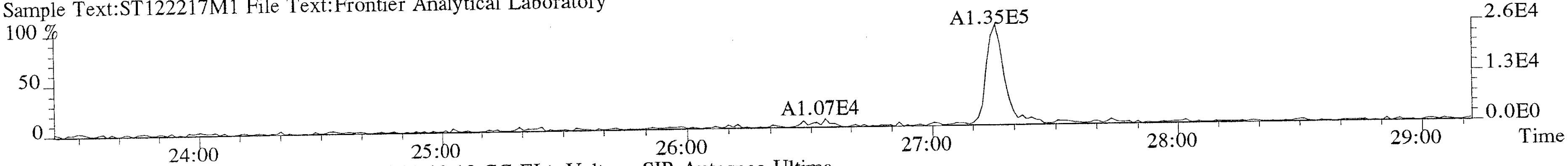
File:22DEC17M #1-361 Acq:22-DEC-2017 10:18:22 GC EI+ Voltage SIR Autospec-Ultima
513.6775 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M0 File Text:Frontier Analytical Laboratory



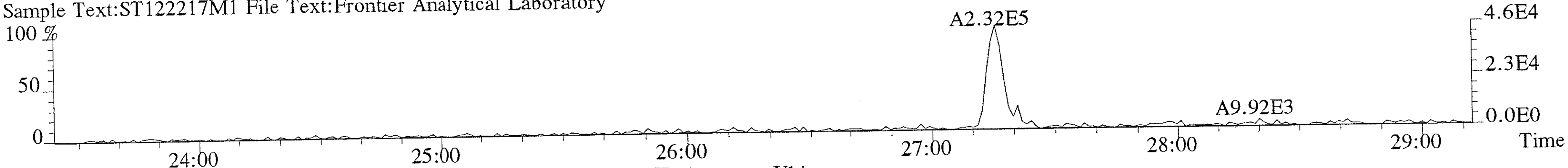
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



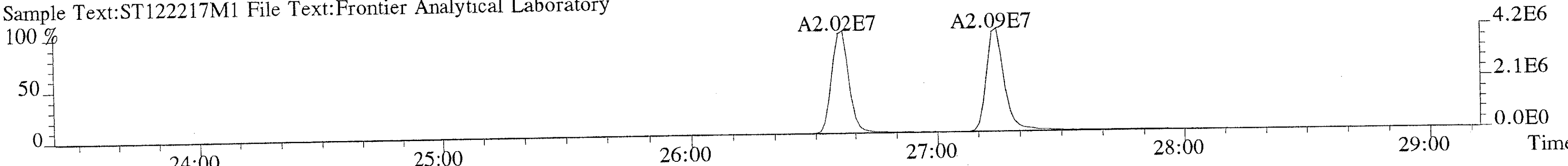
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



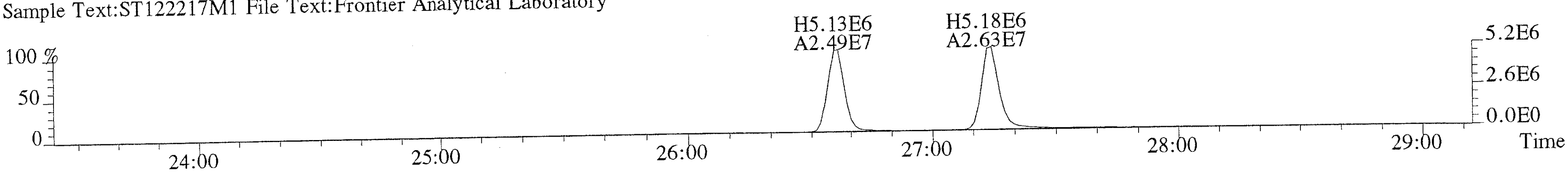
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
327.8847 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



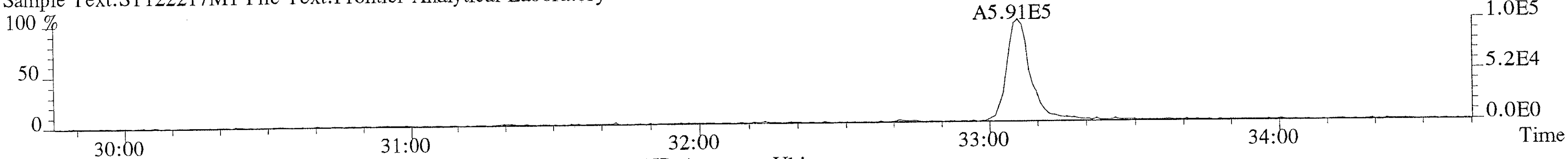
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
331.9368 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



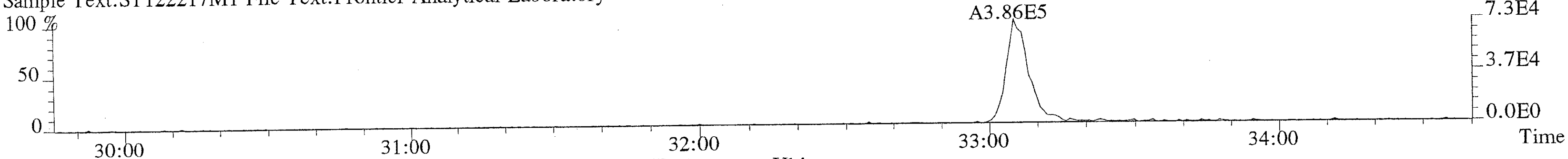
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
333.9339 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



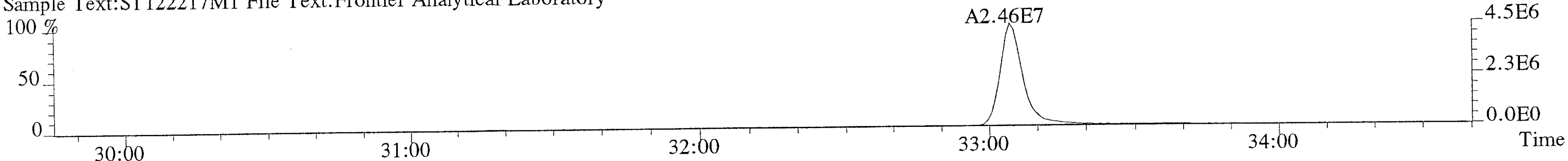
File:22DEC17M #1-411 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
355.8546 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



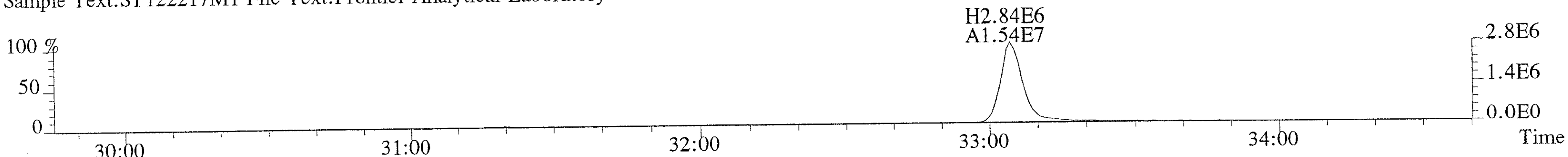
File:22DEC17M #1-411 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
357.8517 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



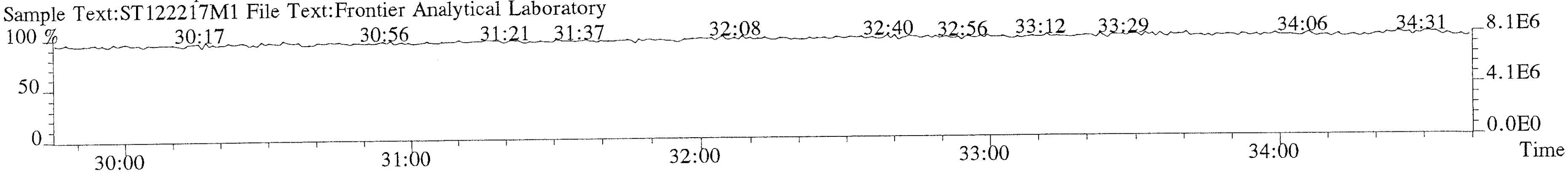
File:22DEC17M #1-411 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
367.8949 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



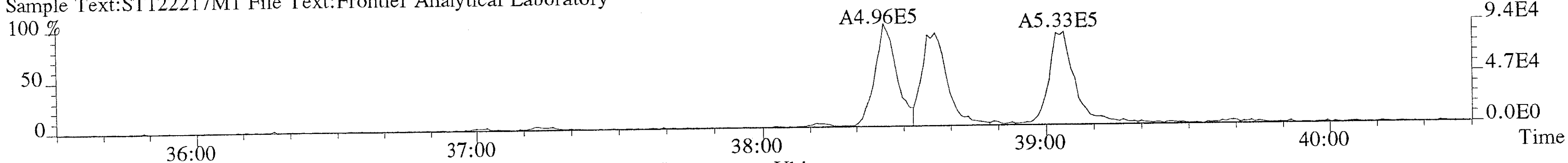
File:22DEC17M #1-411 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
369.8919 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



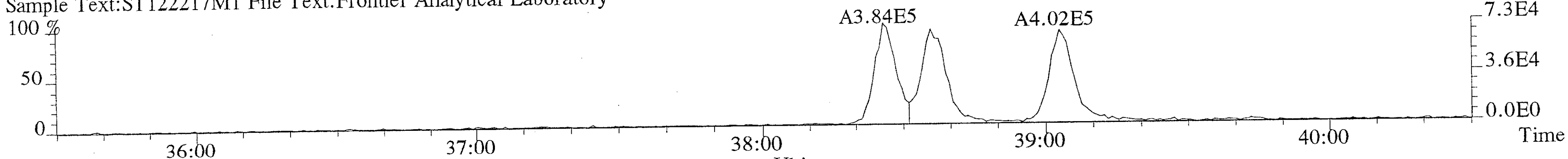
File:22DEC17M #1-411 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
366.9792 S:2 F:2 Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



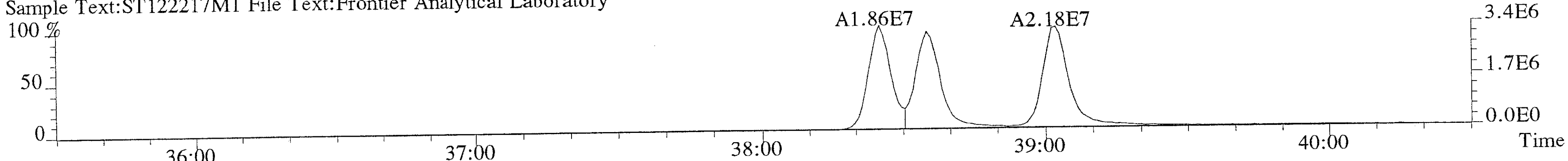
File:22DEC17M #1-495 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
389.8156 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



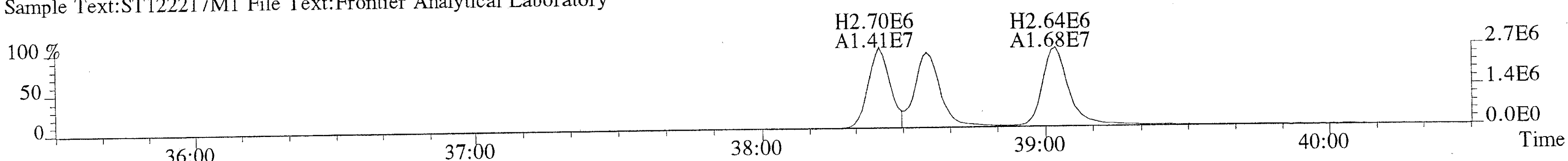
File:22DEC17M #1-495 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
391.8127 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



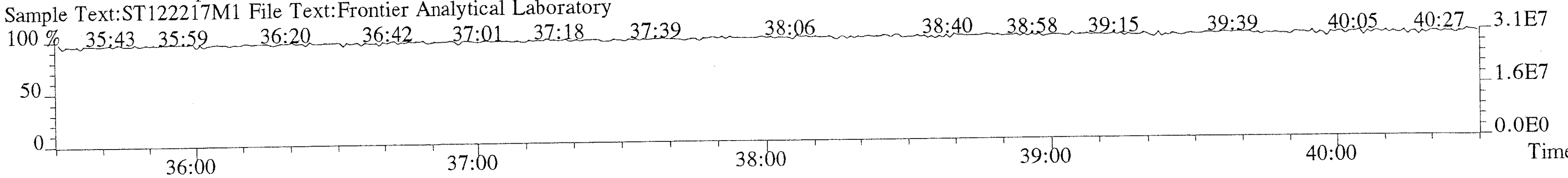
File:22DEC17M #1-495 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
401.8559 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



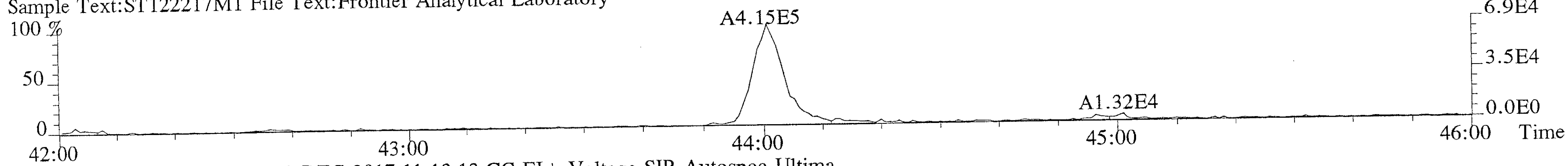
File:22DEC17M #1-495 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
403.8530 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



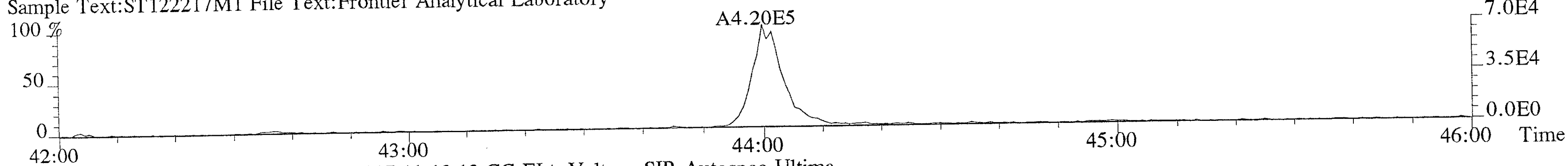
File:22DEC17M #1-495 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
380.9760 S:2 F:3 Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



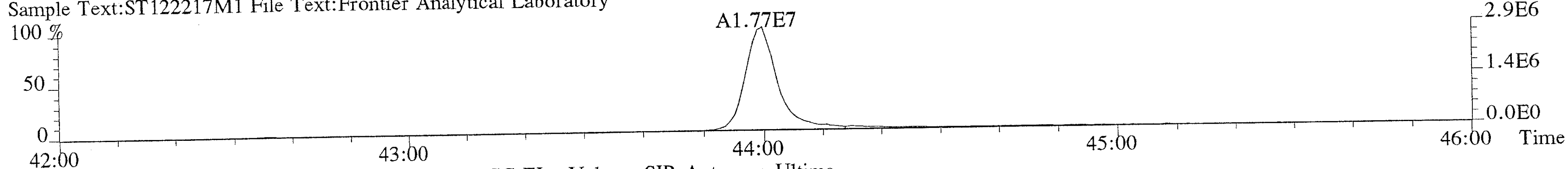
File:22DEC17M #1-521 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
423.7767 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



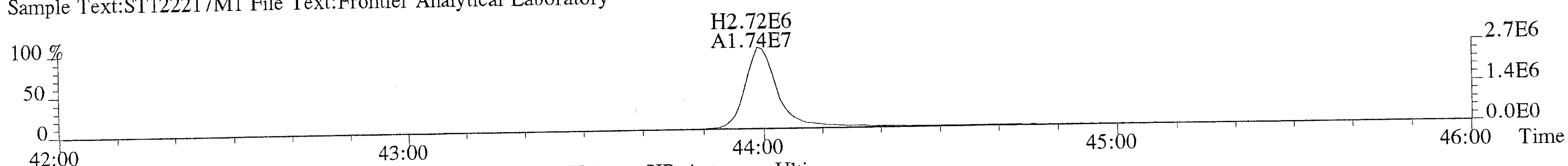
File:22DEC17M #1-521 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
425.7737 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



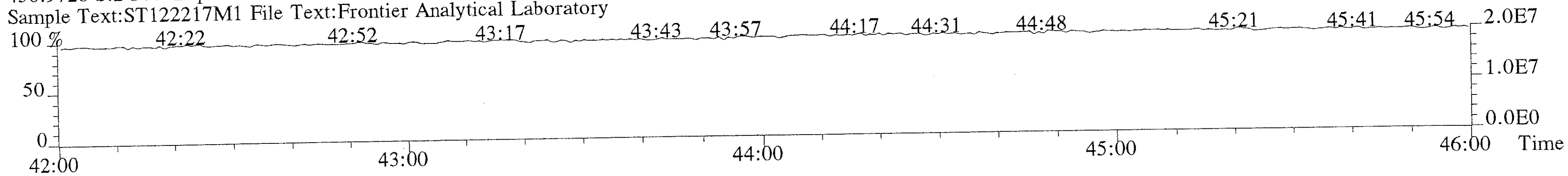
File:22DEC17M #1-521 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
435.8169 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



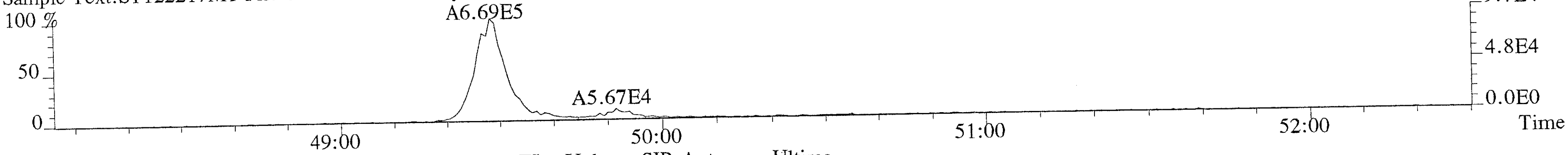
File:22DEC17M #1-521 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
437.8140 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



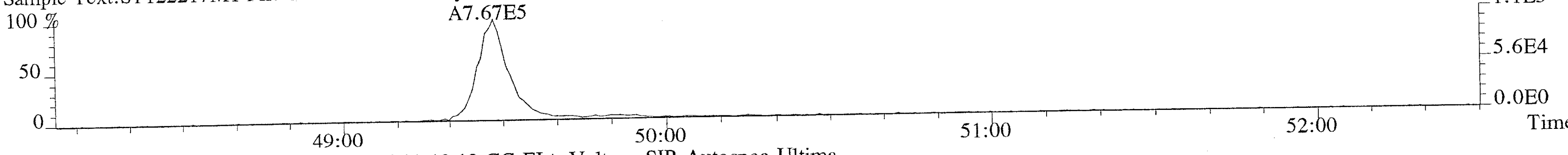
File:22DEC17M #1-521 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
430.9728 S:2 F:4 Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



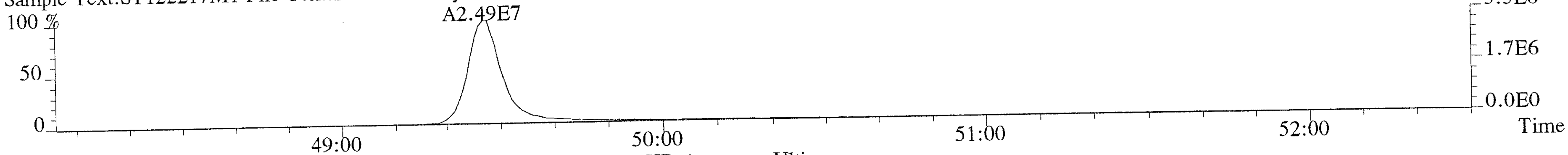
File:22DEC17M #1-361 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
457.7377 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



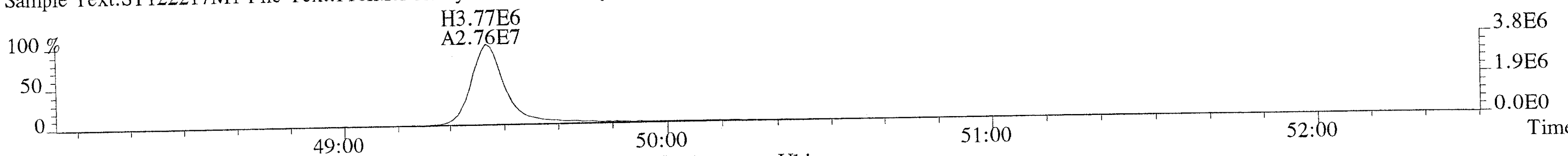
File:22DEC17M #1-361 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
459.7348 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



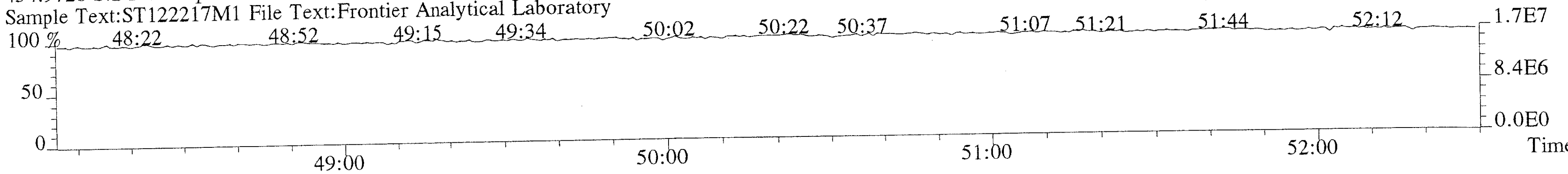
File:22DEC17M #1-361 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
469.7780 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



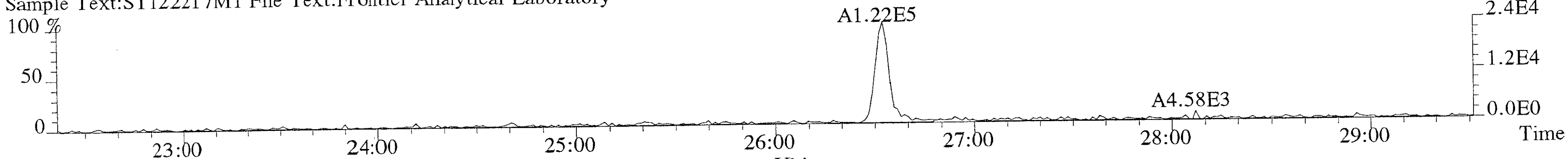
File:22DEC17M #1-361 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
471.7750 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



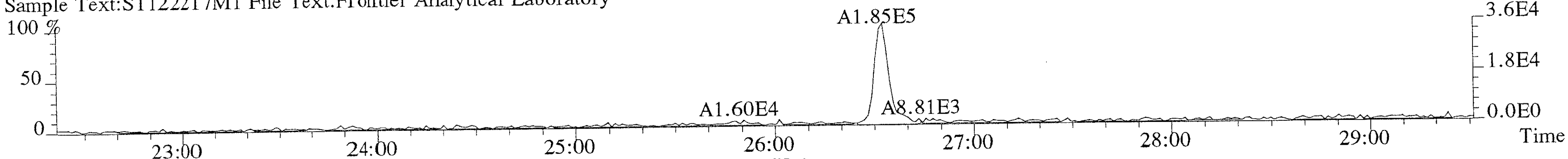
File:22DEC17M #1-361 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
454.9728 S:2 F:5 Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



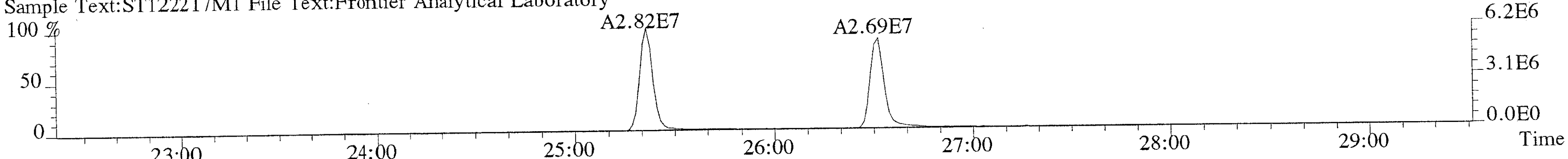
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
303.9016 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



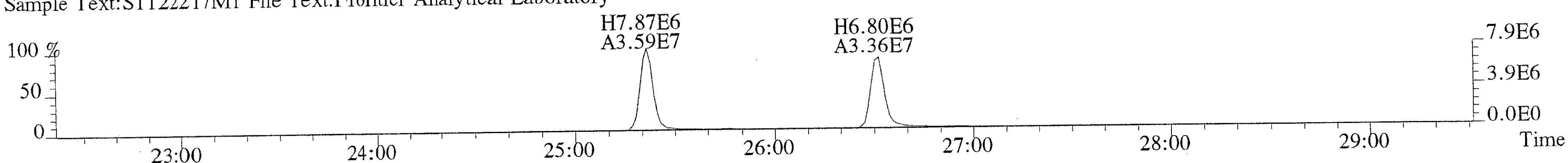
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
305.8987 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



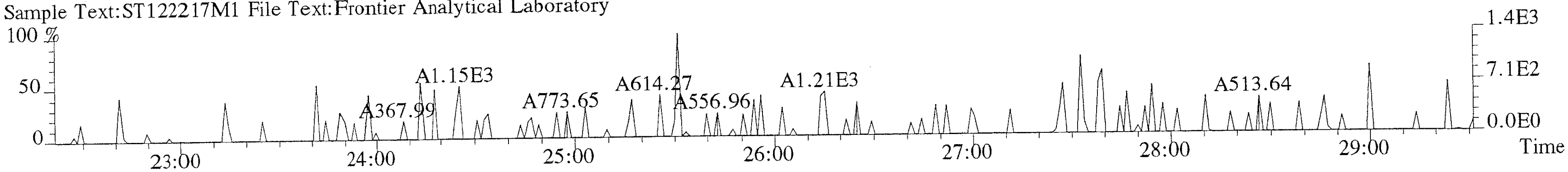
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
315.9419 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



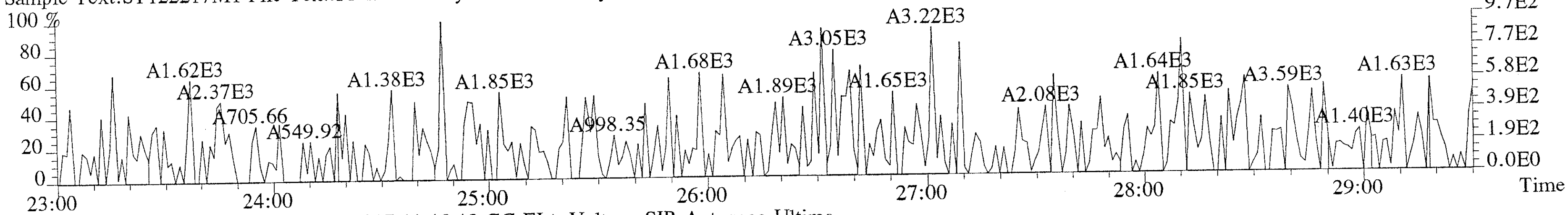
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
317.9389 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



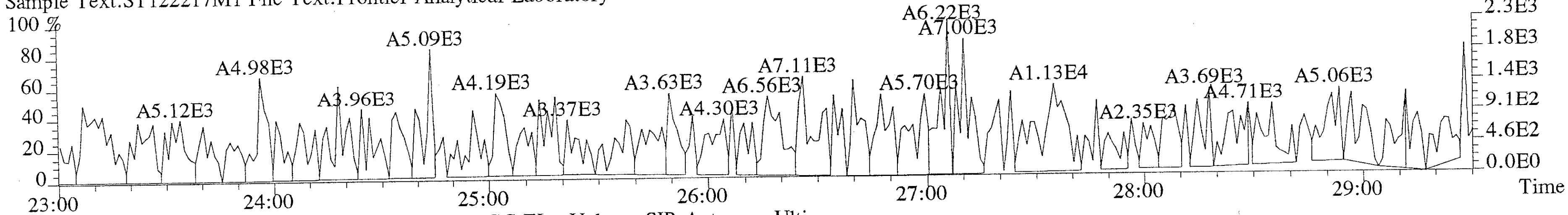
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
375.8364 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



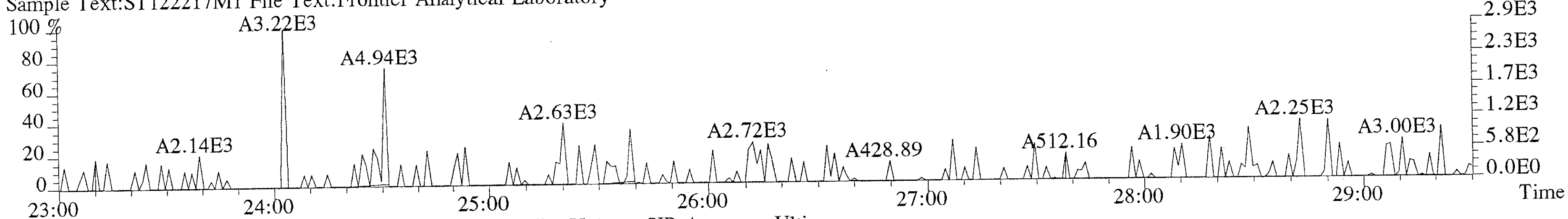
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



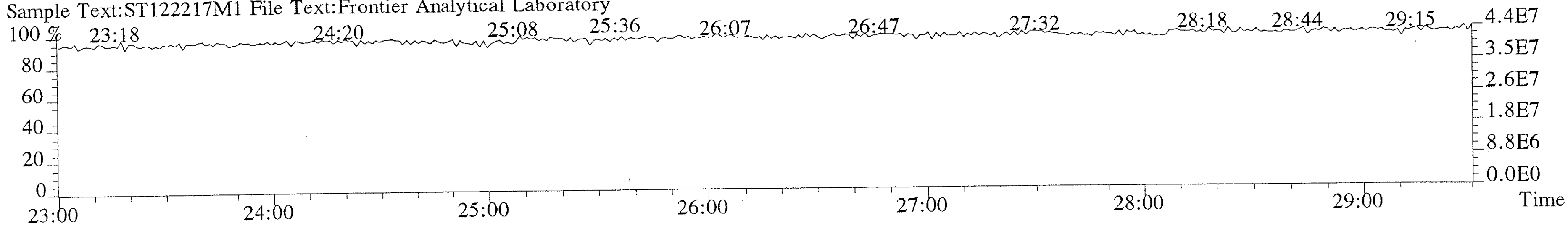
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



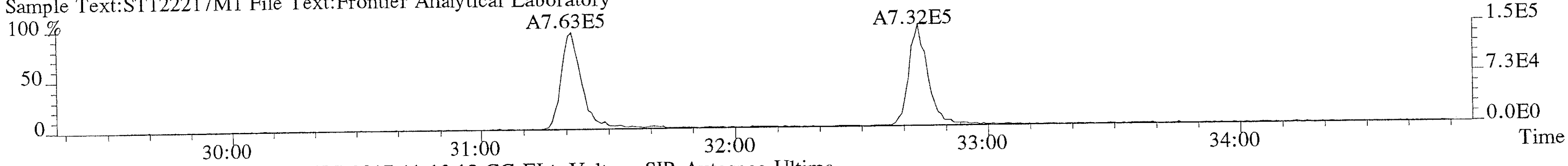
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



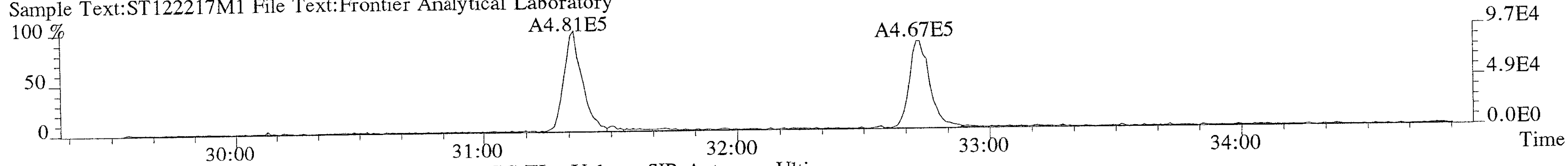
File:22DEC17M #1-400 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
330.9792 S:2 Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



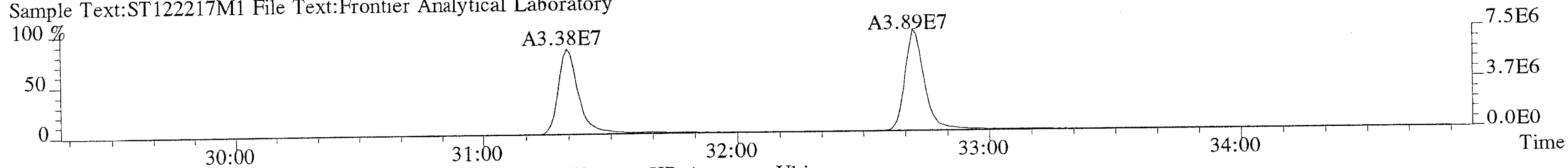
File:22DEC17M #1-411 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



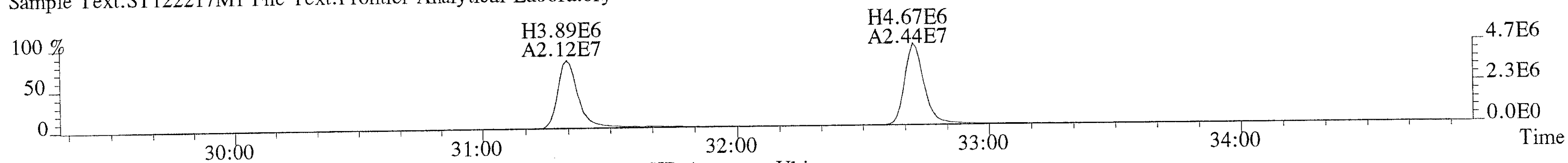
File:22DEC17M #1-411 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



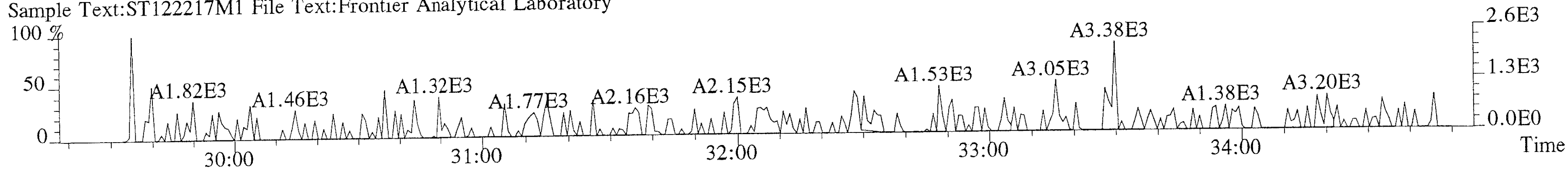
File:22DEC17M #1-411 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



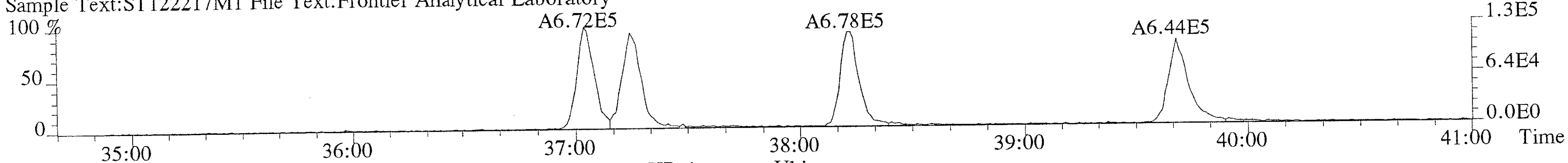
File:22DEC17M #1-411 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
353.8970 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



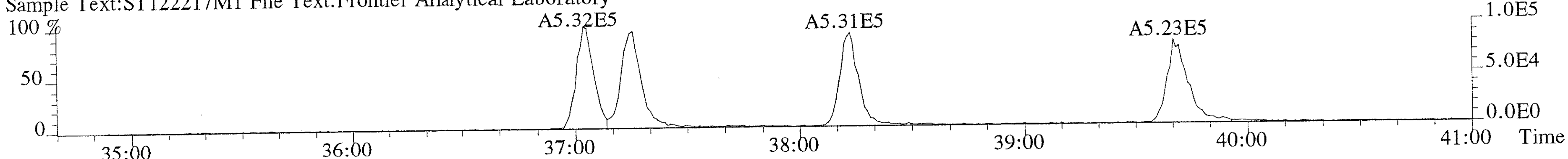
File:22DEC17M #1-411 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:2 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



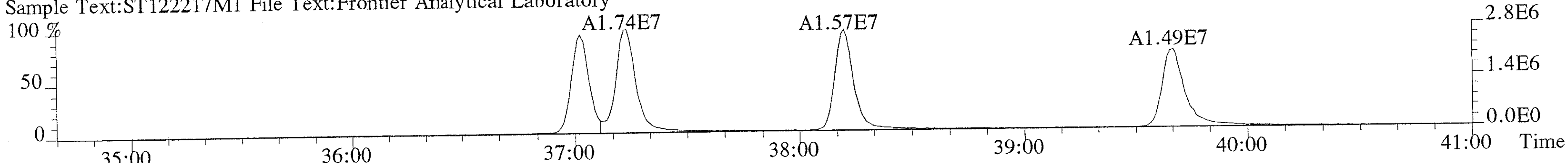
File:22DEC17M #1-495 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
373.8207 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



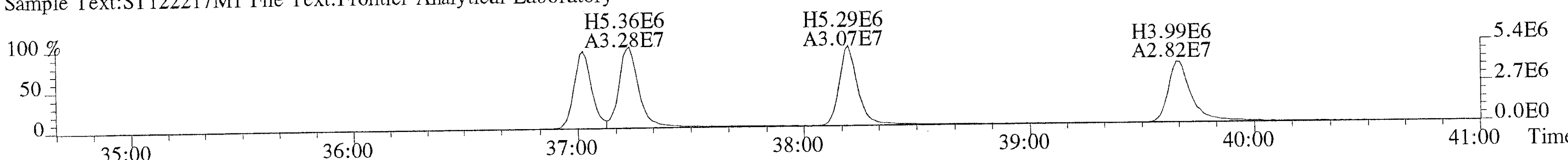
File:22DEC17M #1-495 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
375.8178 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



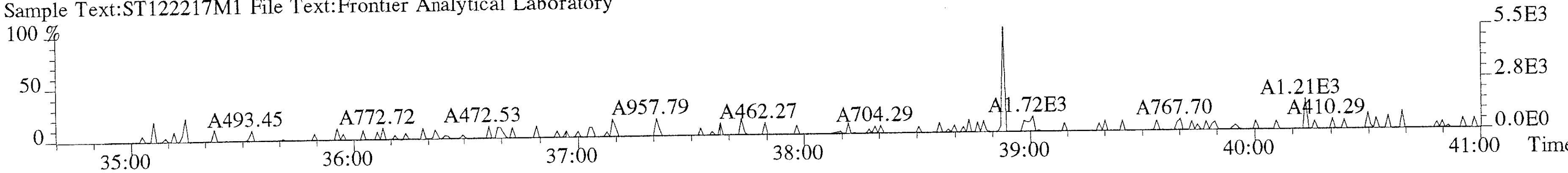
File:22DEC17M #1-495 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



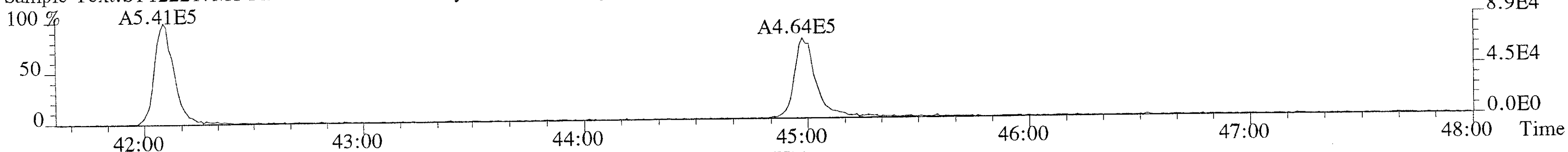
File:22DEC17M #1-495 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
385.8610 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



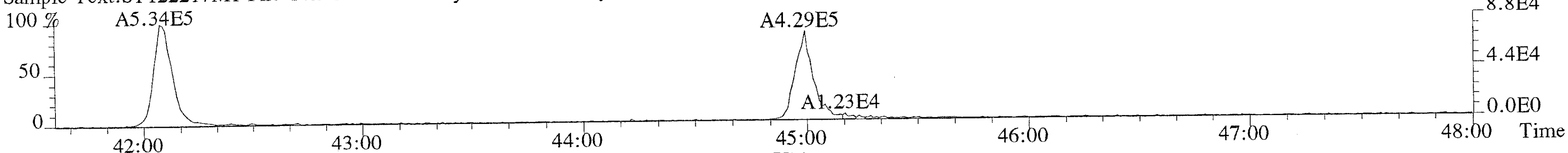
File:22DEC17M #1-495 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
445.7555 S:2 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



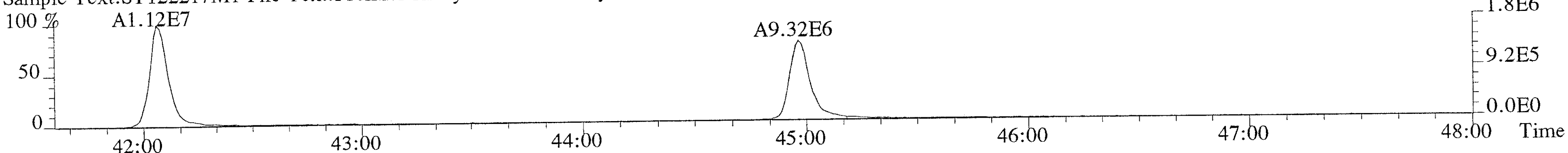
File:22DEC17M #1-521 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



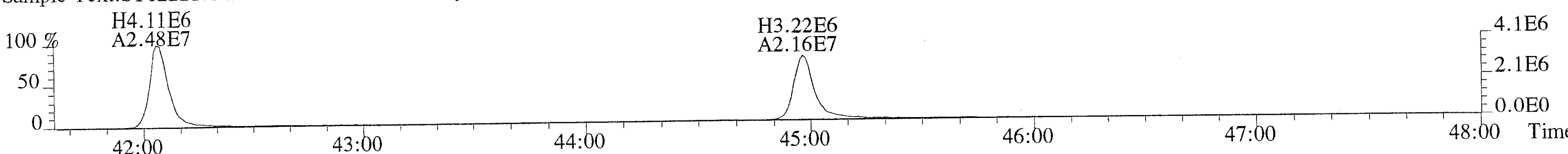
File:22DEC17M #1-521 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
409.7788 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



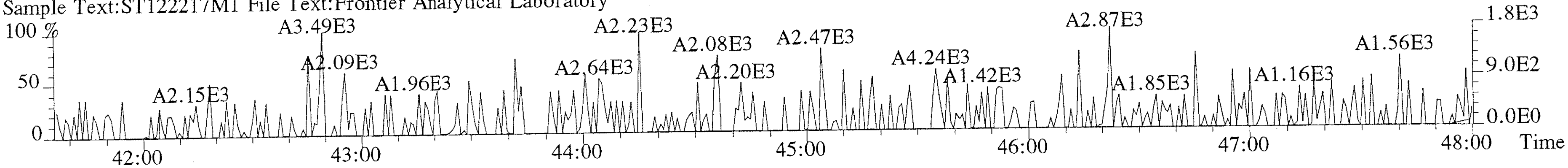
File:22DEC17M #1-521 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
417.8253 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



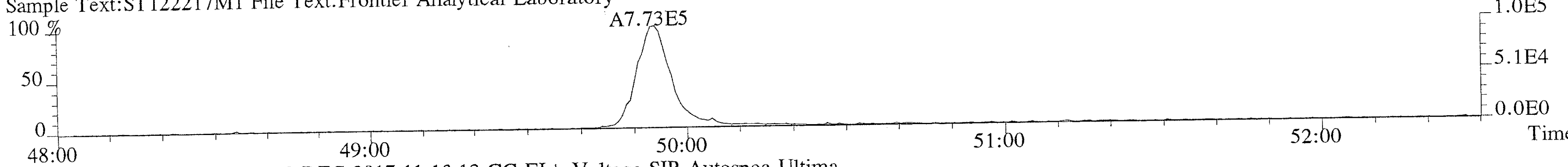
File:22DEC17M #1-521 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
419.8220 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



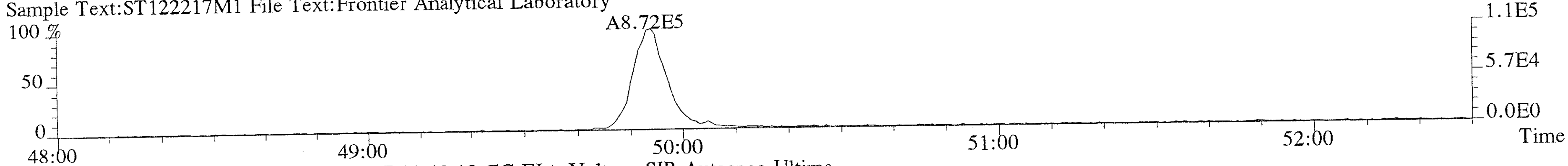
File:22DEC17M #1-521 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:2 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



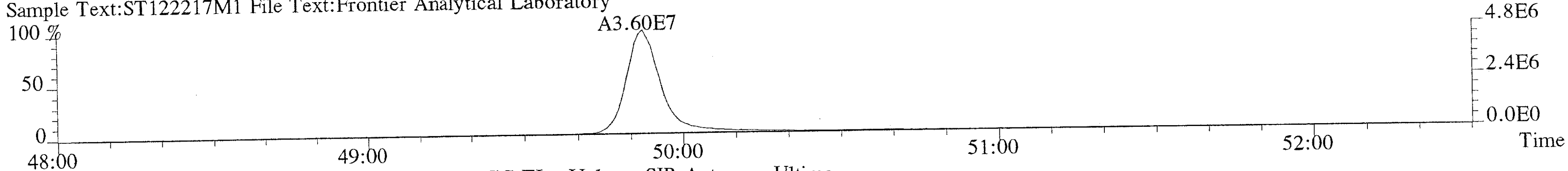
File:22DEC17M #1-361 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



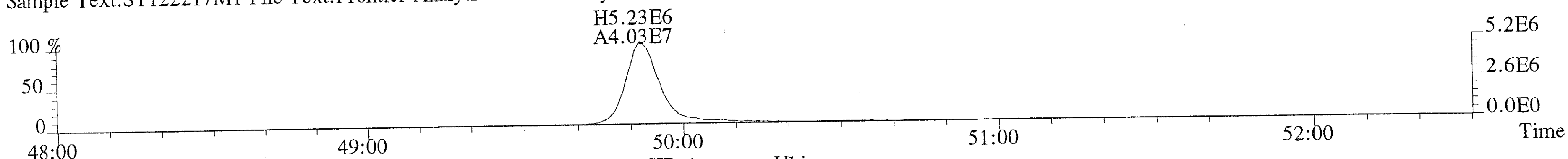
File:22DEC17M #1-361 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
443.7398 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



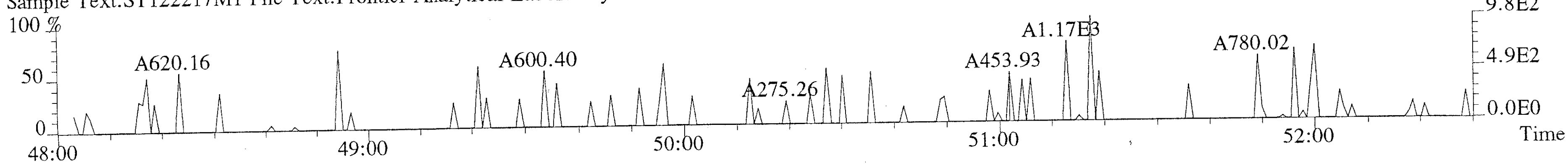
File:22DEC17M #1-361 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



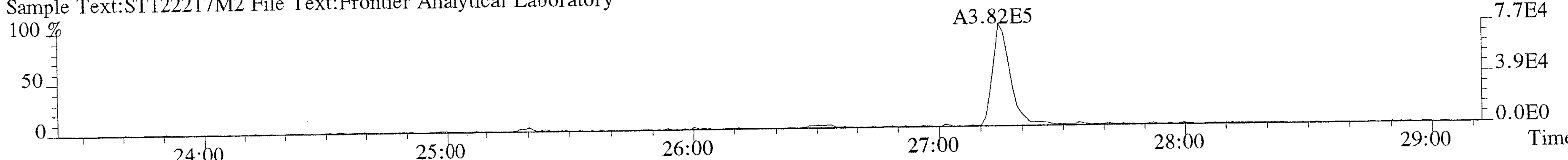
File:22DEC17M #1-361 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



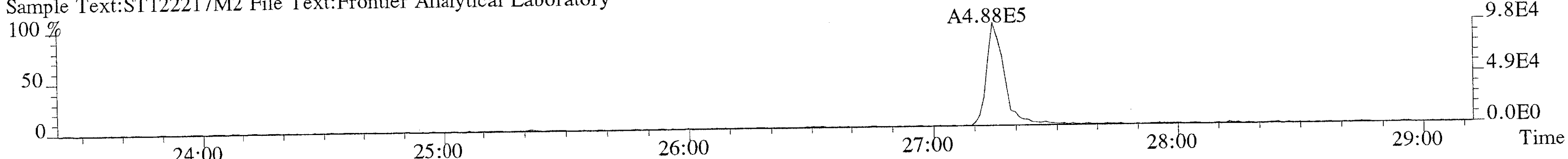
File:22DEC17M #1-361 Acq:22-DEC-2017 11:13:13 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:2 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M1 File Text:Frontier Analytical Laboratory



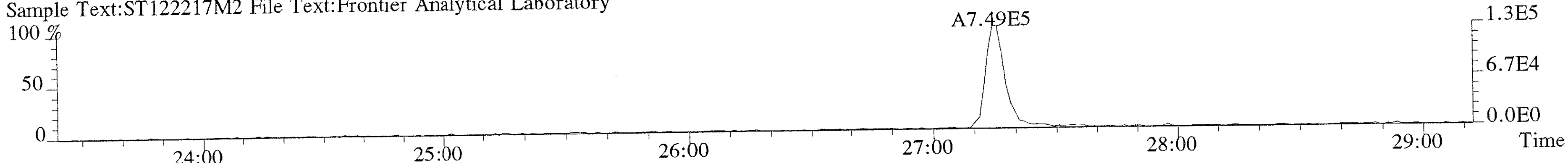
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



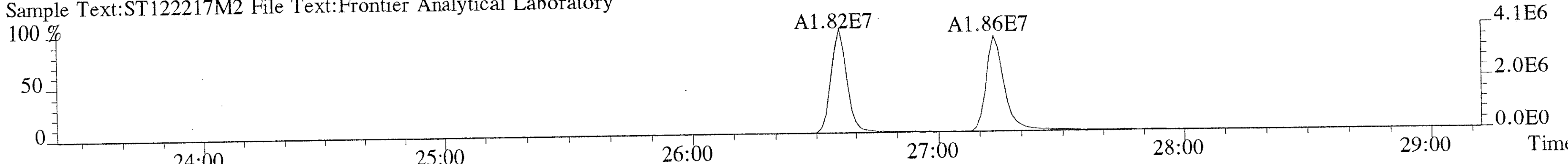
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



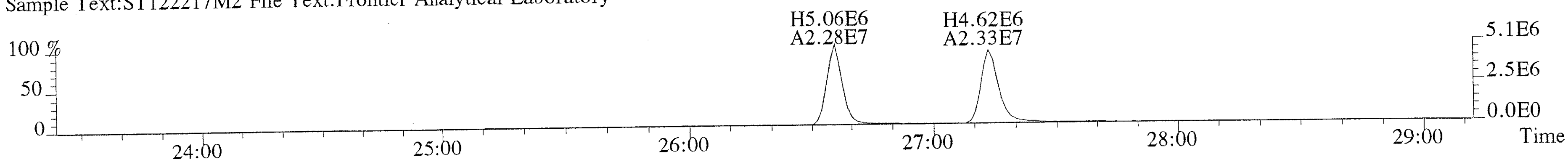
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
327.8847 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



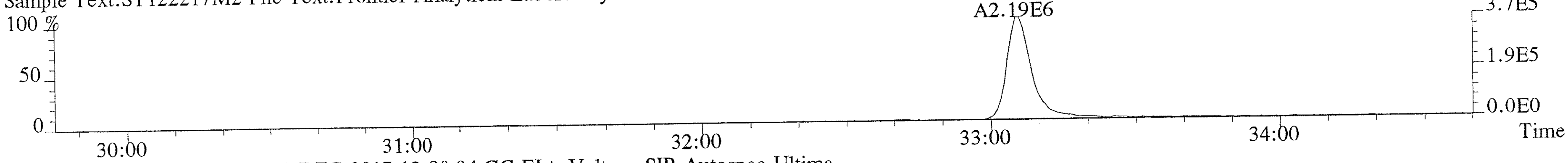
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
331.9368 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



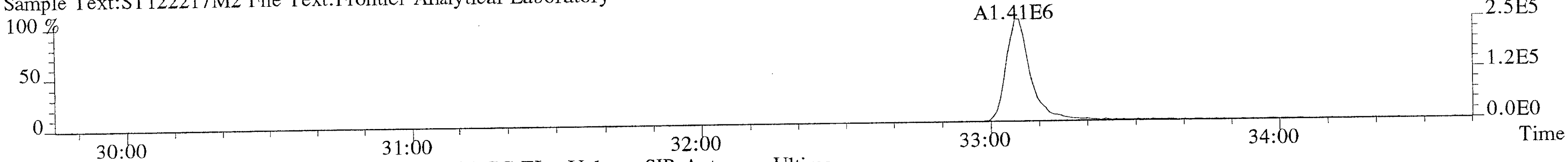
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
333.9339 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



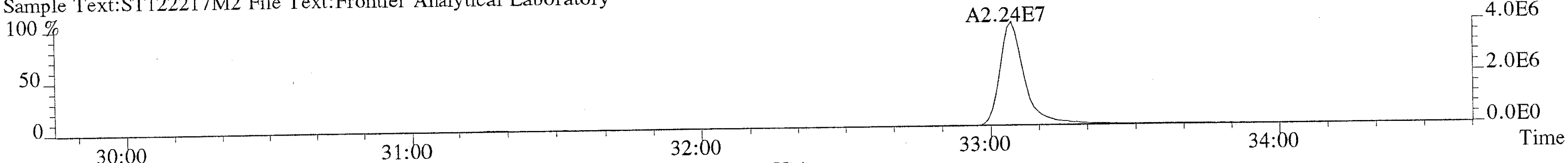
File:22DEC17M #1-411 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
355.8546 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



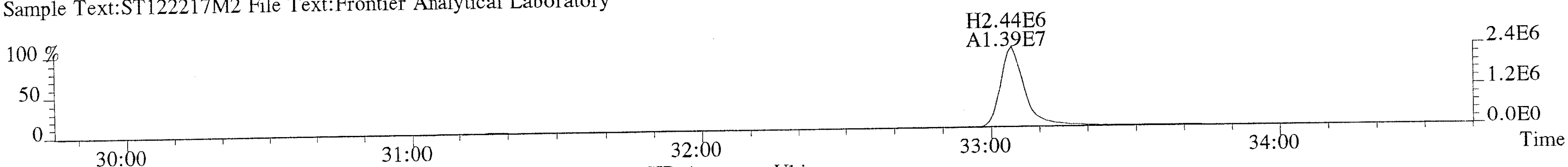
File:22DEC17M #1-411 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
357.8517 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



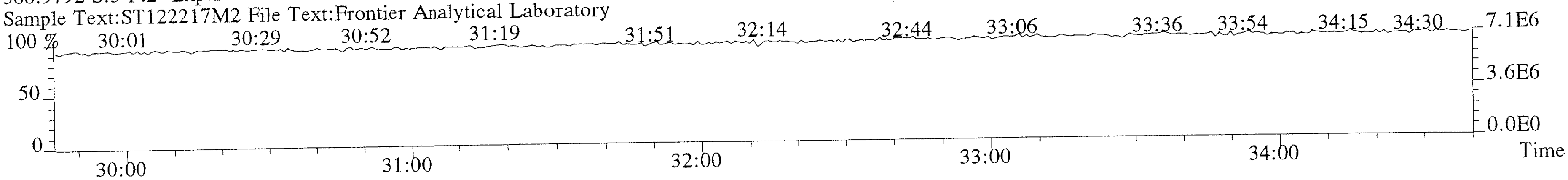
File:22DEC17M #1-411 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
367.8949 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



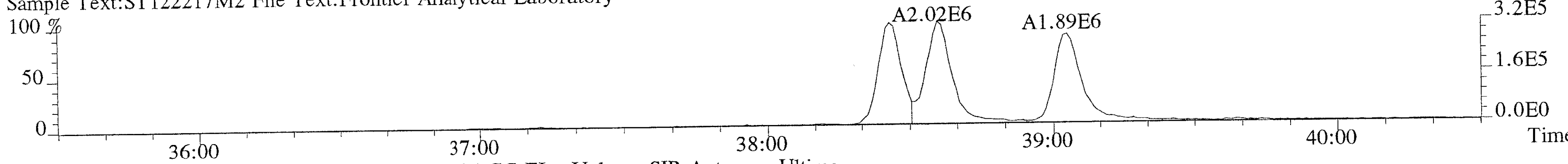
File:22DEC17M #1-411 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
369.8919 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



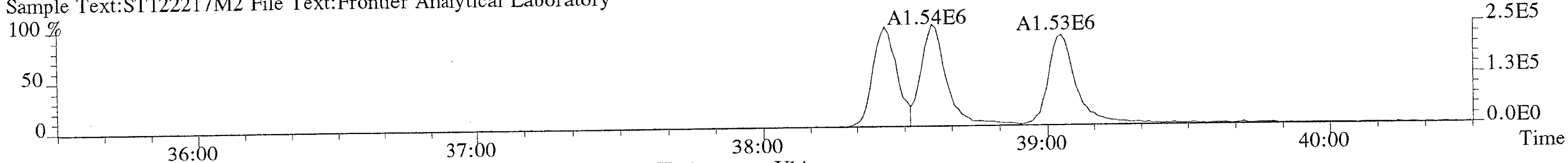
File:22DEC17M #1-411 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
366.9792 S:3 F:2 Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



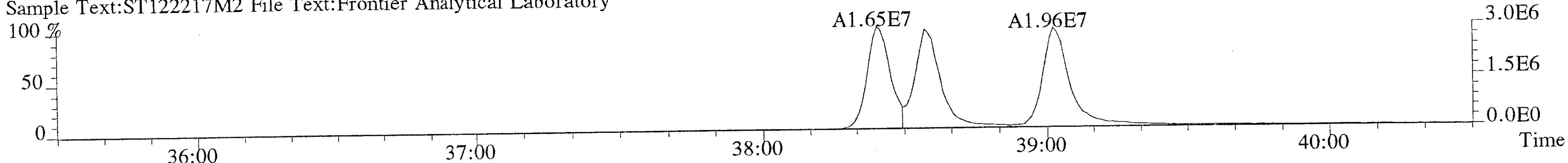
File:22DEC17M #1-495 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
389.8156 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



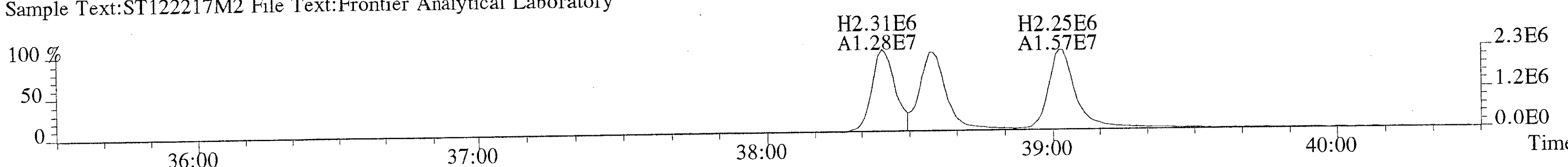
File:22DEC17M #1-495 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
391.8127 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



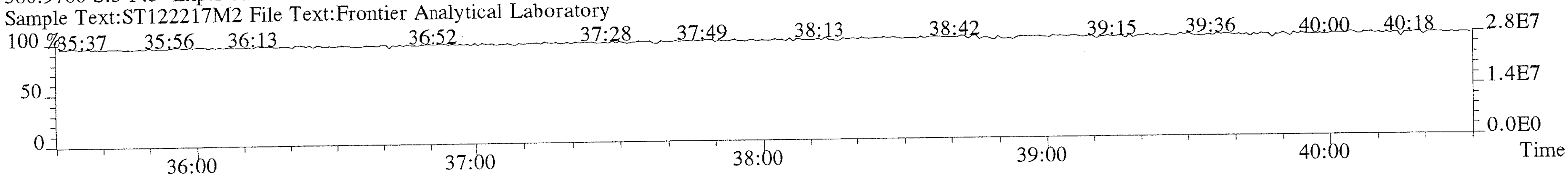
File:22DEC17M #1-495 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
401.8559 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



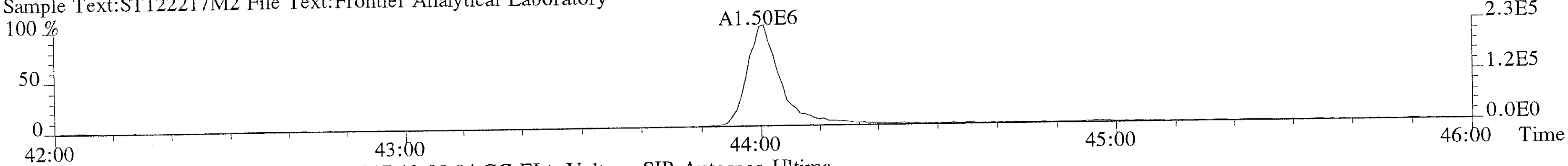
File:22DEC17M #1-495 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
403.8530 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



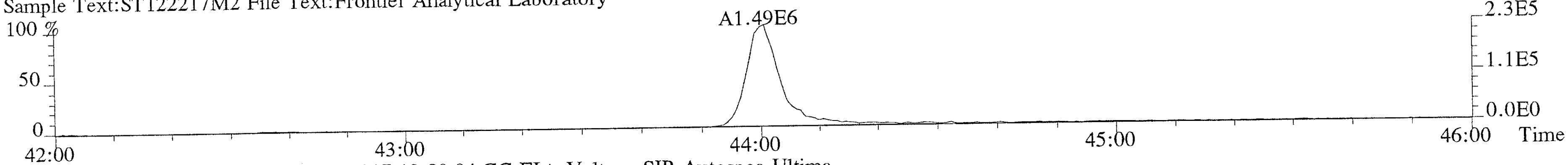
File:22DEC17M #1-495 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
380.9760 S:3 F:3 Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



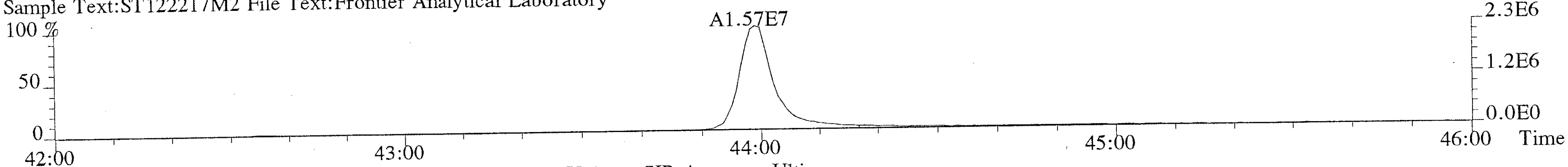
File:22DEC17M #1-521 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
423.7767 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



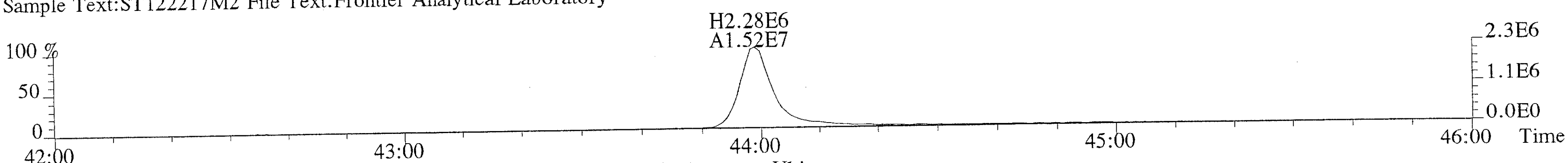
File:22DEC17M #1-521 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
425.7737 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



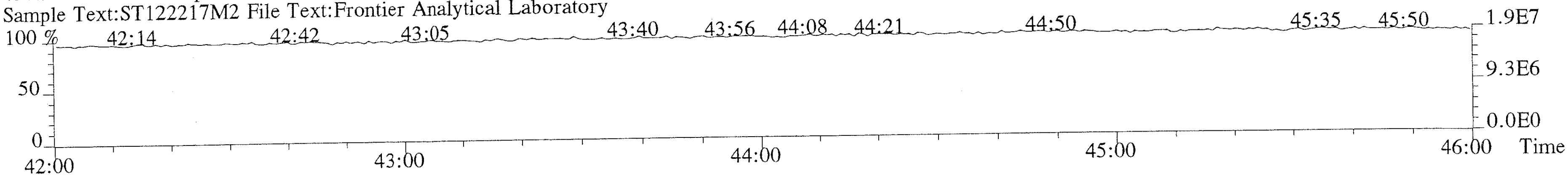
File:22DEC17M #1-521 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
435.8169 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



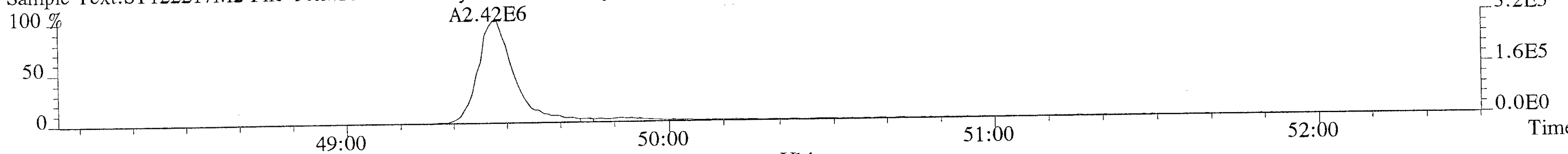
File:22DEC17M #1-521 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
437.8140 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



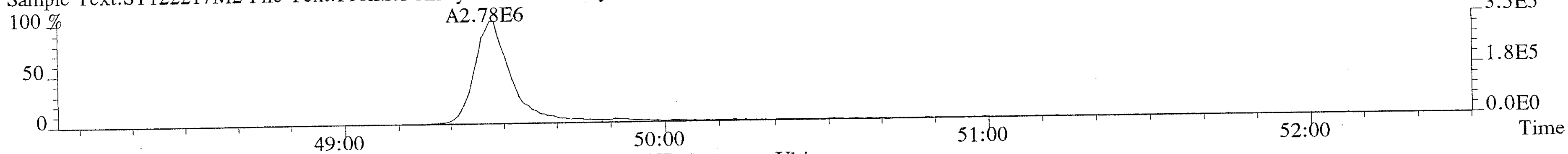
File:22DEC17M #1-521 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
430.9728 S:3 F:4 Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



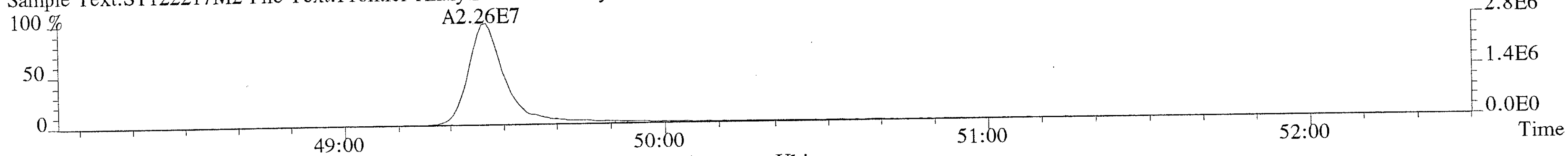
File:22DEC17M #1-361 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
457.7377 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



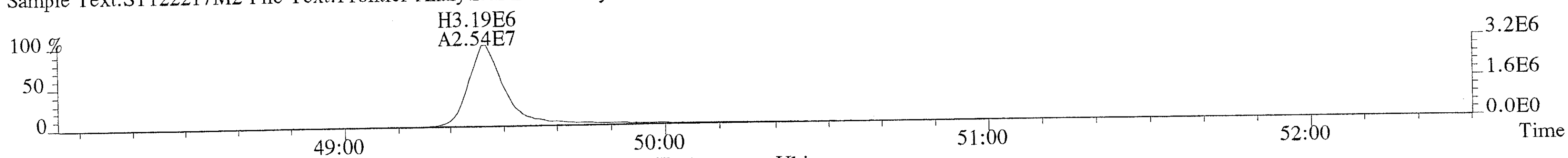
File:22DEC17M #1-361 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
459.7348 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



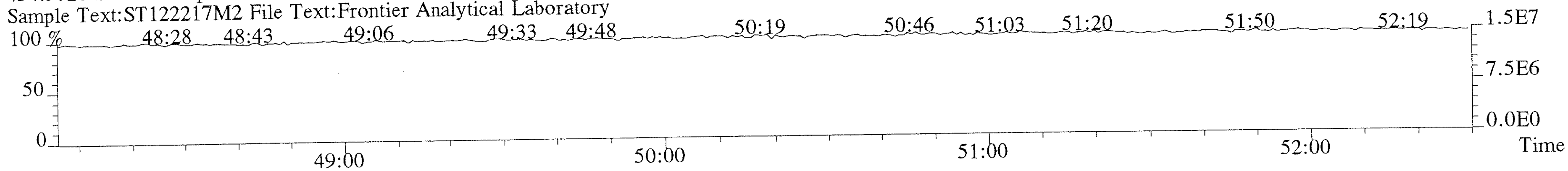
File:22DEC17M #1-361 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
469.7780 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



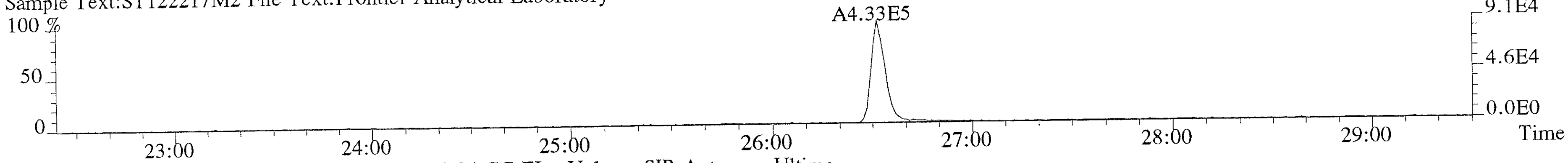
File:22DEC17M #1-361 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
471.7750 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



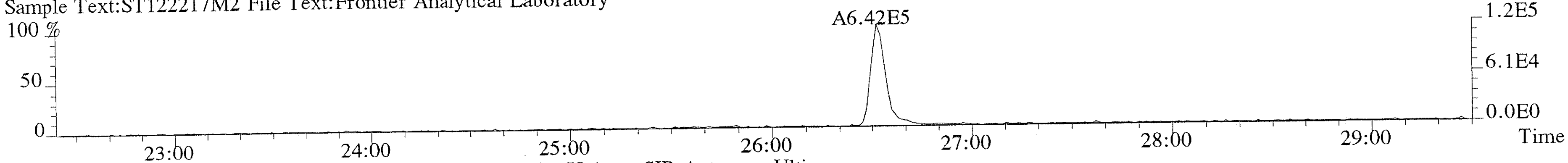
File:22DEC17M #1-361 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
454.9728 S:3 F:5 Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



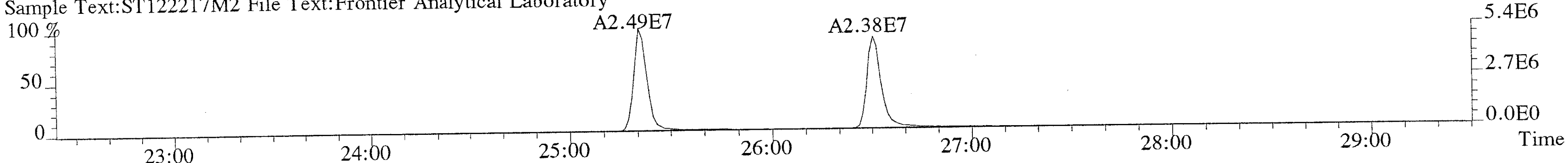
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
303.9016 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



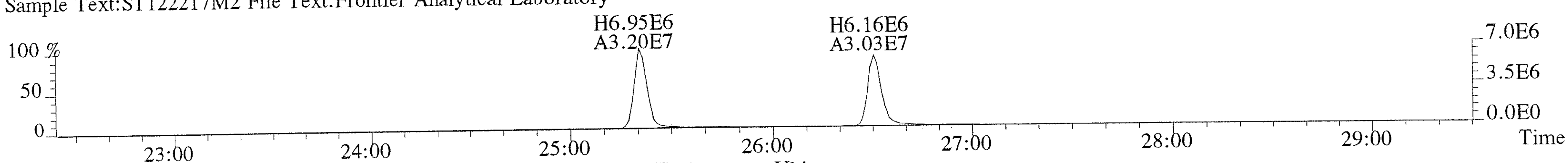
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
305.8987 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



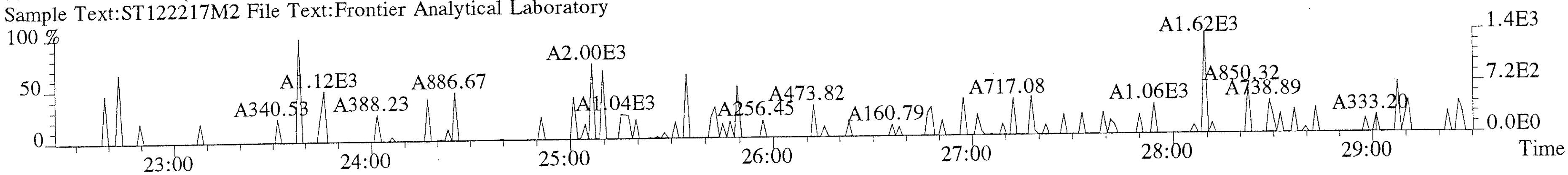
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
315.9419 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



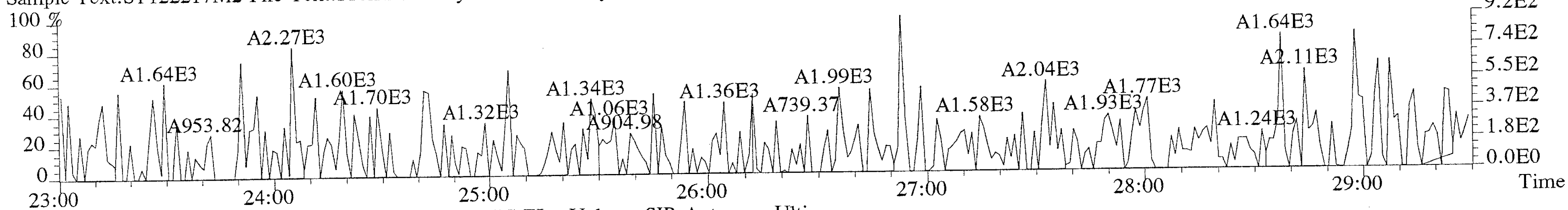
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
317.9389 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



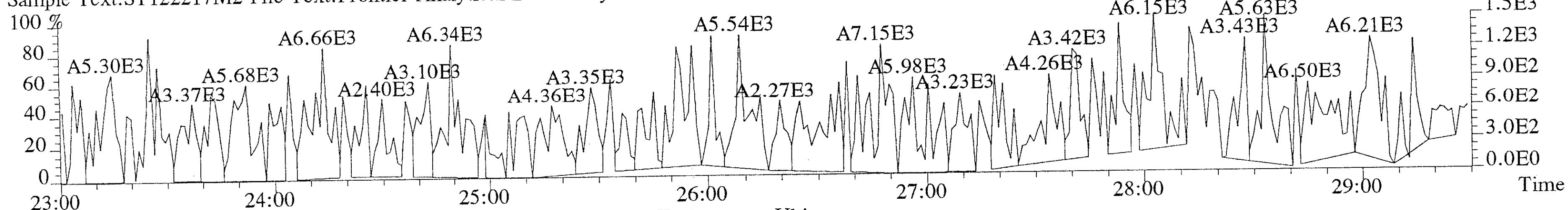
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
375.8364 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



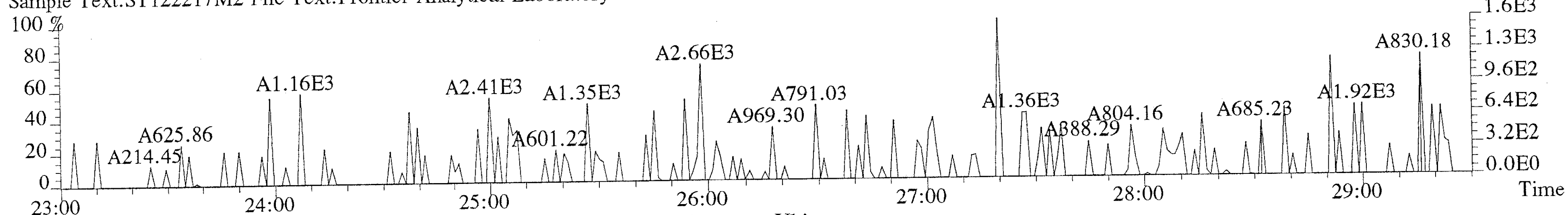
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



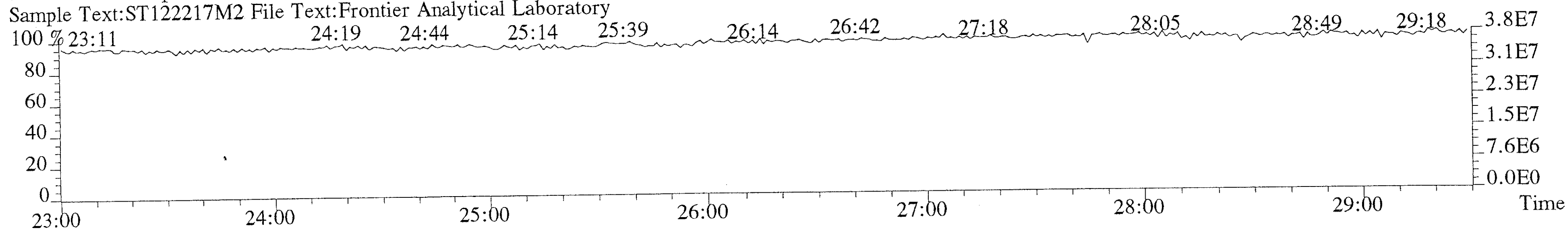
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



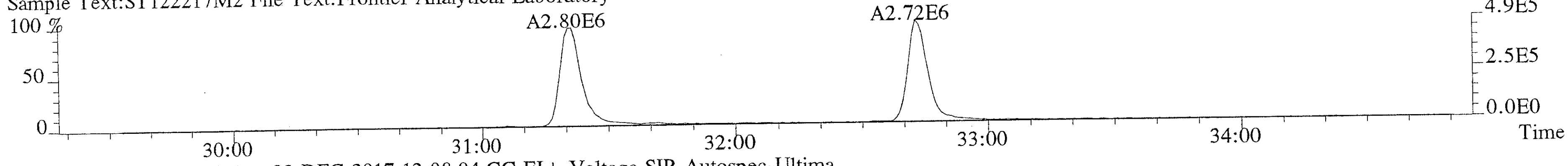
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



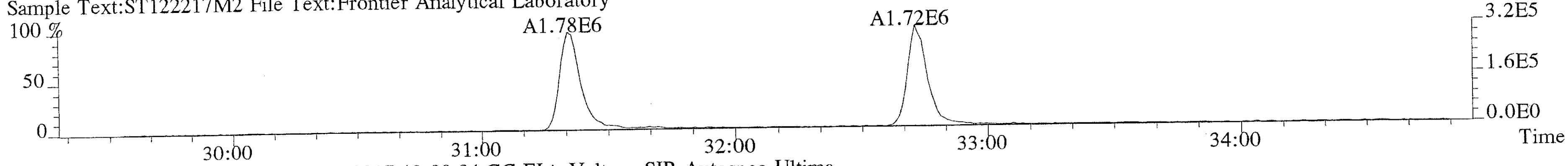
File:22DEC17M #1-399 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
330.9792 S:3 Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



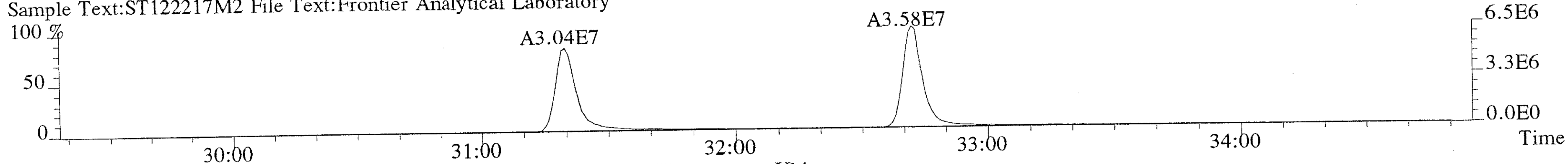
File:22DEC17M #1-411 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



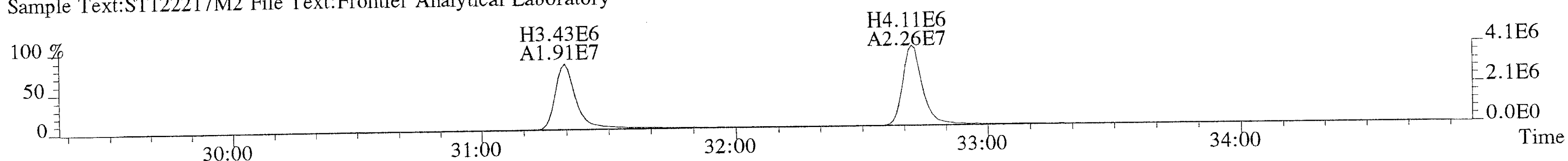
File:22DEC17M #1-411 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



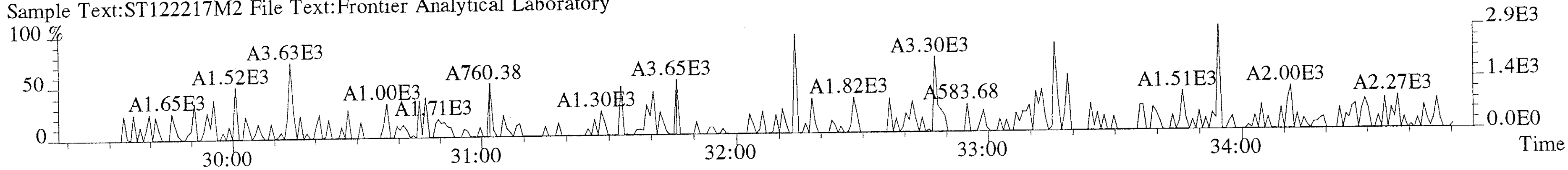
File:22DEC17M #1-411 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



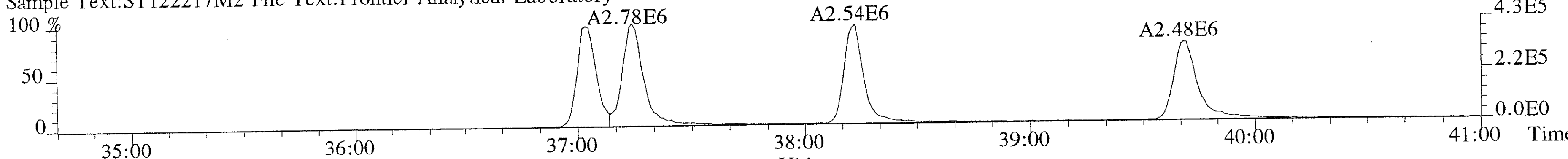
File:22DEC17M #1-411 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
353.8970 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



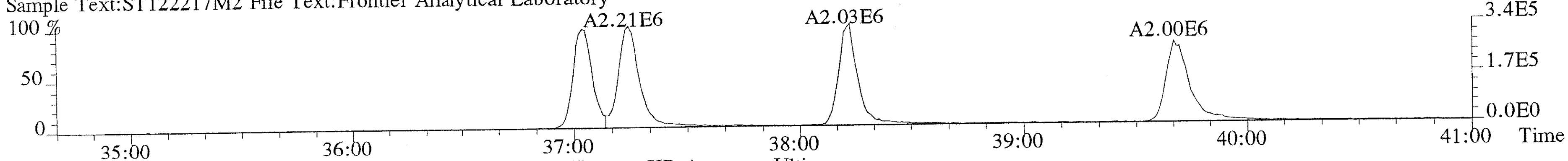
File:22DEC17M #1-411 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:3 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



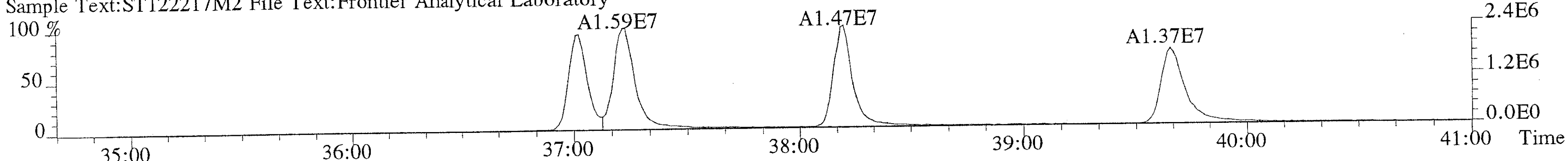
File:22DEC17M #1-495 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
373.8207 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



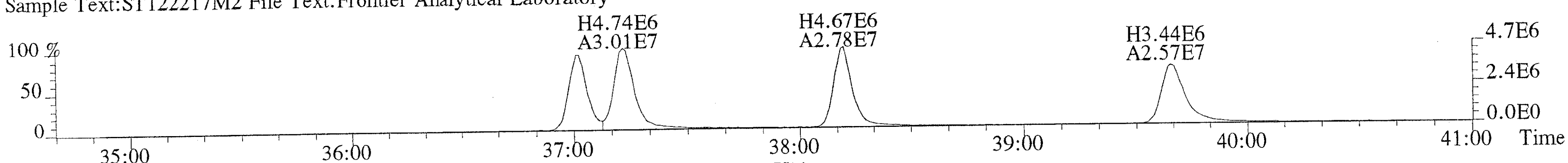
File:22DEC17M #1-495 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
375.8178 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



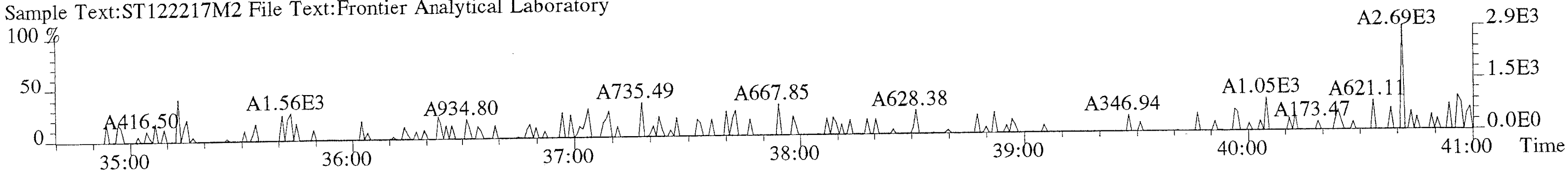
File:22DEC17M #1-495 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



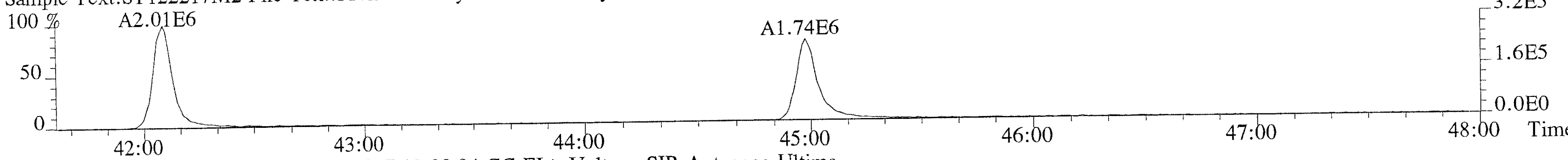
File:22DEC17M #1-495 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
385.8610 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-495 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
445.7555 S:3 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-521 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



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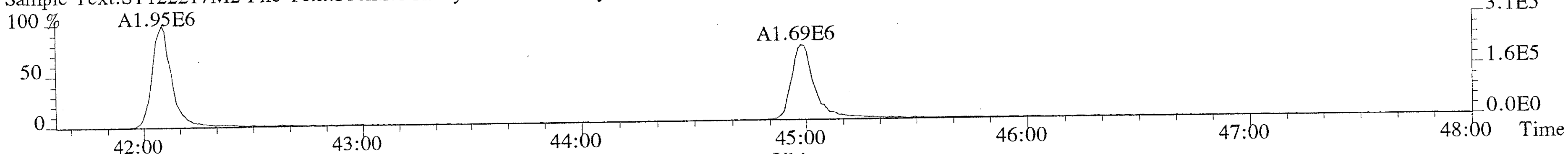
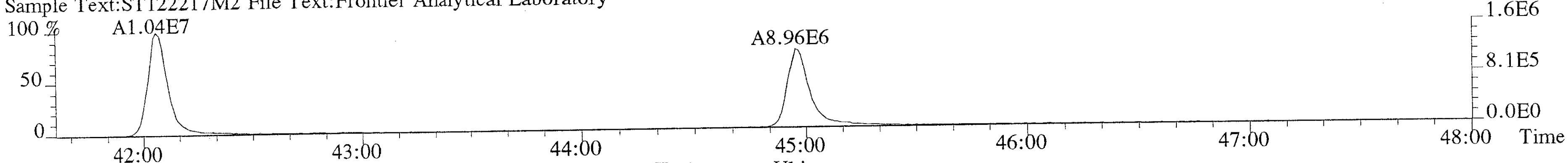
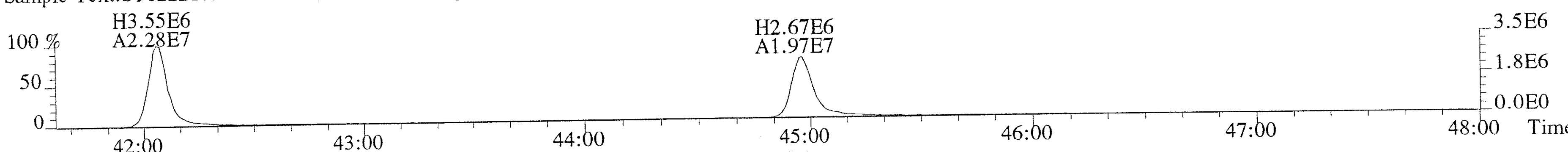
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



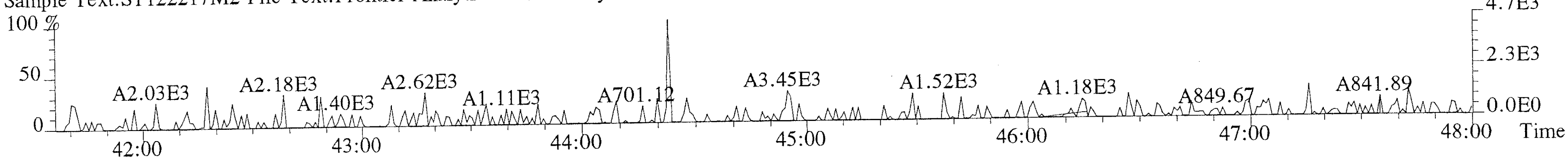
File:22DEC17M #1-521 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
417.8253 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



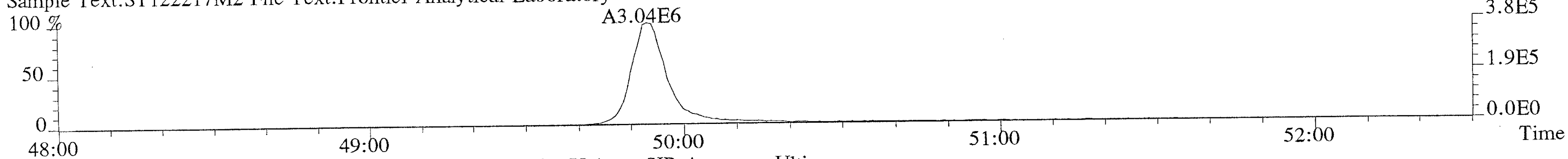
File:22DEC17M #1-521 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
419.8220 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



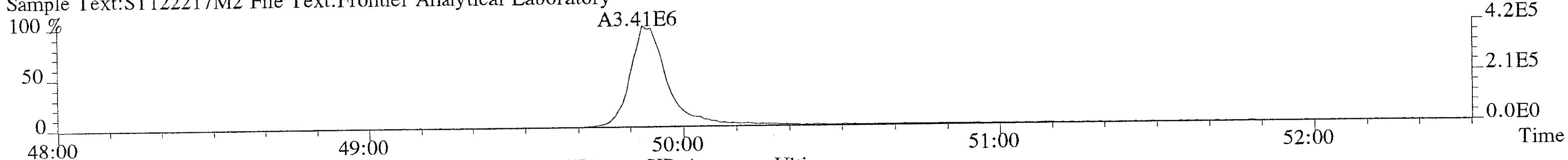
File:22DEC17M #1-521 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:3 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-361 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



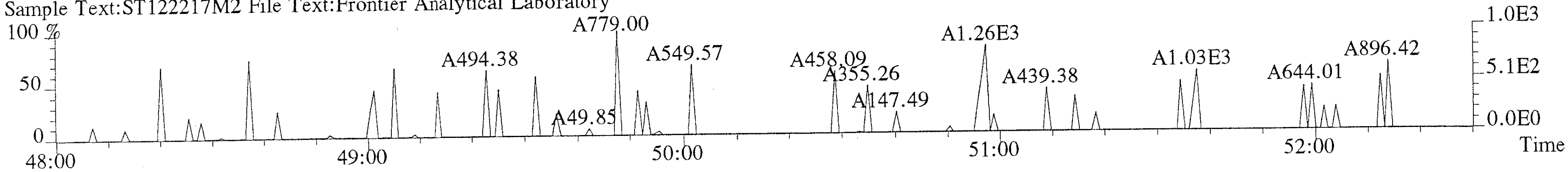
File:22DEC17M #1-361 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
443.7398 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



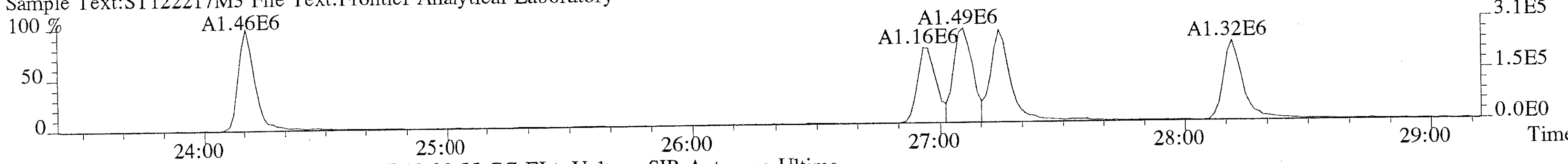
File:22DEC17M #1-361 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory

File:22DEC17M #1-361 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory

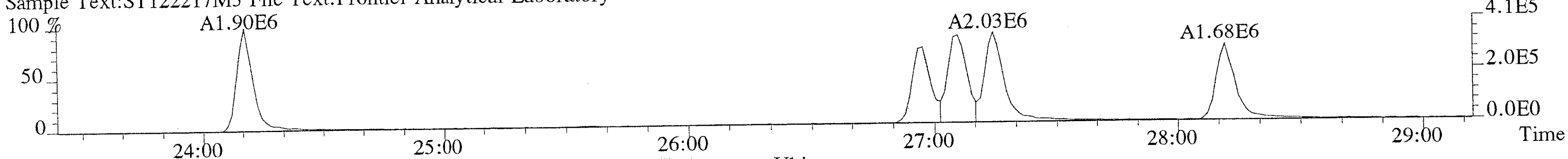
File:22DEC17M #1-361 Acq:22-DEC-2017 12:08:04 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:3 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M2 File Text:Frontier Analytical Laboratory



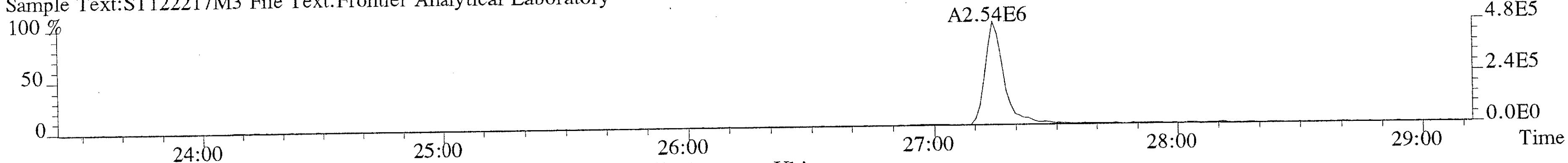
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



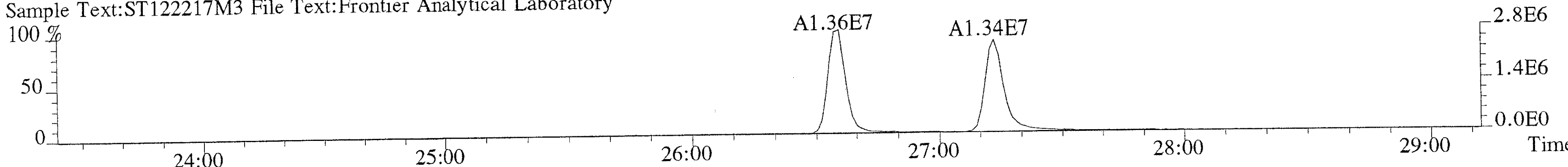
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



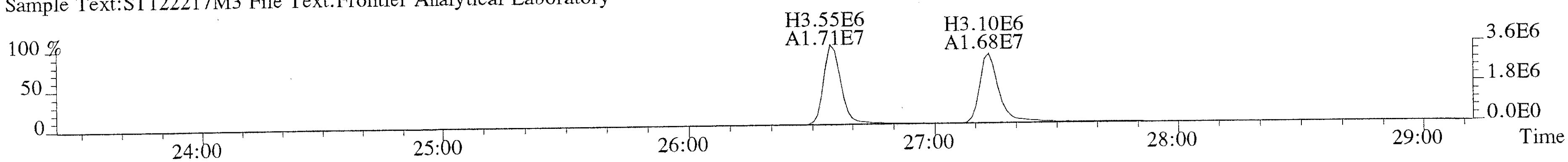
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
327.8847 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



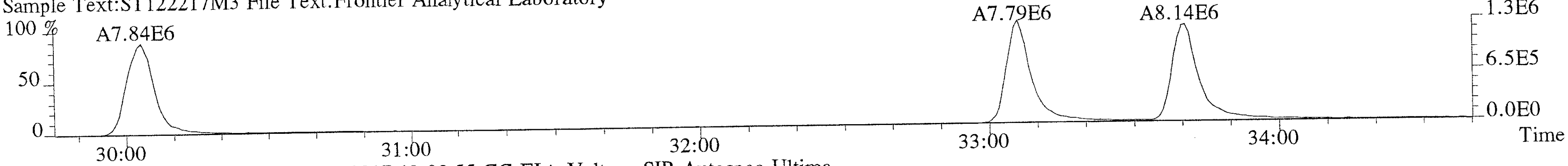
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
331.9368 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



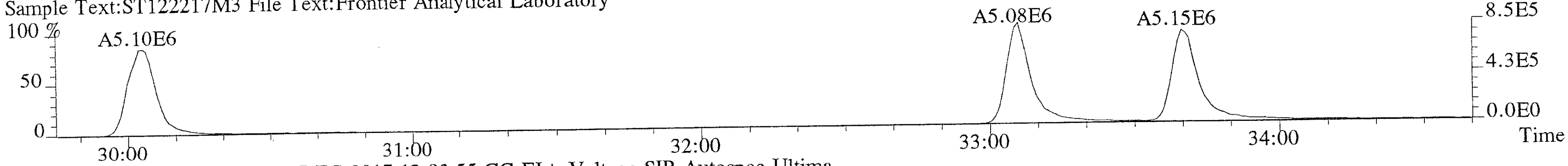
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
333.9339 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



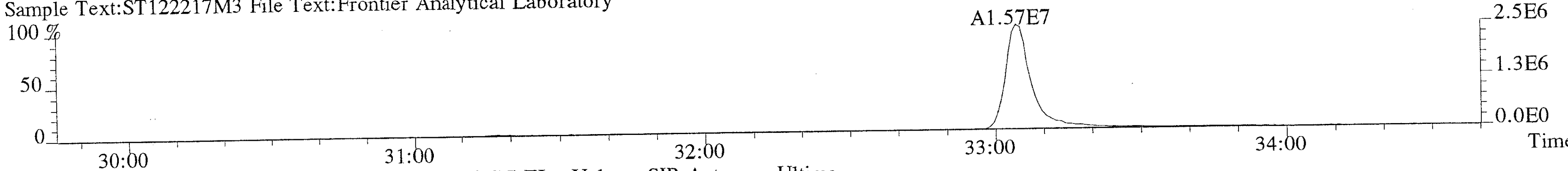
File:22DEC17M #1-411 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
355.8546 S:4 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



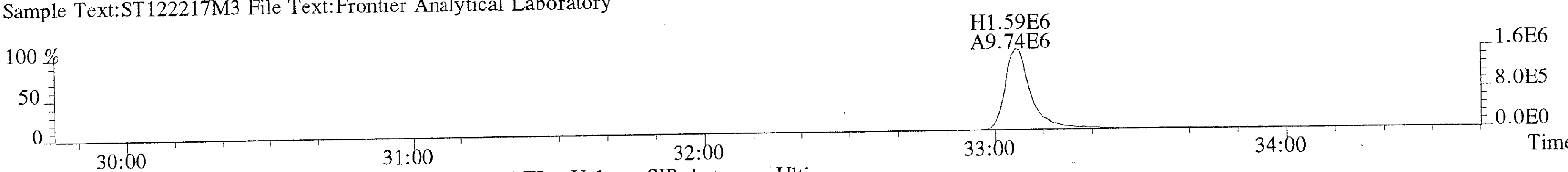
File:22DEC17M #1-411 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
357.8517 S:4 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



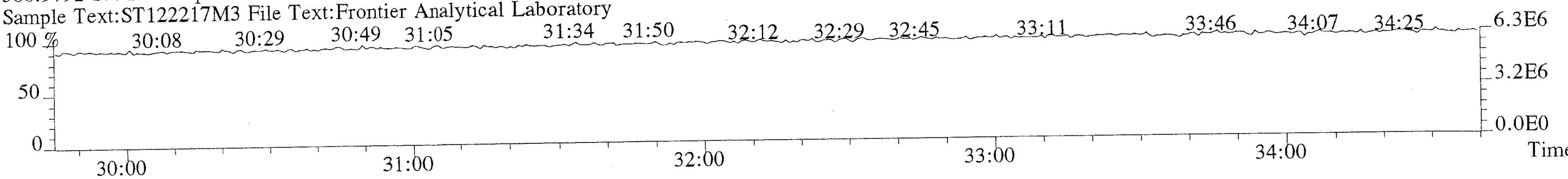
File:22DEC17M #1-411 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
367.8949 S:4 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



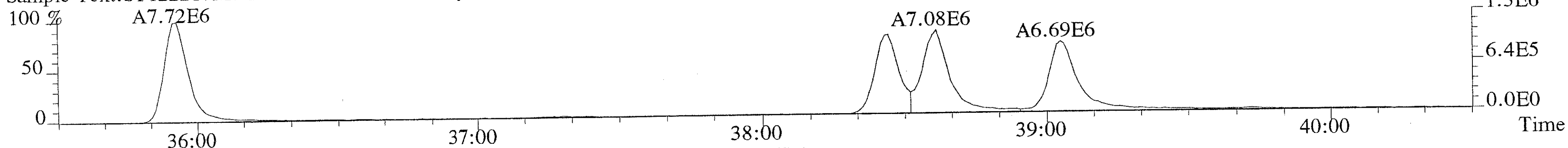
File:22DEC17M #1-411 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
369.8919 S:4 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



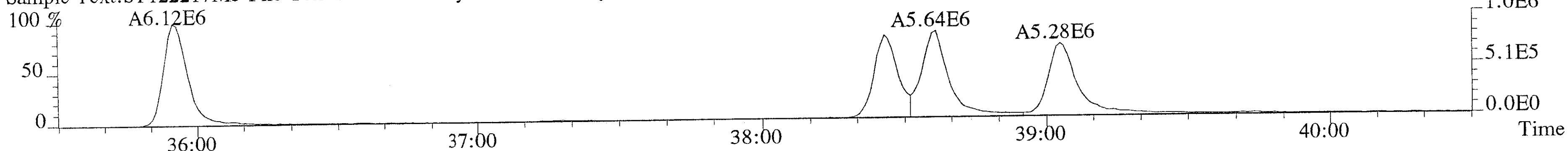
File:22DEC17M #1-411 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
366.9792 S:4 F:2 Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



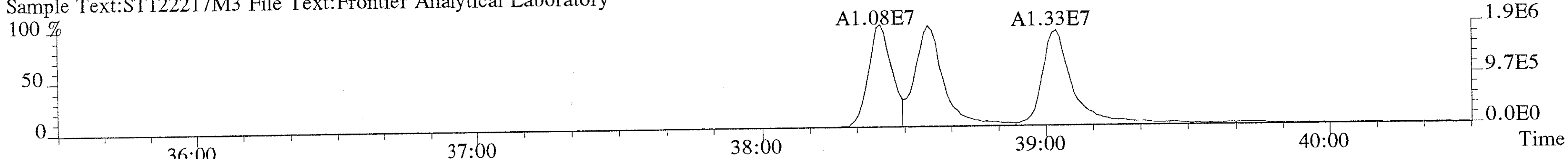
File:22DEC17M #1-495 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
389.8156 S:4 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



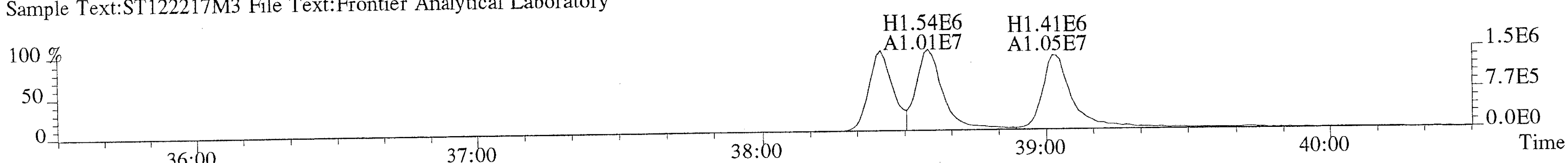
File:22DEC17M #1-495 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
391.8127 S:4 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



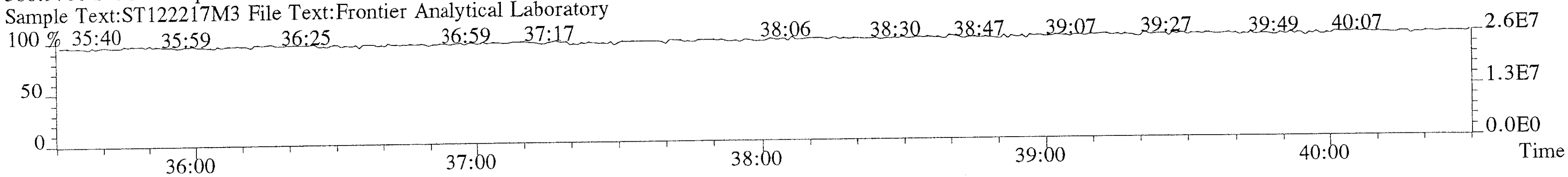
File:22DEC17M #1-495 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
401.8559 S:4 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



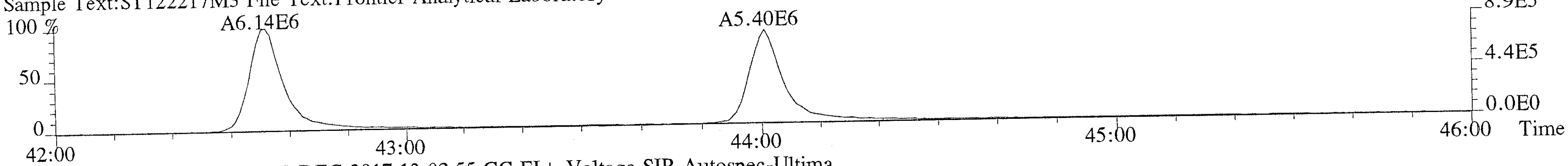
File:22DEC17M #1-495 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
403.8530 S:4 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



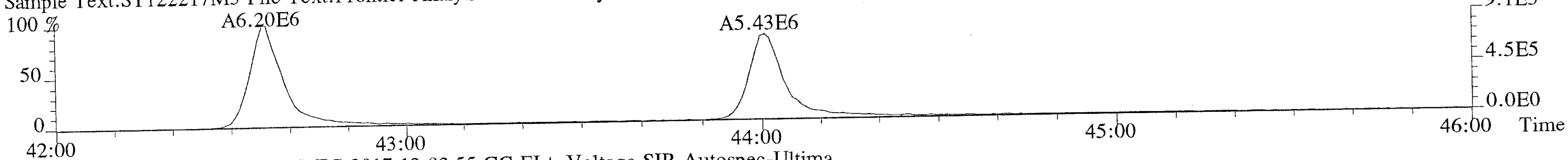
File:22DEC17M #1-495 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
380.9760 S:4 F:3 Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



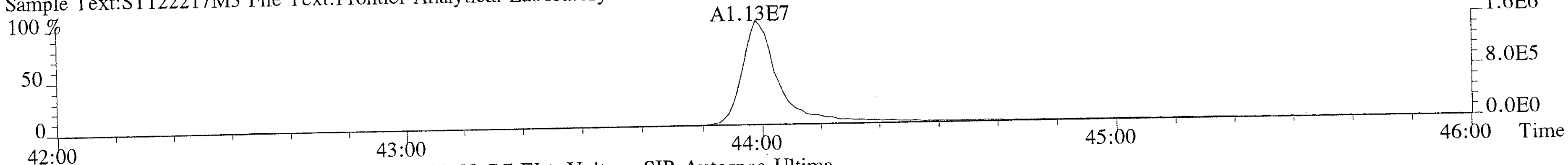
File:22DEC17M #1-521 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
423.7767 S:4 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



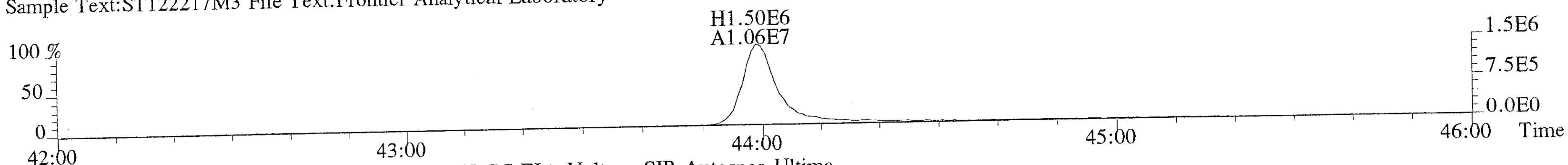
File:22DEC17M #1-521 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
425.7737 S:4 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



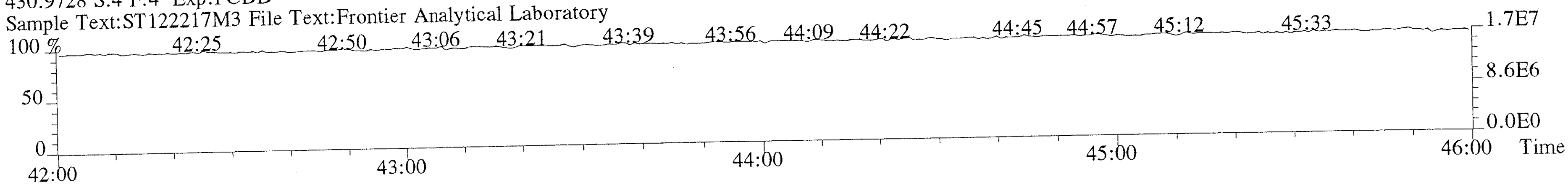
File:22DEC17M #1-521 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
435.8169 S:4 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



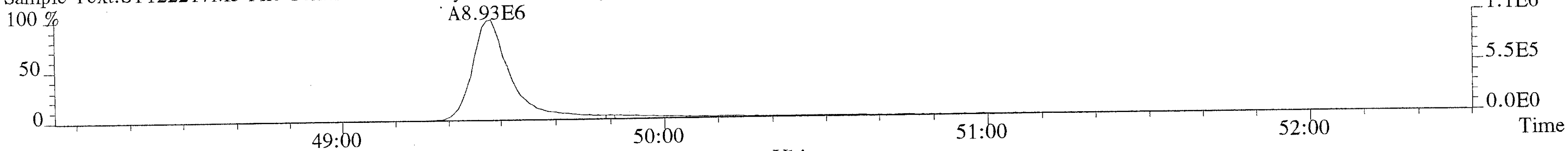
File:22DEC17M #1-521 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
437.8140 S:4 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



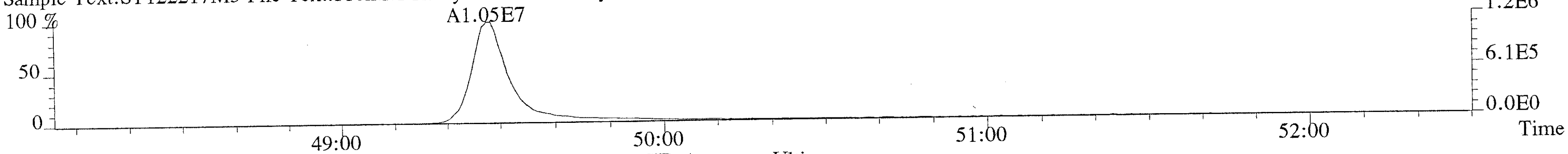
File:22DEC17M #1-521 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
430.9728 S:4 F:4 Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



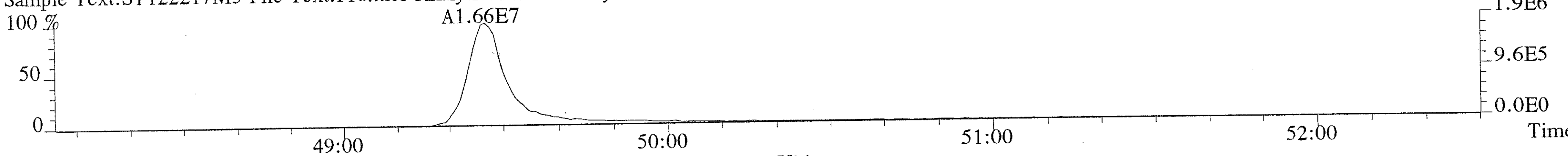
File:22DEC17M #1-361 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
457.7377 S:4 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



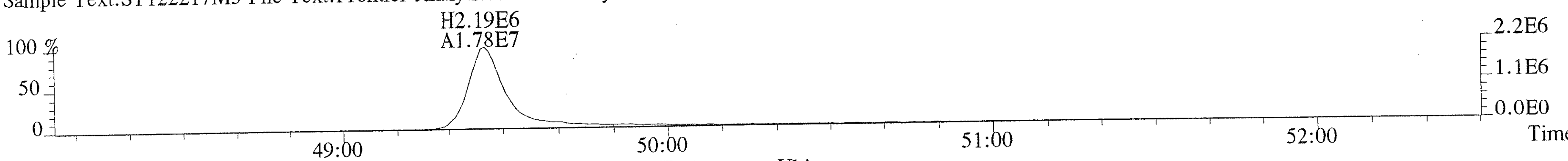
File:22DEC17M #1-361 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
459.7348 S:4 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



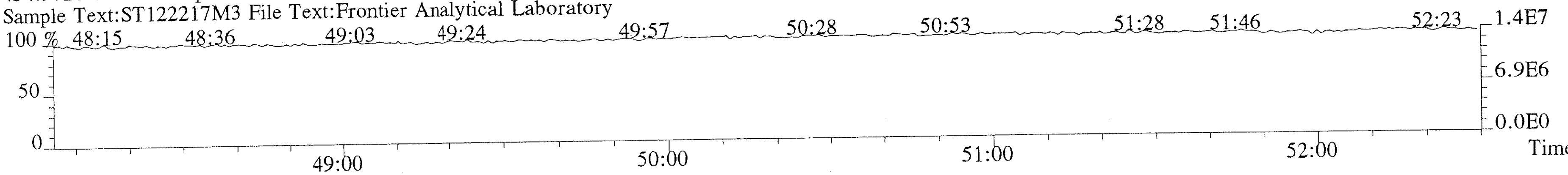
File:22DEC17M #1-361 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
469.7780 S:4 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



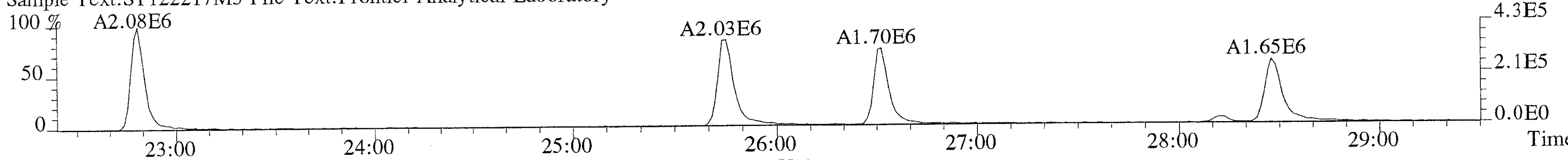
File:22DEC17M #1-361 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
471.7750 S:4 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



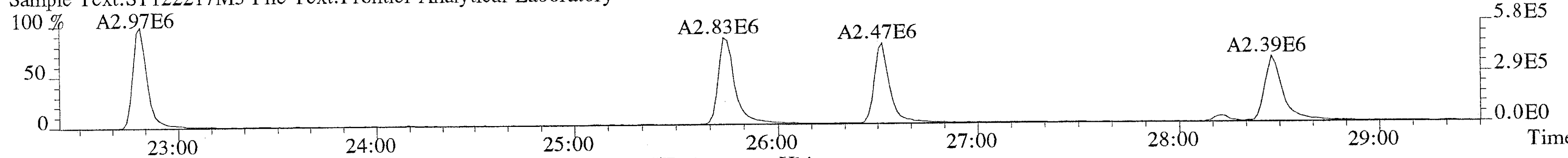
File:22DEC17M #1-361 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
454.9728 S:4 F:5 Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



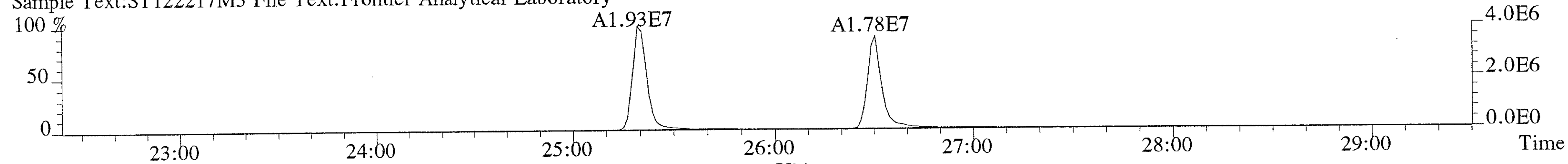
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
303.9016 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



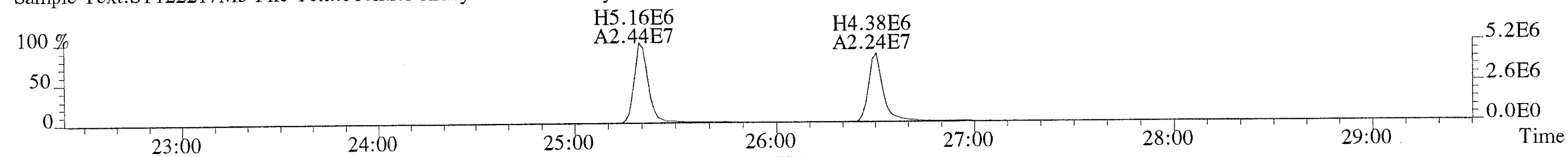
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
305.8987 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



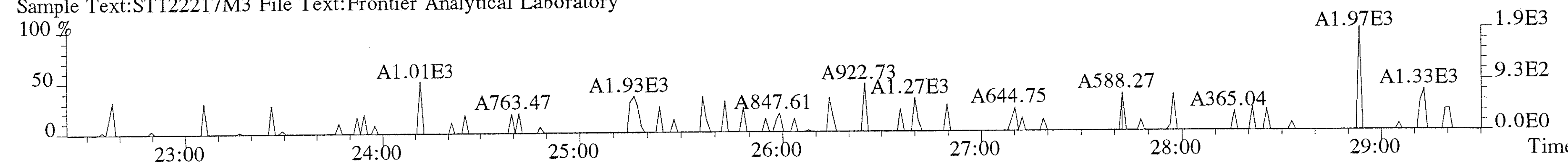
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
315.9419 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



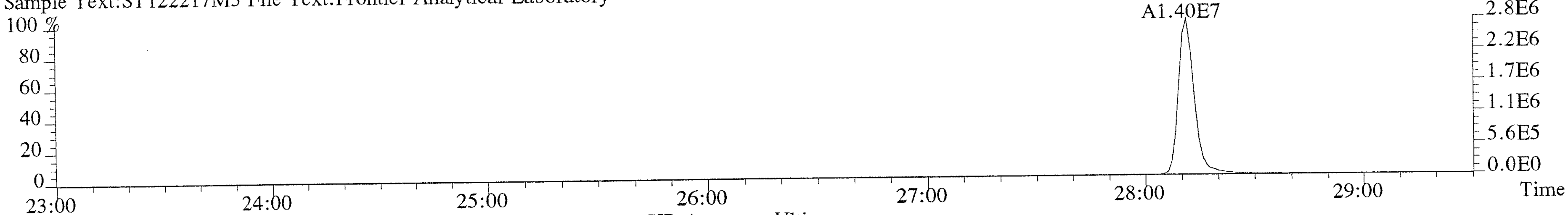
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
317.9389 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



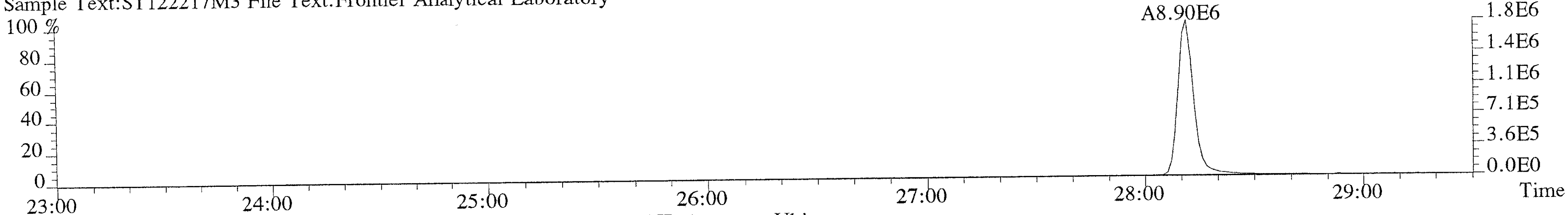
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
375.8364 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



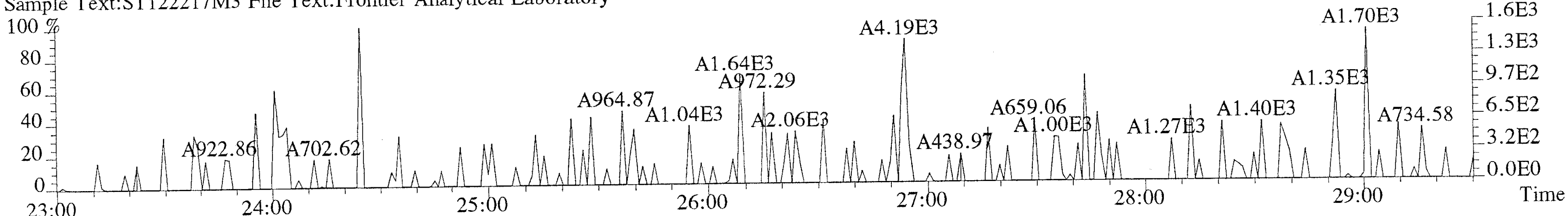
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



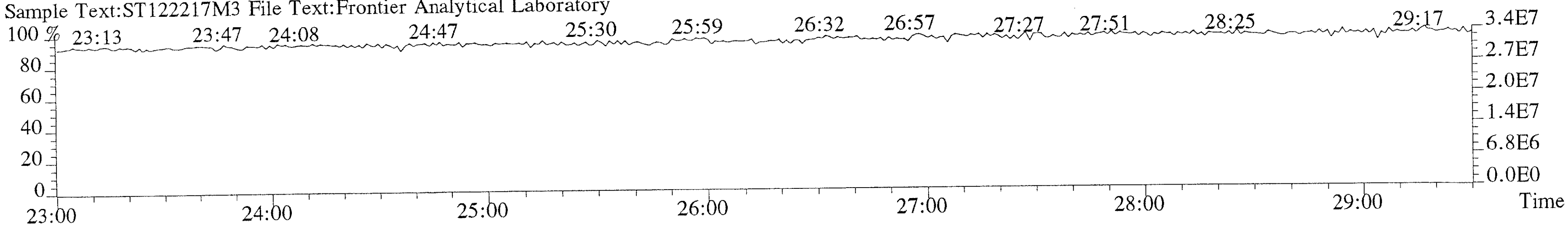
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



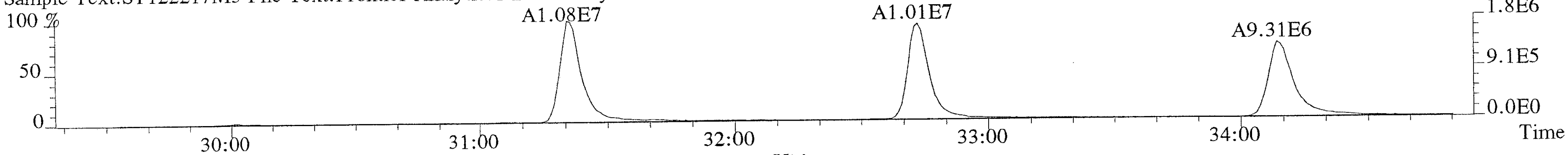
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



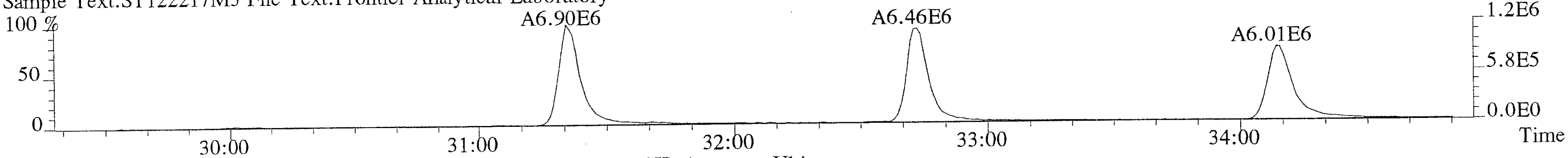
File:22DEC17M #1-400 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
330.9792 S:4 Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



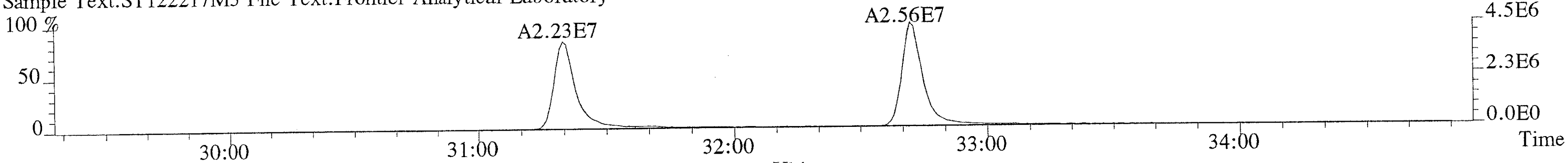
File:22DEC17M #1-411 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:4 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



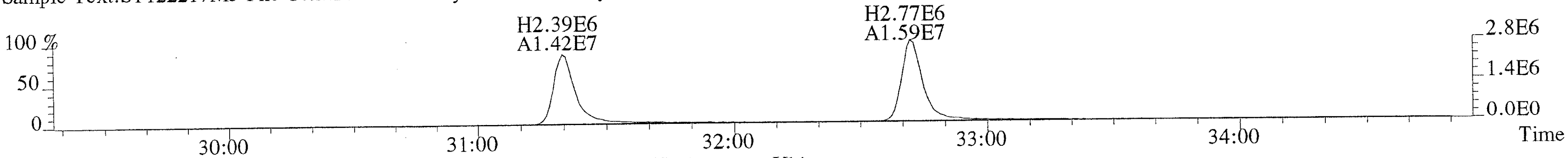
File:22DEC17M #1-411 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:4 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



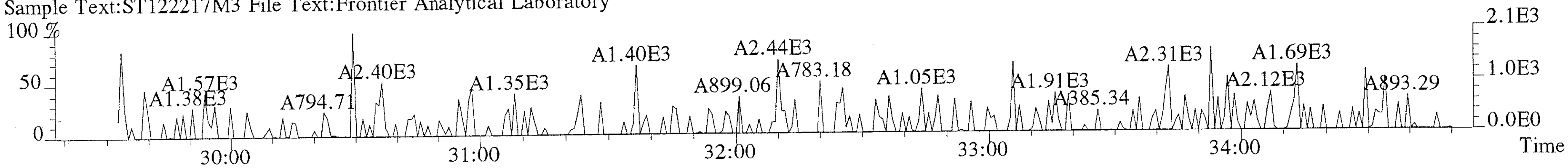
File:22DEC17M #1-411 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:4 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



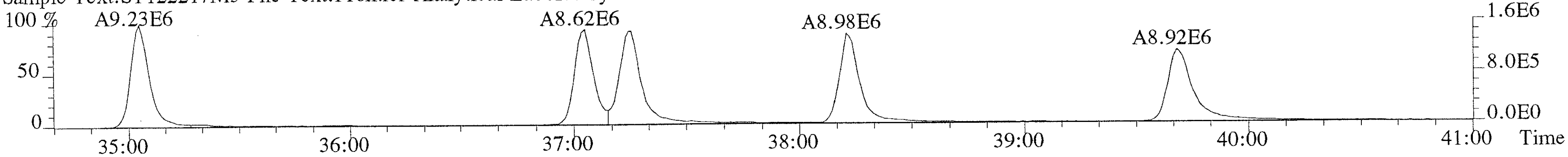
File:22DEC17M #1-411 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
353.8970 S:4 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



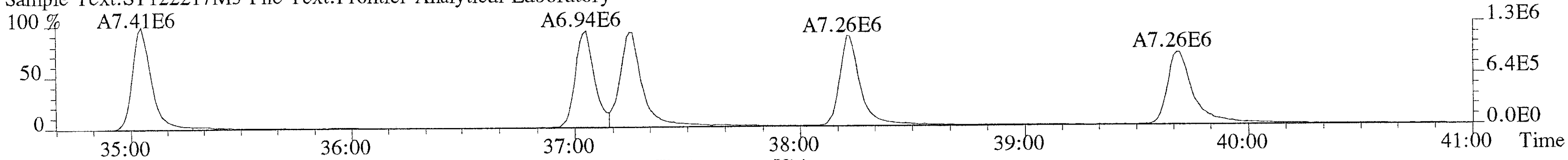
File:22DEC17M #1-411 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:4 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



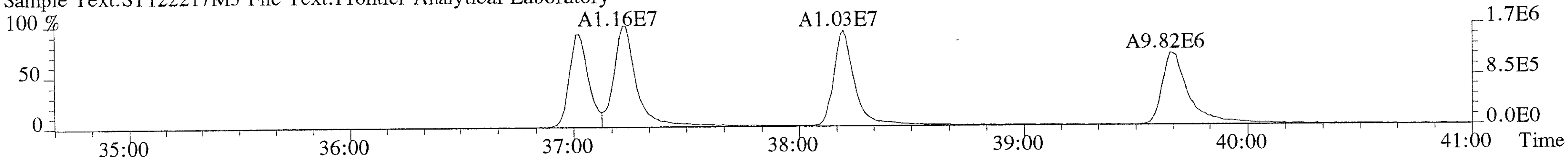
File:22DEC17M #1-495 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
373.8207 S:4 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



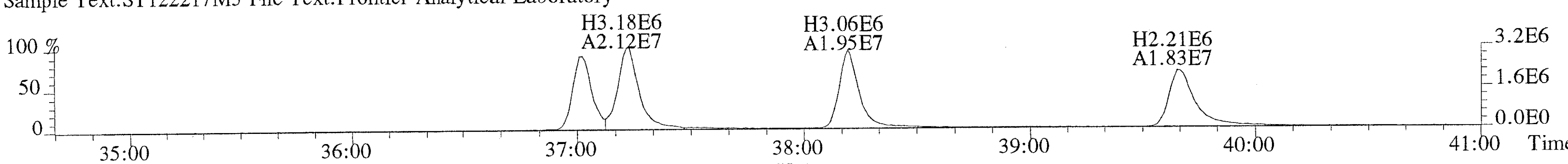
File:22DEC17M #1-495 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
375.8178 S:4 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



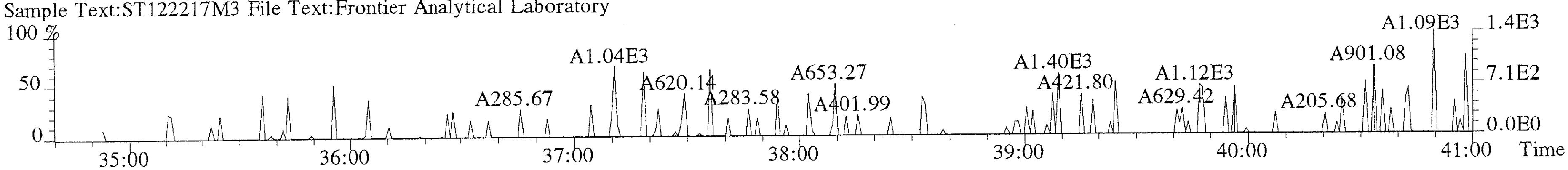
File:22DEC17M #1-495 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:4 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



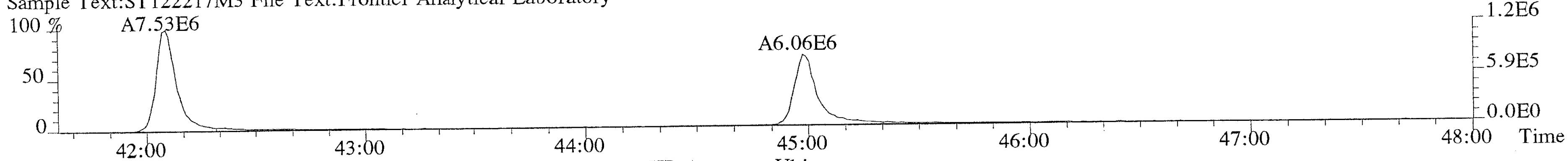
File:22DEC17M #1-495 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
385.8610 S:4 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



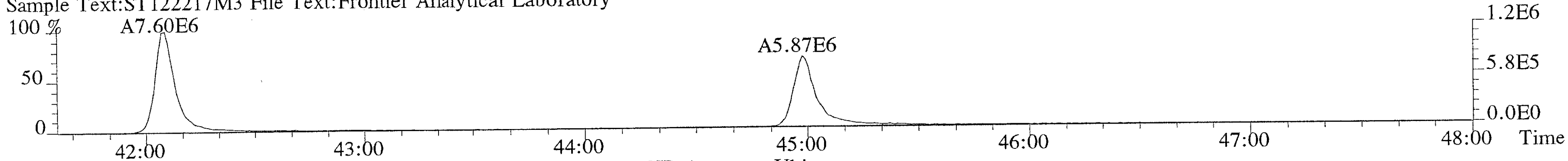
File:22DEC17M #1-495 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
445.7555 S:4 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



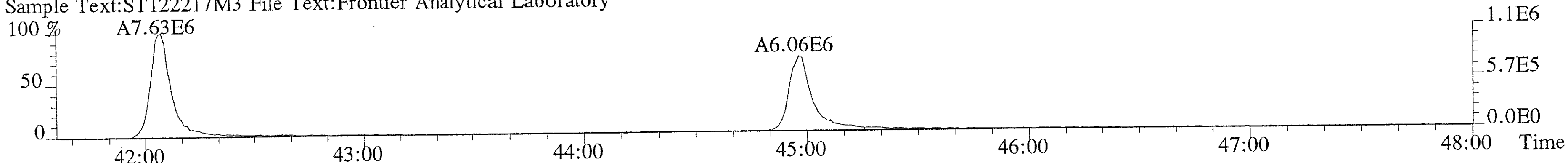
File:22DEC17M #1-521 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:4 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



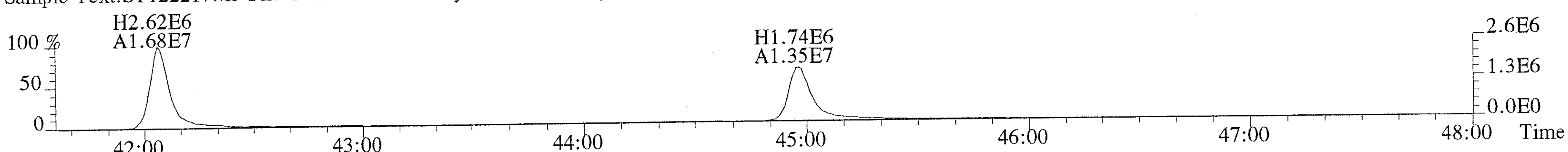
File:22DEC17M #1-521 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
409.7788 S:4 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



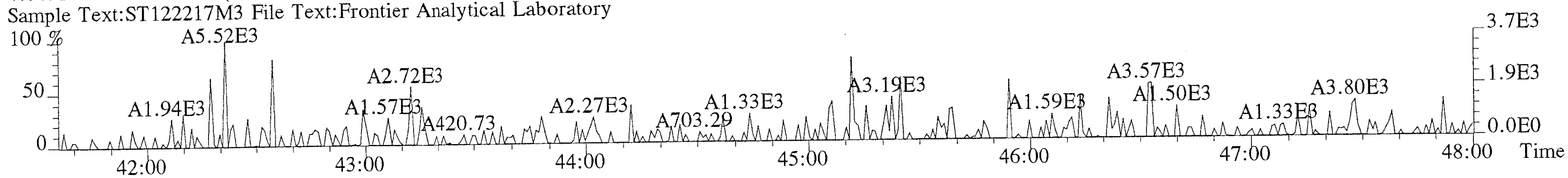
File:22DEC17M #1-521 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
417.8253 S:4 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



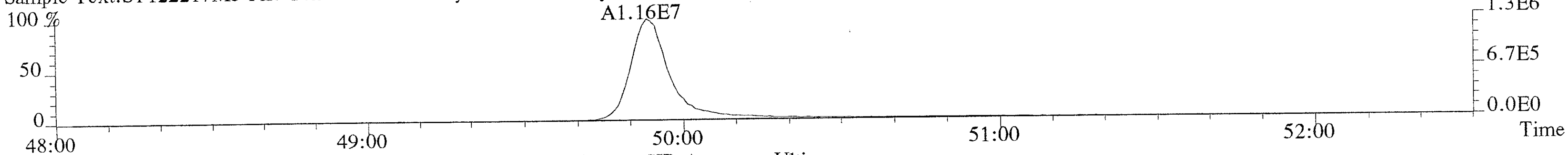
File:22DEC17M #1-521 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
419.8220 S:4 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



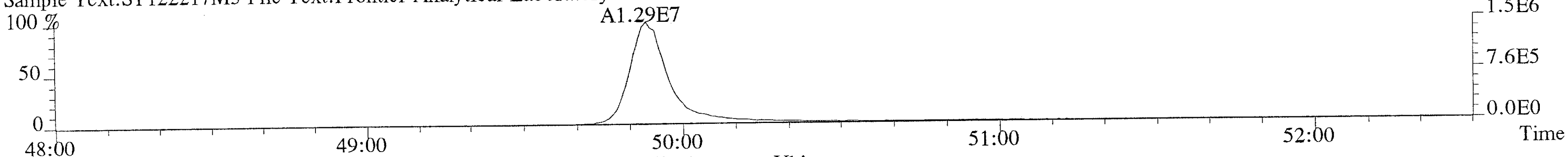
File:22DEC17M #1-521 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:4 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-361 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:4 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory

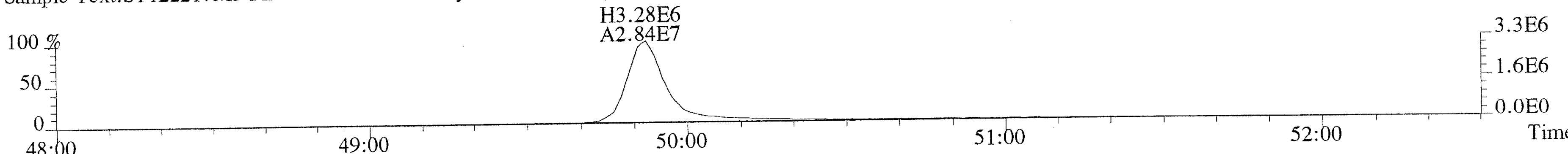


File:22DEC17M #1-361 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
443.7398 S:4 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory

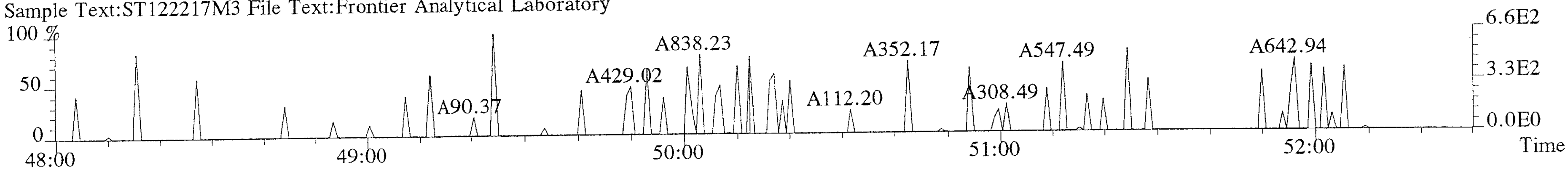


File:22DEC17M #1-361 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:4 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory

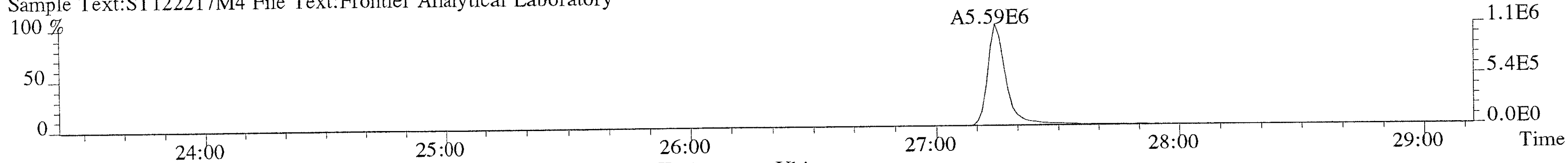
File:22DEC17M #1-361 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:4 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



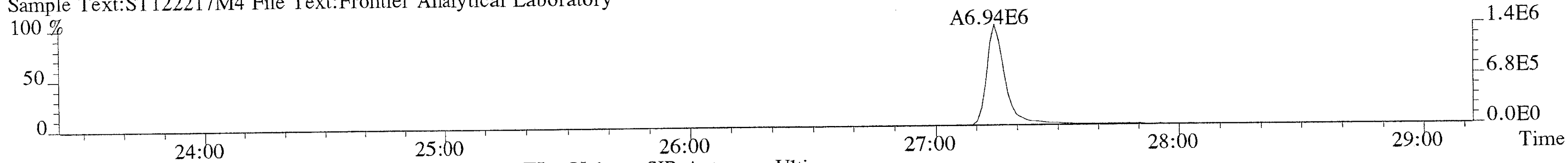
File:22DEC17M #1-361 Acq:22-DEC-2017 13:02:55 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:4 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M3 File Text:Frontier Analytical Laboratory



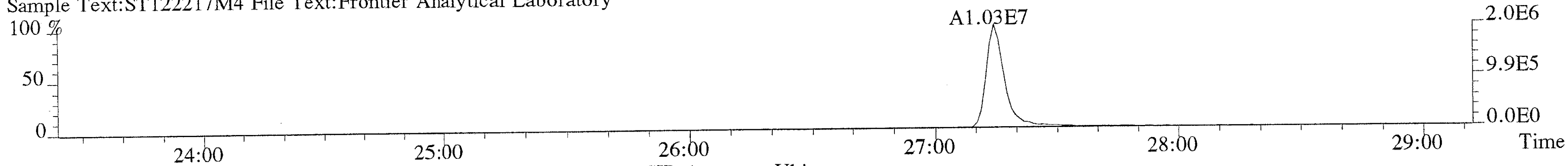
File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



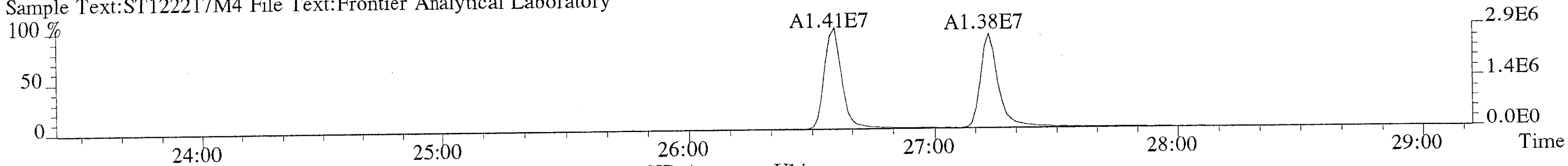
File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



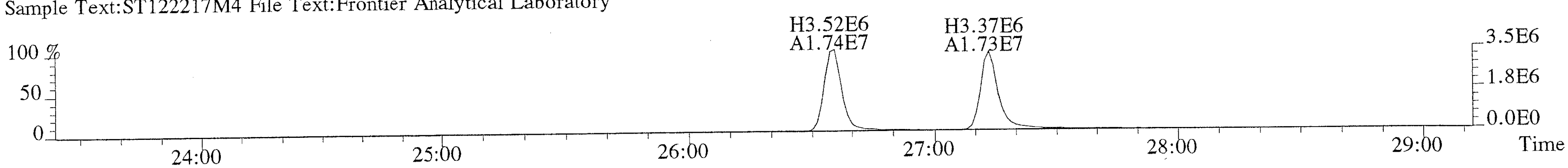
File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
327.8847 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



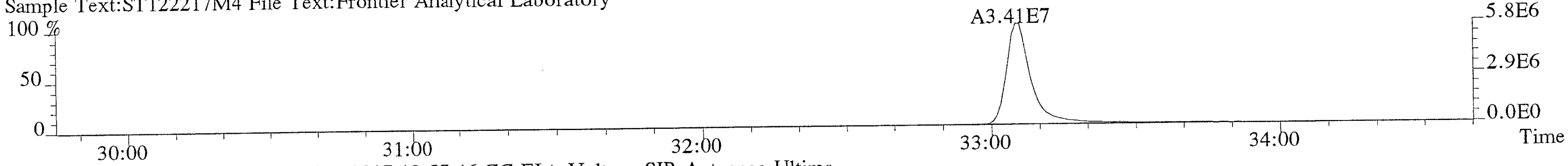
File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
331.9368 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



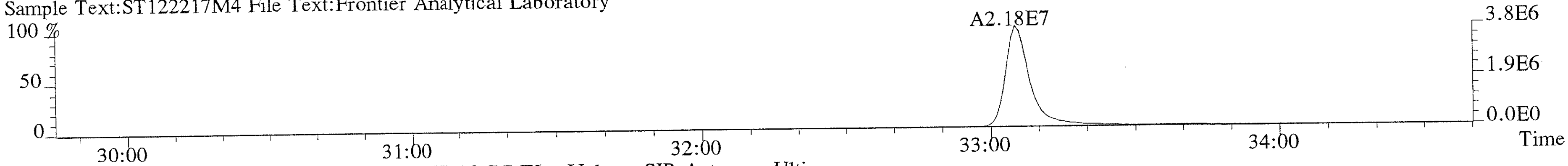
File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
333.9339 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



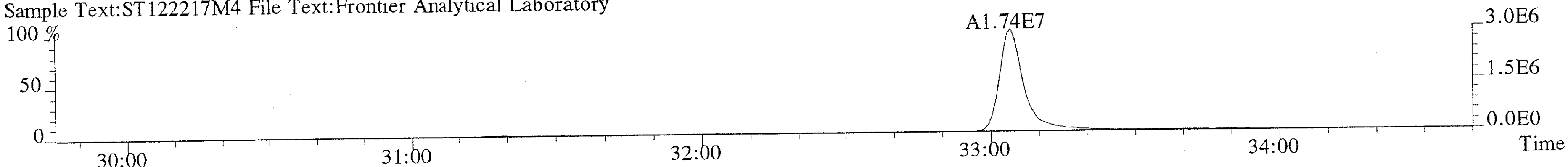
File:22DEC17M #1-411 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
355.8546 S:5 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



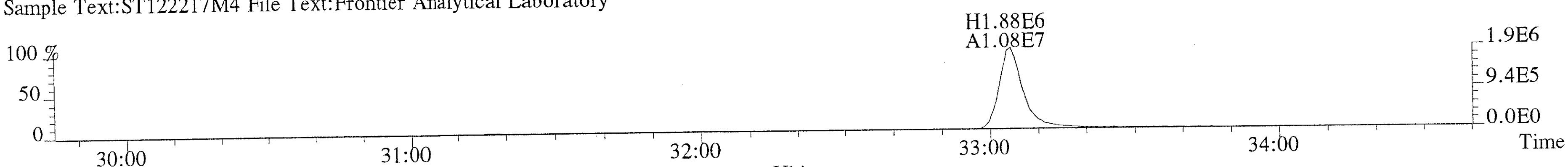
File:22DEC17M #1-411 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
357.8517 S:5 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



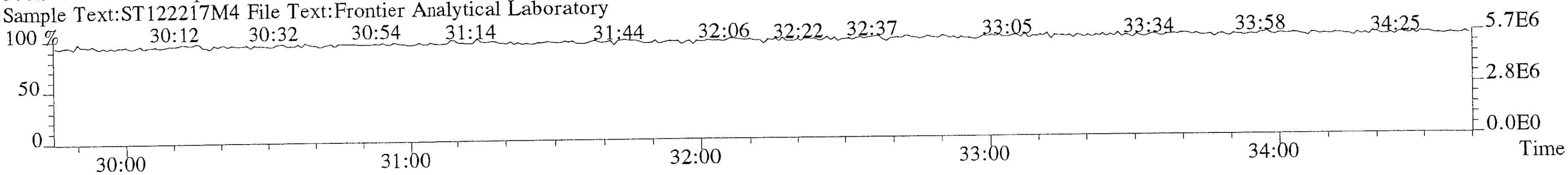
File:22DEC17M #1-411 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
367.8949 S:5 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



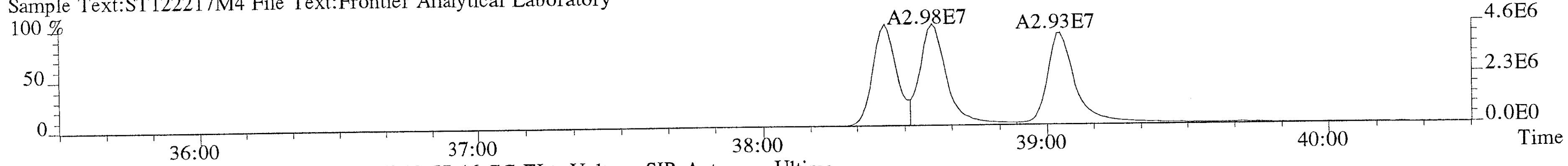
File:22DEC17M #1-411 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
369.8919 S:5 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



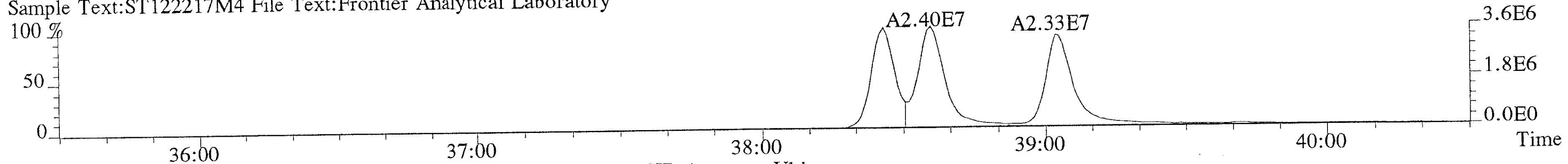
File:22DEC17M #1-411 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
366.9792 S:5 F:2 Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



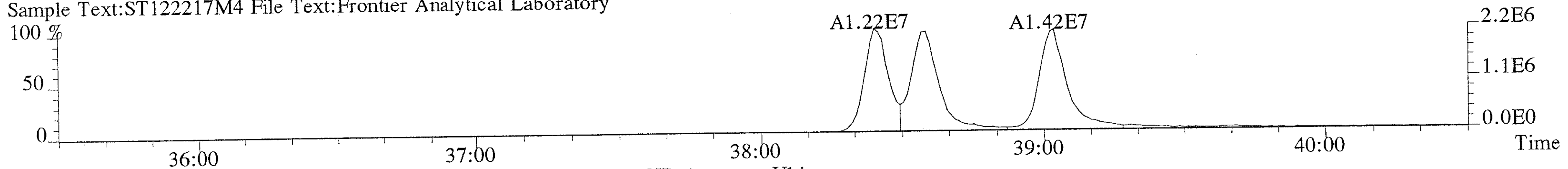
File:22DEC17M #1-495 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
389.8156 S:5 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



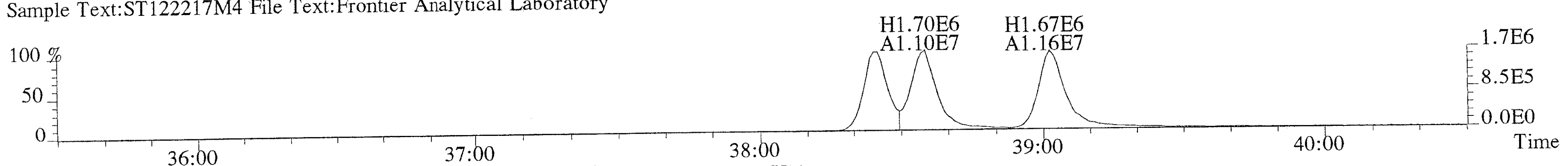
File:22DEC17M #1-495 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
391.8127 S:5 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



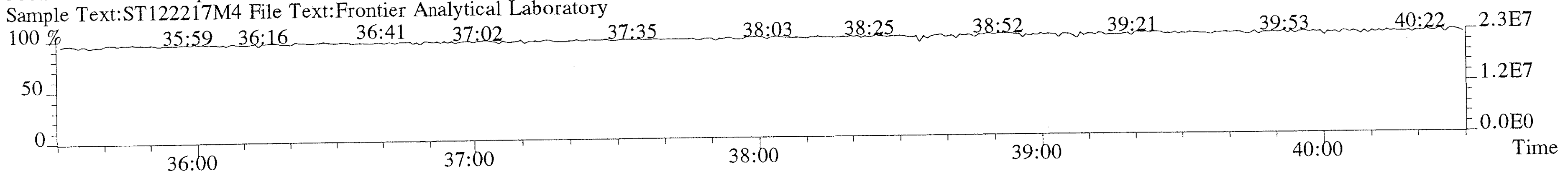
File:22DEC17M #1-495 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
401.8559 S:5 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



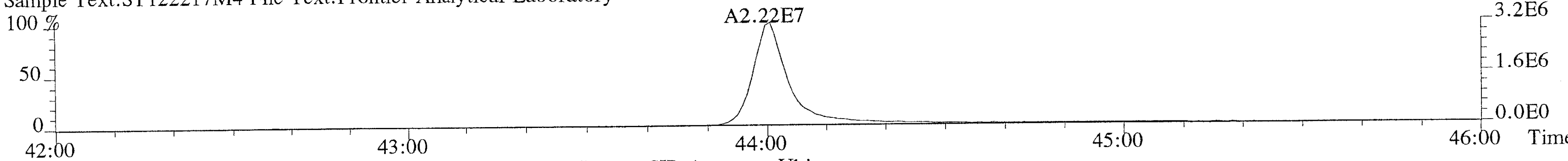
File:22DEC17M #1-495 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
403.8530 S:5 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-495 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
380.9760 S:5 F:3 Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-521 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
423.7767 S:5 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



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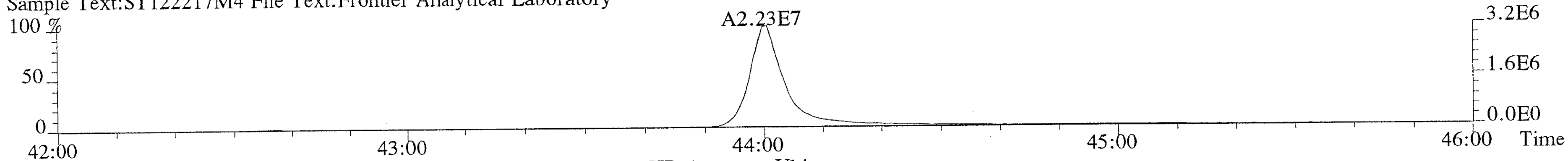
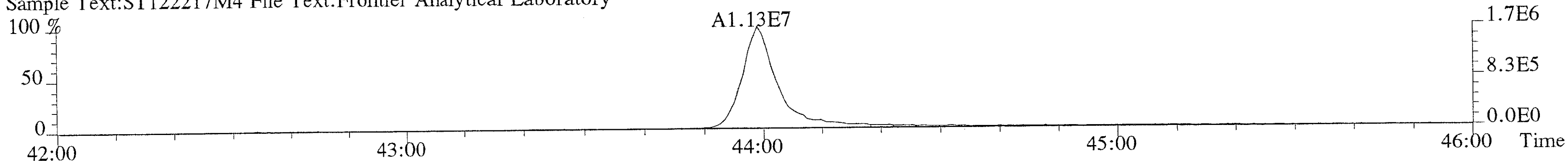
425.7737 S:5 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-521 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
435.8169 S:5 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



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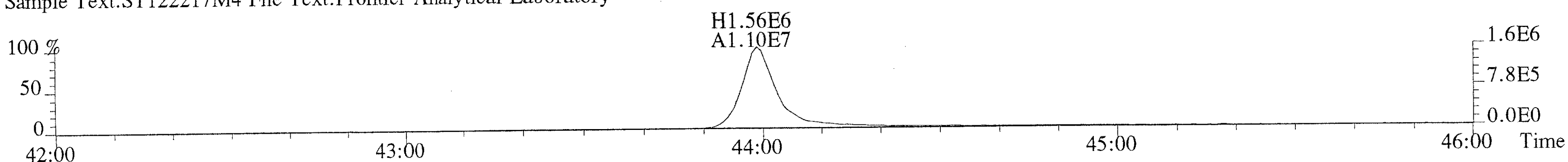
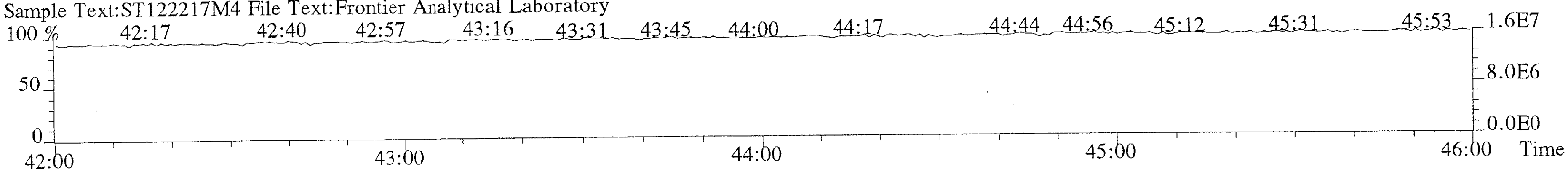
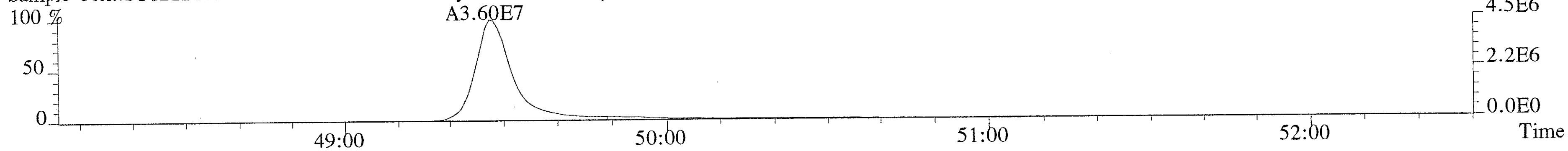
437.8140 S:5 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-521 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
430.9728 S:5 F:4 Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-361 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
457.7377 S:5 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



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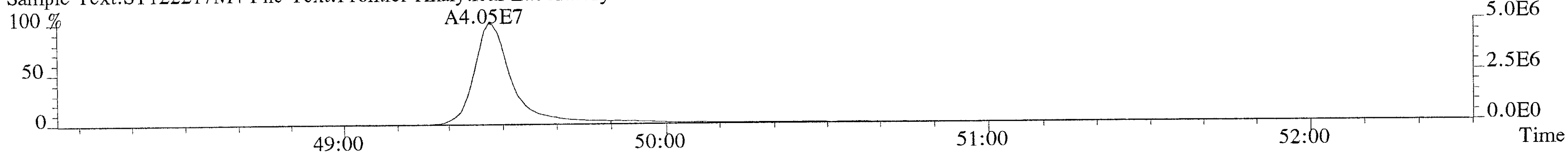
459.7348 S:5 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



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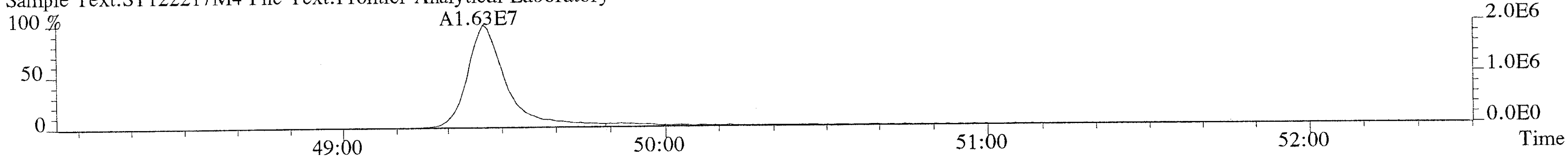
469.7780 S:5 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



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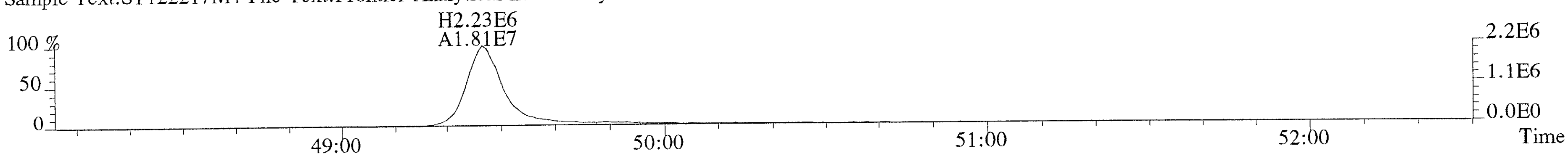

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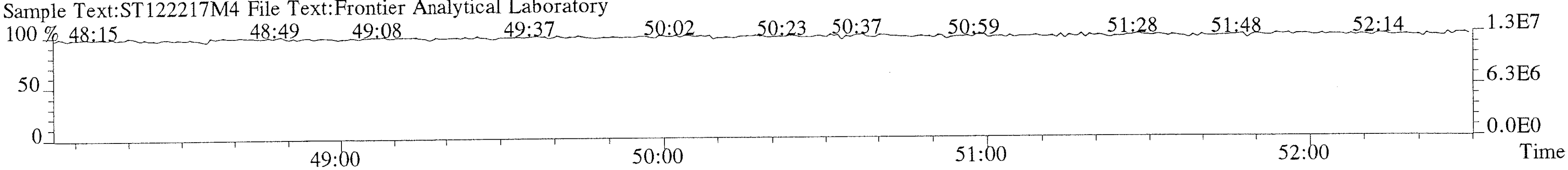
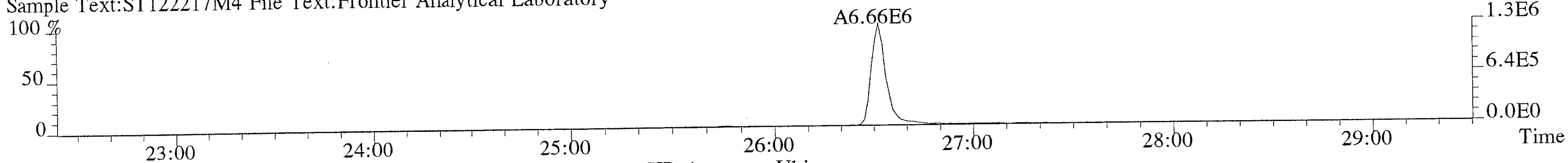
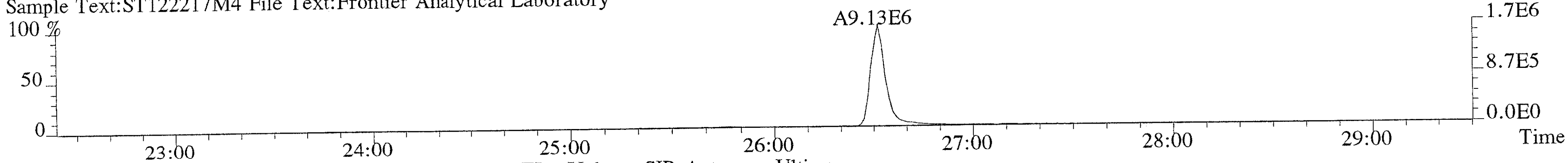
454.9728 S:5 F:5 Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



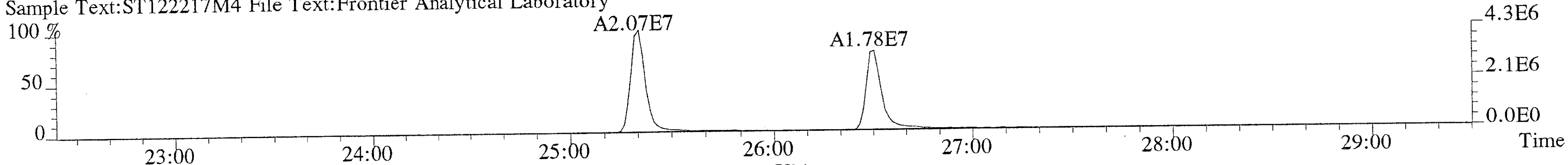
File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
303.9016 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



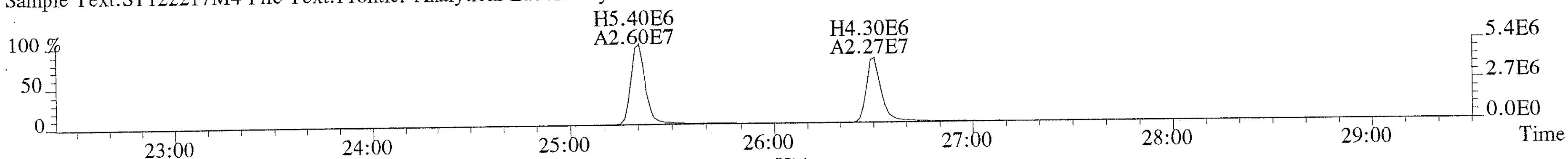
File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
305.8987 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



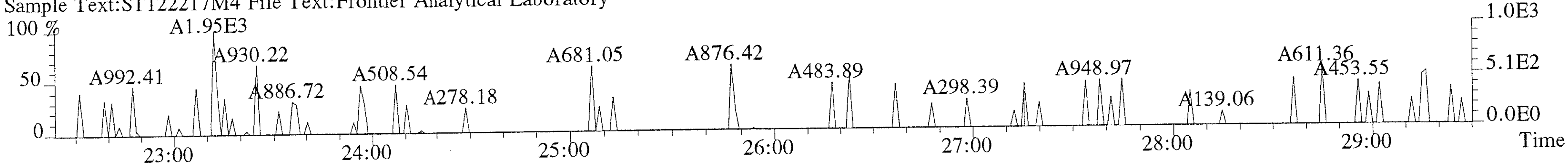
File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
315.9419 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



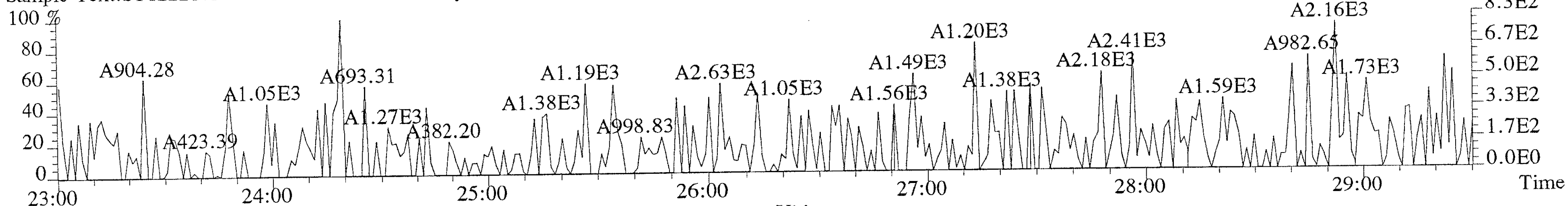
File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
317.9389 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



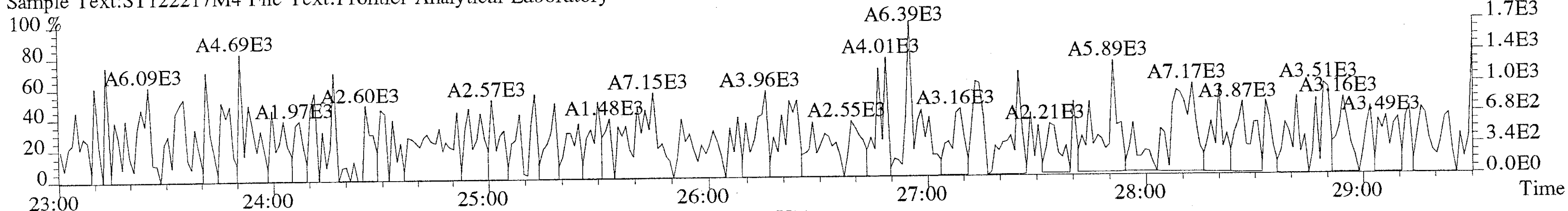
File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
375.8364 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



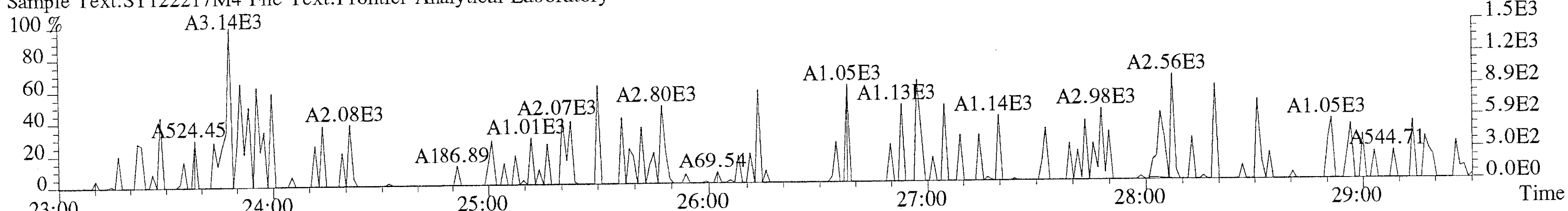
File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



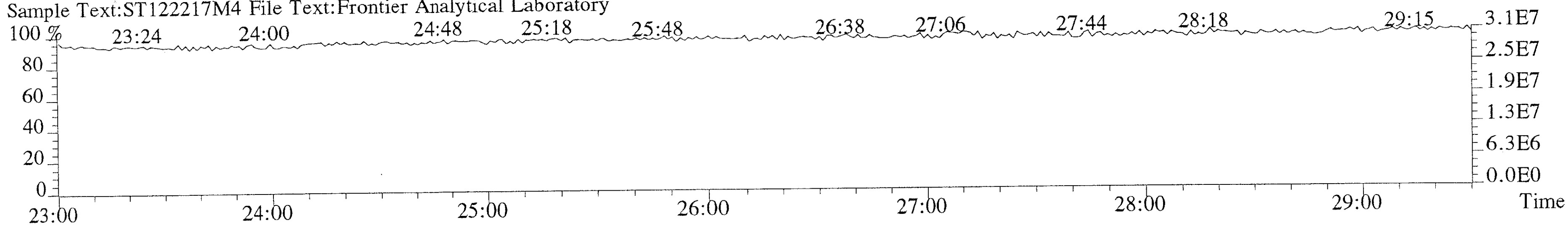
File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-400 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
330.9792 S:5 Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



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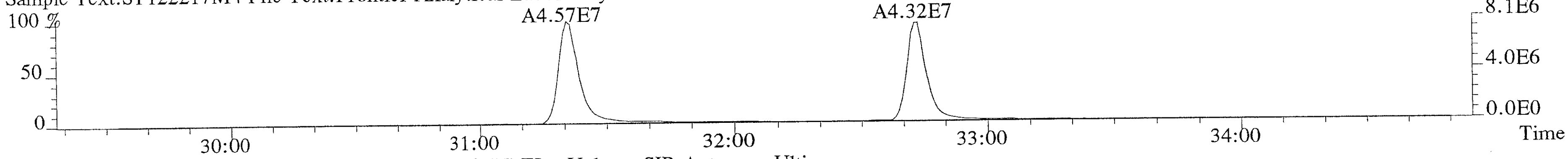
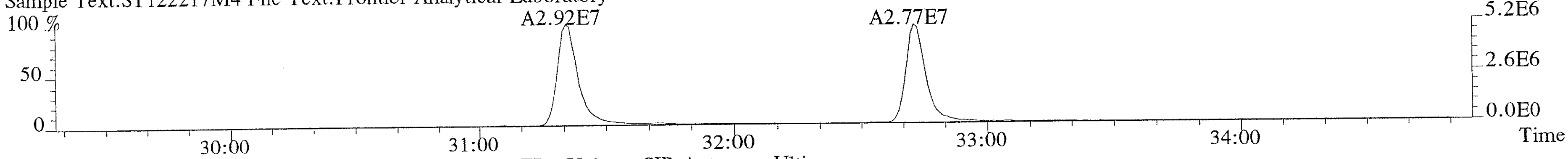
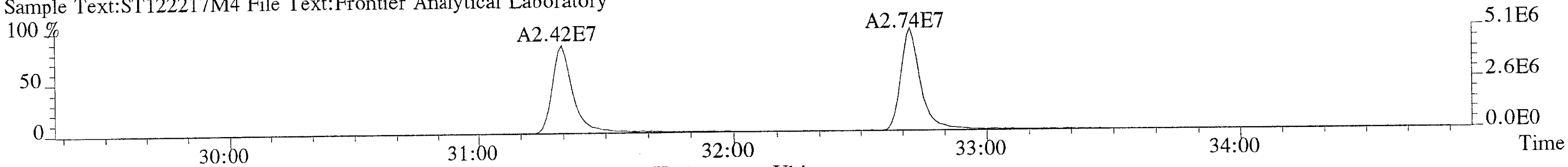
339.8597 S:5 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



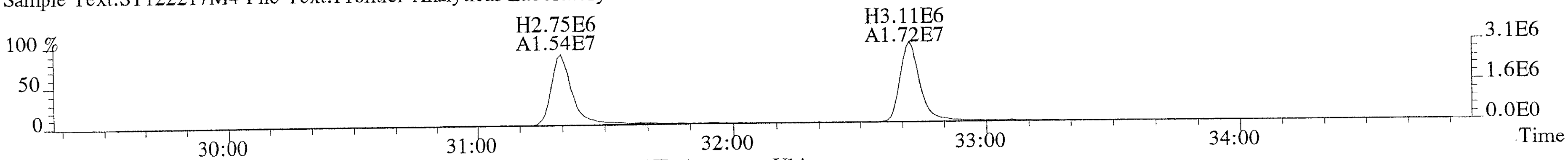
File:22DEC17M #1-411 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:5 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



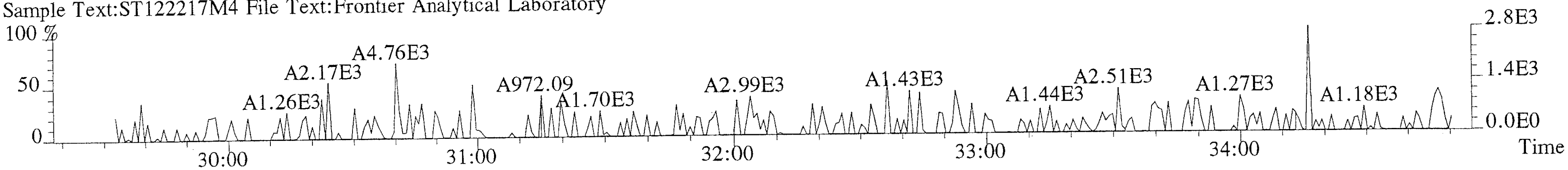
File:22DEC17M #1-411 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:5 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



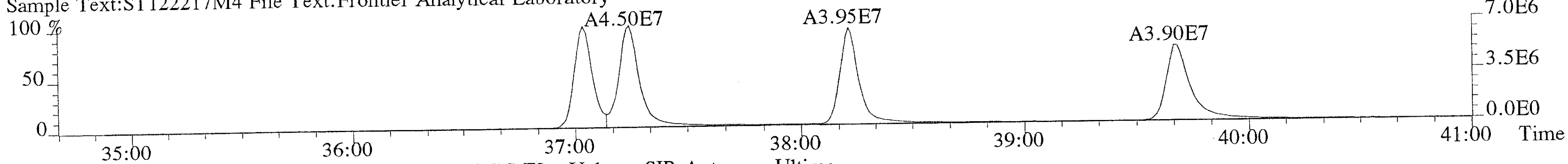
File:22DEC17M #1-411 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
353.8970 S:5 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



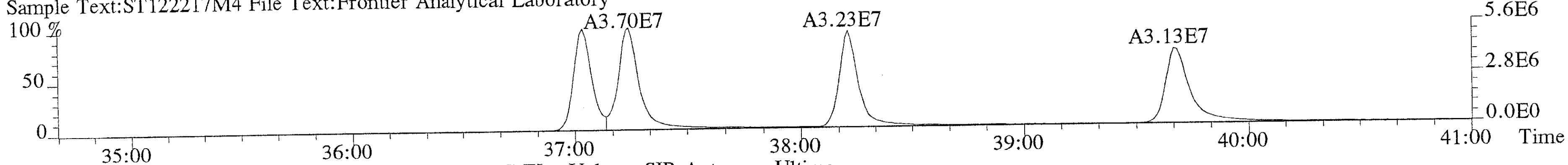
File:22DEC17M #1-411 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:5 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



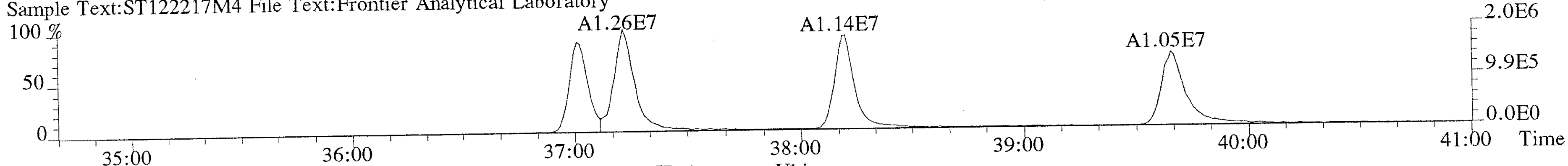
File:22DEC17M #1-495 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
373.8207 S:5 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-495 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
375.8178 S:5 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-495 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:5 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



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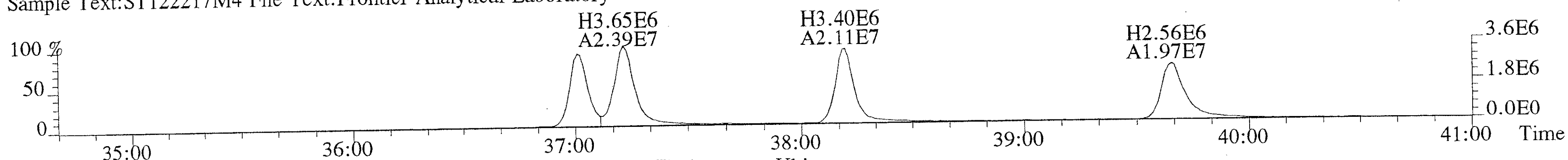
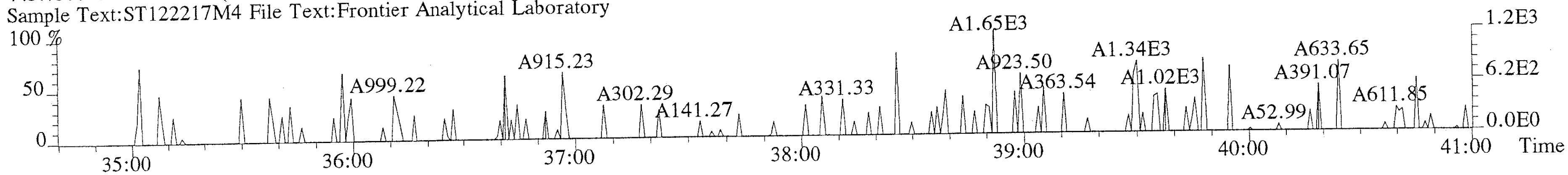
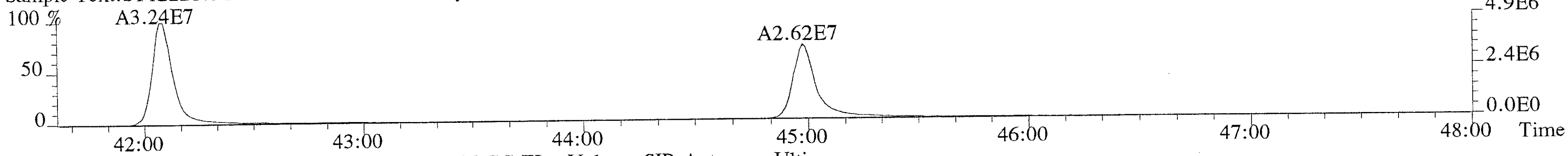
385.8610 S:5 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-495 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
445.7555 S:5 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-521 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:5 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



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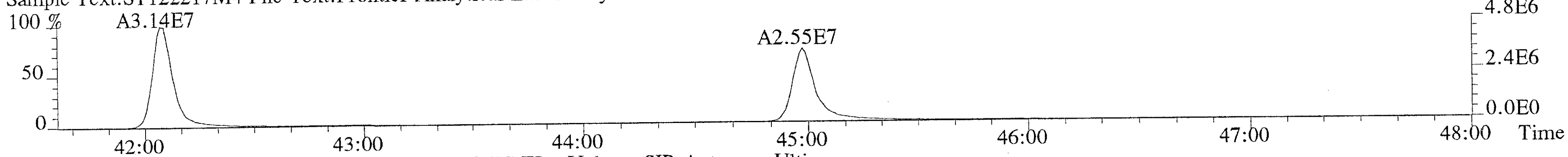
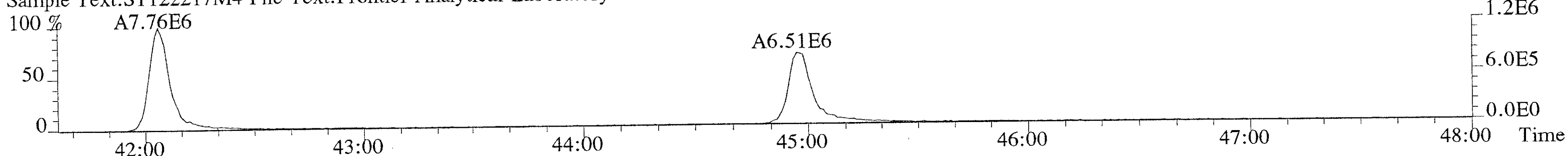
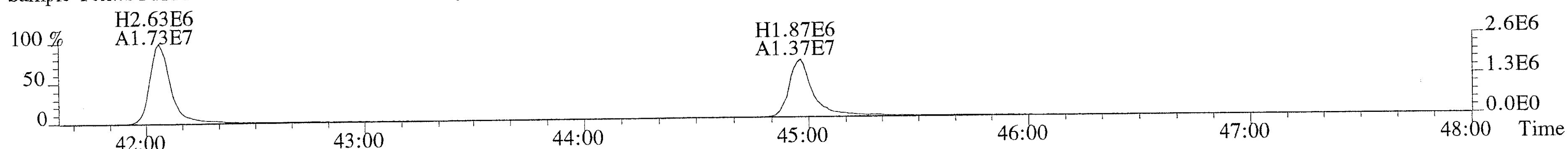
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



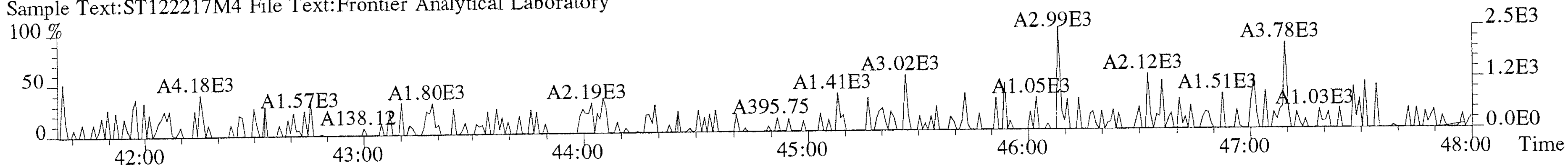
File:22DEC17M #1-521 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
417.8253 S:5 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



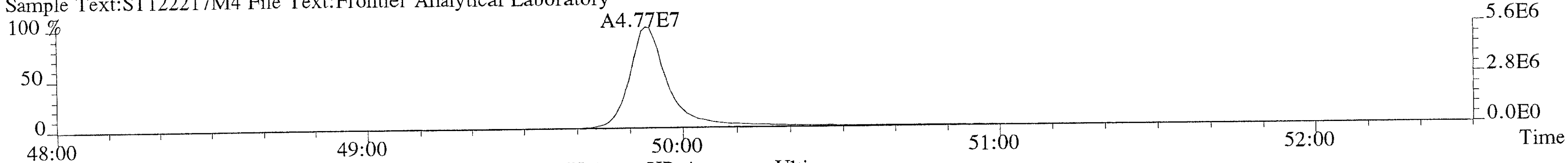
File:22DEC17M #1-521 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
419.8220 S:5 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



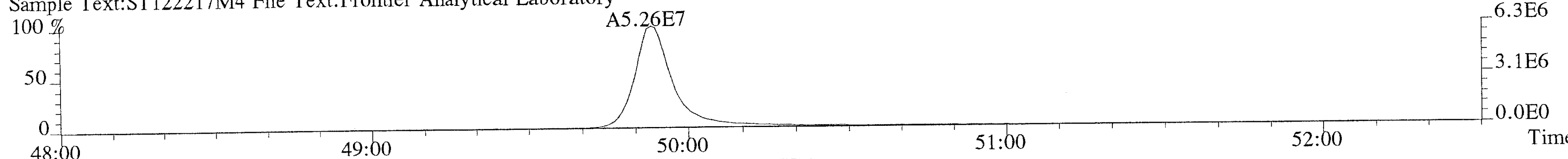
File:22DEC17M #1-521 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:5 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-361 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:5 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory

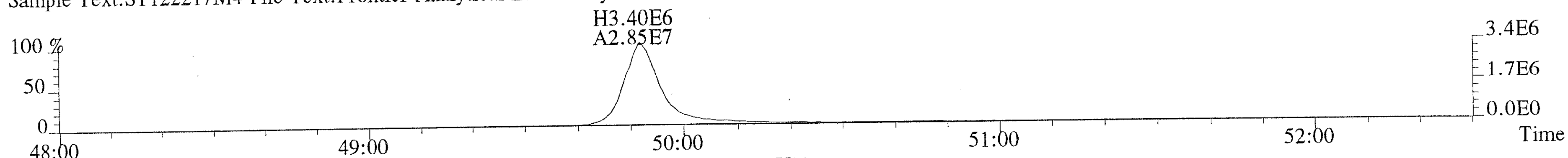


File:22DEC17M #1-361 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
443.7398 S:5 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory

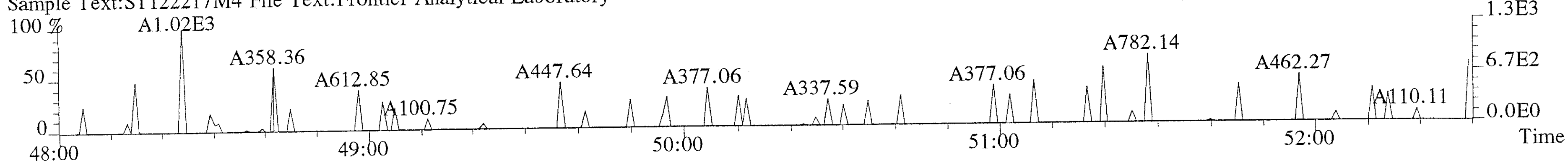


File:22DEC17M #1-361 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:5 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory

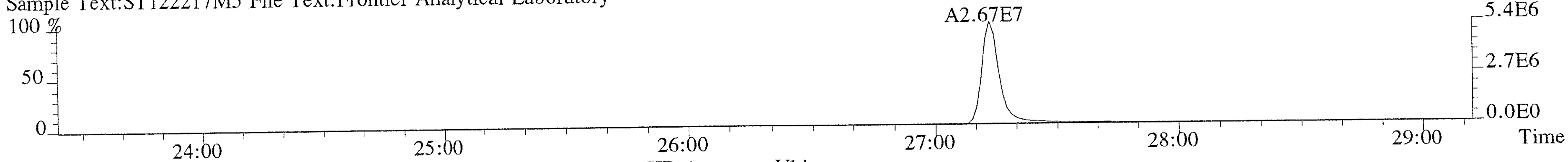
File:22DEC17M #1-361 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:5 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



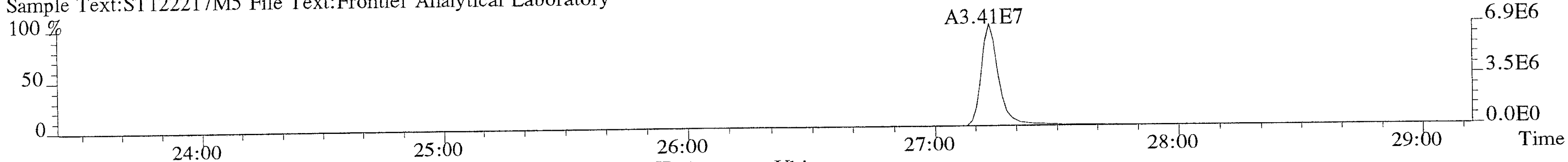
File:22DEC17M #1-361 Acq:22-DEC-2017 13:57:46 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:5 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M4 File Text:Frontier Analytical Laboratory



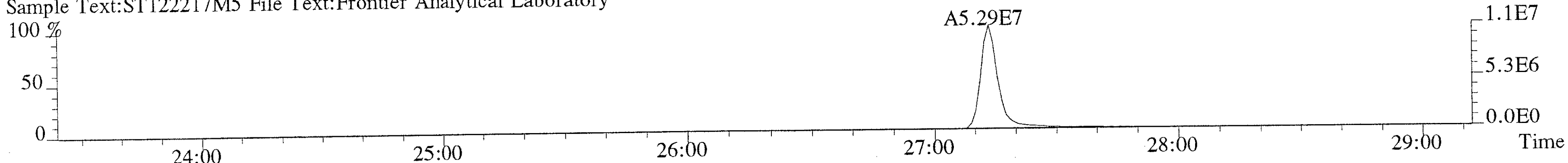
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:6 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



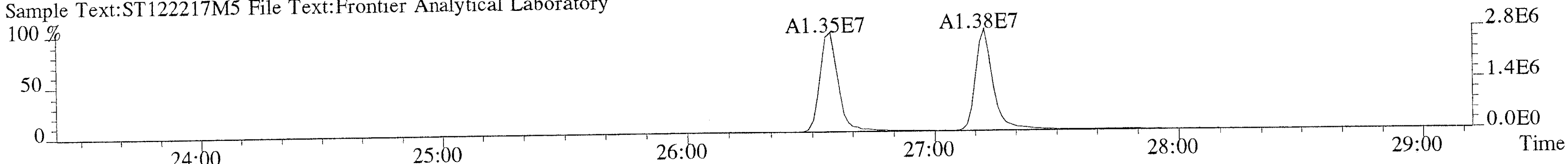
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:6 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



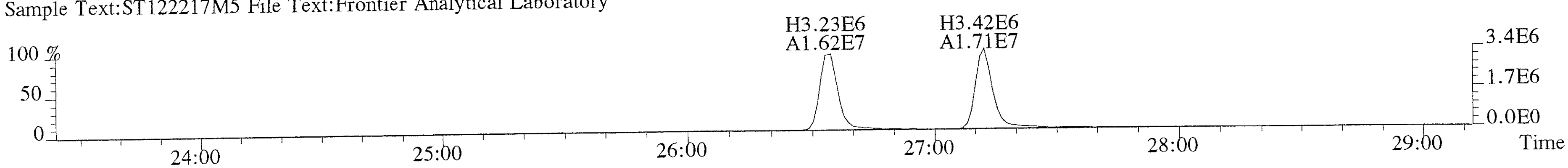
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
327.8847 S:6 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



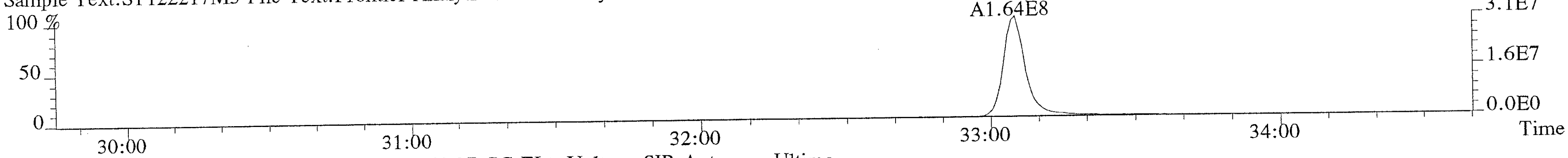
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
331.9368 S:6 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



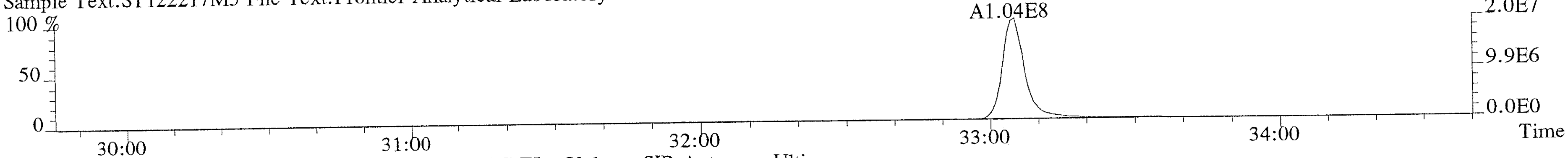
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
333.9339 S:6 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



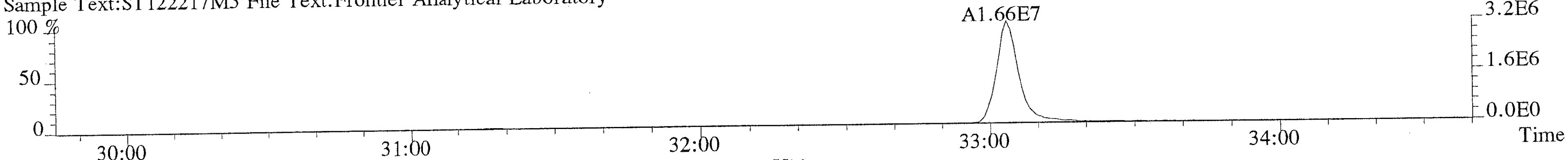
File:22DEC17M #1-411 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
355.8546 S:6 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



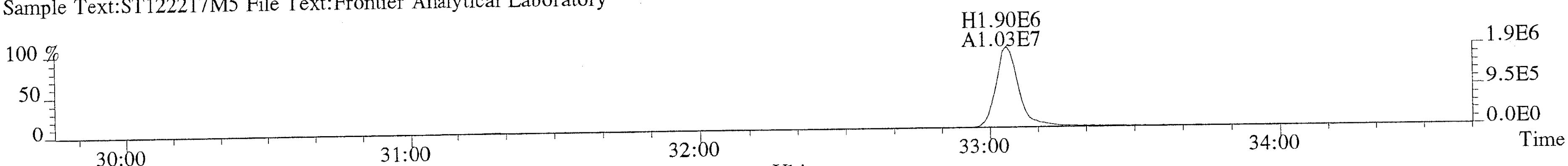
File:22DEC17M #1-411 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
357.8517 S:6 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



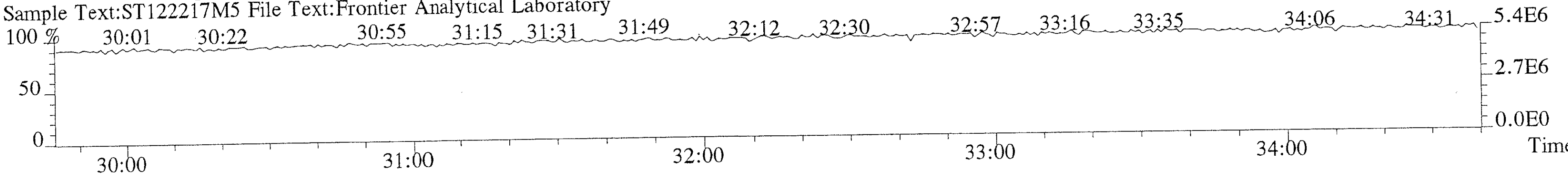
File:22DEC17M #1-411 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
367.8949 S:6 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



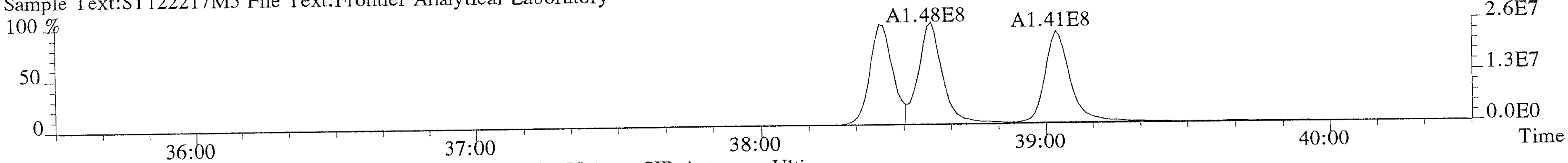
File:22DEC17M #1-411 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
369.8919 S:6 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



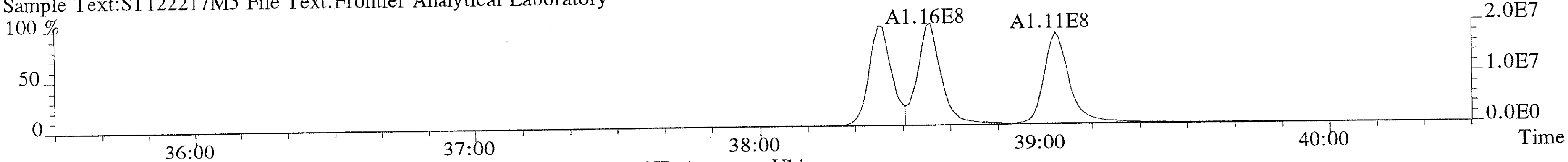
File:22DEC17M #1-411 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
366.9792 S:6 F:2 Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



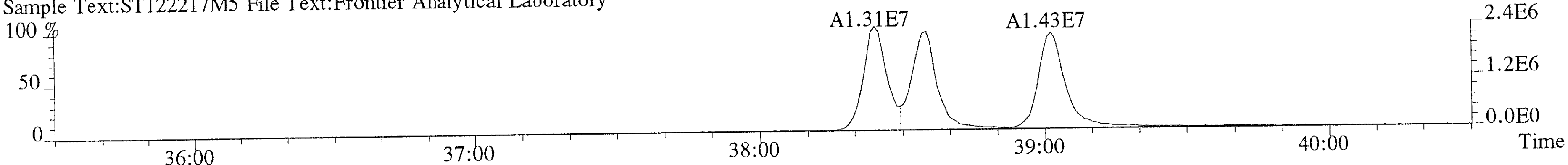
File:22DEC17M #1-495 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
389.8156 S:6 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



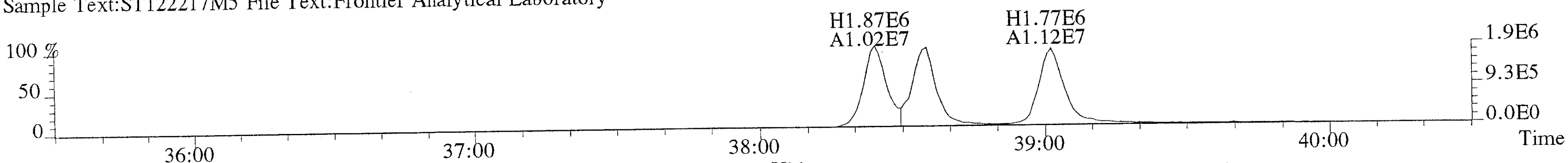
File:22DEC17M #1-495 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
391.8127 S:6 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



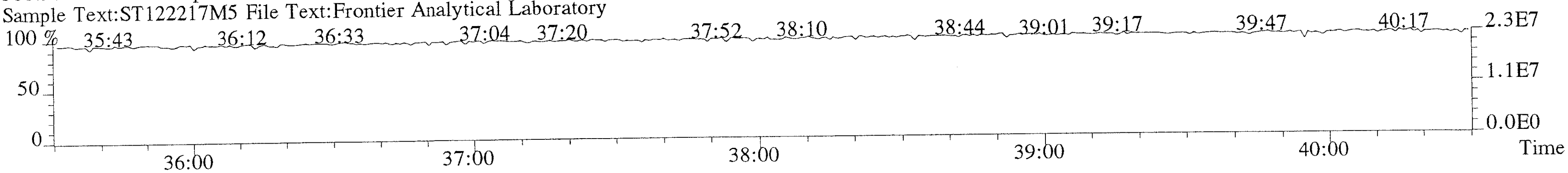
File:22DEC17M #1-495 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
401.8559 S:6 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



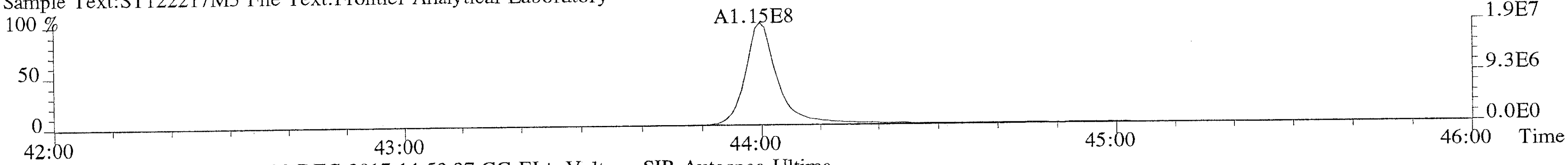
File:22DEC17M #1-495 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
403.8530 S:6 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



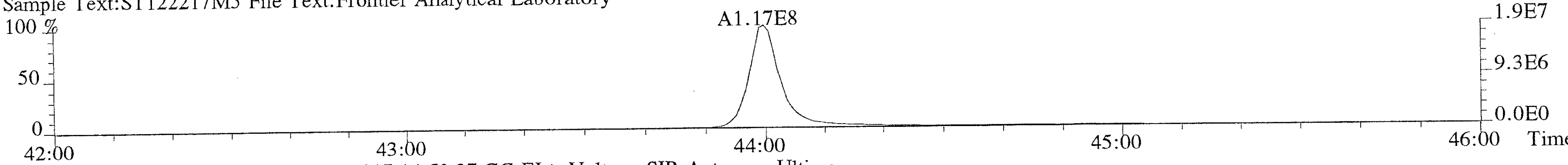
File:22DEC17M #1-495 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
380.9760 S:6 F:3 Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



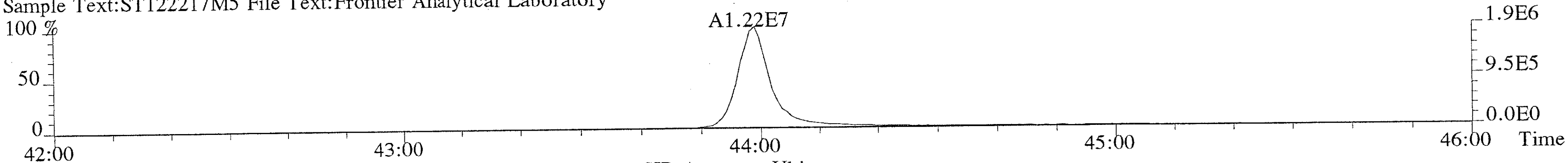
File:22DEC17M #1-521 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
423.7767 S:6 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



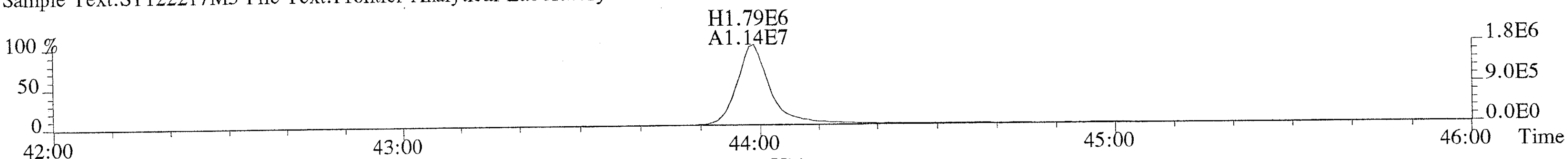
File:22DEC17M #1-521 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
425.7737 S:6 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



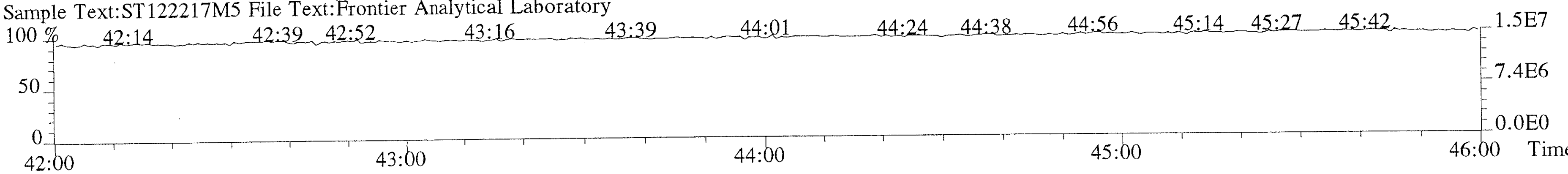
File:22DEC17M #1-521 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
435.8169 S:6 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



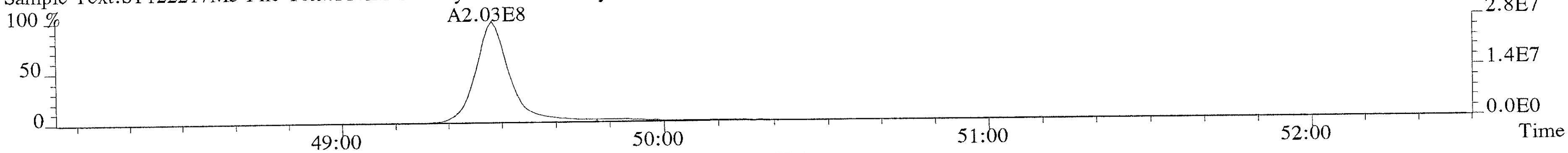
File:22DEC17M #1-521 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
437.8140 S:6 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



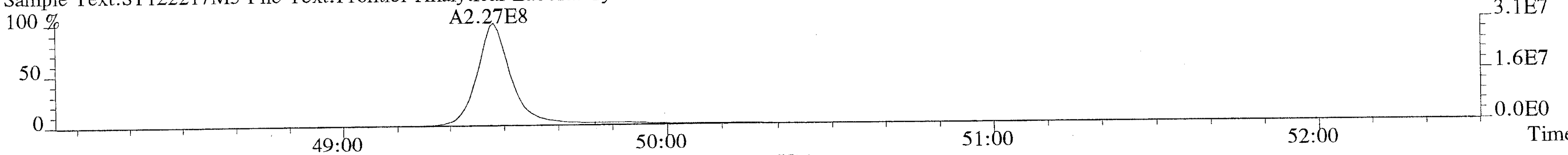
File:22DEC17M #1-521 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
430.9728 S:6 F:4 Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



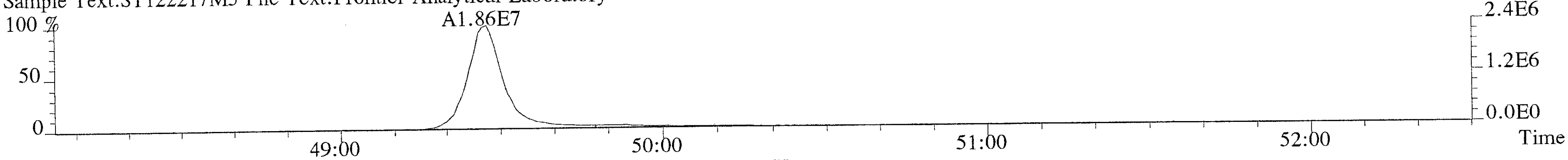
File:22DEC17M #1-361 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
457.7377 S:6 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



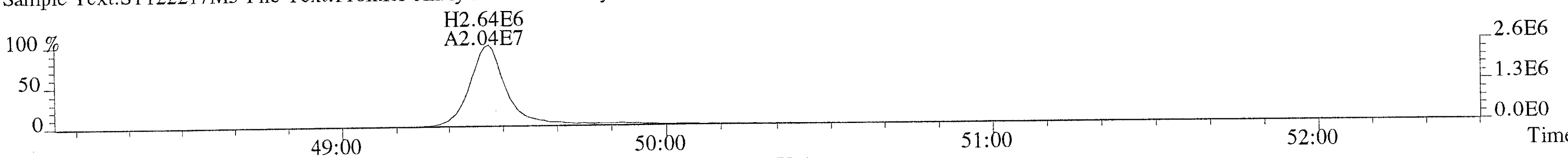
File:22DEC17M #1-361 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
459.7348 S:6 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



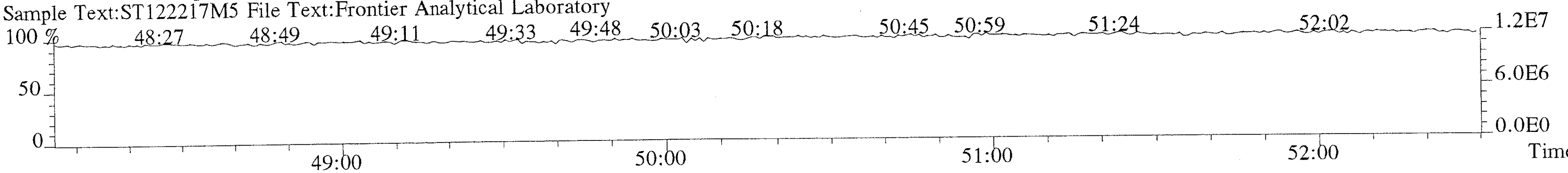
File:22DEC17M #1-361 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
469.7780 S:6 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



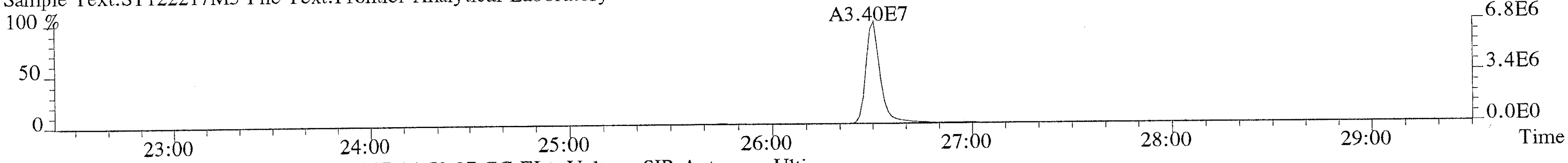
File:22DEC17M #1-361 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
471.7750 S:6 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



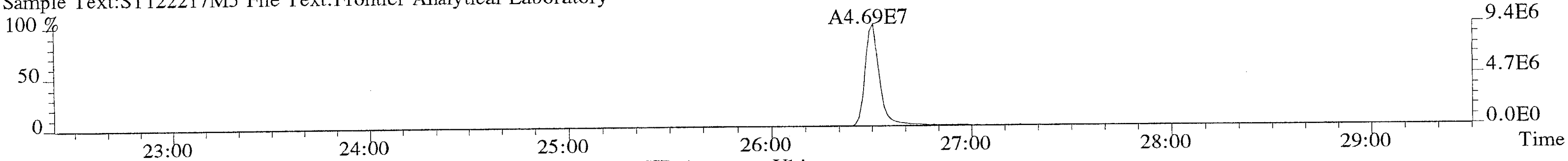
File:22DEC17M #1-361 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
454.9728 S:6 F:5 Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



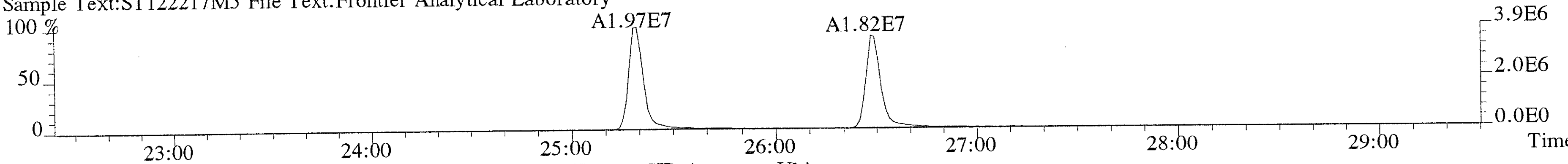
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
303.9016 S:6 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



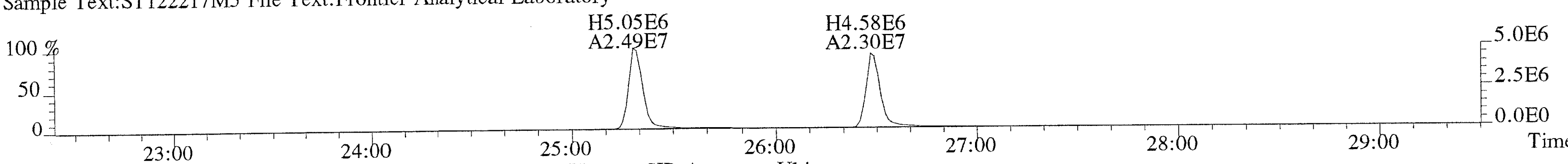
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
305.8987 S:6 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



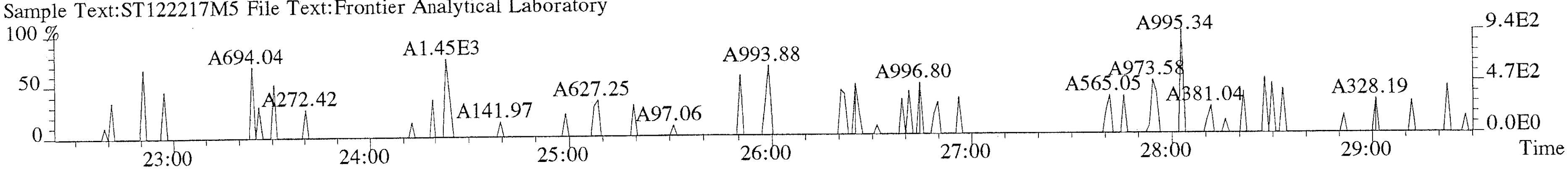
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
315.9419 S:6 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



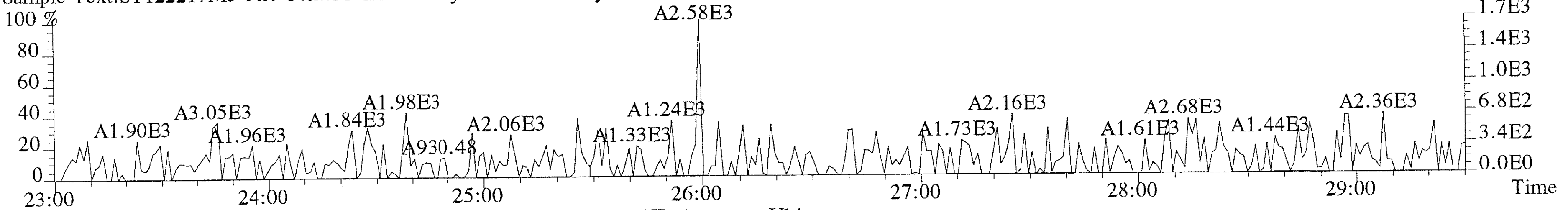
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
317.9389 S:6 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



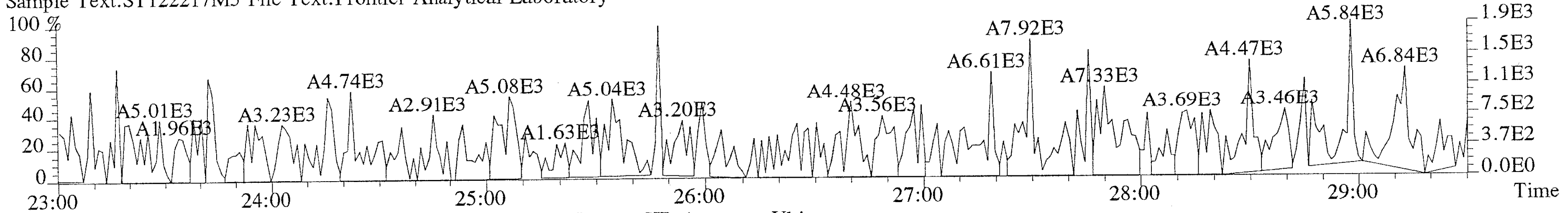
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
375.8364 S:6 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



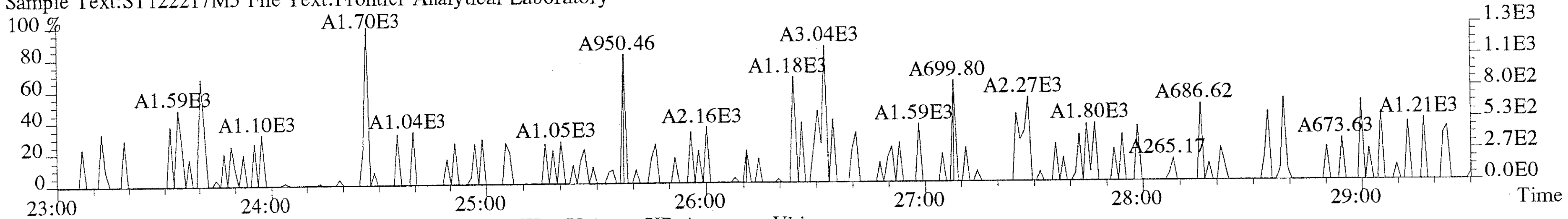
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:6 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



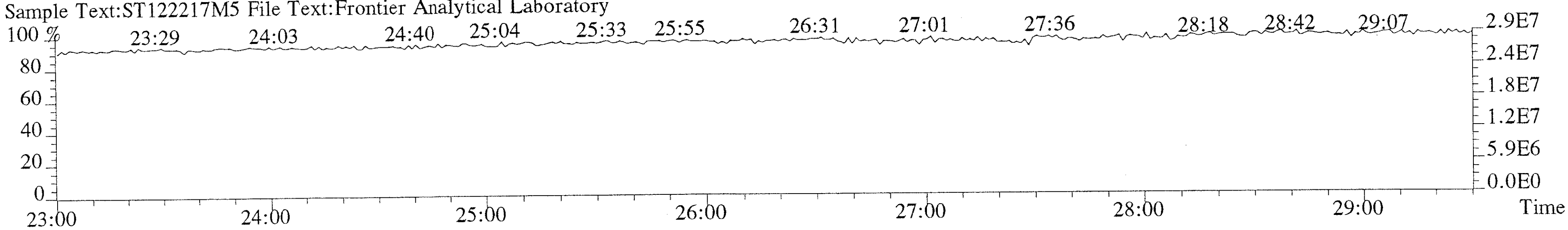
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:6 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



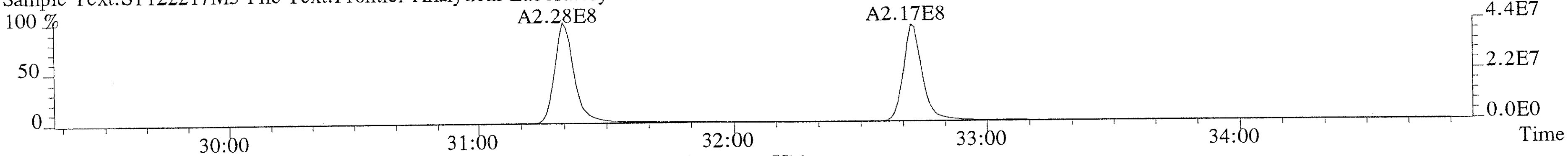
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:6 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



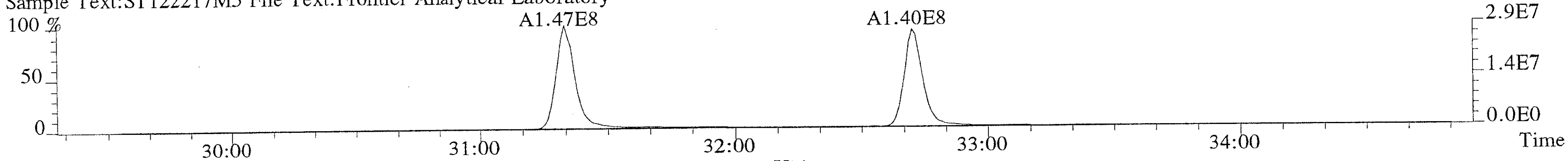
File:22DEC17M #1-400 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
330.9792 S:6 Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



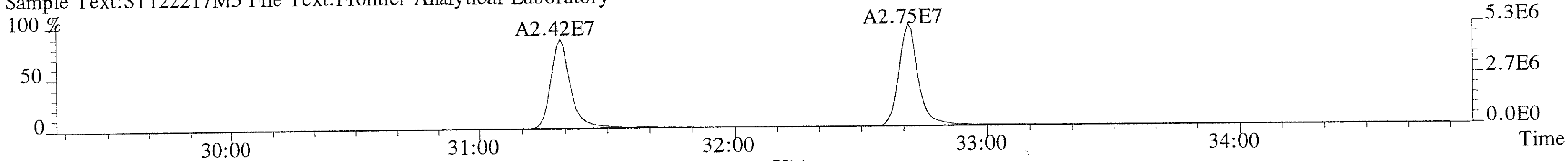
File:22DEC17M #1-411 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:6 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



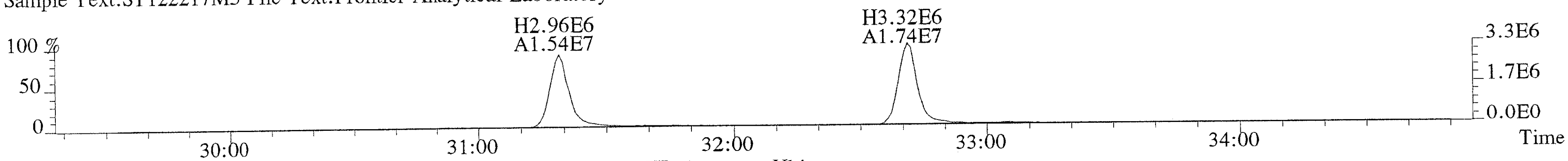
File:22DEC17M #1-411 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:6 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



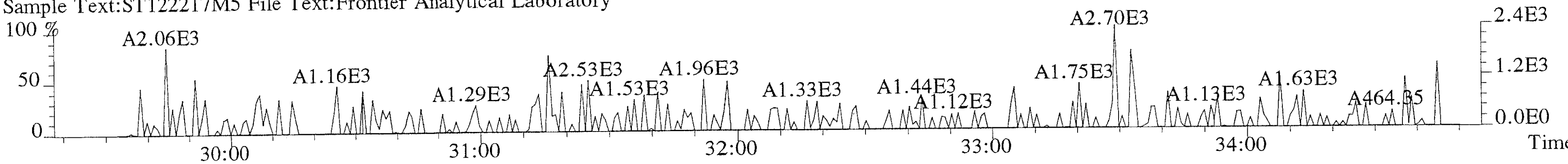
File:22DEC17M #1-411 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:6 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



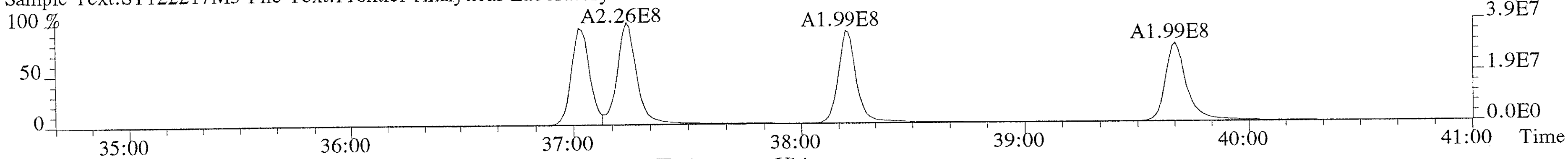
File:22DEC17M #1-411 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
353.8970 S:6 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



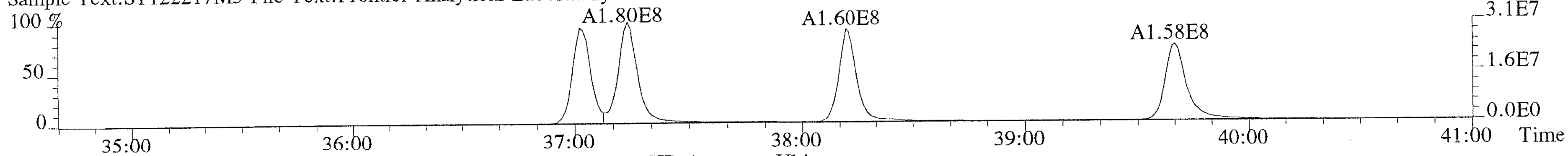
File:22DEC17M #1-411 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:6 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



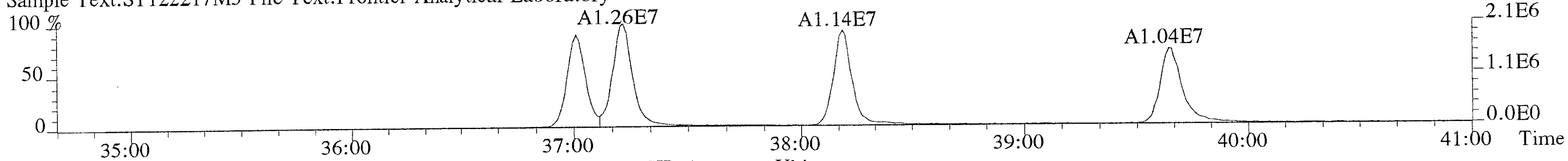
File:22DEC17M #1-495 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
373.8207 S:6 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-495 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
375.8178 S:6 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



File:22DEC17M #1-495 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:6 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



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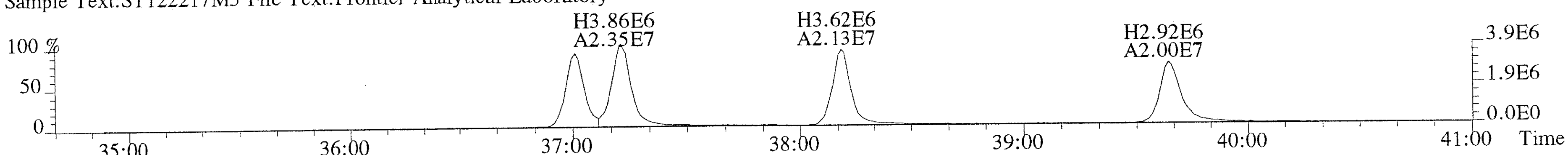
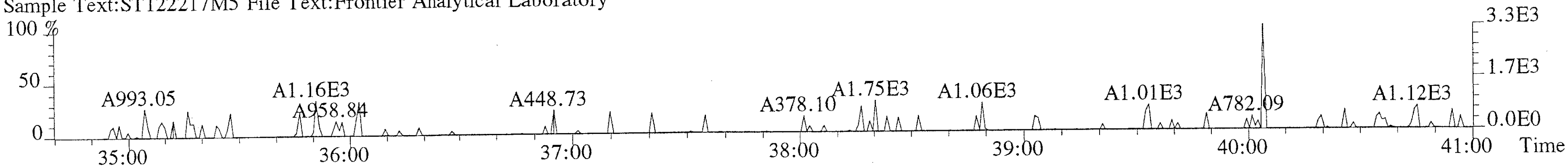
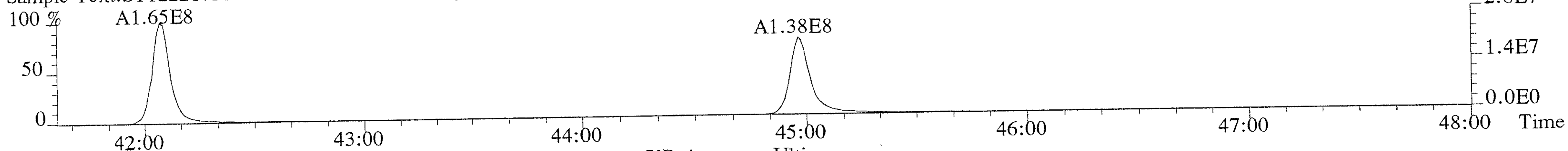
385.8610 S:6 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



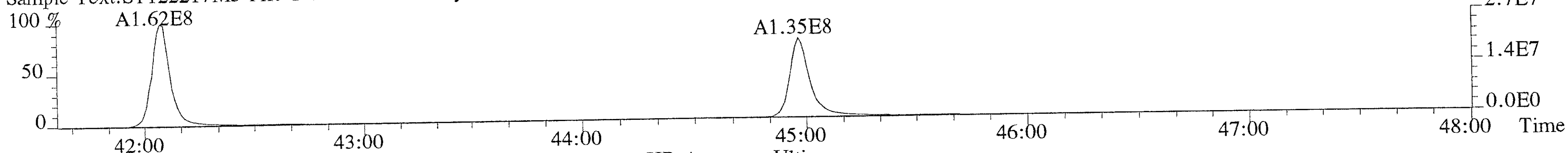
File:22DEC17M #1-495 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
445.7555 S:6 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



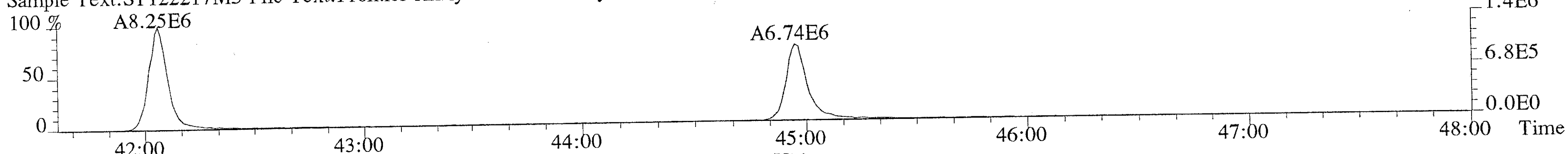
File:22DEC17M #1-521 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:6 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



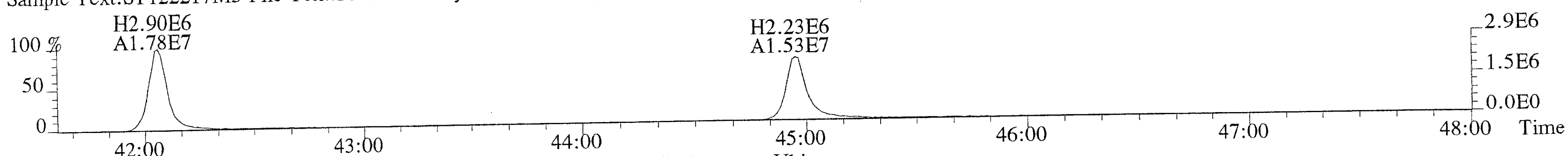
File:22DEC17M #1-521 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
409.7788 S:6 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



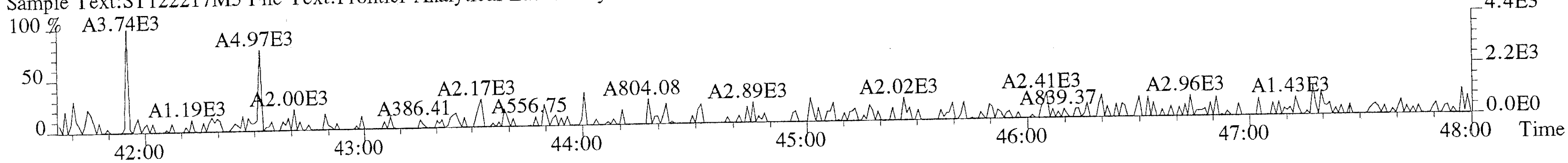
File:22DEC17M #1-521 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
417.8253 S:6 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



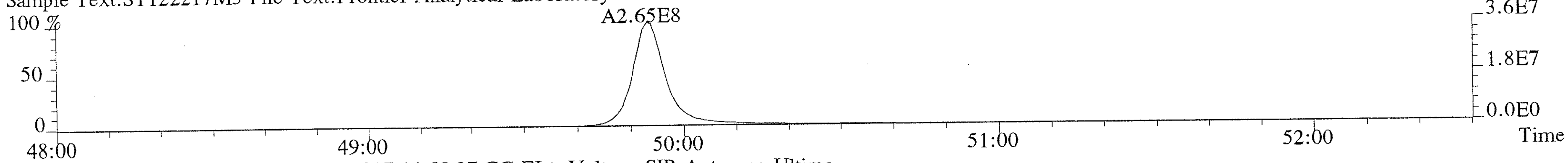
File:22DEC17M #1-521 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
419.8220 S:6 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



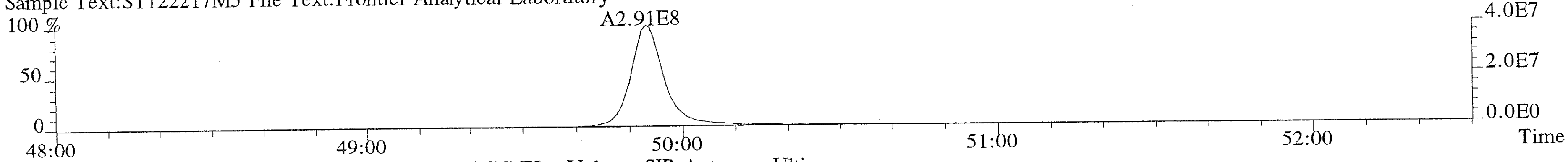
File:22DEC17M #1-521 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:6 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



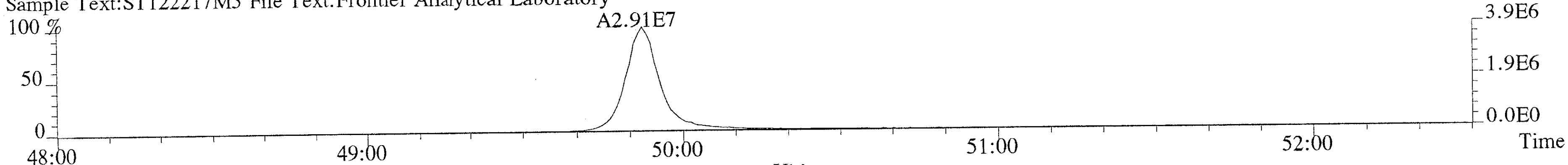
File:22DEC17M #1-361 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:6 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



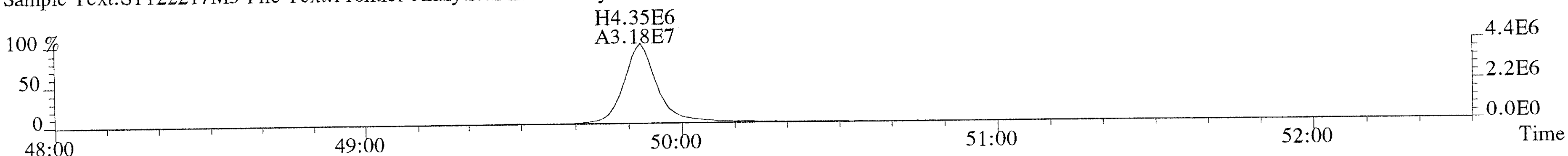
File:22DEC17M #1-361 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
443.7398 S:6 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



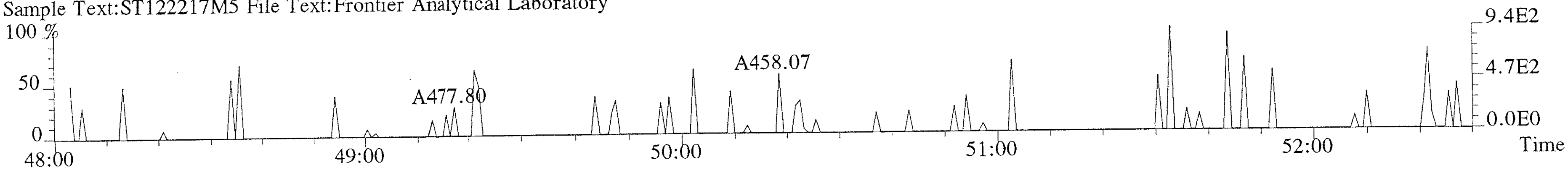
File:22DEC17M #1-361 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:6 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



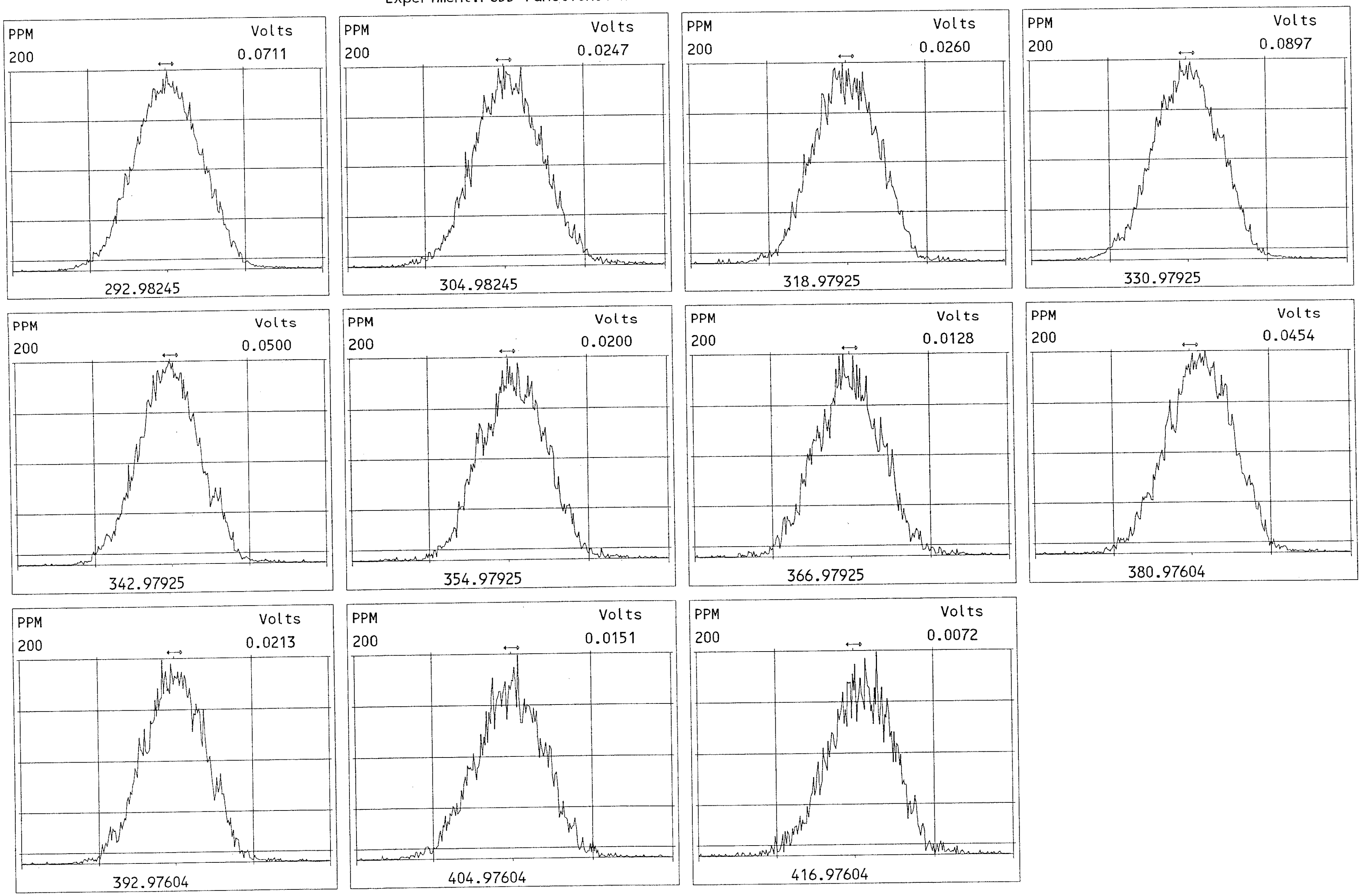
File:22DEC17M #1-361 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:6 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory



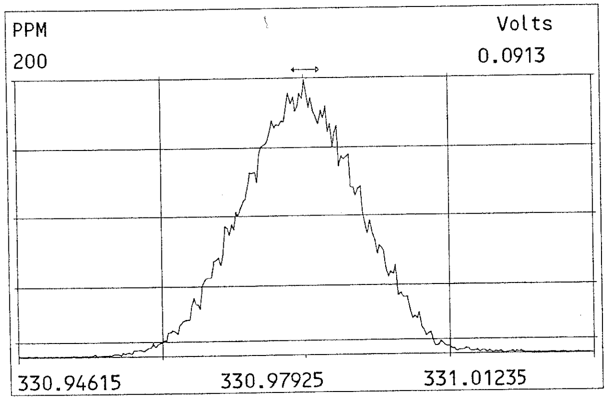
File:22DEC17M #1-361 Acq:22-DEC-2017 14:52:37 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:6 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST122217M5 File Text:Frontier Analytical Laboratory

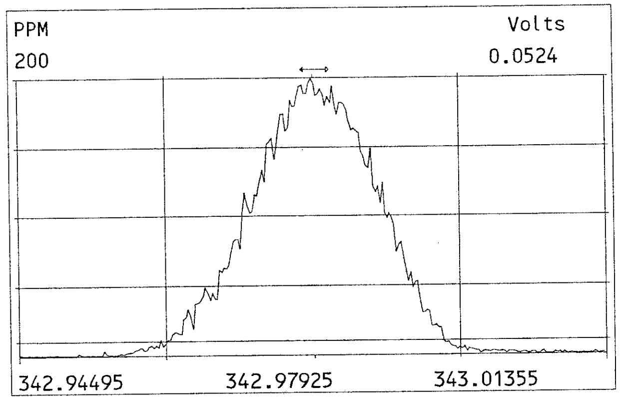


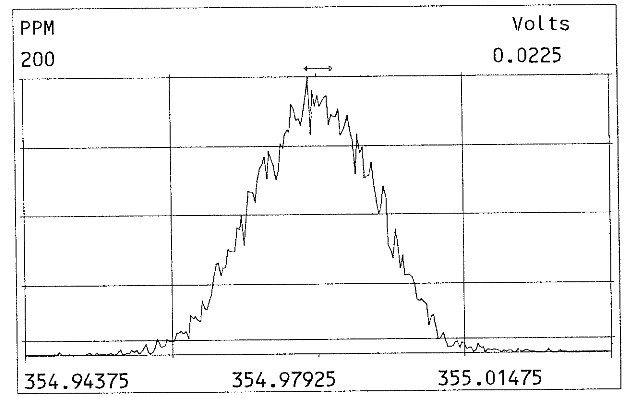
Peak Locate Examination:22-DEC-2017:20:24 File:22DEC17M_RES_CHECK
Experiment:PCDD Function:1 Reference:PFK

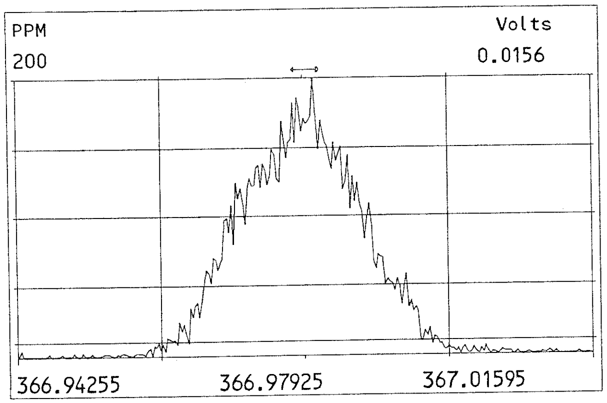


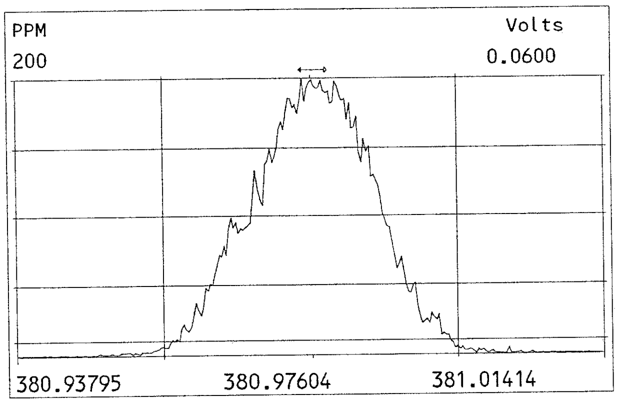
Peak Locate Examination:22-DEC-2017:20:25 File:22DEC17M_RES_CHECK
Experiment:PCDD Function:2 Reference:PFK

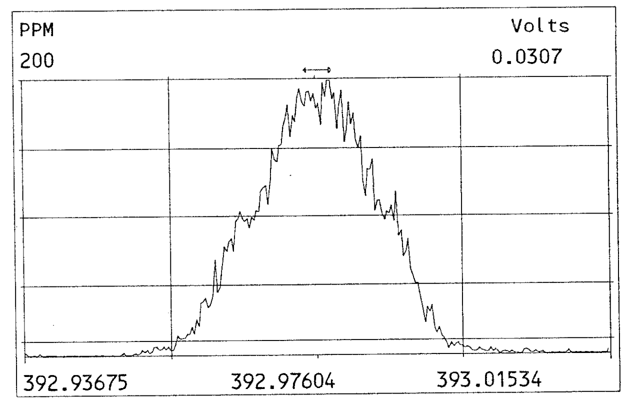


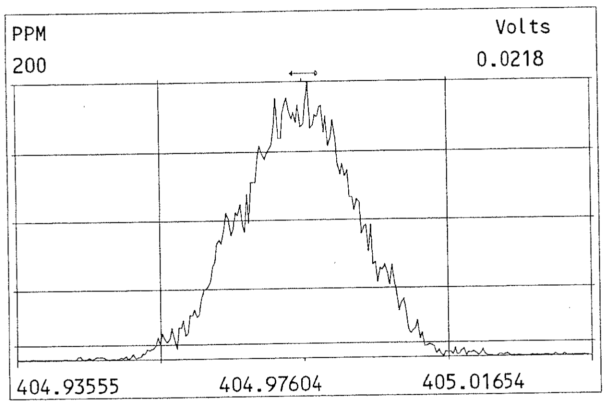


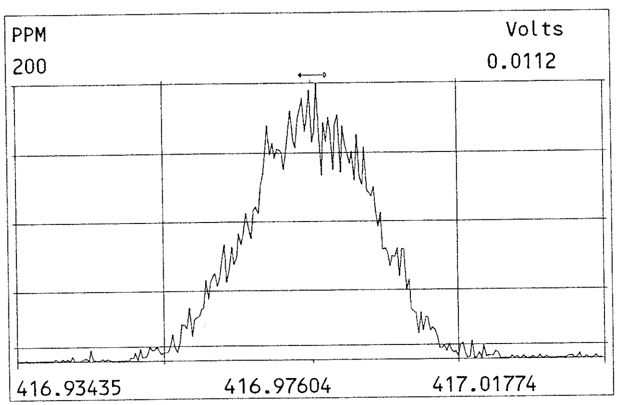




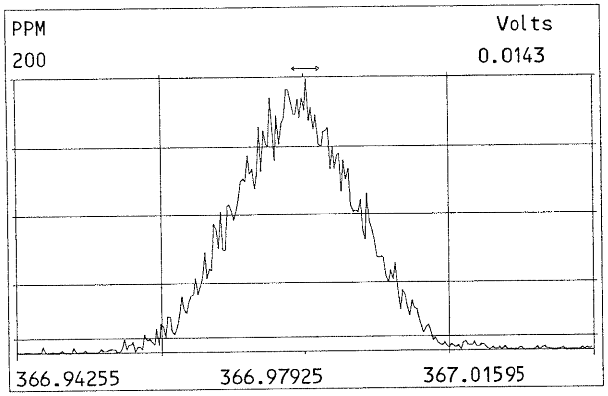


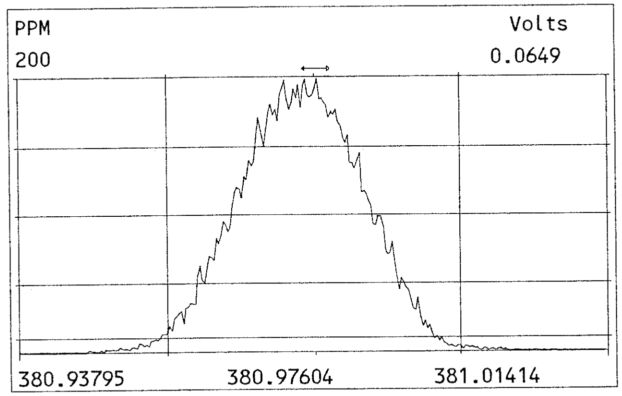


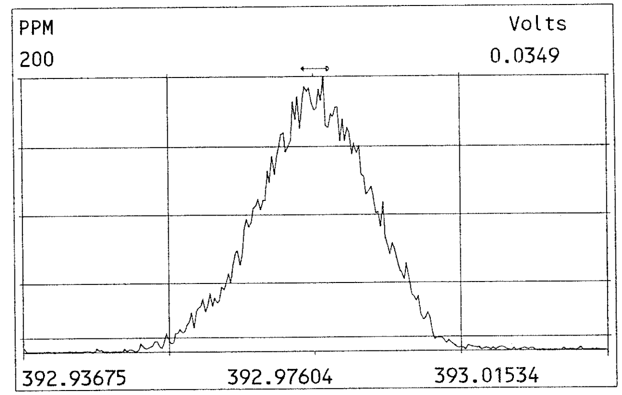


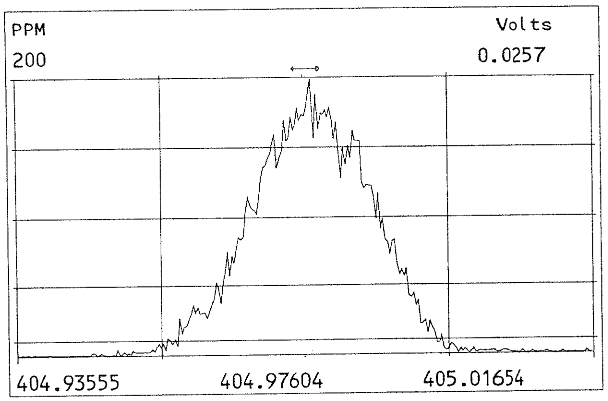


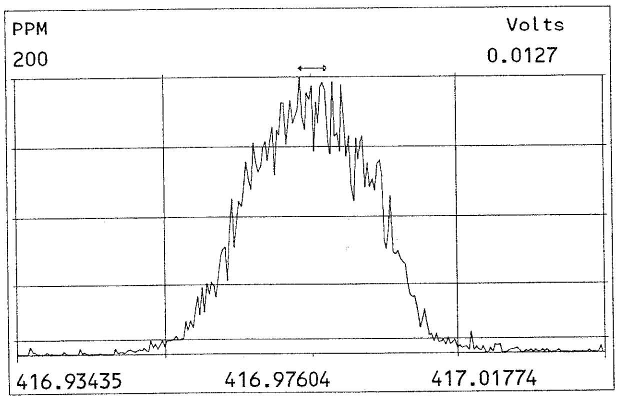
Peak Locate Examination:22-DEC-2017:20:25 File:22DEC17M_RES_CHECK
Experiment:PCDD Function:3 Reference:PFK

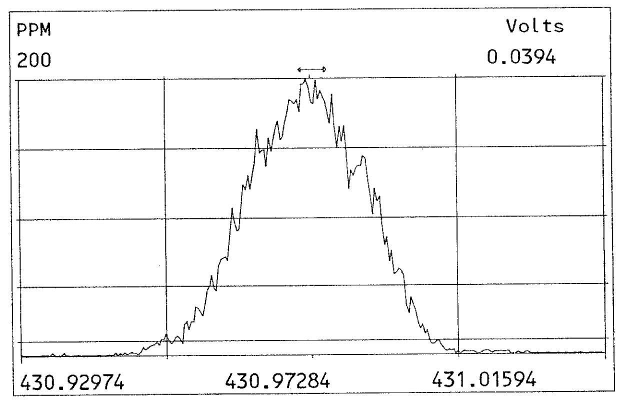


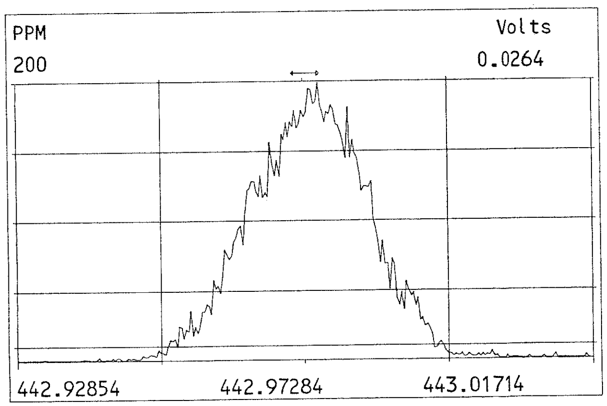


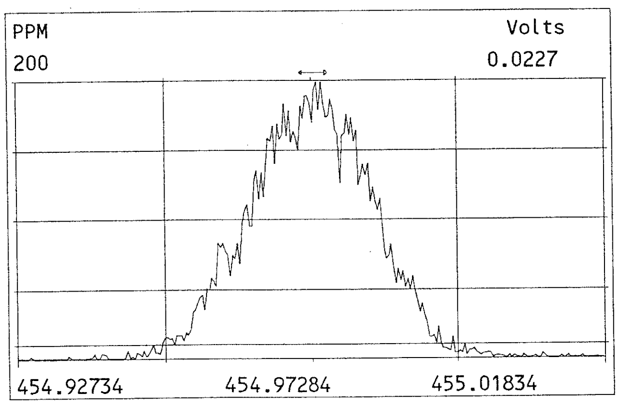




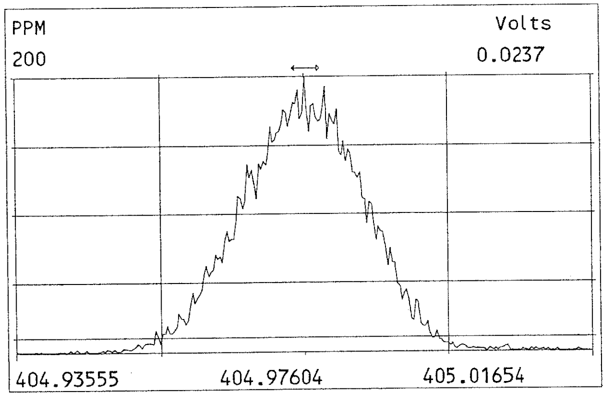


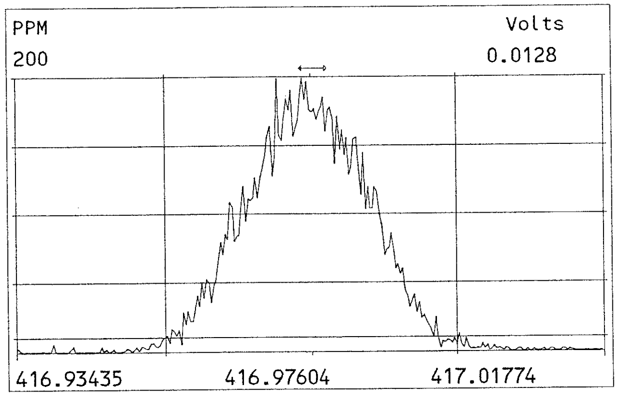


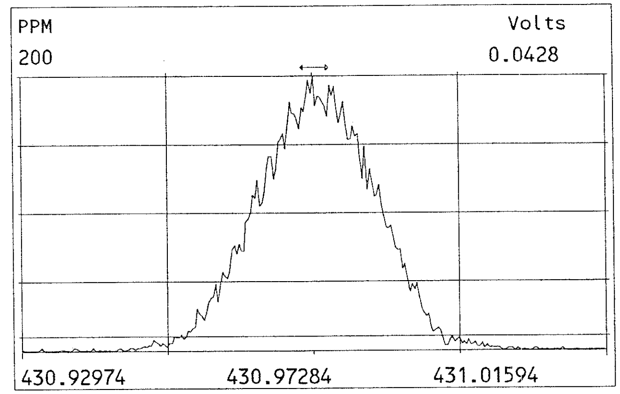


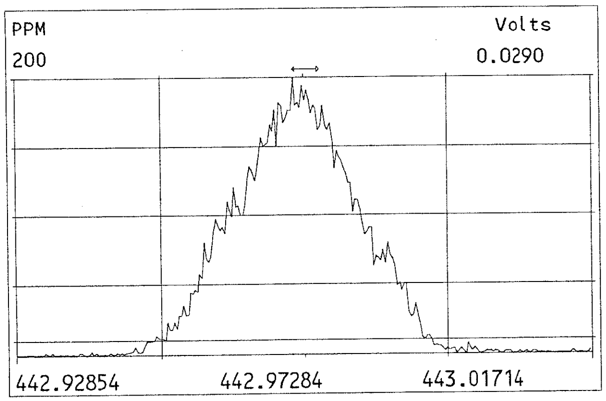


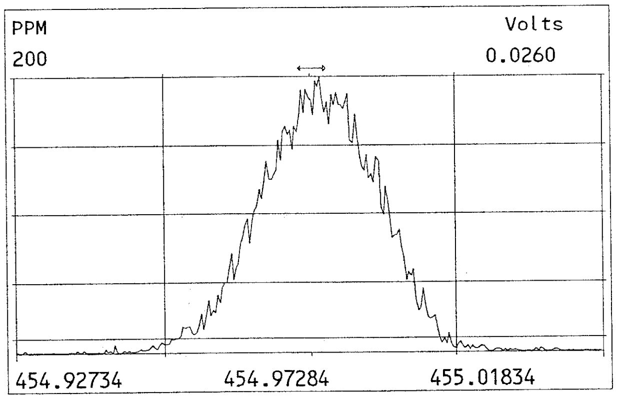
Peak Locate Examination:22-DEC-2017:20:26 File:22DEC17M_RES_CHECK
Experiment:PCDD Function:4 Reference:PFK

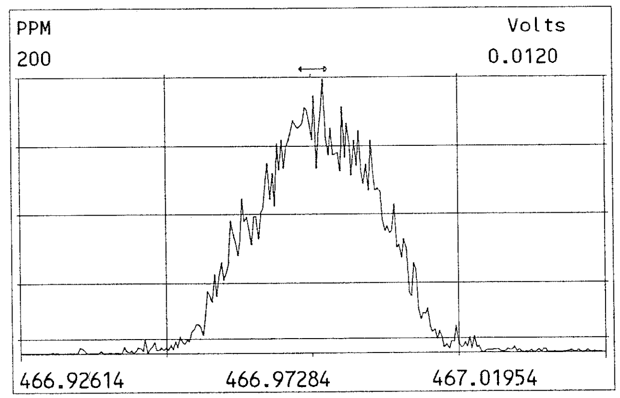


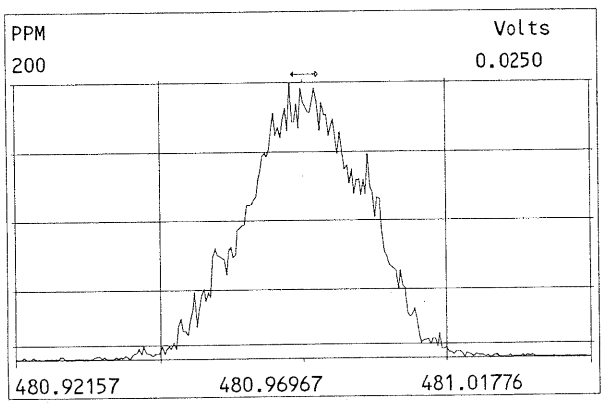




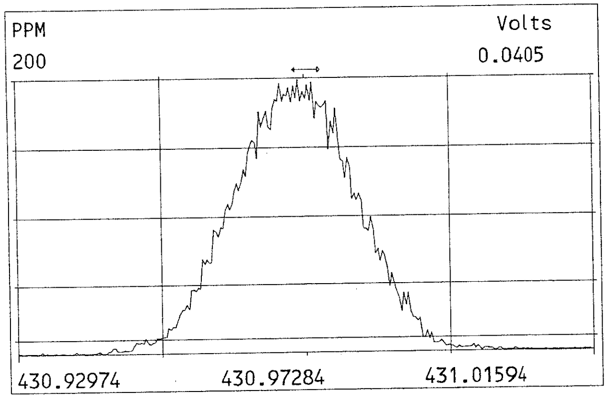


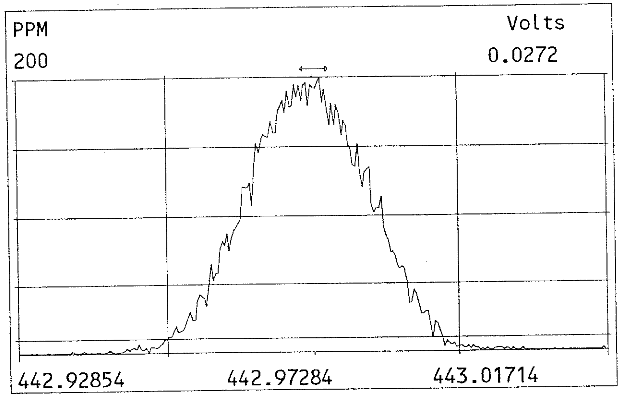


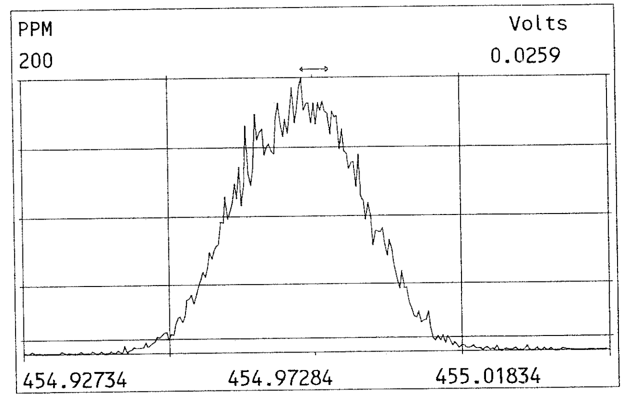


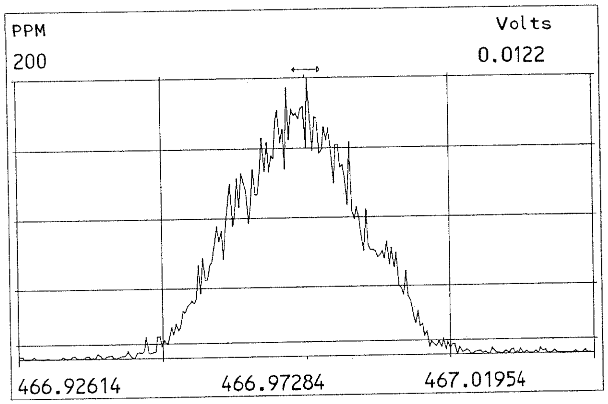


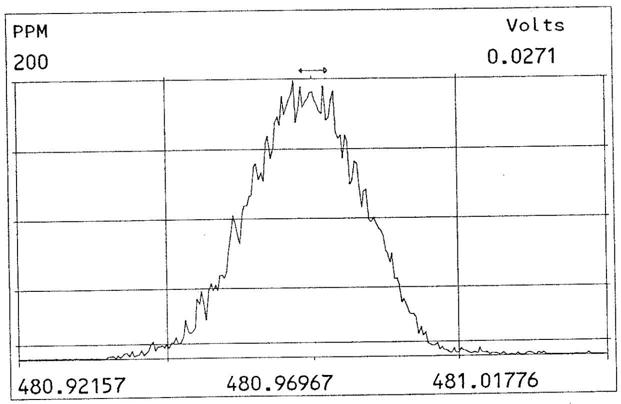
Peak Locate Examination:22-DEC-2017:20:26 File:22DEC17M_RES_CHECK
Experiment:PCDD Function:5 Reference:PFK

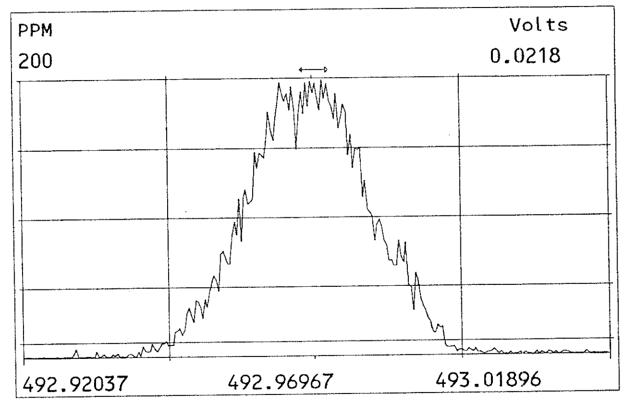


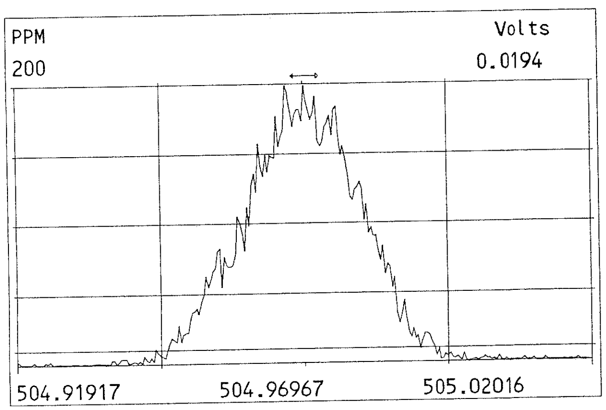


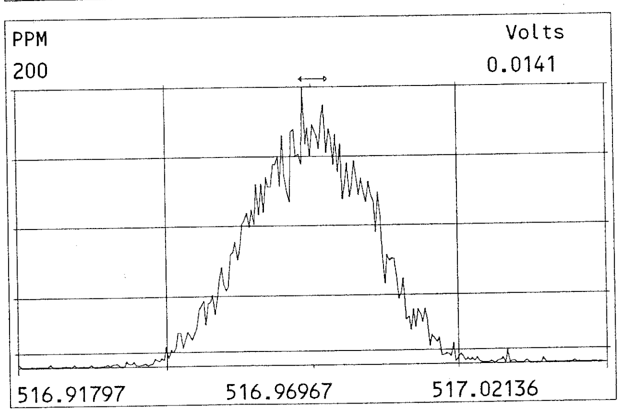












USEPA - ITD

FORM 4A
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:

Initial Calibration Date: 12/22/17

Instrument ID: FAL3   GC Column ID: DB5MS

VER Data Filename: 26JAN18M Sam:1   Analysis Date: 26-JAN-18 13:31:42

NATIVE ANALYTES	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
2,3,7,8-TCDD	M/M+2	0.78	0.65-0.89	y	11.5	7.80 - 12.9
1,2,3,7,8-PeCDD	M+2/M+4	1.50	1.32-1.78	y	50.7	39.0 - 65.0
1,2,3,4,7,8-HxCDD	M+2/M+4	1.28	1.05-1.43	y	52.4	39.0 - 64.0
1,2,3,6,7,8-HxCDD	M+2/M+4	1.18	1.05-1.43	y	52.3	39.0 - 64.0
1,2,3,7,8,9-HxCDD	M+2/M+4	1.26	1.05-1.43	y	54.0	41.0 - 61.0
1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.00	0.88-1.20	y	52.4	43.0 - 58.0
OCDD	M+2/M+4	0.93	0.76-1.02	y	102	79.0 - 126
2,3,7,8-TCDF	M/M+2	0.73	0.65-0.89	y	11.6	8.40 - 12.0
1,2,3,7,8-PeCDF	M+2/M+4	1.49	1.32-1.78	y	55.6	41.0 - 60.0
2,3,4,7,8-PeCDF	M+2/M+4	1.48	1.32-1.78	y	54.8	41.0 - 60.0
1,2,3,4,7,8-HxCDF	M+2/M+4	1.22	1.05-1.43	y	51.3	45.0 - 56.0
1,2,3,6,7,8-HxCDF	M+2/M+4	1.23	1.05-1.43	y	51.6	44.0 - 57.0
2,3,4,6,7,8-HxCDF	M+2/M+4	1.20	1.05-1.43	y	52.4	44.0 - 57.0
1,2,3,7,8,9-HxCDF	M+2/M+4	1.19	1.05-1.43	y	51.7	45.0 - 56.0
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.03	0.88-1.20	y	52.9	45.0 - 55.0
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.00	0.88-1.20	y	53.7	43.0 - 58.0
OCDF	M+2/M+4	0.91	0.76-1.02	y	103	63.0 - 159

(1) See Table 8, Method 1613, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 9, Method 1613.

(3) Contract-required concentration range as specified in Table 6, Method 1613.

Analyst: [signature]   Date: 1/29/18

USEPA - ITD

FORM 4B

PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory Episode No.:

Contract No.: SAS No.:

Initial Calibration Date: 12/22/17

Instrument ID: FAL3 GC Column ID: DB5MS

VER Data Filename: 26JAN18M Sam:1 Analysis Date: 26-JAN-18 13:31:42

	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
LABELED COMPOUNDS						
13C-2,3,7,8-TCDD	M/M+2	0.82	0.65-0.89	y	107	82.0 - 121
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.54	1.32-1.78	y	92.4	62.0 - 160
13C-1,2,3,4,7,8-HxCDD	M+2/M+4	1.25	1.05-1.43	y	99.7	85.0 - 117
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.23	1.05-1.43	y	94.7	85.0 - 118
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.06	0.88-1.20	y	96.1	72.0 - 138
13C-OCDD	M+2/M+4	0.89	0.76-1.02	y	181	96.0 - 415
13C-2,3,7,8-TCDF	M/M+2	0.81	0.65-0.89	y	112	71.0 - 140
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.53	1.32-1.78	y	96.0	76.0 - 130
13C-2,3,4,7,8-PeCDF	M+2/M+4	1.53	1.32-1.78	y	93.4	77.0 - 130
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.55	0.43-0.59	y	102	76.0 - 131
13C-1,2,3,6,7,8-HxCDF	M/M+2	0.55	0.43-0.59	y	93.8	70.0 - 143
13C-2,3,4,6,7,8-HxCDF	M/M+2	0.55	0.43-0.59	y	97.9	73.0 - 137
13C-1,2,3,7,8,9-HxCDF	M/M+2	0.56	0.43-0.59	y	93.8	74.0 - 135
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.49	0.37-0.51	y	97.3	78.0 - 129
13C-1,2,3,4,7,8,9-HpCDF	M/M+2	0.50	0.37-0.51	y	94.4	77.0 - 129
13C-OCDF	M+2/M+4	0.93	0.76-1.02	y	168	96.0 - 415
CLEANUP STANDARD (4)						
37Cl-2,3,7,8-TCDD					11.7	7.90 - 12.7

(1) See Table 8, Method 1613, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 9, Method 1613.

(3) Contract-required concentration range as specified in Table 6, Method 1613.

(4) No ion abundance ratio; report concentration found.

Analyst: [signature] Date: 1/29/18

FORM 5

PCDD/PCDF RT WINDOW AND ISOMER SPECIFICITY STANDARDS

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:

Instrument ID: FAL3   Initial Calibration Date: 12/22/17

RT Window Data Filename: 26JAN18M Sam:1   Analysis Date: 26-JAN-18 Time: 13:31:42

DB-5 IS Data Filename: 26JAN18M Sam:1   Analysis Date: 26-JAN-18 Time: 13:31:42

DB-225 IS Date Filename: Analysis Date: Time:

DB-5 RT WINDOW DEFINING STANDARDS RESULTS

ISOMERS	ABSOLUTE RT	ISOMERS	ABSOLUTE RT
1,3,6,8-TCDD (F)	24:06	1,3,6,8-TCDF (F)	22:43
1,2,8,9-TCDD (L)	28:06	1,2,8,9-TCDF (L)	28:22
1,2,4,7,9-PeCDD (F)	29:58	1,3,4,6,8-PeCDF (F)	28:06
1,2,3,8,9-PeCDD (L)	33:34	1,2,3,8,9-PeCDF (L)	34:01
1,2,4,6,7,9-HxCDD (F)	35:49	1,2,3,4,6,8-HxCDF (F)	34:56
1,2,3,7,8,9-HxCDD (L)	38:56	1,2,3,7,8,9-HxCDF (L)	39:33
1,2,3,4,6,7,9-HpCDD (F)	42:28	1,2,3,4,6,7,8-HpCDF (F)	41:57
1,2,3,4,6,7,8-HpCDD (L)	43:53	1,2,3,4,7,8,9-HpCDF (L)	44:51

(F) = First eluting isomer (DB-5);   (L) = Last eluting isomer (DB-5)

==

ISOMER SPECIFICITY (IS) TEST STANDARD RESULTS

% VALLEY HEIGHT
BETWEEN
COMPARED PEAKS (1)

<25%

(1) To meet contract requirement, %Valley Height Between Compared Peaks shall not exceed 25% (section 15.4.2.2, Method 1613).

Analyst: [signature]   Date: 1/29/18

USEPA - ITD

FORM 6A

PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory Episode No.:

Contract No.: SAS No.: Init. Cal. Date: 12/22/17

Instrument ID: FAL3 GC Column ID: DB5MS

Analysis Date: 26-JAN-18 13:31:42 CS3 or VER Data Filename: 26JAN18M Sam:1

NATIVE ANALYTES	RETENTION TIME REFERENCE	RRT	RRT QC LIMITS (1)
2,3,7,8-TCDD	13C-2,3,7,8-TCDD	1.001	0.999-1.002
2,3,7,8-TCDF	13C-2,3,7,8-TCDF	1.001	0.999-1.003
1,2,3,7,8-PeCDD	13C-1,2,3,7,8-PeCDD	1.001	0.999-1.002
1,2,3,7,8-PeCDF	13C-1,2,3,7,8-PeCDF	1.001	0.999-1.002
2,3,4,7,8-PeCDF	13C-2,3,4,7,8-PeCDF	1.001	0.999-1.002
LABELED COMPOUNDS			
37Cl-2,3,7,8-TCDD	13C-1,2,3,4-TCDD	1.025	0.989-1.052
13C-2,3,7,8-TCDD		1.025	0.976-1.043
13C-2,3,7,8-TCDF		0.997	0.923-1.103
13C-1,2,3,7,8-PeCDD		1.244	1.000-1.567
13C-1,2,3,7,8-PeCDF		1.179	1.000-1.425
13C-2,3,4,7,8-PeCDF		1.230	1.011-1.526

(1) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1613.

Analyst: [signature] Date: 1/29/18

USEPA - ITD

FORM 6B
PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:   Init. Cal. Date: 12/22/17

Instrument ID: FAL3   GC Column ID: DB5MS

Analysis Date: 26-JAN-18 13:31:42   CS3 or VER Data Filename: 26JAN18M   Sam:1

NATIVE ANALYTES	RETENTION TIME REFERENCE	RRT	RRT QC LIMITS (1)
1,2,3,4,7,8-HxCDD	13C-1,2,3,4,7,8-HxCDD	1.000	0.999-1.001
1,2,3,6,7,8-HxCDD	13C-1,2,3,6,7,8-HxCDD	1.000	0.999-1.003
1,2,3,7,8,9-HxCDD	13C-1,2,3,6,7,8-HxCDD	1.012	1.000-1.019
1,2,3,4,7,8-HxCDF	13C-1,2,3,4,7,8-HxCDF	1.001	0.999-1.001
1,2,3,6,7,8-HxCDF	13C-1,2,3,6,7,8-HxCDF	1.000	0.999-1.003
2,3,4,6,7,8-HxCDF	13C-2,3,4,6,7,8-HxCDF	1.001	0.999-1.001
1,2,3,7,8,9-HxCDF	13C-1,2,3,7,8,9-HxCDF	1.001	0.999-1.001
1,2,3,4,6,7,8-HpCDD	13C-1,2,3,4,6,7,8-HpCDD	1.001	0.999-1.001
1,2,3,4,6,7,8-HpCDF	13C-1,2,3,4,6,7,8-HpCDF	1.000	0.999-1.001
1,2,3,4,7,8,9-HpCDF	13C-1,2,3,4,7,8,9-HpCDF	1.001	0.999-1.001
OCDD	13C-OCDD	1.001	0.999-1.001
OCDF	13C-OCDF	1.001	0.999-1.001
LABELED COMPOUNDS			
13C-1,2,3,4,7,8-HxCDD	13C-1,2,3,7,8,9-HxCDD	0.985	0.977-1.000
13C-1,2,3,6,7,8-HxCDD		0.989	0.981-1.003
13C-1,2,3,4,7,8-HxCDF		0.949	0.944-0.970
13C-1,2,3,6,7,8-HxCDF		0.954	0.949-0.975
13C-2,3,4,6,7,8-HxCDF		0.979	0.959-1.021
13C-1,2,3,7,8,9-HxCDF		1.016	0.977-1.047
13C-1,2,3,4,6,7,8-HpCDD		1.127	1.086-1.130
13C-1,2,3,4,6,7,8-HpCDF		1.078	1.043-1.085
13C-1,2,3,4,7,8,9-HpCDF		1.152	1.057-1.156
13C-OCDD		1.266	1.032-1.311
13C-OCDF		1.278	1.000-1.311

(1) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1613.

Analyst: [signature]   Date: 1/29/18

FAL ID: ST012618M1 Filename: 26JAN18M Sam:1 Acquired: 26-JAN-18 13:31:42 ICal: PCDDFAL3-12-22-17
Client ID: 1613 CS3 171128J ConCal: ST012618M1 EndCal: ST012618M2
Results: 11153-3RX GC Golumn: DB5MS Amount: 1.000 NATO 1989 Tox: 107
Instrument ID: FAL3 WHO 1998 Tox: 132 WHO 2005 Tox: 120

Name	Resp	RA	RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	DL	Rec
2,3,7,8-TCDD	8.94e+06	0.78 y	27:10	1.06	11.5		2.50	-	-	*	
1,2,3,7,8-PeCDD	2.78e+07	1.50 y	33:00	1.00	50.7		2.50	-	-	*	
1,2,3,4,7,8-HxCDD	2.54e+07	1.28 y	38:19	1.07	52.4		2.50	-	-	*	
1,2,3,6,7,8-HxCDD	2.68e+07	1.18 y	38:30	1.08	52.3		2.50	-	-	*	
1,2,3,7,8,9-HxCDD	2.78e+07	1.26 y	38:56	1.11	54.0		2.50	-	-	*	
1,2,3,4,6,7,8-HpCDD	2.39e+07	1.00 y	43:53	0.99	52.4		2.50	-	-	*	
OCDD	3.84e+07	0.93 y	49:18	1.11	102		2.50	-	-	*	
2,3,7,8-TCDF	1.18e+07	0.73 y	26:26	1.03	11.6		2.50	-	-	*	
1,2,3,7,8-PeCDF	4.14e+07	1.49 y	31:15	0.95	55.6		2.50	-	-	*	
2,3,4,7,8-PeCDF	3.79e+07	1.48 y	32:37	0.79	54.8		2.50	-	-	*	
1,2,3,4,7,8-HxCDF	3.64e+07	1.22 y	36:56	1.20	51.3		2.50	-	-	*	
1,2,3,6,7,8-HxCDF	3.80e+07	1.23 y	37:07	1.10	51.6		2.50	-	-	*	
2,3,4,6,7,8-HxCDF	3.64e+07	1.20 y	38:06	1.08	52.4		2.50	-	-	*	
1,2,3,7,8,9-HxCDF	3.38e+07	1.19 y	39:33	1.15	51.7		2.50	-	-	*	
1,2,3,4,6,7,8-HpCDF	3.29e+07	1.03 y	41:57	1.23	52.9		2.50	-	-	*	
1,2,3,4,7,8,9-HpCDF	2.70e+07	1.00 y	44:51	1.23	53.7		2.50	-	-	*	
OCDF	4.43e+07	0.91 y	49:44	0.90	103		2.50	-	-	*	
13C-2,3,7,8-TCDD	7.35e+07	0.82 y	27:09	1.02	107						107
13C-1,2,3,7,8-PeCDD	5.48e+07	1.54 y	32:58	0.88	92.4						92.4
13C-1,2,3,4,7,8-HxCDD	4.53e+07	1.25 y	38:18	0.85	99.7						99.7
13C-1,2,3,6,7,8-HxCDD	4.73e+07	1.23 y	38:29	0.94	94.7						94.7
13C-1,2,3,4,6,7,8-HpCDD	4.62e+07	1.06 y	43:51	0.90	96.1						96.1
13C-OCDD	6.75e+07	0.89 y	49:16	0.70	181						90.3
13C-2,3,7,8-TCDF	9.93e+07	0.81 y	26:25	0.93	112						112
13C-1,2,3,7,8-PeCDF	7.88e+07	1.53 y	31:14	0.87	96.0						96.0
13C-2,3,4,7,8-PeCDF	8.76e+07	1.53 y	32:36	0.99	93.4						93.4
13C-1,2,3,4,7,8-HxCDF	5.92e+07	0.55 y	36:54	1.09	102						102
13C-1,2,3,6,7,8-HxCDF	6.71e+07	0.55 y	37:07	1.35	93.8						93.8
13C-2,3,4,6,7,8-HxCDF	6.41e+07	0.55 y	38:04	1.23	97.9						97.9
13C-1,2,3,7,8,9-HxCDF	5.70e+07	0.56 y	39:31	1.14	93.8						93.8
13C-1,2,3,4,6,7,8-HpCDF	5.04e+07	0.49 y	41:56	0.97	97.3						97.3
13C-1,2,3,4,7,8,9-HpCDF	4.10e+07	0.50 y	44:49	0.82	94.4						94.4
13C-OCDF	9.49e+07	0.93 y	49:42	1.06	168						84.0
37Cl-2,3,7,8-TCDD	7.21e+06		27:10	0.91	11.7						117
13C-1,2,3,4-TCDD	6.75e+07	0.82 y	26:30	-	186						
13C-1,2,3,4-TCDF	9.47e+07	0.80 y	25:15	-	182						
13C-1,2,3,7,8,9-HxCDD	5.32e+07	1.22 y	38:54	-	174						

Name	Resp	RT	RRF	Conc	Fac	Noise-1	Noise-2	DL		#Hom
Total Tetra-Dioxins	4.41e+07	23:34	1.06	56.7	2.50	-	-	*		18
Total Penta-Dioxins	8.79e+07	29:58	1.00	160	2.50	-	-	*		10
Total Hexa-Dioxins	1.12e+08	35:49	1.09	223	2.50	-	-	*		27
Total Hepta-Dioxins	5.19e+07	42:28	0.99	114	2.50	-	-	*		25
Total Tetra-Furans	5.40e+07	22:43	1.03	53.1	2.50	-	-	*		18
1st Fn. Tot Penta-Furans	5.56e+07	28:06	0.86	77.5	2.50	-	-	*	PeCDF	4
Total Penta-Furans	1.17e+08	29:54	0.86	162	2.50	-	-	*	240	23
Total Hexa-Furans	1.84e+08	34:56	1.13	264	2.50	-	-	*		33
Total Hepta-Furans	6.13e+07	41:57	1.23	109	2.50	-	-	*		31

Analyst: [signature] Date: 1/29/18

Frontier Analytical Laboratory - Acquisition Log

Run Name:26JAN18M   Instrument: FAL3   GC: DB5MS   Experiment:PCDD

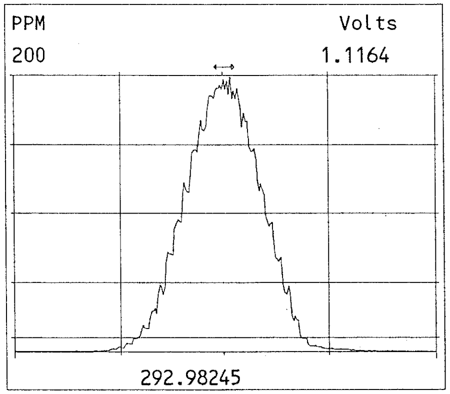
Data File	S	FAL ID	Client ID	Acquired	ConCal	EndCal	Analyst
26JAN18M	1	ST012618M1	1613 CS3 171128J	26-JAN-18 13:31:42	ST012618M1	ST012618M2	TC
26JAN18M	2	04385-001-0001-OPR	OPR	26-JAN-18 14:26:32	ST012618M1	ST012618M2	TC
26JAN18M	3	04385-001-0001-MB	Method Blank	26-JAN-18 15:21:27	ST012618M1	ST012618M2	TC
26JAN18M	4	11157-003-X002-SA	NFMW1d	26-JAN-18 16:16:22	ST012618M1	ST012618M2	TC
26JAN18M	5	11193-001-0001-SA	201801110018	26-JAN-18 17:11:11	ST012618M1	ST012618M2	TC
26JAN18M	6	11194-001-0001-SA	201801110019	26-JAN-18 18:06:03	ST012618M1	ST012618M2	TC
26JAN18M	7	11194-002-0001-SA	201801110020	26-JAN-18 19:00:54	ST012618M1	ST012618M2	TC
26JAN18M	8	11194-003-0001-SA	201801110021	26-JAN-18 19:55:45	ST012618M1	ST012618M2	TC
26JAN18M	9	11202-001-0001-SA	EFF-001A	26-JAN-18 20:50:36	ST012618M1	ST012618M2	TC
26JAN18M	10	SB012618M1	Solvent Blank	26-JAN-18 21:45:27	ST012618M1	ST012618M2	TC
26JAN18M	11	ST012618M2	1613 CS3 171128J	26-JAN-18 22:40:18	ST012618M2	ST012618M3	TC
26JAN18M	12	SB012618M2	Solvent Blank	26-JAN-18 23:35:08	ST012618M2	ST012618M3	TC
26JAN18M	13	11203-001-0001-SA	Sycamore Creek Downstream R╖	27-JAN-18 00:30:00	ST012618M2	ST012618M3	TC
26JAN18M	14	11204-001-0001-SA	Sycamore Creek Upstream RSW╖	27-JAN-18 01:24:51	ST012618M2	ST012618M3	TC
26JAN18M	15	11211-001-0001-SA	AMW-3-011218	27-JAN-18 02:19:42	ST012618M2	ST012618M3	TC
26JAN18M	16	11211-002-0001-SA	AMW-4-011218	27-JAN-18 03:14:35	ST012618M2	ST012618M3	TC
26JAN18M	17	11211-003-0001-SA	AMW-2-011218	27-JAN-18 04:09:25	ST012618M2	ST012618M3	TC
26JAN18M	18	11211-004-0001-SA	AMW-1-011218	27-JAN-18 05:04:16	ST012618M2	ST012618M3	TC
26JAN18M	19	11211-005-0001-SA	AMW-5-011218	27-JAN-18 05:59:07	ST012618M2	ST012618M3	TC
26JAN18M	20	SB012618M3	Solvent Blank	27-JAN-18 06:53:59	ST012618M2	ST012618M3	TC
26JAN18M	21	SB012618M4	Solvent Blank	27-JAN-18 07:48:50	ST012618M2	ST012618M3	TC
26JAN18M	22	ST012618M3	1613 CS3 171128J	27-JAN-18 08:43:41	ST012618M2	ST012618M3	TC

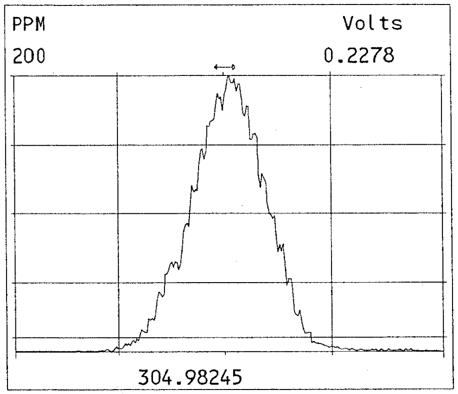
1/29/18

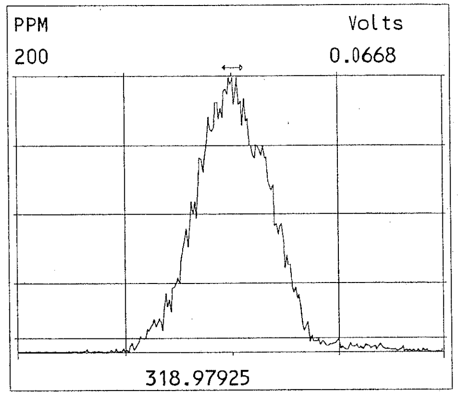
Data Backed Up:________________

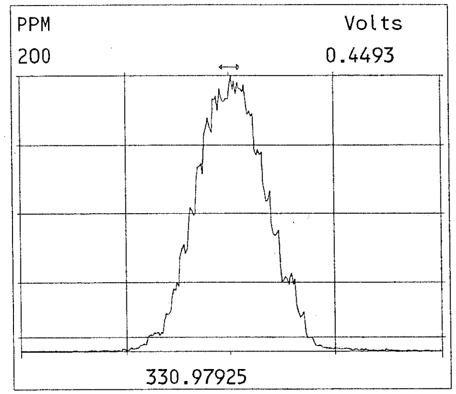
Date:______________________

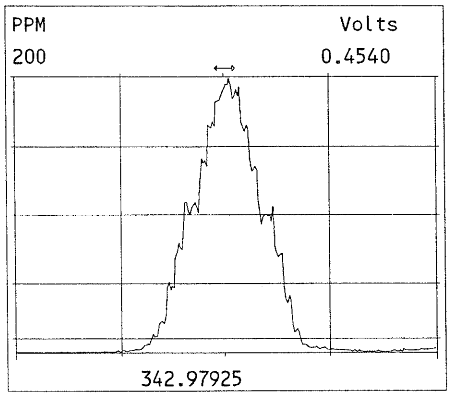
Peak Locate Examination:26-JAN-2018:13:30 File:26JAN18M
Experiment:PCDD Function:1 Reference:PFK

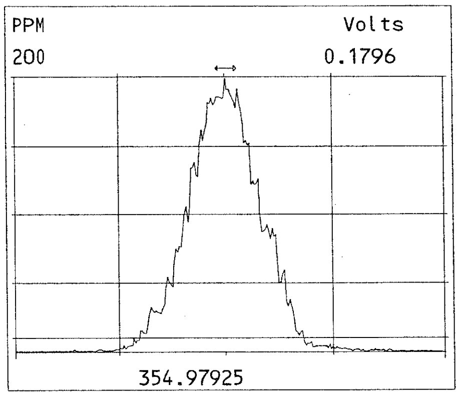


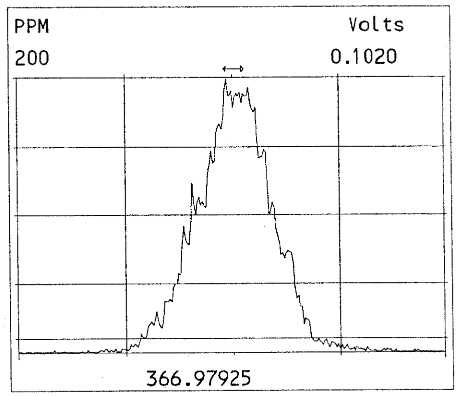


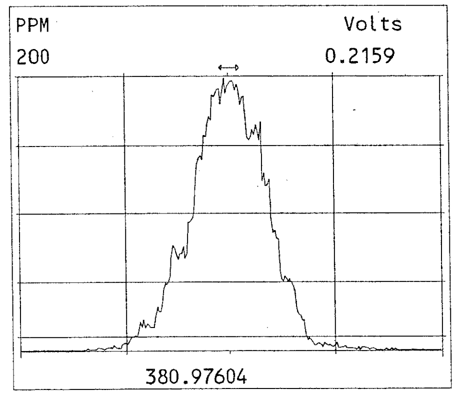


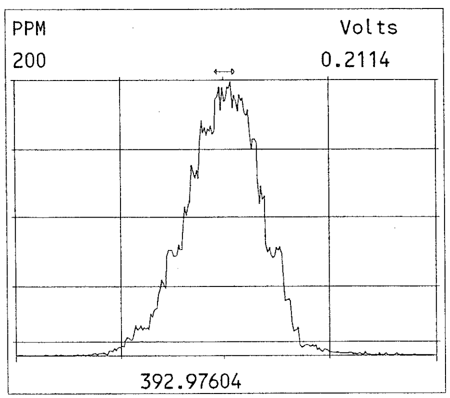


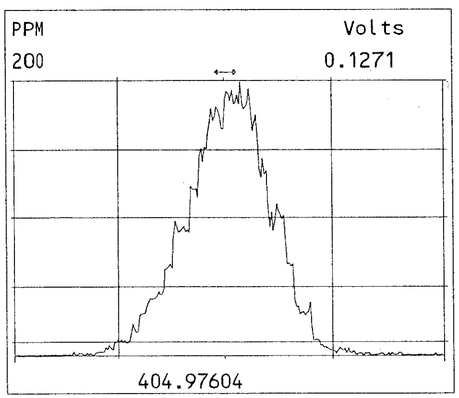


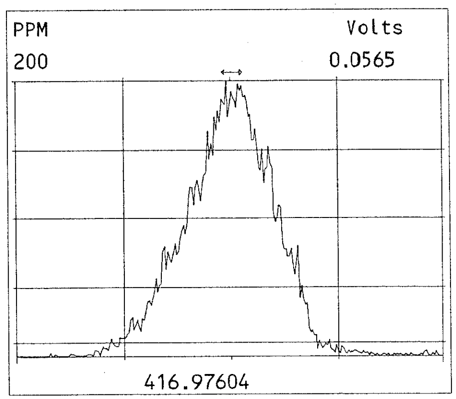




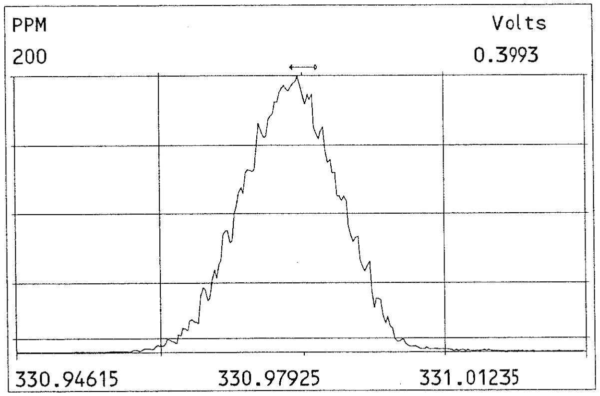


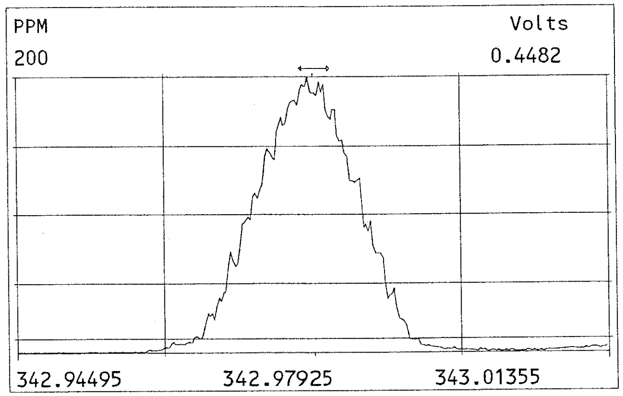


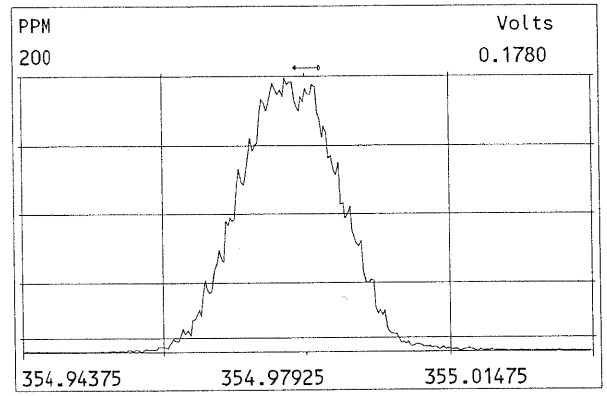


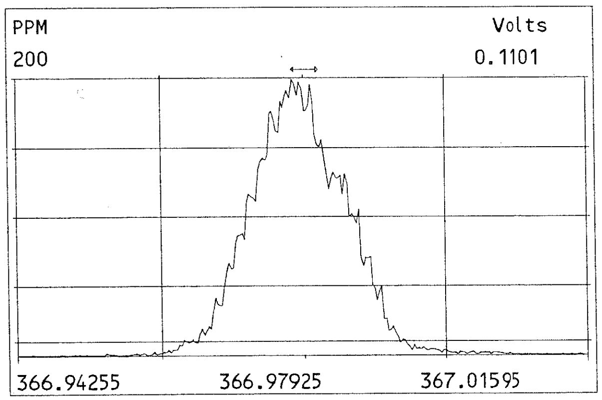


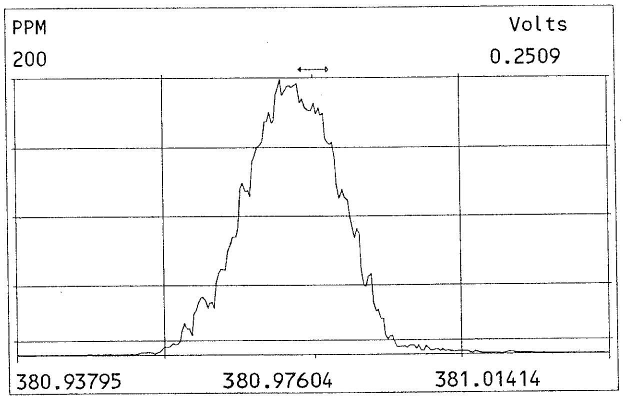
Peak Locate Examination:26-JAN-2018:13:30 File:26JAN18M
Experiment:PCDD Function:2 Reference:PFK

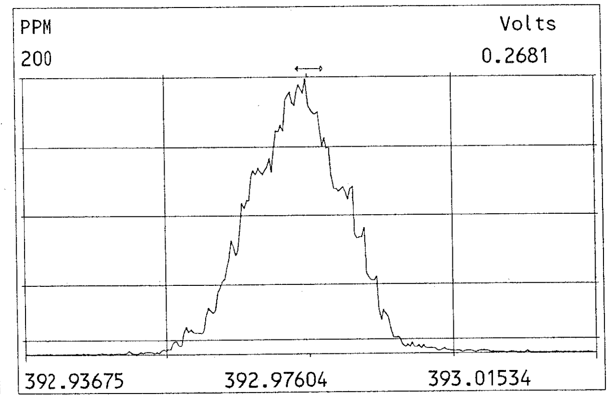


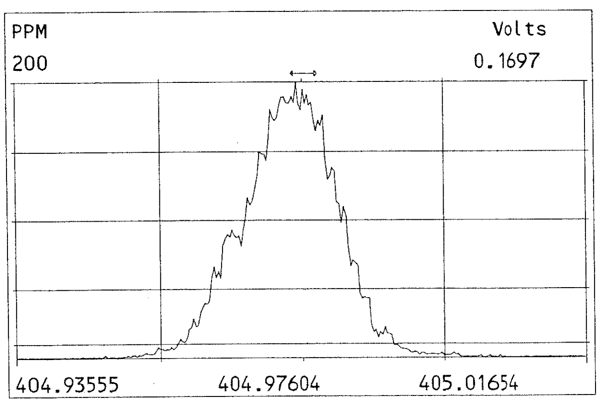


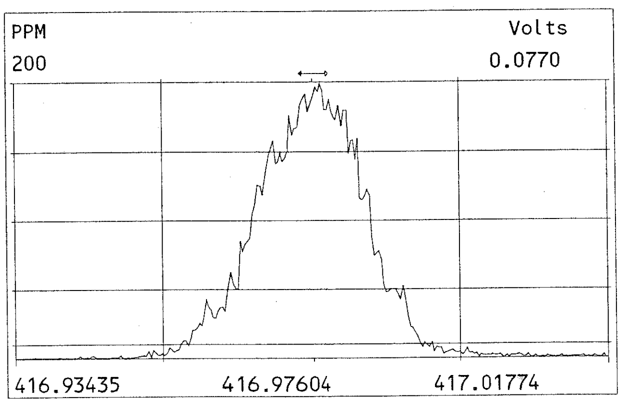




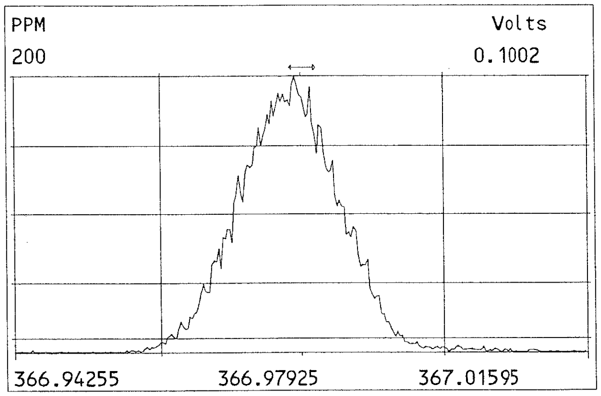


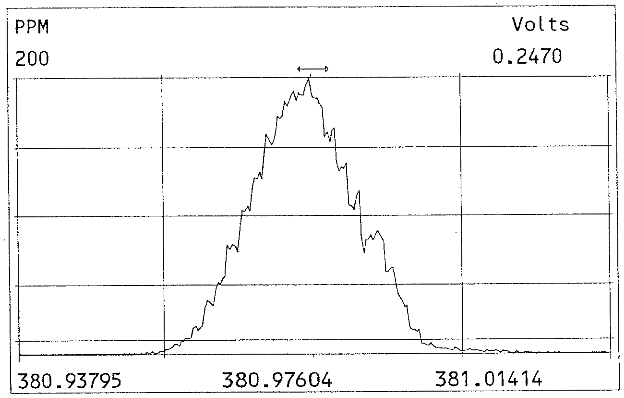


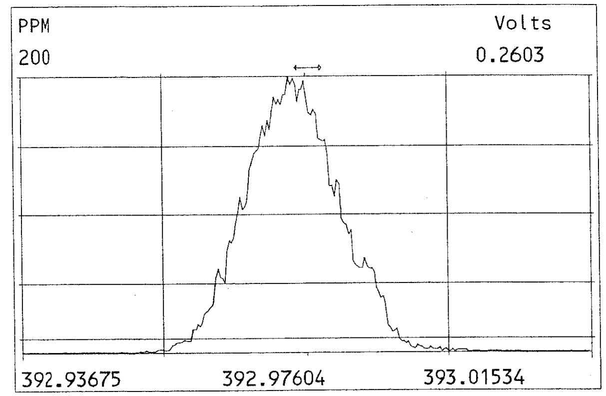


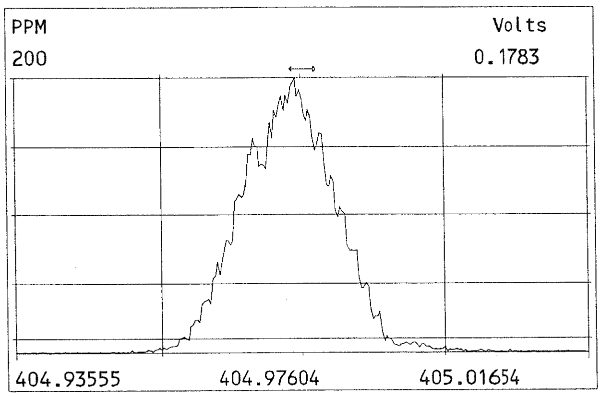


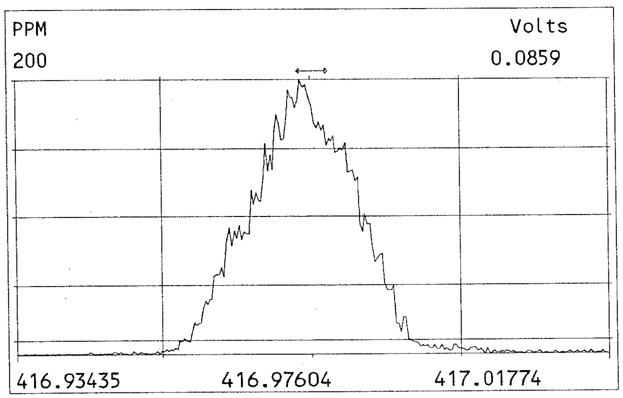
Peak Locate Examination:26-JAN-2018:13:30 File:26JAN18M
Experiment:PCDD Function:3 Reference:PFK

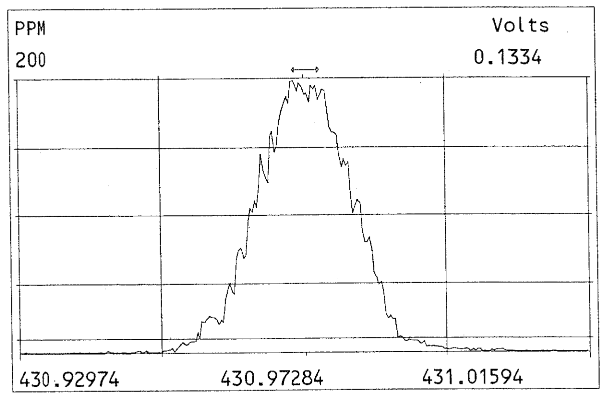


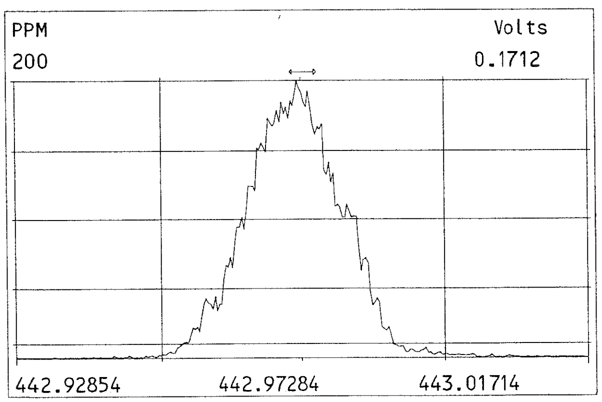


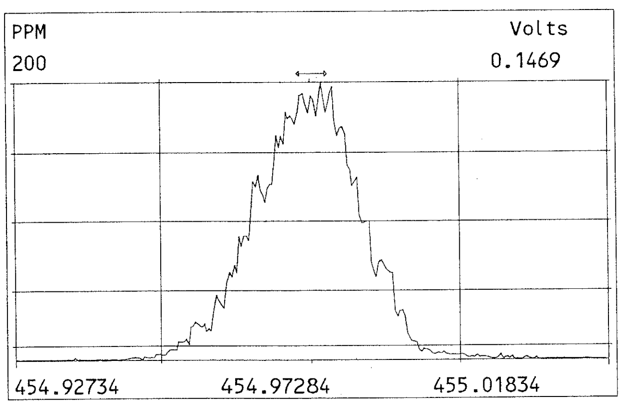




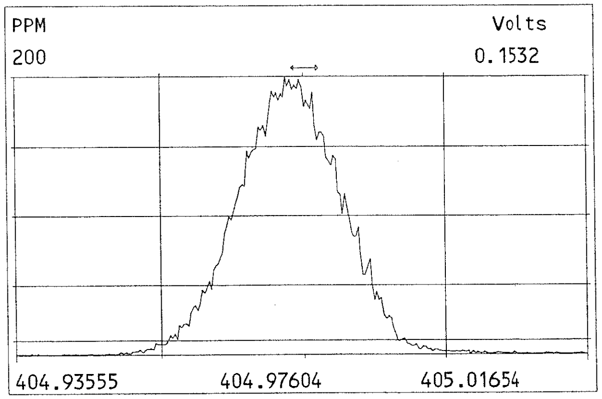


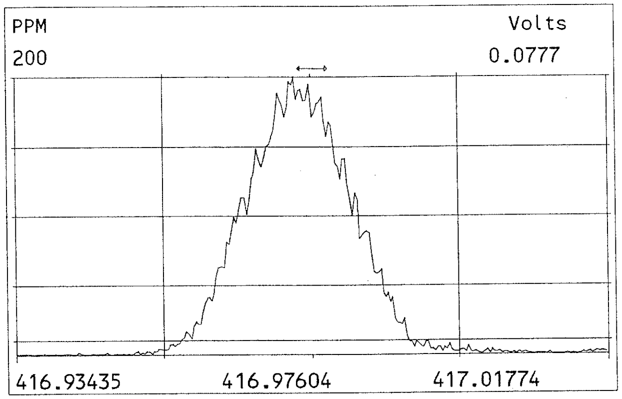


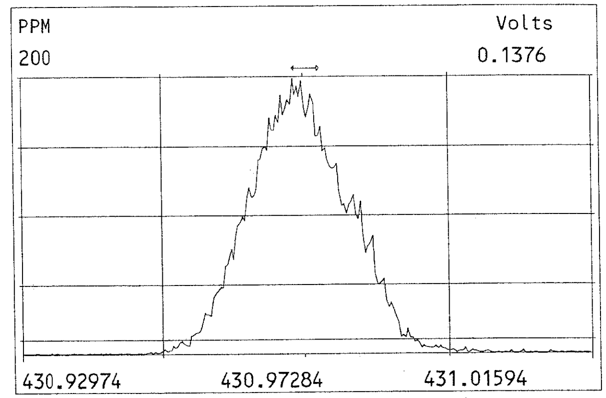


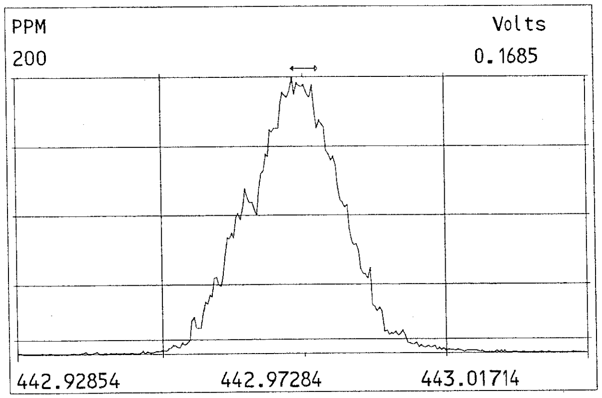


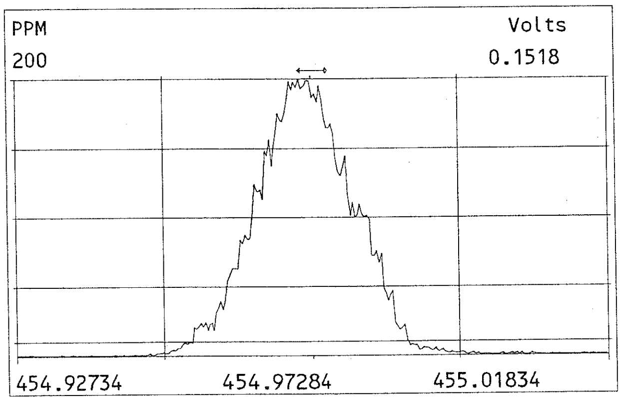
Peak Locate Examination:26-JAN-2018:13:31 File:26JAN18M
Experiment:PCDD Function:4 Reference:PFK

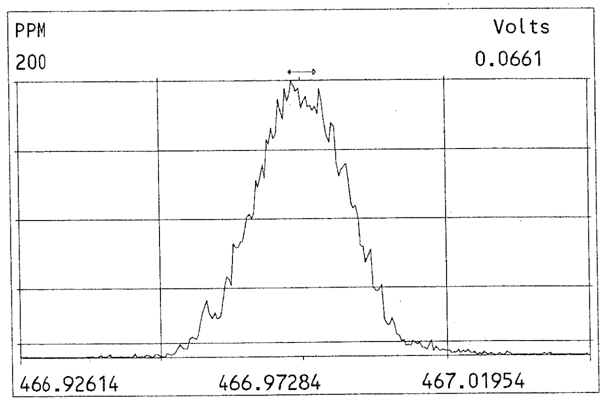


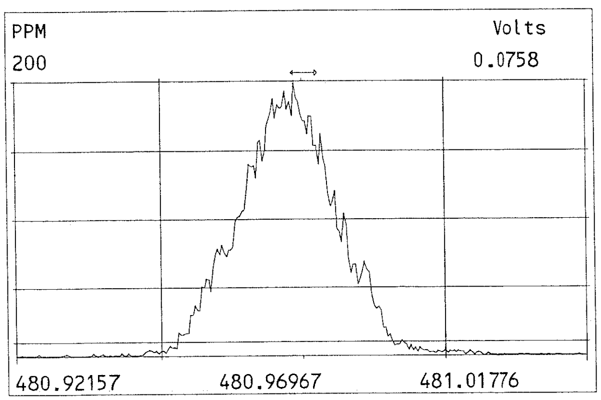




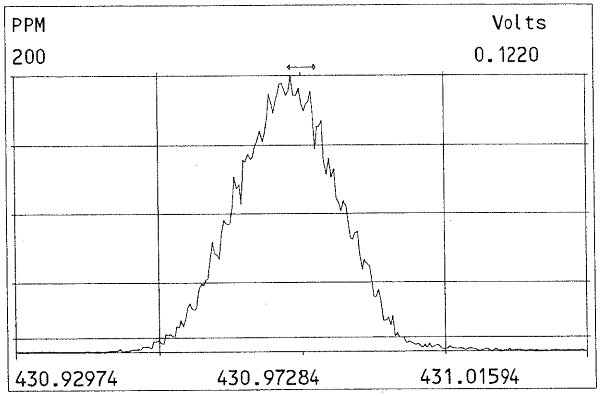


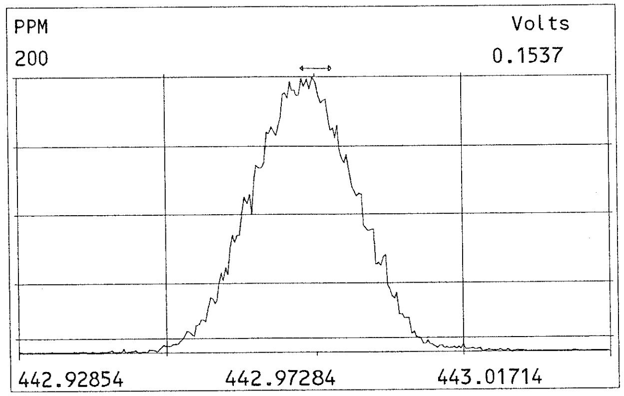


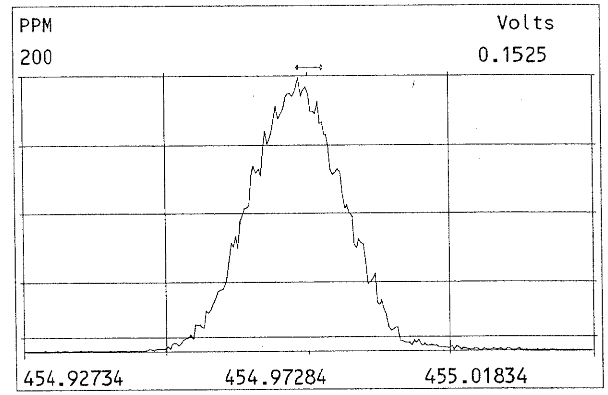


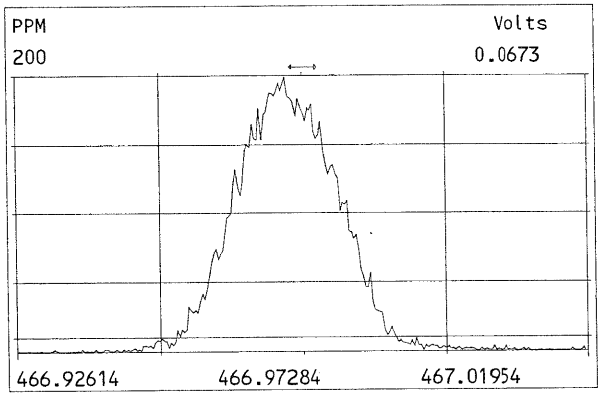


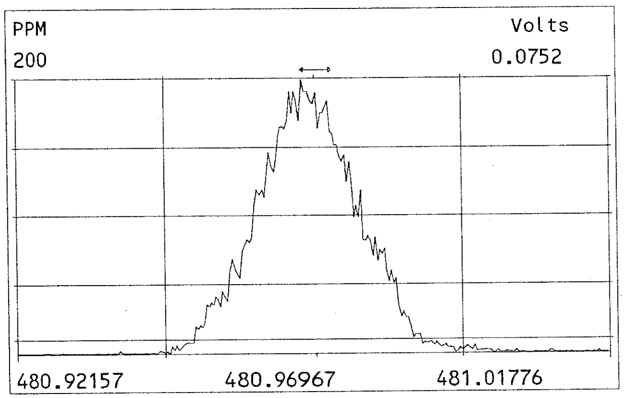
Peak Locate Examination:26-JAN-2018:13:31 File:26JAN18M
Experiment:PCDD Function:5 Reference:PFK

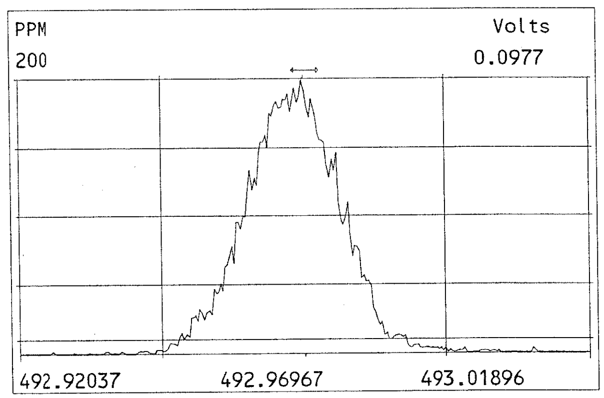


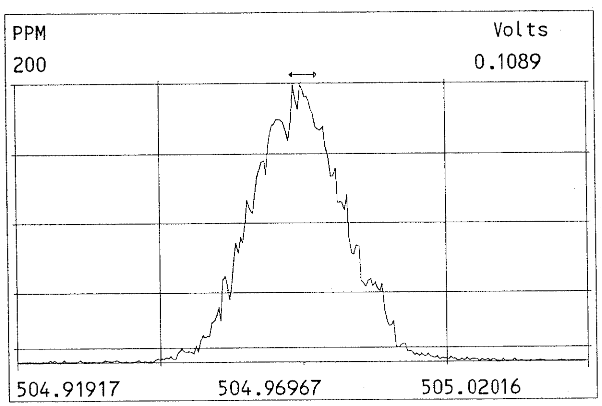


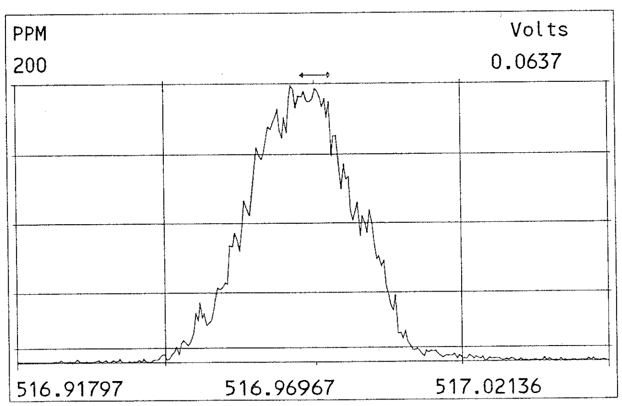




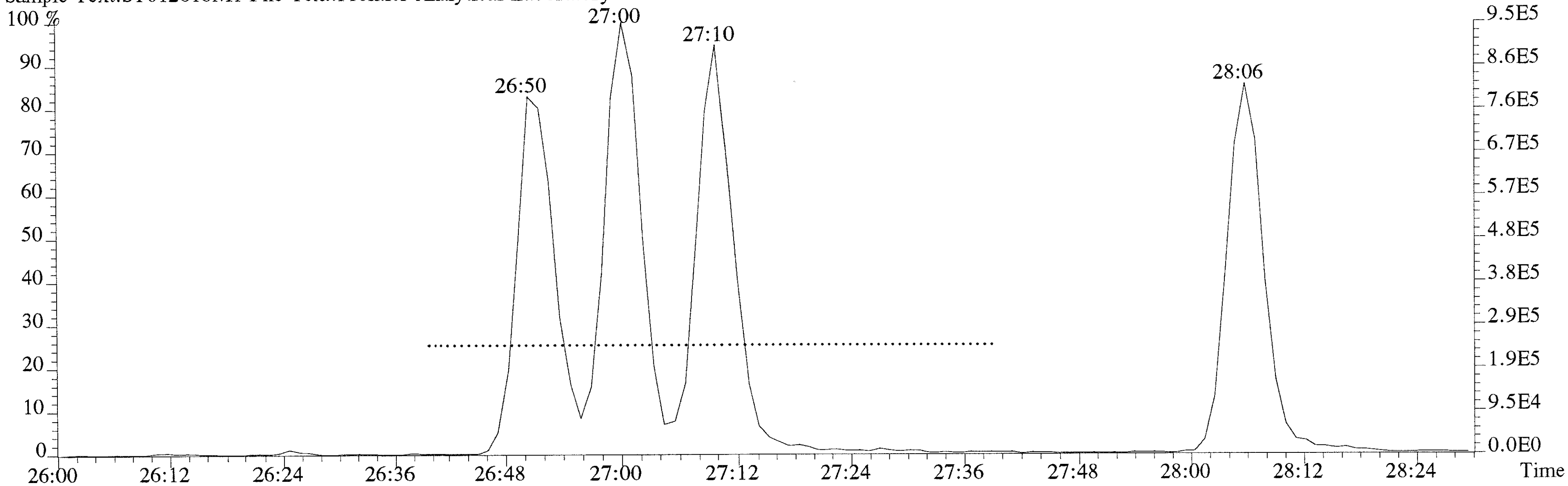




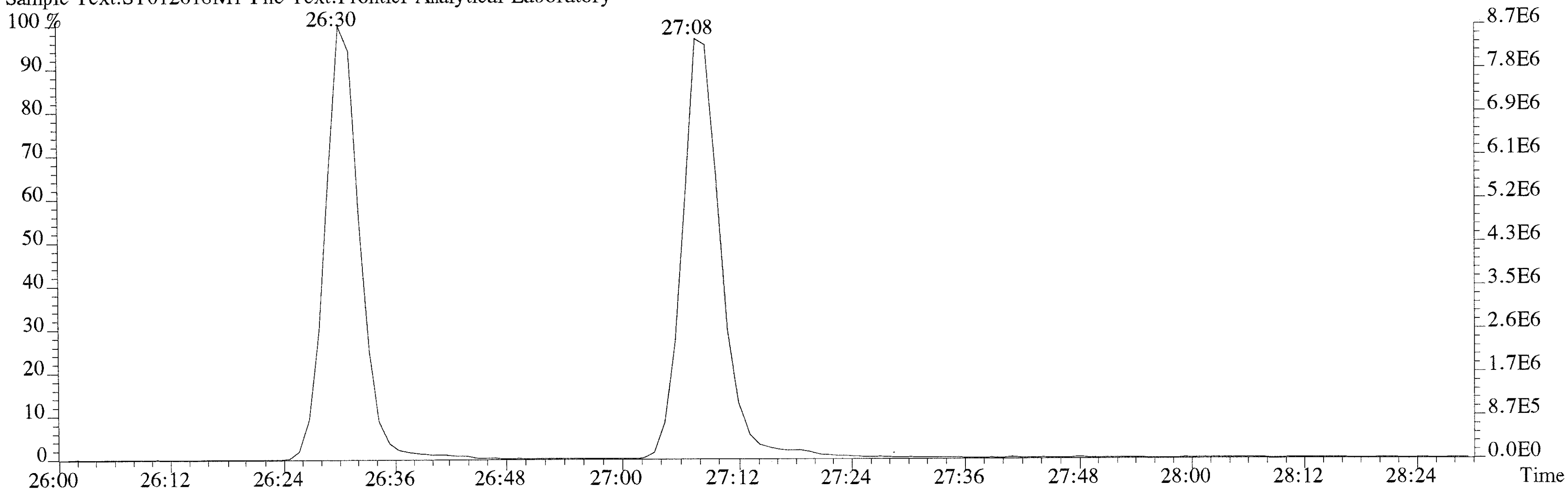




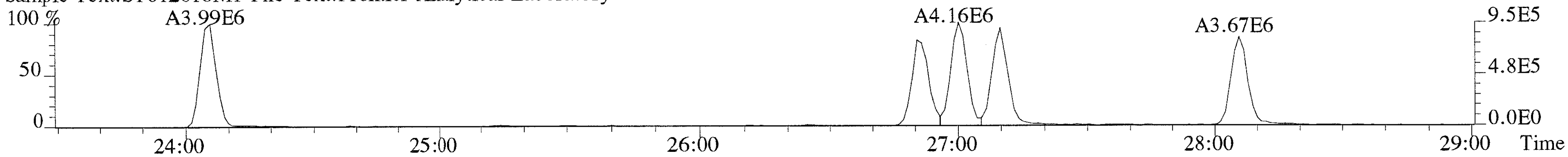
File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
319.8965 Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
333.9339 Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
319.8965 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



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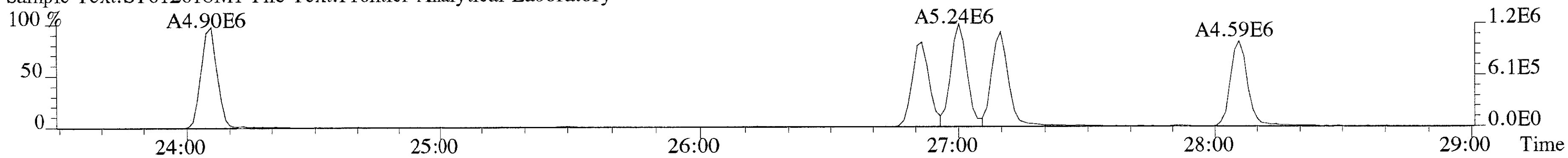
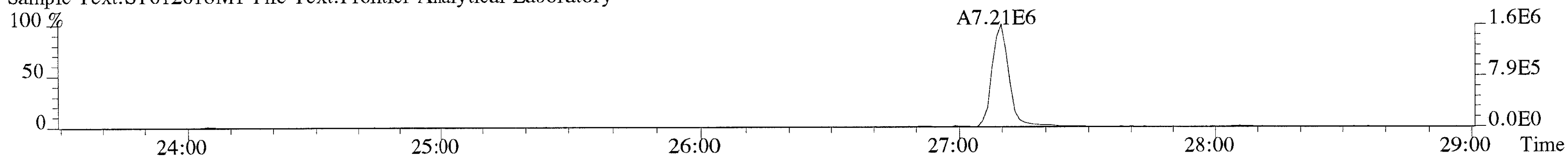
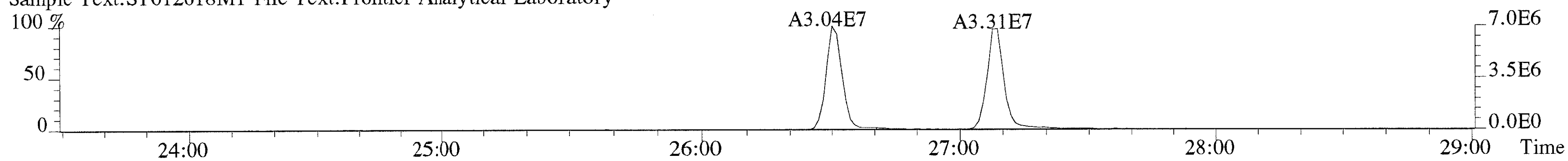
321.8936 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



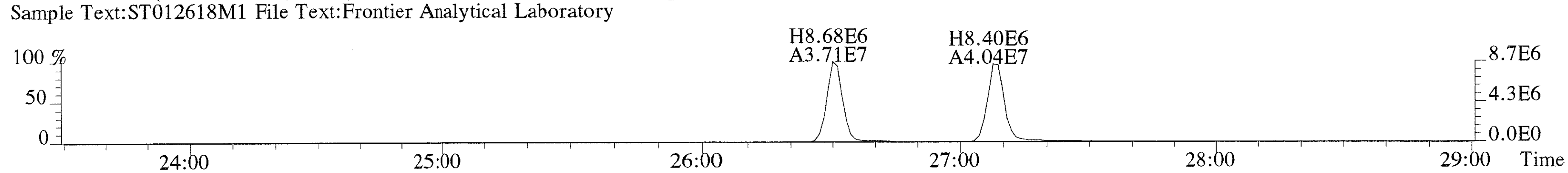
File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
327.8847 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



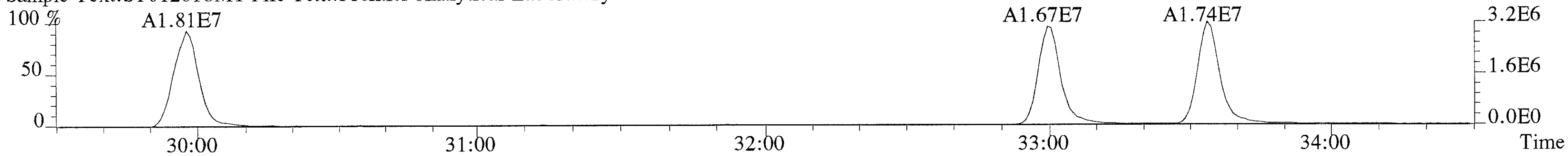
File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
331.9368 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



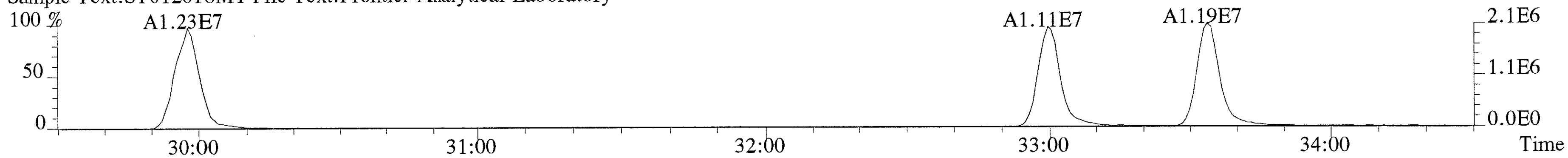
File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
333.9339 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



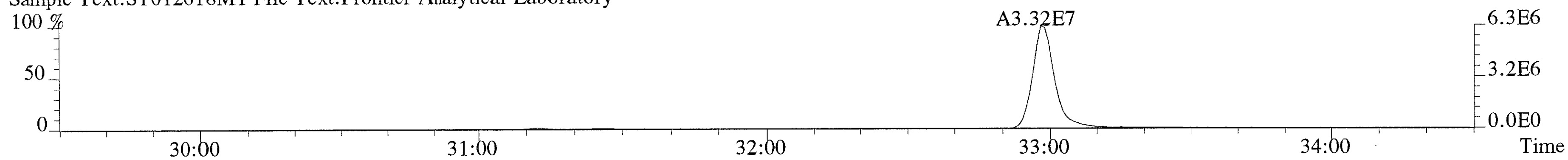
File:26JAN18M #1-423 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
355.8546 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-423 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
357.8517 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-423 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
367.8949 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



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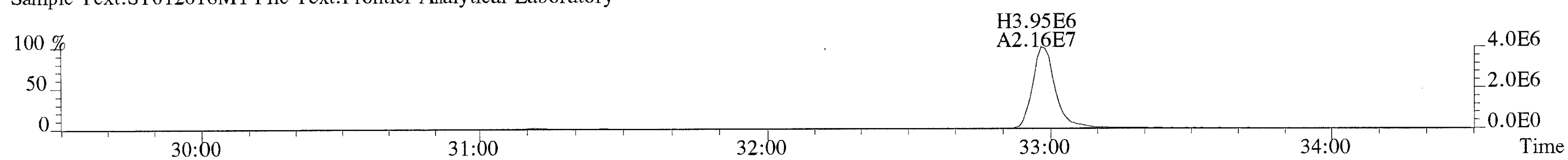
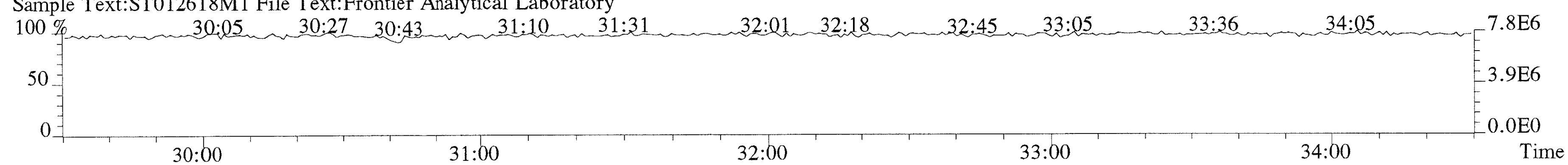
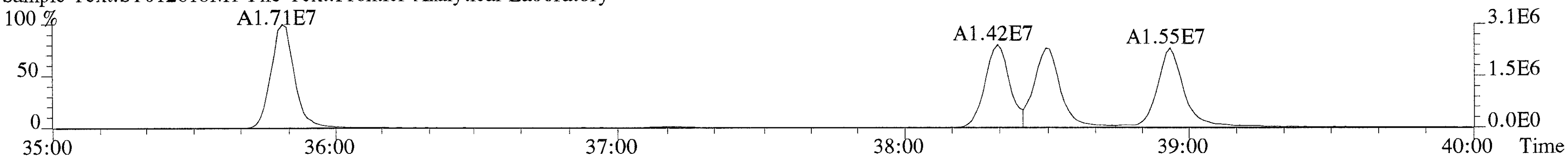
369.8919 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



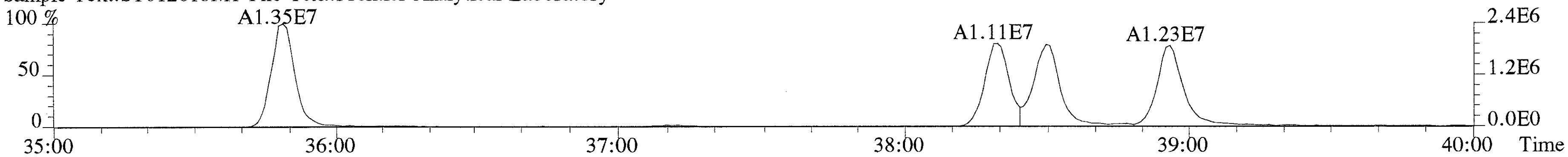
File:26JAN18M #1-423 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
366.9792 F:2 Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



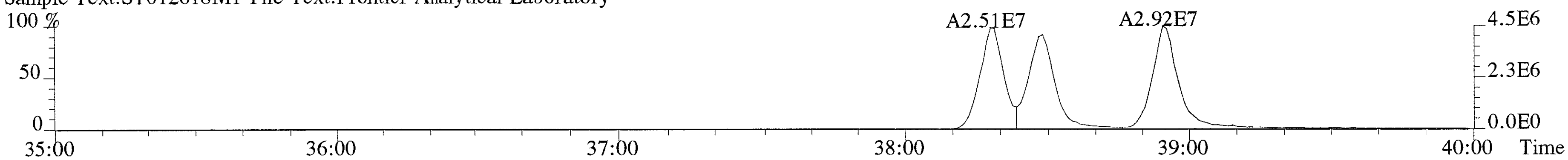
File:26JAN18M #1-520 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
389.8156 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



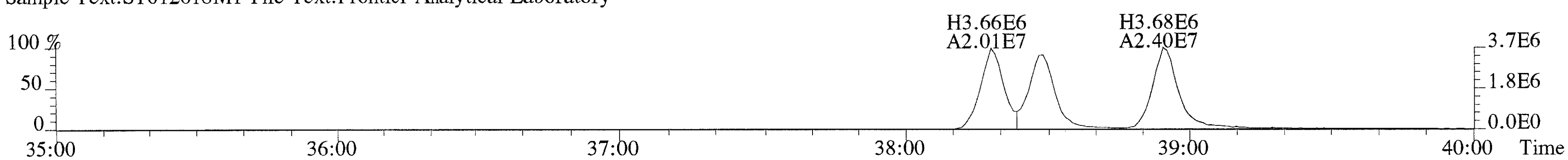
File:26JAN18M #1-520 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
391.8127 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



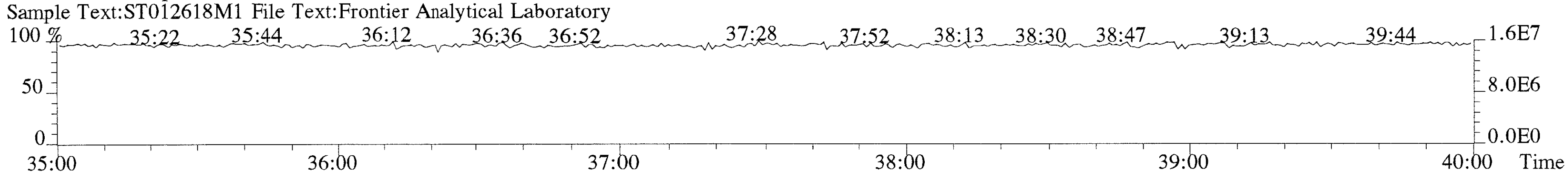
File:26JAN18M #1-520 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
401.8559 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



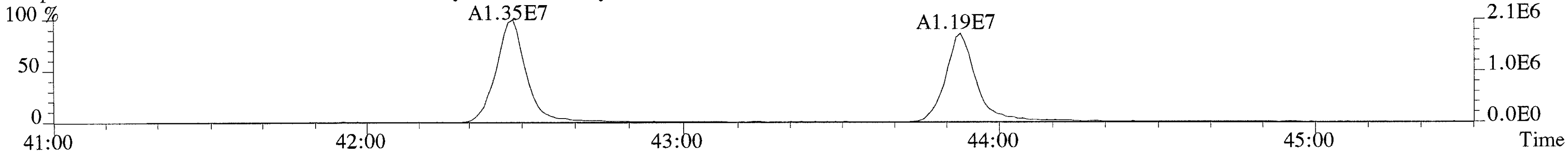
File:26JAN18M #1-520 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
403.8530 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



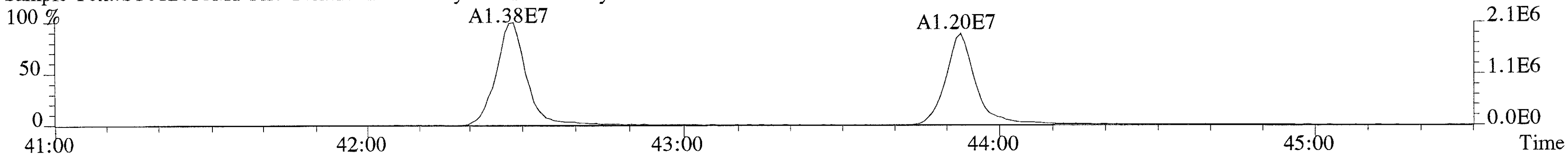
File:26JAN18M #1-520 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
380.9760 F:3 Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



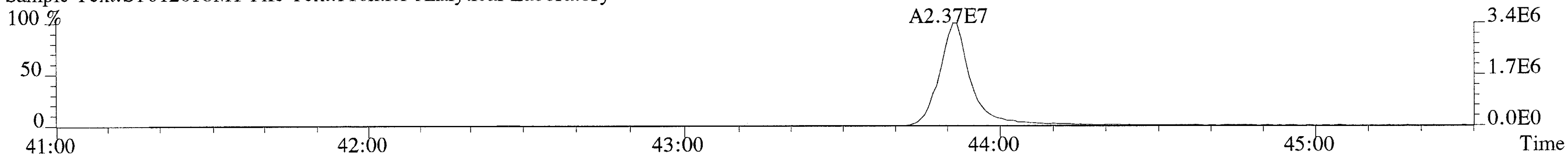
File:26JAN18M #1-521 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
423.7767 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



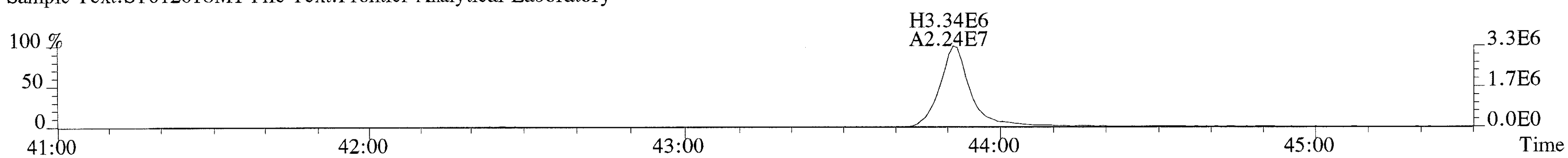
File:26JAN18M #1-521 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
425.7737 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



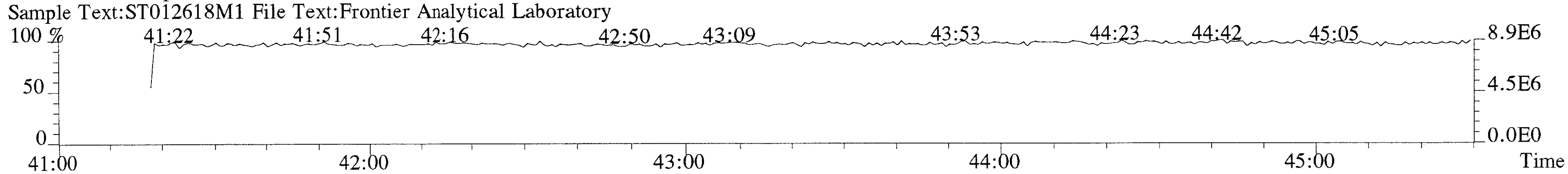
File:26JAN18M #1-521 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
435.8169 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



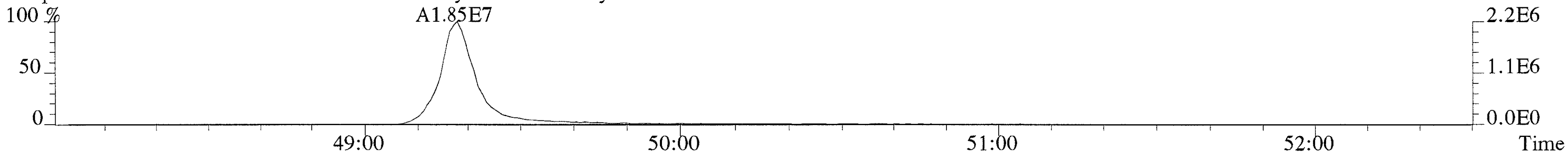
File:26JAN18M #1-521 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
437.8140 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
430.9728 F:4 Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
457.7377 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



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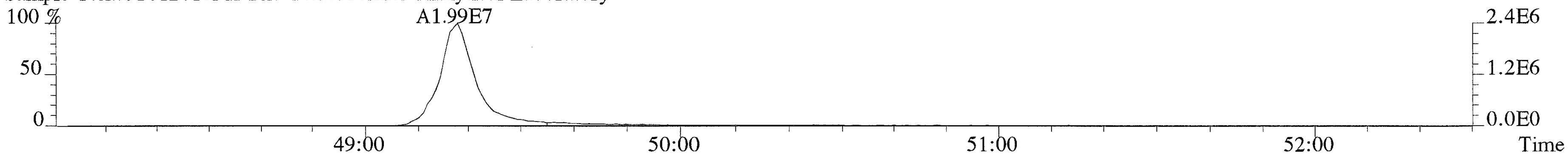

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469.7780 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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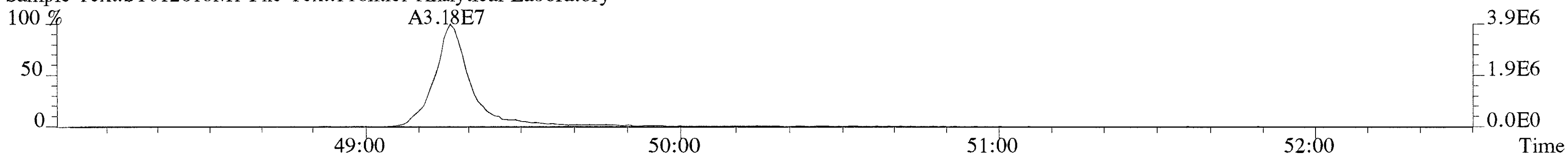

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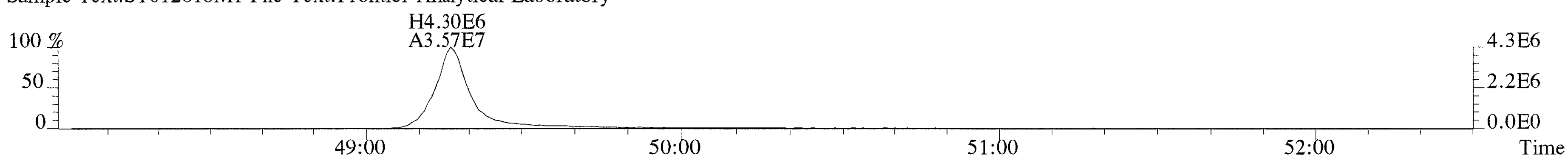
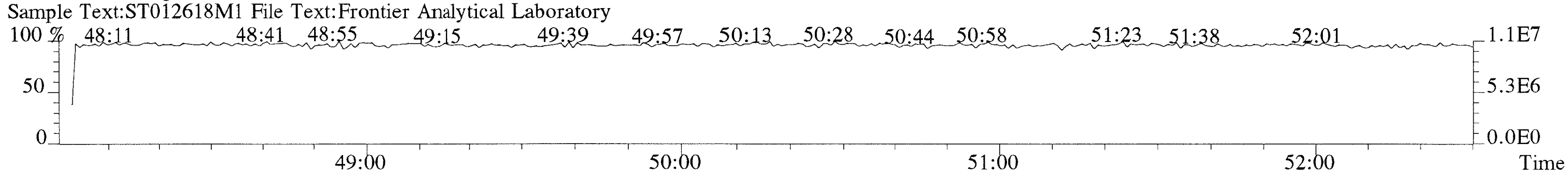
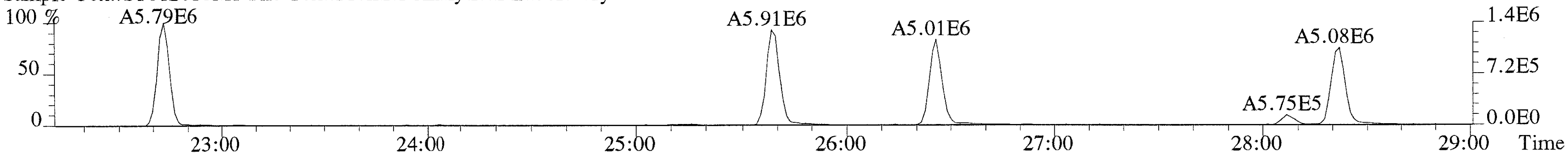


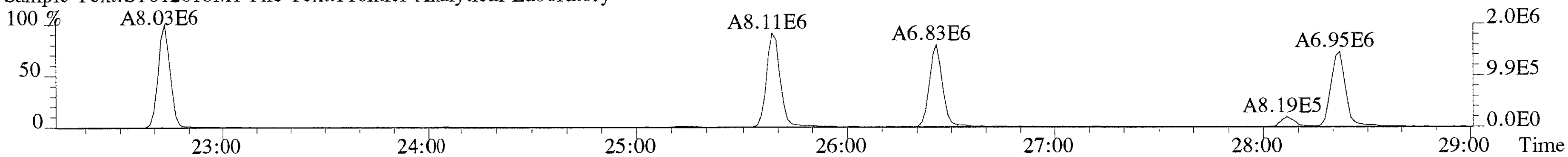
File:26JAN18M #1-361 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
454.9728 F:5 Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



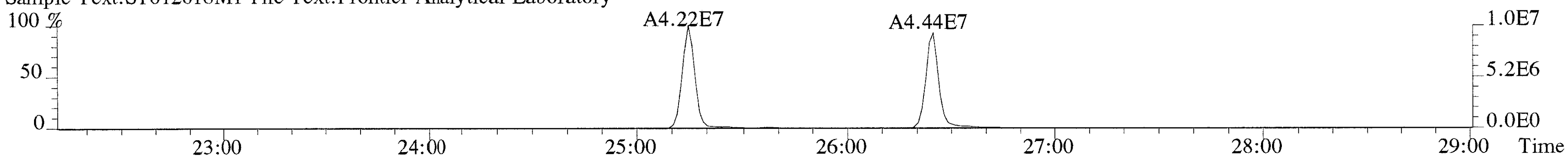
File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
303.9016 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
305.8987 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
315.9419 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



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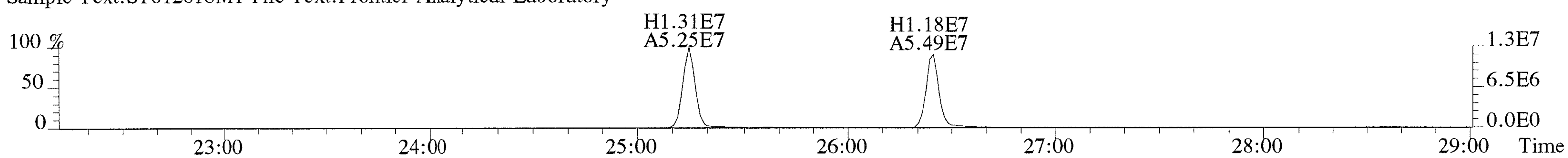
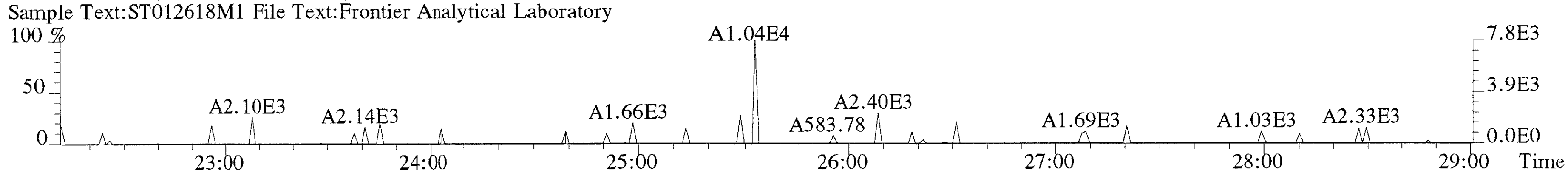
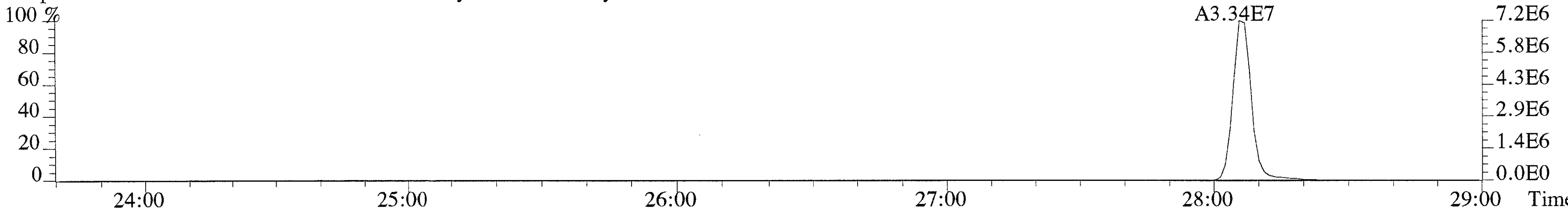
317.9389 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



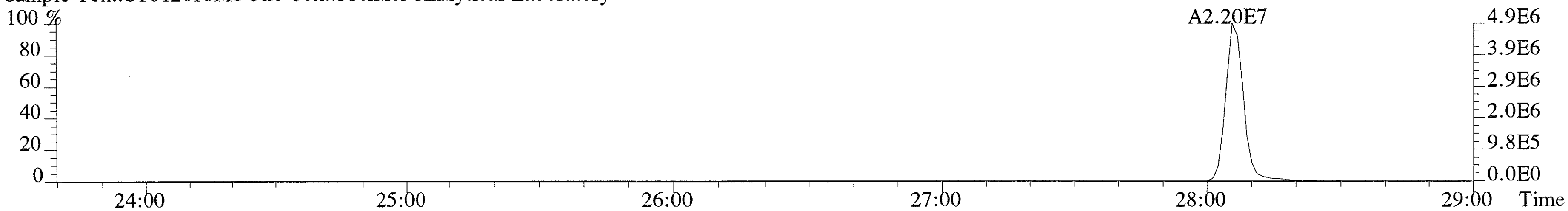
File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
375.8364 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



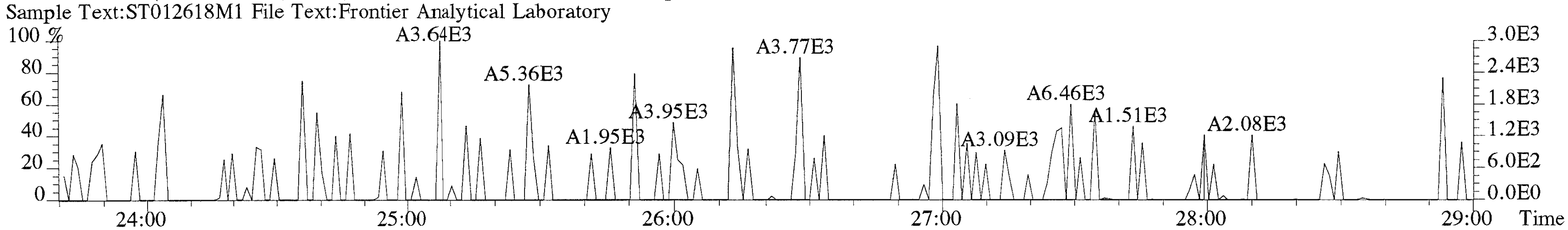
File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
339.8597 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



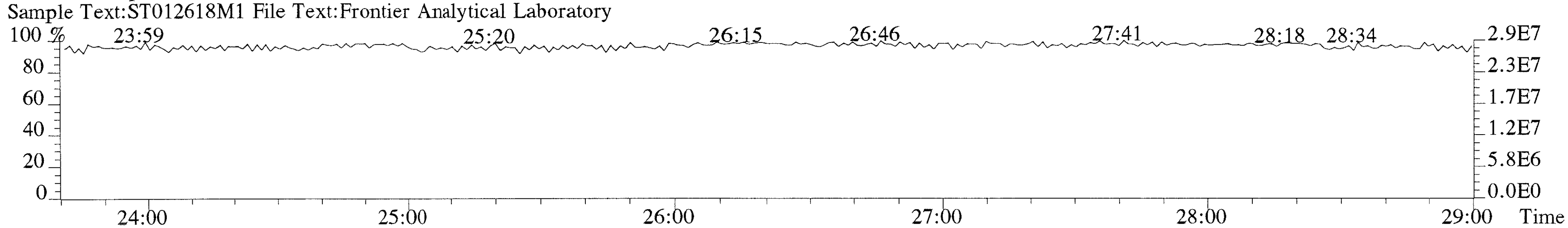
File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
341.8568 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



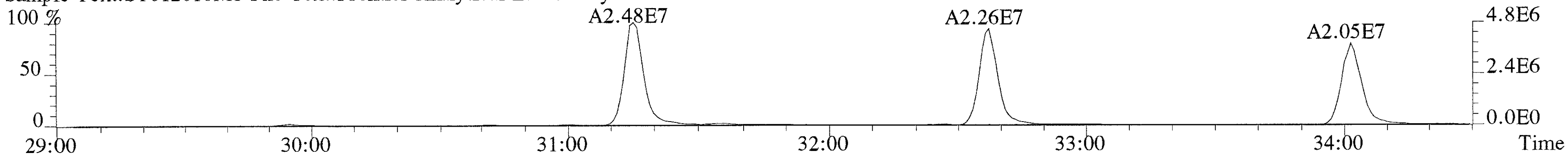
File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
409.7974 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



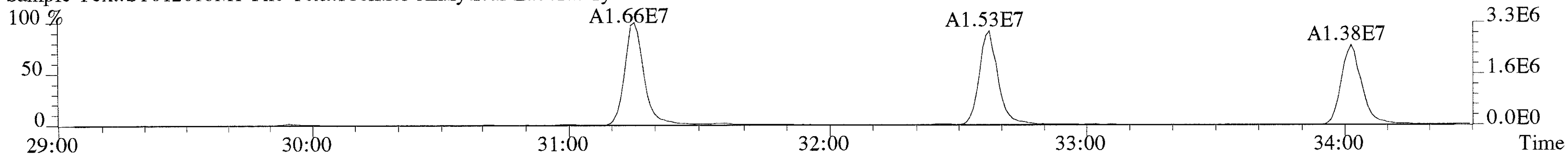
File:26JAN18M #1-381 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
330.9792 Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



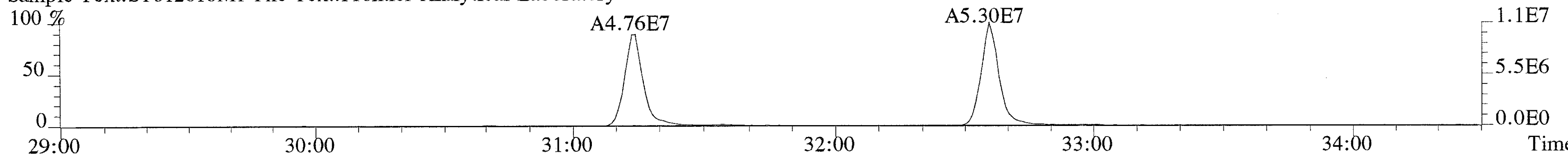
File:26JAN18M #1-423 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
339.8597 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



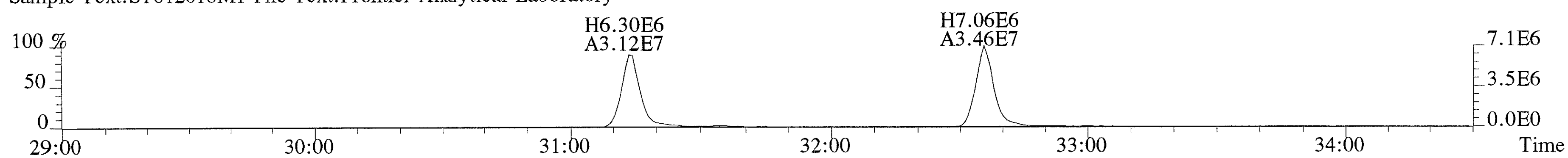
File:26JAN18M #1-423 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
341.8568 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



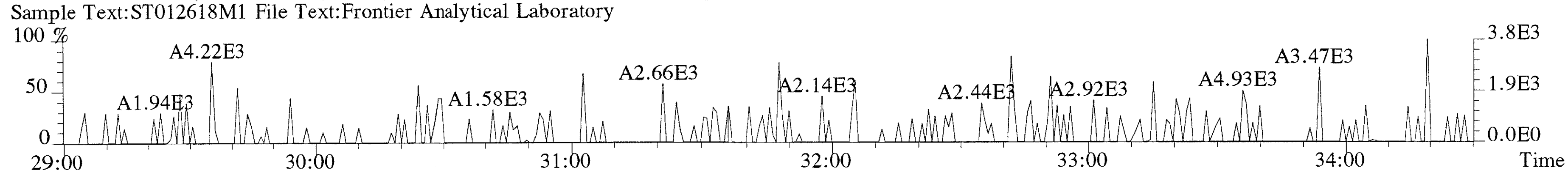
File:26JAN18M #1-423 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
351.9000 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



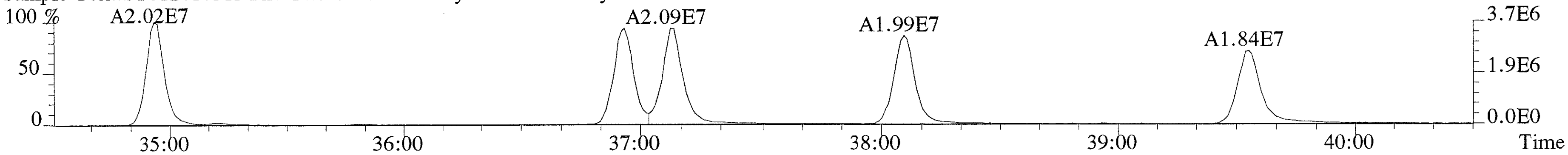
File:26JAN18M #1-423 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
353.8970 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



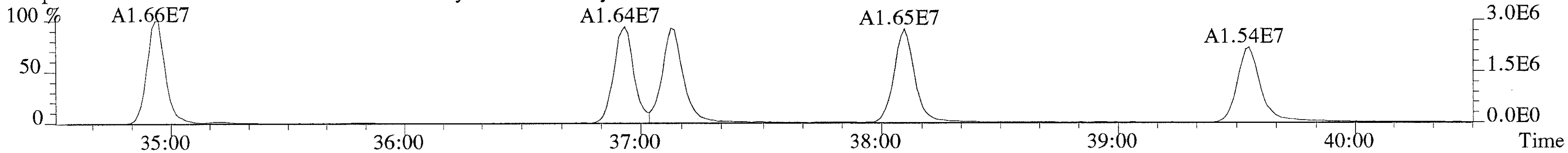
File:26JAN18M #1-423 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
409.7974 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



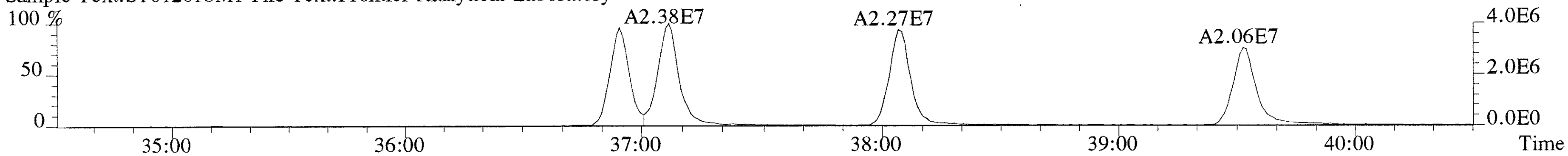
File:26JAN18M #1-520 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
373.8207 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-520 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
375.8178 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-520 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
383.8639 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



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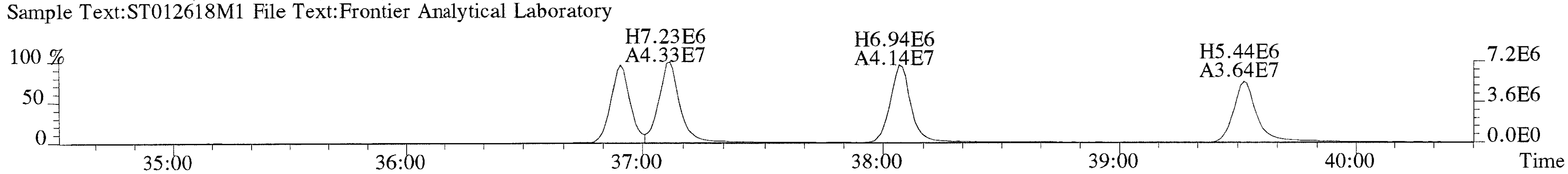
385.8610 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



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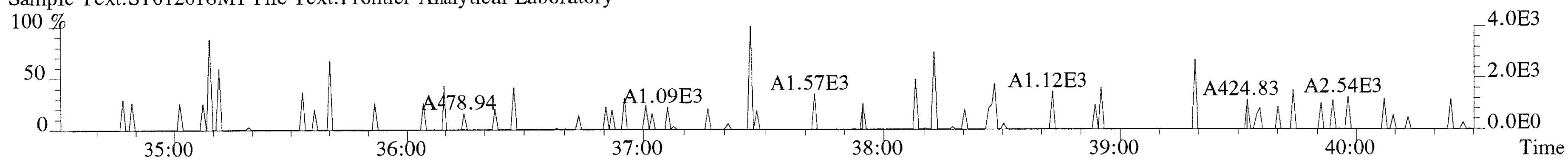
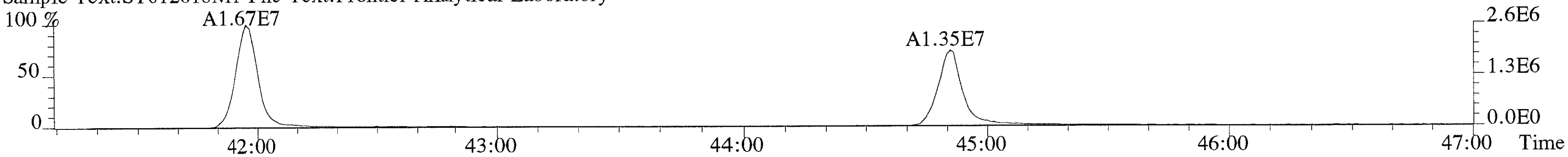
445.7555 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
407.7818 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



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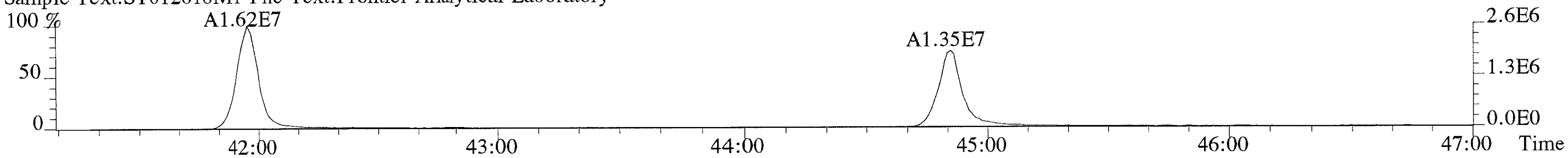
409.7788 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



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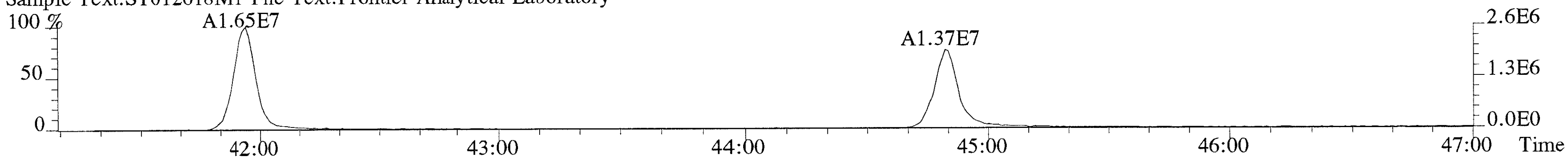
417.8253 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



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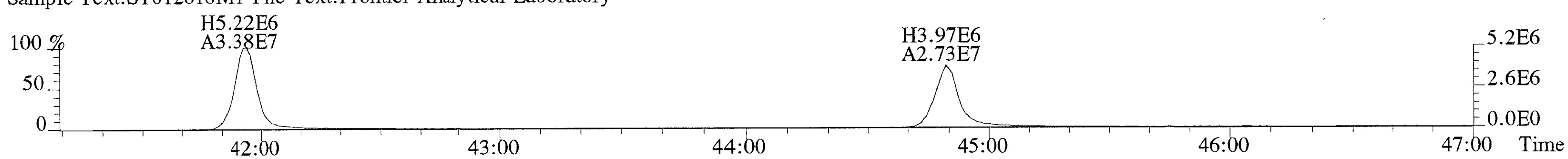
419.8220 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



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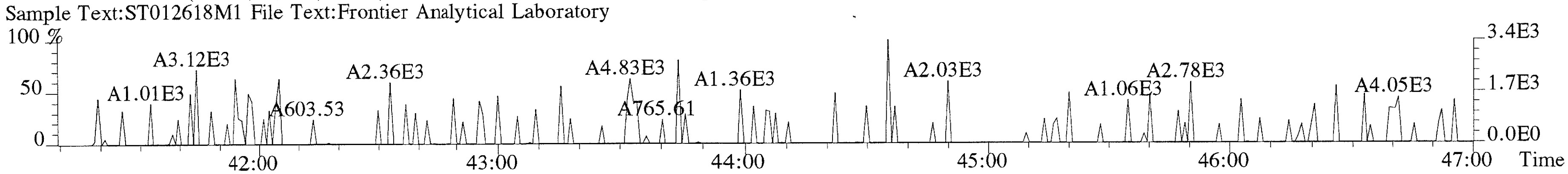
479.7165 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



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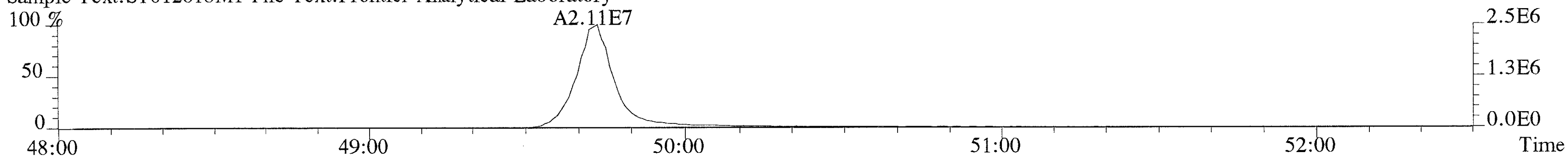
441.7428 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



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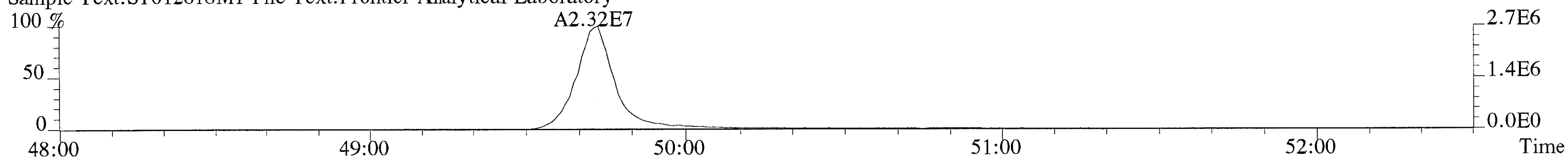
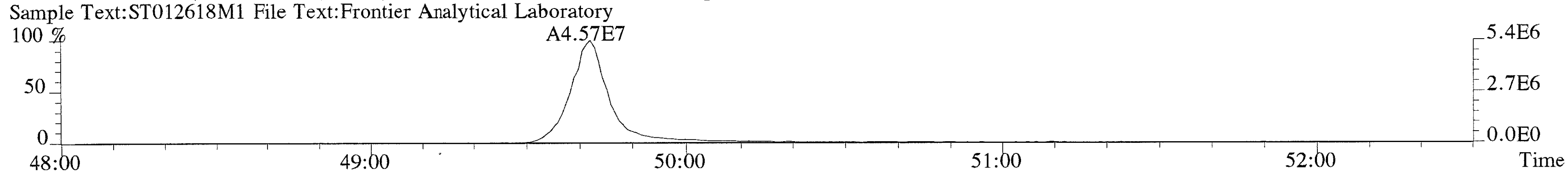
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
453.7831 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



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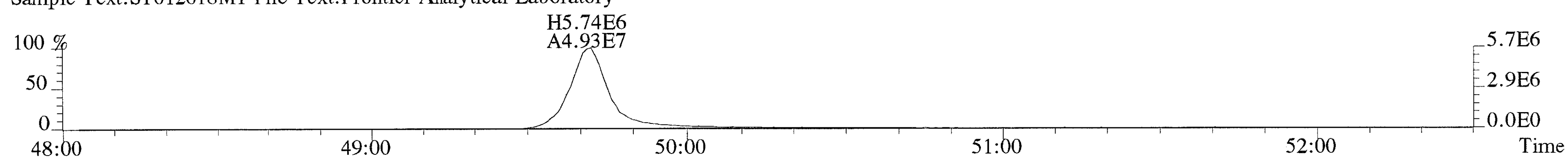
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-361 Acq:26-JAN-2018 13:31:42 GC EI+ Voltage SIR Autospec-Ultima
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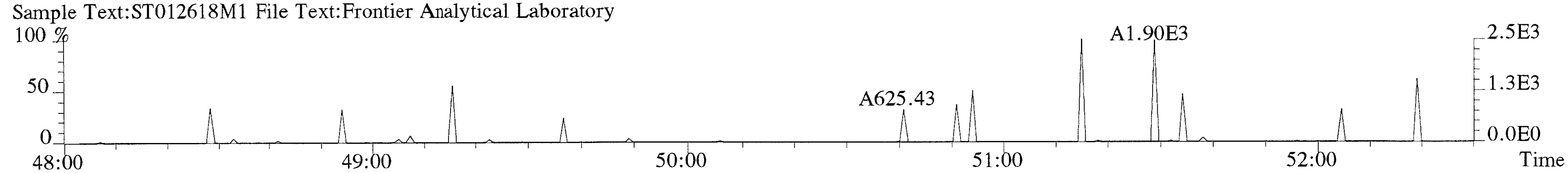
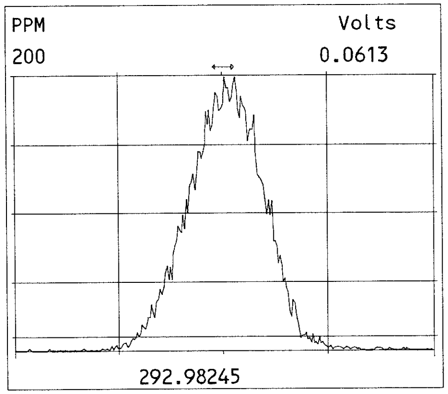
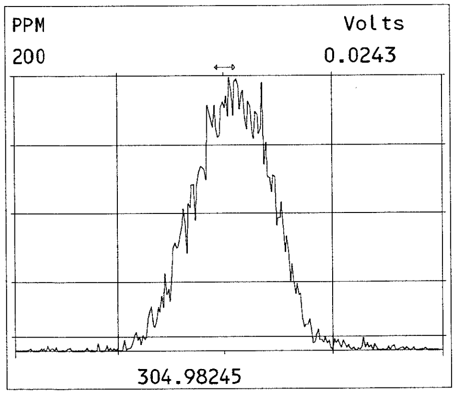
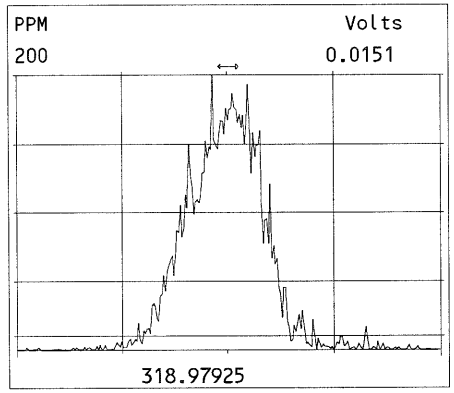
Sample Text:ST012618M1 File Text:Frontier Analytical Laboratory

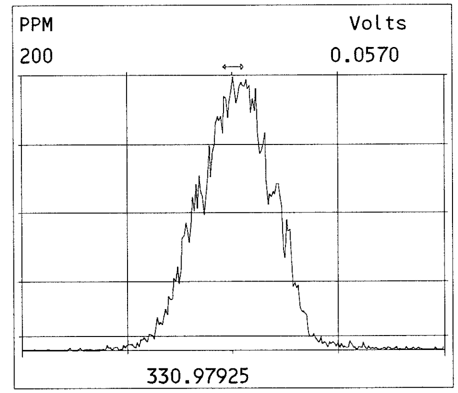


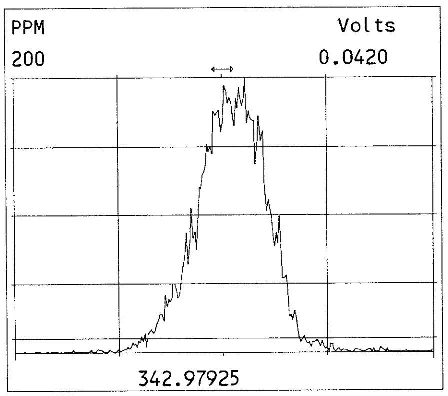
Peak Locate Examination:27-JAN-2018:09:40 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:1 Reference:PFK

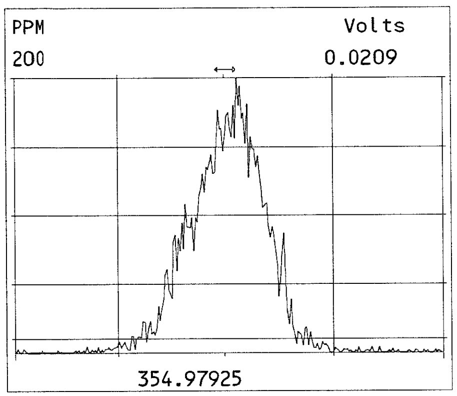


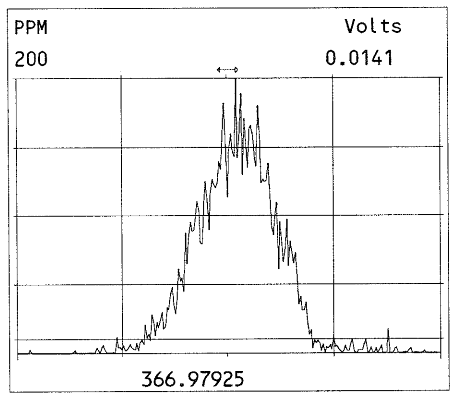


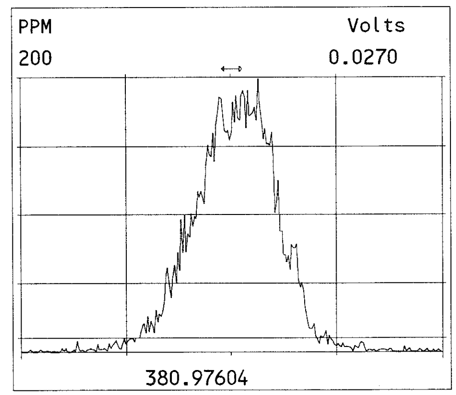


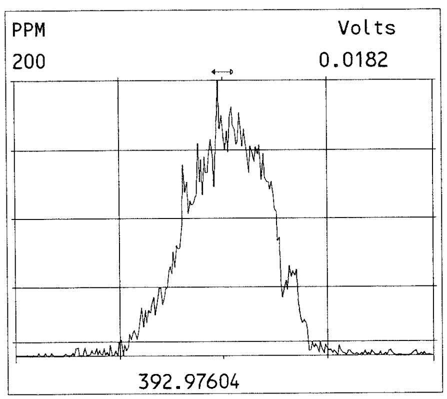


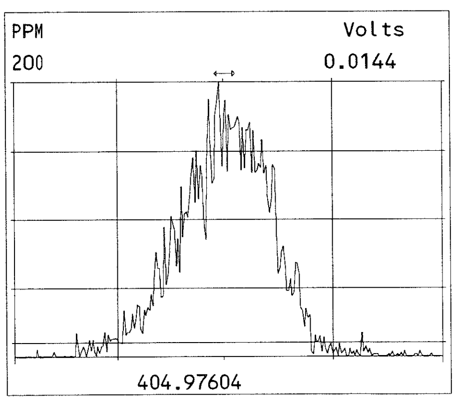


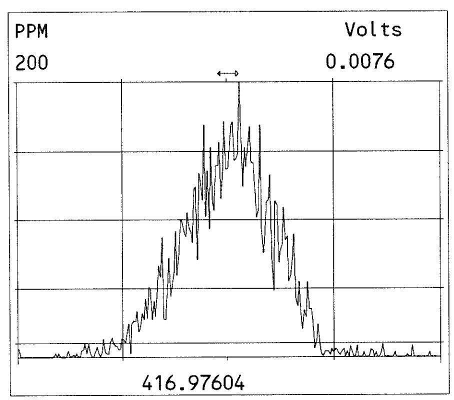




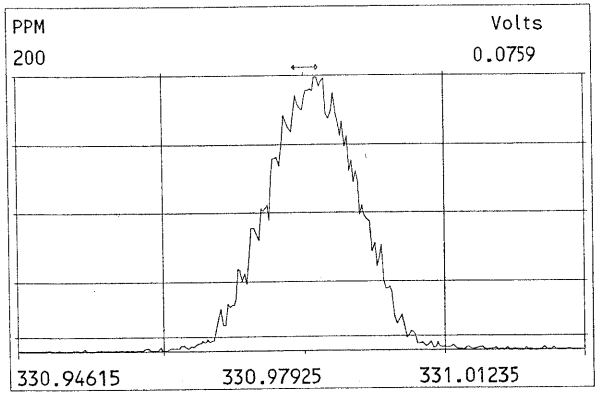


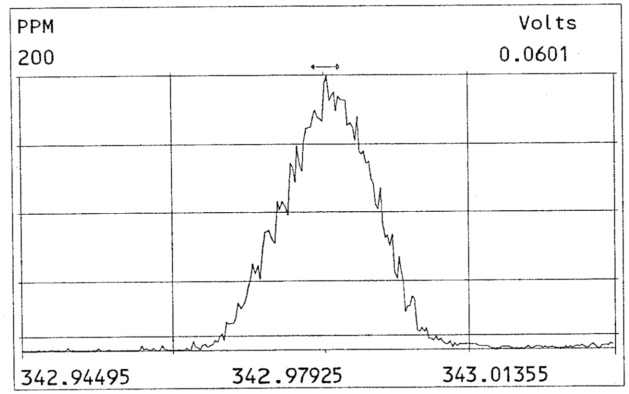


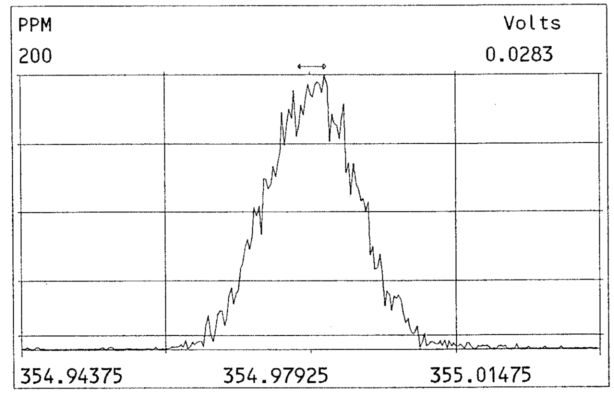


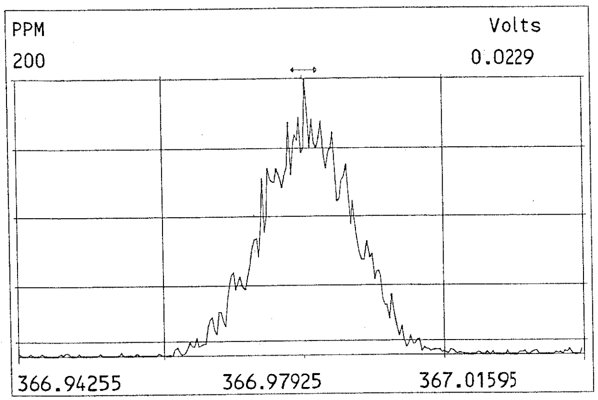


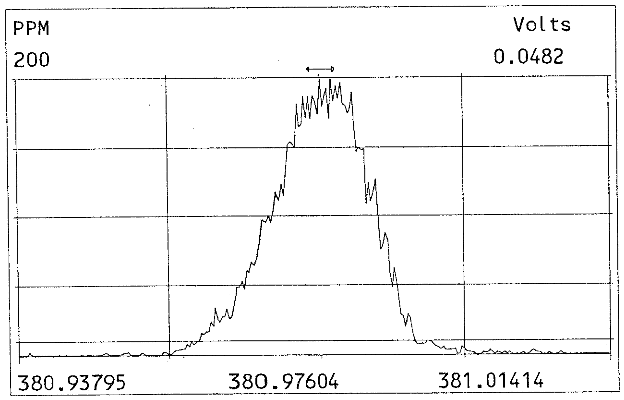
Peak Locate Examination:27-JAN-2018:09:42 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:2 Reference:PFK

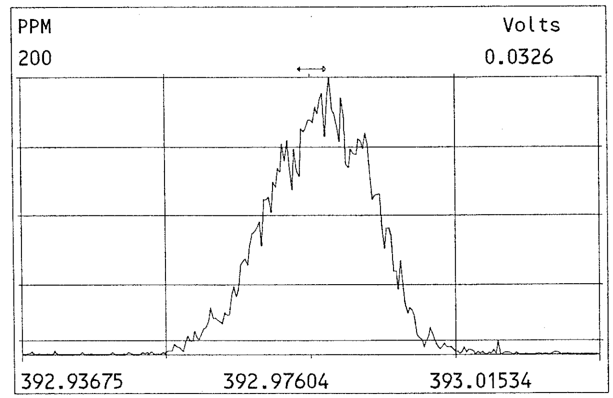


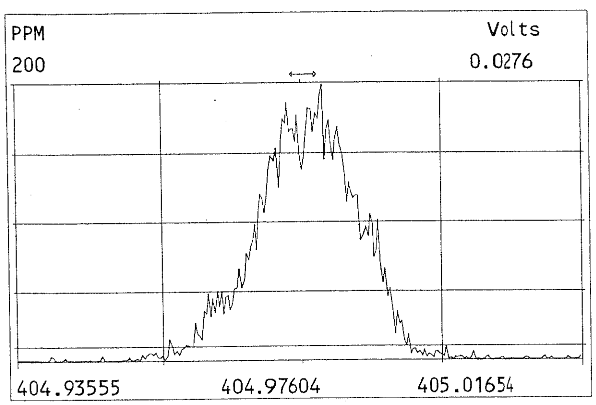


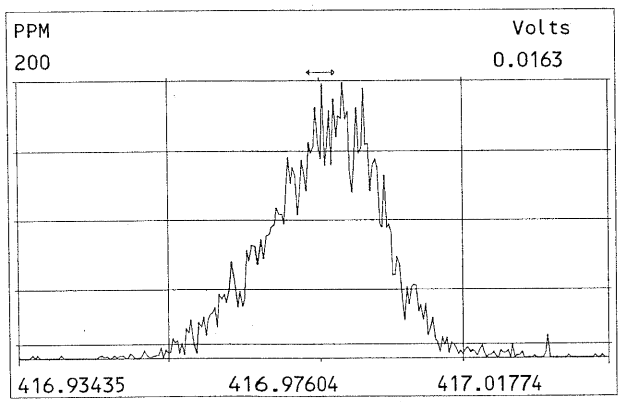




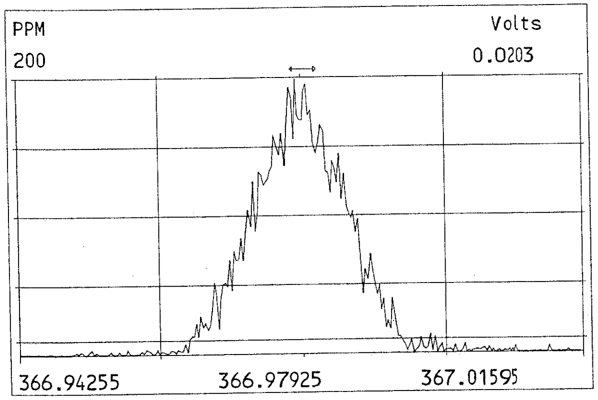


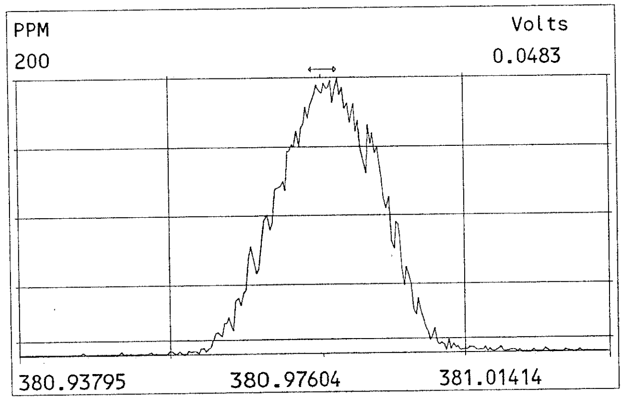


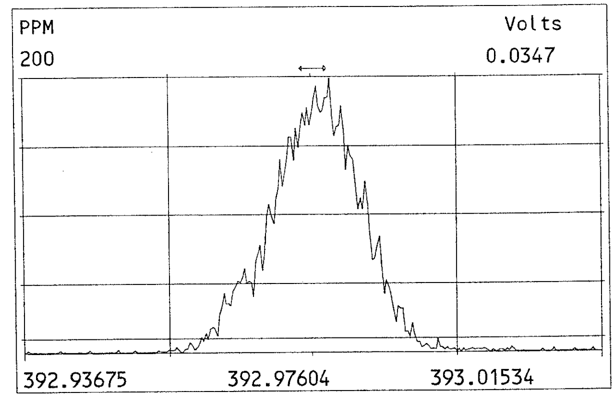


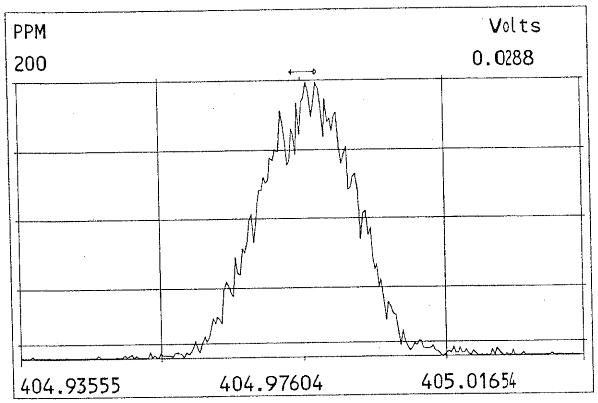


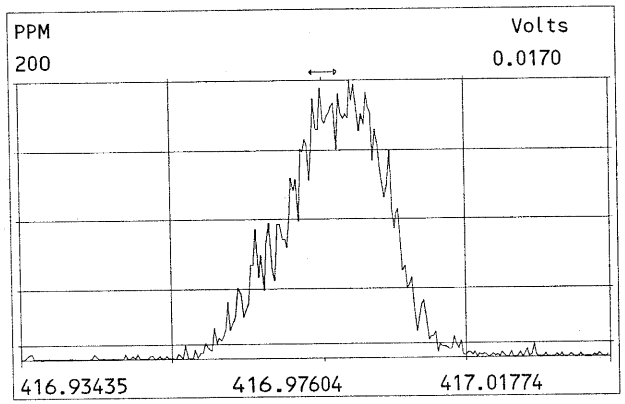
Peak Locate Examination:27-JAN-2018:09:44 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:3 Reference:PFK

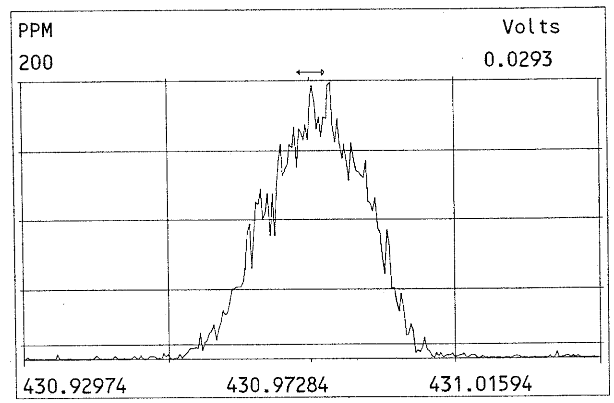


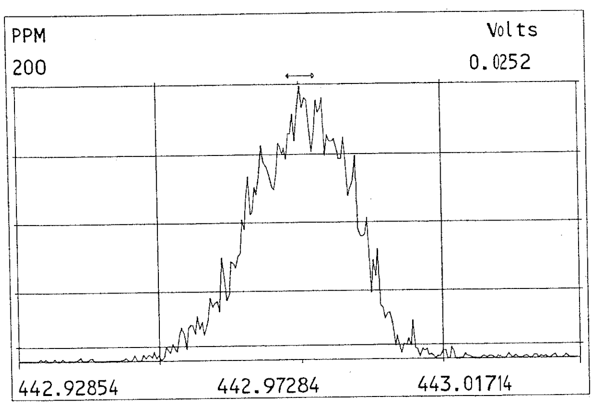


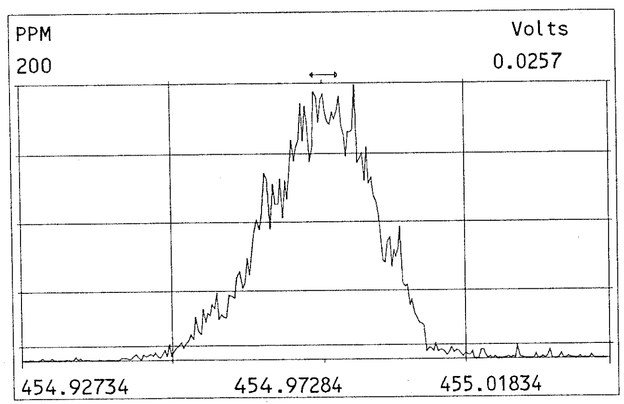




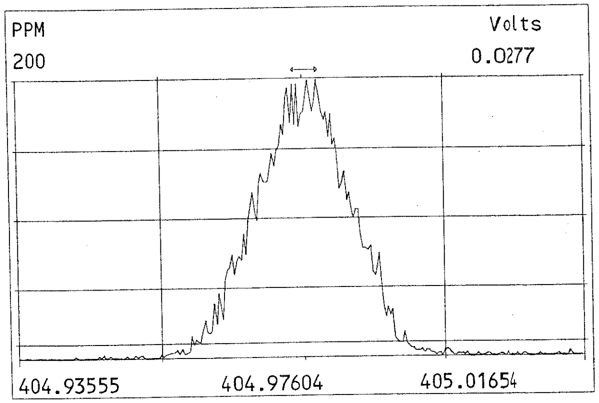


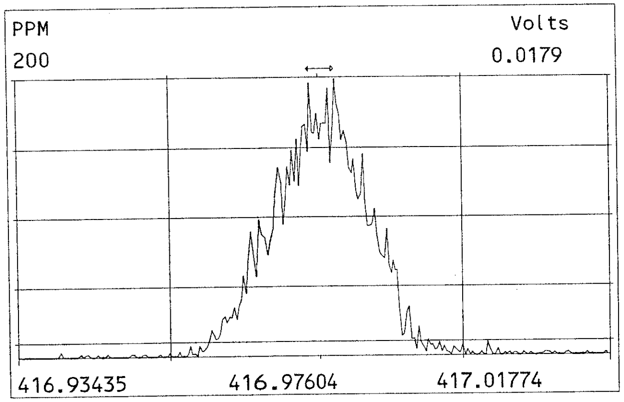


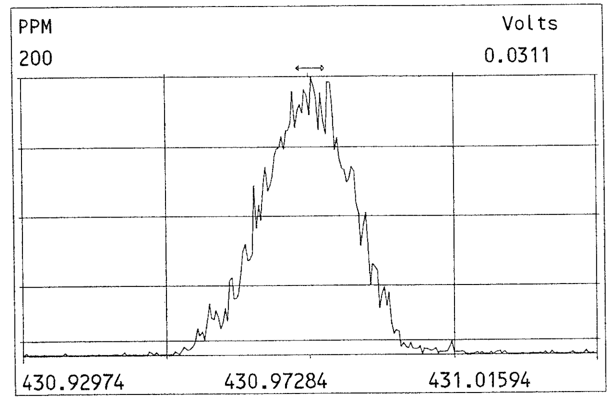


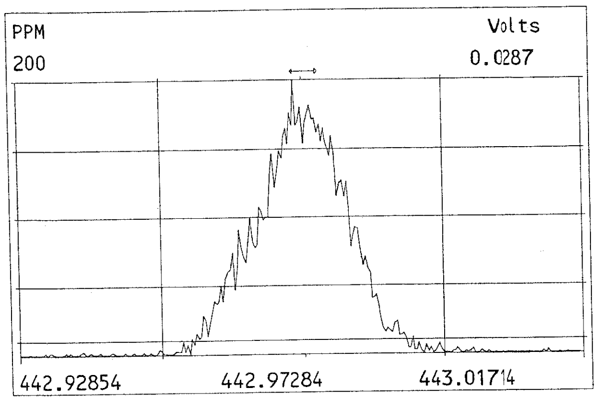


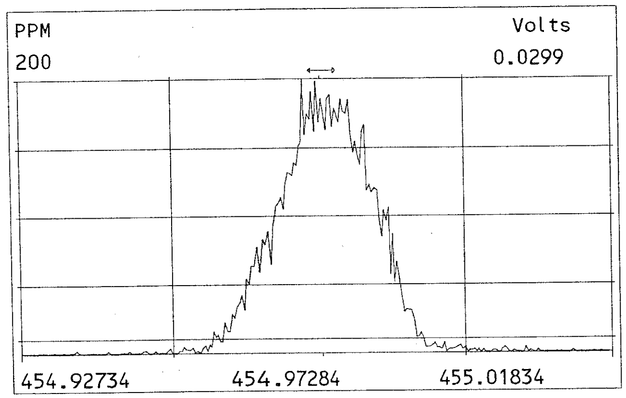
Peak Locate Examination:27-JAN-2018:09:46 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:4 Reference:PFK

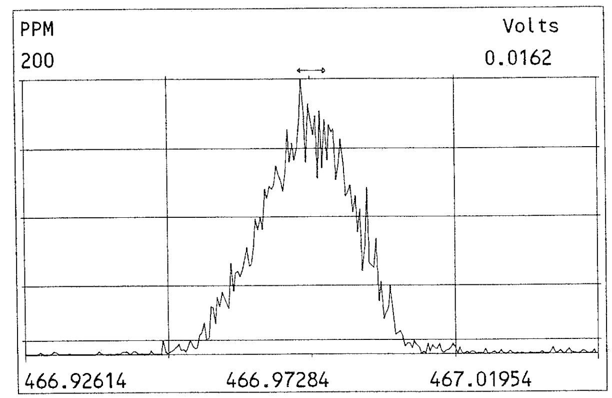


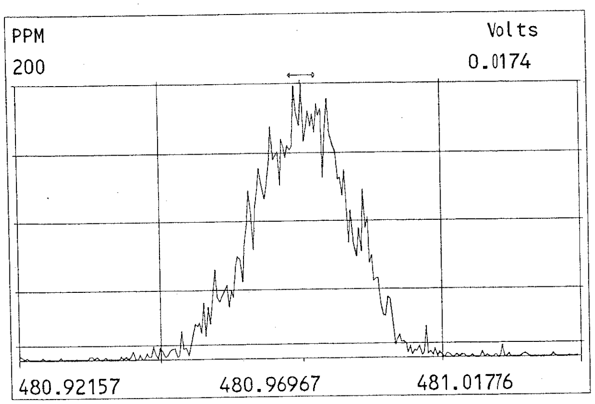






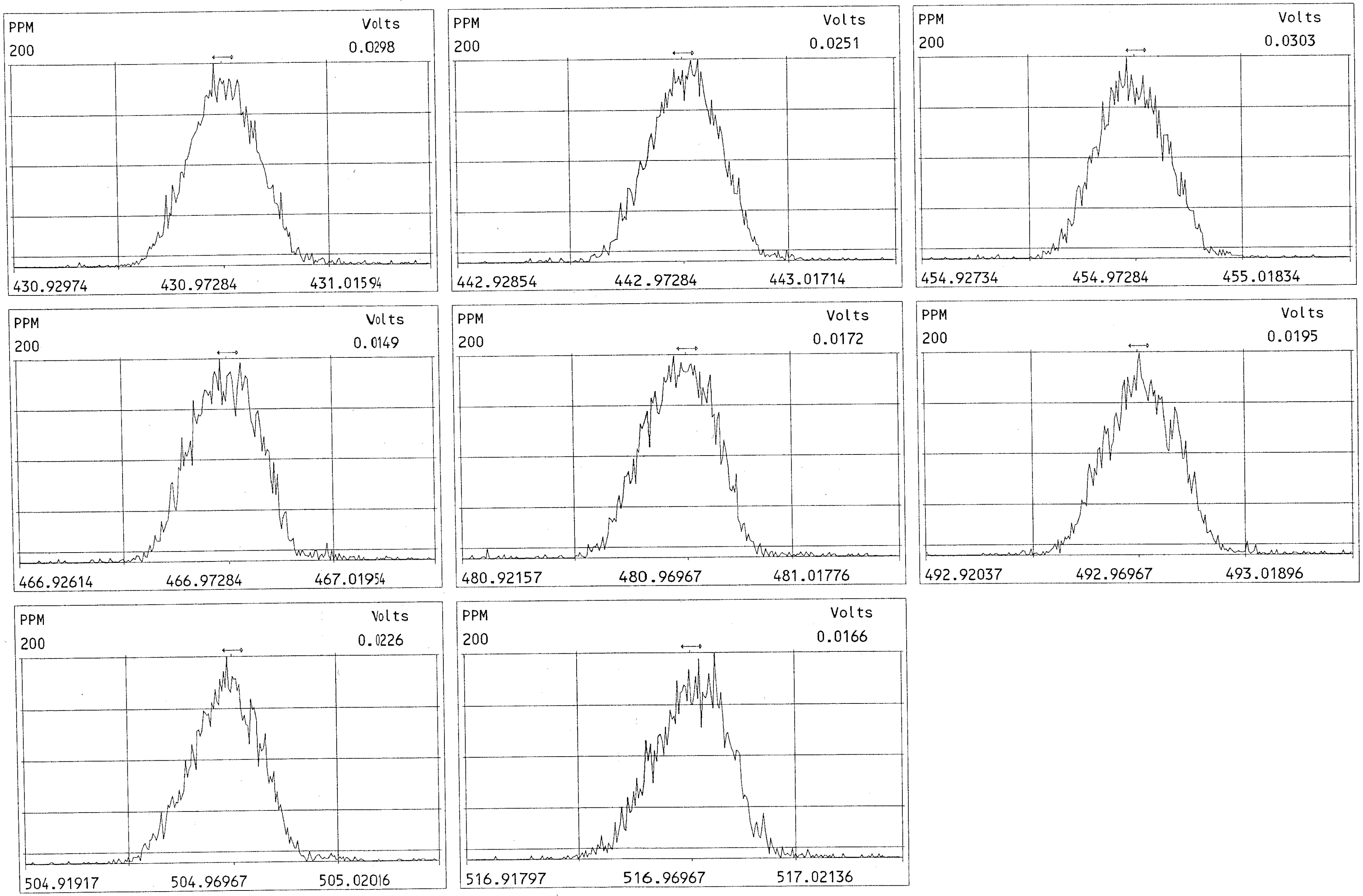






Peak Locate Examination:27-JAN-2018:09:48 File:26JAN18M_RES_CHECK

Experiment:PCDD Function:5 Reference:PFK



USEPA - ITD

FORM 4A
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:

Initial Calibration Date: 12/22/17

Instrument ID: FAL3   GC Column ID: DB5MS

VER Data Filename: 26JAN18M Sam:11   Analysis Date: 26-JAN-18 22:40:18

NATIVE ANALYTES	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
2,3,7,8-TCDD	M/M+2	0.81	0.65-0.89	y	11.6	7.80 - 12.9
1,2,3,7,8-PeCDD	M+2/M+4	1.43	1.32-1.78	y	50.3	39.0 - 65.0
1,2,3,4,7,8-HxCDD	M+2/M+4	1.25	1.05-1.43	y	54.0	39.0 - 64.0
1,2,3,6,7,8-HxCDD	M+2/M+4	1.27	1.05-1.43	y	52.5	39.0 - 64.0
1,2,3,7,8,9-HxCDD	M+2/M+4	1.25	1.05-1.43	y	55.8	41.0 - 61.0
1,2,3,4,6,7,8-HpCDD	M+2/M+4	0.99	0.88-1.20	y	54.2	43.0 - 58.0
OCDD	M+2/M+4	0.90	0.76-1.02	y	107	79.0 - 126
2,3,7,8-TCDF	M/M+2	0.68	0.65-0.89	y	11.4	8.40 - 12.0
1,2,3,7,8-PeCDF	M+2/M+4	1.48	1.32-1.78	y	53.8	41.0 - 60.0
2,3,4,7,8-PeCDF	M+2/M+4	1.47	1.32-1.78	y	52.3	41.0 - 60.0
1,2,3,4,7,8-HxCDF	M+2/M+4	1.22	1.05-1.43	y	51.6	45.0 - 56.0
1,2,3,6,7,8-HxCDF	M+2/M+4	1.20	1.05-1.43	y	52.1	44.0 - 57.0
2,3,4,6,7,8-HxCDF	M+2/M+4	1.21	1.05-1.43	y	51.9	44.0 - 57.0
1,2,3,7,8,9-HxCDF	M+2/M+4	1.17	1.05-1.43	y	49.9	45.0 - 56.0
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.00	0.88-1.20	y	50.3	45.0 - 55.0
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.02	0.88-1.20	y	50.2	43.0 - 58.0
OCDF	M+2/M+4	0.90	0.76-1.02	y	103	63.0 - 159

(1) See Table 8, Method 1613, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 9, Method 1613.

(3) Contract-required concentration range as specified in Table 6, Method 1613.

Analyst: [signature]   Date: 1/29/18

USEPA - ITD

FORM 4B

PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory | Episode No.:

Contract No.: | SAS No.:

Initial Calibration Date: 12/22/17

Instrument ID: FAL3 | GC Column ID: DB5MS

VER Data Filename: 26JAN18M Sam:11 | Analysis Date: 26-JAN-18 22:40:18

LABELED COMPOUNDS	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
13C-2,3,7,8-TCDD	M/M+2	0.82	0.65-0.89	y	112	82.0 - 121
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.53	1.32-1.78	y	99.1	62.0 - 160
13C-1,2,3,4,7,8-HxCDD	M+2/M+4	1.23	1.05-1.43	y	95.4	85.0 - 117
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.25	1.05-1.43	y	94.1	85.0 - 118
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.05	0.88-1.20	y	88.5	72.0 - 138
13C-OCDD	M+2/M+4	0.94	0.76-1.02	y	169	96.0 - 415
13C-2,3,7,8-TCDF	M/M+2	0.81	0.65-0.89	y	113	71.0 - 140
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.53	1.32-1.78	y	100	76.0 - 130
13C-2,3,4,7,8-PeCDF	M+2/M+4	1.54	1.32-1.78	y	96.5	77.0 - 130
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.56	0.43-0.59	y	103	76.0 - 131
13C-1,2,3,6,7,8-HxCDF	M/M+2	0.54	0.43-0.59	y	97.2	70.0 - 143
13C-2,3,4,6,7,8-HxCDF	M/M+2	0.56	0.43-0.59	y	97.3	73.0 - 137
13C-1,2,3,7,8,9-HxCDF	M/M+2	0.57	0.43-0.59	y	89.4	74.0 - 135
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.49	0.37-0.51	y	87.9	78.0 - 129
13C-1,2,3,4,7,8,9-HpCDF	M/M+2	0.48	0.37-0.51	y	89.9	77.0 - 129
13C-OCDF	M+2/M+4	0.92	0.76-1.02	y	158	96.0 - 415
CLEANUP STANDARD (4)						
37Cl-2,3,7,8-TCDD					12.1	7.90 - 12.7

(1) See Table 8, Method 1613, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 9, Method 1613.

(3) Contract-required concentration range as specified in Table 6, Method 1613.

(4) No ion abundance ratio; report concentration found.

Analyst: ____ Date: 1/29/18

FORM 5

PCDD/PCDF RT WINDOW AND ISOMER SPECIFICITY STANDARDS

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:

Instrument ID: FAL3   Initial Calibration Date: 12/22/17

RT Window Data Filename: 26JAN18M Sam:11   Analysis Date: 26-JAN-18 Time: 22:40:18

DB-5 IS Data Filename: 26JAN18M Sam:11   Analysis Date: 26-JAN-18 Time: 22:40:18

DB-225 IS Date Filename: Analysis Date: Time:

DB-5 RT WINDOW DEFINING STANDARDS RESULTS

ISOMERS	ABSOLUTE RT	ISOMERS	ABSOLUTE RT
1,3,6,8-TCDD (F)	24:08	1,3,6,8-TCDF (F)	22:45
1,2,8,9-TCDD (L)	28:08	1,2,8,9-TCDF (L)	28:23
1,2,4,7,9-PeCDD (F)	30:00	1,3,4,6,8-PeCDF (F)	28:08
1,2,3,8,9-PeCDD (L)	33:36	1,2,3,8,9-PeCDF (L)	34:04
1,2,4,6,7,9-HxCDD (F)	35:51	1,2,3,4,6,8-HxCDF (F)	34:58
1,2,3,7,8,9-HxCDD (L)	38:58	1,2,3,7,8,9-HxCDF (L)	39:35
1,2,3,4,6,7,9-HpCDD (F)	42:30	1,2,3,4,6,7,8-HpCDF (F)	41:60
1,2,3,4,6,7,8-HpCDD (L)	43:55	1,2,3,4,7,8,9-HpCDF (L)	44:53

(F) = First eluting isomer (DB-5); (L) = Last eluting isomer (DB-5)

==

ISOMER SPECIFICITY (IS) TEST STANDARD RESULTS

% VALLEY HEIGHT
BETWEEN
COMPARED PEAKS (1)

<25%

(1) To meet contract requirement, %Valley Height Between Compared Peaks shall not exceed 25% (section 15.4.2.2, Method 1613).

Analyst: [signature]   Date: 1/29/18

USEPA - ITD

FORM 6A

PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:   Init. Cal. Date: 12/22/17

Instrument ID: FAL3   GC Column ID: DB5MS

Analysis Date: 26-JAN-18 22:40:18   CS3 or VER Data Filename: 26JAN18M   Sam:11

NATIVE ANALYTES	RETENTION TIME REFERENCE	RRT	RRT QC LIMITS (1)
2,3,7,8-TCDD	13C-2,3,7,8-TCDD	1.001	0.999-1.002
2,3,7,8-TCDF	13C-2,3,7,8-TCDF	1.001	0.999-1.003
1,2,3,7,8-PeCDD	13C-1,2,3,7,8-PeCDD	1.001	0.999-1.002
1,2,3,7,8-PeCDF	13C-1,2,3,7,8-PeCDF	1.001	0.999-1.002
2,3,4,7,8-PeCDF	13C-2,3,4,7,8-PeCDF	1.001	0.999-1.002
LABELED COMPOUNDS			
37Cl-2,3,7,8-TCDD	13C-1,2,3,4-TCDD	1.024	0.989-1.052
13C-2,3,7,8-TCDD		1.024	0.976-1.043
13C-2,3,7,8-TCDF		0.996	0.923-1.103
13C-1,2,3,7,8-PeCDD		1.244	1.000-1.567
13C-1,2,3,7,8-PeCDF		1.178	1.000-1.425
13C-2,3,4,7,8-PeCDF		1.230	1.011-1.526

(1) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1613.

Analyst: [signature]   Date: 1/29/18

USEPA - ITD

FORM 6B
PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:   Init. Cal. Date: 12/22/17

Instrument ID: FAL3   GC Column ID: DB5MS

Analysis Date: 26-JAN-18 22:40:18   CS3 or VER Data Filename: 26JAN18M   Sam:11

NATIVE ANALYTES	RETENTION TIME REFERENCE	RRT	RRT QC LIMITS (1)
1,2,3,4,7,8-HxCDD	13C-1,2,3,4,7,8-HxCDD	1.001	0.999-1.001
1,2,3,6,7,8-HxCDD	13C-1,2,3,6,7,8-HxCDD	1.000	0.999-1.003
1,2,3,7,8,9-HxCDD	13C-1,2,3,6,7,8-HxCDD	1.012	1.000-1.019
1,2,3,4,7,8-HxCDF	13C-1,2,3,4,7,8-HxCDF	1.000	0.999-1.001
1,2,3,6,7,8-HxCDF	13C-1,2,3,6,7,8-HxCDF	1.000	0.999-1.003
2,3,4,6,7,8-HxCDF	13C-2,3,4,6,7,8-HxCDF	1.001	0.999-1.001
1,2,3,7,8,9-HxCDF	13C-1,2,3,7,8,9-HxCDF	1.000	0.999-1.001
1,2,3,4,6,7,8-HpCDD	13C-1,2,3,4,6,7,8-HpCDD	1.001	0.999-1.001
1,2,3,4,6,7,8-HpCDF	13C-1,2,3,4,6,7,8-HpCDF	1.001	0.999-1.001
1,2,3,4,7,8,9-HpCDF	13C-1,2,3,4,7,8,9-HpCDF	1.000	0.999-1.001
OCDD	13C-OCDD	1.000	0.999-1.001
OCDF	13C-OCDF	1.001	0.999-1.001
LABELED COMPOUNDS			
13C-1,2,3,4,7,8-HxCDD	13C-1,2,3,7,8,9-HxCDD	0.984	0.977-1.000
13C-1,2,3,6,7,8-HxCDD		0.989	0.981-1.003
13C-1,2,3,4,7,8-HxCDF		0.949	0.944-0.970
13C-1,2,3,6,7,8-HxCDF		0.954	0.949-0.975
13C-2,3,4,6,7,8-HxCDF		0.978	0.959-1.021
13C-1,2,3,7,8,9-HxCDF		1.016	0.977-1.047
13C-1,2,3,4,6,7,8-HpCDD		1.127	1.086-1.130
13C-1,2,3,4,6,7,8-HpCDF		1.077	1.043-1.085
13C-1,2,3,4,7,8,9-HpCDF		1.152	1.057-1.156
13C-OCDD		1.266	1.032-1.311
13C-OCDF		1.277	1.000-1.311

(1) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1613.

Analyst: [signature]   Date: 1/29/18

FAL ID: ST012618M2 Filename: 26JAN18M Sam:11 Acquired: 26-JAN-18 22:40:18 ICal: PCDDFAL3-12-22-17
Client ID: 1613 CS3 171128J ConCal: ST012618M2 EndCal: ST012618M3
Results: 11153-3RX GC Column: DB5MS Amount: 1.000 NATO 1989 Tox: 105
Instrument ID: FAL3 WHO 1998 Tox: 130 WHO 2005 Tox: 119

Name	Resp	RA	RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	DL
2,3,7,8-TCDD	7.84e+06	0.81 y	27:11	1.06	11.6		2.50	-	-	*
1,2,3,7,8-PeCDD	2.45e+07	1.43 y	33:02	1.00	50.3		2.50	-	-	*
1,2,3,4,7,8-HxCDD	2.42e+07	1.25 y	38:22	1.07	54.0		2.50	-	-	*
1,2,3,6,7,8-HxCDD	2.58e+07	1.27 y	38:32	1.08	52.5		2.50	-	-	*
1,2,3,7,8,9-HxCDD	2.71e+07	1.25 y	38:58	1.11	55.8		2.50	-	-	*
1,2,3,4,6,7,8-HpCDD	2.20e+07	0.99 y	43:55	0.99	54.2		2.50	-	-	*
OCDD	3.62e+07	0.90 y	49:20	1.11	107		2.50	-	-	*
2,3,7,8-TCDF	9.51e+06	0.68 y	26:28	1.03	11.4		2.50	-	-	*
1,2,3,7,8-PeCDF	3.40e+07	1.48 y	31:17	0.95	53.8		2.50	-	-	*
2,3,4,7,8-PeCDF	3.04e+07	1.47 y	32:39	0.79	52.3		2.50	-	-	*
1,2,3,4,7,8-HxCDF	3.56e+07	1.22 y	36:58	1.20	51.6		2.50	-	-	*
1,2,3,6,7,8-HxCDF	3.84e+07	1.20 y	37:10	1.10	52.1		2.50	-	-	*
2,3,4,6,7,8-HxCDF	3.46e+07	1.21 y	38:08	1.08	51.9		2.50	-	-	*
1,2,3,7,8,9-HxCDF	3.01e+07	1.17 y	39:35	1.15	49.9		2.50	-	-	*
1,2,3,4,6,7,8-HpCDF	2.73e+07	1.00 y	42:00	1.23	50.3		2.50	-	-	*
1,2,3,4,7,8,9-HpCDF	2.33e+07	1.02 y	44:53	1.23	50.2		2.50	-	-	*
OCDF	4.00e+07	0.90 y	49:46	0.90	103		2.50	-	-	*

Name	Resp	RA	RT	RRF	Conc	Rec
13C-2,3,7,8-TCDD	6.40e+07	0.82 y	27:10	1.02	112	112
13C-1,2,3,7,8-PeCDD	4.88e+07	1.53 y	33:00	0.88	99.1	99.1
13C-1,2,3,4,7,8-HxCDD	4.18e+07	1.23 y	38:20	0.85	95.4	95.4
13C-1,2,3,6,7,8-HxCDD	4.54e+07	1.25 y	38:31	0.94	94.1	94.1
13C-1,2,3,4,6,7,8-HpCDD	4.11e+07	1.05 y	43:53	0.90	88.5	88.5
13C-OCDD	6.11e+07	0.94 y	49:19	0.70	169	84.7
13C-2,3,7,8-TCDF	8.14e+07	0.81 y	26:26	0.93	113	113
13C-1,2,3,7,8-PeCDF	6.69e+07	1.53 y	31:16	0.87	100	100
13C-2,3,4,7,8-PeCDF	7.37e+07	1.54 y	32:38	0.99	96.5	96.5
13C-1,2,3,4,7,8-HxCDF	5.76e+07	0.56 y	36:57	1.09	103	103
13C-1,2,3,6,7,8-HxCDF	6.72e+07	0.54 y	37:09	1.35	97.2	97.2
13C-2,3,4,6,7,8-HxCDF	6.16e+07	0.56 y	38:06	1.23	97.3	97.3
13C-1,2,3,7,8,9-HxCDF	5.25e+07	0.57 y	39:34	1.14	89.4	89.4
13C-1,2,3,4,6,7,8-HpCDF	4.40e+07	0.49 y	41:58	0.97	87.9	87.9
13C-1,2,3,4,7,8,9-HpCDF	3.77e+07	0.48 y	44:52	0.82	89.9	89.9
13C-OCDF	8.62e+07	0.92 y	49:44	1.06	158	78.9
37Cl-2,3,7,8-TCDD	6.19e+06		27:11	0.91	12.1	121
13C-1,2,3,4-TCDD	5.60e+07	0.83 y	26:32	-	154	
13C-1,2,3,4-TCDF	7.71e+07	0.80 y	25:17	-	148	
13C-1,2,3,7,8,9-HxCDD	5.14e+07	1.21 y	38:57	-	168	

Name	Resp	RT	RRF	Conc	Fac	Noise-1	Noise-2	DL		#Hom
Total Tetra-Dioxins	3.77e+07	24:08	1.06	55.7	2.50	-	-	*		17
Total Penta-Dioxins	7.85e+07	30:00	1.00	161	2.50	-	-	*		18
Total Hexa-Dioxins	1.09e+08	35:51	1.09	230	2.50	-	-	*		31
Total Hepta-Dioxins	4.80e+07	42:30	0.99	118	2.50	-	-	*		30
Total Tetra-Furans	4.37e+07	22:45	1.03	52.3	2.50	-	-	*		21
1st Fn. Tot Penta-Furans	4.72e+07	28:08	0.86	77.8	2.50	-	-	*	PeCDF	1
Total Penta-Furans	9.50e+07	29:56	0.86	157	2.50	-	-	*	234	18
Total Hexa-Furans	1.75e+08	34:58	1.13	260	2.50	-	-	*		25
Total Hepta-Furans	5.21e+07	42:00	1.23	104	2.50	-	-	*		32

Analyst: [signature] Date: 1/29/18

Frontier Analytical Laboratory - Acquisition Log

Run Name:26JAN18M Instrument: FAL3 GC: DB5MS Experiment:PCDD

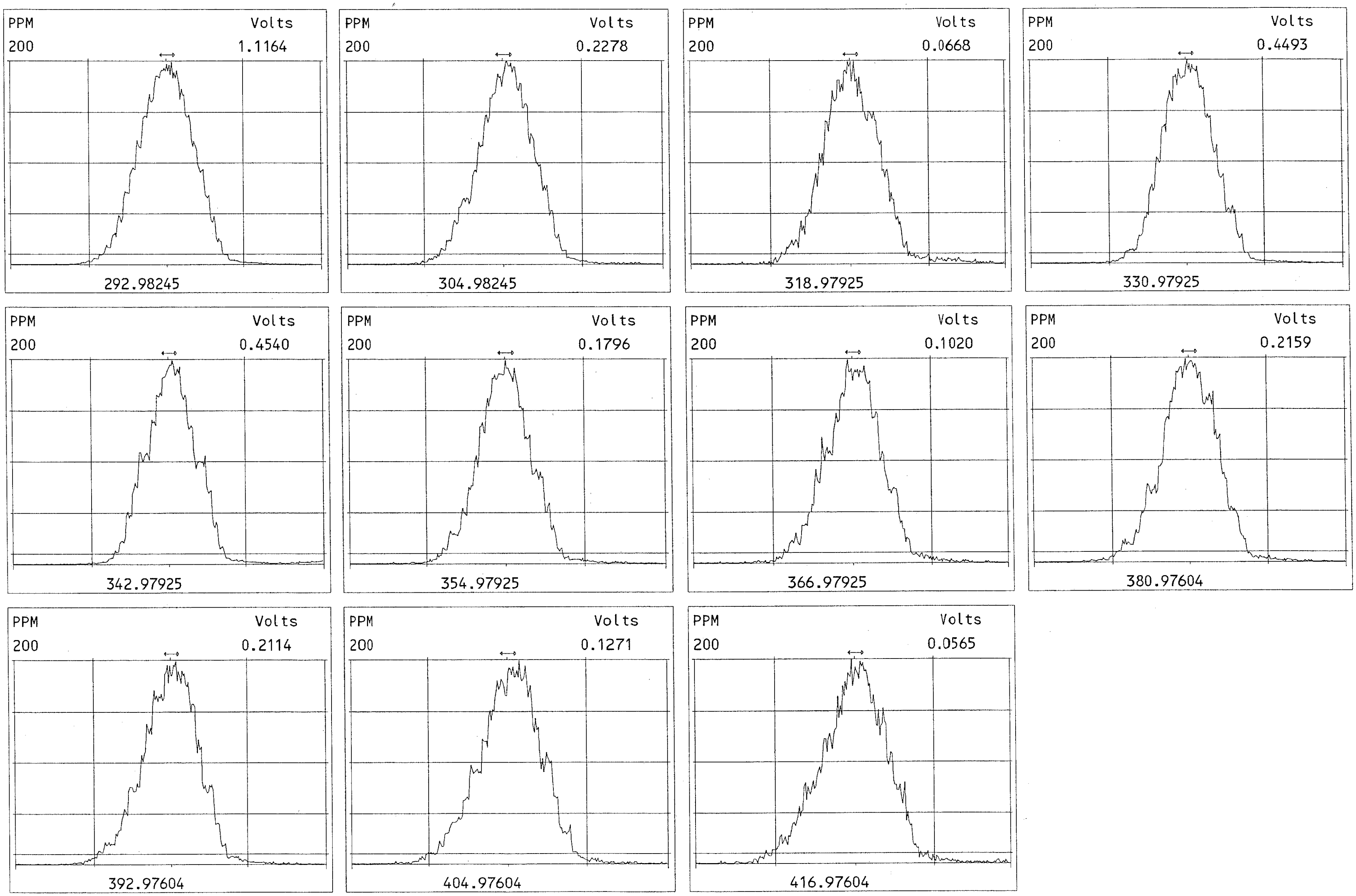
Data File	S	FAL ID	Client ID	Acquired	ConCal	EndCal	Analyst
26JAN18M	1	ST012618M1	1613 CS3 171128J	26-JAN-18 13:31:42	ST012618M1	ST012618M2	TC
26JAN18M	2	04385-001-0001-OPR	OPR	26-JAN-18 14:26:32	ST012618M1	ST012618M2	TC
26JAN18M	3	04385-001-0001-MB	Method Blank	26-JAN-18 15:21:27	ST012618M1	ST012618M2	TC
26JAN18M	4	11157-003-X002-SA	NFMW1d	26-JAN-18 16:16:22	ST012618M1	ST012618M2	TC
26JAN18M	5	11193-001-0001-SA	201801110018	26-JAN-18 17:11:11	ST012618M1	ST012618M2	TC
26JAN18M	6	11194-001-0001-SA	201801110019	26-JAN-18 18:06:03	ST012618M1	ST012618M2	TC
26JAN18M	7	11194-002-0001-SA	201801110020	26-JAN-18 19:00:54	ST012618M1	ST012618M2	TC
26JAN18M	8	11194-003-0001-SA	201801110021	26-JAN-18 19:55:45	ST012618M1	ST012618M2	TC
26JAN18M	9	11202-001-0001-SA	EFF-001A	26-JAN-18 20:50:36	ST012618M1	ST012618M2	TC
26JAN18M	10	SB012618M1	Solvent Blank	26-JAN-18 21:45:27	ST012618M1	ST012618M2	TC
26JAN18M	11	ST012618M2	1613 CS3 171128J	26-JAN-18 22:40:18	ST012618M2	ST012618M3	TC
26JAN18M	12	SB012618M2	Solvent Blank	26-JAN-18 23:35:08	ST012618M2	ST012618M3	TC
26JAN18M	13	11203-001-0001-SA	Sycamore Creek Downstream R╗	27-JAN-18 00:30:00	ST012618M2	ST012618M3	TC
26JAN18M	14	11204-001-0001-SA	Sycamore Creek Upstream RSW╗	27-JAN-18 01:24:51	ST012618M2	ST012618M3	TC
26JAN18M	15	11211-001-0001-SA	AMW-3-011218	27-JAN-18 02:19:42	ST012618M2	ST012618M3	TC
26JAN18M	16	11211-002-0001-SA	AMW-4-011218	27-JAN-18 03:14:35	ST012618M2	ST012618M3	TC
26JAN18M	17	11211-003-0001-SA	AMW-2-011218	27-JAN-18 04:09:25	ST012618M2	ST012618M3	TC
26JAN18M	18	11211-004-0001-SA	AMW-1-011218	27-JAN-18 05:04:16	ST012618M2	ST012618M3	TC
26JAN18M	19	11211-005-0001-SA	AMW-5-011218	27-JAN-18 05:59:07	ST012618M2	ST012618M3	TC
26JAN18M	20	SB012618M3	Solvent Blank	27-JAN-18 06:53:59	ST012618M2	ST012618M3	TC
26JAN18M	21	SB012618M4	Solvent Blank	27-JAN-18 07:48:50	ST012618M2	ST012618M3	TC
26JAN18M	22	ST012618M3	1613 CS3 171128J	27-JAN-18 08:43:41	ST012618M2	ST012618M3	TC

1/29/18

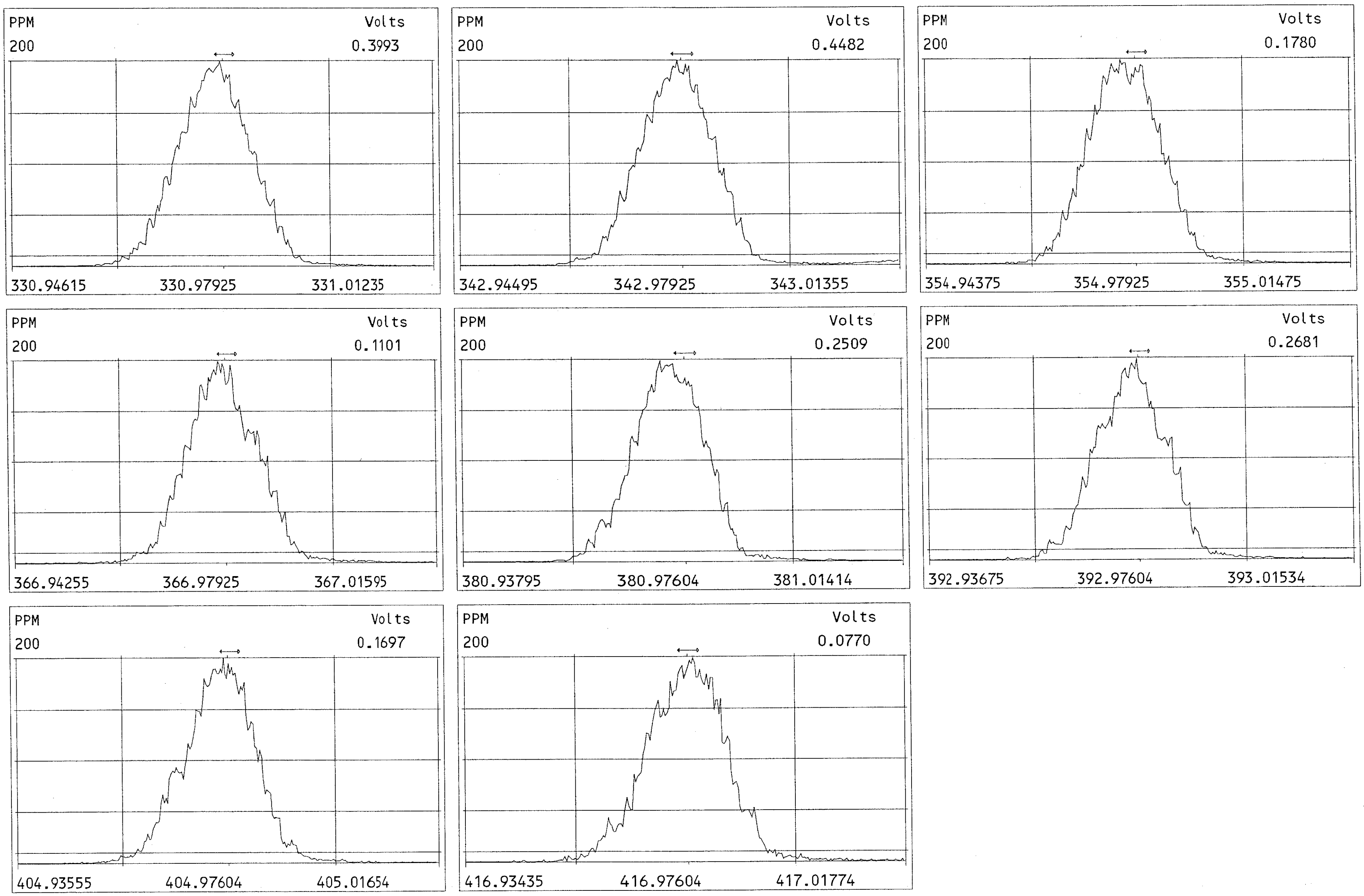
Data Backed Up:________________

Date:________________________

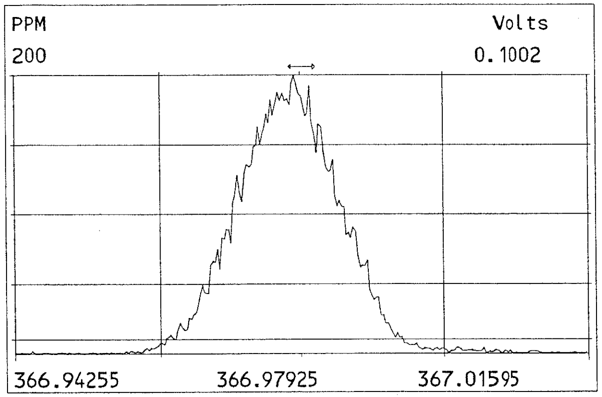
Peak Locate Examination:26-JAN-2018:13:30 File:26JAN18M
Experiment:PCDD Function:1 Reference:PFK

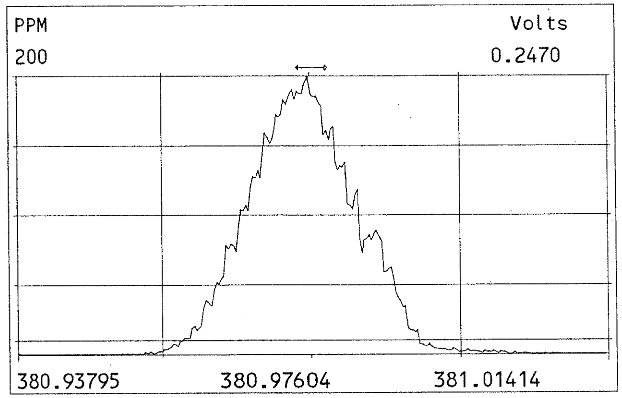


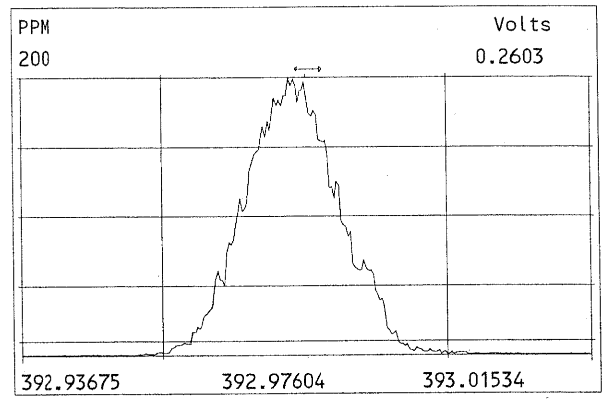
Peak Locate Examination:26-JAN-2018:13:30 File:26JAN18M
Experiment:PCDD Function:2 Reference:PFK

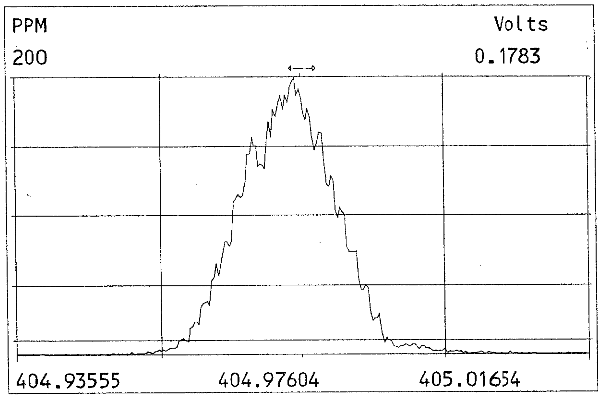


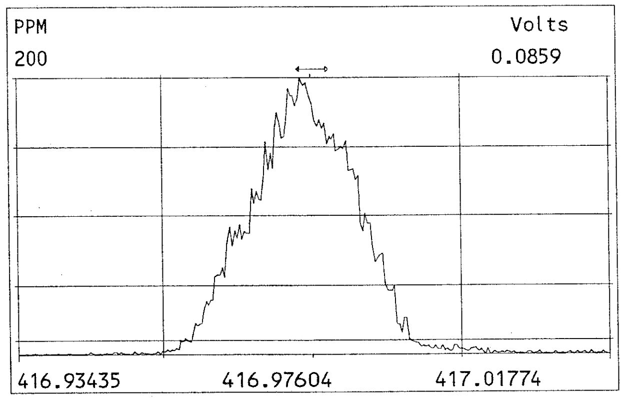
Peak Locate Examination:26-JAN-2018:13:30 File:26JAN18M
Experiment:PCDD Function:3 Reference:PFK

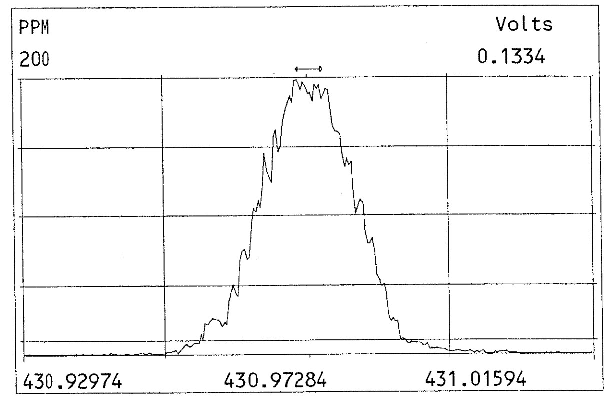


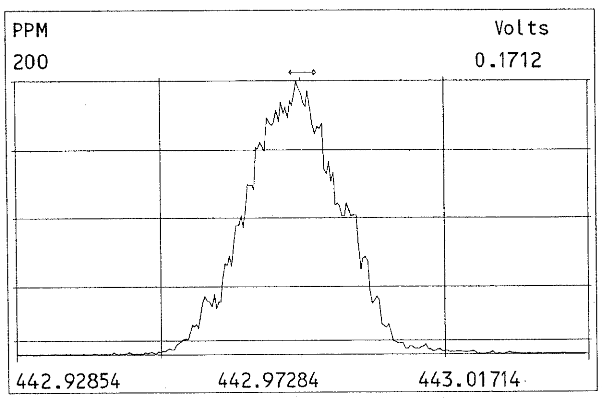


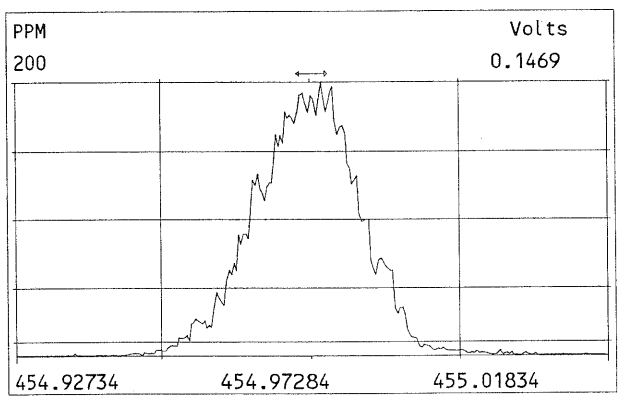




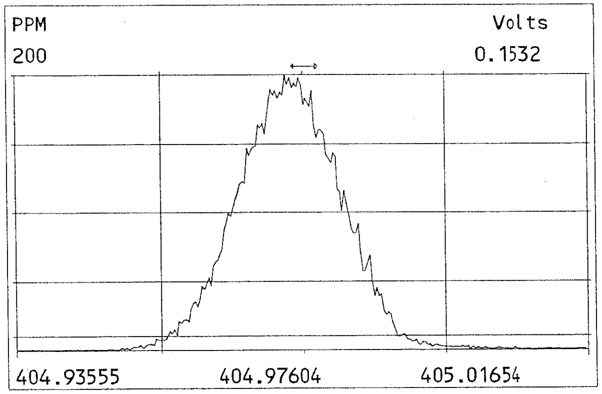


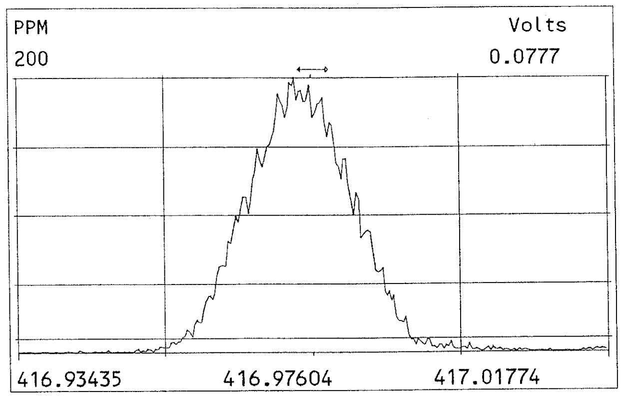


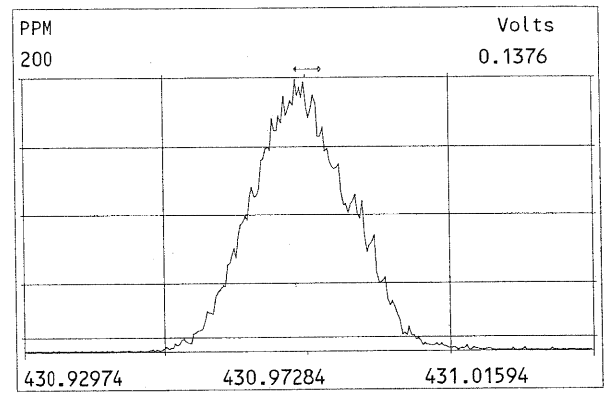


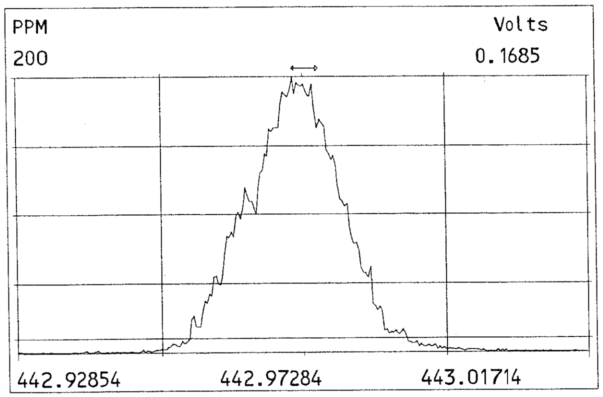


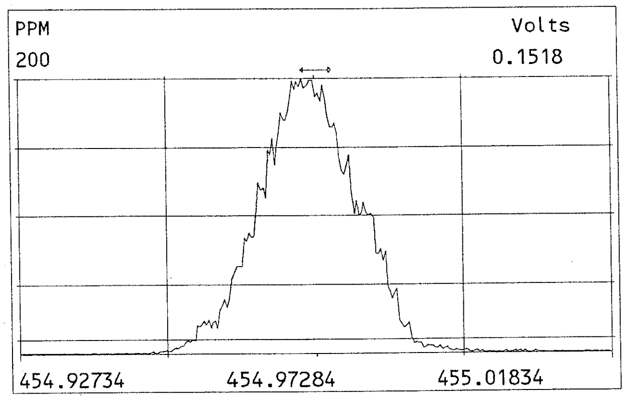
Peak Locate Examination:26-JAN-2018:13:31 File:26JAN18M
Experiment:PCDD Function:4 Reference:PFK

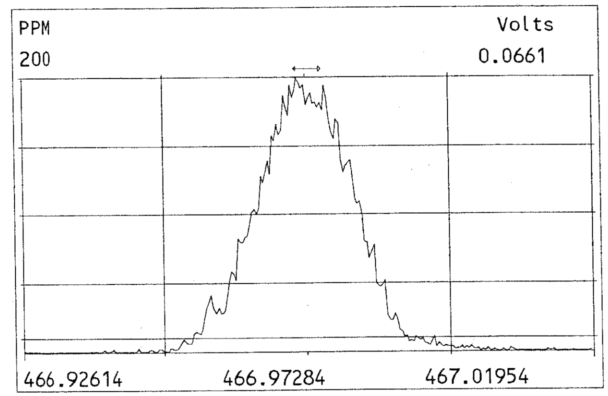


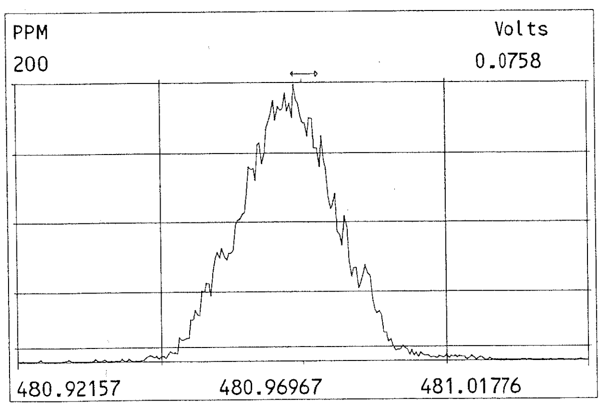




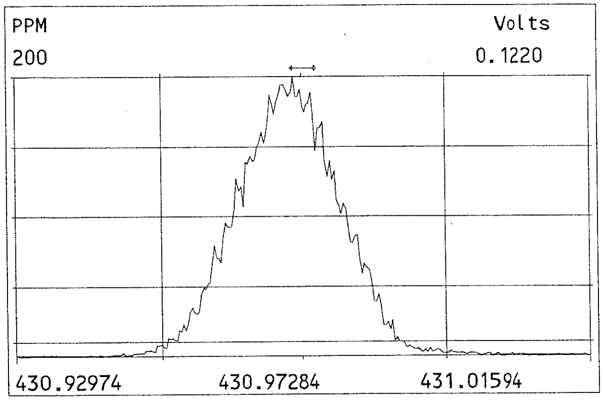


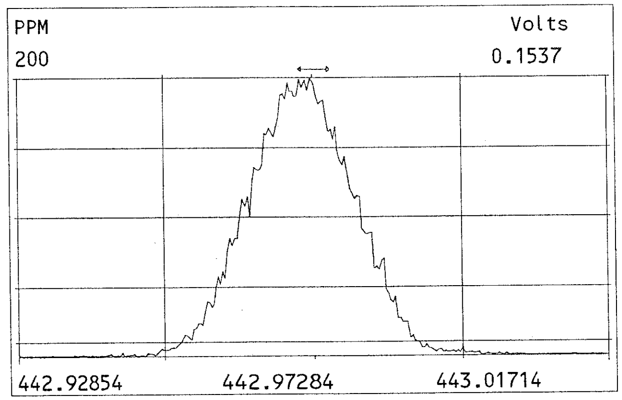


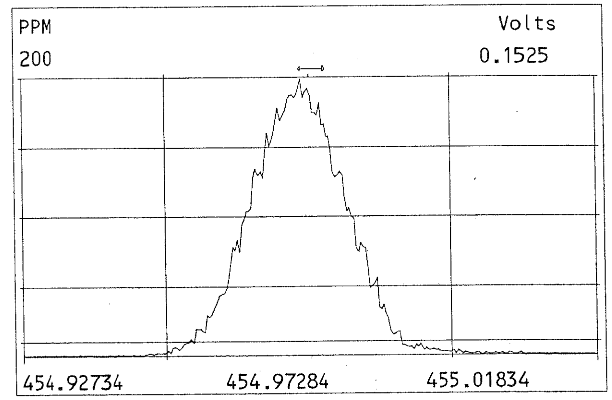


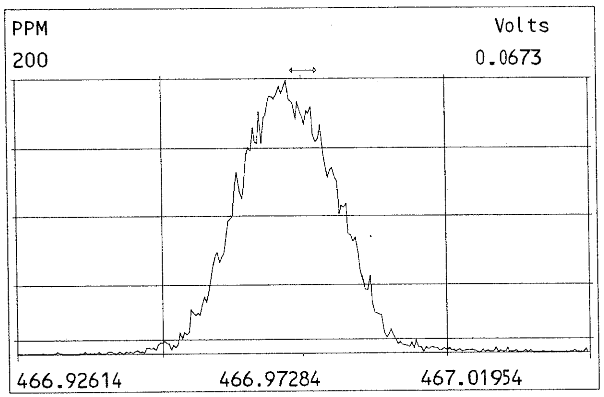


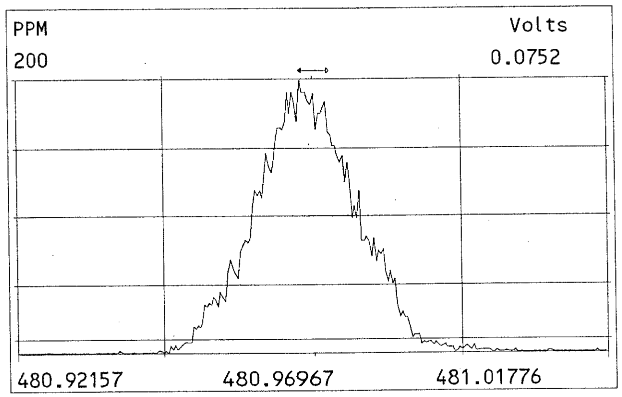
Peak Locate Examination:26-JAN-2018:13:31 File:26JAN18M
Experiment:PCDD Function:5 Reference:PFK

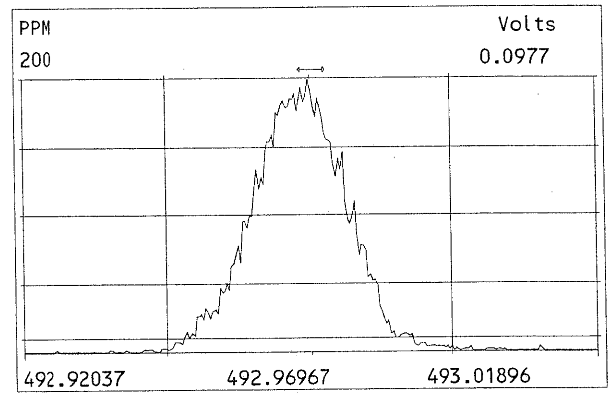


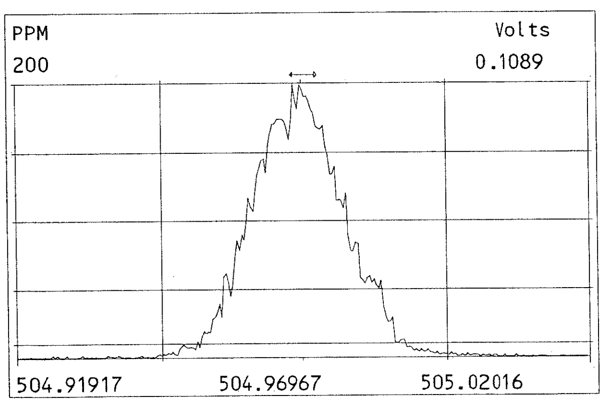


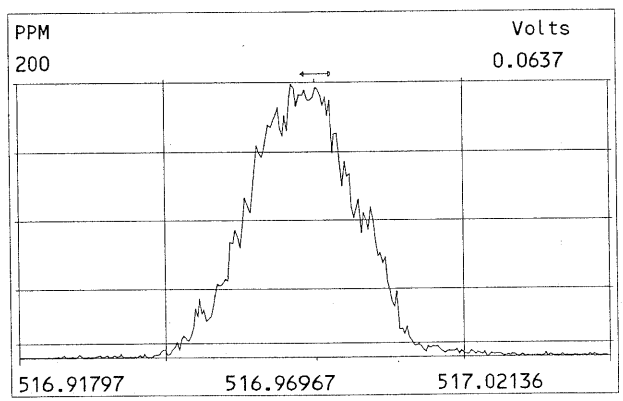




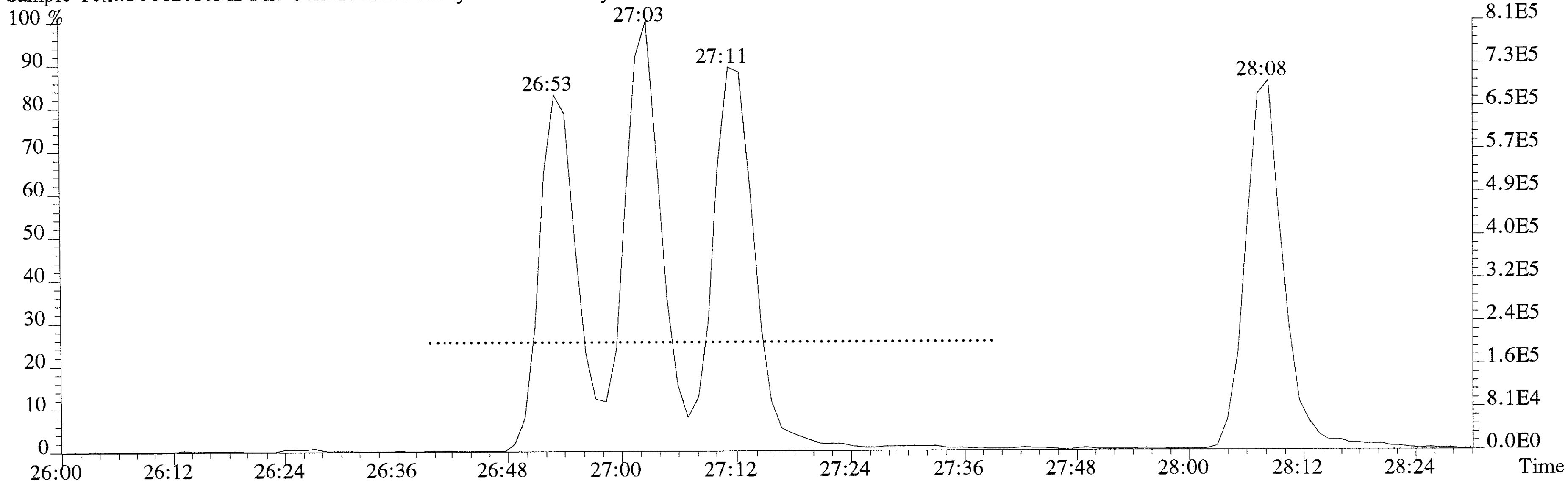








File:26JAN18M #1-381 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:11 Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



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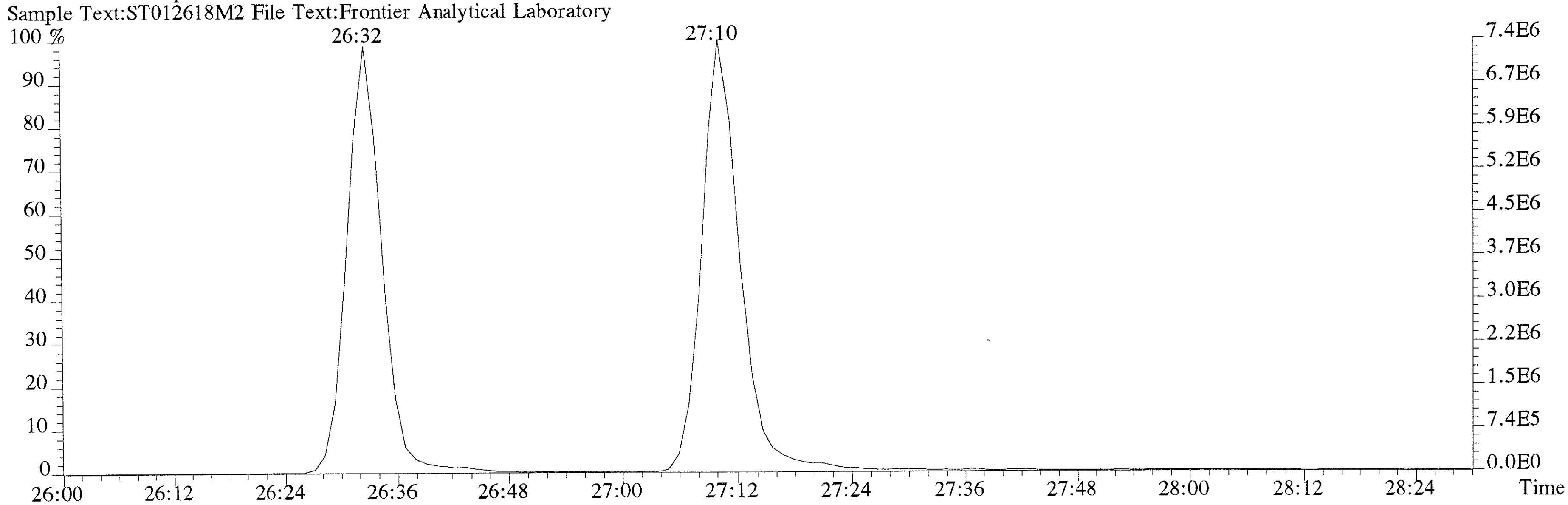
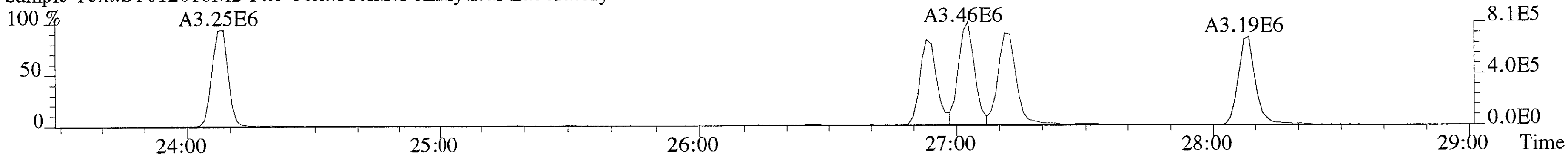
333.9339 S:11 Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:11 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
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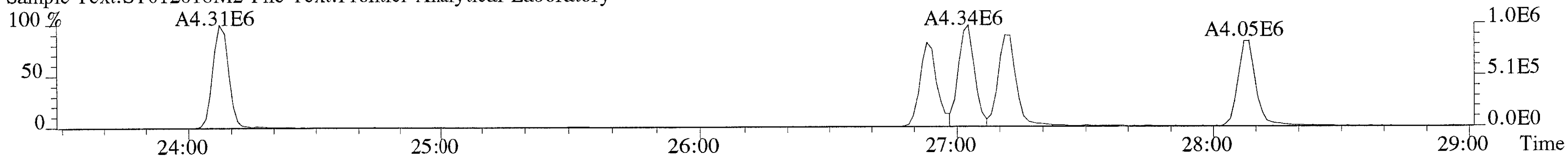
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



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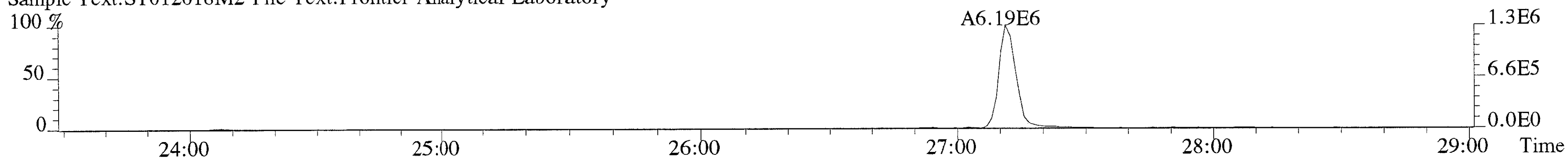

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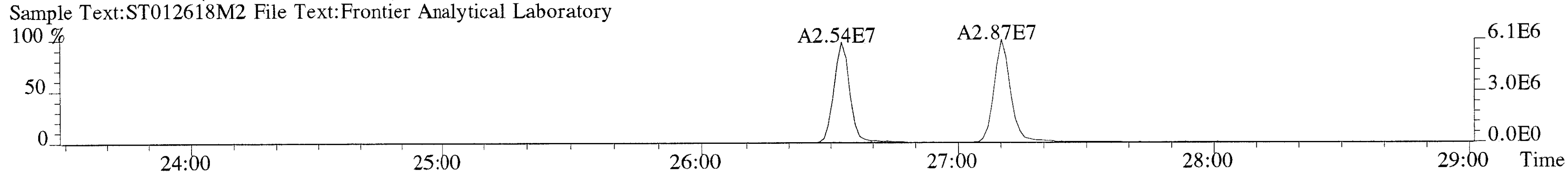

File:26JAN18M #1-381 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
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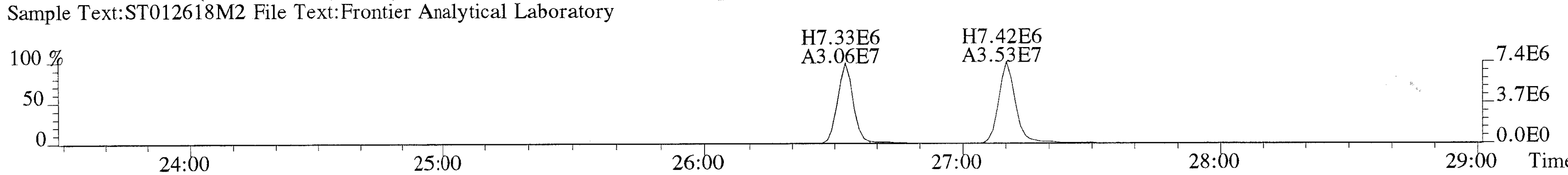
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-424 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
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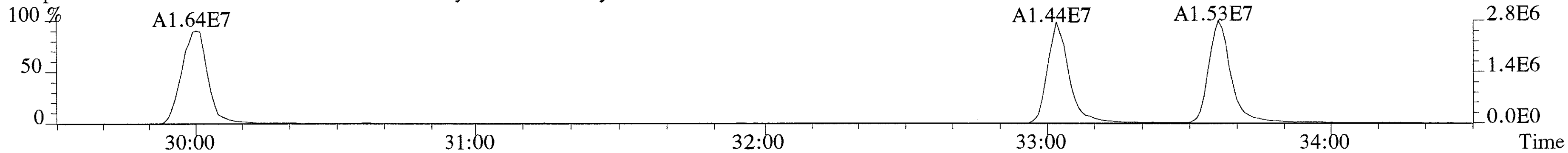
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



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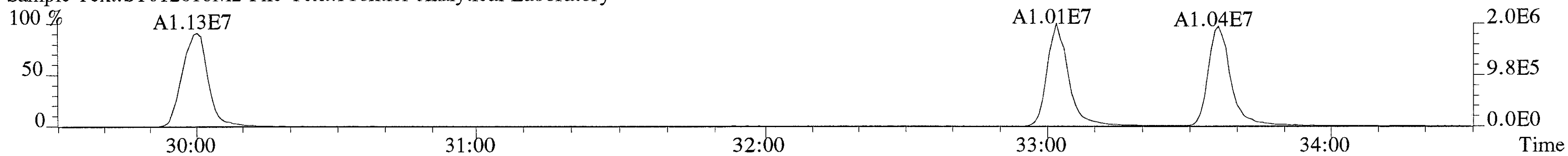

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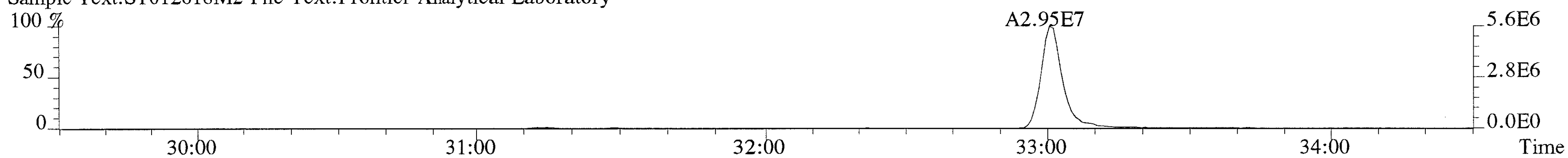
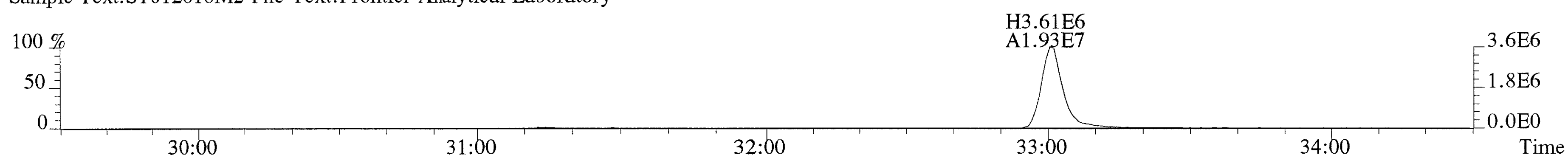
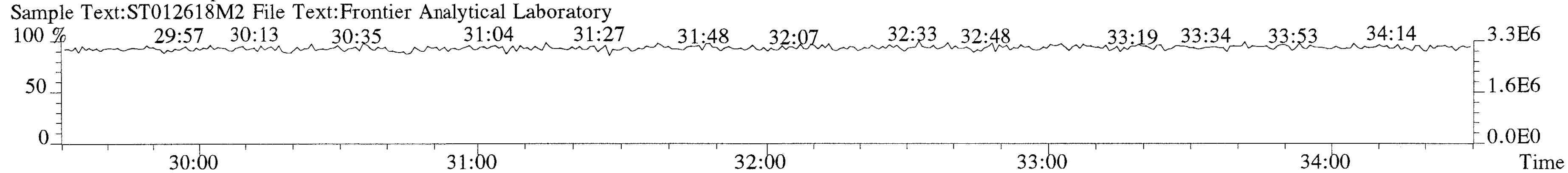
367.8949 S:11 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



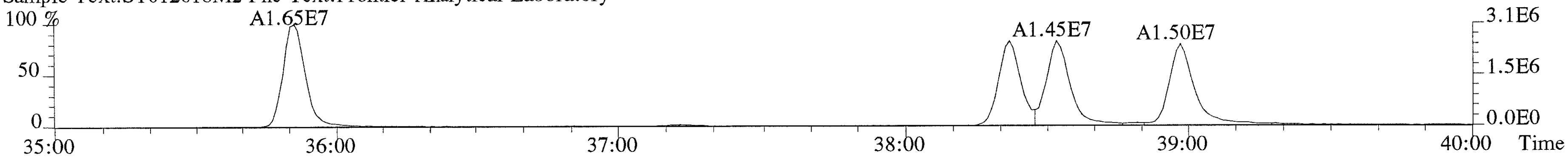
File:26JAN18M #1-424 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
369.8919 S:11 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



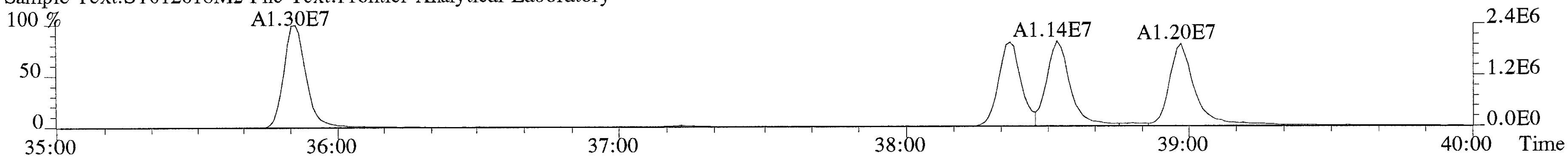
File:26JAN18M #1-424 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
366.9792 S:11 F:2 Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



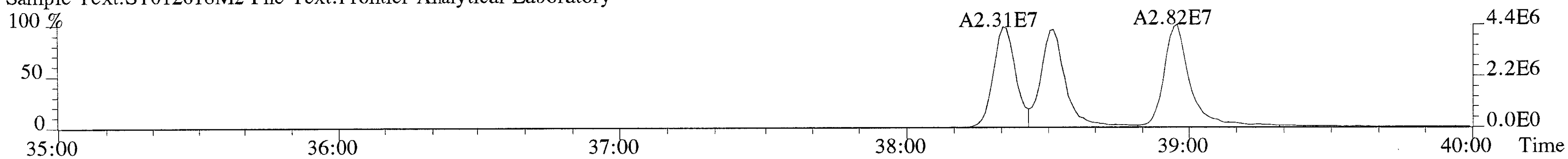
File:26JAN18M #1-520 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
389.8156 S:11 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



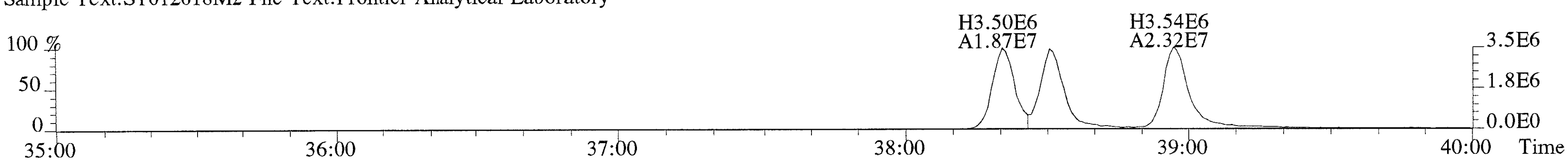
File:26JAN18M #1-520 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
391.8127 S:11 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



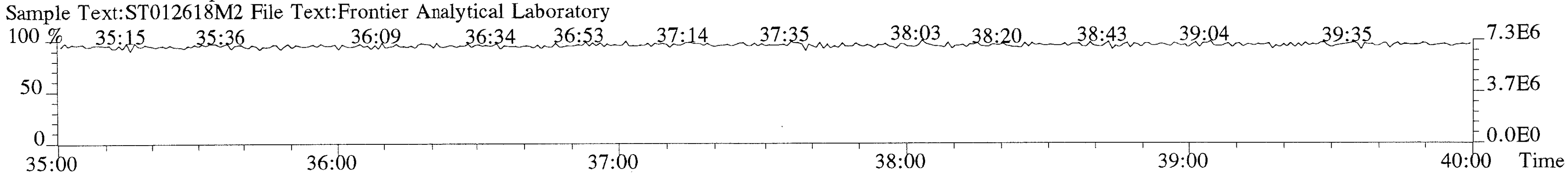
File:26JAN18M #1-520 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
401.8559 S:11 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



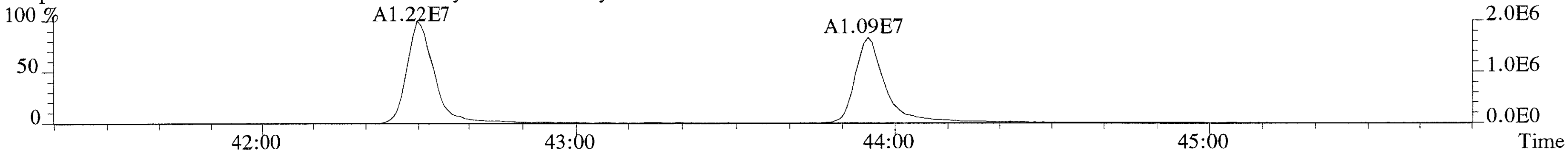
File:26JAN18M #1-520 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
403.8530 S:11 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



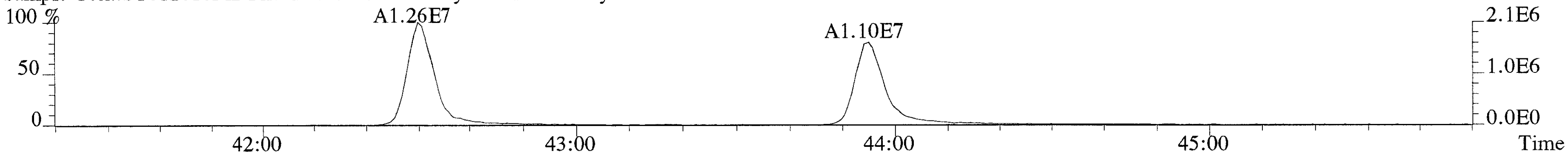
File:26JAN18M #1-520 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
380.9760 S:11 F:3 Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



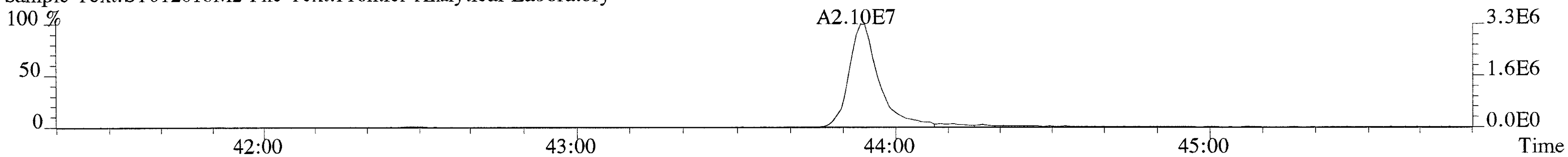
File:26JAN18M #1-521 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
423.7767 S:11 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



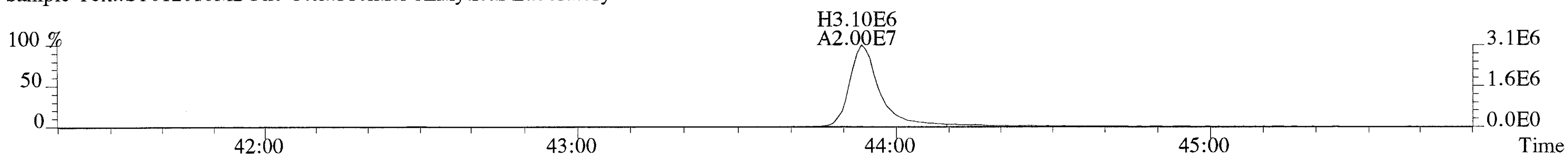
File:26JAN18M #1-521 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
425.7737 S:11 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



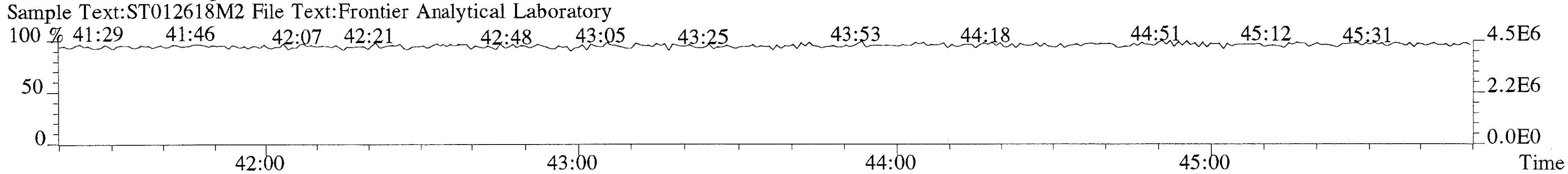
File:26JAN18M #1-521 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
435.8169 S:11 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



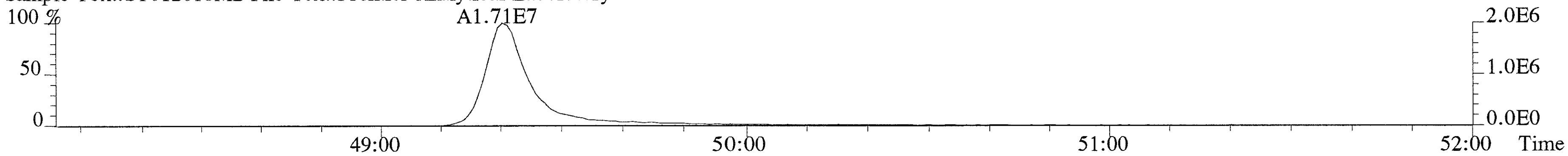
File:26JAN18M #1-521 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
437.8140 S:11 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
430.9728 S:11 F:4 Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



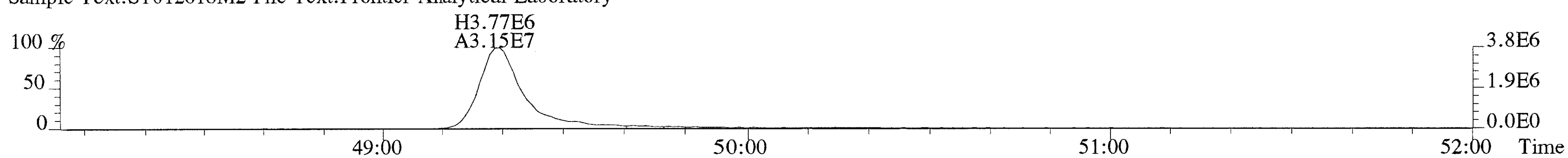
File:26JAN18M #1-361 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
457.7377 S:11 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



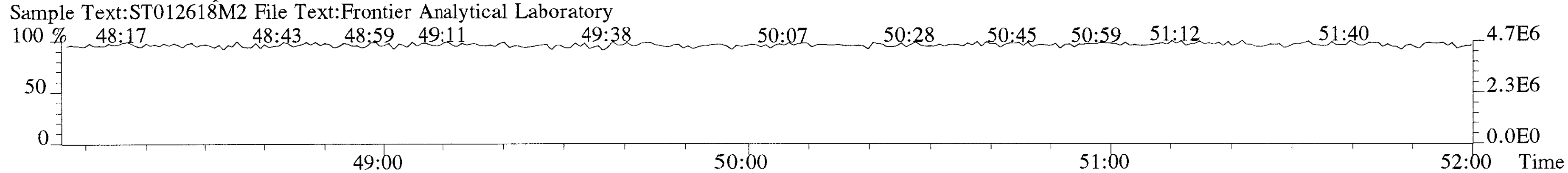
File:26JAN18M #1-361 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
459.7348 S:11 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory

File:26JAN18M #1-361 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
469.7780 S:11 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory

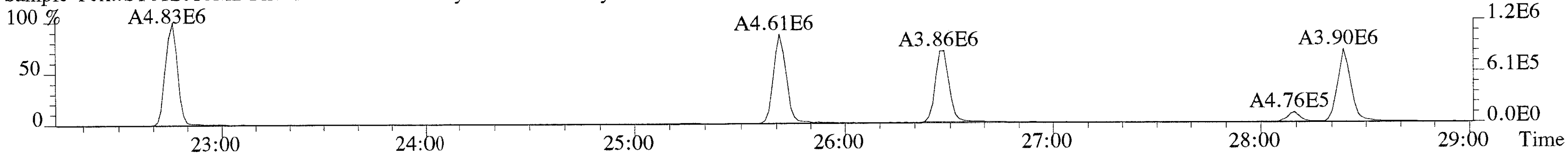
File:26JAN18M #1-361 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
471.7750 S:11 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



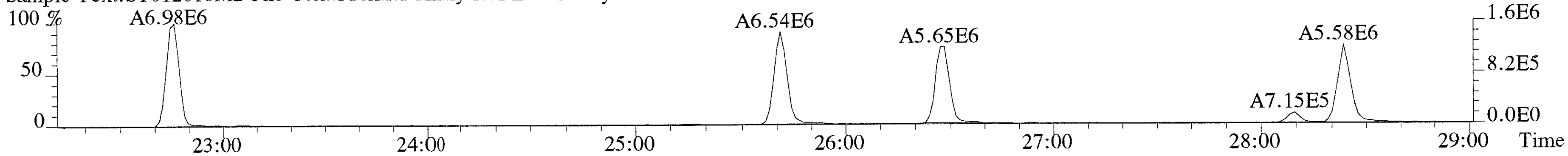
File:26JAN18M #1-361 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
454.9728 S:11 F:5 Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



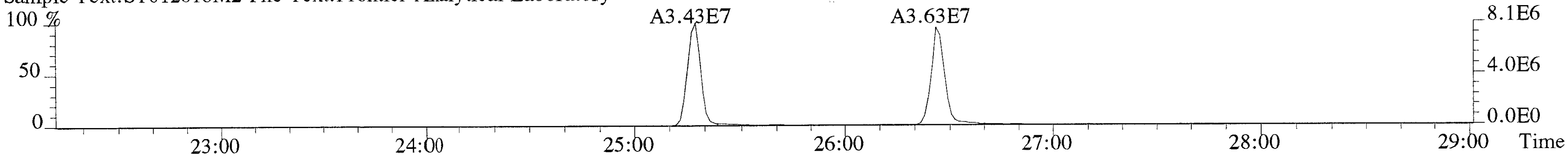
File:26JAN18M #1-381 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
303.9016 S:11 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



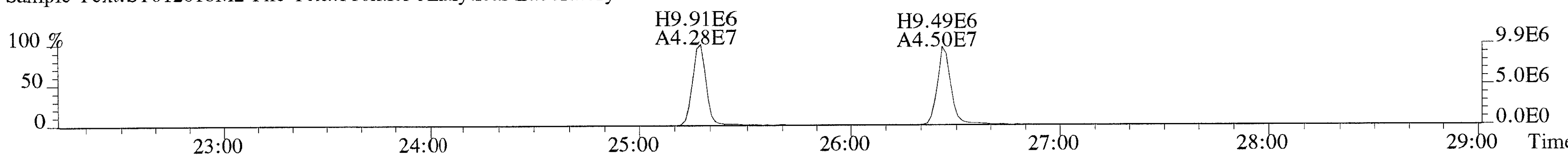
File:26JAN18M #1-381 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
305.8987 S:11 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



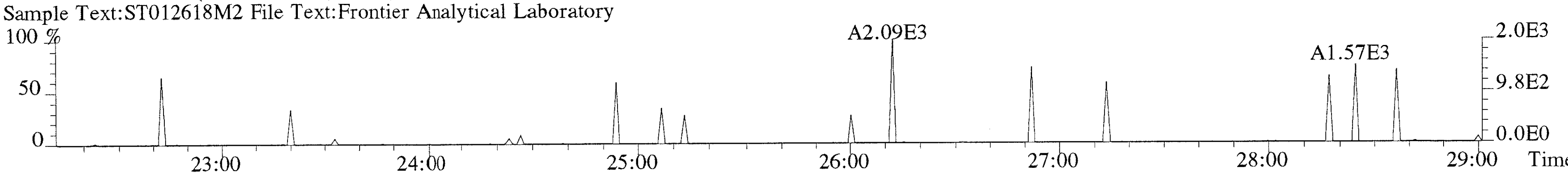
File:26JAN18M #1-381 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
315.9419 S:11 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



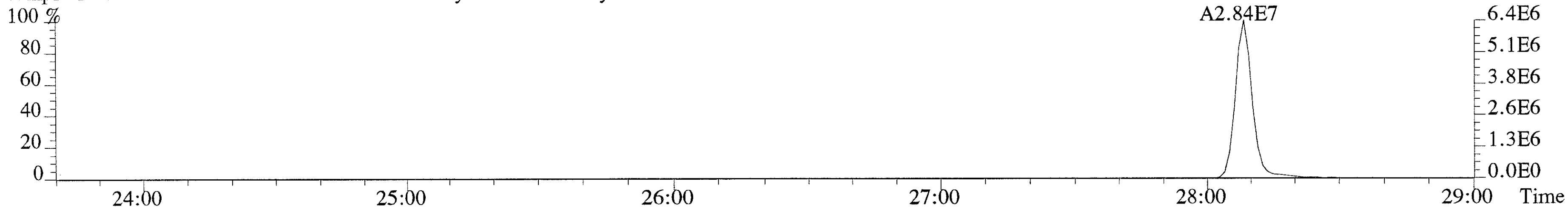
File:26JAN18M #1-381 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
317.9389 S:11 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



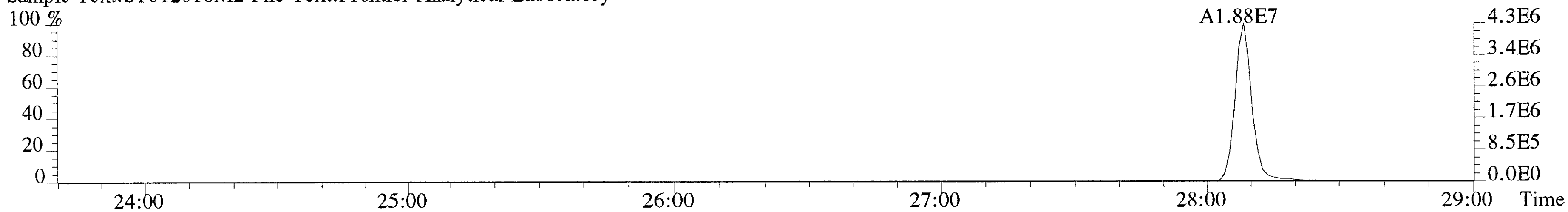
File:26JAN18M #1-381 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
375.8364 S:11 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



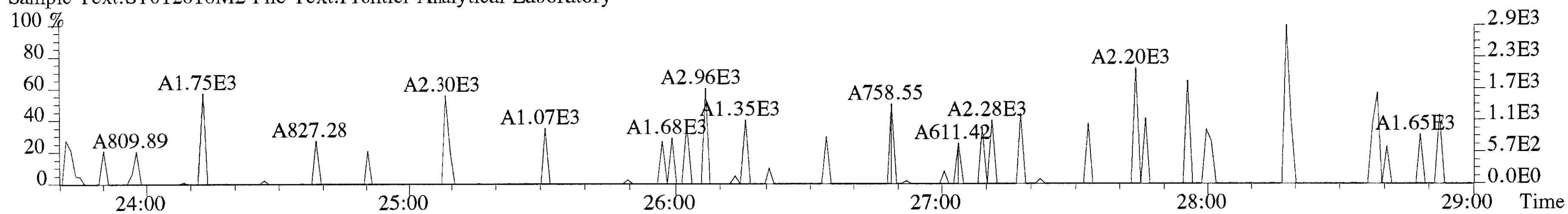
File:26JAN18M #1-381 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:11 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



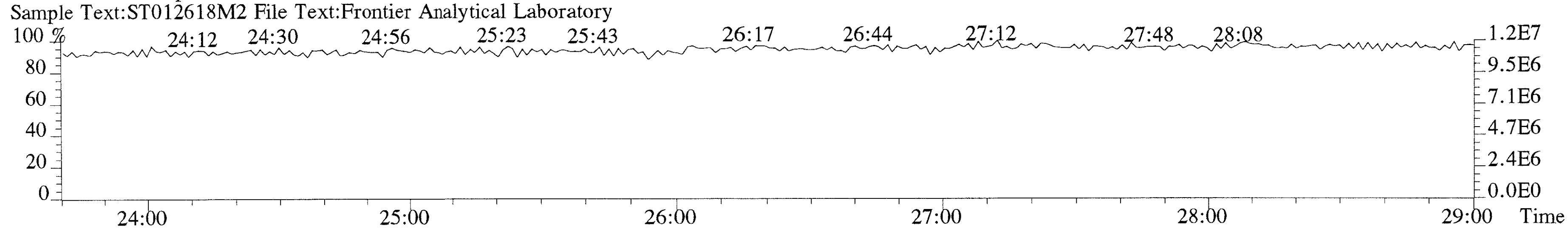
File:26JAN18M #1-381 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:11 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



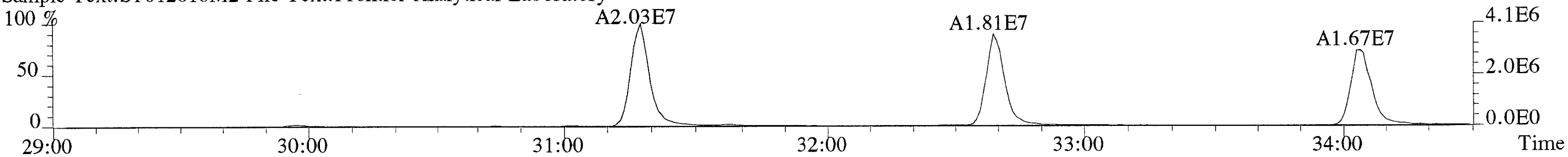
File:26JAN18M #1-381 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:11 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



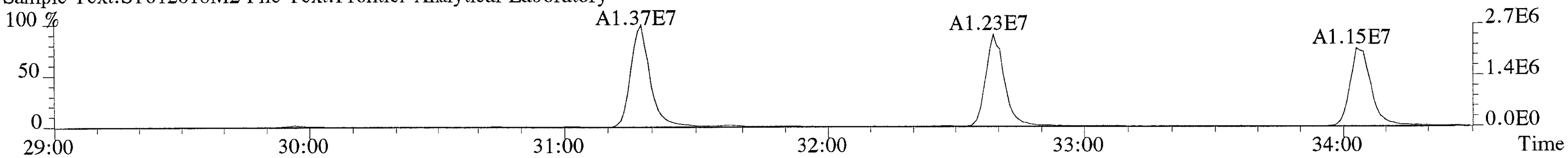
File:26JAN18M #1-381 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
330.9792 S:11 Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



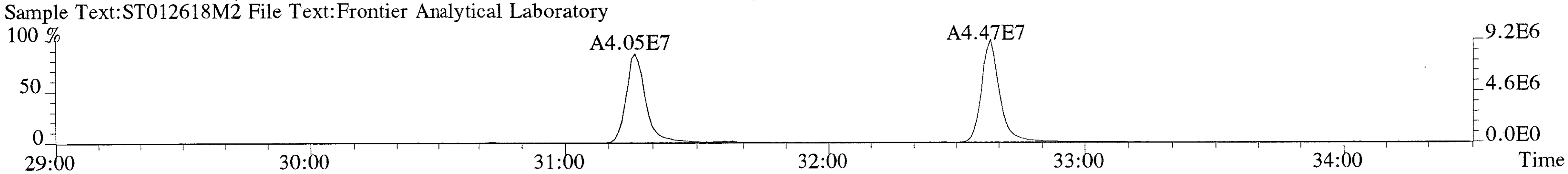
File:26JAN18M #1-424 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:11 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



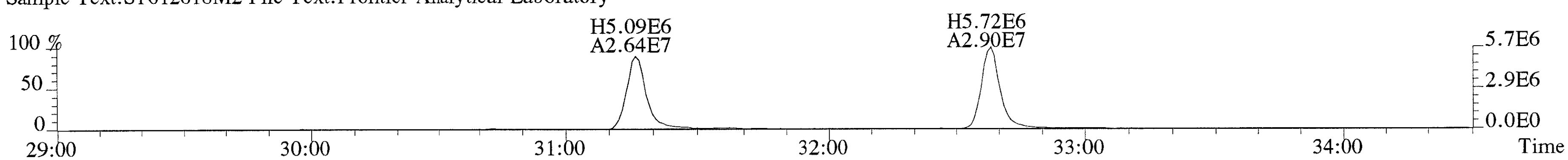
File:26JAN18M #1-424 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:11 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



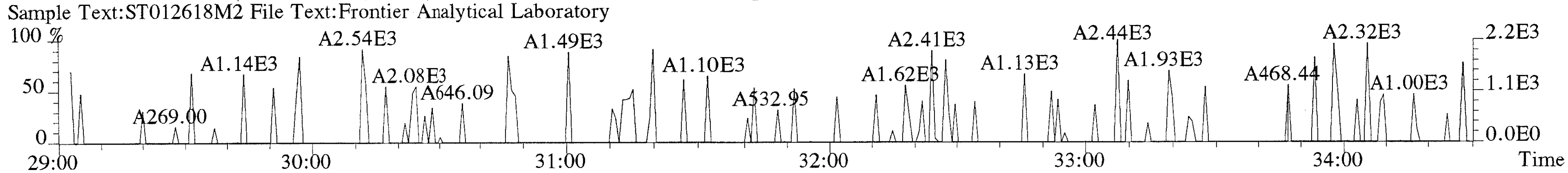
File:26JAN18M #1-424 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:11 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



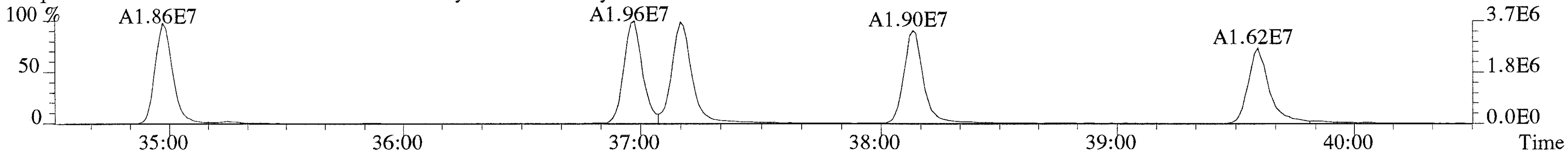
File:26JAN18M #1-424 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
353.8970 S:11 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



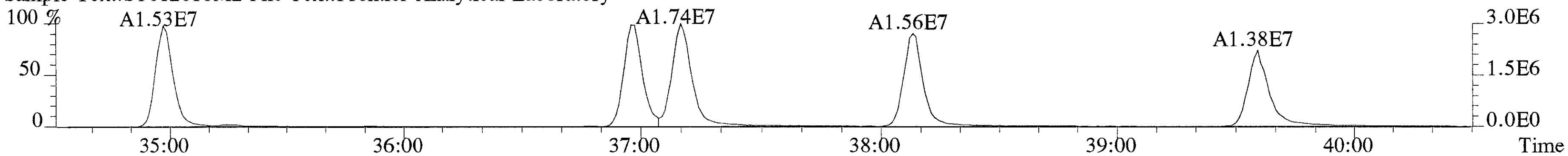
File:26JAN18M #1-424 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:11 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



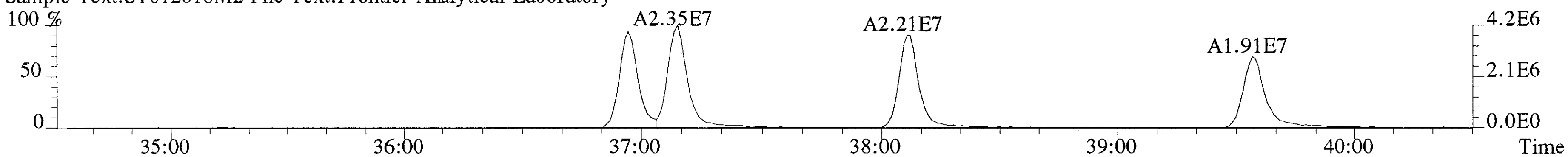
File:26JAN18M #1-520 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
373.8207 S:11 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



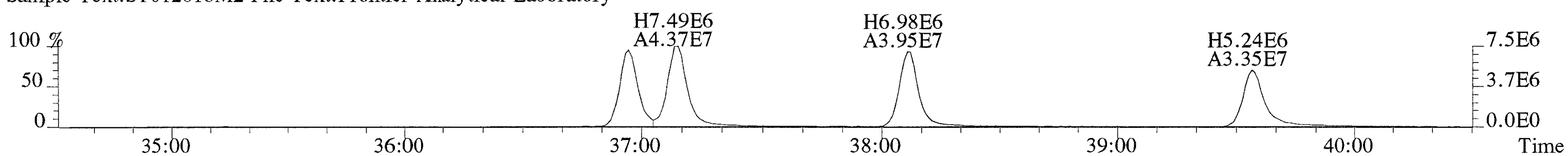
File:26JAN18M #1-520 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
375.8178 S:11 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



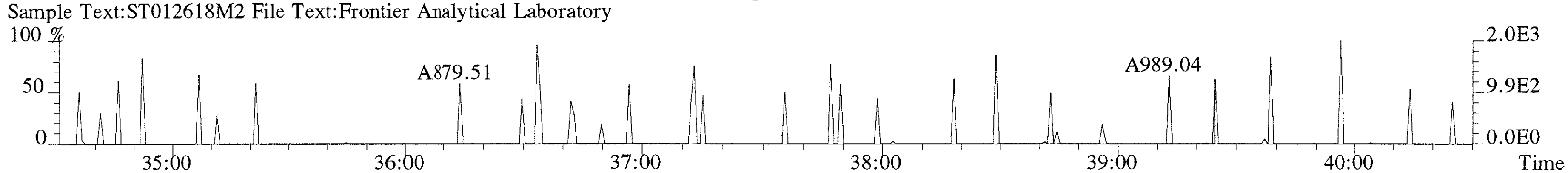
File:26JAN18M #1-520 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:11 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



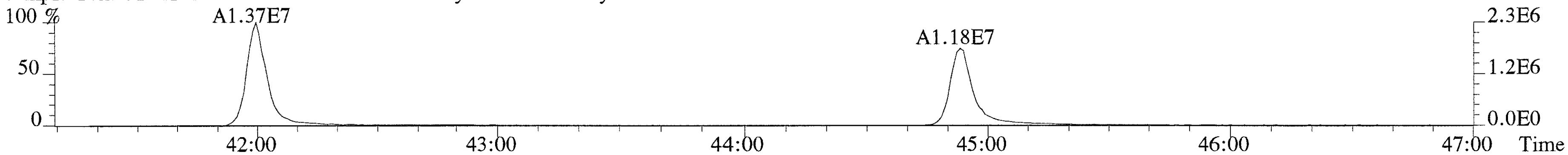
File:26JAN18M #1-520 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
385.8610 S:11 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



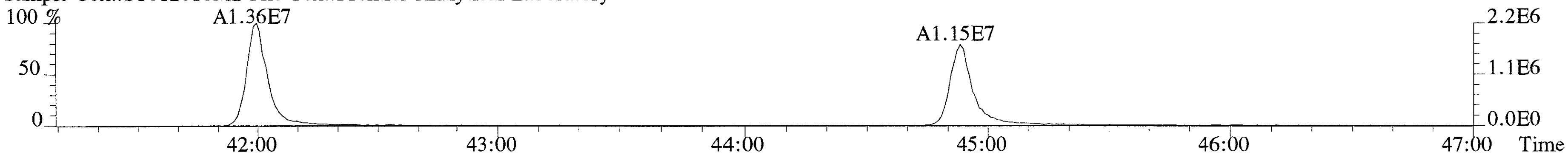
File:26JAN18M #1-520 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
445.7555 S:11 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



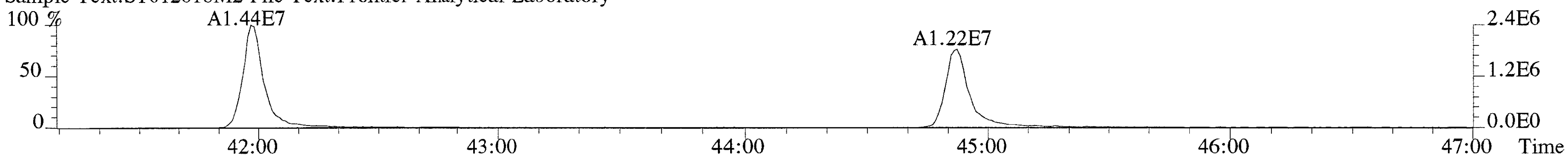
File:26JAN18M #1-521 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:11 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



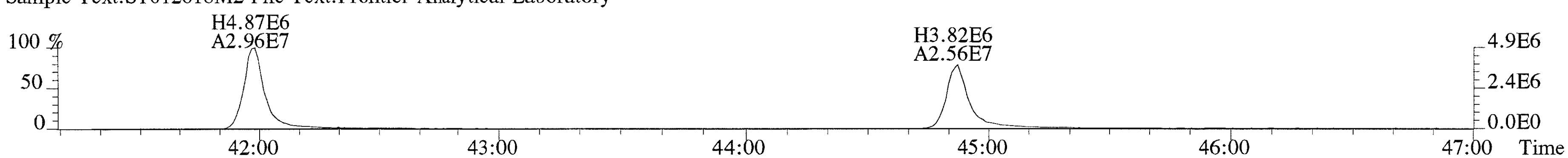
File:26JAN18M #1-521 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
409.7788 S:11 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



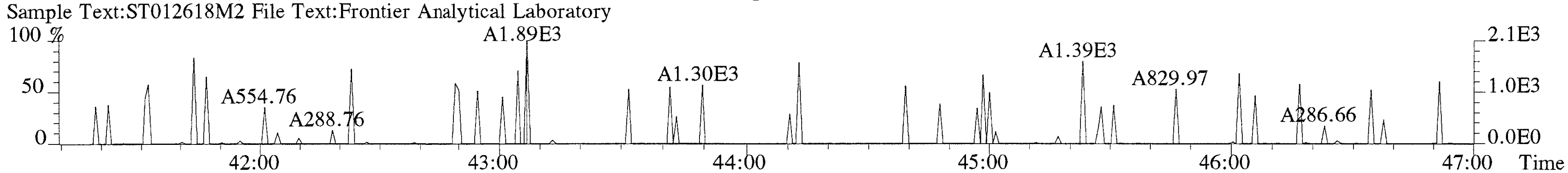
File:26JAN18M #1-521 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
417.8253 S:11 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



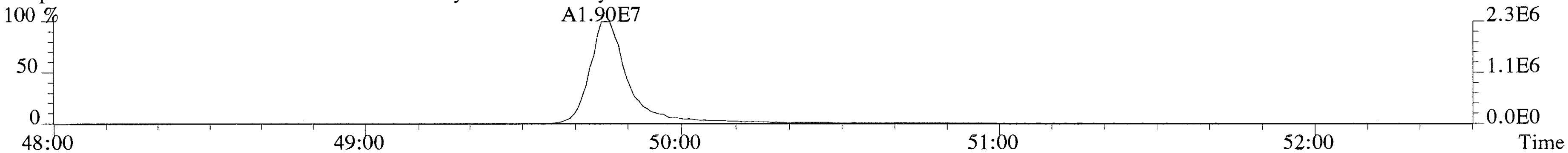
File:26JAN18M #1-521 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
419.8220 S:11 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



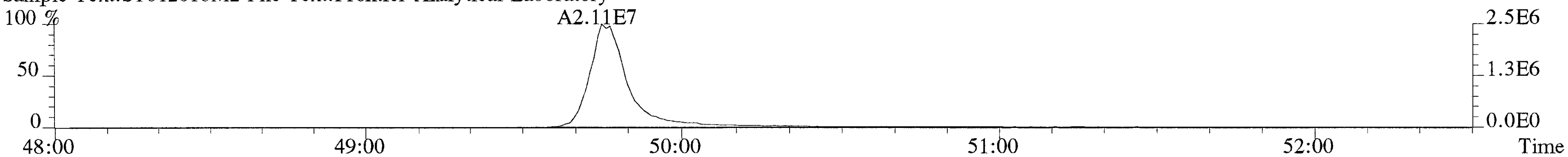
File:26JAN18M #1-521 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:11 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



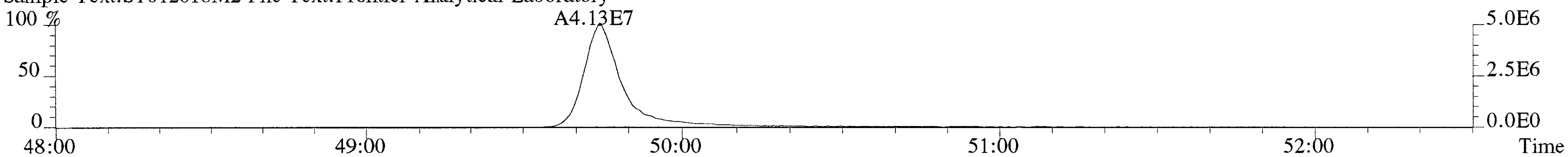
File:26JAN18M #1-361 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:11 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



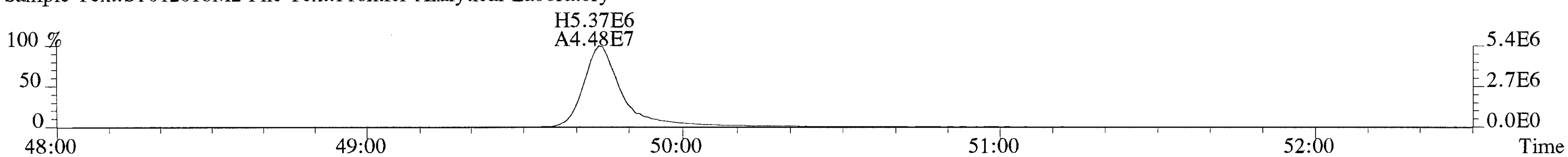
File:26JAN18M #1-361 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
443.7398 S:11 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



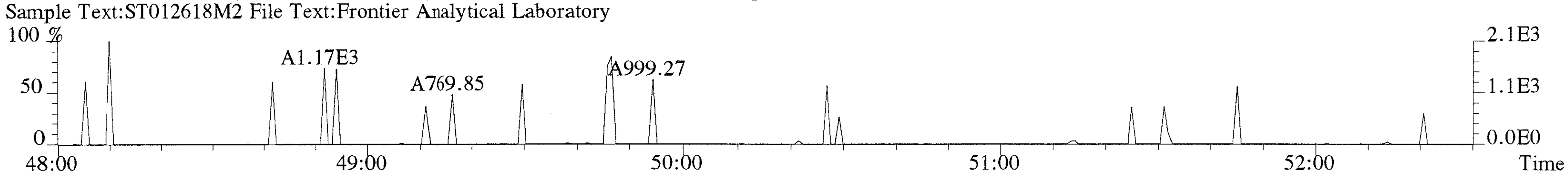
File:26JAN18M #1-361 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:11 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory



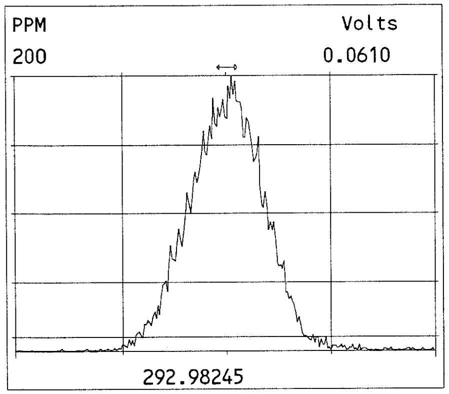
File:26JAN18M #1-361 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:11 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory

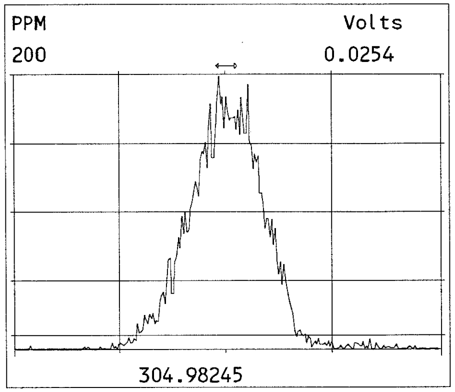


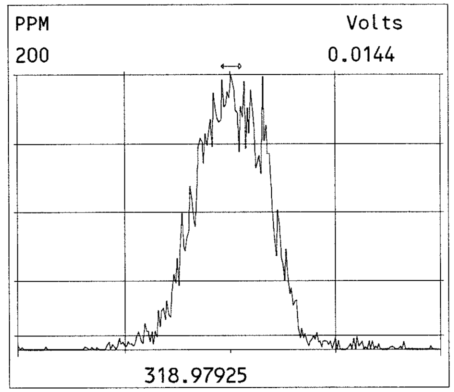
File:26JAN18M #1-361 Acq:26-JAN-2018 22:40:18 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:11 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M2 File Text:Frontier Analytical Laboratory

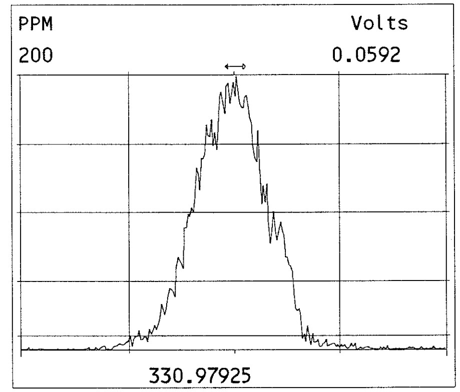


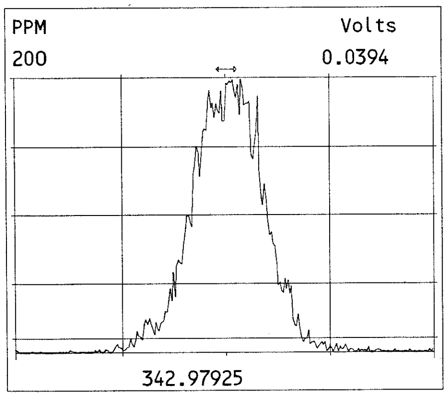
Peak Locate Examination:27-JAN-2018:09:40 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:1 Reference:PFK

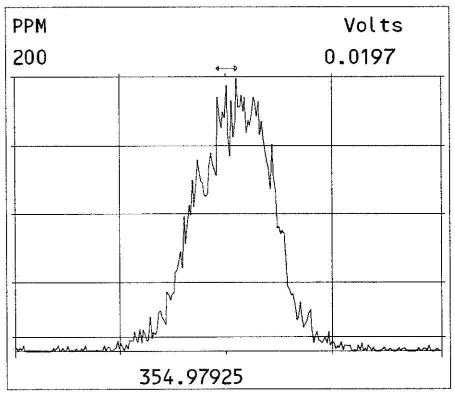


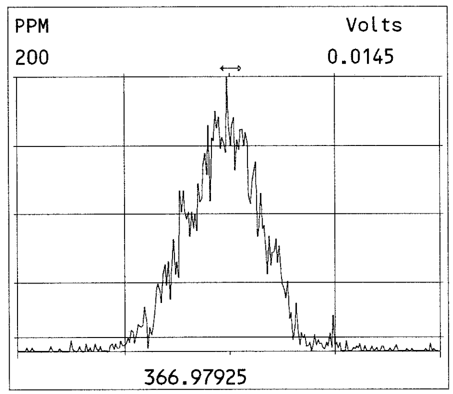


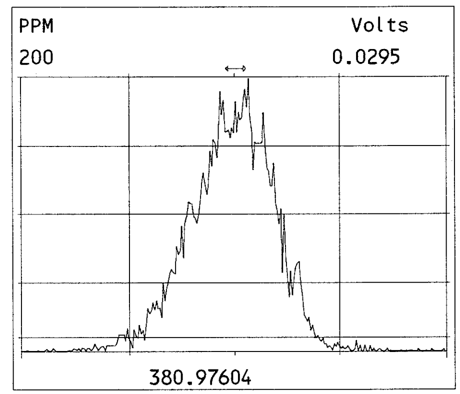


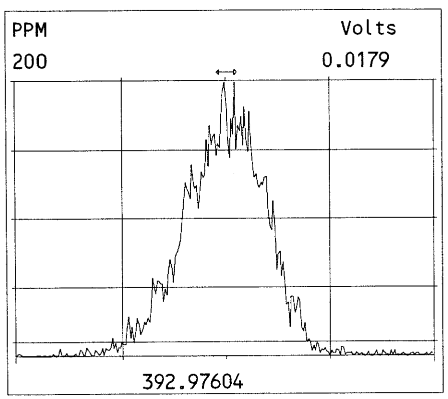


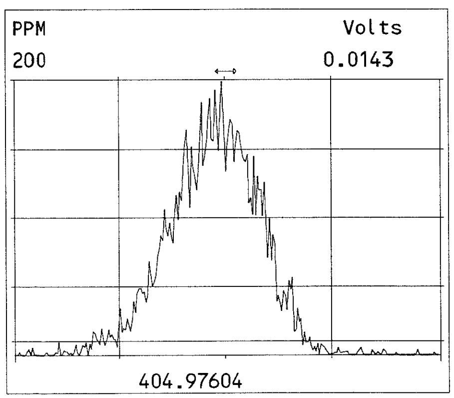


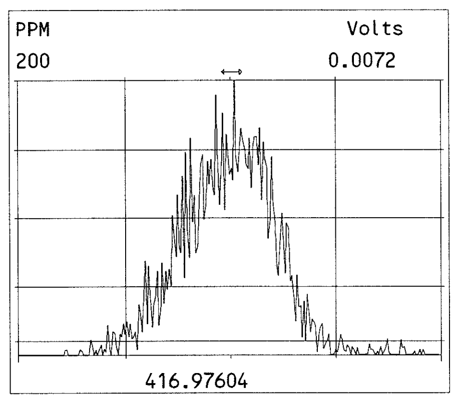




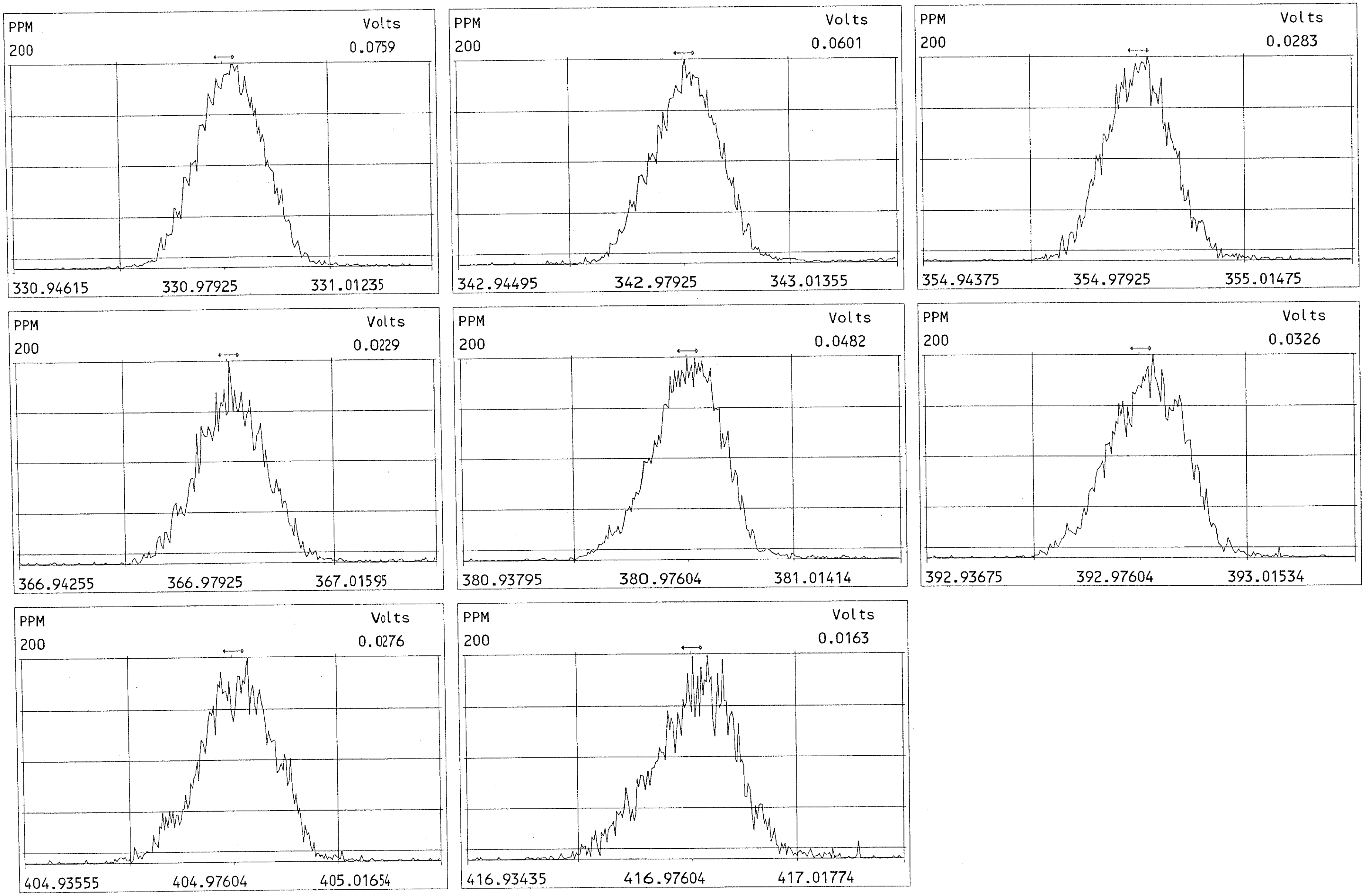




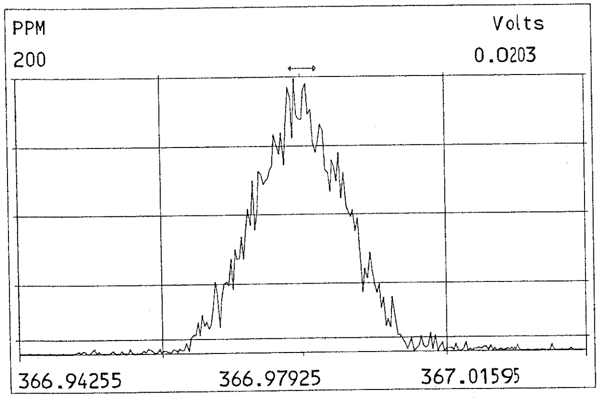


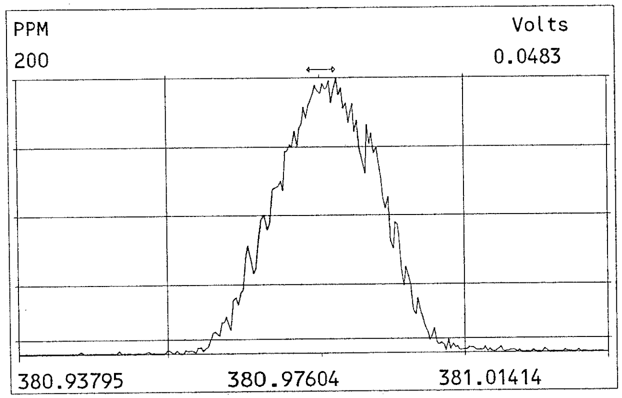


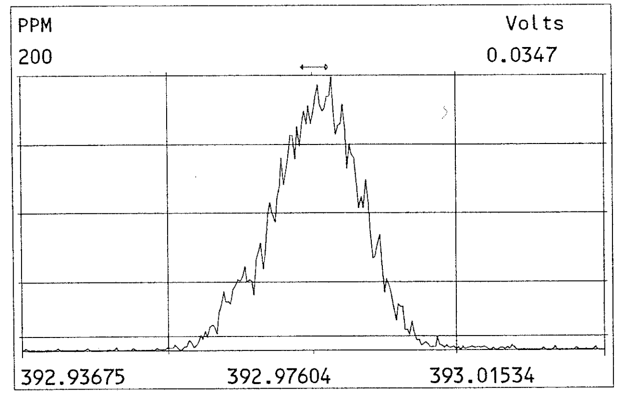
Peak Locate Examination:27-JAN-2018:09:42 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:2 Reference:PFK

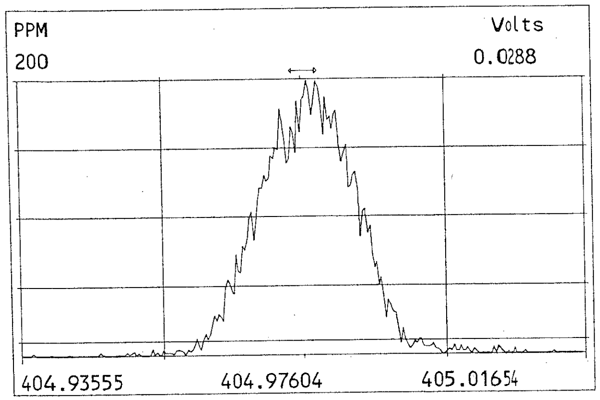


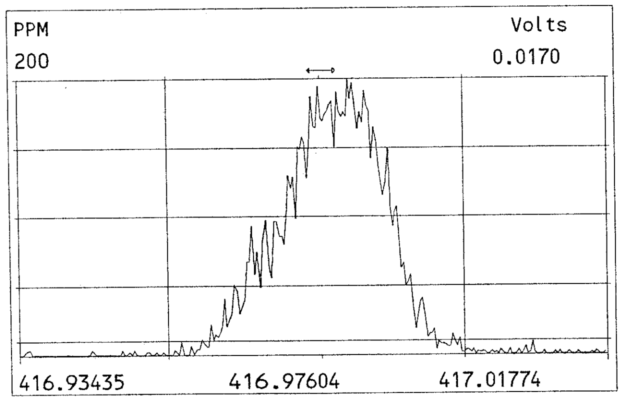
Peak Locate Examination:27-JAN-2018:09:44 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:3 Reference:PFK

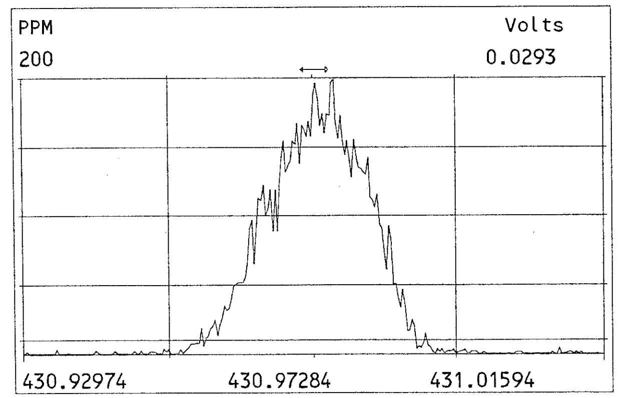


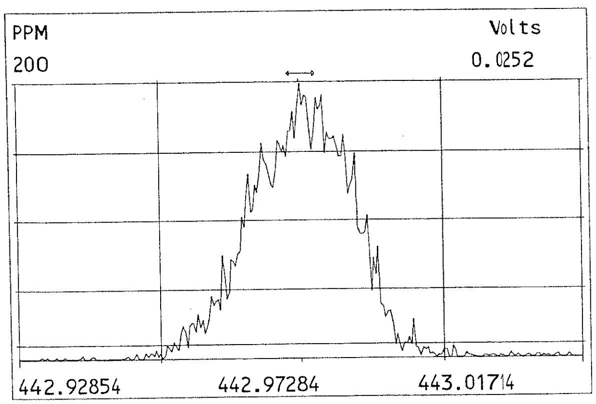


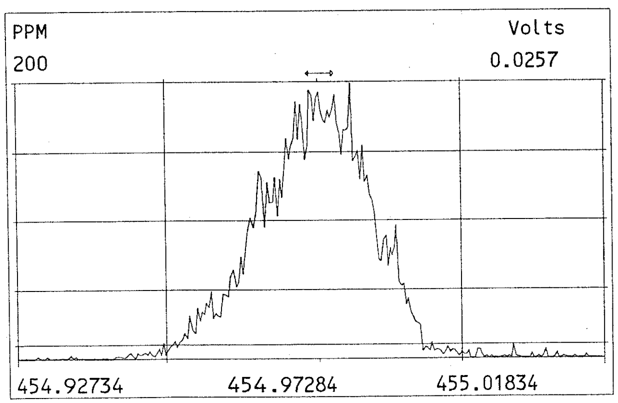




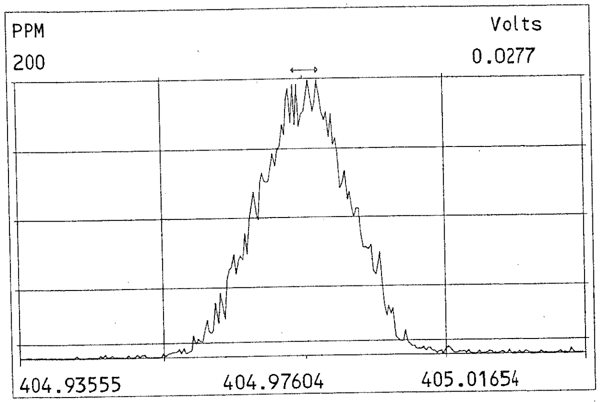


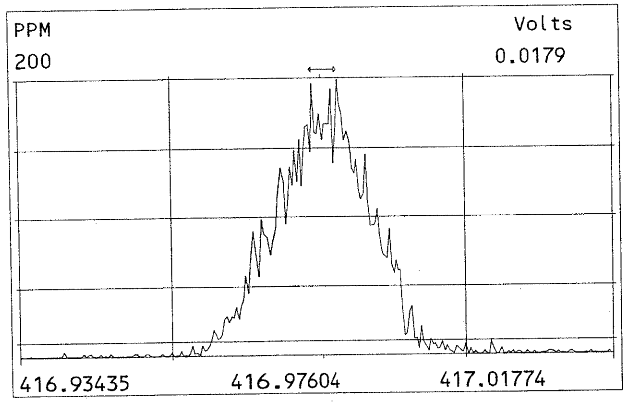


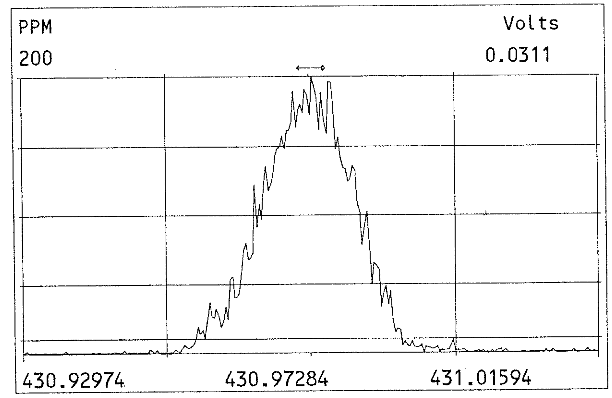


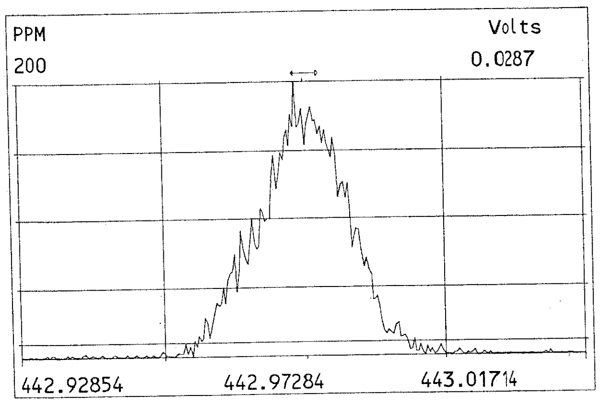


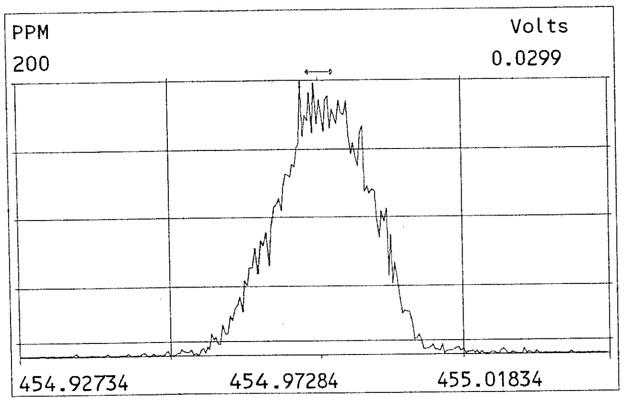
Peak Locate Examination:27-JAN-2018:09:46 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:4 Reference:PFK

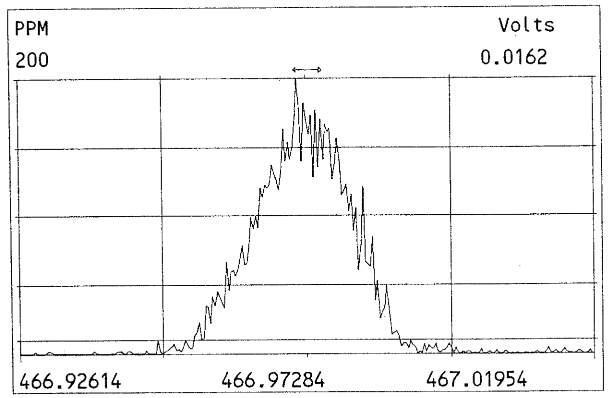


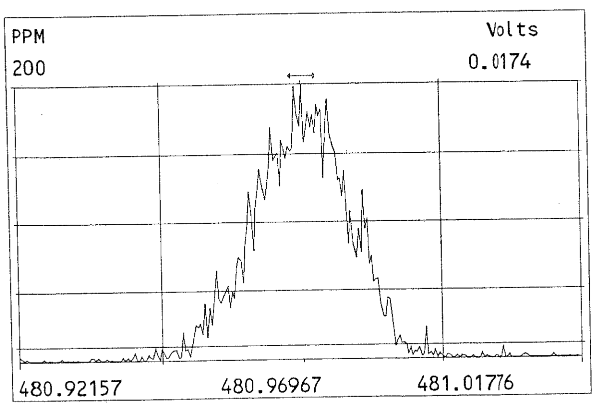




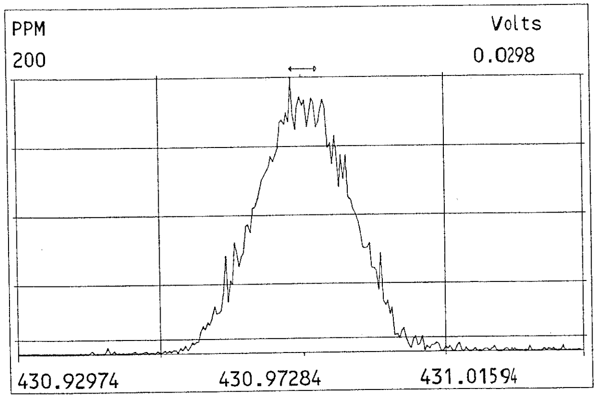


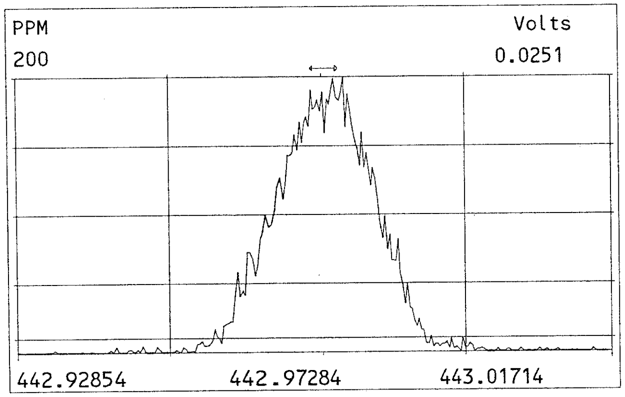


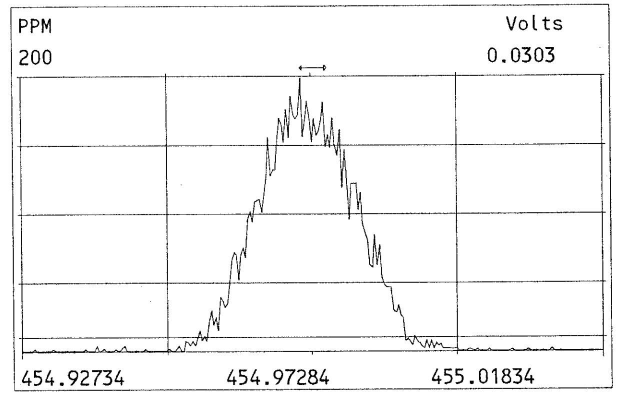


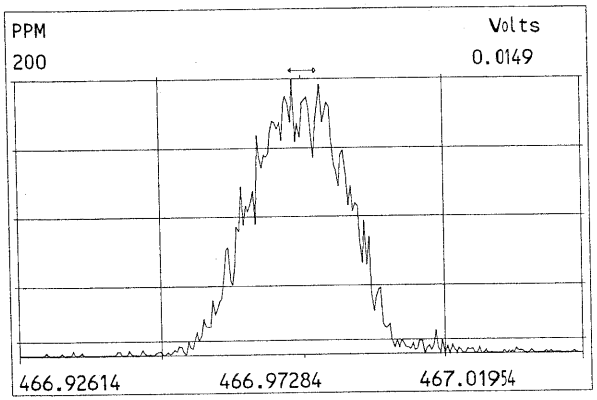


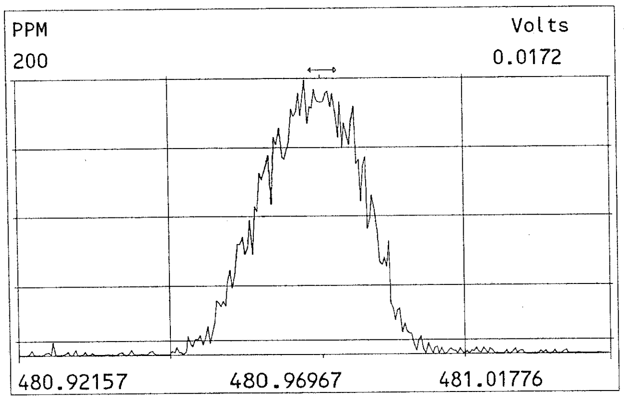
Peak Locate Examination:27-JAN-2018:09:48 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:5 Reference:PFK

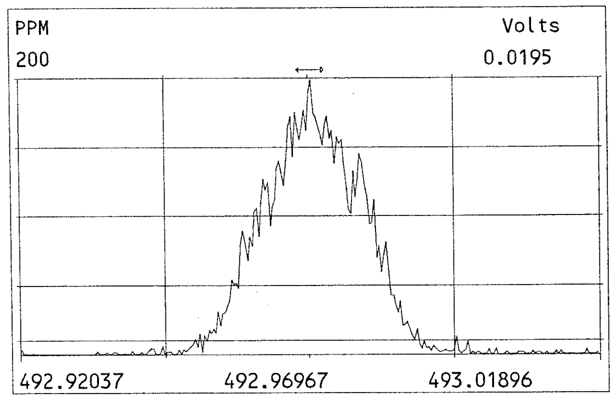


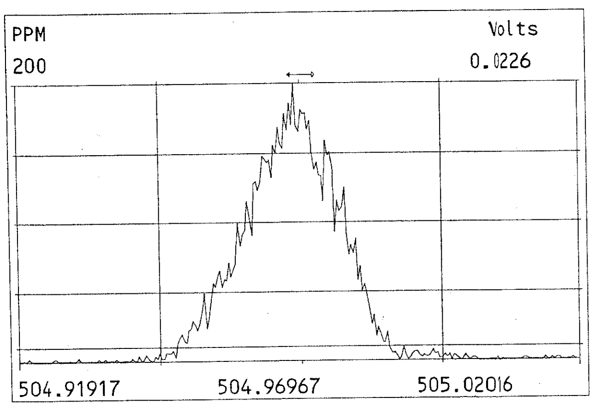


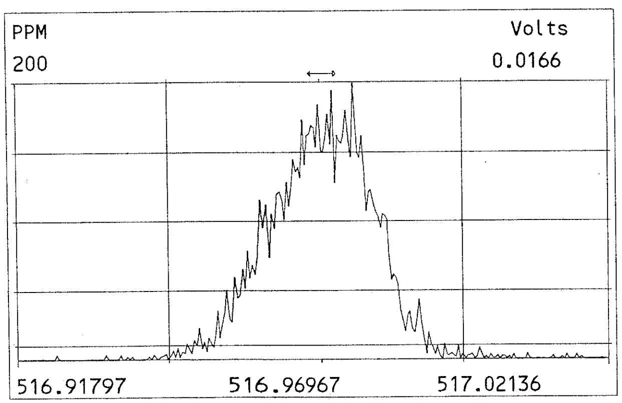












USEPA - ITD

FORM 4A
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:

Initial Calibration Date: 12/22/17

Instrument ID: FAL3   GC Column ID: DB5MS

VER Data Filename: 26JAN18M Sam:22   Analysis Date: 27-JAN-18 08:43:41

NATIVE ANALYTES	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
2,3,7,8-TCDD	M/M+2	0.80	0.65-0.89	y	11.3	7.80 - 12.9
1,2,3,7,8-PeCDD	M+2/M+4	1.46	1.32-1.78	y	50.3	39.0 - 65.0
1,2,3,4,7,8-HxCDD	M+2/M+4	1.28	1.05-1.43	y	54.1	39.0 - 64.0
1,2,3,6,7,8-HxCDD	M+2/M+4	1.26	1.05-1.43	y	54.8	39.0 - 64.0
1,2,3,7,8,9-HxCDD	M+2/M+4	1.28	1.05-1.43	y	56.4	41.0 - 61.0
1,2,3,4,6,7,8-HpCDD	M+2/M+4	0.97	0.88-1.20	y	54.0	43.0 - 58.0
OCDD	M+2/M+4	0.85	0.76-1.02	y	109	79.0 - 126
2,3,7,8-TCDF	M/M+2	0.73	0.65-0.89	y	11.3	8.40 - 12.0
1,2,3,7,8-PeCDF	M+2/M+4	1.47	1.32-1.78	y	51.9	41.0 - 60.0
2,3,4,7,8-PeCDF	M+2/M+4	1.47	1.32-1.78	y	51.8	41.0 - 60.0
1,2,3,4,7,8-HxCDF	M+2/M+4	1.20	1.05-1.43	y	51.9	45.0 - 56.0
1,2,3,6,7,8-HxCDF	M+2/M+4	1.24	1.05-1.43	y	52.2	44.0 - 57.0
2,3,4,6,7,8-HxCDF	M+2/M+4	1.20	1.05-1.43	y	53.1	44.0 - 57.0
1,2,3,7,8,9-HxCDF	M+2/M+4	1.25	1.05-1.43	y	52.3	45.0 - 56.0
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.00	0.88-1.20	y	50.6	45.0 - 55.0
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.01	0.88-1.20	y	48.2	43.0 - 58.0
OCDF	M+2/M+4	0.91	0.76-1.02	y	99.0	63.0 - 159

(1) See Table 8, Method 1613, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 9, Method 1613.

(3) Contract-required concentration range as specified in Table 6, Method 1613.

Analyst: [signature]   Date: 1/29/18

USEPA - ITD

FORM 4B

PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:

Initial Calibration Date: 12/22/17

Instrument ID: FAL3   GC Column ID: DB5MS

VER Data Filename: 26JAN18M   Sam:22   Analysis Date: 27-JAN-18 08:43:41

	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
LABELED COMPOUNDS						
13C-2,3,7,8-TCDD	M/M+2	0.81	0.65-0.89	y	109	82.0 - 121
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.54	1.32-1.78	y	96.4	62.0 - 160
13C-1,2,3,4,7,8-HxCDD	M+2/M+4	1.23	1.05-1.43	y	96.6	85.0 - 117
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.24	1.05-1.43	y	96.1	85.0 - 118
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.07	0.88-1.20	y	89.7	72.0 - 138
13C-OCDD	M+2/M+4	0.90	0.76-1.02	y	153	96.0 - 415
13C-2,3,7,8-TCDF	M/M+2	0.81	0.65-0.89	y	105	71.0 - 140
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.52	1.32-1.78	y	95.3	76.0 - 130
13C-2,3,4,7,8-PeCDF	M+2/M+4	1.53	1.32-1.78	y	95.0	77.0 - 130
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.55	0.43-0.59	y	108	76.0 - 131
13C-1,2,3,6,7,8-HxCDF	M/M+2	0.57	0.43-0.59	y	104	70.0 - 143
13C-2,3,4,6,7,8-HxCDF	M/M+2	0.56	0.43-0.59	y	103	73.0 - 137
13C-1,2,3,7,8,9-HxCDF	M/M+2	0.55	0.43-0.59	y	92.6	74.0 - 135
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.50	0.37-0.51	y	93.5	78.0 - 129
13C-1,2,3,4,7,8,9-HpCDF	M/M+2	0.49	0.37-0.51	y	88.3	77.0 - 129
13C-OCDF	M+2/M+4	0.92	0.76-1.02	y	152	96.0 - 415
CLEANUP STANDARD (4)						
37Cl-2,3,7,8-TCDD					11.6	7.90 - 12.7

(1) See Table 8, Method 1613, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 9, Method 1613.

(3) Contract-required concentration range as specified in Table 6, Method 1613.

(4) No ion abundance ratio; report concentration found.

Analyst: [signature]   Date: 1/29/18

FORM 5

PCDD/PCDF RT WINDOW AND ISOMER SPECIFICITY STANDARDS

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:

Instrument ID: FAL3   Initial Calibration Date: 12/22/17

RT Window Data Filename: 26JAN18M Sam:22   Analysis Date: 27-JAN-18 Time: 08:43:41

DB-5 IS Data Filename: 26JAN18M Sam:22   Analysis Date: 27-JAN-18 Time: 08:43:41

DB-225 IS Date Filename: Analysis Date: Time:

DB-5 RT WINDOW DEFINING STANDARDS RESULTS

ISOMERS	ABSOLUTE RT	ISOMERS	ABSOLUTE RT
1,3,6,8-TCDD (F)	24:06	1,3,6,8-TCDF (F)	22:44
1,2,8,9-TCDD (L)	28:06	1,2,8,9-TCDF (L)	28:22
1,2,4,7,9-PeCDD (F)	29:58	1,3,4,6,8-PeCDF (F)	28:07
1,2,3,8,9-PeCDD (L)	33:34	1,2,3,8,9-PeCDF (L)	34:03
1,2,4,6,7,9-HxCDD (F)	35:50	1,2,3,4,6,8-HxCDF (F)	34:57
1,2,3,7,8,9-HxCDD (L)	38:57	1,2,3,7,8,9-HxCDF (L)	39:34
1,2,3,4,6,7,9-HpCDD (F)	42:29	1,2,3,4,6,7,8-HpCDF (F)	41:58
1,2,3,4,6,7,8-HpCDD (L)	43:54	1,2,3,4,7,8,9-HpCDF (L)	44:52

(F) = First eluting isomer (DB-5);   (L) = Last eluting isomer (DB-5)

==

ISOMER SPECIFICITY (IS) TEST STANDARD RESULTS

% VALLEY HEIGHT
BETWEEN
COMPARED PEAKS (1)

<25%

(1) To meet contract requirement, %Valley Height Between Compared Peaks shall not exceed 25% (section 15.4.2.2, Method 1613).

Analyst: [signature]   Date: 1/29/18

USEPA - ITD

FORM 6A

PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory   Episode No.:

Contract No.:   SAS No.:   Init. Cal. Date: 12/22/17

Instrument ID: FAL3   GC Column ID: DB5MS

Analysis Date: 27-JAN-18 08:43:41   CS3 or VER Data Filename: 26JAN18M   Sam:22

NATIVE ANALYTES	RETENTION TIME REFERENCE	RRT	RRT QC LIMITS (1)
2,3,7,8-TCDD	13C-2,3,7,8-TCDD	1.001	0.999-1.002
2,3,7,8-TCDF	13C-2,3,7,8-TCDF	1.001	0.999-1.003
1,2,3,7,8-PeCDD	13C-1,2,3,7,8-PeCDD	1.001	0.999-1.002
1,2,3,7,8-PeCDF	13C-1,2,3,7,8-PeCDF	1.000	0.999-1.002
2,3,4,7,8-PeCDF	13C-2,3,4,7,8-PeCDF	1.001	0.999-1.002
LABELED COMPOUNDS			
37Cl-2,3,7,8-TCDD	13C-1,2,3,4-TCDD	1.025	0.989-1.052
13C-2,3,7,8-TCDD		1.024	0.976-1.043
13C-2,3,7,8-TCDF		0.996	0.923-1.103
13C-1,2,3,7,8-PeCDD		1.244	1.000-1.567
13C-1,2,3,7,8-PeCDF		1.179	1.000-1.425
13C-2,3,4,7,8-PeCDF		1.229	1.011-1.526

(1) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1613.

Analyst: [signature]   Date: 1/29/18

USEPA - ITD

FORM 6B

PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory Episode No.:

Contract No.: SAS No.: Init. Cal. Date: 12/22/17

Instrument ID: FAL3 GC Column ID: DB5MS

Analysis Date: 27-JAN-18 08:43:41 CS3 or VER Data Filename: 26JAN18M Sam:22

NATIVE ANALYTES	RETENTION TIME REFERENCE	RRT	RRT QC LIMITS (1)
1,2,3,4,7,8-HxCDD	13C-1,2,3,4,7,8-HxCDD	1.001	0.999-1.001
1,2,3,6,7,8-HxCDD	13C-1,2,3,6,7,8-HxCDD	1.001	0.999-1.003
1,2,3,7,8,9-HxCDD	13C-1,2,3,6,7,8-HxCDD	1.012	1.000-1.019
1,2,3,4,7,8-HxCDF	13C-1,2,3,4,7,8-HxCDF	1.000	0.999-1.001
1,2,3,6,7,8-HxCDF	13C-1,2,3,6,7,8-HxCDF	1.000	0.999-1.003
2,3,4,6,7,8-HxCDF	13C-2,3,4,6,7,8-HxCDF	1.001	0.999-1.001
1,2,3,7,8,9-HxCDF	13C-1,2,3,7,8,9-HxCDF	1.000	0.999-1.001
1,2,3,4,6,7,8-HpCDD	13C-1,2,3,4,6,7,8-HpCDD	1.001	0.999-1.001
1,2,3,4,6,7,8-HpCDF	13C-1,2,3,4,6,7,8-HpCDF	1.000	0.999-1.001
1,2,3,4,7,8,9-HpCDF	13C-1,2,3,4,7,8,9-HpCDF	1.001	0.999-1.001
OCDD	13C-OCDD	1.001	0.999-1.001
OCDF	13C-OCDF	1.000	0.999-1.001
LABELED COMPOUNDS			
13C-1,2,3,4,7,8-HxCDD	13C-1,2,3,7,8,9-HxCDD	0.985	0.977-1.000
13C-1,2,3,6,7,8-HxCDD		0.989	0.981-1.003
13C-1,2,3,4,7,8-HxCDF		0.949	0.944-0.970
13C-1,2,3,6,7,8-HxCDF		0.954	0.949-0.975
13C-2,3,4,6,7,8-HxCDF		0.979	0.959-1.021
13C-1,2,3,7,8,9-HxCDF		1.016	0.977-1.047
13C-1,2,3,4,6,7,8-HpCDD		1.127	1.086-1.130
13C-1,2,3,4,6,7,8-HpCDF		1.078	1.043-1.085
13C-1,2,3,4,7,8,9-HpCDF		1.152	1.057-1.156
13C-OCDD		1.266	1.032-1.311
13C-OCDF		1.278	1.000-1.311

(1) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1613.

Analyst: [signature] Date: 1/29/18

FAL ID: ST012618M3 Filename: 26JAN18M Sam:22 Acquired: 27-JAN-18 08:43:41 ICal: PCDDFAL3-12-22-17
Client ID: 1613 CS3 171128J ConCal: ST012618M2 EndCal: ST012618M3
Results: 11153-3RX GC Column: DB5MS Amount: 1.000 NATO 1989 Tox: 105
Instrument ID: FAL3 WHO 1998 Tox: 130 WHO 2005 Tox: 119

Name	Resp	RA	RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	DL
2,3,7,8-TCDD	6.81e+06	0.80 y	27:10	1.06	11.3		2.50	-	-	*
1,2,3,7,8-PeCDD	2.17e+07	1.46 y	33:00	1.00	50.3		2.50	-	-	*
1,2,3,4,7,8-HxCDD	2.07e+07	1.28 y	38:21	1.07	54.1		2.50	-	-	*
1,2,3,6,7,8-HxCDD	2.32e+07	1.26 y	38:31	1.08	54.8		2.50	-	-	*
1,2,3,7,8,9-HxCDD	2.34e+07	1.28 y	38:57	1.11	56.4		2.50	-	-	*
1,2,3,4,6,7,8-HpCDD	1.87e+07	0.97 y	43:54	0.99	54.0		2.50	-	-	*
OCDD	2.82e+07	0.85 y	49:19	1.11	109		2.50	-	-	*
2,3,7,8-TCDF	8.19e+06	0.73 y	26:26	1.03	11.3		2.50	-	-	*
1,2,3,7,8-PeCDF	2.93e+07	1.47 y	31:15	0.95	51.9		2.50	-	-	*
2,3,4,7,8-PeCDF	2.79e+07	1.47 y	32:37	0.79	51.8		2.50	-	-	*
1,2,3,4,7,8-HxCDF	3.16e+07	1.20 y	36:56	1.20	51.9		2.50	-	-	*
1,2,3,6,7,8-HxCDF	3.45e+07	1.24 y	37:09	1.10	52.2		2.50	-	-	*
2,3,4,6,7,8-HxCDF	3.16e+07	1.20 y	38:07	1.08	53.1		2.50	-	-	*
1,2,3,7,8,9-HxCDF	2.74e+07	1.25 y	39:34	1.15	52.3		2.50	-	-	*
1,2,3,4,6,7,8-HpCDF	2.46e+07	1.00 y	41:58	1.23	50.6		2.50	-	-	*
1,2,3,4,7,8,9-HpCDF	1.85e+07	1.01 y	44:52	1.23	48.2		2.50	-	-	*
OCDF	3.12e+07	0.91 y	49:43	0.90	99.0		2.50	-	-	*

Name	Resp	RA	RT	RRF	Conc	Rec
13C-2,3,7,8-TCDD	5.69e+07	0.81 y	27:09	1.02	109	109
13C-1,2,3,7,8-PeCDD	4.31e+07	1.54 y	32:59	0.88	96.4	96.4
13C-1,2,3,4,7,8-HxCDD	3.57e+07	1.23 y	38:19	0.85	96.6	96.6
13C-1,2,3,6,7,8-HxCDD	3.91e+07	1.24 y	38:29	0.94	96.1	96.1
13C-1,2,3,4,6,7,8-HpCDD	3.51e+07	1.07 y	43:52	0.90	89.7	89.7
13C-OCDD	4.65e+07	0.90 y	49:17	0.70	153	76.5
13C-2,3,7,8-TCDF	7.06e+07	0.81 y	26:25	0.93	105	105
13C-1,2,3,7,8-PeCDF	5.98e+07	1.52 y	31:15	0.87	95.3	95.3
13C-2,3,4,7,8-PeCDF	6.81e+07	1.53 y	32:36	0.99	95.0	95.0
13C-1,2,3,4,7,8-HxCDF	5.09e+07	0.55 y	36:55	1.09	108	108
13C-1,2,3,6,7,8-HxCDF	6.03e+07	0.57 y	37:08	1.35	104	104
13C-2,3,4,6,7,8-HxCDF	5.49e+07	0.56 y	38:05	1.23	103	103
13C-1,2,3,7,8,9-HxCDF	4.58e+07	0.55 y	39:33	1.14	92.6	92.6
13C-1,2,3,4,6,7,8-HpCDF	3.94e+07	0.50 y	41:57	0.97	93.5	93.5
13C-1,2,3,4,7,8,9-HpCDF	3.12e+07	0.49 y	44:50	0.82	88.3	88.3
13C-OCDF	6.99e+07	0.92 y	49:43	1.06	152	76.0
37Cl-2,3,7,8-TCDD	5.39e+06		27:10	0.91	11.6	116
13C-1,2,3,4-TCDD	5.09e+07	0.82 y	26:31	-	140	
13C-1,2,3,4-TCDF	7.24e+07	0.82 y	25:16	-	139	
13C-1,2,3,7,8,9-HxCDD	4.33e+07	1.24 y	38:55	-	141	

Name	Resp	RT	RRF	Conc	Fac	Noise-1	Noise-2	DL		#Hom
Total Tetra-Dioxins	3.39e+07	24:06	1.06	56.2	2.50	-	-	*		17
Total Penta-Dioxins	7.02e+07	29:58	1.00	163	2.50	-	-	*		13
Total Hexa-Dioxins	9.63e+07	35:50	1.09	237	2.50	-	-	*		30
Total Hepta-Dioxins	4.17e+07	42:29	0.99	120	2.50	-	-	*		37
Total Tetra-Furans	3.92e+07	22:44	1.03	54.1	2.50	-	-	*		21
1st Fn. Tot Penta-Furans	4.30e+07	28:07	0.86	77.9	2.50	-	-	*	PeCDF	1
Total Penta-Furans	8.40e+07	29:55	0.86	152	2.50	-	-	*	230	12
Total Hexa-Furans	1.60e+08	34:57	1.13	268	2.50	-	-	*		35
Total Hepta-Furans	4.51e+07	41:58	1.23	103	2.50	-	-	*		32

Analyst: [signature] Date: 1/29/18

Frontier Analytical Laboratory - Acquisition Log

Run Name:26JAN18M Instrument: FAL3 GC: DB5MS Experiment:PCDD

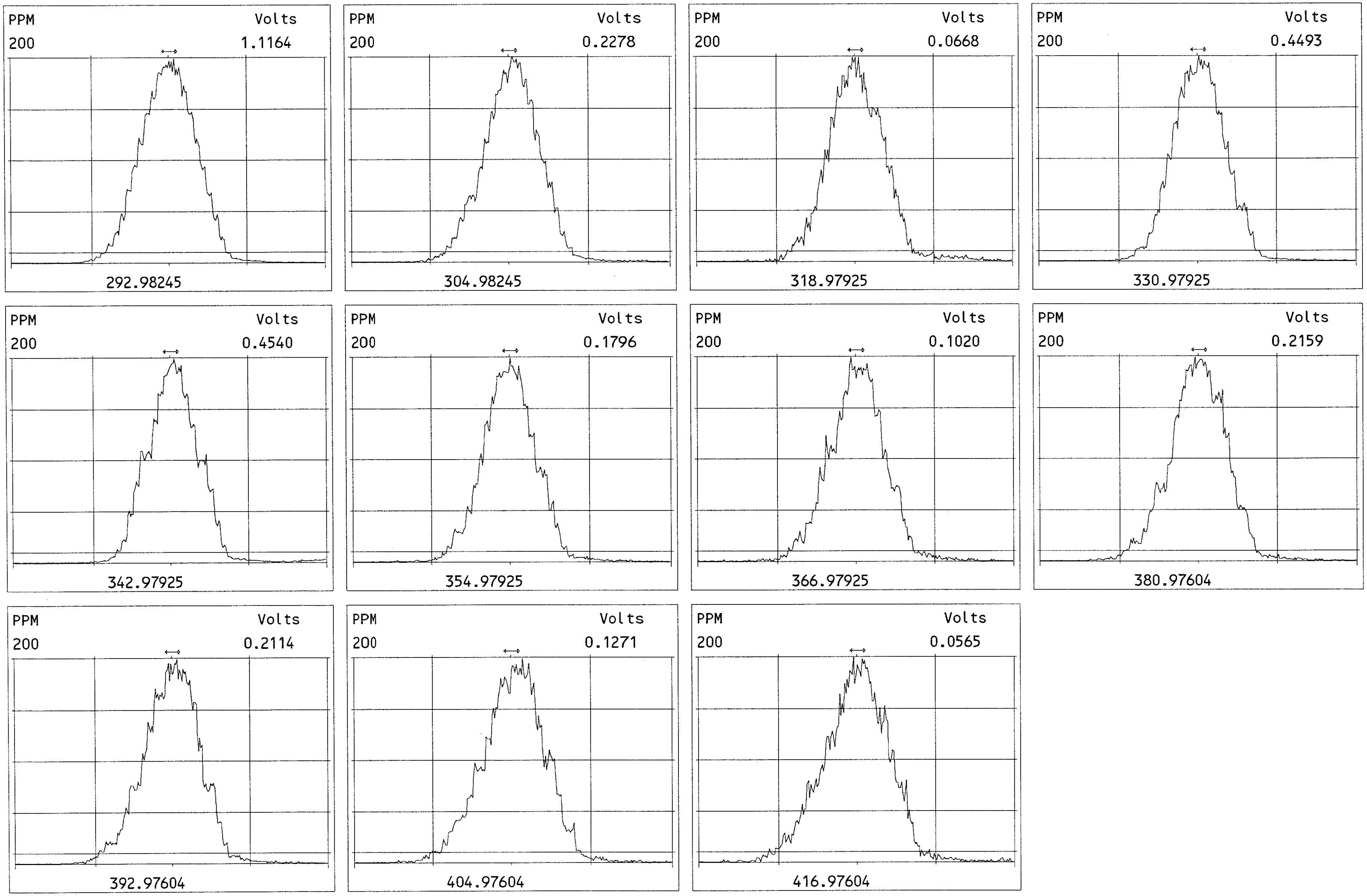
Data File	S	FAL ID	Client ID	Acquired	ConCal	EndCal	Analyst
26JAN18M	1	ST012618M1	1613 CS3 171128J	26-JAN-18 13:31:42	ST012618M1	ST012618M2	TC
26JAN18M	2	04385-001-0001-OPR	OPR	26-JAN-18 14:26:32	ST012618M1	ST012618M2	TC
26JAN18M	3	04385-001-0001-MB	Method Blank	26-JAN-18 15:21:27	ST012618M1	ST012618M2	TC
26JAN18M	4	11157-003-X002-SA	NFMW1d	26-JAN-18 16:16:22	ST012618M1	ST012618M2	TC
26JAN18M	5	11193-001-0001-SA	201801110018	26-JAN-18 17:11:11	ST012618M1	ST012618M2	TC
26JAN18M	6	11194-001-0001-SA	201801110019	26-JAN-18 18:06:03	ST012618M1	ST012618M2	TC
26JAN18M	7	11194-002-0001-SA	201801110020	26-JAN-18 19:00:54	ST012618M1	ST012618M2	TC
26JAN18M	8	11194-003-0001-SA	201801110021	26-JAN-18 19:55:45	ST012618M1	ST012618M2	TC
26JAN18M	9	11202-001-0001-SA	EFF-001A	26-JAN-18 20:50:36	ST012618M1	ST012618M2	TC
26JAN18M	10	SB012618M1	Solvent Blank	26-JAN-18 21:45:27	ST012618M1	ST012618M2	TC
26JAN18M	11	ST012618M2	1613 CS3 171128J	26-JAN-18 22:40:18	ST012618M2	ST012618M3	TC
26JAN18M	12	SB012618M2	Solvent Blank	26-JAN-18 23:35:08	ST012618M2	ST012618M3	TC
26JAN18M	13	11203-001-0001-SA	Sycamore Creek Downstream R╗	27-JAN-18 00:30:00	ST012618M2	ST012618M3	TC
26JAN18M	14	11204-001-0001-SA	Sycamore Creek Upstream RSW╗	27-JAN-18 01:24:51	ST012618M2	ST012618M3	TC
26JAN18M	15	11211-001-0001-SA	AMW-3-011218	27-JAN-18 02:19:42	ST012618M2	ST012618M3	TC
26JAN18M	16	11211-002-0001-SA	AMW-4-011218	27-JAN-18 03:14:35	ST012618M2	ST012618M3	TC
26JAN18M	17	11211-003-0001-SA	AMW-2-011218	27-JAN-18 04:09:25	ST012618M2	ST012618M3	TC
26JAN18M	18	11211-004-0001-SA	AMW-1-011218	27-JAN-18 05:04:16	ST012618M2	ST012618M3	TC
26JAN18M	19	11211-005-0001-SA	AMW-5-011218	27-JAN-18 05:59:07	ST012618M2	ST012618M3	TC
26JAN18M	20	SB012618M3	Solvent Blank	27-JAN-18 06:53:59	ST012618M2	ST012618M3	TC
26JAN18M	21	SB012618M4	Solvent Blank	27-JAN-18 07:48:50	ST012618M2	ST012618M3	TC
26JAN18M	22	ST012618M3	1613 CS3 171128J	27-JAN-18 08:43:41	ST012618M2	ST012618M3	TC

1/29/18

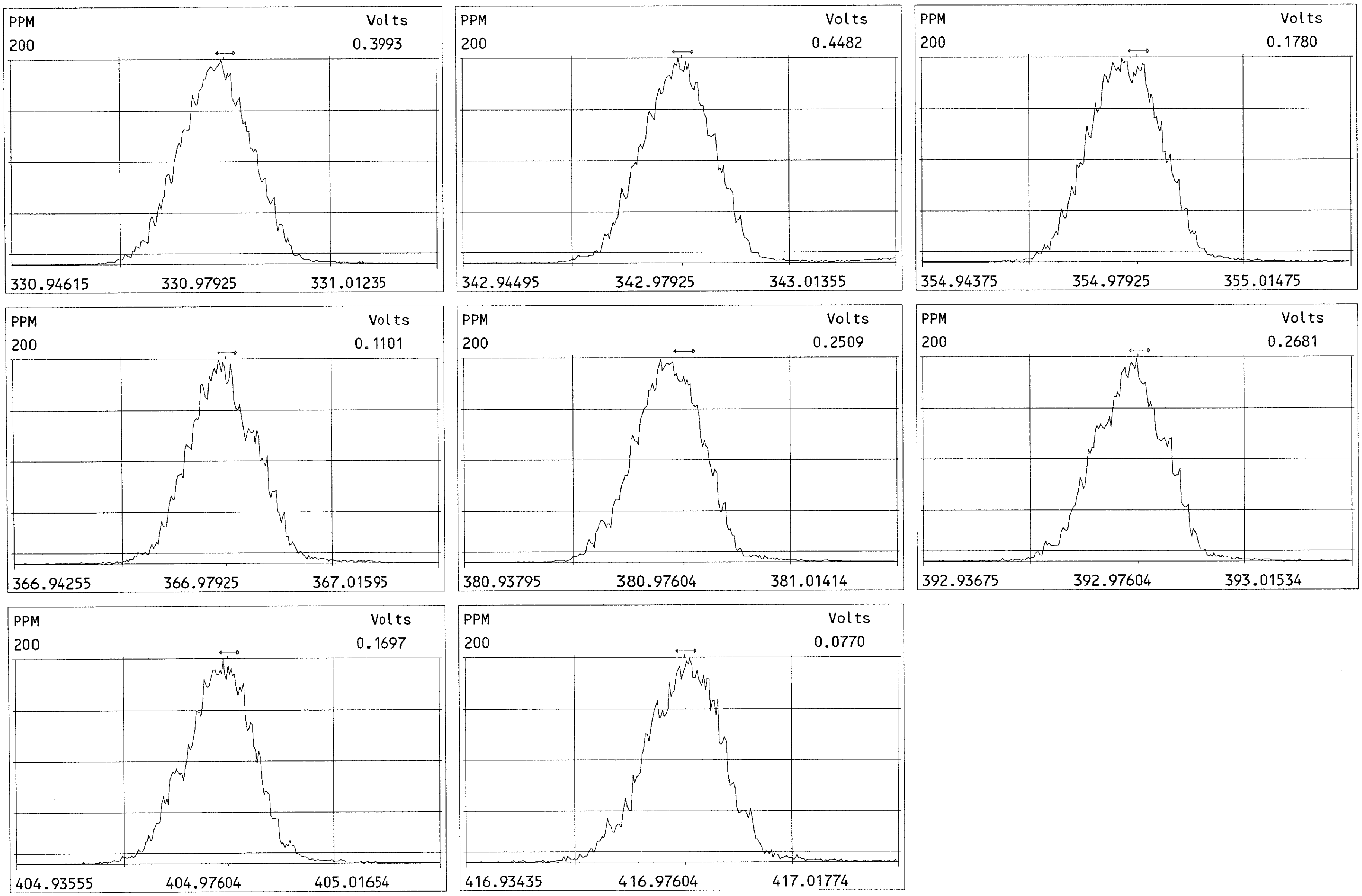
Data Backed Up:________________

Date:______________________

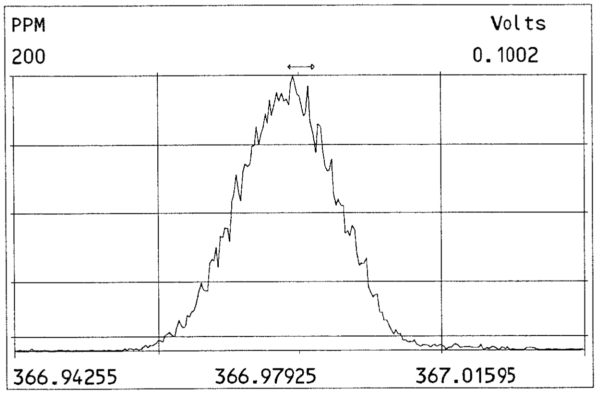
Peak Locate Examination:26-JAN-2018:13:30 File:26JAN18M
Experiment:PCDD Function:1 Reference:PFK

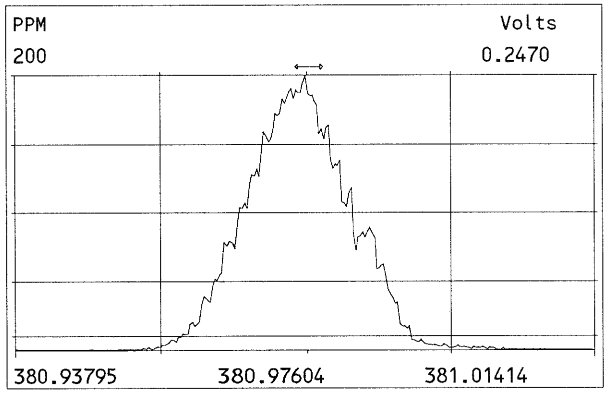


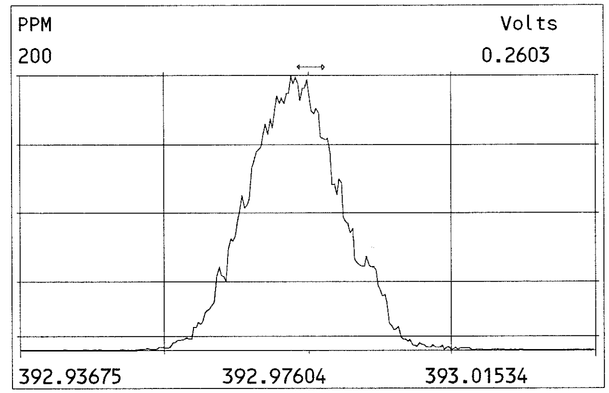
Peak Locate Examination:26-JAN-2018:13:30 File:26JAN18M
Experiment:PCDD Function:2 Reference:PFK

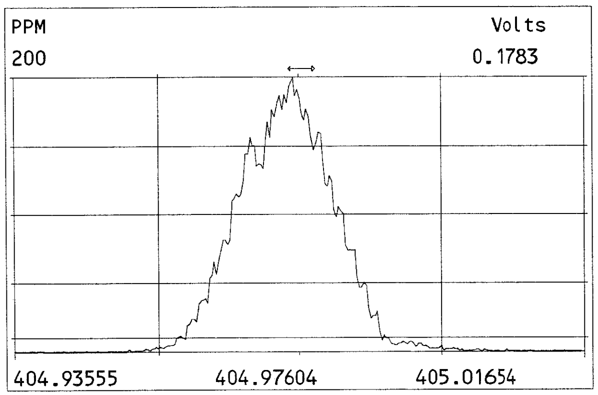


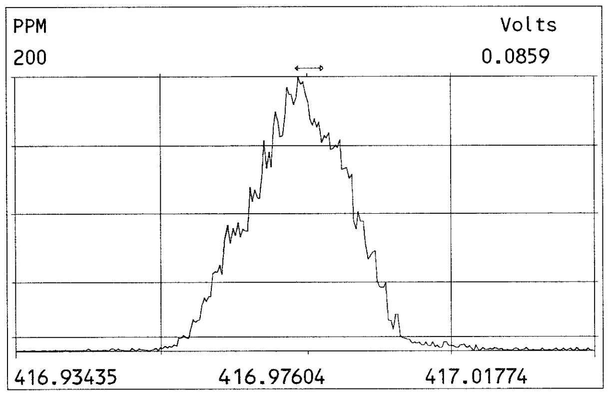
Peak Locate Examination:26-JAN-2018:13:30 File:26JAN18M
Experiment:PCDD Function:3 Reference:PFK

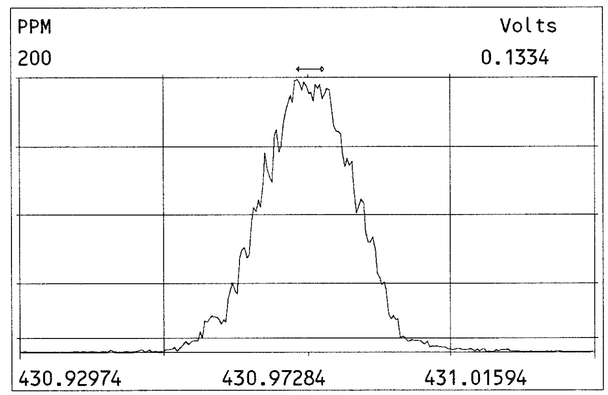


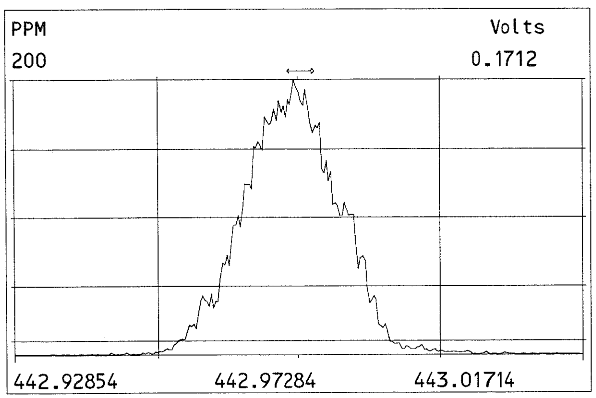


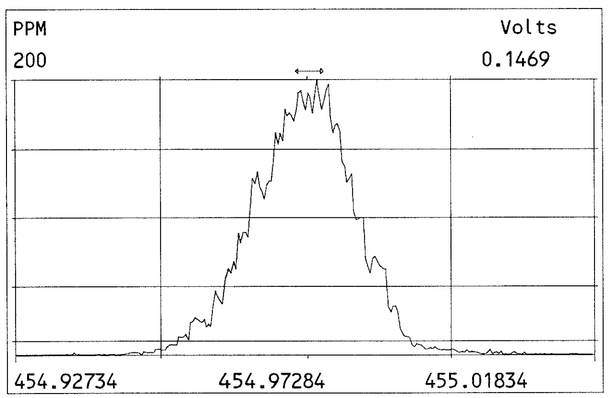




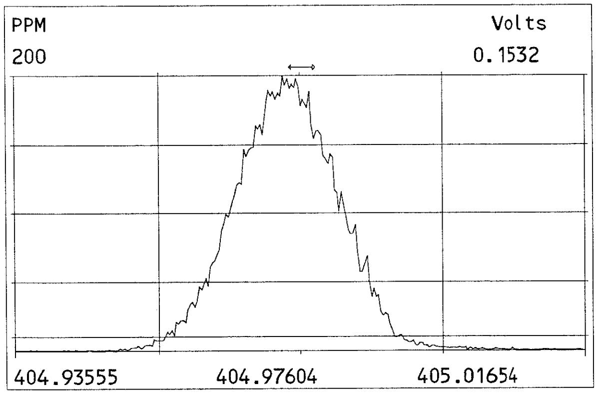


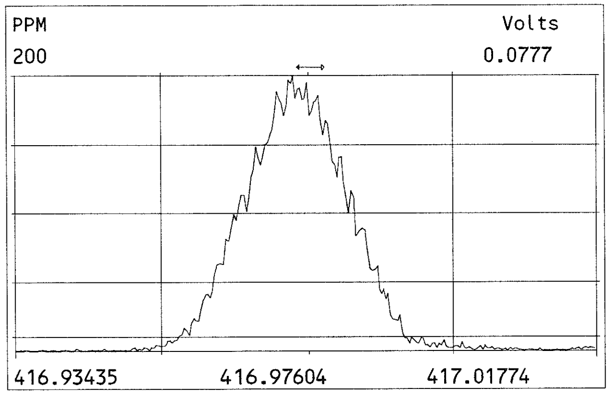


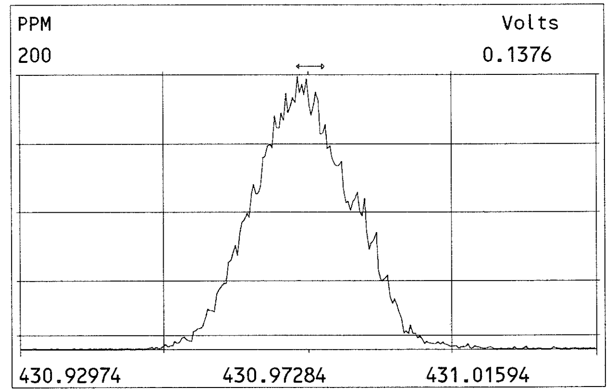


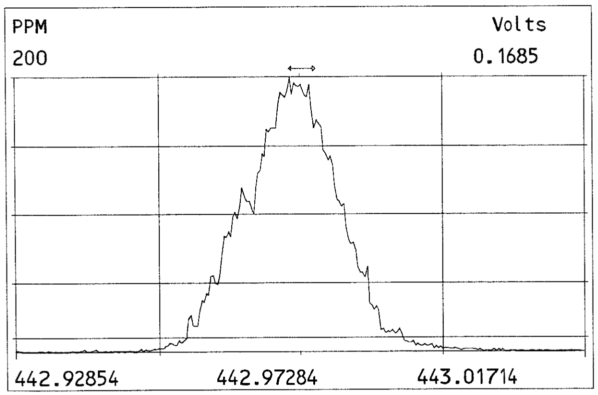


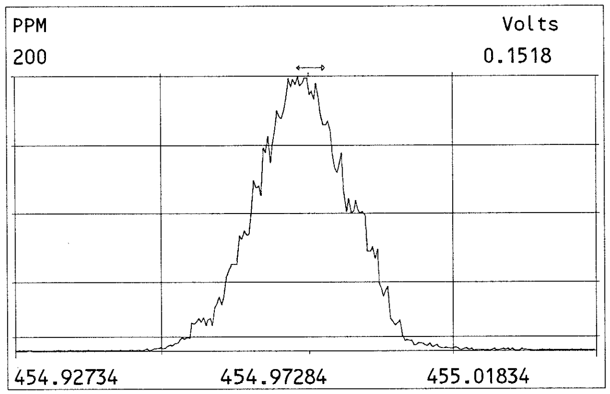
Peak Locate Examination:26-JAN-2018:13:31 File:26JAN18M
Experiment:PCDD Function:4 Reference:PFK

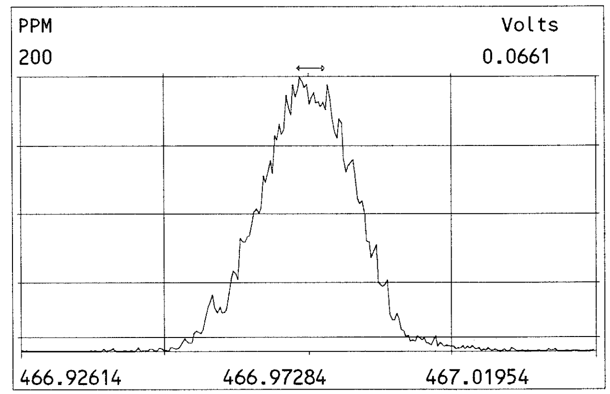


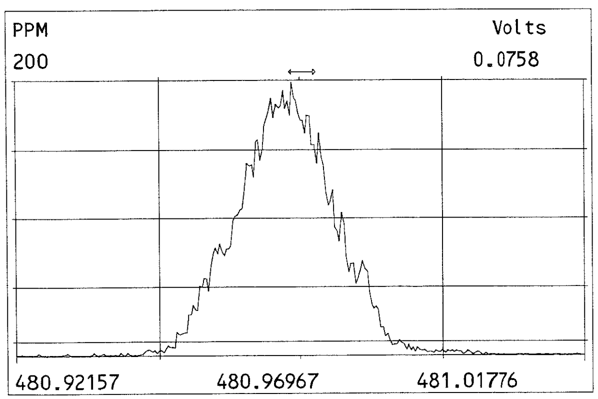




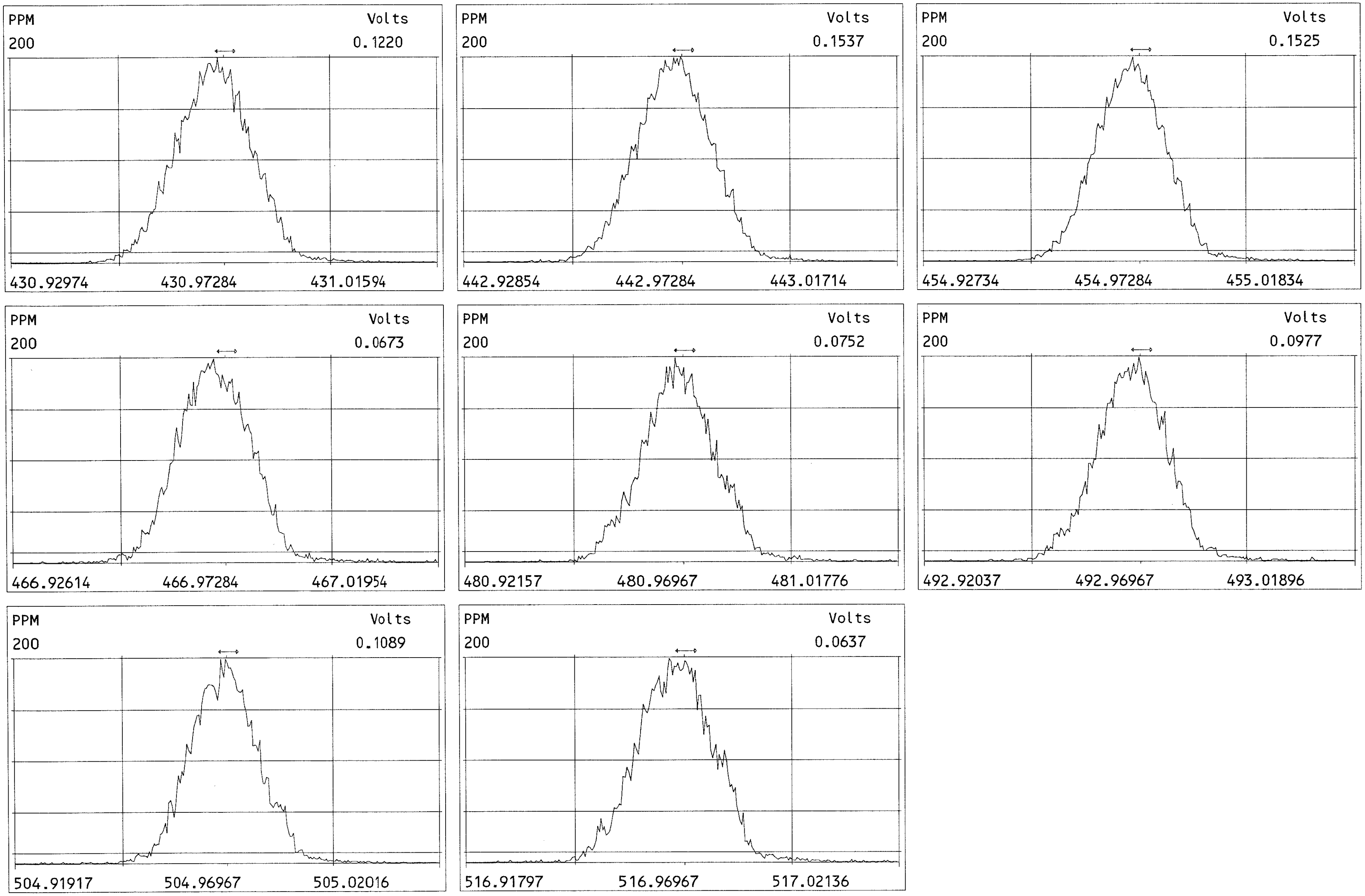




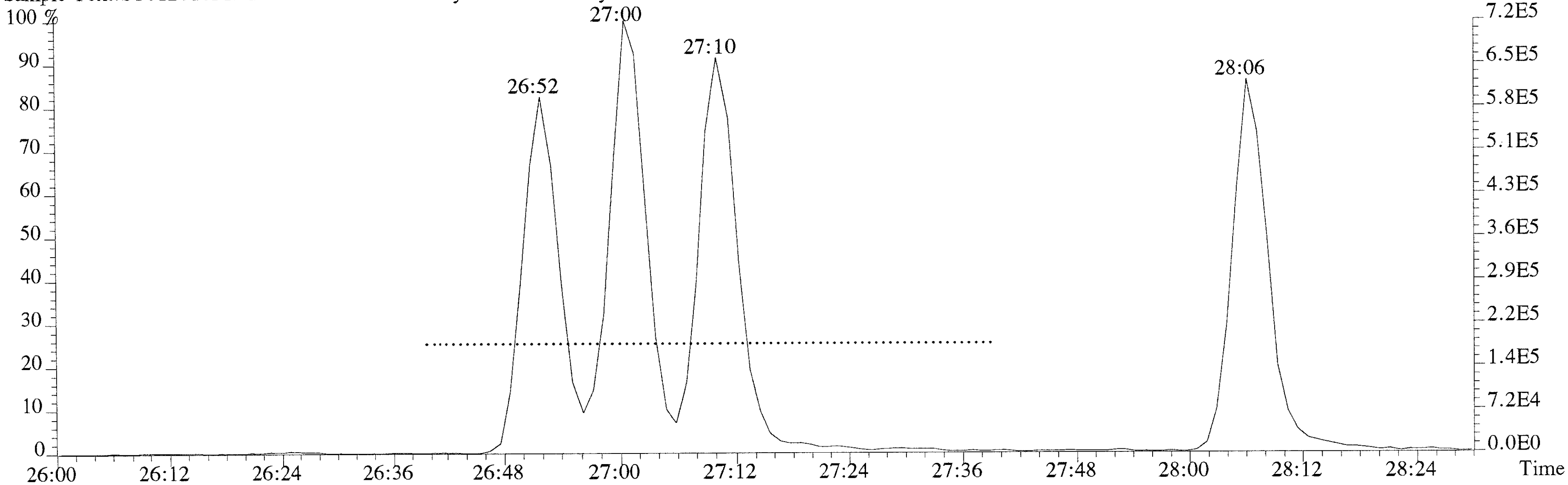




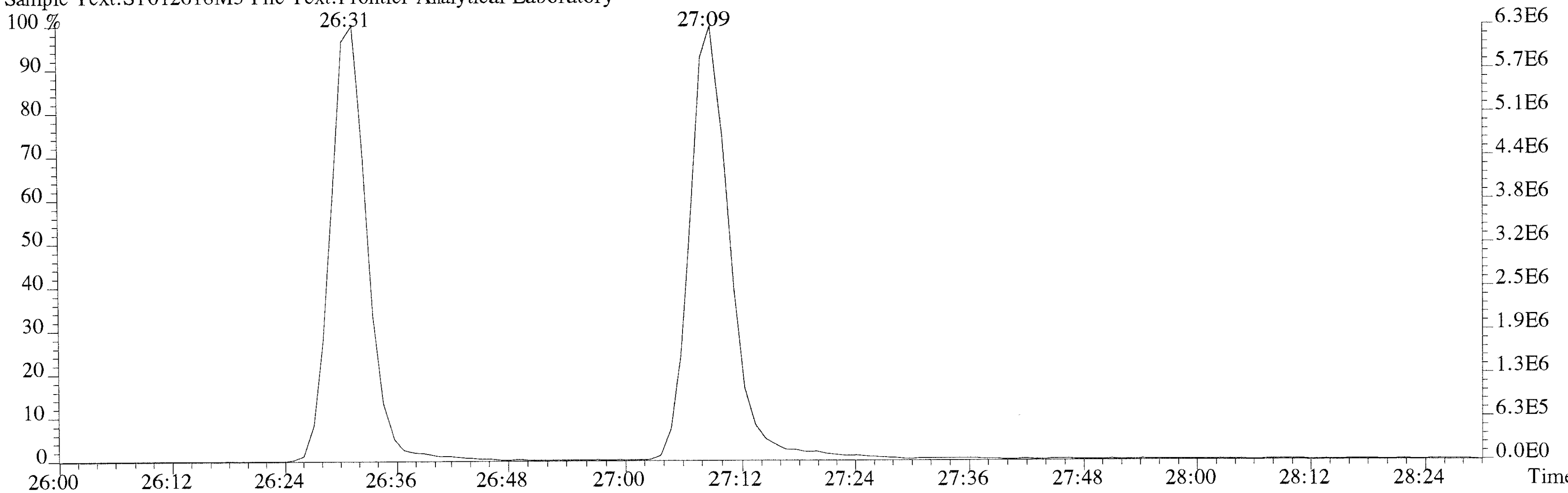
Peak Locate Examination:26-JAN-2018:13:31 File:26JAN18M
Experiment:PCDD Function:5 Reference:PFK



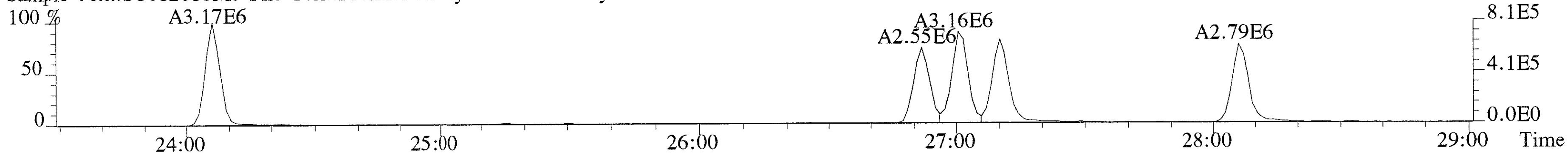
File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:22 Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



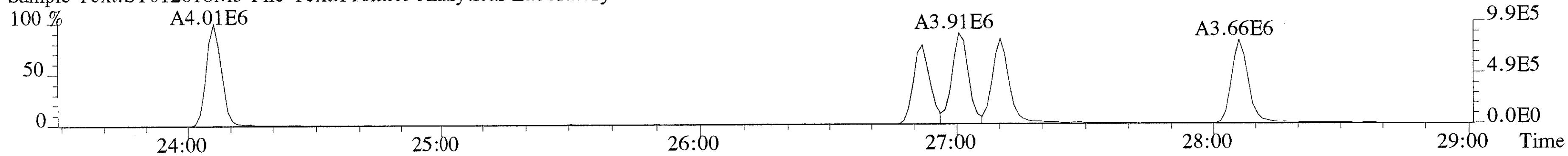
File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
333.9339 S:22 Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



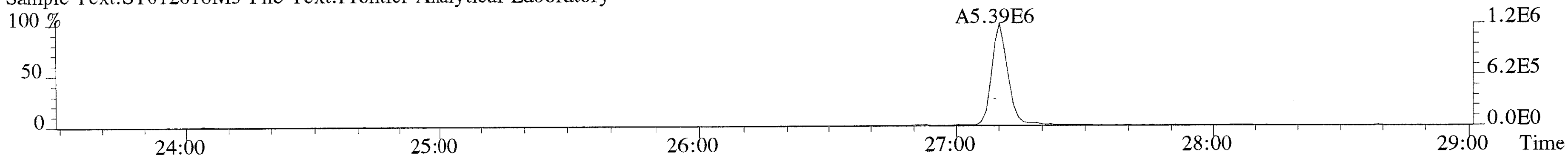
File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:22 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:22 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
327.8847 S:22 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



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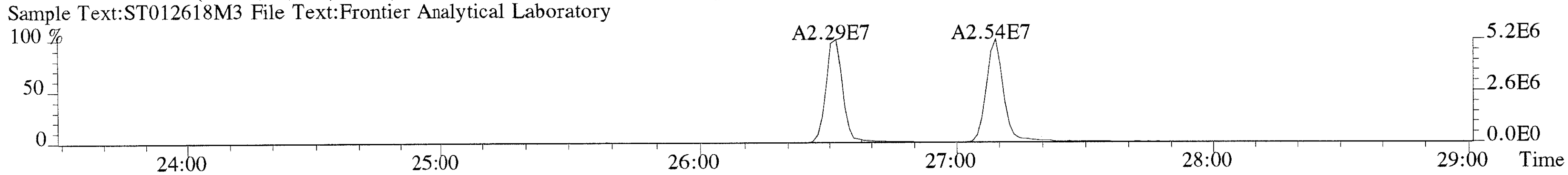
331.9368 S:22 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



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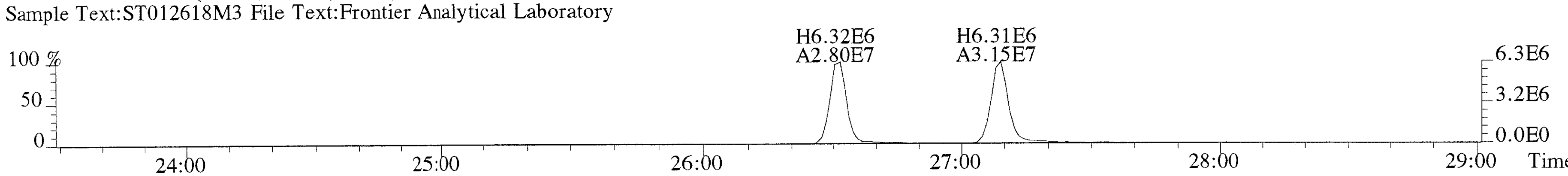
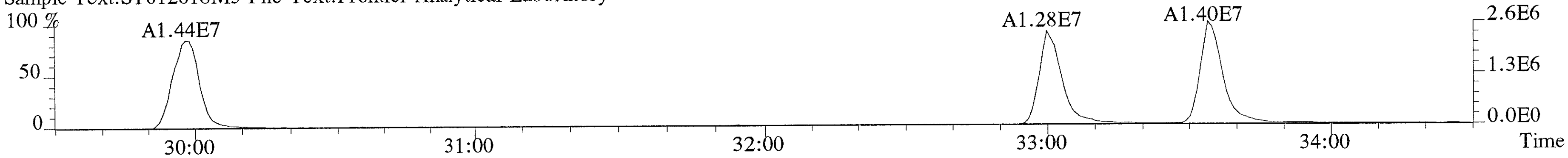
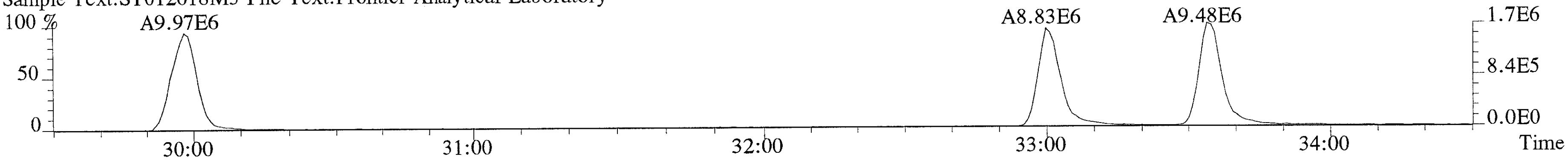
333.9339 S:22 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



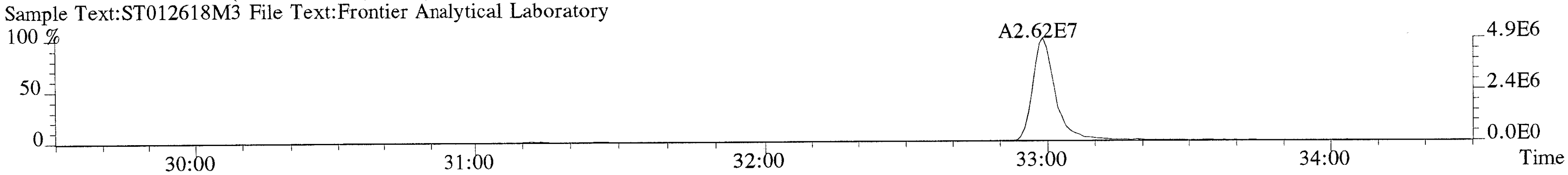
File:26JAN18M #1-423 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
355.8546 S:22 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



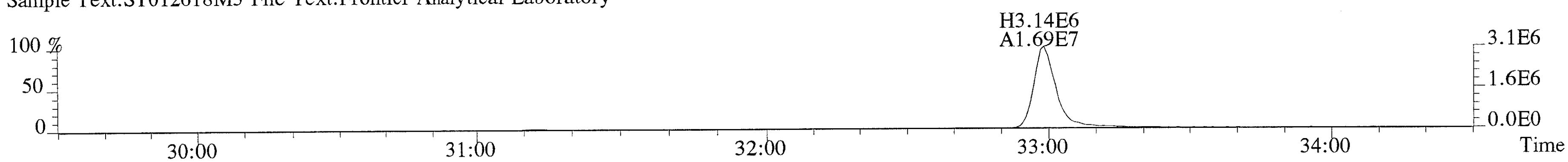
File:26JAN18M #1-423 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
357.8517 S:22 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



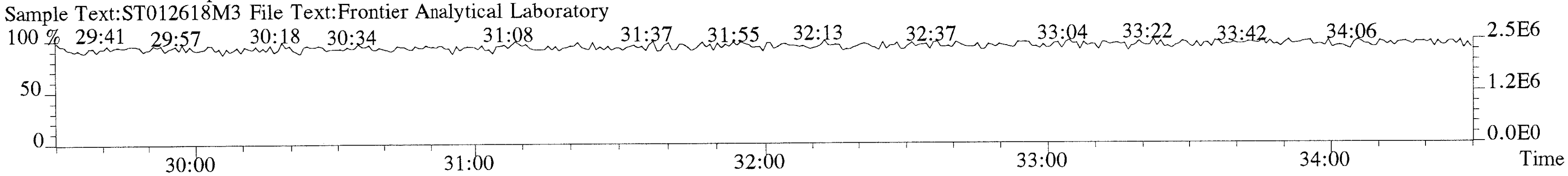
File:26JAN18M #1-423 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
367.8949 S:22 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



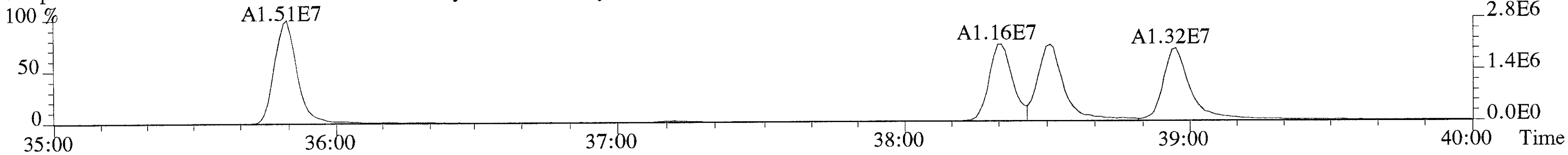
File:26JAN18M #1-423 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
369.8919 S:22 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



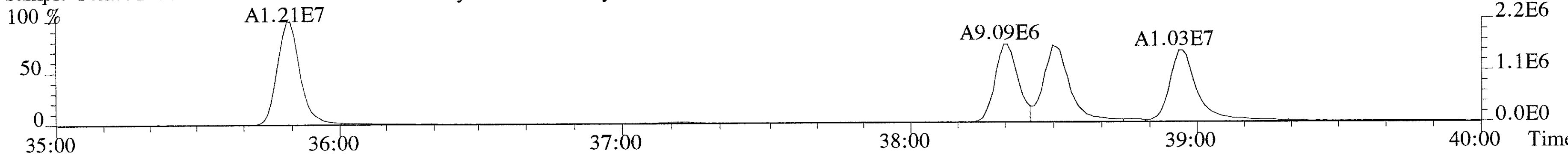
File:26JAN18M #1-423 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
366.9792 S:22 F:2 Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



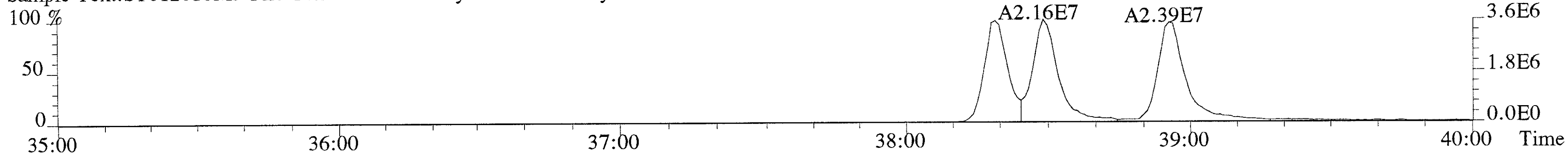
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
389.8156 S:22 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



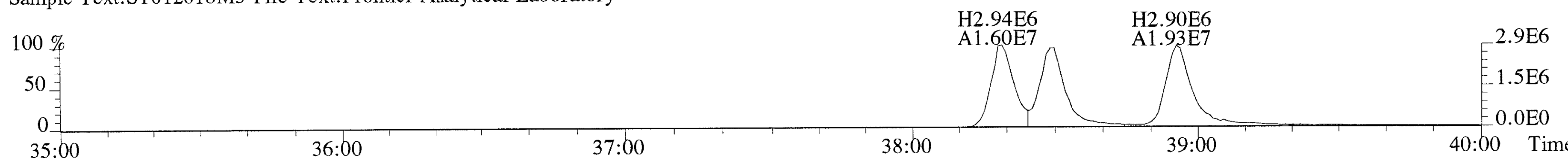
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
391.8127 S:22 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



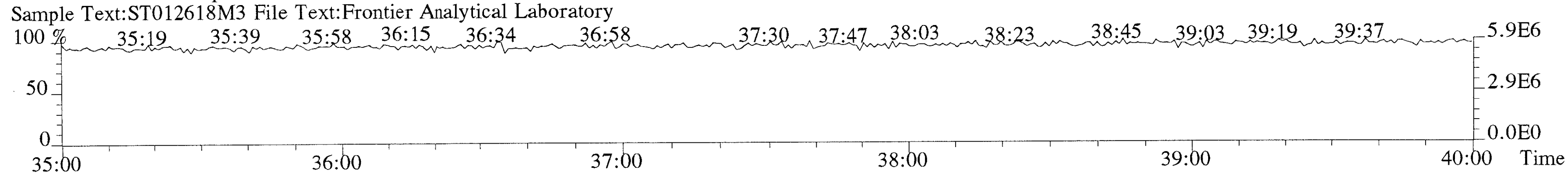
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
401.8559 S:22 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



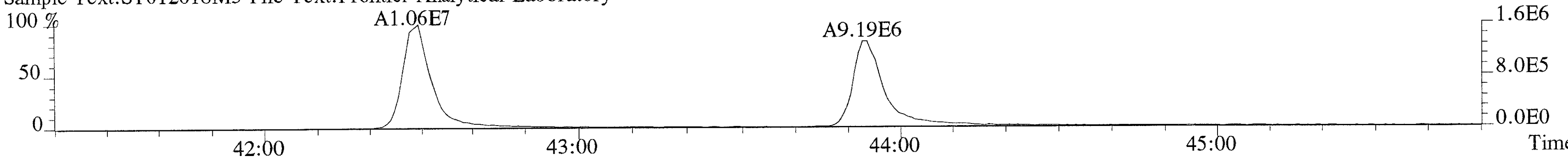
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
403.8530 S:22 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



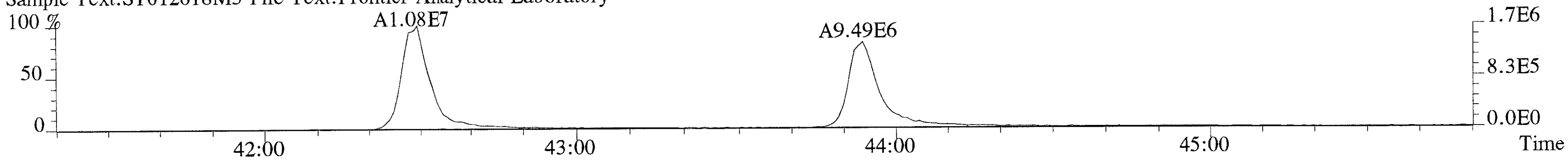
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
380.9760 S:22 F:3 Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



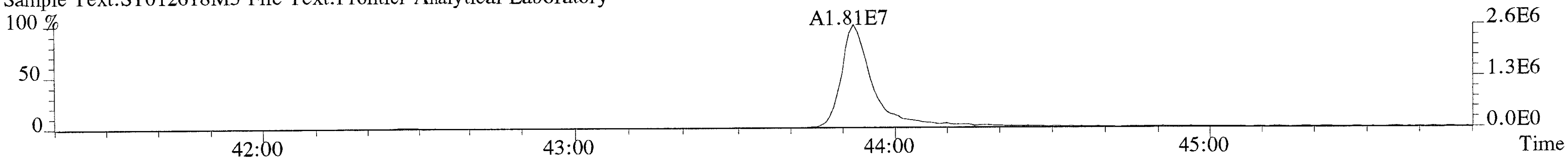
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
423.7767 S:22 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



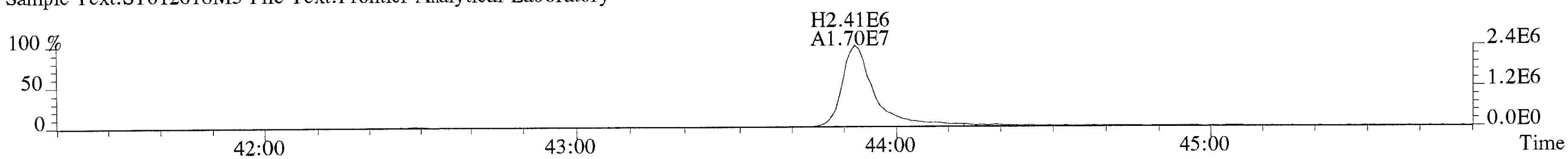
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
425.7737 S:22 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



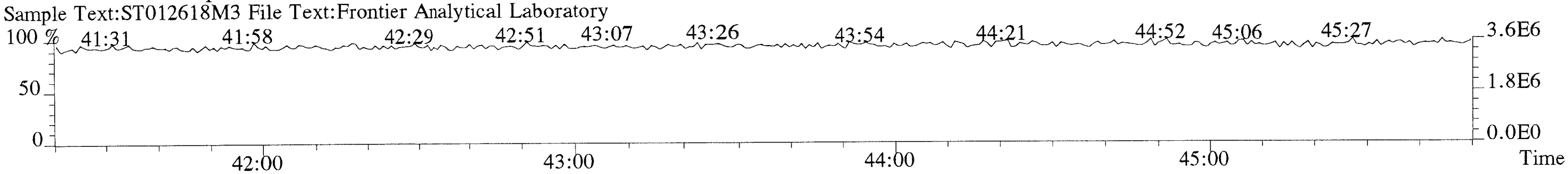
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
435.8169 S:22 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
437.8140 S:22 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory

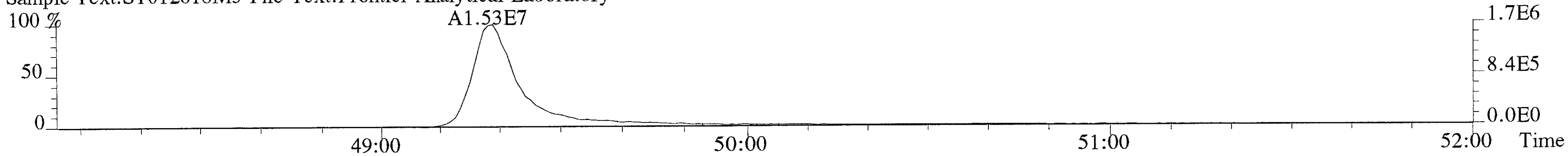


File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
430.9728 S:22 F:4 Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory

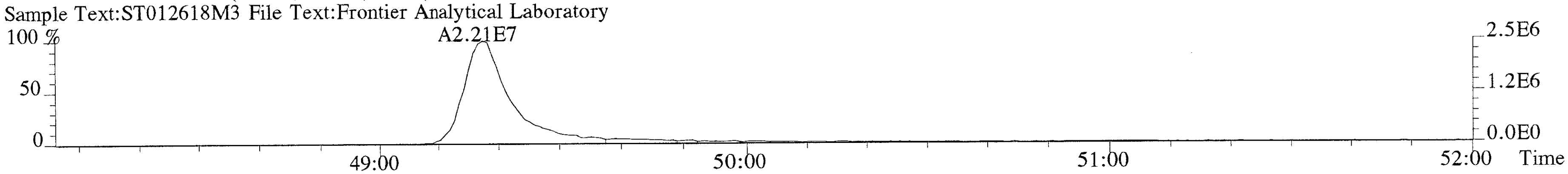


File:26JAN18M #1-360 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
457.7377 S:22 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory

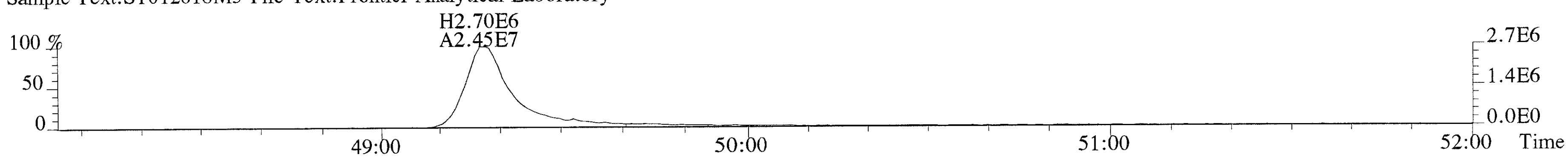
File:26JAN18M #1-360 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
459.7348 S:22 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



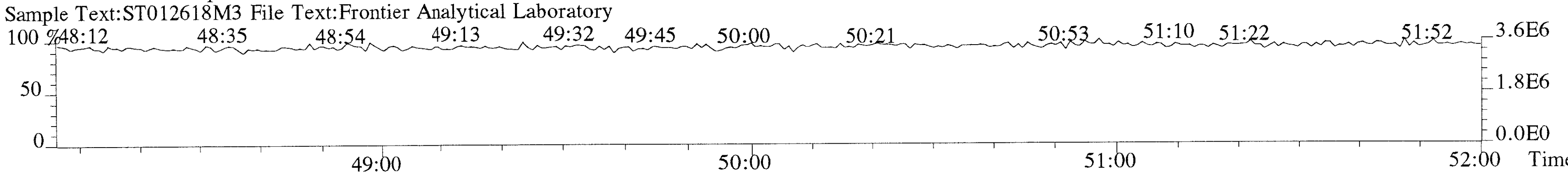
File:26JAN18M #1-360 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
469.7780 S:22 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



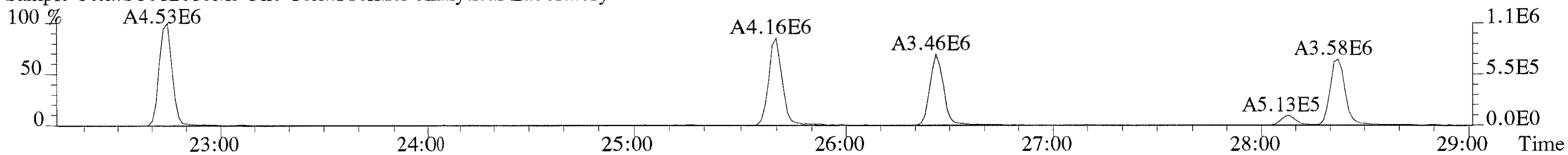
File:26JAN18M #1-360 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
471.7750 S:22 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



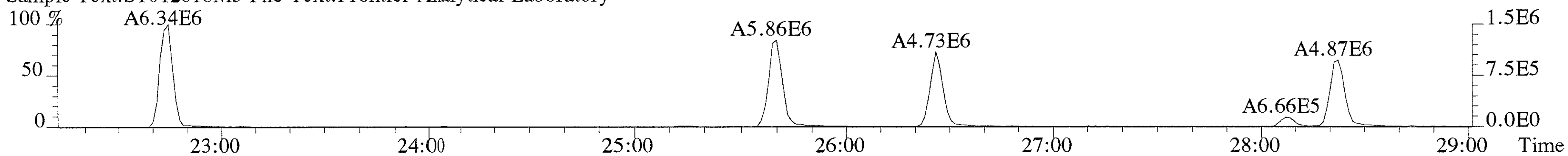
File:26JAN18M #1-360 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
454.9728 S:22 F:5 Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



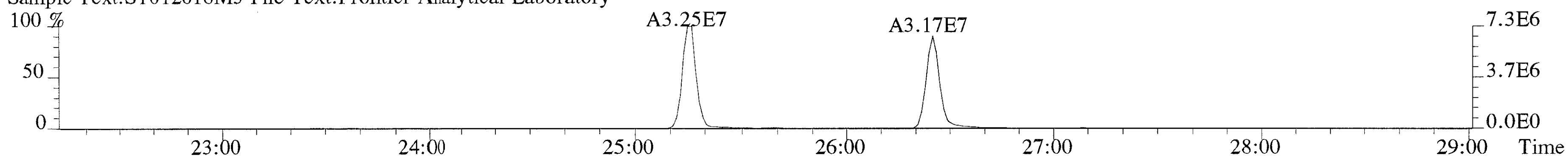
File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
303.9016 S:22 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



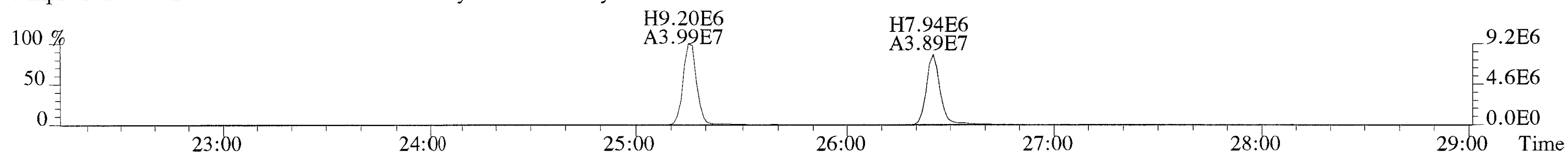
File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
305.8987 S:22 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



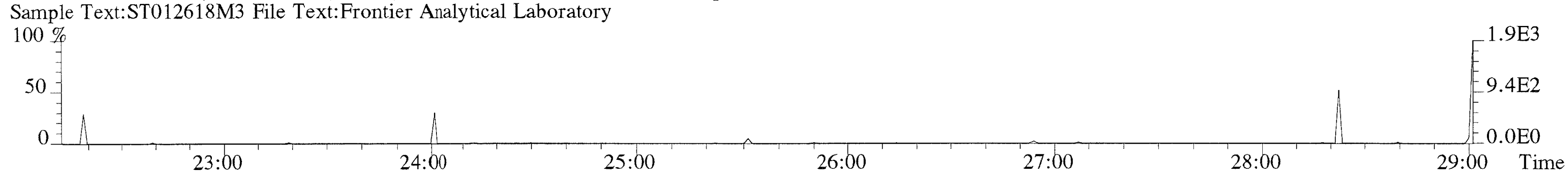
File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
315.9419 S:22 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



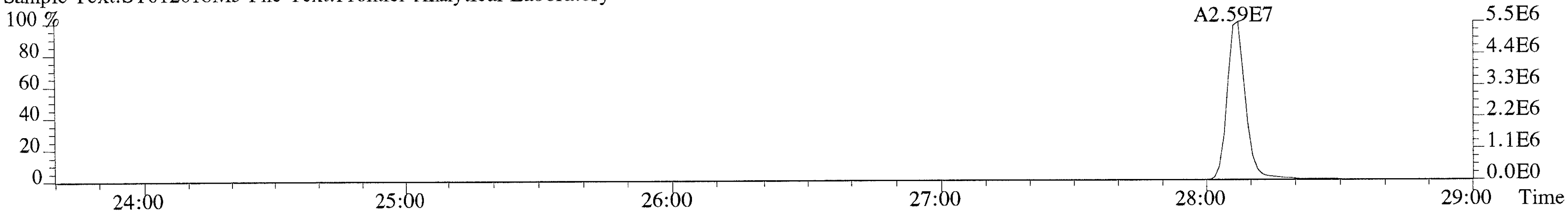
File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
317.9389 S:22 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



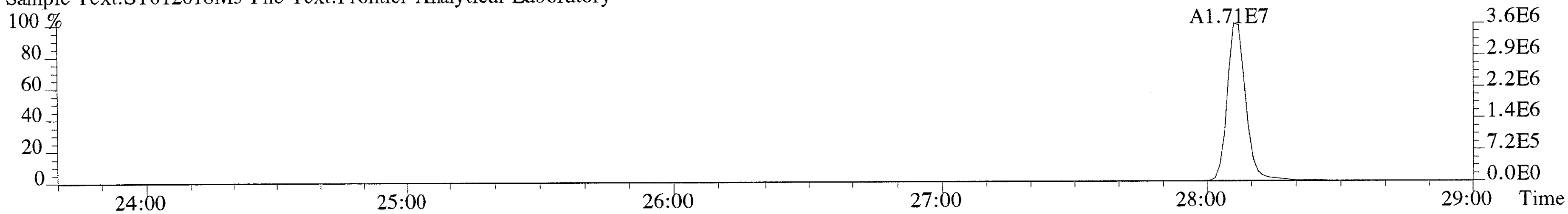
File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
375.8364 S:22 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



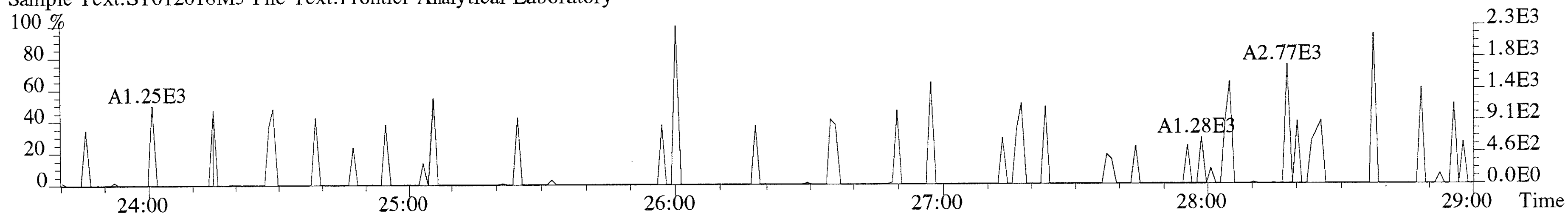
File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:22 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



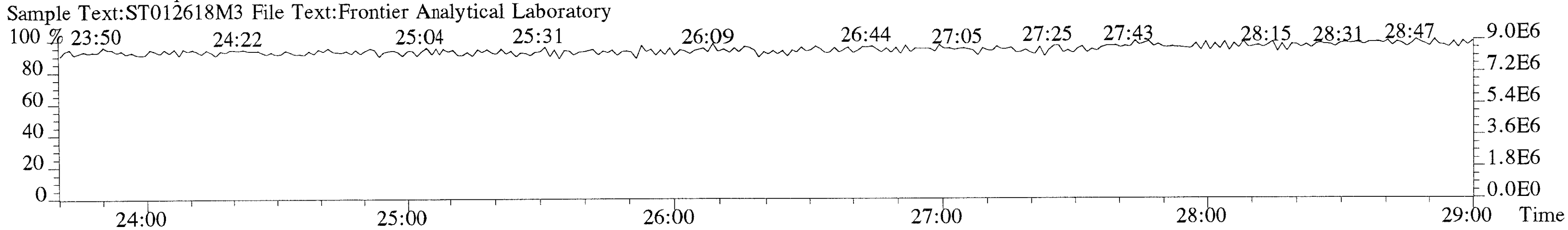
File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:22 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



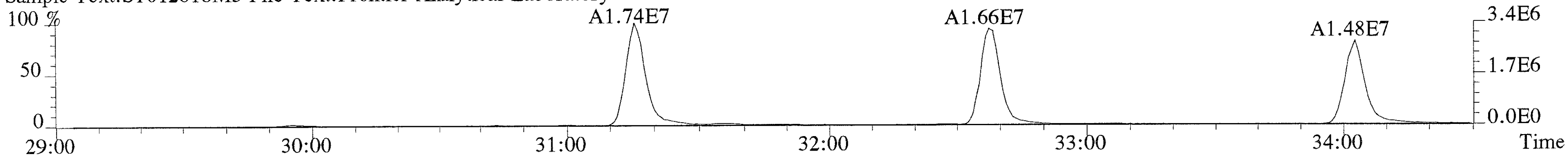
File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:22 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



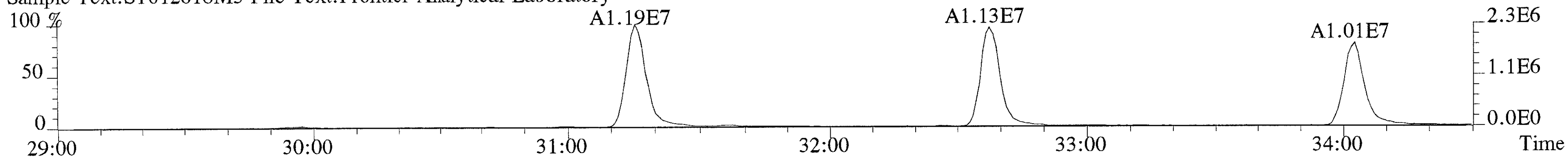
File:26JAN18M #1-381 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
330.9792 S:22 Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



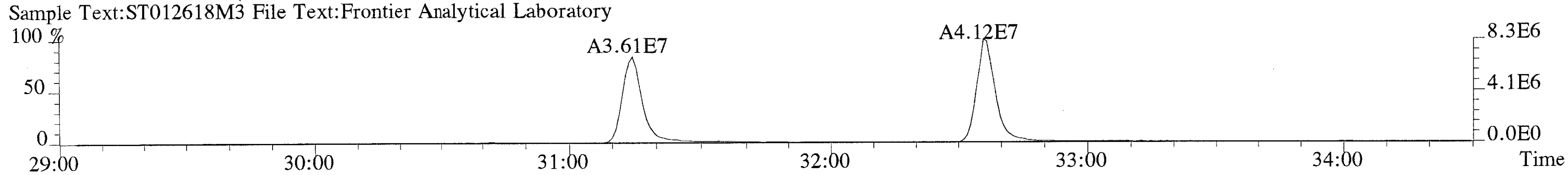
File:26JAN18M #1-423 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
339.8597 S:22 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



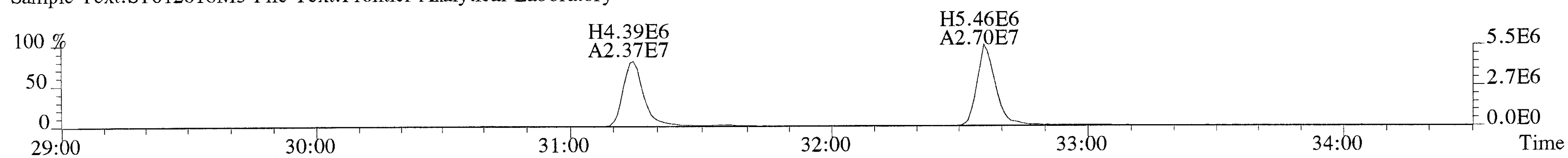
File:26JAN18M #1-423 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
341.8568 S:22 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



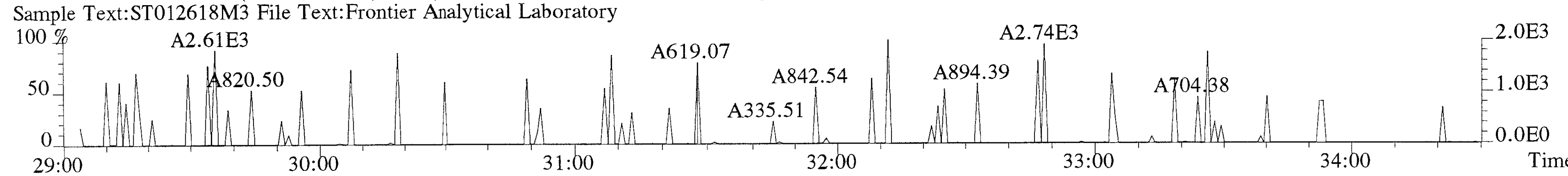
File:26JAN18M #1-423 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
351.9000 S:22 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



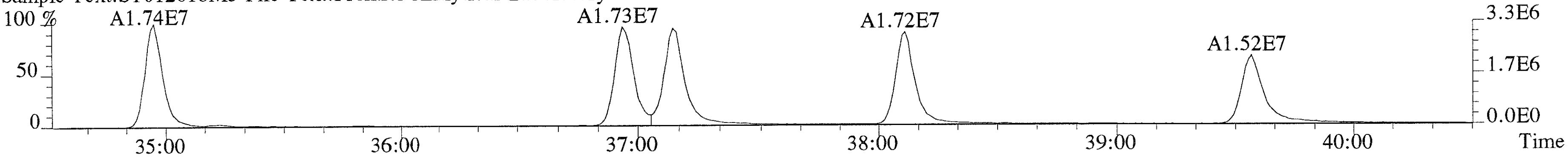
File:26JAN18M #1-423 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
353.8970 S:22 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



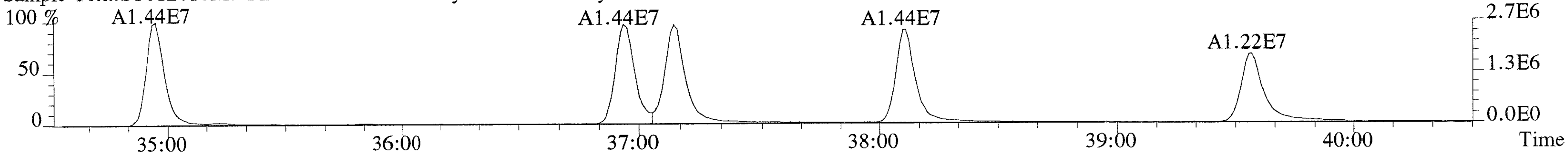
File:26JAN18M #1-423 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
409.7974 S:22 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



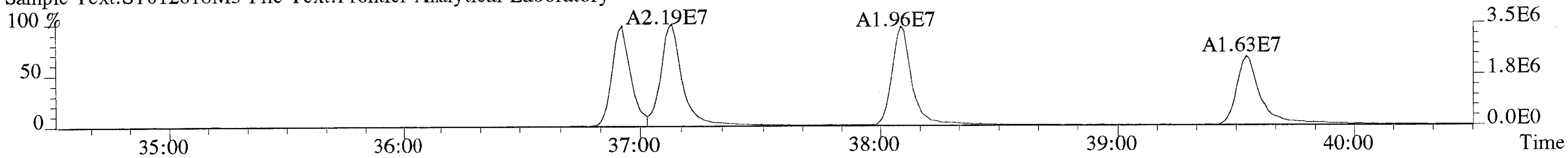
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
373.8207 S:22 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



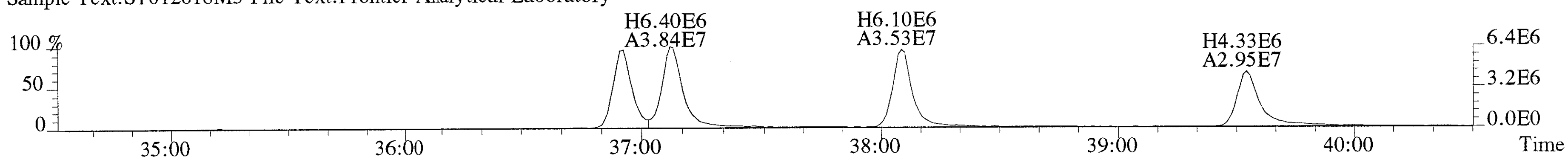
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
375.8178 S:22 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



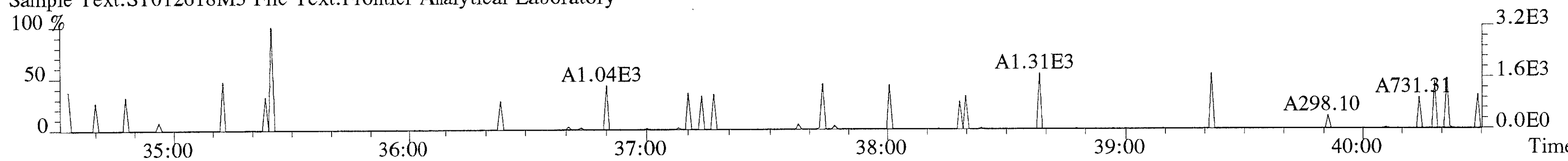
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:22 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



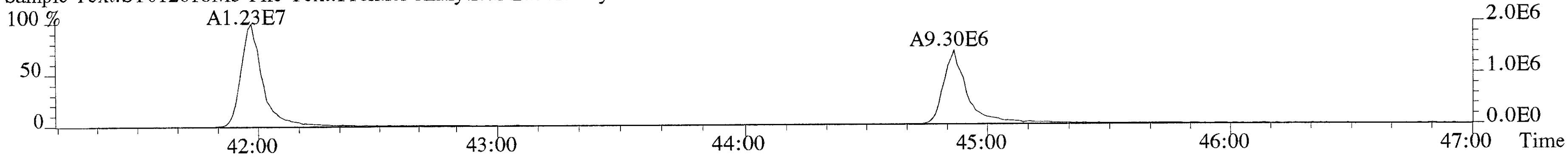
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
385.8610 S:22 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



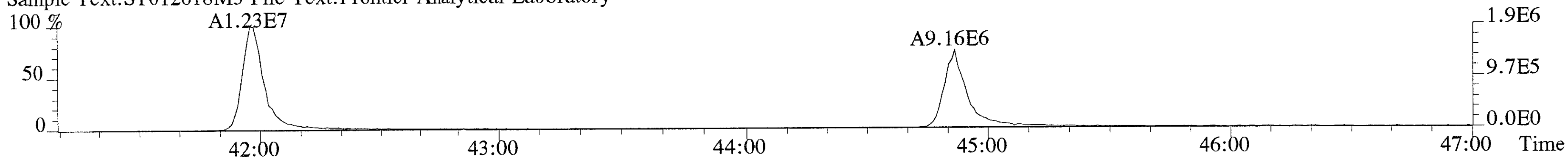
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
445.7555 S:22 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



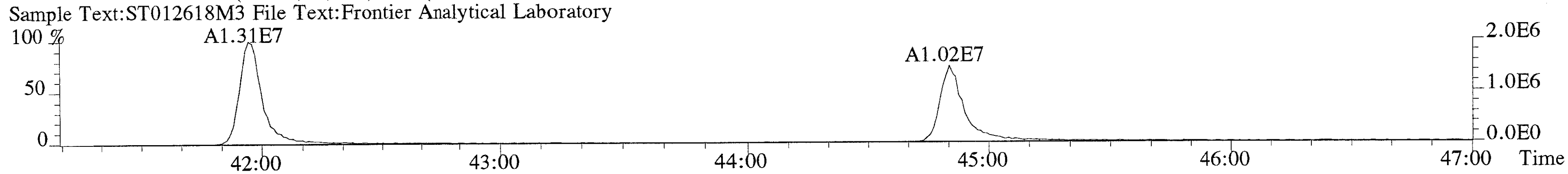
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:22 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



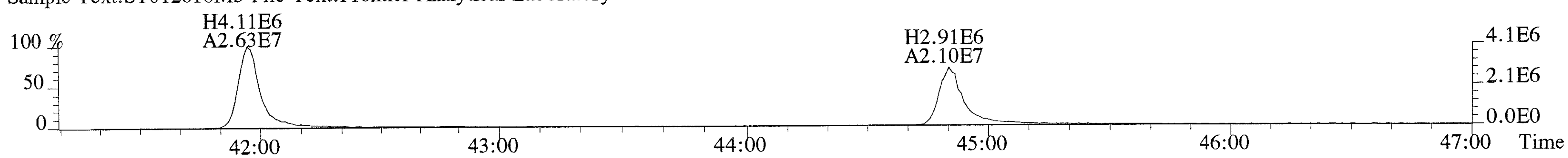
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
409.7788 S:22 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



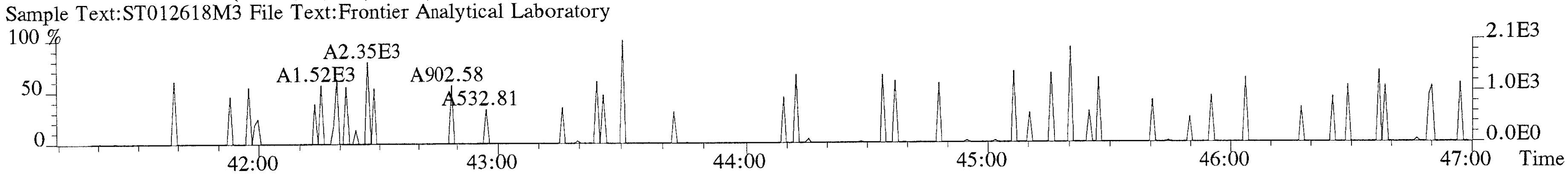
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
417.8253 S:22 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
419.8220 S:22 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



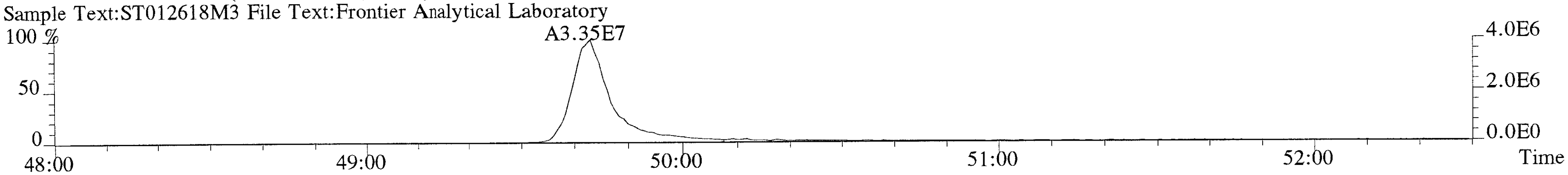
File:26JAN18M #1-521 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:22 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



File:26JAN18M #1-360 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:22 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory

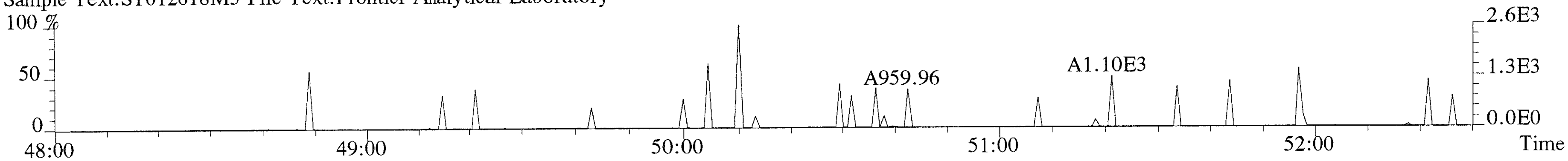
File:26JAN18M #1-360 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
443.7398 S:22 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory

File:26JAN18M #1-360 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:22 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory

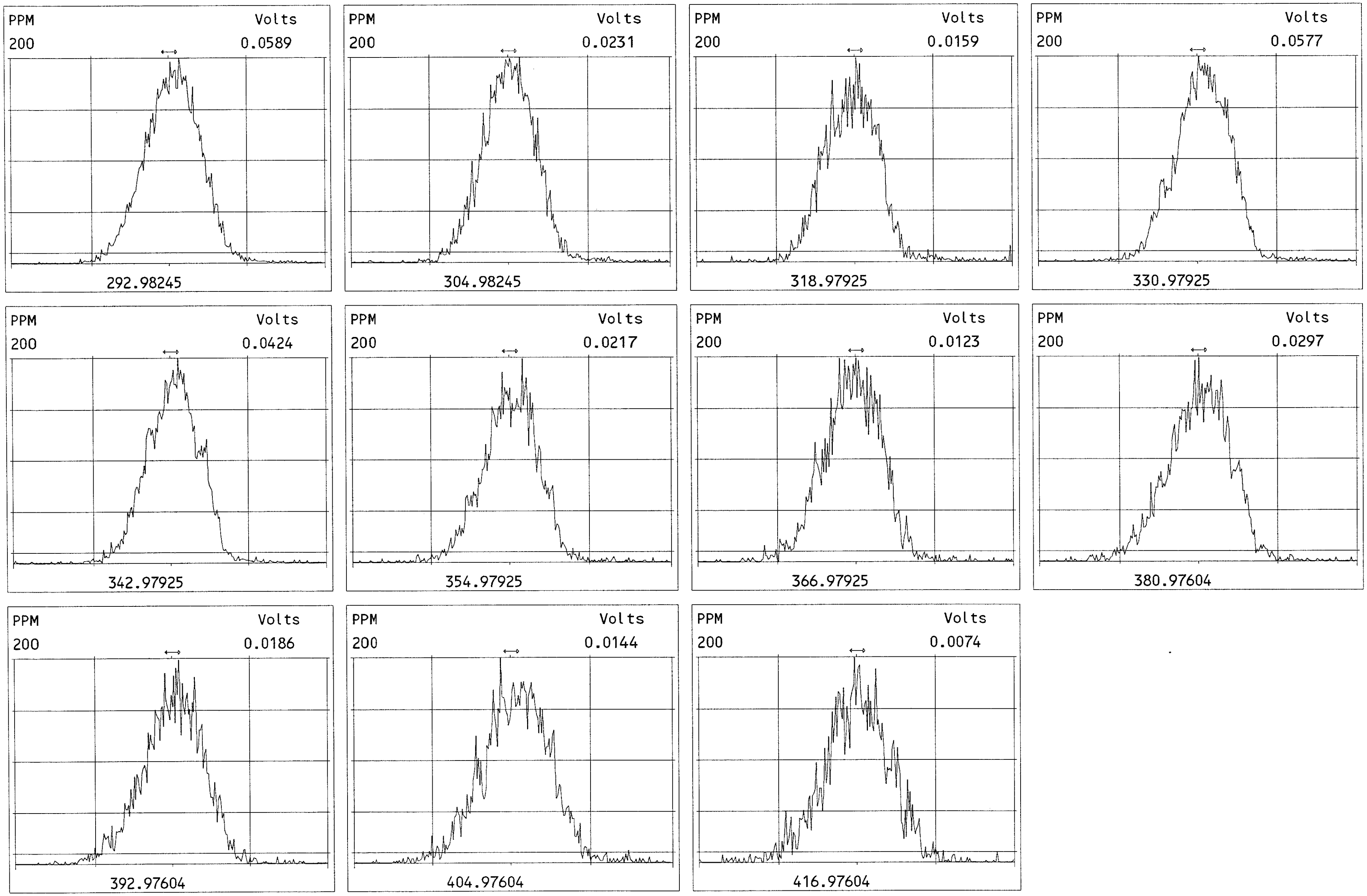


File:26JAN18M #1-360 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:22 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory

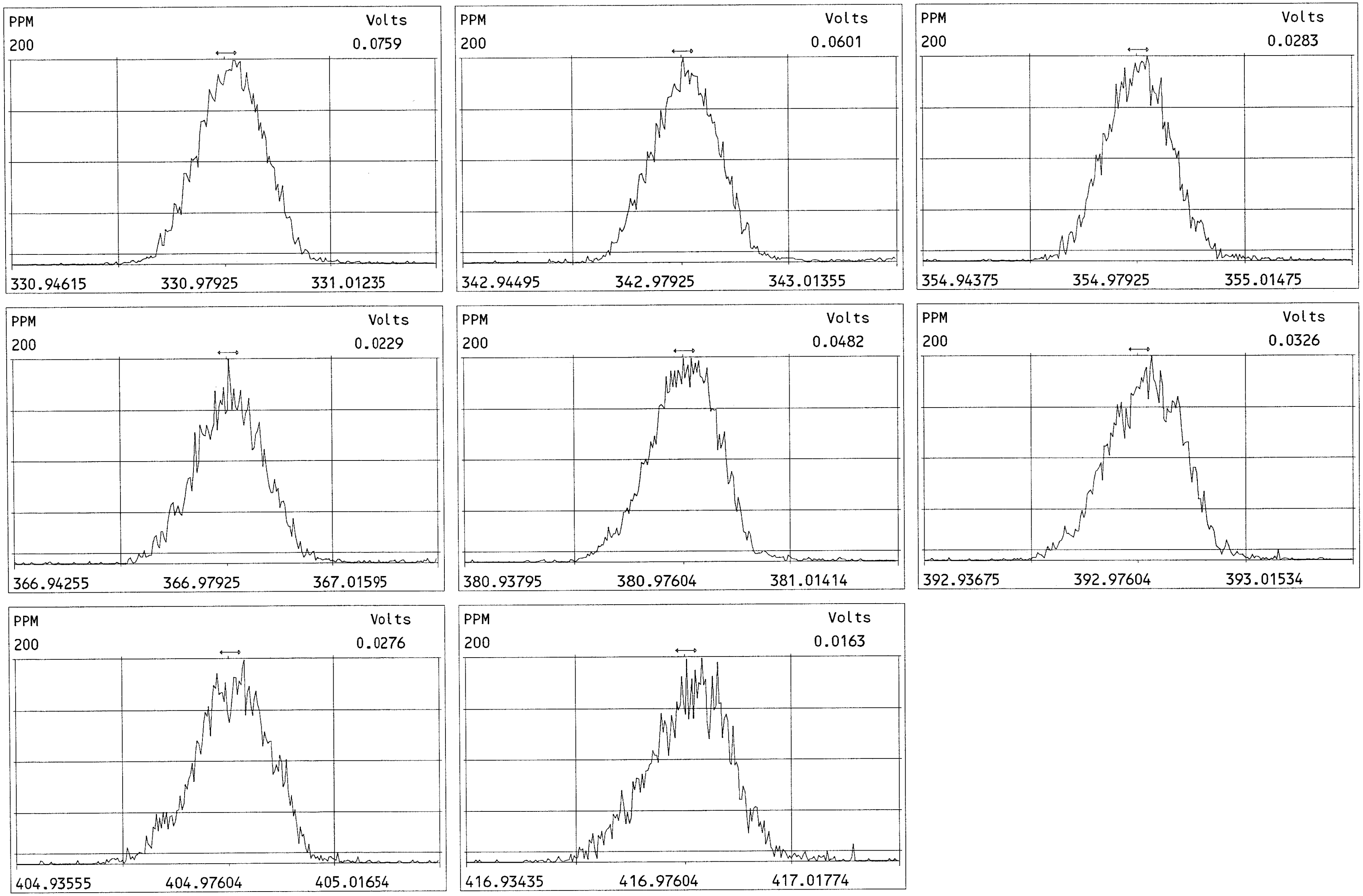
File:26JAN18M #1-360 Acq:27-JAN-2018 08:43:41 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:22 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST012618M3 File Text:Frontier Analytical Laboratory



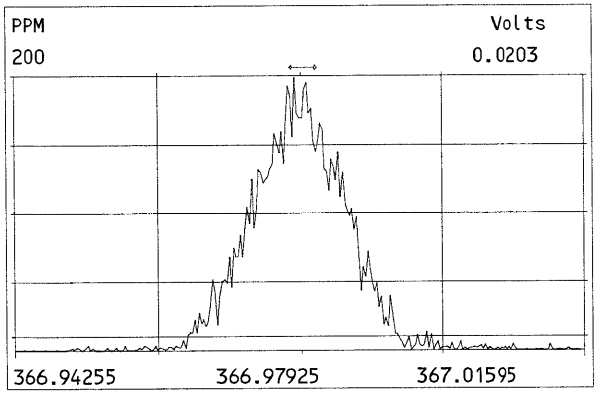
Peak Locate Examination:27-JAN-2018:09:40 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:1 Reference:PFK

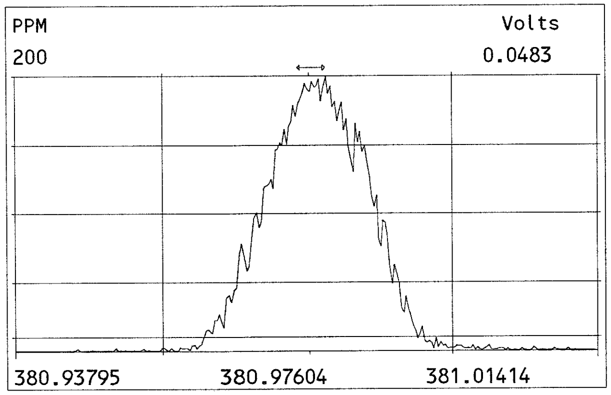


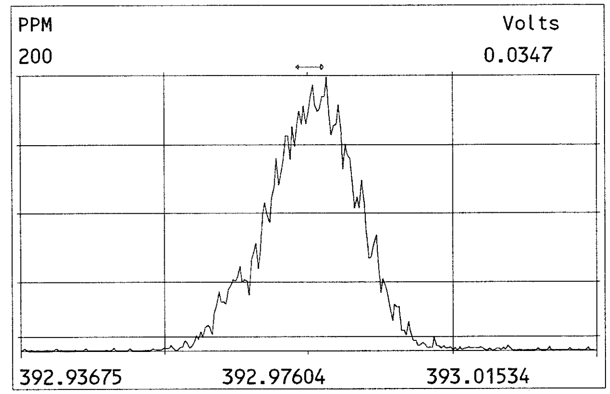
Peak Locate Examination:27-JAN-2018:09:42 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:2 Reference:PFK

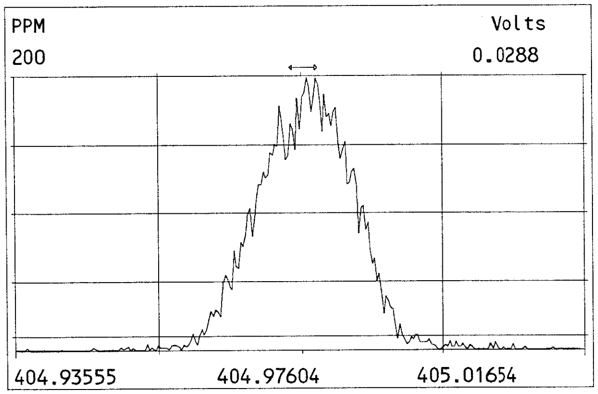


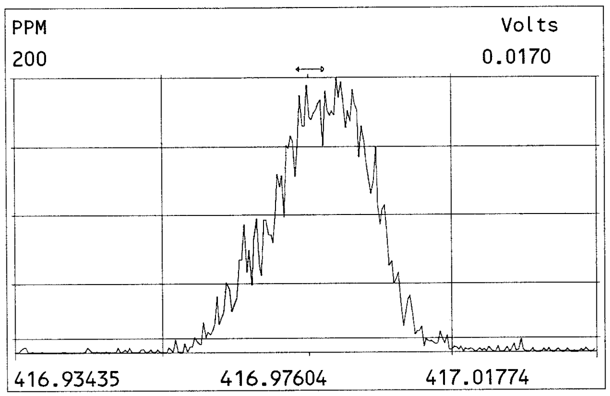
Peak Locate Examination:27-JAN-2018:09:44 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:3 Reference:PFK

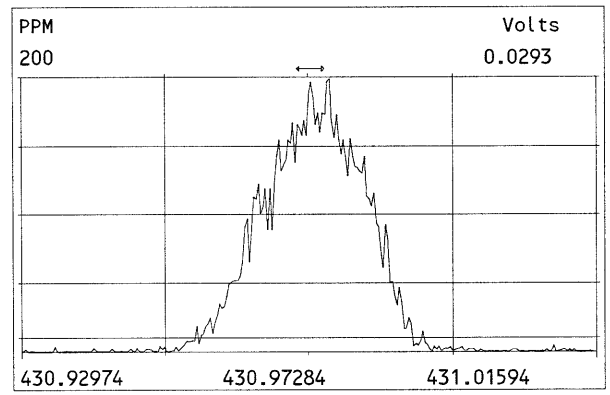


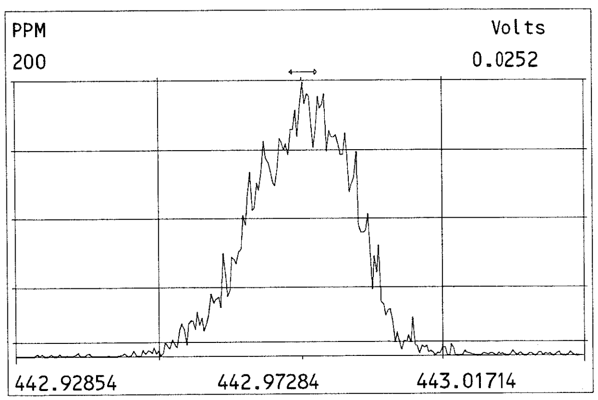


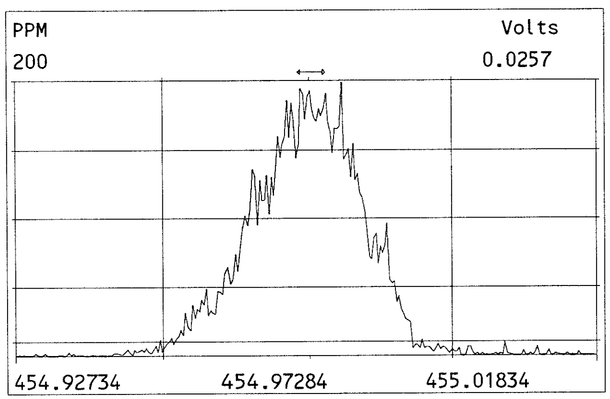




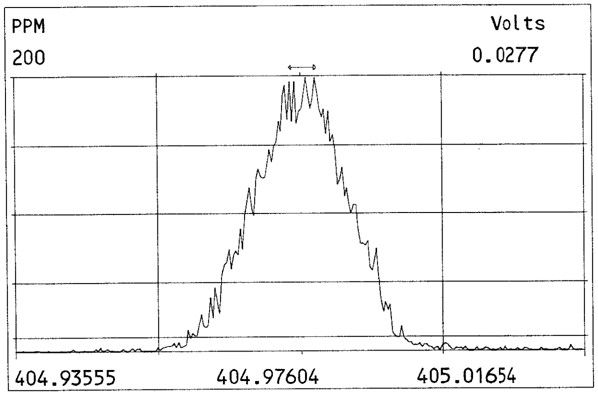


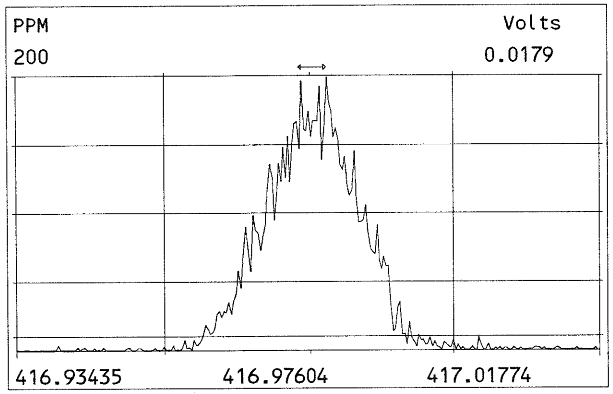


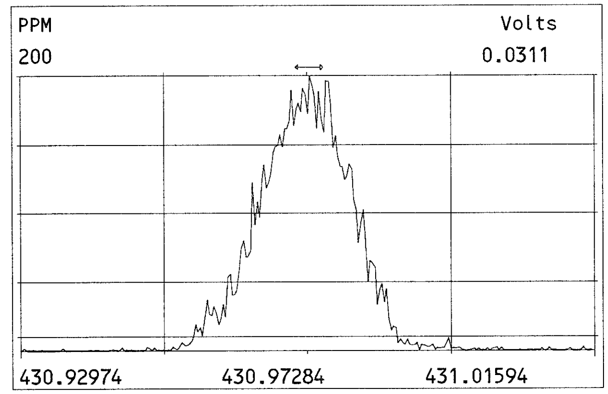


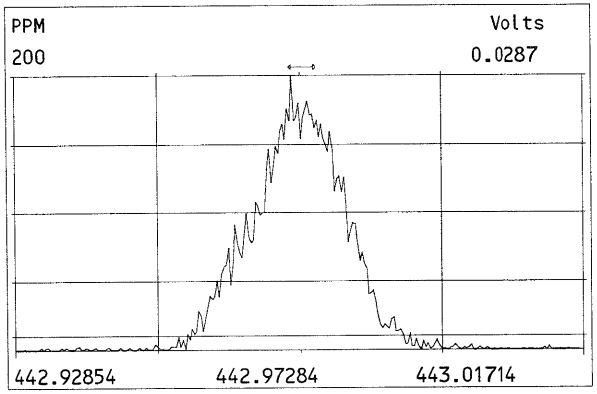


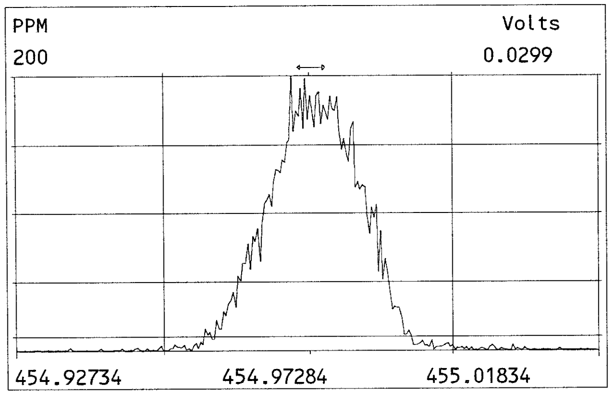
Peak Locate Examination:27-JAN-2018:09:46 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:4 Reference:PFK

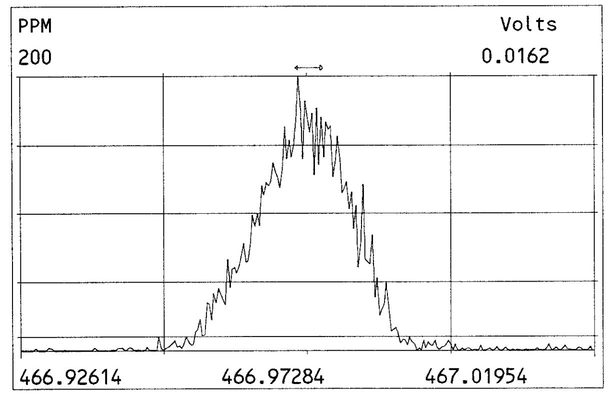


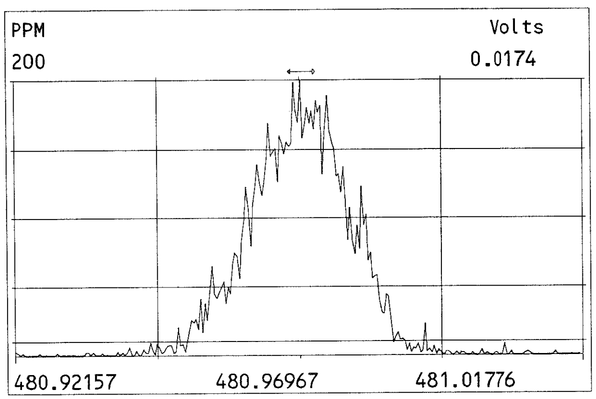




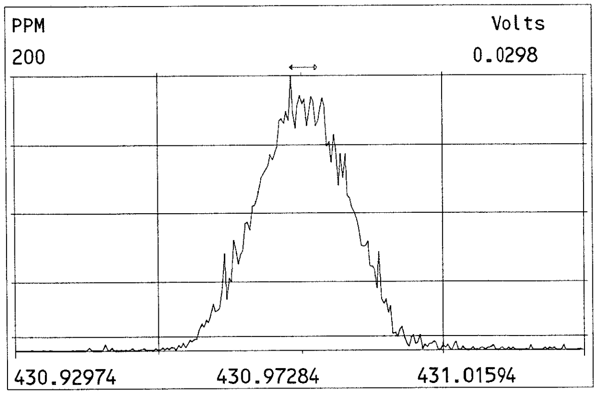


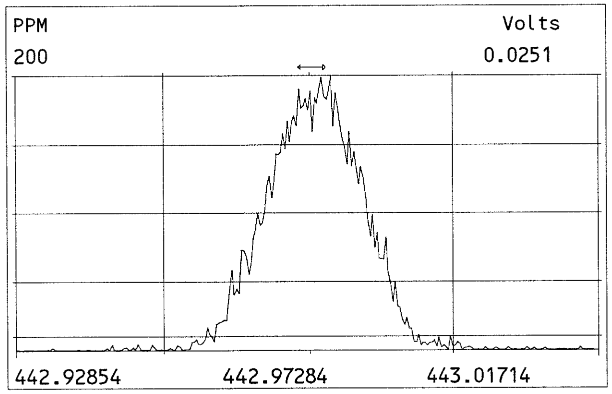


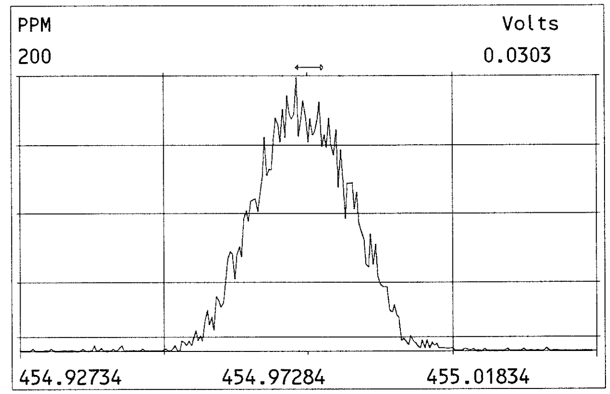


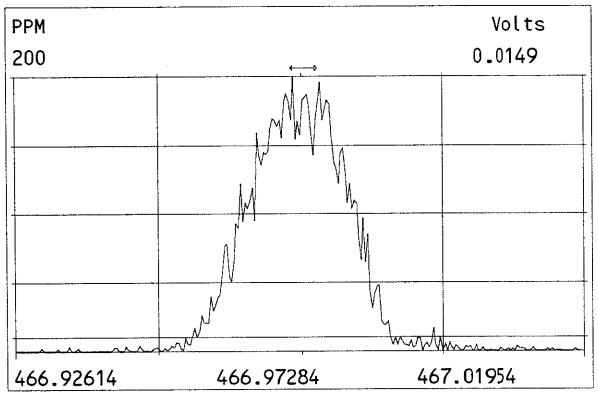


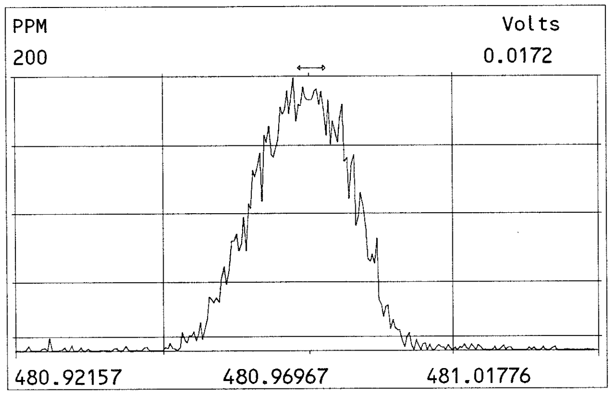
Peak Locate Examination:27-JAN-2018:09:48 File:26JAN18M_RES_CHECK
Experiment:PCDD Function:5 Reference:PFK

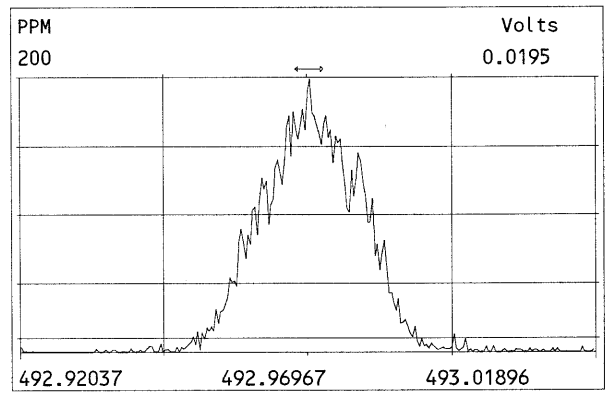


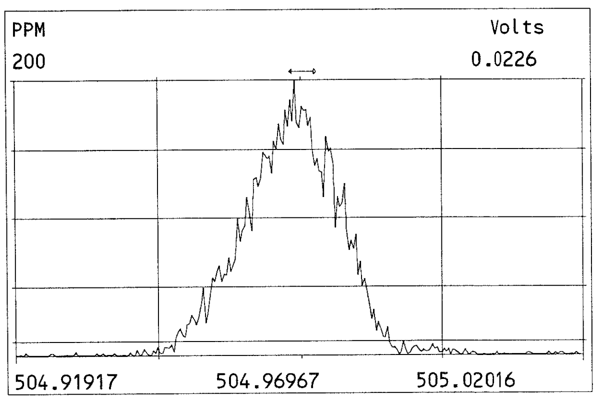


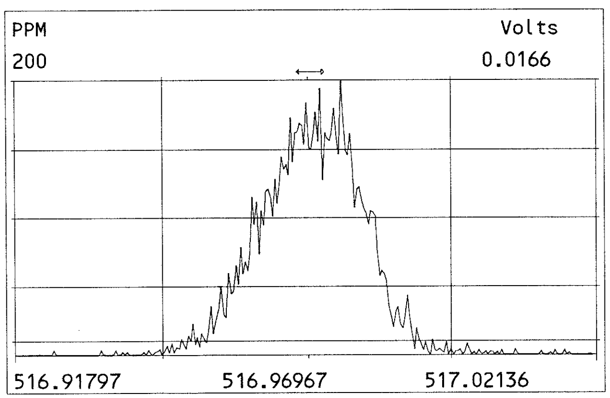












FRONTIER ANALYTICAL LABORATORY

January 15, 2019

FAL Project: 12096

Mr. Michael Erdahl
Friedman and Bruya, Inc.
3012 16th Ave. W
Seattle, WA 98119

Dear Mr. Erdahl,

The following results are associated with Frontier Analytical Laboratory project **12096**. This corresponds to your project number **812310** and purchase order number **A-673**. Five aqueous samples were received on 12/27/2018 in good condition. These samples were extracted and analyzed by EPA Method 8290 for tetra through octa chlorinated dibenzo dioxins and furans. The Toxic Equivalency (TEQ) for your samples has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Freidman and Bruya, Inc. requested a turnaround time of fifteen business days for project **12096**.

The following report consists of an Analytical Data section and a Sample Receipt section. The Analytical Data section contains our sample tracking log and the analytical results. The Sample Receipt section contains your chain of custody, our sample login form and the sample photos. The enclosed results and electronic data deliverable (EDD) are specifically for the samples referenced in this report only. These results meet all NELAP requirements and shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP certificate number is **4041**, our State of California ELAP certificate number is **2934** and our State of Washington certificate number is **C844**. This report along with the associated EDD has been emailed to you. A hardcopy of this report will not be sent to you unless specifically requested.

If you have any questions regarding project **12096**, please feel free to contact me at (916) 934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,

Bradley B. Silverbush
Director of Operations

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: **12096**

Received on: **12/27/2018** Project Due: **01/21/2019** Storage: **R-4**

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
12096-001-SA	0	812310	AMW-1-122018	EPA 8290 D/F	Aqueous	12/20/2018	09:20 am	01/19/2019
12096-002-SA	0	812310	AMW-2-122018	EPA 8290 D/F	Aqueous	12/20/2018	10:31 am	01/19/2019
12096-003-SA	0	812310	AMW-3-122018	EPA 8290 D/F	Aqueous	12/20/2018	01:00 pm	01/19/2019
12096-004-SA	0	812310	AMW-4-122018	EPA 8290 D/F	Aqueous	12/20/2018	11:55 am	01/19/2019
12096-005-SA	0	812310	AMW-5-122018	EPA 8290 D/F	Aqueous	12/20/2018	11:10 am	01/19/2019

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com

EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12096-001-MB	Date Extracted: 01-11-2019	ICal: PCDDFAL4-1-7-19	Acquired: 01-14-2019
Client ID: Method Blank	Date Received: NA	GC Column: DB5MS	2005 WHO TEQ: 0.0
Matrix: Aqueous	Amount: 1.000 L	Units: pg/L	
Batch No: X4766			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.770		-	0.178				
1,2,3,7,8-PeCDD	ND	0.921		-	0.289				
1,2,3,4,7,8-HxCDD	ND	1.08		-	0.311				
1,2,3,6,7,8-HxCDD	ND	1.08		-	0.370	Total TCDD	ND	0.770	
1,2,3,7,8,9-HxCDD	ND	1.01		-	0.324	Total PeCDD	ND	0.921	
1,2,3,4,6,7,8-HpCDD	ND	1.38		-	0.393	Total HxCDD	ND	1.08	
OCDD	ND	2.47		-	1.10	Total HpCDD	ND	1.38	
2,3,7,8-TCDF	ND	0.527		-	0.174				
1,2,3,7,8-PeCDF	ND	0.732		-	0.300				
2,3,4,7,8-PeCDF	ND	0.718		-	0.311				
1,2,3,4,7,8-HxCDF	ND	0.651		-	0.290				
1,2,3,6,7,8-HxCDF	ND	0.733		-	0.264				
2,3,4,6,7,8-HxCDF	ND	0.780		-	0.318				
1,2,3,7,8,9-HxCDF	ND	0.808		-	0.359	Total TCDF	ND	0.527	
1,2,3,4,6,7,8-HpCDF	ND	1.10		-	0.346	Total PeCDF	ND	0.732	
1,2,3,4,7,8,9-HpCDF	ND	1.37		-	0.484	Total HxCDF	ND	0.808	
OCDF	ND	2.36		-	0.858	Total HpCDF	ND	1.37	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	92.5	40.0 - 135	
13C-1,2,3,7,8-PeCDD	93.9	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	92.8	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	93.8	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	88.8	40.0 - 135	
13C-OCDD	86.8	40.0 - 135	
13C-2,3,7,8-TCDF	96.8	40.0 - 135	
13C-1,2,3,7,8-PeCDF	89.6	40.0 - 135	
13C-2,3,4,7,8-PeCDF	92.4	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	87.9	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	93.9	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	91.9	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	92.6	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	86.6	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	91.1	40.0 - 135	
13C-OCDF	87.6	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	85.2	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ________

Date: 1/15/2019

Reviewed By: ________

Date: 1/15/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12096-001-OPR	Date Extracted: 01-11-2019	ICal: PCDDFAL4-1-7-19	Acquired: 01-14-2019
Client ID: OPR	Date Received: NA	GC Column: DB5MS	2005 WHO TEQ: NA
Matrix: Aqueous	Amount: 1.000 L	Units: ng/ml	
Batch No: X4766			

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	9.64	7.00 - 13.0	
1,2,3,7,8-PeCDD	46.8	35.0 - 65.0	
1,2,3,4,7,8-HxCDD	45.3	35.0 - 65.0	
1,2,3,6,7,8-HxCDD	45.3	35.0 - 65.0	
1,2,3,7,8,9-HxCDD	45.2	35.0 - 65.0	
1,2,3,4,6,7,8-HpCDD	46.4	35.0 - 65.0	
OCDD	89.9	70.0 - 130	
2,3,7,8-TCDF	9.09	7.00 - 13.0	
1,2,3,7,8-PeCDF	46.5	35.0 - 65.0	
2,3,4,7,8-PeCDF	45.6	35.0 - 65.0	
1,2,3,4,7,8-HxCDF	46.2	35.0 - 65.0	
1,2,3,6,7,8-HxCDF	45.8	35.0 - 65.0	
2,3,4,6,7,8-HxCDF	45.3	35.0 - 65.0	
1,2,3,7,8,9-HxCDF	45.7	35.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	46.6	35.0 - 65.0	
1,2,3,4,7,8,9-HpCDF	46.4	35.0 - 65.0	
OCDF	91.0	70.0 - 130	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	87.7	40.0 - 135	
13C-1,2,3,7,8-PeCDD	78.9	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	77.9	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	77.8	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	72.8	40.0 - 135	
13C-OCDD	75.1	40.0 - 135	
13C-2,3,7,8-TCDF	94.0	40.0 - 135	
13C-1,2,3,7,8-PeCDF	75.8	40.0 - 135	
13C-2,3,4,7,8-PeCDF	79.6	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	73.6	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	76.4	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	76.9	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	76.7	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	70.8	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	75.7	40.0 - 135	
13C-OCDF	76.3	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	88.9	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________________

Date: 1/15/2019

Reviewed By: ____________________

Date: 1/15/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12096-001-SA	Date Extracted: 01-11-2019	ICal: PCDDFAL4-1-7-19	Acquired: 01-14-2019
Client ID: AMW-1-122018	Date Received: 12-27-2018	GC Column: DB5MS	2005 WHO TEQ: 0.0
Matrix: Aqueous	Amount: 0.475 L	Units: pg/L	
Batch No: X4766			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	1.13		-	0.178				
1,2,3,7,8-PeCDD	ND	1.74		-	0.289				
1,2,3,4,7,8-HxCDD	ND	2.05		-	0.311				
1,2,3,6,7,8-HxCDD	ND	1.89		-	0.370	Total TCDD	ND	1.13	
1,2,3,7,8,9-HxCDD	ND	1.84		-	0.324	Total PeCDD	ND	1.74	
1,2,3,4,6,7,8-HpCDD	ND	3.62		-	0.393	Total HxCDD	ND	2.05	
OCDD	ND	4.66		-	1.10	Total HpCDD	ND	3.62	
2,3,7,8-TCDF	ND	0.797		-	0.174				
1,2,3,7,8-PeCDF	ND	1.75		-	0.300				
2,3,4,7,8-PeCDF	ND	1.82		-	0.311				
1,2,3,4,7,8-HxCDF	ND	1.99		-	0.290				
1,2,3,6,7,8-HxCDF	ND	2.11		-	0.264				
2,3,4,6,7,8-HxCDF	ND	2.31		-	0.318				
1,2,3,7,8,9-HxCDF	ND	2.62		-	0.359	Total TCDF	ND	0.797	
1,2,3,4,6,7,8-HpCDF	ND	2.65		-	0.346	Total PeCDF	ND	1.82	
1,2,3,4,7,8,9-HpCDF	ND	2.36		-	0.484	Total HxCDF	ND	2.62	
OCDF	ND	3.30		-	0.858	Total HpCDF	ND	2.65	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	76.6	40.0 - 135	
13C-1,2,3,7,8-PeCDD	71.6	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	74.3	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	77.1	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	74.1	40.0 - 135	
13C-OCDD	78.6	40.0 - 135	
13C-2,3,7,8-TCDF	78.5	40.0 - 135	
13C-1,2,3,7,8-PeCDF	71.1	40.0 - 135	
13C-2,3,4,7,8-PeCDF	71.6	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	68.9	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	74.2	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	72.4	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	74.0	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	71.4	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	74.0	40.0 - 135	
13C-OCDF	78.1	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	75.0	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ______

Date: 1/15/2019

Reviewed By: ______

Date: 1/15/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12096-002-SA	Date Extracted: 01-11-2019	ICal: PCDDFAL4-1-7-19	Acquired: 01-14-2019
Client ID: AMW-2-122018	Date Received: 12-27-2018	GC Column: DB5MS	2005 WHO TEQ: 0.00342
Matrix: Aqueous	Amount: 0.479 L	Units: pg/L	
Batch No: X4766			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	1.06		-	0.178				
1,2,3,7,8-PeCDD	ND	1.98		-	0.289				
1,2,3,4,7,8-HxCDD	ND	2.92		-	0.311				
1,2,3,6,7,8-HxCDD	ND	3.13		-	0.370	Total TCDD	ND	1.06	
1,2,3,7,8,9-HxCDD	ND	2.83		-	0.324	Total PeCDD	ND	1.98	
1,2,3,4,6,7,8-HpCDD	ND	3.60		-	0.393	Total HxCDD	ND	3.13	
OCDD	11.4	-	J	0.00342	1.10	Total HpCDD	ND	3.60	
2,3,7,8-TCDF	ND	0.988		-	0.174				
1,2,3,7,8-PeCDF	ND	2.17		-	0.300				
2,3,4,7,8-PeCDF	ND	2.33		-	0.311				
1,2,3,4,7,8-HxCDF	ND	1.92		-	0.290				
1,2,3,6,7,8-HxCDF	ND	1.95		-	0.264				
2,3,4,6,7,8-HxCDF	ND	2.18		-	0.318				
1,2,3,7,8,9-HxCDF	ND	2.91		-	0.359	Total TCDF	ND	0.988	
1,2,3,4,6,7,8-HpCDF	ND	2.74		-	0.346	Total PeCDF	ND	2.33	
1,2,3,4,7,8,9-HpCDF	ND	3.42		-	0.484	Total HxCDF	ND	2.91	
OCDF	ND	4.86		-	0.858	Total HpCDF	ND	3.42	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	69.6	40.0 - 135	
13C-1,2,3,7,8-PeCDD	67.7	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	72.1	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	73.1	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	73.2	40.0 - 135	
13C-OCDD	80.5	40.0 - 135	
13C-2,3,7,8-TCDF	68.8	40.0 - 135	
13C-1,2,3,7,8-PeCDF	66.4	40.0 - 135	
13C-2,3,4,7,8-PeCDF	65.2	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	66.3	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	69.2	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	64.7	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	67.6	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	71.5	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	72.4	40.0 - 135	
13C-OCDF	79.3	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	76.9	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________

Date: 1/15/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12096-003-SA
Client ID: AMW-3-122018
Matrix: Aqueous
Batch No: X4766

Date Extracted: 01-11-2019
Date Received: 12-27-2018
Amount: 0.481 L

ICal: PCDDFAL4-1-7-19
GC Column: DB5MS
Units: pg/L

Acquired: 01-14-2019
2005 WHO TEQ: 0.00168

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.952		-	0.178				
1,2,3,7,8-PeCDD	ND	1.82		-	0.289				
1,2,3,4,7,8-HxCDD	ND	2.49		-	0.311				
1,2,3,6,7,8-HxCDD	ND	2.61		-	0.370	Total TCDD	ND	0.952	
1,2,3,7,8,9-HxCDD	ND	2.39		-	0.324	Total PeCDD	ND	1.82	
1,2,3,4,6,7,8-HpCDD	ND	3.27		-	0.393	Total HxCDD	ND	2.61	
OCDD	5.61	-	J	0.00168	1.10	Total HpCDD	ND	3.27	
2,3,7,8-TCDF	ND	0.702		-	0.174				
1,2,3,7,8-PeCDF	ND	1.50		-	0.300				
2,3,4,7,8-PeCDF	ND	1.49		-	0.311				
1,2,3,4,7,8-HxCDF	ND	1.76		-	0.290				
1,2,3,6,7,8-HxCDF	ND	1.85		-	0.264				
2,3,4,6,7,8-HxCDF	ND	1.95		-	0.318				
1,2,3,7,8,9-HxCDF	ND	2.28		-	0.359	Total TCDF	ND	0.702	
1,2,3,4,6,7,8-HpCDF	ND	1.88		-	0.346	Total PeCDF	ND	1.50	
1,2,3,4,7,8,9-HpCDF	ND	2.60		-	0.484	Total HxCDF	ND	2.28	
OCDF	ND	3.59		-	0.858	Total HpCDF	ND	2.60	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	88.9	40.0 - 135	
13C-1,2,3,7,8-PeCDD	85.5	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	86.9	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	89.6	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	89.3	40.0 - 135	
13C-OCDD	99.5	40.0 - 135	
13C-2,3,7,8-TCDF	94.4	40.0 - 135	
13C-1,2,3,7,8-PeCDF	87.5	40.0 - 135	
13C-2,3,4,7,8-PeCDF	87.5	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	80.8	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	84.9	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	85.5	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	87.2	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	85.8	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	87.5	40.0 - 135	
13C-OCDF	93.2	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	88.5	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________________

Date: 1/15/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12096-004-SA
Client ID: AMW-4-122018
Matrix: Aqueous
Batch No: X4766

Date Extracted: 01-11-2019
Date Received: 12-27-2018
Amount: 0.480 L

ICal: PCDDFAL4-1-7-19
GC Column: DB5MS
Units: pg/L

Acquired: 01-14-2019
2005 WHO TEQ: 0.00318

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.914		-	0.178				
1,2,3,7,8-PeCDD	ND	1.46		-	0.289				
1,2,3,4,7,8-HxCDD	ND	1.83		-	0.311				
1,2,3,6,7,8-HxCDD	ND	2.02		-	0.370	Total TCDD	ND	0.914	
1,2,3,7,8,9-HxCDD	ND	1.80		-	0.324	Total PeCDD	ND	1.46	
1,2,3,4,6,7,8-HpCDD	ND	3.29		-	0.393	Total HxCDD	ND	2.02	
OCDD	10.6	-	J	0.00318	1.10	Total HpCDD	ND	3.29	
2,3,7,8-TCDF	ND	0.893		-	0.174				
1,2,3,7,8-PeCDF	ND	1.32		-	0.300				
2,3,4,7,8-PeCDF	ND	1.42		-	0.311				
1,2,3,4,7,8-HxCDF	ND	1.30		-	0.290				
1,2,3,6,7,8-HxCDF	ND	1.29		-	0.264				
2,3,4,6,7,8-HxCDF	ND	1.32		-	0.318				
1,2,3,7,8,9-HxCDF	ND	1.82		-	0.359	Total TCDF	ND	0.893	
1,2,3,4,6,7,8-HpCDF	ND	1.93		-	0.346	Total PeCDF	ND	1.42	
1,2,3,4,7,8,9-HpCDF	ND	2.48		-	0.484	Total HxCDF	ND	1.82	
OCDF	ND	3.46		-	0.858	Total HpCDF	ND	2.48	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	90.4	40.0 - 135	
13C-1,2,3,7,8-PeCDD	88.0	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	89.5	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	92.7	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	90.6	40.0 - 135	
13C-OCDD	97.0	40.0 - 135	
13C-2,3,7,8-TCDF	96.9	40.0 - 135	
13C-1,2,3,7,8-PeCDF	91.5	40.0 - 135	
13C-2,3,4,7,8-PeCDF	92.2	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	84.1	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	87.6	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	87.0	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	87.9	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	89.2	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	91.7	40.0 - 135	
13C-OCDF	94.2	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	90.2	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________

Date: 1/15/2019

Reviewed By: ____________

Date: 1/15/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12096-005-SA	Date Extracted: 01-11-2019	ICal: PCDDFAL4-1-7-19	Acquired: 01-15-2019
Client ID: AMW-5-122018	Date Received: 12-27-2018	GC Column: DB5MS	2005 WHO TEQ: 0.00318
Matrix: Aqueous	Amount: 0.483 L	Units: pg/L	
Batch No: X4766			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.790		-	0.178				
1,2,3,7,8-PeCDD	ND	1.71		-	0.289				
1,2,3,4,7,8-HxCDD	ND	2.34		-	0.311				
1,2,3,6,7,8-HxCDD	ND	2.63		-	0.370	Total TCDD	ND	0.790	
1,2,3,7,8,9-HxCDD	ND	2.32		-	0.324	Total PeCDD	ND	1.71	
1,2,3,4,6,7,8-HpCDD	ND	3.98		-	0.393	Total HxCDD	ND	2.63	
OCDD	10.6	-	J	0.00318	1.10	Total HpCDD	ND	3.98	
2,3,7,8-TCDF	ND	0.965		-	0.174				
1,2,3,7,8-PeCDF	ND	1.51		-	0.300				
2,3,4,7,8-PeCDF	ND	1.58		-	0.311				
1,2,3,4,7,8-HxCDF	ND	1.56		-	0.290				
1,2,3,6,7,8-HxCDF	ND	1.63		-	0.264				
2,3,4,6,7,8-HxCDF	ND	1.65		-	0.318				
1,2,3,7,8,9-HxCDF	ND	2.26		-	0.359	Total TCDF	ND	0.965	
1,2,3,4,6,7,8-HpCDF	ND	2.15		-	0.346	Total PeCDF	ND	1.28	
1,2,3,4,7,8,9-HpCDF	ND	2.68		-	0.484	Total HxCDF	ND	2.26	
OCDF	ND	4.33		-	0.858	Total HpCDF	ND	2.68	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	87.2	40.0 - 135	
13C-1,2,3,7,8-PeCDD	88.8	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	88.9	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	92.6	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	89.6	40.0 - 135	
13C-OCDD	101	40.0 - 135	
13C-2,3,7,8-TCDF	88.3	40.0 - 135	
13C-1,2,3,7,8-PeCDF	89.7	40.0 - 135	
13C-2,3,4,7,8-PeCDF	88.6	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	83.5	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	88.2	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	83.4	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	85.5	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	85.5	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	90.0	40.0 - 135	
13C-OCDF	94.4	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	89.2	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________________

Date: 1/15/2019

Reviewed By: ____________________

Date: 1/15/2019

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SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Frontier	
PROJECT NAME/NO. 812310	PO # A-673
REMARKS Please Email Results 12096 20C	

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:
SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

						ANALYSES REQUESTED										
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Total Organic Carbon	COD	BOD	Chloride	Sulfate	Sulfide	Dioxins/Furans 8290				Notes
AMW-1-122018		12/20/18	0920	water								X				
AMW-2-122018		↓	1031	↓								X				
AMW-3-122018		↓	1300	↓								X				
AMW-4-122018		↓	1155	↓								X				
AMW-5-122018		↓	1110	↓								X				

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Michael Erdahl	Friedman & Bruya	12/21/16	
Received by: Kathy Zepp	Kathy Zupp	Frontier	12/27/18	945
Relinquished by:				
Received by:				

FRONTIER ANALYTICAL LABORATORY

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: **12096**

Client:	Friedman & Bruya, Inc.
Client Project ID:	812310
Date Received:	12/27/2018
Time Received:	09:45 am
Received By:	KZ
Logged In By:	KZ
# of Samples Received:	5
Duplicates:	0
Storage Location:	R-4

Method of Delivery:	Fed-Ex
Tracking Number:	813795597913
Shipping Container Received Intact	Yes
Custody seals(s) present?	No
Custody seals(s) intact?	No
Sample Arrival Temperature (C)	2
Cooling Method	Blue Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	Yes
Test aqueous sample for residual Chlorine	Yes
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	Yes
pH Range of Aqueous Sample	Between 4 and 9
Anomalies or additional comments:	

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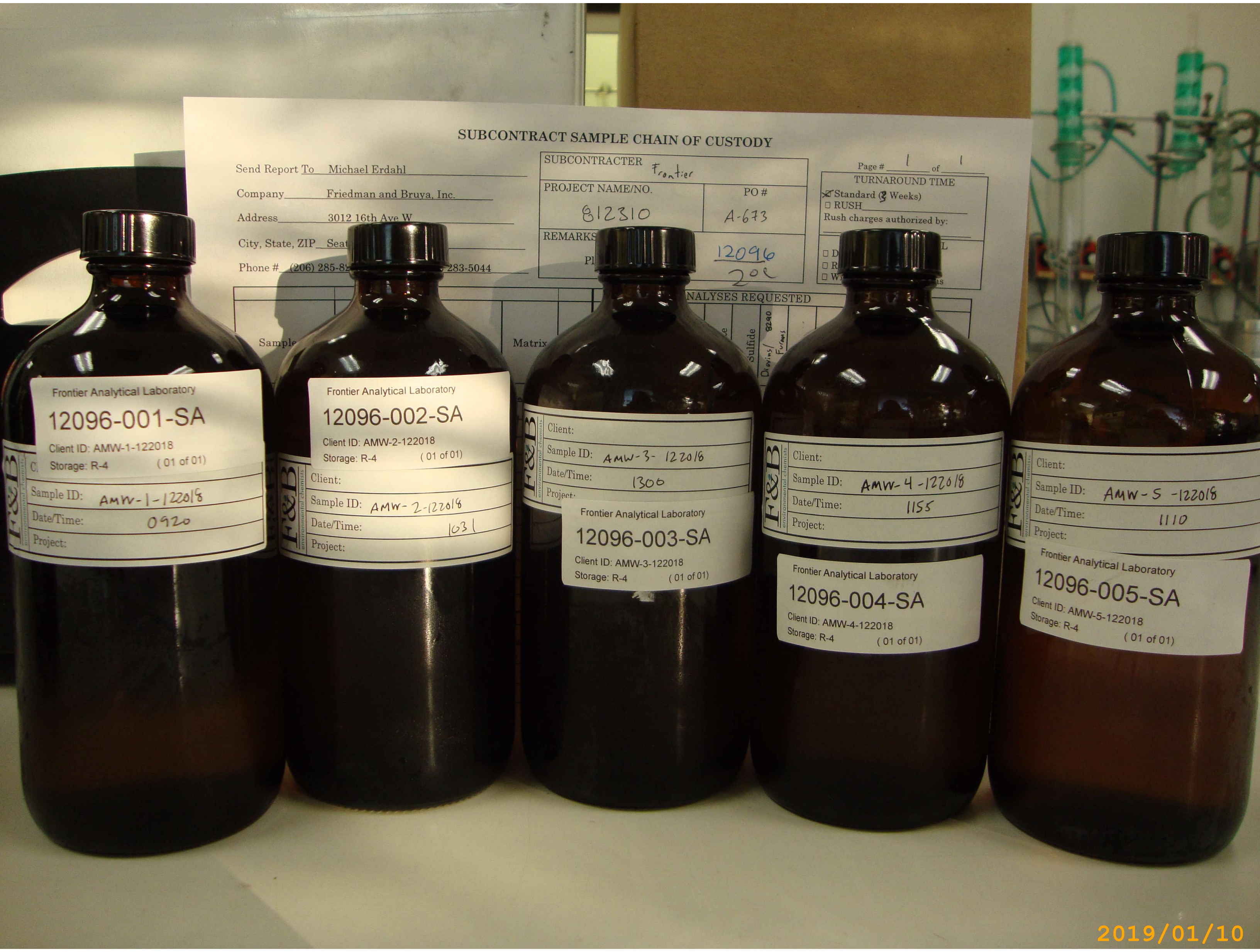
SUBCONTRACT SAMPLE CHAIN OF CUSTODY
Send Report To Michael Erdahl
Company Friedman and Bruya, Inc.
Address 3012 16th Ave W
SUBCONTRACTER Frontier
PROJECT NAME/NO. 812310
PO # A-673
12096
TURNAROUND TIME
ANALYSES REQUESTED
Frontier Analytical Laboratory
12096-001-SA
Client ID: AMW-1-122018
Storage: R-4 (01 of 01)
Sample ID: AMW-1-122018
Date/Time: 0920
Frontier Analytical Laboratory
12096-002-SA
Client ID: AMW-2-122018
Storage: R-4 (01 of 01)
Sample ID: AMW-2-122018
Date/Time: 1031
Sample ID: AMW-3-122018
Date/Time: 1300
Frontier Analytical Laboratory
12096-003-SA
Client ID: AMW-3-122018
Storage: R-4 (01 of 01)
Sample ID: AMW-4-122018
Date/Time: 1155
Frontier Analytical Laboratory
12096-004-SA
Client ID: AMW-4-122018
Storage: R-4 (01 of 01)
Sample ID: AMW-5-122018
Date/Time: 1110
Frontier Analytical Laboratory
12096-005-SA
Client ID: AMW-5-122018
Storage: R-4 (01 of 01)
2019/01/10

FRONTIER ANALYTICAL LABORATORY

NELAP ACCREDITED TNI LABORATORY

July 17, 2019

Mr. Michael Erdahl
Friedman and Bruya, Inc.
3012 16th Ave. W
Seattle, WA 98119

Dear Mr. Erdahl,

The following results are associated with Frontier Analytical Laboratory project **12520**. This corresponds to your project number **907023** and purchase order number **A-312**. Five aqueous samples were received on 7/3/2019 in good condition. All five samples were extracted and analyzed for tetra through octa chlorinated dibenzo dioxins and furans via EPA Method 8290. The Toxic Equivalency (TEQ) for your samples has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Freidman and Bruya, Inc. requested a turnaround time of fifteen business days for project **12520**.

The following Level IV report consists of an Analytical Data section, a Sample Receipt section, a Laboratory Raw Data section, and an Instrument Raw Data section. The Analytical Data section contains our project-sample tracking log and the analytical results. The Sample Receipt section contains your original chain of custody, our sample login form, and a sample photo. The Laboratory Raw Data section contains our project request sheet, a percent solids sheet, an extraction bench sheet and the cleanup bench sheet. The instrument raw data section contains three sub-sections; the sample results section, the initial calibration section and the continuing/ending calibration section. The sample results sub-section consists of the quantitation summary forms with chromatograms for all samples and QC. The initial calibration sub-section consists of the individual quantitation summary forms and chromatograms for each point of the initial calibration curve as well as an overall quantitation summary form of the initial calibration curve. The continuing/ending calibration sub-section consists of the quantitation summary forms and chromatograms for all beginning and ending calibration injections associated with the samples and QC. The Level IV data package on compact disk has been sent to you via OnTrac. The enclosed results and electronic data deliverables (EDDs) are specifically for the samples referenced in this report only. These results meet all National Environmental Laboratory Accreditation Program (NELAP) requirements and shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP Certificate number is **4041**. Our State of California ELAP certificate number is **2934** and our State of Washington certificate number is **C844**. A hardcopy of this report will not be sent to you unless specifically requested.

If you have any questions regarding project **12520**, please feel free to contact me at (916) 934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,

Bradley B. Silverbush
Director of Operations

FRONTIER
ANALYTICAL LABORATORY

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: **12520**

Received on: **07/03/2019** Project Due: **07/26/2019** Storage: **R-3**

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
12520-001-SA	0	907023	AMW-1-070119	EPA 8290 D/F	Aqueous	07/01/2019	12:01 pm	07/31/2019
12520-002-SA	0	907023	AMW-2-070119	EPA 8290 D/F	Aqueous	07/01/2019	02:25 pm	07/31/2019
12520-003-SA	0	907023	AMW-3-070119	EPA 8290 D/F	Aqueous	07/01/2019	05:25 pm	07/31/2019
12520-004-SA	0	907023	AMW-4-070119	EPA 8290 D/F	Aqueous	07/01/2019	04:00 pm	07/31/2019
12520-005-SA	0	907023	AMW-5-070119	EPA 8290 D/F	Aqueous	07/01/2019	09:00 am	07/31/2019

FAL Sample ID	Notes
12520-001-SA	'Using sample date and time from sample bottles.'
12520-002-SA	'Using sample date and time from sample bottles.'
12520-003-SA	'Using sample date and time from sample bottles.'
12520-004-SA	'Using sample date and time from sample bottles.'
12520-005-SA	'Using sample date and time from sample bottles.'

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12520-001-MB
Client ID: Method Blank
Matrix: Aqueous
Batch No: X4974

Date Extracted: 07-15-2019
Date Received: NA
Amount: 1.000 L

ICal: PCDDFAL4-3-20-19
GC Column: DB5MS
Units: pg/L

Acquired: 07-17-2019
2005 WHO TEQ: 0.0

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.560		-	0.448				
1,2,3,7,8-PeCDD	ND	0.833		-	0.473				
1,2,3,4,7,8-HxCDD	ND	0.796		-	0.548				
1,2,3,6,7,8-HxCDD	ND	0.841		-	0.525	Total TCDD	ND	0.560	
1,2,3,7,8,9-HxCDD	ND	0.767		-	0.502	Total PeCDD	ND	0.833	
1,2,3,4,6,7,8-HpCDD	ND	1.52		-	0.561	Total HxCDD	ND	0.841	
OCDD	ND	4.28		-	0.970	Total HpCDD	ND	1.52	
2,3,7,8-TCDF	ND	0.414		-	0.410				
1,2,3,7,8-PeCDF	ND	0.525		-	0.497				
2,3,4,7,8-PeCDF	ND	0.495		-	0.491				
1,2,3,4,7,8-HxCDF	ND	0.748		-	0.506				
1,2,3,6,7,8-HxCDF	ND	0.861		-	0.520				
2,3,4,6,7,8-HxCDF	ND	0.852		-	0.504				
1,2,3,7,8,9-HxCDF	ND	1.02		-	0.474	Total TCDF	ND	0.414	
1,2,3,4,6,7,8-HpCDF	ND	0.750		-	0.548	Total PeCDF	ND	0.525	
1,2,3,4,7,8,9-HpCDF	ND	0.973		-	0.613	Total HxCDF	ND	1.02	
OCDF	ND	2.03		-	0.970	Total HpCDF	ND	0.973	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	90.4	40.0 - 135	
13C-1,2,3,7,8-PeCDD	90.6	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	82.2	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	81.5	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	79.3	40.0 - 135	
13C-OCDD	111	40.0 - 135	
13C-2,3,7,8-TCDF	88.6	40.0 - 135	
13C-1,2,3,7,8-PeCDF	88.1	40.0 - 135	
13C-2,3,4,7,8-PeCDF	94.6	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	84.1	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	84.4	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	88.4	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	86.4	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	80.2	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	80.9	40.0 - 135	
13C-OCDF	85.4	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	93.4	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________

Date: 7/17/2019

Reviewed By: ____________

Date: 7/17/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12520-001-OPR
Client ID: OPR
Matrix: Aqueous
Batch No: X4974

Date Extracted: 07-15-2019
Date Received: NA
Amount: 1.000 L

ICal: PCDDFAL4-3-20-19
GC Column: DB5MS
Units: ng/ml

Acquired: 07-16-2019
2005 WHO TEQ: NA

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	9.78	7.00 - 13.0	
1,2,3,7,8-PeCDD	50.3	35.0 - 65.0	
1,2,3,4,7,8-HxCDD	48.9	35.0 - 65.0	
1,2,3,6,7,8-HxCDD	50.0	35.0 - 65.0	
1,2,3,7,8,9-HxCDD	52.6	35.0 - 65.0	
1,2,3,4,6,7,8-HpCDD	49.4	35.0 - 65.0	
OCDD	89.9	70.0 - 130	
2,3,7,8-TCDF	9.59	7.00 - 13.0	
1,2,3,7,8-PeCDF	47.7	35.0 - 65.0	
2,3,4,7,8-PeCDF	48.4	35.0 - 65.0	
1,2,3,4,7,8-HxCDF	47.6	35.0 - 65.0	
1,2,3,6,7,8-HxCDF	50.1	35.0 - 65.0	
2,3,4,6,7,8-HxCDF	49.9	35.0 - 65.0	
1,2,3,7,8,9-HxCDF	51.0	35.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	49.4	35.0 - 65.0	
1,2,3,4,7,8,9-HpCDF	49.6	35.0 - 65.0	
OCDF	99.8	70.0 - 130	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	78.6	40.0 - 135	
13C-1,2,3,7,8-PeCDD	76.2	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	65.3	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	61.1	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	62.1	40.0 - 135	
13C-OCDD	66.5	40.0 - 135	
13C-2,3,7,8-TCDF	80.0	40.0 - 135	
13C-1,2,3,7,8-PeCDF	75.2	40.0 - 135	
13C-2,3,4,7,8-PeCDF	84.5	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	67.0	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	66.4	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	70.2	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	70.2	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	57.7	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	58.4	40.0 - 135	
13C-OCDF	59.4	40.0 - 135	

Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	89.1	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________________

Date: 7/17/2019

Reviewed By: ____________________

Date: 7/17/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12520-001-SA
Client ID: AMW-1-070119
Matrix: Aqueous
Batch No: X4974

Date Extracted: 07-15-2019
Date Received: 07-03-2019
Amount: 0.457 L

ICal: PCDDFAL4-3-20-19
GC Column: DB5MS
Units: pg/L

Acquired: 07-16-2019
2005 WHO TEQ: 0.0

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.967		-	0.448				
1,2,3,7,8-PeCDD	ND	1.43		-	0.473				
1,2,3,4,7,8-HxCDD	ND	1.38		-	0.548				
1,2,3,6,7,8-HxCDD	ND	1.44		-	0.525	Total TCDD	ND	0.967	
1,2,3,7,8,9-HxCDD	ND	1.32		-	0.502	Total PeCDD	ND	1.43	
1,2,3,4,6,7,8-HpCDD	ND	2.70		-	0.561	Total HxCDD	ND	1.44	
OCDD	ND	6.31		-	0.970	Total HpCDD	ND	2.70	
2,3,7,8-TCDF	ND	0.803		-	0.410				
1,2,3,7,8-PeCDF	ND	0.860		-	0.497				
2,3,4,7,8-PeCDF	ND	0.805		-	0.491				
1,2,3,4,7,8-HxCDF	ND	0.767		-	0.506				
1,2,3,6,7,8-HxCDF	ND	0.875		-	0.520				
2,3,4,6,7,8-HxCDF	ND	0.899		-	0.504				
1,2,3,7,8,9-HxCDF	ND	1.07		-	0.474	Total TCDF	ND	0.803	
1,2,3,4,6,7,8-HpCDF	ND	1.14		-	0.548	Total PeCDF	ND	0.860	
1,2,3,4,7,8,9-HpCDF	ND	1.41		-	0.613	Total HxCDF	ND	1.07	
OCDF	ND	2.10		-	0.970	Total HpCDF	ND	1.41	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	87.4	40.0 - 135	
13C-1,2,3,7,8-PeCDD	87.1	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	81.1	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	81.6	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	83.0	40.0 - 135	
13C-OCDD	94.4	40.0 - 135	
13C-2,3,7,8-TCDF	83.1	40.0 - 135	
13C-1,2,3,7,8-PeCDF	83.8	40.0 - 135	
13C-2,3,4,7,8-PeCDF	88.6	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	85.3	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	86.5	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	87.0	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	88.9	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	82.2	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	87.7	40.0 - 135	
13C-OCDF	87.9	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	90.6	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________

Date: 7/17/2019

Reviewed By: ____________

Date: 7/17/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12520-002-SA	Date Extracted: 07-15-2019	ICal: PCDDFAL4-3-20-19	Acquired: 07-16-2019
Client ID: AMW-2-070119	Date Received: 07-03-2019	GC Column: DB5MS	2005 WHO TEQ: 0.00591
Matrix: Aqueous	Amount: 0.475 L	Units: pg/L	
Batch No: X4974			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.931		-	0.448				
1,2,3,7,8-PeCDD	ND	1.51		-	0.473				
1,2,3,4,7,8-HxCDD	ND	2.13		-	0.548				
1,2,3,6,7,8-HxCDD	ND	2.31		-	0.525	Total TCDD	ND	0.931	
1,2,3,7,8,9-HxCDD	ND	2.08		-	0.502	Total PeCDD	ND	1.51	
1,2,3,4,6,7,8-HpCDD	ND	4.18		-	0.561	Total HxCDD	ND	2.31	
OCDD	19.7	-	J	0.00591	0.970	Total HpCDD	ND	4.18	
2,3,7,8-TCDF	ND	0.811		-	0.410				
1,2,3,7,8-PeCDF	ND	0.961		-	0.497				
2,3,4,7,8-PeCDF	ND	0.875		-	0.491				
1,2,3,4,7,8-HxCDF	ND	0.857		-	0.506				
1,2,3,6,7,8-HxCDF	ND	1.01		-	0.520				
2,3,4,6,7,8-HxCDF	ND	0.998		-	0.504				
1,2,3,7,8,9-HxCDF	ND	1.25		-	0.474	Total TCDF	ND	0.811	
1,2,3,4,6,7,8-HpCDF	ND	1.50		-	0.548	Total PeCDF	ND	0.961	
1,2,3,4,7,8,9-HpCDF	ND	1.63		-	0.613	Total HxCDF	ND	1.25	
OCDF	ND	3.35		-	0.970	Total HpCDF	ND	1.63	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	78.8	40.0 - 135	
13C-1,2,3,7,8-PeCDD	79.6	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	76.9	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	78.1	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	78.9	40.0 - 135	
13C-OCDD	105	40.0 - 135	
13C-2,3,7,8-TCDF	78.0	40.0 - 135	
13C-1,2,3,7,8-PeCDF	79.7	40.0 - 135	
13C-2,3,4,7,8-PeCDF	88.2	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	80.0	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	78.5	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	80.4	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	82.0	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	78.1	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	80.9	40.0 - 135	
13C-OCDF	85.5	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	87.3	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________________

Date: 7/17/2019

Reviewed By: ____________________

Date: 7/17/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12520-003-SA	Date Extracted: 07-15-2019	ICal: PCDDFAL4-3-20-19	Acquired: 07-16-2019
Client ID: AMW-3-070119	Date Received: 07-03-2019	GC Column: DB5MS	2005 WHO TEQ: 0.0
Matrix: Aqueous	Amount: 0.480 L	Units: pg/L	
Batch No: X4974			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.901		-	0.448				
1,2,3,7,8-PeCDD	ND	1.87		-	0.473				
1,2,3,4,7,8-HxCDD	ND	1.39		-	0.548				
1,2,3,6,7,8-HxCDD	ND	1.43		-	0.525	Total TCDD	ND	0.901	
1,2,3,7,8,9-HxCDD	ND	1.32		-	0.502	Total PeCDD	ND	1.87	
1,2,3,4,6,7,8-HpCDD	ND	3.09		-	0.561	Total HxCDD	ND	1.43	
OCDD	ND	5.23		-	0.970	Total HpCDD	ND	3.09	
2,3,7,8-TCDF	ND	0.842		-	0.410				
1,2,3,7,8-PeCDF	ND	0.901		-	0.497				
2,3,4,7,8-PeCDF	ND	0.883		-	0.491				
1,2,3,4,7,8-HxCDF	ND	0.860		-	0.506				
1,2,3,6,7,8-HxCDF	ND	1.01		-	0.520				
2,3,4,6,7,8-HxCDF	ND	0.998		-	0.504				
1,2,3,7,8,9-HxCDF	ND	1.26		-	0.474	Total TCDF	ND	0.842	
1,2,3,4,6,7,8-HpCDF	ND	0.977		-	0.548	Total PeCDF	ND	0.901	
1,2,3,4,7,8,9-HpCDF	ND	1.27		-	0.613	Total HxCDF	ND	1.26	
OCDF	ND	2.24		-	0.970	Total HpCDF	ND	1.27	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	79.5	40.0 - 135	
13C-1,2,3,7,8-PeCDD	83.8	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	81.7	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	83.2	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	88.8	40.0 - 135	
13C-OCDD	103	40.0 - 135	
13C-2,3,7,8-TCDF	77.0	40.0 - 135	
13C-1,2,3,7,8-PeCDF	80.4	40.0 - 135	
13C-2,3,4,7,8-PeCDF	85.8	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	86.6	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	85.9	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	85.4	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	88.8	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	86.0	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	91.4	40.0 - 135	
13C-OCDF	93.0	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	88.5	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________ Reviewed By: ____________

Date: 7/17/2019 Date: 7/17/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12520-004-SA	Date Extracted: 07-15-2019	ICal: PCDDFAL4-3-20-19	Acquired: 07-16-2019
Client ID: AMW-4-070119	Date Received: 07-03-2019	GC Column: DB5MS	2005 WHO TEQ: 0.00537
Matrix: Aqueous	Amount: 0.482 L	Units: pg/L	
Batch No: X4974			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.962		-	0.448				
1,2,3,7,8-PeCDD	ND	1.53		-	0.473				
1,2,3,4,7,8-HxCDD	ND	1.65		-	0.548				
1,2,3,6,7,8-HxCDD	ND	1.74		-	0.525	Total TCDD	ND	0.962	
1,2,3,7,8,9-HxCDD	ND	1.58		-	0.502	Total PeCDD	ND	1.53	
1,2,3,4,6,7,8-HpCDD	ND	4.44		-	0.561	Total HxCDD	ND	1.74	
OCDD	17.9	-	J	0.00537	0.970	Total HpCDD	ND	4.44	
2,3,7,8-TCDF	ND	0.748		-	0.410				
1,2,3,7,8-PeCDF	ND	1.09		-	0.497				
2,3,4,7,8-PeCDF	ND	1.05		-	0.491				
1,2,3,4,7,8-HxCDF	ND	0.915		-	0.506				
1,2,3,6,7,8-HxCDF	ND	1.02		-	0.520				
2,3,4,6,7,8-HxCDF	ND	1.05		-	0.504				
1,2,3,7,8,9-HxCDF	ND	1.24		-	0.474	Total TCDF	ND	0.748	
1,2,3,4,6,7,8-HpCDF	ND	1.26		-	0.548	Total PeCDF	ND	1.09	
1,2,3,4,7,8,9-HpCDF	ND	1.50		-	0.613	Total HxCDF	ND	1.24	
OCDF	ND	2.88		-	0.970	Total HpCDF	ND	1.50	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	77.8	40.0 - 135	
13C-1,2,3,7,8-PeCDD	83.4	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	74.8	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	75.6	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	74.9	40.0 - 135	
13C-OCDD	88.0	40.0 - 135	
13C-2,3,7,8-TCDF	79.0	40.0 - 135	
13C-1,2,3,7,8-PeCDF	79.0	40.0 - 135	
13C-2,3,4,7,8-PeCDF	85.5	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	74.5	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	76.2	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	78.0	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	79.6	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	71.2	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	76.3	40.0 - 135	
13C-OCDF	76.1	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	90.3	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ________________

Date: 7/17/2019

Reviewed By: ________________

Date: 7/17/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12520-005-SA
Client ID: AMW-5-070119
Matrix: Aqueous
Batch No: X4974

Date Extracted: 07-15-2019
Date Received: 07-03-2019
Amount: 0.457 L

ICal: PCDDFAL4-3-20-19
GC Column: DB5MS
Units: pg/L

Acquired: 07-16-2019
2005 WHO TEQ: 0.0

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.977		-	0.448				
1,2,3,7,8-PeCDD	ND	1.84		-	0.473				
1,2,3,4,7,8-HxCDD	ND	1.88		-	0.548				
1,2,3,6,7,8-HxCDD	ND	1.96		-	0.525	Total TCDD	ND	0.977	
1,2,3,7,8,9-HxCDD	ND	1.80		-	0.502	Total PeCDD	ND	1.84	
1,2,3,4,6,7,8-HpCDD	ND	3.28		-	0.561	Total HxCDD	ND	1.96	
OCDD	ND	5.60		-	0.970	Total HpCDD	ND	3.28	
2,3,7,8-TCDF	ND	0.914		-	0.410				
1,2,3,7,8-PeCDF	ND	1.10		-	0.497				
2,3,4,7,8-PeCDF	ND	1.11		-	0.491				
1,2,3,4,7,8-HxCDF	ND	1.01		-	0.506				
1,2,3,6,7,8-HxCDF	ND	1.11		-	0.520				
2,3,4,6,7,8-HxCDF	ND	1.13		-	0.504				
1,2,3,7,8,9-HxCDF	ND	1.34		-	0.474	Total TCDF	ND	0.914	
1,2,3,4,6,7,8-HpCDF	ND	1.53		-	0.548	Total PeCDF	ND	1.11	
1,2,3,4,7,8,9-HpCDF	ND	1.65		-	0.613	Total HxCDF	ND	1.34	
OCDF	ND	2.78		-	0.970	Total HpCDF	ND	1.65	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	70.5	40.0 - 135	
13C-1,2,3,7,8-PeCDD	70.8	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	69.0	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	69.5	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	70.9	40.0 - 135	
13C-OCDD	87.1	40.0 - 135	
13C-2,3,7,8-TCDF	70.6	40.0 - 135	
13C-1,2,3,7,8-PeCDF	70.5	40.0 - 135	
13C-2,3,4,7,8-PeCDF	75.4	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	71.9	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	72.1	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	71.4	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	74.7	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	69.5	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	69.9	40.0 - 135	
13C-OCDF	77.6	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	81.4	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________________

Date: 7/17/2019

Reviewed By: ____________________

Date: 7/17/2019

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12520
0°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Frontier

PROJECT NAME/NO. 907023

PO # A-312

REMARKS

Please Email Results Tier IV

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	VPH	8290 Dioxins/Furans							Notes
AMW-1-070119		7/1/19	1201	water					X							
AMW-2-070119			1420						X							
AMW-3-070119			1600						X							
AMW-4-070119			1725						X							
AMW-5-070119			0900						X							

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman & Bruya	7/2/19	08:34 AM
Received by: Kathy Zipp	K. ZIPP	Frontier	7/3/19	910
Relinquished by:				
Received by:				

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: **12520**

Client:	Friedman & Bruya, Inc.
Client Project ID:	907023
Date Received:	07/03/2019
Time Received:	09:10 am
Received By:	KZ
Logged In By:	RR
# of Samples Received:	5
Duplicates:	0
Storage Location:	R-3

Method of Delivery:	Fed-Ex
Tracking Number:	813795597144
Shipping Container Received Intact	Yes
Custody seals(s) present?	No
Custody seals(s) intact?	No
Sample Arrival Temperature (C)	0
Cooling Method	Blue Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	Yes
Test aqueous sample for residual Chlorine	Yes
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	Yes
pH Range of Aqueous Sample	Between 4 and 9
Anomalies or additional comments:	

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FRONTIER
ANALYTICAL LABORATORY

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 22, 2018

Carla Brock, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

Dear Ms Brock:

Included is the amended report from the testing of material submitted on January 12, 2018 from the Shelton C St. Landfill 150074, F&BI 801176 project. The 8270D SIM naphthalene reporting limit has been raised to <0.1 ug/L.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Ali Cochrane
ASP0207R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

February 7, 2018

Carla Brock, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

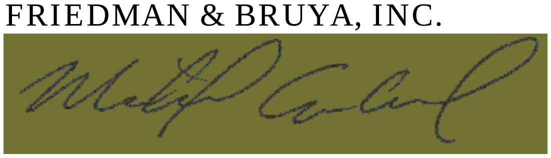
Dear Ms Brock:

Included are the results from the testing of material submitted on January 12, 2018 from the Shelton C St. Landfill 150074, F&BI 801176 project. There are 61 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: data@aspectconsulting.com, Ali Cochrane
ASP0207R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on January 12, 2018 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Shelton C St. Landfill 150074, F&BI 801176 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
801176 -01	AMW-3-011218
801176 -02	AMW-4-011218
801176 -03	AMW-2-011218
801176 -04	AMW-1-011218
801176 -05	AMW-5-011218
801176 -06	Trip Blank

The samples were sent to Fremont Analytical for alkalinity, ammonia, calcium, chloride, cyanide, magnesium, nitrate, nitrite, sodium, sulfate, and sulfide analyses. In addition, samples were sent to Frontier analytical for dioxin and furan. The report is enclosed.

Cadmium and lead were reported below the standard reporting limit. The data were flagged accordingly.

The 8270D 4-nitrophenol calibration standard did not pass the acceptance criteria. The data were flagged accordingly.

2,2'-Oxybis(1-chloropropane) was detected in the 8270D method blank. The detections in samples AMW-3-011218, AMW-2-011218, AMW-1-011218 and AMW-5-011218 were flagged accordingly.

The 8270D and 8081B laboratory control sample and laboratory control sample duplicate failed the relative percent difference for several compounds. The analytes were not detected therefore the data were acceptable.

All other quality control requirements were acceptable.

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176
Date Extracted: 01/16/18
Date Analyzed: 01/16/18

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
USING METHOD NWTPH-Gx
Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Gasoline Range	Surrogate (% Recovery) (Limit 51-134)
AMW-3-011218 801176-01	<100	94
AMW-4-011218 801176-02	<100	93
AMW-2-011218 801176-03	<100	94
AMW-1-011218 801176-04	<100	92
AMW-5-011218 801176-05	<100	91
Method Blank 08-026 MB	<100	94

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176
Date Extracted: 01/16/18
Date Analyzed: 01/16/18

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
AMW-3-011218 801176-01	<50	<250	119
AMW-4-011218 801176-02	60 x	<250	112
AMW-2-011218 801176-03	<50	<250	84
AMW-1-011218 801176-04	<50	<250	114
AMW-5-011218 801176-05	<50	<250	107
Method Blank 08-120 MB2	<50	<250	95

Analysis For Total Metals By EPA Method 200.8

Client ID:	AMW-3-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/22/18	Lab ID:	801176-01
Date Analyzed:	01/22/18	Data File:	801176-01.041
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	2.86
Cadmium	<0.1 j
Chromium	1.06
Copper	1.08
Iron	241
Lead	<0.1 j
Manganese	130
Nickel	1.17
Selenium	<0.5
Silver	<0.2
Zinc	<4

Analysis For Total Metals By EPA Method 200.8

Client ID:	AMW-4-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/22/18	Lab ID:	801176-02
Date Analyzed:	01/22/18	Data File:	801176-02.044
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.665
Barium	42.7
Cadmium	<0.1 j
Chromium	7.35
Copper	9.27
Iron	3,250
Lead	0.334
Manganese	402
Nickel	7.61
Selenium	0.916
Silver	<0.2
Zinc	5.46

Analysis For Total Metals By EPA Method 200.8

Client ID:	AMW-2-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/22/18	Lab ID:	801176-03
Date Analyzed:	01/22/18	Data File:	801176-03.045
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.310
Barium	5.05
Cadmium	<0.1 j
Chromium	1.17
Copper	2.26
Iron	566
Lead	<0.1 j
Manganese	1,250
Nickel	1.82
Selenium	<0.5
Silver	<0.2
Zinc	<4

Analysis For Total Metals By EPA Method 200.8

Client ID:	AMW-1-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/22/18	Lab ID:	801176-04
Date Analyzed:	01/22/18	Data File:	801176-04.046
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	4.69
Cadmium	<0.1 j
Chromium	0.933
Copper	1.08
Iron	233
Lead	<0.1 j
Manganese	71.4
Nickel	1.86
Selenium	<0.5
Silver	<0.2
Zinc	<4

Analysis For Total Metals By EPA Method 200.8

Client ID:	AMW-5-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/22/18	Lab ID:	801176-05
Date Analyzed:	01/22/18	Data File:	801176-05.047
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	4.66
Cadmium	<0.1 j
Chromium	0.952
Copper	1.06
Iron	234
Lead	<0.1 j
Manganese	68.3
Nickel	1.93
Selenium	<0.5
Silver	<0.2
Zinc	<4

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/22/18	Lab ID:	I8-043 mb
Date Analyzed:	01/22/18	Data File:	I8-043 mb.113
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	<0.5
Cadmium	<0.1 j
Chromium	<0.5
Copper	<0.5
Iron	<50
Lead	<0.1 j
Manganese	<1
Nickel	<0.5
Selenium	<0.5
Silver	<0.2
Zinc	<4

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	AMW-3-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/22/18	Lab ID:	801176-01
Date Analyzed:	01/22/18	Data File:	801176-01.050
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	2.40
Cadmium	<0.1 j
Chromium	0.860
Copper	0.883
Iron	128
Lead	<0.1 j
Manganese	132
Nickel	1.06
Selenium	<0.5
Silver	<0.2 j
Zinc	<4

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	AMW-4-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/22/18	Lab ID:	801176-02
Date Analyzed:	01/22/18	Data File:	801176-02.055
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.240
Barium	25.3
Cadmium	<0.1 j
Chromium	1.72
Copper	2.98
Iron	235
Lead	<0.1 j
Manganese	307
Nickel	3.45
Selenium	0.728
Silver	<0.2
Zinc	<4

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ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	AMW-2-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/22/18	Lab ID:	801176-03
Date Analyzed:	01/22/18	Data File:	801176-03.056
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.291
Barium	4.65
Cadmium	<0.1 j
Chromium	0.909
Copper	1.72
Iron	463
Lead	<0.1 j
Manganese	1,140
Nickel	1.73
Selenium	<0.5
Silver	<0.2
Zinc	<4

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	AMW-1-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/22/18	Lab ID:	801176-04
Date Analyzed:	01/22/18	Data File:	801176-04.057
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	3.98
Cadmium	<0.1 j
Chromium	0.699
Copper	0.670
Iron	114
Lead	<0.1 j
Manganese	58.1
Nickel	1.63
Selenium	<0.5
Silver	<0.2
Zinc	<4

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	AMW-5-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/22/18	Lab ID:	801176-05
Date Analyzed:	01/22/18	Data File:	801176-05.058
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	4.05
Cadmium	<0.1 j
Chromium	0.744
Copper	0.651
Iron	111
Lead	<0.1 j
Manganese	58.6
Nickel	1.64
Selenium	<0.5
Silver	<0.2
Zinc	<4

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/22/18	Lab ID:	I8-044 mb
Date Analyzed:	01/22/18	Data File:	I8-044 mb.048
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	<0.5
Cadmium	<0.1 j
Chromium	<0.5
Copper	<0.5
Iron	<50
Lead	<0.1 j
Manganese	<1
Nickel	<0.5
Selenium	<0.5
Silver	<0.2
Zinc	<4

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ENVIRONMENTAL CHEMISTS

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176
Date Extracted: 01/15/18
Date Analyzed: 01/16/18

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR TOTAL MERCURY
USING EPA METHOD 1631E
Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Total Mercury
AMW-3-011218 801176-01	<0.1
AMW-4-011218 801176-02	<0.1
AMW-2-011218 801176-03	<0.1
AMW-1-011218 801176-04	<0.1
AMW-5-011218 801176-05	<0.1
Method Blank	<0.1

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176
Date Extracted: 01/15/18
Date Analyzed: 01/16/18

RESULTS FROM THE ANALYSIS OF WATER SAMPLES
FOR DISSOLVED MERCURY
USING EPA METHOD 1631E
Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Dissolved Mercury
AMW-3-011218 801176-01	<0.1
AMW-4-011218 801176-02	<0.1
AMW-2-011218 801176-03	<0.1
AMW-1-011218 801176-04	<0.1
AMW-5-011218 801176-05	<0.1
Method Blank	<0.1

Analysis For Volatile Compounds By EPA Method 8260C Low Level

Client Sample ID:	AMW-3-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/15/18	Lab ID:	801176-01
Date Analyzed:	01/15/18	Data File:	011515.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	99	91	108
4-Bromofluorobenzene	97	76	126

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<0.2
Chloromethane	<0.5	Tetrachloroethene	<0.2
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<0.2
Trichlorofluoromethane	<0.2	Ethylbenzene	<0.2
Acetone	<50	1,1,1,2-Tetrachloroethane	<0.2
1,1-Dichloroethene	<0.2	m,p-Xylene	<0.4
Hexane	<1	o-Xylene	<0.2
Methylene chloride	<1	Styrene	<0.2
Methyl t-butyl ether (MTBE)	<0.5	Isopropylbenzene	<0.2
trans-1,2-Dichloroethene	<0.2	Bromoform	<0.5
1,1-Dichloroethane	<0.2	n-Propylbenzene	<0.2
2,2-Dichloropropane	<0.5	Bromobenzene	<0.2
cis-1,2-Dichloroethene	<0.2	1,3,5-Trimethylbenzene	<0.2
Chloroform	<0.2	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<2	1,2,3-Trichloropropane	<0.5
1,2-Dichloroethane (EDC)	<0.5	2-Chlorotoluene	<0.2
1,1,1-Trichloroethane	<0.2	4-Chlorotoluene	<0.2
1,1-Dichloropropene	<0.2	tert-Butylbenzene	<0.2
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<0.2
Benzene	<0.2	sec-Butylbenzene	<0.2
Trichloroethene	<0.2	p-Isopropyltoluene	<0.2
1,2-Dichloropropane	<0.2	1,3-Dichlorobenzene	<0.2
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<0.2
Dibromomethane	<0.5	1,2-Dichlorobenzene	<0.2
4-Methyl-2-pentanone	<2	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<0.2
Toluene	<0.2	Hexachlorobutadiene	<0.5
trans-1,3-Dichloropropene	<0.2	Naphthalene	<0.2
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<0.2
2-Hexanone	<2		

Analysis For Volatile Compounds By EPA Method 8260C Low Level

Client Sample ID:	AMW-4-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/15/18	Lab ID:	801176-02
Date Analyzed:	01/15/18	Data File:	011517.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	85	117
Toluene-d8	100	91	108
4-Bromofluorobenzene	98	76	126

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<0.2
Chloromethane	<0.5	Tetrachloroethene	<0.2
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<0.2
Trichlorofluoromethane	<0.2	Ethylbenzene	<0.2
Acetone	<50	1,1,1,2-Tetrachloroethane	<0.2
1,1-Dichloroethene	<0.2	m,p-Xylene	<0.4
Hexane	<1	o-Xylene	<0.2
Methylene chloride	<1	Styrene	<0.2
Methyl t-butyl ether (MTBE)	<0.5	Isopropylbenzene	<0.2
trans-1,2-Dichloroethene	<0.2	Bromoform	<0.5
1,1-Dichloroethane	<0.2	n-Propylbenzene	<0.2
2,2-Dichloropropane	<0.5	Bromobenzene	<0.2
cis-1,2-Dichloroethene	<0.2	1,3,5-Trimethylbenzene	<0.2
Chloroform	<0.2	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<2	1,2,3-Trichloropropane	<0.5
1,2-Dichloroethane (EDC)	<0.5	2-Chlorotoluene	<0.2
1,1,1-Trichloroethane	<0.2	4-Chlorotoluene	<0.2
1,1-Dichloropropene	<0.2	tert-Butylbenzene	<0.2
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<0.2
Benzene	<0.2	sec-Butylbenzene	<0.2
Trichloroethene	<0.2	p-Isopropyltoluene	<0.2
1,2-Dichloropropane	<0.2	1,3-Dichlorobenzene	<0.2
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<0.2
Dibromomethane	<0.5	1,2-Dichlorobenzene	<0.2
4-Methyl-2-pentanone	<2	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<0.2
Toluene	<0.2	Hexachlorobutadiene	<0.5
trans-1,3-Dichloropropene	<0.2	Naphthalene	<0.2
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<0.2
2-Hexanone	<2		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C Low Level

Client Sample ID:	AMW-2-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/15/18	Lab ID:	801176-03
Date Analyzed:	01/15/18	Data File:	011519.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	85	117
Toluene-d8	102	91	108
4-Bromofluorobenzene	101	76	126

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<0.2
Chloromethane	<0.5	Tetrachloroethene	<0.2
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<0.2
Trichlorofluoromethane	<0.2	Ethylbenzene	<0.2
Acetone	<50	1,1,1,2-Tetrachloroethane	<0.2
1,1-Dichloroethene	<0.2	m,p-Xylene	<0.4
Hexane	<1	o-Xylene	<0.2
Methylene chloride	<1	Styrene	<0.2
Methyl t-butyl ether (MTBE)	<0.5	Isopropylbenzene	<0.2
trans-1,2-Dichloroethene	<0.2	Bromoform	<0.5
1,1-Dichloroethane	<0.2	n-Propylbenzene	<0.2
2,2-Dichloropropane	<0.5	Bromobenzene	<0.2
cis-1,2-Dichloroethene	<0.2	1,3,5-Trimethylbenzene	<0.2
Chloroform	<0.2	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<2	1,2,3-Trichloropropane	<0.5
1,2-Dichloroethane (EDC)	<0.5	2-Chlorotoluene	<0.2
1,1,1-Trichloroethane	<0.2	4-Chlorotoluene	<0.2
1,1-Dichloropropene	<0.2	tert-Butylbenzene	<0.2
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<0.2
Benzene	<0.2	sec-Butylbenzene	<0.2
Trichloroethene	<0.2	p-Isopropyltoluene	<0.2
1,2-Dichloropropane	<0.2	1,3-Dichlorobenzene	<0.2
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<0.2
Dibromomethane	<0.5	1,2-Dichlorobenzene	<0.2
4-Methyl-2-pentanone	<2	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<0.2
Toluene	<0.2	Hexachlorobutadiene	<0.5
trans-1,3-Dichloropropene	<0.2	Naphthalene	<0.2
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<0.2
2-Hexanone	<2		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C Low Level

Client Sample ID:	AMW-1-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/15/18	Lab ID:	801176-04
Date Analyzed:	01/15/18	Data File:	011521.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	85	117
Toluene-d8	102	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<0.2
Chloromethane	<0.5	Tetrachloroethene	<0.2
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<0.2
Trichlorofluoromethane	<0.2	Ethylbenzene	<0.2
Acetone	<50	1,1,1,2-Tetrachloroethane	<0.2
1,1-Dichloroethene	<0.2	m,p-Xylene	<0.4
Hexane	<1	o-Xylene	<0.2
Methylene chloride	<1	Styrene	<0.2
Methyl t-butyl ether (MTBE)	<0.5	Isopropylbenzene	<0.2
trans-1,2-Dichloroethene	<0.2	Bromoform	<0.5
1,1-Dichloroethane	<0.2	n-Propylbenzene	<0.2
2,2-Dichloropropane	<0.5	Bromobenzene	<0.2
cis-1,2-Dichloroethene	<0.2	1,3,5-Trimethylbenzene	<0.2
Chloroform	<0.2	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<2	1,2,3-Trichloropropane	<0.5
1,2-Dichloroethane (EDC)	<0.5	2-Chlorotoluene	<0.2
1,1,1-Trichloroethane	<0.2	4-Chlorotoluene	<0.2
1,1-Dichloropropene	<0.2	tert-Butylbenzene	<0.2
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<0.2
Benzene	<0.2	sec-Butylbenzene	<0.2
Trichloroethene	<0.2	p-Isopropyltoluene	<0.2
1,2-Dichloropropane	<0.2	1,3-Dichlorobenzene	<0.2
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<0.2
Dibromomethane	<0.5	1,2-Dichlorobenzene	<0.2
4-Methyl-2-pentanone	<2	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<0.2
Toluene	<0.2	Hexachlorobutadiene	<0.5
trans-1,3-Dichloropropene	<0.2	Naphthalene	<0.2
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<0.2
2-Hexanone	<2		

Analysis For Volatile Compounds By EPA Method 8260C Low Level

Client Sample ID:	AMW-5-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/15/18	Lab ID:	801176-05
Date Analyzed:	01/15/18	Data File:	011523.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<0.2
Chloromethane	<0.5	Tetrachloroethene	<0.2
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<0.2
Trichlorofluoromethane	<0.2	Ethylbenzene	<0.2
Acetone	<50	1,1,1,2-Tetrachloroethane	<0.2
1,1-Dichloroethene	<0.2	m,p-Xylene	<0.4
Hexane	<1	o-Xylene	<0.2
Methylene chloride	<1	Styrene	<0.2
Methyl t-butyl ether (MTBE)	<0.5	Isopropylbenzene	<0.2
trans-1,2-Dichloroethene	<0.2	Bromoform	<0.5
1,1-Dichloroethane	<0.2	n-Propylbenzene	<0.2
2,2-Dichloropropane	<0.5	Bromobenzene	<0.2
cis-1,2-Dichloroethene	<0.2	1,3,5-Trimethylbenzene	<0.2
Chloroform	<0.2	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<2	1,2,3-Trichloropropane	<0.5
1,2-Dichloroethane (EDC)	<0.5	2-Chlorotoluene	<0.2
1,1,1-Trichloroethane	<0.2	4-Chlorotoluene	<0.2
1,1-Dichloropropene	<0.2	tert-Butylbenzene	<0.2
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<0.2
Benzene	<0.2	sec-Butylbenzene	<0.2
Trichloroethene	<0.2	p-Isopropyltoluene	<0.2
1,2-Dichloropropane	<0.2	1,3-Dichlorobenzene	<0.2
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<0.2
Dibromomethane	<0.5	1,2-Dichlorobenzene	<0.2
4-Methyl-2-pentanone	<2	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<0.2
Toluene	<0.2	Hexachlorobutadiene	<0.5
trans-1,3-Dichloropropene	<0.2	Naphthalene	<0.2
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<0.2
2-Hexanone	<2		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C Low Level

Client Sample ID:	Trip Blank	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/15/18	Lab ID:	801176-06
Date Analyzed:	01/15/18	Data File:	011514.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	98	85	117
Toluene-d8	101	91	108
4-Bromofluorobenzene	100	76	126

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<0.2
Chloromethane	<0.5	Tetrachloroethene	<0.2
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<0.2
Trichlorofluoromethane	<0.2	Ethylbenzene	<0.2
Acetone	<50	1,1,1,2-Tetrachloroethane	<0.2
1,1-Dichloroethene	<0.2	m,p-Xylene	<0.4
Hexane	<1	o-Xylene	<0.2
Methylene chloride	<1	Styrene	<0.2
Methyl t-butyl ether (MTBE)	<0.5	Isopropylbenzene	<0.2
trans-1,2-Dichloroethene	<0.2	Bromoform	<0.5
1,1-Dichloroethane	<0.2	n-Propylbenzene	<0.2
2,2-Dichloropropane	<0.5	Bromobenzene	<0.2
cis-1,2-Dichloroethene	<0.2	1,3,5-Trimethylbenzene	<0.2
Chloroform	<0.2	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<2	1,2,3-Trichloropropane	<0.5
1,2-Dichloroethane (EDC)	<0.5	2-Chlorotoluene	<0.2
1,1,1-Trichloroethane	<0.2	4-Chlorotoluene	<0.2
1,1-Dichloropropene	<0.2	tert-Butylbenzene	<0.2
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<0.2
Benzene	<0.2	sec-Butylbenzene	<0.2
Trichloroethene	<0.2	p-Isopropyltoluene	<0.2
1,2-Dichloropropane	<0.2	1,3-Dichlorobenzene	<0.2
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<0.2
Dibromomethane	<0.5	1,2-Dichlorobenzene	<0.2
4-Methyl-2-pentanone	<2	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<0.2
Toluene	<0.2	Hexachlorobutadiene	<0.5
trans-1,3-Dichloropropene	<0.2	Naphthalene	<0.2
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<0.2
2-Hexanone	<2		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C Low Level

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/15/18	Lab ID:	08-0108 mb
Date Analyzed:	01/15/18	Data File:	011513.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	85	117
Toluene-d8	97	91	108
4-Bromofluorobenzene	97	76	126

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<0.2
Chloromethane	<0.5	Tetrachloroethene	<0.2
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<0.2
Trichlorofluoromethane	<0.2	Ethylbenzene	<0.2
Acetone	<50	1,1,1,2-Tetrachloroethane	<0.2
1,1-Dichloroethene	<0.2	m,p-Xylene	<0.4
Hexane	<1	o-Xylene	<0.2
Methylene chloride	<1	Styrene	<0.2
Methyl t-butyl ether (MTBE)	<0.5	Isopropylbenzene	<0.2
trans-1,2-Dichloroethene	<0.2	Bromoform	<0.5
1,1-Dichloroethane	<0.2	n-Propylbenzene	<0.2
2,2-Dichloropropane	<0.5	Bromobenzene	<0.2
cis-1,2-Dichloroethene	<0.2	1,3,5-Trimethylbenzene	<0.2
Chloroform	<0.2	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<2	1,2,3-Trichloropropane	<0.5
1,2-Dichloroethane (EDC)	<0.5	2-Chlorotoluene	<0.2
1,1,1-Trichloroethane	<0.2	4-Chlorotoluene	<0.2
1,1-Dichloropropene	<0.2	tert-Butylbenzene	<0.2
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<0.2
Benzene	<0.2	sec-Butylbenzene	<0.2
Trichloroethene	<0.2	p-Isopropyltoluene	<0.2
1,2-Dichloropropane	<0.2	1,3-Dichlorobenzene	<0.2
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<0.2
Dibromomethane	<0.5	1,2-Dichlorobenzene	<0.2
4-Methyl-2-pentanone	<2	1,2-Dibromo-3-chloropropane	<0.5
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<0.2
Toluene	<0.2	Hexachlorobutadiene	<0.5
trans-1,3-Dichloropropene	<0.2	Naphthalene	<0.2
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<0.2
2-Hexanone	<2		

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-3-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/16/18	Lab ID:	801176-01 1/0.25
Date Analyzed:	01/17/18	Data File:	011709.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	67	31	160
Benzo(a)anthracene-d12	79	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01
1-Methylnaphthalene	<0.01
2-Methylnaphthalene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-4-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/16/18	Lab ID:	801176-02 1/0.25
Date Analyzed:	01/17/18	Data File:	011710.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	23 ip	31	160
Benzo(a)anthracene-d12	62	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	0.010
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01
1-Methylnaphthalene	<0.01
2-Methylnaphthalene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-2-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/16/18	Lab ID:	801176-03 1/0.25
Date Analyzed:	01/17/18	Data File:	011711.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	50	31	160
Benzo(a)anthracene-d12	65	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	0.021
Anthracene	<0.01
Fluoranthene	0.014
Pyrene	0.018
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01
1-Methylnaphthalene	<0.01
2-Methylnaphthalene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-1-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/16/18	Lab ID:	801176-04 1/0.25
Date Analyzed:	01/17/18	Data File:	011712.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	68	31	160
Benzo(a)anthracene-d12	83	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01
1-Methylnaphthalene	<0.01
2-Methylnaphthalene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-5-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/16/18	Lab ID:	801176-05 1/0.25
Date Analyzed:	01/17/18	Data File:	011713.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	77	31	160
Benzo(a)anthracene-d12	97	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01
1-Methylnaphthalene	<0.01
2-Methylnaphthalene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/16/18	Lab ID:	08-134 mb 1/0.25
Date Analyzed:	01/17/18	Data File:	011707.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	83	31	160
Benzo(a)anthracene-d12	92	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01
1-Methylnaphthalene	<0.01
2-Methylnaphthalene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	AMW-3-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/16/18	Lab ID:	801176-01 1/0.25
Date Analyzed:	01/17/18	Data File:	011709.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	39	32	162
Phenol-d6	26	10	170
Nitrobenzene-d5	102	50	150
2-Fluorobiphenyl	94	43	158
2,4,6-Tribromophenol	78	43	146
Terphenyl-d14	98	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<0.5	2,4,5-Trichlorophenol	<0.5
Bis(2-chloroethyl) ether	<0.05	2-Chloronaphthalene	<0.05
2-Chlorophenol	<0.5	2-Nitroaniline	<0.25
1,3-Dichlorobenzene	<0.05	Dimethyl phthalate	<0.5
1,4-Dichlorobenzene	<0.05	2,6-Dinitrotoluene	<0.25
1,2-Dichlorobenzene	<0.05	3-Nitroaniline	<5
Benzyl alcohol	<0.5	2,4-Dinitrophenol	<1.5
2,2'-Oxybis(1-chloropropane)	0.053 fb	Dibenzofuran	<0.05
2-Methylphenol	<0.5	2,4-Dinitrotoluene	<0.25
Hexachloroethane	<0.05	4-Nitrophenol	<1.5 ca
N-Nitroso-di-n-propylamine	<0.05	Diethyl phthalate	<0.5
3-Methylphenol + 4-Methylphenol	<1	4-Chlorophenyl phenyl ether	<0.05
Nitrobenzene	<0.05	N-Nitrosodiphenylamine	<0.05
Isophorone	<0.05	4-Nitroaniline	<5
2-Nitrophenol	<0.5	4,6-Dinitro-2-methylphenol	<1.5
2,4-Dimethylphenol	<0.5	4-Bromophenyl phenyl ether	<0.05
Benzoic acid	<2.5	Hexachlorobenzene	<0.05
Bis(2-chloroethoxy)methane	<0.05	Pentachlorophenol	<0.5
2,4-Dichlorophenol	<0.5	Carbazole	<0.5
1,2,4-Trichlorobenzene	<0.05	Di-n-butyl phthalate	<0.5
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	Bis(2-ethylhexyl) phthalate	<0.8
4-Chloro-3-methylphenol	<0.5	Di-n-octyl phthalate	<0.5
Hexachlorocyclopentadiene	<0.15		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	AMW-4-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/16/18	Lab ID:	801176-02 1/0.25
Date Analyzed:	01/17/18	Data File:	011710.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	37	32	162
Phenol-d6	22	10	170
Nitrobenzene-d5	99	50	150
2-Fluorobiphenyl	91	43	158
2,4,6-Tribromophenol	89	43	146
Terphenyl-d14	98	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<0.5	2,4,5-Trichlorophenol	<0.5
Bis(2-chloroethyl) ether	<0.05	2-Chloronaphthalene	<0.05
2-Chlorophenol	<0.5	2-Nitroaniline	<0.25
1,3-Dichlorobenzene	<0.05	Dimethyl phthalate	<0.5
1,4-Dichlorobenzene	<0.05	2,6-Dinitrotoluene	<0.25
1,2-Dichlorobenzene	<0.05	3-Nitroaniline	<5
Benzyl alcohol	<0.5	2,4-Dinitrophenol	<1.5
2,2'-Oxybis(1-chloropropane)	<0.05	Dibenzofuran	<0.05
2-Methylphenol	<0.5	2,4-Dinitrotoluene	<0.25
Hexachloroethane	<0.05	4-Nitrophenol	<1.5 ca
N-Nitroso-di-n-propylamine	<0.05	Diethyl phthalate	<0.5
3-Methylphenol + 4-Methylphenol	<1	4-Chlorophenyl phenyl ether	<0.05
Nitrobenzene	<0.05	N-Nitrosodiphenylamine	<0.05
Isophorone	<0.05	4-Nitroaniline	<5
2-Nitrophenol	<0.5	4,6-Dinitro-2-methylphenol	<1.5
2,4-Dimethylphenol	<0.5	4-Bromophenyl phenyl ether	<0.05
Benzoic acid	<2.5	Hexachlorobenzene	<0.05
Bis(2-chloroethoxy)methane	<0.05	Pentachlorophenol	<0.5
2,4-Dichlorophenol	<0.5	Carbazole	<0.5
1,2,4-Trichlorobenzene	<0.05	Di-n-butyl phthalate	<0.5
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	Bis(2-ethylhexyl) phthalate	<0.8
4-Chloro-3-methylphenol	<0.5	Di-n-octyl phthalate	<0.5
Hexachlorocyclopentadiene	<0.15		

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	AMW-2-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/16/18	Lab ID:	801176-03 1/0.25
Date Analyzed:	01/17/18	Data File:	011711.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	37	32	162
Phenol-d6	25	10	170
Nitrobenzene-d5	93	50	150
2-Fluorobiphenyl	72	43	158
2,4,6-Tribromophenol	64	43	146
Terphenyl-d14	78	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<0.5	2,4,5-Trichlorophenol	<0.5
Bis(2-chloroethyl) ether	<0.05	2-Chloronaphthalene	<0.05
2-Chlorophenol	<0.5	2-Nitroaniline	<0.25
1,3-Dichlorobenzene	<0.05	Dimethyl phthalate	<0.5
1,4-Dichlorobenzene	<0.05	2,6-Dinitrotoluene	<0.25
1,2-Dichlorobenzene	<0.05	3-Nitroaniline	<5
Benzyl alcohol	<0.5	2,4-Dinitrophenol	<1.5
2,2'-Oxybis(1-chloropropane)	0.061 fb	Dibenzofuran	<0.05
2-Methylphenol	<0.5	2,4-Dinitrotoluene	<0.25
Hexachloroethane	<0.05	4-Nitrophenol	<1.5 ca
N-Nitroso-di-n-propylamine	<0.05	Diethyl phthalate	<0.5
3-Methylphenol + 4-Methylphenol	<1	4-Chlorophenyl phenyl ether	<0.05
Nitrobenzene	<0.05	N-Nitrosodiphenylamine	<0.05
Isophorone	<0.05	4-Nitroaniline	<5
2-Nitrophenol	<0.5	4,6-Dinitro-2-methylphenol	<1.5
2,4-Dimethylphenol	<0.5	4-Bromophenyl phenyl ether	<0.05
Benzoic acid	<2.5	Hexachlorobenzene	<0.05
Bis(2-chloroethoxy)methane	<0.05	Pentachlorophenol	<0.5
2,4-Dichlorophenol	<0.5	Carbazole	<0.5
1,2,4-Trichlorobenzene	<0.05	Di-n-butyl phthalate	<0.5
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	Bis(2-ethylhexyl) phthalate	<0.8
4-Chloro-3-methylphenol	<0.5	Di-n-octyl phthalate	<0.5
Hexachlorocyclopentadiene	<0.15		

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	AMW-1-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/16/18	Lab ID:	801176-04 1/0.25
Date Analyzed:	01/17/18	Data File:	011712.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	30 ip	32	162
Phenol-d6	21	10	170
Nitrobenzene-d5	100	50	150
2-Fluorobiphenyl	96	43	158
2,4,6-Tribromophenol	80	43	146
Terphenyl-d14	102	39	168

Compounds:	Concentration ug/L (ppb)
Phenol	<0.5
Bis(2-chloroethyl) ether	<0.05
2-Chlorophenol	<0.5
1,3-Dichlorobenzene	<0.05
1,4-Dichlorobenzene	<0.05
1,2-Dichlorobenzene	<0.05
Benzyl alcohol	<0.5
2,2'-Oxybis(1-chloropropane)	0.050 fb
2-Methylphenol	<0.5
Hexachloroethane	<0.05
N-Nitroso-di-n-propylamine	<0.05
3-Methylphenol + 4-Methylphenol	<1
Nitrobenzene	<0.05
Isophorone	<0.05
2-Nitrophenol	<0.5
2,4-Dimethylphenol	<0.5
Benzoic acid	<2.5
Bis(2-chloroethoxy)methane	<0.05
2,4-Dichlorophenol	<0.5
1,2,4-Trichlorobenzene	<0.05
Hexachlorobutadiene	<0.05
4-Chloroaniline	<5
4-Chloro-3-methylphenol	<0.5
Hexachlorocyclopentadiene	<0.15

Compounds:	Concentration ug/L (ppb)
2,4,5-Trichlorophenol	<0.5
2-Chloronaphthalene	<0.05
2-Nitroaniline	<0.25
Dimethyl phthalate	<0.5
2,6-Dinitrotoluene	<0.25
3-Nitroaniline	<5
2,4-Dinitrophenol	<1.5
Dibenzofuran	<0.05
2,4-Dinitrotoluene	<0.25
4-Nitrophenol	<1.5 ca
Diethyl phthalate	<0.5
4-Chlorophenyl phenyl ether	<0.05
N-Nitrosodiphenylamine	<0.05
4-Nitroaniline	<5
4,6-Dinitro-2-methylphenol	<1.5
4-Bromophenyl phenyl ether	<0.05
Hexachlorobenzene	<0.05
Pentachlorophenol	<0.5
Carbazole	<0.5
Di-n-butyl phthalate	<0.5
Benzyl butyl phthalate	<0.5
Bis(2-ethylhexyl) phthalate	<0.8
Di-n-octyl phthalate	<0.5

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	AMW-5-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/16/18	Lab ID:	801176-05 1/0.25
Date Analyzed:	01/17/18	Data File:	011713.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	45	32	162
Phenol-d6	27	10	170
Nitrobenzene-d5	103	50	150
2-Fluorobiphenyl	97	43	158
2,4,6-Tribromophenol	87	43	146
Terphenyl-d14	103	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<0.5	2,4,5-Trichlorophenol	<0.5
Bis(2-chloroethyl) ether	<0.05	2-Chloronaphthalene	<0.05
2-Chlorophenol	<0.5	2-Nitroaniline	<0.25
1,3-Dichlorobenzene	<0.05	Dimethyl phthalate	<0.5
1,4-Dichlorobenzene	<0.05	2,6-Dinitrotoluene	<0.25
1,2-Dichlorobenzene	<0.05	3-Nitroaniline	<5
Benzyl alcohol	<0.5	2,4-Dinitrophenol	<1.5
2,2'-Oxybis(1-chloropropane)	0.052 fb	Dibenzofuran	<0.05
2-Methylphenol	<0.5	2,4-Dinitrotoluene	<0.25
Hexachloroethane	<0.05	4-Nitrophenol	<1.5 ca
N-Nitroso-di-n-propylamine	<0.05	Diethyl phthalate	<0.5
3-Methylphenol + 4-Methylphenol	<1	4-Chlorophenyl phenyl ether	<0.05
Nitrobenzene	<0.05	N-Nitrosodiphenylamine	<0.05
Isophorone	<0.05	4-Nitroaniline	<5
2-Nitrophenol	<0.5	4,6-Dinitro-2-methylphenol	<1.5
2,4-Dimethylphenol	<0.5	4-Bromophenyl phenyl ether	<0.05
Benzoic acid	<2.5	Hexachlorobenzene	<0.05
Bis(2-chloroethoxy)methane	<0.05	Pentachlorophenol	<0.5
2,4-Dichlorophenol	<0.5	Carbazole	<0.5
1,2,4-Trichlorobenzene	<0.05	Di-n-butyl phthalate	<0.5
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	Bis(2-ethylhexyl) phthalate	<0.8
4-Chloro-3-methylphenol	<0.5	Di-n-octyl phthalate	<0.5
Hexachlorocyclopentadiene	<0.15		

Analysis For Semivolatile Compounds By EPA Method 8270D

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/16/18	Lab ID:	08-133 mb 1/0.25
Date Analyzed:	01/17/18	Data File:	011707.D
Matrix:	Water	Instrument:	GCMS8
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
2-Fluorophenol	43	32	162
Phenol-d6	29	10	170
Nitrobenzene-d5	99	50	150
2-Fluorobiphenyl	94	43	158
2,4,6-Tribromophenol	62	43	146
Terphenyl-d14	98	39	168

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Phenol	<0.5	2,4,5-Trichlorophenol	<0.5
Bis(2-chloroethyl) ether	<0.05	2-Chloronaphthalene	<0.05
2-Chlorophenol	<0.5	2-Nitroaniline	<0.25
1,3-Dichlorobenzene	<0.05	Dimethyl phthalate	<0.5
1,4-Dichlorobenzene	<0.05	2,6-Dinitrotoluene	<0.25
1,2-Dichlorobenzene	<0.05	3-Nitroaniline	<5
Benzyl alcohol	<0.5	2,4-Dinitrophenol	<1.5
2,2'-Oxybis(1-chloropropane)	0.056 lc	Dibenzofuran	<0.05
2-Methylphenol	<0.5	2,4-Dinitrotoluene	<0.25
Hexachloroethane	<0.05	4-Nitrophenol	<1.5 ca
N-Nitroso-di-n-propylamine	<0.05	Diethyl phthalate	<0.5
3-Methylphenol + 4-Methylphenol	<1	4-Chlorophenyl phenyl ether	<0.05
Nitrobenzene	<0.05	N-Nitrosodiphenylamine	<0.05
Isophorone	<0.05	4-Nitroaniline	<5
2-Nitrophenol	<0.5	4,6-Dinitro-2-methylphenol	<1.5
2,4-Dimethylphenol	<0.5	4-Bromophenyl phenyl ether	<0.05
Benzoic acid	<2.5	Hexachlorobenzene	<0.05
Bis(2-chloroethoxy)methane	<0.05	Pentachlorophenol	<0.5
2,4-Dichlorophenol	<0.5	Carbazole	<0.5
1,2,4-Trichlorobenzene	<0.05	Di-n-butyl phthalate	<0.5
Hexachlorobutadiene	<0.05	Benzyl butyl phthalate	<0.5
4-Chloroaniline	<5	Bis(2-ethylhexyl) phthalate	<0.8
4-Chloro-3-methylphenol	<0.5	Di-n-octyl phthalate	<0.5
Hexachlorocyclopentadiene	<0.15		

Analysis For Organochlorine Pesticides By EPA Method 8081B

Client Sample ID:	AMW-3-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/17/18	Lab ID:	801176-01 1/0.25
Date Analyzed:	01/18/18	Data File:	011816.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	49	45	123
DBC	63	18	174

Compounds:	Concentration ug/L
alpha-BHC	<0.005
gamma-BHC (Lindane)	<0.005
beta-BHC	<0.005
delta-BHC	<0.005
Heptachlor	<0.005
Aldrin	<0.005
Heptachlor Epoxide	<0.005
trans-Chlordane	<0.005
cis-Chlordane	<0.005
4,4'-DDE	<0.005
Endosulfan I	<0.025
Dieldrin	<0.005
Endrin	<0.005
4,4'-DDD	<0.005
Endosulfan II	<0.025
4,4'-DDT	<0.005
Endrin Aldehyde	<0.025
Methoxychlor	<0.005
Endosulfan Sulfate	<0.005
Endrin Ketone	<0.005
Toxaphene	<0.25

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ENVIRONMENTAL CHEMISTS

Analysis For Organochlorine Pesticides By EPA Method 8081B

Client Sample ID:	AMW-4-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/17/18	Lab ID:	801176-02 1/0.25
Date Analyzed:	01/18/18	Data File:	011817.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	60	45	123
DBC	71	18	174

Compounds:	Concentration ug/L
alpha-BHC	<0.005
gamma-BHC (Lindane)	<0.005
beta-BHC	<0.005
delta-BHC	<0.005
Heptachlor	<0.005
Aldrin	<0.005
Heptachlor Epoxide	<0.005
trans-Chlordane	<0.005
cis-Chlordane	<0.005
4,4'-DDE	<0.005
Endosulfan I	<0.025
Dieldrin	<0.005
Endrin	<0.005
4,4'-DDD	<0.005
Endosulfan II	<0.025
4,4'-DDT	<0.005
Endrin Aldehyde	<0.025
Methoxychlor	<0.005
Endosulfan Sulfate	<0.005
Endrin Ketone	<0.005
Toxaphene	<0.25

Analysis For Organochlorine Pesticides By EPA Method 8081B

Client Sample ID:	AMW-2-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/17/18	Lab ID:	801176-03 1/0.25
Date Analyzed:	01/18/18	Data File:	011818.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	30 ip	45	123
DBC	36	18	174

Compounds:	Concentration ug/L
alpha-BHC	<0.005
gamma-BHC (Lindane)	<0.005
beta-BHC	<0.005
delta-BHC	<0.005
Heptachlor	<0.005
Aldrin	<0.005
Heptachlor Epoxide	<0.005
trans-Chlordane	<0.005
cis-Chlordane	<0.005
4,4'-DDE	<0.005
Endosulfan I	<0.025
Dieldrin	<0.005
Endrin	<0.005
4,4'-DDD	<0.005
Endosulfan II	<0.025
4,4'-DDT	<0.005
Endrin Aldehyde	<0.025
Methoxychlor	<0.005
Endosulfan Sulfate	<0.005
Endrin Ketone	<0.005
Toxaphene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Organochlorine Pesticides By EPA Method 8081B

Client Sample ID:	AMW-1-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/17/18	Lab ID:	801176-04 1/0.25
Date Analyzed:	01/18/18	Data File:	011819.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	49	45	123
DBC	66	18	174

Compounds:	Concentration ug/L
alpha-BHC	<0.005
gamma-BHC (Lindane)	<0.005
beta-BHC	<0.005
delta-BHC	<0.005
Heptachlor	<0.005
Aldrin	<0.005
Heptachlor Epoxide	<0.005
trans-Chlordane	<0.005
cis-Chlordane	<0.005
4,4'-DDE	<0.005
Endosulfan I	<0.025
Dieldrin	<0.005
Endrin	<0.005
4,4'-DDD	<0.005
Endosulfan II	<0.025
4,4'-DDT	<0.005
Endrin Aldehyde	<0.025
Methoxychlor	<0.005
Endosulfan Sulfate	<0.005
Endrin Ketone	<0.005
Toxaphene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Organochlorine Pesticides By EPA Method 8081B

Client Sample ID:	AMW-5-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/17/18	Lab ID:	801176-05 1/0.25
Date Analyzed:	01/18/18	Data File:	011820.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	51	45	123
DBC	58	18	174

Compounds:	Concentration ug/L
alpha-BHC	<0.005
gamma-BHC (Lindane)	<0.005
beta-BHC	<0.005
delta-BHC	<0.005
Heptachlor	<0.005
Aldrin	<0.005
Heptachlor Epoxide	<0.005
trans-Chlordane	<0.005
cis-Chlordane	<0.005
4,4'-DDE	<0.005
Endosulfan I	<0.025
Dieldrin	<0.005
Endrin	<0.005
4,4'-DDD	<0.005
Endosulfan II	<0.025
4,4'-DDT	<0.005
Endrin Aldehyde	<0.025
Methoxychlor	<0.005
Endosulfan Sulfate	<0.005
Endrin Ketone	<0.005
Toxaphene	<0.25

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Organochlorine Pesticides By EPA Method 8081B

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/17/18	Lab ID:	08-135 mb 1/0.25
Date Analyzed:	01/18/18	Data File:	011815.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	50	45	123
DBC	65	18	174

Compounds:	Concentration ug/L
alpha-BHC	<0.005
gamma-BHC (Lindane)	<0.005
beta-BHC	<0.005
delta-BHC	<0.005
Heptachlor	<0.005
Aldrin	<0.005
Heptachlor Epoxide	<0.005
trans-Chlordane	<0.005
cis-Chlordane	<0.005
4,4'-DDE	<0.005
Endosulfan I	<0.025
Dieldrin	<0.005
Endrin	<0.005
4,4'-DDD	<0.005
Endosulfan II	<0.025
4,4'-DDT	<0.005
Endrin Aldehyde	<0.025
Methoxychlor	<0.005
Endosulfan Sulfate	<0.005
Endrin Ketone	<0.005
Toxaphene	<0.25

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ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AMW-3-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/17/18	Lab ID:	801176-01 1/0.25
Date Analyzed:	01/18/18	Data File:	011816.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	54	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.025
Aroclor 1232	<0.025
Aroclor 1016	<0.025
Aroclor 1242	<0.025
Aroclor 1248	<0.025
Aroclor 1254	<0.025
Aroclor 1260	<0.025
Aroclor 1262	<0.025
Aroclor 1268	<0.025

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AMW-4-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/17/18	Lab ID:	801176-02 1/0.25
Date Analyzed:	01/18/18	Data File:	011817.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	59	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.025
Aroclor 1232	<0.025
Aroclor 1016	<0.025
Aroclor 1242	<0.025
Aroclor 1248	<0.025
Aroclor 1254	<0.025
Aroclor 1260	<0.025
Aroclor 1262	<0.025
Aroclor 1268	<0.025

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AMW-2-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/17/18	Lab ID:	801176-03 1/0.25
Date Analyzed:	01/18/18	Data File:	011818.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	32	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.025
Aroclor 1232	<0.025
Aroclor 1016	<0.025
Aroclor 1242	<0.025
Aroclor 1248	<0.025
Aroclor 1254	<0.025
Aroclor 1260	<0.025
Aroclor 1262	<0.025
Aroclor 1268	<0.025

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AMW-1-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/17/18	Lab ID:	801176-04 1/0.25
Date Analyzed:	01/18/18	Data File:	011819.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	49	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.025
Aroclor 1232	<0.025
Aroclor 1016	<0.025
Aroclor 1242	<0.025
Aroclor 1248	<0.025
Aroclor 1254	<0.025
Aroclor 1260	<0.025
Aroclor 1262	<0.025
Aroclor 1268	<0.025

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	AMW-5-011218	Client:	Aspect Consulting, LLC
Date Received:	01/12/18	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/17/18	Lab ID:	801176-05 1/0.25
Date Analyzed:	01/18/18	Data File:	011820.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	51	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.025
Aroclor 1232	<0.025
Aroclor 1016	<0.025
Aroclor 1242	<0.025
Aroclor 1248	<0.025
Aroclor 1254	<0.025
Aroclor 1260	<0.025
Aroclor 1262	<0.025
Aroclor 1268	<0.025

Analysis For PCBs By EPA Method 8082A

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C St. Landfill 150074
Date Extracted:	01/17/18	Lab ID:	08-135 mb 1/0.25
Date Analyzed:	01/18/18	Data File:	011815.D
Matrix:	Water	Instrument:	GC7
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	57	24	127

Compounds:	Concentration ug/L (ppb)
Aroclor 1221	<0.025
Aroclor 1232	<0.025
Aroclor 1016	<0.025
Aroclor 1242	<0.025
Aroclor 1248	<0.025
Aroclor 1254	<0.025
Aroclor 1260	<0.025
Aroclor 1262	<0.025
Aroclor 1268	<0.025

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TPH AS GASOLINE USING METHOD NWTPH-Gx

Laboratory Code: 801176-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 20)
Gasoline	ug/L (ppb)	<100	<100	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Gasoline	ug/L (ppb)	1,000	102	69-134

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	72	76	63-142	5

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 801176-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	<0.2	107	112	70-130	5
Barium	ug/L (ppb)	50	2.86	103	109	70-130	6
Cadmium	ug/L (ppb)	5	<0.1 j	106	109	70-130	3
Chromium	ug/L (ppb)	20	1.06	108	108	70-130	0
Copper	ug/L (ppb)	20	1.08	99	102	70-130	3
Iron	ug/L (ppb)	100	241	106	113	70-130	6
Lead	ug/L (ppb)	10	<0.1 j	95	98	70-130	3
Manganese	ug/L (ppb)	20	130	139 b	156 b	70-130	12 b
Nickel	ug/L (ppb)	20	1.17	106	108	70-130	2
Selenium	ug/L (ppb)	5	<0.5	105	106	70-130	1
Silver	ug/L (ppb)	5	<0.2	101	104	70-130	3
Zinc	ug/L (ppb)	50	<4	102	106	70-130	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	100	85-115
Barium	ug/L (ppb)	50	101	85-115
Cadmium	ug/L (ppb)	5	102	85-115
Chromium	ug/L (ppb)	20	102	85-115
Copper	ug/L (ppb)	20	101	85-115
Iron	ug/L (ppb)	100	105	85-115
Lead	ug/L (ppb)	10	101	85-115
Manganese	ug/L (ppb)	20	105	85-115
Nickel	ug/L (ppb)	20	104	85-115
Selenium	ug/L (ppb)	5	100	85-115
Silver	ug/L (ppb)	5	94	85-115
Zinc	ug/L (ppb)	50	103	85-115

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR DISSOLVED METALS USING EPA METHOD 200.8

Laboratory Code: 801229-11 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	0.610	101	104	70-130	3
Barium	ug/L (ppb)	50	5.86	99	102	70-130	3
Cadmium	ug/L (ppb)	5	<0.1 j	99	101	70-130	2
Chromium	ug/L (ppb)	20	1.02	99	99	70-130	0
Copper	ug/L (ppb)	20	2.15	94	97	70-130	3
Iron	ug/L (ppb)	100	<50	92	101	70-130	9
Lead	ug/L (ppb)	10	0.293	91	95	70-130	4
Manganese	ug/L (ppb)	20	61.9	69 b	89 b	70-130	25 b
Nickel	ug/L (ppb)	20	1.89	99	102	70-130	3
Selenium	ug/L (ppb)	5	<0.5	98	98	70-130	0
Silver	ug/L (ppb)	5	<0.2	90	95	70-130	5
Zinc	ug/L (ppb)	50	<4	97	98	70-130	1

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	107	85-115
Barium	ug/L (ppb)	50	108	85-115
Cadmium	ug/L (ppb)	5	112	85-115
Chromium	ug/L (ppb)	20	110	85-115
Copper	ug/L (ppb)	20	112	85-115
Iron	ug/L (ppb)	100	110	85-115
Lead	ug/L (ppb)	10	104	85-115
Manganese	ug/L (ppb)	20	111	85-115
Nickel	ug/L (ppb)	20	113	85-115
Selenium	ug/L (ppb)	5	108	85-115
Silver	ug/L (ppb)	5	110	85-115
Zinc	ug/L (ppb)	50	111	85-115

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES FOR
TOTAL MERCURY
USING EPA METHOD 1631E

Laboratory Code: 801176-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	ug/L (ppb)	0.5	<0.1	102	104	71-125	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	ug/L (ppb)	0.5	105	79-120

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES FOR
DISSOLVED MERCURY
USING EPA METHOD 1631E

Laboratory Code: 801176-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	ug/L (ppb)	0.5	<0.1	105	105	71-125	0

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	ug/L (ppb)	0.5	106	79-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 801176-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	111	55-137
Chloromethane	ug/L (ppb)	50	<0.5	94	61-120
Vinyl chloride	ug/L (ppb)	50	<0.2	101	61-139
Bromomethane	ug/L (ppb)	50	<1	111	20-265
Chloroethane	ug/L (ppb)	50	<1	105	55-149
Trichlorofluoromethane	ug/L (ppb)	50	<0.2	106	71-128
Acetone	ug/L (ppb)	250	<50	98	48-149
1,1-Dichloroethene	ug/L (ppb)	50	<0.2	99	71-123
Hexane	ug/L (ppb)	50	<1	102	44-139
Methylene chloride	ug/L (ppb)	50	<1	101	61-126
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<0.5	105	68-125
trans-1,2-Dichloroethene	ug/L (ppb)	50	<0.2	102	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<0.2	104	79-113
2,2-Dichloropropane	ug/L (ppb)	50	<0.5	109	48-157
cis-1,2-Dichloroethene	ug/L (ppb)	50	<0.2	99	63-126
Chloroform	ug/L (ppb)	50	<0.2	99	77-117
2-Butanone (MEK)	ug/L (ppb)	250	<2	105	70-135
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<0.5	102	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<0.2	101	75-121
1,1-Dichloropropene	ug/L (ppb)	50	<0.2	99	67-121
Carbon tetrachloride	ug/L (ppb)	50	<0.2	106	70-132
Benzene	ug/L (ppb)	50	<0.2	100	75-114
Trichloroethene	ug/L (ppb)	50	<0.2	105	73-122
1,2-Dichloropropane	ug/L (ppb)	50	<0.2	100	80-111
Bromodichloromethane	ug/L (ppb)	50	<0.2	104	78-117
Dibromomethane	ug/L (ppb)	50	<0.5	105	73-125
4-Methyl-2-pentanone	ug/L (ppb)	250	<2	104	79-140
cis-1,3-Dichloropropene	ug/L (ppb)	50	<0.2	104	76-120
Toluene	ug/L (ppb)	50	<0.2	99	73-117
trans-1,3-Dichloropropene	ug/L (ppb)	50	<0.2	99	75-122
1,1,2-Trichloroethane	ug/L (ppb)	50	<0.2	96	81-116
2-Hexanone	ug/L (ppb)	250	<2	95	74-127
1,3-Dichloropropane	ug/L (ppb)	50	<0.2	97	80-113
Tetrachloroethene	ug/L (ppb)	50	<0.2	100	72-113
Dibromochloromethane	ug/L (ppb)	50	<0.2	102	69-129
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<0.2	99	79-120
Chlorobenzene	ug/L (ppb)	50	<0.2	100	75-115
Ethylbenzene	ug/L (ppb)	50	<0.2	100	66-124
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<0.2	102	76-130
m,p-Xylene	ug/L (ppb)	100	<0.4	103	63-128
o-Xylene	ug/L (ppb)	50	<0.2	102	64-129
Styrene	ug/L (ppb)	50	<0.2	95	56-142
Isopropylbenzene	ug/L (ppb)	50	<0.2	102	74-122
Bromoform	ug/L (ppb)	50	<0.5	110	49-138
n-Propylbenzene	ug/L (ppb)	50	<0.2	102	65-129
Bromobenzene	ug/L (ppb)	50	<0.2	95	70-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<0.2	102	60-138
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<0.2	103	79-120
1,2,3-Trichloropropane	ug/L (ppb)	50	<0.5	97	62-125
2-Chlorotoluene	ug/L (ppb)	50	<0.2	102	40-159
4-Chlorotoluene	ug/L (ppb)	50	<0.2	99	76-122
tert-Butylbenzene	ug/L (ppb)	50	<0.2	104	74-125
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<0.2	101	59-136
sec-Butylbenzene	ug/L (ppb)	50	<0.2	103	69-127
p-Isopropyltoluene	ug/L (ppb)	50	<0.2	103	64-132
1,3-Dichlorobenzene	ug/L (ppb)	50	<0.2	102	77-113
1,4-Dichlorobenzene	ug/L (ppb)	50	<0.2	98	75-110
1,2-Dichlorobenzene	ug/L (ppb)	50	<0.2	102	70-120
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<0.5	97	69-129
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<0.2	105	66-123
Hexachlorobutadiene	ug/L (ppb)	50	<0.5	106	53-136
Naphthalene	ug/L (ppb)	50	<0.2	104	60-145
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<0.2	106	59-130

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	50	109	110	50-157	1
Chloromethane	ug/L (ppb)	50	94	91	62-130	3
Vinyl chloride	ug/L (ppb)	50	97	100	70-128	3
Bromomethane	ug/L (ppb)	50	105	109	62-188	4
Chloroethane	ug/L (ppb)	50	101	102	66-149	1
Trichlorofluoromethane	ug/L (ppb)	50	104	107	70-132	3
Acetone	ug/L (ppb)	250	95	93	44-145	2
1,1-Dichloroethene	ug/L (ppb)	50	97	96	75-119	1
Hexane	ug/L (ppb)	50	105	103	51-153	2
Methylene chloride	ug/L (ppb)	50	100	100	63-132	0
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	102	101	70-122	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	99	99	76-118	0
1,1-Dichloroethane	ug/L (ppb)	50	101	100	77-119	1
2,2-Dichloropropane	ug/L (ppb)	50	99	106	62-141	7
cis-1,2-Dichloroethene	ug/L (ppb)	50	94	96	76-119	2
Chloroform	ug/L (ppb)	50	95	96	78-117	1
2-Butanone (MEK)	ug/L (ppb)	250	105	106	49-147	1
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	99	100	78-114	1
1,1,1-Trichloroethane	ug/L (ppb)	50	97	99	80-116	2
1,1-Dichloropropene	ug/L (ppb)	50	97	97	78-119	0
Carbon tetrachloride	ug/L (ppb)	50	102	104	72-128	2
Benzene	ug/L (ppb)	50	98	98	75-116	0
Trichloroethene	ug/L (ppb)	50	102	103	72-119	1
1,2-Dichloropropane	ug/L (ppb)	50	99	100	79-121	1
Bromodichloromethane	ug/L (ppb)	50	102	104	76-120	2
Dibromomethane	ug/L (ppb)	50	104	104	79-121	0
4-Methyl-2-pentanone	ug/L (ppb)	250	106	106	54-153	0
cis-1,3-Dichloropropene	ug/L (ppb)	50	104	104	76-128	0
Toluene	ug/L (ppb)	50	97	98	79-115	1
trans-1,3-Dichloropropene	ug/L (ppb)	50	100	100	76-128	0
1,1,2-Trichloroethane	ug/L (ppb)	50	96	97	78-120	1
2-Hexanone	ug/L (ppb)	250	101	101	49-147	0
1,3-Dichloropropane	ug/L (ppb)	50	97	98	81-115	1
Tetrachloroethene	ug/L (ppb)	50	98	98	78-109	0
Dibromochloromethane	ug/L (ppb)	50	101	101	63-140	0
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	100	100	82-118	0
Chlorobenzene	ug/L (ppb)	50	98	99	80-113	1
Ethylbenzene	ug/L (ppb)	50	99	99	83-111	0
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	98	99	76-125	1
m,p-Xylene	ug/L (ppb)	100	100	100	84-112	0
o-Xylene	ug/L (ppb)	50	99	99	81-117	0
Styrene	ug/L (ppb)	50	94	95	83-121	1
Isopropylbenzene	ug/L (ppb)	50	98	99	81-122	1
Bromoform	ug/L (ppb)	50	112	111	40-161	1
n-Propylbenzene	ug/L (ppb)	50	101	100	81-115	1
Bromobenzene	ug/L (ppb)	50	93	95	80-113	2
1,3,5-Trimethylbenzene	ug/L (ppb)	50	99	100	83-117	1
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	102	102	79-118	0
1,2,3-Trichloropropane	ug/L (ppb)	50	98	98	74-116	0
2-Chlorotoluene	ug/L (ppb)	50	100	100	79-112	0
4-Chlorotoluene	ug/L (ppb)	50	98	98	80-116	0
tert-Butylbenzene	ug/L (ppb)	50	100	101	81-119	1
1,2,4-Trimethylbenzene	ug/L (ppb)	50	98	98	81-121	0
sec-Butylbenzene	ug/L (ppb)	50	101	100	83-123	1
p-Isopropyltoluene	ug/L (ppb)	50	100	101	81-122	1
1,3-Dichlorobenzene	ug/L (ppb)	50	100	101	80-115	1
1,4-Dichlorobenzene	ug/L (ppb)	50	97	97	77-112	0
1,2-Dichlorobenzene	ug/L (ppb)	50	99	99	79-115	0
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	95	96	62-133	1
1,2,4-Trichlorobenzene	ug/L (ppb)	50	100	101	75-119	1
Hexachlorobutadiene	ug/L (ppb)	50	107	104	70-116	3
Naphthalene	ug/L (ppb)	50	97	100	72-131	3
1,2,3-Trichlorobenzene	ug/L (ppb)	50	99	102	74-122	3

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	0.25	89	89	67-116	0
2-Methylnaphthalene	ug/L (ppb)	0.25	89	89	63-122	0
1-Methylnaphthalene	ug/L (ppb)	0.25	89	89	65-122	0
Acenaphthylene	ug/L (ppb)	0.25	89	90	65-119	1
Acenaphthene	ug/L (ppb)	0.25	90	91	66-118	1
Fluorene	ug/L (ppb)	0.25	91	89	64-125	2
Phenanthrene	ug/L (ppb)	0.25	92	90	67-120	2
Anthracene	ug/L (ppb)	0.25	91	89	65-122	2
Fluoranthene	ug/L (ppb)	0.25	92	91	65-127	6
Pyrene	ug/L (ppb)	0.25	94	97	62-130	2
Benz(a)anthracene	ug/L (ppb)	0.25	96	95	60-118	1
Chrysene	ug/L (ppb)	0.25	95	93	66-125	2
Benzo(b)fluoranthene	ug/L (ppb)	0.25	89	87	55-135	2
Benzo(k)fluoranthene	ug/L (ppb)	0.25	92	89	62-125	3
Benzo(a)pyrene	ug/L (ppb)	0.25	89	87	58-127	2
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	0.25	85	85	36-142	0
Dibenz(a,h)anthracene	ug/L (ppb)	0.25	84	81	37-133	4
Benzo(g,h,i)perylene	ug/L (ppb)	0.25	85	84	34-135	1

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR SEMIVOLATILES BY EPA METHOD 8270D

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Phenol	ug/L (ppb)	2.5	27	32	10-84	17
Bis(2-chloroethyl) ether	ug/L (ppb)	2.5	89	94	52-113	5
2-Chlorophenol	ug/L (ppb)	2.5	69	84	50-110	20
1,3-Dichlorobenzene	ug/L (ppb)	2.5	85	90	45-109	6
1,4-Dichlorobenzene	ug/L (ppb)	2.5	85	89	44-118	5
1,2-Dichlorobenzene	ug/L (ppb)	2.5	87	92	46-116	6
Benzyl alcohol	ug/L (ppb)	2.5	73	78	42-100	7
2,2'-Oxybis(1-chloropropane)	ug/L (ppb)	2.5	91	96	51-124	5
2-Methylphenol	ug/L (ppb)	2.5	56	69	38-100	21 vo
Hexachloroethane	ug/L (ppb)	2.5	87	89	42-117	2
N-Nitroso-di-n-propylamine	ug/L (ppb)	2.5	99	103	48-124	4
3-Methylphenol + 4-Methylphenol	ug/L (ppb)	2.5	52	63	40-105	19
Nitrobenzene	ug/L (ppb)	2.5	92	98	50-118	6
Isophorone	ug/L (ppb)	2.5	96	101	55-116	5
2-Nitrophenol	ug/L (ppb)	2.5	96	104	42-127	8
2,4-Dimethylphenol	ug/L (ppb)	2.5	49	63	11-135	25 vo
Benzoic acid	ug/L (ppb)	16	25	30	10-110	18
Bis(2-chloroethoxy)methane	ug/L (ppb)	2.5	92	97	55-115	5
2,4-Dichlorophenol	ug/L (ppb)	2.5	85	97	55-113	13
1,2,4-Trichlorobenzene	ug/L (ppb)	2.5	87	91	50-109	4
Hexachlorobutadiene	ug/L (ppb)	2.5	88	93	50-109	6
4-Chloroaniline	ug/L (ppb)	5	87	82	30-109	6
4-Chloro-3-methylphenol	ug/L (ppb)	2.5	75	90	54-114	18
2-Methylnaphthalene	ug/L (ppb)	2.5	90	94	53-113	4
1-Methylnaphthalene	ug/L (ppb)	2.5	90	94	70-130	4
Hexachlorocyclopentadiene	ug/L (ppb)	2.5	57	55	10-121	4
2,4,6-Trichlorophenol	ug/L (ppb)	2.5	92	99	46-114	7
2,4,5-Trichlorophenol	ug/L (ppb)	2.5	90	98	57-122	9
2-Chloronaphthalene	ug/L (ppb)	2.5	87	91	52-112	4
2-Nitroaniline	ug/L (ppb)	2.5	91	98	47-128	7
Dimethyl phthalate	ug/L (ppb)	2.5	92	103	55-116	11
2,6-Dinitrotoluene	ug/L (ppb)	2.5	88	97	49-126	10
3-Nitroaniline	ug/L (ppb)	5	78	81	21-125	4
2,4-Dinitrophenol	ug/L (ppb)	2.5	82	87	29-130	6
Dibenzofuran	ug/L (ppb)	2.5	86	93	53-113	8
2,4-Dinitrotoluene	ug/L (ppb)	2.5	82	92	48-129	11
4-Nitrophenol	ug/L (ppb)	2.5	30	32	10-80	6
Diethyl phthalate	ug/L (ppb)	2.5	88	99	55-116	12
4-Chlorophenyl phenyl ether	ug/L (ppb)	2.5	87	95	52-115	9
N-Nitrosodiphenylamine	ug/L (ppb)	2.5	94	99	51-112	5
4-Nitroaniline	ug/L (ppb)	5	89	86	42-115	3
4,6-Dinitro-2-methylphenol	ug/L (ppb)	2.5	98	99	40-128	1
4-Bromophenyl phenyl ether	ug/L (ppb)	2.5	93	97	53-114	4
Hexachlorobenzene	ug/L (ppb)	2.5	91	95	54-115	4
Pentachlorophenol	ug/L (ppb)	2.5	95	96	49-114	1
Carbazole	ug/L (ppb)	2.5	95	96	54-115	1
Di-n-butyl phthalate	ug/L (ppb)	2.5	102	110	54-115	8
Benzyl butyl phthalate	ug/L (ppb)	2.5	100	108	53-122	8
Bis(2-ethylhexyl) phthalate	ug/L (ppb)	2.5	89	95	54-122	7
Di-n-octyl phthalate	ug/L (ppb)	2.5	88	90	50-131	2

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES FOR
ORGANOCHLORINE PESTICIDES
BY EPA METHOD 8081B

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
alpha-BHC	ug/L (ppb)	0.12	68	74	52-107	8
gamma-BHC (Lindane)	ug/L (ppb)	0.12	68	74	55-105	8
beta-BHC	ug/L (ppb)	0.12	68	76	58-105	11
delta-BHC	ug/L (ppb)	0.12	67	75	58-102	11
Heptachlor	ug/L (ppb)	0.12	61	70	50-107	14
Aldrin	ug/L (ppb)	0.12	61	69	51-103	12
Heptachlor Epoxide	ug/L (ppb)	0.12	69	77	57-109	11
trans-Chlordane	ug/L (ppb)	0.12	66	73	42-123	10
cis-Chlordane	ug/L (ppb)	0.12	67	76	51-106	13
4,4'-DDE	ug/L (ppb)	0.12	68	77	55-113	12
Endosulfan I	ug/L (ppb)	0.12	39	49	15-150	23 vo
Dieldrin	ug/L (ppb)	0.12	71	80	61-112	12
Endrin	ug/L (ppb)	0.12	74	80	44-136	8
4,4'-DDD	ug/L (ppb)	0.12	70	80	47-131	13
Endosulfan II	ug/L (ppb)	0.12	23	31	15-122	30 vo
4,4'-DDT	ug/L (ppb)	0.12	65	74	55-111	13
Endrin Aldehyde	ug/L (ppb)	0.12	65	77	51-112	17
Methoxychlor	ug/L (ppb)	0.12	70	78	51-118	11
Endosulfan Sulfate	ug/L (ppb)	0.12	73	83	63-109	13
Endrin Ketone	ug/L (ppb)	0.12	71	81	62-106	13
Toxaphene	ug/L (ppb)	0.5	74	79	70-130	7

Date of Report: 02/07/18
Date Received: 01/12/18
Project: Shelton C St. Landfill 150074, F&BI 801176

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR POLYCHLORINATED BIPHENYLS AS AROCLOR 1016/1260 BY EPA METHOD 8082A

Laboratory Code: Laboratory Control Sample 1/0.25

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Aroclor 1016	ug/L (ppb)	0.63	81	82	37-136	1
Aroclor 1260	ug/L (ppb)	0.63	85	85	41-135	0

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

FRONTIER ANALYTICAL LABORATORY

NELAP ACCREDITED TNI LABORATORY

January 31, 2018

Mr. Michael Erdahl
Friedman and Bruya, Inc.
3012 16th Ave. W
Seattle, WA 98119

Dear Mr. Erdahl,

The following results are associated with Frontier Analytical Laboratory project **11211**. This corresponds to your project number **801176** and purchase order number **A-233**. Five aqueous samples were received at Frontier Analytical Laboratory (FAL) on 1/16/2018 in good condition. These samples were extracted and analyzed by EPA Method 1613 for tetra through octa chlorinated dibenzo dioxins and furans. The Toxic Equivalency (TEQ) for your samples has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Freidman and Bruya, Inc. requested a turnaround time of fifteen business days for project **11211**.

The following Level IV report consists of an Analytical Data section, a Sample Receipt section, a Laboratory Raw Data section, and an Instrument Raw Data section. The Analytical Data section contains our project-sample tracking log and the analytical results. The Sample Receipt section contains your original chain of custody, our sample login form and a sample photo. The Laboratory Raw Data section contains our project request sheet, a percent solids sheet, an extraction bench sheet and the cleanup bench sheet. The instrument raw data section contains three sub-sections; the sample results section, the initial calibration section and the continuing/ending calibration section. The sample results sub-section consists of the quantitation summary forms with chromatograms for all samples and QC. The initial calibration sub-section consists of the individual quantitation summary forms and chromatograms for each point of the initial calibration curve as well as an overall quantitation summary form of the initial calibration curve. The continuing/ending calibration sub-section consists of the quantitation summary forms and chromatograms for all beginning and ending calibration injections associated with the samples and QC. The Level IV data package on compact disk has been sent to you via OnTrac. The enclosed results are specifically for the samples referenced in this report only. These results meet all National Environmental Laboratory Accreditation Program (NELAP) requirements and shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP Certificate number is 4041. Our State of California ELAP certificate number is **2934.**

If you have any questions regarding project **11211**, please feel free to contact me at (916) 934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,

Thomas C. Crabtree

Thomas C. Crabtree
Director

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: **11211**

Received on: **01/16/2018** Project Due: **02/07/2018** Storage: **R2**

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
11211-001-SA	0	801176	AMW-3-011218	EPA 1613 D/F	Aqueous	01/12/2018	10:15 am	01/14/2019
11211-002-SA	0	801176	AMW-4-011218	EPA 1613 D/F	Aqueous	01/12/2018	12:15 pm	01/14/2019
11211-003-SA	0	801176	AMW-2-011218	EPA 1613 D/F	Aqueous	01/12/2018	01:50 pm	01/14/2019
11211-004-SA	0	801176	AMW-1-011218	EPA 1613 D/F	Aqueous	01/12/2018	03:30 pm	01/14/2019
11211-005-SA	0	801176	AMW-5-011218	EPA 1613 D/F	Aqueous	01/12/2018	05:00 pm	01/14/2019

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 11211-001-MB	Date Extracted: 01-25-2018	ICal: PCDDFAL3-12-22-17	Acquired: 01-26-2018
Client ID: Method Blank	Date Received: NA	GC Column: DB5MS	2005 WHO TEQ: 0.0
Matrix: Aqueous	Amount: 1.000 L	Units: pg/L	
Batch No: X4385			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.588		-	0.209				
1,2,3,7,8-PeCDD	ND	0.892		-	0.231				
1,2,3,4,7,8-HxCDD	ND	1.75		-	0.305				
1,2,3,6,7,8-HxCDD	ND	1.75		-	0.319	Total TCDD	ND	0.588	
1,2,3,7,8,9-HxCDD	ND	1.70		-	0.306	Total PeCDD	ND	0.892	
1,2,3,4,6,7,8-HpCDD	ND	2.03		-	0.408	Total HxCDD	ND	1.75	
OCDD	ND	4.95		-	1.01	Total HpCDD	ND	2.03	
2,3,7,8-TCDF	ND	0.699		-	0.196				
1,2,3,7,8-PeCDF	ND	0.889		-	0.271				
2,3,4,7,8-PeCDF	ND	0.937		-	0.303				
1,2,3,4,7,8-HxCDF	ND	0.940		-	0.251				
1,2,3,6,7,8-HxCDF	ND	0.986		-	0.260				
2,3,4,6,7,8-HxCDF	ND	1.02		-	0.279				
1,2,3,7,8,9-HxCDF	ND	1.38		-	0.332	Total TCDF	ND	0.699	
1,2,3,4,6,7,8-HpCDF	ND	1.30		-	0.324	Total PeCDF	ND	0.937	
1,2,3,4,7,8,9-HpCDF	ND	1.81		-	0.401	Total HxCDF	ND	1.38	
OCDF	ND	2.61		-	0.619	Total HpCDF	ND	1.81	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	84.9	25.0 - 164	
13C-1,2,3,7,8-PeCDD	76.6	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	79.0	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	76.7	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	72.8	23.0 - 140	
13C-OCDD	68.7	17.0 - 157	
13C-2,3,7,8-TCDF	84.7	24.0 - 169	
13C-1,2,3,7,8-PeCDF	75.6	24.0 - 185	
13C-2,3,4,7,8-PeCDF	74.4	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	81.9	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	78.4	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	79.4	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	70.3	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	72.3	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	70.4	26.0 - 138	
13C-OCDF	64.6	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	87.3	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ________ Reviewed By: ________

Date: 1/30/2018 Date: 1/30/2018

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 11211-001-OPR
Client ID: OPR
Matrix: Aqueous
Batch No: X4385

Date Extracted: 01-25-2018
Date Received: NA
Amount: 1.000 L

ICal: PCDDFAL3-12-22-17
GC Column: DB5MS
Units: ng/ml

Acquired: 01-26-2018
2005 WHO TEQ: NA

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	10.5	6.70 - 15.8	
1,2,3,7,8-PeCDD	50.2	35.0 - 71.0	
1,2,3,4,7,8-HxCDD	51.9	35.0 - 82.0	
1,2,3,6,7,8-HxCDD	50.9	38.0 - 67.0	
1,2,3,7,8,9-HxCDD	51.4	32.0 - 81.0	
1,2,3,4,6,7,8-HpCDD	51.6	35.0 - 70.0	
OCDD	99.2	78.0 - 144	
2,3,7,8-TCDF	11.2	7.50 - 15.8	
1,2,3,7,8-PeCDF	52.5	40.0 - 67.0	
2,3,4,7,8-PeCDF	53.7	34.0 - 80.0	
1,2,3,4,7,8-HxCDF	50.4	36.0 - 67.0	
1,2,3,6,7,8-HxCDF	51.5	42.0 - 65.0	
2,3,4,6,7,8-HxCDF	51.5	35.0 - 78.0	
1,2,3,7,8,9-HxCDF	50.2	39.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	50.3	41.0 - 61.0	
1,2,3,4,7,8,9-HpCDF	51.1	39.0 - 69.0	
OCDF	99.6	63.0 - 170	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	91.6	20.0 - 175	
13C-1,2,3,7,8-PeCDD	73.8	21.0 - 227	
13C-1,2,3,4,7,8-HxCDD	73.6	21.0 - 193	
13C-1,2,3,6,7,8-HxCDD	70.8	25.0 - 163	
13C-1,2,3,4,6,7,8-HpCDD	63.9	26.0 - 166	
13C-OCDD	63.2	13.0 - 198	
13C-2,3,7,8-TCDF	94.8	22.0 - 152	
13C-1,2,3,7,8-PeCDF	76.6	21.0 - 192	
13C-2,3,4,7,8-PeCDF	76.5	13.0 - 328	
13C-1,2,3,4,7,8-HxCDF	77.0	19.0 - 202	
13C-1,2,3,6,7,8-HxCDF	70.1	21.0 - 159	
13C-2,3,4,6,7,8-HxCDF	75.1	22.0 - 176	
13C-1,2,3,7,8,9-HxCDF	67.9	17.0 - 205	
13C-1,2,3,4,6,7,8-HpCDF	67.1	21.0 - 158	
13C-1,2,3,4,7,8,9-HpCDF	65.1	20.0 - 186	
13C-OCDF	57.8	13.0 - 198	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	94.8	31.0 - 191	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ______

Date: 1/30/2018

Reviewed By: ______

Date: 1/30/2018

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 11211-001-SA	Date Extracted: 01-25-2018	ICal: PCDDFAL3-12-22-17	Acquired: 01-27-2018
Client ID: AMW-3-011218	Date Received: 01-16-2018	GC Column: DB5MS	2005 WHO TEQ: 0.0
Matrix: Aqueous	Amount: 0.879 L	Units: pg/L	
Batch No: X4385			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.665		-	0.209				
1,2,3,7,8-PeCDD	ND	0.959		-	0.231				
1,2,3,4,7,8-HxCDD	ND	2.06		-	0.305				
1,2,3,6,7,8-HxCDD	ND	2.00		-	0.319	Total TCDD	ND	0.665	
1,2,3,7,8,9-HxCDD	ND	1.97		-	0.306	Total PeCDD	ND	0.959	
1,2,3,4,6,7,8-HpCDD	ND	2.62		-	0.408	Total HxCDD	ND	2.06	
OCDD	ND	4.61		-	1.01	Total HpCDD	ND	2.62	
2,3,7,8-TCDF	ND	0.704		-	0.196				
1,2,3,7,8-PeCDF	ND	0.899		-	0.271				
2,3,4,7,8-PeCDF	ND	0.903		-	0.303				
1,2,3,4,7,8-HxCDF	ND	0.810		-	0.251				
1,2,3,6,7,8-HxCDF	ND	0.825		-	0.260				
2,3,4,6,7,8-HxCDF	ND	0.901		-	0.279				
1,2,3,7,8,9-HxCDF	ND	1.20		-	0.332	Total TCDF	ND	0.704	
1,2,3,4,6,7,8-HpCDF	ND	1.26		-	0.324	Total PeCDF	ND	0.903	
1,2,3,4,7,8,9-HpCDF	ND	1.78		-	0.401	Total HxCDF	ND	1.20	
OCDF	ND	2.14		-	0.619	Total HpCDF	ND	1.78	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	82.3	25.0 - 164	
13C-1,2,3,7,8-PeCDD	77.2	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	73.7	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	74.9	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	72.7	23.0 - 140	
13C-OCDD	70.0	17.0 - 157	
13C-2,3,7,8-TCDF	76.4	24.0 - 169	
13C-1,2,3,7,8-PeCDF	72.0	24.0 - 185	
13C-2,3,4,7,8-PeCDF	72.7	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	79.0	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	78.2	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	76.0	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	70.3	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	74.0	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	69.4	26.0 - 138	
13C-OCDF	66.5	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	88.9	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ________

Date: 1/30/2018

Reviewed By: ________

Date: 1/30/2018

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 11211-002-SA	Date Extracted: 01-25-2018	ICal: PCDDFAL3-12-22-17	Acquired: 01-27-2018
Client ID: AMW-4-011218	Date Received: 01-16-2018	GC Column: DB5MS	2005 WHO TEQ: 0.0255
Matrix: Aqueous	Amount: 0.960 L	Units: pg/L	
Batch No: X4385			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.585		-	0.209				
1,2,3,7,8-PeCDD	ND	1.07		-	0.231				
1,2,3,4,7,8-HxCDD	ND	2.03		-	0.305				
1,2,3,6,7,8-HxCDD	ND	1.92		-	0.319	Total TCDD	ND	0.585	
1,2,3,7,8,9-HxCDD	ND	1.91		-	0.306	Total PeCDD	ND	1.07	
1,2,3,4,6,7,8-HpCDD	2.08	-	J	0.0208	0.408	Total HxCDD	ND	2.03	
OCDD	15.5	-	J	0.00465	1.01	Total HpCDD	4.87	-	J
2,3,7,8-TCDF	ND	0.643		-	0.196				
1,2,3,7,8-PeCDF	ND	1.21		-	0.271				
2,3,4,7,8-PeCDF	ND	1.23		-	0.303				
1,2,3,4,7,8-HxCDF	ND	0.989		-	0.251				
1,2,3,6,7,8-HxCDF	ND	1.04		-	0.260				
2,3,4,6,7,8-HxCDF	ND	1.10		-	0.279				
1,2,3,7,8,9-HxCDF	ND	1.44		-	0.332	Total TCDF	ND	0.643	
1,2,3,4,6,7,8-HpCDF	ND	0.860		-	0.324	Total PeCDF	ND	1.23	
1,2,3,4,7,8,9-HpCDF	ND	1.18		-	0.401	Total HxCDF	ND	1.44	
OCDF	ND	2.63		-	0.619	Total HpCDF	ND	1.18	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	86.7	25.0 - 164	
13C-1,2,3,7,8-PeCDD	81.2	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	75.2	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	76.8	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	74.3	23.0 - 140	
13C-OCDD	69.0	17.0 - 157	
13C-2,3,7,8-TCDF	80.6	24.0 - 169	
13C-1,2,3,7,8-PeCDF	77.7	24.0 - 185	
13C-2,3,4,7,8-PeCDF	77.7	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	81.7	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	78.8	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	79.7	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	73.2	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	73.7	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	71.5	26.0 - 138	
13C-OCDF	63.6	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	85.6	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ______ Reviewed By: ______

Date: 1/30/2018 Date: 1/30/2018

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com

EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 11211-003-SA
Client ID: AMW-2-011218
Matrix: Aqueous
Batch No: X4385

Date Extracted: 01-25-2018
Date Received: 01-16-2018
Amount: 0.903 L

ICal: PCDDFAL3-12-22-17
GC Column: DB5MS
Units: pg/L

Acquired: 01-27-2018
2005 WHO TEQ: 0.00666

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.692		-	0.209				
1,2,3,7,8-PeCDD	ND	1.64		-	0.231				
1,2,3,4,7,8-HxCDD	ND	1.87		-	0.305				
1,2,3,6,7,8-HxCDD	ND	1.88		-	0.319	Total TCDD	ND	0.692	
1,2,3,7,8,9-HxCDD	ND	1.82		-	0.306	Total PeCDD	ND	1.64	
1,2,3,4,6,7,8-HpCDD	ND	3.18		-	0.408	Total HxCDD	ND	1.88	
OCDD	22.2	-	J	0.00666	1.01	Total HpCDD	ND	3.18	
2,3,7,8-TCDF	ND	0.856		-	0.196				
1,2,3,7,8-PeCDF	ND	0.781		-	0.271				
2,3,4,7,8-PeCDF	ND	0.842		-	0.303				
1,2,3,4,7,8-HxCDF	ND	1.23		-	0.251				
1,2,3,6,7,8-HxCDF	ND	1.24		-	0.260				
2,3,4,6,7,8-HxCDF	ND	1.41		-	0.279				
1,2,3,7,8,9-HxCDF	ND	1.71		-	0.332	Total TCDF	ND	0.856	
1,2,3,4,6,7,8-HpCDF	ND	1.52		-	0.324	Total PeCDF	ND	0.842	
1,2,3,4,7,8,9-HpCDF	ND	2.16		-	0.401	Total HxCDF	ND	1.71	
OCDF	ND	3.22		-	0.619	Total HpCDF	ND	2.16	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	60.4	25.0 - 164	
13C-1,2,3,7,8-PeCDD	56.9	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	58.1	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	56.5	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	56.3	23.0 - 140	
13C-OCDD	55.5	17.0 - 157	
13C-2,3,7,8-TCDF	56.8	24.0 - 169	
13C-1,2,3,7,8-PeCDF	55.5	24.0 - 185	
13C-2,3,4,7,8-PeCDF	51.9	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	61.1	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	59.0	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	56.6	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	54.0	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	56.6	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	53.8	26.0 - 138	
13C-OCDF	50.2	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	80.0	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: [signature]

Date: 1/30/2018

Reviewed By: [signature]

Date: 1/30/2018

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EPA Method 1613
PCDD/F

FAL ID: 11211-004-SA
Client ID: AMW-1-011218
Matrix: Aqueous
Batch No: X4385

Date Extracted: 01-25-2018
Date Received: 01-16-2018
Amount: 0.958 L

ICal: PCDDFAL3-12-22-17
GC Column: DB5MS
Units: pg/L

Acquired: 01-27-2018
2005 WHO TEQ: 0.0

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.510		-	0.209				
1,2,3,7,8-PeCDD	ND	1.02		-	0.231				
1,2,3,4,7,8-HxCDD	ND	1.36		-	0.305				
1,2,3,6,7,8-HxCDD	ND	1.45		-	0.319	Total TCDD	ND	0.510	
1,2,3,7,8,9-HxCDD	ND	1.36		-	0.306	Total PeCDD	ND	1.02	
1,2,3,4,6,7,8-HpCDD	ND	2.29		-	0.408	Total HxCDD	ND	1.45	
OCDD	ND	5.81		-	1.01	Total HpCDD	ND	2.29	
2,3,7,8-TCDF	ND	0.499		-	0.196				
1,2,3,7,8-PeCDF	ND	0.656		-	0.271				
2,3,4,7,8-PeCDF	ND	0.688		-	0.303				
1,2,3,4,7,8-HxCDF	ND	0.819		-	0.251				
1,2,3,6,7,8-HxCDF	ND	0.845		-	0.260				
2,3,4,6,7,8-HxCDF	ND	0.873		-	0.279				
1,2,3,7,8,9-HxCDF	ND	1.14		-	0.332	Total TCDF	ND	0.499	
1,2,3,4,6,7,8-HpCDF	ND	0.929		-	0.324	Total PeCDF	ND	0.688	
1,2,3,4,7,8,9-HpCDF	ND	1.23		-	0.401	Total HxCDF	ND	1.14	
OCDF	ND	1.48		-	0.619	Total HpCDF	ND	1.23	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	92.9	25.0 - 164	
13C-1,2,3,7,8-PeCDD	86.1	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	86.6	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	86.0	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	86.9	23.0 - 140	
13C-OCDD	79.0	17.0 - 157	
13C-2,3,7,8-TCDF	91.5	24.0 - 169	
13C-1,2,3,7,8-PeCDF	87.1	24.0 - 185	
13C-2,3,4,7,8-PeCDF	85.9	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	91.5	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	88.9	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	89.2	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	84.5	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	83.0	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	84.6	26.0 - 138	
13C-OCDF	74.1	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	94.9	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: [signature]
Date: 1/30/2018

Reviewed By: [signature]
Date: 1/30/2018

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 11211-005-SA
Client ID: AMW-5-011218
Matrix: Aqueous
Batch No: X4385

Date Extracted: 01-25-2018
Date Received: 01-16-2018
Amount: 0.940 L

ICal: PCDDFAL3-12-22-17
GC Column: DB5MS
Units: pg/L

Acquired: 01-27-2018
2005 WHO TEQ: 0.0

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.795		-	0.209				
1,2,3,7,8-PeCDD	ND	1.36		-	0.231				
1,2,3,4,7,8-HxCDD	ND	1.90		-	0.305				
1,2,3,6,7,8-HxCDD	ND	1.93		-	0.319	Total TCDD	ND	0.795	
1,2,3,7,8,9-HxCDD	ND	1.85		-	0.306	Total PeCDD	ND	1.36	
1,2,3,4,6,7,8-HpCDD	ND	2.62		-	0.408	Total HxCDD	ND	1.93	
OCDD	ND	5.81		-	1.01	Total HpCDD	ND	2.62	
2,3,7,8-TCDF	ND	0.883		-	0.196				
1,2,3,7,8-PeCDF	ND	1.06		-	0.271				
2,3,4,7,8-PeCDF	ND	1.04		-	0.303				
1,2,3,4,7,8-HxCDF	ND	0.827		-	0.251				
1,2,3,6,7,8-HxCDF	ND	0.867		-	0.260				
2,3,4,6,7,8-HxCDF	ND	0.901		-	0.279				
1,2,3,7,8,9-HxCDF	ND	1.21		-	0.332	Total TCDF	ND	0.883	
1,2,3,4,6,7,8-HpCDF	ND	1.43		-	0.324	Total PeCDF	ND	1.06	
1,2,3,4,7,8,9-HpCDF	ND	1.92		-	0.401	Total HxCDF	ND	1.21	
OCDF	ND	2.29		-	0.619	Total HpCDF	ND	1.92	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	80.0	25.0 - 164	
13C-1,2,3,7,8-PeCDD	77.6	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	73.2	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	71.3	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	68.0	23.0 - 140	
13C-OCDD	62.6	17.0 - 157	
13C-2,3,7,8-TCDF	78.4	24.0 - 169	
13C-1,2,3,7,8-PeCDF	74.7	24.0 - 185	
13C-2,3,4,7,8-PeCDF	76.1	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	77.9	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	74.8	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	76.2	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	67.8	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	67.9	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	67.0	26.0 - 138	
13C-OCDF	59.6	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	86.4	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ____________

Date: 1/30/2018

Reviewed By: ____________

Date: 1/30/2018

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SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Frontier

PROJECT NAME/NO.	PO #
801176	A-233

REMARKS

Please Email Results

11211
1°C

Page # 1 of 1

TURNAROUND TIME
- [x] Standard ~~(2 Weeks)~~
- [ ] RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
- [ ] Dispose after 30 days
- [ ] Return samples
- [ ] Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	1613 Dioxins/Furans	EPH	VPH	Nitrate	Sulfate	Alkalinity	TOC-9060M				Notes
AMW-3-011218		1/12/18	1015	water		X										
AMW-4-011218		↓	1215	↓		X										
AMW-2-011218		↓	1350	↓		X										
AMW-1-011218		↓	1530	↓		X										
AMW-5-011218		↓	1700	↓		X										

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Michael Erdahl	Friedman and Bruya	1/15/18	11:34
Received by: [signature]	Kathy Zipp	Frontier	1.16.18	1105
Relinquished by:				
Received by:				

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: **11211**

Client:	Friedman & Bruya, Inc.
Client Project ID:	801176
Date Received:	01/16/2018
Time Received:	11:05 am
Received By:	KZ
Logged In By:	KZ
# of Samples Received:	5
Duplicates:	0
Storage Location:	R2

Method of Delivery:	Fed-Ex
Tracking Number:	809992619570
Shipping Container Received Intact	Yes
Custody seals(s) present?	No
Custody seals(s) intact?	No
Sample Arrival Temperature (C)	1
Cooling Method	Blue Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	Yes
Test aqueous sample for residual Chlorine	Yes
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	Yes
pH Range of Aqueous Sample	Between 4 and 9
Anomalies or additional comments:	

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SUBCONTRACT SAMPLE CHAIN OF CUSTODY
Frontier Analytical Laboratory
11211-001-SA
Client ID:AMW-3-011218
Storage: R2
FRIEDMAN & BRUYA, INC.
Frontier Analytical Laboratory
11211-002-SA
Client ID: AMW-4-011218
Storage: R2
FRIEDMAN & BRUYA, INC.
Frontier Analytical Laboratory
11211-003-SA
Client ID: AMW-2-011218
Storage: R2
FRIEDMAN & BRUYA, INC.
Frontier Analytical Laboratory
11211-004-SA
Client ID:AMW-1-011218
Storage: R2
FRIEDMAN & BRUYA, INC.
Frontier Analytical Laboratory
11211-005-SA
Client ID: AMW-5-011218
Storage: R2
FRIEDMAN & BRUYA, INC.
2018/01/16

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 801176
Work Order Number: 1801202

February 05, 2018

Attention Michael Erdahl:

Fremont Analytical, Inc. received 5 sample(s) on 1/15/2018 for the analyses presented in the following report.

Ammonia by SM 4500 NH3G
Cyanide by SM 4500-CN C, E
Dissolved Metals by EPA Method 200.8
Dissolved Organic Carbon by SM 5310C
Herbicides by EPA Method 8151A
Ion Chromatography by EPA Method 300.0
Sulfide by SM 4500-S2-F
Total Metals by EPA Method 200.8
Total Alkalinity by SM 2320B

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

DoD/ELAP Certification #L17-135, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

Date: *02/05/2018*

CLIENT:	Friedman & Bruya
Project:	801176
Work Order:	1801202

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1801202-001	AMW-3-011218	01/12/2018 10:15 AM	01/15/2018 3:05 PM
1801202-002	AMW-4-011218	01/12/2018 12:15 PM	01/15/2018 3:05 PM
1801202-003	AMW-2-011218	01/12/2018 1:50 PM	01/15/2018 3:05 PM
1801202-004	AMW-1-011218	01/12/2018 3:30 PM	01/15/2018 3:05 PM
1801202-005	AMW-5-011218	01/12/2018 5:00 PM	01/15/2018 3:05 PM

Original

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1801202**

Date: **2/5/2018**

CLIENT: Friedman & Bruya
Project: 801176

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Fremont Analytical

Work Order: **1801202**
Date Reported: **2/5/2018**

Client: Friedman & Bruya
Project: 801176
Lab ID: 1801202-001
Client Sample ID: AMW-3-011218

Collection Date: 1/12/2018 10:15:00 AM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 19542		Analyst: IH
Dicamba	ND	4.49		µg/L	1	2/3/2018 4:08:55 AM
2,4-D	ND	2.00		µg/L	1	2/3/2018 4:08:55 AM
2,4-DP	ND	0.999		µg/L	1	2/3/2018 4:08:55 AM
2,4,5-TP (Silvex)	ND	0.599		µg/L	1	2/3/2018 4:08:55 AM
2,4,5-T	ND	0.999		µg/L	1	2/3/2018 4:08:55 AM
Dinoseb	ND	3.75		µg/L	1	2/3/2018 4:08:55 AM
Dalapon	ND	4.00	*	µg/L	1	2/3/2018 4:08:55 AM
2,4-DB	ND	3.00		µg/L	1	2/3/2018 4:08:55 AM
MCPP	ND	9.99		µg/L	1	2/3/2018 4:08:55 AM
MCPA	ND	9.99		µg/L	1	2/3/2018 4:08:55 AM
Picloram	ND	0.499		µg/L	1	2/3/2018 4:08:55 AM
Bentazon	ND	2.70		µg/L	1	2/3/2018 4:08:55 AM
Chloramben	ND	1.20		µg/L	1	2/3/2018 4:08:55 AM
Acifluorfen	ND	4.25		µg/L	1	2/3/2018 4:08:55 AM
3,5-Dichlorobenzoic acid	ND	4.99		µg/L	1	2/3/2018 4:08:55 AM
4-Nitrophenol	ND	0.749	*	µg/L	1	2/3/2018 4:08:55 AM
Dacthal (DCPA)	ND	0.849		µg/L	1	2/3/2018 4:08:55 AM
Surr: 2,4-Dichlorophenylacetic acid	101	34.8 - 149		%Rec	1	2/3/2018 4:08:55 AM

NOTES:
* - Flagged value is not within established control limits.

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: R41130		Analyst: KT
Chloride	1.91	0.100		mg/L	1	1/16/2018 4:12:00 PM
Nitrite (as N)	ND	0.100	H	mg/L	1	1/16/2018 4:12:00 PM
Nitrate (as N)	0.858	0.100	H	mg/L	1	1/16/2018 4:12:00 PM
Sulfate	14.0	0.300		mg/L	1	1/16/2018 4:12:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 19551		Analyst: TN
Calcium	30,500	100		µg/L	1	1/19/2018 1:45:14 PM
Magnesium	17,700	100		µg/L	1	1/19/2018 1:45:14 PM
Sodium	3,870	100		µg/L	1	1/19/2018 1:45:14 PM
Total Metals by EPA Method 200.8				Batch ID: 19553		Analyst: TN
Calcium	29,800	100		µg/L	1	1/19/2018 2:53:40 PM
Magnesium	16,900	100		µg/L	1	1/19/2018 2:53:40 PM
Sodium	3,730	100		µg/L	1	1/19/2018 2:53:40 PM

Fremont Analytical

Analytical Report

Work Order: **1801202**
Date Reported: **2/5/2018**

Client: Friedman & Bruya
Collection Date: 1/12/2018 10:15:00 AM
Project: 801176
Lab ID: 1801202-001
Matrix: Water
Client Sample ID: AMW-3-011218

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Organic Carbon by SM 5310C				Batch ID: R41191		Analyst: KT
Organic Carbon, Dissolved	15.3	2.00	D	mg/L	4	1/19/2018 8:21:02 AM
Total Alkalinity by SM 2320B				Batch ID: R41238		Analyst: WF
Alkalinity, Total (As CaCO3)	138	2.50		mg/L	1	1/22/2018 3:24:57 PM
Ammonia by SM 4500 NH3G				Batch ID: 19559		Analyst: KT
Nitrogen, Ammonia	ND	0.100		mg/L	1	1/18/2018 2:58:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 19544		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	1/18/2018 6:19:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R41236		Analyst: KT
Sulfide	ND	0.500		mg/L	1	1/19/2018 1:23:00 PM

Analytical Report

Fremont Analytical

Work Order: **1801202**
Date Reported: **2/5/2018**

Client: Friedman & Bruya
Project: 801176
Lab ID: 1801202-002
Client Sample ID: **AMW-4-011218**

Collection Date: 1/12/2018 12:15:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 19542		Analyst: IH
Dicamba	ND	4.50		µg/L	1	2/3/2018 4:48:43 AM
2,4-D	ND	2.00		µg/L	1	2/3/2018 4:48:43 AM
2,4-DP	ND	0.999		µg/L	1	2/3/2018 4:48:43 AM
2,4,5-TP (Silvex)	ND	0.599		µg/L	1	2/3/2018 4:48:43 AM
2,4,5-T	ND	0.999		µg/L	1	2/3/2018 4:48:43 AM
Dinoseb	ND	3.75		µg/L	1	2/3/2018 4:48:43 AM
Dalapon	ND	4.00	*	µg/L	1	2/3/2018 4:48:43 AM
2,4-DB	ND	3.00		µg/L	1	2/3/2018 4:48:43 AM
MCPP	ND	9.99		µg/L	1	2/3/2018 4:48:43 AM
MCPA	ND	9.99		µg/L	1	2/3/2018 4:48:43 AM
Picloram	ND	0.500		µg/L	1	2/3/2018 4:48:43 AM
Bentazon	ND	2.70		µg/L	1	2/3/2018 4:48:43 AM
Chloramben	ND	1.20		µg/L	1	2/3/2018 4:48:43 AM
Acifluorfen	ND	4.25		µg/L	1	2/3/2018 4:48:43 AM
3,5-Dichlorobenzoic acid	ND	5.00		µg/L	1	2/3/2018 4:48:43 AM
4-Nitrophenol	ND	0.749	*	µg/L	1	2/3/2018 4:48:43 AM
Dacthal (DCPA)	ND	0.849		µg/L	1	2/3/2018 4:48:43 AM
Surr: 2,4-Dichlorophenylacetic acid	96.5	34.8 - 149		%Rec	1	2/3/2018 4:48:43 AM

NOTES:
* - Flagged value is not within established control limits.

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: R41130		Analyst: KT
Chloride	5.46	1.00	D	mg/L	10	1/16/2018 4:35:00 PM
Nitrite (as N)	ND	1.00	DH	mg/L	10	1/16/2018 4:35:00 PM
Nitrate (as N)	1.39	1.00	DH	mg/L	10	1/16/2018 4:35:00 PM
Sulfate	55.7	3.00	D	mg/L	10	1/16/2018 4:35:00 PM

NOTES:
Diluted due to matrix.

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Metals by EPA Method 200.8				Batch ID: 19567		Analyst: TN
Calcium	67,400	100		µg/L	1	1/22/2018 12:33:08 PM
Magnesium	22,000	100		µg/L	1	1/22/2018 12:33:08 PM
Sodium	76,000	1,000	D	µg/L	10	1/22/2018 12:29:06 PM
Total Metals by EPA Method 200.8				Batch ID: 19553		Analyst: TN
Calcium	75,000	100		µg/L	1	1/19/2018 3:29:55 PM

Fremont Analytical

Analytical Report

Work Order: **1801202**
Date Reported: **2/5/2018**

Client: Friedman & Bruya
Collection Date: 1/12/2018 12:15:00 PM
Project: 801176
Lab ID: 1801202-002
Matrix: Water
Client Sample ID: **AMW-4-011218**

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Metals by EPA Method 200.8				Batch ID: 19553		Analyst: TN
Magnesium	23,300	100		µg/L	1	1/19/2018 3:29:55 PM
Sodium	73,300	1,000	D	µg/L	10	1/22/2018 11:56:25 AM
Dissolved Organic Carbon by SM 5310C				Batch ID: R41191		Analyst: KT
Organic Carbon, Dissolved	54.4	2.50	D	mg/L	5	1/19/2018 8:44:28 AM
Total Alkalinity by SM 2320B				Batch ID: R41238		Analyst: WF
Alkalinity, Total (As CaCO3)	375	2.50		mg/L	1	1/22/2018 3:24:57 PM
Ammonia by SM 4500 NH3G				Batch ID: 19559		Analyst: KT
Nitrogen, Ammonia	ND	0.100		mg/L	1	1/18/2018 3:03:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 19544		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	1/18/2018 6:22:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R41236		Analyst: KT
Sulfide	ND	0.500		mg/L	1	1/19/2018 1:39:00 PM

Analytical Report

Fremont Analytical

Work Order: **1801202**
Date Reported: **2/5/2018**

Client: Friedman & Bruya
Collection Date: 1/12/2018 1:50:00 PM
Project: 801176
Lab ID: 1801202-003
Matrix: Water
Client Sample ID: AMW-2-011218

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 19542		Analyst: IH
Dicamba	ND	4.49		µg/L	1	2/3/2018 5:08:34 AM
2,4-D	ND	2.00		µg/L	1	2/3/2018 5:08:34 AM
2,4-DP	ND	0.998		µg/L	1	2/3/2018 5:08:34 AM
2,4,5-TP (Silvex)	ND	0.599		µg/L	1	2/3/2018 5:08:34 AM
2,4,5-T	ND	0.998		µg/L	1	2/3/2018 5:08:34 AM
Dinoseb	ND	3.74		µg/L	1	2/3/2018 5:08:34 AM
Dalapon	ND	3.99	*	µg/L	1	2/3/2018 5:08:34 AM
2,4-DB	ND	2.99		µg/L	1	2/3/2018 5:08:34 AM
MCPP	ND	9.98		µg/L	1	2/3/2018 5:08:34 AM
MCPA	ND	9.98		µg/L	1	2/3/2018 5:08:34 AM
Picloram	ND	0.499		µg/L	1	2/3/2018 5:08:34 AM
Bentazon	ND	2.70		µg/L	1	2/3/2018 5:08:34 AM
Chloramben	ND	1.20		µg/L	1	2/3/2018 5:08:34 AM
Acifluorfen	ND	4.24		µg/L	1	2/3/2018 5:08:34 AM
3,5-Dichlorobenzoic acid	ND	4.99		µg/L	1	2/3/2018 5:08:34 AM
4-Nitrophenol	ND	0.749	*	µg/L	1	2/3/2018 5:08:34 AM
Dacthal (DCPA)	ND	0.849		µg/L	1	2/3/2018 5:08:34 AM
Surr: 2,4-Dichlorophenylacetic acid	97.5	34.8 - 149		%Rec	1	2/3/2018 5:08:34 AM

NOTES:
* - Flagged value is not within established control limits.

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: R41130		Analyst: KT
Chloride	2.10	0.500	D	mg/L	5	1/16/2018 4:58:00 PM
Nitrite (as N)	ND	0.500	DH	mg/L	5	1/16/2018 4:58:00 PM
Nitrate (as N)	ND	0.500	DH	mg/L	5	1/16/2018 4:58:00 PM
Sulfate	14.9	1.50	D	mg/L	5	1/16/2018 4:58:00 PM

NOTES:
Diluted due to matrix.

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Metals by EPA Method 200.8				Batch ID: 19551		Analyst: TN
Calcium	31,700	100		µg/L	1	1/19/2018 1:49:15 PM
Magnesium	13,900	100		µg/L	1	1/19/2018 1:49:15 PM
Sodium	5,330	100		µg/L	1	1/19/2018 1:49:15 PM
Total Metals by EPA Method 200.8				Batch ID: 19553		Analyst: TN
Calcium	30,900	100		µg/L	1	1/19/2018 3:33:56 PM

Analytical Report

Work Order: **1801202**
Date Reported: **2/5/2018**

Client: Friedman & Bruya **Collection Date:** 1/12/2018 1:50:00 PM
Project: 801176
Lab ID: 1801202-003 **Matrix:** Water
Client Sample ID: AMW-2-011218

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Metals by EPA Method 200.8				Batch ID: 19553		Analyst: TN
Magnesium	13,300	100		µg/L	1	1/19/2018 3:33:56 PM
Sodium	4,600	100		µg/L	1	1/19/2018 3:33:56 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R41191		Analyst: KT
Organic Carbon, Dissolved	21.6	2.50	D	mg/L	5	1/19/2018 9:02:41 AM
Total Alkalinity by SM 2320B				Batch ID: R41238		Analyst: WF
Alkalinity, Total (As CaCO3)	114	2.50		mg/L	1	1/22/2018 3:24:57 PM
Ammonia by SM 4500 NH3G				Batch ID: 19559		Analyst: KT
Nitrogen, Ammonia	ND	0.100		mg/L	1	1/18/2018 3:08:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 19544		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	1/18/2018 6:25:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R41236		Analyst: KT
Sulfide	ND	0.500		mg/L	1	1/19/2018 1:43:00 PM

Fremont Analytical

Analytical Report

Work Order: **1801202**
Date Reported: **2/5/2018**

Client: Friedman & Bruya
Collection Date: 1/12/2018 3:30:00 PM
Project: 801176
Lab ID: 1801202-004
Matrix: Water
Client Sample ID: AMW-1-011218

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 19542		Analyst: IH
Dicamba	ND	4.49		µg/L	1	2/3/2018 5:28:31 AM
2,4-D	ND	1.99		µg/L	1	2/3/2018 5:28:31 AM
2,4-DP	ND	0.997		µg/L	1	2/3/2018 5:28:31 AM
2,4,5-TP (Silvex)	ND	0.598		µg/L	1	2/3/2018 5:28:31 AM
2,4,5-T	ND	0.997		µg/L	1	2/3/2018 5:28:31 AM
Dinoseb	ND	3.74		µg/L	1	2/3/2018 5:28:31 AM
Dalapon	ND	3.99	*	µg/L	1	2/3/2018 5:28:31 AM
2,4-DB	ND	2.99		µg/L	1	2/3/2018 5:28:31 AM
MCPP	ND	9.97		µg/L	1	2/3/2018 5:28:31 AM
MCPA	ND	9.97		µg/L	1	2/3/2018 5:28:31 AM
Picloram	ND	0.499		µg/L	1	2/3/2018 5:28:31 AM
Bentazon	ND	2.69		µg/L	1	2/3/2018 5:28:31 AM
Chloramben	ND	1.20		µg/L	1	2/3/2018 5:28:31 AM
Acifluorfen	ND	4.24		µg/L	1	2/3/2018 5:28:31 AM
3,5-Dichlorobenzoic acid	ND	4.99		µg/L	1	2/3/2018 5:28:31 AM
4-Nitrophenol	ND	0.748	*	µg/L	1	2/3/2018 5:28:31 AM
Dacthal (DCPA)	ND	0.848		µg/L	1	2/3/2018 5:28:31 AM
Surr: 2,4-Dichlorophenylacetic acid	96.7	34.8 - 149		%Rec	1	2/3/2018 5:28:31 AM

NOTES:
* - Flagged value is not within established control limits.

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: R41130		Analyst: KT
Chloride	2.28	0.200	D	mg/L	2	1/16/2018 5:21:00 PM
Nitrite (as N)	ND	0.200	DH	mg/L	2	1/16/2018 5:21:00 PM
Nitrate (as N)	0.110	0.200	JDH	mg/L	2	1/16/2018 5:21:00 PM
Sulfate	17.4	0.600	D	mg/L	2	1/16/2018 5:21:00 PM

NOTES:
Diluted due to matrix.

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Metals by EPA Method 200.8				Batch ID: 19551		Analyst: TN
Calcium	30,300	100		µg/L	1	1/19/2018 1:53:16 PM
Magnesium	12,400	100		µg/L	1	1/19/2018 1:53:16 PM
Sodium	4,940	100		µg/L	1	1/19/2018 1:53:16 PM
Total Metals by EPA Method 200.8				Batch ID: 19553		Analyst: TN
Calcium	30,600	100		µg/L	1	1/19/2018 3:37:57 PM

Analytical Report

Fremont Analytical

Work Order: **1801202**
Date Reported: **2/5/2018**

Client: Friedman & Bruya
Project: 801176
Lab ID: 1801202-004
Client Sample ID: **AMW-1-011218**

Collection Date: 1/12/2018 3:30:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Metals by EPA Method 200.8				Batch ID: 19553		Analyst: TN
Magnesium	12,100	100		µg/L	1	1/19/2018 3:37:57 PM
Sodium	4,820	100		µg/L	1	1/19/2018 3:37:57 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R41191		Analyst: KT
Organic Carbon, Dissolved	18.1	2.50	D	mg/L	5	1/19/2018 9:26:38 AM
Total Alkalinity by SM 2320B				Batch ID: R41238		Analyst: WF
Alkalinity, Total (As CaCO3)	112	2.50		mg/L	1	1/22/2018 3:24:57 PM
Ammonia by SM 4500 NH3G				Batch ID: 19559		Analyst: KT
Nitrogen, Ammonia	ND	0.100		mg/L	1	1/18/2018 3:14:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 19544		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	1/18/2018 6:28:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R41236		Analyst: KT
Sulfide	ND	0.500		mg/L	1	1/19/2018 1:47:00 PM

Analytical Report

Fremont Analytical

Work Order: **1801202**
Date Reported: **2/5/2018**

Client: Friedman & Bruya
Project: 801176
Lab ID: 1801202-005
Client Sample ID: **AMW-5-011218**

Collection Date: 1/12/2018 5:00:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 19542		Analyst: IH
Dicamba	ND	4.50		µg/L	1	2/3/2018 5:48:24 AM
2,4-D	ND	2.00		µg/L	1	2/3/2018 5:48:24 AM
2,4-DP	ND	0.999		µg/L	1	2/3/2018 5:48:24 AM
2,4,5-TP (Silvex)	ND	0.600		µg/L	1	2/3/2018 5:48:24 AM
2,4,5-T	ND	0.999		µg/L	1	2/3/2018 5:48:24 AM
Dinoseb	ND	3.75		µg/L	1	2/3/2018 5:48:24 AM
Dalapon	ND	4.00	*	µg/L	1	2/3/2018 5:48:24 AM
2,4-DB	ND	3.00		µg/L	1	2/3/2018 5:48:24 AM
MCPP	ND	9.99		µg/L	1	2/3/2018 5:48:24 AM
MCPA	ND	9.99		µg/L	1	2/3/2018 5:48:24 AM
Picloram	ND	0.500		µg/L	1	2/3/2018 5:48:24 AM
Bentazon	ND	2.70		µg/L	1	2/3/2018 5:48:24 AM
Chloramben	ND	1.20		µg/L	1	2/3/2018 5:48:24 AM
Acifluorfen	ND	4.25		µg/L	1	2/3/2018 5:48:24 AM
3,5-Dichlorobenzoic acid	ND	5.00		µg/L	1	2/3/2018 5:48:24 AM
4-Nitrophenol	ND	0.749	*	µg/L	1	2/3/2018 5:48:24 AM
Dacthal (DCPA)	ND	0.849		µg/L	1	2/3/2018 5:48:24 AM
Surr: 2,4-Dichlorophenylacetic acid	95.7	34.8 - 149		%Rec	1	2/3/2018 5:48:24 AM

NOTES:
* - Flagged value is not within established control limits.

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: R41130		Analyst: KT
Chloride	2.28	0.200	D	mg/L	2	1/16/2018 6:31:00 PM
Nitrite (as N)	ND	0.200	DH	mg/L	2	1/16/2018 6:31:00 PM
Nitrate (as N)	0.128	0.200	JDH	mg/L	2	1/16/2018 6:31:00 PM
Sulfate	17.3	0.600	D	mg/L	2	1/16/2018 6:31:00 PM

NOTES:
Diluted due to matrix.

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Metals by EPA Method 200.8				Batch ID: 19551		Analyst: TN
Calcium	31,200	100		µg/L	1	1/19/2018 1:57:18 PM
Magnesium	12,000	100		µg/L	1	1/19/2018 1:57:18 PM
Sodium	4,940	100		µg/L	1	1/19/2018 1:57:18 PM
Total Metals by EPA Method 200.8				Batch ID: 19553		Analyst: TN
Calcium	30,100	100		µg/L	1	1/19/2018 3:41:59 PM

Analytical Report

Work Order: **1801202**
Date Reported: **2/5/2018**

Client: Friedman & Bruya
Project: 801176
Lab ID: 1801202-005
Client Sample ID: AMW-5-011218

Collection Date: 1/12/2018 5:00:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Metals by EPA Method 200.8				Batch ID: 19553		Analyst: TN
Magnesium	12,400	100		µg/L	1	1/19/2018 3:41:59 PM
Sodium	4,510	100		µg/L	1	1/19/2018 3:41:59 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R41191		Analyst: KT
Organic Carbon, Dissolved	17.0	2.50	D	mg/L	5	1/19/2018 9:50:06 AM
Total Alkalinity by SM 2320B				Batch ID: R41238		Analyst: WF
Alkalinity, Total (As CaCO3)	110	2.50		mg/L	1	1/22/2018 3:24:57 PM
Ammonia by SM 4500 NH3G				Batch ID: 19559		Analyst: KT
Nitrogen, Ammonia	ND	0.100		mg/L	1	1/18/2018 3:19:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 19544		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	1/18/2018 6:31:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R41236		Analyst: KT
Sulfide	ND	0.500		mg/L	1	1/19/2018 1:51:00 PM

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Work Order: 1801202
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QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID **MB-R41238**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **1/22/2018**		RunNo: **41238**			
Client ID: **MBLKW**	Batch ID: **R41238**					Analysis Date: **1/22/2018**		SeqNo: **795002**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID **LCS-R41238**	SampType: **LCS**			Units: **mg/L**		Prep Date: **1/22/2018**		RunNo: **41238**			
Client ID: **LCSW**	Batch ID: **R41238**					Analysis Date: **1/22/2018**		SeqNo: **795003**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	101	2.50	100.0	0	101	80	120				

Sample ID **1801202-001BDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **1/22/2018**		RunNo: **41238**			
Client ID: **AMW-3-011218**	Batch ID: **R41238**					Analysis Date: **1/22/2018**		SeqNo: **795005**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	137	2.50						137.7	0.743	20	

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Date: *2/5/2018*

Work Order: 1801202
CLIENT: Friedman & Bruya
Project: 801176

QC SUMMARY REPORT

Ammonia by SM 4500 NH3G

Sample ID **MB-19559** SampType: **MBLK** Units: **mg/L** Prep Date: **1/19/2018** RunNo: **41185**
Client ID: **MBLKW** Batch ID: **19559** Analysis Date: **1/18/2018** SeqNo: **793702**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100									

Sample ID **LCS-19559** SampType: **LCS** Units: **mg/L** Prep Date: **1/19/2018** RunNo: **41185**
Client ID: **LCSW** Batch ID: **19559** Analysis Date: **1/18/2018** SeqNo: **793703**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	0.478	0.100	0.5000	0	95.6	80	120				

Sample ID **1801202-001HDUP** SampType: **DUP** Units: **mg/L** Prep Date: **1/19/2018** RunNo: **41185**
Client ID: **AMW-3-011218** Batch ID: **19559** Analysis Date: **1/18/2018** SeqNo: **793712**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100						0		30	

Sample ID **1801202-001HMS** SampType: **MS** Units: **mg/L** Prep Date: **1/19/2018** RunNo: **41185**
Client ID: **AMW-3-011218** Batch ID: **19559** Analysis Date: **1/18/2018** SeqNo: **793715**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	0.433	0.100	0.5000	0	86.6	70	130				

Sample ID **1801202-001HMSD** SampType: **MSD** Units: **mg/L** Prep Date: **1/19/2018** RunNo: **41185**
Client ID: **AMW-3-011218** Batch ID: **19559** Analysis Date: **1/18/2018** SeqNo: **793716**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	0.419	0.100	0.5000	0	83.8	70	130	0.4330	3.29	30	

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Work Order: 1801202
CLIENT: Friedman & Bruya
Project: 801176

QC SUMMARY REPORT

Cyanide by SM 4500-CN C, E

Sample ID **MB-19544** SampType: **MBLK** Units: **mg/L** Prep Date: **1/18/2018** RunNo: **41167**
Client ID: **MBLKW** Batch ID: **19544** Analysis Date: **1/18/2018** SeqNo: **793530**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	ND	0.0500									

Sample ID **LCS-19544** SampType: **LCS** Units: **mg/L** Prep Date: **1/18/2018** RunNo: **41167**
Client ID: **LCSW** Batch ID: **19544** Analysis Date: **1/18/2018** SeqNo: **793531**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.260	0.0500	0.2500	0	104	80	120				

Sample ID **1801213-002ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **1/18/2018** RunNo: **41167**
Client ID: **BATCH** Batch ID: **19544** Analysis Date: **1/18/2018** SeqNo: **793533**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	ND	0.0500						0		20	

Sample ID **1801213-002AMS** SampType: **MS** Units: **mg/L** Prep Date: **1/18/2018** RunNo: **41167**
Client ID: **BATCH** Batch ID: **19544** Analysis Date: **1/18/2018** SeqNo: **793534**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.134	0.0500	0.2500	0	53.5	80	120				S

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID **1801213-002AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **1/18/2018** RunNo: **41167**
Client ID: **BATCH** Batch ID: **19544** Analysis Date: **1/18/2018** SeqNo: **793535**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.198	0.0500	0.2500	0	79.4	80	120	0.1337	39.0	30	RS

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.
R - High RPD observed. The method is in control as indicated by the LCS.

Date: *2/5/2018*

Work Order: 1801202
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QC SUMMARY REPORT

Dissolved Organic Carbon by SM 5310C

Sample ID **MB-R41191** SampType: **MBLK** Units: **mg/L** Prep Date: **1/18/2018** RunNo: **41191**
Client ID: **MBLKW** Batch ID: **R41191** Analysis Date: **1/18/2018** SeqNo: **793790**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	ND	0.500									

Sample ID **LCS-R41191** SampType: **LCS** Units: **mg/L** Prep Date: **1/18/2018** RunNo: **41191**
Client ID: **LCSW** Batch ID: **R41191** Analysis Date: **1/18/2018** SeqNo: **793791**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	5.28	0.500	5.000	0	106	80	120				

Sample ID **1801228-004BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **1/18/2018** RunNo: **41191**
Client ID: **BATCH** Batch ID: **R41191** Analysis Date: **1/18/2018** SeqNo: **793796**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	7.83	0.500						8.605	9.42	20	

Sample ID **1801228-004BMS** SampType: **MS** Units: **mg/L** Prep Date: **1/18/2018** RunNo: **41191**
Client ID: **BATCH** Batch ID: **R41191** Analysis Date: **1/18/2018** SeqNo: **793797**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	11.9	0.500	5.000	8.605	65.7	70	130				S

NOTES:
S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).

Sample ID **1801228-004BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **1/18/2018** RunNo: **41191**
Client ID: **BATCH** Batch ID: **R41191** Analysis Date: **1/18/2018** SeqNo: **793798**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	11.9	0.500	5.000	8.605	65.5	70	130	11.89	0.0841	30	S

NOTES:
S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).

Date: *2/5/2018*

Work Order: 1801202
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QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **MB-R41130** SampType: **MBLK** Units: **mg/L** Prep Date: **1/16/2018** RunNo: **41130**
Client ID: **MBLKW** Batch ID: **R41130** Analysis Date: **1/16/2018** SeqNo: **792464**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									
Nitrite (as N)	ND	0.100									
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.300									

Sample ID **LCS-R41130** SampType: **LCS** Units: **mg/L** Prep Date: **1/16/2018** RunNo: **41130**
Client ID: **LCSW** Batch ID: **R41130** Analysis Date: **1/16/2018** SeqNo: **792465**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.718	0.100	0.7500	0	95.7	90	110				
Nitrite (as N)	0.730	0.100	0.7500	0	97.3	90	110				
Nitrate (as N)	0.735	0.100	0.7500	0	98.0	90	110				
Sulfate	3.58	0.300	3.750	0	95.4	90	110				

Sample ID **1801207-001CDUP** SampType: **DUP** Units: **mg/L** Prep Date: **1/16/2018** RunNo: **41130**
Client ID: **BATCH** Batch ID: **R41130** Analysis Date: **1/16/2018** SeqNo: **792467**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	3.22	0.100						3.210	0.435	20	E
Nitrite (as N)	ND	0.100						0		20	
Nitrate (as N)	ND	0.100						0		20	
Sulfate	0.456	0.300						0.4580	0.438	20	

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID **1801207-001CMS** SampType: **MS** Units: **mg/L** Prep Date: **1/16/2018** RunNo: **41130**
Client ID: **BATCH** Batch ID: **R41130** Analysis Date: **1/16/2018** SeqNo: **792468**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	4.10	0.100	0.7500	3.210	119	80	120				E

Date: *2/5/2018*

Work Order: 1801202
CLIENT: Friedman & Bruya
Project: 801176

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **1801207-001CMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **1/16/2018**	RunNo: **41130**
Client ID: **BATCH**	Batch ID: **R41130**		Analysis Date: **1/16/2018**	SeqNo: **792468**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	0.753	0.100	0.7500	0	100	80	120				
Nitrate (as N)	0.764	0.100	0.7500	0	102	80	120				
Sulfate	4.09	0.300	3.750	0.4580	96.9	80	120				

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID **1801207-001CMSD**	SampType: **MSD**	Units: **mg/L**	Prep Date: **1/16/2018**	RunNo: **41130**
Client ID: **BATCH**	Batch ID: **R41130**		Analysis Date: **1/16/2018**	SeqNo: **792469**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	4.10	0.100	0.7500	3.210	119	80	120	4.100	0.0975	20	E
Nitrite (as N)	0.758	0.100	0.7500	0	101	80	120	0.7530	0.662	20	
Nitrate (as N)	0.765	0.100	0.7500	0	102	80	120	0.7640	0.131	20	
Sulfate	4.11	0.300	3.750	0.4580	97.3	80	120	4.093	0.293	20	

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

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QC SUMMARY REPORT

Sulfide by SM 4500-S2-F

Sample ID **MB-R41236**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **1/19/2018**		RunNo: **41236**			
Client ID: **MBLKW**	Batch ID: **R41236**					Analysis Date: **1/19/2018**		SeqNo: **794893**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	ND	0.500									

Sample ID **LCS-R41236**	SampType: **LCS**			Units: **mg/L**		Prep Date: **1/19/2018**		RunNo: **41236**			
Client ID: **LCSW**	Batch ID: **R41236**					Analysis Date: **1/19/2018**		SeqNo: **794894**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	2.20	0.500	2.000	0	110	65	135				

Sample ID **1801202-001CDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **1/19/2018**		RunNo: **41236**			
Client ID: **AMW-3-011218**	Batch ID: **R41236**					Analysis Date: **1/19/2018**		SeqNo: **794896**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	ND	0.500						0		30	

Sample ID **1801202-001CMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **1/19/2018**		RunNo: **41236**			
Client ID: **AMW-3-011218**	Batch ID: **R41236**					Analysis Date: **1/19/2018**		SeqNo: **794897**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	2.00	0.500	2.000	0	100	65	135				

Sample ID **1801202-001CMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **1/19/2018**		RunNo: **41236**			
Client ID: **AMW-3-011218**	Batch ID: **R41236**					Analysis Date: **1/19/2018**		SeqNo: **794898**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	1.80	0.500	2.000	0	90.0	65	135	2.000	10.5	30	

Date: *2/5/2018*

Work Order: 1801202
CLIENT: Friedman & Bruya
Project: 801176

QC SUMMARY REPORT
Dissolved Metals by EPA Method 200.8

Sample ID **MB-19548FB**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **1/19/2018**			RunNo: **41205**		
Client ID: **MBLKW**	Batch ID: **19551**					Analysis Date: **1/19/2018**			SeqNo: **794157**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	100									
Sodium	ND	100									

NOTES:
Filter Blank

Sample ID **MB-19551**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **1/19/2018**			RunNo: **41205**		
Client ID: **MBLKW**	Batch ID: **19551**					Analysis Date: **1/19/2018**			SeqNo: **794158**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	100									
Sodium	ND	100									

Sample ID **LCS-19551**	SampType: **LCS**			Units: **µg/L**		Prep Date: **1/19/2018**			RunNo: **41205**		
Client ID: **LCSW**	Batch ID: **19551**					Analysis Date: **1/19/2018**			SeqNo: **794159**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	1,110	100	1,000	0	111	50	150				
Sodium	1,030	100	1,000	0	103	50	150				

Sample ID **1801187-016DDUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **1/19/2018**			RunNo: **41205**		
Client ID: **BATCH**	Batch ID: **19551**					Analysis Date: **1/19/2018**			SeqNo: **794161**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	74,400	100						79,360	6.39	30	
Sodium	15,100	100						15,420	1.92	30	

Work Order: 1801202
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Project: 801176

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID 1801187-016DMS	SampType: MS	Units: µg/L	Prep Date: 1/19/2018	RunNo: 41205
Client ID: BATCH	Batch ID: 19551		Analysis Date: 1/19/2018	SeqNo: 794162

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	78,800	100	5,000	79,360	-11.0	50	150				S
Sodium	19,800	100	5,000	15,420	86.6	50	150				

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed and recovered within range.

Sample ID 1801187-016DMSD	SampType: MSD	Units: µg/L	Prep Date: 1/19/2018	RunNo: 41205
Client ID: BATCH	Batch ID: 19551		Analysis Date: 1/19/2018	SeqNo: 794163

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	85,300	100	5,000	79,360	118	50	150	78,810	7.88	30	
Sodium	20,400	100	5,000	15,420	99.5	50	150	19,750	3.22	30	

Sample ID MB-19567	SampType: MBLK	Units: µg/L	Prep Date: 1/22/2018	RunNo: 41230
Client ID: MBLKW	Batch ID: 19567		Analysis Date: 1/22/2018	SeqNo: 794685

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	100									
Magnesium	ND	100									
Sodium	ND	100									

Sample ID MB-19565FB	SampType: MBLK	Units: µg/L	Prep Date: 1/22/2018	RunNo: 41230
Client ID: MBLKW	Batch ID: 19567		Analysis Date: 1/22/2018	SeqNo: 794686

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	100									
Magnesium	ND	100									
Sodium	ND	100									

NOTES:
Filter Blank

Work Order: 1801202
CLIENT: Friedman & Bruya
Project: 801176

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID **LCS-19567** SampType: **LCS** Units: **µg/L** Prep Date: **1/22/2018** RunNo: **41230**
Client ID: **LCSW** Batch ID: **19567** Analysis Date: **1/22/2018** SeqNo: **794687**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	1,070	100	1,000	0	107	50	150				
Magnesium	965	100	1,000	0	96.5	50	150				
Sodium	1,030	100	1,000	0	103	50	150				

Sample ID **1801202-002EDUP** SampType: **DUP** Units: **µg/L** Prep Date: **1/22/2018** RunNo: **41230**
Client ID: **AMW-4-011218** Batch ID: **19567** Analysis Date: **1/22/2018** SeqNo: **794692**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	69,400	100						67,390	2.87	30	
Magnesium	21,700	100						22,030	1.45	30	
Sodium	71,100	100						68,870	3.19	30	

Sample ID **1801202-002EMS** SampType: **MS** Units: **µg/L** Prep Date: **1/22/2018** RunNo: **41230**
Client ID: **AMW-4-011218** Batch ID: **19567** Analysis Date: **1/22/2018** SeqNo: **794693**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	75,500	100	5,000	67,390	163	50	150				S
Magnesium	26,200	100	5,000	22,030	82.5	70	130				
Sodium	74,800	100	5,000	68,870	119	50	150				

Sample ID **1801202-002EMSD** SampType: **MSD** Units: **µg/L** Prep Date: **1/22/2018** RunNo: **41230**
Client ID: **AMW-4-011218** Batch ID: **19567** Analysis Date: **1/22/2018** SeqNo: **794694**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	73,700	100	5,000	67,390	126	50	150	75,520	2.43	30	
Magnesium	26,600	100	5,000	22,030	91.5	70	130	26,160	1.70	30	
Sodium	71,300	100	5,000	68,870	47.9	50	150	74,840	4.89	30	S

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Date: *2/5/2018*

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CLIENT: Friedman & Bruya
Project: 801176

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID **MB-19553** SampType: **MBLK** Units: **µg/L** Prep Date: **1/19/2018** RunNo: **41211**
Client ID: **MBLKW** Batch ID: **19553** Analysis Date: **1/19/2018** SeqNo: **794345**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	ND	100									
Magnesium	ND	100									
Sodium	ND	100									

Sample ID **LCS-19553** SampType: **LCS** Units: **µg/L** Prep Date: **1/19/2018** RunNo: **41211**
Client ID: **LCSW** Batch ID: **19553** Analysis Date: **1/19/2018** SeqNo: **794346**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	1,010	100	1,000	0	101	50	150				
Magnesium	998	100	1,000	0	99.8	50	150				
Sodium	893	100	1,000	0	89.3	50	150				

Sample ID **1801202-001DDUP** SampType: **DUP** Units: **µg/L** Prep Date: **1/19/2018** RunNo: **41211**
Client ID: **AMW-3-011218** Batch ID: **19553** Analysis Date: **1/19/2018** SeqNo: **794348**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	31,500	100						29,830	5.33	30	
Magnesium	16,600	100						16,930	1.89	30	
Sodium	3,810	100						3,735	2.07	30	

Sample ID **1801202-001DMS** SampType: **MS** Units: **µg/L** Prep Date: **1/19/2018** RunNo: **41211**
Client ID: **AMW-3-011218** Batch ID: **19553** Analysis Date: **1/19/2018** SeqNo: **794349**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	37,900	100	5,000	29,830	162	50	150				S
Magnesium	22,200	100	5,000	16,930	105	70	130				
Sodium	8,790	100	5,000	3,735	101	50	150				

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed and recovered within range.

Date: *2/5/2018*

Work Order: 1801202
CLIENT: Friedman & Bruya
Project: 801176

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID	1801202-001DMSD	SampType:	MSD	Units:	µg/L	Prep Date:	1/19/2018	RunNo:	41211			
Client ID:	AMW-3-011218	Batch ID:	19553			Analysis Date:	1/19/2018	SeqNo:	794350			

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Calcium	36,900	100	5,000	29,830	141	50	150	37,920	2.76	30	
Magnesium	22,400	100	5,000	16,930	109	70	130	22,170	0.999	30	
Sodium	8,570	100	5,000	3,735	96.6	50	150	8,795	2.64	30	

Date: *2/5/2018*

Work Order: 1801202
CLIENT: Friedman & Bruya
Project: 801176

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID **MB-19542** SampType: **MBLK** Units: **µg/L** Prep Date: **1/18/2018** RunNo: **41523**
Client ID: **MBLKW** Batch ID: **19542** Analysis Date: **2/2/2018** SeqNo: **800400**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	ND	4.50									
2,4-D	ND	2.00									
2,4-DP	ND	1.00									
2,4,5-TP (Silvex)	ND	0.600									
2,4,5-T	ND	1.00									
Dinoseb	ND	3.75									
Dalapon	ND	4.00									*
2,4-DB	ND	3.00									
MCPP	ND	10.0									
MCPA	ND	10.0									
Picloram	ND	0.500									
Bentazon	ND	2.70									
Chloramben	ND	1.20									
Acifluorfen	ND	4.25									
3,5-Dichlorobenzoic acid	ND	5.00									
4-Nitrophenol	ND	0.750									*
Dacthal (DCPA)	ND	0.850									
Surr: 2,4-Dichlorophenylacetic acid	24.0		19.99		120	34.8	149				

NOTES:
* - Flagged value is not within established control limits.

Sample ID **LCS-19542** SampType: **LCS** Units: **µg/L** Prep Date: **1/18/2018** RunNo: **41523**
Client ID: **LCSW** Batch ID: **19542** Analysis Date: **2/2/2018** SeqNo: **800401**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	3.54	4.49	3.995	0	88.6	29.9	130				
2,4-D	4.02	2.00	3.995	0	101	22.3	166				
2,4-DP	4.29	0.999	3.995	0	107	10	137				
2,4,5-TP (Silvex)	4.36	0.599	3.995	0	109	26.5	146				
2,4,5-T	3.81	0.999	3.995	0	95.4	15	148				
Dinoseb	3.60	3.75	3.995	0	90.2	10	130				

Date: *2/5/2018*

Work Order: 1801202
CLIENT: Friedman & Bruya
Project: 801176

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID **LCS-19542**	SampType: **LCS**			Units: **µg/L**		Prep Date: **1/18/2018**		RunNo: **41523**			
Client ID: **LCSW**	Batch ID: **19542**					Analysis Date: **2/2/2018**		SeqNo: **800401**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dalapon	ND	4.00	19.98	0	0	19	159				S
2,4-DB	3.65	3.00	3.995	0	91.3	26.8	157				
MCPP	13.0	9.99	19.98	0	65.0	23.1	178				
MCPA	14.7	9.99	19.98	0	73.4	24.7	153				
Picloram	2.70	0.499	3.995	0	67.6	10	159				
Bentazon	3.15	2.70	3.995	0	78.7	38.4	132				
Chloramben	0.595	1.20	3.995	0	14.9	5	131				
Acifluorfen	3.11	4.24	3.995	0	77.9	10	136				
3,5-Dichlorobenzoic acid	3.58	4.99	3.995	0	89.6	10	116				
4-Nitrophenol	ND	0.749	3.995	0	0	5	122				S
Dacthal (DCPA)	0.747	0.849	3.995	0	18.7	10	161				
Surr: 2,4-Dichlorophenylacetic acid	18.4		19.98		92.1	34.8	149				

NOTES:
S - Outlying spike recovery observed (low bias). Samples will be qualified with a *.

Sample ID **LCSD-19542**	SampType: **LCSD**			Units: **µg/L**		Prep Date: **1/18/2018**		RunNo: **41523**			
Client ID: **LCSW02**	Batch ID: **19542**					Analysis Date: **2/2/2018**		SeqNo: **800402**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	3.57	4.50	3.998	0	89.2	29.9	130	0		30	
2,4-D	3.92	2.00	3.998	0	98.1	22.3	166	4.023	2.58	30	
2,4-DP	4.19	1.00	3.998	0	105	10	137	4.293	2.40	30	
2,4,5-TP (Silvex)	4.37	0.600	3.998	0	109	26.5	146	4.360	0.324	30	
2,4,5-T	3.77	1.00	3.998	0	94.3	15	148	3.810	1.03	30	
Dinoseb	3.86	3.75	3.998	0	96.7	10	130	3.602	7.04	30	
Dalapon	ND	4.00	19.99	0	0	19	159	0		30	S
2,4-DB	3.53	3.00	3.998	0	88.3	26.8	157	3.650	3.34	30	
MCPP	17.6	10.0	19.99	0	87.8	23.1	178	12.99	29.9	30	
MCPA	19.6	10.0	19.99	0	98.0	24.7	153	14.67	28.8	30	
Picloram	3.15	0.500	3.998	0	78.8	10	159	2.702	15.3	30	
Bentazon	3.35	2.70	3.998	0	83.9	38.4	132	3.145	6.39	30	

Fremont Analytical

Date: *2/5/2018*

Work Order: 1801202
CLIENT: Friedman & Bruya
Project: 801176

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID **LCSD-19542** SampType: **LCSD** Units: **µg/L** Prep Date: **1/18/2018** RunNo: **41523**
Client ID: **LCSW02** Batch ID: **19542** Analysis Date: **2/2/2018** SeqNo: **800402**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloramben	1.87	1.20	3.998	0	46.8	5	131	0.5946	104	30	R
Acifluorfen	3.98	4.25	3.998	0	99.4	10	136	0		30	
3,5-Dichlorobenzoic acid	4.19	5.00	3.998	0	105	10	116	0		30	
4-Nitrophenol	ND	0.750	3.998	0	0	5	122	0		30	S
Dacthal (DCPA)	1.67	0.850	3.998	0	41.8	10	161	0.7473	76.5	30	R
Surr: 2,4-Dichlorophenylacetic acid	20.2		19.99		101	34.8	149		0		

NOTES:
S - Outlying spike recovery observed (low bias). Samples will be qualified with a *.
R - High RPD observed, spike recoveries are within range.

Sample ID **1801202-001FDUP** SampType: **DUP** Units: **µg/L** Prep Date: **1/18/2018** RunNo: **41523**
Client ID: **AMW-3-011218** Batch ID: **19542** Analysis Date: **2/3/2018** SeqNo: **800404**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	ND	5.24						0		50	
2,4-D	ND	2.33						0		50	
2,4-DP	ND	1.16						0		50	
2,4,5-TP (Silvex)	ND	0.699						0		50	
2,4,5-T	ND	1.16						0		50	
Dinoseb	ND	4.37						0		50	
Dalapon	ND	4.66						0		50	*
2,4-DB	ND	3.49						0		50	
MCPP	ND	11.6						0		50	
MCPA	ND	11.6						0		50	
Picloram	ND	0.582						0		50	
Bentazon	ND	3.15						0		50	
Chloramben	ND	1.40						0		50	
Acifluorfen	ND	4.95						0		50	
3,5-Dichlorobenzoic acid	ND	5.82						0		50	
4-Nitrophenol	ND	0.874						0		50	*
Dacthal (DCPA)	ND	0.990						0		50	

Fremont Analytical

Date: *2/5/2018*

Work Order: 1801202
CLIENT: Friedman & Bruya
Project: 801176

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID	1801202-001FDUP	SampType:	DUP	Units:	µg/L	Prep Date:	1/18/2018	RunNo:	41523		
Client ID:	AMW-3-011218	Batch ID:	19542			Analysis Date:	2/3/2018	SeqNo:	800404		

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Surr: 2,4-Dichlorophenylacetic acid	23.0		23.30		98.9	34.8	149		0		

NOTES:
* - Flagged value is not within established control limits.

Fremont Analytical

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1801202**
Logged by:	**Brianna Barnes**	Date Received:	**1/15/2018 3:05:00 PM**

Chain of Custody

1. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? Courier

Log In

3. Coolers are present? Yes ☑ No ☐ NA ☐
4. Shipping container/cooler in good condition? Yes ☑ No ☐
5. Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact) Yes ☐ No ☐ Not Required ☑
6. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
7. Were all items received at a temperature of >0°C to 10.0°C* Yes ☐ No ☑ NA ☐

   Samples received at appropriate temperature
8. Sample(s) in proper container(s)? Yes ☑ No ☐
9. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
10. Are samples properly preserved? Yes ☑ No ☐
11. Was preservative added to bottles? Yes ☑ No ☐ NA ☐

    NaOH to C fraction, H2SO4 to G fraction.
12. Is there headspace in the VOA vials? Yes ☐ No ☐ NA ☑
13. Did all samples containers arrive in good condition(unbroken)? Yes ☑ No ☐
14. Does paperwork match bottle labels? Yes ☑ No ☐
15. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
16. Is it clear what analyses were requested? Yes ☑ No ☐
17. Were all holding times able to be met? Yes ☐ No ☑

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes ☑ No ☐ NA ☐

Person Notified:	Micheal Erdahl	Date	1/15/2018
By Whom:	Brianna Barnes	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	Confirmation of DOC filtration; ammonia method.		
Client Instructions:	DOC volume not filtered;		

19. Additional remarks:

    Nitrate and Nitrite received out of hold time.

Item Information

Item #	Temp ºC
Cooler 1	10.3
Cooler 2	6.2
Sample 1	9.1
Sample 2	5.9

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

1801202

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont

PROJECT NAME/NO. 801176

PO # A-234

REMARKS

Please Email Results Aspect EDD

TURNAROUND TIME
- X Standard ~~(2 Weeks)~~
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

						ANALYSES REQUESTED											
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Cyanide ~~Dioxins/Furans~~	Chloride ~~EPH~~	Nitrite ~~VPH~~	Nitrate	Sulfate	Alkalinity	Sulfide ~~TOC-9060M~~	Herbicides	Ammonia	Total & Dissolved Ca, Mg, Na	Dissolved Organic Carbon	Notes
AMW-3-011218		1/12/18	1015	water	8	X	X	X	X	X	X	X	X	X	X	X	
AMW-4-011218		↓	1215	↓	8	X	X	X	X	X	X	X	X	X	X	X	
AMW-2-011218		↓	1350	↓	8	X	X	X	X	X	X	X	X	X	X	X	
AMW-1-011218		↓	1530	↓	8	X	X	X	X	X	X	X	X	X	X	X	
AMW-5-011218		↓	1700	↓	8	X	X	X	X	X	X	X	X	X	X	X	

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman and Bruya	1/15/18	11:53
Received by:	Brianna Barnes	FAI	1/15/18	14:55
Relinquished by:	Brianna Barnes	FAI	1/15/18	1505
Received by: Casey O'Keefe	Casey O'Keefe	FAI	1/15/18	1505

801176

ME 01/12/18 E04/VW4/AI6

SAMPLE CHAIN OF CUSTODY

Report To Carla Brock & Ali Cochrane
Company Aspect Consulting
Address 401 2nd Ave S Suite 201
City, State, ZIP Seattle, WA 98104
Phone ______ Email ______

SAMPLERS (*signature*)	Krst Beck
PROJECT NAME	Shelton CSt. Landfill
PO #	150074
REMARKS	Please hold CB 1/15/18
INVOICE TO	Accts Payable

Page # 1 of 1

TURNAROUND TIME
- ☒ Standard Turnaround
- ☐ RUSH ______
- Rush charges authorized by: ______

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other ______

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	See Table A-1, attached CBM 1/15/18				Notes
AMW-3-011218	01 A-U	1/12/18	1015	Water	~~15~~ 21								X				
AMW-4-011218	02	1/12/18	1215		21								X				
AMW-2-011218	03	1/12/18	1350		21								X				
AMW-1-011218	04	1/12/18	1530		21								X				
AMW-5-011218	05	1/12/18	~~[illegible]~~ 1700		21								X				
Trip Blank	06 A-B				8					X							PB 1/15

Samples received at 4 °C

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Krst Beck	Kristin Beck	Aspect	1/12/18	1924
Received by:	[illegible]	Eric Young	F&B	1/12/18	1924
Relinquished by:					
Received by:					

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

Table A-1. Analytical Methods, Sample Containers, Preservation, and Holding Times

Project No. 150074, Shelton C Street Landfill
Shelton, Washington

Sample Matrix	Analytical Parameter	Analytical Method	Sample Container	No. Containers	Preservation Requirements	Holding Time
Soil	Gasoline-Range TPH	NWTPH-GX	8 ounce jar, 3 40-ml vials	4	4°C ±2°C, Freeze within 48 hours to <-7°C	14 days for extraction; 40 days for analysis
	Diesel-Range TPH	NWTPH-Dx/SW846 Method 3630 (Silica Gel Cleanup)	4 ounce jar	1	4°C ±2°C	14 days for extraction; 40 days for analysis
	VOCs	EPA 8260C	Method 5035A, 40-ml vials, 2 ounce jar	5	4°C ±2°C, Freeze within 48 hours to <-7°C, Methanol, Sodium Bisulfate	14 days
	Metals[1]	EPA 200.8/6010/7471A	4 ounce jar	1	4°C ±2°C	6 months, Hg-28 days
	Mercury	EPA 1631E	4 ounce jar	1	4°C ±2°C	28 days
	SVOCs w/low-level PAHs	EPA 8270D/8270D-SIM	8 ounce jar	1	4°C ±2°C	14 days for extraction; 40 days for analysis
	Pesticides	EPA 8081B	4 ounce jar	1	4°C ±2°C	14 days for extraction; 40 days for analysis
	PCBs	EPA 8082	4 ounce jar	1	4°C ±2°C	14 days for extraction; 40 days for analysis
	Herbicides	EPA 8151	4 ounce jar	1	4°C ±2°C	14 days for extraction; 40 days for analysis
	Cyanide	EPA 9012	4 ounce jar	1	4°C ±2°C	14 days
	Dioxins/Furans	EPA 1613	4 ounce jar	1	4°C ±2°C	1 year
Groundwater	Gasoline-Range TPH	NWTPH-Gx	40-mL VOA vial	3	4°C ±2°C, HCl	14 days
	Diesel-Range TPH	NWTPH-Dx/SW846 Method 3630 (Silica Gel Cleanup)	500-mL Amber Glass	2	4°C ±2°C	7 days for extraction, 40 days for analysis
	VOCs	EPA 8260C	40-mL VOA Vials	3	4°C ±2°C, 2 with HCl pH < 2, 2 without HCl	14 days for analysis
	Metals[1], total/dissolved (field filter)	EPA 200.7/200.8	500-mL HDPE	1	4°C ±2°C, HNO_3 pH < 2 (after filtration)	180 days
	Mercury, total dissolved (field filter)	EPA 7470/245.1	500-mL HDPE	1	4°C ±2°C, HNO_3 pH < 2 (after filtration)	28 days for analysis
	SVOCs with low-level PAHs	EPA 8270D/8270D-SIM	500-mL Amber Glass	2	4°C ±2°C	7 days for extraction, 40 days for analysis
	Pesticides	EPA 8081	1-L Amber Glass	2	≤6°C	7 days for extraction, 40 days for analysis
	PCBs	EPA 8082	1-L Amber Glass	2	≤6°C	7 days for extraction, 40 days for analysis
	Herbicides	EPA 8151	1-L Amber Glass	2	≤6°C	7 days for extraction, 40 days for analysis
	Dioxins/Furans	EPA 1613	1-L Amber Glass	2	≤6°C	1 year for analysis
	Ammonia	Method 350.1	500-mL HDPE	1	4°C ±2°C, H_2SO_4 pH < 2	28 days
	Dissolved Sulfide	Method 376.2	500-mL HDPE	1	4°C ±2°C, Zinc Acetate and NaOH pH > 9 (after filtration)	7 days
	Chloride	SM4500-Cl	250-mL HDPE	1	none	28 days
	Cyanide, Total	SM4500-CN	500-mL HDPE	1	NaOH, pH>12	14 days
	Dissolved Organic Carbon	SM5310B	250-mL Amber glass	1	H_2SO_4 ph<2, ≤6°C, (after filtration)	28 days
	Nitrogen as Nitrate	353.2/9056	500-mL HDPE	1	≤6°C	48 hours
	Nitrogen as Nitrite	353.2/9056	500-mL HDPE	1	≤6°C	48 hours
	Sulfate	300.0/9056	500-mL HDPE	1	≤6°C	28 days
	Manganese, dissolved	Method 200.7/200.8	500-mL HDPE	1	4°C ±2°C, HNO_3 pH < 2 (after filtration)	180 days
	Alkalinity	SM 2320B-97	500-mL HDPE	1	≤6°C	14 days
Soil Gas	VOCs/APH	EPA TO-15/MassDEP APH	6-L Summa Canister	1	na	30 days

Analyses for 1/12/18 groundwater samples
C Bonnde 1-15-2018

Notes

[1]Metals include arsenic, barium, cadmium, calcium, chromium, copper, iron, lead, magnesium, manganese, sodium, nickel, selenium, silver and zinc.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

January 4, 2019

Carla Brock, Project Manager
Aspect Consulting, LLC
401 2nd Ave S, Suite 201
Seattle, WA 98104

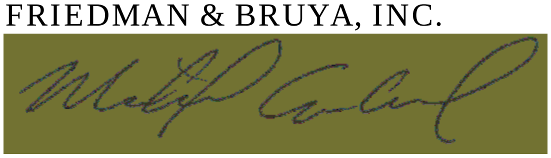
Dear Ms Brock:

Included are the results from the testing of material submitted on December 21, 2018 from the Shelton C St-Landfill 150074, F&BI 812310 project. There are 47 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
c: Data Aspect, Kristin Beck
ASP0104R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on December 21, 2018 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Shelton C St-Landfill 150074, F&BI 812310 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
812310 -01	AMW-1-122018
812310 -02	AMW-2-122018
812310 -03	AMW-3-122018
812310 -04	AMW-4-122018
812310 -05	AMW-5-122018
812310 -06	Trip Blank

The samples were sent to Fremont Analytical for nitrate, nitrite, sulfate, sulfide, alkalinity, chloride, dissolved organic carbon, ammonia, and cyanide analyses. The report is enclosed. In addition, the samples were sent to Frontier Analytical for dioxin and furan analysis. The report will be forwarded upon receipt.

The 8260C compound dibromochloromethane was reported between the method detection limit and the method reporting limit. The data were flagged accordingly.

All quality control requirements were acceptable.

Date of Report: 01/04/19
Date Received: 12/21/18
Project: Shelton C St-Landfill 150074, F&BI 812310
Date Extracted: 12/24/18
Date Analyzed: 12/24/18

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 41-152)
AMW-1-122018 812310-01	<50	<250	118
AMW-2-122018 812310-02	<50	<250	92
AMW-3-122018 812310-03	<50	<250	115
AMW-4-122018 812310-04	<50	<250	122
AMW-5-122018 812310-05	<50	<250	98
Method Blank 08-2901 MB	<50	<250	101

Analysis For Total Metals By EPA Method 200.8

Client ID:	AMW-1-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-01 x100
Date Analyzed:	12/28/18	Data File:	812310-01 x100.065
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	25.1
Magnesium	9.08

Analysis For Total Metals By EPA Method 200.8

Client ID:	AMW-2-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-02 x100
Date Analyzed:	12/28/18	Data File:	812310-02 x100.066
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	35.6
Magnesium	15.4

Analysis For Total Metals By EPA Method 200.8

Client ID:	AMW-3-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-03 x100
Date Analyzed:	12/28/18	Data File:	812310-03 x100.067
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	66.0
Magnesium	38.7

Analysis For Total Metals By EPA Method 200.8

Client ID:	AMW-4-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-04 x100
Date Analyzed:	12/28/18	Data File:	812310-04 x100.068
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	61.0
Magnesium	19.2

Analysis For Total Metals By EPA Method 200.8

Client ID:	AMW-5-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-05 x100
Date Analyzed:	12/28/18	Data File:	812310-05 x100.069
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	37.6
Magnesium	16.4

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	I8-886 mb
Date Analyzed:	12/28/18	Data File:	I8-886 mb.054
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	<0.05
Magnesium	<0.05

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	AMW-1-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-01 x10
Date Analyzed:	12/28/18	Data File:	812310-01 x10.057
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	27.1
Magnesium	9.78

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	AMW-2-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-02 x100
Date Analyzed:	12/28/18	Data File:	812310-02 x100.060
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	35.2
Magnesium	14.9

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	AMW-3-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-03 x100
Date Analyzed:	12/28/18	Data File:	812310-03 x100.061
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	64.5
Magnesium	37.2

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	AMW-4-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-04 x100
Date Analyzed:	12/28/18	Data File:	812310-04 x100.062
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	57.8
Magnesium	17.9

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	AMW-5-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-05 x100
Date Analyzed:	12/28/18	Data File:	812310-05 x100.063
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	35.5
Magnesium	15.5

Analysis For Dissolved Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	I8-885 mb
Date Analyzed:	12/28/18	Data File:	I8-885 mb.043
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	<0.05
Magnesium	<0.05

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-1-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-01
Date Analyzed:	12/27/18	Data File:	812310-01.061
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	5.22
Cadmium	<1
Chromium	1.09
Copper	<5
Iron	274
Lead	<1
Manganese	15.9
Mercury	<1
Nickel	1.19
Selenium	<1
Silver	<1
Zinc	<5

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ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-2-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-02
Date Analyzed:	12/27/18	Data File:	812310-02.064
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.248
Barium	2.52
Cadmium	<1
Chromium	1.48
Copper	<5
Iron	279
Lead	<1
Manganese	1,970
Mercury	<1
Nickel	1.56
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-3-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-03
Date Analyzed:	12/27/18	Data File:	812310-03.065
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	6.91
Cadmium	<1
Chromium	1.12
Copper	<5
Iron	574
Lead	<1
Manganese	2,560
Mercury	<1
Nickel	2.64
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-4-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-04
Date Analyzed:	12/27/18	Data File:	812310-04.066
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.225
Barium	19.6
Cadmium	<1
Chromium	2.79
Copper	<5
Iron	1,390
Lead	<1
Manganese	84.0
Mercury	<1
Nickel	3.51
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-5-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-05
Date Analyzed:	12/27/18	Data File:	812310-05.067
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	2.37
Cadmium	<1
Chromium	1.55
Copper	<5
Iron	317
Lead	<1
Manganese	1,910
Mercury	<1
Nickel	1.61
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	I8-888 mb
Date Analyzed:	12/27/18	Data File:	I8-888 mb.043
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	<1
Cadmium	<1
Chromium	<1
Copper	<5
Iron	<50
Lead	<1
Manganese	<1
Mercury	<1
Nickel	<1
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-1-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-01
Date Analyzed:	12/27/18	Data File:	812310-01.054
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	5.06
Cadmium	<1
Chromium	<1
Copper	<5
Iron	114
Lead	<1
Manganese	14.2
Mercury	<1
Nickel	1.11
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-2-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-02
Date Analyzed:	12/27/18	Data File:	812310-02.055
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.236
Barium	2.35
Cadmium	<1
Chromium	1.40
Copper	<5
Iron	231
Lead	<1
Manganese	1,880
Mercury	<1
Nickel	1.49
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-3-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-03
Date Analyzed:	12/27/18	Data File:	812310-03.056
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	4.58
Cadmium	<1
Chromium	<1
Copper	<5
Iron	189
Lead	<1
Manganese	404
Mercury	<1
Nickel	1.61
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-4-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-04
Date Analyzed:	12/27/18	Data File:	812310-04.059
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.230
Barium	18.6
Cadmium	<1
Chromium	1.02
Copper	<5
Iron	275
Lead	<1
Manganese	64.9
Mercury	<1
Nickel	2.14
Selenium	<1
Silver	<1
Zinc	<5

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ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-5-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-05
Date Analyzed:	12/27/18	Data File:	812310-05.060
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.220
Barium	2.33
Cadmium	<1
Chromium	1.34
Copper	<5
Iron	226
Lead	<1
Manganese	1,900
Mercury	<1
Nickel	1.51
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	I8-887 mb
Date Analyzed:	12/27/18	Data File:	I8-887 mb.052
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	<1
Cadmium	<1
Chromium	<1
Copper	<5
Iron	<50
Lead	<1
Manganese	<1
Mercury	<1
Nickel	<1
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-1-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/24/18	Lab ID:	812310-01
Date Analyzed:	12/24/18	Data File:	122412.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2 j
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<2
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

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ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-2-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/24/18	Lab ID:	812310-02
Date Analyzed:	12/24/18	Data File:	122413.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	102	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2 j
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<2
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-3-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/24/18	Lab ID:	812310-03
Date Analyzed:	12/24/18	Data File:	122414.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	57	121
Toluene-d8	102	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2 j
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<2
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-4-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/24/18	Lab ID:	812310-04
Date Analyzed:	12/24/18	Data File:	122415.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	101	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2 j
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<2
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-5-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/24/18	Lab ID:	812310-05
Date Analyzed:	12/24/18	Data File:	122416.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	57	121
Toluene-d8	103	63	127
4-Bromofluorobenzene	100	60	133

Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1
Chloromethane	<10
Vinyl chloride	<0.2
Bromomethane	<1
Chloroethane	<1
Trichlorofluoromethane	<1
Acetone	<50
1,1-Dichloroethene	<1
Hexane	<1
Methylene chloride	<5
Methyl t-butyl ether (MTBE)	<1
trans-1,2-Dichloroethene	<1
1,1-Dichloroethane	<1
2,2-Dichloropropane	<1
cis-1,2-Dichloroethene	<1
Chloroform	<1
2-Butanone (MEK)	<10
1,2-Dichloroethane (EDC)	<0.2
1,1,1-Trichloroethane	<1
1,1-Dichloropropene	<1
Carbon tetrachloride	<0.2
Benzene	<0.35
Trichloroethene	<0.2
1,2-Dichloropropane	<1
Bromodichloromethane	<0.2
Dibromomethane	<1
4-Methyl-2-pentanone	<10
cis-1,3-Dichloropropene	<0.2
Toluene	<1
trans-1,3-Dichloropropene	<0.2
1,1,2-Trichloroethane	<0.2
2-Hexanone	<10

Compounds:	Concentration ug/L (ppb)
1,3-Dichloropropane	<1
Tetrachloroethene	<1
Dibromochloromethane	<0.2 j
1,2-Dibromoethane (EDB)	<0.2
Chlorobenzene	<1
Ethylbenzene	<1
1,1,1,2-Tetrachloroethane	<1
m,p-Xylene	<2
o-Xylene	<1
Styrene	<1
Isopropylbenzene	<1
Bromoform	<1
n-Propylbenzene	<1
Bromobenzene	<1
1,3,5-Trimethylbenzene	<1
1,1,2,2-Tetrachloroethane	<0.2
1,2,3-Trichloropropane	<0.2
2-Chlorotoluene	<1
4-Chlorotoluene	<1
tert-Butylbenzene	<1
1,2,4-Trimethylbenzene	<1
sec-Butylbenzene	<1
p-Isopropyltoluene	<1
1,3-Dichlorobenzene	<1
1,4-Dichlorobenzene	<1
1,2-Dichlorobenzene	<1
1,2-Dibromo-3-chloropropane	<2
1,2,4-Trichlorobenzene	<1
Hexachlorobutadiene	<0.2
Naphthalene	<1
1,2,3-Trichlorobenzene	<1

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/24/18	Lab ID:	08-2856 mb
Date Analyzed:	12/24/18	Data File:	122409A.D
Matrix:	Water	Instrument:	GCMS4
Units:	ug/L (ppb)	Operator:	JS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	103	57	121
Toluene-d8	93	63	127
4-Bromofluorobenzene	93	60	133

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2 j
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<2
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-1-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-01 1/0.5
Date Analyzed:	12/28/18	Data File:	122735.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	87	31	160
Benzo(a)anthracene-d12	89	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-2-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-02 1/0.5
Date Analyzed:	12/28/18	Data File:	122736.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	87	31	160
Benzo(a)anthracene-d12	90	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-3-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-03 1/0.5
Date Analyzed:	12/28/18	Data File:	122737.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91	31	160
Benzo(a)anthracene-d12	70	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-4-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-04 1/0.5
Date Analyzed:	12/28/18	Data File:	122738.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	94	31	160
Benzo(a)anthracene-d12	86	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-5-122018	Client:	Aspect Consulting, LLC
Date Received:	12/21/18	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	812310-05 1/0.5
Date Analyzed:	12/28/18	Data File:	122739.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	81	31	160
Benzo(a)anthracene-d12	75	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.14
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C St-Landfill 150074
Date Extracted:	12/26/18	Lab ID:	08-2898 mb2 1/0.5
Date Analyzed:	12/27/18	Data File:	122707.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	90	31	160
Benzo(a)anthracene-d12	96	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Date of Report: 01/04/19
Date Received: 12/21/18
Project: Shelton C St-Landfill 150074, F&BI 812310

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	96	112	63-142	15

Date of Report: 01/04/19
Date Received: 12/21/18
Project: Shelton C St-Landfill 150074, F&BI 812310

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Calcium	mg/L (ppm)	1.0	107	108	85-115	1
Magnesium	mg/L (ppm)	1.0	110	112	85-115	2

Date of Report: 01/04/19
Date Received: 12/21/18
Project: Shelton C St-Landfill 150074, F&BI 812310

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR DISSOLVED METALS USING EPA METHOD 200.8**

Laboratory Code: 812310-01 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Calcium	mg/L (ppm)	1.0	27.1	96	100	70-130	4
Magnesium	mg/L (ppm)	1.0	9.78	96	94	70-130	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Calcium	mg/L (ppm)	1.0	102	85-115
Magnesium	mg/L (ppm)	1.0	104	85-115

Date of Report: 01/04/19
Date Received: 12/21/18
Project: Shelton C St-Landfill 150074, F&BI 812310

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 812348-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	0.827	111	115	75-125	4
Barium	ug/L (ppb)	50	5.57	108	111	75-125	3
Cadmium	ug/L (ppb)	5	<1	106	109	75-125	3
Chromium	ug/L (ppb)	20	<1	111	114	75-125	3
Copper	ug/L (ppb)	20	<5	104	106	75-125	2
Iron	ug/L (ppb)	100	80.3	98	99	75-125	1
Lead	ug/L (ppb)	10	<1	109	112	75-125	3
Manganese	ug/L (ppb)	20	3.92	110	112	75-125	2
Mercury	ug/L (ppb)	5	<1	103	104	75-125	1
Nickel	ug/L (ppb)	20	<1	105	107	75-125	2
Selenium	ug/L (ppb)	5	<1	115	118	75-125	3
Silver	ug/L (ppb)	5	<1	105	108	75-125	3
Zinc	ug/L (ppb)	50	6.10	104	107	75-125	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	103	80-120
Barium	ug/L (ppb)	50	102	80-120
Cadmium	ug/L (ppb)	5	102	80-120
Chromium	ug/L (ppb)	20	106	80-120
Copper	ug/L (ppb)	20	101	80-120
Iron	ug/L (ppb)	100	108	80-120
Lead	ug/L (ppb)	10	110	80-120
Manganese	ug/L (ppb)	20	106	80-120
Mercury	ug/L (ppb)	5	102	80-120
Nickel	ug/L (ppb)	20	101	80-120
Selenium	ug/L (ppb)	5	110	80-120
Silver	ug/L (ppb)	5	99	80-120
Zinc	ug/L (ppb)	50	101	80-120

Date of Report: 01/04/19
Date Received: 12/21/18
Project: Shelton C St-Landfill 150074, F&BI 812310

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: 812310-03 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	<0.2	108	113	75-125	5
Barium	ug/L (ppb)	50	4.58	101	108	75-125	7
Cadmium	ug/L (ppb)	5	<1	97	102	75-125	5
Chromium	ug/L (ppb)	20	<1	109	114	75-125	4
Copper	ug/L (ppb)	20	<5	93	97	75-125	4
Iron	ug/L (ppb)	100	189	118 b	140 b	75-125	17 b
Lead	ug/L (ppb)	10	<1	96	102	75-125	6
Manganese	ug/L (ppb)	20	404	203 b	319 b	75-125	44 b
Mercury	ug/L (ppb)	5	<1	93	99	75-125	6
Nickel	ug/L (ppb)	20	1.61	98	102	75-125	4
Selenium	ug/L (ppb)	5	<1	112	118	75-125	5
Silver	ug/L (ppb)	5	<1	84	90	75-125	7
Zinc	ug/L (ppb)	50	<5	95	99	75-125	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	106	80-120
Barium	ug/L (ppb)	50	106	80-120
Cadmium	ug/L (ppb)	5	107	80-120
Chromium	ug/L (ppb)	20	111	80-120
Copper	ug/L (ppb)	20	106	80-120
Iron	ug/L (ppb)	100	114	80-120
Lead	ug/L (ppb)	10	115	80-120
Manganese	ug/L (ppb)	20	110	80-120
Mercury	ug/L (ppb)	5	106	80-120
Nickel	ug/L (ppb)	20	106	80-120
Selenium	ug/L (ppb)	5	109	80-120
Silver	ug/L (ppb)	5	100	80-120
Zinc	ug/L (ppb)	50	106	80-120

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 01/04/19
Date Received: 12/21/18
Project: Shelton C St-Landfill 150074, F&BI 812310

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 812310-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	129	10-172
Chloromethane	ug/L (ppb)	50	<10	108	25-166
Vinyl chloride	ug/L (ppb)	50	<0.2	110	36-166
Bromomethane	ug/L (ppb)	50	<1	105	47-169
Chloroethane	ug/L (ppb)	50	<1	106	46-160
Trichlorofluoromethane	ug/L (ppb)	50	<1	104	44-165
Acetone	ug/L (ppb)	250	<50	85	10-182
1,1-Dichloroethene	ug/L (ppb)	50	<1	95	60-136
Hexane	ug/L (ppb)	50	<1	91	52-150
Methylene chloride	ug/L (ppb)	50	<5	90	67-132
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	93	74-127
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	93	72-129
1,1-Dichloroethane	ug/L (ppb)	50	<1	90	70-128
2,2-Dichloropropane	ug/L (ppb)	50	<1	80	36-154
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	93	71-127
Chloroform	ug/L (ppb)	50	<1	93	65-132
2-Butanone (MEK)	ug/L (ppb)	250	<10	91	10-129
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<0.2	92	69-133
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	97	60-146
1,1-Dichloropropene	ug/L (ppb)	50	<1	93	69-133
Carbon tetrachloride	ug/L (ppb)	50	<0.2	108	56-152
Benzene	ug/L (ppb)	50	<0.35	91	76-125
Trichloroethene	ug/L (ppb)	50	<0.2	90	66-135
1,2-Dichloropropane	ug/L (ppb)	50	<1	96	78-125
Bromodichloromethane	ug/L (ppb)	50	<0.2	99	61-150
Dibromomethane	ug/L (ppb)	50	<1	93	66-141
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	103	10-185
cis-1,3-Dichloropropene	ug/L (ppb)	50	<0.2	95	72-132
Toluene	ug/L (ppb)	50	<1	88	76-122
trans-1,3-Dichloropropene	ug/L (ppb)	50	<0.2	90	76-130
1,1,2-Trichloroethane	ug/L (ppb)	50	<0.2	92	68-131
2-Hexanone	ug/L (ppb)	250	<10	89	10-185
1,3-Dichloropropane	ug/L (ppb)	50	<1	94	71-128
Tetrachloroethene	ug/L (ppb)	50	<1	93	10-226
Dibromochloromethane	ug/L (ppb)	50	<0.2 j	109	70-139
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<0.2	94	69-134
Chlorobenzene	ug/L (ppb)	50	<1	91	77-122
Ethylbenzene	ug/L (ppb)	50	<1	89	69-135
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	101	73-137
m,p-Xylene	ug/L (ppb)	100	<2	88	69-135
o-Xylene	ug/L (ppb)	50	<1	89	60-140
Styrene	ug/L (ppb)	50	<1	91	71-133
Isopropylbenzene	ug/L (ppb)	50	<1	89	65-142
Bromoform	ug/L (ppb)	50	<1	119	65-142
n-Propylbenzene	ug/L (ppb)	50	<1	89	58-144
Bromobenzene	ug/L (ppb)	50	<1	95	75-124
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	90	66-137
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<0.2	93	51-154
1,2,3-Trichloropropane	ug/L (ppb)	50	<0.2	91	53-150
2-Chlorotoluene	ug/L (ppb)	50	<1	88	66-127
4-Chlorotoluene	ug/L (ppb)	50	<1	88	65-130
tert-Butylbenzene	ug/L (ppb)	50	<1	88	65-137
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	91	59-146
sec-Butylbenzene	ug/L (ppb)	50	<1	87	64-140
p-Isopropyltoluene	ug/L (ppb)	50	<1	89	65-141
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	91	72-123
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	91	69-126
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	93	69-128
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<2	93	32-164
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	90	66-136
Hexachlorobutadiene	ug/L (ppb)	50	<0.2	91	60-143
Naphthalene	ug/L (ppb)	50	<1	90	44-164
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	88	69-148

Date of Report: 01/04/19
Date Received: 12/21/18
Project: Shelton C St-Landfill 150074, F&BI 812310

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	50	131	133	25-158	2
Chloromethane	ug/L (ppb)	50	106	108	45-156	2
Vinyl chloride	ug/L (ppb)	50	108	113	50-154	5
Bromomethane	ug/L (ppb)	50	104	105	55-143	1
Chloroethane	ug/L (ppb)	50	109	108	58-146	1
Trichlorofluoromethane	ug/L (ppb)	250	108	108	50-150	0
Acetone	ug/L (ppb)	250	88	92	53-131	4
1,1-Dichloroethene	ug/L (ppb)	50	99	103	67-136	4
Hexane	ug/L (ppb)	50	95	97	57-137	2
Methylene chloride	ug/L (ppb)	50	93	95	39-148	2
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	92	93	64-147	1
trans-1,2-Dichloroethene	ug/L (ppb)	50	98	98	68-128	0
1,1-Dichloroethane	ug/L (ppb)	50	95	96	79-121	1
2,2-Dichloropropane	ug/L (ppb)	50	92	91	55-143	1
cis-1,2-Dichloroethene	ug/L (ppb)	50	98	97	80-123	1
Chloroform	ug/L (ppb)	50	99	98	80-121	1
2-Butanone (MEK)	ug/L (ppb)	250	91	95	57-149	4
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	93	96	73-132	3
1,1,1-Trichloroethane	ug/L (ppb)	50	98	100	83-130	2
1,1-Dichloropropene	ug/L (ppb)	50	99	98	77-129	1
Carbon tetrachloride	ug/L (ppb)	50	111	112	75-158	1
Benzene	ug/L (ppb)	50	93	93	69-134	0
Trichloroethene	ug/L (ppb)	50	92	92	80-120	0
1,2-Dichloropropane	ug/L (ppb)	50	96	98	77-123	2
Bromodichloromethane	ug/L (ppb)	50	102	102	81-133	0
Dibromomethane	ug/L (ppb)	50	93	95	82-125	2
4-Methyl-2-pentanone	ug/L (ppb)	250	98	103	65-138	5
cis-1,3-Dichloropropene	ug/L (ppb)	50	96	97	82-132	1
Toluene	ug/L (ppb)	50	92	91	72-122	1
trans-1,3-Dichloropropene	ug/L (ppb)	50	92	94	80-136	2
1,1,2-Trichloroethane	ug/L (ppb)	50	90	94	75-124	4
2-Hexanone	ug/L (ppb)	250	84	93	60-136	10
1,3-Dichloropropane	ug/L (ppb)	50	92	96	76-126	4
Tetrachloroethene	ug/L (ppb)	50	95	94	76-121	1
Dibromochloromethane	ug/L (ppb)	50	110	111	84-133	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	91	96	82-125	5
Chlorobenzene	ug/L (ppb)	50	93	93	83-114	0
Ethylbenzene	ug/L (ppb)	50	91	91	77-124	0
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	105	104	84-127	1
m,p-Xylene	ug/L (ppb)	100	90	91	83-125	1
o-Xylene	ug/L (ppb)	50	92	92	81-121	0
Styrene	ug/L (ppb)	50	91	93	84-119	2
Isopropylbenzene	ug/L (ppb)	50	92	92	85-117	0
Bromoform	ug/L (ppb)	50	119	120	74-136	1
n-Propylbenzene	ug/L (ppb)	50	93	92	74-126	1
Bromobenzene	ug/L (ppb)	50	95	95	80-121	0
1,3,5-Trimethylbenzene	ug/L (ppb)	50	93	92	78-123	1
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	96	98	66-126	2
1,2,3-Trichloropropane	ug/L (ppb)	50	91	95	67-124	4
2-Chlorotoluene	ug/L (ppb)	50	91	90	77-127	1
4-Chlorotoluene	ug/L (ppb)	50	91	92	78-128	1
tert-Butylbenzene	ug/L (ppb)	50	93	90	80-123	3
1,2,4-Trimethylbenzene	ug/L (ppb)	50	92	90	79-122	2
sec-Butylbenzene	ug/L (ppb)	50	92	90	80-125	2
p-Isopropyltoluene	ug/L (ppb)	50	92	91	81-123	1
1,3-Dichlorobenzene	ug/L (ppb)	50	93	93	85-116	0
1,4-Dichlorobenzene	ug/L (ppb)	50	92	92	84-121	0
1,2-Dichlorobenzene	ug/L (ppb)	50	94	93	85-116	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	98	96	57-141	2
1,2,4-Trichlorobenzene	ug/L (ppb)	50	86	88	72-130	2
Hexachlorobutadiene	ug/L (ppb)	50	90	90	53-141	0
Naphthalene	ug/L (ppb)	50	85	86	64-133	1
1,2,3-Trichlorobenzene	ug/L (ppb)	50	83	86	65-136	4

Date of Report: 01/04/19
Date Received: 12/21/18
Project: Shelton C St-Landfill 150074, F&BI 812310

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample 1/0.5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	0.5	90	91	67-116	1
Acenaphthylene	ug/L (ppb)	0.5	104	103	65-119	1
Acenaphthene	ug/L (ppb)	0.5	98	98	66-118	0
Fluorene	ug/L (ppb)	0.5	109	108	64-125	1
Phenanthrene	ug/L (ppb)	0.5	91	91	67-120	0
Anthracene	ug/L (ppb)	0.5	96	95	65-122	1
Fluoranthene	ug/L (ppb)	0.5	97	98	65-127	1
Pyrene	ug/L (ppb)	0.5	100	100	62-130	0
Benz(a)anthracene	ug/L (ppb)	0.5	96	95	60-118	1
Chrysene	ug/L (ppb)	0.5	93	92	66-125	1
Benzo(b)fluoranthene	ug/L (ppb)	0.5	105	99	55-135	6
Benzo(k)fluoranthene	ug/L (ppb)	0.5	91	95	62-125	4
Benzo(a)pyrene	ug/L (ppb)	0.5	102	98	58-127	4
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	0.5	109	104	36-142	5
Dibenz(a,h)anthracene	ug/L (ppb)	0.5	99	87	37-133	13
Benzo(g,h,i)perylene	ug/L (ppb)	0.5	99	92	34-135	7

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

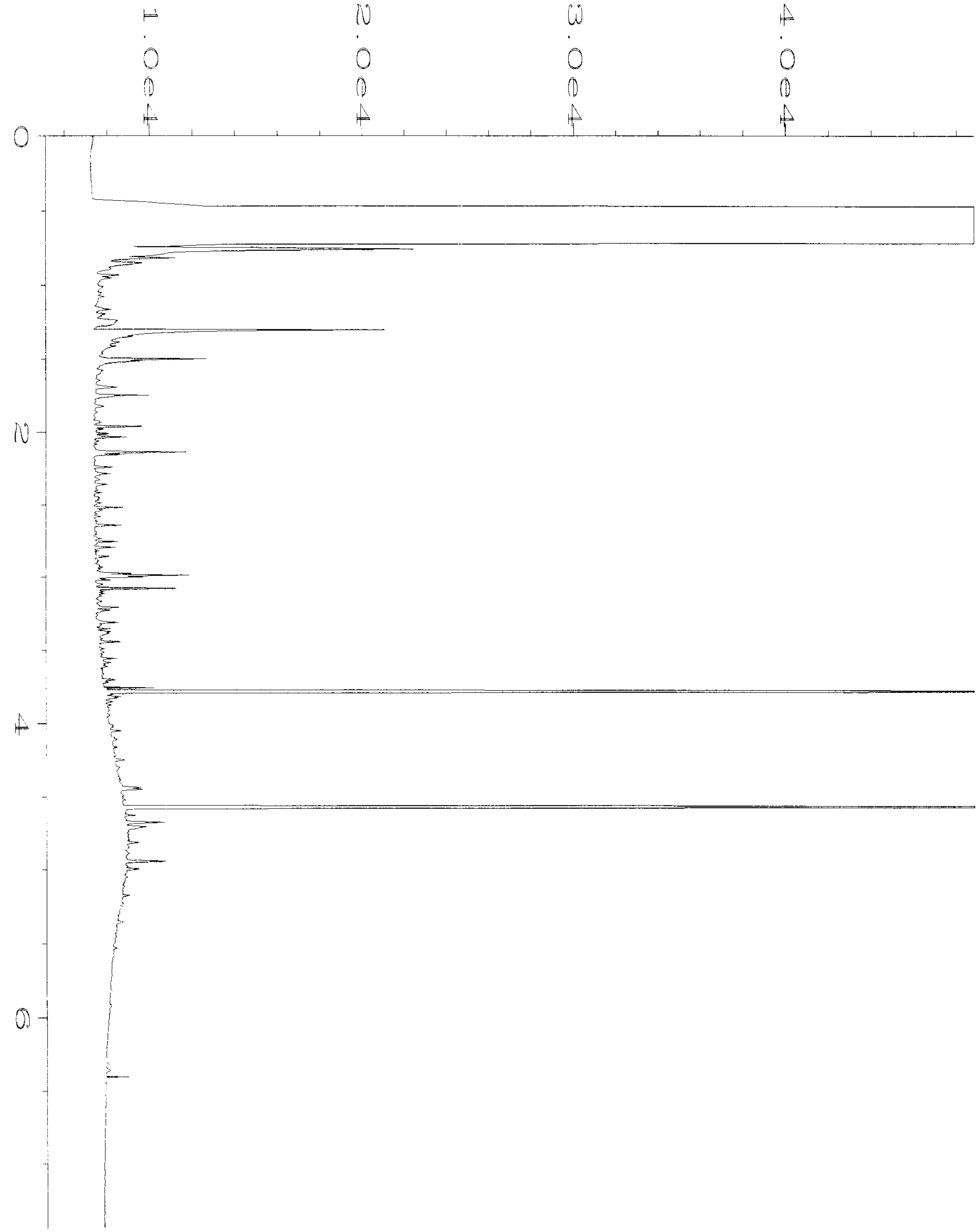
nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

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Data File Name    : C:\HPCHEM\1\DATA\12-24-18\012F0501.D
Operator          : TL                           Page Number       : 1
Instrument        : GC1                          Vial Number       : 12
Sample Name       : 812310-01                    Injection Number  : 1
Run Time Bar Code:                               Sequence Line     : 5
Acquired on       : 24 Dec 18   11:53 AM         Instrument Method: DX.MTH
Report Created on: 26 Dec 18   08:40 AM          Analysis Method   : DX.MTH
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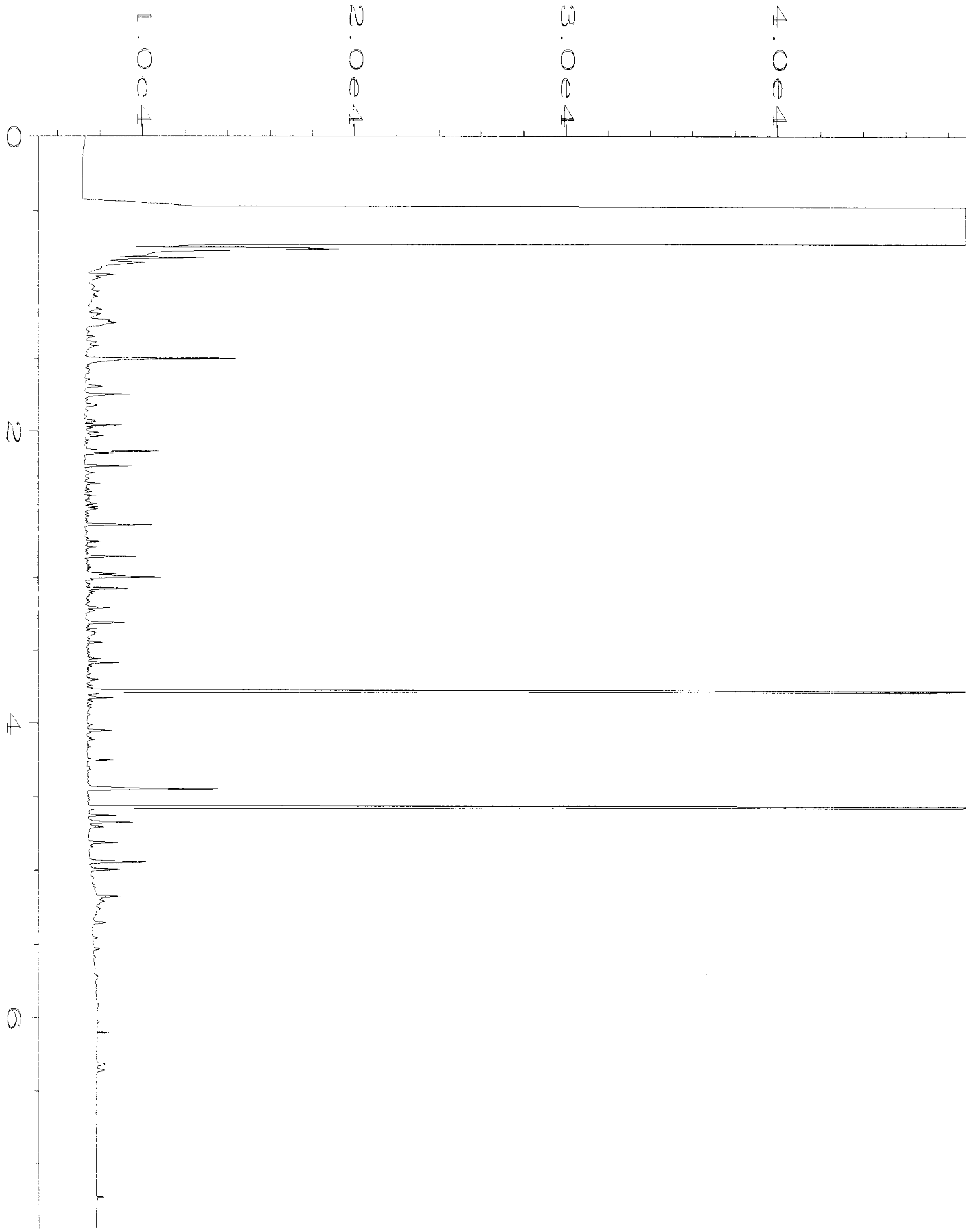

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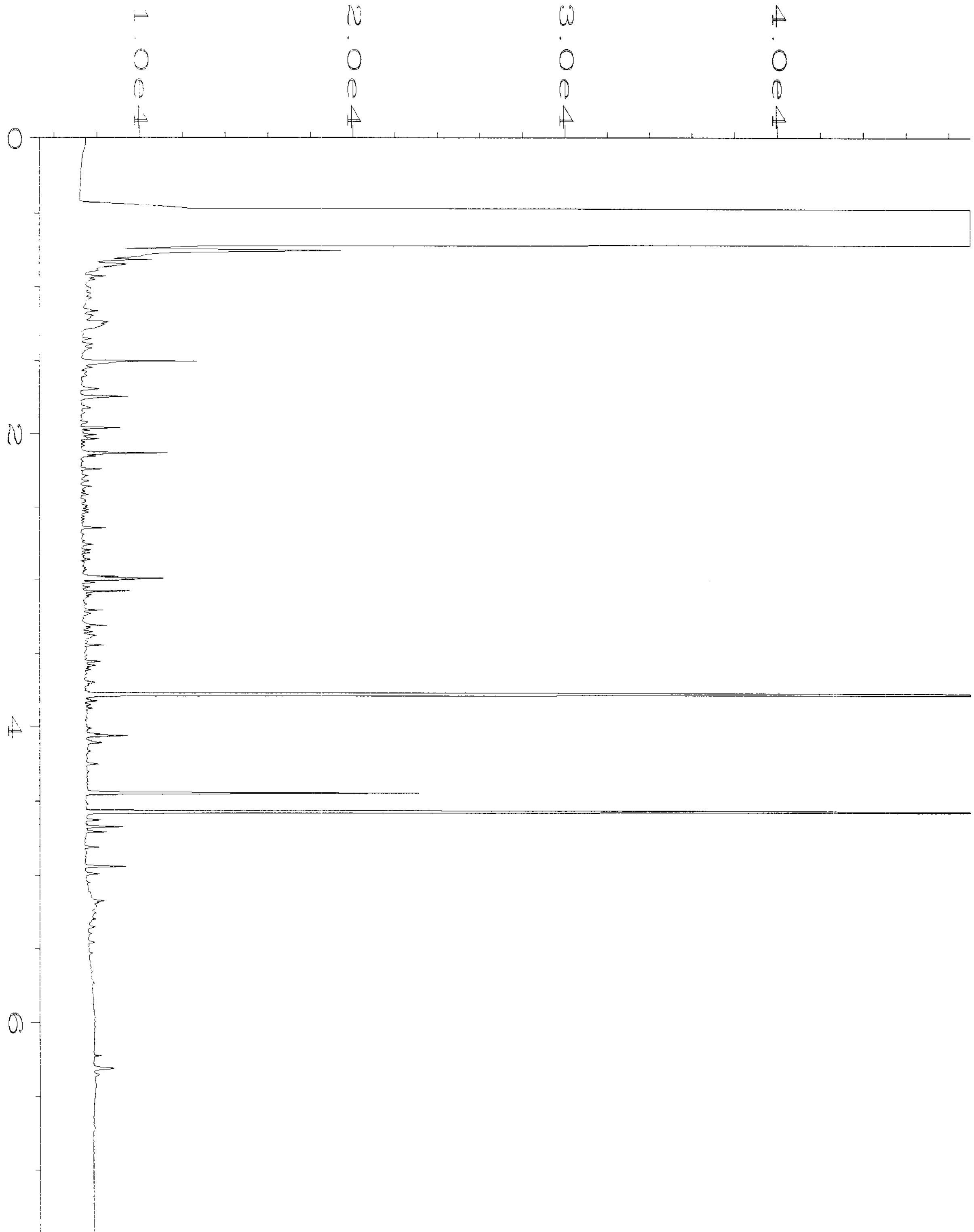
Instrument : GC1
Sample Name : 812310-02
Run Time Bar Code:
Acquired on : 24 Dec 18 12:05 PM
Report Created on: 26 Dec 18 08:40 AM

Page Number : 1
Vial Number : 13
Injection Number : 1
Sequence Line : 5
Instrument Method: DX.MTH
Analysis Method : DX.MTH



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Instrument : GC1
Sample Name : 812310-03
Run Time Bar Code:
Acquired on : 24 Dec 18 12:16 PM
Report Created on: 26 Dec 18 08:40 AM

Page Number : 1
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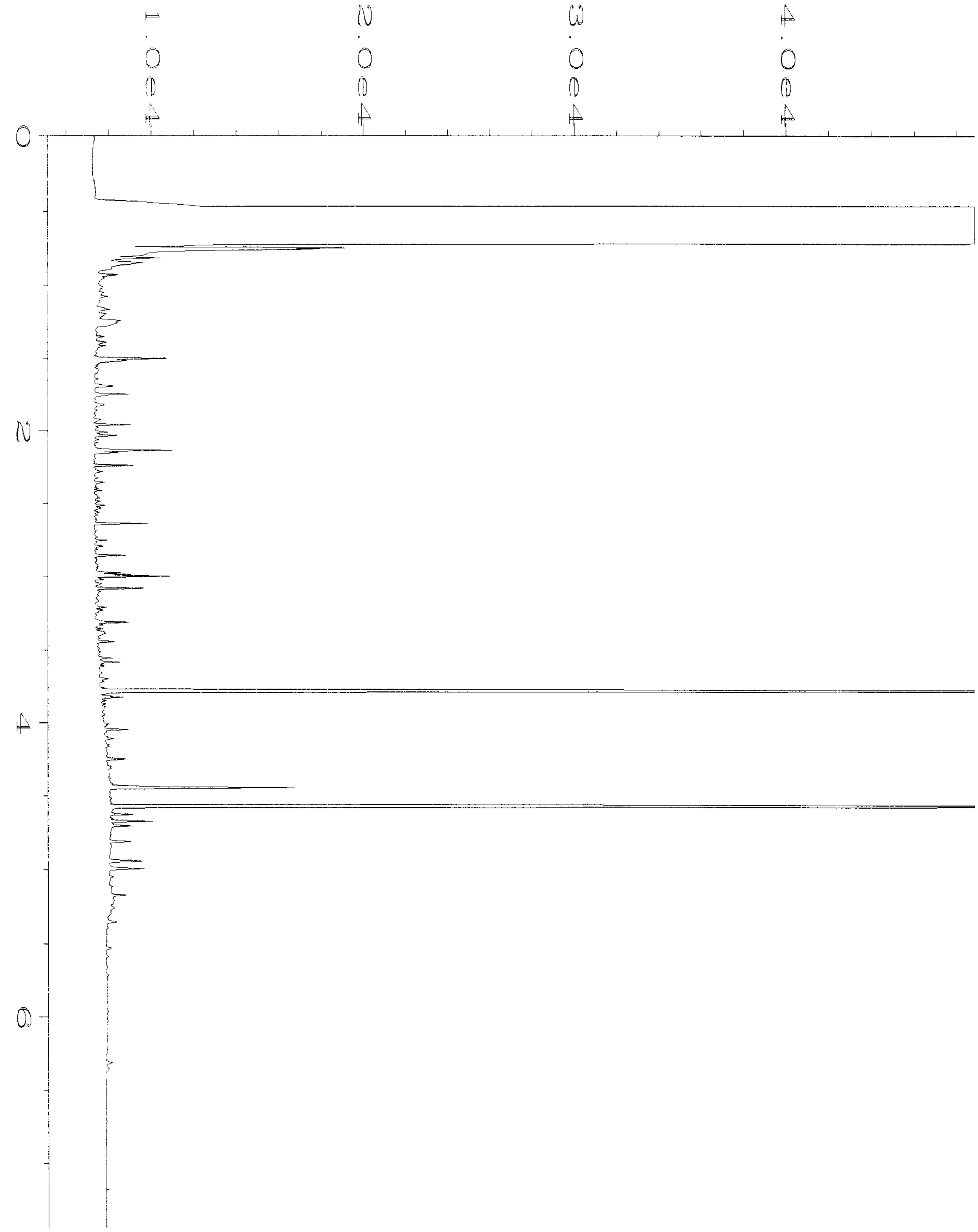
Injection Number : 1
Sequence Line : 5
Instrument Method: DX.MTH
Analysis Method : DX.MTH



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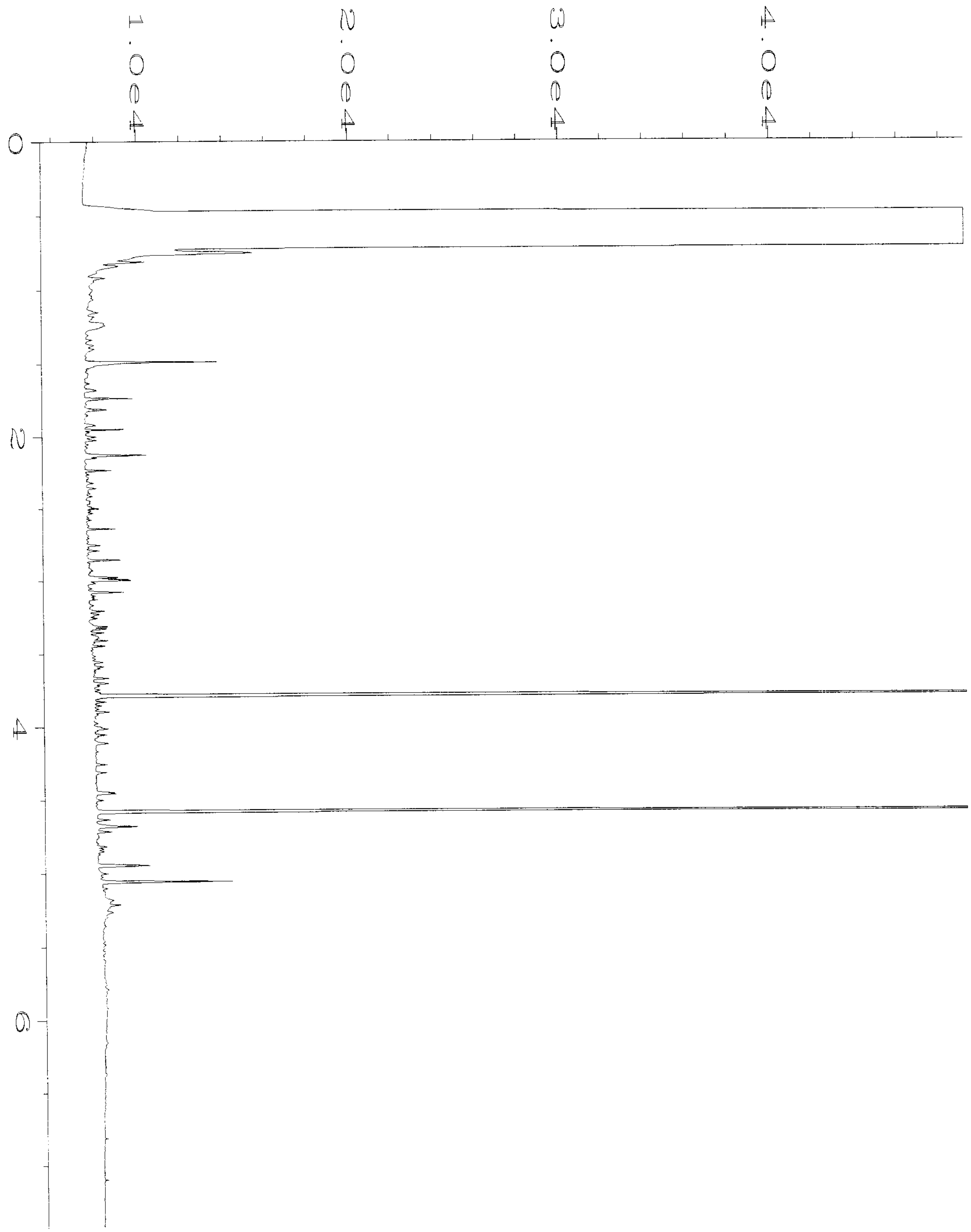
Operator : TL
Instrument : GC1
Sample Name : 812310-04
Run Time Bar Code:
Acquired on : 24 Dec 18 12:27 PM
Report Created on: 26 Dec 18 08:40 AM

Page Number : 1
Vial Number : 15
Injection Number : 1
Sequence Line : 5
Instrument Method: DX.MTH
Analysis Method : DX.MTH



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Operator : TL
Instrument : GC1
Sample Name : 812310-05
Run Time Bar Code:
Acquired on : 24 Dec 18 12:39 PM
Report Created on: 26 Dec 18 08:40 AM

Page Number : 1
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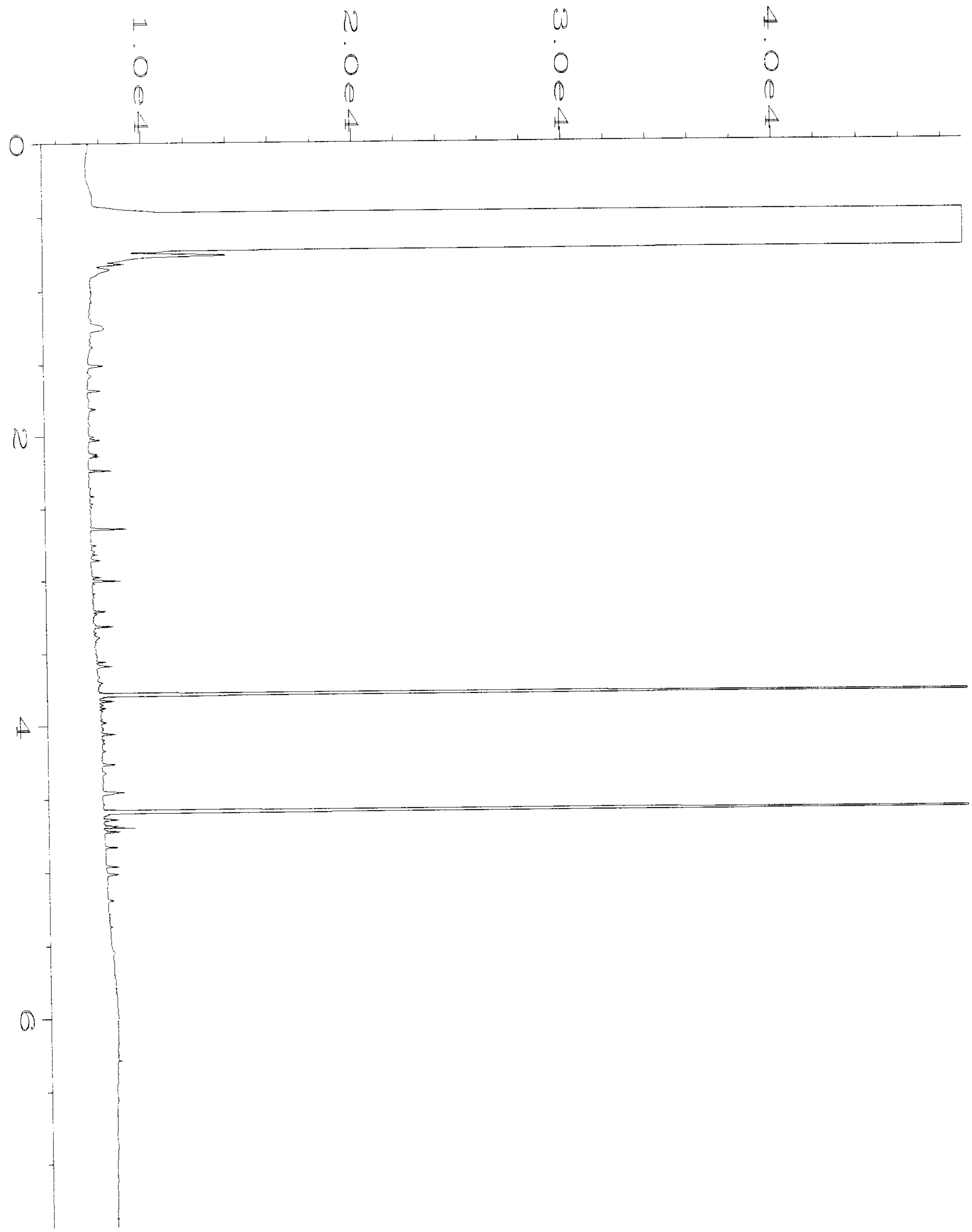
Injection Number : 1
Sequence Line : 5
Instrument Method: DX.MTH
Analysis Method : DX.MTH



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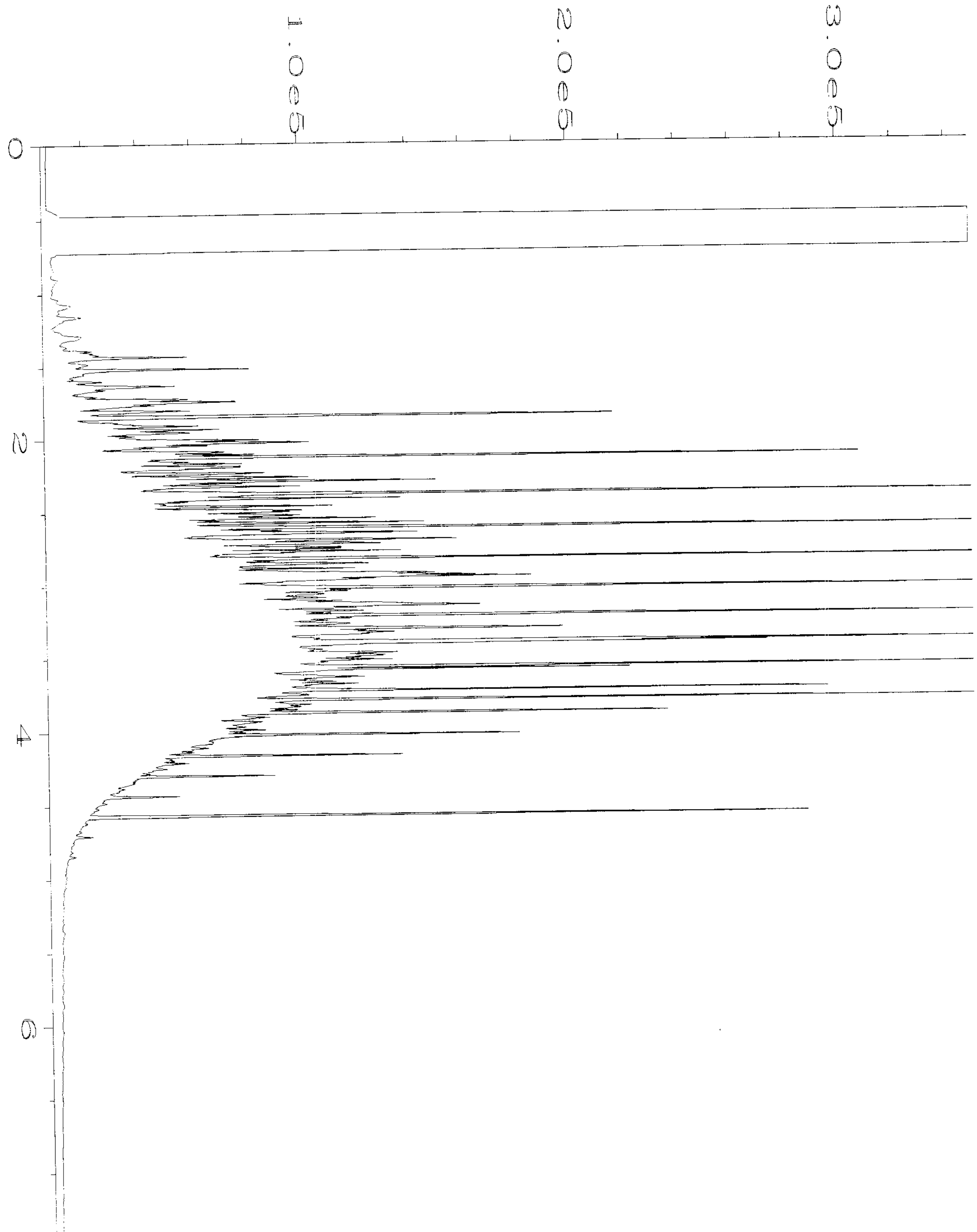
Operator : TL
Instrument : GC1
Sample Name : 08-2901 mb
Run Time Bar Code:
Acquired on : 24 Dec 18 10:48 AM
Report Created on: 26 Dec 18 08:37 AM

Page Number : 1
Vial Number : 6
Injection Number : 1
Sequence Line : 5
Instrument Method: DX.MTH
Analysis Method : DX.MTH



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Operator : TL
Instrument : GC1
Sample Name : 1000 Dx 55-96F
Run Time Bar Code:
Acquired on : 24 Dec 18 01:39 PM
Report Created on: 26 Dec 18 08:37 AM

Page Number : 1
Vial Number : 5
Injection Number : 1
Sequence Line : 6
Instrument Method: DX.MTH
Analysis Method : DX.MTH

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info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 812310
Work Order Number: 1812337

January 02, 2019

Attention Michael Erdahl:

Fremont Analytical, Inc. received 5 sample(s) on 12/21/2018 for the analyses presented in the following report.

Ammonia by SM 4500 NH3G
Cyanide by SM 4500-CN C, E
Dissolved Metals by EPA Method 200.8
Dissolved Organic Carbon by SM 5310C
Ion Chromatography by EPA Method 300.0
Sulfide by SM 4500-S2-F
Total Metals by EPA Method 200.8
Total Alkalinity by SM 2320B

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

DoD/ELAP Certification #L17-135, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

CLIENT:	Friedman & Bruya
Project:	812310
Work Order:	1812337

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1812337-001	AMW-1-122018	12/20/2018 9:20 AM	12/21/2018 1:30 PM
1812337-002	AMW-2-122018	12/20/2018 10:31 AM	12/21/2018 1:30 PM
1812337-003	AMW-3-122018	12/20/2018 1:00 PM	12/21/2018 1:30 PM
1812337-004	AMW-4-122018	12/20/2018 11:55 AM	12/21/2018 1:30 PM
1812337-005	AMW-5-122018	12/20/2018 11:10 AM	12/21/2018 1:30 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **1812337**

Date: **1/2/2019**

CLIENT: Friedman & Bruya
Project: 812310

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **1812337**
Date Reported: **1/2/2019**

Client: Friedman & Bruya
Project: 812310
Lab ID: 1812337-001
Client Sample ID: **AMW-1-122018**

Collection Date: 12/20/2018 9:20:00 AM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 23037		Analyst: TN
Chloride	1.54	0.100		mg/L	1	12/21/2018 7:11:00 PM
Nitrogen, Nitrite	ND	0.100		mg/L	1	12/21/2018 7:11:00 PM
Nitrogen, Nitrate	2.53	0.200	DH	mg/L	2	12/24/2018 11:57:00 PM
Nitrogen, Nitrate	2.64	0.100	E	mg/L	1	12/21/2018 7:11:00 PM
Sulfate	25.6	0.600	D	mg/L	2	12/24/2018 11:57:00 PM

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dissolved Metals by EPA Method 200.8				Batch ID: 23079		Analyst: WC
Sodium	36,900	100		µg/L	1	12/27/2018 1:41:01 PM
Total Metals by EPA Method 200.8				Batch ID: 23061		Analyst: TN
Sodium	38,600	1,000	D	µg/L	10	12/27/2018 10:59:51 AM
Dissolved Organic Carbon by SM 5310C				Batch ID: R48642		Analyst: GM
Organic Carbon, Dissolved	2.11	0.500		mg/L	1	12/28/2018 3:23:00 PM
Total Alkalinity by SM 2320B				Batch ID: R48601		Analyst: ME
Alkalinity, Total (As CaCO3)	129	2.50		mg/L	1	12/27/2018 11:07:00 AM
Ammonia by SM 4500 NH3G				Batch ID: 23117		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	12/31/2018 3:47:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 23100		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	12/28/2018 12:45:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R48643		Analyst: GM
Sulfide	ND	0.500		mg/L	1	12/27/2018 8:22:00 PM

Analytical Report

Work Order: **1812337**
Date Reported: **1/2/2019**

Client: Friedman & Bruya
Project: 812310
Lab ID: 1812337-002
Client Sample ID: **AMW-2-122018**
Collection Date: 12/20/2018 10:31:00 AM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 23037		Analyst: TN
Chloride	2.78	0.100		mg/L	1	12/21/2018 7:34:00 PM
Nitrogen, Nitrite	ND	0.100		mg/L	1	12/21/2018 7:34:00 PM
Nitrogen, Nitrate	ND	0.100		mg/L	1	12/21/2018 7:34:00 PM
Sulfate	18.2	0.600	D	mg/L	2	12/25/2018 12:20:00 AM
Dissolved Metals by EPA Method 200.8				Batch ID: 23079		Analyst: WC
Sodium	4,870	100		µg/L	1	12/27/2018 1:45:02 PM
Total Metals by EPA Method 200.8				Batch ID: 23061		Analyst: TN
Sodium	5,020	100		µg/L	1	12/26/2018 1:27:31 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R48642		Analyst: GM
Organic Carbon, Dissolved	12.0	0.500		mg/L	1	12/28/2018 3:51:00 PM
Total Alkalinity by SM 2320B				Batch ID: R48601		Analyst: ME
Alkalinity, Total (As CaCO3)	124	2.50		mg/L	1	12/27/2018 11:07:00 AM
Ammonia by SM 4500 NH3G				Batch ID: 23117		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	12/27/2018 4:38:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 23100		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	12/28/2018 12:48:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R48643		Analyst: GM
Sulfide	ND	0.500		mg/L	1	12/27/2018 8:22:00 PM

Analytical Report

Fremont Analytical

Work Order: **1812337**
Date Reported: **1/2/2019**

Client: Friedman & Bruya
Project: 812310
Lab ID: 1812337-003
Client Sample ID: AMW-3-122018
Collection Date: 12/20/2018 1:00:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 23037		Analyst: TN
Chloride	2.24	0.200	D	mg/L	2	12/21/2018 7:57:00 PM
Nitrogen, Nitrite	ND	0.200	D	mg/L	2	12/21/2018 7:57:00 PM
Nitrogen, Nitrate	1.47	0.200	D	mg/L	2	12/21/2018 7:57:00 PM
Sulfate	29.3	0.600	D	mg/L	2	12/21/2018 7:57:00 PM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 200.8				Batch ID: 23079		Analyst: WC
Sodium	6,190	100		µg/L	1	12/28/2018 6:54:17 PM
Total Metals by EPA Method 200.8				Batch ID: 23061		Analyst: TN
Sodium	6,770	100		µg/L	1	12/26/2018 1:31:32 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R48642		Analyst: GM
Organic Carbon, Dissolved	3.83	0.500		mg/L	1	12/28/2018 5:13:00 PM
Total Alkalinity by SM 2320B				Batch ID: R48601		Analyst: ME
Alkalinity, Total (As CaCO3)	258	2.50		mg/L	1	12/27/2018 11:07:00 AM
Ammonia by SM 4500 NH3G				Batch ID: 23117		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	12/27/2018 4:43:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 23100		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	12/28/2018 12:51:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R48643		Analyst: GM
Sulfide	ND	0.500		mg/L	1	12/27/2018 8:22:00 PM

Analytical Report

Work Order: **1812337**
Date Reported: **1/2/2019**

Client: Friedman & Bruya
Collection Date: 12/20/2018 11:55:00 AM
Project: 812310
Lab ID: 1812337-004
Matrix: Water
Client Sample ID: AMW-4-122018

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 23037		Analyst: TN
Chloride	3.92	0.200	D	mg/L	2	12/21/2018 8:20:00 PM
Nitrogen, Nitrite	ND	0.200	D	mg/L	2	12/21/2018 8:20:00 PM
Nitrogen, Nitrate	0.406	0.200	D	mg/L	2	12/21/2018 8:20:00 PM
Sulfate	44.9	1.50	D	mg/L	5	12/25/2018 12:43:00 AM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 200.8				Batch ID: 23079		Analyst: WC
Sodium	45,200	100		µg/L	1	12/28/2018 6:58:18 PM
Total Metals by EPA Method 200.8				Batch ID: 23061		Analyst: TN
Sodium	47,600	1,000	D	µg/L	10	12/27/2018 11:03:53 AM
Dissolved Organic Carbon by SM 5310C				Batch ID: R48642		Analyst: GM
Organic Carbon, Dissolved	3.90	0.500		mg/L	1	12/28/2018 5:33:00 PM
Total Alkalinity by SM 2320B				Batch ID: R48601		Analyst: ME
Alkalinity, Total (As CaCO3)	258	2.50		mg/L	1	12/27/2018 11:07:00 AM
Ammonia by SM 4500 NH3G				Batch ID: 23117		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	12/31/2018 4:07:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 23100		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	12/28/2018 12:54:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R48643		Analyst: GM
Sulfide	ND	0.500		mg/L	1	12/27/2018 8:22:00 PM

Fremont Analytical

Analytical Report

Work Order: **1812337**
Date Reported: **1/2/2019**

Client: Friedman & Bruya
Project: 812310
Lab ID: 1812337-005
Client Sample ID: **AMW-5-122018**

Collection Date: 12/20/2018 11:10:00 AM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 23037		Analyst: TN
Chloride	2.78	0.100		mg/L	1	12/21/2018 8:43:00 PM
Nitrogen, Nitrite	ND	0.100		mg/L	1	12/21/2018 8:43:00 PM
Nitrogen, Nitrate	ND	0.100		mg/L	1	12/21/2018 8:43:00 PM
Sulfate	18.2	0.600	D	mg/L	2	12/25/2018 1:06:00 AM
Dissolved Metals by EPA Method 200.8				Batch ID: 23079		Analyst: WC
Sodium	4,590	100		µg/L	1	12/28/2018 7:02:19 PM
Total Metals by EPA Method 200.8				Batch ID: 23061		Analyst: TN
Sodium	5,140	100		µg/L	1	12/26/2018 1:47:39 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R48642		Analyst: GM
Organic Carbon, Dissolved	12.0	0.500		mg/L	1	12/28/2018 5:53:00 PM
Total Alkalinity by SM 2320B				Batch ID: R48601		Analyst: ME
Alkalinity, Total (As CaCO3)	121	2.50		mg/L	1	12/27/2018 11:07:00 AM
Ammonia by SM 4500 NH3G				Batch ID: 23117		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	12/27/2018 5:41:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 23100		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	12/28/2018 12:57:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R48643		Analyst: GM
Sulfide	ND	0.500		mg/L	1	12/27/2018 8:22:00 PM

Date: *1/2/2019*

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID **MB-R48601**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **12/27/2018**		RunNo: **48601**			
Client ID: **MBLKW**	Batch ID: **R48601**					Analysis Date: **12/27/2018**		SeqNo: **952710**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID **LCS-R48601**	SampType: **LCS**			Units: **mg/L**		Prep Date: **12/27/2018**		RunNo: **48601**			
Client ID: **LCSW**	Batch ID: **R48601**					Analysis Date: **12/27/2018**		SeqNo: **952711**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	100	2.50	100.0	0	100	80	120				

Sample ID **1812337-001ADUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **12/27/2018**		RunNo: **48601**			
Client ID: **AMW-1-122018**	Batch ID: **R48601**					Analysis Date: **12/27/2018**		SeqNo: **952713**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	129	2.50						129.0	0	20	

Fremont Analytical

Date: *1/2/2019*

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT
Ammonia by SM 4500 NH3G

Sample ID **LCS-23117** SampType: **LCS** Units: **mg/L** Prep Date: **12/27/2018** RunNo: **48622**
Client ID: **LCSW** Batch ID: **23117** Analysis Date: **12/27/2018** SeqNo: **953196**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	0.560	0.100	0.5000	0	112	80	120				B

Sample ID **MB-23117** SampType: **MBLK** Units: **mg/L** Prep Date: **12/27/2018** RunNo: **48622**
Client ID: **MBLKW** Batch ID: **23117** Analysis Date: **12/27/2018** SeqNo: **953197**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	0.112	0.100									

Sample ID **1812372-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **12/27/2018** RunNo: **48622**
Client ID: **BATCH** Batch ID: **23117** Analysis Date: **12/27/2018** SeqNo: **953199**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100						0		30	

Sample ID **1812372-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **12/27/2018** RunNo: **48622**
Client ID: **BATCH** Batch ID: **23117** Analysis Date: **12/27/2018** SeqNo: **953200**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	0.488	0.100	0.5000	0	97.6	70	130				B

Sample ID **1812372-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **12/27/2018** RunNo: **48622**
Client ID: **BATCH** Batch ID: **23117** Analysis Date: **12/27/2018** SeqNo: **953201**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	0.455	0.100	0.5000	0	91.0	70	130	0.4880	7.00	30	B

Date: *1/2/2019*

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT

Ammonia by SM 4500 NH3G

Sample ID **1812345-004EDUP** SampType: **DUP** Units: **mg/L** Prep Date: **12/27/2018** RunNo: **48622**
Client ID: **BATCH** Batch ID: **23117** Analysis Date: **12/27/2018** SeqNo: **953222**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100						0		30	

Sample ID **1812345-004EMS** SampType: **MS** Units: **mg/L** Prep Date: **12/27/2018** RunNo: **48622**
Client ID: **BATCH** Batch ID: **23117** Analysis Date: **12/27/2018** SeqNo: **953223**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	0.498	0.100	0.5000	0.04700	90.2	70	130				B

Date: *1/2/2019*

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT

Cyanide by SM 4500-CN C, E

Sample ID **MB-23100** SampType: **MBLK** Units: **mg/L** Prep Date: **12/27/2018** RunNo: **48621**
Client ID: **MBLKW** Batch ID: **23100** Analysis Date: **12/28/2018** SeqNo: **953133**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	ND	0.0500									

Sample ID **LCS-23100** SampType: **LCS** Units: **mg/L** Prep Date: **12/27/2018** RunNo: **48621**
Client ID: **LCSW** Batch ID: **23100** Analysis Date: **12/28/2018** SeqNo: **953134**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.290	0.0500	0.2500	0	116	80	120				

Sample ID **1812373-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **12/27/2018** RunNo: **48621**
Client ID: **BATCH** Batch ID: **23100** Analysis Date: **12/28/2018** SeqNo: **953136**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	ND	0.0500						0		20	

Sample ID **1812373-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **12/27/2018** RunNo: **48621**
Client ID: **BATCH** Batch ID: **23100** Analysis Date: **12/28/2018** SeqNo: **953137**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.307	0.0500	0.2500	0	123	80	120				S

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID **1812373-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **12/27/2018** RunNo: **48621**
Client ID: **BATCH** Batch ID: **23100** Analysis Date: **12/28/2018** SeqNo: **953138**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.316	0.0500	0.2500	0	126	80	120	0.3072	2.79	30	S

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT

Dissolved Organic Carbon by SM 5310C

Sample ID **MB-48642**	SampType: **MBLK**	Units: **mg/L**	Prep Date: **12/28/2018**	RunNo: **48642**
Client ID: **MBLKW**	Batch ID: **R48642**		Analysis Date: **12/28/2018**	SeqNo: **953657**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	ND	0.500									

NOTES:
Filter blank

Sample ID **LCS-48642**	SampType: **LCS**	Units: **mg/L**	Prep Date: **12/28/2018**	RunNo: **48642**
Client ID: **LCSW**	Batch ID: **R48642**		Analysis Date: **12/28/2018**	SeqNo: **953658**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	5.15	0.500	5.000	0	103	80	120				

Sample ID **1812357-001ADUP**	SampType: **DUP**	Units: **mg/L**	Prep Date: **12/28/2018**	RunNo: **48642**
Client ID: **BATCH**	Batch ID: **R48642**		Analysis Date: **12/28/2018**	SeqNo: **953660**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	3.71	0.500						3.631	2.15	20	

Sample ID **1812357-001AMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **12/28/2018**	RunNo: **48642**
Client ID: **BATCH**	Batch ID: **R48642**		Analysis Date: **12/28/2018**	SeqNo: **953661**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	8.26	0.500	5.000	3.631	92.6	70	130				

Sample ID **1812357-001AMSD**	SampType: **MSD**	Units: **mg/L**	Prep Date: **12/28/2018**	RunNo: **48642**
Client ID: **BATCH**	Batch ID: **R48642**		Analysis Date: **12/28/2018**	SeqNo: **953662**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	8.46	0.500	5.000	3.631	96.5	70	130	8.262	2.31	30	

Date: *1/2/2019*

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT

Dissolved Organic Carbon by SM 5310C

Sample ID **1812345-001DUP** SampType: **DUP** Units: **mg/L** Prep Date: **12/28/2018** RunNo: **48642**
Client ID: **BATCH** Batch ID: **R48642** Analysis Date: **12/28/2018** SeqNo: **953673**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	0.546	0.500						0.5720	4.65	20	

Sample ID **1812345-001DMS** SampType: **MS** Units: **mg/L** Prep Date: **12/28/2018** RunNo: **48642**
Client ID: **BATCH** Batch ID: **R48642** Analysis Date: **12/28/2018** SeqNo: **953674**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	5.49	0.500	5.000	0.5720	98.3	70	130				

Fremont Analytical

Date: *1/2/2019*

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **MB-23037** SampType: **MBLK** Units: **mg/L** Prep Date: **12/21/2018** RunNo: **48495**
Client ID: **MBLKW** Batch ID: **23037** Analysis Date: **12/21/2018** SeqNo: **950113**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									
Nitrogen, Nitrite	ND	0.100									
Nitrogen, Nitrate	ND	0.100									
Sulfate	ND	0.300									

Sample ID **LCS-23037** SampType: **LCS** Units: **mg/L** Prep Date: **12/21/2018** RunNo: **48495**
Client ID: **LCSW** Batch ID: **23037** Analysis Date: **12/21/2018** SeqNo: **950114**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.694	0.100	0.7500	0	92.5	90	110				
Nitrogen, Nitrite	0.725	0.100	0.7500	0	96.7	90	110				
Nitrogen, Nitrate	0.704	0.100	0.7500	0	93.9	90	110				
Sulfate	3.47	0.300	3.750	0	92.5	90	110				

Sample ID **1812319-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **12/21/2018** RunNo: **48495**
Client ID: **BATCH** Batch ID: **23037** Analysis Date: **12/21/2018** SeqNo: **950099**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	5.92	0.100						5.921	0.0676	20	E
Nitrogen, Nitrite	ND	0.100						0		20	
Nitrogen, Nitrate	0.836	0.100						0.8370	0.120	20	
Sulfate	14.5	0.300						14.54	0.0551	20	

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID **1812319-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **12/21/2018** RunNo: **48495**
Client ID: **BATCH** Batch ID: **23037** Analysis Date: **12/21/2018** SeqNo: **950100**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	6.76	0.100	0.7500	5.921	111	80	120				E

Date: *1/2/2019*

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **1812319-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **12/21/2018** RunNo: **48495**
Client ID: **BATCH** Batch ID: **23037** Analysis Date: **12/21/2018** SeqNo: **950100**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrite	0.743	0.100	0.7500	0	99.1	80	120				
Nitrogen, Nitrate	1.63	0.100	0.7500	0.8370	105	80	120				
Sulfate	18.7	0.300	3.750	14.54	111	80	120				E

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID **1812319-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **12/21/2018** RunNo: **48495**
Client ID: **BATCH** Batch ID: **23037** Analysis Date: **12/21/2018** SeqNo: **950101**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	6.76	0.100	0.7500	5.921	111	80	120	6.756	0.0148	20	E
Nitrogen, Nitrite	0.736	0.100	0.7500	0	98.1	80	120	0.7430	0.947	20	
Nitrogen, Nitrate	1.62	0.100	0.7500	0.8370	105	80	120	1.626	0.308	20	
Sulfate	18.7	0.300	3.750	14.54	111	80	120	18.68	0.0963	20	E

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID **1812320-006DDUP** SampType: **DUP** Units: **mg/L** Prep Date: **12/21/2018** RunNo: **48495**
Client ID: **BATCH** Batch ID: **23037** Analysis Date: **12/21/2018** SeqNo: **950110**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	5.71	0.100						5.706	0.140	20	E
Nitrogen, Nitrite	ND	0.100						0		20	
Nitrogen, Nitrate	1.80	0.100						1.794	0.278	20	
Sulfate	9.47	0.300						9.348	1.32	20	

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Date: *1/2/2019*

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **1812320-006DMS** SampType: **MS** Units: **mg/L** Prep Date: **12/21/2018** RunNo: **48495**
Client ID: **BATCH** Batch ID: **23037** Analysis Date: **12/21/2018** SeqNo: **950111**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	6.22	0.100	0.7500	5.706	68.5	80	120				ES
Nitrogen, Nitrite	0.464	0.100	0.7500	0	61.9	80	120				S
Nitrogen, Nitrate	2.28	0.100	0.7500	1.794	65.3	80	120				S
Sulfate	11.6	0.300	3.750	9.348	59.7	80	120				S

NOTES:
S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID **LCS-23032** SampType: **LCS** Units: **mg/L** Prep Date: **12/24/2018** RunNo: **48556**
Client ID: **LCSW** Batch ID: **23032** Analysis Date: **12/24/2018** SeqNo: **951699**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate	0.704	0.100	0.7500	0	93.9	90	110				
Sulfate	3.51	0.300	3.750	0	93.7	90	110				

Sample ID **MB-23032** SampType: **MBLK** Units: **mg/L** Prep Date: **12/24/2018** RunNo: **48556**
Client ID: **MBLKW** Batch ID: **23032** Analysis Date: **12/24/2018** SeqNo: **951700**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate	ND	0.100									
Sulfate	ND	0.300									

Sample ID **1812146-002BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **12/24/2018** RunNo: **48556**
Client ID: **BATCH** Batch ID: **23032** Analysis Date: **12/24/2018** SeqNo: **951705**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate	ND	0.100						0		20	
Sulfate	0.969	0.300						0.9760	0.720	20	

Fremont Analytical

Date: *1/2/2019*

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **1812146-002BMS** SampType: **MS** Units: **mg/L** Prep Date: **12/24/2018** RunNo: **48556**
Client ID: **BATCH** Batch ID: **23032** Analysis Date: **12/24/2018** SeqNo: **951706**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate	0.662	0.100	0.7500	0	88.3	80	120				
Sulfate	3.95	0.300	3.750	0.9760	79.3	80	120				S

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID **1812146-002BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **12/24/2018** RunNo: **48556**
Client ID: **BATCH** Batch ID: **23032** Analysis Date: **12/24/2018** SeqNo: **951707**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate	0.638	0.100	0.7500	0	85.1	80	120	0.6620	3.69	20	
Sulfate	3.84	0.300	3.750	0.9760	76.4	80	120	3.949	2.80	20	S

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID **1812146-016BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **12/24/2018** RunNo: **48556**
Client ID: **BATCH** Batch ID: **23032** Analysis Date: **12/24/2018** SeqNo: **951722**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate	ND	0.100						0		20	
Sulfate	0.313	0.300						0.3150	0.637	20	

Sample ID **1812146-016BMS** SampType: **MS** Units: **mg/L** Prep Date: **12/24/2018** RunNo: **48556**
Client ID: **BATCH** Batch ID: **23032** Analysis Date: **12/24/2018** SeqNo: **951723**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Nitrate	0.674	0.100	0.7500	0	89.9	80	120				
Sulfate	3.10	0.300	3.750	0.3150	74.2	80	120				S

NOTES:
S - Spike recovery indicates a possible matrix effect. The method is in control as indicated by the Laboratory Control Sample (LCS).

Fremont Analytical

Date: *1/2/2019*

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT

Sulfide by SM 4500-S2-F

Sample ID **MB-R48643**	SampType: **MBLK**				Units: **mg/L**		Prep Date: **12/27/2018**		RunNo: **48643**		
Client ID: **MBLKW**	Batch ID: **R48643**						Analysis Date: **12/27/2018**		SeqNo: **953702**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	ND	0.500									

Sample ID **LCS-R48643**	SampType: **LCS**				Units: **mg/L**		Prep Date: **12/27/2018**		RunNo: **48643**		
Client ID: **LCSW**	Batch ID: **R48643**						Analysis Date: **12/27/2018**		SeqNo: **953703**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	2.00	0.500	2.000	0	100	65	135				

Sample ID **LCSD-R48643**	SampType: **LCSD**				Units: **mg/L**		Prep Date: **12/27/2018**		RunNo: **48643**		
Client ID: **LCSW02**	Batch ID: **R48643**						Analysis Date: **12/27/2018**		SeqNo: **953709**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	1.80	0.500	2.000	0	90.0	65	135	2.000	10.5	20	

Fremont Analytical

Date: *1/2/2019*

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID **MB-23079** SampType: **MBLK** Units: **µg/L** Prep Date: **12/27/2018** RunNo: **48598**
Client ID: **MBLKW** Batch ID: **23079** Analysis Date: **12/27/2018** SeqNo: **952526**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	ND	100									

Sample ID **LCS-23079** SampType: **LCS** Units: **µg/L** Prep Date: **12/27/2018** RunNo: **48598**
Client ID: **LCSW** Batch ID: **23079** Analysis Date: **12/27/2018** SeqNo: **952528**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	1,010	100	1,000	0	101	50	150				

Sample ID **1812259-001DDUP** SampType: **DUP** Units: **µg/L** Prep Date: **12/27/2018** RunNo: **48598**
Client ID: **BATCH** Batch ID: **23079** Analysis Date: **12/27/2018** SeqNo: **952530**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	5,210	100						5,641	8.01	30	

Sample ID **1812259-001DMS** SampType: **MS** Units: **µg/L** Prep Date: **12/27/2018** RunNo: **48598**
Client ID: **BATCH** Batch ID: **23079** Analysis Date: **12/27/2018** SeqNo: **952531**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	10,600	100	5,000	5,641	99.8	50	150				

Sample ID **1812259-001DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **12/27/2018** RunNo: **48598**
Client ID: **BATCH** Batch ID: **23079** Analysis Date: **12/27/2018** SeqNo: **952532**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	10,900	100	5,000	5,641	105	50	150	10,630	2.49	30	

Fremont Analytical

Date: *1/2/2019*

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID **MB1-23023FB**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/27/2018**			RunNo: **48598**		
Client ID: **MBLKW**	Batch ID: **23079**					Analysis Date: **12/27/2018**			SeqNo: **952615**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	ND	100									

NOTES:
Filter Blank

Sample ID **MB2-23023FB**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/27/2018**			RunNo: **48598**		
Client ID: **MBLKW**	Batch ID: **23079**					Analysis Date: **12/27/2018**			SeqNo: **952616**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	ND	100									

NOTES:
Filter Blank

Fremont Analytical

Date: *1/2/2019*

Work Order: 1812337
CLIENT: Friedman & Bruya
Project: 812310

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID **MB-23061**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **12/26/2018**		RunNo: **48564**			
Client ID: **MBLKW**	Batch ID: **23061**					Analysis Date: **12/26/2018**		SeqNo: **952027**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	ND	100									

Sample ID **LCS-23061**	SampType: **LCS**			Units: **µg/L**		Prep Date: **12/26/2018**		RunNo: **48564**			
Client ID: **LCSW**	Batch ID: **23061**					Analysis Date: **12/26/2018**		SeqNo: **952028**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	1,020	100	1,000	0	102	50	150				

Sample ID **1812341-001ADUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **12/26/2018**		RunNo: **48564**			
Client ID: **BATCH**	Batch ID: **23061**					Analysis Date: **12/26/2018**		SeqNo: **952030**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	24,400	100						24,750	1.62	30	

Sample ID **1812341-001AMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **12/26/2018**		RunNo: **48564**			
Client ID: **BATCH**	Batch ID: **23061**					Analysis Date: **12/26/2018**		SeqNo: **952031**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	28,500	100	5,000	24,750	74.5	50	150				E

Sample ID **1812341-001AMSD**	SampType: **MSD**			Units: **µg/L**		Prep Date: **12/26/2018**		RunNo: **48564**			
Client ID: **BATCH**	Batch ID: **23061**					Analysis Date: **12/26/2018**		SeqNo: **952032**			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	28,600	100	5,000	24,750	76.2	50	150	28,470	0.310	30	E

Fremont Analytical

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1812337**
Logged by:	**Clare Griggs**	Date Received:	**12/21/2018 1:30:00 PM**

Chain of Custody

#	Question	Yes	No	Other
1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

#	Question	Yes	No	Other
3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☑	Not Required ☐
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C*	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☐	No ☑	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

#	Question	Yes	No	Other
18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: Date

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler	5.4
Sample	4.4

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

1812337

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont	
PROJECT NAME/NO. 812310	PO # A-671
REMARKS Limited Volume - See Email Please Email Results	

TURNAROUND TIME
- ☒ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Total Organic Carbon	Alkalinity ~~COD~~	Chloride ~~BOD~~	Na Total Dissolved ~~Chloride~~	Sulfate	Sulfide	Nitrate, Nitrite	Dissolved Organic Carbon	Ammonia	Cyanide	Notes
AMW-1-122018		12/20/18	0920	water	1		x	x	x	x	x	x	x	x	x	
AMW-2-122018		↓	1031	↓	1		x	x	x	x	x	x	x	x	x	
AMW-3-122018		↓	1300	↓	1		x	x	x	x	x	x	x	x	x	
AMW-4-122018		↓	1155	↓	1		x	x	x	x	x	x	x	x	x	
AMW-5-122018		↓	1110	↓	1		x	x	x	x	x	x	x	x	x	

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Michael Erdahl	Friedman & Bruya	12/21/18	12:02
Received by: [signature]	Claire Griggs		12/21/18	1330
Relinquished by:				
Received by:				

812310

SAMPLE CHAIN OF CUSTODY

ME 12-21-18

Page # 1 of 1 E04/ AI6/ VW3

Report To Carla Brock & Kristin Beck

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA 98104

Phone ____ Email ____

SAMPLERS (signature) Kst Beck

PROJECT NAME	PO #
Shelton C St- Landfill	150074
REMARKS Metals: Ag, As, Ba, Cd, Ca, Cr, Cu, Fe, Hg, Pb, Mg, Mn, Na, Ni, Se, Zn	INVOICE TO Accts payable

TURNAROUND TIME
- ☒ Standard Turnaround
- ☐ RUSH ____
- Rush charges authorized by: ____

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other ____

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Dioxin/Furans	TOT/Diss Metals	Geochem Parameters		Notes
AMW-1-122018	01 A-K	12/20/18	0920	water	11		X			X		X	X	X	X		X - Nitrate/Nitrite
AMW-2-122018	02	↓	1031	↓	↓		X			X		X	X	X	X		Sulfate/Sulfide
AMW-3-122018	03	↓	1300	↓	↓		X			X		X	X	X	X		Alkalinity/Chloride
AMW-4-122018	04	↓	1155	↓	↓		X			X		X	X	X	X		Dissolved Organic Carbon
AMW-5-122018	05	↓	1110	↓	↓		X			X		X	X	X	X		Ammonia/Cyanide
Trip Blank TB 12/21	06 A-B				2												
																	Samples received at 2 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Kst Beck	Kristin Beck	Aspect	12/21/18	0900
Received by: S. Obam	S. Obam	F&B, Inc.	↓	↓
Relinquished by:				
Received by:				

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

April 23, 2019

Carla Brock, Project Manager
Aspect Consulting, LLC
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Ms Brock:

Included are the results from the testing of material submitted on April 1, 2019 from the Shelton C Street Landfill 150074, F&BI 904021 project. There are 47 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Data Aspect, Ali Cochrane
ASP0423R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 1, 2019 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Shelton C Street Landfill 150074, F&BI 904021 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
904021 -01	AMW-1-040119
904021 -02	AMW-2-040119
904021 -03	AMW-3-040119
904021 -04	AMW-4-040119
904021 -05	AMW-5-040119
904021 -06	Trip Blank

The samples were sent to Fremont Analytical for nitrate, nitrite, sulfate, sulfide, alkalinity, chloride, dissolved organic carbon, ammonia, and cyanide analyses. The report is enclosed. In addition, the samples were sent to Frontier Analytical for dioxin and furan analysis. The report will be forwarded upon receipt.

The 8270D matrix spike and matrix spike duplicate failed the relative percent difference for several compounds. The analytes were not detected therefore the data were acceptable.

The 8260C laboratory control sample and laboratory control sample duplicate failed the relative percent difference for several compounds. The analytes were not detected therefore the data were acceptable.

1,3-Dichloropropane in the 8260C laboratory control sample failed the acceptance criteria. The data were flagged accordingly.

All other quality control requirements were acceptable.

Date of Report: 04/23/19
Date Received: 04/01/19
Project: Shelton C Street Landfill 150074, F&BI 904021
Date Extracted: 04/02/19
Date Analyzed: 04/02/19

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 47-140)
AMW-1-040119 904021-01	<50	<250	111
AMW-2-040119 904021-02	<50	<250	80
AMW-3-040119 904021-03	<50	<250	107
AMW-4-040119 904021-04	<50	<250	119
AMW-5-040119 904021-05	<50	<250	105
Method Blank 09-698 MB2	<50	<250	109

Analysis For Dissolved Metals By EPA Method 200.8 and SM 2340B

Client ID:	AMW-1-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/02/19	Lab ID:	904021-01 x10
Date Analyzed:	04/05/19	Data File:	904021-01 x10.052
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	33.1
Magnesium	13.2

Analysis For Dissolved Metals By EPA Method 200.8 and SM 2340B

Client ID:	AMW-2-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/02/19	Lab ID:	904021-02 x10
Date Analyzed:	04/05/19	Data File:	904021-02 x10.061
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	26.3
Magnesium	11.5

Analysis For Dissolved Metals By EPA Method 200.8 and SM 2340B

Client ID:	AMW-3-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/02/19	Lab ID:	904021-03 x10
Date Analyzed:	04/05/19	Data File:	904021-03 x10.064
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	82.2
Magnesium	50.1

Analysis For Dissolved Metals By EPA Method 200.8 and SM 2340B

Client ID:	AMW-4-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/02/19	Lab ID:	904021-04 x10
Date Analyzed:	04/05/19	Data File:	904021-04 x10.065
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	77.7
Magnesium	23.6

Analysis For Dissolved Metals By EPA Method 200.8 and SM 2340B

Client ID:	AMW-5-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/02/19	Lab ID:	904021-05 x10
Date Analyzed:	04/05/19	Data File:	904021-05 x10.066
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	76.7
Magnesium	23.3

Analysis For Dissolved Metals By EPA Method 200.8 and SM 2340B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/02/19	Lab ID:	I9-216 mb
Date Analyzed:	04/05/19	Data File:	I9-216 mb.058
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	<0.05
Magnesium	<0.05

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-1-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-01
Date Analyzed:	04/03/19	Data File:	904021-01.088
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	3.34
Cadmium	<1
Chromium	<1
Copper	<5
Iron	113
Lead	<1
Manganese	<1
Mercury	<1
Nickel	1.33
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-2-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-02
Date Analyzed:	04/03/19	Data File:	904021-02.096
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	2.27
Cadmium	<1
Chromium	<1
Copper	<5
Iron	118
Lead	<1
Manganese	433
Mercury	<1
Nickel	1.13
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-3-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-03
Date Analyzed:	04/03/19	Data File:	904021-03.099
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	5.75
Cadmium	<1
Chromium	<1
Copper	<5
Iron	263
Lead	<1
Manganese	479
Mercury	<1
Nickel	2.53
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-4-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-04
Date Analyzed:	04/03/19	Data File:	904021-04.100
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.319
Barium	31.4
Cadmium	<1
Chromium	2.42
Copper	<5
Iron	240
Lead	<1
Manganese	1.03
Mercury	<1
Nickel	2.47
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-5-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-05
Date Analyzed:	04/03/19	Data File:	904021-05.101
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.278
Barium	29.2
Cadmium	<1
Chromium	2.26
Copper	<5
Iron	227
Lead	<1
Manganese	<1
Mercury	<1
Nickel	2.33
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	I9-222 mb
Date Analyzed:	04/03/19	Data File:	I9-222 mb.093
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	<1
Cadmium	<1
Chromium	<1
Copper	<5
Iron	<50
Lead	<1
Manganese	<1
Mercury	<1
Nickel	<1
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	AMW-1-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/02/19	Lab ID:	904021-01 x10
Date Analyzed:	04/05/19	Data File:	904021-01 x10.060
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	32.3
Magnesium	13.0

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	AMW-2-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/02/19	Lab ID:	904021-02 x10
Date Analyzed:	04/05/19	Data File:	904021-02 x10.053
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	28.4
Magnesium	12.5

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	AMW-3-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/02/19	Lab ID:	904021-03 x10
Date Analyzed:	04/05/19	Data File:	904021-03 x10.054
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	83.2
Magnesium	51.0

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Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	AMW-4-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/02/19	Lab ID:	904021-04 x10
Date Analyzed:	04/05/19	Data File:	904021-04 x10.055
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	78.1
Magnesium	24.4

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	AMW-5-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/02/19	Lab ID:	904021-05 x10
Date Analyzed:	04/05/19	Data File:	904021-05 x10.057
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	77.5
Magnesium	23.8

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/02/19	Lab ID:	I9-215 mb
Date Analyzed:	04/05/19	Data File:	I9-215 mb.046
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	<0.05
Magnesium	<0.05

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-1-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-01
Date Analyzed:	04/03/19	Data File:	904021-01.095
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	3.44
Cadmium	<1
Chromium	<1
Copper	<5
Iron	129
Lead	<1
Manganese	1.80
Mercury	<1
Nickel	1.35
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-2-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-02
Date Analyzed:	04/03/19	Data File:	904021-02.089
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	2.38
Cadmium	<1
Chromium	<1
Copper	<5
Iron	149
Lead	<1
Manganese	464
Mercury	<1
Nickel	1.25
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-3-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-03
Date Analyzed:	04/03/19	Data File:	904021-03.090
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	6.37
Cadmium	<1
Chromium	<1
Copper	<5
Iron	289
Lead	<1
Manganese	757
Mercury	<1
Nickel	2.65
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-4-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-04
Date Analyzed:	04/03/19	Data File:	904021-04.091
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.344
Barium	33.8
Cadmium	<1
Chromium	3.85
Copper	<5
Iron	1,180
Lead	<1
Manganese	31.4
Mercury	<1
Nickel	3.74
Selenium	<1
Silver	<1
Zinc	<5

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Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-5-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-05
Date Analyzed:	04/03/19	Data File:	904021-05.092
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.339
Barium	31.0
Cadmium	<1
Chromium	3.16
Copper	<5
Iron	860
Lead	<1
Manganese	19.9
Mercury	<1
Nickel	3.09
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	I9-221 mb
Date Analyzed:	04/03/19	Data File:	I9-221 mb.075
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	<1
Cadmium	<1
Chromium	<1
Copper	<5
Iron	<50
Lead	<1
Manganese	<1
Mercury	<1
Nickel	<1
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-1-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-01 1/0.5
Date Analyzed:	04/04/19	Data File:	040408.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	48	31	160
Benzo(a)anthracene-d12	38	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-2-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-02 1/0.5
Date Analyzed:	04/04/19	Data File:	040409.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	36	31	160
Benzo(a)anthracene-d12	13	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-3-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-03 1/0.5
Date Analyzed:	04/04/19	Data File:	040410.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	43	31	160
Benzo(a)anthracene-d12	20	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-4-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-04 1/0.5
Date Analyzed:	04/04/19	Data File:	040411.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	46	31	160
Benzo(a)anthracene-d12	30	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

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Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-5-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-05 1/0.5
Date Analyzed:	04/04/19	Data File:	040412.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	48	31	160
Benzo(a)anthracene-d12	33	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	09-716 mb 1/0.5
Date Analyzed:	04/04/19	Data File:	040407.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	40	31	160
Benzo(a)anthracene-d12	42	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

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ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-1-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-01
Date Analyzed:	04/03/19	Data File:	040334.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	50	150
Toluene-d8	99	50	150
4-Bromofluorobenzene	97	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1 jl	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<2
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-2-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-02
Date Analyzed:	04/03/19	Data File:	040335.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	50	150
Toluene-d8	99	50	150
4-Bromofluorobenzene	97	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1 jl	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<2
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-3-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-03
Date Analyzed:	04/03/19	Data File:	040336.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	50	150
Toluene-d8	98	50	150
4-Bromofluorobenzene	98	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1 jl	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<2
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-4-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-04
Date Analyzed:	04/03/19	Data File:	040337.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	50	150
Toluene-d8	99	50	150
4-Bromofluorobenzene	99	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1 jl	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<2
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-5-040119	Client:	Aspect Consulting, LLC
Date Received:	04/01/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	904021-05
Date Analyzed:	04/03/19	Data File:	040338.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	102	50	150
Toluene-d8	99	50	150
4-Bromofluorobenzene	97	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1 jl	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<2
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C Street Landfill 150074
Date Extracted:	04/03/19	Lab ID:	09-681 mb
Date Analyzed:	04/03/19	Data File:	040312.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	50	150
Toluene-d8	101	50	150
4-Bromofluorobenzene	98	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1 jl	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<2
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Date of Report: 04/23/19
Date Received: 04/01/19
Project: Shelton C Street Landfill 150074, F&BI 904021

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	112	104	63-142	7

Date of Report: 04/23/19
Date Received: 04/01/19
Project: Shelton C Street Landfill 150074, F&BI 904021

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR DISSOLVED METALS USING EPA METHOD 200.8 AND SM 2340B**

Laboratory Code: 904021-02 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Calcium	mg/L (ppm)	1.0	26.3	140 b	137 b	70-130	2 b
Magnesium	mg/L (ppm)	1.0	11.5	130	107	70-130	19

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Calcium	mg/L (ppm)	1.0	90	85-115
Magnesium	mg/L (ppm)	1.0	93	85-115

Date of Report: 04/23/19
Date Received: 04/01/19
Project: Shelton C Street Landfill 150074, F&BI 904021

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: 904021-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	0.278	96	98	75-125	2
Barium	ug/L (ppb)	50	29.2	98	102	75-125	4
Cadmium	ug/L (ppb)	5	<1	94	96	75-125	2
Chromium	ug/L (ppb)	20	2.26	99	102	75-125	3
Copper	ug/L (ppb)	20	<5	88	90	75-125	2
Iron	ug/L (ppb)	100	227	103	112	75-125	8
Lead	ug/L (ppb)	10	<1	82	85	75-125	4
Manganese	ug/L (ppb)	20	<1	96	98	75-125	2
Mercury	ug/L (ppb)	5	<1	88	94	75-125	7
Nickel	ug/L (ppb)	20	2.33	90	92	75-125	2
Selenium	ug/L (ppb)	5	<1	93	95	75-125	2
Silver	ug/L (ppb)	5	<1	85	89	75-125	5
Zinc	ug/L (ppb)	50	<5	89	93	75-125	4

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	91	80-120
Barium	ug/L (ppb)	50	100	80-120
Cadmium	ug/L (ppb)	5	98	80-120
Chromium	ug/L (ppb)	20	103	80-120
Copper	ug/L (ppb)	20	95	80-120
Iron	ug/L (ppb)	100	101	80-120
Lead	ug/L (ppb)	10	99	80-120
Manganese	ug/L (ppb)	20	97	80-120
Mercury	ug/L (ppb)	5	106	80-120
Nickel	ug/L (ppb)	20	97	80-120
Selenium	ug/L (ppb)	5	89	80-120
Silver	ug/L (ppb)	5	96	80-120
Zinc	ug/L (ppb)	50	98	80-120

Date of Report: 04/23/19
Date Received: 04/01/19
Project: Shelton C Street Landfill 150074, F&BI 904021

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 200.8 AND SM 2340B**

Laboratory Code: 904013-01 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Calcium	mg/L (ppm)	1.0	25.3	68 b	193 b	70-130	96 b
Magnesium	mg/L (ppm)	1.0	13.0	66 b	126 b	70-130	62 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Calcium	mg/L (ppm)	1.0	93	85-115
Magnesium	mg/L (ppm)	1.0	94	85-115

Date of Report: 04/23/19
Date Received: 04/01/19
Project: Shelton C Street Landfill 150074, F&BI 904021

**QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 6020B**

Laboratory Code: 904054-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	30.0	107	99	75-125	8
Barium	ug/L (ppb)	50	65.1	108	95	75-125	13
Cadmium	ug/L (ppb)	5	<1	100	98	75-125	2
Chromium	ug/L (ppb)	20	1.33	102	99	75-125	3
Copper	ug/L (ppb)	20	8.35	93	90	75-125	3
Iron	ug/L (ppb)	100	659	115	110	75-125	4
Lead	ug/L (ppb)	10	<1	89	87	75-125	2
Manganese	ug/L (ppb)	20	334	155 b	129 b	75-125	18 b
Mercury	ug/L (ppb)	5	<1	94	95	75-125	1
Nickel	ug/L (ppb)	20	8.26	97	94	75-125	3
Selenium	ug/L (ppb)	5	<1	99	98	75-125	1
Silver	ug/L (ppb)	5	<1	95	92	75-125	3
Zinc	ug/L (ppb)	50	<5	93	91	75-125	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	92	80-120
Barium	ug/L (ppb)	50	100	80-120
Cadmium	ug/L (ppb)	5	99	80-120
Chromium	ug/L (ppb)	20	97	80-120
Copper	ug/L (ppb)	20	97	80-120
Iron	ug/L (ppb)	100	96	80-120
Lead	ug/L (ppb)	10	94	80-120
Manganese	ug/L (ppb)	20	96	80-120
Mercury	ug/L (ppb)	5	99	80-120
Nickel	ug/L (ppb)	20	97	80-120
Selenium	ug/L (ppb)	5	91	80-120
Silver	ug/L (ppb)	5	98	80-120
Zinc	ug/L (ppb)	50	95	80-120

Date of Report: 04/23/19
Date Received: 04/01/19
Project: Shelton C Street Landfill 150074, F&BI 904021

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample 1/0.5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	0.5	67	81	67-116	19
Acenaphthylene	ug/L (ppb)	0.5	78	96	65-119	21 vo
Acenaphthene	ug/L (ppb)	0.5	73	92	66-118	23 vo
Fluorene	ug/L (ppb)	0.5	82	101	64-125	21 vo
Phenanthrene	ug/L (ppb)	0.5	74	87	67-120	16
Anthracene	ug/L (ppb)	0.5	79	92	65-122	15
Fluoranthene	ug/L (ppb)	0.5	81	97	65-127	18
Pyrene	ug/L (ppb)	0.5	79	92	62-130	15
Benz(a)anthracene	ug/L (ppb)	0.5	81	97	60-118	18
Chrysene	ug/L (ppb)	0.5	78	90	66-125	14
Benzo(b)fluoranthene	ug/L (ppb)	0.5	80	97	55-135	19
Benzo(k)fluoranthene	ug/L (ppb)	0.5	84	95	62-125	12
Benzo(a)pyrene	ug/L (ppb)	0.5	85	101	58-127	17
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	0.5	96	112	36-142	15
Dibenz(a,h)anthracene	ug/L (ppb)	0.5	57	89	37-133	44 vo
Benzo(g,h,i)perylene	ug/L (ppb)	0.5	71	94	34-135	28 vo

Date of Report: 04/23/19
Date Received: 04/01/19
Project: Shelton C Street Landfill 150074, F&BI 904021

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 904046-02 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	104	55-137
Chloromethane	ug/L (ppb)	50	<10	102	61-120
Vinyl chloride	ug/L (ppb)	50	<0.2	107	61-139
Bromomethane	ug/L (ppb)	50	<1	97	20-265
Chloroethane	ug/L (ppb)	50	<1	114	55-149
Trichlorofluoromethane	ug/L (ppb)	50	<1	107	71-128
Acetone	ug/L (ppb)	250	<50	105	48-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	106	71-123
Hexane	ug/L (ppb)	50	<1	88	44-139
Methylene chloride	ug/L (ppb)	50	<5	101	61-126
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	96	68-125
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	99	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	97	79-113
2,2-Dichloropropane	ug/L (ppb)	50	<1	116	48-157
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	92	63-126
Chloroform	ug/L (ppb)	50	<1	95	77-117
2-Butanone (MEK)	ug/L (ppb)	250	<10	93	70-135
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	96	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	106	75-121
1,1-Dichloropropene	ug/L (ppb)	50	<1	99	67-121
Carbon tetrachloride	ug/L (ppb)	50	<1	111	70-132
Benzene	ug/L (ppb)	50	<0.35	91	75-114
Trichloroethene	ug/L (ppb)	50	<1	96	73-122
1,2-Dichloropropane	ug/L (ppb)	50	<1	95	80-111
Bromodichloromethane	ug/L (ppb)	50	<1	108	78-117
Dibromomethane	ug/L (ppb)	50	<1	96	73-125
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	109	79-140
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	108	76-120
Toluene	ug/L (ppb)	50	<1	92	73-117
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	106	75-122
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	98	81-116
2-Hexanone	ug/L (ppb)	250	<10	96	74-127
1,3-Dichloropropane	ug/L (ppb)	50	<1	93	80-113
Tetrachloroethene	ug/L (ppb)	50	<1	96	72-113
Dibromochloromethane	ug/L (ppb)	50	<1	114	69-129
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	100	79-120
Chlorobenzene	ug/L (ppb)	50	<1	92	75-115
Ethylbenzene	ug/L (ppb)	50	<1	95	66-124
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	105	76-130
m,p-Xylene	ug/L (ppb)	100	<2	96	63-128
o-Xylene	ug/L (ppb)	50	<1	93	64-129
Styrene	ug/L (ppb)	50	<1	100	56-142
Isopropylbenzene	ug/L (ppb)	50	<1	100	74-122
Bromoform	ug/L (ppb)	50	<1	118	49-138
n-Propylbenzene	ug/L (ppb)	50	<1	96	65-129
Bromobenzene	ug/L (ppb)	50	<1	98	70-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	100	60-138
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	102	79-120
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	93	62-125
2-Chlorotoluene	ug/L (ppb)	50	<1	95	40-159
4-Chlorotoluene	ug/L (ppb)	50	<1	97	76-122
tert-Butylbenzene	ug/L (ppb)	50	<1	103	74-125
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	99	59-136
sec-Butylbenzene	ug/L (ppb)	50	<1	100	69-127
p-Isopropyltoluene	ug/L (ppb)	50	<1	101	64-132
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	95	77-113
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	92	75-110
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	95	70-120
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	114	69-129
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	95	66-123
Hexachlorobutadiene	ug/L (ppb)	50	<1	91	53-136
Naphthalene	ug/L (ppb)	50	<1	98	60-145
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	95	59-130

Date of Report: 04/23/19
Date Received: 04/01/19
Project: Shelton C Street Landfill 150074, F&BI 904021

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	50	81	76	50-157	6
Chloromethane	ug/L (ppb)	50	90	86	62-130	5
Vinyl chloride	ug/L (ppb)	50	99	94	70-128	5
Bromomethane	ug/L (ppb)	50	90	90	62-188	0
Chloroethane	ug/L (ppb)	50	108	108	66-149	0
Trichlorofluoromethane	ug/L (ppb)	50	102	101	70-132	1
Acetone	ug/L (ppb)	250	96	103	44-145	7
1,1-Dichloroethene	ug/L (ppb)	50	106	102	75-119	4
Hexane	ug/L (ppb)	50	79	83	51-153	5
Methylene chloride	ug/L (ppb)	50	103	97	63-132	6
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	100	96	70-122	4
trans-1,2-Dichloroethene	ug/L (ppb)	50	100	96	76-118	4
1,1-Dichloroethane	ug/L (ppb)	50	98	96	77-119	2
2,2-Dichloropropane	ug/L (ppb)	50	123	116	62-141	6
cis-1,2-Dichloroethene	ug/L (ppb)	50	92	91	76-119	1
Chloroform	ug/L (ppb)	50	96	95	78-117	1
2-Butanone (MEK)	ug/L (ppb)	250	73	92	49-147	23 vo
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	88	95	78-114	8
1,1,1-Trichloroethane	ug/L (ppb)	50	107	104	80-116	3
1,1-Dichloropropene	ug/L (ppb)	50	93	96	78-119	3
Carbon tetrachloride	ug/L (ppb)	50	110	110	72-128	0
Benzene	ug/L (ppb)	50	86	90	75-116	5
Trichloroethene	ug/L (ppb)	50	88	93	72-119	6
1,2-Dichloropropane	ug/L (ppb)	50	85	94	79-121	10
Bromodichloromethane	ug/L (ppb)	50	98	106	76-120	8
Dibromomethane	ug/L (ppb)	50	86	95	79-121	10
4-Methyl-2-pentanone	ug/L (ppb)	250	89	106	54-153	17
cis-1,3-Dichloropropene	ug/L (ppb)	50	89	105	76-128	16
Toluene	ug/L (ppb)	50	88	93	79-115	6
trans-1,3-Dichloropropene	ug/L (ppb)	50	90	107	76-128	17
1,1,2-Trichloroethane	ug/L (ppb)	50	87	98	78-120	12
2-Hexanone	ug/L (ppb)	250	71	93	49-147	27 vo
1,3-Dichloropropane	ug/L (ppb)	50	78 vo	93	81-115	18
Tetrachloroethene	ug/L (ppb)	50	90	95	78-109	5
Dibromochloromethane	ug/L (ppb)	50	104	114	63-140	9
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	85	100	82-118	16
Chlorobenzene	ug/L (ppb)	50	84	92	80-113	9
Ethylbenzene	ug/L (ppb)	50	91	96	83-111	5
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	111	108	76-125	3
m,p-Xylene	ug/L (ppb)	100	91	97	84-112	6
o-Xylene	ug/L (ppb)	50	93	95	81-117	2
Styrene	ug/L (ppb)	50	90	100	83-121	11
Isopropylbenzene	ug/L (ppb)	50	101	102	81-122	1
Bromoform	ug/L (ppb)	50	105	118	40-161	12
n-Propylbenzene	ug/L (ppb)	50	91	95	81-115	4
Bromobenzene	ug/L (ppb)	50	88	96	80-113	9
1,3,5-Trimethylbenzene	ug/L (ppb)	50	99	100	83-117	1
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	92	102	79-118	10
1,2,3-Trichloropropane	ug/L (ppb)	50	82	93	74-116	13
2-Chlorotoluene	ug/L (ppb)	50	92	95	79-112	3
4-Chlorotoluene	ug/L (ppb)	50	88	96	80-116	9
tert-Butylbenzene	ug/L (ppb)	50	101	104	81-119	3
1,2,4-Trimethylbenzene	ug/L (ppb)	50	98	100	81-121	2
sec-Butylbenzene	ug/L (ppb)	50	99	100	83-123	1
p-Isopropyltoluene	ug/L (ppb)	50	99	101	81-122	2
1,3-Dichlorobenzene	ug/L (ppb)	50	88	95	80-115	8
1,4-Dichlorobenzene	ug/L (ppb)	50	84	92	77-112	9
1,2-Dichlorobenzene	ug/L (ppb)	50	92	96	79-115	4
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	105	114	62-133	8
1,2,4-Trichlorobenzene	ug/L (ppb)	50	98	96	75-119	2
Hexachlorobutadiene	ug/L (ppb)	50	92	95	70-116	3
Naphthalene	ug/L (ppb)	50	100	99	72-131	1
1,2,3-Trichlorobenzene	ug/L (ppb)	50	99	96	74-122	3

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

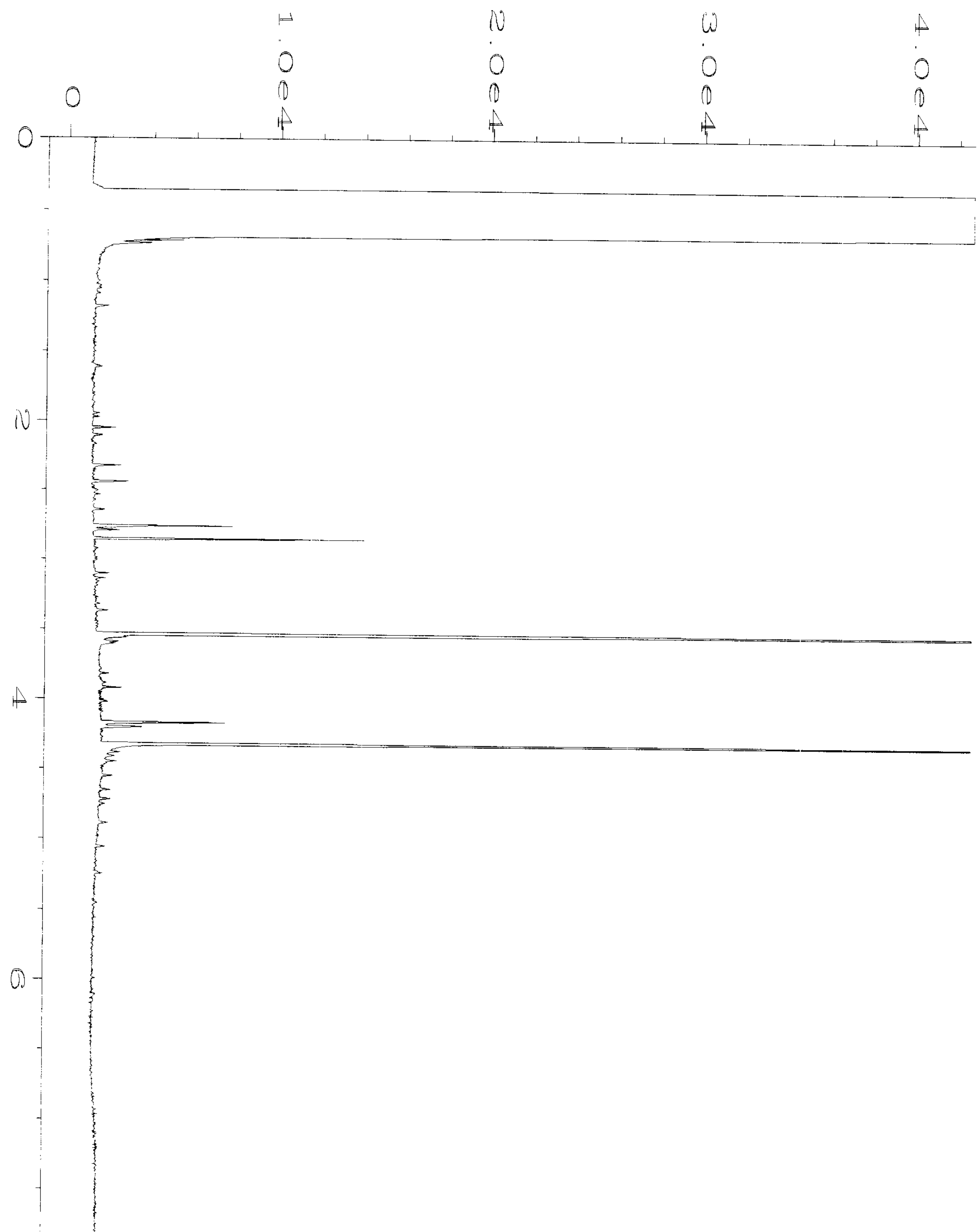
nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

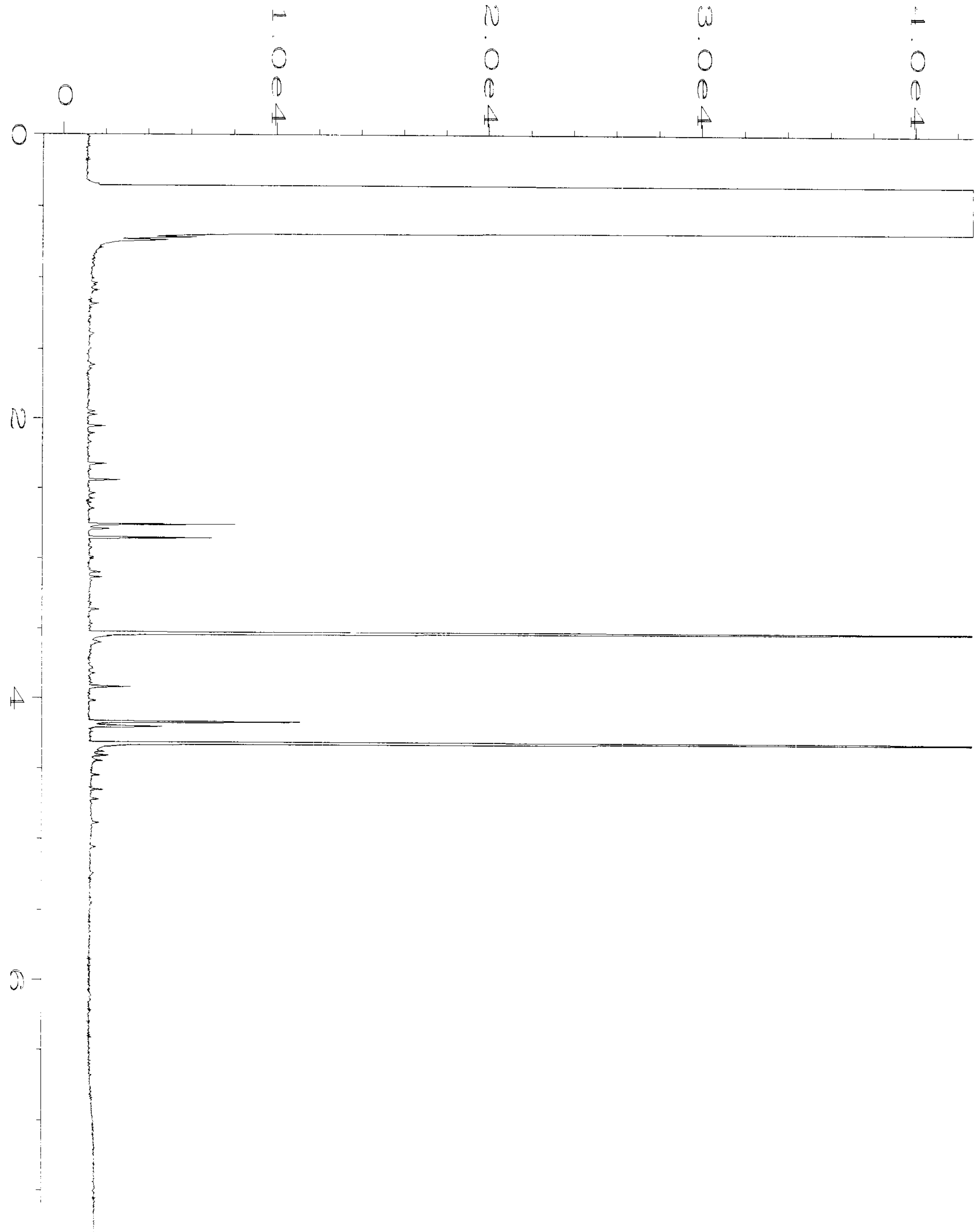
vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.



Data File Name : C:\HPCHEM\4\DATA\04-02-19\024F0301.D
Operator : TL
Instrument : GC#4
Sample Name : 904021-01
Run Time Bar Code:
Acquired on : 02 Apr 19 01:14 PM
Report Created on: 03 Apr 19 07:55 AM

Page Number : 1
Vial Number : 24
Injection Number : 1
Sequence Line : 3
Instrument Method: DX.MTH
Analysis Method : DX.MTH



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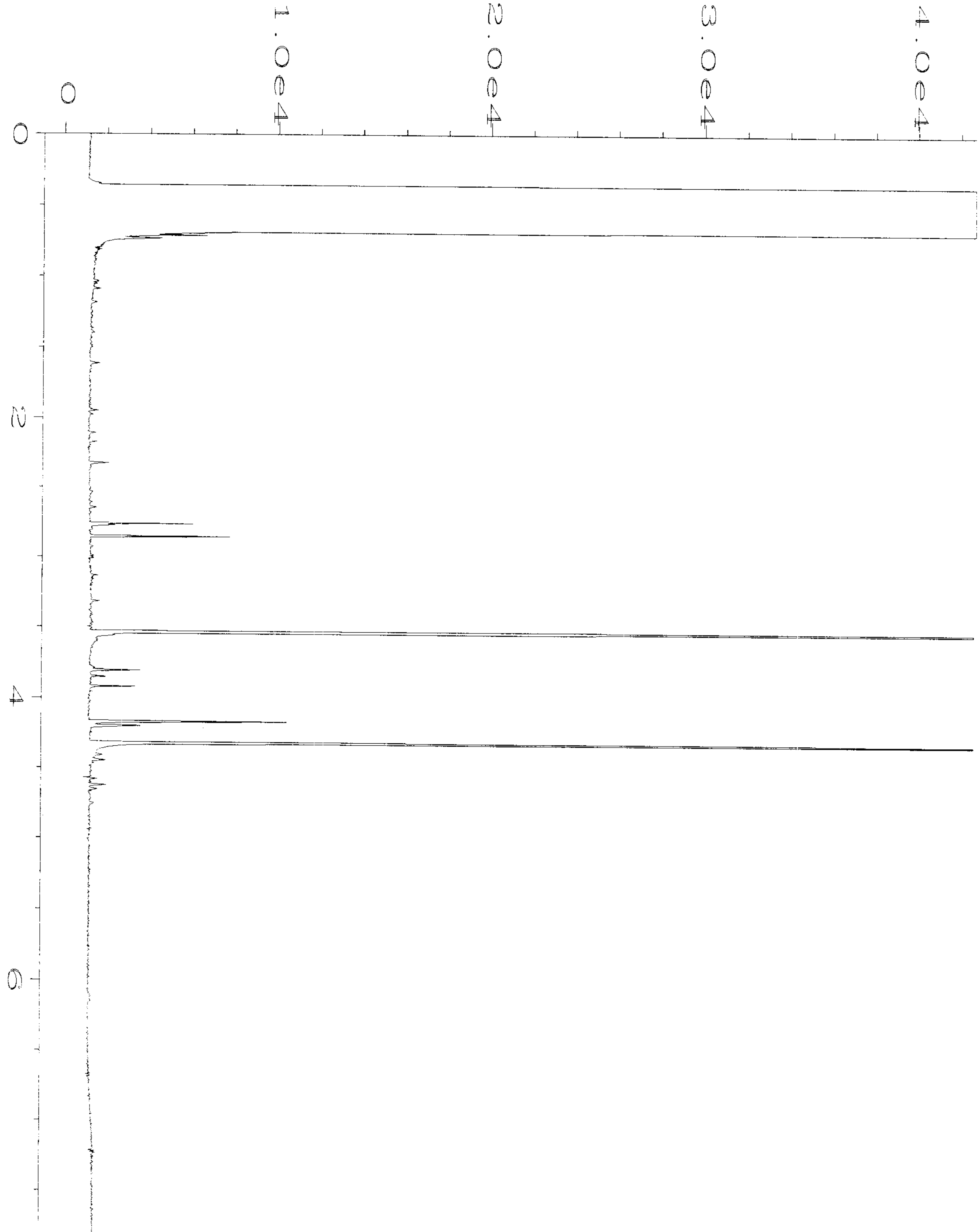
Operator : TL
Instrument : GC#4
Sample Name : 904021-02
Run Time Bar Code:
Acquired on : 02 Apr 19 01:26 PM
Report Created on: 03 Apr 19 07:55 AM

Page Number : 1
Vial Number : 25
Injection Number : 1
Sequence Line : 3
Instrument Method: DX.MTH
Analysis Method : DX.MTH



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Operator	: TL		Page Number	:	1
Instrument	: GC#4		Vial Number	:	26
Sample Name	: 904021-03		Injection Number	:	1
Run Time Bar Code:			Sequence Line	:	3
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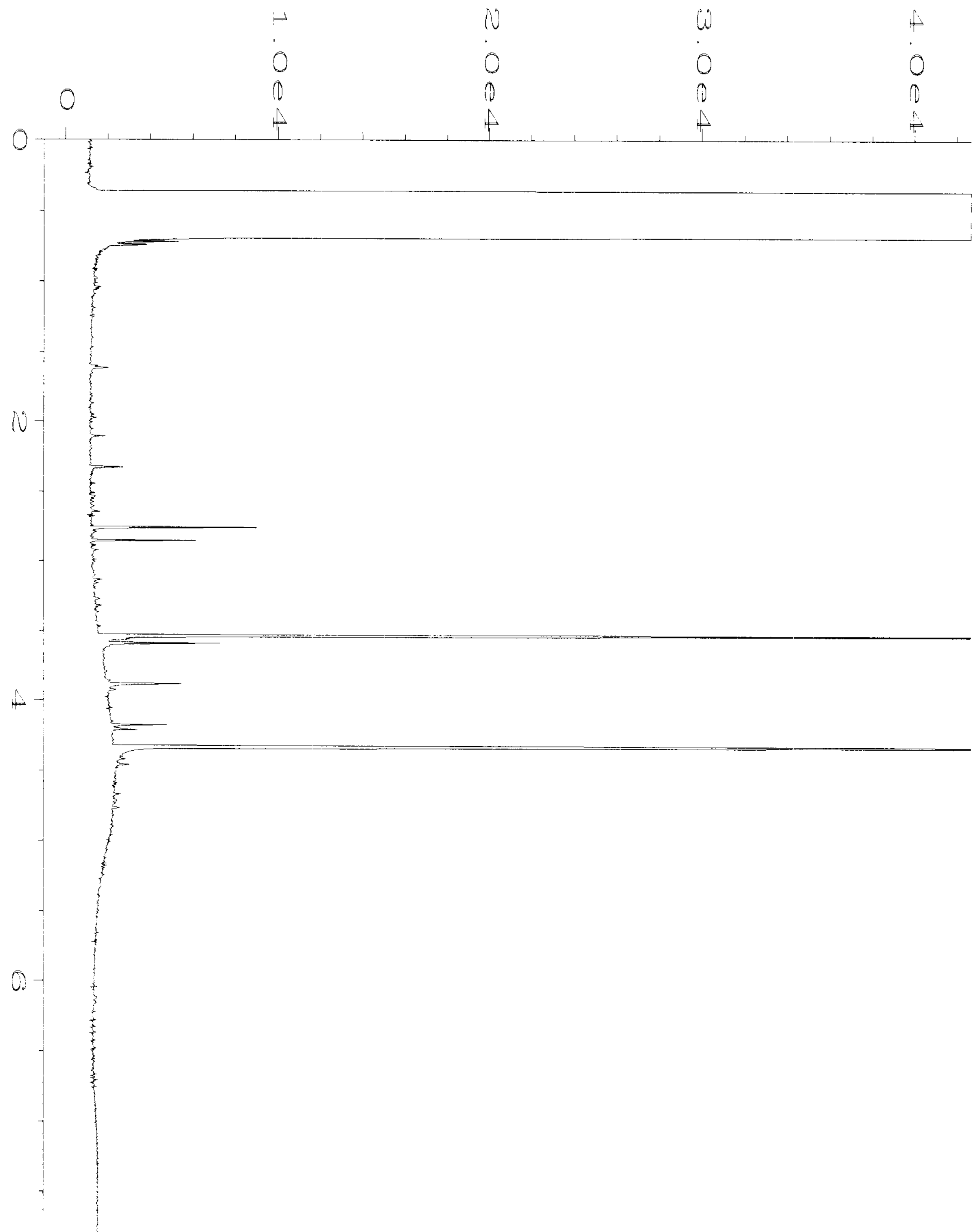
Report Created on:	03 Apr 19	07:55 AM	Analysis Method	:	DX.MTH



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Operator	: TL	Page Number	: 1
Instrument	: GC#4	Vial Number	: 27
Sample Name	: 904021-04	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 3
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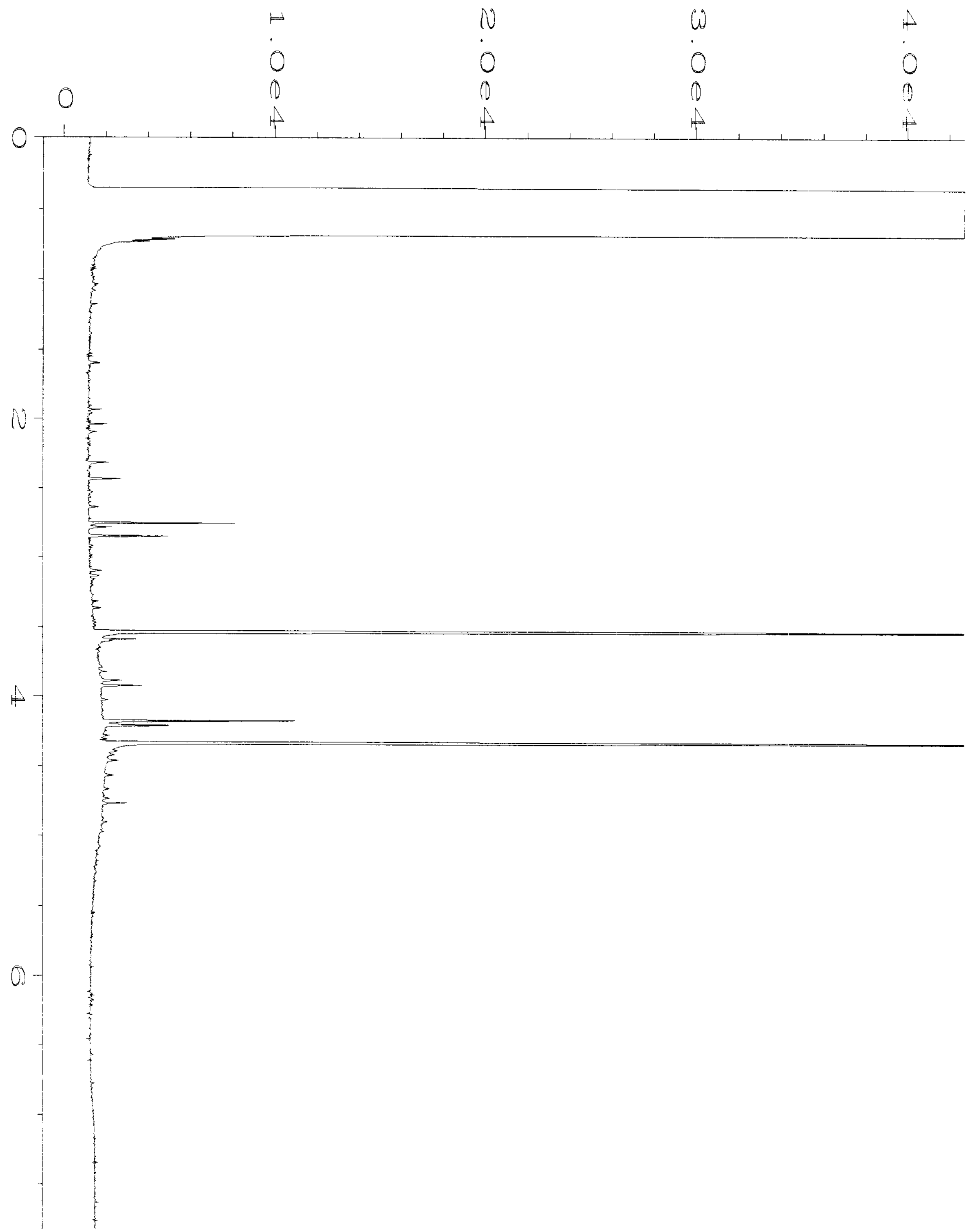
Report Created on:	03 Apr 19 07:56 AM	Analysis Method	: DX.MTH



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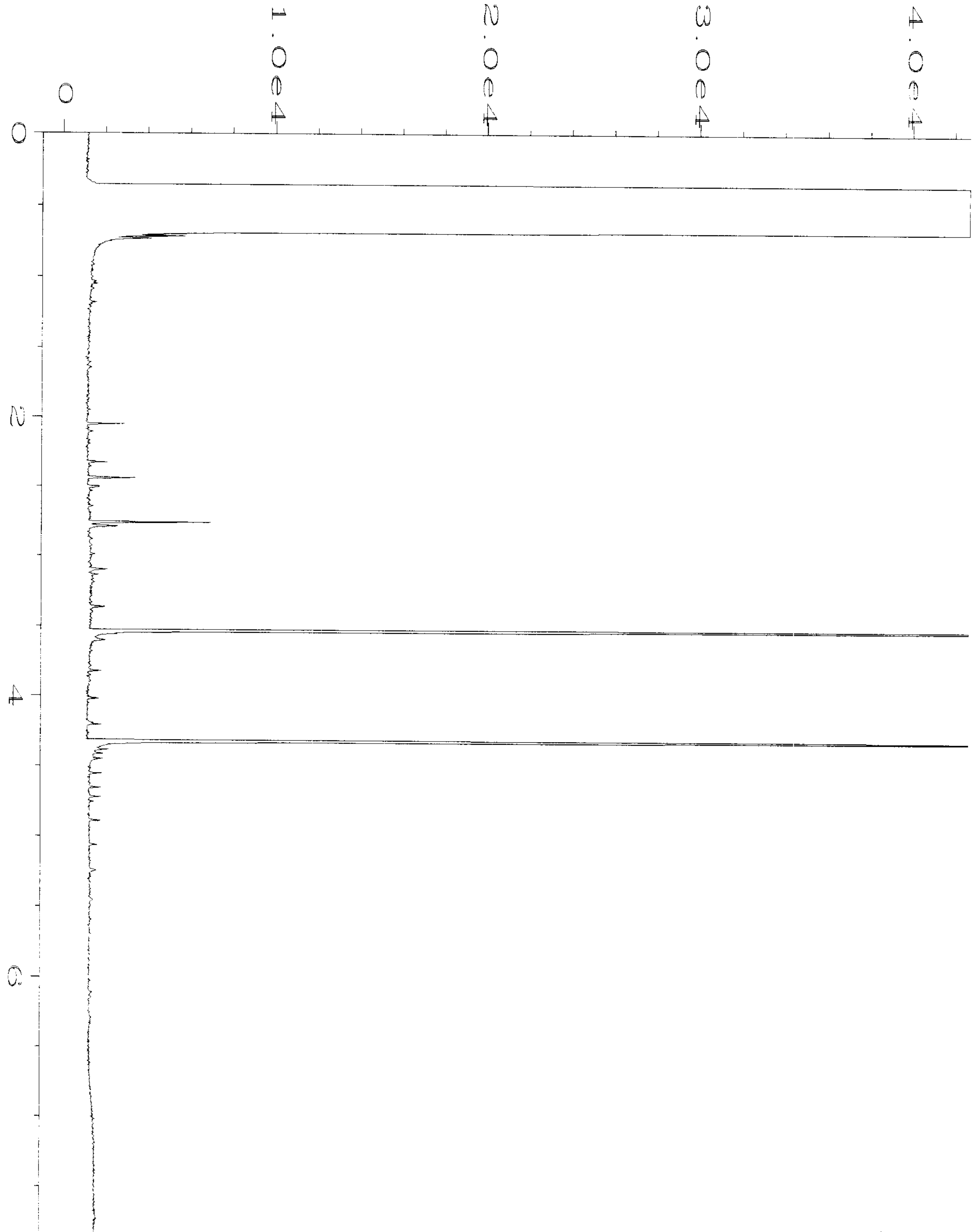
Operator	: TL	Page Number	:	1
Instrument	: GC#4	Vial Number	:	28
Sample Name	: 904021-05	Injection Number	:	1
Run Time Bar Code:		Sequence Line	:	4
Acquired on	: 02 Apr 19 02:07 PM	Instrument Method:		DX.MTH
Report Created on:	03 Apr 19 07:58 AM	Analysis Method	:	DX.MTH



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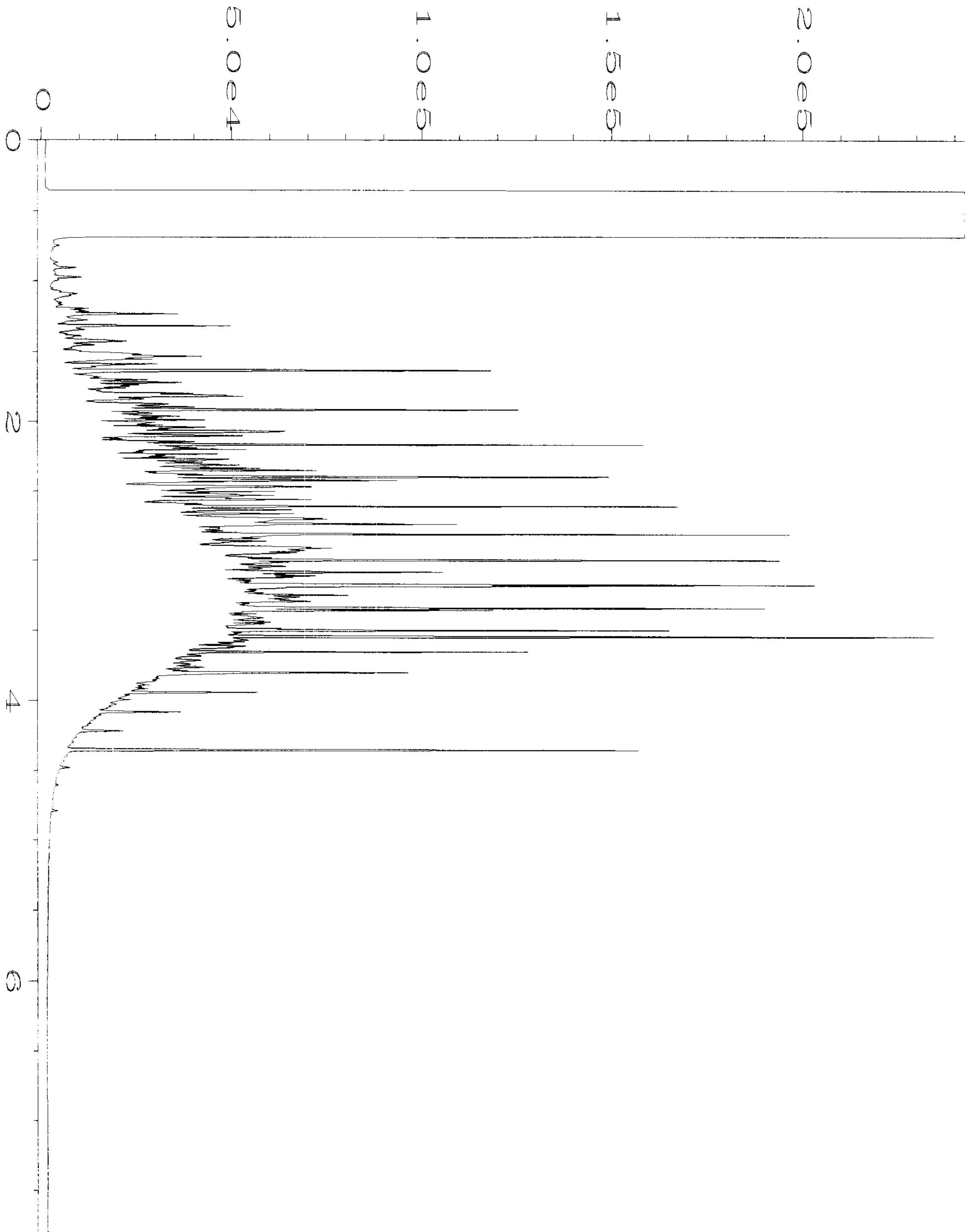
Operator : TL
Instrument : GC#4
Sample Name : 09-698 mb2
Run Time Bar Code:
Acquired on : 02 Apr 19 01:02 PM
Report Created on: 03 Apr 19 07:56 AM

Page Number : 1
Vial Number : 23
Injection Number : 1
Sequence Line : 3
Instrument Method: DX.MTH
Analysis Method : DX.MTH



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Operator : TL
Instrument : GC#4
Sample Name : 1000 Dx 56-131C
Run Time Bar Code:
Acquired on : 02 Apr 19 02:34 PM
Report Created on: 03 Apr 19 07:57 AM

Page Number : 1
Vial Number : 5
Injection Number : 1
Sequence Line : 5
Instrument Method: DX.MTH
Analysis Method : DX.MTH

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 904021
Work Order Number: 1904032

April 10, 2019

Attention Michael Erdahl:

Fremont Analytical, Inc. received 5 sample(s) on 4/2/2019 for the analyses presented in the following report.

Ammonia by SM 4500 NH3G
Cyanide by SM 4500-CN C, E
Dissolved Metals by EPA Method 200.8
Dissolved Organic Carbon by SM 5310C
Ion Chromatography by EPA Method 300.0
Sulfide by SM 4500-S2-F
Total Metals by EPA Method 200.8
Total Alkalinity by SM 2320B

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Mike Ridgeway
Laboratory Director

DoD/ELAP Certification #L17-135, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

Fremont Analytical

Date: *04/10/2019*

CLIENT: Friedman & Bruya
Project: 904021
Work Order: 1904032

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1904032-001	AMW-1-040119	04/01/2019 9:51 AM	04/02/2019 10:50 AM
1904032-002	AMW-2-040119	04/01/2019 11:00 AM	04/02/2019 10:50 AM
1904032-003	AMW-3-040119	04/01/2019 1:00 PM	04/02/2019 10:50 AM
1904032-004	AMW-4-040119	04/01/2019 12:01 PM	04/02/2019 10:50 AM
1904032-005	AMW-5-040119	04/01/2019 8:40 AM	04/02/2019 10:50 AM

Original

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

CLIENT: Friedman & Bruya

Project: 904021

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Fremont Analytical

Analytical Report

Work Order: **1904032**
Date Reported: **4/10/2019**

Client: Friedman & Bruya
Project: 904021
Lab ID: 1904032-001
Client Sample ID: **AMW-1-040119**

Collection Date: 4/1/2019 9:51:00 AM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 24051		Analyst: GM
Chloride	1.48	0.100		mg/L	1	4/2/2019 7:05:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	4/2/2019 7:05:00 PM
Nitrate (as N)	1.86	0.100		mg/L	1	4/2/2019 7:05:00 PM
Sulfate	5.70	0.300		mg/L	1	4/2/2019 7:05:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 24101		Analyst: WC
Sodium	8,680	100		µg/L	1	4/9/2019 9:42:42 PM
Total Metals by EPA Method 200.8				Batch ID: 24059		Analyst: WC
Sodium	10,100	100		µg/L	1	4/9/2019 6:22:19 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R50569		Analyst: GM
Organic Carbon, Dissolved	2.33	0.500		mg/L	1	4/5/2019 10:47:00 PM
Total Alkalinity by SM 2320B				Batch ID: R50596		Analyst: WF
Alkalinity, Total (As CaCO3)	150	2.50		mg/L	1	4/9/2019 11:42:09 AM
Ammonia by SM 4500 NH3G				Batch ID: 24119		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	4/5/2019 1:33:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 24086		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	4/4/2019 4:58:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R50592		Analyst: GM
Sulfide	ND	0.500		mg/L	1	4/8/2019 4:18:00 PM

Fremont Analytical

Analytical Report

Work Order: **1904032**
Date Reported: **4/10/2019**

Client: Friedman & Bruya
Project: 904021
Lab ID: 1904032-002
Client Sample ID: **AMW-2-040119**

Collection Date: 4/1/2019 11:00:00 AM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 24051		Analyst: GM
Chloride	1.88	0.100		mg/L	1	4/2/2019 9:47:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	4/2/2019 9:47:00 PM
Nitrate (as N)	0.235	0.100		mg/L	1	4/2/2019 9:47:00 PM
Sulfate	14.7	0.600	D	mg/L	2	4/2/2019 9:24:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 24101		Analyst: WC
Sodium	5,710	100		µg/L	1	4/9/2019 9:47:29 PM
Total Metals by EPA Method 200.8				Batch ID: 24059		Analyst: WC
Sodium	6,040	100		µg/L	1	4/9/2019 6:27:51 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R50569		Analyst: GM
Organic Carbon, Dissolved	5.49	0.500		mg/L	1	4/6/2019 12:15:00 AM
Total Alkalinity by SM 2320B				Batch ID: R50596		Analyst: WF
Alkalinity, Total (As CaCO3)	120	2.50		mg/L	1	4/9/2019 11:42:09 AM
Ammonia by SM 4500 NH3G				Batch ID: 24119		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	4/5/2019 1:53:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 24086		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	4/4/2019 5:12:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R50592		Analyst: GM
Sulfide	ND	0.500		mg/L	1	4/8/2019 4:18:00 PM

Fremont Analytical

Analytical Report

Work Order: **1904032**
Date Reported: **4/10/2019**

Client: Friedman & Bruya
Project: 904021
Lab ID: 1904032-003
Client Sample ID: **AMW-3-040119**

Collection Date: 4/1/2019 1:00:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 24051		Analyst: GM
Chloride	2.61	0.200	D	mg/L	2	4/2/2019 10:33:00 PM
Nitrite (as N)	ND	0.200	D	mg/L	2	4/2/2019 10:33:00 PM
Nitrate (as N)	0.258	0.200	D	mg/L	2	4/2/2019 10:33:00 PM
Sulfate	36.8	1.50	D	mg/L	5	4/2/2019 10:10:00 PM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 200.8				Batch ID: 24101		Analyst: WC
Sodium	8,300	100		µg/L	1	4/9/2019 9:52:16 PM
Total Metals by EPA Method 200.8				Batch ID: 24059		Analyst: WC
Sodium	9,240	100		µg/L	1	4/9/2019 6:33:22 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R50569		Analyst: GM
Organic Carbon, Dissolved	5.12	0.500		mg/L	1	4/6/2019 12:35:00 AM
Total Alkalinity by SM 2320B				Batch ID: R50596		Analyst: WF
Alkalinity, Total (As CaCO3)	400	2.50		mg/L	1	4/9/2019 11:42:09 AM
Ammonia by SM 4500 NH3G				Batch ID: 24119		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	4/5/2019 1:58:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 24086		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	4/4/2019 5:16:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R50592		Analyst: GM
Sulfide	ND	0.500		mg/L	1	4/8/2019 4:18:00 PM

Fremont Analytical

Analytical Report

Work Order: **1904032**
Date Reported: **4/10/2019**

Client: Friedman & Bruya
Project: 904021
Lab ID: 1904032-004
Client Sample ID: **AMW-4-040119**

Collection Date: 4/1/2019 12:01:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 24051		Analyst: GM
Chloride	5.12	0.500	D	mg/L	5	4/2/2019 11:19:00 PM
Nitrite (as N)	ND	0.500	D	mg/L	5	4/2/2019 11:19:00 PM
Nitrate (as N)	1.18	0.500	D	mg/L	5	4/2/2019 11:19:00 PM
Sulfate	69.4	1.50	D	mg/L	5	4/2/2019 11:19:00 PM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 200.8				Batch ID: 24101		Analyst: WC
Sodium	90,200	100		µg/L	1	4/9/2019 9:57:03 PM
Total Metals by EPA Method 200.8				Batch ID: 24059		Analyst: WC
Sodium	98,800	100		µg/L	1	4/9/2019 6:38:54 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R50569		Analyst: GM
Organic Carbon, Dissolved	2.73	0.500		mg/L	1	4/6/2019 12:55:00 AM
Total Alkalinity by SM 2320B				Batch ID: R50596		Analyst: WF
Alkalinity, Total (As CaCO3)	410	2.50		mg/L	1	4/9/2019 11:42:09 AM
Ammonia by SM 4500 NH3G				Batch ID: 24119		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	4/5/2019 2:03:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 24086		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	4/4/2019 5:19:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R50592		Analyst: GM
Sulfide	ND	0.500		mg/L	1	4/8/2019 4:18:00 PM

Analytical Report

Fremont Analytical

Work Order: **1904032**
Date Reported: **4/10/2019**

Client: Friedman & Bruya
Project: 904021
Lab ID: 1904032-005
Client Sample ID: **AMW-5-040119**
Collection Date: 4/1/2019 8:40:00 AM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 24051		Analyst: GM
Chloride	4.99	0.500	D	mg/L	5	4/3/2019 12:52:00 AM
Nitrite (as N)	ND	0.500	D	mg/L	5	4/3/2019 12:52:00 AM
Nitrate (as N)	1.18	0.500	D	mg/L	5	4/3/2019 12:52:00 AM
Sulfate	66.2	1.50	D	mg/L	5	4/3/2019 12:52:00 AM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 200.8				Batch ID: 24101		Analyst: WC
Sodium	86,300	100		µg/L	1	4/9/2019 10:01:50 PM
Total Metals by EPA Method 200.8				Batch ID: 24059		Analyst: WC
Sodium	95,200	100		µg/L	1	4/9/2019 6:44:26 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R50569		Analyst: GM
Organic Carbon, Dissolved	2.02	0.500		mg/L	1	4/6/2019 1:15:00 AM
Total Alkalinity by SM 2320B				Batch ID: R50596		Analyst: WF
Alkalinity, Total (As CaCO3)	405	2.50		mg/L	1	4/9/2019 11:42:09 AM
Ammonia by SM 4500 NH3G				Batch ID: 24119		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	4/5/2019 2:13:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 24086		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	4/4/2019 5:22:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R50592		Analyst: GM
Sulfide	ND	0.500		mg/L	1	4/8/2019 4:18:00 PM

Fremont Analytical

Date: *4/10/2019*

Work Order: 1904032
CLIENT: Friedman & Bruya
Project: 904021

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID MB-R50596	SampType: MBLK			Units: mg/L		Prep Date: 4/9/2019			RunNo: 50596		
Client ID: MBLKW	Batch ID: R50596					Analysis Date: 4/9/2019			SeqNo: 993519		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID LCS-R50596	SampType: LCS			Units: mg/L		Prep Date: 4/9/2019			RunNo: 50596		
Client ID: LCSW	Batch ID: R50596					Analysis Date: 4/9/2019			SeqNo: 993520		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	100	2.50	100.0	0	100	80	120				

Sample ID 1904032-001BDUP	SampType: DUP			Units: mg/L		Prep Date: 4/9/2019			RunNo: 50596		
Client ID: AMW-1-040119	Batch ID: R50596					Analysis Date: 4/9/2019			SeqNo: 993522		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	153	2.50						149.5	2.15	20	

Fremont Analytical

Date: *4/10/2019*

Work Order: 1904032
CLIENT: Friedman & Bruya
Project: 904021

QC SUMMARY REPORT
Ammonia by SM 4500 NH3G

Sample ID **MB-24119** SampType: **MBLK** Units: **mg/L** Prep Date: **4/5/2019** RunNo: **50586**
Client ID: **MBLKW** Batch ID: **24119** Analysis Date: **4/5/2019** SeqNo: **993421**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100									

Sample ID **LCS-24119** SampType: **LCS** Units: **mg/L** Prep Date: **4/5/2019** RunNo: **50586**
Client ID: **LCSW** Batch ID: **24119** Analysis Date: **4/5/2019** SeqNo: **993422**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	0.459	0.100	0.5000	0	91.8	80	120				

Sample ID **1904032-001GDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/5/2019** RunNo: **50586**
Client ID: **AMW-1-040119** Batch ID: **24119** Analysis Date: **4/5/2019** SeqNo: **993424**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100						0		30	

Sample ID **1904032-001GMS** SampType: **MS** Units: **mg/L** Prep Date: **4/5/2019** RunNo: **50586**
Client ID: **AMW-1-040119** Batch ID: **24119** Analysis Date: **4/5/2019** SeqNo: **993425**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100	0.5000	0	0	70	130				S

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID **1904032-001GMSD** SampType: **MSD** Units: **mg/L** Prep Date: **4/5/2019** RunNo: **50586**
Client ID: **AMW-1-040119** Batch ID: **24119** Analysis Date: **4/5/2019** SeqNo: **993426**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100	0.5000	0	0	70	130	0		30	S

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 1904032
CLIENT: Friedman & Bruya
Project: 904021

QC SUMMARY REPORT

Cyanide by SM 4500-CN C, E

Sample ID **MB-24086** SampType: **MBLK** Units: **mg/L** Prep Date: **4/4/2019** RunNo: **50538**
Client ID: **MBLKW** Batch ID: **24086** Analysis Date: **4/4/2019** SeqNo: **992587**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	ND	0.0500									

Sample ID **LCS-24086** SampType: **LCS** Units: **mg/L** Prep Date: **4/4/2019** RunNo: **50538**
Client ID: **LCSW** Batch ID: **24086** Analysis Date: **4/4/2019** SeqNo: **992588**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.252	0.0500	0.2500	0	101	80	120				

Sample ID **1904032-001ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/4/2019** RunNo: **50538**
Client ID: **AMW-1-040119** Batch ID: **24086** Analysis Date: **4/4/2019** SeqNo: **992590**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	ND	0.0500						0		20	

Sample ID **1904032-001AMS** SampType: **MS** Units: **mg/L** Prep Date: **4/4/2019** RunNo: **50538**
Client ID: **AMW-1-040119** Batch ID: **24086** Analysis Date: **4/4/2019** SeqNo: **992591**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.228	0.0500	0.2500	0	91.4	80	120				

Sample ID **1904032-001AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **4/4/2019** RunNo: **50538**
Client ID: **AMW-1-040119** Batch ID: **24086** Analysis Date: **4/4/2019** SeqNo: **992592**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.248	0.0500	0.2500	0	99.0	80	120	0.2285	8.02	30	

Fremont Analytical

Date: 4/10/2019

Work Order: 1904032
CLIENT: Friedman & Bruya
Project: 904021

QC SUMMARY REPORT

Dissolved Organic Carbon by SM 5310C

Sample ID **MBLK-50569** SampType: **MBLK** Units: **mg/L** Prep Date: **4/5/2019** RunNo: **50569**
Client ID: **MBLKW** Batch ID: **R50569** Analysis Date: **4/5/2019** SeqNo: **993011**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	ND	0.500									

Sample ID **LCS-50569** SampType: **LCS** Units: **mg/L** Prep Date: **4/5/2019** RunNo: **50569**
Client ID: **LCSW** Batch ID: **R50569** Analysis Date: **4/5/2019** SeqNo: **993012**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	5.02	0.500	5.000	0	100	80	120				

Sample ID **1904032-001FDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/5/2019** RunNo: **50569**
Client ID: **AMW-1-040119** Batch ID: **R50569** Analysis Date: **4/5/2019** SeqNo: **993014**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	2.40	0.500						2.329	3.17	20	

Sample ID **1904032-001FMS** SampType: **MS** Units: **mg/L** Prep Date: **4/5/2019** RunNo: **50569**
Client ID: **AMW-1-040119** Batch ID: **R50569** Analysis Date: **4/5/2019** SeqNo: **993015**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	7.46	0.500	5.000	2.329	103	70	130				

Sample ID **1904032-001FMSD** SampType: **MSD** Units: **mg/L** Prep Date: **4/5/2019** RunNo: **50569**
Client ID: **AMW-1-040119** Batch ID: **R50569** Analysis Date: **4/5/2019** SeqNo: **993016**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	7.43	0.500	5.000	2.329	102	70	130	7.460	0.403	30	

Work Order: 1904032
CLIENT: Friedman & Bruya
Project: 904021

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **LCS-24051** | SampType: **LCS** | Units: **mg/L** | Prep Date: **4/2/2019** | RunNo: **50499**
Client ID: **LCSW** | Batch ID: **24051** | Analysis Date: **4/2/2019** | SeqNo: **991845**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.703	0.100	0.7500	0	93.7	90	110				
Nitrite (as N)	0.734	0.100	0.7500	0	97.9	90	110				
Nitrate (as N)	0.704	0.100	0.7500	0	93.9	90	110				
Sulfate	3.52	0.300	3.750	0	93.9	90	110				

Sample ID **MB-24051** | SampType: **MBLK** | Units: **mg/L** | Prep Date: **4/2/2019** | RunNo: **50499**
Client ID: **MBLKW** | Batch ID: **24051** | Analysis Date: **4/2/2019** | SeqNo: **991846**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									
Nitrite (as N)	ND	0.100									
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.300									

Sample ID **1904016-001BDUP** | SampType: **DUP** | Units: **mg/L** | Prep Date: **4/2/2019** | RunNo: **50499**
Client ID: **BATCH** | Batch ID: **24051** | Analysis Date: **4/2/2019** | SeqNo: **991850**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	3.73	0.100						3.715	0.349	20	E
Nitrite (as N)	ND	0.100						0		20	
Nitrate (as N)	0.102	0.100						0.1020	0	20	
Sulfate	1.76	0.300						1.752	0.171	20	

Sample ID **1904016-001BMS** | SampType: **MS** | Units: **mg/L** | Prep Date: **4/2/2019** | RunNo: **50499**
Client ID: **BATCH** | Batch ID: **24051** | Analysis Date: **4/2/2019** | SeqNo: **991851**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	4.65	0.100	0.7500	3.715	125	80	120				ES
Nitrite (as N)	0.723	0.100	0.7500	0	96.4	80	120				

Fremont Analytical

Date: *4/10/2019*

Work Order: 1904032
CLIENT: Friedman & Bruya
Project: 904021

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **1904016-001BMS** SampType: **MS** Units: **mg/L** Prep Date: **4/2/2019** RunNo: **50499**
Client ID: **BATCH** Batch ID: **24051** Analysis Date: **4/2/2019** SeqNo: **991851**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrate (as N)	0.793	0.100	0.7500	0.1020	92.1	80	120				
Sulfate	5.38	0.300	3.750	1.752	96.6	80	120				

NOTES:
S - Analyte concentration was too high for accurate spike recovery(ies).
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID **1904016-001BMSD** SampType: **MSD** Units: **mg/L** Prep Date: **4/2/2019** RunNo: **50499**
Client ID: **BATCH** Batch ID: **24051** Analysis Date: **4/2/2019** SeqNo: **991852**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	4.62	0.100	0.7500	3.715	121	80	120	4.651	0.604	20	ES
Nitrite (as N)	0.698	0.100	0.7500	0	93.1	80	120	0.7230	3.52	20	
Nitrate (as N)	0.773	0.100	0.7500	0.1020	89.5	80	120	0.7930	2.55	20	
Sulfate	5.38	0.300	3.750	1.752	96.7	80	120	5.375	0.0744	20	

NOTES:
S - Analyte concentration was too high for accurate spike recovery(ies).
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID **1904032-001BDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/2/2019** RunNo: **50499**
Client ID: **AMW-1-040119** Batch ID: **24051** Analysis Date: **4/2/2019** SeqNo: **991859**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	1.47	0.100						1.480	0.542	20	
Nitrite (as N)	ND	0.100						0		20	
Nitrate (as N)	1.86	0.100						1.865	0.322	20	
Sulfate	5.69	0.300						5.699	0.211	20	

Date: *4/10/2019*

Work Order: 1904032
CLIENT: Friedman & Bruya
Project: 904021

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID **1904032-001BMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **4/2/2019**	RunNo: **50499**
Client ID: **AMW-1-040119**	Batch ID: **24051**		Analysis Date: **4/2/2019**	SeqNo: **991860**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	2.26	0.100	0.7500	1.480	104	80	120				
Nitrite (as N)	0.722	0.100	0.7500	0	96.3	80	120				
Nitrate (as N)	2.66	0.100	0.7500	1.865	106	80	120				E
Sulfate	9.59	0.300	3.750	5.699	104	80	120				

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Work Order: 1904032
CLIENT: Friedman & Bruya
Project: 904021

QC SUMMARY REPORT

Sulfide by SM 4500-S2-F

Sample ID **MB-R50592** SampType: **MBLK** Units: **mg/L** Prep Date: **4/8/2019** RunNo: **50592**
Client ID: **MBLKW** Batch ID: **R50592** Analysis Date: **4/8/2019** SeqNo: **993477**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	ND	0.500									

Sample ID **LCS-R50592** SampType: **LCS** Units: **mg/L** Prep Date: **4/8/2019** RunNo: **50592**
Client ID: **LCSW** Batch ID: **R50592** Analysis Date: **4/8/2019** SeqNo: **993478**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	2.00	0.500	2.000	0	100	65	135				

Sample ID **1904032-001EDUP** SampType: **DUP** Units: **mg/L** Prep Date: **4/8/2019** RunNo: **50592**
Client ID: **AMW-1-040119** Batch ID: **R50592** Analysis Date: **4/8/2019** SeqNo: **993480**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	ND	0.500						0		30	

Sample ID **1904032-001EMS** SampType: **MS** Units: **mg/L** Prep Date: **4/8/2019** RunNo: **50592**
Client ID: **AMW-1-040119** Batch ID: **R50592** Analysis Date: **4/8/2019** SeqNo: **993481**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	1.60	0.500	2.000	0	80.0	65	135				

Sample ID **1904032-001EMSD** SampType: **MSD** Units: **mg/L** Prep Date: **4/8/2019** RunNo: **50592**
Client ID: **AMW-1-040119** Batch ID: **R50592** Analysis Date: **4/8/2019** SeqNo: **993482**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	1.80	0.500	2.000	0	90.0	65	135	1.600	11.8	30	

Fremont Analytical

Date: *4/10/2019*

Work Order: 1904032
CLIENT: Friedman & Bruya
Project: 904021

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID **MB-24101**	SampType: **MBLK**			Units: **µg/L**		Prep Date: **4/8/2019**			RunNo: **50614**		
Client ID: **MBLKW**	Batch ID: **24101**					Analysis Date: **4/9/2019**			SeqNo: **993952**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	ND	100									

Sample ID **LCS-24101**	SampType: **LCS**			Units: **µg/L**		Prep Date: **4/8/2019**			RunNo: **50614**		
Client ID: **LCSW**	Batch ID: **24101**					Analysis Date: **4/9/2019**			SeqNo: **993953**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	1,090	100	1,000	0	109	50	150				

Sample ID **1904030-001BDUP**	SampType: **DUP**			Units: **µg/L**		Prep Date: **4/8/2019**			RunNo: **50614**		
Client ID: **BATCH**	Batch ID: **24101**					Analysis Date: **4/9/2019**			SeqNo: **993955**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	28,700	100						29,850	3.77	30	

Sample ID **1904030-001BMS**	SampType: **MS**			Units: **µg/L**		Prep Date: **4/8/2019**			RunNo: **50614**		
Client ID: **BATCH**	Batch ID: **24101**					Analysis Date: **4/9/2019**			SeqNo: **993956**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	35,500	100	5,000	29,850	112	50	150				

Sample ID **1904030-001BMSD**	SampType: **MSD**			Units: **µg/L**		Prep Date: **4/8/2019**			RunNo: **50614**		
Client ID: **BATCH**	Batch ID: **24101**					Analysis Date: **4/9/2019**			SeqNo: **993959**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	34,600	100	5,000	29,850	95.7	50	150	35,470	2.40	30	

Work Order: 1904032
CLIENT: Friedman & Bruya
Project: 904021

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID	MB-24081FB	SampType:	MBLK		Units:	µg/L		Prep Date:	4/8/2019		RunNo:	50614
Client ID:	MBLKW	Batch ID:	24101					Analysis Date:	4/9/2019		SeqNo:	993975
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Sodium	ND	100										

Sample ID	MB-24098FB	SampType:	MBLK		Units:	µg/L		Prep Date:	4/8/2019		RunNo:	50614
Client ID:	MBLKW	Batch ID:	24101					Analysis Date:	4/9/2019		SeqNo:	993976
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual	
Sodium	ND	100										

Work Order: 1904032
CLIENT: Friedman & Bruya
Project: 904021

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID **MB-24059** SampType: **MBLK** Units: **µg/L** Prep Date: **4/4/2019** RunNo: **50607**
Client ID: **MBLKW** Batch ID: **24059** Analysis Date: **4/9/2019** SeqNo: **993797**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	ND	100									

Sample ID **LCS-24059** SampType: **LCS** Units: **µg/L** Prep Date: **4/4/2019** RunNo: **50607**
Client ID: **LCSW** Batch ID: **24059** Analysis Date: **4/9/2019** SeqNo: **993798**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	1,060	100	1,000	0	106	50	150				

Sample ID **1904045-001EDUP** SampType: **DUP** Units: **µg/L** Prep Date: **4/4/2019** RunNo: **50607**
Client ID: **BATCH** Batch ID: **24059** Analysis Date: **4/9/2019** SeqNo: **993800**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	11,100	100						10,970	1.08	30	

Sample ID **1904045-001EMS** SampType: **MS** Units: **µg/L** Prep Date: **4/4/2019** RunNo: **50607**
Client ID: **BATCH** Batch ID: **24059** Analysis Date: **4/9/2019** SeqNo: **993801**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	18,000	100	5,000	10,970	140	50	150				

Sample ID **1904045-001EMSD** SampType: **MSD** Units: **µg/L** Prep Date: **4/4/2019** RunNo: **50607**
Client ID: **BATCH** Batch ID: **24059** Analysis Date: **4/9/2019** SeqNo: **993802**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	17,600	100	5,000	10,970	133	50	150	17,970	1.89	30	

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1904032**
Logged by:	**Brianna Barnes**	Date Received:	**4/2/2019 10:50:00 AM**

Chain of Custody

1. Is Chain of Custody complete? — Yes ☑ No ☐ Not Present ☐
2. How was the sample delivered? — FedEx

Log In

3. Coolers are present? — Yes ☑ No ☐ NA ☐
4. Shipping container/cooler in good condition? — Yes ☑ No ☐
5. Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact) — Yes ☐ No ☑ Not Required ☐
6. Was an attempt made to cool the samples? — Yes ☑ No ☐ NA ☐
7. Were all items received at a temperature of >0°C to 10.0°C* — Yes ☑ No ☐ NA ☐
8. Sample(s) in proper container(s)? — Yes ☑ No ☐
9. Sufficient sample volume for indicated test(s)? — Yes ☑ No ☐
10. Are samples properly preserved? — Yes ☑ No ☐
11. Was preservative added to bottles? — Yes ☑ No ☐ NA ☐
    See additional remarks.
12. Is there headspace in the VOA vials? — Yes ☐ No ☐ NA ☑
13. Did all samples containers arrive in good condition(unbroken)? — Yes ☑ No ☐
14. Does paperwork match bottle labels? — Yes ☑ No ☐
15. Are matrices correctly identified on Chain of Custody? — Yes ☑ No ☐
16. Is it clear what analyses were requested? — Yes ☑ No ☐
17. Were all holding times able to be met? — Yes ☑ No ☐

Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? — Yes ☐ No ☐ NA ☑

Person Notified:		Date	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

19. Additional remarks:

    HNO3 added to fractions C and D, H2SO4 added to F and G, Zn Acetate added to E.

Item Information

Item #	Temp ºC
Cooler	7.4
Sample	6.3

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

1904032

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont

PROJECT NAME/NO. 904021

PO # B-211

REMARKS

Please Email Results

TURNAROUND TIME
- ☒ Standard (~~2 Weeks~~) 1 Week
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	Cyanide ~~EPH~~	Nitrate, Nitrite ~~VPH~~	Alkalinity	Chloride	Total & Dissolved Na	Sulfate	Sulfide	Dissolved Organic Carbon	Ammonia	Notes
AMW-1-040119		4/1/19	0951	water			X	X	X	X	X	X	X	X	X	
AMW-2-040119			1100				X	X	X	X	X	X	X	X	X	
AMW-3-040119			1300				X	X	X	X	X	X	X	X	X	
AMW-4-040119			1201				X	X	X	X	X	X	X	X	X	
AMW-5-040119			0840				X	X	X	X	X	X	X	X	X	

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Michael Erdahl	Friedman & Bruya	4/2/19	0833
Received by: Casey O'Keefe	Casey O'Keefe	FAI	4/2/19	1050
Relinquished by:				
Received by:				

FRONTIER ANALYTICAL LABORATORY

April 19, 2019

FAL Project: 12312

Mr. Michael Erdahl
Friedman and Bruya, Inc.
3012 16th Ave. W
Seattle, WA 98119

Dear Mr. Erdahl,

The following results are associated with Frontier Analytical Laboratory project **12312**. This corresponds to your project number **904021** and purchase order number **B-196**. Five aqueous samples were received on 4/3/2019 in good condition. There samples were extracted and analyzed by EPA Method 8290 for tetra through octa chlorinated dibenzo dioxins and furans. The Toxic Equivalency (TEQ) for your samples has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Freidman and Bruya, Inc. requested a turnaround time of fifteen business days for project **12312**.

The following Level IV report consists of an Analytical Data section, a Sample Receipt section, a Laboratory Raw Data section, and an Instrument Raw Data section. The Analytical Data section contains our project-sample tracking log and the analytical results. The Sample Receipt section contains your original chain of custody, our sample login form and a sample photo. The Laboratory Raw Data section contains our project request sheet, a percent solids sheet, an extraction bench sheet and the cleanup bench sheet. The instrument raw data section contains three sub-sections; the sample results section, the initial calibration section and the continuing/ending calibration section. The sample results sub-section consists of the quantitation summary forms with chromatograms for all samples and QC. The initial calibration sub-section consists of the individual quantitation summary forms and chromatograms for each point of the initial calibration curve as well as an overall quantitation summary form of the initial calibration curve. The continuing/ending calibration sub-section consists of the quantitation summary forms and chromatograms for all beginning and ending calibration injections associated with the samples and QC. The Level IV data package on compact disk has been sent to you via OnTrac. The enclosed results and electronic data deliverables (EDDs) are specifically for the samples referenced in this report only. These results meet all National Environmental Laboratory Accreditation Program (NELAP) requirements and shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP Certificate number is **4041**. Our State of California ELAP certificate number is **2934** and our State of Washington certificate number is **C844**. A hardcopy of this report will not be sent to you unless specifically requested.

If you have any questions regarding project **12312**, please feel free to contact me at (916) 934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,

Thomas C. Crabtree

Thomas C. Crabtree
Director

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: **12312**

Received on: **04/03/2019** Project Due: **04/25/2019** Storage: **R-3**

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
12312-001-SA	0	904021	AMW-1-040119	EPA 8290 D/F	Aqueous	04/01/2019	09:51 am	05/01/2019
12312-002-SA	0	904021	AMW-2-040119	EPA 8290 D/F	Aqueous	04/01/2019	11:00 am	05/01/2019
12312-003-SA	0	904021	AMW-3-040119	EPA 8290 D/F	Aqueous	04/01/2019	01:00 pm	05/01/2019
12312-004-SA	0	904021	AMW-4-040119	EPA 8290 D/F	Aqueous	04/01/2019	12:01 pm	05/01/2019
12312-005-SA	0	904021	AMW-5-040119	EPA 8290 D/F	Aqueous	04/01/2019	08:40 am	05/01/2019

FAL Sample ID	Notes
12312-003-SA	'Use sampling time from COC per Eric to Kathy.'

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12312-001-MB
Client ID: Method Blank
Matrix: Aqueous
Batch No: X4871

Date Extracted: 04-16-2019
Date Received: NA
Amount: 1.000 L

ICal: PCDDFAL3-3-11-19
GC Column: DB5MS
Units: pg/L

Acquired: 04-18-2019
2005 WHO TEQ: 0.0

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.654		-	0.214				
1,2,3,7,8-PeCDD	ND	1.07		-	0.387				
1,2,3,4,7,8-HxCDD	ND	1.85		-	0.447				
1,2,3,6,7,8-HxCDD	ND	1.91		-	0.477	Total TCDD	ND	0.654	
1,2,3,7,8,9-HxCDD	ND	1.77		-	0.444	Total PeCDD	ND	1.07	
1,2,3,4,6,7,8-HpCDD	ND	2.41		-	0.572	Total HxCDD	ND	1.91	
OCDD	ND	2.48		-	1.12	Total HpCDD	ND	2.41	
2,3,7,8-TCDF	ND	0.787		-	0.206				
1,2,3,7,8-PeCDF	ND	1.28		-	0.326				
2,3,4,7,8-PeCDF	ND	1.18		-	0.341				
1,2,3,4,7,8-HxCDF	ND	0.893		-	0.317				
1,2,3,6,7,8-HxCDF	ND	0.942		-	0.330				
2,3,4,6,7,8-HxCDF	ND	0.996		-	0.350				
1,2,3,7,8,9-HxCDF	ND	1.30		-	0.399	Total TCDF	ND	0.787	
1,2,3,4,6,7,8-HpCDF	ND	1.02		-	0.301	Total PeCDF	ND	1.28	
1,2,3,4,7,8,9-HpCDF	ND	1.34		-	0.445	Total HxCDF	ND	1.30	
OCDF	ND	2.63		-	0.717	Total HpCDF	ND	1.34	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	84.4	40.0 - 135	
13C-1,2,3,7,8-PeCDD	98.1	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	80.8	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	83.0	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	79.7	40.0 - 135	
13C-OCDD	72.5	40.0 - 135	
13C-2,3,7,8-TCDF	86.3	40.0 - 135	
13C-1,2,3,7,8-PeCDF	88.9	40.0 - 135	
13C-2,3,4,7,8-PeCDF	93.8	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	77.5	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	81.7	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	79.8	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	80.3	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	78.6	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	77.9	40.0 - 135	
13C-OCDF	72.0	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	81.9	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: JC

Date: 4/19/2019

Reviewed By: [signature]

Date: 4/19/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12312-001-OPR
Client ID: OPR
Matrix: Aqueous
Batch No: X4871

Date Extracted: 04-16-2019
Date Received: NA
Amount: 1.000 L

ICal: PCDDFAL3-3-11-19
GC Column: DB5MS
Units: ng/ml

Acquired: 04-18-2019
2005 WHO TEQ: NA

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	10.4	7.00 - 13.0	
1,2,3,7,8-PeCDD	58.3	35.0 - 65.0	
1,2,3,4,7,8-HxCDD	53.8	35.0 - 65.0	
1,2,3,6,7,8-HxCDD	55.6	35.0 - 65.0	
1,2,3,7,8,9-HxCDD	55.5	35.0 - 65.0	
1,2,3,4,6,7,8-HpCDD	56.4	35.0 - 65.0	
OCDD	112	70.0 - 130	
2,3,7,8-TCDF	10.7	7.00 - 13.0	
1,2,3,7,8-PeCDF	50.8	35.0 - 65.0	
2,3,4,7,8-PeCDF	52.7	35.0 - 65.0	
1,2,3,4,7,8-HxCDF	53.7	35.0 - 65.0	
1,2,3,6,7,8-HxCDF	53.1	35.0 - 65.0	
2,3,4,6,7,8-HxCDF	53.5	35.0 - 65.0	
1,2,3,7,8,9-HxCDF	52.9	35.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	56.3	35.0 - 65.0	
1,2,3,4,7,8,9-HpCDF	53.9	35.0 - 65.0	
OCDF	108	70.0 - 130	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	83.2	40.0 - 135	
13C-1,2,3,7,8-PeCDD	71.7	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	62.5	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	65.3	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	60.0	40.0 - 135	
13C-OCDD	53.9	40.0 - 135	
13C-2,3,7,8-TCDF	87.1	40.0 - 135	
13C-1,2,3,7,8-PeCDF	77.4	40.0 - 135	
13C-2,3,4,7,8-PeCDF	80.6	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	45.7	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	51.9	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	65.1	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	63.7	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	42.6	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	60.1	40.0 - 135	
13C-OCDF	51.1	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	80.9	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: JC

Date: 4/19/2019

Reviewed By: [signature]

Date: 4/19/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12312-001-SA
Client ID: AMW-1-040119
Matrix: Aqueous
Batch No: X4871

Date Extracted: 04-16-2019
Date Received: 04-03-2019
Amount: 0.487 L

ICal: PCDDFAL3-3-11-19
GC Column: DB5MS
Units: pg/L

Acquired: 04-18-2019
2005 WHO TEQ: 0.0

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	1.20		-	0.214				
1,2,3,7,8-PeCDD	ND	1.96		-	0.387				
1,2,3,4,7,8-HxCDD	ND	3.54		-	0.447				
1,2,3,6,7,8-HxCDD	ND	3.87		-	0.477	Total TCDD	ND	1.20	
1,2,3,7,8,9-HxCDD	ND	3.49		-	0.444	Total PeCDD	ND	1.96	
1,2,3,4,6,7,8-HpCDD	ND	3.76		-	0.572	Total HxCDD	ND	3.87	
OCDD	ND	4.82		-	1.12	Total HpCDD	ND	3.76	
2,3,7,8-TCDF	ND	1.45		-	0.206				
1,2,3,7,8-PeCDF	ND	2.22		-	0.326				
2,3,4,7,8-PeCDF	ND	2.26		-	0.341				
1,2,3,4,7,8-HxCDF	ND	1.57		-	0.317				
1,2,3,6,7,8-HxCDF	ND	1.58		-	0.330				
2,3,4,6,7,8-HxCDF	ND	1.73		-	0.350				
1,2,3,7,8,9-HxCDF	ND	2.17		-	0.399	Total TCDF	ND	1.45	
1,2,3,4,6,7,8-HpCDF	ND	1.96		-	0.301	Total PeCDF	ND	2.26	
1,2,3,4,7,8,9-HpCDF	ND	2.59		-	0.445	Total HxCDF	ND	2.17	
OCDF	ND	4.97		-	0.717	Total HpCDF	ND	2.59	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	86.5	40.0 - 135	
13C-1,2,3,7,8-PeCDD	102	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	79.4	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	83.9	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	86.2	40.0 - 135	
13C-OCDD	85.7	40.0 - 135	
13C-2,3,7,8-TCDF	89.6	40.0 - 135	
13C-1,2,3,7,8-PeCDF	93.2	40.0 - 135	
13C-2,3,4,7,8-PeCDF	99.0	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	80.2	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	84.2	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	82.2	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	81.7	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	86.7	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	84.3	40.0 - 135	
13C-OCDF	81.0	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	81.5	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ______

Date: 4/19/2019

Reviewed By: ______

Date: 4/19/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12312-002-SA	Date Extracted: 04-16-2019	ICal: PCDDFAL3-3-11-19	Acquired: 04-18-2019
Client ID: AMW-2-040119	Date Received: 04-03-2019	GC Column: DB5MS	2005 WHO TEQ: 0.0
Matrix: Aqueous	Amount: 0.483 L	Units: pg/L	
Batch No: X4871			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	1.61		-	0.214				
1,2,3,7,8-PeCDD	ND	3.89		-	0.387				
1,2,3,4,7,8-HxCDD	ND	3.69		-	0.447				
1,2,3,6,7,8-HxCDD	ND	3.88		-	0.477	Total TCDD	ND	1.61	
1,2,3,7,8,9-HxCDD	ND	3.56		-	0.444	Total PeCDD	ND	3.89	
1,2,3,4,6,7,8-HpCDD	ND	4.06		-	0.572	Total HxCDD	ND	3.88	
OCDD	ND	6.91		-	1.12	Total HpCDD	ND	4.06	
2,3,7,8-TCDF	ND	2.03		-	0.206				
1,2,3,7,8-PeCDF	ND	3.04		-	0.326				
2,3,4,7,8-PeCDF	ND	2.91		-	0.341				
1,2,3,4,7,8-HxCDF	ND	1.79		-	0.317				
1,2,3,6,7,8-HxCDF	ND	1.96		-	0.330				
2,3,4,6,7,8-HxCDF	ND	2.01		-	0.350				
1,2,3,7,8,9-HxCDF	ND	2.58		-	0.399	Total TCDF	ND	2.03	
1,2,3,4,6,7,8-HpCDF	ND	1.76		-	0.301	Total PeCDF	ND	3.04	
1,2,3,4,7,8,9-HpCDF	ND	2.42		-	0.445	Total HxCDF	ND	2.58	
OCDF	ND	5.00		-	0.717	Total HpCDF	ND	2.42	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	77.8	40.0 - 135	
13C-1,2,3,7,8-PeCDD	92.0	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	73.2	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	77.4	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	78.0	40.0 - 135	
13C-OCDD	72.9	40.0 - 135	
13C-2,3,7,8-TCDF	76.5	40.0 - 135	
13C-1,2,3,7,8-PeCDF	83.4	40.0 - 135	
13C-2,3,4,7,8-PeCDF	86.6	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	73.6	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	76.5	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	74.7	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	74.7	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	79.1	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	75.5	40.0 - 135	
13C-OCDF	71.8	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	78.7	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: JC

Date: 4/19/2019

Reviewed By:

Date: 4/19/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12312-003-SA
Client ID: AMW-3-040119
Matrix: Aqueous
Batch No: X4871

Date Extracted: 04-16-2019
Date Received: 04-03-2019
Amount: 0.485 L

ICal: PCDDFAL3-3-11-19
GC Column: DB5MS
Units: pg/L

Acquired: 04-18-2019
2005 WHO TEQ: 0.0

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	2.36		-	0.214				
1,2,3,7,8-PeCDD	ND	3.39		-	0.387				
1,2,3,4,7,8-HxCDD	ND	4.84		-	0.447				
1,2,3,6,7,8-HxCDD	ND	4.56		-	0.477	Total TCDD	ND	2.36	
1,2,3,7,8,9-HxCDD	ND	4.42		-	0.444	Total PeCDD	ND	3.39	
1,2,3,4,6,7,8-HpCDD	ND	5.08		-	0.572	Total HxCDD	ND	4.84	
OCDD	ND	5.52		-	1.12	Total HpCDD	ND	5.08	
2,3,7,8-TCDF	ND	2.18		-	0.206				
1,2,3,7,8-PeCDF	ND	2.84		-	0.326				
2,3,4,7,8-PeCDF	ND	2.78		-	0.341				
1,2,3,4,7,8-HxCDF	ND	2.10		-	0.317				
1,2,3,6,7,8-HxCDF	ND	2.11		-	0.330				
2,3,4,6,7,8-HxCDF	ND	2.19		-	0.350				
1,2,3,7,8,9-HxCDF	ND	2.87		-	0.399	Total TCDF	ND	2.18	
1,2,3,4,6,7,8-HpCDF	ND	2.00		-	0.301	Total PeCDF	ND	2.84	
1,2,3,4,7,8,9-HpCDF	ND	2.68		-	0.445	Total HxCDF	ND	2.87	
OCDF	ND	5.54		-	0.717	Total HpCDF	ND	2.68	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	81.9	40.0 - 135	
13C-1,2,3,7,8-PeCDD	100	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	79.4	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	81.3	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	84.6	40.0 - 135	
13C-OCDD	83.8	40.0 - 135	
13C-2,3,7,8-TCDF	86.4	40.0 - 135	
13C-1,2,3,7,8-PeCDF	88.3	40.0 - 135	
13C-2,3,4,7,8-PeCDF	96.3	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	75.7	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	81.8	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	78.5	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	81.4	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	83.3	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	82.5	40.0 - 135	
13C-OCDF	79.1	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	81.7	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: JC

Date: 4/19/2019

Reviewed By:

Date: 4/19/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12312-004-SA	Date Extracted: 04-16-2019	ICal: PCDDFAL3-3-11-19	Acquired: 04-18-2019
Client ID: AMW-4-040119	Date Received: 04-03-2019	GC Column: DB5MS	2005 WHO TEQ: 0.00336
Matrix: Aqueous	Amount: 0.472 L	Units: pg/L	
Batch No: X4871			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	1.98		-	0.214				
1,2,3,7,8-PeCDD	ND	3.37		-	0.387				
1,2,3,4,7,8-HxCDD	ND	3.82		-	0.447				
1,2,3,6,7,8-HxCDD	ND	3.86		-	0.477	Total TCDD	ND	1.98	
1,2,3,7,8,9-HxCDD	ND	3.61		-	0.444	Total PeCDD	ND	3.37	
1,2,3,4,6,7,8-HpCDD	ND	3.81		-	0.572	Total HxCDD	ND	3.86	
OCDD	11.2	-	J	0.00336	1.12	Total HpCDD	ND	3.81	
2,3,7,8-TCDF	ND	2.10		-	0.206				
1,2,3,7,8-PeCDF	ND	2.50		-	0.326				
2,3,4,7,8-PeCDF	ND	2.37		-	0.341				
1,2,3,4,7,8-HxCDF	ND	1.68		-	0.317				
1,2,3,6,7,8-HxCDF	ND	1.80		-	0.330				
2,3,4,6,7,8-HxCDF	ND	1.89		-	0.350				
1,2,3,7,8,9-HxCDF	ND	2.44		-	0.399	Total TCDF	ND	2.10	
1,2,3,4,6,7,8-HpCDF	ND	1.88		-	0.301	Total PeCDF	ND	2.50	
1,2,3,4,7,8,9-HpCDF	ND	2.55		-	0.445	Total HxCDF	ND	2.44	
OCDF	ND	4.60		-	0.717	Total HpCDF	ND	2.55	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	90.0	40.0 - 135	
13C-1,2,3,7,8-PeCDD	111	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	86.4	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	89.3	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	92.7	40.0 - 135	
13C-OCDD	90.9	40.0 - 135	
13C-2,3,7,8-TCDF	93.1	40.0 - 135	
13C-1,2,3,7,8-PeCDF	101	40.0 - 135	
13C-2,3,4,7,8-PeCDF	105	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	81.5	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	88.1	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	86.6	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	85.8	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	93.1	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	91.4	40.0 - 135	
13C-OCDF	85.8	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	87.6	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: JC

Date: 4/19/2019

Reviewed By: [signature]

Date: 4/19/2019

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EPA Method 8290
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12312-005-SA	Date Extracted: 04-16-2019	ICal: PCDDFAL3-3-11-19	Acquired: 04-18-2019
Client ID: AMW-5-040119	Date Received: 04-03-2019	GC Column: DB5MS	2005 WHO TEQ: 0.0
Matrix: Aqueous	Amount: 0.485 L	Units: pg/L	
Batch No: X4871			

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	1.98		-	0.214				
1,2,3,7,8-PeCDD	ND	3.05		-	0.387				
1,2,3,4,7,8-HxCDD	ND	4.00		-	0.447				
1,2,3,6,7,8-HxCDD	ND	4.10		-	0.477	Total TCDD	ND	1.98	
1,2,3,7,8,9-HxCDD	ND	3.81		-	0.444	Total PeCDD	ND	3.05	
1,2,3,4,6,7,8-HpCDD	ND	3.32		-	0.572	Total HxCDD	ND	4.10	
OCDD	ND	6.88		-	1.12	Total HpCDD	ND	3.32	
2,3,7,8-TCDF	ND	2.10		-	0.206				
1,2,3,7,8-PeCDF	ND	2.25		-	0.326				
2,3,4,7,8-PeCDF	ND	2.19		-	0.341				
1,2,3,4,7,8-HxCDF	ND	1.67		-	0.317				
1,2,3,6,7,8-HxCDF	ND	1.70		-	0.330				
2,3,4,6,7,8-HxCDF	ND	1.72		-	0.350				
1,2,3,7,8,9-HxCDF	ND	2.34		-	0.399	Total TCDF	ND	2.10	
1,2,3,4,6,7,8-HpCDF	ND	1.56		-	0.301	Total PeCDF	ND	2.25	
1,2,3,4,7,8,9-HpCDF	ND	2.14		-	0.445	Total HxCDF	ND	2.34	
OCDF	ND	4.77		-	0.717	Total HpCDF	ND	2.14	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	87.1	40.0 - 135	
13C-1,2,3,7,8-PeCDD	107	40.0 - 135	
13C-1,2,3,4,7,8-HxCDD	82.2	40.0 - 135	
13C-1,2,3,6,7,8-HxCDD	88.7	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDD	92.6	40.0 - 135	
13C-OCDD	91.4	40.0 - 135	
13C-2,3,7,8-TCDF	90.0	40.0 - 135	
13C-1,2,3,7,8-PeCDF	100	40.0 - 135	
13C-2,3,4,7,8-PeCDF	103	40.0 - 135	
13C-1,2,3,4,7,8-HxCDF	79.4	40.0 - 135	
13C-1,2,3,6,7,8-HxCDF	85.7	40.0 - 135	
13C-2,3,4,6,7,8-HxCDF	84.4	40.0 - 135	
13C-1,2,3,7,8,9-HxCDF	83.9	40.0 - 135	
13C-1,2,3,4,6,7,8-HpCDF	92.1	40.0 - 135	
13C-1,2,3,4,7,8,9-HpCDF	90.5	40.0 - 135	
13C-OCDF	87.6	40.0 - 135	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	89.2	50.0 - 150	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: JC

Date: 4/19/2019

Reviewed By: [signature]

Date: 4/19/2019

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SUBCONTRACT SAMPLE CHAIN OF CUSTODY

12312
OGL

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Frontier.

PROJECT NAME/NO. 904021

PO # B-196

REMARKS Tier IV Data package
Please Email Results

TURNAROUND TIME
☒ ~~Standard (2 Weeks)~~ 3 weeks
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	ANALYSES REQUESTED: 8290 Dioxins/Furans	EPH	VPH								Notes
AMW-1-040119		4/1/19	0951	water	1	X										
AMW-2-040119		↓	1100	↓	1	X										
AMW-3-040119			1300		1	X										1331
AMW-4-040119			1201		1	X										
AMW-5-040119			0840		1	X										

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Michael Erdahl	Friedman & Bruya	4/2/19	0833
Received by: [signature]	Kathy Zipp	Frontier Analytical	4/3/19	1523
Relinquished by:				
Received by:				

ANALYTICAL LABORATORY

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: **12312**

Client:	Friedman & Bruya, Inc.
Client Project ID:	904021
Date Received:	04/03/2019
Time Received:	03:23 pm
Received By:	KZ
Logged In By:	KZ
# of Samples Received:	5
Duplicates:	0
Storage Location:	R-3

Method of Delivery:	Fed-Ex
Tracking Number:	813795597810
Shipping Container Received Intact	Yes
Custody seals(s) present?	No
Custody seals(s) intact?	No
Sample Arrival Temperature (C)	0
Cooling Method	Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	Yes
Test aqueous sample for residual Chlorine	Yes
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	Yes
pH Range of Aqueous Sample	Between 4 and 9
Anomalies or additional comments:	

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com

ANALYTICAL LABORATORY

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com

904021

[redacted]

SAMPLE CHAIN OF CUSTODY

ME 04-01-19 [redacted] Page # 1 of 1 AI4/

Report To Carla Brock & Ali Cochrane

Company Aspect Consulting

Address 710 2nd Ave Suite 550

City, State, ZIP Seattle, WA 98104

Phone ______ Email ______

SAMPLERS (signature) Kristin Beck

PROJECT NAME	PO #
Shelton C Street Landfill	150074
REMARKS	INVOICE TO Accts Payable

TURNAROUND TIME
- ☒ Standard Turnaround BOS/VW4
- ☐ RUSH ______
- Rush charges authorized by: ______

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other ______

ANALYSES REQUESTED

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Metals (Tot, Diss)	Dioxins/furans	Alkalinity	Nitrite/Nitrate	Sulfate/Sulfide	Diss. Org. Carbon	Chloride Notes	Ammonia	Cyanide
AMW-1-040119	01 A-O	4/1/19	0951	water	15		X			X		X	X	X	X	X	X	X	X	X	X
AMW-2-040119	02		1100		15		X			X		X	X	X	X	X	X	X	X	X	X
AMW-3-040119	03		13		15		X			X		X	X	X	X	X	X	X	X	X	X
AMW-4-040119	04		1201		15		X			X		X	X	X	X	X	X	X	X	X	X
AMW-5-040119	05		0840		15		X			X		X	X	X	X	X	X	X	X	X	X
Trip Blank B4/13	06 A-B				3																

Samples received at 5 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

SIGNATURE		PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Kristin Beck	Kristin Beck	Aspect	4/1/19	1630
Received by:	Amelia Oates	Amelia Oates	Aspect	4/1/19	1636
Relinquished by:	Amelia Oates	Amelia Oates	Aspect	4/1/19	1725
Received by:	[illegible]	BISRAT TADESSE	FBI	4/1/19	1725

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

July 12, 2019

Carla Brock, Project Manager
Aspect Consulting, LLC
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Ms Brock:

Included are the results from the testing of material submitted on July 2, 2019 from the Shelton C Street Landfill 150074, F&BI 907023 project. There are 50 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Data Aspect, Ali Cochrane
ASP0712R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 2, 2019 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Shelton C Street Landfill 150074, F&BI 907023 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
907023 -01	AMW-1-070119
907023 -02	AMW-2-070119
907023 -03	AMW-3-070119
907023 -04	AMW-4-070119
907023 -05	AMW-5-070119
907023 -06	Trip Blank

The samples were sent to Fremont Analytical for nitrate, nitrite, sulfate, sulfide, alkalinity, chloride, dissolved organic carbon, ammonia, and cyanide analyses. The report is enclosed. In addition, the samples were sent to Frontier Analytical for dioxin and furan analysis. The report will be forwarded upon receipt.

1,1,1-Trichloroethane in the 8260C laboratory control sample duplicate exceeded the acceptance criteria. The analyte was not detected in the samples, therefore the data were acceptable.

All other quality control requirements were acceptable.

Date of Report: 07/12/19
Date Received: 07/02/19
Project: Shelton C Street Landfill 150074, F&BI 907023
Date Extracted: 07/03/19
Date Analyzed: 07/03/19

RESULTS FROM THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported as ug/L (ppb)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 51-134)
AMW-1-070119 907023-01	65 x	<250	97
AMW-2-070119 907023-02	55 x	<250	92
AMW-3-070119 907023-03	<50	<250	105
AMW-4-070119 907023-04	100 x	440	103
AMW-5-070119 907023-05	<50	<250	117
Method Blank 09-1605 MB	<50	<250	95

Analysis For Dissolved Metals By EPA Method 200.8 and SM 2340B

Client ID:	AMW-1-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-01 x10
Date Analyzed:	07/03/19	Data File:	907023-01 x10.050
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	24.3
Magnesium	8.65
Hardness (as CaCO3)	96.3

Analysis For Dissolved Metals By EPA Method 200.8 and SM 2340B

Client ID:	AMW-2-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-02 x10
Date Analyzed:	07/03/19	Data File:	907023-02 x10.053
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	16.3
Magnesium	7.10
Hardness (as CaCO3)	69.9

Analysis For Dissolved Metals By EPA Method 200.8 and SM 2340B

Client ID:	AMW-3-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-03 x10
Date Analyzed:	07/03/19	Data File:	907023-03 x10.054
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	48.5
Magnesium	29.7
Hardness (as CaCO3)	243

Analysis For Dissolved Metals By EPA Method 200.8 and SM 2340B

Client ID:	AMW-4-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-04 x10
Date Analyzed:	07/03/19	Data File:	907023-04 x10.055
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	43.4
Magnesium	13.4
Hardness (as CaCO3)	164

Analysis For Dissolved Metals By EPA Method 200.8 and SM 2340B

Client ID:	AMW-5-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-05 x10
Date Analyzed:	07/03/19	Data File:	907023-05 x10.056
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	24.5
Magnesium	8.54
Hardness (as CaCO3)	96.3

Analysis For Dissolved Metals By EPA Method 200.8 and SM 2340B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	I9-403 mb
Date Analyzed:	07/03/19	Data File:	I9-403 mb.039
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	<0.1
Magnesium	<0.05
Hardness (as CaCO3)	<0.50

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-1-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/05/19	Lab ID:	907023-01
Date Analyzed:	07/05/19	Data File:	907023-01.096
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	4.06
Cadmium	<1
Chromium	<1
Copper	<5
Iron	114
Lead	<1
Manganese	24.8
Mercury	<1
Nickel	1.63
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-2-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/05/19	Lab ID:	907023-02
Date Analyzed:	07/05/19	Data File:	907023-02.097
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	2.14
Cadmium	<1
Chromium	<1
Copper	<5
Iron	127
Lead	<1
Manganese	425
Mercury	<1
Nickel	1.07
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-3-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/05/19	Lab ID:	907023-03
Date Analyzed:	07/05/19	Data File:	907023-03.098
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	5.26
Cadmium	<1
Chromium	<1
Copper	<5
Iron	220
Lead	<1
Manganese	661
Mercury	<1
Nickel	2.38
Selenium	<1
Silver	<1
Zinc	<5

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-4-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/05/19	Lab ID:	907023-04
Date Analyzed:	07/05/19	Data File:	907023-04.099
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.236
Barium	30.8
Cadmium	<1
Chromium	1.14
Copper	<5
Iron	196
Lead	<1
Manganese	78.0
Mercury	<1
Nickel	2.30
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	AMW-5-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/05/19	Lab ID:	907023-05
Date Analyzed:	07/05/19	Data File:	907023-05.102
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	4.11
Cadmium	<1
Chromium	<1
Copper	<5
Iron	115
Lead	<1
Manganese	24.9
Mercury	<1
Nickel	1.63
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Dissolved Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/05/19	Lab ID:	I9-408 mb
Date Analyzed:	07/05/19	Data File:	I9-408 mb.092
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	<1
Cadmium	<1
Chromium	<1
Copper	<5
Iron	<50
Lead	<1
Manganese	<1
Mercury	<1
Nickel	<1
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	AMW-1-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-01 x10
Date Analyzed:	07/03/19	Data File:	907023-01 x10.057
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	23.8
Magnesium	8.36
Hardness (as CaCO3)	93.9

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	AMW-2-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-02 x10
Date Analyzed:	07/03/19	Data File:	907023-02 x10.059
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	15.7
Magnesium	6.72
Hardness (as CaCO3)	66.9

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	AMW-3-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-03 x10
Date Analyzed:	07/03/19	Data File:	907023-03 x10.062
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	49.5
Magnesium	30.3
Hardness (as CaCO3)	248

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	AMW-4-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-04 x10
Date Analyzed:	07/03/19	Data File:	907023-04 x10.063
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	43.7
Magnesium	13.8
Hardness (as CaCO3)	166

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	AMW-5-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-05 x10
Date Analyzed:	07/03/19	Data File:	907023-05 x10.064
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	24.2
Magnesium	8.42
Hardness (as CaCO3)	95.1

Analysis For Hardness By EPA Method 200.8 and SM 2340B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	I9-404 mb
Date Analyzed:	07/03/19	Data File:	I9-404 mb.048
Matrix:	Water	Instrument:	ICPMS2
Units:	mg/L (ppm)	Operator:	SP

Analyte:	Concentration mg/L (ppm)
Calcium	<0.05
Magnesium	<0.05
Hardness (as CaCO3)	<0.35

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-1-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-01
Date Analyzed:	07/02/19	Data File:	907023-01.042
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	4.79
Cadmium	<1
Chromium	<1
Copper	<5
Iron	348
Lead	<1
Manganese	46.5
Mercury	<1
Nickel	2.22
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-2-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-02
Date Analyzed:	07/02/19	Data File:	907023-02.043
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	4.04
Cadmium	<1
Chromium	4.06
Copper	<5
Iron	463
Lead	<1
Manganese	759
Mercury	<1
Nickel	5.43
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-3-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-03
Date Analyzed:	07/02/19	Data File:	907023-03.044
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.207
Barium	12.1
Cadmium	<1
Chromium	<1
Copper	<5
Iron	486
Lead	<1
Manganese	2,380 ve
Mercury	<1
Nickel	3.65
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-3-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-03 x10
Date Analyzed:	07/02/19	Data File:	907023-03 x10.048
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Manganese	2,350

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-4-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-04
Date Analyzed:	07/02/19	Data File:	907023-04.045
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	0.718
Barium	55.2
Cadmium	<1
Chromium	9.30
Copper	10.4
Iron	5,770 ve
Lead	<1
Manganese	176
Mercury	<1
Nickel	9.00
Selenium	<1
Silver	<1
Zinc	9.83

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-4-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-04 x10
Date Analyzed:	07/02/19	Data File:	907023-04 x10.051
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Iron	5,630

Analysis For Total Metals By EPA Method 6020B

Client ID:	AMW-5-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-05
Date Analyzed:	07/02/19	Data File:	907023-05.046
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	4.91
Cadmium	<1
Chromium	<1
Copper	<5
Iron	339
Lead	<1
Manganese	41.9
Mercury	<1
Nickel	2.22
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	I9-401 mb2
Date Analyzed:	07/02/19	Data File:	I9-401 mb2.033
Matrix:	Water	Instrument:	ICPMS2
Units:	ug/L (ppb)	Operator:	SP

Analyte:	Concentration ug/L (ppb)
Arsenic	<0.2
Barium	<1
Cadmium	<1
Chromium	<1
Copper	<5
Iron	<50
Lead	<1
Manganese	<1
Mercury	<1
Nickel	<1
Selenium	<1
Silver	<1
Zinc	<5

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-1-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-01 1/0.5
Date Analyzed:	07/02/19	Data File:	070209.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	31	160
Benzo(a)anthracene-d12	71	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-2-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-02 1/0.5
Date Analyzed:	07/02/19	Data File:	070210.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	100	31	160
Benzo(a)anthracene-d12	74	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-3-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-03 1/0.5
Date Analyzed:	07/02/19	Data File:	070211.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	191	31	160
Benzo(a)anthracene-d12	142	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	0.15
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-4-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-04 1/0.5
Date Analyzed:	07/02/19	Data File:	070212.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	91	31	160
Benzo(a)anthracene-d12	65	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	AMW-5-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-05 1/0.5
Date Analyzed:	07/02/19	Data File:	070213.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	103	31	160
Benzo(a)anthracene-d12	74	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Semivolatile Compounds By EPA Method 8270D SIM

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	09-1573 mb 1/0.5
Date Analyzed:	07/02/19	Data File:	070207.D
Matrix:	Water	Instrument:	GCMS6
Units:	ug/L (ppb)	Operator:	ya

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	97	31	160
Benzo(a)anthracene-d12	90	25	165

Compounds:	Concentration ug/L (ppb)
Naphthalene	<0.1
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-1-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-01
Date Analyzed:	07/02/19	Data File:	070213.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	MS/AEN

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	50	150
Toluene-d8	95	50	150
4-Bromofluorobenzene	93	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<2
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-2-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-02
Date Analyzed:	07/02/19	Data File:	070214.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	MS/AEN

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	50	150
Toluene-d8	96	50	150
4-Bromofluorobenzene	95	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-3-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-03
Date Analyzed:	07/02/19	Data File:	070215.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	MS/AEN

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	50	150
Toluene-d8	94	50	150
4-Bromofluorobenzene	94	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<1	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-4-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-04
Date Analyzed:	07/02/19	Data File:	070216.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	MS/AEN

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	50	150
Toluene-d8	94	50	150
4-Bromofluorobenzene	94	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	AMW-5-070119	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-05
Date Analyzed:	07/02/19	Data File:	070217.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	MS/AEN

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	50	150
Toluene-d8	97	50	150
4-Bromofluorobenzene	96	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Trip Blank	Client:	Aspect Consulting, LLC
Date Received:	07/02/19	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	907023-06
Date Analyzed:	07/02/19	Data File:	070212.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	MS/AEN

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	99	50	150
Toluene-d8	96	50	150
4-Bromofluorobenzene	94	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	0.29
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Analysis For Volatile Compounds By EPA Method 8260C

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C Street Landfill 150074
Date Extracted:	07/02/19	Lab ID:	09-1509 mb
Date Analyzed:	07/02/19	Data File:	070211.D
Matrix:	Water	Instrument:	GCMS9
Units:	ug/L (ppb)	Operator:	MS/AEN

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	100	50	150
Toluene-d8	95	50	150
4-Bromofluorobenzene	94	50	150

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.2	Dibromochloromethane	<0.2
Bromomethane	<1	1,2-Dibromoethane (EDB)	<0.2
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<1	o-Xylene	<1
Methylene chloride	<5	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<1
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<10	1,2,3-Trichloropropane	<0.2
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.2	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.2	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.2	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<0.2	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.2
trans-1,3-Dichloropropene	<0.2	Naphthalene	<1
1,1,2-Trichloroethane	<0.2	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

Date of Report: 07/12/19
Date Received: 07/02/19
Project: Shelton C Street Landfill 150074, F&BI 907023

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	ug/L (ppb)	2,500	108	116	58-134	7

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 07/12/19
Date Received: 07/02/19
Project: Shelton C Street Landfill 150074, F&BI 907023

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR DISSOLVED METALS USING EPA METHOD 200.8 AND SM 2340B

Laboratory Code: 907023-01 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Calcium	mg/L (ppm)	1.0	24.3	138 b	113 b	70-130	20 b
Magnesium	mg/L (ppm)	1.0	8.65	59 b	57 b	70-130	3 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Calcium	mg/L (ppm)	1.0	99	85-115
Magnesium	mg/L (ppm)	1.0	99	85-115

Date of Report: 07/12/19
Date Received: 07/02/19
Project: Shelton C Street Landfill 150074, F&BI 907023

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR DISSOLVED METALS USING EPA METHOD 6020B

Laboratory Code: 907023-05 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	<0.2	99	101	75-125	2
Barium	ug/L (ppb)	50	4.11	95	96	75-125	1
Cadmium	ug/L (ppb)	5	<1	93	93	75-125	0
Chromium	ug/L (ppb)	20	<1	100	99	75-125	1
Copper	ug/L (ppb)	20	<5	92	88	75-125	4
Iron	ug/L (ppb)	100	115	99	99	75-125	0
Lead	ug/L (ppb)	10	<1	100	100	75-125	0
Manganese	ug/L (ppb)	20	24.9	113	111	75-125	2
Mercury	ug/L (ppb)	5	<1	101	102	75-125	1
Nickel	ug/L (ppb)	20	1.63	95	94	75-125	1
Selenium	ug/L (ppb)	5	<1	99	101	75-125	2
Silver	ug/L (ppb)	5	<1	91	92	75-125	1
Zinc	ug/L (ppb)	50	<5	94	91	75-125	3

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	96	80-120
Barium	ug/L (ppb)	50	93	80-120
Cadmium	ug/L (ppb)	5	94	80-120
Chromium	ug/L (ppb)	20	97	80-120
Copper	ug/L (ppb)	20	93	80-120
Iron	ug/L (ppb)	100	97	80-120
Lead	ug/L (ppb)	10	102	80-120
Manganese	ug/L (ppb)	20	93	80-120
Mercury	ug/L (ppb)	5	101	80-120
Nickel	ug/L (ppb)	20	95	80-120
Selenium	ug/L (ppb)	5	97	80-120
Silver	ug/L (ppb)	5	96	80-120
Zinc	ug/L (ppb)	50	97	80-120

Date of Report: 07/12/19
Date Received: 07/02/19
Project: Shelton C Street Landfill 150074, F&BI 907023

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 200.8 AND SM 2340B

Laboratory Code: 907023-02 x10 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Calcium	mg/L (ppm)	1.0	15.7	30 b	36 b	70-130	18 b
Magnesium	mg/L (ppm)	1.0	6.72	64 b	73 b	70-130	13 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Calcium	mg/L (ppm)	1.0	101	85-115
Magnesium	mg/L (ppm)	1.0	102	85-115

Date of Report: 07/12/19
Date Received: 07/02/19
Project: Shelton C Street Landfill 150074, F&BI 907023

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF WATER SAMPLES
FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 906532-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	ug/L (ppb)	10	1.45	101	102	75-125	1
Barium	ug/L (ppb)	50	129	101	104	75-125	3
Cadmium	ug/L (ppb)	5	<1	103	103	75-125	0
Chromium	ug/L (ppb)	20	1.56	99	101	75-125	2
Copper	ug/L (ppb)	20	1,100 ve	0 b	0 b	75-125	0 b
Iron	ug/L (ppb)	100	775 ve	78 b	144 b	75-125	59 b
Lead	ug/L (ppb)	10	7.69	95	96	75-125	1
Manganese	ug/L (ppb)	20	94.8	84	90	75-125	7
Mercury	ug/L (ppb)	5	<1	94	97	75-125	3
Nickel	ug/L (ppb)	20	3.39	99	99	75-125	0
Selenium	ug/L (ppb)	5	<1	105	108	75-125	3
Silver	ug/L (ppb)	5	<1	98	98	75-125	0
Zinc	ug/L (ppb)	50	2,090 ve	0 b	12 b	75-125	200 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	ug/L (ppb)	10	100	80-120
Barium	ug/L (ppb)	50	100	80-120
Cadmium	ug/L (ppb)	5	101	80-120
Chromium	ug/L (ppb)	20	104	80-120
Copper	ug/L (ppb)	20	101	80-120
Iron	ug/L (ppb)	100	106	80-120
Lead	ug/L (ppb)	10	104	80-120
Manganese	ug/L (ppb)	20	103	80-120
Mercury	ug/L (ppb)	5	99	80-120
Nickel	ug/L (ppb)	20	102	80-120
Selenium	ug/L (ppb)	5	102	80-120
Silver	ug/L (ppb)	5	103	80-120
Zinc	ug/L (ppb)	50	101	80-120

Date of Report: 07/12/19
Date Received: 07/02/19
Project: Shelton C Street Landfill 150074, F&BI 907023

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR PAHS BY EPA METHOD 8270D SIM

Laboratory Code: Laboratory Control Sample 1/0.5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	ug/L (ppb)	1	75	78	57-114	4
Acenaphthylene	ug/L (ppb)	1	79	83	65-119	5
Acenaphthene	ug/L (ppb)	1	79	82	66-118	4
Fluorene	ug/L (ppb)	1	77	81	64-125	5
Phenanthrene	ug/L (ppb)	1	78	85	67-120	9
Anthracene	ug/L (ppb)	1	82	89	65-122	8
Fluoranthene	ug/L (ppb)	1	73	81	65-127	10
Pyrene	ug/L (ppb)	1	81	83	62-130	2
Benz(a)anthracene	ug/L (ppb)	1	80	87	60-118	8
Chrysene	ug/L (ppb)	1	86	89	66-125	3
Benzo(b)fluoranthene	ug/L (ppb)	1	85	84	55-135	1
Benzo(k)fluoranthene	ug/L (ppb)	1	82	92	62-125	11
Benzo(a)pyrene	ug/L (ppb)	1	77	82	58-127	6
Indeno(1,2,3-cd)pyrene	ug/L (ppb)	1	76	80	36-142	5
Dibenz(a,h)anthracene	ug/L (ppb)	1	77	82	37-133	6
Benzo(g,h,i)perylene	ug/L (ppb)	1	77	80	34-135	4

Date of Report: 07/12/19
Date Received: 07/02/19
Project: Shelton C Street Landfill 150074, F&BI 907023

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: 907023-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Dichlorodifluoromethane	ug/L (ppb)	50	<1	91	55-137
Chloromethane	ug/L (ppb)	50	<10	95	57-129
Vinyl chloride	ug/L (ppb)	50	<0.2	99	61-139
Bromomethane	ug/L (ppb)	50	<1	106	20-265
Chloroethane	ug/L (ppb)	50	<1	105	55-149
Trichlorofluoromethane	ug/L (ppb)	50	<1	106	65-137
Acetone	ug/L (ppb)	250	<50	60	48-149
1,1-Dichloroethene	ug/L (ppb)	50	<1	114	71-123
Hexane	ug/L (ppb)	50	<1	84	44-139
Methylene chloride	ug/L (ppb)	50	<5	92	61-126
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	<1	97	68-125
trans-1,2-Dichloroethene	ug/L (ppb)	50	<1	112	72-122
1,1-Dichloroethane	ug/L (ppb)	50	<1	109	79-113
2,2-Dichloropropane	ug/L (ppb)	50	<1	98	48-157
cis-1,2-Dichloroethene	ug/L (ppb)	50	<1	99	63-126
Chloroform	ug/L (ppb)	50	<1	104	77-117
2-Butanone (MEK)	ug/L (ppb)	250	<10	78	70-135
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	<1	99	70-119
1,1,1-Trichloroethane	ug/L (ppb)	50	<1	112	75-121
1,1-Dichloropropene	ug/L (ppb)	50	<1	103	67-121
Carbon tetrachloride	ug/L (ppb)	50	<1	112	70-132
Benzene	ug/L (ppb)	50	<0.35	99	75-114
Trichloroethene	ug/L (ppb)	50	<1	99	73-122
1,2-Dichloropropane	ug/L (ppb)	50	<1	100	80-111
Bromodichloromethane	ug/L (ppb)	50	<1	111	78-117
Dibromomethane	ug/L (ppb)	50	<1	102	73-125
4-Methyl-2-pentanone	ug/L (ppb)	250	<10	107	79-140
cis-1,3-Dichloropropene	ug/L (ppb)	50	<1	110	76-120
Toluene	ug/L (ppb)	50	<1	103	73-117
trans-1,3-Dichloropropene	ug/L (ppb)	50	<1	114	75-122
1,1,2-Trichloroethane	ug/L (ppb)	50	<1	102	81-116
2-Hexanone	ug/L (ppb)	250	<10	98	74-127
1,3-Dichloropropane	ug/L (ppb)	50	<1	103	80-113
Tetrachloroethene	ug/L (ppb)	50	<1	102	40-155
Dibromochloromethane	ug/L (ppb)	50	<1	125	69-129
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	<1	105	79-120
Chlorobenzene	ug/L (ppb)	50	<1	102	75-115
Ethylbenzene	ug/L (ppb)	50	<1	103	66-124
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	<1	117	76-130
m,p-Xylene	ug/L (ppb)	100	<2	105	63-128
o-Xylene	ug/L (ppb)	50	<1	104	64-129
Styrene	ug/L (ppb)	50	<1	105	56-142
Isopropylbenzene	ug/L (ppb)	50	<1	103	74-122
Bromoform	ug/L (ppb)	50	<1	116	49-138
n-Propylbenzene	ug/L (ppb)	50	<1	101	65-129
Bromobenzene	ug/L (ppb)	50	<1	101	70-121
1,3,5-Trimethylbenzene	ug/L (ppb)	50	<1	104	60-138
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	<1	109	77-120
1,2,3-Trichloropropane	ug/L (ppb)	50	<1	101	62-125
2-Chlorotoluene	ug/L (ppb)	50	<1	102	40-159
4-Chlorotoluene	ug/L (ppb)	50	<1	101	76-122
tert-Butylbenzene	ug/L (ppb)	50	<1	104	74-125
1,2,4-Trimethylbenzene	ug/L (ppb)	50	<1	103	59-136
sec-Butylbenzene	ug/L (ppb)	50	<1	102	69-127
p-Isopropyltoluene	ug/L (ppb)	50	<1	102	64-132
1,3-Dichlorobenzene	ug/L (ppb)	50	<1	103	77-113
1,4-Dichlorobenzene	ug/L (ppb)	50	<1	98	75-110
1,2-Dichlorobenzene	ug/L (ppb)	50	<1	103	70-120
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	<10	115	69-129
1,2,4-Trichlorobenzene	ug/L (ppb)	50	<1	100	66-123
Hexachlorobutadiene	ug/L (ppb)	50	<1	94	53-136
Naphthalene	ug/L (ppb)	50	<1	104	60-145
1,2,3-Trichlorobenzene	ug/L (ppb)	50	<1	102	59-130

Date of Report: 07/12/19
Date Received: 07/02/19
Project: Shelton C Street Landfill 150074, F&BI 907023

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260C

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	50	93	94	50-157	1
Chloromethane	ug/L (ppb)	50	99	100	62-130	1
Vinyl chloride	ug/L (ppb)	50	99	101	70-128	2
Bromomethane	ug/L (ppb)	50	107	108	60-143	1
Chloroethane	ug/L (ppb)	50	104	106	66-149	2
Trichlorofluoromethane	ug/L (ppb)	50	107	109	65-138	2
Acetone	ug/L (ppb)	250	63	62	44-145	2
1,1-Dichloroethene	ug/L (ppb)	50	116	119	72-121	3
Hexane	ug/L (ppb)	50	89	88	51-153	1
Methylene chloride	ug/L (ppb)	50	97	99	63-132	2
Methyl t-butyl ether (MTBE)	ug/L (ppb)	50	98	102	70-122	4
trans-1,2-Dichloroethene	ug/L (ppb)	50	113	114	76-118	1
1,1-Dichloroethane	ug/L (ppb)	50	109	112	77-119	3
2,2-Dichloropropane	ug/L (ppb)	50	110	114	62-141	4
cis-1,2-Dichloroethene	ug/L (ppb)	50	100	102	76-119	2
Chloroform	ug/L (ppb)	50	105	107	78-117	2
2-Butanone (MEK)	ug/L (ppb)	250	77	75	48-150	3
1,2-Dichloroethane (EDC)	ug/L (ppb)	50	98	98	75-116	0
1,1,1-Trichloroethane	ug/L (ppb)	50	115	117 vo	80-116	2
1,1-Dichloropropene	ug/L (ppb)	50	103	103	78-119	0
Carbon tetrachloride	ug/L (ppb)	50	117	119	72-128	2
Benzene	ug/L (ppb)	50	98	99	75-116	1
Trichloroethene	ug/L (ppb)	50	100	100	72-119	0
1,2-Dichloropropane	ug/L (ppb)	50	99	98	79-121	1
Bromodichloromethane	ug/L (ppb)	50	113	111	76-120	2
Dibromomethane	ug/L (ppb)	50	101	100	79-121	1
4-Methyl-2-pentanone	ug/L (ppb)	250	106	102	54-153	4
cis-1,3-Dichloropropene	ug/L (ppb)	50	111	108	76-128	3
Toluene	ug/L (ppb)	50	102	102	79-115	0
trans-1,3-Dichloropropene	ug/L (ppb)	50	116	111	76-128	4
1,1,2-Trichloroethane	ug/L (ppb)	50	100	98	78-120	2
2-Hexanone	ug/L (ppb)	250	96	89	49-147	8
1,3-Dichloropropane	ug/L (ppb)	50	102	98	81-111	4
Tetrachloroethene	ug/L (ppb)	50	101	101	78-109	0
Dibromochloromethane	ug/L (ppb)	50	130	127	63-140	2
1,2-Dibromoethane (EDB)	ug/L (ppb)	50	103	99	82-118	4
Chlorobenzene	ug/L (ppb)	50	101	100	80-113	1
Ethylbenzene	ug/L (ppb)	50	102	101	83-111	1
1,1,1,2-Tetrachloroethane	ug/L (ppb)	50	120	123	76-125	2
m,p-Xylene	ug/L (ppb)	100	105	103	81-112	2
o-Xylene	ug/L (ppb)	50	104	104	81-117	0
Styrene	ug/L (ppb)	50	105	103	83-121	2
Isopropylbenzene	ug/L (ppb)	50	104	105	78-118	1
Bromoform	ug/L (ppb)	50	123	118	40-161	4
n-Propylbenzene	ug/L (ppb)	50	102	102	81-115	0
Bromobenzene	ug/L (ppb)	50	101	100	80-113	1
1,3,5-Trimethylbenzene	ug/L (ppb)	50	105	107	83-117	2
1,1,2,2-Tetrachloroethane	ug/L (ppb)	50	108	108	79-118	0
1,2,3-Trichloropropane	ug/L (ppb)	50	100	99	74-116	1
2-Chlorotoluene	ug/L (ppb)	50	101	102	79-112	1
4-Chlorotoluene	ug/L (ppb)	50	101	100	80-116	1
tert-Butylbenzene	ug/L (ppb)	50	104	107	81-119	3
1,2,4-Trimethylbenzene	ug/L (ppb)	50	104	105	81-121	1
sec-Butylbenzene	ug/L (ppb)	50	104	106	83-123	2
p-Isopropyltoluene	ug/L (ppb)	50	103	105	81-117	2
1,3-Dichlorobenzene	ug/L (ppb)	50	104	104	80-115	0
1,4-Dichlorobenzene	ug/L (ppb)	50	98	97	77-112	1
1,2-Dichlorobenzene	ug/L (ppb)	50	104	105	79-115	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	50	119	123	62-133	3
1,2,4-Trichlorobenzene	ug/L (ppb)	50	102	107	75-119	5
Hexachlorobutadiene	ug/L (ppb)	50	99	101	70-116	2
Naphthalene	ug/L (ppb)	50	106	111	72-131	5
1,2,3-Trichlorobenzene	ug/L (ppb)	50	102	110	74-122	8

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

3600 Fremont Ave. N.
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F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 907023
Work Order Number: 1907028

July 10, 2019

Attention Michael Erdahl:

Fremont Analytical, Inc. received 5 sample(s) on 7/2/2019 for the analyses presented in the following report.

Ammonia by SM 4500 NH3G
Cyanide by SM 4500-CN C, E
Dissolved Metals by EPA Method 200.8
Dissolved Organic Carbon by SM 5310C
Ion Chromatography by EPA Method 300.0
Sulfide by SM 4500-S2-F
Total Metals by EPA Method 200.8
Total Alkalinity by SM 2320B

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

DoD/ELAP Certification #L17-135, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

CLIENT:	Friedman & Bruya
Project:	907023
Work Order:	1907028

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
1907028-001	AMW-1-070119	07/01/2019 12:01 PM	07/02/2019 10:13 AM
1907028-002	AMW-2-070119	07/01/2019 2:20 PM	07/02/2019 10:13 AM
1907028-003	AMW-3-070119	07/01/2019 4:00 PM	07/02/2019 10:13 AM
1907028-004	AMW-4-070119	07/01/2019 5:25 PM	07/02/2019 10:13 AM
1907028-005	AMW-5-070119	07/01/2019 9:00 AM	07/02/2019 10:13 AM

Fremont Analytical

Case Narrative

WO#: **1907028**

Date: **7/10/2019**

CLIENT: Friedman & Bruya

Project: 907023

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Analytical Report

Work Order: **1907028**
Date Reported: **7/10/2019**

Client: Friedman & Bruya
Project: 907023
Lab ID: 1907028-001
Client Sample ID: **AMW-1-070119**

Collection Date: 7/1/2019 12:01:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 25111		Analyst: SS
Chloride	1.71	0.100		mg/L	1	7/2/2019 4:53:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	7/2/2019 4:53:00 PM
Nitrate (as N)	0.634	0.100		mg/L	1	7/2/2019 4:53:00 PM
Sulfate	17.6	1.50	D	mg/L	5	7/2/2019 5:16:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 25124		Analyst: CO
Sodium	5,910	100		µg/L	1	7/5/2019 11:39:12 AM
Total Metals by EPA Method 200.8				Batch ID: 25114		Analyst: CO
Sodium	7,030	100		µg/L	1	7/3/2019 2:43:56 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R52592		Analyst: GM
Organic Carbon, Dissolved	5.34	0.500		mg/L	1	7/9/2019 4:00:00 PM
Total Alkalinity by SM 2320B				Batch ID: R52573		Analyst: SS
Alkalinity, Total (As CaCO3)	166	2.50		mg/L	1	7/10/2019 9:41:39 AM
Ammonia by SM 4500 NH3G				Batch ID: 25126		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	7/3/2019 2:37:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 25139		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	7/9/2019 4:11:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R52539		Analyst: SS
Sulfide	ND	0.500		mg/L	1	7/8/2019 5:30:06 PM

Fremont Analytical

Analytical Report

Work Order: **1907028**
Date Reported: **7/10/2019**

Client: Friedman & Bruya
Project: 907023
Lab ID: 1907028-002
Client Sample ID: **AMW-2-070119**

Collection Date: 7/1/2019 2:20:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 25111		Analyst: SS
Chloride	1.89	0.100		mg/L	1	7/2/2019 6:48:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	7/2/2019 6:48:00 PM
Nitrate (as N)	0.576	0.100		mg/L	1	7/2/2019 6:48:00 PM
Sulfate	16.6	1.50	D	mg/L	5	7/2/2019 7:11:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 25124		Analyst: CO
Sodium	5,140	100		µg/L	1	7/5/2019 11:44:44 AM
Total Metals by EPA Method 200.8				Batch ID: 25114		Analyst: CO
Sodium	5,970	100		µg/L	1	7/3/2019 2:55:01 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R52592		Analyst: GM
Organic Carbon, Dissolved	6.40	0.500		mg/L	1	7/9/2019 4:21:00 PM
Total Alkalinity by SM 2320B				Batch ID: R52573		Analyst: SS
Alkalinity, Total (As CaCO3)	121	2.50		mg/L	1	7/10/2019 9:41:39 AM
Ammonia by SM 4500 NH3G				Batch ID: 25126		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	7/3/2019 2:42:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 25139		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	7/9/2019 4:46:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R52539		Analyst: SS
Sulfide	ND	0.500		mg/L	1	7/8/2019 5:30:06 PM

Analytical Report

Work Order: **1907028**
Date Reported: **7/10/2019**

Client: Friedman & Bruya
Project: 907023
Lab ID: 1907028-003
Client Sample ID: AMW-3-070119

Collection Date: 7/1/2019 4:00:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 25111		Analyst: SS
Chloride	2.89	0.100		mg/L	1	7/3/2019 12:01:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	7/3/2019 12:01:00 PM
Nitrate (as N)	0.106	0.100		mg/L	1	7/3/2019 12:01:00 PM
Sulfate	42.2	1.50	D	mg/L	5	7/2/2019 8:21:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 25124		Analyst: CO
Sodium	8,190	100		µg/L	1	7/5/2019 11:50:15 AM
Total Metals by EPA Method 200.8				Batch ID: 25114		Analyst: CO
Sodium	9,840	100		µg/L	1	7/3/2019 3:06:06 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R52592		Analyst: GM
Organic Carbon, Dissolved	5.11	0.500		mg/L	1	7/9/2019 5:46:00 PM
Total Alkalinity by SM 2320B				Batch ID: R52573		Analyst: SS
Alkalinity, Total (As CaCO3)	453	2.50		mg/L	1	7/10/2019 9:41:39 AM
Ammonia by SM 4500 NH3G				Batch ID: 25126		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	7/3/2019 2:47:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 25139		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	7/9/2019 4:49:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R52539		Analyst: SS
Sulfide	1.56	0.500		mg/L	1	7/8/2019 5:30:06 PM

Analytical Report

Work Order: **1907028**
Date Reported: **7/10/2019**

Client: Friedman & Bruya
Project: 907023
Lab ID: 1907028-004
Client Sample ID: **AMW-4-070119**

Collection Date: 7/1/2019 5:25:00 PM
Matrix: Water

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 25111		Analyst: SS
Chloride	5.44	0.500	D	mg/L	5	7/2/2019 9:07:00 PM
Nitrite (as N)	ND	0.500	D	mg/L	5	7/2/2019 9:07:00 PM
Nitrate (as N)	1.57	0.500	D	mg/L	5	7/2/2019 9:07:00 PM
Sulfate	71.4	1.50	D	mg/L	5	7/2/2019 9:07:00 PM
NOTES: Diluted due to matrix.						
Dissolved Metals by EPA Method 200.8				Batch ID: 25124		Analyst: CO
Sodium	61,800	1,000	D	µg/L	10	7/5/2019 1:05:39 PM
Total Metals by EPA Method 200.8				Batch ID: 25114		Analyst: CO
Sodium	60,500	1,000	D	µg/L	10	7/5/2019 10:30:51 AM
Dissolved Organic Carbon by SM 5310C				Batch ID: R52592		Analyst: GM
Organic Carbon, Dissolved	2.08	0.500		mg/L	1	7/9/2019 6:06:00 PM
Total Alkalinity by SM 2320B				Batch ID: R52573		Analyst: SS
Alkalinity, Total (As CaCO3)	375	2.50		mg/L	1	7/10/2019 9:41:39 AM
Ammonia by SM 4500 NH3G				Batch ID: 25126		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	7/3/2019 2:52:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 25139		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	7/9/2019 4:52:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R52539		Analyst: SS
Sulfide	ND	0.500		mg/L	1	7/8/2019 5:30:06 PM

Analytical Report

Fremont Analytical

Work Order: **1907028**
Date Reported: **7/10/2019**

Client: Friedman & Bruya
Collection Date: 7/1/2019 9:00:00 AM
Project: 907023
Lab ID: 1907028-005
Matrix: Water
Client Sample ID: AMW-5-070119

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Ion Chromatography by EPA Method 300.0				Batch ID: 25111		Analyst: SS
Chloride	1.71	0.100		mg/L	1	7/2/2019 9:53:00 PM
Nitrite (as N)	ND	0.100		mg/L	1	7/2/2019 9:53:00 PM
Nitrate (as N)	0.649	0.100		mg/L	1	7/2/2019 9:53:00 PM
Sulfate	18.1	1.50	D	mg/L	5	7/2/2019 10:16:00 PM
Dissolved Metals by EPA Method 200.8				Batch ID: 25124		Analyst: CO
Sodium	5,870	100		µg/L	1	7/5/2019 12:01:18 PM
Total Metals by EPA Method 200.8				Batch ID: 25114		Analyst: CO
Sodium	7,420	100		µg/L	1	7/3/2019 3:17:09 PM
Dissolved Organic Carbon by SM 5310C				Batch ID: R52592		Analyst: GM
Organic Carbon, Dissolved	5.69	0.500		mg/L	1	7/9/2019 6:28:00 PM
Total Alkalinity by SM 2320B				Batch ID: R52573		Analyst: SS
Alkalinity, Total (As CaCO3)	176	2.50		mg/L	1	7/10/2019 9:41:39 AM
Ammonia by SM 4500 NH3G				Batch ID: 25126		Analyst: GM
Nitrogen, Ammonia	ND	0.100		mg/L	1	7/3/2019 2:57:00 PM
Cyanide by SM 4500-CN C, E				Batch ID: 25139		Analyst: WF
Cyanide, Total	ND	0.0500		mg/L	1	7/9/2019 4:55:00 PM
Sulfide by SM 4500-S2-F				Batch ID: R52539		Analyst: SS
Sulfide	ND	0.500		mg/L	1	7/8/2019 5:30:06 PM

Fremont Analytical

Date: *7/10/2019*

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: **MB-R52573** SampType: **MBLK** Units: **mg/L** Prep Date: **7/10/2019** RunNo: **52573**
Client ID: **MBLKW** Batch ID: **R52573** Analysis Date: **7/10/2019** SeqNo: **1038323**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	ND	2.50									

Sample ID: **LCS-R52573** SampType: **LCS** Units: **mg/L** Prep Date: **7/10/2019** RunNo: **52573**
Client ID: **LCSW** Batch ID: **R52573** Analysis Date: **7/10/2019** SeqNo: **1038324**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	106	2.50	100.0	0	106	80	120				

Sample ID: **1907028-001ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **7/10/2019** RunNo: **52573**
Client ID: **AMW-1-070119** Batch ID: **R52573** Analysis Date: **7/10/2019** SeqNo: **1038326**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	176	2.50						165.8	5.71	20	

Sample ID: **LCS1-R52573** SampType: **LCS** Units: **mg/L** Prep Date: **7/10/2019** RunNo: **52573**
Client ID: **LCSW** Batch ID: **R52573** Analysis Date: **7/10/2019** SeqNo: **1038331**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	107	2.50	100.0	0	107	80	120				

Sample ID: **LCS2-R52573** SampType: **LCS** Units: **mg/L** Prep Date: **7/10/2019** RunNo: **52573**
Client ID: **LCSW** Batch ID: **R52573** Analysis Date: **7/10/2019** SeqNo: **1038332**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	107	2.50	100.0	0	107	80	120				

Date: *7/10/2019*

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Total Alkalinity by SM 2320B

Sample ID: **LCS3-R52573** SampType: **LCS** Units: **mg/L** Prep Date: **7/10/2019** RunNo: **52573**
Client ID: **LCSW** Batch ID: **R52573** Analysis Date: **7/10/2019** SeqNo: **1038333**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Alkalinity, Total (As CaCO3)	109	2.50	100.0	0	109	80	120				

Fremont Analytical

Date: *7/10/2019*

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT
Ammonia by SM 4500 NH3G

Sample ID: **LCS-25126**	SampType: **LCS**			Units: **mg/L**		Prep Date: **7/5/2019**			RunNo: **52499**		
Client ID: **LCSW**	Batch ID: **25126**					Analysis Date: **7/3/2019**			SeqNo: **1036986**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	0.550	0.100	0.5000	0	110	80	120				

Sample ID: **MB-25126**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **7/5/2019**			RunNo: **52499**		
Client ID: **MBLKW**	Batch ID: **25126**					Analysis Date: **7/3/2019**			SeqNo: **1036987**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100									

Sample ID: **1907028-001GDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **7/5/2019**			RunNo: **52499**		
Client ID: **AMW-1-070119**	Batch ID: **25126**					Analysis Date: **7/3/2019**			SeqNo: **1036994**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100						0		30	

Sample ID: **1907028-001GMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **7/5/2019**			RunNo: **52499**		
Client ID: **AMW-1-070119**	Batch ID: **25126**					Analysis Date: **7/3/2019**			SeqNo: **1036995**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100	0.5000	0.05100	1.40	70	130				S

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: **1907028-001GMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **7/5/2019**			RunNo: **52499**		
Client ID: **AMW-1-070119**	Batch ID: **25126**					Analysis Date: **7/3/2019**			SeqNo: **1036996**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100	0.5000	0.05100	0	70	130	0		30	S

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Date: *7/10/2019*

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Ammonia by SM 4500 NH3G

Sample ID: **1907028-002GDUP** SampType: **DUP** Units: **mg/L** Prep Date: **7/5/2019** RunNo: **52499**
Client ID: **AMW-2-070119** Batch ID: **25126** Analysis Date: **7/3/2019** SeqNo: **1037007**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100						0		30	

Sample ID: **1907028-002GMS** SampType: **MS** Units: **mg/L** Prep Date: **7/5/2019** RunNo: **52499**
Client ID: **AMW-2-070119** Batch ID: **25126** Analysis Date: **7/3/2019** SeqNo: **1037008**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrogen, Ammonia	ND	0.100	0.5000	0.05000	-0.800	70	130				S

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Date: *7/10/2019*

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Cyanide by SM 4500-CN C, E

Sample ID: **MB-25139** SampType: **MBLK** Units: **mg/L** Prep Date: **7/8/2019** RunNo: **52577**
Client ID: **MBLKW** Batch ID: **25139** Analysis Date: **7/9/2019** SeqNo: **1038365**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	ND	0.0500									

Sample ID: **LCS-25139** SampType: **LCS** Units: **mg/L** Prep Date: **7/8/2019** RunNo: **52577**
Client ID: **LCSW** Batch ID: **25139** Analysis Date: **7/9/2019** SeqNo: **1038366**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.272	0.0500	0.2500	0	109	80	120				

Sample ID: **1907028-001DDUP** SampType: **DUP** Units: **mg/L** Prep Date: **7/8/2019** RunNo: **52577**
Client ID: **AMW-1-070119** Batch ID: **25139** Analysis Date: **7/9/2019** SeqNo: **1038368**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	ND	0.0500						0		20	

Sample ID: **1907028-001DMS** SampType: **MS** Units: **mg/L** Prep Date: **7/8/2019** RunNo: **52577**
Client ID: **AMW-1-070119** Batch ID: **25139** Analysis Date: **7/9/2019** SeqNo: **1038369**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.227	0.0500	0.2500	0	91.0	80	120				

Sample ID: **1907028-001DMSD** SampType: **MSD** Units: **mg/L** Prep Date: **7/8/2019** RunNo: **52577**
Client ID: **AMW-1-070119** Batch ID: **25139** Analysis Date: **7/9/2019** SeqNo: **1038370**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cyanide, Total	0.286	0.0500	0.2500	0	115	80	120	0.2274	23.0	30	R

NOTES:
R - High RPD observed, spike recovery is within range.

Fremont Analytical

Date: *7/10/2019*

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Dissolved Organic Carbon by SM 5310C

Sample ID: **MB-52592**	SampType: **MBLK**			Units: **mg/L**		Prep Date: **7/9/2019**			RunNo: **52592**		
Client ID: **MBLKW**	Batch ID: **R52592**					Analysis Date: **7/9/2019**			SeqNo: **1038594**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	ND	0.500									

Sample ID: **LCS-52592**	SampType: **LCS**			Units: **mg/L**		Prep Date: **7/9/2019**			RunNo: **52592**		
Client ID: **LCSW**	Batch ID: **R52592**					Analysis Date: **7/9/2019**			SeqNo: **1038595**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	5.22	0.500	5.000	0	104	80	120				

Sample ID: **1907028-002BDUP**	SampType: **DUP**			Units: **mg/L**		Prep Date: **7/9/2019**			RunNo: **52592**		
Client ID: **AMW-2-070119**	Batch ID: **R52592**					Analysis Date: **7/9/2019**			SeqNo: **1038603**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	6.44	0.500						6.403	0.607	20	

Sample ID: **1907028-002BMS**	SampType: **MS**			Units: **mg/L**		Prep Date: **7/9/2019**			RunNo: **52592**		
Client ID: **AMW-2-070119**	Batch ID: **R52592**					Analysis Date: **7/9/2019**			SeqNo: **1038604**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	11.5	0.500	5.000	6.403	101	70	130				

Sample ID: **1907028-002BMSD**	SampType: **MSD**			Units: **mg/L**		Prep Date: **7/9/2019**			RunNo: **52592**		
Client ID: **AMW-2-070119**	Batch ID: **R52592**					Analysis Date: **7/9/2019**			SeqNo: **1038605**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Organic Carbon, Dissolved	11.5	0.500	5.000	6.403	102	70	130	11.47	0.218	30	

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **MB-25111** SampType: **MBLK** Units: **mg/L** Prep Date: **7/2/2019** RunNo: **52497**
Client ID: **MBLKW** Batch ID: **25111** Analysis Date: **7/2/2019** SeqNo: **1036894**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									
Nitrite (as N)	ND	0.100									
Nitrate (as N)	ND	0.100									
Sulfate	ND	0.300									

Sample ID: **LCS-25111** SampType: **LCS** Units: **mg/L** Prep Date: **7/2/2019** RunNo: **52497**
Client ID: **LCSW** Batch ID: **25111** Analysis Date: **7/2/2019** SeqNo: **1036895**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	0.752	0.100	0.7500	0	100	90	110				
Nitrite (as N)	0.758	0.100	0.7500	0	101	90	110				
Nitrate (as N)	0.750	0.100	0.7500	0	100	90	110				
Sulfate	3.74	0.300	3.750	0	99.8	90	110				

Sample ID: **1907028-001ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **7/2/2019** RunNo: **52497**
Client ID: **AMW-1-070119** Batch ID: **25111** Analysis Date: **7/2/2019** SeqNo: **1036898**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	1.71	0.100						1.714	0.117	20	
Nitrite (as N)	ND	0.100						0		20	
Nitrate (as N)	0.635	0.100						0.6340	0.158	20	
Sulfate	18.3	0.300						18.30	0.219	20	E

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: **1907028-001AMS** SampType: **MS** Units: **mg/L** Prep Date: **7/2/2019** RunNo: **52497**
Client ID: **AMW-1-070119** Batch ID: **25111** Analysis Date: **7/2/2019** SeqNo: **1036899**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	2.43	0.100	0.7500	1.714	95.5	80	120				

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **1907028-001AMS** SampType: **MS** Units: **mg/L** Prep Date: **7/2/2019** RunNo: **52497**
Client ID: **AMW-1-070119** Batch ID: **25111** Analysis Date: **7/2/2019** SeqNo: **1036899**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Nitrite (as N)	0.656	0.100	0.7500	0	87.5	80	120				
Nitrate (as N)	1.30	0.100	0.7500	0.6340	88.5	80	120				
Sulfate	21.7	0.300	3.750	18.30	91.5	80	120				E

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: **1907028-001AMSD** SampType: **MSD** Units: **mg/L** Prep Date: **7/2/2019** RunNo: **52497**
Client ID: **AMW-1-070119** Batch ID: **25111** Analysis Date: **7/2/2019** SeqNo: **1036900**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	2.51	0.100	0.7500	1.714	106	80	120	2.430	3.08	20	
Nitrite (as N)	0.721	0.100	0.7500	0	96.1	80	120	0.6560	9.44	20	
Nitrate (as N)	1.39	0.100	0.7500	0.6340	100	80	120	1.298	6.63	20	
Sulfate	22.2	0.300	3.750	18.30	104	80	120	21.73	2.16	20	E

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: **1907028-005ADUP** SampType: **DUP** Units: **mg/L** Prep Date: **7/2/2019** RunNo: **52497**
Client ID: **AMW-5-070119** Batch ID: **25111** Analysis Date: **7/2/2019** SeqNo: **1036911**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	1.71	0.100						1.714	0	20	
Nitrite (as N)	ND	0.100						0		20	
Nitrate (as N)	0.648	0.100						0.6490	0.154	20	
Sulfate	18.3	0.300						18.35	0.0436	20	E

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Fremont Analytical

Date: *7/10/2019*

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Ion Chromatography by EPA Method 300.0

Sample ID: **1907028-005AMS**	SampType: **MS**	Units: **mg/L**	Prep Date: **7/2/2019**	RunNo: **52497**
Client ID: **AMW-5-070119**	Batch ID: **25111**		Analysis Date: **7/2/2019**	SeqNo: **1036912**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	2.50	0.100	0.7500	1.714	105	80	120				
Nitrite (as N)	0.729	0.100	0.7500	0	97.2	80	120				
Nitrate (as N)	1.40	0.100	0.7500	0.6490	101	80	120				
Sulfate	22.3	0.300	3.750	18.35	104	80	120				E

NOTES:

E - Estimated value. The amount exceeds the linear working range of the instrument.

Fremont Analytical

Date: 7/10/2019

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Sulfide by SM 4500-S2-F

Sample ID: **MB-R52539** SampType: **MBLK** Units: **mg/L** Prep Date: **7/8/2019** RunNo: **52539**
Client ID: **MBLKW** Batch ID: **R52539** Analysis Date: **7/8/2019** SeqNo: **1037733**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	ND	0.500									

Sample ID: **LCS-R52539** SampType: **LCS** Units: **mg/L** Prep Date: **7/8/2019** RunNo: **52539**
Client ID: **LCSW** Batch ID: **R52539** Analysis Date: **7/8/2019** SeqNo: **1037734**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	1.90	0.500	2.000	0	95.0	65	135				

Sample ID: **LCSD-R52539** SampType: **LCSD** Units: **mg/L** Prep Date: **7/8/2019** RunNo: **52539**
Client ID: **LCSW02** Batch ID: **R52539** Analysis Date: **7/8/2019** SeqNo: **1037735**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	1.88	0.500	2.000	0	94.0	65	135	1.900	1.06	20	

Sample ID: **LCS2-R52539** SampType: **LCS** Units: **mg/L** Prep Date: **7/8/2019** RunNo: **52539**
Client ID: **LCSW** Batch ID: **R52539** Analysis Date: **7/8/2019** SeqNo: **1037741**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	1.77	0.500	2.000	0	88.4	65	135				

Sample ID: **LCS3-R52539** SampType: **LCS** Units: **mg/L** Prep Date: **7/8/2019** RunNo: **52539**
Client ID: **LCSW** Batch ID: **R52539** Analysis Date: **7/8/2019** SeqNo: **1037742**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	1.62	0.500	2.000	0	81.2	65	135				

Date: *7/10/2019*

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Sulfide by SM 4500-S2-F

Sample ID: **LCS4-R52539** SampType: **LCS** Units: **mg/L** Prep Date: **7/8/2019** RunNo: **52539**

Client ID: **LCSW** Batch ID: **R52539** Analysis Date: **7/8/2019** SeqNo: **1037743**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sulfide	1.60	0.500	2.000	0	80.0	65	135				

Fremont Analytical

Date: *7/10/2019*

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-25124** SampType: **MBLK** Units: **µg/L** Prep Date: **7/5/2019** RunNo: **52512**
Client ID: **MBLKW** Batch ID: **25124** Analysis Date: **7/5/2019** SeqNo: **1037248**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	ND	100									

Sample ID: **LCS-25124** SampType: **LCS** Units: **µg/L** Prep Date: **7/5/2019** RunNo: **52512**
Client ID: **LCSW** Batch ID: **25124** Analysis Date: **7/5/2019** SeqNo: **1037249**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	1,100	100	1,000	0	110	50	150				

Sample ID: **1906390-013DDUP** SampType: **DUP** Units: **µg/L** Prep Date: **7/5/2019** RunNo: **52512**
Client ID: **BATCH** Batch ID: **25124** Analysis Date: **7/5/2019** SeqNo: **1037253**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	21,500	100						21,920	2.04	30	

Sample ID: **1906390-013DMS** SampType: **MS** Units: **µg/L** Prep Date: **7/5/2019** RunNo: **52512**
Client ID: **BATCH** Batch ID: **25124** Analysis Date: **7/5/2019** SeqNo: **1037254**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	27,300	100	5,000	21,920	107	50	150				E

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: **1906390-013DMSD** SampType: **MSD** Units: **µg/L** Prep Date: **7/5/2019** RunNo: **52512**
Client ID: **BATCH** Batch ID: **25124** Analysis Date: **7/5/2019** SeqNo: **1037255**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	27,100	100	5,000	21,920	103	50	150	27,290	0.832	30	E

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Date: *7/10/2019*

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Dissolved Metals by EPA Method 200.8

Sample ID: **MB-25119FB** SampType: **MBLK** Units: **µg/L** Prep Date: **7/5/2019** RunNo: **52512**

Client ID: **MBLKW** Batch ID: **25124** Analysis Date: **7/5/2019** SeqNo: **1037262**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	ND	100									

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **MB-25114** SampType: **MBLK** Units: **µg/L** Prep Date: **7/3/2019** RunNo: **52489**
Client ID: **MBLKW** Batch ID: **25114** Analysis Date: **7/3/2019** SeqNo: **1036686**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	ND	100									

Sample ID: **LCS-25114** SampType: **LCS** Units: **µg/L** Prep Date: **7/3/2019** RunNo: **52489**
Client ID: **LCSW** Batch ID: **25114** Analysis Date: **7/3/2019** SeqNo: **1036687**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	1,100	100	1,000	0	110	50	150				

Sample ID: **1907023-001ADUP** SampType: **DUP** Units: **µg/L** Prep Date: **7/3/2019** RunNo: **52489**
Client ID: **BATCH** Batch ID: **25114** Analysis Date: **7/3/2019** SeqNo: **1036689**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	1,010,000	100						1,015,000	0.684	30	E

NOTES:
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: **1907023-001AMS** SampType: **MS** Units: **µg/L** Prep Date: **7/3/2019** RunNo: **52489**
Client ID: **BATCH** Batch ID: **25114** Analysis Date: **7/3/2019** SeqNo: **1036690**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	981,000	100	5,000	1,015,000	-671	50	150				ES

NOTES:
S - Analyte concentration was too high for accurate spike recovery(ies).
E - Estimated value. The amount exceeds the linear working range of the instrument.

Sample ID: **1907023-001AMSD** SampType: **MSD** Units: **µg/L** Prep Date: **7/3/2019** RunNo: **52489**
Client ID: **BATCH** Batch ID: **25114** Analysis Date: **7/3/2019** SeqNo: **1036691**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Sodium	997,000	100	5,000	1,015,000	-360	50	150	981,300	1.57	30	ES

Date: *7/10/2019*

Work Order: 1907028
CLIENT: Friedman & Bruya
Project: 907023

QC SUMMARY REPORT

Total Metals by EPA Method 200.8

Sample ID: **1907023-001AMSD**	SampType: **MSD**			Units: **µg/L**		Prep Date: **7/3/2019**			RunNo: **52489**		
Client ID: **BATCH**	Batch ID: **25114**					Analysis Date: **7/3/2019**			SeqNo: **1036691**		
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:

S - Analyte concentration was too high for accurate spike recovery(ies).

E - Estimated value. The amount exceeds the linear working range of the instrument.

Fremont Analytical

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**1907028**
Logged by:	**Carissa True**	Date Received:	**7/2/2019 10:13:00 AM**

Chain of Custody

#	Question	Yes	No	Other
1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

#	Question	Yes	No	Other
3.	Coolers are present?	Yes ☑	No ☐	NA ☐
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☑	Not Required ☐
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >0°C to 10.0°C*	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☑	No ☐	NA ☐
		NAOH added C, HNO3 added E/F, H2SO4 added G		
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

#	Question	Yes	No	Other
18.	Was client notified of all discrepancies with this order?	Yes ☑	No ☐	NA ☐

Person Notified:	Michael	Date:	7/2/2019
By Whom:	Carissa True	Via:	☑ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:	N.N or N+N		
Client Instructions:			

19. Additional remarks:

Item Information

Item #	Temp ºC
Cooler 1	6.1
Sample 1	3.9

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

1907028

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 Fax # (206) 283-5044

SUBCONTRACTER Fremont	
PROJECT NAME/NO. 907023	PO # A-313.
REMARKS Please Email Results Aspect EDD	

Page # 1 of 1

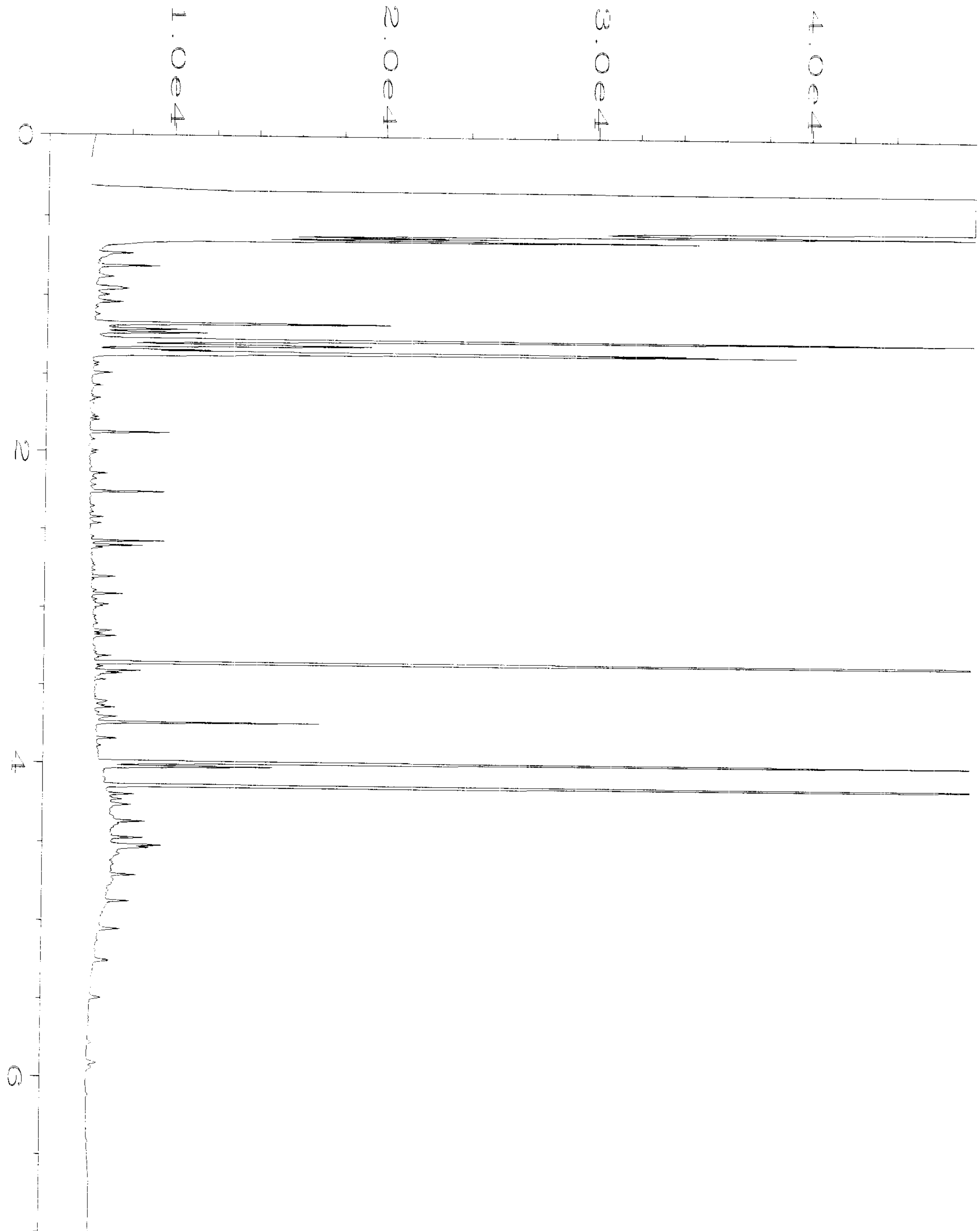
TURNAROUND TIME
- ☒ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	Cyanide ~~EPH~~	Nitrate, Nitrite ~~VPH~~	Alkalinity	Chloride	Total + Dissolved Sodium	Sulfate	Sulfide	Dissolved Organic Carbon	Ammonia	Notes
AMW-1-070119		7/1/19	1201	water			X	X	X	X	X	X	X	X	X	
AMW-2-070119			1420				X	X	X	X	X	X	X	X	X	
AMW-3-070119			1600				X	X	X	X	X	X	X	X	X	
AMW-4-070119			1725				X	X	X	X	X	X	X	X	X	
AMW-5-070119			0900				X	X	X	X	X	X	X	X	X	

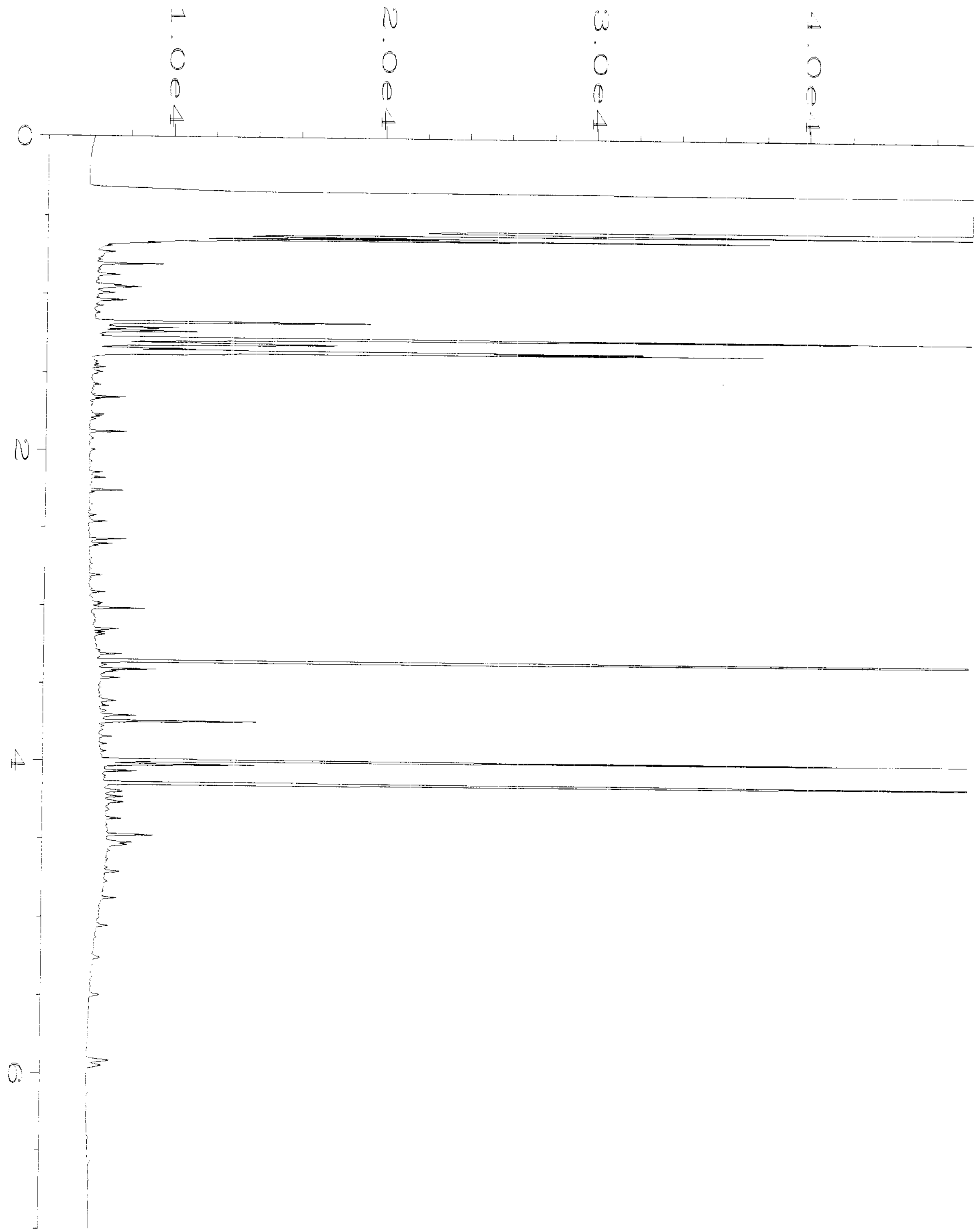
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Michael Erdahl	Friedman & Bruya	7/2/19	08:34 AM
Received by: Kayla Pet			7/2/19	10:13
Relinquished by:				
Received by:				



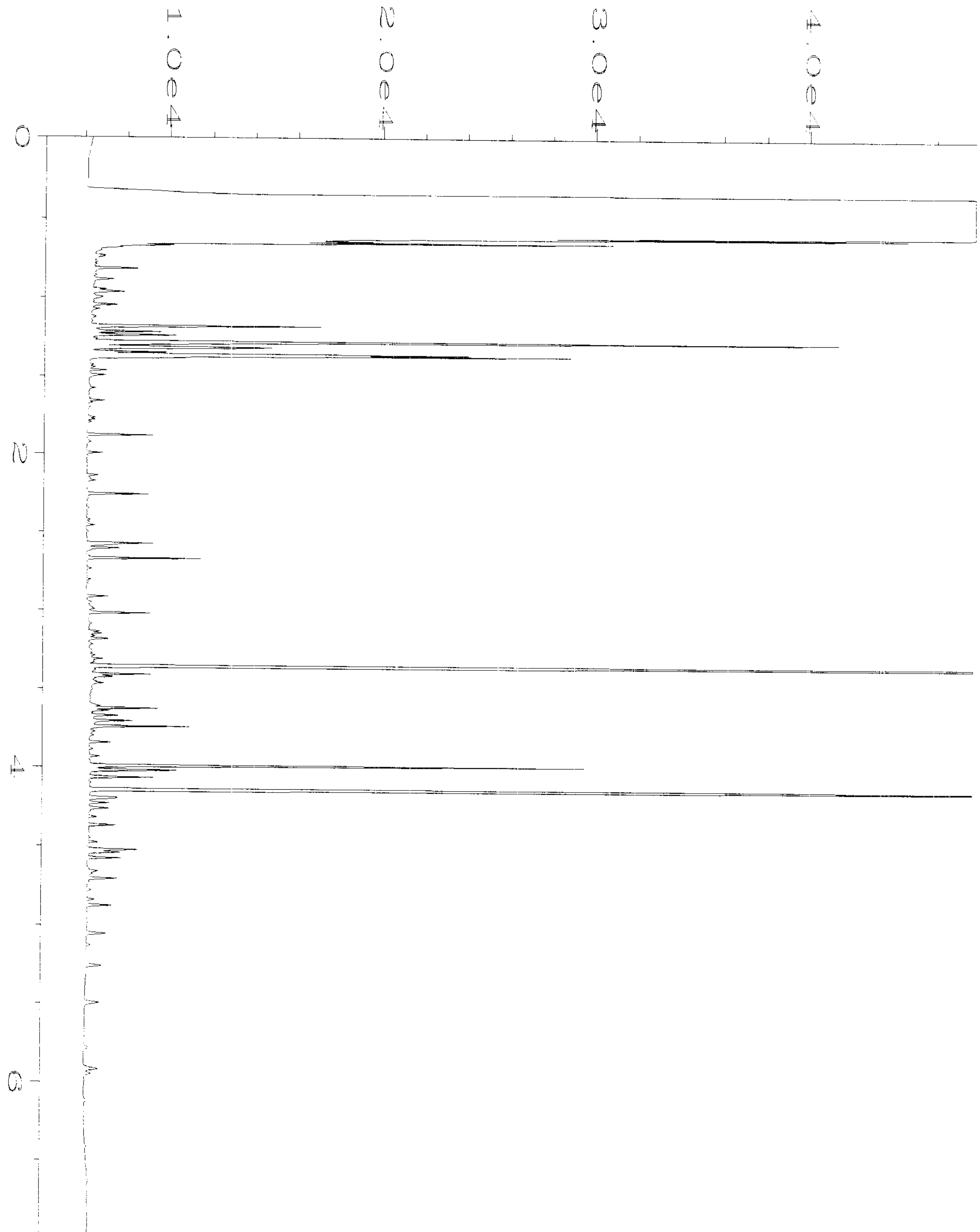
Data File Name : C:\HPCHEM\6\DATA\07-03-19\039F1001.D
Operator : TL
Instrument : GC6
Sample Name : 907023-01
Run Time Bar Code:
Acquired on : 03 Jul 19 05:50 PM
Report Created on: 05 Jul 19 10:02 AM

Page Number : 1
Vial Number : 39
Injection Number : 1
Sequence Line : 10
Instrument Method: DX.MTH
Analysis Method : DEFAULT.MTH



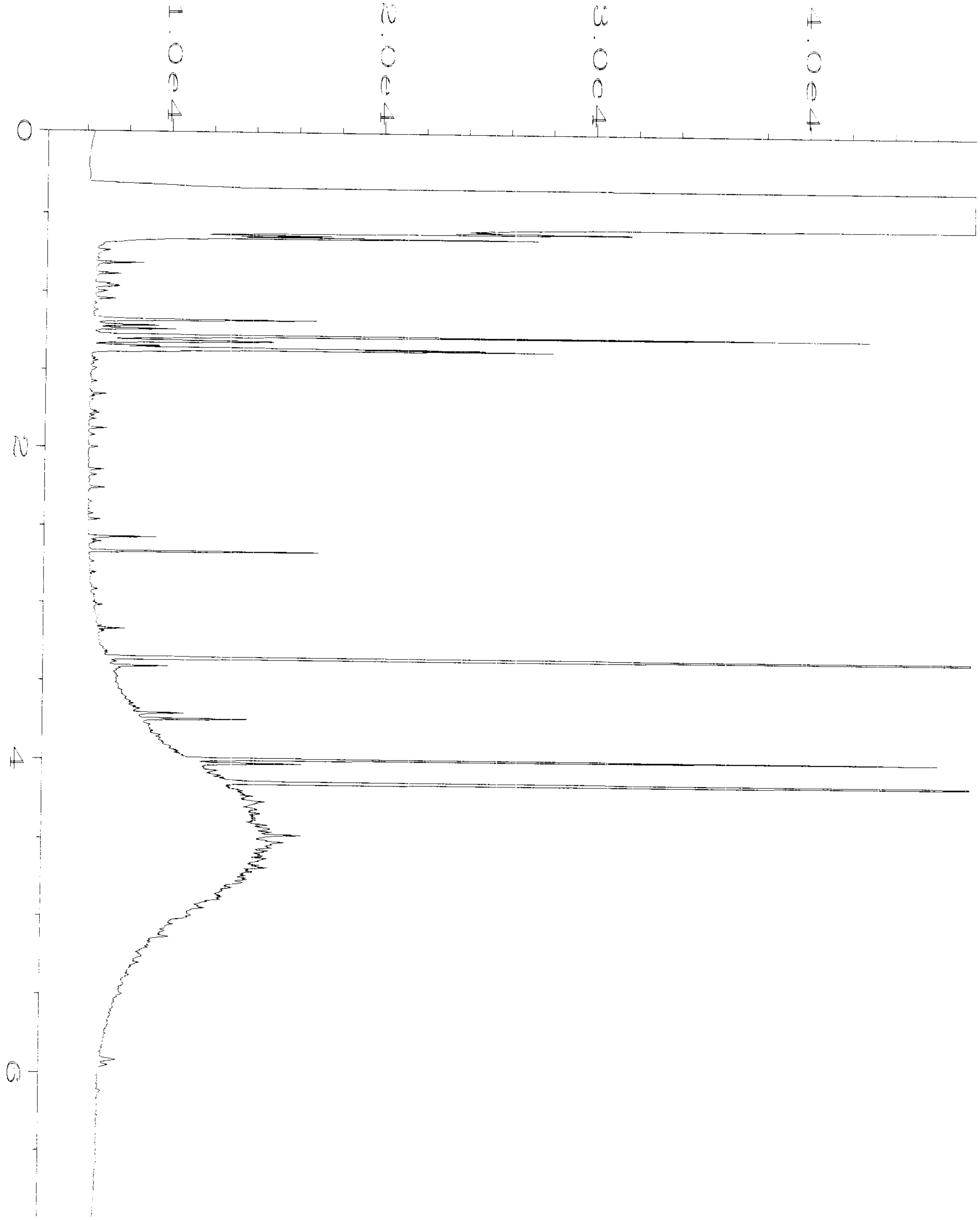
Data File Name : C:\HPCHEM\6\DATA\07-03-19\040F1001.D
Operator : TL
Instrument : GC6
Sample Name : 907023-02
Run Time Bar Code:
Acquired on : 03 Jul 19 06:01 PM
Report Created on: 05 Jul 19 10:03 AM

Page Number : 1
Vial Number : 40
Injection Number : 1
Sequence Line : 10
Instrument Method: DX.MTH
Analysis Method : DEFAULT.MTH

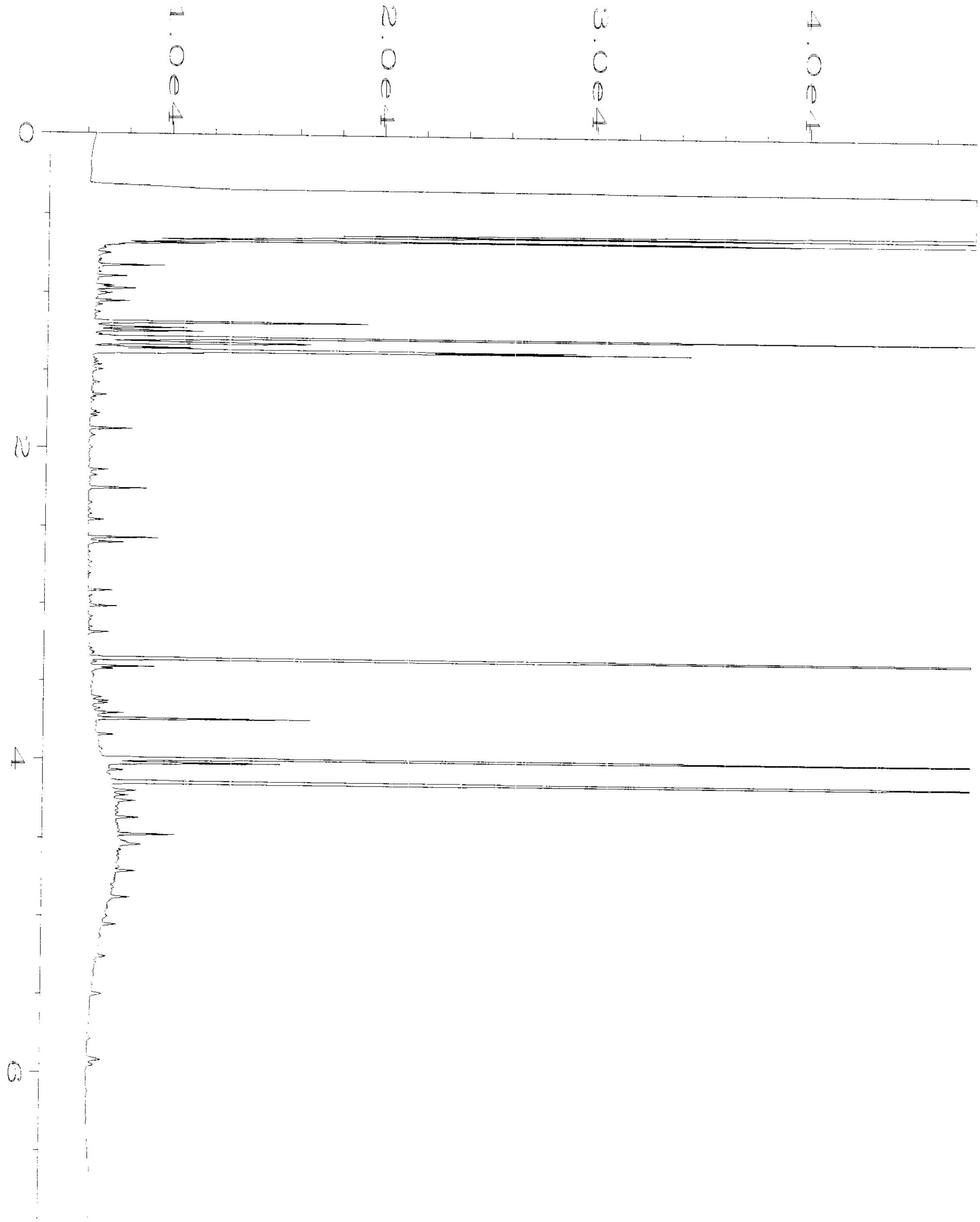


Data File Name : C:\HPCHEM\6\DATA\07-03-19\041F1001.D
Operator : TL
Instrument : GC6
Sample Name : 907023-03
Run Time Bar Code:
Acquired on : 03 Jul 19 06:12 PM
Report Created on: 05 Jul 19 10:03 AM

Page Number : 1
Vial Number : 41
Injection Number : 1
Sequence Line : 10
Instrument Method: DX.MTH
Analysis Method : DEFAULT.MTH

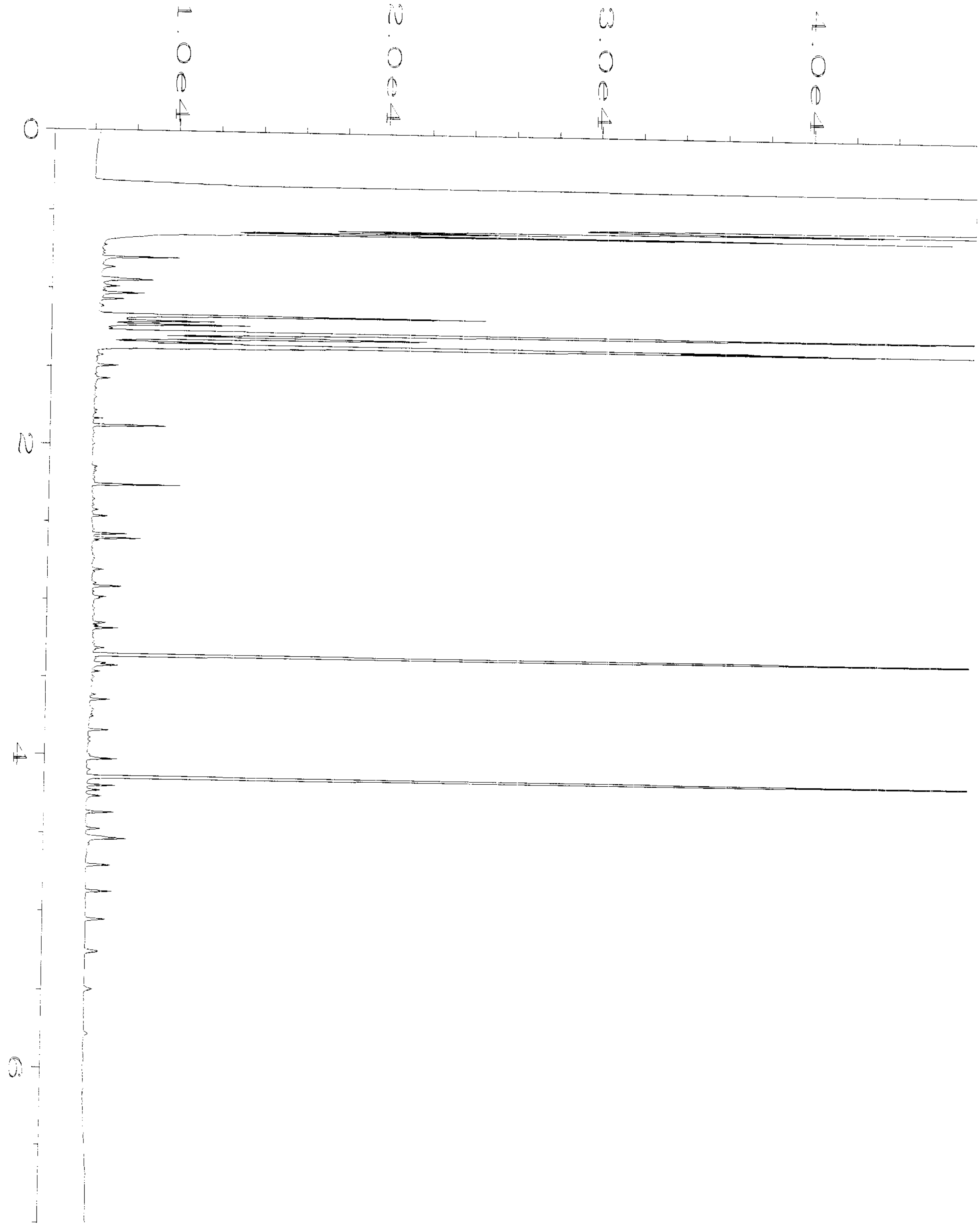


Data File Name	: C:\HPCHEM\6\DATA\07-03-19\042F1001.D		
Operator	: TL	Page Number	: 1
Instrument	: GC6	Vial Number	: 42
Sample Name	: 907023-04	Injection Number	: 1
Run Time Bar Code	:	Sequence Line	: 10
Acquired on	: 03 Jul 19 06:23 PM	Instrument Method	: DX.MTH
Report Created on	: 05 Jul 19 10:03 AM	Analysis Method	: DEFAULT.MTH



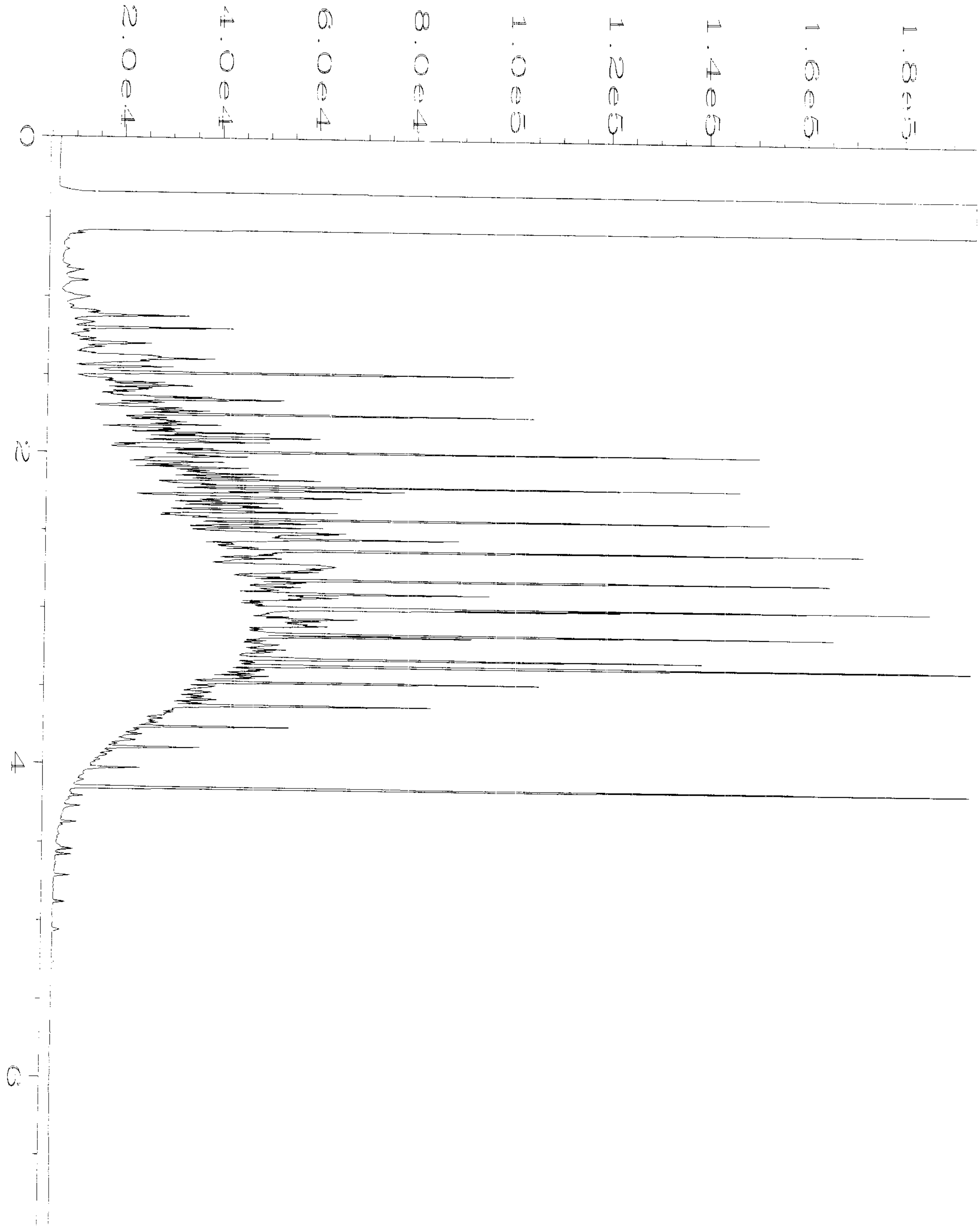
Data File Name : C:\HPCHEM\6\DATA\07-03-19\043F1001.D
Operator : TL
Instrument : GC6
Sample Name : 907023-05
Run Time Bar Code:
Acquired on : 03 Jul 19 06:34 PM
Report Created on: 05 Jul 19 10:03 AM

Page Number : 1
Vial Number : 43
Injection Number : 1
Sequence Line : 10
Instrument Method: DX.MTH
Analysis Method : DEFAULT.MTH



Data File Name : C:\HPCHEM\6\DATA\07-03-19\036F1001.D
Operator : TL
Instrument : GC6
Sample Name : 09-1605 mb
Run Time Bar Code:
Acquired on : 03 Jul 19 05:16 PM
Report Created on: 05 Jul 19 10:02 AM

Page Number : 1
Vial Number : 36
Injection Number : 1
Sequence Line : 10
Instrument Method: DX.MTH
Analysis Method : DEFAULT.MTH



Data File Name : C:\HPCHEM\6\DATA\07-03-19\003F0201.D
Operator : TL
Instrument : GC6
Sample Name : 500 Dx 57-78E
Run Time Bar Code:
Acquired on : 03 Jul 19 06:08 AM
Report Created on: 05 Jul 19 10:02 AM

Page Number : 1
Vial Number : 3
Injection Number : 1
Sequence Line : 2
Instrument Method: DX.MTH
Analysis Method : DEFAULT.MTH

907023

SAMPLE CHAIN OF CUSTODY

ME 07/02/19 [redacted] Page # 1 of 1 VW2/A04/AT2

Report To Carla Brock & Ali Cochrane

Company Aspect Consulting

Address 710 2nd Ave Suite 550

City, State, ZIP Seattle, WA 98104

Phone ______ Email ______

SAMPLERS (*signature*)	Kr Beck
PROJECT NAME	PO #
Shelton C Street Landfill	150c74
REMARKS	INVOICE TO

TURNAROUND TIME
- ☒ Standard Turnaround
- ☐ RUSH ______
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☒ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other ______

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Dioxins/furans	Metals (Tot/Diss)	Alkalinity	Nitrite/Nitrate	Sulfide/Sulfate	Diss Org Carbon	Chloride	Ammonia	Cyanide	Notes
AMW-1-070119	01 A-N	7/1/19	1201	Water	14		X			X		X	X	X	X	X	X	X	X	X	X	
AMW-2-070119	02		1420				X			X		X	X	X	X	X	X	X	X	X	X	
AMW-3-070119	03		1600				X			X		X	X	X	X	X	X	X	X	X	X	
AMW-4-070119	04		1725				X			X		X	X	X	X	X	X	X	X	X	X	
AMW-5-070119	05		0900				X			X		X	X	X	X	X	X	X	X	X	X	
Trip Blank	06									X												

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Kr Beck	Kristin Beck	Aspect	7/2/19	06:05
Received by: S. Osborn	S. Osborn	F&B Inc	7/2/19	06:05
Relinquished by:				
Received by:				

Samples received at 2 °C

Cover Soil Results

FRONTIER ANALYTICAL LABORATORY

March 3, 2020

FAL Project: 12963

Mr. Michael Erdahl
Friedman and Bruya, Inc.
3012 16th Ave. W
Seattle, WA 98119

Dear Mr. Erdahl,

The following results are associated with Frontier Analytical Laboratory project **12963**. This corresponds to your project number **002211** and purchase order number **B-150**. One soil sample was received on 2/18/2020 in good condition. This sample was extracted and analyzed by EPA Method 1613 for tetra through octa chlorinated dibenzo dioxins and furans. The Toxic Equivalency (TEQ) for your sample has been calculated using the 2005 World Health Organization's (WHO's) toxic equivalency factors (TEFs). Freidman and Bruya, Inc. requested a turnaround time of fifteen business days for project **12963**.

The following report consists of an Analytical Data section and a Sample Receipt section. The Analytical Data section contains our sample tracking log and the analytical results. The Sample Receipt section contains your chain of custody, our sample login form and a sample photo. The enclosed results and electronic data deliverable (EDD) are specifically for the sample referenced in this report only. These results meet all NELAP requirements and shall not be reproduced except in full. Frontier Analytical Laboratory's State of Oregon NELAP certificate number is **4041**, our State of California ELAP certificate number is **2934** and our State of Washington certificate number is **C844**. This report along with the associated EDD has been emailed to you. A hardcopy of this report will not be sent to you unless specifically requested.

If you have any questions regarding project **12963**, please feel free to contact me at (916) 934-0900. Thank you for choosing Frontier Analytical Laboratory for your analytical testing needs.

Sincerely,

Daniel P. Vickers

Daniel P. Vickers
Vice President

Frontier Analytical Laboratory

Sample Tracking Log

FAL Project ID: **12963**

Received on: **02/18/2020** Project Due: **03/11/2020** Storage: **R-4**

FAL Sample ID	Dup	Client Project ID	Client Sample ID	Requested Method	Matrix	Sampling Date	Sampling Time	Hold Time Due Date
12963-001-SA	1	002211	TP-03-021420	EPA 1613 D/F	Soil	02/14/2020	10:10 am	02/15/2021

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12963-001-MB
Client ID: Method Blank
Matrix: Soil
Batch No: X5252

Date Extracted: 02-21-2020
Date Received: NA
Amount: 10.00 g

ICal: PCDDFAL4-12-2-19
GC Column: DB5MS
Units: pg/g

Acquired: 02-25-2020
2005 WHO TEQ: 0.0
Basis: Dry Weight

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	ND	0.0729		-	0.0464				
1,2,3,7,8-PeCDD	ND	0.0904		-	0.0791				
1,2,3,4,7,8-HxCDD	ND	0.107		-	0.0846				
1,2,3,6,7,8-HxCDD	ND	0.110		-	0.0993	Total TCDD	ND	0.0729	
1,2,3,7,8,9-HxCDD	ND	0.0998		-	0.0861	Total PeCDD	ND	0.0904	
1,2,3,4,6,7,8-HpCDD	ND	0.150		-	0.0980	Total HxCDD	ND	0.110	
OCDD	ND	0.406		-	0.122	Total HpCDD	ND	0.150	
2,3,7,8-TCDF	ND	0.0544		-	0.0397				
1,2,3,7,8-PeCDF	ND	0.0801		-	0.0626				
2,3,4,7,8-PeCDF	ND	0.0797		-	0.0713				
1,2,3,4,7,8-HxCDF	ND	0.0679		-	0.0513				
1,2,3,6,7,8-HxCDF	ND	0.0731		-	0.0576				
2,3,4,6,7,8-HxCDF	ND	0.0714		-	0.0623				
1,2,3,7,8,9-HxCDF	ND	0.0809		-	0.0715	Total TCDF	ND	0.0544	
1,2,3,4,6,7,8-HpCDF	ND	0.0841		-	0.0753	Total PeCDF	ND	0.0801	
1,2,3,4,7,8,9-HpCDF	ND	0.0999		-	0.0868	Total HxCDF	ND	0.0809	
OCDF	ND	0.223		-	0.156	Total HpCDF	ND	0.0999	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	81.6	25.0 - 164	
13C-1,2,3,7,8-PeCDD	82.7	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	90.4	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	88.6	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	82.1	23.0 - 140	
13C-OCDD	68.8	17.0 - 157	
13C-2,3,7,8-TCDF	89.2	24.0 - 169	
13C-1,2,3,7,8-PeCDF	83.2	24.0 - 185	
13C-2,3,4,7,8-PeCDF	86.3	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	80.5	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	74.9	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	82.4	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	84.7	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	70.7	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	82.6	26.0 - 138	
13C-OCDF	75.0	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	80.0	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: [signature]
Date: 3/2/2020

Reviewed By: DPV
Date: 3/2/2020

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12963-001-OPR	Date Extracted: 02-21-2020	ICal: PCDDFAL4-12-2-19	Acquired: 02-25-2020
Client ID: OPR	Date Received: NA	GC Column: DB5MS	2005 WHO TEQ: NA
Matrix: Soil	Amount: 10.00 g	Units: ng/ml	
Batch No: X5252			

Compound	Conc	QC Limits	Qual
2,3,7,8-TCDD	9.24	6.70 - 15.8	
1,2,3,7,8-PeCDD	46.9	35.0 - 71.0	
1,2,3,4,7,8-HxCDD	44.1	35.0 - 82.0	
1,2,3,6,7,8-HxCDD	44.2	38.0 - 67.0	
1,2,3,7,8,9-HxCDD	43.3	32.0 - 81.0	
1,2,3,4,6,7,8-HpCDD	46.1	35.0 - 70.0	
OCDD	95.7	78.0 - 144	
2,3,7,8-TCDF	9.05	7.50 - 15.8	
1,2,3,7,8-PeCDF	46.8	40.0 - 67.0	
2,3,4,7,8-PeCDF	46.0	34.0 - 80.0	
1,2,3,4,7,8-HxCDF	47.2	36.0 - 67.0	
1,2,3,6,7,8-HxCDF	48.2	42.0 - 65.0	
2,3,4,6,7,8-HxCDF	47.5	35.0 - 78.0	
1,2,3,7,8,9-HxCDF	47.7	39.0 - 65.0	
1,2,3,4,6,7,8-HpCDF	48.3	41.0 - 61.0	
1,2,3,4,7,8,9-HpCDF	48.2	39.0 - 69.0	
OCDF	91.7	63.0 - 170	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	76.0	20.0 - 175	
13C-1,2,3,7,8-PeCDD	76.2	21.0 - 227	
13C-1,2,3,4,7,8-HxCDD	80.5	21.0 - 193	
13C-1,2,3,6,7,8-HxCDD	80.5	25.0 - 163	
13C-1,2,3,4,6,7,8-HpCDD	68.8	26.0 - 166	
13C-OCDD	53.8	13.0 - 198	
13C-2,3,7,8-TCDF	78.1	22.0 - 152	
13C-1,2,3,7,8-PeCDF	71.4	21.0 - 192	
13C-2,3,4,7,8-PeCDF	77.7	13.0 - 328	
13C-1,2,3,4,7,8-HxCDF	73.8	19.0 - 202	
13C-1,2,3,6,7,8-HxCDF	69.3	21.0 - 159	
13C-2,3,4,6,7,8-HxCDF	72.4	22.0 - 176	
13C-1,2,3,7,8,9-HxCDF	74.7	17.0 - 205	
13C-1,2,3,4,6,7,8-HpCDF	59.1	21.0 - 158	
13C-1,2,3,4,7,8,9-HpCDF	71.3	20.0 - 186	
13C-OCDF	61.4	13.0 - 198	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	76.3	31.0 - 191	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: ________ Reviewed By: DPV

Date: 3/2/2020 Date: 3/2/2020

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EPA Method 1613
PCDD/F

FRONTIER ANALYTICAL LABORATORY

FAL ID: 12963-001-SA	Date Extracted: 02-21-2020	ICal: PCDDFAL4-12-2-19	Acquired: 02-25-2020
Client ID: TP-03-021420	Date Received: 02-18-2020	GC Column: DB5MS	2005 WHO TEQ: 25.5
Matrix: Soil	Amount: 10.46 g	Units: pg/g	Basis: Dry Weight
Batch No: X5252	% Solids: 87.23		

Compound	Conc	DL	Qual	2005 WHO Tox	MDL	Compound	Conc	DL	Qual
2,3,7,8-TCDD	1.92	-		1.92	0.0464				
1,2,3,7,8-PeCDD	9.32	-		9.32	0.0791				
1,2,3,4,7,8-HxCDD	13.0	-		1.30	0.0846				
1,2,3,6,7,8-HxCDD	26.0	-		2.60	0.0993	Total TCDD	505	-	
1,2,3,7,8,9-HxCDD	18.7	-		1.87	0.0861	Total PeCDD	593	-	
1,2,3,4,6,7,8-HpCDD	265	-		2.65	0.0980	Total HxCDD	673	-	
OCDD	1550	-		0.465	0.122	Total HpCDD	497	-	
2,3,7,8-TCDF	4.67	-	F	0.467	0.0397				
1,2,3,7,8-PeCDF	4.29	-		0.129	0.0626				
2,3,4,7,8-PeCDF	7.56	-		2.27	0.0713				
1,2,3,4,7,8-HxCDF	6.37	-		0.637	0.0513				
1,2,3,6,7,8-HxCDF	4.99	-		0.499	0.0576				
2,3,4,6,7,8-HxCDF	6.13	-		0.613	0.0623				
1,2,3,7,8,9-HxCDF	1.73	-	J	0.173	0.0715	Total TCDF	97.4	-	D,M
1,2,3,4,6,7,8-HpCDF	50.3	-		0.503	0.0753	Total PeCDF	84.7	-	D,M
1,2,3,4,7,8,9-HpCDF	3.59	-		0.0359	0.0868	Total HxCDF	95.3	-	D,M
OCDF	147	-		0.0441	0.156	Total HpCDF	170	-	

Internal Standards	% Rec	QC Limits	Qual
13C-2,3,7,8-TCDD	92.7	25.0 - 164	
13C-1,2,3,7,8-PeCDD	92.3	25.0 - 181	
13C-1,2,3,4,7,8-HxCDD	95.7	32.0 - 141	
13C-1,2,3,6,7,8-HxCDD	93.8	28.0 - 130	
13C-1,2,3,4,6,7,8-HpCDD	90.8	23.0 - 140	
13C-OCDD	82.9	17.0 - 157	
13C-2,3,7,8-TCDF	92.7	24.0 - 169	
13C-1,2,3,7,8-PeCDF	87.9	24.0 - 185	
13C-2,3,4,7,8-PeCDF	92.9	21.0 - 178	
13C-1,2,3,4,7,8-HxCDF	82.6	26.0 - 152	
13C-1,2,3,6,7,8-HxCDF	78.7	26.0 - 123	
13C-2,3,4,6,7,8-HxCDF	85.4	28.0 - 136	
13C-1,2,3,7,8,9-HxCDF	87.4	29.0 - 147	
13C-1,2,3,4,6,7,8-HpCDF	75.1	28.0 - 143	
13C-1,2,3,4,7,8,9-HpCDF	88.0	26.0 - 138	
13C-OCDF	82.6	17.0 - 157	
Cleanup Surrogate			
37Cl-2,3,7,8-TCDD	85.2	35.0 - 197	

A	Isotopic Labeled Standard outside QC range but signal to noise ratio is >10:1
B	Analyte is present in Method Blank
C	Chemical Interference
D	Presence of Diphenyl Ethers
DNQ	Analyte concentration is below calibration range
E	Analyte concentration is above calibration range
F	Analyte confirmation on secondary column
J	Analyte concentration is below calibration range
M	Maximum possible concentration
ND	Analyte Not Detected at Detection Limit Level
NP	Not Provided
P	Pre-filtered through a Whatman 0.7um GF/F filter
S	Sample acceptance criteria not met
X	Matrix interferences
*	Result taken from dilution or reinjection

Analyst: [signature]

Date: 3/2/2020

Reviewed By: DPV

Date: 3/2/2020

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SUBCONTRACT SAMPLE CHAIN OF CUSTODY

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER Frontier

PROJECT NAME/NO.	PO #
002211	B-150

REMARKS 12963
1°C

Page # 1 of 1

TURNAROUND TIME
- ☒ Standard TAT
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	1613 Dioxins/Furans	EPH	VPH								Notes
TP-03-021420		2/14/20	1010	Soil	2	X										

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: [signature]	Michael Erdahl	Friedman & Bruya	2/17/20	0903
Received by: Kathy Zoop	Kathy Zoop	Frontier	02/18/2020	910
Relinquished by:				
Received by:				

ANALYTICAL LABORATORY

Frontier Analytical Laboratory

Sample Login Form

FAL Project ID: **12963**

Client:	Friedman & Bruya, Inc.
Client Project ID:	002211
Date Received:	02/18/2020
Time Received:	09:10 am
Received By:	KZ
Logged In By:	KZ
# of Samples Received:	1
Duplicates:	1
Storage Location:	R-4

Method of Delivery:	Fed-Ex
Tracking Number:	813795596972
Shipping Container Received Intact	Yes
Custody seals(s) present?	No
Custody seals(s) intact?	No
Sample Arrival Temperature (C)	1
Cooling Method	Blue Ice
Chain Of Custody Present?	Yes
Return Shipping Container To Client	Yes
Test aqueous sample for residual Chlorine	No
Sodium Thiosulfate Added	No
Adequate Sample Volume	Yes
Appropriate Sample Container	Yes
pH Range of Aqueous Sample	N/A
Anomalies or additional comments:	

5172 Hillsdale Circle * El Dorado Hills, CA 95762 * Tel (916) 934-0900 * Fax (916) 934-0999 * www.frontieranalytical.com


CHAIN OF CUSTODY
Send Report To Michael Erdahl
Company Friedman and Bruya, Inc.
Address 3012 16th Ave W
City, State, ZIP Seattle, WA 98119
Phone # (206) 285-8282 merdahl@friedmanandbruya.com
SUBCONTRACTER Frontier
PROJECT NAME/NO. 002211
PO # B-150
REMARKS 12963 1°C
Page # 1 of 1
TURNAROUND TIME
Standard TAT
RUSH
Rush charges authorized by:
SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions
ANALYSES REQUESTED
Sample ID
Lab ID
Date Sampled
Time Sampled
Matrix
# of jars
1613 Dioxins/Furans
EPH
VPH
Notes
TP-03-021420 2/14/20 1010 Soil 2 X
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044
COMPANY
DATE
TIME
& Bruya
2/17/20 0903
02/18/2020 910
2211 -03 G
2211 -03 H
Frontier Analytical Laboratory
12963-001-SA
Client ID:TP-03-021420
Storage: R-4
(01 of 02)
Frontier Analytical Laboratory
12963-001-SA
Client ID: TP-03-021420
Storage: R-4
(02 of 02)
Client: Aspect
Sample ID: TP-03-021420
Date/Time: 2/14/20 1010
Project: 150074
2020/02/18

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
Eric Young, B.S.

3012 16th Avenue West
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March 3, 2020

Ali Cochrane, Project Manager
Aspect Consulting, LLC
710 2nd Ave S, Suite 550
Seattle, WA 98104

Dear Ms Cochrane:

Included are the results from the testing of material submitted on February 14, 2020 from the Shelton C St. Landfill 150074, F&BI 002211 project. There are 27 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Data Aspect
ASP0303R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on February 14, 2020 by Friedman & Bruya, Inc. from the Aspect Consulting, LLC Shelton C St. Landfill 150074, F&BI 002211 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Aspect Consulting, LLC
002211 -01	TP-01-021420
002211 -02	TP-02-021420
002211 -03	TP-03-021420
002211 -04	TP-04-021420
002211 -05	TP-03-1.0

Samples TP-01-021420, TP-02-021420, TP-03-021420, and TP-04-021420 were sent to Fremont Analytical for chlorinated herbicide analysis. In addition, sample TP-03-021420 was sent to Frontier Analytical for dioxin and furan analysis. The Fremont report is enclosed, and the report from Frontier Analytical will be forwarded upon receipt.

The 8081B calibration standard failed the acceptance criteria for several analytes. The data were flagged accordingly. In addition, several analytes in the matrix spike and matrix spike duplicate failed the acceptance criteria. The laboratory control sample passed the acceptance criteria, therefore the results were due to matrix effect.

All other quality control requirements were acceptable.

Date of Report: 03/03/20
Date Received: 02/14/20
Project: Shelton C St. Landfill 150074, F&BI 002211
Date Extracted: 02/20/20
Date Analyzed: 02/20/20

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES AND TPH AS GASOLINE USING METHODS 8021B AND NWTPH-Gx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Gasoline Range	Surrogate (% Recovery) (Limit 50-150)
TP-03-1.0 002211-05	<0.02	<0.02	<0.02	<0.06	<5	82
Method Blank 02-20-20 07:19	<0.02	<0.02	<0.02	<0.06	<5	83

Date of Report: 03/03/20
Date Received: 02/14/20
Project: Shelton C St. Landfill 150074, F&BI 002211
Date Extracted: 02/17/20
Date Analyzed: 02/17/20

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL AND MOTOR OIL USING METHOD NWTPH-Dx

Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Diesel Range (C_{10}-C_{25})	Motor Oil Range (C_{25}-C_{36})	Surrogate (% Recovery) (Limit 48-168)
TP-01-021420 002211-01	<50	<250	70
TP-02-021420 002211-02	<50	460	77
TP-03-021420 002211-03	<50	<250	78
TP-04-021420 002211-04	<50	<250	73
Method Blank 00-433 MB	<50	<250	71

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 6020B

Client ID:	TP-01-021420	Client:	Aspect Consulting, LLC
Date Received:	02/14/20	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/18/20	Lab ID:	002211-01
Date Analyzed:	02/18/20	Data File:	002211-01.097
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.08
Cadmium	1.16
Chromium	32.4
Lead	153

Analysis For Total Metals By EPA Method 6020B

Client ID:	TP-02-021420	Client:	Aspect Consulting, LLC
Date Received:	02/14/20	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/18/20	Lab ID:	002211-02
Date Analyzed:	02/18/20	Data File:	002211-02.098
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.02
Cadmium	<1
Chromium	34.5
Lead	62.2

Analysis For Total Metals By EPA Method 6020B

Client ID:	TP-03-021420	Client:	Aspect Consulting, LLC
Date Received:	02/14/20	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/18/20	Lab ID:	002211-03
Date Analyzed:	02/18/20	Data File:	002211-03.099
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.45
Cadmium	<1
Chromium	35.7
Lead	29.5

Analysis For Total Metals By EPA Method 6020B

Client ID:	TP-04-021420	Client:	Aspect Consulting, LLC
Date Received:	02/14/20	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/18/20	Lab ID:	002211-04
Date Analyzed:	02/18/20	Data File:	002211-04.100
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.50
Cadmium	<1
Chromium	33.7
Lead	33.9

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	NA	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/18/20	Lab ID:	I0-098 mb
Date Analyzed:	02/18/20	Data File:	I0-098 mb.061
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Cadmium	<1
Chromium	<1
Lead	<1

Date of Report: 03/03/20
Date Received: 02/14/20
Project: Shelton C St. Landfill 150074, F&BI 002211
Date Extracted: 02/24/20
Date Analyzed: 02/24/20

RESULTS FROM THE ANALYSIS OF SOIL SAMPLES
FOR TOTAL MERCURY
USING EPA METHOD 1631E
Results Reported on a Dry Weight Basis
Results Reported as mg/kg (ppm)

Sample ID Laboratory ID	Total Mercury
TP-01-021420 002211-01	0.15
TP-02-021420 002211-02	<0.1
TP-03-021420 002211-03	0.14
TP-04-021420 002211-04	<0.1
Method Blank	<0.1

Analysis For Semivolatile Compounds By EPA Method 8270E SIM

Client Sample ID:	TP-01-021420	Client:	Aspect Consulting, LLC
Date Received:	02/14/20	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/17/20	Lab ID:	002211-01 1/25
Date Analyzed:	02/17/20	Data File:	021708.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	85 d	31	163
Benzo(a)anthracene-d12	89 d	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	0.086
Pyrene	0.086
Benz(a)anthracene	0.056
Chrysene	0.070
Benzo(a)pyrene	0.080
Benzo(b)fluoranthene	0.080
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	0.053
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Analysis For Semivolatile Compounds By EPA Method 8270E SIM

Client Sample ID:	TP-02-021420	Client:	Aspect Consulting, LLC
Date Received:	02/14/20	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/17/20	Lab ID:	002211-02 1/25
Date Analyzed:	02/17/20	Data File:	021709.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	83 d	31	163
Benzo(a)anthracene-d12	91 d	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	0.085
Pyrene	0.086
Benz(a)anthracene	<0.05
Chrysene	0.051
Benzo(a)pyrene	<0.05
Benzo(b)fluoranthene	0.050
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Analysis For Semivolatile Compounds By EPA Method 8270E SIM

Client Sample ID:	TP-03-021420	Client:	Aspect Consulting, LLC
Date Received:	02/14/20	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/17/20	Lab ID:	002211-03 1/25
Date Analyzed:	02/17/20	Data File:	021710.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	88 d	31	163
Benzo(a)anthracene-d12	96 d	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	<0.05
Pyrene	<0.05
Benz(a)anthracene	<0.05
Chrysene	<0.05
Benzo(a)pyrene	<0.05
Benzo(b)fluoranthene	<0.05
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Analysis For Semivolatile Compounds By EPA Method 8270E SIM

Client Sample ID:	TP-04-021420	Client:	Aspect Consulting, LLC
Date Received:	02/14/20	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/17/20	Lab ID:	002211-04 1/25
Date Analyzed:	02/17/20	Data File:	021711.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	84 d	31	163
Benzo(a)anthracene-d12	100 d	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.05
Acenaphthylene	<0.05
Acenaphthene	<0.05
Fluorene	<0.05
Phenanthrene	<0.05
Anthracene	<0.05
Fluoranthene	0.083
Pyrene	0.069
Benz(a)anthracene	<0.05
Chrysene	<0.05
Benzo(a)pyrene	<0.05
Benzo(b)fluoranthene	<0.05
Benzo(k)fluoranthene	<0.05
Indeno(1,2,3-cd)pyrene	<0.05
Dibenz(a,h)anthracene	<0.05
Benzo(g,h,i)perylene	<0.05

Analysis For Semivolatile Compounds By EPA Method 8270E SIM

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/17/20	Lab ID:	00-437 mb 1/5
Date Analyzed:	02/17/20	Data File:	021707.D
Matrix:	Soil	Instrument:	GCMS6
Units:	mg/kg (ppm) Dry Weight	Operator:	VM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
Anthracene-d10	72	31	163
Benzo(a)anthracene-d12	88	24	168

Compounds:	Concentration mg/kg (ppm)
Naphthalene	<0.01
Acenaphthylene	<0.01
Acenaphthene	<0.01
Fluorene	<0.01
Phenanthrene	<0.01
Anthracene	<0.01
Fluoranthene	<0.01
Pyrene	<0.01
Benz(a)anthracene	<0.01
Chrysene	<0.01
Benzo(a)pyrene	<0.01
Benzo(b)fluoranthene	<0.01
Benzo(k)fluoranthene	<0.01
Indeno(1,2,3-cd)pyrene	<0.01
Dibenz(a,h)anthracene	<0.01
Benzo(g,h,i)perylene	<0.01

Analysis For Organochlorine Pesticides By EPA Method 8081B

Client Sample ID:	TP-01-021420	Client:	Aspect Consulting, LLC
Date Received:	02/14/20	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/19/20	Lab ID:	002211-01 1/6
Date Analyzed:	02/19/20	Data File:	021913.D
Matrix:	Soil	Instrument:	GC9
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	73	50	150
DBC	74	50	150

Compounds:	Concentration mg/kg (ppm)
alpha-BHC	<0.01
gamma-BHC (Lindane)	<0.01
beta-BHC	<0.01
delta-BHC	<0.01
Heptachlor	<0.01 ca
Aldrin	<0.01
Heptachlor Epoxide	0.027
trans-Chlordane	0.011
cis-Chlordane	0.011
4,4'-DDE	<0.01
Endosulfan I	<0.01
Dieldrin	0.011
Endrin	<0.01 ca
4,4'-DDD	<0.01
Endosulfan II	<0.01
4,4'-DDT	0.037 ca
Endrin Aldehyde	<0.01
Methoxychlor	<0.01 ca
Endosulfan Sulfate	<0.01
Endrin Ketone	<0.01 ca
Toxaphene	<1 ca

Note: Heptachlor Epoxide RPD between primary and confirmation column is 130%.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Organochlorine Pesticides By EPA Method 8081B

Client Sample ID:	TP-02-021420	Client:	Aspect Consulting, LLC
Date Received:	02/14/20	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/19/20	Lab ID:	002211-02 1/6
Date Analyzed:	02/19/20	Data File:	021914.D
Matrix:	Soil	Instrument:	GC9
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	63	50	150
DBC	59	50	150

Compounds:	Concentration mg/kg (ppm)
alpha-BHC	<0.01
gamma-BHC (Lindane)	<0.01
beta-BHC	<0.01
delta-BHC	<0.01
Heptachlor	<0.01 ca
Aldrin	<0.01
Heptachlor Epoxide	<0.01
trans-Chlordane	<0.01
cis-Chlordane	<0.01
4,4'-DDE	<0.01
Endosulfan I	<0.01
Dieldrin	<0.01
Endrin	<0.01 ca
4,4'-DDD	<0.01
Endosulfan II	<0.01
4,4'-DDT	<0.01 ca
Endrin Aldehyde	<0.01
Methoxychlor	<0.01 ca
Endosulfan Sulfate	<0.01
Endrin Ketone	<0.01 ca
Toxaphene	<1 ca

Analysis For Organochlorine Pesticides By EPA Method 8081B

Client Sample ID:	TP-03-021420	Client:	Aspect Consulting, LLC
Date Received:	02/14/20	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/19/20	Lab ID:	002211-03 1/6
Date Analyzed:	02/19/20	Data File:	021915.D
Matrix:	Soil	Instrument:	GC9
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	69	50	150
DBC	71	50	150

Compounds:	Concentration mg/kg (ppm)
alpha-BHC	<0.01
gamma-BHC (Lindane)	<0.01
beta-BHC	<0.01
delta-BHC	<0.01
Heptachlor	<0.01 ca
Aldrin	<0.01
Heptachlor Epoxide	<0.01
trans-Chlordane	<0.01
cis-Chlordane	0.012
4,4'-DDE	<0.01
Endosulfan I	<0.01
Dieldrin	<0.01
Endrin	<0.01 ca
4,4'-DDD	<0.01
Endosulfan II	<0.01
4,4'-DDT	<0.01 ca
Endrin Aldehyde	<0.01
Methoxychlor	<0.01 ca
Endosulfan Sulfate	<0.01
Endrin Ketone	<0.01 ca
Toxaphene	<1 ca

Analysis For Organochlorine Pesticides By EPA Method 8081B

Client Sample ID:	TP-04-021420	Client:	Aspect Consulting, LLC
Date Received:	02/14/20	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/19/20	Lab ID:	002211-04 1/6
Date Analyzed:	02/19/20	Data File:	021916.D
Matrix:	Soil	Instrument:	GC9
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	83	50	150
DBC	77	50	150

Compounds:	Concentration mg/kg (ppm)
alpha-BHC	<0.01
gamma-BHC (Lindane)	<0.01
beta-BHC	<0.01
delta-BHC	<0.01
Heptachlor	<0.01 ca
Aldrin	<0.01
Heptachlor Epoxide	<0.01
trans-Chlordane	<0.01
cis-Chlordane	<0.01
4,4'-DDE	<0.01
Endosulfan I	<0.01
Dieldrin	<0.01
Endrin	<0.01 ca
4,4'-DDD	<0.01
Endosulfan II	<0.01
4,4'-DDT	<0.01 ca
Endrin Aldehyde	<0.01
Methoxychlor	<0.01 ca
Endosulfan Sulfate	<0.01
Endrin Ketone	<0.01 ca
Toxaphene	<1 ca

Analysis For Organochlorine Pesticides By EPA Method 8081B

Client Sample ID:	Method Blank	Client:	Aspect Consulting, LLC
Date Received:	Not Applicable	Project:	Shelton C St. Landfill 150074
Date Extracted:	02/19/20	Lab ID:	00-438 mb 1/6
Date Analyzed:	02/19/20	Data File:	021906.D
Matrix:	Soil	Instrument:	GC9
Units:	mg/kg (ppm) Dry Weight	Operator:	IJL

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
TCMX	88	50	150
DBC	88	50	150

Compounds:	Concentration mg/kg (ppm)
alpha-BHC	<0.01
gamma-BHC (Lindane)	<0.01
beta-BHC	<0.01
delta-BHC	<0.01
Heptachlor	<0.01
Aldrin	<0.01
Heptachlor Epoxide	<0.01
trans-Chlordane	<0.01
cis-Chlordane	<0.01
4,4'-DDE	<0.01
Endosulfan I	<0.01
Dieldrin	<0.01
Endrin	<0.01
4,4'-DDD	<0.01
Endosulfan II	<0.01
4,4'-DDT	<0.01
Endrin Aldehyde	<0.01
Methoxychlor	<0.01
Endosulfan Sulfate	<0.01
Endrin Ketone	<0.01
Toxaphene	<1

Date of Report: 03/03/20
Date Received: 02/14/20
Project: Shelton C St. Landfill 150074, F&BI 002211

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR BENZENE, TOLUENE, ETHYLBENZENE, XYLENES, AND TPH AS GASOLINE USING EPA METHOD 8021B AND NWTPH-Gx

Laboratory Code: 002211-05 (Duplicate)

Analyte	Reporting Units	Sample Result (Wet Wt)	Duplicate Result (Wet Wt)	RPD (Limit 20)
Benzene	mg/kg (ppm)	<0.02	<0.02	nm
Toluene	mg/kg (ppm)	<0.02	<0.02	nm
Ethylbenzene	mg/kg (ppm)	<0.02	<0.02	nm
Xylenes	mg/kg (ppm)	<0.06	<0.06	nm
Gasoline	mg/kg (ppm)	<5	<5	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Benzene	mg/kg (ppm)	0.5	96	69-120
Toluene	mg/kg (ppm)	0.5	96	70-117
Ethylbenzene	mg/kg (ppm)	0.5	98	65-123
Xylenes	mg/kg (ppm)	1.5	93	66-120
Gasoline	mg/kg (ppm)	20	105	71-131

Date of Report: 03/03/20
Date Received: 02/14/20
Project: Shelton C St. Landfill 150074, F&BI 002211

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF SOIL SAMPLES FOR TOTAL PETROLEUM HYDROCARBONS AS DIESEL EXTENDED USING METHOD NWTPH-Dx

Laboratory Code: 002207-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet Wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Diesel Extended	mg/kg (ppm)	5,000	<50	116	104	73-135	11

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Diesel Extended	mg/kg (ppm)	5,000	102	74-139

Date of Report: 03/03/20
Date Received: 02/14/20
Project: Shelton C St. Landfill 150074, F&BI 002211

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 002223-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Arsenic	mg/kg (ppm)	10	30.1	0 b	0 b	75-125	0 b
Cadmium	mg/kg (ppm)	10	<1	98	95	75-125	3
Chromium	mg/kg (ppm)	50	13.6	88	81	75-125	8
Lead	mg/kg (ppm)	50	18.6	77 b	72 b	75-125	7 b

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	81	80-120
Cadmium	mg/kg (ppm)	10	100	80-120
Chromium	mg/kg (ppm)	50	104	80-120
Lead	mg/kg (ppm)	50	106	80-120

Date of Report: 03/03/20
Date Received: 02/14/20
Project: Shelton C St. Landfill 150074, F&BI 002211

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL MERCURY USING EPA METHOD 1631E

Laboratory Code: 002211-04 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result (Wet wt)	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
Mercury	mg/kg (ppm)	0.125	<0.1	98	96	71-125	2

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Mercury	mg/kg (ppm)	0.125	100	68-125

Date of Report: 03/03/20
Date Received: 02/14/20
Project: Shelton C St. Landfill 150074, F&BI 002211

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR PAHS BY EPA METHOD 8270E SIM

Laboratory Code: Laboratory Control Sample 1/5

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Naphthalene	mg/kg (ppm)	0.17	82	85	58-121	4
Acenaphthylene	mg/kg (ppm)	0.17	86	89	54-121	3
Acenaphthene	mg/kg (ppm)	0.17	85	88	54-123	3
Fluorene	mg/kg (ppm)	0.17	86	91	56-127	6
Phenanthrene	mg/kg (ppm)	0.17	87	90	55-122	3
Anthracene	mg/kg (ppm)	0.17	85	93	50-120	9
Fluoranthene	mg/kg (ppm)	0.17	92	96	54-129	4
Pyrene	mg/kg (ppm)	0.17	88	89	53-127	1
Benz(a)anthracene	mg/kg (ppm)	0.17	89	93	51-115	4
Chrysene	mg/kg (ppm)	0.17	86	91	55-129	6
Benzo(b)fluoranthene	mg/kg (ppm)	0.17	76	77	56-123	1
Benzo(k)fluoranthene	mg/kg (ppm)	0.17	77	83	54-131	7
Benzo(a)pyrene	mg/kg (ppm)	0.17	78	85	51-118	9
Indeno(1,2,3-cd)pyrene	mg/kg (ppm)	0.17	82	80	49-148	2
Dibenz(a,h)anthracene	mg/kg (ppm)	0.17	90	83	50-141	8
Benzo(g,h,i)perylene	mg/kg (ppm)	0.17	83	76	52-131	9

Date of Report: 03/03/20
Date Received: 02/14/20
Project: Shelton C St. Landfill 150074, F&BI 002211

QUALITY ASSURANCE RESULTS
FOR THE ANALYSIS OF SOIL SAMPLES FOR
ORGANOCHLORINE PESTICIDES
BY EPA METHOD 8081B

Laboratory Code: 002211-04 1/6 (Matrix Spike) 1/6

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Percent Recovery MSD	Acceptance Criteria	RPD (Limit 20)
alpha-BHC	mg/kg (ppm)	0.1	<0.01	25 vo	27 vo	50-150	8
gamma-BHC (Lindane)	mg/kg (ppm)	0.1	<0.01	25 vo	26 vo	50-150	4
beta-BHC	mg/kg (ppm)	0.1	<0.01	26 vo	28 vo	50-150	7
delta-BHC	mg/kg (ppm)	0.1	<0.01	26 vo	28 vo	50-150	7
Heptachlor	mg/kg (ppm)	0.1	<0.01	20 vo	22 vo	50-150	10
Aldrin	mg/kg (ppm)	0.1	<0.01	26 vo	28 vo	50-150	7
Heptachlor Epoxide	mg/kg (ppm)	0.1	<0.01	28 vo	30 vo	50-150	7
trans-Chlordane	mg/kg (ppm)	0.1	<0.01	54	49 vo	50-150	10
cis-Chlordane	mg/kg (ppm)	0.1	<0.01	26 vo	28 vo	50-150	7
4,4'-DDE	mg/kg (ppm)	0.1	<0.01	27 vo	29 vo	50-150	7
Endosulfan I	mg/kg (ppm)	0.1	<0.01	27 vo	29 vo	50-150	7
Dieldrin	mg/kg (ppm)	0.1	<0.01	28 vo	29 vo	50-150	4
Endrin	mg/kg (ppm)	0.1	<0.01	26 vo	28 vo	50-150	7
4,4'-DDD	mg/kg (ppm)	0.1	<0.01	34 vo	33 vo	50-150	3
Endosulfan II	mg/kg (ppm)	0.1	<0.01	30 vo	30 vo	50-150	0
4,4'-DDT	mg/kg (ppm)	0.1	<0.01	9 vo	12 vo	50-150	29 vo
Endrin Aldehyde	mg/kg (ppm)	0.1	<0.01	23 vo	28 vo	50-150	20
Methoxychlor	mg/kg (ppm)	0.1	<0.01	13 vo	15 vo	50-150	14
Endosulfan Sulfate	mg/kg (ppm)	0.1	<0.01	24 vo	29 vo	50-150	19
Endrin Ketone	mg/kg (ppm)	0.1	<0.01	19 vo	22 vo	50-150	15
Toxaphene	mg/kg (ppm)	4	<1	45 vo	42 vo	50-150	7

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 03/03/20
Date Received: 02/14/20
Project: Shelton C St. Landfill 150074, F&BI 002211

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR ORGANOCHLORINE PESTICIDES BY EPA METHOD 8081B

Laboratory Code: Laboratory Control Sample 1/6

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
alpha-BHC	mg/kg (ppm)	0.1	86	70-130
gamma-BHC (Lindane)	mg/kg (ppm)	0.1	88	70-130
beta-BHC	mg/kg (ppm)	0.1	88	70-130
delta-BHC	mg/kg (ppm)	0.1	91	70-130
Heptachlor	mg/kg (ppm)	0.1	87	70-130
Aldrin	mg/kg (ppm)	0.1	89	70-130
Heptachlor Epoxide	mg/kg (ppm)	0.1	90	70-130
trans-Chlordane	mg/kg (ppm)	0.1	92	70-130
cis-Chlordane	mg/kg (ppm)	0.1	92	70-130
4,4'-DDE	mg/kg (ppm)	0.1	92	70-130
Endosulfan I	mg/kg (ppm)	0.1	91	70-130
Dieldrin	mg/kg (ppm)	0.1	93	70-130
Endrin	mg/kg (ppm)	0.1	93	70-130
4,4'-DDD	mg/kg (ppm)	0.1	89	70-130
Endosulfan II	mg/kg (ppm)	0.1	92	70-130
4,4'-DDT	mg/kg (ppm)	0.1	97	70-130
Endrin Aldehyde	mg/kg (ppm)	0.1	94	70-130
Methoxychlor	mg/kg (ppm)	0.1	101	70-130
Endosulfan Sulfate	mg/kg (ppm)	0.1	93	70-130
Endrin Ketone	mg/kg (ppm)	0.1	93	70-130
Toxaphene	mg/kg (ppm)	4	86	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 002211
Work Order Number: 2002273

March 02, 2020

Attention Michael Erdahl:

Fremont Analytical, Inc. received 4 sample(s) on 2/17/2020 for the analyses presented in the following report.

Herbicides by EPA Method 8151A
Sample Moisture (Percent Moisture)

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

DoD/ELAP Certification #L17-135, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

CLIENT:	Friedman & Bruya
Project:	002211
Work Order:	2002273

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2002273-001	TP-01-021420	02/14/2020 8:55 AM	02/17/2020 9:33 AM
2002273-002	TP-02-021420	02/14/2020 9:40 AM	02/17/2020 9:33 AM
2002273-003	TP-03-021420	02/14/2020 10:10 AM	02/17/2020 9:33 AM
2002273-004	TP-04-021420	02/14/2020 10:55 AM	02/17/2020 9:33 AM

Case Narrative

WO#: **2002273**

Date: **3/2/2020**

CLIENT: Friedman & Bruya

Project: 002211

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Fremont Analytical

Analytical Report

Work Order: **2002273**
Date Reported: **3/2/2020**

Client: Friedman & Bruya
Project: 002211
Lab ID: 2002273-001
Client Sample ID: **TP-01-021420**

Collection Date: 2/14/2020 8:55:00 AM
Matrix: Soil

Herbicides by EPA Method 8151A

Batch ID: 27511 Analyst: SB

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dicamba	ND	40.4		µg/Kg-dry	1	2/25/2020 4:49:16 PM
2,4-D	ND	34.6		µg/Kg-dry	1	2/25/2020 4:49:16 PM
2,4-DP	ND	28.8		µg/Kg-dry	1	2/25/2020 4:49:16 PM
2,4,5-TP (Silvex)	ND	23.1		µg/Kg-dry	1	2/25/2020 4:49:16 PM
2,4,5-T	ND	57.7		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Dinoseb	ND	34.6		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Dalapon	ND	231	Q	µg/Kg-dry	1	2/25/2020 4:49:16 PM
2,4-DB	ND	28.8		µg/Kg-dry	1	2/25/2020 4:49:16 PM
MCPP	ND	5,080		µg/Kg-dry	1	2/25/2020 4:49:16 PM
MCPA	ND	3,230		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Picloram	ND	57.7	Q	µg/Kg-dry	1	2/25/2020 4:49:16 PM
Bentazon	ND	40.4		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Chloramben	ND	23.1		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Acifluorfen	ND	92.3	Q	µg/Kg-dry	1	2/25/2020 4:49:16 PM
3,5-Dichlorobenzoic acid	ND	46.2		µg/Kg-dry	1	2/25/2020 4:49:16 PM
4-Nitrophenol	ND	34.6		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Dacthal (DCPA)	ND	34.6		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Surr: 2,4-Dichlorophenylacetic acid	76.0	15.3 - 163		%Rec	1	2/25/2020 4:49:16 PM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample Moisture (Percent Moisture)

Batch ID: R57485 Analyst: MM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Percent Moisture	15.2	0.500		wt%	1	2/20/2020 9:59:07 AM

Analytical Report

Work Order: **2002273**
Date Reported: **3/2/2020**

Client: Friedman & Bruya
Project: 002211
Lab ID: 2002273-002
Client Sample ID: **TP-02-021420**

Collection Date: 2/14/2020 9:40:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 27511		Analyst: SB
Dicamba	ND	41.7		µg/Kg-dry	1	2/25/2020 5:09:49 PM
2,4-D	ND	35.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
2,4-DP	ND	29.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
2,4,5-TP (Silvex)	ND	23.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
2,4,5-T	ND	59.6		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Dinoseb	ND	35.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Dalapon	ND	238	Q	µg/Kg-dry	1	2/25/2020 5:09:49 PM
2,4-DB	ND	29.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
MCPP	ND	5,250		µg/Kg-dry	1	2/25/2020 5:09:49 PM
MCPA	ND	3,340		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Picloram	ND	59.6	Q	µg/Kg-dry	1	2/25/2020 5:09:49 PM
Bentazon	ND	41.7		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Chloramben	ND	23.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Acifluorfen	ND	95.4	Q	µg/Kg-dry	1	2/25/2020 5:09:49 PM
3,5-Dichlorobenzoic acid	ND	47.7		µg/Kg-dry	1	2/25/2020 5:09:49 PM
4-Nitrophenol	ND	35.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Dacthal (DCPA)	ND	35.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Surr: 2,4-Dichlorophenylacetic acid	54.3	15.3 - 163		%Rec	1	2/25/2020 5:09:49 PM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Sample Moisture (Percent Moisture)				Batch ID: R57485		Analyst: MM
Percent Moisture	17.6	0.500		wt%	1	2/20/2020 9:59:07 AM

Analytical Report

Fremont Analytical

Work Order: **2002273**
Date Reported: **3/2/2020**

Client: Friedman & Bruya
Collection Date: 2/14/2020 10:10:00 AM
Project: 002211
Lab ID: 2002273-003
Matrix: Soil
Client Sample ID: TP-03-021420

Analyses	Result	RL	Qual	Units	DF	Date Analyzed

Herbicides by EPA Method 8151A Batch ID: 27511 Analyst: SB

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dicamba	ND	41.6		µg/Kg-dry	1	2/25/2020 5:30:15 PM
2,4-D	ND	35.6		µg/Kg-dry	1	2/25/2020 5:30:15 PM
2,4-DP	ND	29.7		µg/Kg-dry	1	2/25/2020 5:30:15 PM
2,4,5-TP (Silvex)	ND	23.7		µg/Kg-dry	1	2/25/2020 5:30:15 PM
2,4,5-T	ND	59.4		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Dinoseb	ND	35.6		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Dalapon	ND	237	Q	µg/Kg-dry	1	2/25/2020 5:30:15 PM
2,4-DB	ND	29.7		µg/Kg-dry	1	2/25/2020 5:30:15 PM
MCPP	ND	5,220		µg/Kg-dry	1	2/25/2020 5:30:15 PM
MCPA	ND	3,320		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Picloram	ND	59.4	Q	µg/Kg-dry	1	2/25/2020 5:30:15 PM
Bentazon	ND	41.6		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Chloramben	ND	23.7		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Acifluorfen	ND	95.0	Q	µg/Kg-dry	1	2/25/2020 5:30:15 PM
3,5-Dichlorobenzoic acid	ND	47.5		µg/Kg-dry	1	2/25/2020 5:30:15 PM
4-Nitrophenol	ND	35.6		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Dacthal (DCPA)	ND	35.6		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Surr: 2,4-Dichlorophenylacetic acid	71.1	15.3 - 163		%Rec	1	2/25/2020 5:30:15 PM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample Moisture (Percent Moisture) Batch ID: R57485 Analyst: MM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Percent Moisture	15.9	0.500		wt%	1	2/20/2020 9:59:07 AM

Analytical Report

Work Order: **2002273**
Date Reported: **3/2/2020**

Client: Friedman & Bruya
Collection Date: 2/14/2020 10:55:00 AM
Project: 002211
Lab ID: 2002273-004
Matrix: Soil
Client Sample ID: TP-04-021420

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 27511		Analyst: SB
Dicamba	ND	41.4		µg/Kg-dry	1	2/25/2020 5:50:42 PM
2,4-D	ND	35.5		µg/Kg-dry	1	2/25/2020 5:50:42 PM
2,4-DP	ND	29.6		µg/Kg-dry	1	2/25/2020 5:50:42 PM
2,4,5-TP (Silvex)	ND	23.7		µg/Kg-dry	1	2/25/2020 5:50:42 PM
2,4,5-T	ND	59.1		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Dinoseb	ND	35.5		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Dalapon	ND	237	Q	µg/Kg-dry	1	2/25/2020 5:50:42 PM
2,4-DB	ND	29.6		µg/Kg-dry	1	2/25/2020 5:50:42 PM
MCPP	ND	5,200		µg/Kg-dry	1	2/25/2020 5:50:42 PM
MCPA	ND	3,310		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Picloram	ND	59.1	Q	µg/Kg-dry	1	2/25/2020 5:50:42 PM
Bentazon	ND	41.4		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Chloramben	ND	23.7		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Acifluorfen	ND	94.6	Q	µg/Kg-dry	1	2/25/2020 5:50:42 PM
3,5-Dichlorobenzoic acid	ND	47.3		µg/Kg-dry	1	2/25/2020 5:50:42 PM
4-Nitrophenol	ND	35.5		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Dacthal (DCPA)	ND	35.5		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Surr: 2,4-Dichlorophenylacetic acid	67.7	15.3 - 163		%Rec	1	2/25/2020 5:50:42 PM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Sample Moisture (Percent Moisture)				Batch ID: R57485		Analyst: MM
Percent Moisture	16.9	0.500		wt%	1	2/20/2020 9:59:07 AM

Fremont *Analytical*

Date: *3/2/2020*

Work Order: 2002273
CLIENT: Friedman & Bruya
Project: 002211

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID: **MB-27511**	SampType: **MBLK**		Units: **µg/Kg**		Prep Date: **2/19/2020**		RunNo: **57630**				
Client ID: **MBLKS**	Batch ID: **27511**				Analysis Date: **2/25/2020**		SeqNo: **1150345**				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	ND	35.0									
2,4-D	ND	30.0									
2,4-DP	ND	25.0									
2,4,5-TP (Silvex)	ND	20.0									
2,4,5-T	ND	50.0									
Dinoseb	ND	30.0									
Dalapon	ND	200									Q
2,4-DB	ND	25.0									
MCPP	ND	4,400									
MCPA	ND	2,800									
Picloram	ND	50.0									Q
Bentazon	ND	35.0									
Chloramben	ND	20.0									
Acifluorfen	ND	80.0									Q
3,5-Dichlorobenzoic acid	ND	40.0									
4-Nitrophenol	ND	30.0									
Dacthal (DCPA)	ND	30.0									
Surr: 2,4-Dichlorophenylacetic acid	1,050		1,000		105	15.3	163				

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: **LCS-27511**	SampType: **LCS**		Units: **µg/Kg**		Prep Date: **2/19/2020**		RunNo: **57630**				
Client ID: **LCSS**	Batch ID: **27511**				Analysis Date: **2/25/2020**		SeqNo: **1150346**				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	198	35.0	200.0	0	99.1	21.2	167				
2,4-D	220	30.0	200.0	0	110	32	176				
2,4-DP	202	25.0	200.0	0	101	25.8	171				
2,4,5-TP (Silvex)	214	20.0	200.0	0	107	23.6	164				
2,4,5-T	215	50.0	200.0	0	108	25	166				
Dinoseb	71.9	30.0	200.0	0	36.0	5	168				

Date: *3/2/2020*

Work Order: 2002273
CLIENT: Friedman & Bruya
Project: 002211

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID: **LCS-27511**	SampType: **LCS**		Units: **µg/Kg**		Prep Date: **2/19/2020**		RunNo: **57630**			
Client ID: **LCSS**	Batch ID: **27511**				Analysis Date: **2/25/2020**		SeqNo: **1150346**			
Analyte	**Result**	**RL**	**SPK value**	**SPK Ref Val**	**%REC**	**LowLimit**	**HighLimit**	**RPD Ref Val**	**%RPD**	**RPDLimit**	**Qual**
Dalapon	843	200	1,000	0	84.3	29.2	195				
2,4-DB	216	25.0	200.0	0	108	8.11	184				
MCPP	1200	4,400	1,000	0	120	17.3	191				
MCPA	1210	2,800	1,000	0	121	13.6	192				
Picloram	229	50.0	200.0	0	114	5	175				
Bentazon	213	35.0	200.0	0	107	21.5	170				
Chloramben	117	20.0	200.0	0	58.4	5	114				
Acifluorfen	102	80.0	200.0	0	51.2	5	168				
3,5-Dichlorobenzoic acid	204	40.0	200.0	0	102	26.2	174				
4-Nitrophenol	227	30.0	200.0	0	114	5.02	160				
Dacthal (DCPA)	207	30.0	200.0	0	103	18	168				
Surr: 2,4-Dichlorophenylacetic acid	1,090		1,000		109	15.3	163				

Sample ID: **2002204-034ADUP**	SampType: **DUP**		Units: **µg/Kg-dry**		Prep Date: **2/19/2020**		RunNo: **57630**			
Client ID: **BATCH**	Batch ID: **27511**				Analysis Date: **2/25/2020**		SeqNo: **1150348**			
Analyte	**Result**	**RL**	**SPK value**	**SPK Ref Val**	**%REC**	**LowLimit**	**HighLimit**	**RPD Ref Val**	**%RPD**	**RPDLimit**	**Qual**
Dicamba	ND	59.4						0	0	30	
2,4-D	ND	50.9						0	0	30	
2,4-DP	ND	42.4						0	0	30	
2,4,5-TP (Silvex)	ND	33.9						0	0	30	
2,4,5-T	ND	84.8						0	0	30	
Dinoseb	ND	50.9						0	0	30	
Dalapon	ND	339						0	0	30	Q
2,4-DB	ND	42.4						0	0	30	
MCPP	ND	7,470						0	0	30	
MCPA	ND	4,750						0	0	30	
Picloram	ND	84.8						0	0	30	Q
Bentazon	ND	59.4						0	0	30	
Chloramben	ND	33.9						0	0	30	

Date: *3/2/2020*

Work Order: 2002273
CLIENT: Friedman & Bruya
Project: 002211

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID: **2002204-034ADUP** SampType: **DUP** Units: **µg/Kg-dry** Prep Date: **2/19/2020** RunNo: **57630**
Client ID: **BATCH** Batch ID: **27511** Analysis Date: **2/25/2020** SeqNo: **1150348**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acifluorfen	ND	136						0	0	30	Q
3,5-Dichlorobenzoic acid	ND	67.9						0	0	30	
4-Nitrophenol	ND	50.9						0	0	30	
Dacthal (DCPA)	ND	50.9						0	0	30	
Surr: 2,4-Dichlorophenylacetic acid	527		1,697		31.0	15.3	163		0		

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: **2002204-034AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **2/19/2020** RunNo: **57630**
Client ID: **BATCH** Batch ID: **27511** Analysis Date: **2/25/2020** SeqNo: **1150349**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	39.2	59.6	340.4	0	11.5	5	136				
2,4-D	78.3	51.1	340.4	0	23.0	5	151				
2,4-DP	95.3	42.5	340.4	0	28.0	5	149				
2,4,5-TP (Silvex)	123	34.0	340.4	0	36.2	5.43	140				
2,4,5-T	76.5	85.1	340.4	0	22.5	6.68	133				
Dinoseb	192	51.1	340.4	0	56.4	5	141				
Dalapon	118	340	1,702	0	6.96	5	179				
2,4-DB	203	42.5	340.4	0	59.7	5.57	160				
MCPP	746	7,490	1,702	0	43.8	5	174				
MCPA	728	4,770	1,702	0	42.8	5	154				
Picloram	62.0	85.1	340.4	0	18.2	5	139				
Bentazon	138	59.6	340.4	0	40.5	5.31	146				
Chloramben	30.7	34.0	340.4	0	9.02	5	134				
Acifluorfen	65.7	136	340.4	0	19.3	5	168				
3,5-Dichlorobenzoic acid	97.5	68.1	340.4	0	28.6	6.99	144				
4-Nitrophenol	198	51.1	340.4	0	58.3	10.2	139				
Dacthal (DCPA)	9.84	51.1	340.4	0	2.89	5	156				S
Surr: 2,4-Dichlorophenylacetic acid	690		1,702		40.5	15.3	163				

Fremont *Analytical*

Date: *3/2/2020*

Work Order: 2002273
CLIENT: Friedman & Bruya
Project: 002211

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID: **2002204-034AMS**	SampType: **MS**	Units: **µg/Kg-dry**	Prep Date: **2/19/2020**	RunNo: **57630**
Client ID: **BATCH**	Batch ID: **27511**		Analysis Date: **2/25/2020**	SeqNo: **1150349**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: **2002204-034AMSD**	SampType: **MSD**	Units: **µg/Kg-dry**	Prep Date: **2/19/2020**	RunNo: **57630**
Client ID: **BATCH**	Batch ID: **27511**		Analysis Date: **2/25/2020**	SeqNo: **1150350**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	64.3	59.3	338.7	0	19.0	5	136	39.15	48.7	30	
2,4-D	101	50.8	338.7	0	29.8	5	151	78.30	25.2	30	
2,4-DP	119	42.3	338.7	0	35.2	5	149	95.35	22.4	30	
2,4,5-TP (Silvex)	150	33.9	338.7	0	44.4	5.43	140	123.4	19.8	30	
2,4,5-T	103	84.7	338.7	0	30.5	6.68	133	76.46	29.9	30	
Dinoseb	207	50.8	338.7	0	61.1	5	141	192.0	7.45	30	
Dalapon	146	339	1,694	0	8.63	5	179	118.4	21.0	30	
2,4-DB	219	42.3	338.7	0	64.6	5.57	160	203.2	7.42	30	
MCPP	997	7,450	1,694	0	58.9	5	174	746.2	28.8	30	
MCPA	980	4,740	1,694	0	57.9	5	154	727.8	29.6	30	
Picloram	64.2	84.7	338.7	0	19.0	5	139	62.03	3.45	30	
Bentazon	157	59.3	338.7	0	46.4	5.31	146	138.0	12.9	30	
Chloramben	33.5	33.9	338.7	0	9.89	5	134	30.72	8.63	30	
Acifluorfen	113	135	338.7	0	33.5	5	168	65.69	53.4	30	
3,5-Dichlorobenzoic acid	128	67.7	338.7	0	37.9	6.99	144	97.50	27.3	30	
4-Nitrophenol	180	50.8	338.7	0	53.1	10.2	139	198.3	9.69	30	
Dacthal (DCPA)	8.91	50.8	338.7	0	2.63	5	156	9.837	9.85	30	S
Surr: 2,4-Dichlorophenylacetic acid	743		1,694		43.9	15.3	163		0		

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**2002273**
Logged by:	**Carissa True**	Date Received:	**2/17/2020 9:33:00 AM**

Chain of Custody

#	Question	Yes	No	Other
1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

#	Question	Yes	No	Other
3.	Coolers are present?	Yes ☐	No ☑	NA ☐
		No cooler present		
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☑	Not Required ☐
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

#	Question	Yes	No	Other
18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified: ______ Date: ______

By Whom: ______ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: ______

Client Instructions: ______

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample 1	5.9

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2002273

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER Fremont

PROJECT NAME/NO.	PO #
002211	B-111

REMARKS
Aspect EDD

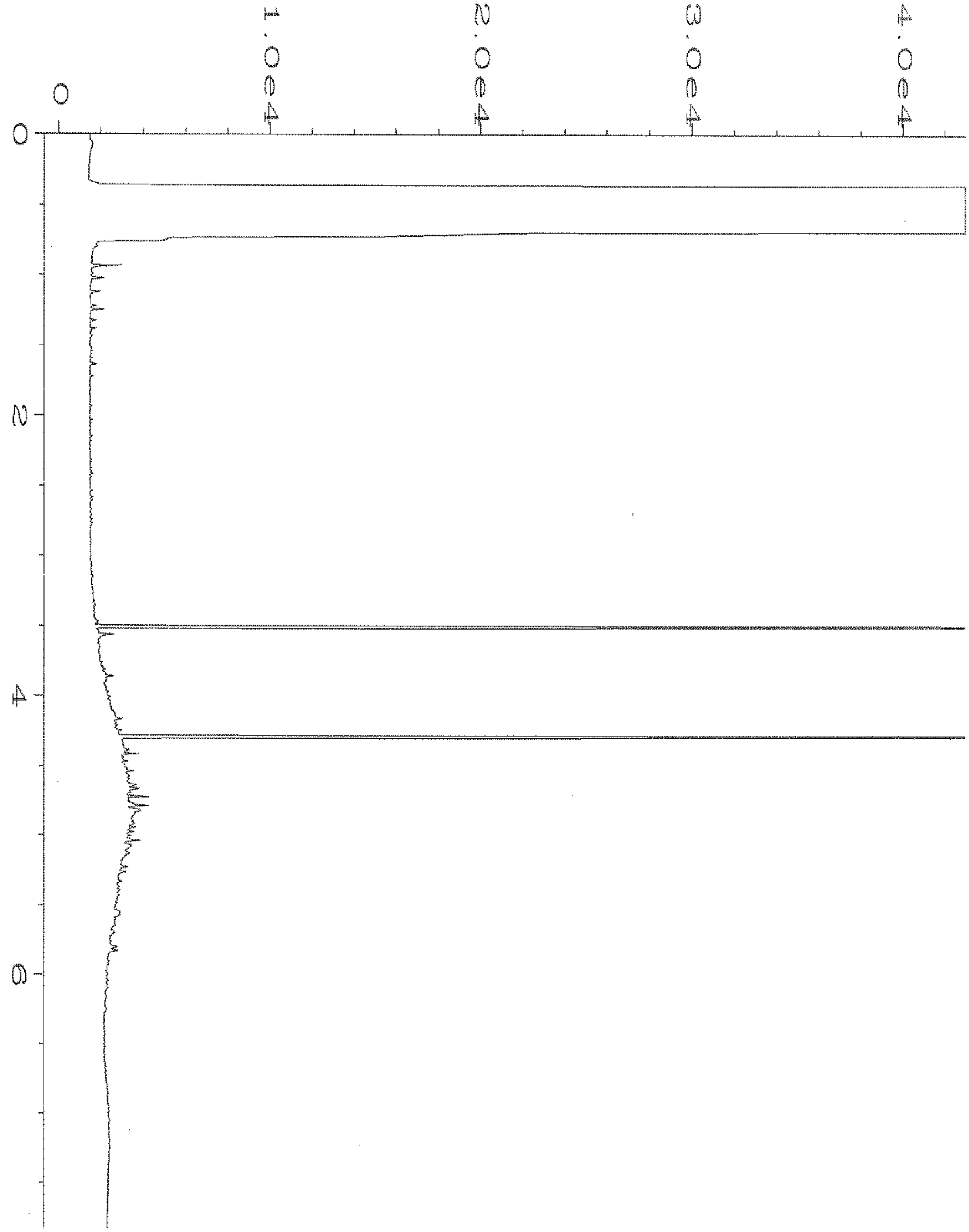
TURNAROUND TIME
- ☒ Standard TAT
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	VPH	8151							Notes
TP-01-021420		2/14/20	0855	Soil	1				X							
TP-02-021420		|	0940	|	1				X							
TP-03-021420		|	1010	|	1				X							
TP-04-021420		|	1055	|	1				X							

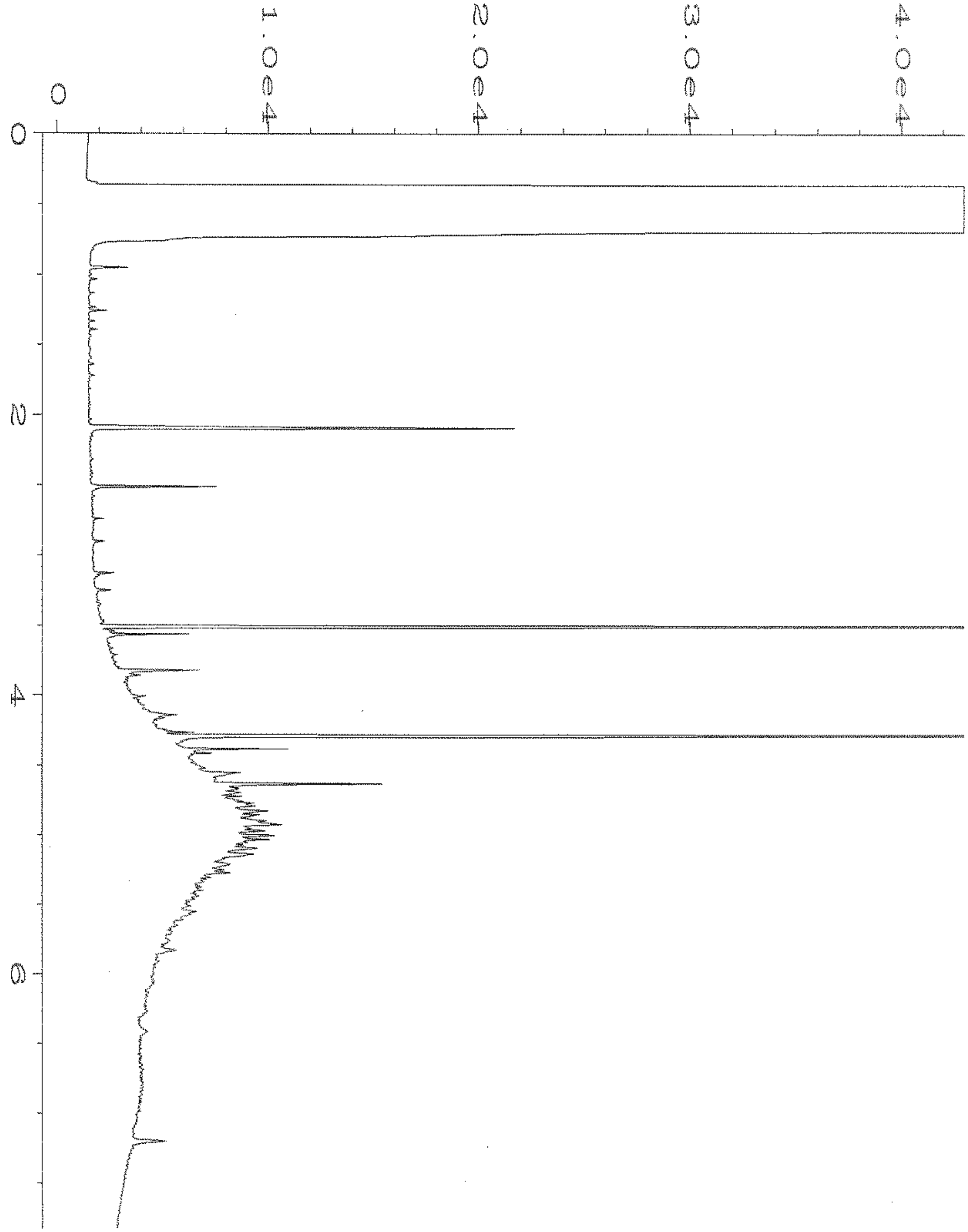
Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman & Bruya	2/17/20	08:50AM
Received by:	Carter Johnson	FAI	2/17/20	0933
Relinquished by:				
Received by:				

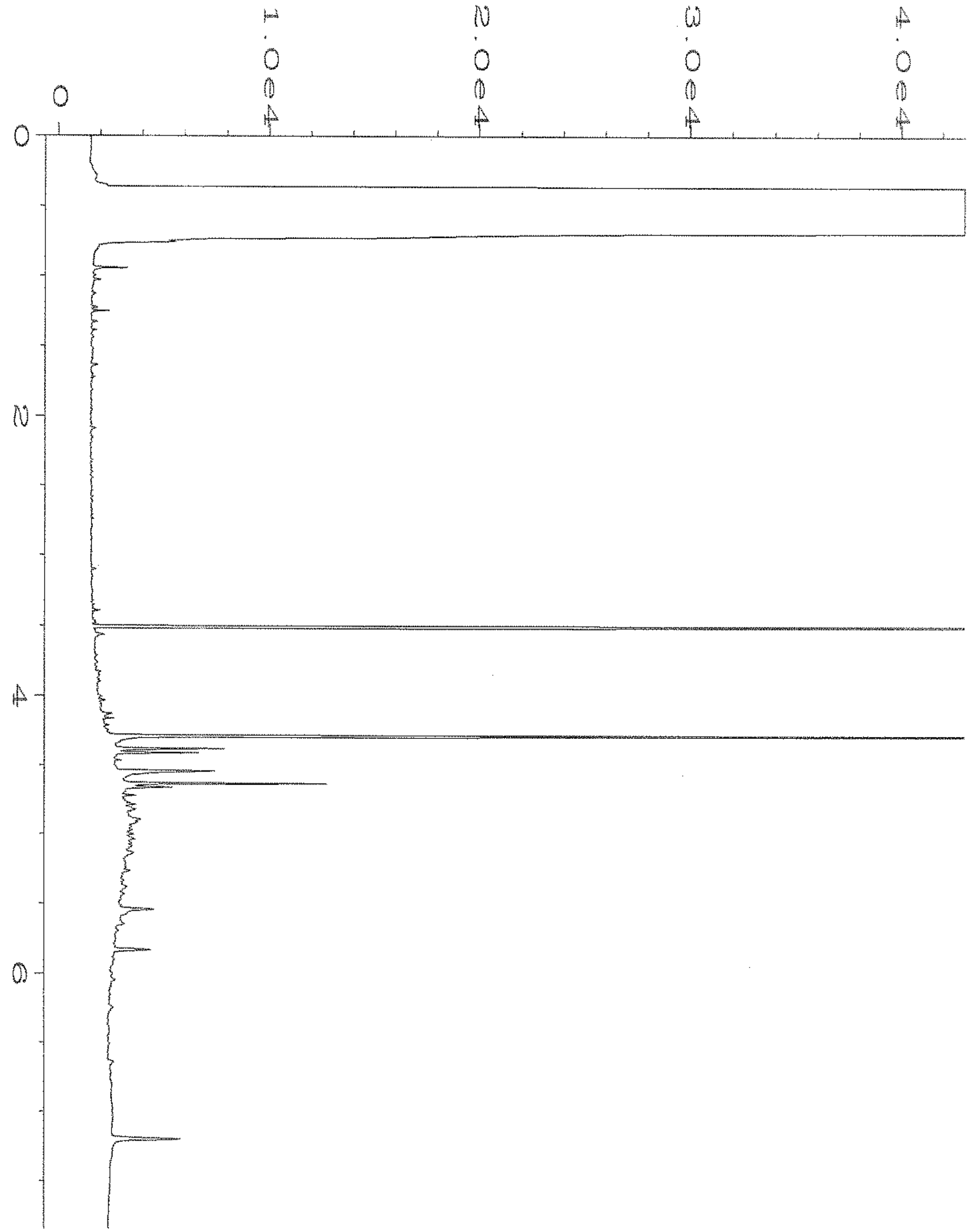


Data File Name : C:\HPCHEM\4\DATA\02-17-20\016F0301.D
Operator : TL
Instrument : GC#4
Sample Name : 002211-01
Run Time Bar Code:
Acquired on : 17 Feb 20 11:20 AM
Report Created on: 18 Feb 20 07:12 AM

Page Number : 1
Vial Number : 16
Injection Number : 1
Sequence Line : 3
Instrument Method: DX.MTH
Analysis Method : DEFAULT.MTH

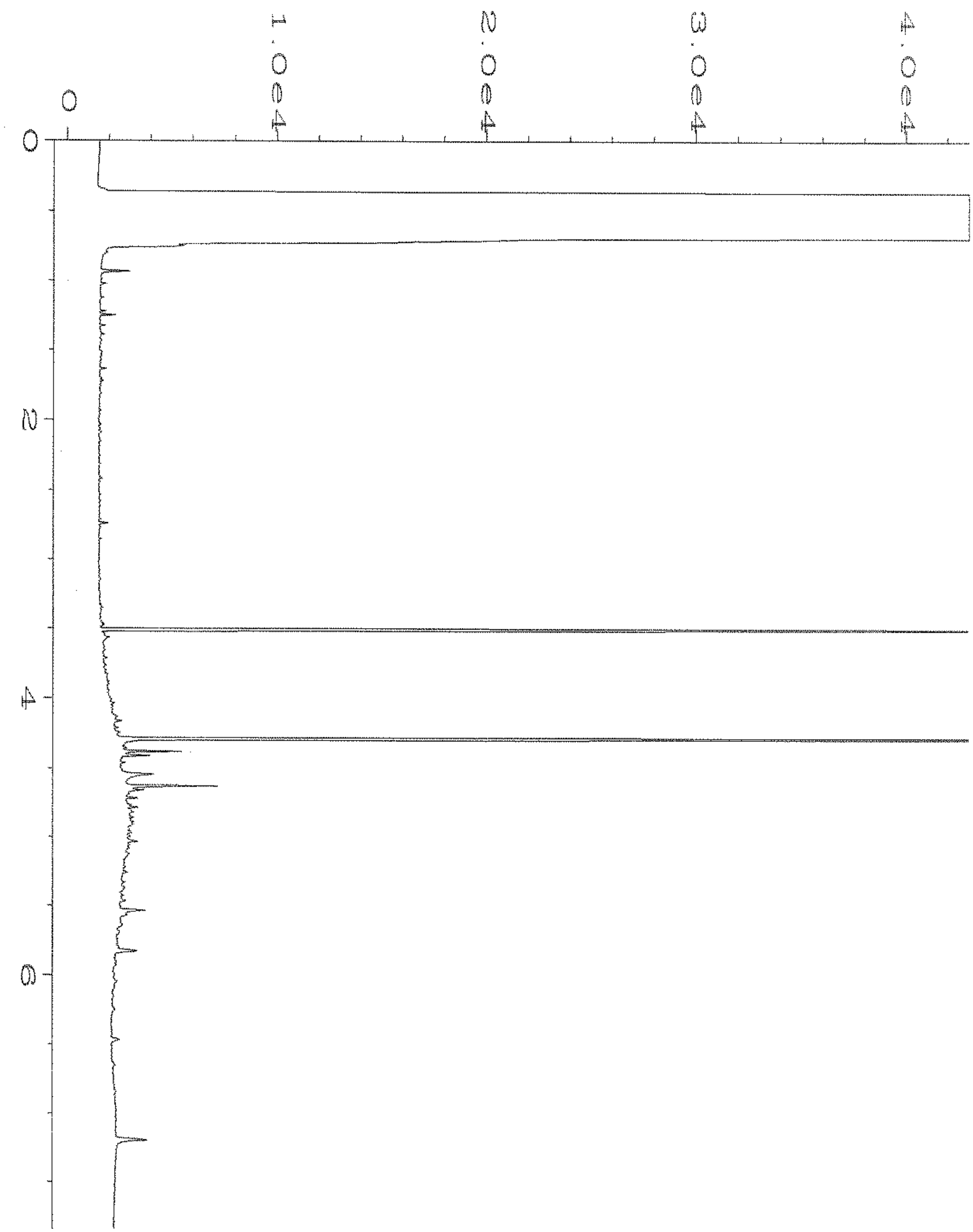


Data File Name	: C:\HPCHEM\4\DATA\02-17-20\017F0301.D		
Operator	: TL	Page Number	: 1
Instrument	: GC#4	Vial Number	: 17
Sample Name	: 002211-02	Injection Number	: 1
Run Time Bar Code:		Sequence Line	: 3
Acquired on	: 17 Feb 20 11:32 AM	Instrument Method	: DX.MTH
Report Created on	: 18 Feb 20 07:12 AM	Analysis Method	: DEFAULT.MTH



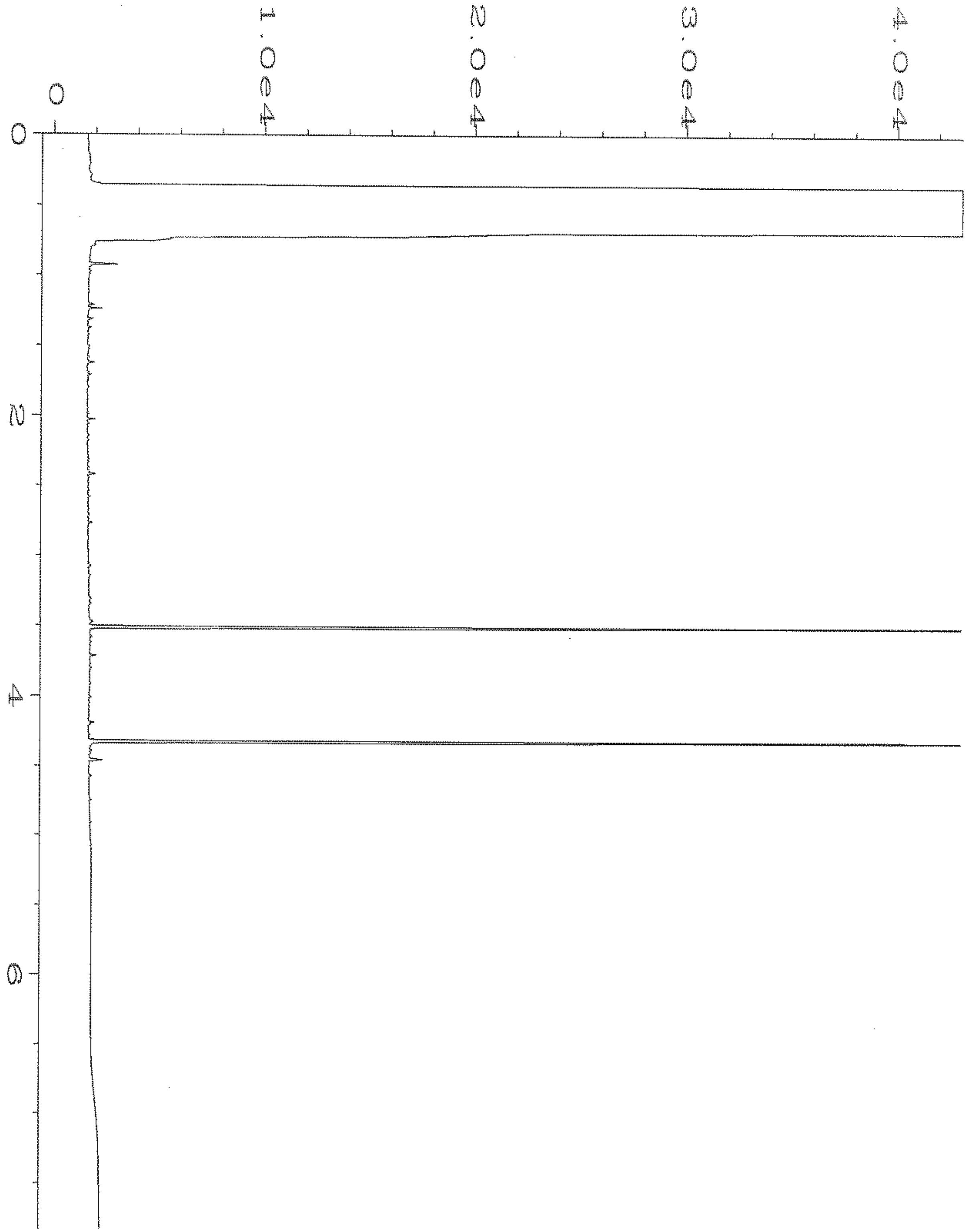
Data File Name : C:\HPCHEM\4\DATA\02-17-20\018F0301.D
Operator : TL
Instrument : GC#4
Sample Name : 002211-03
Run Time Bar Code:
Acquired on : 17 Feb 20 11:44 AM
Report Created on: 18 Feb 20 07:13 AM

Page Number : 1
Vial Number : 18
Injection Number : 1
Sequence Line : 3
Instrument Method: DX.MTH
Analysis Method : DEFAULT.MTH



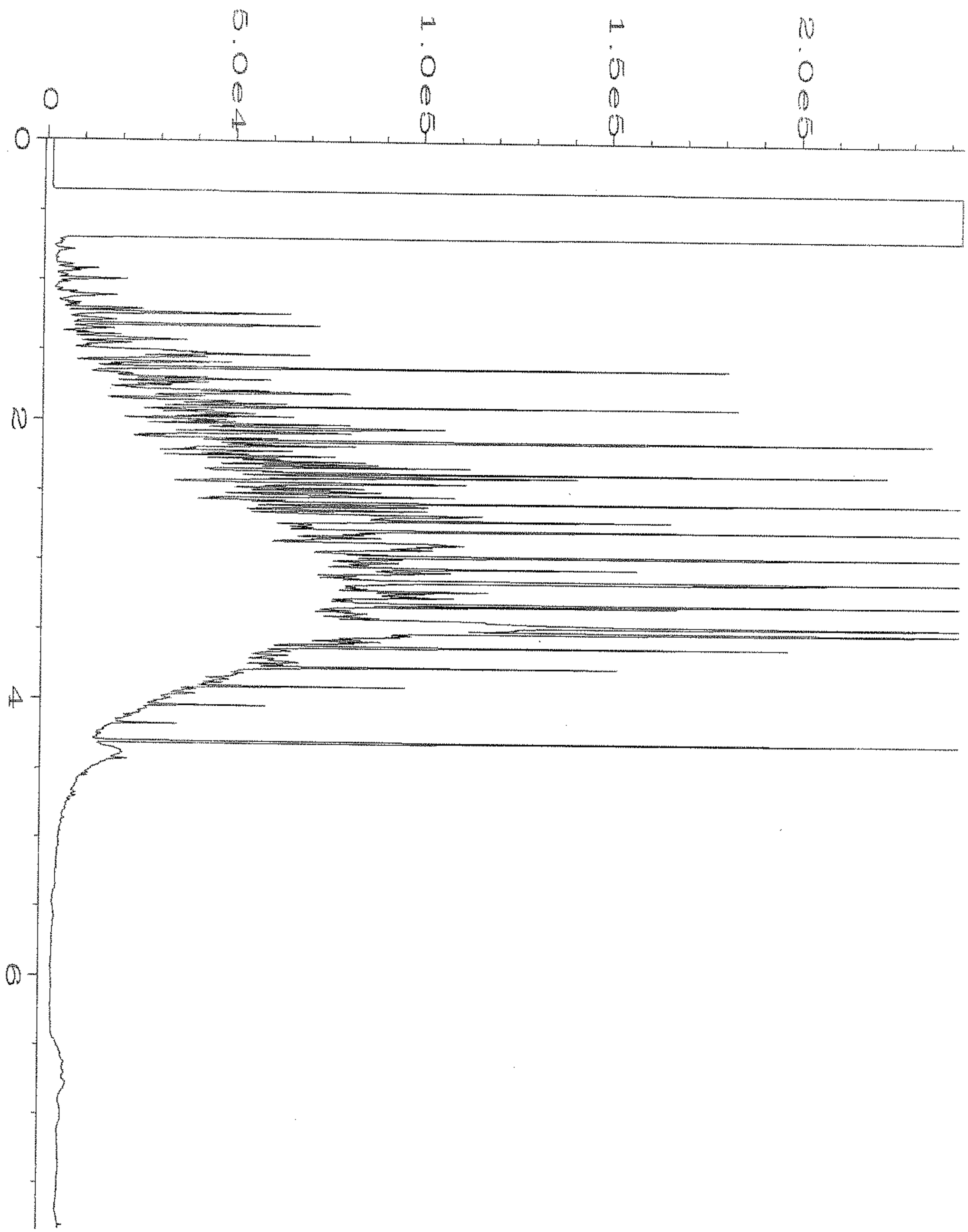
Data File Name   : C:\HPCHEM\4\DATA\02-17-20\019F0301.D
Operator   : TL
Instrument   : GC#4
Sample Name   : 002211-04
Run Time Bar Code:
Acquired on   : 17 Feb 20   11:56 AM
Report Created on: 18 Feb 20   07:13 AM

Page Number   : 1
Vial Number   : 19
Injection Number : 1
Sequence Line   : 3
Instrument Method: DX.MTH
Analysis Method   : DEFAULT.MTH



Data File Name   : C:\HPCHEM\4\DATA\02-17-20\006F0301.D
Operator   : TL
Instrument   : GC#4
Sample Name   : 00-433 mb
Run Time Bar Code:
Acquired on   : 17 Feb 20 08:47 AM
Report Created on: 18 Feb 20 07:13 AM

Page Number   : 1
Vial Number   : 6
Injection Number : 1
Sequence Line   : 3
Instrument Method: DX.MTH
Analysis Method   : DEFAULT.MTH



Data File Name : C:\HPCHEM\4\DATA\02-17-20\005F0501.D
Operator : TL
Instrument : GC#4
Sample Name : 1000 Dx 58-146C
Run Time Bar Code:
Acquired on : 17 Feb 20 01:46 PM
Report Created on: 18 Feb 20 07:13 AM

Page Number : 1
Vial Number : 5
Injection Number : 1
Sequence Line : 5
Instrument Method: DX.MTH
Analysis Method : DEFAULT.MTH

002211

SAMPLE CHAIN OF CUSTODY ME 02/14/20 VS3/ BI2

Page # 1 of 1

Report To Ali Cochrane

Company Aspect Consulting

Address 710 2nd Ave, Suite 550

City, State, ZIP Seattle, WA, 98104

Phone 2069497478 Email acochrane@aspectconsulting.com

SAMPLERS (signature) B Cell	
PROJECT NAME Shelton C St. Landfill	PO # 150074
REMARKS Project specific RLs? Yes / No	INVOICE TO

TURNAROUND TIME
X Standard turnaround
RUSH
Rush charges authorized by:
SAMPLE DISPOSAL
Archive samples
Other
Default: Dispose after 30 days

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	NWTPH-Dx	NWTPH-Gx	BTEX EPA 8021	NWTPH-HCID	VOCs EPA 8260	PAHs EPA 8270	PCBs EPA 8082	Metals - MTCA5 EPA 200.8/6010/7471A	Chlorinated pesticides EPA 8081B, 8151	Dioxins/Furans EPA 1613		Notes
TP-01-021420	01 A-F	2/14/20	0835	soil	6	X					X		X	X			
TP-02-021420	02 A-F	↓	0940	↓	6	↓					↓		↓	↓			
TP-03-021420	03 A-H	↓	1010	↓	8	↓					↓		↓	↓	X		
TP-04-021420	04 A-F	↓	1055	↓	6	↓					↓		↓	↓			
TP-03-1.0	05 A-D	↓	1010	↓	4		X	X									

Samples received at 3 °C

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: B Cell	Baxter Cell	Aspect Consulting	2/14/20	1400
Received by: [signature]	Nhan Phan	FeBI	2/14/20	~~140~~ 1445 NP
Relinquished by:				
Received by:				

3600 Fremont Ave. N.
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

Friedman & Bruya
Michael Erdahl
3012 16th Ave. W.
Seattle, WA 98119

RE: 002211
Work Order Number: 2002273

March 02, 2020

Attention Michael Erdahl:

Fremont Analytical, Inc. received 4 sample(s) on 2/17/2020 for the analyses presented in the following report.

Herbicides by EPA Method 8151A
Sample Moisture (Percent Moisture)

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes
Project Manager

DoD/ELAP Certification #L17-135, ISO/IEC 17025:2005
ORELAP Certification: WA 100009-007 (NELAP Recognized)

Date: *03/02/2020*

CLIENT:	Friedman & Bruya
Project:	002211
Work Order:	2002273

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2002273-001	TP-01-021420	02/14/2020 8:55 AM	02/17/2020 9:33 AM
2002273-002	TP-02-021420	02/14/2020 9:40 AM	02/17/2020 9:33 AM
2002273-003	TP-03-021420	02/14/2020 10:10 AM	02/17/2020 9:33 AM
2002273-004	TP-04-021420	02/14/2020 10:55 AM	02/17/2020 9:33 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Case Narrative

WO#: **2002273**

Date: **3/2/2020**

CLIENT: Friedman & Bruya

Project: 002211

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20%RSD, <20% Drift or minimum RRF)
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

Fremont Analytical

Analytical Report

Work Order: **2002273**
Date Reported: **3/2/2020**

Client: Friedman & Bruya
Project: 002211
Lab ID: 2002273-001
Client Sample ID: **TP-01-021420**

Collection Date: 2/14/2020 8:55:00 AM
Matrix: Soil

Herbicides by EPA Method 8151A — Batch ID: 27511 — Analyst: SB

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Dicamba	ND	40.4		µg/Kg-dry	1	2/25/2020 4:49:16 PM
2,4-D	ND	34.6		µg/Kg-dry	1	2/25/2020 4:49:16 PM
2,4-DP	ND	28.8		µg/Kg-dry	1	2/25/2020 4:49:16 PM
2,4,5-TP (Silvex)	ND	23.1		µg/Kg-dry	1	2/25/2020 4:49:16 PM
2,4,5-T	ND	57.7		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Dinoseb	ND	34.6		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Dalapon	ND	231	Q	µg/Kg-dry	1	2/25/2020 4:49:16 PM
2,4-DB	ND	28.8		µg/Kg-dry	1	2/25/2020 4:49:16 PM
MCPP	ND	5,080		µg/Kg-dry	1	2/25/2020 4:49:16 PM
MCPA	ND	3,230		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Picloram	ND	57.7	Q	µg/Kg-dry	1	2/25/2020 4:49:16 PM
Bentazon	ND	40.4		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Chloramben	ND	23.1		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Acifluorfen	ND	92.3	Q	µg/Kg-dry	1	2/25/2020 4:49:16 PM
3,5-Dichlorobenzoic acid	ND	46.2		µg/Kg-dry	1	2/25/2020 4:49:16 PM
4-Nitrophenol	ND	34.6		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Dacthal (DCPA)	ND	34.6		µg/Kg-dry	1	2/25/2020 4:49:16 PM
Surr: 2,4-Dichlorophenylacetic acid	76.0	15.3 - 163		%Rec	1	2/25/2020 4:49:16 PM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample Moisture (Percent Moisture) — Batch ID: R57485 — Analyst: MM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Percent Moisture	15.2	0.500		wt%	1	2/20/2020 9:59:07 AM

Analytical Report

Work Order: **2002273**
Date Reported: **3/2/2020**

Client: Friedman & Bruya
Project: 002211
Lab ID: 2002273-002
Client Sample ID: **TP-02-021420**

Collection Date: 2/14/2020 9:40:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 27511		Analyst: SB
Dicamba	ND	41.7		µg/Kg-dry	1	2/25/2020 5:09:49 PM
2,4-D	ND	35.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
2,4-DP	ND	29.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
2,4,5-TP (Silvex)	ND	23.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
2,4,5-T	ND	59.6		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Dinoseb	ND	35.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Dalapon	ND	238	Q	µg/Kg-dry	1	2/25/2020 5:09:49 PM
2,4-DB	ND	29.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
MCPP	ND	5,250		µg/Kg-dry	1	2/25/2020 5:09:49 PM
MCPA	ND	3,340		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Picloram	ND	59.6	Q	µg/Kg-dry	1	2/25/2020 5:09:49 PM
Bentazon	ND	41.7		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Chloramben	ND	23.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Acifluorfen	ND	95.4	Q	µg/Kg-dry	1	2/25/2020 5:09:49 PM
3,5-Dichlorobenzoic acid	ND	47.7		µg/Kg-dry	1	2/25/2020 5:09:49 PM
4-Nitrophenol	ND	35.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Dacthal (DCPA)	ND	35.8		µg/Kg-dry	1	2/25/2020 5:09:49 PM
Surr: 2,4-Dichlorophenylacetic acid	54.3	15.3 - 163		%Rec	1	2/25/2020 5:09:49 PM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Sample Moisture (Percent Moisture)				Batch ID: R57485		Analyst: MM
Percent Moisture	17.6	0.500		wt%	1	2/20/2020 9:59:07 AM

Analytical Report

Work Order: **2002273**
Date Reported: **3/2/2020**

Client: Friedman & Bruya
Project: 002211
Lab ID: 2002273-003
Client Sample ID: **TP-03-021420**

Collection Date: 2/14/2020 10:10:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 27511		Analyst: SB
Dicamba	ND	41.6		µg/Kg-dry	1	2/25/2020 5:30:15 PM
2,4-D	ND	35.6		µg/Kg-dry	1	2/25/2020 5:30:15 PM
2,4-DP	ND	29.7		µg/Kg-dry	1	2/25/2020 5:30:15 PM
2,4,5-TP (Silvex)	ND	23.7		µg/Kg-dry	1	2/25/2020 5:30:15 PM
2,4,5-T	ND	59.4		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Dinoseb	ND	35.6		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Dalapon	ND	237	Q	µg/Kg-dry	1	2/25/2020 5:30:15 PM
2,4-DB	ND	29.7		µg/Kg-dry	1	2/25/2020 5:30:15 PM
MCPP	ND	5,220		µg/Kg-dry	1	2/25/2020 5:30:15 PM
MCPA	ND	3,320		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Picloram	ND	59.4	Q	µg/Kg-dry	1	2/25/2020 5:30:15 PM
Bentazon	ND	41.6		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Chloramben	ND	23.7		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Acifluorfen	ND	95.0	Q	µg/Kg-dry	1	2/25/2020 5:30:15 PM
3,5-Dichlorobenzoic acid	ND	47.5		µg/Kg-dry	1	2/25/2020 5:30:15 PM
4-Nitrophenol	ND	35.6		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Dacthal (DCPA)	ND	35.6		µg/Kg-dry	1	2/25/2020 5:30:15 PM
Surr: 2,4-Dichlorophenylacetic acid	71.1	15.3 - 163		%Rec	1	2/25/2020 5:30:15 PM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Sample Moisture (Percent Moisture)				Batch ID: R57485		Analyst: MM
Percent Moisture	15.9	0.500		wt%	1	2/20/2020 9:59:07 AM

Analytical Report

Work Order: **2002273**
Date Reported: **3/2/2020**

Client: Friedman & Bruya
Project: 002211
Lab ID: 2002273-004
Client Sample ID: **TP-04-021420**

Collection Date: 2/14/2020 10:55:00 AM
Matrix: Soil

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Herbicides by EPA Method 8151A				Batch ID: 27511		Analyst: SB
Dicamba	ND	41.4		µg/Kg-dry	1	2/25/2020 5:50:42 PM
2,4-D	ND	35.5		µg/Kg-dry	1	2/25/2020 5:50:42 PM
2,4-DP	ND	29.6		µg/Kg-dry	1	2/25/2020 5:50:42 PM
2,4,5-TP (Silvex)	ND	23.7		µg/Kg-dry	1	2/25/2020 5:50:42 PM
2,4,5-T	ND	59.1		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Dinoseb	ND	35.5		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Dalapon	ND	237	Q	µg/Kg-dry	1	2/25/2020 5:50:42 PM
2,4-DB	ND	29.6		µg/Kg-dry	1	2/25/2020 5:50:42 PM
MCPP	ND	5,200		µg/Kg-dry	1	2/25/2020 5:50:42 PM
MCPA	ND	3,310		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Picloram	ND	59.1	Q	µg/Kg-dry	1	2/25/2020 5:50:42 PM
Bentazon	ND	41.4		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Chloramben	ND	23.7		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Acifluorfen	ND	94.6	Q	µg/Kg-dry	1	2/25/2020 5:50:42 PM
3,5-Dichlorobenzoic acid	ND	47.3		µg/Kg-dry	1	2/25/2020 5:50:42 PM
4-Nitrophenol	ND	35.5		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Dacthal (DCPA)	ND	35.5		µg/Kg-dry	1	2/25/2020 5:50:42 PM
Surr: 2,4-Dichlorophenylacetic acid	67.7	15.3 - 163		%Rec	1	2/25/2020 5:50:42 PM

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Sample Moisture (Percent Moisture)				Batch ID: R57485		Analyst: MM
Percent Moisture	16.9	0.500		wt%	1	2/20/2020 9:59:07 AM

Work Order: 2002273
CLIENT: Friedman & Bruya
Project: 002211

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID: **MB-27511** SampType: **MBLK** Units: **µg/Kg** Prep Date: **2/19/2020** RunNo: **57630**
Client ID: **MBLKS** Batch ID: **27511** Analysis Date: **2/25/2020** SeqNo: **1150345**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	ND	35.0									
2,4-D	ND	30.0									
2,4-DP	ND	25.0									
2,4,5-TP (Silvex)	ND	20.0									
2,4,5-T	ND	50.0									
Dinoseb	ND	30.0									
Dalapon	ND	200									Q
2,4-DB	ND	25.0									
MCPP	ND	4,400									
MCPA	ND	2,800									
Picloram	ND	50.0									Q
Bentazon	ND	35.0									
Chloramben	ND	20.0									
Acifluorfen	ND	80.0									Q
3,5-Dichlorobenzoic acid	ND	40.0									
4-Nitrophenol	ND	30.0									
Dacthal (DCPA)	ND	30.0									
Surr: 2,4-Dichlorophenylacetic acid	1,050		1,000		105	15.3	163				

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: **LCS-27511** SampType: **LCS** Units: **µg/Kg** Prep Date: **2/19/2020** RunNo: **57630**
Client ID: **LCSS** Batch ID: **27511** Analysis Date: **2/25/2020** SeqNo: **1150346**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	198	35.0	200.0	0	99.1	21.2	167				
2,4-D	220	30.0	200.0	0	110	32	176				
2,4-DP	202	25.0	200.0	0	101	25.8	171				
2,4,5-TP (Silvex)	214	20.0	200.0	0	107	23.6	164				
2,4,5-T	215	50.0	200.0	0	108	25	166				
Dinoseb	71.9	30.0	200.0	0	36.0	5	168				

Date: *3/2/2020*

Work Order: 2002273
CLIENT: Friedman & Bruya
Project: 002211

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID: **LCS-27511** SampType: **LCS** Units: **µg/Kg** Prep Date: **2/19/2020** RunNo: **57630**
Client ID: **LCSS** Batch ID: **27511** Analysis Date: **2/25/2020** SeqNo: **1150346**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dalapon	843	200	1,000	0	84.3	29.2	195				
2,4-DB	216	25.0	200.0	0	108	8.11	184				
MCPP	1200	4,400	1,000	0	120	17.3	191				
MCPA	1210	2,800	1,000	0	121	13.6	192				
Picloram	229	50.0	200.0	0	114	5	175				
Bentazon	213	35.0	200.0	0	107	21.5	170				
Chloramben	117	20.0	200.0	0	58.4	5	114				
Acifluorfen	102	80.0	200.0	0	51.2	5	168				
3,5-Dichlorobenzoic acid	204	40.0	200.0	0	102	26.2	174				
4-Nitrophenol	227	30.0	200.0	0	114	5.02	160				
Dacthal (DCPA)	207	30.0	200.0	0	103	18	168				
Surr: 2,4-Dichlorophenylacetic acid	1,090		1,000		109	15.3	163				

Sample ID: **2002204-034ADUP** SampType: **DUP** Units: **µg/Kg-dry** Prep Date: **2/19/2020** RunNo: **57630**
Client ID: **BATCH** Batch ID: **27511** Analysis Date: **2/25/2020** SeqNo: **1150348**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	ND	59.4						0	0	30	
2,4-D	ND	50.9						0	0	30	
2,4-DP	ND	42.4						0	0	30	
2,4,5-TP (Silvex)	ND	33.9						0	0	30	
2,4,5-T	ND	84.8						0	0	30	
Dinoseb	ND	50.9						0	0	30	
Dalapon	ND	339						0	0	30	Q
2,4-DB	ND	42.4						0	0	30	
MCPP	ND	7,470						0	0	30	
MCPA	ND	4,750						0	0	30	
Picloram	ND	84.8						0	0	30	Q
Bentazon	ND	59.4						0	0	30	
Chloramben	ND	33.9						0	0	30	

Date: *3/2/2020*

Work Order: 2002273
CLIENT: Friedman & Bruya
Project: 002211

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID: **2002204-034ADUP** SampType: **DUP** Units: **µg/Kg-dry** Prep Date: **2/19/2020** RunNo: **57630**
Client ID: **BATCH** Batch ID: **27511** Analysis Date: **2/25/2020** SeqNo: **1150348**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acifluorfen	ND	136						0	0	30	Q
3,5-Dichlorobenzoic acid	ND	67.9						0	0	30	
4-Nitrophenol	ND	50.9						0	0	30	
Dacthal (DCPA)	ND	50.9						0	0	30	
Surr: 2,4-Dichlorophenylacetic acid	527		1,697		31.0	15.3	163		0		

NOTES:
Q - Indicates an analyte with a continuing calibration that does not meet established acceptance criteria

Sample ID: **2002204-034AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **2/19/2020** RunNo: **57630**
Client ID: **BATCH** Batch ID: **27511** Analysis Date: **2/25/2020** SeqNo: **1150349**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	39.2	59.6	340.4	0	11.5	5	136				
2,4-D	78.3	51.1	340.4	0	23.0	5	151				
2,4-DP	95.3	42.5	340.4	0	28.0	5	149				
2,4,5-TP (Silvex)	123	34.0	340.4	0	36.2	5.43	140				
2,4,5-T	76.5	85.1	340.4	0	22.5	6.68	133				
Dinoseb	192	51.1	340.4	0	56.4	5	141				
Dalapon	118	340	1,702	0	6.96	5	179				
2,4-DB	203	42.5	340.4	0	59.7	5.57	160				
MCPP	746	7,490	1,702	0	43.8	5	174				
MCPA	728	4,770	1,702	0	42.8	5	154				
Picloram	62.0	85.1	340.4	0	18.2	5	139				
Bentazon	138	59.6	340.4	0	40.5	5.31	146				
Chloramben	30.7	34.0	340.4	0	9.02	5	134				
Acifluorfen	65.7	136	340.4	0	19.3	5	168				
3,5-Dichlorobenzoic acid	97.5	68.1	340.4	0	28.6	6.99	144				
4-Nitrophenol	198	51.1	340.4	0	58.3	10.2	139				
Dacthal (DCPA)	9.84	51.1	340.4	0	2.89	5	156				S
Surr: 2,4-Dichlorophenylacetic acid	690		1,702		40.5	15.3	163				

Fremont Analytical

Date: *3/2/2020*

Work Order: 2002273
CLIENT: Friedman & Bruya
Project: 002211

QC SUMMARY REPORT

Herbicides by EPA Method 8151A

Sample ID: **2002204-034AMS**	SampType: **MS**	Units: **µg/Kg-dry**	Prep Date: **2/19/2020**	RunNo: **57630**
Client ID: **BATCH**	Batch ID: **27511**		Analysis Date: **2/25/2020**	SeqNo: **1150349**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: **2002204-034AMSD**	SampType: **MSD**	Units: **µg/Kg-dry**	Prep Date: **2/19/2020**	RunNo: **57630**
Client ID: **BATCH**	Batch ID: **27511**		Analysis Date: **2/25/2020**	SeqNo: **1150350**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Dicamba	64.3	59.3	338.7	0	19.0	5	136	39.15	48.7	30	
2,4-D	101	50.8	338.7	0	29.8	5	151	78.30	25.2	30	
2,4-DP	119	42.3	338.7	0	35.2	5	149	95.35	22.4	30	
2,4,5-TP (Silvex)	150	33.9	338.7	0	44.4	5.43	140	123.4	19.8	30	
2,4,5-T	103	84.7	338.7	0	30.5	6.68	133	76.46	29.9	30	
Dinoseb	207	50.8	338.7	0	61.1	5	141	192.0	7.45	30	
Dalapon	146	339	1,694	0	8.63	5	179	118.4	21.0	30	
2,4-DB	219	42.3	338.7	0	64.6	5.57	160	203.2	7.42	30	
MCPP	997	7,450	1,694	0	58.9	5	174	746.2	28.8	30	
MCPA	980	4,740	1,694	0	57.9	5	154	727.8	29.6	30	
Picloram	64.2	84.7	338.7	0	19.0	5	139	62.03	3.45	30	
Bentazon	157	59.3	338.7	0	46.4	5.31	146	138.0	12.9	30	
Chloramben	33.5	33.9	338.7	0	9.89	5	134	30.72	8.63	30	
Acifluorfen	113	135	338.7	0	33.5	5	168	65.69	53.4	30	
3,5-Dichlorobenzoic acid	128	67.7	338.7	0	37.9	6.99	144	97.50	27.3	30	
4-Nitrophenol	180	50.8	338.7	0	53.1	10.2	139	198.3	9.69	30	
Dacthal (DCPA)	8.91	50.8	338.7	0	2.63	5	156	9.837	9.85	30	S
Surr: 2,4-Dichlorophenylacetic acid	743		1,694		43.9	15.3	163		0		

NOTES:
S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample Log-In Check List

Client Name:	**FB**	Work Order Number:	**2002273**
Logged by:	**Carissa True**	Date Received:	**2/17/2020 9:33:00 AM**

Chain of Custody

1.	Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
2.	How was the sample delivered?	FedEx		

Log In

3.	Coolers are present?	Yes ☐	No ☑	NA ☐
		No cooler present		
4.	Shipping container/cooler in good condition?	Yes ☑	No ☐	
5.	Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact)	Yes ☐	No ☑	Not Required ☐
6.	Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
7.	Were all items received at a temperature of >2°C to 6°C *	Yes ☑	No ☐	NA ☐
8.	Sample(s) in proper container(s)?	Yes ☑	No ☐	
9.	Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
10.	Are samples properly preserved?	Yes ☑	No ☐	
11.	Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
12.	Is there headspace in the VOA vials?	Yes ☐	No ☐	NA ☑
13.	Did all samples containers arrive in good condition(unbroken)?	Yes ☑	No ☐	
14.	Does paperwork match bottle labels?	Yes ☑	No ☐	
15.	Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
16.	Is it clear what analyses were requested?	Yes ☑	No ☐	
17.	Were all holding times able to be met?	Yes ☑	No ☐	

Special Handling (if applicable)

18.	Was client notified of all discrepancies with this order?	Yes ☐	No ☐	NA ☑

Person Notified:		Date:	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

19. Additional remarks:

Item Information

Item #	Temp ºC
Sample 1	5.9

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2002273

Page # 1 of 1

Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 3012 16th Ave W

City, State, ZIP Seattle, WA 98119

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER Fremont	
PROJECT NAME/NO. 002211	PO # B-111
REMARKS Aspect EDD	

TURNAROUND TIME
- ☒ Standard TAT
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

						ANALYSES REQUESTED										
Sample ID	Lab ID	Date Sampled	Time Sampled	Matrix	# of jars	Dioxins/Furans	EPH	VPH	8151							Notes
TP-01-021420		2/14/20	0855	Soil	1				X							
TP-02-021420		|	0940	|	1				X							
TP-03-021420		|	1010	|	1				X							
TP-04-021420		|	1055	|	1				X							

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	Michael Erdahl	Friedman & Bruya	2/17/20	08:50AM
Received by:	Carter Johnson	FAI	2/17/20	0933
Relinquished by:				
Received by:				

APPENDIX D

Remedial Alternative Cost Estimate

Table D-1. Alternative 1 Cost Estimate

Project No. 150074, City of Shelton, C Street Landfill, Shelton, WA

Remedial Action Description: Permeable Soil Cap, Institutional Controls, and Monitoring

Cleanup Elements	Qty	Unit	Unit Cost	Cost	Notes
DIRECT CAPITAL COSTS[1]					
Contractor mobilization/demobilization	1	LS	$ 20,000	$ 20,000	2
Temporary erosion and sedimentation controls	1	LS	$ 6,000	$ 6,000	
Clearing/grubbing and grading of existing cover soil	4.0	acre	$ 8,000	$ 32,000	
Geotextile (isolation barrier, installed)	19,360	SY	$ 1.70	$ 32,912	
Import, place, grade, and compact fill (2 ft thickness)	12,907	CY	$ 32	$ 413,013	3
Import, place, and grade topsoil (1 ft thickness)	6,453	CY	$ 36	$ 232,320	3
Post-construction topographic survey	1	LS	$ 8,000	$ 8,000	
Hydroseed capped area	4.0	acre	$ 5,000	$ 20,000	
Institutional controls	1	LS	$ 20,000	$ 20,000	4
Subtotal for Direct Capital Costs				**$ 784,245**	
INDIRECT CAPITAL COSTS[1]					
Remedial design and permitting	12%			$ 94,109	5
Project management	5%			$ 39,212	6
Construction management and monitoring	8%			$ 62,740	7
Construction reporting and IM&M Plan	1	LS		$ 30,000	
Taxes	8.8%			$ 69,014	
Subtotal for Indirect Capital Costs				**$ 295,075**	
Subtotal for Direct and Indirect Capital Costs				**$ 1,079,320**	
Contingency for Direct and Indirect Capital Costs	20%			**$ 215,864**	8
Total for Direct and Indirect Capital Costs				**$ 1,295,184**	
POST-CONSTRUCTION COSTS[1]					
Quarterly inspections and informal reporting in Years 1 through 3	3	year	$ 10,000	$ 29,122	9
Semi-annual inspections and informal reporting in Years 4 through 30	27	year	$ 5,000	$ 105,518	9
Semi-annual groundwater sampling and informal reporting	30	year	$ 2,000	$ 48,032	10
Annual topographic survey in Years 1 through 5	5	year	$ 8,000	$ 38,261	11
Annual maintenance and formal reporting	30	year	$ 12,000	$ 288,190	12
5-year reviews with Ecology	5	ea	$ 10,000	$ 39,620	13
Subtotal for Post-Construction Costs				**$ 548,743**	
Contingency for Post-Construction Costs	20%			**$ 109,749**	8
Total for Post-Construction Costs				**$ 658,492**	
NET PRESENT VALUE OF ALTERNATIVE 1				**$ 1,950,000**	14

IM&M = inspection, monitoring, and maintenance

Notes:

1) All costs are in 2019 dollars. Costs are evaluated over a 30-year period. The net present value (NPV) of post-construction costs is estimated using a discount factor of 1.5 percent.
2) Mobilization/demobilization includes contractor submittals and temporary facilities.
3) A total fill/topsoil thickness of 3 feet is assumed to ensure that a minimum thickness of 30 inches is achieved everywhere.
4) Institutional controls include signage, access road barrier, and environmental covenant.
5) Remedial design includes preparation of construction plans and specifications, engineer's cost estimate, and bidding support.
6) Project management includes bid/contract administration, cost and performance reporting, planning, and coordination.
7) Construction management includes submittal review, change order review, design modifications, and construction schedule tracking.
8) Contingency costs include miscellaneous costs not itemized due to the current (preliminary) stage of remedy development, as well as costs to address unanticipated conditions encountered during remedy execution.
9) Informal reporting to Ecology site manager (e.g., via e-mail) following each inspection event.
10) It is assumed that the 4 existing wells are sampled for iron and manganese, and that sampling is performed during site inspections.
11) It is assumed that the capped surface is demonstrated to be stable after 5 years, so that annual surveys are no longer needed.
12) Annual maintenance includes removal of large vegetation.
13) Five-year reviews with Ecology are assumed to occur in Years 6, 11, 16, 21, and 26.
14) The total estimated cost is rounded to three significant figures.

Table D-2. Alternative 2 Cost Estimate

Project No. 150074, City of Shelton, C Street Landfill, Shelton, WA

Remedial Action Description: Impermeable Cap, Institutional Controls, and Monitoring

Cleanup Elements	Qty	Unit	Unit Cost	Cost	Notes
DIRECT CAPITAL COSTS[1]					
Contractor mobilization/demobilization	1	LS	$ 20,000	$ 20,000	2
Temporary erosion and sedimentation controls	1	LS	$ 6,000	$ 6,000	
Clearing/grubbing and grading of existing cover soil	4.0	acre	$ 10,000	$ 40,000	
Impermeable cap	4.0	acre	$ 180,000	$ 720,000	3
Stormwater management system	1	LS	$ 200,000	$ 200,000	
Post-construction topographic survey	1	LS	$ 8,000	$ 8,000	
Hydroseed capped area	4.0	acre	$ 5,000	$ 20,000	
Institutional controls	1	LS	$ 20,000	$ 20,000	4
Subtotal for Direct Capital Costs				**$ 1,034,000**	
INDIRECT CAPITAL COSTS[1]					
Remedial design and permitting	15%			$ 155,100	5
Project management	5%			$ 51,700	6
Construction management and monitoring	10%			$ 103,400	7
Construction reporting and IM&M Plan	1	LS		$ 40,000	
Taxes	8.8%			$ 90,992	
Subtotal for Indirect Capital Costs				**$ 441,192**	
Subtotal for Direct and Indirect Capital Costs				**$ 1,475,192**	
Contingency for Direct and Indirect Capital Costs	20%			**$ 295,038**	8
Total for Direct and Indirect Capital Costs				**$ 1,770,230**	
POST-CONSTRUCTION COSTS[1]					
Quarterly inspections and informal reporting in Years 1 through 3	3	year	$ 12,000	$ 34,946	9
Semi-annual inspections and informal reporting in Years 4 through 30	27	year	$ 6,000	$ 126,622	9
Semi-annual groundwater sampling and informal reporting	30	year	$ 2,000	$ 48,032	10
Annual topographic survey in Years 1 through 5	5	year	$ 8,000	$ 38,261	11
Annual maintenance and formal reporting	30	year	$ 16,000	$ 384,253	12
5-year reviews with Ecology	5	ea	$ 10,000	$ 39,620	13
Subtotal for Post-Construction Costs				**$ 671,735**	
Contingency for Post-Construction Costs	20%			**$ 134,347**	8
Total for Post-Construction Costs				**$ 806,082**	
NET PRESENT VALUE OF ALTERNATIVE 2				**$ 2,580,000**	14

IM&M inspection, monitoring, and maintenance

Notes:

1) All costs are in 2019 dollars. Costs are evaluated over a 30-year period. The net present value (NPV) of post-construction costs is estimated using a discount factor of 1.5 percent.
2) Mobilization/demobilization includes contractor submittals and temporary facilities.
3) Based on typical unit cost for sanitary landfill closure (escalated to 2019 dollars) from *Estimated Costs of Landfill Closure* , Maryland Department of the Environment, Solid Waste Program, April 2015.
4) Institutional controls include signage, access road barrier, and environmental covenant.
5) Remedial design includes preparation of construction plans and specifications, engineer's cost estimate, and bidding support.
6) Project management includes bid/contract administration, cost and performance reporting, planning, and coordination.
7) Construction management includes submittal review, change order review, design modifications, and construction schedule tracking.
8) Contingency costs include miscellaneous costs not itemized due to the current (preliminary) stage of remedy development, as well as costs to address unanticipated conditions encountered during remedy execution.
9) Informal reporting to Ecology site manager (e.g., via e-mail) following each inspection event.
10) It is assumed that the 4 existing wells are sampled for iron and manganese, and that sampling is performed during site inspections.
11) It is assumed that the capped surface is demonstrated to be stable after 5 years, so that annual surveys are no longer needed.
12) Annual maintenance includes removal of large vegetation.
13) Five-year reviews with Ecology are assumed to occur in Years 6, 11, 16, 21, and 26.
14) The total estimated cost is rounded to three significant figures.

Table D-3. Alternative 3 Cost Estimate

Project No. 150074, City of Shelton, C Street Landfill, Shelton, WA

Remedial Action Description: Removal of WWTP Sludge, Permeable Soil Cap, Institutional Controls, and Monitoring

Cleanup Elements	Qty	Unit	Unit Cost	Cost	Notes
DIRECT CAPITAL COSTS[1]					
Contractor mobilization/demobilization	1	LS	$ 20,000	$ 20,000	2
Temporary erosion and sedimentation controls	1	LS	$ 6,000	$ 6,000	
Excavation and loading of WWTP sludge	8,663	CY	$ 15	$ 129,950	3
WWTP sludge transport and disposal	10,396	ton	$ 190	$ 1,975,248	4,5
Clearing/grubbing and grading of existing cover soil	4.0	acre	$ 8,000	$ 32,000	
Geotextile (isolation barrier, installed)	19,360	SY	$ 1.70	$ 32,912	
Import, place, grade, and compact fill (2 ft thickness)	12,907	CY	$ 32	$ 413,013	6
Import, place, and grade topsoil (1 ft thickness)	6,453	CY	$ 36	$ 232,320	6
Post-construction topographic survey	1	LS	$ 8,000	$ 8,000	
Hydroseed capped area	4.0	acre	$ 5,000	$ 20,000	
Institutional controls	1	LS	$ 20,000	$ 20,000	7
Subtotal for Direct Capital Costs				**$ 2,889,443**	
INDIRECT CAPITAL COSTS[1]					
Remedial design and permitting	12%			$ 346,733	8
Project management	5%			$ 144,472	9
Construction management and monitoring	8%			$ 231,155	10
Construction reporting and IM&M Plan	1	LS		$ 30,000	
Taxes	8.8%			$ 254,271	
Subtotal for Indirect Capital Costs				**$ 1,006,632**	
Subtotal for Direct and Indirect Capital Costs				**$ 3,896,075**	
Contingency for Direct and Indirect Capital Costs	20%			**$ 779,215**	11
Total for Direct and Indirect Capital Costs				**$ 4,675,290**	
POST-CONSTRUCTION COSTS[1]					
Quarterly inspections and informal reporting in Years 1 through 3	3	year	$ 10,000	$ 29,122	12
Semi-annual inspections and informal reporting in Years 4 through 30	27	year	$ 5,000	$ 105,518	12
Semi-annual groundwater sampling and informal reporting	30	year	$ 2,000	$ 48,032	13
Annual topographic survey in Years 1 through 5	5	year	$ 8,000	$ 38,261	14
Annual maintenance and formal reporting	30	year	$ 12,000	$ 288,190	15
5-year reviews with Ecology	5	ea	$ 10,000	$ 39,620	16
Subtotal for Post-Construction Costs				**$ 548,743**	
Contingency for Post-Construction Costs	20%			**$ 109,749**	11
Total for Post-Construction Costs				**$ 658,492**	
NET PRESENT VALUE OF ALTERNATIVE 3				**$ 5,330,000**	17

IM&M inspection, monitoring, and maintenance
WWTP wastewater treatment plant

Notes:

1) All costs are in 2019 dollars. Costs are evaluated over a 30-year period. The net present value (NPV) of post-construction costs is estimated using a discount factor of 1.5 percent.
2) Mobilization/demobilization includes contractor submittals and temporary facilities.
3) The volume of WWTP sludge is estimated based on an initial application of 4.5 million gallons of sludge with an average moisture content of 65% by weight, and an assumed moisture content of 10% by weight at the time of excavation.
4) The weight of WWTP sludge is estimated based on an in-place bulk density of 1.2 tons per cubic yard.
5) It is assumed that the WWTP sludge is disposed of in a hazardous waste landfill.
6) A total fill/topsoil thickness of 3 feet is assumed to ensure that a minimum thickness of 30 inches is achieved everywhere.
7) Institutional controls include signage, access road barrier, and environmental covenant.
8) Remedial design includes preparation of construction plans and specifications, engineer's cost estimate, and bidding support.
9) Project management includes bid/contract administration, cost and performance reporting, planning, and coordination.
10) Construction management includes submittal review, change order review, design modifications, and construction schedule tracking.
11) Contingency costs include miscellaneous costs not itemized due to the current (preliminary) stage of remedy development, as well as costs to address unanticipated conditions encountered during remedy execution.
12) Informal reporting to Ecology site manager (e.g., via e-mail) following each inspection event.
13) It is assumed that the 4 existing wells are sampled for iron and manganese, and that sampling is performed during site inspections.
14) It is assumed that the capped surface is demonstrated to be stable after 5 years, so that annual surveys are no longer needed.
15) Annual maintenance includes removal of large vegetation.
16) Five-year reviews with Ecology are assumed to occur in Years 6, 11, 16, 21, and 26.
17) The total estimated cost is rounded to three significant figures.

Table D-4. Alternative 4 Cost Estimate

Project No. 150074, City of Shelton, C Street Landfill, Shelton, WA

Remedial Action Description: Full Removal of Contaminated Media

Cleanup Elements	Qty	Unit	Unit Cost	Cost	Notes
DIRECT CAPITAL COSTS[1]					
Contractor mobilization/demobilization	1	LS	$ 40,000	$ 40,000	2
Temporary erosion and sedimentation controls	1	LS	$ 6,000	$ 6,000	
Excavation and loading of WWTP sludge	8,663	CY	$ 15	$ 129,950	3
WWTP sludge transport and disposal	10,396	ton	$ 190	$ 1,975,248	4,5
Excavation and loading of all other cover soil and landfill waste	159,123	CY	$ 15	$ 2,386,850	6
Transport/disposal of cover soil and landfill waste	238,685	ton	$ 50	$ 11,934,248	7,8
Import, place, grade, and compact fill (25 ft thickness)	161,333	CY	$ 30	$ 4,840,000	9
Import, place, and grade topsoil (1 ft thickness)	6,453	CY	$ 36	$ 232,320	9
Hydroseed capped area	4.0	acre	$ 5,000	$ 20,000	
Subtotal for Direct Capital Costs				**$ 21,564,615**	
INDIRECT CAPITAL COSTS[1]					
Remedial design and permitting	6%			$ 1,293,877	10
Project management	3%			$ 646,938	11
Construction management and monitoring	4%			$ 862,585	12
Construction reporting	1	LS		$ 100,000	
Taxes	8.8%			$ 1,897,686	
Subtotal for Indirect Capital Costs				**$ 4,801,086**	
Subtotal for Direct and Indirect Capital Costs				**$ 26,365,701**	
Contingency for Direct and Indirect Capital Costs	20%			**$ 5,273,140**	13
NET PRESENT VALUE OF ALTERNATIVE 4				**$ 31,600,000**	14

WWTP wastewater treatment plant

Notes:

1) All costs are in 2019 dollars. Alternative 4 is assumed to have no post-construction costs.
2) Mobilization/demobilization includes contractor submittals and temporary facilities.
3) The volume of WWTP sludge is estimated based on an initial application of 4.5 million gallons of sludge with an average moisture content of 65% by weight, and an assumed moisture content of 10% by weight at the time of excavation.
4) The weight of WWTP sludge is estimated based on an in-place bulk density of 1.2 tons per cubic yard.
5) It is assumed that the WWTP sludge is disposed of in a hazardous waste landfill.
6) The total volume of cover soil and landfill waste (including WWTP sludge) is estimated based on a surface area of 4.0 acres and an average thickness of 26 feet.
7) The weight of cover soil and landfill waste (excluding WWTP sludge) is estimated based on an in-place bulk density of 1.5 tons per cubic yard.
8) It is assumed that the cover soil and landfill waste are disposed of in a non-hazardous waste landfill.
9) A total fill/topsoil thickness of 26 feet is assumed to restore grade.
10) Remedial design includes preparation of construction plans and specifications, engineer's cost estimate, and bidding support.
11) Project management includes bid/contract administration, cost and performance reporting, planning, and coordination.
12) Construction management includes submittal review, change order review, design modifications, and construction schedule tracking.
13) Contingency costs include miscellaneous costs not itemized due to the current (preliminary) stage of remedy development, as well as costs to address unanticipated conditions encountered during remedy execution.
14) The total estimated cost is rounded to three significant figures.

APPENDIX E

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND USE GUIDELINES

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on this report or the product of our services without the express written consent of Aspect Consulting, LLC (Aspect). This limitation is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual conditions or limitations and guidelines governing their use of the report. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with the Client and recognized standards of professionals in the same locality and involving similar conditions.

Services for Specific Purposes, Persons and Projects

Aspect has performed the services in general accordance with the scope and limitations of our Agreement. This report has been prepared for the exclusive use of the Client and their authorized third parties, approved in writing by Aspect. This report is not intended for use by others, and the information contained herein is not applicable to other properties.

This report is not, and should not, be construed as a warranty or guarantee regarding the presence or absence of hazardous substances or petroleum products that may affect the subject property. The report is not intended to make any representation concerning title or ownership to the subject property. If real property records were reviewed, they were reviewed for the sole purpose of determining the subject property's historical uses. All findings, conclusions, and recommendations stated in this report are based on the data and information provided to Aspect, current use of the subject property, and observations and conditions that existed on the date and time of the report.

Aspect structures its services to meet the specific needs of our clients. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and subject property. This report should not be applied for any purpose or project except the purpose described in the Agreement.

This Report Is Project-Specific

Aspect considered a number of unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you
- Not prepared for the specific purpose identified in the Agreement
- Not prepared for the specific real property assessed
- Completed before important changes occurred concerning the subject property, project or governmental regulatory actions

If changes are made to the project or subject property after the date of this report, Aspect should be retained to assess the impact of the changes with respect to the conclusions contained in the report.

Geoscience Interpretations

The geoscience practices (geotechnical engineering, geology, and environmental science) require interpretation of spatial information that can make them less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Use Guidelines" apply to your project or site, you should contact Aspect.

Discipline-Specific Reports Are Not Interchangeable

The equipment, techniques and personnel used to perform an environmental study differ significantly from those used to perform a geotechnical or geologic study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

Environmental Regulations Are Not Static

Some hazardous substances or petroleum products may be present near the subject property in quantities or under conditions that may have led, or may lead, to contamination of the subject property, but are not included in current local, state or federal regulatory definitions of hazardous substances or petroleum products or do not otherwise present potential liability. Changes may occur in the standards for appropriate inquiry or regulatory definitions of hazardous substance and petroleum products; therefore, this report has a limited useful life.

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time (for example, Phase I ESA reports are applicable for 180 days), by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope failure or groundwater fluctuations. If more than six months have passed since issuance of our report, or if any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Phase I ESAs – Uncertainty Remains After Completion

Aspect has performed the services in general accordance with the scope and limitations of our Agreement and the current version of the "Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process", ASTM E1527, and U.S. Environmental Protection Agency (EPA)'s Federal Standard 40 CFR Part 312 "Innocent Landowners, Standards for Conducting All Appropriate Inquiries".

No ESA can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with subject property. Performance of an ESA study is intended to reduce, but not eliminate, uncertainty regarding the potential for environmental conditions affecting the subject property. There is always a potential that areas with contamination that were not identified during this ESA exist at the subject property or in the study area. Further evaluation of such potential would require additional research, subsurface exploration, sampling and/or testing.

Historical Information Provided by Others

Aspect has relied upon information provided by others in our description of historical conditions and in our review of regulatory databases and files. The available data does not provide definitive information with regard to all past uses, operations or incidents affecting the subject property or adjacent properties. Aspect makes no warranties or guarantees regarding the accuracy or completeness of information provided or compiled by others.

Exclusion of Mold, Fungus, Radon, Lead, and HBM

Aspect's services do not include the investigation, detection, prevention or assessment of the presence of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detection, assessment, prevention or abatement of molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts. Aspect's services also do not include the investigation or assessment of hazardous building materials (HBM) such as asbestos, polychlorinated biphenyls (PCBs) in light ballasts, lead based paint, asbestos-containing building materials, urea-formaldehyde insulation in on-site structures or debris or any other HBMs. Aspect's services do not include an evaluation of radon or lead in drinking water, unless specifically requested.