



June 2018
Sudden Valley Area Z Remediation



Data Report and Cleanup Plan

Prepared for Wilson Engineering and
Sudden Valley Community Association

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ABBREVIATIONS

ARI	Analytical Resources, Inc.
AST	aboveground storage tank
BTEX	benzene, toluene, ethylbenzene, and xylene
Ecology	Washington State Department of Ecology
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MTCA	Model Toxics Control Act
NWTPH	Northwest Total Petroleum Hydrocarbon (analytical method)
NWTPH-d	Northwest Total Petroleum Hydrocarbon-diesel range
NWTPH-dx	Northwest Total Petroleum Hydrocarbon-diesel range extended
NWTPH-g	Northwest Total Petroleum Hydrocarbon-gasoline range
Sudden Valley	Sudden Valley Communication Association
UST	underground storage tank
WAC	Washington Administrative Code

1 Introduction

This report documents the results of soil and groundwater testing conducted by Anchor QEA, LLC, on behalf of Wilson Engineering and the Sudden Valley Community Association (Sudden Valley).

The supplemental soil and groundwater testing was performed to evaluate current environmental conditions within the portion of Sudden Valley known as Area Z. Soil and groundwater contamination in Area Z was discovered in 1999 and reported to the Washington State Department of Ecology (Ecology) in accordance with the Model Toxics Control Act (MTCA; WAC 173-304).

Subsequent cleanup actions have been performed within Area Z, and Sudden Valley has requested review of the cleanup actions under the Voluntary Cleanup Program. Area Z remains listed as a MTCA cleanup site at this time.

1.1 Site Background

Previous investigation and cleanup actions were performed between 1999 and 2014 by Sudden Valley under the direction of GeoEngineers. Figures 1 and 2 summarize locations of previous soil and groundwater testing activities, soil removal areas, and other site features.

Excerpts of previous GeoEngineers reports are attached as Appendix A. These include the following:

- **Environmental Drilling and Sampling Results for Area Z (September 1999)**
(GeoEngineers 1999): This report documents the presence of diesel contamination in soil at concentrations of up to 14,100 milligrams per kilogram (mg/kg). Contamination was also detected in groundwater at diesel concentrations up to 19.2 milligrams per liter (mg/L). These concentrations exceeded applicable cleanup levels at the time, and also exceed current applicable cleanup levels (2,000 mg diesel/kg for soils, and 0.5 mg diesel/L for groundwater). The most heavily contaminated area was located in an area near Bear Creek. This area was near a former aboveground storage tank (AST) present within Area Z during 1975 (refer to Section 2.1 and Figure 3).
- **February and May 2001 Groundwater Sampling Area Z (GeoEngineers 2000):** During 2000, contaminated soils were excavated from Area Z and placed in an on-site stockpile (see 2001 aerial photograph in Figure 4). The soils were treated using biotreatment (i.e., landfarming). Following that remediation work, GeoEngineers installed a monitoring well (MW-4) at the downgradient edge of the soil removal area, just upgradient from Beaver Creek. Diesel concentrations in that well were measured quarterly between August 2000 and May of 2001. Diesel concentrations in that well decreased over time from 16 mg/L in August 2000 to 1.7 mg/L in May 2001. All four measurements exceeded the groundwater cleanup level applicable at that time for diesel hydrocarbons (1.0 mg/L) and also exceeded the current MTCA Method A groundwater cleanup level (0.5 mg/L).

- **Report of Environmental Services – Area Z Soil Stockpile Sampling (GeoEngineers 2014):** During 2014, GeoEngineers conducted test pit sampling within the portion of Area Z used to treat the petroleum-contaminated soils. Two locations adjacent to the soil stockpile were also tested. One of the stockpile samples (TP-4) contained petroleum concentrations of 2,410 mg/kg, slightly in excess of the current MTCA Method A cleanup level (2,000 mg/kg). Two other samples exceeded the ecological screening levels used by Ecology for diesel hydrocarbons (260 mg/kg for soil biota; screening level revised as of August 2017). One of the samples from the adjacent area (diesel/oil concentration of 650 mg/kg) also exceeded this ecological screening level but not the Method A cleanup level. Despite the presence of organic matter (plant roots, etc.) in the soil samples, testing during this study was not performed using silica gel cleanup (used to differentiate between petroleum hydrocarbons and non-petroleum, polar or biogenic compounds).

Results of these studies were reviewed by Ecology under the Voluntary Cleanup Program. Ecology concluded that additional information was required to demonstrate compliance with MTCA requirements (Ecology 2014).

1.2 Purpose of the Current Report

Anchor QEA was retained by Wilson Engineering and Sudden Valley to resolve site data gaps, assess compliance of the site conditions with MTCA requirements, and make recommendations regarding final cleanup of the site. Data gaps addressed with the supplemental sampling included the following:

- **Historical Research:** Historical aerial photographs and environmental reports were reviewed to resolve the source of the petroleum contamination. Results were used to update the site base map.
- **Supplemental Soil Stockpile Testing:** Supplemental test pits were sampled by Anchor QEA within the soil stockpile and adjacent areas. This testing was performed to assess whether additional biotreatment was required to comply with MTCA Method A cleanup levels. Soils were analyzed for petroleum concentrations. Additional testing was performed to evaluate protectiveness for sensitive terrestrial ecological receptors.
- **Supplemental Groundwater Testing:** Supplemental groundwater testing was performed in two areas. Groundwater testing was performed in the soil stockpile area to verify that soil treatment operations did not impact groundwater quality in this area. Groundwater testing was also performed in the area along Bear Creek, downgradient of the former soil removal area. That testing was performed using both the existing monitoring well (MW-4) and two temporary soil borings located east and west of MW-4.

Methods and results of the supplemental testing conducted by Anchor QEA work are described in Sections 2 and 3 of this report, respectively. These data are then used as the basis for defining a recommended cleanup plan for the site. That cleanup plan is provided in Section 4.

2 Investigation Methods

The work performed by Anchor QEA was intended to document current soil and groundwater quality relative to MTCA cleanup standards. Activities performed by Anchor QEA are described in this section.

2.1 Historical Research and Base Map Update

Historical research was conducted to resolve the source of the petroleum contamination. This included review of prior environmental reports and Ecology files, compilation and review of historical aerial photographs, and completing interviews with current Sudden Valley staff. Significant observations from that research are summarized below:

- **1992 Underground Storage Tank Removal Report:** Two underground storage tanks (USTs; reported as two 1,000-gallon gasoline tanks) had been located along the western edge of the 2000 source removal area. The completion report for that tank removal (Pinner 1992) did not indicate the presence of petroleum contamination at the UST removal locations. Testing was performed for gasoline and benzene, toluene, ethylbenzene, and xylene (BTEX) compounds, and no contamination was detected above applicable cleanup levels. Testing was not performed for diesel.
- **Subsequent Soil and Groundwater Testing:** Diesel fuel contamination was identified during geotechnical studies for a proposed utility project. Subsequent soil testing was performed by GeoEngineers to assess the nature and extent of the diesel contamination and guide soil remediation activities (GeoEngineers 1999). Measured petroleum concentrations near the former UST removal area did not exceed current MTCA Method A cleanup levels. Concentrations were much higher in the central northern portion of the source removal area. The maximum concentration detected there was 14,100 mg/kg.
- **Initial Release Report and Subsequent Cleanup:** A release report was submitted by GeoEngineers to Ecology (GeoEngineers 2000). That release report referenced the source of the contamination as an AST.
- **Review of Aerial Photographs:** Historical aerial photographs were obtained and reviewed. These photographs are contained in Figures 3 (1975) and 4 (2001) and in Appendix B.
 - 1975 AST: In a photograph from 1975, a large cylindrical AST is visible. The location of the tank is consistent with the areas of highest measured petroleum concentrations in soil. The tank was no longer visible in that location in the next aerial photograph reviewed (1981).
 - UST removal areas: A concrete slab is visible in a photograph from 1988 in approximately the location of the UST removal. The resolution of the photographs is not sufficient to identify pump islands or additional details.
 - Soil treatment stockpile: The soil treatment stockpile area is clearly visible in the photograph from 2001.

- Interviews: Anchor QEA attempted to identify former residents or employees with knowledge of the former UST and AST operations or subsequent cleanup activities. No persons with direct knowledge of these activities were identified.

Figure 1 integrates the findings of the above-listed research, along with the locations of identified utilities, structures, and previous sampling locations.

2.2 Soil Sampling and Analysis

Anchor QEA conducted soil sampling using a small rubber-tired backhoe operated by Sudden Valley staff. Prior to testing, Wilson Engineering confirmed the absence of any regulated wetlands or sensitive areas in the project area.

The locations of previous testing locations were verified by differential GPS. The boundaries of the former stockpile were also confirmed in this manner based on the historical aerial photograph. The historical boundaries were approximately the same as the boundaries of the stockpile observed based on current site topography.

Test pits were then excavated throughout the stockpile area and at one location between the stockpile and the community garden. Test pit locations are shown on Figures 1 and 2.

Each test pit was logged and photographed. Soil samples were screened for the potential presence of volatile organic compounds using a photo-ionization detector. These compounds were not present, consistent with the results of previous testing.

Soil samples were collected for analysis of diesel- and oil-range petroleum hydrocarbons using the Northwest Total Petroleum Hydrocarbon-diesel extended (NWTPH-dx) method. The analysis was performed both with and without silica gel cleanup to assess the influence of non-petroleum hydrocarbons on measured diesel/oil concentrations.

Chemical analyses were performed by Analytical Resources Inc. (ARI, Tukwila). Additional soil samples were archived for contingent earthworm bioassay testing. These samples were sent to the bioassay laboratory (EcoAnalysts, Port Gamble).

Following receipt of soil petroleum testing data, three soil samples were selected for earthworm bioassay testing. Testing was performed by EcoAnalysts consistent with current Ecology guidance. Testing methods are described in Appendix D.

2.3 Groundwater Sampling and Analysis

Groundwater sampling was performed in two steps. First well MW-4 was inspected. Based on silt accumulations in the well, it was redeveloped. Following redevelopment, groundwater samples were collected by low-flow sampling. Groundwater sampling was conducted in August 24, 2017.

Temporary soil borings were then driven by geoprobe to collect groundwater from four additional locations. This second step was performed on September 13, 2017. The four testing locations included the following:

- Locations Near MW-4: Two borings were placed to the east (SB-111) and west (SB-112) of MW-4, along the downgradient edge of the former excavation.
- Locations within Treated Soil Stockpile: Two borings (SB-109 and SB-110) were placed within the footprint of the treated soil stockpile. These were located near the soils containing the highest measured petroleum concentrations during the 2014 and 2017 soil sampling activities.

Groundwater samples were analyzed by ARI for the following constituents:

- Gasoline hydrocarbons (NWTPH-g)
- Diesel/oil hydrocarbons (NWTPH-dx; paired analysis with and without silica gel cleanup)
- BTEX compounds (EPA 8020)

Appendix C contains copies of field logs and associated documentation. Appendix D contains copies of the laboratory testing data.

3 Findings of Supplemental Testing

This section summarizes the preliminary findings of soil and groundwater testing performed by Anchor QEA in 2017. The results are discussed along with the results of prior testing.

3.1 Soil Quality in Stockpile Area

Test pit observations completed in August 2017 verified the location and composition of the treated soil stockpile area. Anchor QEA excavated test pits at each of the locations shown in Figure 1. The boundaries of the stockpile were confirmed visually (based on topography; and based on the presence of plastic liner material in the test pits). Vegetation (saplings, brush, and grasses) was present at each sampling location.

Table 1 summarizes the petroleum concentrations measured in the stockpile soils. The highest concentrations of diesel and oil were measured at TP-102 and TP-103. These locations were near GeoEngineers sampling locations TP-4 and TP-9, the test pits containing the highest petroleum concentrations (petroleum concentrations were measured without the use of silica gel cleanup) during from the 2014 test pit survey.

The Anchor QEA testing included NWTPH-d analyses performed with and without silica gel cleanup. Results of the paired analyses showed that between 40% and 60% of the petroleum contamination consisted of non-petroleum hydrocarbons (polar organic matter such as plant matter or biodegraded petroleum hydrocarbons). Chromatographic analyses of the soil petroleum hydrocarbon data are contained in Appendix E. These analyses confirm the contribution of non-petroleum hydrocarbons to the measured hydrocarbon concentrations in soil.

Consistent with current Ecology guidance for the NWTPH-d analyses, the results of tests performed using silica gel cleanup were used to assess compliance with MTCA Method A cleanup levels:

- None of the petroleum concentrations measured using silica gel cleanup during the 2017 test pit survey exceeded the MTCA Method A cleanup level.
- The 2014 testing results from the GeoEngineers study were evaluated in light of the 2017 results. Only a single sample from the 2014 survey (TP-4; reported TPH concentration of 2,410 mg/kg) had exceeded the MTCA Method A cleanup level. However, when a conservative allowance of 40 percent non-petroleum hydrocarbons is assumed (consistent with the findings of paired analyses performed in 2017 from the same area), the true petroleum concentration estimated for TP-4 is 1,446 mg/kg. A lower concentration would be estimated if the average non-petroleum composition of the 2017 samples were used.

3.2 Soil Quality Near the Community Garden

Test pit sampling was also performed near the community garden, in the location previously sampled by GeoEngineers. No odors, staining, or other indications of contaminated soil were noted. Results of testing at sample TP-100 were well below MTCA Method A cleanup levels.

3.3 Earthworm Toxicity Evaluation

To evaluate potential adverse impacts to sensitive terrestrial ecological receptors, soil toxicity testing was performed using earthworm toxicity bioassays. Results of these bioassays are summarized in Table 2, and laboratory reports are contained in Appendix D.

Testing was performed on soils from TP-102 and TP-103, where the highest petroleum concentrations were measured. Soils from near the community garden (TP-100) were also tested to assess potential background effects.

No toxicity was observed in any of the samples tested. Results demonstrate that existing soil quality is protective of ecological receptors.

3.4 Groundwater Quality in Treated Soil Stockpile Area

Groundwater quality was tested in the treated soil stockpile area. Testing locations are shown in Figure 1 and included two temporary soil borings (SB-109 and SB-110) located near the areas of highest measured petroleum concentrations in soils. No exceedances of groundwater cleanup levels were noted at either of these testing locations.

Results confirm that there were no impacts to groundwater during previous biotreatment of the petroleum-contaminated soils.

3.5 Groundwater Quality in Former Source Removal Area

Groundwater quality was tested in the former source removal area using a combination of the existing groundwater well (MW-4) and two additional temporary soil borings located east and west of that location (see Figure 1).

Prior to the 2000 source removal, three groundwater wells (MW-1, MW-2, and MW-3) had been located at the site. These wells were removed during the cleanup action. MW-4 was then installed following the source removal, at the downgradient edge of the excavation, adjacent to Bear Creek.

Significant siltation was present in MW-4. This was addressed by re-developing the well prior to sampling. Sampling was performed in August 2017 both for MW-4 and for the two nearby soil borings (SB-111 and SB-112).

Diesel- and oil-range petroleum hydrocarbons were well below MTCA Method A cleanup levels in water samples collected from each of the temporary soil borings. Higher concentrations were detected in MW-4.

Results of paired NWTPH-dx analyses were performed on the sample from MW-4 both with and without silica gel cleanup. The paired analyses were used to quantitatively assess the contribution of the non-petroleum hydrocarbons to measured diesel and oil concentrations:

- **Results without silica gel cleanup:** The combined concentration (0.65 mg/L) exceeded the MTCA cleanup level for groundwater (0.5 mg/L). This cleanup level is also considered applicable to surface water (i.e., waters of Beaver Creek) by Ecology.
- **Results with silica gel cleanup:** As with the stockpiled soils, testing with silica gel cleanup showed significantly lower concentrations. In that analysis, concentrations of diesel- and oil-range hydrocarbons were below the method reporting limits (0.10 mg/L and 0.20 mg/L, respectively). Results confirmed that the presence of non-petroleum compounds produces a high bias to the measured concentrations of diesel and oil in MW-4 groundwater.
- **Chromatogram Review:** Appendix E contains a review of TPH chromatograms for the MW-4 groundwater. Results are not consistent with diesel hydrocarbons. The results of paired analyses (with and without silica gel cleanup) indicate a significant contribution of non-petroleum organic matter to the concentrations of petroleum reported from analyses not utilizing silica gel cleanup.

4 Recommended Cleanup Action

This section provides a concise summary of the environmental conditions at Area C, and recommendations regarding additional actions to complete the cleanup of Area Z soils and groundwater under current MTCA regulations and guidance.

4.1 No Additional Work Required in Soil Stockpile Area

Current environmental conditions within the former soil stockpile area comply with applicable MTCA cleanup levels for both soils and groundwater:

- **Soils Comply with MTCA Method A Cleanup Levels:** Results of soil testing confirmed that the stockpiled soil has been successfully treated to below applicable cleanup levels for human health and groundwater quality protection (i.e., below MTCA Method A cleanup levels of 2,000 mg/kg) as measured using appropriate testing procedures (NWTPH-dx with silica gel cleanup). Results of paired analyses demonstrate that both the current data collected by Anchor QEA and the data collected by GeoEngineers in 2014 comply with MTCA Method A cleanup levels.
- **No Impacts were Observed to Terrestrial Ecological Receptors:** The potential for treated soils in the stockpile area to adversely impact the most sensitive terrestrial ecological receptors (in this case earthworms) was directly assessed using soil toxicity bioassays. That testing also included a sample collected near the community garden. No toxicity to earthworms was detected in any of the test samples, confirming that current conditions are protective of ecological receptors.
- **Groundwater Complies with Method A Cleanup Levels:** Groundwater testing was also performed within the soil treatment stockpile area. Results demonstrated that groundwater in that area complies with current MTCA cleanup levels. Testing was performed at two locations representing the highest residual petroleum concentrations, and no impacts were detected.

Based on the foregoing findings, no additional remediation activities are warranted for the soil stockpile area. Neither institutional controls nor future monitoring are required for this area.

4.2 Additional Monitoring Recommended for Groundwater in Former Soil Removal Area

Groundwater testing has shown substantial reductions of petroleum hydrocarbon concentrations in groundwater since completion of source area soil removal near Bear Creek. Results show that conditions have improved substantially over time. These results are consistent with 1) the removal of the source of the contamination; and 2) subsequent attenuation of residual groundwater contamination through natural biodegradation.

Observations from recent testing include the following:

- **Groundwater Analyses Show Decreasing Concentrations at MW-4:** Petroleum concentrations (measured without silica gel cleanup) have decreased dramatically since the source removal was performed in 2000. Reported diesel/oil concentrations have decreased from 19.1 mg/L in 2000, to 1.7 mg/L in 2001 to 0.65 mg/L in 2017. Results are consistent with natural attenuation of residual hydrocarbon concentrations following source removal.
- **Groundwater Near MW-4 Complies with MTCA Cleanup Levels:** The existing monitoring well (MW-4) is located just downgradient of the source removal area. Borings were placed to the east and west of this location. No exceedances of MTCA Method A cleanup levels were detected in groundwater samples collected from either of these borings. This result was consistent both with and without the use of silica gel cleanup.
- **Biogenic Compounds Contribute to Reported Petroleum Concentrations at MW-4:** Prior to the current study, petroleum testing was performed at Area Z without the use of silica gel cleanup. Results of paired analyses of petroleum performed with and without silica gel cleanup were evaluated quantitatively, showing that silica gel cleanup removed the majority of the measured hydrocarbons. Results in samples analyzed with silica gel cleanup comply with MTCA Method A cleanup levels (at reporting limits of 0.10 mg/L for diesel-range and 0.20 mg/L for oil-range hydrocarbons). Chromatograms were also analyzed for chemical signatures (see Appendix E). Results demonstrated the presence of biogenic organic compounds. These observations are consistent with observations from boring logs that showed organic matter (roots, plant matter) in saturated zone soils. Taken together, these factors indicate that the petroleum concentration measurements performed without silica gel cleanup are biased high and are not representative of true petroleum concentrations in MW-4 groundwater.

At this time, we recommend that four quarters of groundwater monitoring be performed at MW-4 to assess seasonal variability and provide a basis for conclusively assessing compliance with MTCA Method A cleanup levels. The recommended monitoring approach is as follows:

- **Collect Four Quarters of Groundwater Data from MW-4:** Four quarters of groundwater monitoring data should be collected from location MW-4. Groundwater should be collected using standard low-flow sampling techniques.
- **Analyze Petroleum Hydrocarbons with and without Silica Gel Cleanup:** Groundwater monitoring should be performed using method NWTPH-dx, both with and without silica gel cleanup. The larger data set (2017 analyses plus four quarters of additional data) will enable the contribution of biogenic hydrocarbons to the observed petroleum concentrations to be more conclusively assessed.
- **Assess Compliance with Method A Cleanup Levels at Year-End:** After four quarters of groundwater monitoring data have been collected, the compliance of the site with MTCA Method A cleanup levels should be re-evaluated.

5 References Cited

- Ecology (Washington State Department of Ecology), 2014. Letter to: Mr. Jeff Schlaak, Sudden Valley Resort. Regarding: Further Action at the Following Site: Sudden Valley Resort. September 2, 2014.
- GeoEngineers, 1999. Memorandum to: Sandy Cameron, Sudden Valley Community Association. Regarding: Environmental Drilling and Sampling Results for Area Z. September 14, 1999.
- GeoEngineers, 2000. *Report of Remedial Excavation Activities, Area Z, Sudden Valley Community Association, Bellingham, Washington*. Prepared for Sudden Valley Community Association. May 23, 2000.
- GeoEngineers, 2014. *Report of Environmental Services, Area Z Soil Stockpile Sampling*. Prepared for Sudden Valley Community Association. May 14, 2014.
- Pinner (John A. Pinner & Associates), 1992. *Sudden Valley, Three Regulated Underground Storage Tank Removals*. Prepared for Mr. Gordy Gerard, Gerard Enterprises. November 6, 1992.

Tables

Table 1
Soil Chemical Testing Data

	Location ID	SVCA-TP-100	SVCA-TP-101			SVCA-TP-102		SVCA-TP-103		SVCA-SB-111	SVCA-SB-112
	Sample Date	08/23/2017	08/23/2017	08/23/2017	08/23/2017	08/23/2017	08/23/2017	08/23/2017	08/23/2017	09/13/2017	09/13/2017
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Depth Interval	0-4 ft	0-2 ft	2-3.5 ft	0-2 ft	3-4 ft	0-2 ft	3-4 ft	14-16 ft	12.5-14.5 ft	
	MTCA Method A Cleanup Levels										
Gasoline Range Hydrocarbons	30	2.98 U	2.91 U	--	2.61 U	--	2.93 U	--	5.79 U	5.95 U	
Total Petroleum Hydrocarbons (mg/kg)											
Diesel range hydrocarbons	2000	14.5	30.8	80.8	65.4	42.0	265	754 D	5.48 U	5.51 U	
Motor oil range hydrocarbons	2000	130	56	58.5	889	114	315	2300 D	11.0 U	11.0 U	
Total diesel and motor oil range hydrocarbons	2000	144.5	86.8	139.3	954.4	156.0	580	3054	8.29 ¹ U	8.26 ¹ U	
Total Petroleum Hydrocarbons (with silica gel cleanup) (mg/kg)											
Diesel range hydrocarbons (with silica gel cleanup)	2000	22.2	29.2	70.2	36.4	20.5 U	256	447 D	5.57 U	5.50 U	
Motor oil range hydrocarbons (with silica gel cleanup)	2000	174	36.9	42.3	469	42.5	91.2	861 D	11.1 U	11.0 U	
Total diesel and motor oil range hydrocarbons (with silica gel cleanup)	2000	196.2	66.1	112.5	505.4	52.8¹	347.2	1308	8.33 ¹ U	8.25 ¹ U	
Fraction removed by silica gel cleanup	--	--	--	--	47%	66%	40%	57%	--	--	
Results of earthworm toxicity tests (see Table 2)	--	Pass	Not tested	Not tested	Pass	Not tested	Pass	Not tested	Not tested	Not tested	
Volatile Organics (µg/kg)											
Benzene	30	0.42 J	0.2 J	--	0.95	--	0.25 J	--	0.98 U	0.88 U	
Ethylbenzene	6000	0.55 U	0.51 U	--	0.47 U	--	0.23 J	--	0.98 U	0.88 U	
Toluene	7000	13.4	0.32 J	--	0.41 J	--	0.34 J	--	0.98 U	0.88 U	
m,p-Xylene	9000	1.11 U	1.02 U	--	0.95 U	--	0.62 J	--	1.96 U	1.76 U	
o-Xylene	9000	0.55 U	0.51 U	--	0.47 U	--	0.24 J	--	0.98 U	0.88 U	

Detected concentration is greater than the corresponding MTCA Method A cleanup level.

Bold: Detected result

J: Estimated value

U: Compound analyzed, but not detected above detection limit

D: Reported value is from a dilution

*: Silica gel cleanup is used to remove biogenic interferences when significant quantities of plant matter or other non-petroleum organic matter is present. In the case of biodegraded petroleum products the Washington State Department of Ecology determines on a case-by-case basis whether silica gel cleanup is appropriate for determining compliance with cleanup levels.

mg/kg: milligrams per kilogram

µg/kg: micrograms per kilogram

Table 2
Earthworm Bioassay Testing Data

Location ID	Sample Date	Depth Interval	TPH Concentration (Diesel and Oil)	Replicate	Number Initiated	Number Surviving	Number Missing or Dead	Percentage Survival	Mean Percentage Survival	SD
Control	--	--	--	1	10	10	0	100%	100%	0
				2	10	10	0	100%		
				3	10	10	0	100%		
SVCA-TP-100	8/23/2017	0-4 ft	144.5 (196.2)	1	10	10	0	100%	100%	0
				2	10	10	0	100%		
				3	10	10	0	100%		
SVCA-TP-102	8/23/2017	0-2 ft	954.4 (505.4)	1	10	10	0	100%	100%	0
				2	10	10	0	100%		
				3	10	10	0	100%		
SVCA-TP-103	8/23/2017	0-2 ft	580 (340.7)	1	10	9	1	90%	97%	5.8
				2	10	10	0	100%		
				3	10	10	0	100%		

Notes:

Bold values represent petroleum hydrocarbon concentrations measured without silica gel cleanup. The values in parentheses represent petroleum concentrations measured after silica gel cleanup.

TPH: total petroleum hydrocarbon


SD: standard deviation

Table 3
Groundwater Testing Data

	Location ID	SVCA-MW-4	SVCA-MW-4	SVCA-GW-109	SVCA-GW-110	SVCA-GW-111	SVCA-SB-112
	Sample Date	08/24/2017	03/26/2018	09/13/2017	09/13/2017	09/13/2017	09/13/2017
	Sample Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
	MTCA Method A Cleanup Levels						
Gasoline range hydrocarbons (mg/L)	0.8	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Total Petroleum Hydrocarbons (mg/L)							
Diesel range hydrocarbons	0.5	0.37	0.10 U	0.23	0.10 U	0.14	0.10 U
Motor oil range hydrocarbons	0.5	0.28	0.20 U	0.23 U	0.20 U	0.20 U	0.20 U
Total diesel and motor oil range hydrocarbons	0.5	0.65	0.15 U	0.35¹	0.15 ¹ U	0.23¹	0.15 ¹ U
Total Petroleum Hydrocarbons (with silica gel cleanup) (mg/L)							
Diesel range hydrocarbons (with silica gel cleanup)	0.5	0.05 U	0.12	0.10 U	0.10 U	0.10 U	0.10 U
Motor oil range hydrocarbons (with silica gel cleanup)	0.5	0.10 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Total diesel and motor oil range hydrocarbons (with silica gel cleanup)	0.5	0.15 U	0.12	0.15 ¹ U	0.15 ¹ U	0.15 ¹ U	0.15 ¹ U
Fraction removed by silica gel cleanup	--	--	--	--	--	--	--
Volatile Organics (µg/L)							
Benzene	5	0.20 U	0.20 U	0.20 U	0.20 U	0.04 J	0.20 U
Ethylbenzene	700	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Toluene	1000	0.04 J	0.20 U	0.20 U	0.20 U	0.05 J	0.20 U
m,p-Xylene	1000	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
o-Xylene	1000	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U

Notes:

1. When calculating the total concentration of diesel and motor oil range hydrocarbons, non-detect results are assigned a value equal to half of the reporting limit

 Detected concentration is greater than the corresponding MTCA Method A cleanup level.

Bold: Detected result

J: Estimated value

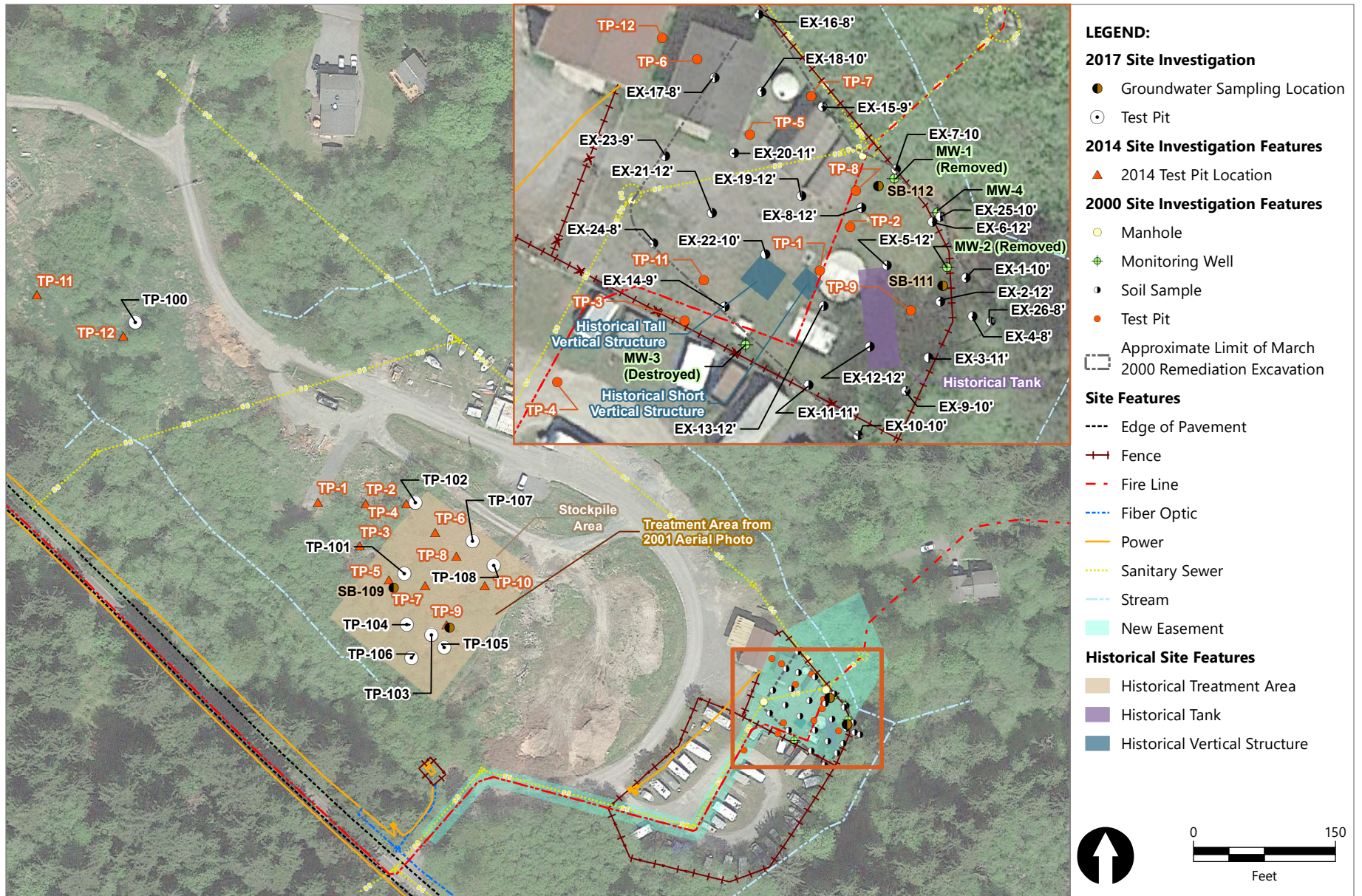
U: Compound analyzed, but not detected above detection limit

* : Silica gel cleanup is used to remove biogenic interferences when significant quantities of plant matter or other non-petroleum organic matter are present. In the case of biodegraded petroleum products, the Washington State Department of Ecology determines on a case-by-case basis whether silica gel cleanup is appropriate for determining compliance with cleanup levels.

mg/L: milligrams per liter

µg/L: micrograms per liter

Figures

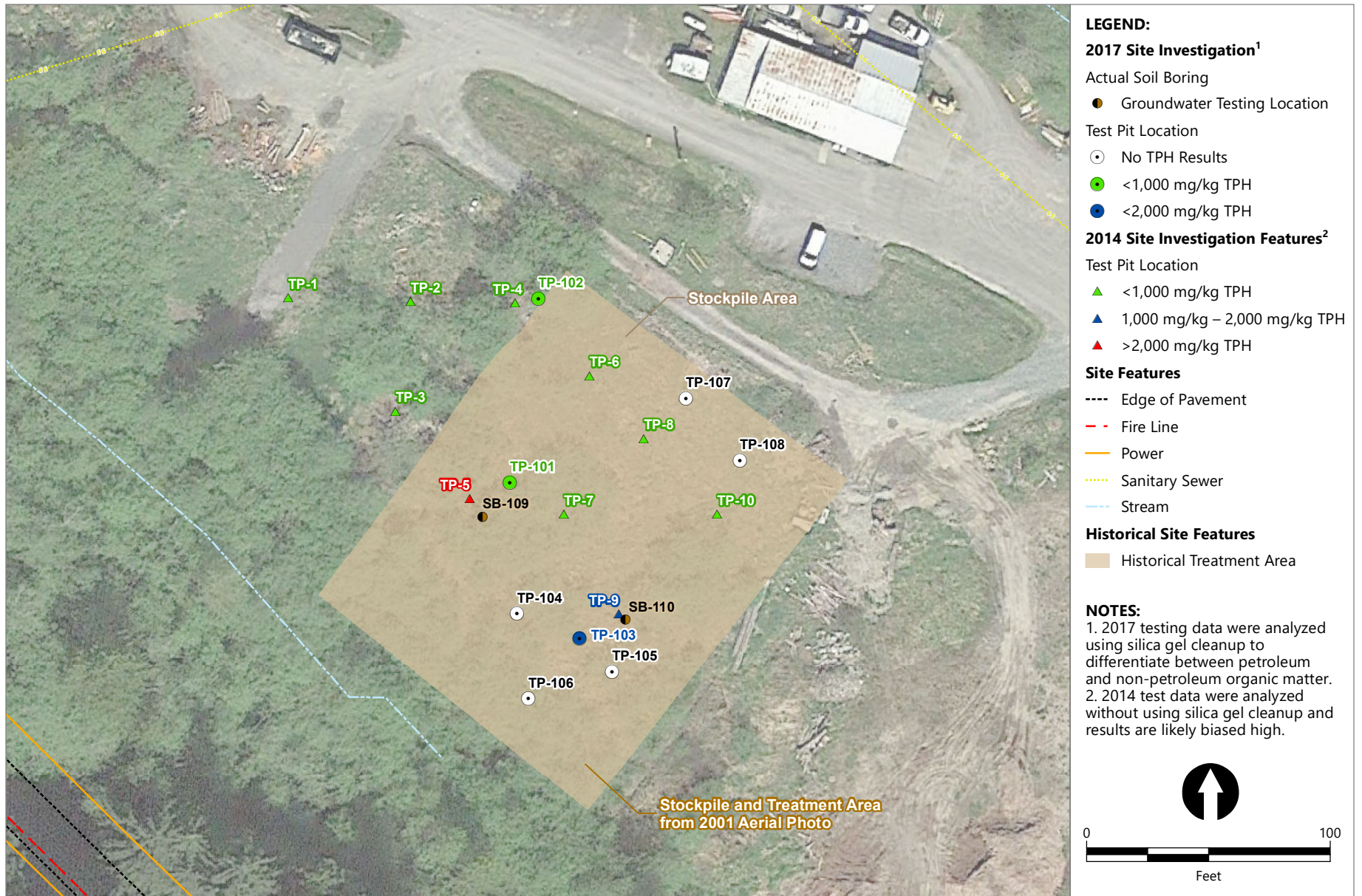


Publish Date: 2018/06/08, 6:58 AM | User: lhudson

Filepath: \\orcas\gis\Jobs\WilsonEngineering_1240\SuddenValleyCommunityAssoc\Maps\AreaZ_Remediation\Memo_to_Ecology\SVCA_Fig1_AllSampling_SummaryMap.mxd



Figure 1
Sampling
 Area Z Remediation
 Sudden Valley Community Association



Publish Date: 2018/06/08, 7:02 AM | User: lhudson

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Figure 2
Treatment Area
Area Z Remediation
Sudden Valley Community Association





Appendix A

Previous Field Investigations

Three Regulated Underground Storage Tank Removals, John A. Pinner & Associates,
November 6, 1992

Environmental Drilling and Sampling Results for Area Z, GeoEngineers, September 14, 1999

Report of Remedial Excavation Activities, Area Z, GeoEngineers, May 23, 2000

Report of Environmental Services, Area Z Soil Stockpile Sampling, GeoEngineers, May 14, 2014

Further Action at the Following Site: Sudden Valley Resort, Washington State Department of Ecology,
September 2, 2014

**SUDDEN VALLEY
2145 LAKE WHATCOM BLVD.
BELLINGHAM, WASHINGTON**

**MULTIPLE UNDERGROUND STORAGE TANK
REMOVAL**

**JOHN A. PINNER & ASSOCIATES
201 GRAND AVENUE
BELLINGHAM, WASHINGTON 98225
(206) 733- 4021 FAX (206)676-6170**

JOHN A. PINNER & ASSOCIATES

CIVIL, STRUCTURAL & GEOTECHNICAL ENGINEERING AND ENVIRONMENTAL SERVICES

November 6, 1992

Mr. Gordy Gerard
Gerard Enterprises
6084 Neevel Road
Ferndale, Wa 98248

RE: Sudden Valley
Three Regulated Underground Storage Tank Removals
2145 Lake Whatcom Blvd.
Bellingham, Washington
Site ID#101773
Owner #U0010184

Dear Mr. Gerard,

Enclosed you will find the results of the soil testing performed by our firm on October 6th & 7th, 1992, together with a Field Inspection Report and Laboratory testing results.

TANK #1

Tank #1 was located in the area of the Restaurant and Golf Course in the Sudden Valley Community. This was a 300 gallon gasoline tank. The tank was purged of all remaining gasoline and removed using a JCB Sidemaster Excavator operated by Mike Wagner of Cannon Electric. Two soil samples were taken from this location.

Soil Sample #5 was taken from under the fill spout at an approximate depth of 3.5 feet. This sample was tested for WTPH-G/BTEX combination with the following results; **<1.0 mg/kg for Total Petroleum Hydrocarbons, <0.05 mg/kg for Benzene, Toluene, Ethyl Benzene and Xylenes.** All of these results are **below** the D.O.E. action levels.

Soil Sample #6 was taken from the side wall at an approximate depth of 3.5 feet. This sample was tested for WTPH-G with the following results; **<1.0 mg/kg for Total Petroleum Hydrocarbons,** which is **below** the D.O.E. action levels.

TANK #2

Tank #2 was located at the Maintenance Shop for the Sudden Valley Community. This tank held 1000 gallons of gasoline. The tank was purged of all remaining fuel and removed. This tank was fairly new and had no damage to it from the removal.

In this location there was some contaminated soil. The soil was removed and taken to a location within the Sudden Valley Community which is called "Area Z". It was recommended that the soil be placed on Visqueen with hay bales around the perimeter of the soil beds and covered with visqueen during treatment. Further testing of this soil will be done during the treatment process.

Soil Sample #7 & #8 were taken from the side walls of the of the pit. These samples were tested for WTPH-G with the following results; **<1.0 mg/kg** for Total Petroleum Hydrocarbons, which are **below** the D.O.E. action levels.

Soil Sample #9 was taken from the bottom of the pit. This sample was tested for WTPH-G/BTEX combination with the following results; **6.5 mg/kg** for Total Petroleum Hydrocarbons, **<0.05 mg/kg** for Benzene, Toluene and Xylenes and **0.18 mg/kg** for Ethyl Benzene. All of these results are **below** the D.O.E. action levels.

TANK #3 & #4

Tank #3 and #4 were located in the designated Area Z on Lake Louise Road in the Sudden Valley Community. These were each 1000 gallon gasoline tanks and were together in the same pit. Both tanks were purged with remaining fuel and excavated from the pit.

Soil Sample #10 was taken from under the fill spout of tank #3 at an approximate depth of 4.5 feet. This sample was tested for WTPH-G/BTEX combination with the following results; **<1.0 mg/kg** for Total Petroleum Hydrocarbons, **<0.05 mg/kg** for Benzene, Toluene, Ethyl Benzene and Xylenes. All of these results are **below** the D.O.E. action levels.

Soil Sample #11 was taken from under the fill spout of tank #4 at an approximate depth of 4.5 feet. This sample was tested for WTPH-G with the following results; **<1.0 mg/kg** for Total Petroleum Hydrocarbons, which is **below** the D.O.E. action levels.

Soil Sample #12 was taken from the north wall of the pit at an approximate depth of 6.5 feet. This sample was tested for

WTPH-G with the following results; <1.0 mg/kg for Total Petroleum Hydrocarbons, which is again below the D.O.E. action levels.

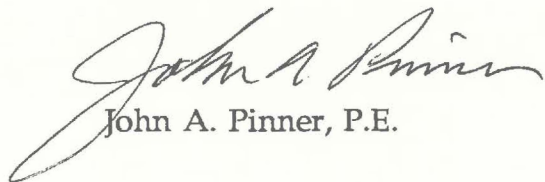
Soil Sample #13 was taken from the south wall of the pit at an approximate depth of 4.0 feet. This sample was tested for WTPH-G with the following results; <1.0 mg/kg for Total Petroleum Hydrocarbons, which is below the D.O.E. action levels.

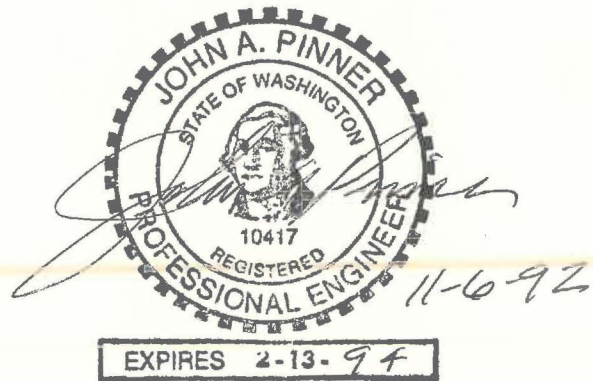
Soil Sample #14 was taken from the bottom of the pit. This sample was tested for WTPH-G/BTEX combination with the following results; <1.0 mg/kg for Total Petroleum Hydrocarbons, <0.05 mg/kg for Benzene, Toluene, Ethyl Benzene and Xylenes. All of these results are below the D.O.E. action levels.

It is our conclusion from the laboratory testing results, these sites be considered permanently closed with acceptable levels of contamination.

A follow-up report will be needed when additional testing is done at the "Area Z" treatment location. Please inform our firm when you are ready for additional testing.

Sincerely,


John A. Pinner, P.E.



Enc: Field Inspection Report
Sound Analytical Lab results
Vicinity Map
Photographs
Site Assessment Checklist

cc: Mr. Joe Hickey, D.O.E., Bellevue, Wa
Underground Storage Tank Section, Olympia, Wa
Sudden Valley Management





TANK #1



VIEW OF EXCAVATED TANK NEAR RESTAURNT/CLUB HOUSE



VIEW OF GOLF COURSE FROM BANK THAT TANK WAS LOCATED ON

TANK #2



LOADED AND READY FOR TRANSPORT (TANK LOOKS LIKE NEW)



PIT FROM TANK #2 AT MAINTENANCE BUILDING

TANKS #3 & #4



LOCATION OF TANKS 3 & 4 IN "AREA Z" NEAR SHOP BUILDING



SOUND ANALYTICAL SERVICES, INC.

John A. Pinner & Assoc.

Project: Gerard Enterprises, Sudden Valley

Page 3 of 9

Lab No. 27748

October 30, 1992

Lab No. 27748-5

Client ID: #5

WTPH-G with BTEX by Method 8020

Date Extracted: 10-15-92

Date Analyzed: 10-20-92

Gasoline, mg/kg (C7-C12)	< 1.0
Benzene, mg/kg	< 0.05
Toluene, mg/kg	< 0.05
Ethyl Benzene, mg/kg	< 0.05
Xylenes, mg/kg	< 0.05

SURROGATE RECOVERY, %

Trifluorotoluene	72
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Continued

SOUND ANALYTICAL SERVICES, INC.

John A. Pinner & Assoc.
Project: Gerard Enterprises, Sudden Valley
Page 7 of 9
Lab No. 27748
October 30, 1992

Lab No. 27748-9

Client ID: #6

WTPH-G

Date Extracted: 10-15-92

Date Analyzed: 10-20-92

Gasoline, mg/kg < 1.0
(C7-C12)

SURROGATE RECOVERY, %

Trifluorotoluene 74

Lab No. 27748-10

Client ID: #7

WTPH-G

Date Extracted: 10-15-92

Date Analyzed: 10-20-92

Gasoline, mg/kg < 1.0
(C7-C12)

SURROGATE RECOVERY, %

Trifluorotoluene 66

Continued

SOUND ANALYTICAL SERVICES, INC.

John A. Pinner & Assoc.

Project: Gerard Enterprises, Sudden Valley

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Lab No. 27748

October 30, 1992

Lab No. 27748-11

Client ID: #8

WTPH-G

Date Extracted: 10-15-92

Date Analyzed: 10-20-92

Gasoline, mg/kg < 1.0
(C7-C12)

SURROGATE RECOVERY, %

Trifluorotoluene 74

Lab No. 27748-12

Client ID: #11

WTPH-G

Date Extracted: 10-15-92

Date Analyzed: 10-20-92

Gasoline, mg/kg < 1.0
(C7-C12)

SURROGATE RECOVERY, %

Trifluorotoluene 74

Continued

SOUND ANALYTICAL SERVICES, INC.

John A. Pinner & Assoc.

Project: Gerard Enterprises, Sudden Valley

Page 4 of 9

Lab No. 27748

October 30, 1992

Lab No. 27748-6

Client ID: #9

WTPH-G with BTEX by Method 8020

Date Extracted: 10-15-92

Date Analyzed: 10-20-92

Gasoline, mg/kg (C7 - C12)	6.5	X2
-------------------------------	-----	----

Benzene, mg/kg	< 0.05
Toluene, mg/kg	< 0.05
Ethyl Benzene, mg/kg	0.18
Xylenes, mg/kg	< 0.05

SURROGATE RECOVERY, %

Trifluorotoluene	66
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Continued

SOUND ANALYTICAL SERVICES, INC.

John A. Pinner & Assoc.

Project: Gerard Enterprises, Sudden Valley

Page 5 of 9

Lab No. 27748

October 30, 1992

Lab No. 27748-7

Client ID: #10

WTPH-G with BTEX by Method 8020

Date Extracted: 10-15-92

Date Analyzed: 10-20-92

Gasoline, mg/kg < 1.0
(C7-C12)

Benzene, mg/kg < 0.05

Toluene, mg/kg < 0.05

Ethyl Benzene, mg/kg < 0.05

Xylenes, mg/kg < 0.05

SURROGATE RECOVERY, %

Trifluorotoluene 70

Continued

SOUND ANALYTICAL SERVICES, INC.

John A. Pinner & Assoc.
Project: Gerard Enterprises, Sudden Valley
Page 9 of 9
Lab No. 27748
October 30, 1992

Lab No. 27748-13

Client ID: #12

WTPH-G

Date Extracted: 10-15-92

Date Analyzed: 10-20-92

Gasoline, mg/kg < 1.0
(C7 - C12)

SURROGATE RECOVERY, %

Trifluorotoluene 63

Lab No. 27748-14

Client ID: #13

WTPH-G

Date Extracted: 10-15-92

Date Analyzed: 10-20-92

Gasoline, mg/kg < 1.0
(C7 - C12)

SURROGATE RECOVERY, %

Trifluorotoluene 65

SOUND ANALYTICAL SERVICES


MARTY FRENCH

SOUND ANALYTICAL SERVICES, INC.

John A. Pinner & Assoc.
Project: Gerard Enterprises, Sudden Valley
Page 6 of 9
Lab No. 27748
October 30, 1992

Lab No. 27748-8

Client ID: #14

WTPH-G with BTEX by Method 8020
Date Extracted: 10-15-92
Date Analyzed: 10-20-92

Gasoline, mg/kg (C7-C12)	< 1.0
Benzene, mg/kg	< 0.05
Toluene, mg/kg	< 0.05
Ethyl Benzene, mg/kg	< 0.05
Xylenes, mg/kg	< 0.05

SURROGATE RECOVERY, %

Trifluorotoluene	71
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Continued

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

WTPH-G with BTEX by EPA SW-846 Method 8020

Client: John A Pinner & Assoc.
Lab No: 27748qc1
Matrix: Soil
Units: mg/kg
Date: October 30, 1992

DUPLICATES

Dup No. 27748-14

Parameter	Sample (S)	Duplicate (D)	RPD	FLAGS
Gasoline (C ₇ -C ₁₂)	< 1.0	< 1.0	0.0	
<u>SURROGATE RECOVERY, %</u> Trifluorotoluene	65	70		

RPD = Relative Percent Difference
= $[(S - D) / ((S + D) / 2)] \times 100$

METHOD BLANK

Blank No. 92101957

Parameter	Blank Value
Gasoline (C ₇ -C ₁₂)	< 1.0
Benzene	< 0.05
Toluene	< 0.05
Ethyl Benzene	< 0.05
Xylenes	< 0.05
<u>SURROGATE RECOVERY, %</u> Trifluorotoluene	88

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

WTPH-D (Diesel Range Organics)

Client: John A Pinner & Assoc.
Lab No: 27748qc2
Matrix: Soil
Units: mg/kg
Date: October 30, 1992

DUPLICATES

Dup No. 27748-4

Parameter	Sample (S)	Duplicate (D)	RPD	Flag
Diesel ($>C_{12}-C_{24}$)	< 25	< 25	0.0	
<u>SURROGATE RECOVERY, %</u> o-terphenyl	62	51		

RPD = Relative Percent Difference
= $[(S - D) / ((S + D) / 2)] \times 100$

METHOD BLANK

Parameter	Blank Value
Diesel	< 25
<u>SURROGATE RECOVERY, %</u> o-terphenyl	70

**MEMORANDUM**

Redmond

TO: Sandy Cameron, Sudden Valley Community Association
FROM: Lisa Bona and Chuck Lindsay
DATE: September 14, 1999
FILE: 7536-002-00
SUBJECT: Environmental Drilling and Sampling Results for Area Z

INTRODUCTION

GeoEngineers completed eleven shallow test pits in a portion of Area Z in July 1999 to characterize subsurface soil contamination encountered during previous geotechnical investigations at the site. The soil contamination appeared to be caused by releases from pumps and/or piping that extended from a former diesel aboveground storage tank located to the west of the contaminated area. Based on field screening and chemical analytical results for soil samples obtained from the test pits, GeoEngineers estimated the limits of petroleum-related soil contamination, as shown in our memorandum "Subsurface Soil Contamination in Area Z" dated August 13, 1999. In a meeting with the Sudden Valley Community Association (SVCA) on August 13, 1999, GeoEngineers recommended that ground water conditions be evaluated at the site. The ground water sampling results will be used to determine an appropriate remedial option for soil contamination.

RESULTS OF ENVIRONMENTAL DRILLING AND SAMPLING**GENERAL**

GeoEngineers subcontracted Gregory Drilling to complete three monitoring wells in the area of known soil contamination on August 27, 1999. The monitoring well borings (MW-1 through MW-3) were completed at depths of approximately 13.5 to 19.0 feet below ground surface (bgs). MW-1 and MW-2 are located north of an existing fence, as close to Beaver Creek as the drill rig was able to work. These wells are located hydraulically downgradient from the soil contamination. MW-3 is located in the vehicle parking area, upgradient of the soil contamination area. The approximate locations of the monitoring wells are shown on the Site Plan, Figure 1. Boring logs are attached. Ground water samples were obtained from the monitoring wells on August 31, 1999.

SOIL

The monitoring well borings encountered fill from the surface to approximately 7.5 feet bgs at the locations of MW-1 and MW-2. The fill generally consisted of silty sand. Native soil beneath the fill generally consisted of sand with silt, sandy silt and sand with occasional silt and with variable gravel to the completion depths of the borings. Boring MW-2 was completed at 13.5 feet because of apparent refusal on a boulder.

Memorandum to Sandy Cameron,
Sudden Valley Community Association
September 14, 1999
Page 2

Soil samples were obtained from the borings at approximate 2.5-foot depth intervals for field screening using visual, water sheen screening and headspace vapor screening methods. At least one soil sample was selected from each boring for chemical analysis of diesel- and heavy oil-range hydrocarbons by Ecology Method NWTPH-Dx. Soil samples were selected for chemical analysis based on field screening results and/or proximity to the water table. The soil sample with the highest field screening results (MW-2-11) also was submitted for chemical analysis of benzene, ethylbenzene, toluene and xylenes (BETX) by EPA Method 8021B and gasoline-range hydrocarbons by Ecology Method NWTPH-Gx.

Field screening results indicated the likely presence of soil contamination in boring MW-1 at depths of 5 to 9 feet bgs, and in MW-2 at depths of 7.5 to 11 feet bgs. Samples MW-1-8, MW-2-11 and MW-3-8 were submitted for chemical analysis (Table 1). Diesel-range hydrocarbons were detected in sample MW-1-8 (14,100 milligrams per kilogram [mg/kg]) and MW-2-11 (1,780 mg/kg) at concentrations exceeding the MTCA Method A cleanup level of 200 mg/kg. Gasoline-range hydrocarbons were detected in sample MW-2-11 at a concentration less than the MTCA Method A cleanup level of 100 mg/kg. BETX were not detected in sample MW-2-11. Diesel- and heavy oil-range hydrocarbons were not detected in sample MW-3-8. Sample MW-1-13 was submitted for chemical analysis after receiving preliminary results for the other samples. Diesel- and heavy oil-range hydrocarbons were not detected in sample MW-1-13.

GROUND WATER

Ground water was encountered at depths ranging from 8.5 to 11 feet bgs in the monitoring well borings during drilling. The monitoring wells were completed at depths ranging from 12.5 to 17.5 feet bgs. The monitoring wells were developed on August 27 by removing approximately five well volumes from each well casing by surging and hand bailing.

Depths to ground water on August 31 ranged from 8 to 11 feet bgs. The shallow ground water flow direction is estimated to be to the north, based on the calculated ground water elevations. Ground water samples were obtained from the wells after purging approximately three well volumes from each well casing by hand bailing. The ground water samples were submitted for chemical analysis of BETX, and gasoline-, diesel- and heavy oil-range hydrocarbons. Benzene and toluene were detected at low concentrations in sample MW-2; BETX were not detected in the other samples. Diesel-range hydrocarbons were detected at a concentration less than the MTCA Method A cleanup level in sample MW-1. The sum of gasoline- and diesel-range hydrocarbon concentrations (20.8 milligrams per liter [mg/l]) detected in sample MW-2 exceeded the MTCA Method A cleanup level of 1 mg/l. Petroleum-related compounds were not detected in sample MW-3.

Memorandum to Sandy Cameron,
Sudden Valley Community Association
September 14, 1999
Page 3

DISCUSSION

Remedial options are discussed in our August 13, 1999 memorandum. As outlined in the memorandum, either MTCA Method A cleanup levels can be used for remediation levels at petroleum-contaminated sites, or a site-specific MTCA Method B cleanup level protective of soil direct contact can be calculated for use as a remediation level at the site. Based on our experience at other sites, the MTCA Method B cleanup level likely would exceed 3,000 mg/kg. Diesel-range hydrocarbons were detected at a concentration exceeding a likely site-specific MTCA Method B cleanup level in the 8-foot sample from MW-1, and less than the anticipated Method B cleanup level in the 11 foot sample from MW-2. Both concentrations exceed the MTCA Method A cleanup level. Based on the results of our sampling from the monitoring well explorations, it is our opinion that the most cost-effective remedial approach for this site is to remediate to a MTCA Method B cleanup level for petroleum hydrocarbons. However, Method A cleanup levels should be achievable in the area that will be excavated by the sewer system contractor.

Petroleum concentrations in the ground water sample from MW-2 are 20 times higher than the MTCA Method A cleanup level. Petroleum concentrations in ground water in MW-2 could be reduced by the removal of petroleum-contaminated soil in the area. Because of the topography adjacent to Beaver Creek, it will be logistically difficult to excavate much closer to the creek than where MW-2 is located. However, a best effort should be attempted to remove as much contaminated soil as possible, minimizing any sediment that might enter the creek. It is unlikely that MTCA Method A cleanup levels will be immediately achieved in ground water adjacent to the creek near MW-2, even after soil remediation. Gradual improvement in ground water quality likely will occur over time after contaminated soil is removed from the area.

The estimated impacted soil volumes and remedial costs are provided in our August 13, 1999 memorandum. However, based on the results of the August 1999 explorations, it is estimated that the volume of petroleum-contaminated soil exceeding the MTCA Method B cleanup level may be 600 yd³, which is approximately 100 yds³ greater than our original estimate. Therefore, our revised cost estimate for a Method B-based cleanup at the site is \$42,000.

TABLE 1
SUMMARY OF SOIL FIELD SCREENING AND CHEMICAL ANALYTICAL DATA
 SUDDEN VALLEY COMMUNITY ASSOCIATION AREA Z
 BELLINGHAM, WASHINGTON

Sample Number/ Depth of Sample ¹	Date Sampled	Field Screening Results		BETX ² (mg/kg)				Gasoline- range Hydrocarbons ³ (mg/kg)	Diesel- range Hydrocarbons ⁴ (mg/kg)	Heavy Oil- range Hydrocarbons ⁴ (mg/kg)
		Headspace Vapors (ppm)	Sheen	B	E	T	X			
MW-1-8	08/27/99	<1.00	MS	-	-	-	-	-	14,100	<275
MW-1-13	08/27/99	<1.00	NS	-	-	-	-	-	<10.0	<25.0
MW-2-11	08/27/99	<1.00	HS	<0.100	<0.100	<0.100	<0.200	72.7	1,780	<125
MW-3-8	08/27/99	<1.00	SS	-	-	-	-	-	<10.0	<25.0
MTCA Method A Cleanup Level				0.5	20	40	20	100	200	200

Notes:

¹Approximate sample locations are shown in Figure 1.

²B = benzene, E = ethylbenzene, T = toluene, X = xylenes. BETX analyzed by EPA Method 8021B.

³Analyzed by Ecology Method NWTPH-Gx.

⁴Analyzed by Ecology Method NWTPH-Dx.

ppm = parts per million

mg/kg = milligrams per kilogram

- = not analyzed

Shading indicates concentration exceeds the MTCA Method A cleanup level.

Chemical analyses conducted by North Creek Analytical of Bothell, Washington.

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TABLE 2
SUMMARY OF GROUND WATER ELEVATIONS AND CHEMICAL ANALYTICAL DATA
 SUDDEN VALLEY COMMUNITY ASSOCIATION AREA Z
 BELLINGHAM, WASHINGTON

Sample Number ¹	Date Sampled	Depth to Ground Water from Ground Surface (feet)	Ground Water Elevation ² (feet)	BETX ³ (µg/l)				Gasoline-range Hydrocarbons ⁴ (mg/l)	Diesel-range Hydrocarbons ⁵ (mg/l)	Heavy Oil-range Hydrocarbons ⁵ (mg/l)
				B	E	T	X			
MW-1	08/31/99	10.79	88.25	<0.500	<0.500	<0.500	<0.100	<0.0500	0.515	<0.500
MW-2	08/31/99	7.91	90.87	0.660	<0.500	0.670	<0.100	1.59	19.2	<2.50
MW-3	08/31/99	11.11	92.02	<0.500	<0.500	<0.500	<0.100	<0.0500	<0.250	<0.500
Purge ⁶	08/31/99	NA	NA	<0.500	<0.500	<0.500	<0.100	--	--	--
MITCA Method A Cleanup Level				5	30	40	20	100	200	200

Notes:

¹ Approximate monitoring well locations are shown in Figure 1

² Elevations are measured relative to a temporary benchmark with an assumed elevation of 100.00 feet

³ B = benzene, E = ethylbenzene, T = toluene, X = xylenes. BETX analyzed by EPA Method 8021B.

⁴ Analyzed by Ecology Method NWTPH-Gx

⁵ Analyzed by Ecology Method NWTPH-Dx

⁶ Purge water sample also analyzed for fats, oil and greases (FOG) by EPA Method 413.2. FOG were detected at a concentration of 5.88 mg/l.

µg/l = micrograms per liter

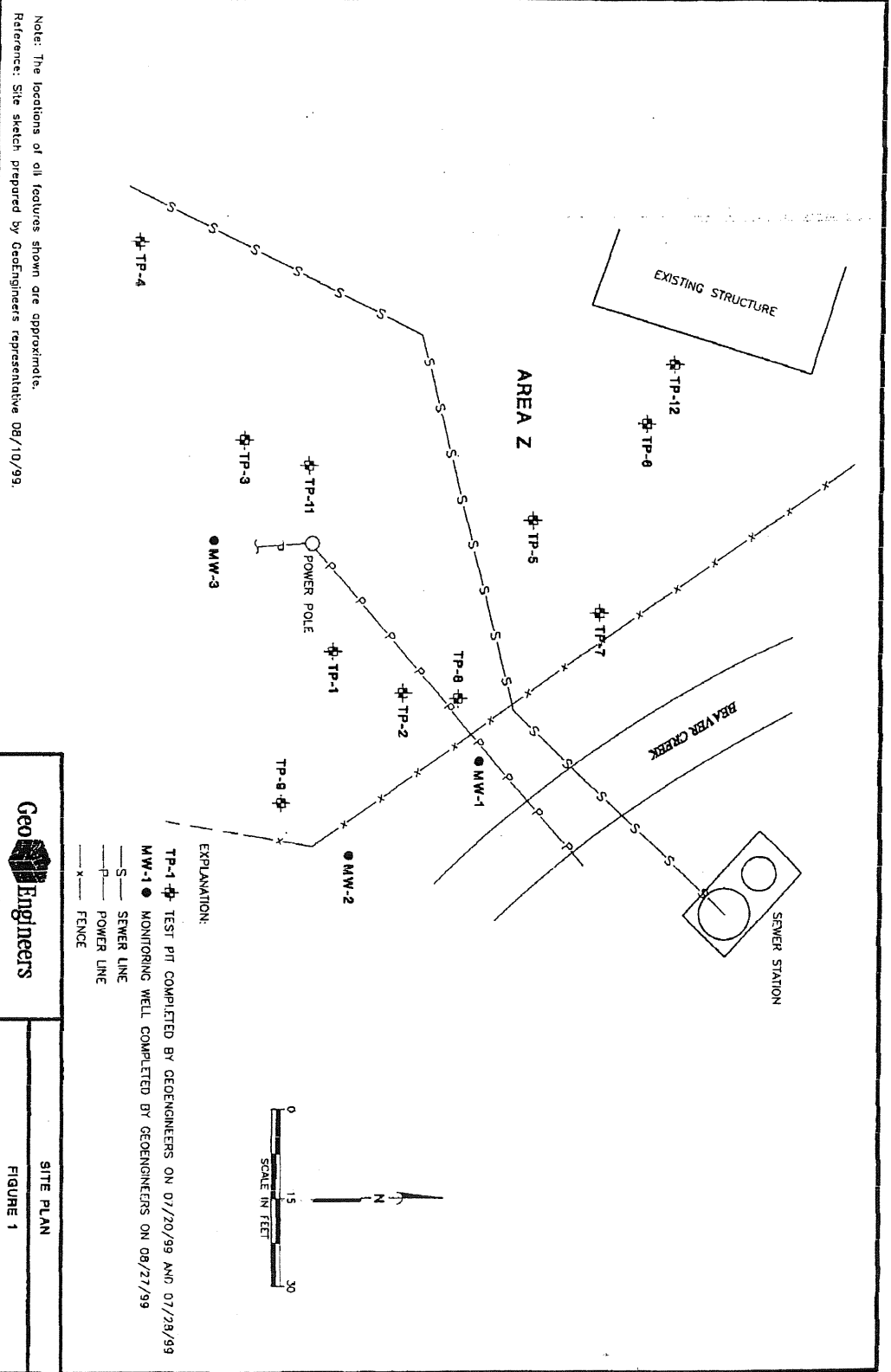
mg/l = milligrams per liter

-- = not analyzed

NA = not applicable

Shading indicates a concentration exceeding the MITCA Method A cleanup level.

Chemical analyses conducted by North Creek Analytical of Bothell, Washington.




Note: The locations of all features shown are approximate.
 Reference: Site sketch prepared by GeoEngineers representative 08/10/99.

Geo Engineers

SITE PLAN
FIGURE 1

ATTACHMENT A

SOIL CLASSIFICATION SYSTEM				
MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE GRAINED SOILS	GRAVEL More Than 50% of Coarse Fraction Retained on No. 4 Sieve	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND More Than 50% of Coarse Fraction Passes No. 4 Sieve	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
			SC	CLAYEY SAND
FINE GRAINED SOILS	SILT AND CLAY Liquid Limit Less Than 50	INORGANIC	ML	SILT
			CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
	SILT AND CLAY Liquid Limit 50 or More	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	OH	ORGANIC CLAY, ORGANIC SILT
HIGHLY ORGANIC SOILS			PT	PEAT
<p>NOTES:</p> <ol style="list-style-type: none"> Field classification is based on visual examination of soil in general accordance with ASTM D2486-90. Soil classification using laboratory tests is in general accordance with ASTM D2487-90. Descriptions of soil density or consistency are based on interpretation of blow count data, visual appearance of soils, and/or test data. 				
<p>SOIL MOISTURE MODIFIERS:</p> <p>Dry - Absence of moisture, dusty, dry to the touch</p> <p>Moist - Damp, but no visible water</p> <p>Wet - Visible free water or saturated, usually soil is obtained from below water table</p>				
			SOIL CLASSIFICATION SYSTEM	
			FIGURE A-1	

LABORATORY TESTS

CA Chemical Analysis

FIELD SCREENING TESTS:

Headspace vapor concentration data given in parts per million

Sheen classification system:

- NS No Visible Sheen
- SS Slight Sheen
- MS Moderate Sheen
- HS Heavy Sheen
- NT Not Tested

BLOW COUNT/SAMPLE DATA:

SOIL GRAPH:



SM Soil Group Symbol (See Note 2)

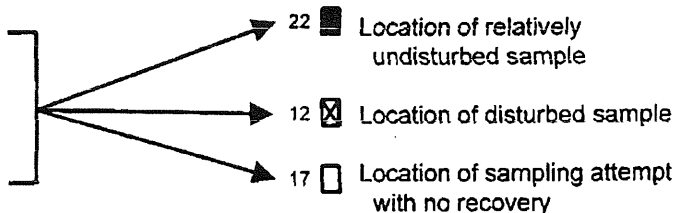
Distinct Contact Between Soil Strata

Gradual or Approximate Location of Change Between Soil Strata

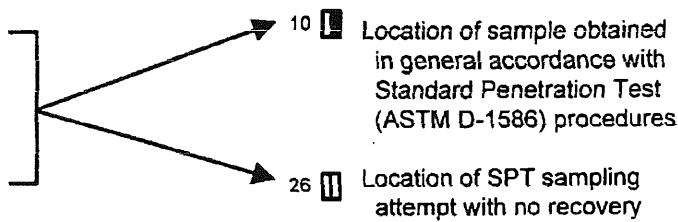
▽ Water Level

Bottom of Boring

Blows required to drive a 2.4-inch I.D. split-barrel sampler 12 inches or other indicated distances using a 300-pound hammer falling 30 inches.



Blows required to drive a 1.5-inch I.D. (SPT) split-barrel sampler 12 inches or other indicated distances using a 140-pound hammer falling 30 inches.



▨ Location of grab sample

"P" indicates sampler pushed with weight of hammer or against weight of drill rig.

NOTES:

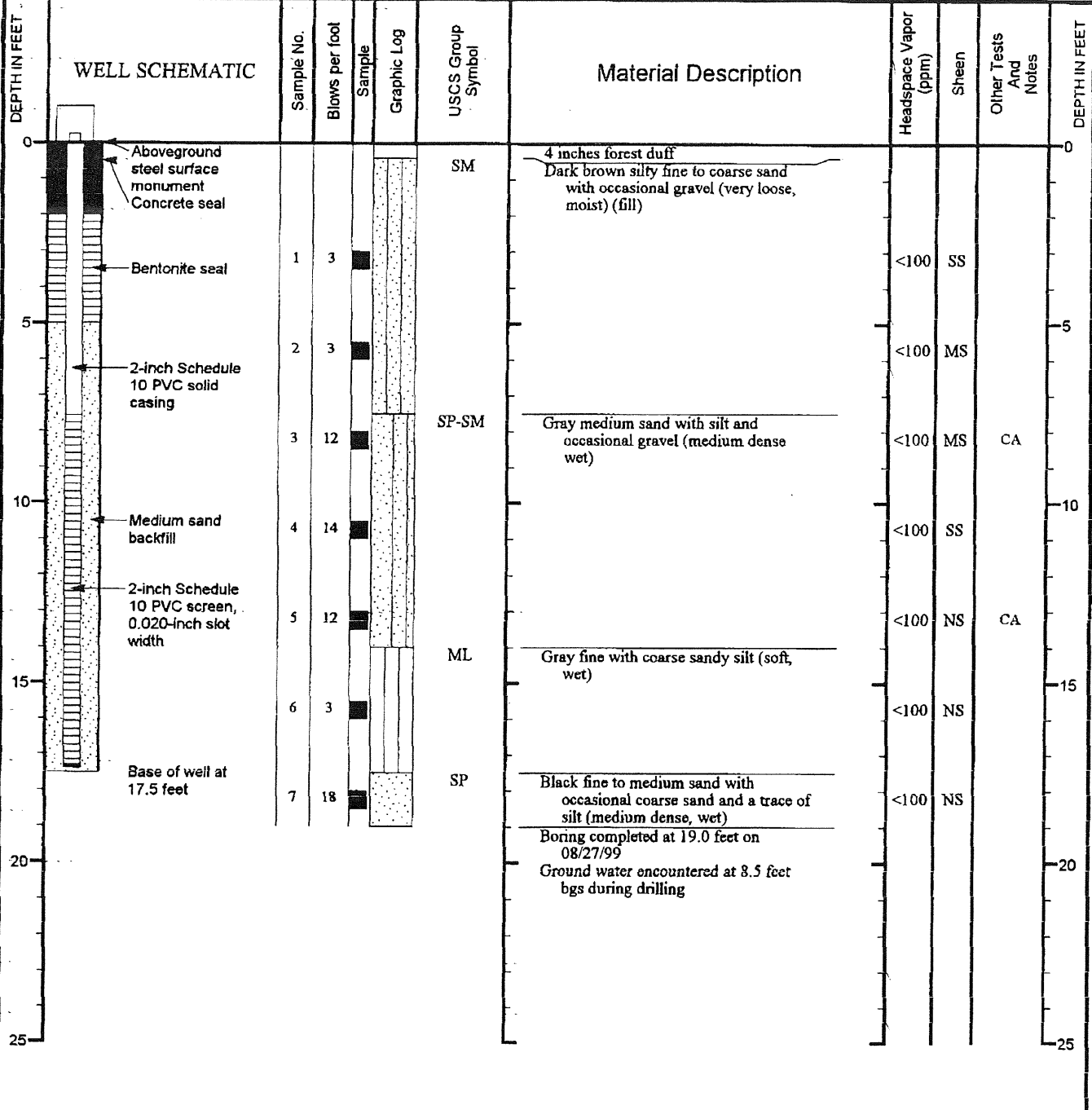
1. The reader must refer to the discussion in the report text, the Key to Boring Log Symbols and the exploration logs for a proper understanding of subsurface conditions.
2. Soil classification system is summarized in Figure A-1.



KEY TO BORING LOG SYMBOLS

FIGURE A-2

Project SVCA		Job Number 7536-002-00		Location Sudden Valley	
Date Drilled 8/27/99	Logged By REC		Contractor Gregory Drilling		
Drill Method 4"HSA	Equipment Track-mounted rig		Drill Bit		
Sample Method D&M	Hammer Data 300 lb hammer		X-coordinate:	Not Determined	
				Y-coordinate:	Not Determined
Total Depth (ft) 19	Elevation (ft) 99.04		Datum:	Not Determined	
				System:	Not Determined
Total Well Depth (ft) 17.5	Monument Elevation 99.45		Casing Elevation	99.45	
		Stickup (ft) 0.4			



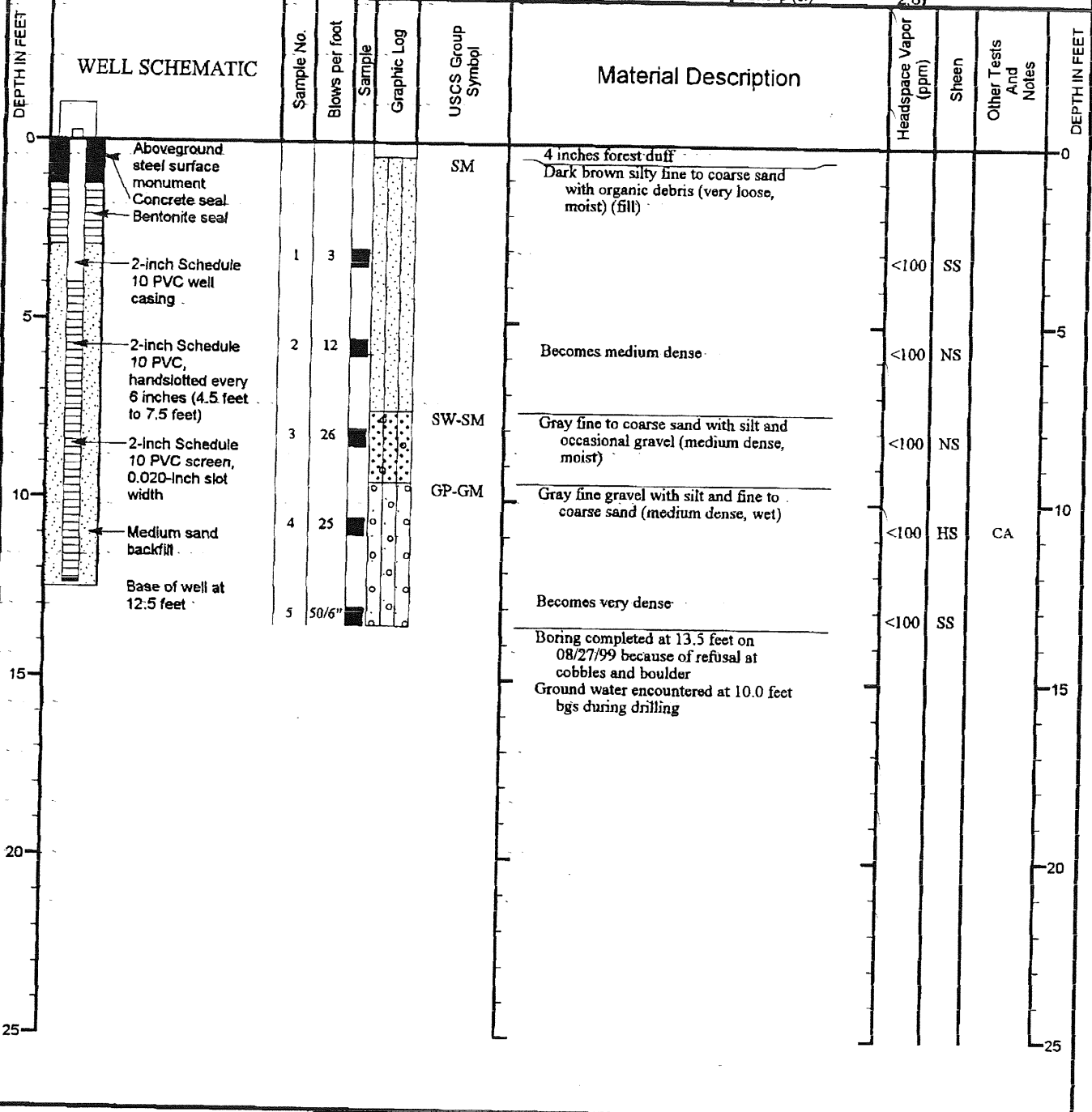
GEI WELL LOG 7536002.GPJ GEI CORP.GDT 9/14/99 7536-002-00



LOG OF MONITORING WELL MW-1

FIGURE A-3

Project SVCA		Job Number 7536-002-00		Location Sudden Valley	
Date Drilled 8/27/99	Logged By REC	Contractor Gregory Drilling			
Drill Method 4"HSA	Equipment Track-mounted rig	Drill Bit			
Sample Method D&M	Hammer Data 300 lb hammer	X-coordinate: Not Determined	Y-coordinate: Not Determined		
Total Depth (ft) 13.5	Elevation (ft) 98.78	Datum: Not Determined		System: Not Determined	
Total Well Depth (ft) 12.5	Monument Elevation 101.39	Casing Elevation 2.61		Stickup (ft) 2.61	



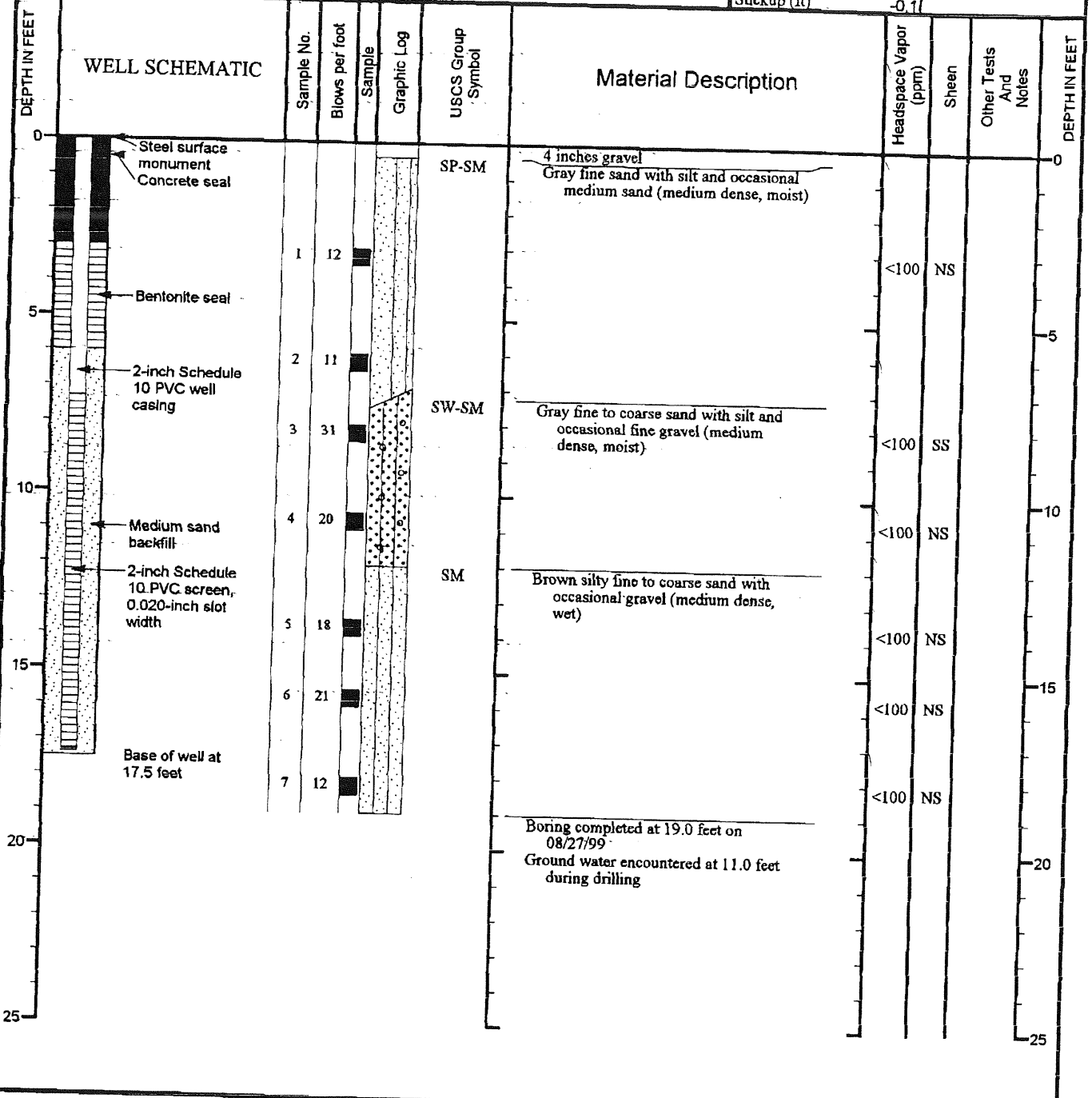
GEL WELL LOG 7536002.GPJ GEL CORP.GDT 9/14/99 7536-002-00



LOG OF MONITORING WELL MW-2

FIGURE A-4

Project SVCA		Job Number 7536-002-00		Location Sudden Valley	
Date Drilled 8/27/99	Logged By REC		Contractor Gregory Drilling		
Drill Method 4"HSA	Equipment Track-mounted rig		Drill Bit		
Sample Method D&M	Hammer Data 300 lb hammer		X-coordinate: Not Determined		
Total Depth (ft) 19		Elevation (ft) 103.13		Y-coordinate: Not Determined	
Total Well Depth (ft) 17.5		Monument Elevation Stickup (ft)		Datum: Not Determined	
				System: Not Determined	
				Casing Elevation Stickup (ft) 103.02	
				Stickup (ft) -0.11	



GEI WELL LOG 7536002.GPJ GEI CORP.GDT 8/14/99 7536-002-00



LOG OF MONITORING WELL MW-3

FIGURE A-5

**Report of Remedial Excavation Activities,
Area Z**

**Sudden Valley Community Association
Bellingham, Washington**

May 23, 2000

**For
Sudden Valley Community Association**

May 23, 2000

Sudden Valley Community Association
2145 Lake Whatcom Boulevard
Bellingham, Washington 98226

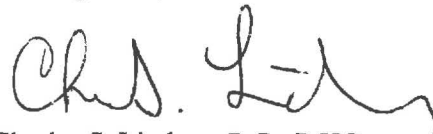
Attention: Dave Olson

We are submitting two copies of our "Report of Remedial Excavation Activities, Area Z" for the Sudden Valley Community Association located in Bellingham, Washington. Our services were completed in general accordance with the scope of services provided in our Services Agreement dated February 8, 2000. Our services were authorized by you on February 10, 2000. Soil sampling of the excavation limits was conducted in accordance with Washington Administrative Code (WAC) 173-340. This report serves as a site characterization and independent remedial action report, also in accordance with WAC 173-340.

We appreciate the opportunity to be of service to the Sudden Valley Community Association. Please call if you have questions regarding this report.

Yours very truly,

GeoEngineers, Inc.



Charles S. Lindsay, P.G., P.H.G.
Associate Hydrogeologist

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cc: Washington State Dept. of Ecology
Northwest Regional Office
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Bellevue, WA 98008

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Redmond, WA 98052
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**REPORT OF REMEDIAL EXCAVATION
ACTIVITIES, AREA Z
SUDDEN VALLEY COMMUNITY ASSOCIATION
BELLINGHAM, WASHINGTON**

INTRODUCTION

This report summarizes GeoEngineers' services during remedial excavation activities at Sudden Valley Community Association's (SVCA) Area Z located in Sudden Valley, Whatcom County, Washington. The site is owned by SVCA and is currently used for the storage of recreation vehicles. The activities described in this report were conducted between March 20 and March 30, 2000. The site is shown relative to surrounding features in the Vicinity Map, Figure 1. Whatcom County Water District No. 10 has proposed construction of a new sewer lift station within a portion of Area Z where petroleum contaminated soil was encountered in 1999. The approximate location of the proposed sewer lift station is shown in Figure 2.

GeoEngineers completed eleven shallow test pits (TP-1 to TP-11) in a portion of Area Z in July 1999 to characterize subsurface soil contamination encountered during previous geotechnical investigations at the site. The test pits were completed to depths ranging from 5 to 12.5 feet below ground surface (bgs). GeoEngineers obtained soil samples from various depths and submitted selected soil samples for chemical analysis for petroleum-related compounds. Chemical analytical results from the selected test pit soil samples ranged from 180 milligrams per kilogram (mg/kg) to 890 mg/kg for gasoline-range hydrocarbons, and 46 mg/kg to 6,200 mg/kg for diesel- and heavy oil-range hydrocarbons. The soil contamination appeared to be caused by releases from fuel pumps and/or piping that extended from a former diesel aboveground storage tank (AST) located to the west of the contaminated area. Based on field screening and chemical analytical results for soil samples obtained from the test pits, GeoEngineers estimated the limits of petroleum-related soil contamination, as discussed in our memorandum "Subsurface Soil Contamination in Area Z" dated August 13, 1999.

Additionally, GeoEngineers observed the completion of three monitoring wells (MW-1 to MW-3) to evaluate ground water conditions at the site, as discussed in our memorandum "Environmental Drilling and Sampling Results for Area Z" dated September 14, 1999. The monitoring well borings (MW-1 through MW-3) were completed at depths of approximately 13.5 to 19.0 feet bgs on August 27, 1999. MW-1 and MW-2 were located north of an existing fence, as close to Beaver Creek as the drill rig was able to work (Figure 2). These wells were located hydraulically downgradient from the soil contamination. MW-3 is located in the vehicle parking area, upgradient of the identified soil contamination area (Figure 2). Diesel-range hydrocarbons were detected in sample MW-1-8 (14,100 mg/kg) and MW-2-11 (1,780 mg/kg) at concentrations exceeding the MTCA Method A cleanup level of 200 mg/kg.

Depths to ground water in the monitoring wells ranged from 8 to 11 feet bgs on August 31, 1999. The shallow ground water flow direction was estimated to be generally to the north

(toward Beaver Creek), based on the calculated ground water elevations. Chemical analytical data for the August 1999 ground water samples indicate benzene, ethylbenzene, toluene and xylenes (BETX) either were not detected or were detected at concentrations less than the MTCA Method A cleanup levels. Diesel-range hydrocarbons were detected at a concentration less than the MTCA Method A cleanup level in sample MW-1 (0.515 milligrams per liter [mg/l]). The sum of gasoline- and diesel-range hydrocarbon concentrations (20.8 mg/l) detected in water sample MW-2 exceeded the MTCA Method A cleanup level of 1 mg/l. Petroleum compounds were not detected in sample MW-3.

PURPOSE AND SCOPE

The purpose of our services was to observe and document remedial activities in the area of known petroleum-related contamination in Area Z. The goal of the remedial activities was to remove all petroleum-hydrocarbon contaminated soil greater than MTCA Method A cleanup levels; however, where removal of soil with concentrations greater than MTCA Method A cleanup levels was not possible, the soil was evaluated with respect to the Washington State Department of Ecology's (Ecology) *Interim Interpretive and Policy Statement, Cleanup of Total Petroleum Hydrocarbons (Interim TPH Policy)*. Our specific scope of services completed for this project is presented below:

1. Observed remedial excavation activities.
2. Assisted the contractor in segregation of excavated soil into apparently noncontaminated and contaminated soil stockpiles.
3. Obtained soil samples from the limits of the excavation.
4. Conducted field screening on each soil sample from the excavation and apparently noncontaminated stockpile for evidence of petroleum-related contamination using visual, water sheen and headspace vapor screening methods.
5. Submitted 26 soil samples from the limits of the excavations for chemical analysis of total diesel- and heavy oil-range hydrocarbons by Ecology Method NWTPH-Dx.
6. Submitted one selected sample for chemical analysis of total volatile petroleum hydrocarbons (VPH), BETX, methyl tert butyl ether (MTBE), total extractable petroleum hydrocarbons (EPH) and polycyclic aromatic hydrocarbons (PAHs) by Ecology Interim TPH Policy methods and EPA Methods 8260 and 8270.
7. Submitted ten discrete samples from the apparently noncontaminated, overburden excavated soil for chemical analysis of diesel-range hydrocarbons and heavy oil-range hydrocarbons by Ecology Method NWTPH-Dx.
8. Obtained a sample from MW-1 to characterize the excavation water for disposal via the sanitary sewer. The water sample was analyzed for flashpoint by EPA Method 1010; and fats, oils and grease (FOG) by EPA Method 1664.
9. Calculated a site-specific MTCA Method B Cleanup level for protection of human health by direct contact with soil.

10. Observed the preparation and construction of a landfarm cell. Provided recommendations to the contractor as to the location, size and orientation of the landfarm cell.
11. Evaluated the compaction of the backfill using a combination of probing with a ½-inch-diameter steel probe rod and in-place density testing with a nuclear density gauge.
12. Evaluated the field and laboratory data with respect to current regulatory guidelines.

REMEDIAL EXCAVATION ACTIVITIES

GENERAL

A remedial excavation was completed in the vicinity of the proposed sewer lift station on March 20 to 24 and March 30, 2000 by Ram Construction of Bellingham, Washington. A representative of GeoEngineers observed remedial excavation activities. Soil samples (EX-1-10 through EX-26-8) were obtained from the limits of remedial excavation and submitted to verify that petroleum contamination had been successfully removed. An active, 10-inch-diameter clay tile sanitary sewer line was encountered extending east-west through the northern portion of the excavation. The sanitary sewer line was removed during excavation activities and replaced by Whatcom County Water District No. 10 in clean, imported material. Monitoring wells MW-1 and MW-2 were removed during remedial excavation activities.

Approximate soil sampling locations are shown in Figure 2. A description of our field methods is presented in Appendix A. Summaries of soil and water chemical analytical data are presented in Tables 1 through 4. Chemical analytical data sheets are presented in Appendix B.

SOIL SAMPLING RESULTS

Field screening results indicated that petroleum contamination was removed from the excavation limits with the following exceptions: Soil samples EX-7-10 and EX-25-10 displayed heavy and moderate sheens, respectively.

Petroleum hydrocarbons were not detected at concentrations exceeding the MTCA Method A cleanup levels in the samples from the final limits of the remedial excavation, with the exception of samples EX-7-10 and EX-25-10 (Table 1). The petroleum hydrocarbon concentration detected in sample EX-7-10 was significantly below the site-specific Method B cleanup level (see the following section). The petroleum hydrocarbon concentration detected in soil sample EX-25-10 exceeded the site-specific MTCA Method B cleanup level; however, the additional soil in that area could not be removed because of the close proximity to Beaver Creek. Soil samples that were removed by overexcavation (EX-4-8.0 and EX-6-12.0) are noted as such in Table 1. Petroleum hydrocarbons were detected at concentrations less than MTCA Method A cleanup levels in confirmation soil sample EX-26-8 obtained from the overexcavation area near EX-4-8.0.

INTERIM TPH POLICY EVALUATION

GENERAL

The MTCA Method A cleanup level for diesel-range and heavy oil-range hydrocarbons (200 mg/kg each) in soil cannot be adjusted to account for specific properties of the petroleum

product, such as the possible absence of the more toxic constituents (i.e., volatile and/or carcinogenic fractions of hydrocarbons). The Interim TPH Policy allows for calculation of a site-specific MTCA Method B cleanup level for the petroleum product in soil based on the actual constituents present in the petroleum. GeoEngineers used the Interim TPH Policy methodology to (1) calculate a site-specific MTCA Method B TPH soil cleanup level, and (2) evaluate the risk of remaining petroleum hydrocarbons in soil at the site. The reader is referred to Appendix C of this report and the Interim TPH Policy for background information and assumptions that pertain to the use of the Interim TPH Policy.

EPH and VPH fractions, BETX and non-carcinogenic PAHs were detected in sample EX-7-10 (Table 4). Based on the collected chemical analytical data data, we calculated a site-specific MTCA B cleanup level for TPH of 3,672 mg/kg (Table C-2).

BACKFILLING

The remedial excavation was backfilled to a depth of 2.5 to 3 feet below initial site grade with imported bank run (sand and gravel). The contractor used a dozer and a vibratory drum roller to place the material. The backfill was dumped at the west edge of the excavation, bladed into loose lifts approximately 1-foot thick, and compacted with several passes of the roller. Ground water that flowed into the excavation was pumped out with a sump pump (see the "Wastewater Disposal" section of this report).

A representative from GeoEngineers visited the site daily during backfilling. Compaction was evaluated using observations of contractor practices, surface performance under the compactor, probing with a ½-inch diameter probe rod, and density tests with a nuclear density gage.

The first two days of filling proceeded while leaving an area at the north side of the excavation open. This area was about 10 feet wide and extended from the manhole at the north edge of the excavation to the east edge of the excavation. On the third day of backfilling, additional contaminated soil was removed from the north edge of the remedial excavation and placed in the on-site landfarm. The area then was backfilled in the same manner as the remainder of the remedial excavation. The additional remedial excavation work and backfilling of the bottom 6 feet along the north edge of the excavation were not observed by the representative of GEI. Compaction of overlying backfill was evaluated during subsequent site visits.

SOIL STOCKPILE

Approximately 375 cubic yards of potentially clean overburden were segregated and placed in a stockpile near to the remedial excavation. A total of ten soil stockpile samples (SP-1 to SP-5 and CSP-1 to CSP-5) were submitted for analysis of diesel- and heavy oil-range hydrocarbons (Table 2). Petroleum concentrations in five of the ten samples exceeded the MTCA Method A cleanup levels for diesel- or heavy oil-range hydrocarbons. Therefore, the stockpile was not used as backfill and instead was transferred to the on-site landfarm.

ON-SITE LANDFARM OF PETROLEUM-CONTAMINATED SOIL

A total estimated volume of 2,500 cubic yards of soil with petroleum hydrocarbons at concentrations exceeding MTCA Method A cleanup levels was removed from the remedial excavation and transferred to the on-site landfarm. The 140-foot by 140-foot and 3-foot-high landfarm is located just west of an unpaved parking area on site, to the west of the excavation area. The landfarm cell was constructed using 6-millimeter thick plastic liner at the base of the cell. The cell was surrounded by hay bales. The contaminated soil was covered with 6-millimeter thick plastic and sand bags were used to secure the plastic in place.

WASTE WATER DISPOSAL

A ground water sample was obtained from MW-1 and analyzed for fats, oils and greases (FOG) and flashpoint on March 20, 2000 (Table 4). Based on the results of sample MW-1, the wastewater was approved by Water District No. 10 for discharge into the sanitary sewer. Water entering the excavation was pumped directly into the sanitary sewer manhole located at the north side of the excavation using a sump pump. During discharge the water was monitored for flow rate, sheen, odor and turbidity (Table 4). A total of approximately 19,200 gallons of water were discharged into the sanitary sewer.

CONCLUSIONS

The following is a summary of the remedial activities conducted at the site.

- A site-specific MTCA Method B cleanup level of 3,672 mg/kg that is protective of direct contact of petroleum hydrocarbons was calculated for petroleum-impacted soil.
- Petroleum hydrocarbons in soil were successfully remediated to less than the MTCA Method A cleanup level at the limits of the remedial excavation, with the exception of the area near EX-7-10 and EX-25-10, located at the northern limit of the remedial excavation. Petroleum hydrocarbons were detected significantly less than the site-specific MTCA Method B cleanup level in soil sample EX-7-10. Soil sample EX-25-10, which could not be overexcavated because of the proximity to Beaver Creek, had a petroleum hydrocarbon concentration that exceeds the site-specific MTCA Method B cleanup level.
- It is likely that residual soil contamination near EX-25-10, at the northern limit of the remedial excavation, is in contact with ground water table.
- Approximately 2,500 cubic yards of petroleum-contaminated soil were excavated in March 2000. The petroleum-contaminated soil was placed in an on-site landfarm for future treatment.
- Monitoring wells MW-1 and MW-2 were removed during remedial activities.
- The excavation backfill was generally compacted to at least 95% of the maximum dry density (MDD) in substantial accordance with our recommendations and the plans and specifications.

RECOMMENDATIONS

Two new monitoring wells should be installed to replace monitoring wells MW-1 and MW-2, which were removed during remedial excavation activities. One well should be placed downgradient of EX-25-10, if possible, and the second well in the approximate location of removed MW-2 to evaluate the impact of residual soil contamination on ground water. The monitoring wells should be sampled for four consecutive quarters. Additional ground water sampling should be evaluated after the end of the first year.

The proposed on-site treatment of contaminated soil is landfarming. Landfarming operations should be conducted at the site during periods of drier, warmer weather. The practical landfarming season in the Puget Sound region ranges from about May through September, pending weather conditions. The landfarm cell should be monitored routinely by personnel who are present at the site on a routine basis. Routine monitoring activities will include observation of the runoff drainage system, and integrity of the cover during periods of wet weather.

Landfarming activities should involve tilling the soil on a schedule determined to be most effective. We anticipate that tilling should be conducted approximately every three weeks. Water should be added to the landfarm cell, as needed, to maintain slightly moist conditions.

Testing should be conducted, as tilling proceeds, to determine when petroleum-related contamination in the upper portion of the treatment cell has been reduced to concentrations below MTCA Method A cleanup levels. Soil samples should be collected from depths that are believed to be successfully treated (likely 6 to 12 inches). Approximately four discrete soil samples should be obtained from the landfarm cell during each sampling event. The total number of samples obtained during the soil remediation should depend upon the variability of the analytical results. Each soil sample should be submitted for chemical analysis of diesel- and heavy oil-range hydrocarbons using Ecology Method NWTPH-D extended.

In the event that some of the confirmatory soil samples have analyte concentrations slightly exceeding MTCA Method A cleanup levels, only those portions of the landfarm cell in which the confirmatory soil samples have analyte concentrations less than MTCA Method A cleanup levels should be removed. After removing an entire lift or portions of a lift, tilling will begin on the underlying, untreated soil.

Treated soil removed from the landfarm cell should qualify as Class 1 or Class 2, soil based on Ecology's end use criteria. Soil that is removed from the landfarm cell should be used or spread on site. This end use of the treated soil is in accordance with Ecology guidelines for Class 1 or Class 2 soil.

Depending on weather conditions, we anticipate that all of the soil may be treated at the site during a summer of landfarming activities.

LIMITATIONS

We have prepared this report for use by Sudden Valley Community Association. This report also may be made available to Ecology, other state and local agencies and potential site purchasers. This report is not intended for use by others and the information contained herein is not applicable to other sites.

Our interpretations of subsurface conditions are based on observations and testing data from the explored portions of the site. It is possible that contamination is present in areas of the site that have not been explored or tested.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.



We appreciate the opportunity to be of service on this project. Please call if you have questions regarding our report.

Respectfully submitted,

GeoEngineers, Inc.

Lisa J. Bona
Senior Geologist

Charles S. Lindsay, P.G., P.HG.
Associate Hydrogeologist

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TABLE 1 (PAGE 1 OF 2)
SUMMARY OF SOIL CHEMICAL ANALYTICAL RESULTS
MARCH 2000 REMEDIAL EXCAVATION
AREA Z, SUDDEN VALLEY COMMUNITY ASSOCIATION
BELLINGHAM, WASHINGTON

Sample Number/ Depth of Sample (bgs)	Date Sampled	General Location	Field Screening Results ²		Diesel-range Hydrocarbons ³ (mg/kg)	Heavy Oil-range Hydrocarbons ³ (mg/kg)
			Headspace Vapors (ppm)	Sheen		
EX-1-10.0	03/21/00	Northeast Sidewall	<100	SS	27.0	<50.0
EX-2-12.0	03/21/00	Base	<100	NS	<25.0	<50.0
EX-3-11.0	03/21/00	East Sidewall	<100	NS	<25.0	<50.0
EX-4-8.0	03/21/00	Northeast Sidewall	1,000	HS	13,000	<1,000
EX-5-12.0	03/21/00	Base	<100	NS	<25.0	<50.0
EX-6-12.0	03/21/00	North Sidewall	150	HS	4,300	<500
EX-7-10.0	03/21/00	North Sidewall	1,000	HS	1,900	<100
EX-8-12.0	03/21/00	Base	<100	NS	<25.0	<50.0
EX-9-10.0	03/22/00	East sidewall	--	NS	<25.0	<50.0
EX-10-10.0	03/22/00	Southeast sidewall	--	NS	<25.0	<50.0
EX-11-11.0	03/22/00	South Sidewall	--	NS	<25.0	<50.0
EX-12-12.0	03/22/00	Base	--	NS	<25.0	<50.0
EX-13-12.0	03/22/00	Base	--	NS	<25.0	<50.0
EX-14-9.0	03/22/00	South Sidewall	--	NS	<25.0	<50.0
EX-15-9.0	03/23/00	North Sidewall	--	NS	140	<50.0
EX-16-8.0	03/23/00	Northwest Sidewall	--	NS	<25.0	<50.0
EX-17-8.0	03/23/00	West Sidewall	--	NS	<25.0	<50.0
EX-18-10.0	03/23/00	Base	--	NS	<25.0	<50.0
EX-19-12.0	03/23/00	Base	--	NS	<25.0	<50.0
EX-20-11.0	03/24/00	Base	--	NS	<25.0	<50.0
EX-21-12.0	03/24/00	Base	--	NS	<25.0	<50.0
EX-22-10.0	03/24/00	Base	--	NS	<25.0	<50.0
EX-23-9.0	03/24/00	East Sidewall	--	NS	<25.0	<50.0
EX-24-8.0	03/24/00	Southeast Sidewall	--	NS	<25.0	<50.0
EX-25-10.0 ⁵	03/30/00	North Sidewall	150	MS	5,900	<500
EX-26-8.0 ⁵	03/30/00	Northwest Sidewall	<100	NS	33	<50.0
MTCA ⁶ Method A Cleanup Level					200	200
Site-specific MTCA ⁶ Method B Cleanup Level					3,672	

Notes appear on page 2 of 2

TABLE 1 (PAGE 2 OF 2)

Notes:	
¹ Approximate soil sample location	are shown in Figure 2.
² NS=no sheen; SS=slight sheen; MS=moderate sheen; HS=heavy sheen. Field procedures are summarized in Appendix A.	Headspace vapor results were obtained with a TLV combustible gas meter.
³ Analyzed by Ecology Method NV	TPH Dx.
⁴ Depth is given below ground surface	on slope; approximately equivalent to 12 feet below surrounding site grade.
⁵ EX-26-8.0 is confirmation sample	at limit of excavation after overexcavation of EX-4-8; EX-25-10 was obtained at limit of excavation after overexcavation of EX-6-12.
⁶ MTCA = Model Toxics Control Act.	
bgs = below ground surface	
mg/kg = milligrams per kilogram;	"-" = not measured
Shaded results indicates a concentration	that exceed MTCA Method B cleanup level.
Shaded sample numbers indicate	that additional soil was removed from this area and the area was resampled.
Chemical analyses by CCI Analytical Laboratories, Inc. of Everett.	Laboratory reports are provided in Appendix B.

TABLE 2
SUMMARY OF SOIL CHEMICAL ANALYTICAL RESULTS
TEMPORARY STOCKPILE
AREA Z, SUDDEN VALLEY COMMUNITY ASSOCIATION
BELLINGHAM, WASHINGTON

Sample Number	Date Sampled	Field Screening Results ¹		Diesel-range Hydrocarbons ³ (mg/kg)	Heavy Oil-range Hydrocarbons ³ (mg/kg)
		Headspace Vapors (ppm)	Sheen		
CSP-1	03/21/00	—	NS	480	160
CSP-2	03/21/00	—	NS	32.0	180
CSP-3	03/21/00	—	NS	34.0	84.0
CSP-4	03/21/00	—	NS	160	<50.0
CSP-5	03/21/00	—	NS	240	110.0
SP-1	03/28/00	—	—	120	290
SP-2	03/28/00	—	—	430	<50.0
SP-3	03/28/00	—	—	110	190
SP-4	03/28/00	—	—	270	57.0
SP-5	03/28/00	—	—	67.0	<50.0
MTCA ³ Method A Cleanup Level				200	200

Notes:

¹NS=no sheen, SS=slight sheen, MS=moderate sheen, HS=heavy sheen. Headspace vapor results were obtained with a TLV combustible gas meter. Field procedures are summarized in Appendix A.

²Analyzed by Ecology Method NWTPH-Dx

³MTCA = Model Toxics Control Act.

mg/kg = milligrams per kilogram; "—" = not measured

Shaded results indicate concentrations that exceed MTCA Method A cleanup level.

Chemical Analyses by CCI Analytical Laboratories, Inc. of Everett, Washington. Laboratory reports are reported in Appendix B.

TABLE 3 (Page 1 of 2)
SUMMARY OF SOIL FIELD SCREENING
AND CHEMICAL ANALYTICAL RESULTS

SAMPLE EX-7-10

Area Z, Sudden Valley Community Association
 Bellingham, Washington

Description	Sample Number EX-7-10 ¹	MTCA Method B Cleanup Level ² (mg/kg)
Date Sampled	03/21/00	
Depth of Sample (feet bgs)	10.0	
Field Screening Results ³		
Headspace Vapors (ppm)	1,000	
Sheen	HS	
TPH ⁴ (mg/kg)		
Diesel-range Hydrocarbons	1,900	
Heavy Oil-range Hydrocarbons	<100	
VPH ⁵ (mg/kg)		
Aliphatics		
EC5-EC6	<5.00	
EC6-EC8	<5.00	
EC8-EC10	5.00	
EC10-EC12	--	
Aromatics		
EC8-EC10	<5.00	
EC10-EC12	--	
EC12-EC13	--	
Other Volatile Petroleum Hydrocarbons ⁵ (mg/kg)		
Benzene	<0.500	34.5
Ethylbenzene	<0.500	8,000
Toluene	<0.500	16,000
Xylenes	<1.00	160,000
MTBE	<0.500	NE
EPH ⁶ (mg/kg)		
Aliphatics		
EC8-EC10	--	
EC10-EC12	18.0	
EC12-EC16	200	
EC16-EC21	240	
EC21-EC34	50.0	
Aromatics		
EC8-EC10	--	
EC10-EC12	<5.00	
EC12-EC16	15.0	
EC16-EC21	150	
EC21-EC34	47.0	

Notes appear on Page 2 of 2

Table 3 (Page 2 of 2)

Description	Sample Number EX-7-10 ¹	MTCA Method B Cleanup Level ² (mg/kg)
PAHs⁶ (mg/kg)		
Carcinogenic		
Benzo(a)anthracene	<0.020	0.137
Benzo(b)fluoranthene	<0.020	0.137
Benzo(k)fluoranthene	<0.020	0.137
Benzo(a)pyrene	<0.020	0.137
Chrysene	<0.020	0.137
Dibenzo(a,h)anthracene	<0.020	0.137
Indeno(1,2,3-cd)pyrene	<0.020	0.137
Noncarcinogenic		
Acenaphthene	<0.020	4,800
Acenaphthylene	<0.020	NE
Anthracene	<0.020	24,000
Benzo(ghi)perylene	<0.020	NE
Fluorene	<0.020	3,200
Fluoranthene	<0.020	3,200
Naphthalene	<0.020	3,200
Phenanthrene	<0.020	NE
Pyrene	<0.0100	2,400

Notes:

¹The approximate sample location is shown in Figure 2

²From MTCA Cleanup Levels and Risk Calculations (CLARC II) Update February 1996 Publication #94-145

³Field screening procedures are described in Appendix A. NS = no sheen, SS = slight sheen, MS = moderate sheen. HS = heavy sheen

⁴TPH = total petroleum hydrocarbons. Gasoline-, diesel- and heavy oil-range hydrocarbons analyzed by Ecology NWTPH series.

⁵VPH = volatile petroleum hydrocarbons, BETX, naphthalene, and methyl tert butylether (MTBE) by Ecology Method (June 1997) and EPA Method 8260.

⁶EPH = extractable petroleum hydrocarbons and polynuclear aromatic hydrocarbons (PAHs) Ecology Method (June 1997) and EPA Method 8270.

mg/kg = milligrams per kilogram

-- = not analyzed or measured

ppm = parts per million

NE = not established

Chemical analyses conducted by CCI Analytical Laboratories, Inc. of Everett. The laboratory report is presented in Appendix B.

TABLE 4
WASTEWATER DISCHARGE DATA¹
AREA Z, SUDDEN VALLEY COMMUNITY ASSOCIATION
BELLINGHAM, WASHINGTON

Date Measured or Sampled	Sample Number	Flashpoint ² (° F)	FOG ³ (mg/l)	Sheen ⁴	Odor ⁵	Rate of Discharge ⁶ (gpm)	Total Volume Discharged (gallons)
03/20/00	MW-1	>200	8.0	SS	Moderate	--	--
03/21/00	--	--	--	NS	None	10	3,300
03/22/00	--	--	--	NS	None	10	4,800
03/23/00	--	--	--	NS	None	10	4,800
03/24/00	--	--	--	NS	None	15	3,600
03/30/00	--	--	--	NS	None	15	2,700

Notes:

¹Water from the remedial excavation was pumped into an on-site sanitary sewer line through an existing manhole.

²Analyzed by EPA Method 1010.

³FOG (Fats, Oils and Greases) analyzed by EPA Method 1664.

⁴Sheen was measured by visual observation at water discharge point, with the exception of sample MW-1.

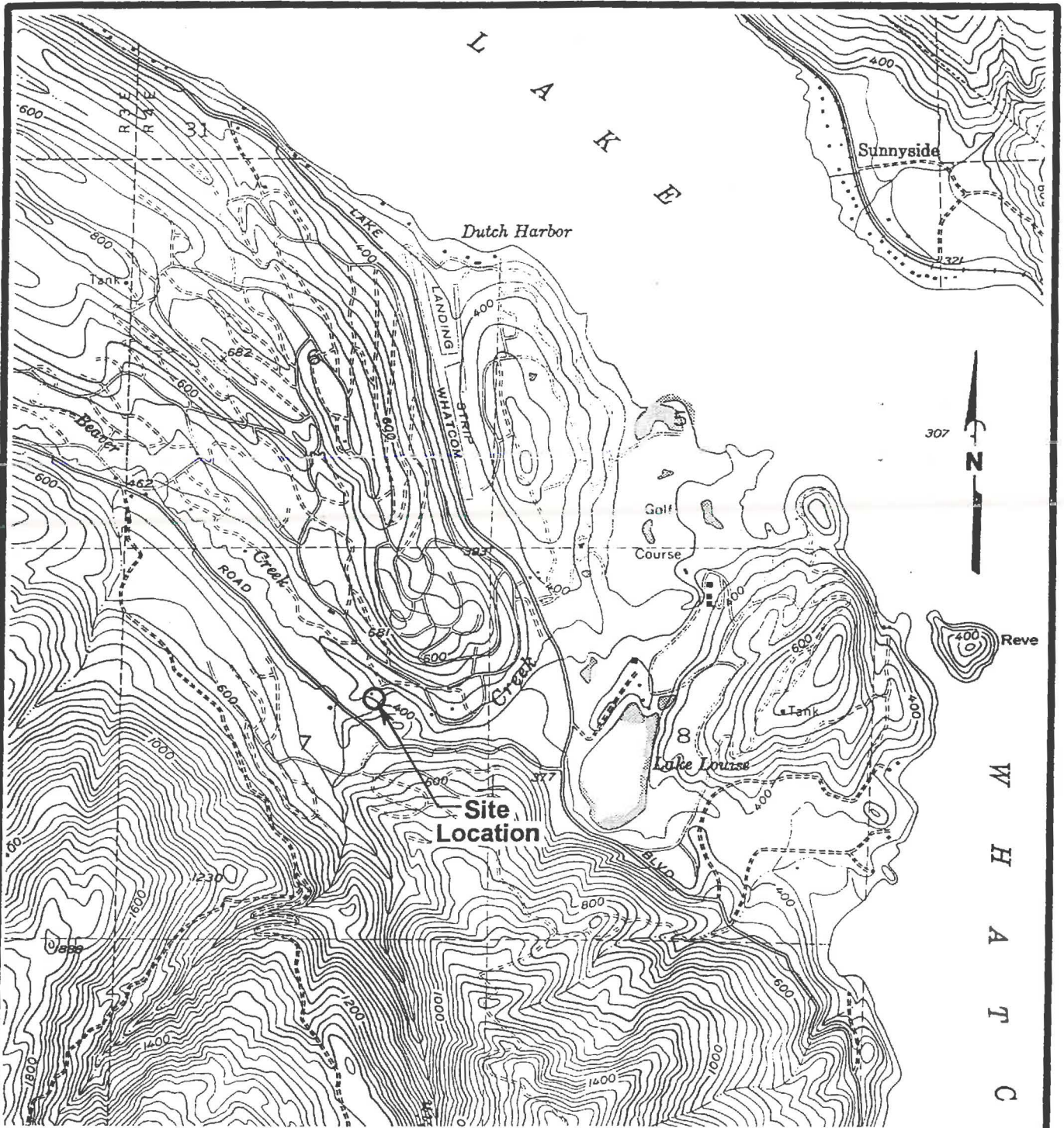
⁵Odor was detected at discharge point, with the exception of sample MW-1.

⁶Discharge was measured by visual estimation.

°F = degrees Fahrenheit

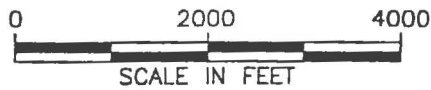
mg/l = milligrams per liter gpm = gallons per minute

Chemical analyses conducted by CCI Analytical Laboratories, Inc. of Everett, Washington. The laboratory report is provided in Appendix B.



753600200:091399

BX11USGS.DWG



Reference: USGS 7.5 Minute Series (Topographic) Quadrangle for Lake Whatcom, Washington, dated 1952, photorevised 1972.

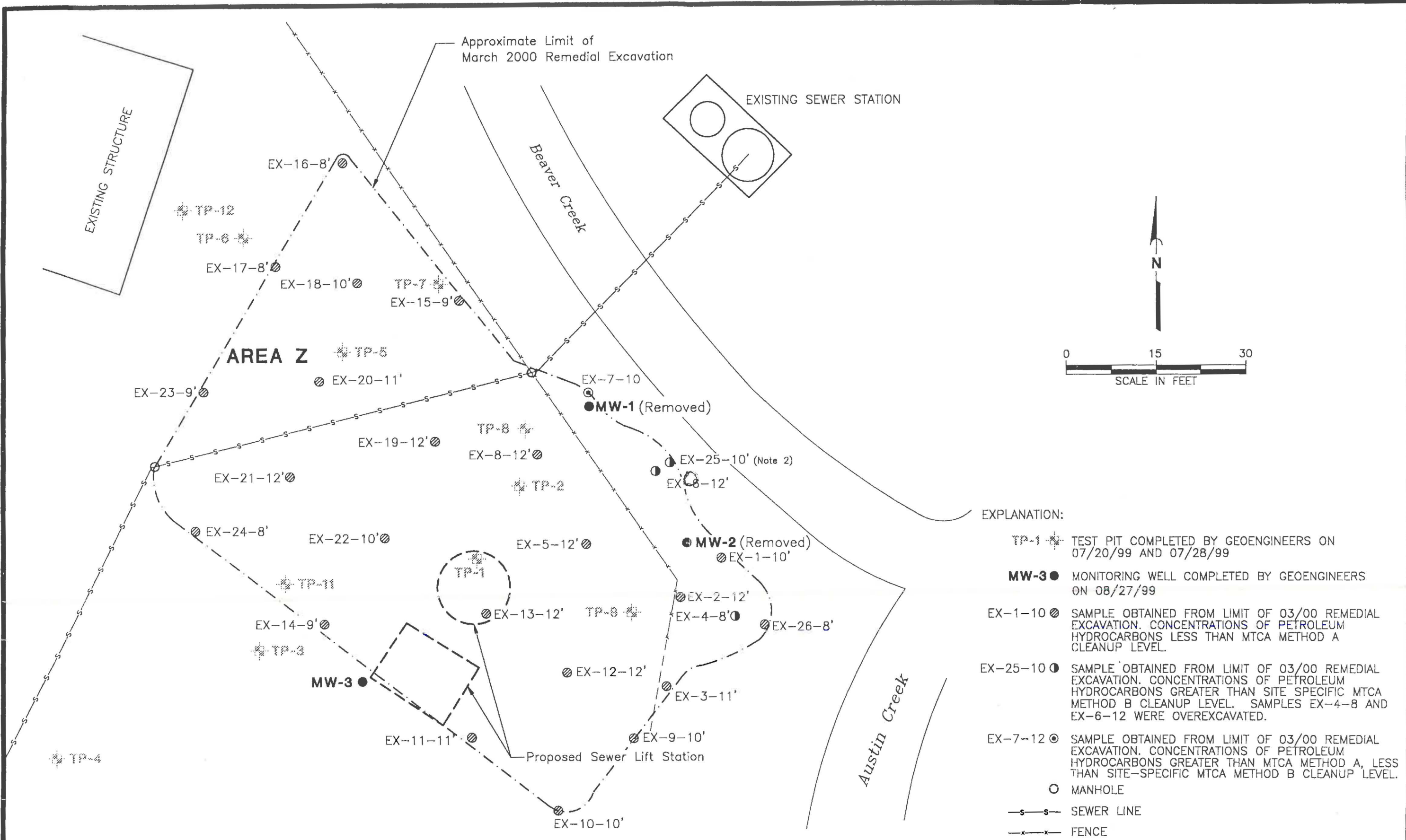


VICINITY MAP

FIGURE 1

LJB:dsm

BES:SYF P:\7536002\CAD\02\753600202A.DWG 05/18/00



EXPLANATION:

- TP-1 TEST PIT COMPLETED BY GEOENGINEERS ON 07/20/99 AND 07/28/99
- MW-3 MONITORING WELL COMPLETED BY GEOENGINEERS ON 08/27/99
- EX-1-10 SAMPLE OBTAINED FROM LIMIT OF 03/00 REMEDIAL EXCAVATION. CONCENTRATIONS OF PETROLEUM HYDROCARBONS LESS THAN MTCA METHOD A CLEANUP LEVEL.
- EX-25-10 SAMPLE OBTAINED FROM LIMIT OF 03/00 REMEDIAL EXCAVATION. CONCENTRATIONS OF PETROLEUM HYDROCARBONS GREATER THAN SITE SPECIFIC MTCA METHOD B CLEANUP LEVEL. SAMPLES EX-4-8 AND EX-6-12 WERE OVEREXCAVATED.
- EX-7-12 SAMPLE OBTAINED FROM LIMIT OF 03/00 REMEDIAL EXCAVATION. CONCENTRATIONS OF PETROLEUM HYDROCARBONS GREATER THAN MTCA METHOD A, LESS THAN SITE-SPECIFIC MTCA METHOD B CLEANUP LEVEL.
- MANHOLE
- SEWER LINE
- FENCE

Notes: 1. The locations of all features shown are approximate.
 2. Depth given is below ground surface on slope; approximately equivalent to 12 feet below surrounding site grade.

Reference: Site sketch prepared by GeoEngineers' representative 08/10/99.

	REMEDIAL EXCAVATION LIMITS AND SAMPLE LOCATIONS
	FIGURE 2

APPENDIX A

FIELD METHODS

APPENDIX A

FIELD METHODS

FIELD SCREENING OF SOIL SAMPLES

A GeoEngineers representative field screened soil samples obtained from the excavations, soil stockpile and explorations. Field screening results are used as a general guideline to delineate areas of possible petroleum-related contamination. In addition, screening results are used to aid in the selection of soil samples for chemical analysis. The screening methods used include (1) visual screening, (2) water sheen screening, and/or (3) headspace vapor screening using a Bacharach TLV Sniffer.

Visual screening consists of inspecting the soil for stains indicative of petroleum-related contamination. Visual screening is generally more effective when contamination is related to heavy petroleum hydrocarbons such as motor oil, or when hydrocarbon concentrations are high. Water sheen screening and headspace vapor screening are more sensitive methods that have been effective in detecting contamination at concentrations less than regulatory cleanup guidelines. However, field screening results are site-specific. The effectiveness of field screening results will vary with temperature, moisture content, organic content, soil type and type and age of contaminant. The presence or absence of a sheen or headspace vapors does not necessarily indicate the presence or absence of petroleum hydrocarbons.

Water sheen screening involves placing soil in water and observing the water surface for signs of sheen. Sheen screening may detect both volatile and nonvolatile petroleum hydrocarbons. Sheen classifications are as follows:

No Sheen (NS)	No visible sheen on water surface.
Slight Sheen (SS)	Light, colorless, dull sheen; spread is irregular, not rapid; sheen dissipates rapidly. Natural organic matter in the soil may produce a slight sheen.
Moderate Sheen (MS)	Light to heavy sheen; may have some color/iridescence; spread is irregular to flowing, may be rapid; few remaining areas of no sheen on water surface.
Heavy Sheen (HS)	Heavy sheen with color/iridescence; spread is rapid; entire water surface may be covered with sheen.

Headspace vapor screening involves placing a soil sample in a plastic sample bag. Air is captured in the bag, and the bag is shaken to expose the soil to the air trapped in the bag. The probe of a Bacharach TLV Sniffer is inserted in the bag, and the TLV Sniffer measures the concentration of combustible vapors present within the sample bag headspace. Headspace vapor screening targets volatile petroleum hydrocarbon compounds. The TLV Sniffer measures combustible vapor concentrations in ppm (parts per million) and is calibrated to hexane. The TLV Sniffer is designed to quantify combustible gas concentrations from 100 to 10,000 ppm in this application.

APPENDIX B

CHEMICAL ANALYTICAL PROGRAM

ANALYTICAL METHODS

Chain-of-custody procedures were followed during the transport of the field samples to CCI Analytical Laboratories, Inc. of Everett, Washington. The soil samples were held in cold storage pending extraction and/or analysis. The analytical results, analytical methods reference and laboratory quality control records are included in this appendix. The analytical results are also summarized in the text and tables of this report.

ANALYTICAL DATA REVIEW

The laboratories maintain internal quality assurance programs as documented in their laboratory quality assurance manuals. The laboratories use a combination of blanks, surrogate recoveries, duplicates, matrix spike recoveries, matrix spike duplicate recoveries, blank spike recoveries and blank spike duplicate recoveries to evaluate the validity of the analytical results. The laboratories also use data quality goals for individual chemicals or groups of chemicals based on the long-term performance of the test methods. The data quality goals were included in the laboratory reports, where appropriate. The laboratory compared each group of samples with the existing data quality goals and noted any exceptions in the laboratory report. The data quality exceptions documented by the laboratory in the laboratory reports were reviewed by GeoEngineers.

ANALYTICAL DATA REVIEW SUMMARY

No significant data quality exceptions were noted in the laboratory report or during our review. Based on our data quality review, it is our opinion that the analytical data are of acceptable quality for their intended use.



CCI
ANALYTICAL
LABORATORIES, INC.

MAR 27 2000

Routing *lib*
File

CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/21/00
CCIL JOB #: 003073
CCIL SAMPLE #: 1
DATE RECEIVED: 3/20/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: MW-1 3/20/00 1230

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TOTAL FATS, OILS, GREASES	EPA-1664	8	MG/L		3/21/00	HJK
FLASH POINT	EPA-1010	>200	DEG F		3/21/00	HJK

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: *lib*



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
 8410 154TH AVE. NE
 REDMOND, WA 98052

DATE: 3/21/00
 CCIL JOB #: 003073

DATE RECEIVED: 3/20/00
 WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02

QUALITY CONTROL RESULTS


BLANK AND DUPLICATE RESULTS

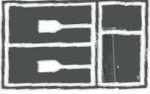
METHOD	BLK RESULT	ASSOC SMPLS	DUP RESULT	ORIG RESULT	%RDP	ASSOC SMPLS
EPA-1664	ND(<1)	003073-01	N/A	N/A	****	SAME

SPIKE/ SPIKE DUPLICATE RESULTS

METHOD	SPIKE ID	ASSOCIATED SAMPLES	% SPIKE RECOVERY	% SPIKE DUP RECOVERY	REL % DIFF
EPA-1664	MOTOR OIL	003073-01	99	N/A	N/A
EPA-1010	XYLENE	003073-01	100	N/A	N/A

**** %RPD NOT REPORTED FOR VALUES <X5 THE REPORTING LIMIT

APPROVED BY:  _____



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003079
CCIL SAMPLE #: 1
DATE RECEIVED: 3/21/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-1-10' 3/21/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	27	MG/KG		3/22/00	SNC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY DIESEL

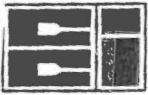
* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: C142



APR 10 2000

Routing *[Signature]*
File

CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/23/00
CCIL JOB #: 003079
CCIL SAMPLE #: 2
DATE RECEIVED: 3/21/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-2-12' 3/21/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		3/22/00	SNC

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: *[Signature]*



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/23/00
CCIL JOB #: 003079
CCIL SAMPLE #: 3
DATE RECEIVED: 3/21/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-3-11' 3/21/00

DATA RESULTS

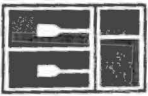
ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		3/22/00	SNC

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: CVA



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003079
CCIL SAMPLE #: 4
DATE RECEIVED: 3/21/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-4-8' 3/21/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	13000	MG/KG		3/24/00	SNC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY DIESEL

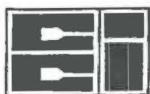
* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 500 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 1000 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
 8410 154TH AVE. NE
 REDMOND, WA 98052

DATE: 3/23/00
 CCIL JOB #: 003079
 CCIL SAMPLE #: 5
 DATE RECEIVED: 3/21/00
 WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
 CLIENT SAMPLE ID: EX-5-12' 3/21/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		3/22/00	SNC

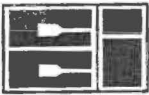
* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
 LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: C142



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003079
CCIL SAMPLE #: 6
DATE RECEIVED: 3/21/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-6-12' 3/21/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	4300	MG/KG		3/24/00	SNC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY DIESEL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 250 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 500 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: C142



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003079
CCIL SAMPLE #: 7
DATE RECEIVED: 3/21/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-7-10' 3/21/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	1900	MG/KG		3/24/00	SNC

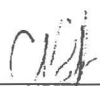
NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY DIESEL

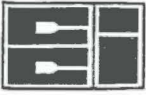
* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 50 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 100 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 4/5/00
CCIL JOB #: 003079
CCIL SAMPLE #: 7
DATE RECEIVED: 3/21/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-7-10' 3/21/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	REPORTING LIMIT	ANALYSIS DATE
EXTRACTABLE PETROLEUM HYDROCARBONS					
>C10-C12 ALIPHATICS	WDOE-EPH	18	MG/KG	5	4/4/00
>C12-C16 ALIPHATICS	WDOE-EPH	200	MG/KG	5	4/4/00
>C16-C21 ALIPHATICS	WDOE-EPH	240	MG/KG	5	4/4/00
>C21-C34 ALIPHATICS	WDOE-EPH	50	MG/KG	5	4/4/00
>C10-C12 AROMATICS	WDOE-EPH	U	MG/KG	5	4/4/00
>C12-C16 AROMATICS	WDOE-EPH	15	MG/KG	5	4/4/00
>C16-C21 AROMATICS	WDOE-EPH	150	MG/KG	5	4/4/00
>C21-C34 AROMATICS	WDOE-EPH	47	MG/KG	5	4/4/00
TOTAL ALIPHATICS		510	MG/KG	10	
TOTAL AROMATICS		210	MG/KG	10	

SURROGATES	% RECOVERY
PENTACOSANE(C25)	99
P-TERPHENYL	79

NOTE: TOTAL ALIPHATICS AND AROMATICS ARE BASED ON EC RANGE "U" RESULTS SUMMED AT 1/2 OF REPORTING LIMIT

* "U" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY: 

CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 4/5/00
CCIL JOB #: 003079
CCIL SAMPLE #: 7
DATE RECEIVED: 3/21/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-7-10' 3/21/00

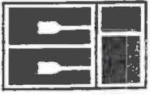
DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ANALYSIS
				DATE
NAPHTHALENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
ACENAPHTHYLENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
ACENAPHTHENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
FLUORENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
PHENANTHRENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
ANTHRACENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
FLUORANTHENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
PYRENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
BENZO[A]ANTHRACENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
CHRYSENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
BENZO[B]FLUORANTHENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
BENZO[K]FLUORANTHENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
BENZO[A]PYRENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
INDENO[1,2,3-CD]PYRENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
DIBENZ[A,H]ANTHRACENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00
BENZO[G,H,I]PERYLENE	EPA-8270 SIM	ND(<20)	UG/KG	4/3/00

* "U" INDICATES ANALYTE NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

APPROVED BY:



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003079
CCIL SAMPLE #: 9
DATE RECEIVED: 3/21/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: CSP-1 3/21/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-DIESEL RANGE	NWTPH-DX	480	MG/KG		3/23/00	SNC
TPH-OIL RANGE	NWTPH-DX	160	MG/KG		3/23/00	SNC

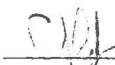
NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS TWO PRODUCTS WHICH ARE LIKELY DIESEL AND LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY:  _____



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003079
CCIL SAMPLE #: 10
DATE RECEIVED: 3/21/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: CSP-2 3/21/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-DIESEL RANGE	NWTPH-DX	32	MG/KG		3/23/00	SNC
TPH-OIL RANGE	NWTPH-DX	180	MG/KG		3/23/00	SNC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS TWO PRODUCTS WHICH ARE LIKELY DIESEL AND LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 25 MG/KG

LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

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*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: C142



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003079
CCIL SAMPLE #: 11
DATE RECEIVED: 3/21/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: CSP-3 3/21/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-DIESEL RANGE	NWTPH-DX	34	MG/KG		3/23/00	SNC
TPH-OIL RANGE	NWTPH-DX	84	MG/KG		3/23/00	SNC

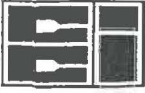
NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS TWO PRODUCTS WHICH ARE LIKELY DIESEL AND LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
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APPROVED BY: C142



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003079

DATE RECEIVED: 3/21/00
WDOE ACCREDITATION #: C142

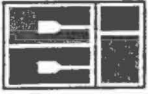
CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
003079-01	NWTPH-DX	C25	100
003079-02	NWTPH-DX	C25	91
003079-03	NWTPH-DX	C25	86
003079-04	NWTPH-DX	C25	*
003079-05	NWTPH-DX	C25	88
003079-06	NWTPH-DX	C25	*
003079-07	NWTPH-DX	C25	142
003079-08	NWTPH-DX	C25	97
003079-09	NWTPH-DX	C25	130
003079-10	NWTPH-DX	C25	114
003079-11	NWTPH-DX	C25	119
003079-12	NWTPH-DX	C25	112
003079-13	NWTPH-DX	C25	122



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003079

DATE RECEIVED: 3/21/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02

QUALITY CONTROL RESULTS

BLANK AND DUPLICATE RESULTS

METHOD	BLK RESULT	ASSOC SMPLS	DUP RESULT	ORIG RESULT	%RDP	ASSOC SMPLS
NWTPH-DX(DSL RANGE)	ND(<25)	003079-01 TO 13	ND(<25)	ND(<25)	****	SAME
NWTPH-DX(OIL RANGE)	ND(<50)	003079-01 TO 13	ND(<50)	ND(<50)	****	SAME

**** %RDP NOT REPORTED FOR RESULTS < X5 THE REPORTING LIMIT

APPROVED BY: 



CCI
ANALYTICAL
LABORATORIES, INC.

GeoEngineers

MAR 27 2000

Routing *lib*

File

CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003084
CCIL SAMPLE #: 1
DATE RECEIVED: 3/22/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-9-10' 3/21/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		3/23/00	SNC

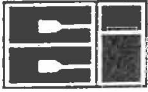
* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: *[Signature]*



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003084
CCIL SAMPLE #: 2
DATE RECEIVED: 3/22/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-10-10' 3/21/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		3/23/00	SNC

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
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APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003084

DATE RECEIVED: 3/22/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
003084-01	NWTPH-DX	C25	130
003084-02	NWTPH-DX	C25	100
003084-03	NWTPH-DX	C25	105
003084-04	NWTPH-DX	C25	104
003084-05	NWTPH-DX	C25	99

BLANK AND DUPLICATE RESULTS

METHOD	BLK RESULT	ASSOC SMPLS	DUP RESULT	ORIG RESULT	%RDP	ASSOC SMPLS
NWTPH-DX(DSL RANGE)	ND(<25)	003084-01 TO 05	230	240	6	SAME
NWTPH-DX(OIL RANGE)	ND(<50)	003084-01 TO 05	99	110	****	SAME

**** %RDP NOT REPORTED FOR RESULTS < X5 THE REPORTING LIMIT

APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003094
CCIL SAMPLE #: 2
DATE RECEIVED: 3/23/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-15-9' 3/23/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	140	MG/KG		3/24/00	SNC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY DIESEL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

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APPROVED BY: CRJ



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/24/00
CCIL JOB #: 003094
CCIL SAMPLE #: 5
DATE RECEIVED: 3/23/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-18-10' 3/23/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		3/24/00	SNC

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 25 MG/KG

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APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/27/00
CCIL JOB #: 003105
CCIL SAMPLE #: 1
DATE RECEIVED: 3/24/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-20-11' 3/24/00

DATA RESULTS

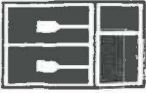
ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		3/25/00	SNC

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
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APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/27/00
CCIL JOB #: 003105
CCIL SAMPLE #: 2
DATE RECEIVED: 3/24/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-21-12' 3/24/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		3/25/00	SNC

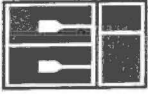
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APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/27/00
CCIL JOB #: 003105
CCIL SAMPLE #: 3
DATE RECEIVED: 3/24/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-22-10' 3/24/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		3/25/00	SNC

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

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LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

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APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/27/00
CCIL JOB #: 003105
CCIL SAMPLE #: 4
DATE RECEIVED: 3/24/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-23-9' 3/24/00

DATA RESULTS

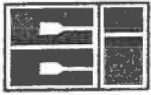
ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		3/25/00	SNC

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
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APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/27/00
CCIL JOB #: 003105
CCIL SAMPLE #: 5
DATE RECEIVED: 3/24/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-24-8' 3/24/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	ND	MG/KG		3/25/00	SNC

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/27/00
CCIL JOB #: 003105

DATE RECEIVED: 3/24/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

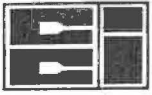
CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
003105-01	NWTPH-DX	C25	115
003105-02	NWTPH-DX	C25	115
003105-03	NWTPH-DX	C25	114
003105-04	NWTPH-DX	C25	92
003105-05	NWTPH-DX	C25	102

BLANK AND DUPLICATE RESULTS

METHOD	BLK RESULT	ASSOC SMPLS	DUP RESULT	ORIG RESULT	%RDP	ASSOC SMPLS
NWTPH-DX(DSL RANGE)	ND(<25)	003105-01 TO 05	ND(<25)	ND(<25)	****	SAME
NWTPH-DX(OIL RANGE)	ND(<50)	003105-01 TO 05	ND(<50)	ND(<50)	****	SAME

**** %RPD NOT REPORTED FOR RESULTS < X5 THE REPORTING LIMIT

APPROVED BY: _____



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/29/00
CCIL JOB #: 003117
CCIL SAMPLE #: 1
DATE RECEIVED: 3/28/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: SP-1 3/28/00 1550

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-DIESEL RANGE	NWTPH-DX	120	MG/KG		3/28/00	SNC
TPH-OIL RANGE	NWTPH-DX	290	MG/KG		3/28/00	SNC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS TWO PRODUCTS WHICH ARE LIKELY DIESEL AND LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY:  _____



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/29/00
CCIL JOB #: 003117
CCIL SAMPLE #: 2
DATE RECEIVED: 3/28/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: SP-2 3/28/00 1552

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	430	MG/KG		3/28/00	SNC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY DIESEL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: 

CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/29/00
CCIL JOB #: 003117
CCIL SAMPLE #: 3
DATE RECEIVED: 3/28/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: SP-3 3/28/00 1555

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-DIESEL RANGE	NWTPH-DX	110	MG/KG		3/28/00	SNC
TPH-OIL RANGE	NWTPH-DX	190	MG/KG		3/28/00	SNC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS TWO PRODUCTS WHICH ARE LIKELY DIESEL AND LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/29/00
CCIL JOB #: 003117
CCIL SAMPLE #: 4
DATE RECEIVED: 3/28/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: SP-4 3/28/00 1558

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-DIESEL RANGE	NWTPH-DX	270	MG/KG		3/28/00	SNC
TPH-OIL RANGE	NWTPH-DX	57	MG/KG		3/28/00	SNC

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS TWO PRODUCTS WHICH ARE LIKELY DIESEL AND LUBE OIL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: CVA

CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/29/00
CCIL JOB #: 003117
CCIL SAMPLE #: 5
DATE RECEIVED: 3/28/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: SP-5 3/28/00 1602

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	67	MG/KG		3/28/00	SNC

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 25 MG/KG

LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 3/29/00
CCIL JOB #: 003117

DATE RECEIVED: 3/28/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

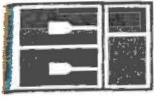
CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
003117-01	NWTPH-DX	C25	115
003117-02	NWTPH-DX	C25	116
003117-03	NWTPH-DX	C25	111
003117-04	NWTPH-DX	C25	116
003117-05	NWTPH-DX	C25	105

BLANK AND DUPLICATE RESULTS

METHOD	BLK RESULT	ASSOC SMPLS	DUP RESULT	ORIG RESULT	%RDP	ASSOC SMPLS
NWTPH-DX(DSL RANGE)	ND(<25)	003117-01 TO 05	ND(<25)	ND(<25)	****	SAME
NWTPH-DX(OIL RANGE)	ND(<50)	003117-01 TO 05	ND(<50)	ND(<50)	****	SAME

**** %RDP NOT REPORTED FOR RESULTS < X5 THE REPORTING LIMIT

APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS, INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 4/4/00
CCIL JOB #: 003124
CCIL SAMPLE #: 1
DATE RECEIVED: 3/30/00
WDOE ACCREDITATION #: C142
GeoEngineers

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-25-10' 3/30/00

APR 10 2000

Routing *[Signature]*
File

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION	ANALYSIS	ANALYSIS
				LEVEL***	DATE	BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	5900	MG/KG		4/3/00	CMH

NOTE: CHROMATOGRAM INDICATES SAMPLE CONTAINS PRODUCT WHICH IS LIKELY DIESEL

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:
DIESEL RANGE REPORTING LIMIT IS 250 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 500 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: *[Signature]*



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 4/4/00
CCIL JOB #: 003124
CCIL SAMPLE #: 2
DATE RECEIVED: 3/30/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02
CLIENT SAMPLE ID: EX-26-8' 3/30/00

DATA RESULTS

ANALYTE	METHOD	RESULTS*	UNITS**	ACTION LEVEL***	ANALYSIS DATE	ANALYSIS BY
TPH-SEMIVOLATILE RANGE	NWTPH-DX	33	MG/KG		3/31/00	CMH

* "ND" INDICATES ANALYTE ANALYZED FOR BUT NOT DETECTED AT LEVEL ABOVE REPORTING LIMIT. REPORTING LIMIT IS GIVEN IN PARENTHESES OR AS FOLLOWS:

DIESEL RANGE REPORTING LIMIT IS 25 MG/KG
LUBE OIL RANGE REPORTING LIMIT IS 50 MG/KG

** UNITS FOR ALL NON LIQUID SAMPLES ARE REPORTED ON A DRY WEIGHT BASIS

*** ACTIONS LEVELS ARE PROVIDED ONLY WHEN PARAMETER DATA IS USED FOR A GENERALLY CONSISTENT APPLICATION. WHEN PROVIDED, THEY SHOULD BE USED AS GUIDELINES ONLY. THE APPROPRIATE REGULATORY DOCUMENT SHOULD BE CONSULTED BEFORE MAKING ANY DECISIONS BASED ON ANALYTICAL DATA

APPROVED BY: 



CERTIFICATE OF ANALYSIS

CLIENT: GEOENGINEERS , INC.
8410 154TH AVE. NE
REDMOND, WA 98052

DATE: 4/4/00
CCIL JOB #: 003124

DATE RECEIVED: 3/30/00
WDOE ACCREDITATION #: C142

CLIENT CONTACT: LISA BONA

CLIENT PROJECT ID: 7536-002-02

QUALITY CONTROL RESULTS

SURROGATE RECOVERY

CCIL SAMPLE ID	ANALYTE	SUR ID	% RECV
003124-01	NWTPH-DX	C25	*
003124-02	NWTPH-DX	C25	112

BLANK AND DUPLICATE RESULTS

METHOD	BLK RESULT	ASSOC SMPLS	DUP RESULT	ORIG RESULT	%RDP	ASSOC SMPLS
NWTPH-DX(DSL RANGE)	ND(<25)	003124-01 TO 02	ND(<25)	ND(<25)	****	SAME

* SURROGATE DILUTED OUT OF CALIBRATION RANGE

**** %RPD NOT REPORTED FOR RESULTS < X5 THE REPORTING LIMIT

APPROVED BY: 

APPENDIX C

USE OF INTERIM TPH POLICY

APPENDIX C

USE OF INTERIM TPH POLICY

INTERIM TPH POLICY METHODS

The MTCA cleanup regulations require that the evaluation of soil contamination and determination of soil cleanup levels be based on consideration of (1) direct contact, and (2) protection of ground water. Similarly, the Interim TPH Policy requires consideration of both components in evaluating petroleum contamination and arriving at a soil cleanup level. Identification of the hydrocarbon fractions and quantification of their toxicity and transport characteristics (using surrogates) were required to evaluate the level of contamination and calculate a soil cleanup level for the site's petroleum constituents in accordance with the Interim TPH Policy. Considerations of current and future site use also were necessary to apply the appropriate MTCA method. For this site, it was assumed that the highest potential beneficial use of the property is residential; therefore, MTCA Method B was used for evaluation of contamination and in calculating a soil cleanup level.

The MTCA Method B formula for evaluating soil contamination and calculating a human health risk-based soil cleanup based on direct contact, as applied in the Interim TPH Policy, considers only the soil ingestion exposure pathway. This was considered sufficient for contamination evaluation and calculation of a TPH cleanup level in soil. The soil-to-ground water transport of and subsequent ingestion of ground water after remediation was not evaluated in March 2000. The reader is referred to the Interim TPH Policy (Ecology Publication ECY 97-600) for background information and assumptions that pertain to the use of the Interim TPH policy.

TOXICITY

Petroleum products typically are composed of thousands of individual chemicals. Toxicity criteria that relate the intake (dose) of a chemical to a response are available for only a handful of the individual chemicals that may be present in petroleum products. A cleanup level based on toxicity cannot be calculated for individual chemicals (or for petroleum products) unless a toxicity criterion, such as a reference dose for a non-carcinogen or a potency factor for a carcinogen, is available. The Interim TPH Policy uses a surrogate approach to account for compound-specific data that is not yet available. In the surrogate approach, a reference compound is identified as a representative of individual petroleum hydrocarbon fractions. These reference compounds are selected because their toxicity is relatively well characterized in that either a reference dose or potency factor is available, or a dose-response value can be developed from available toxicity data. The toxicity criterion identified for the reference compound is then assumed to represent a surrogate toxicity criterion for the associated hydrocarbon fraction.

For the purpose of identifying surrogate toxicity criteria for hydrocarbon fractions, petroleum hydrocarbons are divided into broad chemical classes. Surrogate toxicity criteria are then identified for each group of compounds using the methods described above. Ecology has selected one compound representing the aliphatic fractions (n-hexane) and one compound representing the aromatic fractions (pyrene) that likely have the most conservative toxicity criteria. Surrogate criteria for other hydrocarbon fractions are likely multiples of these. Until sufficient data are made available for developing surrogate toxicity criteria for the other hydrocarbon fractions, the Ecology Interim TPH Policy requires that (1) all aliphatics be grouped together, (2) all aromatics be grouped together, and (3) the aliphatic and aromatic groups be represented by the toxicity criteria for n-hexane and pyrene, respectively. This surrogate approach was used in our calculation of the Method B cleanup level in soil based on direct contact.

The surrogate method used in the Interim TPH Policy for evaluation of contamination and in calculating petroleum hydrocarbon cleanup levels does not account for the noncarcinogenic toxicity contribution of ethylbenzene, toluene, and xylene. It also does not account for the carcinogenic health effect contribution from benzene and carcinogenic PAHs that may be present in the petroleum product. These compounds are quantified and evaluated separately, and cleanup levels are calculated for each compound using their specific reference dose or potency factors.

Although a reference dose value is not available for benzene for noncarcinogenic health effects, these health effects are accounted for in evaluating the contamination and in calculating the TPH cleanup level by the surrogate approach. The Interim TPH Policy assumes that benzene has noncarcinogenic health effects as well as its carcinogenic health effects and assumes that the reference dose for benzene is equal to the surrogate value for aromatics (0.03 mg/kg/day).

The hydrocarbon fractions and their associated surrogate toxicity criterion values for the Ecology Interim TPH Policy are summarized in Table 4. The hydrocarbon compounds are all considered noncarcinogenic, based on the toxicity information currently available. Therefore, only reference dose (ORfD) values are provided.

FATE AND TRANSPORT

The fate and transport of hydrocarbons in the subsurface is a significant component of the Interim TPH Policy. Similar to the approach discussed above for toxicity, surrogate physical and chemical properties of different hydrocarbon fractions are used to represent and evaluate hydrocarbons movement through and into soil, water and air. Based largely on studies completed by the National TPH Criteria Working Group, the Ecology Interim TPH policy uses six aliphatic fractions, five aromatic fractions, and benzene and toluene in evaluating the fate and transport of petroleum products. The TPH Criteria Working Group grouped the numerous TPH constituents into the aliphatic and aromatic fractions based on the similarity of their chemical properties. Constituent chemical properties such as equivalent carbon number, soil-water sorption coefficient, organic-carbon partition coefficient, octanol-water partition coefficient, and Henry's Law Constant, dictate how they are transported in different media and where used to select the hydrocarbon fractions.

Soil Direct Contact Pathway

The sum of petroleum fractions quantified by EPH and VPH (assuming a concentration of one half the detection limit if a fraction was not detected) in sample EX-7-10 was 735 mg/kg. The concentration of petroleum hydrocarbons detected by the NWTPH-Dx method was 1,900 mg/kg. The concentrations of petroleum hydrocarbons reported by the EPH/VPH and NWTPH-Dx methods have a relative percent difference of 88 percent. This difference likely is caused by sample heterogeneity and the different extraction procedures of the analytical methods. Using NWTPH-Dx data yields conservative results for conditions at the limit of the excavation in the location of EX-7-10.

Using the detected concentrations of VPH and EPH total aliphatic and total aromatic hydrocarbons (sample EX-7-10), we calculated a residential hazard index of 0.20 for the petroleum hydrocarbons in the vicinity of the EX-7-10. The ratio of aliphatic compounds to aromatic compounds in this sample is about 70 percent aliphatics and 30 percent aromatics. The residential hazard index for sample EX-7-10 is presented in Table C-1.

GeoEngineers reviewed the carcinogenic risk by evaluating the cPAHs and benzene in the soil sample. Benzene and cPAHs were not detected in sample EX-7-10. Therefore, there appears to be no cumulative health risk for carcinogenic compounds.

We calculated a site-specific MTCA Method B cleanup level for TPH of 3,672 mg/kg. This concentration is protective of a soil direct contact exposure in the residential exposure scenario, under MTCA Method B. The calculation is based on the residential direct contact exposure, the reference dose values, and the total aliphatic and aromatic compound fractions in Table 3. The cleanup level calculation is presented in Table C-2.

Other Pathways

Although MTCA requires that each potential transport pathway of concern be evaluated, the Interim TPH Policy specifically mentions two transport pathways: (1) soil-to-ground water and (2) soil-to-indoor air confined space. An evaluation of the soil-to-ground water pathway determines what petroleum concentrations in soil may be left in place while being protective of ground water. We did not evaluate the post-remedial soil-to-ground water pathway. We recommend that monitoring wells MW-1 and MW-2 be replaced for ground water evaluation.

Specific methods for evaluating the soil-to-indoor air confined space pathway are not addressed in the Interim TPH Policy; however, this pathway is not of concern to the current or proposed future site use.

TABLE C-1
RESIDENTIAL HAZARD INDEX
SAMPLE EX-7-10.0
AREA Z, SUDDEN VALLEY COMMUNITY ASSOCIATION
BELLINGHAM, WASHINGTON

Compound	Soil Concentration ¹ (mg/kg)	ORfD	Residential		
			Factor	Multiplier	HQ
Total aliphatics	518	0.06	1.25E-05	2.08E-04	1.08E-01
Total aromatics	217	0.03	See Below	See Below	See Below
Benzene	0.250	NA	NA	NA	NA
Ethylbenzene	0.250	0.1	1.25E-05	1.25E-04	3.13E-05
Toluene	0.250	0.2	1.25E-05	6.25E-05	1.56E-05
Xylenes	0.500	2	1.25E-05	6.25E-06	3.13E-06
Total aromatic+B-E-X	216.5	0.03	1.25E-05	4.17E-04	9.02E-02
Hazard Index					0.20

Notes:

¹The highest concentration for each compound or fraction detected by VPH or EPH. Values not detected are assumed as 1/2 of the detection limit.

Total TPH (sum of aliphatic and aromatics) =	735
% total aliphatics	70.48%
% total aromatics	29.52%

ORfD = oral reference dose as defined in Interim Policy

Factor = residential factor as defined in Interim Policy

Multiplier = Factor/ORfD

HQ = hazard quotient

Hazard Index = sum of HQs

NA = not applicable

TABLE C-2
MTCA METHOD B SOIL CLEANUP LEVEL CALCULATION¹
BASED ON RESIDENTIAL DIRECT CONTACT

AREA Z, SUDDEN VALLEY COMMUNITY ASSOCIATION
 BELLINGHAM, WASHINGTON

Compound	Soil Conc. (mg/kg)	ORfD	Residential		
			Factor	Multiplier	HQ
Total aliphatic	2,588	0.06	1.25E-05	2.08E-04	5.39E-01
Total aromatic	1,084	0.03	See Below	See Below	See Below
Benzene	1,249	NA	NA	NA	NA
Ethylbenzene	1,249	0.1	1.25E-05	1.25E-04	1.56E-04
Toluene	1,249	0.2	1.25E-05	6.25E-05	7.81E-05
Xylenes	2,498	2	1.25E-05	6.25E-06	1.56E-05
Total aromatic+B-E-X	1,082	0.03	1.25E-05	4.17E-04	4.51E-01
Hazard Index					0.99

MTCA Method B Cleanup level for TPH	3,672				
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Notes:

¹The MTCA Method B cleanup level is the TPH concentration (sum of aliphatics and aromatics) which results in a Hazard Index of 0.99 with same proportions of aliphatics, aromatics, and BETX as the sample tested.

Total Hydrocarbon Concentration =	3,672 mg/kg
% Total aliphatic fraction =	70.48 %
% Total aromatic fraction =	29.52 %
% Total benzene fraction =	0.03 %
% Total ethylbenzene fraction =	0.03 %
% Total toluene fraction =	0.03 %
% Total xylene fraction =	0.07 %
% Total aromatic+B-E-X fraction =	29.46 %

mg/kg = milligrams per kilogram

ORfD = oral reference dose

Factor = residential factor

Multiplier = Factor/ORfD

HQ = hazard quotient (soil concentration [mg/kg]) (factor)/ORfD

TPH = total petroleum hydrocarbons

NA = not applicable

May 14, 2014

Sudden Valley Community Association
4 Clubhouse Circle
Bellingham, Washington 98229

Attention: Jeff Schlaack

Subject: Report of Environmental Services
Area Z Soil Stockpile Sampling
File No. 7536-002-05

INTRODUCTION AND SCOPE OF SERVICES

This report summarizes GeoEngineers' observations and soil sampling results on the "Area Z soil stockpile" in the Sudden Valley Community in Whatcom County. The soil stockpile was generated during removal of petroleum-impacted soil from the location of a sanitary sewer lift station installed in 2000 on Sudden Valley Community Association (SVCA) property. The volume of the soil stockpile was estimated at approximately 2,500 cubic yards during the remediation and placed into a lined area surrounded by hay bales and covered with visqueen. The approximate location of the site relative to surrounding physical features is shown in Vicinity Map, Figure 1. The approximate location of the soil stockpile and sample locations in the stockpile are shown in Area Z Soil Stockpile Test Pit Locations, Figure 2 and Area Z Community Garden Vicinity Test Pit Locations, Figure 3.

This report will be submitted to Washington State Department of Ecology (Ecology) for review under the Voluntary Cleanup Program (VCP) in pursuit of obtaining a no further action (NFA) opinion. We understand that SVCA will prepare and submit the VCP application to Ecology.

Our specific scope of services included the following:

1. Reviewed previous reports and file information related to the stockpile environmental conditions in Area Z.
2. Worked with SVCA to notify the underground utilities notification center in accordance with state law before conducting exploration activities.
3. Observed the completion of 10 shallow test pits in representative locations spatially distributed across the soil stockpile and 2 shallow test pits near the community garden. Test pit explorations were completed with a backhoe provided by SVCA.



4. Obtained representative soil samples from each of the test pits at approximately 2-foot-depth intervals. Field screened the soil samples for evidence of petroleum hydrocarbons using visual and water sheen screening methods. Selected samples at representative depths from each exploration for chemical analyses of gasoline-, diesel- and oil-range hydrocarbons by NWTPH-Gx and NWTPH-Dx with sulfuric acid/silica gel cleanup; benzene, ethylbenzene, toluene and total xylenes (BETX) by EPA Method 8021; selected two samples for chemical analyses of carcinogenic polycyclic aromatic hydrocarbons (cPAHs) by EPA Method 8270DSIM; and MTCA Metals (mercury, arsenic, cadmium, chromium and lead) by EPA Method 6000/7000 series.
5. Evaluated the field and laboratory data relative to Washington State Model Toxics Control Act (MTCA) Method A cleanup levels, soil end-use criteria presented in Ecology's Guidance for the Remediation of Petroleum Contaminated Sites dated September 2011, and Ecology's Terrestrial Ecological Evaluation Process.

PREVIOUS REPORTS

We reviewed our report titled "Report of Remedial Excavation Activities, Area Z" dated May 23, 2000. A remedial excavation occurred in the SVCA Area Z property in March 2000 at the location of a proposed sewer lift station. The soil contamination appeared to be caused by releases from fuel pumps and/or piping that extended from a former diesel aboveground storage tank (AST) located to the west of the contaminated area. A total estimated volume of 2,500 cubic yards of soil with petroleum hydrocarbons at concentrations exceeding MTCA Method A cleanup levels was removed from the remedial excavation and placed at the present location of the soil stockpile that was sampled in March 2014. The soil stockpile (referred to as the landfarm cell in March 2000) was constructed using 6-millimeter thick plastic liner at the base of the cell. The cell was surrounded by hay bales. The contaminated soil was covered with 6-millimeter thick plastic and sand bags were used to secure the plastic in place.

The proposed on-site treatment of the contaminated soil stockpile was landfarming. GeoEngineers did not observe landfarming activities. We are not aware of any landfarming activity that has taken place on the contaminated soil stockpile.

SITE CONDITIONS

- The soil stockpile is located on Whatcom County Assessor parcel number 3704073823790000.
- The soil stockpile is located in a maintenance administration area used by SVCA employees. An access road and maintenance shop are located to the north, stockpiles of tree cuttings and unvegetated, straw covered ground to the east, a wooded area and then Lake Louise Road to the south, and stockpiles of tree cuttings and undeveloped area to the west.
- The soil stockpile is a level area approximately ½-acre in size. The surface of the stockpile is vegetated with alder tree saplings and tall grass. It appears that additional soil was placed over the original plastic sheeting covering the landfarm cell/stockpiled soil.
- Beaver Creek is located approximately 220 feet to the northeast of the soil stockpile. Austin Creek is located approximately 400 feet to the southeast of the soil stockpile.



- The site is zoned as “Rural” according to the Whatcom County Title 20 Zoning Designation map dated 2013.
- The nearest drinking water well is located at 2097 Lake Whatcom Boulevard, approximately 1.7 miles northeast from the site according to the Ecology Washington State Well Log Viewer online mapping application.
- We reviewed a U.S. Geologic Survey (USGS) geologic map for the project area, "Geologic Map of Western Whatcom County, Washington" by Don J. Easterbrook, 1976. The site lies within an area mapped as bedrock of the Chuckanut Formation. However, based on our previous exploration and excavation activities, the Area Z has modified ground (fill has been historically placed in this area) over alluvium from the nearby creek activity, glacial deposits and then bedrock.
- We reviewed “Soil Survey of Whatcom County Area, Washington,” United States Department of Agriculture Soil Conservation Service (SCS), 1992. The site lies within an area mapped as Sehome loam, described as gravelly loam underlain by dense glacial till at depth. Permeability is moderate in the upper part of the Sehome soil and very slow in the dense glacial till.

2014 SOIL SAMPLING

General

A representative of GeoEngineers obtained soil samples and documented subsurface conditions during excavation of the test pits. During soil sampling activities, our representative also visually observed the soils encountered and performed field screening of soil samples from the test pits. Selected samples obtained from the test pits were submitted for chemical analytical testing. Soil sampling activities were conducted in general accordance with Ecology’s “Guidance for Site Checks and Site Assessments for Underground Storage Tanks,” dated February 1991 and revised in April 2003. Soil samples were submitted for chemical analyses from test pits TP-1 through TP-10 to characterize the soil in the soil stockpile. Soil samples were submitted for chemical analyses from test pits TP-11 and TP-12 to evaluate the potential for contaminant migration from the soil stockpile impacting soil at the community garden, located approximately 400 feet northwest of the soil stockpile. Soil samples were obtained from approximate 2-foot sample intervals from each test pit for field screening. The test pit locations shown in Figures 2 and 3 were recorded with a hand held GPS. Soil sample field screening and chemical analytical results are summarized in Summary of Soil Field Screening and Chemical Analytical Data, Table 1.

Sample Collection, Handling and Field Screening of Soil Samples

Soil samples were obtained from the test pits using a clean nitrile-gloved hand from the excavator bucket. Each sample was placed in a 4-ounce laboratory-prepared jar filled to minimize headspace. Samples obtained for gasoline-range petroleum hydrocarbons and volatiles analyses were collected using EPA Method 5035A sampling kits. Gloves were changed between samples to prevent cross-contamination. The soil samples were placed in an iced cooler pending transport to the analytical laboratory.

Each soil sample submitted for chemical analysis was identified by a unique sample designation that corresponded to its mapped sample location and depth below ground surface. Chain-of-custody procedures were followed in transporting the samples to the laboratory.



Field screening results were used to aid in the selection of soil samples for chemical analysis. The screening methods used included visual screening and water sheen screening. Visual screening consists of inspecting the soil for stains indicative of petroleum hydrocarbons. Visual screening is generally more effective when hydrocarbons are heavier, such as motor oil, or when hydrocarbon concentrations are high.

Water sheen screening involves placing soil in water and observing the water surface for signs of sheen. Sheen screening may detect both volatile and nonvolatile petroleum hydrocarbons. Sheen classifications are as follows:

- No Sheen (NS): No visible sheen on water surface.
- Slight Sheen (SS): Light, colorless, dull sheen; spread is irregular, not rapid; sheen dissipates rapidly. Natural organic matter in the soil may produce a slight sheen.
- Moderate Sheen (MS): Light to heavy sheen; may have some color/iridescence; spread is irregular to flowing, may be rapid; few remaining areas of no sheen on water surface.
- Heavy Sheen (HS): Heavy sheen with color/iridescence; spread is rapid; entire water surface may be covered with sheen.

Soil Stockpile Test Pits

Test pits TP-1 through TP-10 were completed at depths ranging from 5 to 10 feet below the surface (bgs). Subsurface conditions encountered in test pits TP-1 through TP-10 consisted of fill soil comprised of brown and gray silty sand with varying gravel content. Buried visqueen, assumed to be from the original landfarm cell construction, was observed at 3 feet bgs. The soils above the visqueen did not exhibit any field screening evidence of petroleum contamination; the gray colored soils below the visqueen intermittently exhibited field screening evidence of petroleum contamination. Occasional wood, concrete rubble, cobbles and asphalt concrete fragments were encountered in several test pits. Significant amounts of asphalt concrete (pavement) fragments were encountered in test pit TP-5 approximately 3 to 5 feet bgs. Shallow perched groundwater seepage was encountered approximately 5 feet and 4 feet bgs in test pits TP-3 and TP-5, respectively. Petroleum sheen was not observed on the groundwater seepage.

Community Garden Area Test Pits

Test pits TP-11 and TP-12 were completed at 4 to 6 feet bgs, respectively. Subsurface conditions encountered in test pit TP-11 consisted of brown silt with sand interpreted to be reworked, native weathered glaciomarine drift. Test pit TP-12 encountered a buried asphalt concrete pavement surface approximately 6 inches bgs underlain by gray silty sand with gravel interpreted to be native undisturbed soil. Shallow perched groundwater seepage was encountered approximately 3 feet bgs in test pit TP-11. Petroleum sheen was not observed on the groundwater seepage.

CHEMICAL ANALYTICAL RESULTS

Soil samples that exhibited the highest field screening evidence of petroleum contamination were submitted to ALS Environmental (ALS) in Everett for chemical analysis as previously described in the scope of this report. In some test pits, no field screening evidence of petroleum was observed. The laboratory report is attached to this report.



Gasoline-range petroleum hydrocarbons and BETX were not detected. Diesel- and or lube oil-range petroleum hydrocarbons either were not detected or were detected at concentrations less than the respective MTCA Method A cleanup levels with the exception of soil sample TP5-4-032514 from test pit TP-5. Soil sample TP5-4-032514 contained asphalt fragments which we were unable to segregate from the soil. This soil sample is the only sample that required dilution by the laboratory during NWTPH-Dx analysis. In our opinion, the elevated concentration of petroleum hydrocarbons in soil sample TP5-4-032514 is the result of the asphalt fragments in the soil sample.

MTCA 5 Metals and cPAHs either were not detected or were detected at concentrations less than the respective MTCA Method A cleanup levels.

TERRESTRIAL ECOLOGICAL EVALUATION

GeoEngineers evaluated whether contaminants detected in soil at the site pose a threat to terrestrial ecological receptors (plants, soil biota and wildlife). The site doesn't appear to qualify for the Terrestrial Ecological Evaluation (TEE) exclusions in WAC 173-340-7491(1). However, the site does qualify for a simplified TEE based on the summary of site conditions (habitat and potential receptors) presented below:

- According to the Whatcom County Critical Areas Ordinance Environmentally and Biologically Sensitive Areas map dated 2005, the site is not mapped in environmentally or biologically sensitive areas such as Category 1 through 4 wetlands, protected habitats and species, stream buffers, or aquifer susceptibility areas.
- The site is not used by wildlife species classified as threatened or endangered based on our review of the Washington Department of Fish & Wildlife (WDFW) Washington State Species of Concern Lists accessed online at <http://wdfw.wa.gov/conservation/endangered/All/>.
- The site is not used by plants classified as endangered, threatened, or sensitive based on our review of the Washington State Department of Natural Resources (WDNR) Natural Heritage Program List of Known Occurrences of Rare Plants in Washington, March 2014, Whatcom County lists accessed online at <http://www1.dnr.wa.gov/nhp/refdesk/lists/plantsxco/whatcom.html>.

GeoEngineers compared chemical analytical results from soil samples obtained at the site to MTCA simplified TEE soil concentrations (MTCA Table 749-2). The results of this comparison indicate that diesel and heavy oil-range petroleum hydrocarbons are the only chemicals of ecological concern. Diesel and heavy oil-range petroleum hydrocarbons were detected at concentrations less than the diesel-range organics simplified TEE soil concentration for unrestricted land use of 460 mg/kg in 8 of the 12 soil samples; the exceptions are soil samples obtained from test pits TP-4 (sample depth = 6 feet), TP-5 (sample depth = 4 feet), TP-9 (sample depth = 4 feet) and TP-12 (sample depth = 6 feet). These four samples are in the lower portion of the MTCA default biologically active zone, which ranges from 0 to 6 feet bgs.

The unrestricted land use simplified TEE soil concentration for diesel of 460 mg/kg is based on protection of soil biota. The industrial land use simplified TEE soil concentration for diesel is 15,000 mg/kg and is based on protection of wildlife. Diesel and heavy oil soil concentrations in the 12 soil samples obtained



at the site are less than 15,000 mg/kg. Therefore, we conclude that the diesel and heavy oil soil concentrations at the site do not pose a risk to wildlife.

In our opinion, the diesel-range and heavy oil range petroleum hydrocarbon concentrations detected in site soil are not likely to pose a risk to soil biota for the following reasons:

- Field screening evidence of petroleum hydrocarbons generally was not observed in the upper 5 feet of soil.
- Soil biota are expected to primarily be present in the top few feet of soil and not be significantly exposed to petroleum hydrocarbons in soil at between 4 and 6 feet bgs.
- Visqueen sheeting separates the upper clean soils and the lower petroleum hydrocarbon contaminated soils. The visqueen sheeting is present approximately 3 feet bgs.
- Based on the results of GeoEngineers' "Revised Draft Remedial Investigation/Feasibility Study Report" for the Irondale Iron and Steel Plant, Ecology Facility/Site No. 95275518 prepared for Ecology, dated August 13, 2009, soil biota bioassays at Irondale indicate that total petroleum hydrocarbons (TPH; diesel-range plus heavy oil-range petroleum hydrocarbons) soil cleanup levels protective of soil biota are much higher than the diesel-range simplified TEE soil concentration of 460 mg/kg. The site-specific TPH soil screening level for soil biota at Irondale was 5,200 mg/kg. This finding suggests that a higher TPH concentration limit for soil biota is likely more appropriate than the diesel-range simplified TEE soil concentration.

PETROLEUM HYDROCARBON IMPACTED SOIL REUSE CATEGORIES

Tables 12.1 and 12.2 in Ecology's Guidance for Remediation of Petroleum Contaminated Sites Publication No. 10-09-057 provide guidelines for reuse of petroleum contaminated soil. Based on the detected concentrations of diesel and heavy oil-range petroleum hydrocarbons, the soil generally classifies as soil category 2 (commercial fill above water table). The soil may also be classified as category 3 (paving base material & road construction) or category 4 (landfill daily cover or asphalt manufacturing). The Ecology guidance includes soil reuse limitations pertinent to the petroleum contaminated soil including but not limited to the following:

- The soil should not be placed in or directly adjacent to wetlands or surface water where contact with water is possible.
- If the soil is exposed, stormwater runoff should be contained or treated to prevent entrance to storm drains, surface water or wetlands.
- The soil should not be placed under stormwater infiltration facility or septic drain field.
- For category 3 soils, the soil should be a maximum 2 feet thick to minimize potential for leaching or vapor impacts.

Tables 12.1 and 12.2 are attached to this report. The complete soil reuse guidance can be accessed in Section 12 of the publication, online at <https://fortress.wa.gov/ecy/publications/publications/1009057.pdf>.



CONCLUSIONS

Based on the results of the chemical analytical testing, the following impacts to soil were identified:

MTCA Method A Cleanup Levels

- Gasoline-range petroleum hydrocarbons and BETX were not detected in any of the soil samples.
- Diesel and heavy oil-range petroleum hydrocarbons were detected at concentrations less than the MTCA Method A cleanup levels with the exception of soil sample TP5-4-032514, which contained fragments of asphalt concrete pavement. It is our opinion that the cured asphalt concrete fragments in the soil sample resulted in the high diesel and heavy oil-range concentrations in soil sample TP5-4-032514.
- Mercury, chromium and lead were detected at concentrations less than the corresponding MTCA Method A cleanup levels. Arsenic and cadmium were not detected.
- cPAHs were either not detected or were detected at concentrations less than the MTCA Method A Cleanup level.

Simplified TEE Soil Concentrations

- Mercury, chromium, lead and cPAHs were detected at concentrations less than their corresponding simplified TEE soil concentrations protective of plants, soil biota and wildlife.
- Diesel-range or heavy oil-range petroleum hydrocarbons were detected at concentrations greater than the diesel-range simplified TEE soil concentration in 4 out of 12 soil samples. However, based on the depth of these four soil samples, the expected depth of soil biota at the site, the presence of visqueen sheeting above petroleum-impacted soil, and the conservative nature of the simplified TEE soil concentration for diesel-range petroleum hydrocarbons, the diesel-range and heavy oil-range petroleum hydrocarbons are not expected to pose a risk to ecological receptors at the site.
- The community garden is located in an inferred upgradient location relative to the soil stockpile. Based on subsurface conditions observed in test pits completed in the soil stockpile and in the vicinity of the community garden, and distance between the two site features, it is unlikely that the petroleum hydrocarbons in the soil stockpile have migrated toward the community garden in our opinion. The somewhat elevated concentration of diesel-range petroleum hydrocarbons in soil sample TP12-6-032514 is potentially a result of asphalt fragments that fell into the test pit from asphalt concrete pavement that was encountered during excavation.

Petroleum Hydrocarbon Impacted Soil Status and Reuse Categories

Based on the detected concentrations of diesel and heavy oil-range petroleum hydrocarbons, the soil generally classifies as soil category 2 (commercial fill above water table). The soil may also be classified as category 3 (paving base material and road construction) or category 4 (landfill daily cover or asphalt manufacturing).

We conclude that the soil can remain in place at the site and does not need to be disposed off-site. If SVCA is considering other land uses that would involve moving the stockpiled soil, it should stay within Area Z and be placed above the water table, and capped by a paved surface or compacted gravel. In our opinion, this is a practicable alternative soil reuse activity that would be protective of the environment in accordance with the Ecology guidelines.



LIMITATIONS

We have prepared this report for the exclusive use of Sudden Valley Community Association. This report may be provided to regulatory agencies for review. This report is not intended for use by others and the information contained herein is not applicable to other sites. No other party may rely on the product of our services unless we agree in advance, and in writing, to such reliance. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions.


Our conclusions are based on our site observations, field screening results and chemical analysis of a limited number of soil samples at the site. It is always possible that contaminants remain in areas that were not observed, sampled or tested.

Within the limitations of scope, schedule and budget, our services have been performed in accordance with our confirming agreement dated January 6, 2014, and generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

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Please refer to the Attachment titled "Report Limitations and Guidelines for Use," for additional information pertaining to use of this report.

Sincerely,
GeoEngineers, Inc.

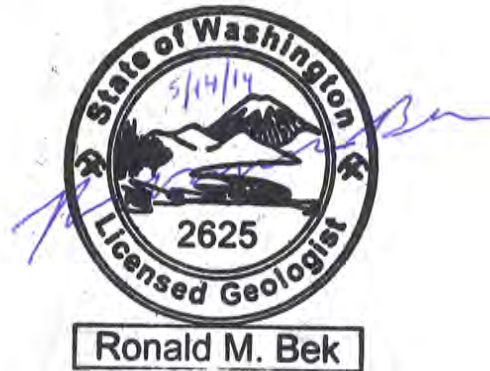

Ron Bek, LG
Project Geologist


J. Robert Gordon, PE
Principal

RMB:JRG:tjh

Attachments:

- Table 1. Summary of Soil Field Screening and Chemical Analytical Data
- Figure 1. Vicinity Map
- Figure 2. Area Z Soil Stockpile Test Pit Locations
- Figure 3. Area Z Community Garden Vicinity Test Pit Locations
- ALS Environmental Laboratory Report
- Ecology Tables 12.1 and 12.2
- Attachment A. Report Limitations and Guidelines for Use



One copy submitted electronically. Four hard copies submitted.

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Table 1

Summary of Soil Field Screening and Chemical Analytical Data¹

Area Z, Sudden Valley
Whatcom County, Washington

Sample Identification ²	Date Sampled	Sample Depth (feet bgs)	Water Sheen Screening	Petroleum Hydrocarbons (mg/kg)			BTEX ⁵ (mg/kg)				MTCA Metals ⁶ (mg/kg)					Total cPAHs ⁷ (mg/kg)
				Gasoline Range ³	Diesel Range ⁴	Heavy Oil Range ⁴	Benzene	Toluene	Ethylbenzene	Total Xylenes	Mercury	Arsenic	Cadmium	Chromium	Lead	TEQ
Soil Stockpile Samples																
TP1-3-032514	3/25/2014	3.0	NS	<3.0	<25	260	<0.030	<0.050	<0.050	<0.20	--	--	--	--	--	--
TP2-4-032514	3/25/2014	4.0	NS	<3.0	<25	100	<0.030	<0.050	<0.050	<0.20	--	--	--	--	--	--
TP3-5-032514	3/25/2014	5.0	SS	<3.0	<25	95	<0.030	<0.050	<0.050	<0.20	--	--	--	--	--	--
TP4-6-032514	3/25/2014	6.0	MS	<3.0	<25	630	<0.030	<0.050	<0.050	<0.20	<0.020	<5.0	<0.50	17	28	0.004
TP5-4-032514	3/25/2014	4.0	MS	<19	910	1500	<0.030	<0.050	<0.050	<0.20	--	--	--	--	--	--
TP6-6-032514	3/25/2014	6.0	SS	<3.0	<25	110	<0.030	<0.050	<0.050	<0.20	--	--	--	--	--	--
TP7-5-032514	3/25/2014	5.0	NS	<3.0	<25	98	<0.030	<0.050	<0.050	<0.20	--	--	--	--	--	--
TP8-4-032514	3/25/2014	4.0	NS	<3.0	<25	76	<0.030	<0.050	<0.050	<0.20	--	--	--	--	--	--
TP9-4-032514	3/25/2014	4.0	MS	<49	1500	120	<0.030	<0.050	<0.050	<0.20	0.040	<5.0	<0.50	32	5.5	<0.020
TP10-4-032514	3/25/2014	4.0	NS	<3.0	<25	130	<0.030	<0.050	<0.050	<0.20	--	--	--	--	--	--
Community Garden Area Samples																
TP11-3-032514	3/25/2014	3.0	NS	<3.0	<25	92	<0.030	<0.050	<0.050	<0.20	--	--	--	--	--	--
TP12-6-032514	3/25/2014	6.0	NS	<3.0	<25	650	<0.030	<0.050	<0.050	<0.20	--	--	--	--	--	--
MTCA Method A Cleanup Level for Unrestricted Land Use				100	2,000	2,000	0.03	7	6	9	2	20	2	2000 ⁸	250	0.1
Simplified Terrestrial Ecological Evaluation Concentrations ⁹				200	460	460 ¹⁰	NA	NA	NA	NA	9	95	25	42	220	30

Notes:

¹ Chemical analyses by ALS Environmental, Inc. in Everett, Washington.

² Approximate sample locations are shown in Figures 2 and 3. Field screening results are described in the report.

³ Gasoline range hydrocarbons analyzed using NWTPH-Gx.

⁴ Diesel and heavy oil range hydrocarbons analyzed by petroleum hydrocarbon identification using NWTPH-Dx with silica gel cleanup.

⁵ Benzene, toluene, ethylbenzene and total xylenes analysed using EPA Method 8021.

⁶ MTCA metals analyzed by EPA Method 6020 except mercury analysed using EPA Method 7471.

⁷ Carcinogenic Polycyclic Aromatic Hydrocarbons (cPAHs) analyzed by EPA Method 8270D/SIM. Total cPAHs calculated using the toxicity equivalency (TEQ) methodology specified in WAC 173-340-780(8). cPAHs that were not detected were not included for these calculations.

⁸ Cleanup level for Chromium III.

⁹ Values from MTCA Table 749-2.

¹⁰ Diesel range organics value from MTCA Table 749-2 used as a surrogate for heavy oil-range petroleum hydrocarbons.

NWTPH-Dx = Northwest Total Petroleum Hydrocarbons - Diesel Extended

NWTPH-Gx = Northwest Total Petroleum Hydrocarbons - Gasoline Extended

bgs = below ground surface

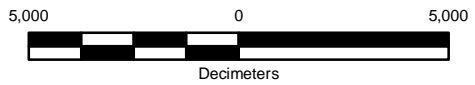
mg/kg = milligrams per kilogram

NA = No soil concentration is presented in MTCA Table 749-2.

MS = moderate sheen, SS = slight sheen, NS = no sheen.

MTCA = Model Toxics Control Act

A bolded value indicates an analyte has been detected at the indicated concentration.



Vicinity Map

**Area Z, Sudden Valley
Whatcom County, Washington**



Figure 1

Office: BAW Path: P:\17536002\GIS\753600205_F1_Vicinity Map.mxd Modified: 4/29/2014 11:48:30 AM

Notes:
 1. The locations of all features shown are approximate. 2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication. 3. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without permission.
 Data Sources: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community
 State Plane Washington North FIPS 4601 (Feet),
 North American Datum 1983. North arrow oriented to grid north.



Legend



TP-1

Approximate Soil Stockpile / Site Boundary
 Approximate Test Pit Location and Test Pit Number



Notes:

1. The locations of all features shown are approximate.
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- Source: Google Earth Aerial Photograph August 2011

Area Z Soil Stockpile Test Pit Locations

Area Z, Sudden Valley
 Whatcom County, Washington



Figure 2



Legend



Approximate Test Pit Location and Test Pit Number

TP-11



Notes:

1. The locations of all features shown are approximate.
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- Source: Google Earth Aerial Photograph August 2011

Area Z Community Garden Vicinity Test Pit Locations

Area Z, Sudden Valley
Whatcom County, Washington



Figure 3



April 9, 2014

Mr. Ron Bek
Geoengineers, Inc.
600 DuPont St.
Bellingham, WA 98225

Dear Mr. Bek,

On March 26th, 14 samples were received by our laboratory and assigned our laboratory project number EV14030179. The project was identified as your 7536-002-05. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan
Laboratory Director



CERTIFICATE OF ANALYSIS

CLIENT:	Geoengineers, Inc. 600 DuPont St. Bellingham, WA 98225	DATE:	4/9/2014
CLIENT CONTACT:	Ron Bek	ALS JOB#:	EV14030179
CLIENT PROJECT:	7536-002-05	ALS SAMPLE#:	EV14030179-01
CLIENT SAMPLE ID	TP1-3-032514	DATE RECEIVED:	03/26/14
		COLLECTION DATE:	3/25/2014 8:30:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	RL	LIMITS		DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	PQL	FACTOR	QUAL		DATE	BY
Gasoline	NWTPH-GX	ND	3.0	0.49	1.5	1	U	MG/KG	03/26/14	DLC
Benzene	SW8021	ND	0.030	0.0096	0.012	1	U	MG/KG	03/26/14	DLC
Toluene	SW8021	ND	0.050	0.0032	0.009	1	U	MG/KG	03/26/14	DLC
Ethylbenzene	SW8021	ND	0.050	0.0037	0.011	1	U	MG/KG	03/26/14	DLC
Total Xylenes	SW8021	ND	0.20	0.0096	0.025	1	U	MG/KG	03/26/14	DLC
Total Petroleum Hydrocarbon – Diesel	NWTPH-DX w/ SGA	ND	25	3.5	11	1	U	MG/KG	03/27/14	EBS
Total Petroleum Hydrocarbon – Oil	NWTPH-DX w/ SGA	260	50	6.9	21	1		MG/KG	03/27/14	EBS

SURROGATE	METHOD	RESULTS	MIN	LIMITS		SPIKE ADDED	QUAL	%REC	ANALYSIS	ANALYSIS
				MAX	RPD				DATE	BY
TFT	NWTPH-GX	1.06	60	140		0.843		106	03/26/14	DLC
TFT	SW8021	1.07	60	140		0.843		107	03/26/14	DLC
Pentacosane	NWTPH-DX w/ SGA	1.27	58	134		4.50		127	03/27/14	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.



CERTIFICATE OF ANALYSIS

CLIENT:	Geoengineers, Inc. 600 DuPont St. Bellingham, WA 98225	DATE:	4/9/2014
CLIENT CONTACT:	Ron Bek	ALS JOB#:	EV14030179
CLIENT PROJECT:	7536-002-05	ALS SAMPLE#:	EV14030179-02
CLIENT SAMPLE ID	TP2-4-032514	DATE RECEIVED:	03/26/14
		COLLECTION DATE:	3/25/2014 8:50:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	RL	LIMITS		DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	PQL	FACTOR	QUAL		DATE	BY
Gasoline	NWTPH-GX	ND	3.0	0.52	1.6	1	U	MG/KG	03/26/14	DLC
Benzene	SW8021	ND	0.030	0.010	0.013	1	U	MG/KG	03/26/14	DLC
Toluene	SW8021	ND	0.050	0.0034	0.010	1	U	MG/KG	03/26/14	DLC
Ethylbenzene	SW8021	ND	0.050	0.0039	0.012	1	U	MG/KG	03/26/14	DLC
Total Xylenes	SW8021	ND	0.20	0.010	0.031	1	U	MG/KG	03/26/14	DLC
Total Petroleum Hydrocarbon – Diesel	NWTPH-DX w/ SGA	ND	25	3.0	8.9	1	U	MG/KG	03/27/14	EBS
Total Petroleum Hydrocarbon – Oil	NWTPH-DX w/ SGA	100	50	5.8	17	1		MG/KG	03/27/14	EBS

SURROGATE	METHOD	RESULTS	MIN	LIMITS		RPD	SPIKE ADDED	QUAL	%REC	ANALYSIS	ANALYSIS
				MAX						DATE	BY
TFT	NWTPH-GX	1.09	60	140			0.895		109	03/26/14	DLC
TFT	SW8021	1.10	60	140			0.895		110	03/26/14	DLC
Pentacosane	NWTPH-DX w/ SGA	1.20	58	134			3.79		120	03/27/14	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.



CERTIFICATE OF ANALYSIS

CLIENT:	Geoengineers, Inc. 600 DuPont St. Bellingham, WA 98225	DATE:	4/9/2014
CLIENT CONTACT:	Ron Bek	ALS JOB#:	EV14030179
CLIENT PROJECT:	7536-002-05	ALS SAMPLE#:	EV14030179-03
CLIENT SAMPLE ID	TP3-5-032514	DATE RECEIVED:	03/26/14
		COLLECTION DATE:	3/25/2014 9:13:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	RL	LIMITS		DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	PQL	FACTOR	QUAL		DATE	BY
Gasoline	NWTPH-GX	ND	3.0	0.39	1.2	1	U	MG/KG	03/26/14	DLC
Benzene	SW8021	ND	0.030	0.0077	0.009	1	U	MG/KG	03/26/14	DLC
Toluene	SW8021	ND	0.050	0.0026	0.007	1	U	MG/KG	03/26/14	DLC
Ethylbenzene	SW8021	ND	0.050	0.0030	0.008	1	U	MG/KG	03/26/14	DLC
Total Xylenes	SW8021	ND	0.20	0.0077	0.023	1	U	MG/KG	03/26/14	DLC
Total Petroleum Hydrocarbon – Diesel	NWTPH-DX w/ SGA	ND	25	3.0	9.1	1	U	MG/KG	03/27/14	EBS
Total Petroleum Hydrocarbon – Oil	NWTPH-DX w/ SGA	95	50	5.9	18	1		MG/KG	03/27/14	EBS

SURROGATE	METHOD	RESULTS	MIN	LIMITS		SPIKE ADDED	QUAL	%REC	ANALYSIS	ANALYSIS
				MAX	RPD				DATE	BY
TFT	NWTPH-GX	0.924	60	140		0.678		92.4	03/26/14	DLC
TFT	SW8021	0.917	60	140		0.678		91.7	03/26/14	DLC
Pentacosane	NWTPH-DX w/ SGA	1.12	58	134		3.87		112	03/27/14	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.



CERTIFICATE OF ANALYSIS

CLIENT:	Geoengineers, Inc. 600 DuPont St. Bellingham, WA 98225	DATE:	4/9/2014
CLIENT CONTACT:	Ron Bek	ALS JOB#:	EV14030179
CLIENT PROJECT:	7536-002-05	ALS SAMPLE#:	EV14030179-04
CLIENT SAMPLE ID	TP4-6-032514	DATE RECEIVED:	03/26/14
		COLLECTION DATE:	3/25/2014 9:30:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	RL	LIMITS		DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	PQL	FACTOR	QUAL		DATE	BY
Gasoline	NWTPH-GX	ND	3.0	0.37	1.1	1	U	MG/KG	03/26/14	DLC
Benzene	SW8021	ND	0.030	0.0072	0.008	1	U	MG/KG	03/26/14	DLC
Toluene	SW8021	ND	0.050	0.0024	0.007	1	U	MG/KG	03/26/14	DLC
Ethylbenzene	SW8021	ND	0.050	0.0028	0.008	1	U	MG/KG	03/26/14	DLC
Total Xylenes	SW8021	ND	0.20	0.0072	0.022	1	U	MG/KG	03/26/14	DLC
Total Petroleum Hydrocarbon – Diesel	NWTPH-DX w/ SGA	ND	25	2.8	8.4	1	U	MG/KG	03/27/14	EBS
Total Petroleum Hydrocarbon – Oil	NWTPH-DX w/ SGA	630	50	5.4	16	1		MG/KG	03/27/14	EBS
Benzo[a]anthracene	SW8270DSIM	ND	20	1.1	3.2	1	U	UG/KG	04/02/14	LAP
Chrysene	SW8270DSIM	ND	20	1.5	4.4	1	U	UG/KG	04/02/14	LAP
Benzo(b)fluoranthene	SW8270DSIM	ND	20	1.4	4.3	1	U	UG/KG	04/02/14	LAP
Benzo(k)fluoranthene	SW8270DSIM	ND	20	1.2	3.6	1	U	UG/KG	04/02/14	LAP
Benzo(a)pyrene	SW8270DSIM	ND	20	1.2	3.5	1	U	UG/KG	04/02/14	LAP
Indeno(1,2,3-cd)pyrene	SW8270DSIM	21	20	1.4	4.1	1		UG/KG	04/02/14	LAP
Dibenzo(a,h)anthracene	SW8270DSIM	20	20	1.6	4.9	1		UG/KG	04/02/14	LAP
Mercury	SW7471	ND	0.020	0.0014	0.004	1	U	MG/KG	04/04/14	RAL
Arsenic	SW6020	ND	5.0	0.27	0.80	5	U	MG/KG	04/07/14	RAL
Cadmium	SW6020	ND	0.50	0.082	0.25	5	U	MG/KG	04/07/14	RAL
Chromium	SW6020	17	0.50	0.14	0.41	5		MG/KG	04/07/14	RAL
Lead	SW6020	28	0.50	0.088	0.26	5		MG/KG	04/07/14	RAL

SURROGATE	METHOD	RESULTS	MIN	LIMITS		SPIKE ADDED	QUAL	%REC	ANALYSIS	ANALYSIS
				MAX	RPD				DATE	BY
TFT	NWTPH-GX	1.09	60	140		0.635		109	03/26/14	DLC
TFT	SW8021	1.13	60	140		0.635		113	03/26/14	DLC
Pentacosane	NWTPH-DX w/ SGA	1.23	58	134		3.55		123	03/27/14	EBS
Terphenyl-d14	SW8270DSIM	0.770	28.9	157		982		77.0	04/02/14	LAP

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.

CERTIFICATE OF ANALYSIS

CLIENT:	Geoengineers, Inc. 600 DuPont St. Bellingham, WA 98225	DATE:	4/9/2014
CLIENT CONTACT:	Ron Bek	ALS JOB#:	EV14030179
CLIENT PROJECT:	7536-002-05	ALS SAMPLE#:	EV14030179-06
CLIENT SAMPLE ID	TP5-4-032514	DATE RECEIVED:	03/26/14
		COLLECTION DATE:	3/25/2014 10:00:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	RL	LIMITS		DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	PQL	FACTOR	QUAL		DATE	BY
Gasoline	NWTPH-GX	ND	19	0.56	1.7	1	U	MG/KG	03/26/14	DLC
Benzene	SW8021	ND	0.030	0.011	0.013	1	U	MG/KG	03/26/14	DLC
Toluene	SW8021	ND	0.050	0.0036	0.011	1	U	MG/KG	03/26/14	DLC
Ethylbenzene	SW8021	ND	0.050	0.0042	0.013	1	U	MG/KG	03/26/14	DLC
Total Xylenes	SW8021	ND	0.20	0.011	0.033	1	U	MG/KG	03/26/14	DLC
Total Petroleum Hydrocarbon – Diesel	NWTPH-DX w/ SGA	910	250	30	89	10		MG/KG	03/27/14	EBS
Total Petroleum Hydrocarbon – Oil	NWTPH-DX w/ SGA	1500	500	57	170	10		MG/KG	03/27/14	EBS

SURROGATE	METHOD	RESULTS	MIN	LIMITS		SPIKE	QUAL	%REC	ANALYSIS	ANALYSIS
				MAX	RPD				ADDED	DATE	BY
TFT	NWTPH-GX	1.02	60	140		0.959		102	03/26/14	DLC
TFT	SW8021	1.09	60	140		0.959		109	03/26/14	DLC
Pentacosane 10X Dilution	NWTPH-DX w/ SGA	1.31	58	134		3.76	DS2	131	03/27/14	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
 DS2 - Due to high dilution factor surrogate results should be considered uncontrolled.
 Chromatogram indicates that it is likely that sample contains weathered diesel and lube oil.
 Gasoline range reporting limit raised due to semivolatle range product overlap.



CERTIFICATE OF ANALYSIS

CLIENT:	Geoengineers, Inc. 600 DuPont St. Bellingham, WA 98225	DATE:	4/9/2014
CLIENT CONTACT:	Ron Bek	ALS JOB#:	EV14030179
CLIENT PROJECT:	7536-002-05	ALS SAMPLE#:	EV14030179-07
CLIENT SAMPLE ID	TP6-6-032514	DATE RECEIVED:	03/26/14
		COLLECTION DATE:	3/25/2014 10:30:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	RL	LIMITS		DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	PQL	FACTOR	QUAL		DATE	BY
Gasoline	NWTPH-GX	ND	3.0	0.39	1.2	1	U	MG/KG	03/26/14	DLC
Benzene	SW8021	ND	0.030	0.0076	0.009	1	U	MG/KG	03/26/14	DLC
Toluene	SW8021	ND	0.050	0.0025	0.007	1	U	MG/KG	03/26/14	DLC
Ethylbenzene	SW8021	ND	0.050	0.0029	0.008	1	U	MG/KG	03/26/14	DLC
Total Xylenes	SW8021	ND	0.20	0.0076	0.023	1	U	MG/KG	03/26/14	DLC
Total Petroleum Hydrocarbon – Diesel	NWTPH-DX w/ SGA	ND	25	3.1	9.3	1	U	MG/KG	03/27/14	EBS
Total Petroleum Hydrocarbon – Oil	NWTPH-DX w/ SGA	110	50	6.0	18	1		MG/KG	03/27/14	EBS

SURROGATE	METHOD	RESULTS	MIN	LIMITS		SPIKE ADDED	QUAL	%REC	ANALYSIS	ANALYSIS
				MAX	RPD				DATE	BY
TFT	NWTPH-GX	1.07	60	140		0.666		107	03/26/14	DLC
TFT	SW8021	1.20	60	140		0.666		120	03/26/14	DLC
Pentacosane	NWTPH-DX w/ SGA	1.06	58	134		3.92		106	03/27/14	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.



CERTIFICATE OF ANALYSIS

CLIENT:	Geoengineers, Inc. 600 DuPont St. Bellingham, WA 98225	DATE:	4/9/2014
CLIENT CONTACT:	Ron Bek	ALS JOB#:	EV14030179
CLIENT PROJECT:	7536-002-05	ALS SAMPLE#:	EV14030179-08
CLIENT SAMPLE ID	TP7-5-032514	DATE RECEIVED:	03/26/14
		COLLECTION DATE:	3/25/2014 10:50:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	RL	LIMITS		DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	PQL	FACTOR	QUAL		DATE	BY
Gasoline	NWTPH-GX	ND	3.0	0.32	0.97	1	U	MG/KG	03/26/14	DLC
Benzene	SW8021	ND	0.030	0.0063	0.007	1	U	MG/KG	03/26/14	DLC
Toluene	SW8021	ND	0.050	0.0021	0.006	1	U	MG/KG	03/26/14	DLC
Ethylbenzene	SW8021	ND	0.050	0.0024	0.007	1	U	MG/KG	03/26/14	DLC
Total Xylenes	SW8021	ND	0.20	0.0063	0.01	1	U	MG/KG	03/26/14	DLC
Total Petroleum Hydrocarbon – Diesel	NWTPH-DX w/ SGA	ND	25	3.0	9.1	1	U	MG/KG	03/27/14	EBS
Total Petroleum Hydrocarbon – Oil	NWTPH-DX w/ SGA	98	50	5.9	18	1		MG/KG	03/27/14	EBS

SURROGATE	METHOD	RESULTS	MIN	LIMITS		RPD	SPIKE ADDED	QUAL	%REC	ANALYSIS	ANALYSIS
				MAX						DATE	BY
TFT	NWTPH-GX	1.03	60	140			0.556		103	03/26/14	DLC
TFT	SW8021	1.16	60	140			0.556		116	03/26/14	DLC
Pentacosane	NWTPH-DX w/ SGA	1.18	58	134			3.84		118	03/27/14	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.



CERTIFICATE OF ANALYSIS

CLIENT:	Geoengineers, Inc. 600 DuPont St. Bellingham, WA 98225	DATE:	4/9/2014
CLIENT CONTACT:	Ron Bek	ALS JOB#:	EV14030179
CLIENT PROJECT:	7536-002-05	ALS SAMPLE#:	EV14030179-09
CLIENT SAMPLE ID	TP8-4-032514	DATE RECEIVED:	03/26/14
		COLLECTION DATE:	3/25/2014 11:07:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	RL	LIMITS		DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	PQL	FACTOR	QUAL		DATE	BY
Gasoline	NWTPH-GX	ND	3.0	0.46	1.4	1	U	MG/KG	03/26/14	DLC
Benzene	SW8021	ND	0.030	0.0091	0.011	1	U	MG/KG	03/26/14	DLC
Toluene	SW8021	ND	0.050	0.0030	0.009	1	U	MG/KG	03/26/14	DLC
Ethylbenzene	SW8021	ND	0.050	0.0035	0.010	1	U	MG/KG	03/26/14	DLC
Total Xylenes	SW8021	ND	0.20	0.0091	0.027	1	U	MG/KG	03/26/14	DLC
Total Petroleum Hydrocarbon – Diesel	NWTPH-DX w/ SGA	ND	25	3.0	9.1	1	U	MG/KG	03/27/14	EBS
Total Petroleum Hydrocarbon – Oil	NWTPH-DX w/ SGA	76	50	5.9	18	1		MG/KG	03/27/14	EBS

SURROGATE	METHOD	RESULTS	MIN	LIMITS		RPD	SPIKE ADDED	QUAL	%REC	ANALYSIS	ANALYSIS
				MAX						DATE	BY
TFT	NWTPH-GX	0.843	60	140			0.795		84.3	03/26/14	DLC
TFT	SW8021	0.970	60	140			0.795		97.0	03/26/14	DLC
Pentacosane	NWTPH-DX w/ SGA	1.24	58	134			3.84		124	03/27/14	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.



CERTIFICATE OF ANALYSIS

CLIENT:	Geoengineers, Inc. 600 DuPont St. Bellingham, WA 98225	DATE:	4/9/2014
CLIENT CONTACT:	Ron Bek	ALS JOB#:	EV14030179
CLIENT PROJECT:	7536-002-05	ALS SAMPLE#:	EV14030179-10
CLIENT SAMPLE ID	TP9-4-032514	DATE RECEIVED:	03/26/14
		COLLECTION DATE:	3/25/2014 11:30:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	RL	LIMITS		DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	PQL	FACTOR	QUAL		DATE	BY
Gasoline	NWTPH-GX	ND	49	0.57	1.7	1	U	MG/KG	03/26/14	DLC
Benzene	SW8021	ND	0.030	0.011	0.014	1	U	MG/KG	03/26/14	DLC
Toluene	SW8021	ND	0.050	0.0037	0.011	1	U	MG/KG	03/26/14	DLC
Ethylbenzene	SW8021	ND	0.050	0.0043	0.013	1	U	MG/KG	03/26/14	DLC
Total Xylenes	SW8021	ND	0.20	0.011	0.034	1	U	MG/KG	03/26/14	DLC
Total Petroleum Hydrocarbon – Diesel	NWTPH-DX w/ SGA	1500	25	2.9	8.8	1		MG/KG	03/27/14	EBS
Total Petroleum Hydrocarbon – Oil	NWTPH-DX w/ SGA	120	50	5.7	17	1		MG/KG	03/27/14	EBS
Benzo[a]anthracene	SW8270DSIM	ND	20	1.1	3.2	1	U	UG/KG	04/02/14	LAP
Chrysene	SW8270DSIM	ND	20	1.4	4.3	1	U	UG/KG	04/02/14	LAP
Benzo(b)fluoranthene	SW8270DSIM	ND	20	1.4	4.2	1	U	UG/KG	04/02/14	LAP
Benzo(k)fluoranthene	SW8270DSIM	ND	20	1.2	3.5	1	U	UG/KG	04/02/14	LAP
Benzo(a)pyrene	SW8270DSIM	ND	20	1.1	3.4	1	U	UG/KG	04/02/14	LAP
Indeno(1,2,3-cd)pyrene	SW8270DSIM	ND	20	1.4	4.1	1	U	UG/KG	04/02/14	LAP
Dibenzo(a,h)anthracene	SW8270DSIM	ND	20	1.6	4.8	1	U	UG/KG	04/02/14	LAP
Mercury	SW7471	0.040	0.020	0.0014	0.004	1		MG/KG	04/04/14	RAL
Arsenic	SW6020	ND	5.0	0.30	0.89	5	U	MG/KG	04/07/14	RAL
Cadmium	SW6020	ND	0.50	0.092	0.28	5	U	MG/KG	04/07/14	RAL
Chromium	SW6020	32	0.50	0.15	0.45	5		MG/KG	04/07/14	RAL
Lead	SW6020	5.5	0.50	0.098	0.29	5		MG/KG	04/07/14	RAL

SURROGATE	METHOD	RESULTS	MIN	LIMITS		RPD	SPIKE ADDED	QUAL	%REC	ANALYSIS	ANALYSIS
				MAX						DATE	BY
TFT	NWTPH-GX	1.05	60	140			0.986		105	03/26/14	DLC
TFT	SW8021	1.13	60	140			0.986		113	03/26/14	DLC
Pentacosane	NWTPH-DX w/ SGA	1.22	58	134			3.72		122	03/27/14	EBS
Terphenyl-d14	SW8270DSIM	0.791	28.9	157			963		79.1	04/02/14	LAP

U - Analyte analyzed for but not detected at level above reporting limit.
 Chromatogram indicates that it is likely that sample contains weathered diesel and lube oil.
 Gasoline range reporting limit raised due to semivolatle range product overlap.
 Oil range product results biased high due to diesel range product overlap.



CERTIFICATE OF ANALYSIS

CLIENT:	Geoengineers, Inc. 600 DuPont St. Bellingham, WA 98225	DATE:	4/9/2014
CLIENT CONTACT:	Ron Bek	ALS JOB#:	EV14030179
CLIENT PROJECT:	7536-002-05	ALS SAMPLE#:	EV14030179-12
CLIENT SAMPLE ID	TP10-4-032514	DATE RECEIVED:	03/26/14
		COLLECTION DATE:	3/25/2014 11:57:00 AM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	RL	LIMITS		DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	PQL	FACTOR	QUAL		DATE	BY
Gasoline	NWTPH-GX	ND	3.0	0.39	1.2	1	U	MG/KG	03/27/14	DLC
Benzene	SW8021	ND	0.030	0.0075	0.009	1	U	MG/KG	03/27/14	DLC
Toluene	SW8021	ND	0.050	0.0025	0.007	1	U	MG/KG	03/27/14	DLC
Ethylbenzene	SW8021	ND	0.050	0.0029	0.008	1	U	MG/KG	03/27/14	DLC
Total Xylenes	SW8021	ND	0.20	0.0075	0.023	1	U	MG/KG	03/27/14	DLC
Total Petroleum Hydrocarbon – Diesel	NWTPH-DX w/ SGA	ND	25	2.9	8.7	1	U	MG/KG	03/27/14	EBS
Total Petroleum Hydrocarbon – Oil	NWTPH-DX w/ SGA	130	50	5.6	17	1		MG/KG	03/27/14	EBS

SURROGATE	METHOD	RESULTS	MIN	LIMITS		RPD	SPIKE ADDED	QUAL	%REC	ANALYSIS	ANALYSIS
				MAX						DATE	BY
TFT	NWTPH-GX	1.00	60	140			0.661		100	03/27/14	DLC
TFT	SW8021	1.07	60	140			0.661		107	03/27/14	DLC
Pentacosane	NWTPH-DX w/ SGA	1.32	58	134			3.69		132	03/27/14	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.



CERTIFICATE OF ANALYSIS

CLIENT:	Geoengineers, Inc. 600 DuPont St. Bellingham, WA 98225	DATE:	4/9/2014
CLIENT CONTACT:	Ron Bek	ALS JOB#:	EV14030179
CLIENT PROJECT:	7536-002-05	ALS SAMPLE#:	EV14030179-13
CLIENT SAMPLE ID	TP11-3-032514	DATE RECEIVED:	03/26/14
		COLLECTION DATE:	3/25/2014 1:45:00 PM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	RL	LIMITS		DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	PQL	FACTOR	QUAL		DATE	BY
Gasoline	NWTPH-GX	ND	3.0	0.46	1.4	1	U	MG/KG	03/26/14	DLC
Benzene	SW8021	ND	0.030	0.0090	0.011	1	U	MG/KG	03/26/14	DLC
Toluene	SW8021	ND	0.050	0.0030	0.0090	1	U	MG/KG	03/26/14	DLC
Ethylbenzene	SW8021	ND	0.050	0.0035	0.010	1	U	MG/KG	03/26/14	DLC
Total Xylenes	SW8021	ND	0.20	0.0090	0.027	1	U	MG/KG	03/26/14	DLC
Total Petroleum Hydrocarbon – Diesel	NWTPH-DX w/ SGA	ND	25	3.0	8.9	1	U	MG/KG	03/27/14	EBS
Total Petroleum Hydrocarbon – Oil	NWTPH-DX w/ SGA	92	50	5.8	17	1		MG/KG	03/27/14	EBS

SURROGATE	METHOD	RESULTS	MIN	LIMITS		RPD	SPIKE ADDED	QUAL	%REC	ANALYSIS	ANALYSIS
				MAX						DATE	BY
TFT	NWTPH-GX	1.01	60	140			0.791		101	03/26/14	DLC
TFT	SW8021	1.12	60	140			0.791		112	03/26/14	DLC
Pentacosane	NWTPH-DX w/ SGA	1.24	58	134			3.78		124	03/27/14	EBS

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT:	Geoengineers, Inc. 600 DuPont St. Bellingham, WA 98225	DATE:	4/9/2014
CLIENT CONTACT:	Ron Bek	ALS JOB#:	EV14030179
CLIENT PROJECT:	7536-002-05	ALS SAMPLE#:	EV14030179-14
CLIENT SAMPLE ID	TP12-6-032514	DATE RECEIVED:	03/26/14
		COLLECTION DATE:	3/25/2014 2:00:00 PM
		WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	RL	LIMITS		DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	PQL	FACTOR	QUAL		DATE	BY
Gasoline	NWTPH-GX	ND	3.0	0.51	1.5	1	U	MG/KG	03/27/14	DLC
Benzene	SW8021	ND	0.030	0.010	0.012	1	U	MG/KG	03/27/14	DLC
Toluene	SW8021	ND	0.050	0.0034	0.010	1	U	MG/KG	03/27/14	DLC
Ethylbenzene	SW8021	ND	0.050	0.0039	0.012	1	U	MG/KG	03/27/14	DLC
Total Xylenes	SW8021	ND	0.20	0.010	0.030	1	U	MG/KG	03/27/14	DLC
Total Petroleum Hydrocarbon – Diesel	NWTPH-DX w/ SGA	ND	50	5.6	17	2	U	MG/KG	03/28/14	EBS
Total Petroleum Hydrocarbon – Oil	NWTPH-DX w/ SGA	650	100	11	33	2		MG/KG	03/28/14	EBS

SURROGATE	METHOD	RESULTS	MIN	LIMITS		RPD	SPIKE ADDED	QUAL	%REC	ANALYSIS	ANALYSIS
				MAX						DATE	BY
TFT	NWTPH-GX	1.17	60	140			0.882		117	03/27/14	DLC
TFT	SW8021	1.26	60	140			0.882		126	03/27/14	DLC
Pentacosane 2X Dilution	NWTPH-DX w/ SGA	1.22	58	134			3.59		122	03/28/14	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.



CERTIFICATE OF ANALYSIS

CLIENT: Geoengeers, Inc.
 600 DuPont St.
 Bellingham, WA 98225

CLIENT CONTACT: Ron Bek
 CLIENT PROJECT: 7536-002-05

DATE: 4/9/2014
 ALS SDG#: EV14030179
 WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-032514S - Batch 7742 - Soil by NWTPH-GX Prepared 03/25/14 09:00

ANALYTE	METHOD	RESULTS	RL	LIMITS		PQL	DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	MAX		FACTOR	QUAL		DATE	BY
Gasoline	NWTPH-GX	ND	3.0	0.49		1.5	1	U	MG/KG-dry	03/25/14	DLC
SURROGATE	METHOD	RESULTS	MIN	MAX	RPD	SPIKE ADDED	QUAL	%REC		DATE	BY
TFT	NWTPH-GX	112	60	140		0.500		112		03/25/14	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

MB-032514S - Batch 7742 - Soil by SW8021 Prepared 03/25/14 09:00

ANALYTE	METHOD	RESULTS	RL	LIMITS		PQL	DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	MAX		FACTOR	QUAL		DATE	BY
Benzene	SW8021	ND	0.030	0.0061		0.018	1	U	MG/KG-dry	03/25/14	DLC
Toluene	SW8021	ND	0.050	0.0067		0.020	1	U	MG/KG-dry	03/25/14	DLC
Ethylbenzene	SW8021	ND	0.050	0.0053		0.016	1	U	MG/KG-dry	03/25/14	DLC
Total Xylenes	SW8021	ND	0.20	0.018		0.053	1	U	MG/KG-dry	03/25/14	DLC
SURROGATE	METHOD	RESULTS	MIN	MAX	RPD	SPIKE ADDED	QUAL	%REC		DATE	BY
TFT	SW8021	99.5	60	140		0.500		99.5		03/25/14	DLC

U - Analyte analyzed for but not detected at level above reporting limit.

MB-032714S - Batch 7766 - Soil by NWTPH-DX Prepared 03/27/14 13:14

ANALYTE	METHOD	RESULTS	RL	LIMITS		PQL	DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	MAX		FACTOR	QUAL		DATE	BY
Total Petroleum Hydrocarbon – Diesel	NWTPH-DX	ND	25	3.9		12	1	U	MG/KG	03/28/14	EBS
Total Petroleum Hydrocarbon – Oil	NWTPH-DX	ND	50	7.6		23	1	U	MG/KG	03/28/14	EBS
SURROGATE	METHOD	RESULTS	MIN	MAX	RPD	SPIKE ADDED	QUAL	%REC		DATE	BY
Pentacosane	NWTPH-DX	115	58	134		5.00		115		03/28/14	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-040214S - Batch 7784 - Soil by SW8270DSIM Prepared 04/04/14 17:37

ANALYTE	METHOD	RESULTS	RL	LIMITS		PQL	DILUTION		UNITS	ANALYSIS	ANALYSIS
				MDL	MAX		FACTOR	QUAL		DATE	BY
Benz[a]anthracene	SW8270DSIM	ND	20	1.1		3.3	1	U	UG/KG	04/04/14	LAP
Chrysene	SW8270DSIM	ND	20	1.5		4.5	1	U	UG/KG	04/04/14	LAP
Benzo(b)fluoranthene	SW8270DSIM	ND	20	1.5		4.4	1	U	UG/KG	04/04/14	LAP
Benzo(k)fluoranthene	SW8270DSIM	ND	20	1.2		3.6	1	U	UG/KG	04/04/14	LAP
Benzo(a)pyrene	SW8270DSIM	ND	20	1.2		3.5	1	U	UG/KG	04/04/14	LAP



CERTIFICATE OF ANALYSIS

CLIENT: Geoengeers, Inc.
 600 DuPont St.
 Bellingham, WA 98225

CLIENT CONTACT: Ron Bek
 CLIENT PROJECT: 7536-002-05

DATE: 4/9/2014
 ALS SDG#: EV14030179
 WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-040214S - Batch 7784 - Soil by SW8270DSIM Prepared 04/04/14 17:37

Indeno(1,2,3-cd)pyrene	SW8270DSIM	ND	20	1.4	4.2	1	U	UG/KG	04/04/14	LAP
Dibenzo(a,h)anthracene	SW8270DSIM	ND	20	1.7	5.0	1	U	UG/KG	04/04/14	LAP

SURROGATE	METHOD	RESULTS	MIN	LIMITS MAX	RPD	SPIKE ADDED	QUAL	%REC	ANALYSIS DATE	ANALYSIS BY
Terphenyl-d14	SW8270DSIM	89.5	28.9	157		1000		89.5	04/04/14	LAP

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-231354 - Batch R231354 - Soil by SW7471 Prepared 04/04/14

ANALYTE	METHOD	RESULTS	RL	LIMITS MDL	PQL	DILUTION FACTOR	QUAL	UNITS	ANALYSIS DATE	ANALYSIS BY
Mercury	SW7471	ND	0.020	0.0014	0.0041	1	U	MG/KG	04/04/14	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MB2-040414S - Batch 7783 - Soil by SW6020 Prepared 04/04/14 12:00

ANALYTE	METHOD	RESULTS	RL	LIMITS MDL	PQL	DILUTION FACTOR	QUAL	UNITS	ANALYSIS DATE	ANALYSIS BY
Arsenic	SW6020	ND	1.0	0.049	0.15	1	U	MG/KG	04/04/14	RAL
Cadmium	SW6020	ND	0.10	0.015	0.045	1	U	MG/KG	04/04/14	RAL
Chromium	SW6020	ND	0.10	0.025	0.074	1	U	MG/KG	04/04/14	RAL
Lead	SW6020	ND	0.10	0.016	0.047	1	U	MG/KG	04/04/14	RAL

U - Analyte analyzed for but not detected at level above reporting limit.



CERTIFICATE OF ANALYSIS

CLIENT: Geoenineers, Inc.
600 DuPont St.
Bellingham, WA 98225

DATE: 4/9/2014
ALS SDG#: EV14030179
WDOE ACCREDITATION: C601

CLIENT CONTACT: Ron Bek
CLIENT PROJECT: 7536-002-05

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 7742 - Soil by NWT PH-GX Prepared 03/25/14 09:00

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	SPIKE ADDED	MIN	LIMITS MAX	RPD	ANALYSIS DATE	ANALYSIS BY
Gasoline - BS	NWT PH-GX	18			25.0	59	104		03/25/14	DLC
Gasoline - BSD	NWT PH-GX	18	1		25.0	59	104	15	03/25/14	DLC

SURROGATE	METHOD	%REC	RPD	QUAL	SPIKE ADDED	MIN	LIMITS MAX	RPD	ANALYSIS DATE	ANALYSIS BY
TFT - BS	NWT PH-GX	129			0.500	60	140		03/25/14	DLC
TFT - BSD	NWT PH-GX	131			0.500	60	140		03/25/14	DLC

ALS Test Batch ID: 7742 - Soil by SW8021 Prepared 03/25/14 09:00

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	SPIKE ADDED	MIN	LIMITS MAX	RPD	ANALYSIS DATE	ANALYSIS BY
Benzene - BS	SW8021	0.87			1.00	67.7	124		03/25/14	DLC
Benzene - BSD	SW8021	0.86	0		1.00	67.7	124	8.5	03/25/14	DLC
Toluene - BS	SW8021	0.90			1.00	71	123		03/25/14	DLC
Toluene - BSD	SW8021	0.90	0		1.00	71	123	9.7	03/25/14	DLC
Ethylbenzene - BS	SW8021	0.89			1.00	69.8	117		03/25/14	DLC
Ethylbenzene - BSD	SW8021	0.89	0		1.00	69.8	117	10	03/25/14	DLC
Total Xylenes - BS	SW8021	2.7			3.00	70	119		03/25/14	DLC
Total Xylenes - BSD	SW8021	2.7	0		3.00	70	119	10	03/25/14	DLC

SURROGATE	METHOD	%REC	RPD	QUAL	SPIKE ADDED	MIN	LIMITS MAX	RPD	ANALYSIS DATE	ANALYSIS BY
TFT - BS	SW8021	91.7			0.500	60	140		03/25/14	DLC
TFT - BSD	SW8021	90.9			0.500	60	140		03/25/14	DLC

ALS Test Batch ID: 7766 - Soil by NWT PH-DX Prepared 03/27/14 13:14

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	SPIKE ADDED	MIN	LIMITS MAX	RPD	ANALYSIS DATE	ANALYSIS BY
Total Petroleum Hydrocarbon – Diesel - BS	NWT PH-DX	130			125	76.2	112		03/27/14	EBS
Total Petroleum Hydrocarbon – Diesel - BSD	NWT PH-DX	130	1		125	76.2	112	12	03/27/14	EBS

SURROGATE	METHOD	%REC	RPD	QUAL	SPIKE ADDED	MIN	LIMITS MAX	RPD	ANALYSIS DATE	ANALYSIS BY
Pentacosane - BS	NWT PH-DX	116			5.00	58	134		03/27/14	EBS
Pentacosane - BSD	NWT PH-DX	115			5.00	58	134		03/27/14	EBS



CERTIFICATE OF ANALYSIS

CLIENT: Geoengeers, Inc.
600 DuPont St.
Bellingham, WA 98225

DATE: 4/9/2014
ALS SDG#: EV14030179
WDOE ACCREDITATION: C601

CLIENT CONTACT: Ron Bek
CLIENT PROJECT: 7536-002-05

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 7784 - Soil by SW8270DSIM Prepared 04/02/14 17:37

SURROGATE	METHOD	%REC	RPD	QUAL	SPIKE ADDED	MIN	MAX	RPD	ANALYSIS DATE	ANALYSIS BY
Terphenyl-d14 - BS	SW8270DSIM	72.2			1000	28.9	157		04/02/14	LAP
Terphenyl-d14 - BSD	SW8270DSIM	73.8			1000	28.9	157		04/02/14	LAP

ALS Test Batch ID: R231354 - Soil by SW7471 Prepared 04/04/14

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	SPIKE ADDED	MIN	MAX	RPD	ANALYSIS DATE	ANALYSIS BY
Mercury - BS	SW7471	99			100	81.8	117		04/04/14	RAL
Mercury - BSD	SW7471	99	0		100	81.8	117	8.84	04/04/14	RAL

ALS Test Batch ID: 7783 - Soil by SW6020 Prepared 04/04/14 12:00

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	SPIKE ADDED	MIN	MAX	RPD	ANALYSIS DATE	ANALYSIS BY
Arsenic - BS	SW6020	5.2			5.00	80	120		04/04/14	RAL
Arsenic - BSD	SW6020	5.3	2		5.00	80	120	8.91	04/04/14	RAL
Cadmium - BS	SW6020	5.1			5.00	80	120		04/04/14	RAL
Cadmium - BSD	SW6020	5.2	3		5.00	80	120	9.2	04/04/14	RAL
Chromium - BS	SW6020	5.2			5.00	80	120		04/04/14	RAL
Chromium - BSD	SW6020	5.3	2		5.00	80	120	9.6	04/04/14	RAL
Lead - BS	SW6020	5.2			5.00	80	120		04/04/14	RAL
Lead - BSD	SW6020	5.3	3		5.00	80	120	9.36	04/04/14	RAL

APPROVED BY

Laboratory Director



ALS Environmental
 8620 Holly Drive, Suite 100
 Everett, WA 98208
 Phone (425) 356-2600
 Fax (425) 356-2626
 http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only)

EV14030179

Date 3-25-14 Page 1 of 2

PROJECT ID: 7536-002-05	ANALYSIS REQUESTED	OTHER (Specify)
REPORT TO COMPANY: GeoEngineers		
PROJECT MANAGER: Ron Beck		
ADDRESS: 600 Dupont ST Bellingham WA 98225		
PHONE: 3603032819 FAX: 3606475044		
P.O. #: E-MAIL: rbeck@geoengineers.com		
INVOICE TO COMPANY:	NWTPH-HCID NWTPH-DX w/si gel clean NWTPH-GX w/BTEX BTEX by EPA-8021 MTBE by EPA-8021 <input type="checkbox"/> EPA-8260 <input type="checkbox"/> Halogenated Volatiles by EPA 8260 Volatile Organic Compounds by EPA 8260 EDB / EDC by EPA 8260 SIM (water) EDB / EDC by EPA 8260 (soil) Semivolatile Organic Compounds by EPA 8270 Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM <input type="checkbox"/> PCB <input type="checkbox"/> Pesticides <input type="checkbox"/> by EPA 8081/8082 Metals-MTCA-5 <input checked="" type="checkbox"/> RCRA-8 <input type="checkbox"/> Pri Pol <input type="checkbox"/> TAL <input type="checkbox"/> Metals Other (Specify) TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Pest <input type="checkbox"/> Herbs <input type="checkbox"/> CPAHS	NUMBER OF CONTAINERS RECEIVED IN GOOD CONDITION?
ATTENTION: SAA		
ADDRESS:		

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX w/si gel clean	NWTPH-GX w/BTEX	BTEX by EPA-8021	MTBE by EPA-8021 <input type="checkbox"/> EPA-8260 <input type="checkbox"/>	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM <input type="checkbox"/>	PCB <input type="checkbox"/> Pesticides <input type="checkbox"/> by EPA 8081/8082	Metals-MTCA-5 <input checked="" type="checkbox"/> RCRA-8 <input type="checkbox"/> Pri Pol <input type="checkbox"/> TAL <input type="checkbox"/>	Metals Other (Specify)	TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Pest <input type="checkbox"/> Herbs <input type="checkbox"/>	NUMBER OF CONTAINERS RECEIVED IN GOOD CONDITION?
1. TP1-3-032514	3,25,14	830	S	1		XX														2
2. TP2-4-032514		850		2		XX														
3. TP3-5-032514		913		3		XX														
4. TP4-6-032514		930		4		XX												(X)	(X)	
5. TP4-7-032514		940		5																
6. TP5-4-032514		1000		6		XX														
7. TP6-6-032514		1030		7		XX														
8. TP7-5-032514		1050		8		XX														
9. TP8-4-032514		1107		9		XX														
10. TP9-4-032514	3,25,14	1130	S	10		XX												(X)	(X)	2

SPECIAL INSTRUCTIONS: Return cooler & box of 4oz jars. Hold leftover samples for more tests.

SIGNATURES (Name, Company, Date, Time):
 1. Relinquished By: Ron Beck, GEI, 3/26/14, 1300
 Received By: Shawn Robinson ALS 3/26/14 12:40
 2. Relinquished By: _____
 Received By: _____

TURNAROUND REQUESTED in Business Days*
 Organic, Metals & Inorganic Analysis
 10 Standard 5 3 2 1 SAME DAY
 Fuels & Hydrocarbon Analysis
 3 Standard 3 1 SAME DAY
 OTHER: (X) Added 4/2/14 on Std TAT. OK
 * Turnaround request less than standard may incur Rush Charges



ALS Environmental
 8620 Holly Drive, Suite 100
 Everett, WA 98208
 Phone (425) 356-2600
 Fax (425) 356-2626
 http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only)

EV14030179

Date 3/25/14 Page 2 Of 2

PROJECT ID: 7536-002-05					ANALYSIS REQUESTED										OTHER (Specify)	
REPORT TO COMPANY: Geo Engineers					NWTPH-HCID NWTPH-DX w/ si gel clean NWTPH-GX w/ BTEX BTEX by EPA-8021 MTBE by EPA-8021 <input type="checkbox"/> EPA-8260 <input type="checkbox"/> Halogenated Volatiles by EPA 8260 Volatile Organic Compounds by EPA 8260 EDB / EDC by EPA 8260 SIM (water) EDB / EDC by EPA 8260 (soil) Semivolatile Organic Compounds by EPA 8270 Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM <input type="checkbox"/> PCB <input type="checkbox"/> Pesticides <input type="checkbox"/> by EPA 8081/8082 Metals-MTCA-5 <input type="checkbox"/> RCRA-8 <input type="checkbox"/> Pri Pol <input type="checkbox"/> TAL <input type="checkbox"/> Metals Other (Specify) TCLP-Metals <input type="checkbox"/> VOA <input type="checkbox"/> Semi-Vol <input type="checkbox"/> Pest <input type="checkbox"/> Herbs <input type="checkbox"/>											NUMBER OF CONTAINERS RECEIVED IN GOOD CONDITION?
PROJECT MANAGER: Ron Beck																
ADDRESS: 600 Dupont ST Bellingham WA 98225																
PHONE: 360 303 2819 FAX: 360 647 5044																
PO. #: E-MAIL: rbeck@geoengineers.com																
INVOICE TO COMPANY:																
ATTENTION: SAA																
ADDRESS:																
SAMPLE I.D.	DATE	TIME	TYPE	LAB#												
1. TP9-6-032514	3/25/14	1133	S	11											2	
2. TP10-4-032514	3/25/14	1157	I	12	XX										1	
3. TP11-3-032514		1345	I	13	XX										1	
4. TP12-6-032514	3/25/14	1400	S	14	XX										2	
5.																
6.																
7.																
8.																
9.																
10.																

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Wm Ron GEI 3/26/14, 1300
 Received By: Shawn Robinson ALS 3/26/14 12:40

2. Relinquished By: _____
 Received By: _____

TURNAROUND REQUESTED in Business Days*
 Organic, Metals & Inorganic Analysis OTHER:

10	5	3	2	1	SAME DAY
Standard					
Fuels & Hydrocarbon Analysis					
10	5	3	2	1	SAME DAY
Standard					

Specify: _____

* Turnaround request less than standard may incur Rush Charges

Table 12.1 Guidelines for Reuse of Petroleum-Contaminated Soil

Parameter	Analytical Method	Soil Category (8)(9)(10)			
		1 No detectable Petroleum Components (mg/kg)	2 Commercial Fill Above Water Table (mg/kg)	3 Paving Base Material & Road Construction (mg/kg)	4 Landfill Daily Cover or Asphalt Manufacturing (mg/kg)
Total Petroleum Hydrocarbons (1)(2) See Table 7.1 for petroleum products that fall within these categories.					
Gasoline Range Organics	NWTPH-Gx	<5	5 - 30	>30 - 100	>100
Diesel Range Organics	NWTPH-Dx	<25	25 - 200	>200 - 500	>500
Heavy Fuels and Oils*	NWTPH-Dx	<100	100 - 200	>200 - 500	>500
Mineral Oil	NWTPH-Dx	<100	100 - 200	>200 - 500	>500
Volatile Petroleum Components					
Benzene	SW8260B	<0.005	0.005 - 0.03	0.03 or less	See Table 12.2
Ethyl benzene	SW8260B	<0.005	0.005 - 6	6 or less	>6
Toluene	SW8260B	<0.005	0.005 - 7	7 or less	>7
Xylenes (3)	SW8260B	<0.015	0.015 - 9	9 or less	>9
Fuel Additives & Blending Components					
(MTBE) Methyl Tert-Butyl Ether	SW8260B	<0.005	0.005 - 0.1	0.1 or less	>0.1
Lead	SW6010A	<17	17 - 50	>50 - 220	See Table 12.2
Other Petroleum Components					
Polychlorinated (4) Biphenyls (PCBs)	SW8082	<0.04	<0.04	<0.04	See Table 12.2
Naphthalenes (5)	SW8260B	<0.05	0.05 - 5	5 or less	>5
cPAHs (6)	SW8270C	<0.05	0.05 - 0.1	>0.1 - 2	>2
Other Petroleum Characteristics (Applies to soils contaminated with any petroleum product.)					
Odors	Smell	No detectable odor			
Staining	Visual	No unusual color or staining			
Sheen Test	See Footnote # 7	No visible sheen			
IMPORTANT: See Table 12.2 and the footnotes to this Table on the following pages!					
Test soil for the parameters specified in Table 7.2.					
*Does NOT include waste oil contaminated soils, which should be disposed of in a landfill.					
“<” means less than; “>” means greater than					

Table 12.2 Description and Recommended Best Management Practices for Soil Categories in Table 12.1 (continues on next page)

Category	Acceptable Uses	Limitations
<p>Category 1 Soils: Soils with no detectable/ quantifiable levels of petroleum hydrocarbons or constituents using the analytical methods listed in Table 7.3 and are not suspected of being contaminated with any other hazardous substances.</p>	<ul style="list-style-type: none"> • Can be used anywhere the use is allowed under other regulations. • Any use allowed for Category 2, 3 & 4 soils. 	<ul style="list-style-type: none"> • These soils may have a slight petroleum odor, depending on the sensitivity of individuals, and this should be considered when reusing these soils.
<p>Category 2 Soils: Soils with residual levels of petroleum hydrocarbons that could have adverse impacts on the environment in some circumstances.</p>	<ul style="list-style-type: none"> • Any use allowed for Category 3 & 4 soils. • Backfill at cleanup sites above the water table. • Fill in commercial or industrial areas above the water table. • Road and bridge embankment construction in areas above the water table. 	<ul style="list-style-type: none"> • Should be placed above the highest anticipated high water table. If seasonal groundwater elevation information is not available, place at least 10 feet above the current water table. • Should not be placed within 100 feet of any private drinking water well or within the 10 year wellhead protection area of a public water supply well. • Should not be placed in or directly adjacent to wetlands or surface water where contact with water is possible. • Should not be placed under a surface water infiltration facility or septic drain field. • Any other limitations in state or local regulations.
<p>Category 3 Soils: Soils with moderate levels of residual petroleum contamination that could have adverse impacts on the environment unless re-used in carefully controlled situations.</p>	<ul style="list-style-type: none"> • Any use allowed for Category 4 soils. • Use as pavement base material under public and private paved streets and roads. • Use as pavement base material under commercial and industrial parking lots. 	<ul style="list-style-type: none"> • Should be placed above the highest anticipated high water table. If seasonal ground water elevation information is not available, place at least 10 feet above the water table. • Should be a maximum of 2 feet thick to minimize potential for leaching or vapor impacts. • Should not be placed within 100 feet of any private drinking water well or within the 10 year wellhead protection area of a public water supply well. • Should not be placed in or directly adjacent to wetlands or surface water. • Should not be placed under a surface water infiltration facility or septic drain field. • When exposed, runoff from area in use should be contained or treated to prevent entrance to storm drains, surface water or wetlands. • Any other limitations in state or local regulations.

Table 12.2 Description and Recommended Best Management Practices for Soil Categories in Table 12.1 (continued)

Category	Acceptable Uses	Limitations
<p>Category 4 Soils: Soils with high levels of petroleum contamination that should not be re-used except in very limited circumstances.</p>	<ul style="list-style-type: none"> • Use in the manufacture of asphalt. • Use as daily cover in a lined municipal solid waste or limited purpose landfill provided this is allowed under the landfill operating permit. 	<p><u>Landfill Limitations:</u></p> <p>The soil should be tested for and pass the following tests:</p> <ul style="list-style-type: none"> ➤ Free liquids test. Soils that contain free liquids cannot be landfilled without treatment. ➤ TCLP for lead and benzene. Unless exempt under WAC 173-303-071(3)(t), soils that fail a TCLP for lead or benzene must be disposed of as hazardous waste. ➤ Flammability test. Soils that fail this test must be disposed of as hazardous waste. ➤ Bioassay test under WAC 173-303-100(5). Soils that fail this test must be disposed of as hazardous waste. ➤ PCBs. Soils with a total PCB content of 2 ppm or more must be disposed of as hazardous waste. <p>Soil used for daily cover should be stockpiled within the landfill lined fill area.</p> <p>Soil containing more than 10,000 mg/kg TPH should be buried immediately with other wastes or daily covered to limit potential worker exposure.</p> <p>Any additional limitations specified in the landfill permit or in other state or local regulations.</p> <p><u>Asphalt Manufacturing Limitations:</u></p> <p>Soil storage areas should be contained in a bermed area to minimize contact with surface water runoff from adjacent areas. Runoff from storage areas should be considered contaminated until tested to prove otherwise.</p> <p>Soil storage areas should also be lined and covered with a roof or secured tarp to minimize contact with precipitation and potential groundwater contamination. Leachate from storage areas should be considered contaminated until tested to prove otherwise.</p> <p>The soil should be tested for and pass the following tests:</p> <ul style="list-style-type: none"> ➤ TCLP for lead and benzene. Unless exempt under WAC 173-303-071(3)(t), soils that fail a TCLP for lead or benzene must be disposed of as hazardous waste. ➤ Flammability test. Soils that fail this test must be disposed of as hazardous waste. ➤ Bioassay test under WAC 173-303-100(5). Soils that fail this test must be disposed of as hazardous waste. ➤ No detectable levels of PCBs in soil (<0.04 mg/kg). <p>Precautions should be taken to minimize worker exposure to soil storage piles and any dust or vapors from these piles prior to feeding into the asphalt batch plant.</p>

IMPORTANT: See the following page for additional information!

Notes to Table 12.1:

Contaminated soils can be treated to achieve these concentrations but dilution with clean soil to achieve these concentrations is a violation of Washington State solid and hazardous waste laws.

(1) See Table 7.1 for a description of what products fall within these general categories. If the product released is unknown, use the limitations for gasoline range organics. If the soil is contaminated from releases from more than one product, use the limitations for both products. For example, if the release is a mixture of gasoline and diesel, the soil should be tested for components of both gas and diesel and the limitations for both fuels and their components used.

(2) The concentrations for diesel, heavy oil and mineral oil are not additive. Use the TPH product category most closely representing the TPH mixture and apply the limitations for that product to the mixture. ***The reuse of waste oil contaminated soil is not allowed due to the wide variety of contaminants likely to be present.***

(3) Value is total of m, o, & p xylenes.

(4) Value is the total of all PCBs. Only heavy oil and mineral oil contaminated soils need to be tested for PCBs. Soil contaminated with a spill from a regulated PCB containing device must be disposed of in a TSCA permitted landfill, regardless of the PCB concentration. Other PCB contaminated soils may be disposed of in a municipal solid waste landfill permitted to receive such materials, provided the concentration does not exceed 2 ppm PCBs (WAC 173-303-9904).

(5) Value is total of naphthalene, 1-methyl naphthalene and 2-methyl naphthalene. Only diesel and heavy oil contaminated soils need to be tested for naphthalenes.

(6) The value is the benzo(a)pyrene equivalent concentration of the following seven cPAHs, using the procedures in WAC 173-340-708(8). The seven cPAHs are as follows: benz(a)anthracene; benzo(b)fluoranthene; benzo(k)fluoranthene; benzo(a)pyrene; chrysene; dibenz(a,h)anthracene; and, indeno(1,2,3-cd)pyrene. Only diesel and heavy oil contaminated soils need to be tested for cPAHs. Soils contaminated with more than 1% polycyclic aromatic hydrocarbons, as that term is defined in WAC 173-303-040 (which is more expansive than the above list), must be disposed of as hazardous waste.

(7) No visible sheen observed on water when approximately one tablespoon of soil placed in approximately ½ liter of water held in a shallow pan (like a gold pan or similar container).

(8) A soil in a lower category can be used for uses specified in any higher category. This means that:

- A category 1 soil can be used for any use specified in categories 1, 2, 3 and 4.
- A category 2 soil can be used for any use specified in categories 2, 3 and 4.
- A categories 3 soil can be used for any use specified in categories 3 and 4.

(9) ***If an environmental site assessment or soil or groundwater analyses indicate contaminants other than common petroleum constituents and naturally occurring levels of metals are likely to be present in the soil of interest at the site (for example, solvents or pesticides), do not reuse the soil.*** The soil should instead be treated using appropriate technology to address all contaminants or landfilled at a solid waste or hazardous waste facility permitted to receive these materials.

(10) Soils in categories 2, 3 and 4 should be stockpiled consistent with the soil storage recommendations in Section 11.3 of this guidance.

ATTACHMENT A REPORT LIMITATIONS AND GUIDELINES FOR USE¹

This Attachment provides information to help you manage your risks with respect to the use of this report.

Read These Provisions Closely

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering, geology and environmental science) are far less exact than other engineering and natural science disciplines. This lack of understanding can create unrealistic expectations that could lead to disappointments, claims and disputes. GeoEngineers includes these explanatory “limitations” provisions in our reports to help reduce such risks. Please confer with GeoEngineers if you are unclear how these “Report Limitations and Guidelines for Use” apply to your project or site.

Environmental Services Are Performed for Specific Purposes, Persons and Projects

This report has been prepared for the exclusive use of Sudden Valley Community Association and their authorized agents. This report may be provided to regulatory agencies for review. This report is not intended for use by others, and the information contained herein is not applicable to other sites.

GeoEngineers structures our services to meet the specific needs of our clients. For example, an environmental site assessment study conducted for a property owner may not fulfill the needs of a prospective purchaser of the same property. Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and project site. No one except Sudden Valley Community Association and their authorized agents and regulatory agencies should rely on this environmental report without first conferring with GeoEngineers. This report should not be applied for any purpose or project except the one originally contemplated.

This Environmental Report Is Based on a Unique Set of Project-Specific Factors

This report has been prepared for the Area Z site in Sudden Valley, Whatcom County, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, do not rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

¹ Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; www.asfe.org.



If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation, as appropriate.

Reliance Conditions for Third Parties

Our report was prepared for the exclusive use of Sudden Valley Community Association and their authorized agents and regulatory agencies. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions. Within the limitations of scope, schedule and budget, our services have been executed in accordance with our Agreement with Sudden Valley Community Association and generally accepted environmental practices in this area at the time this report was prepared.

Environmental Regulations Are Always Evolving

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead, to contamination of the subject site, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability. GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substance, change or if more stringent environmental standards are developed in the future.

Uncertainty May Remain after Completion of Soil Sampling Activities

Soil sampling activities completed in a portion of a site cannot wholly eliminate uncertainty regarding the potential for contamination in connection with a property. Our interpretation of subsurface conditions in this study is based on field observations and chemical analytical data from widely-spaced sampling locations. It is always possible that contamination exists in areas that were not explored, sampled or analyzed.

Subsurface Conditions Can Change

This environmental 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, by manmade events such as construction on or adjacent to the site, by new releases of hazardous substances, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. Always contact GeoEngineers before applying this report to determine if it is still applicable.

Soil and Groundwater End Use

The cleanup levels referenced in this report are site- and situation-specific. The cleanup levels may not be applicable for other sites or for other on-site uses of the affected media (soil and/or groundwater). Note that hazardous substances may be present in some of the site soil and/or groundwater at detectable concentrations that are less than the referenced cleanup levels. GeoEngineers should be contacted prior to the export of soil or groundwater from the subject site or reuse of the affected media on site to evaluate the potential for associated environmental liabilities. We cannot be responsible for potential environmental liability arising out of the transfer of soil and/or groundwater from the subject site to another location or its reuse on site in instances that we were not aware of or could not control.



Most Environmental Findings Are Professional Opinions

Our interpretations of subsurface conditions are based on field observations and chemical analytical data from widely spaced sampling locations at the site. Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ – sometimes significantly – from those indicated in this report. Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions.

Geotechnical, Geologic and Geoenvironmental Reports Should Not Be Interchanged

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 relate 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 a specific project.

Biological Pollutants

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings, or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants and no conclusions or inferences should be drawn regarding Biological Pollutants, as they may relate to this project. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and/or any of their byproducts.

If Sudden Valley Community Association desires these specialized services, they should be obtained from a consultant who offers services in this specialized field.





STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

Bellingham Field Office • 1440 10th Street, Ste 102 • Bellingham, WA 98225
(360) 715-5200 • FAX (360) 715-5225

September 2, 2014

Mr. Jeff Schlaack
Sudden Valley Resort
4 Clubhouse Circle
Bellingham, WA 98229

Re: Further Action at the following Site:

- **Site Name:** Sudden Valley Resort
- **Site Address:** 2650 Lake Louise Road, Bellingham, WA 98229
- **Facility/Site No.:** 47652753
- **VCP Project No.:** NW2897
- **Cleanup Site ID No.:** 6154
- **LUST No.:** 3929 - Sudden Valley Area Z

Dear Mr. Schlaack:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of the Sudden Valley Resort facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

Issue Presented and Opinion

Is further remedial action necessary to clean up contamination at the Site?

YES. Ecology has determined that further remedial action is necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following releases:

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- Gasoline-, diesel- and oil-range petroleum hydrocarbons into the soil.
- Diesel-range petroleum hydrocarbons into the ground water.

Enclosure A includes a diagram that illustrates the approximate location of the Site.

Please note a parcel of real property can be affected by multiple sites. At this time, we are uncertain that the parcel associated with this Site is affected by other sites.

Ecology understands that a Voluntary Cleanup Program opinion was requested for only a portion of the Site (i.e., the soil stockpile). However, Ecology has determined that your characterization of the overall Site is not sufficient to establish cleanup standards and select a cleanup action for the soil stockpile portion of the Site.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. John A. Pinner & Associates, *Sudden Valley 2145 Lake Whatcom Blvd, Bellingham, Washington, Multiple Underground Storage Tank Removal*, November 6, 1992.
2. John A. Pinner & Associates, *Final Report, Treatment Bed Area Z, Sudden Valley, Washington*, July 16, 1993.
3. GeoEngineers, Memorandum – *Environmental Drilling and Sampling Results for Area Z*, September 14, 1999.
4. GeoEngineers, *Report of Remedial Excavation Activities, Area Z, Sudden Valley Community Association, Bellingham, Washington*, May 23, 2000.
5. GeoEngineers, *Report of Environmental Services, Monitoring Well Replacement and Ground Water Sampling, Area Z, Bellingham, Washington*, December 27, 2000.
6. GeoEngineers, *February and May 2001 Ground Water Sampling, Area Z, Bellingham, Washington*, June 4, 2001.
7. GeoEngineers, *February 2002 Ground Water Sampling, Sudden Valley Community Association, Area Z, Bellingham, Washington*, February 26, 2002.
8. GeoEngineers, *Report of Environmental Services, Area Z Soil Stockpile Sampling*, May 14, 2014.

These documents are kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. You can make an appointment by calling the NWRO resource contact at (425) 649-7235 or by emailing nwro_public_request@ecy.wa.gov.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that **further remedial action** is necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. **Characterization of the Site.**

Ecology has determined your characterization of the Site is not sufficient to establish cleanup standards and select a cleanup action.

Additional remedial investigation work is necessary to fully characterize the nature and extent of soil contamination, establish points of compliance for the soil Site and to meet the substantive requirements of the MTCA. Based on the following history of potential contaminant sources, the entire soil Site should be characterized.

Four gasoline underground storage tanks (USTs) were removed from the Sudden Valley community Property in 1992:

1. One 300-gallon gasoline UST was removed from the area of the restaurant and golf course. There is no report of contaminated soil being removed from this area.
2. One 1,000-gallon gasoline UST was removed from the golf course maintenance shop area. An unknown quantity of contaminated soil was transferred to Area Z from this area.
3. Two 1,000-gallon gasoline USTs were removed from Area Z. There is no report of contaminated soil being removed from this area.

Petroleum hydrocarbon-contaminated soil above the MTCA Method A soil cleanup levels was encountered during geotechnical work associated with the expansion of a proposed sewer lift station at Area Z in 1999. The aforementioned USTs all contained gasoline but the petroleum hydrocarbon-contaminated soil associated with the sewer lift station remedial excavation was reported in the diesel- and oil-range. The source of this petroleum hydrocarbon-contaminated soil has not been reported.

Approximately 2,500 cubic yards of diesel- and oil-range petroleum hydrocarbon - contaminated soil were excavated as part of the development of the new sewer lift station in 2000. It is not clear if the diesel-range contaminated soil was mixed with the gasoline-range contaminated soil generated from the UST removals in 1992 and stockpiled at Area Z.

In 2014, a total of ten test pits (TP-1 through TP-10) were completed in the soil stockpile and one soil sample was collected from each test pit. Each test pit was completed to a

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depth ranging from 5 to 10 feet below the ground surface bgs. Subsurface conditions encountered in each of the test pits consisted of fill soil comprised of brown and gray silty sand with varying gravel content. Buried visqueen, assumed to be from the cover of the original stockpile was observed at approximately 3 feet bgs in some areas – indicating that clean fill may have been placed on the stockpile. The soils above the visqueen did not exhibit evidence of petroleum contamination by field screening. The gray colored soils below the visqueen intermittently exhibited field screening evidence of petroleum contamination. Occasional wood, concrete rubble, cobbles and asphalt concrete fragments were encountered in several test pits. Significant amounts of asphalt concrete fragments were encountered in test pit TP-5 approximately 3 to 5 feet bgs. Shallow perched groundwater seepage was encountered approximately 5 feet and 4 feet bgs in test pits TP-3 and TP-5, respectively. Petroleum sheen was not observed on the groundwater seepage. The bottom of the stockpile and condition of the original visqueen liner was not identified. The sources of the wood, concrete rubble, cobbles and asphalt concrete fragments were not reported.

Oil-range petroleum hydrocarbon contamination was detected in two shallow surface soil samples (TP-11 and TP-12) collected southeast of the community garden area at concentrations below Method A soil cleanup levels in 2014. No potential source for this oil-range petroleum hydrocarbon contamination has been reported or identified.

The Site is defined by the nature and extent, both lateral and vertical, of contamination that resulted from the above-referenced releases. The nature and extent of soil and ground water contamination at the overall Site has not been completely characterized. Ecology recommends that additional soil and ground water sampling and analysis be conducted to characterize the entire Site.

The MTCA 173-340-350(7) WAC provides elements of a remedial investigation necessary to fully characterize a site. An annotated outline of the MTCA remedial investigation requirements are presented in an attachment to this letter. Additional remedial investigation information necessary to characterize the nature and extent of contamination at the Site should include:

- Preparing a narrative or diagram that shows the relationship between the sources of the releases and the current location of impacted soil and groundwater associated with those releases.
- Determining the quantity and fate of contaminated soil excavated from each of the four underground storage tanks (USTs) removed in 1992 (presumably part of the current stockpile) and included with the 2000 remedial excavation stockpile.

- Preparing a cross-section of the 2000 remedial excavation (and possibly the 1992 UST removal excavations) showing soil sample locations and depths, excavation depths and estimated depth to groundwater relative to the bottom of the excavation.
- Preparing a cross-section of the soil stockpile including soil sample locations and depths, stockpile thickness and estimated depth to groundwater beneath the bottom of the stockpile.
- Remediating the soil stockpile in the vicinity of soil sample TP5-4-032515 including collection and analysis of confirmation soil samples in accordance with Ecology's current standards as described in *Guidance for Remediation of Petroleum Contaminated Sites*, Ecology Publication 10-09-057 and *Guidance on Sampling and Data Analysis Methods*, Ecology Publication 94-49).
- Remediating the sewer lift station excavation (i.e., remedial excavation) in the vicinity of sample EX-25-10.0 including the collection and analysis of confirmation soil samples.
- Ground water monitoring well MW-4 should be checked for free product (NAPL) based on the detection of diesel-range petroleum hydrocarbons at 16,000 micrograms per liter ($\mu\text{g/L}$).
- Completing a minimum of two additional ground water monitoring wells necessary to determine depth to ground water, seasonal ground water variation in water quality and the ground water hydraulic gradient.
- Ground water characterization should consider potential discharge to Beaver Creek and ground water cleanup levels protective of surface water may be needed.

2. Establishment of cleanup standards.

Ecology has determined that the soil cleanup levels you established for the Site do not meet the substantive requirements of the MTCA.

The MTCA Method A soil cleanup levels may be appropriate for the Site. However, Ecology cannot determine if the MTCA Method A cleanup levels are protective of human health and the environment until the soil and ground water at the Site are completely characterized and a subsequent terrestrial ecological evaluation (TEE) is completed or an appropriate TEE exclusion is demonstrated.

No ground water cleanup levels have been established for the Site.

3. Selection of cleanup action.

No cleanup action has been selected for the Site at this time.

It has not been demonstrated that natural attenuation of petroleum contamination in the soil stockpile soil has occurred. One stockpile and one remedial excavation soil sample results are above the MTCA Method A soil cleanup levels. The combined diesel- and oil-range petroleum hydrocarbons detected in stockpile soil sample TP5-4-032515 is 2,410 milligram per kilogram (mg/kg). Diesel-range petroleum hydrocarbons were detected in remedial excavation soil sample EX-25-10.0 at 5,900 mg/kg. It was also reported that sample EX-25-10.0 was located near Beaver Creek and possibly in contact with ground water. The MTCA Method A soil cleanup level for diesel-range petroleum hydrocarbons is 2,000 mg/kg.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

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3. State is immune from liability.

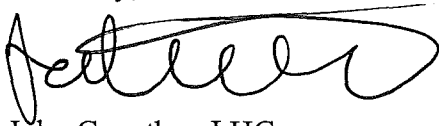
The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. See RCW 70.105D.030(1)(i).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me by phone at (360) 715-5213 or e-mail at john.guenther@ecy.wa.gov.

Sincerely,



John Guenther, LHG
Site Manager
Toxics Cleanup Program

cc: Ron Bek, GeoEngineers
Sonia Fernandez, VCP Coordinator, Ecology

Enclosures: A - Description and Diagram of the Site
B - Remedial Investigation Outline

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Enclosure A

Description and Diagram of the Site

Site Description

This section provides Ecology's understanding and interpretation of Site conditions, and is the basis for the opinions expressed in the body of the letter.

Site Definition

The Site is defined by the nature and extent of gasoline-, diesel- and oil-range petroleum hydrocarbons into the soil and diesel-range petroleum hydrocarbons into the ground water at 2650 Lake Louise Road, Bellingham, Washington. The Site is located within a Property known as Sudden Valley Resort Area Z.

Area/Property Description

The Property (Area Z) is a developed maintenance and service area consisting of gravel surfaced roads and parking areas, a couple of maintenance shop buildings, boat storage, slash piles and an underground sewer lift station. The Property is identified as Whatcom County Tax Parcel 3704073823790000.

Property History and Current Use

The Property was undeveloped and forested until sometime during the 1970s when it was developed as part of the Sudden Valley residential and recreational community. Current use consists of materials storage, equipment maintenance and an underground sewer lift station. The Property is zoned "Rural" according to the Whatcom County Title 20 Zoning Designation map dated 2013.

Contaminant Source and History

The source of gasoline-range petroleum hydrocarbon contamination in soil is from four gasoline underground storage tanks. The sources of diesel- and oil-range petroleum hydrocarbon contamination in soil and ground water are unknown.

Physiographic Setting

The Site is located within the northern portion of the Puget Sound Lowland Physiographic Province, a north-south trending structural and topographic depression bordered on its west side by the Puget Sound and San Juan Islands and to the east by the Cascade Mountain foothills. The San Juan Islands form the division between the Puget Sound Lowland and the Strait of Georgia in British Columbia. The Puget Sound Lowland is underlain by Tertiary volcanic and sedimentary bedrock, and has been filled to the present day land surface with Pleistocene glacial and non-glacial sediments.

Repeated advances and retreats of the continental glaciers that flowed through the area out of Canada more than 10,000 years ago created the low undulating plains that are characteristic of the Puget Sound Lowland. Current land surfaces reflect the most recent changes that are directly related to glacial events, including the regionally expansive Fraser River Delta, occurring between 13,000 and 20,000 years ago.

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Ecological Setting

The ecological setting is forested with two creeks (Beaver and Austin) within relatively close proximity to the Site. Beaver Creek is located approximately 200 feet to the northeast of the soil stockpile. Austin Creek is located approximately 400 feet to the southeast of the soil stockpile. Considerable terrestrial wildlife habitat surrounds the Property.

Geology

According to a U.S. Geologic Survey (USGS) geologic map for the project area, "Geologic Map of Western Whatcom County, Washington" by Don J. Easterbrook, 1976, the Site lies within an area mapped as being underlain by bedrock of the Chuckanut Formation. However, based on our previous exploration and excavation activities, the Area Z has modified ground (fill has been historically placed in this area) over alluvium from the nearby Beaver and Austin Creeks, glacial deposits and then bedrock.

According to the "Soil Survey of Whatcom County Area, Washington," United States Department of Agriculture Soil Conservation Service (SCS), 1992, the Site lies within an area mapped as Sehome loam, described as gravelly loam underlain by dense glacial till at depth. Permeability is moderate in the upper part of the Sehome soil and very slow in the dense glacial till.

Ground Water

The nearest drinking water well is located at 2097 Lake Whatcom Boulevard, approximately 1.7 miles northeast from the site according to Ecology's Washington State Well Log Viewer online mapping application.

Depth to ground water in monitoring well MW-4, the only known ground water monitoring well on the Property, has ranged from 9.16 to 10.05 feet bgs. The ground water hydraulic gradient has not been determined but is presumed to be eastward toward Beaver Creek.

Surface Water

Natural surface water features proximal to the Property include Beaver Creek, Austin Creek, Lake Louise and Lake Whatcom. Beaver Creek is located approximately 200 feet to the northeast, Austin Creek is located approximately 400 feet to the southeast, Lake Louise is located approximately 2,000 feet to the east and Lake Whatcom is located approximately 1 mile east of the Site.

Water Use/Water Supply

Potable water is supplied to the Sudden Valley Resort and surrounding community via a water intake located in Lake Whatcom that is owned, operated and maintained by the Lake Whatcom Water and Sewer District.

Release and Extent of Contamination – Soil

Diesel- and oil-range petroleum hydrocarbon contaminated soil was encountered during geotechnical work associated with the expansion of a proposed sewer lift station at Area Z in 1999. Approximately 2,500 cubic yards of diesel- and oil-range petroleum hydrocarbon contaminated soil were excavated as part of the development of the new sewer lift station in 2000. It is not clear if the 2,500 cubic yards of diesel- and oil-range petroleum hydrocarbon contaminated soil generated as part of the sewer lift station development in 2000 was mixed with gasoline-range petroleum hydrocarbon contaminated soil generated from the removal of the four USTs in 1992 and stockpiled at Area Z.

In 2014, a total of ten test pits (TP-1 through TP-10) were completed in the soil stockpile and one soil sample was collected from each test pit. Each test pit was completed to a depth ranging from 5 to 10 feet below the ground surface bgs. Subsurface conditions encountered in each of the test pits consisted of fill soil comprised of brown and gray silty sand with varying gravel content. Buried visqueen, assumed to be from the cover of the original stockpile, was observed at approximately 3 feet bgs in some areas – indicating that clean fill may have been placed on the stockpile. The soils above the visqueen did not exhibit evidence of petroleum contamination by field screening. The gray-colored soils below the visqueen intermittently exhibited visual field screening evidence of petroleum contamination. Occasional wood, concrete rubble, cobbles and asphalt concrete fragments were encountered in several test pits. Significant amounts of asphalt concrete fragments were encountered in test pit TP-5 at approximately 3 to 5 feet bgs. Shallow perched groundwater seepage was also encountered approximately 5 feet and 4 feet bgs in test pits TP-3 and TP-5, respectively. Petroleum sheen was not observed on the groundwater seepage. The bottom of the stockpile and condition of the visqueen liner below the stockpile was not identified. The sources of the wood, concrete rubble, cobbles and asphalt concrete fragments were not reported.

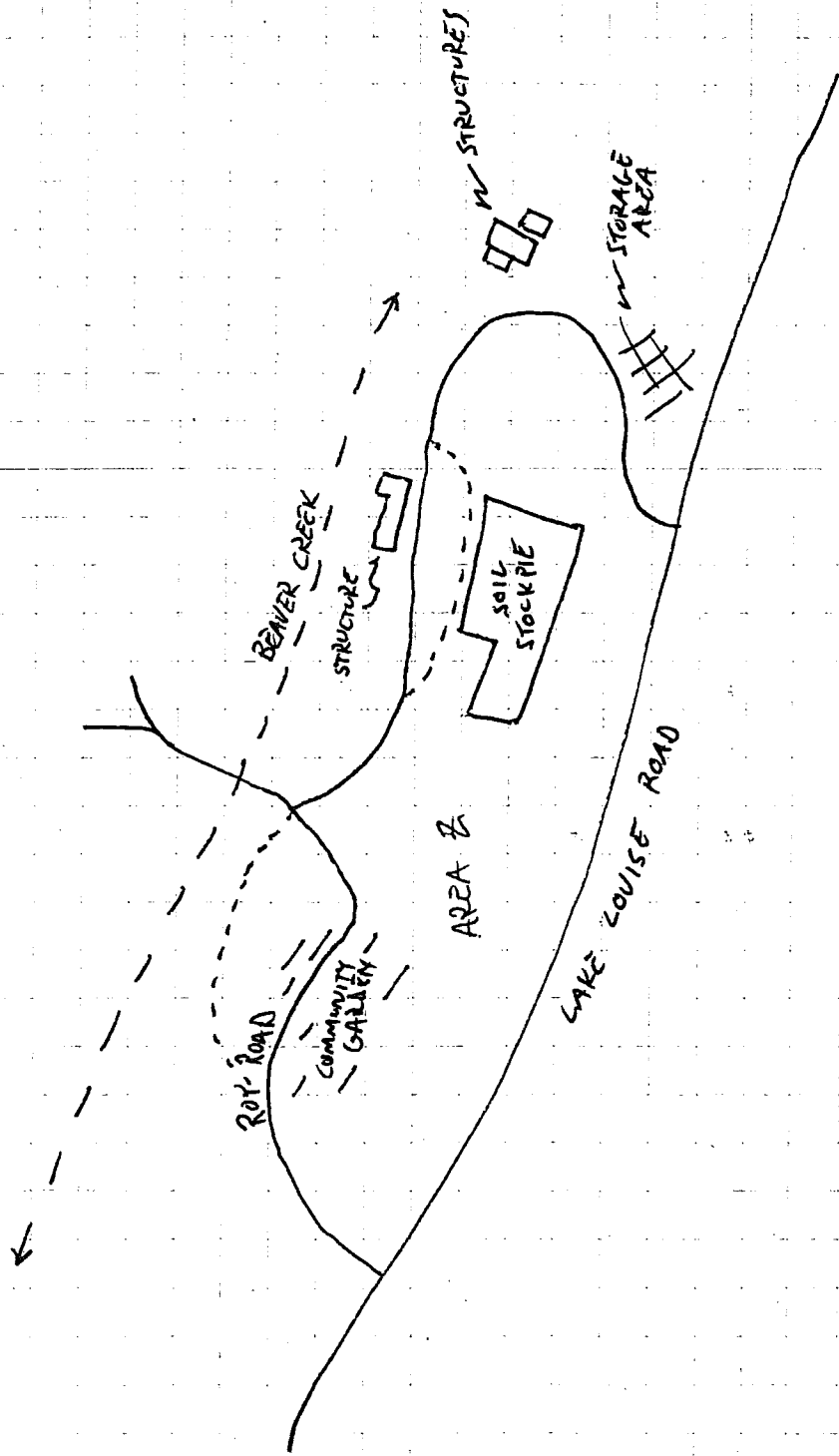
Oil-range petroleum hydrocarbon contamination was detected in two soil samples (TP-11 and TP-12) collected near the community garden area in 2014. No potential source for this oil-range petroleum hydrocarbon contamination has been reported.

Release and Extent of Contamination – Ground Water

Ground water contamination beneath the Site has not been characterized. Three ground water monitoring wells (MW-1 through MW-3) were completed on the Property in 1999. Monitoring wells MW-1 and MW-2 were removed during remediation activities at a later unknown date. Monitoring well MW-3 was covered or destroyed and has not been re-located. No ground water data from monitoring well's MW-1, MW-2 or MW-3 have been reported. A fourth ground water monitoring well (MW-4) was completed to 20 feet bgs on the Property in 2000. Ground water samples have been collected from monitoring well MW-4 on six occasions in August and November 2000, February, May and August 2001 and in February 2002. Diesel-range petroleum

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hydrocarbons were detected in each of the MW-4 ground water samples ranging from 1,400 to 16,000 micrograms per liter ($\mu\text{g/L}$). The MTCA Method A groundwater cleanup level for diesel-range petroleum hydrocarbons is 500 $\mu\text{g/L}$.



- 1) LUST LOCATIONS UNKNOWN
- 2) REMEDIAL EXCAVATION LOCATION UNKNOWN

NW 2897 SITE DIAGRAM
ECOLOGIST 2014

**DEPARTMENT OF ECOLOGY
NORTHWEST REGIONAL OFFICE
REMEDIAL INVESTIGATION OUTLINE
MTCA VCP SITES**

The following annotated outline is a suggested schematic for elements to be included in a Remedial Investigation report. It is not intended to replace MTCA's specific requirements as presented in 173-340-350(7) WAC.

The main purpose of the outline is to facilitate the preparation of a document that is clear, comprehensive, and to the point. A secondary, but important, purpose is to make document preparation and review more efficient.

INTRODUCTION *(Concise, bulleted if possible)*

- **Site name, VCP number, Name, address, and phone number of project consultant, Current owner/operator**
- **Purpose of document** *(very brief restatement of what an RI is for, reference the WAC)*

SITE IDENTIFICATION AND LOCATION *(Focus on defining the site in the context of its location)*

- **Site discovery and regulatory status** *(describe how the site was identified and where it is in the MTCA process)*
- **Site and property location/definition** *(define actual MTCA site location relative to property or study area)*
- **Neighborhood setting**

Figure – Vicinity Map *(preferably with topography)*

Figure – Property/Site Map *(preferably with topography)*

Appendix – Legal description of property, present owner and operator, chronological listing of past owners and operators

ENVIRONMENTAL INVESTIGATION/INTERIM ACTION SUMMARY *(Concise summary presentation of the investigations that have been done at the site, along with prior remedial actions. Focused mostly on figures and tables. Details of and methods used in former investigations and remediation in appendices)*

- **Constituents of Concern** *(brief discussion about which specific compounds were chosen for analysis and why)*
- **Soil**
- **Surface water**
- **Ground water**
- **Sediment**
- **Air/soil vapor**

- **Natural resources/wildlife**
- **Cultural history/archeology**
- **Interim actions** (*brief intro to prior remediation activities*)

Figure – Soil investigation data points (<i>show potential source areas</i>)
Figure – Surface water/groundwater investigation data points (<i>show potential source areas</i>)
Figure – Air investigation data points (<i>show potential source areas</i>)
Figure – Prior remediation activities
Table – Exploration Summary
Table – Analytical Schedule per media (<i>include analytical methods and reporting limits, as possible</i>)
Appendix – Previous Investigations (<i>detailed discussion goes here</i>)
Appendix - Exploration and sampling methodology (<i>may combine with Previous Investigations</i>)
Appendix – Boring / Well logs
Appendix - Prior Interim Actions

PROPERTY DEVELOPMENT AND HISTORY (*This section focuses on the built environment, both current and historical, and presents the sources of contamination and release mechanisms.*)

- **Past site uses and facilities**
- **Current site use and facilities**
- **Proposed or potential future site uses**
- **Zoning** (*if appropriate*)
- **Transportation/roads**
- **Utilities, water supply**
- **Potential sources of site contamination**
- **Potential sources of contamination from neighboring properties** (*discuss nearby sources if known*)

Figure – Historical site features (<i>may be combined with Figure 2</i>)
Figure – Potential contaminant sources
Figure – Utilities (<i>may be combined with Figure 2</i>)
Table – Potential Contaminants

NATURAL CONDITIONS

- **Physiographic setting/topography**
- **Geology** (*focus on interpretation*)
 - Regional Setting (*brief*)

- Property Geologic Conditions (*synthesis, not a copy of boring logs, provide cross sections*)
- Physical Properties (*unlikely to need this section, but in some cases may be useful to present data on soil adsorptive capacity, organic content, strength, etc.*)

Figure – Plan view of geologic unit distribution (*if helpful*)
 Figure – Cross section A-A' (*show borings, wells, screened intervals, water levels*)
 Figure – Cross section B-B' (*if necessary*)

- **Surface Water** (*brief description of the surface water system*)

- Property drainage
- Area surface water/floodplain issues
- Regulatory classifications, if any (*e.g. surface water classification*)

Figure – Surface water Conditions (*only if information not already in a prior figure*)

- **Ground Water** (*focus on interpretation, show on cross sections*)

- Occurrence (*aquifers, water levels, confinement, geometry, continuity, physical properties*)
- Movement (*directions, gradient if important, seasonal fluctuations, tidal influence*)
- Discharge
- Recharge (*if significant for site*)
- Regulatory classifications, if any (*e.g. sole source aquifer*)

Figure – Cross section with ground water information (*if not already included above*)
 Figure – Water table/potentiometric surface maps (*for various seasons or tidal conditions, show surface water*)
 Appendix – Ground water elevation data (*a table*)

- **Natural Resources and Ecological Receptors** (*preparatory to a Terrestrial Ecological Evaluation*)

- Greenbelts and other natural habitat
- Wildlife
- Other Information required to conduct evaluations under WAC 173-340 - 7491, -7492, or if necessary -7493

Figure – showing natural areas, as appropriate

CONTAMINANT OCCURRENCE AND MOVEMENT (*Very little text, mostly figures and tables, main point is to provide easy-to-understand figures showing the depth and breadth of contamination.*)

- **Waste Material** (*sludges, fluids, stockpiles*)
- **Soil**
- **Surface Water**
- **Ground Water**
- **Sediment**
- **Air/Soil Vapor**

Figures – Cross sections showing soil contamination with depth
Figures – Plan views showing soil contamination across site (*relative to releases if known*)
Figures – Cross section showing ground water contamination with depth (*if appropriate*)
Figures – Plan views showing ground water contamination in each aquifer (*relative to soil contamination and P-head map*)
Figures – XY plots of specific contaminants with time (*as appropriate*)
Figures – Others as appropriate to show the distribution of surface water, ground water, or air data

Tables – All of the analytical data against final cleanup levels (*exceedances highlighted, no need to develop screening levels*)
Tables – Summary of exceedances (*if helpful*)

Appendix – QA report
Appendix – Analytical lab reports

CONCEPTUAL MODEL (*Putting the whole story together, graphic illustrations are best.*)

- **Contaminant release/fate and transport/potential or actual receptors**
- **Data gaps** (*is anything missing*)

CLEANUP STANDARDS (*Developing appropriate cleanup standards based on receptors and pathways.*)

- **Soil**
 - Reasonable maximum exposure
 - Cleanup levels protective of direct contact, ground water, inhalation, terrestrial species, surface water, sediment
 - Points of compliance
 - Regulatory classifications (*classification of soil as dangerous or solid waste*)

- **Ground Water**
 - Highest beneficial use/reasonable maximum exposure
 - Cleanup levels protective of potable use, inhalation, surface water, sediment
 - Points of compliance

- **Other Media as appropriate**
 - Cleanup levels protective of
 - Points of compliance

Table – Cleanup Levels *(all potentially applicable values with final selected cleanup level noted)*

AREAS REQUIRING CLEANUP *(The final story detailing where the contamination exceeds an applicable cleanup standard, brief text, mostly tables, figures.)*

- **Constituents of Concern** *(a brief summary of compounds that exceed cleanup levels or “indicator hazardous substances” under MTCA. For most service station sites, the COCs should be the same)*
- **Soil – vertical and lateral**
- **Ground water – vertical and lateral**
- **Sediment**
- **Surface Water**
- **Soil Vapor/air**

Figures – Plan view and vertical sections of areas requiring cleanup

REFERENCES

Revised 8/21/14



Appendix B

Historical Aerial Photographs

Aerial Photograph: March 24, 1969

Aerial Photograph: March 27, 1975

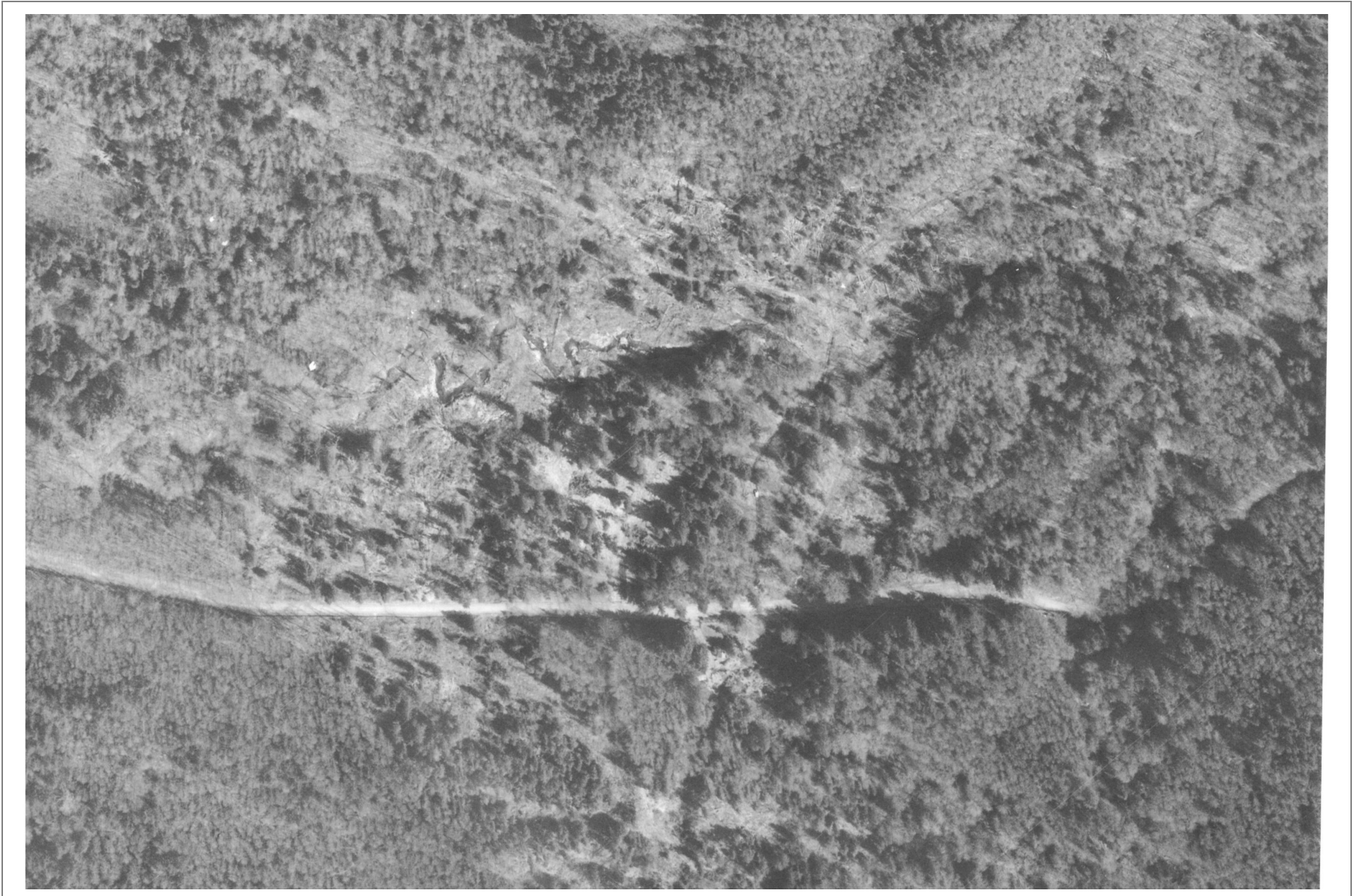
Aerial Photograph: March 10, 1981

Aerial Photograph: March 18, 1988

Aerial Photograph: March 24, 1992

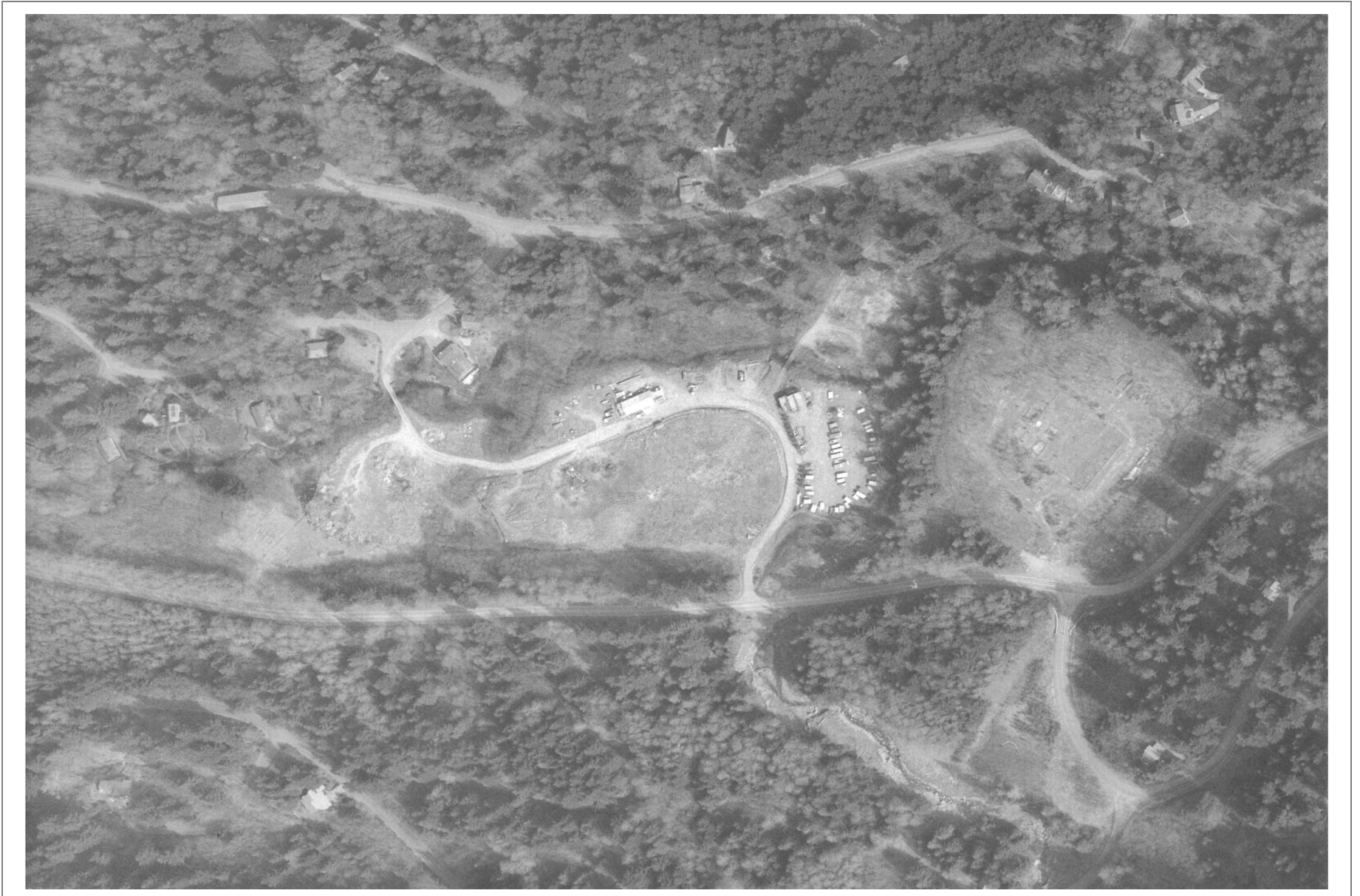
Aerial Photograph: August 17, 1997

Aerial Photograph: August 9, 2001















Appendix C

Field Documentation

Test Pit and Groundwater Monitoring Logs and Photographs, Anchor QEA, August 2017

Soil Boring and Groundwater Monitoring Logs, Anchor QEA, September 2017

Groundwater Monitoring Logs, Anchor QEA, March 2018



Soil Excavation Field Log

Job: SVCA Area Z Remediation	Station: SVCA-TP-100
Project No: 171240-01.01 Task 2	Date: 8/23/2017
Field Staff: B. Wright, J. Allen	Time: 0946
Contractor: SVCA	Sample Method: Grab/Composite
Horizontal Datum: NAD83 WA SP North, US feet	Logged By: JA
Northing/Latitude:	Recovery Depth: 0-4 feet
Easting/Longitude:	

Excavation Notes: Corresponds to GeoEngineers TP-12.

Sample Description:

0-0.5' Plant matter extending to 0.5-feet below surface grade (BSG).

0.5'-1' Concrete and asphalt encountered.

1'-4' Loose, dry, brown, sand with rocks (up to 5" in diameter). Some concrete encountered near base of the excavation. No odor, minor sheen.

Sheen Test Results: Minor sheen

PID Results: 2.2 ppm

Sample Identification and Time: SVCA-TP-100-0-4-170823 @ 0946

Sample Containers: 9

Analyses: NWTPH-D, NWTPH-G, BTEX

Archive: Bioassay, NWTPH-D



Soil Excavation Field Log

Job: SVCA Area Z Remediation	Station: SVCA-TP-101
Project No: 171240-01.01 Task 2	Date: 8/23/2017
Field Staff: B. Wright, J. Allen	Time: 1059
Contractor: SVCA	Sample Method: Grab/Composite
Horizontal Datum: NAD83 WA SP North, US feet	Logged By: JA
Northing/Latitude:	Recovery Depth: 0-3.5 feet
Easting/Longitude:	

Excavation Notes: Large rocks encountered up to 2' BSG. Plants included alders, rush, and reed canary grass.

Sample Description:

0-2' Grasses, trees covering loose, dry, light brown sand with rocks (up to 2" in diameter). Some rocks up to 1" in diameter. No sheen, no odor. Roots extended 1' BSG.

2-3.5' Grades to sand with cobbles (approximately 8-10" in diameter). Liner and asphalt encountered approximately 3.5' BSG.

Sheen Test Results: None, none

PID Results: 4.2 ppm, 3.8 ppm

Sample Identification and Time: SVCA-TP-101-0-2-170823 @ 1059, SVCA-TP-101-2-3.5-170823 @ 1115

Sample Containers: 10

Analyses: NWTPH-D, NWTPH-G, BTEX

Archive: Bioassay, NWTPH-D



Soil Excavation Field Log

Job: SVCA Area Z Remediation	Station: SVCA-TP-102
Project No: 171240-01.01 Task 2	Date: 8/23/2017
Field Staff: B. Wright, J. Allen	Time: 1302
Contractor: SVCA	Sample Method: Grab/Composite
Horizontal Datum: NAD83 WA SP North, US feet	Logged By: JA
Northing/Latitude:	Recovery Depth: 0-4 feet
Easting/Longitude:	

Excavation Notes: Plastic covered the ground. Branches and leaves were on top of the plastic. This plastic was not the stockpile liner.

Sample Description:

- 0-1' Grasses, blackberries covering loose, dry, brown, fine sandy rock (up to 2" in diameter). No odor, no sheen. Some roots in upper 6". Stockpile liner encountered approximately 1' BSG.
- 1-3' Loose, dry, brown, sand with rocks (up to 2" in diameter). No sheen, no odor. Asphalt encountered approximately 2.5' BSG.
- 3-4' Loose, moist, grey, fine sand. Woody debris throughout. No sheen, no odor. No anthropogenic material. A large piece of wood was encountered approximately 4' BSG.

Sheen Test Results: None, none

PID Results: 0.2 ppm, 0.0 ppm

Sample Identification and Time: SVCA-TP-102-0-2-170823 @ 1302, SVCA-TP-102-3-4-170823 @ 1330

Sample Containers: 10

Analyses: NWTPH-D, NWTPH-G, BTEX

Archive: Bioassay, NWTPH-D



Soil Excavation Field Log

Job: SVCA Area Z Remediation	Station: SVCA-TP-103
Project No: 171240-01.01 Task 2	Date: 8/23/2017
Field Staff: B. Wright, J. Allen	Time: 1445
Contractor: SVCA	Sample Method: Grab/Composite
Horizontal Datum: NAD83 WA SP North, US feet	Logged By: JA
Northing/Latitude:	Recovery Depth: 0-6 feet
Easting/Longitude:	

Excavation Notes:

Sample Description:

0-2.5' Alders, thistles, canary reed grass and blackberries on the surface. Roots extend approximately 6" BSG. Packed, dry, brown, fine sand with gravel (up to 1" in diameter). Some cobbles (up to 6" in diameter). No odor, some sheen visible. Untreated wood encountered 2.2' BSG.

2.5-4' Loose, dry, grey to dark grey, gravel with coarse sand. Visible asphalt. Strong petroleum odor, minor sheen. Trace red brick fragments. Liner visible approximately 3' BSG.

4-6' Grades to coarse sand, Odor grades to mild, sheen visible.

Sheen Test Results: Sheen, sheen

PID Results: 2.7 ppm, 2.8 ppm

Sample Identification and Time: SVCA-TP-103-0-2-170823 @ 1445, SVCA-TP-103-3-4-170823 @ 1530

Sample Containers: 10

Analyses: NWTPH-D, NWTPH-G, BTEX

Archive: Bioassay, NWTPH-D



Soil Excavation Field Log

Job: SVCA Area Z Remediation	Station: SVCA-TP-104
Project No: 171240-01.01 Task 2	Date: 8/24/2017
Field Staff: B. Wright, J. Allen	Time: 0917
Contractor: SVCA	Sample Method: N/A
Horizontal Datum: NAD83 WA SP North, US feet	Logged By: JA
Northing/Latitude:	Recovery Depth: 0-4 feet
Easting/Longitude:	

Excavation Notes: Approximately 15' northeast of TP-103. Visual observations only

Sample Description:

0-5' Alders, rush, blackberries. Abandoned debris (steel pipe) encountered 6" BSG.

0.5-4' Loose, dry, grey to dark grey, gravel with coarse sand (consistent with material encountered in TO-103 but significantly less of this material). Mild petroleum odor, no sheen. No asphalt encountered.

Sheen Test Results: None, none

PID Results: 4.1 ppm, 1.5 ppm

Sample Identification and Time:

Sample Containers:

Analyses:

Archive:



Soil Excavation Field Log

Job: SVCA Area Z Remediation	Station: SVCA-TP-105
Project No: 171240-01.01 Task 2	Date: 8/24/2017
Field Staff: B. Wright, J. Allen	Time: 0954
Contractor: SVCA	Sample Method: N/A
Horizontal Datum: NAD83 WA SP North, US feet	Logged By: JA
Northing/Latitude:	Recovery Depth: 0-3 feet
Easting/Longitude:	

Excavation Notes: Approximately 15' southeast of TP-103. Visual observations only

Sample Description: surface cover, (density), moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

0-0.7'	Alders, pine trees, canary reed grass, blackberries. Roots extend 6-8" BSG.
0.7-3'	Loose, dry, brown, fine sand with rocks (average 5-7" in diameter, up to 1' in diameter). No anthropogenic material. No odor, no sheen. Liner encountered approximately 3' BSG.
below 3'	Material immediately above and below the liner is consistent with material at TP-103 encountered 8/23. Mild petroleum odor, no sheen. Appears to be the extent of contamination (radius of contamination).

Sheen Test Results: None, none

PID Results: 1.2 ppm, 1.2 ppm

Sample Identification and Time:

Sample Containers:

Analyses:

Archive:

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Soil Excavation Field Log

Job: SVCA Area Z Remediation	Station: SVCA-TP-106
Project No: 171240-01.01 Task 2	Date: 8/24/2017
Field Staff: B. Wright, J. Allen	Time: 1031
Contractor: SVCA	Sample Method: N/A
Horizontal Datum: NAD83 WA SP North, US feet	Logged By: JA
Northing/Latitude:	Recovery Depth: 0-4.5 feet
Easting/Longitude:	

Excavation Notes: Approximately 15' east of TP-103. Visual observations only

Sample Description: surface cover, (density), moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

0-3.5' Alders, wheat grass, canary reed grass, blackberries, moss. Loose, dry, brown, cobbles and fine sand (no anthropogenic material). Some woody debris (untreated). Mild petroleum odor, no sheen.

3.5-4.5' Liner encountered at 3.5' BSG. Minor amounts of material consistend with TP-103 (dark grey, coarse sand, mild petroleum odor). Otherwise, material is same as above (0-3.5'). Some asphalt debris.

Sheen Test Results: None, none

PID Results: 21.1 ppm, 13.8 ppm

Sample Identification and Time:

Sample Containers:

Analyses:

Archive:



Soil Excavation Field Log

Job: SVCA Area Z Remediation

Station: SVCA-TP-107

Project No: 171240-01.01 Task 2

Date: 8/24/2017

Field Staff: B. Wright, J. Allen

Time: 1058

Contractor: SVCA

Sample Method: N/A

Horizontal Datum: NAD83 WA SP North, US feet

Logged By: JA

Northing/Latitude:

Recovery Depth: 0-4.5 feet

Easting/Longitude:

Excavation Notes: In front of the maintenance shop. Southwest of the concrete pad.

Sample Description: surface cover, (density), moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

0-2.5' Thistles, rag wort, canary reed grass. Loose, dry, brown, gravelly to coarse sand. Rocks between 2-5" in diameter.

Minor anthropogenic material (nails, bricks). No sheen, no odor. Liner encountered at 2.5' BSG.

2.5-4.5' Loose, damp, grey, coarse sand with rocks (average is 3" in diameter, up to 5" in diameter).

No anthropogenic material. No odor, no sheen.

Sheen Test Results: None, none

PID Results: 0.7 ppm, 0.9 ppm

Sample Identification and Time:

Sample Containers:

Analyses:

Archive:



Soil Excavation Field Log

Job: SVCA Area Z Remediation	Station: SVCA-TP-108
Project No: 171240-01.01 Task 2	Date: 8/24/2017
Field Staff: B. Wright, J. Allen	Time: 1125
Contractor: SVCA	Sample Method: N/A
Horizontal Datum: NAD83 WA SP North, US feet	Logged By: JA
Northing/Latitude:	Recovery Depth: 0-4.5 feet
Easting/Longitude:	

Excavation Notes: South end of the stockpile area, close to the driveway. Nearest TP to pump station.

Sample Description: surface cover, (density), moisture, color, minor modifier, MAJOR modifier, other constituents, odor, sheen, layering, anoxic layer, debris, plant matter, shells, biota

0-3' Thistles, canary reed grass. Loose, dry, brown, gravel to coarse sand (0.5" in diameter). Rocks up to 4" in diameter. Minor anthropogenic debris (concrete). No odor, do sheen.

3-4.5' Loose, dry, brown, sand with rocks (4-6" in diameter). Anthropogenic debris (concrete chunks). Minor amounts of grey coarse sand and rock material. Some grey clay chunks. No odor, no sheen. Liner encountered at approximately 3.8' BSG.

Sheen Test Results: None, none

PID Results: 1.7 ppm, 2.7 ppm


Sample Identification and Time:

Sample Containers:

Analyses:

Archive:

FIELD SAMPLING DATA SHEET

	1605 Cornwall Avenue Bellingham, WA 98225
	Office: (360) 733-4311 Fax:

PROJECT NAME: SVCA WELL ID: MW-4
 SITE ADDRESS: Bellingham, WA BLIND ID: NA

DUP ID: NA

WIND FROM:	N	NE	E	SE	S	SW	W	NW	LIGHT	MEDIUM	HEAVY
WEATHER:	SUNNY		CLOUDY		RAIN		?		TEMPERATURE: (F) 75. °C		

HYDROLOGY/LEVEL MEASUREMENTS (Nearest 0.01 ft)							[Product Thickness]	[Water Column]	[Water Column x Gal/ft]
Date	Time	DT-Bottom	DT-Product	DT-Water	DTP-DTW	DTB-DTW			Volume (gal)
8/24/17	15:50	22.2	.	12.75	.	9.45		X 1	1.54
/ /	:	.	.	.	.	.		X 3	4.62
Gal/ft = (dia./2) ² x 0.163		1" = 0.041	2" = 0.163	3" = 0.367	4" = 0.653	6" = 1.469	10" = 4.080	12" = 5.875	

§ METHODS: (A) Submersible Pump (B) Peristaltic Pump (C) Disposable Bailor (D) PVC/Teflon Bailor (E) Dedicated Bailor (F) Dedicated Pump (G) Other =

GROUNDWATER SAMPLING DATA (if product is detected, do NOT sample)								Sample Depth: 17 ft		[√ if used]
Bottle Type	Date	Time	Method	Amount & Volume mL	Preservative [circle]	Ice	Filter	pH	√	
VOA Glass	8/24/17	17:00	B	15 40 ml	HCl	YES	NO			
Amber Glass	8/24/17	17:00	B	4 250, 500 1L	(None) (HCl) (H ₂ SO ₄)	YES	NO			
White Poly	/ /	:		250, 500, 1L	None	YES	NO	NA		
Yellow Poly	/ /	:		250, 500, 1L	H ₂ SO ₄	YES	NO			
Green Poly	/ /	:		250, 500, 1L	NaOH	YES	NO			
Red Total Poly	/ /	:		250, 500, 1L	HNO ₃	YES	NO			
Red Diss. Poly	/ /	:		250, 500, 1L	HNO ₃	YES	YES			
	/ /	:		250, 500, 1L		YES				

Total Bottles (include duplicate count): 9

Analysis Allowed per Bottle Type	BOTTLE TYPE	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
	VOA - Glass	(8021) (8260B) (BTEX) (NWTPH-Cx)
AMBER - Glass	(PAH) (TPH-HCID) (NWTPH-Dx) (TPH-418.1) (Oil & Grease) (8081A)	
WHITE - Poly	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO ₃ /CO ₃) (Cl) (SO ₄) (NO ₃) (NO ₂) (F)	
YELLOW - Poly	(COD) (TOC) (Total PO ₄) (Total Keldahl Nitrogen) (NH ₃) (NO ₂ /NO ₃)	
GREEN - Poly	(Cyanide)	
RED TOTAL - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)	
RED DISSOLVED - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)	

Notes: Sample collected @ 17:00 SVCA-MW-4-170823

for

SAMPLER: Benedette Wright (PRINTED NAME) [Signature] (SIGNATURE)

FIELD SAMPLING DATA SHEET



1605 Cornwall Avenue
Bellingham, WA 98225

Office:

(360) 733-4311

Fax:

PROJECT NAME: SVCA Area Z Remediation **WELL ID:** MW-4
SITE ADDRESS: Bellingham, WA **BLIND ID:** NA
PROJECT # 171240-01.01 Task 2 **DUP ID:** NA

WATER QUALITY DATA			Purge Start Time: 16:00			Method ^S - B [Select A-G]				Pump/Bailer Inlet Depth: 17ft	
Time	DTW (ft)	Purged (gal)	pH	E Cond (µS)	°F Temp °C	DO (mg/l)	ORP	TDS	Salinity	Turbidity	Water Quality
1605	13.3	1.25	6.42	426.1	14.4	1.04	37.4				
1607	13.3	1.75	6.42	426.1	14.4	1.04	37.4			2.60	clear, white particles
1610	13.3	2.50	6.23	393.0	14.3	0.44	15.4			2.65	clear
1614	13.3	3.50	6.25	387.0	14.2	0.37	10.1			2.16	"
1618	13.25	4.50	6.29	384.7	14.1	0.31	4.8			2.14	"
1622	13.25	5.50	6.30	385.2	14.2	0.29	2.6			1.84	"
1626	13.25	6.50	6.31	385.2	14.2	0.25	1.2			1.45	"
1630	13.25	7.50	6.31	385.3	13.8	0.24	-6.5			1.55	"
1634	13.25	8.50	6.30	384.8	13.8	0.23	-3.1			1.11	"
1638	13.25	9.50	6.32	385.7	13.8	0.21	-2.6			0.87	"
1642	13.25	10.50	6.33	385.8	14.0	0.19	-0.2			0.96	"
1646	13.25	11.50	6.33	385.4	14.1	0.19	0.3			0.75	"
1650	13.25	12.50	6.34	385.3	14.1	0.18	-0.3			0.77	"
1654	13.25	13.50	6.33	386.1	14.0	0.18	1.0			0.67	"
1658	13.25	14.50	6.33	385.5	14.1	0.17	0.6			0.67	"

[Cumulative Totals]

[Circle units]

[Clarity, Color]

Notes:

pumps @ 250 ml/min
 Sampled @ ~~16:00~~ 17:00 SVCA-MW-4-170823
 *DTW measured from top of monument, subtract 0.5 ft for top of casing

SAMPLER: Bernadette Wright
(PRINTED NAME)

[Signature]
(SIGNATURE)

Photo 1
TP-100 (August 23, 2017)



Photo 2
TP-100 (August 23, 2017)



Photo 3
TP-102 (August 23, 2017)



Photo 4
TP-102 (August 23, 2017)



Photo 5
TP-103 (August 23, 2017)



Photo 6
TP-103 (August 23, 2017)



Photo 7
Groundwater Well Redevelopment – All Drums (August 23, 2017)



Photo 8
Drum 1 (August 23, 2017)



Photo 9
Drum 2 (August 23, 2017)



Photo 10
Drum 3 (August 23, 2017)



Photo 11
Drum 4 (August 23, 2017)



Photo 12
Drum 5 (August 23, 2017)



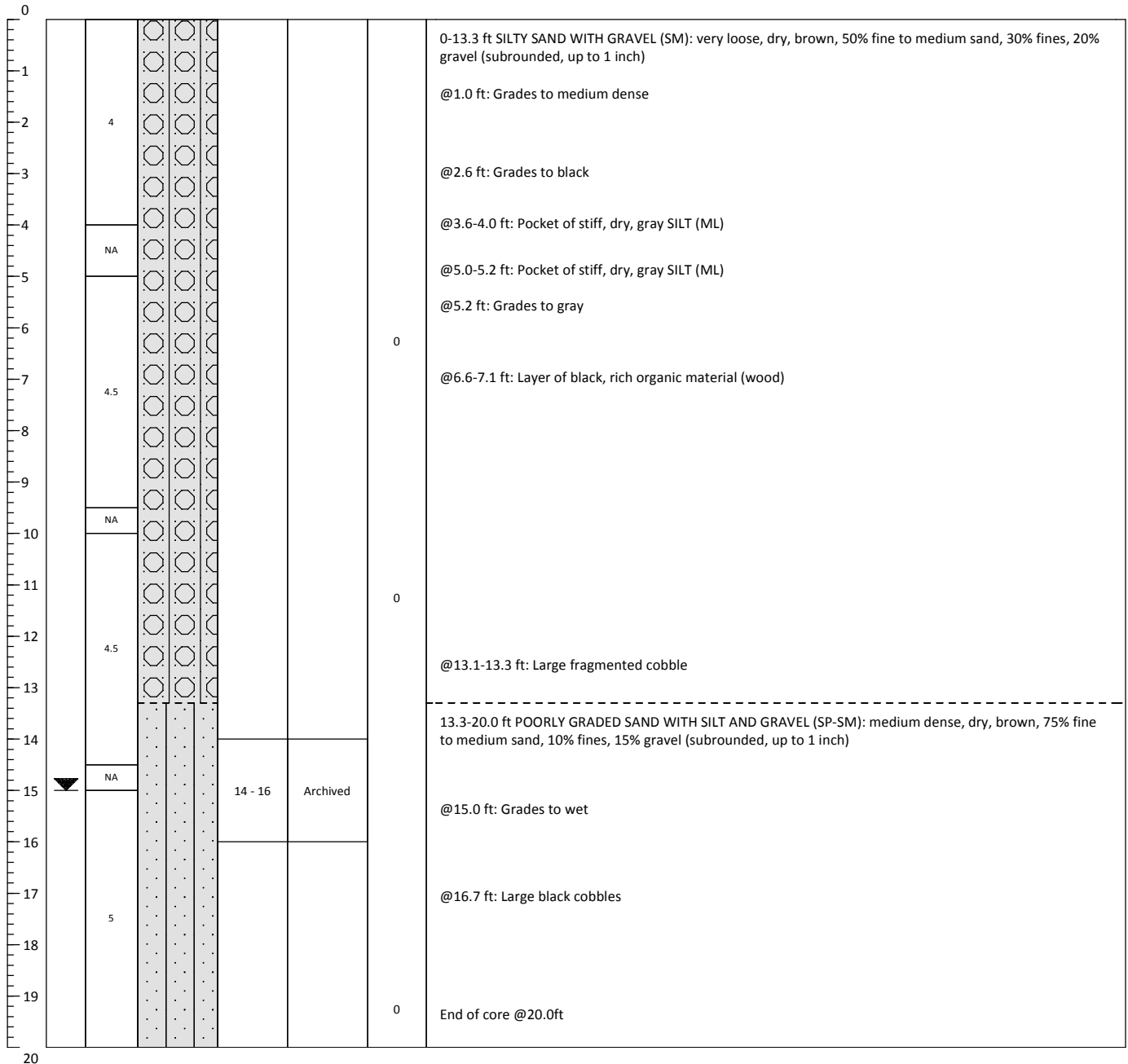
Soil Boring Log

SVCA-SB-109

Sheet 1 of 1

Project: SVCA Area Z Remediation	Location: Bellingham, WA	Project #: 171240-01.01 Task 2
Client: SVCA	Contractor: Holocene Drilling	Operator: Mitch McCarey
Logged By: B Wright, E Malczyk	Method/Core Diameter: Direct Push/1.5" ID, 2.25" OD	Drilling Equipment: Geoprobe
Northing: 628091.07 Easting: 1275905.98	Horizontal Datum: NAD 83 WA State Plane North, US feet	Collection Date: 9/13/2017
Penetration Depth (feet): 20	Temporary Well Screened Interval (ft. bgs): 14-19	Groundwater depth (ft. bgs): 15

Depth (feet)	Depth to GW (ft.)	Recovery (ft)	Lithologic Column	Sample Interval (ft. bgs)	Analysis	PID	Soil Description
Samples and Descriptions are in Recovered Depths. Classification Method: USCS Visual Manual Procedure							



ANCHOR OEA 720 Olive Way, Suite 1900 Seattle, WA 98101 206-287-9130	Notes: 1) NA = no recovery. Each geoprobe push was 5 feet (e.g. 0-5 feet, 5-10 feet, 10-15 feet, and 15-20 feet).
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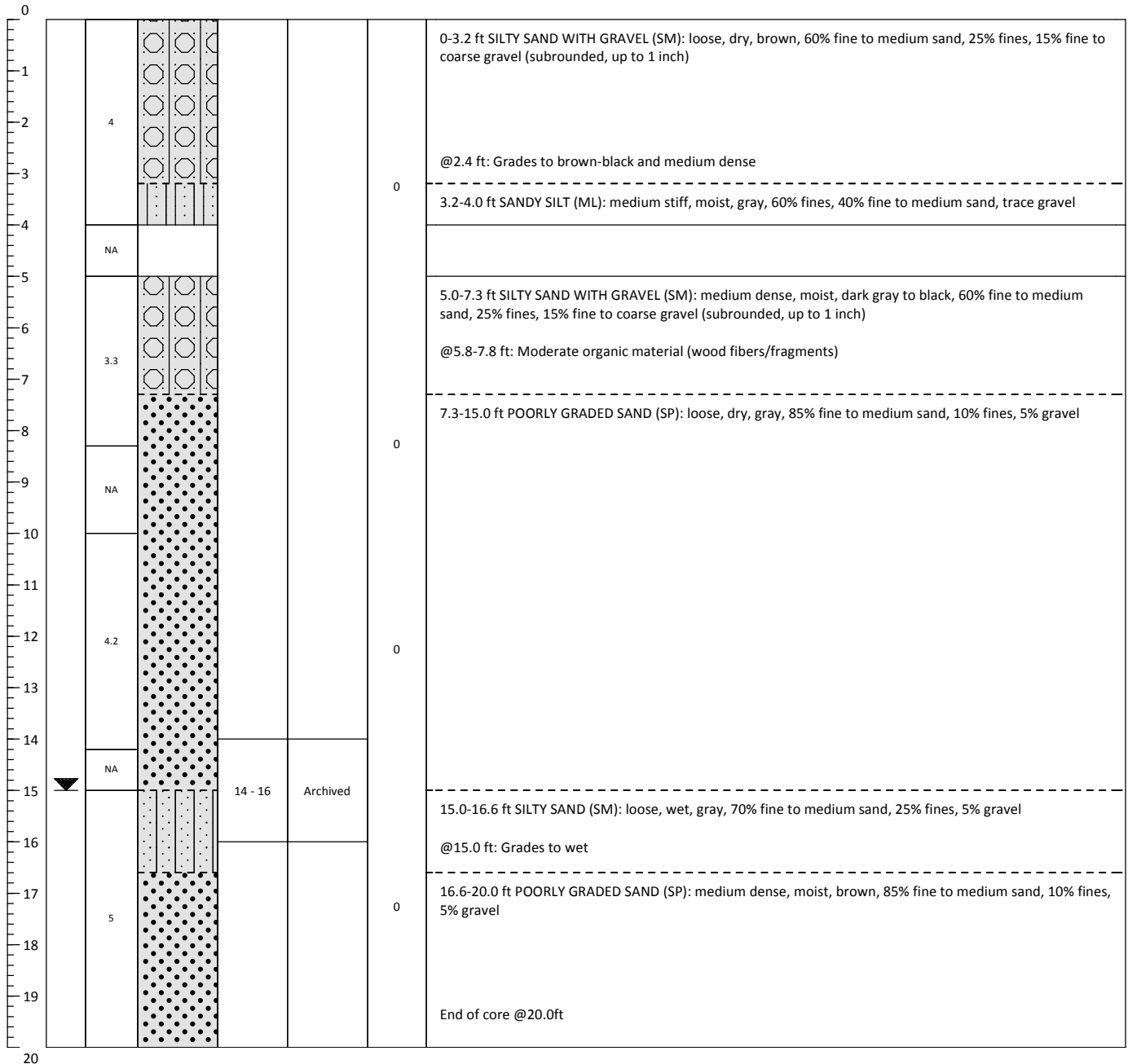
Soil Boring Log

SVCA-SB-110

Sheet 1 of 1

Project: SVCA Area Z Remediation	Location: Bellingham, WA	Project #: 171240-01.01 Task 2
Client: SVCA	Contractor: Holocene Drilling	Operator: Mitch McCarey
Logged By: B Wright, E Malczyk	Method/Core Diameter: Direct Push/1.5" ID, 2.25" OD	Drilling Equipment: Geoprobe
Northing: 628048.86 Easting: 1275964.7	Horizontal Datum: NAD 83 WA State Plane North, US feet	Collection Date: 9/13/2017
Penetration Depth (feet): 20	Temporary Well Screened Interval (ft. bgs): 14-19	Groundwater depth (ft. bgs): 15

Depth (feet)	Depth to GW (ft.)	Recovery (ft)	Lithologic Column	Sample Interval (ft. bgs)	Analysis	PID	Soil Description
							Samples and Descriptions are in Recovered Depths. Classification Method: USCS Visual Manual Procedure



ANCHOR OEA 720 Olive Way, Suite 1900 Seattle, WA 98101 206-287-9130	Notes: 1) NA = no recovery. Each geoprobe push was 5 feet (e.g. 0-5 feet, 5-10 feet, 10-15 feet, and 15-20 feet).
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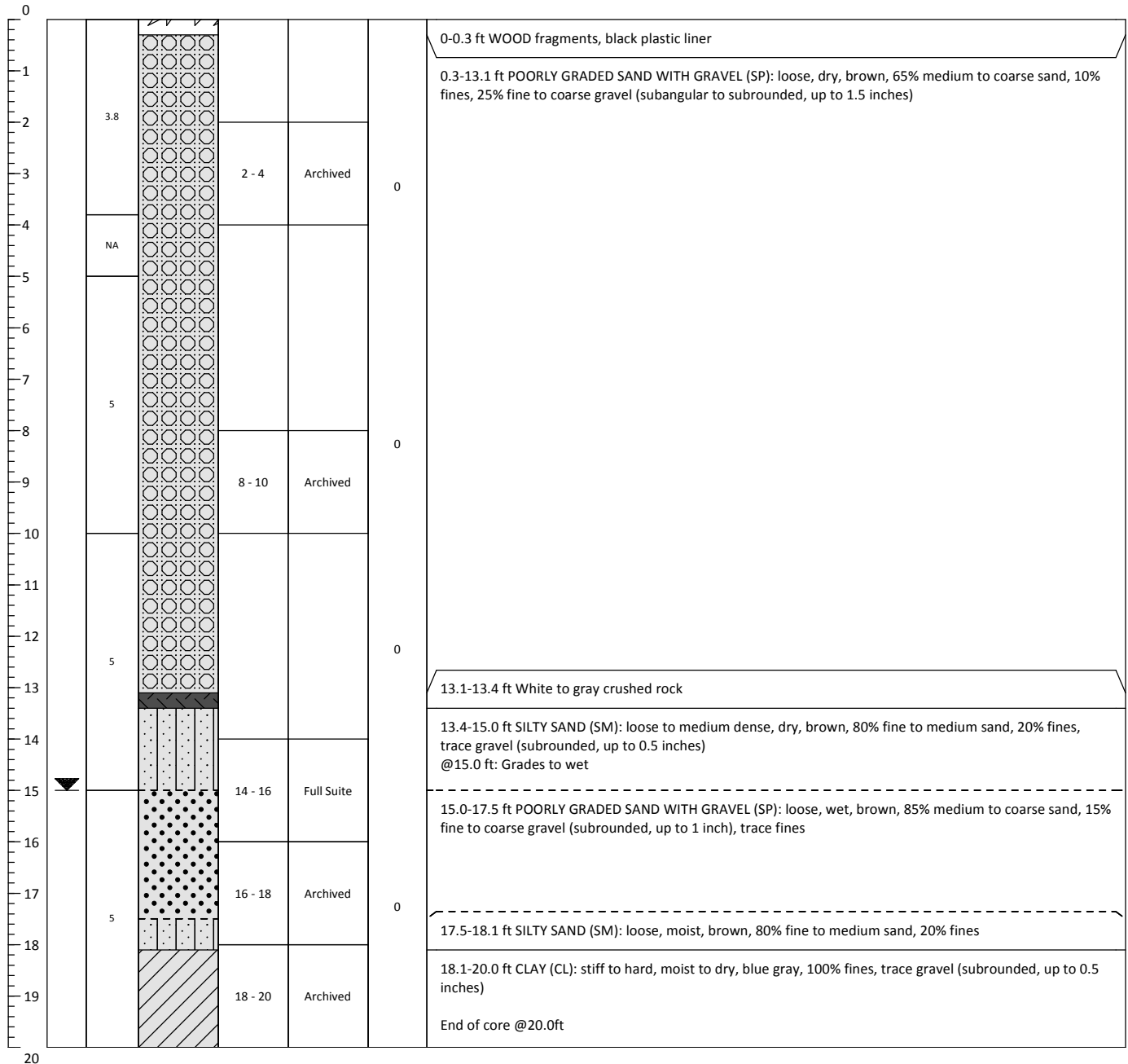
Soil Boring Log

SVCA-SB-111

Sheet 1 of 1

Project: SVCA Area Z Remediation	Location: Bellingham, WA	Project #: 171240-01.01 Task 2
Client: SVCA	Contractor: Holocene Drilling	Operator: Mitch McCarey
Logged By: B Wright, E Malczyk	Method/Core Diameter: Direct Push/1.5" ID, 2.25" OD	Drilling Equipment: Geoprobe
Northing: 627945.93 Easting: 1276385.22	Horizontal Datum: NAD 83 WA State Plane North, US feet	Collection Date: 9/13/2017
Penetration Depth (feet): 20	Temporary Well Screened Interval (ft. bgs): 14-19	Groundwater depth (ft. bgs): 15

Depth (feet)	Depth to GW (ft.)	Recovery (ft)	Lithologic Column	Sample Interval (ft. bgs)	Analysis	PID	Soil Description
Samples and Descriptions are in Recovered Depths. Classification Method: USCS Visual Manual Procedure							



ANCHOR OEA
 720 Olive Way, Suite 1900
 Seattle, WA 98101
 206-287-9130

Notes: 1) NA = no recovery. Each geoprobe push was 5 feet (e.g. 0-5 feet, 5-10 feet, 10-15 feet, and 15-20 feet).
 2) Full Suite includes NWTPH-Gx, NWTPH-Dx (with and without silica gel cleanup), and BTEX (Method 8260C).

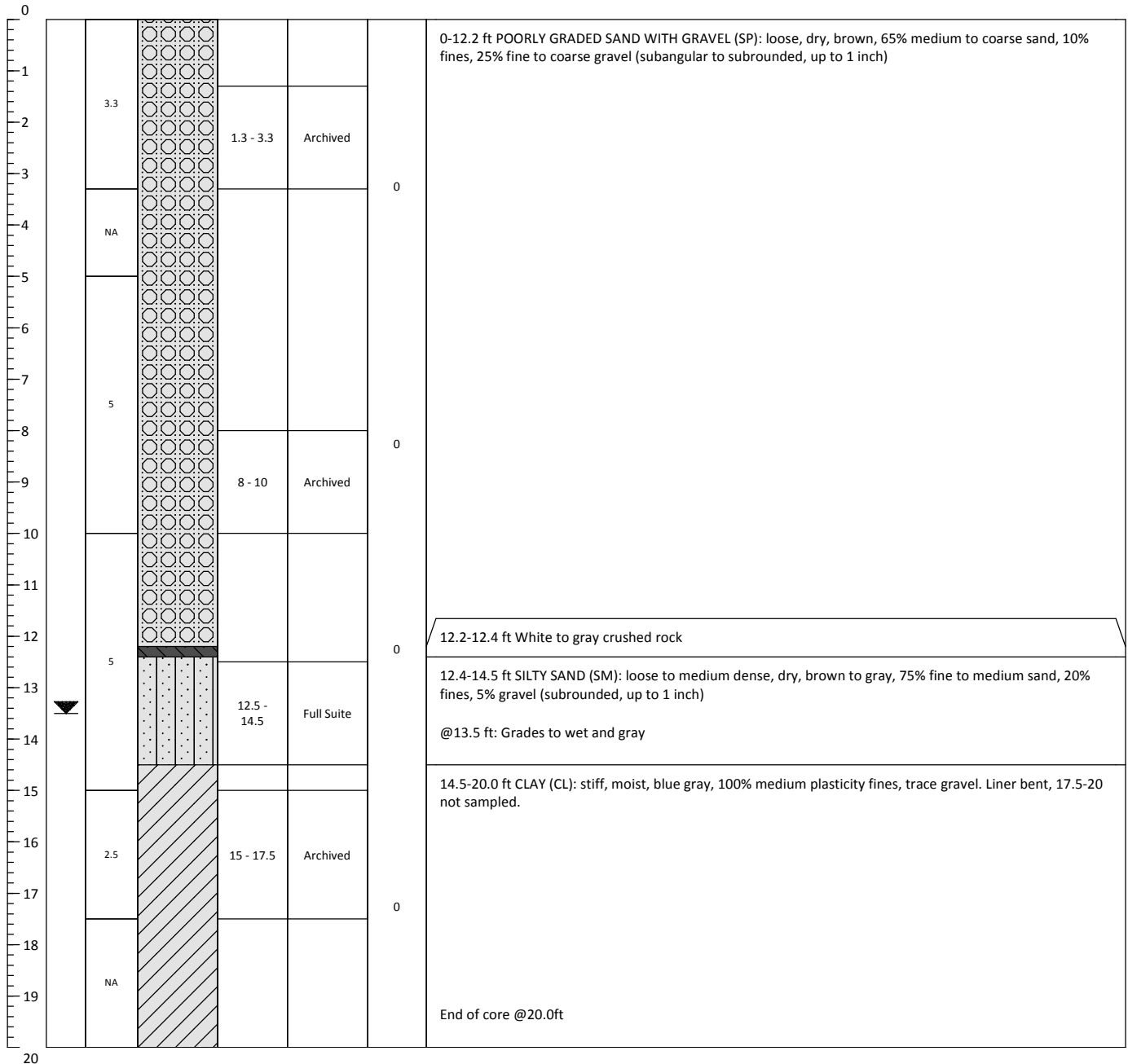
Soil Boring Log

SVCA-SB-112

Sheet 1 of 1

Project: SVCA Area Z Remediation		Location: Bellingham, WA	Project #: 171240-01.01 Task 2
Client: SVCA		Contractor: Holocene Drilling	Operator: Mitch McCarey
Logged By: B Wright, E Malczyk		Method/Core Diameter: Direct Push/1.5" ID, 2.25" OD	Drilling Equipment: Geoprobe
Northing: 627974.3	Easting: 1276366.99	Horizontal Datum: NAD 83 WA State Plane North, US feet	Collection Date: 9/13/2017
Penetration Depth (feet): 20		Temporary Well Screened Interval (ft. bgs): 12.5-17.5	Groundwater depth (ft. bgs): 13.5

Depth (feet)	Depth to GW (ft.)	Recovery (ft)	Lithologic Column	Sample Interval (ft. bgs)	Analysis	PID	Soil Description
Samples and Descriptions are in Recovered Depths. Classification Method: USCS Visual Manual Procedure							



ANCHOR OEA 720 Olive Way, Suite 1900 Seattle, WA 98101 206-287-9130	Notes: 1) NA = no recovery. Each geoprobe push was 5 feet (e.g. 0-5 feet, 5-10 feet, 10-15 feet, and 15-20 feet). 2) Full Suite includes NWTPH-Gx, NWTPH-Dx (with and without silica gel cleanup), and BTEX (Method 8260C).
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FIELD SAMPLING DATA SHEET



1605 Cornwall Avenue
Bellingham, WA 98225

Office: (360) 733-4311 Fax:

PROJECT NAME: SVCA WELL ID: SVCA-SB-109 @1110
SITE ADDRESS: Bellingham, WA BLIND ID: SVCA-GW-109-14-19-170913

DUP ID: NA

WIND FROM: N NE E SE S SW W NW LIGHT MEDIUM HEAVY
WEATHER: SUNNY CLOUDY RAIN ? TEMPERATURE: °F 65 °C

HYDROLOGY/LEVEL MEASUREMENTS (Nearest 0.01 ft)							[Product Thickness]	[Water Column]	[Circle appropriate unit]
Date	Time	DT-Bottom	DT-Product	DT-Water	DTP-DTW	DTB-DTW			Volume (gal)
/ /	:			X 1
/ /	:			X 3
Gal/ft = (dia./2) ² × 0.163		1" = 0.041	2" = 0.163	3" = 0.367	4" = 0.653	6" = 1.469	10" = 4.080	12" = 5.875	

§ METHODS: (A) Submersible Pump (B) Peristaltic Pump (C) Disposable Bailor (D) PVC/Teflon Bailor (E) Dedicated Bailor (F) Dedicated Pump (G) Other -

GROUNDWATER SAMPLING DATA (if product is detected, do NOT sample)							Sample Depth:			[√ if used]
Bottle Type	Date	Time	Method	Amount & Volume mL	Preservative [circle]	Ice	Filter	pH	√	
VOA Glass	9/13/17	11:10	B	15 40 ml	HCl	YES	NO		✓	
Amber Glass	9/13/17	11:10	B	4 250, 500, 1L	(None) (HCl) (H ₂ SO ₄)	YES	NO		✓	
White Poly	/ /	:		250, 500, 1L	None	YES	NO	NA		
Yellow Poly	/ /	:		250, 500, 1L	H ₂ SO ₄	YES	NO			
Green Poly	/ /	:		250, 500, 1L	NaOH	YES	NO			
Red Total Poly	/ /	:		250, 500, 1L	HNO ₃	YES	NO			
Red Diss. Poly	/ /	:		250, 500, 1L	HNO ₃	YES	YES			
	/ /	:		250, 500, 1L		YES				

Total Bottles (include duplicate count): 9

Analysis Allowed per Bottle Type	BOTTLE TYPE	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
	VOA - Glass	(8021) (8260B) (BTEX) (NWTPH-Gx)
	AMBER - Glass	(PAH) (TPH-HCl) (NWTPH-Dx) (TPH-418.1) (Oil & Grease) (8081A)
	WHITE - Poly	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO ₃ /CO ₃) (Cl) (SO ₄) (NO ₃) (NO ₂) (F)
	YELLOW - Poly	(COD) (TOC) (Total PO ₄) (Total Keldahl Nitrogen) (NH ₃) (NO ₂ /NO ₃)
	GREEN - Poly	(Cyanide)
	RED TOTAL - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Ti) (V) (Zn) (Hg) (K) (Na)
RED DISSOLVED - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Ti) (V) (Zn) (Hg) (K) (Na)	

Notes: Sample time 1110

SAMPLER: EVAN MACCYK
(PRINTED NAME)

(SIGNATURE)

FIELD SAMPLING DATA SHEET



1605 Cornwall Avenue
Bellingham, WA 98225

Office:

(360) 733-4311

Fax:

PROJECT NAME: SVCA Area Z Remediation

WELL ID: SVCA-SB-109

SITE ADDRESS: Bellingham, WA

BLIND ID: SVCA-GW-109-14-19-170913

PROJECT #: 171240-01.01 Task 2

DUP ID:

WATER QUALITY DATA L			Purge Start Time: :			Method ^S - [Select A-G]				Pump/Bailer Inlet Depth:	
Time	DTW (ft)	Purged (gal)	pH	E Cond (µS)	°F Temp °C	DO (mg/l)	ORP	TDS	Salinity	Turbidity	Water Quality
1040	NA		6.36	89.0	11.7	2.19	70.1	57.2	0.04	>Unit	cloudy brown
1050		2.6	6.13	81.9	10.9	2.46	83.9	53.3	0.04	502	
1055			6.13	81.5	11.0	2.56	89.5	53.3	0.04	144	clearing, cloudy
1100			6.13	80.9	10.8	2.63	94.7	52.6	0.04	62.1	no color, some cloudiness
1107		to	6.12	80.1	10.8	3.27	99.7	52	0.04	27.5	mostly clear
1110		6.6	6.12	80.2	10.9	3.42	102.3	52	0.04	34.3	u
<i>PAW</i>											

Notes: [Cumulative Totals] Pump on @ 1027, cloudy brown at start [Circle units] Attach to YSI @ 1038 [Clarity, Color]
 0.1 l/min SONDE still cloudy but clearing
 @ 1034 - still turbid brown @ 1047 increased flow to 0.2 l/min
 Start sample @ 1110

SAMPLER: *PAW MALAYK*
(PRINTED NAME)

[Signature]
(SIGNATURE)

FIELD SAMPLING DATA SHEET



1605 Cornwall Avenue
Bellingham, WA 98225

Office: (360) 733-4311 Fax:

PROJECT NAME: SVCA

WELL ID: SB-110

SITE ADDRESS: Bellingham, WA

BLIND ID: SVCA-GW-110-14-19-170913 @ 1257

DUP ID: NA

WIND FROM:	N	NE	E	SE	S	SW	W	NW	LIGHT	MEDIUM	HEAVY
WEATHER:	SUNNY		CLOUDY		RAIN		?		TEMPERATURE: °F 70 °C		

HYDROLOGY/LEVEL MEASUREMENTS (Nearest 0.01 ft)

Date	Time	DT-Bottom	DT-Product	DT-Water	DTP-DTW	DTB-DTW	Volume (gal)	
/ /	:	X 1	
/ /	:	X 3	
Gal/ft = (dia./2) ² x 0.163		1" = 0.041	2" = 0.163	3" = 0.367	4" = 0.653	6" = 1.469	10" = 4.080	12" = 5.875

§ METHODS: (A) Submersible Pump (B) Peristaltic Pump (C) Disposable Bailer (D) PVC/Teflon Bailer (E) Dedicated Bailer (F) Dedicated Pump (G) Other =

GROUNDWATER SAMPLING DATA (if product is detected, do NOT sample)								Sample Depth:		[√ if used]
Bottle Type	Date	Time	Method	Amount & Volume mL	Preservative [circle]	Ice	Filter	pH	√	
VOA Glass	9/13/17	12:57	B	25 40 ml	HCl	YES	NO		✓	
Amber Glass	9/13/17	12:57	B	250 (500) 1L	None (HCl) (H ₂ SO ₄)	YES	NO		✓	
White Poly	/ /	:		250, 500, 1L	None	YES	NO	NA		
Yellow Poly	/ /	:		250, 500, 1L	H ₂ SO ₄	YES	NO			
Green Poly	/ /	:		250, 500, 1L	NaOH	YES	NO			
Red Total Poly	/ /	:		250, 500, 1L	HNO ₃	YES	NO			
Red Diss. Poly	/ /	:		250, 500, 1L	HNO ₃	YES	YES			
	/ /	:		250, 500, 1L		YES				

Total Bottles (include duplicate count): 9

Analysis Allowed per Bottle Type	BOTTLE TYPE	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
	VOA - Glass	(8021) (8260B) (BTEX) (NWTPH-G)
	AMBER - Glass	(PAH) (IPH-HCID) (NWTPH-D*) (NPH-418.1) (Oil & Grease) (8081A)
	WHITE - Poly	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO ₃ /CO ₃) (Cl) (SO ₄) (NO ₃) (NO ₂) (F)
	YELLOW - Poly	(COD) (TOC) (Total PO ₄) (Total Keldahl Nitrogen) (NH ₃) (NO ₃ /NO ₂)
	GREEN - Poly	(Cyanide)
	RED TOTAL - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	RED DISSOLVED - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)

Notes: Sample time 1257

SAMPLER: Evon Malczyk
(PRINTED NAME)

[Signature]
(SIGNATURE)

FIELD SAMPLING DATA SHEET



1605 Cornwall Avenue
Bellingham, WA 98225

Office:

(360) 733-4311

Fax:

PROJECT NAME: SVCA Area Z Remediation

WELL ID: SB-110

SITE ADDRESS: Bellingham, WA

BLIND ID: SVCA-GW-110-14-19-170913 @1257

PROJECT # 171240-01.01 Task 2

DUP ID:

WATER QUALITY DATA			Purge Start Time: :			Method ^s - [Select A-G]				Pump/Bailer Inlet Depth:	
Time	DTW (ft)	Purged (gal)	pH	E Cond (µS)	°F Temp °C	DO (mg/l)	ORP	TDS	Salinity	Turbidity	Water Quality
1736	NA		6.69	189.6	12.0	0.29	53.7	122.8	0.09	315	no tint, slightly cloudy
1243	↓		6.66	186.9	11.4	0.11	-11.5	121.5	0.09	207	"
1247	↓		6.65	187.4	11.4	0.11	-27.4	121.6	0.09	70.4	" clearing
1253	↓		6.67	188	11.8	0.21	-33.2	122.2	0.07	20.8	mostly clear
1256	↓	9L	6.69	188.5	11.3	0.29	-38.9	122.2	0.09	13.5	"

Notes: Pump on @1240, @1250, 0.25 L/min
Brown, heavy sediment at start.
took awhile to get flow at start due to medium-coarse sand in line.
Start sample @1257

SAMPLER: EVAN WALLACE
(PRINTED NAME)

[Signature]
(SIGNATURE)

FIELD SAMPLING DATA SHEET



1605 Cornwall Avenue
Bellingham, WA 98225

Office: (360) 733-4311 Fax:

PROJECT NAME: SVCA WELL ID: SB-111

SITE ADDRESS: Bellingham, WA BLIND ID: SVCA-MW-111-14-19-170913

DUP ID: NA

WIND FROM: N NE E SE S SW W NW LIGHT MEDIUM HEAVY
WEATHER: SUNNY CLOUDY RAIN ? TEMPERATURE: °F 70 °C

HYDROLOGY/LEVEL MEASUREMENTS (Nearest 0.01 ft)							[Product Thickness]	[Water Column]	[Circle appropriate unit]
Date	Time	DT-Bottom	DT-Product	DT-Water	DTP-DTW	DTB-DTW			Volume (gal)
/ /	:	.	.	.	.	.			X 1
/ /	:	.	.	.	.	.			X 3
Gal/ft = (dia./2) ² x 0.163	1" = 0.041	2" = 0.163	3" = 0.367	4" = 0.653	6" = 1.469	10" = 4.080	12" = 5.875		

§ METHODS: (A) Submersible Pump (B) Peristaltic Pump (C) Disposable Bailer (D) PVC/Teflon Bailer (E) Dedicated Bailer (F) Dedicated Pump (G) Other =

GROUNDWATER SAMPLING DATA (if product is detected, do NOT sample)							Sample Depth:			[√ if used]
Bottle Type	Date	Time	Method	Amount & Volume mL	Preservative [circle]	Ice	Filter	pH	√	
VOA Glass	9/13/17	15:45	B	50	40 ml	HCl	YES	NO	—	
Amber Glass	9/13/17	15:45	B	3	250, 500, 1L	(None) (HCl) (H ₂ SO ₄)	YES	NO	—	
White Poly	/ /	:			250, 500, 1L	None	YES	NO	NA	
Yellow Poly	/ /	:			250, 500, 1L	H ₂ SO ₄	YES	NO		
Green Poly	/ /	:			250, 500, 1L	NaOH	YES	NO		
Red Total Poly	/ /	:			250, 500, 1L	HNO ₃	YES	NO		
Red Diss. Poly	/ /	:			250, 500, 1L	HNO ₃	YES	YES		
	/ /	:			250, 500, 1L		YES			

Total Bottles (include duplicate count): 8

Analysis Allowed per Bottle Type	BOTTLE TYPE	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
	VOA - Glass	(8021) (8260B) (BTEX) (KWTPH-GW)
	AMBER - Glass	(PAH) (TPH-HCID) (NWTPH-Dx) (TPH-418.1) (Oil & Grease) (8081A)
	WHITE - Poly	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO ₃ /CO ₃) (Cl) (SO ₄) (NO ₃) (NO ₂) (F)
	YELLOW - Poly	(COD) (TOC) (Total PO ₄) (Total Keldahl Nitrogen) (NH ₃) (NO ₂ /NO ₃)
	GREEN - Poly	(Cyanide)
	RED TOTAL - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (TI) (V) (Zn) (Hg) (K) (Na)
	RED DISSOLVED - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (TI) (V) (Zn) (Hg) (K) (Na)

Notes: Start pump 1416
low volume well, higher turbidity. ~133 NTU

SAMPLER: EVAN MALICK
(PRINTED NAME)

(SIGNATURE)

FIELD SAMPLING DATA SHEET



1605 Cornwall Avenue
Bellingham, WA 98225

Office:

(360) 733-4311

Fax:

PROJECT NAME: SVCA Area Z Remediation

WELL ID: SB-111

SITE ADDRESS: Bellingham, WA

BLIND ID: SVCA-MW-111-14-19-170913 @ 1545

PROJECT #: 171240-01.01 Task 2

DUP ID:

WATER QUALITY DATA			Purge Start Time: _____ :			Method ^s - _____ [Select A-G]				Pump/Bailer Inlet Depth: _____	
Time	DTW (ft)	Purged (gal)	pH	E Cond (µS)	°F Temp °C	DO (mg/l)	ORP	TDS	Salinity	Turbidity	Water Quality
1500	NA		6.12	209.7	14.0	1.20	-325	135.2	0.10	213	partly cloudy
1545										133	"

Notes: Pump on 1416, troubleshoot line clogging, replaced tubing water coming through @ 1435, cloudy brown heavy sedimentation @ 1439 pumping air, pump off @ 1442, will allow some time for well recharge. Pump back on 1459, 0.15 4min well dry @ 1500, with pump off. Pump on @ 1521, filled 213 of 2500ml amber, pump off @ 1527. Pump on @ 1545, finished 2 ambers & 5x40ml log, then filled extra 500ml amber.

Final turbidity: 133

SAMPLER: EVAN MALLUM (PRINTED NAME) [Signature] (SIGNATURE)

14-19
12.5-17.5

FIELD SAMPLING DATA SHEET



1605 Cornwall Avenue
Bellingham, WA 98225

Office: (360) 733-4311 Fax:

PROJECT NAME: SVCA **WELL ID:** SB-112
SITE ADDRESS: Bellingham, WA **BLIND ID:** SVCA-MW-112-12.5-17.5-170713
DUP ID: NA

WIND FROM: N NE E SE S SW W NW LIGHT MEDIUM HEAVY
WEATHER: SUNNY CLOUDY RAIN ? **TEMPERATURE:** °F 65 °C

HYDROLOGY/LEVEL MEASUREMENTS (Nearest 0.01 ft)							[Product Thickness]	[Water Column]	[Circle appropriate unit]
Date	Time	DT-Bottom	DT-Product	DT-Water	DTP-DTW	DTB-DTW			[Water Column x Gal/ft]
/ /	:	.	.	.	.	.			X 1
/ /	:	.	.	.	.	.			X 3
Gal/ft = (dia./2) ² x 0.163	1" = 0.041	2" = 0.163	3" = 0.367	4" = 0.653	6" = 1.469	10" = 4.080	12" = 5.875		

§ METHODS: (A) Submersible Pump (B) Peristaltic Pump (C) Disposable Bailer (D) PVC/Teflon Bailer (E) Dedicated Bailer (F) Dedicated Pump (G) Other =

GROUNDWATER SAMPLING DATA (if product is detected, do NOT sample)							Sample Depth:			[√ if used]
Bottle Type	Date	Time	Method	Amount & Volume mL	Preservative [circle]	Ice	Filter	pH	√	
VOA Glass	9/13/17	17:03	B	5.2 40 ml	HCl	YES	NO		✓	
Amber Glass	9/13/17	17:03	B	4 250, 500, 1L	(None) (HCl) (H ₂ SO ₄)	YES	NO		✓	
White Poly	/ /	:		250, 500, 1L	None	YES	NO	NA		
Yellow Poly	/ /	:		250, 500, 1L	H ₂ SO ₄	YES	NO			
Green Poly	/ /	:		250, 500, 1L	NaOH	YES	NO			
Red Total Poly	/ /	:		250, 500, 1L	HNO ₃	YES	NO			
Red Diss. Poly	/ /	:		250, 500, 1L	HNO ₃	YES	YES			
	/ /	:		250, 500, 1L		YES				

Total Bottles (include duplicate count): 9

Analysis Allowed per Bottle Type	BOTTLE TYPE	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
	VOA - Glass	(8021) (8260B) (BTEX) (NWTPH-G)
	AMBER - Glass	(PAH) (TPH-HCID) (NWTPH-D) (TPH-418.1) (Oil & Grease) (8081A)
	WHITE - Poly	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO ₃ /CO ₃) (Cl) (SO ₄) (NO ₃) (NO ₂) (F)
	YELLOW - Poly	(COD) (TOC) (Total PO ₄) (Total Keldahl Nitrogen) (NH ₄) (NO ₃ /NO ₂)
	GREEN - Poly	(Cyanide)
	RED TOTAL - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Ti) (V) (Zn) (Hg) (K) (Na)
	RED DISSOLVED - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Ti) (V) (Zn) (Hg) (K) (Na)

Notes: Sample time 1703

SAMPLER: EVAN MALLUCK
 (PRINTED NAME)

[Signature]
 (SIGNATURE)

FIELD SAMPLING DATA SHEET



1605 Cornwall Avenue
Bellingham, WA 98225

Office:

(360) 733-4311

Fax:

PROJECT NAME: SVCA Area Z Remediation

WELL ID: SB-112

SITE ADDRESS: Bellingham, WA

BLIND ID: SVCA-MW-112-12.5-17.5-170913 @ 1703

PROJECT #: 171240-01.01 Task 2

DUP ID:

WATER QUALITY DATA			Purge Start Time: :			Method ^s - [Select A-G]				Pump/Bailer Inlet Depth:	
Time	DTW (ft)	Purged (gal)	pH	E Cond (µS)	°F Temp °C	DO (mg/l)	ORP	TDS	Salinity	Turbidity	Water Quality
1624	NA									540	
1627	|		7.16	438.6	15.8	0.93	-87.6	284.7	0.21	294	cloudy light gray
1633	|		7.16	438.9	15.9	0.47	-114.5	285.35	0.21	240	4', clearing
1645	|		7.08	428	15.5	0.32	-145.9	278.2	0.21	55.4	partly cloudy
1653	|		7.15	431.3	15.3	0.33	-157.4	280.8	0.24	59.3	
1702	|		7.09	429.3	15.4	0.37	-160.7	278.8	0.24	25.8	
										15.2	

[Cumulative Totals]
[Circle units]
[Clarity, Color]

Notes: Start pump @ 1615 cloudy, gray, heavy sedimentation
0.125L/min

Start Sample @ 1703

SAMPLER: EVAN MALLUM
(PRINTED NAME)

(SIGNATURE)

FIELD SAMPLING DATA SHEET



1605 Cornwall Avenue
Bellingham, WA 98225

Office: (360) 733-4311 Fax:

PROJECT NAME: SVCA WELL ID: MW-4

SITE ADDRESS: Bellingham, WA BLIND ID: NA

DUP ID: NK NA

WIND FROM: N NE E SE S SW W NW LIGHT MEDIUM HEAVY
WEATHER: SUNNY CLOUDY RAIN ? TEMPERATURE: 40.0 °C

HYDROLOGY/LEVEL MEASUREMENTS (Nearest 0.01 ft) [Product Thickness] [Water Column] [Water Column x Gal/ft]

Date	Time	DT-Bottom	DT-Product	DT-Water	DTP-DTW	DTB-DTW	Volume (gal)
3/26/18	10:28	22.25	.	11.47	.	10.78	X 1 1.76
/ /	:	.	.	.	.	.	X 3 5.27

Gal/ft = (dia./2)² x 0.163 1" = 0.041 2" = 0.163 3" = 0.367 4" = 0.653 6" = 1.469 10" = 4.080 12" = 5.875

§ METHODS: (A) Submersible Pump (B) Peristaltic Pump (C) Disposable Bailer (D) PVC/Teflon Bailer (E) Dedicated Bailer (F) Dedicated Pump (G) Other =

GROUNDWATER SAMPLING DATA (if product is detected, do NOT sample) Sample Depth: 17 ft [if used]

Bottle Type	Date	Time	Method	Amount & Volume mL	Preservative [circle]	Ice	Filter	pH	✓
VOA Glass	3/26/18	11:42	B	25 40 ml	HCl	YES	NO		✓
Amber Glass	3/26/18	11:42	B	4 250, 500, 1L	(None) (HCl) (H ₂ SO ₄)	YES	NO		✓
White Poly	/ /	:		250, 500, 1L	None	YES	NO	NA	
Yellow Poly	/ /	:		250, 500, 1L	H ₂ SO ₄	YES	NO		
Green Poly	/ /	:		250, 500, 1L	NaOH	YES	NO		
Red Total Poly	/ /	:		250, 500, 1L	HNO ₃	YES	NO		
Red Diss. Poly	/ /	:		250, 500, 1L	HNO ₃	YES	YES		
	/ /	:		250, 500, 1L		YES			

Total Bottles (include duplicate count): 9

Analysis Allowed per Bottle Type	BOTTLE TYPE	TYPICAL ANALYSIS ALLOWED PER BOTTLE TYPE (Circle applicable or write non-standard analysis below)
	VOA - Glass	(8021) (8260B) (RTEX) (NWTPH-Gx)
	AMBER - Glass	(PAH) (TPH-HCID) (NWTPH-Dx) (TPH-418.1) (Oil & Grease) (8081A)
	WHITE - Poly	(pH) (Conductivity) (TDS) (TSS) (BOD) (Turbidity) (Alkalinity) (HCO ₃ /CO ₃) (Cl) (SO ₄) (NO ₃) (NO ₂) (F)
	YELLOW - Poly	(COD) (TOC) (Total PO ₄) (Total Keldahl Nitrogen) (NH ₃) (NO ₃ /NO ₂)
	GREEN - Poly	(Cyanide)
	RED TOTAL - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)
	RED DISSOLVED - Poly	(As) (Sb) (Ba) (Be) (Ca) (Cd) (Co) (Cr) (Cu) (Fe) (Pb) (Mg) (Mn) (Ni) (Ag) (Se) (Tl) (V) (Zn) (Hg) (K) (Na)

Notes:

0.5 ft from TOC to measuring point
SVCA-MW-4-180326 collected @ 1142
TPH-Dx with 2 w/out silica gel cleanup

SAMPLER: Bernadette Wright
(PRINTED NAME)

Bernadette Wright
(SIGNATURE)

FIELD SAMPLING DATA SHEET



1605 Cornwall Avenue
Bellingham, WA 98225

Office:

(360) 733-4311

Fax:

PROJECT NAME: SVCA Area Z Remediation

WELL ID: MW-4

SITE ADDRESS: Bellingham, WA

BLIND ID: NA

PROJECT # 171240-01.01 Task 2

DUP ID: NA

WATER QUALITY DATA			Purge Start Time: 10 : 38	Method ^S - B [Select A-G]						Pump/Bailer Inlet Depth: 12 FT	
Time	DTW (ft)	Purged (gal)	pH	E Cond (µS/cm)	°F Temp (°C)	DO (mg/l)	ORP	TDS	Salinity	Turbidity	Water Quality
1123	11.5	11.25	6.16	246.7	7.6	0.8	115.4	160.5	0.12	6.46	slightly yellow
1126	11.5	11.5	6.13	248.2	7.6	0.7	112.4	151.52	0.12	6.56	
1129	11.51	11.75	6.12	249.6	7.6	0.6	111.9	152.58	0.12	5.72	"
1131	11.51	12.00	6.13	248.2	7.7	0.6	111.1	151.25	0.12	6.64	"
1134	11.51	14.25	6.14	249.0	7.6	0.6	106.6	151.86	0.12	4.35	"
1137	11.51	15.0	6.13	247.1	7.6	0.6	107.4	150.6	0.12	4.13	"
1140	11.52	15.75	6.13	247.5	7.6	0.6	106.1	160.02	0.12	3.91	"
[Cumulative Totals]			[Circle units]			[Clarity, Color]					

12.0
12.75
13.5

Notes:

pumping @ 250 ml/min

Sample collected @ 1142, SVCA-MW-4-180326
soft bottom

SAMPLER: Bernellott Wright
(PRINTED NAME)

Bernellott Wright
(SIGNATURE)

Appendix D

Analytical Results

Test Pit Analytical Results (17H0298 and 17I0040), Analytical Resources, Inc., September 2017

Soil Boring Analytical Results (17I0171), Analytical Resources, Inc., September 2017

Groundwater Analytical Results (17H0298 and 17I0171), Analytical Resources, Inc., September 2017

Earthworm Toxicity Testing Results, EcoAnalysts, Inc., October 2017

Groundwater Analytical Results (18C0424), Analytical Resources, Inc., April 2018



08 June 2018

Cheronne Oreiro
Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101

RE: SCVA Area Z Remediation

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
17H0298

Associated SDG ID(s)
N/A

Amanda
Volgardsen

Digitally signed by Amanda Volgardsen
DN: c=US, st=Washington, l=Tukwila,
o=Analytical Resources, Inc., ou=Project
Manager, cn=Amanda Volgardsen,
email=amanda.volgardsen@arilabs.com
Date: 2018.06.08 14:21:42 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Amanda Volgardsen, Project Manager



17H0298

Chain of Custody Record & Laboratory Analysis Request

Laboratory: Analytical Resources, Inc.

Date: 8/23

Project Name: SVCA Area Z Remediation

Project Manager: Jennifer Allen

Phone Number: 360-715-2724

Shipment Method:



Line	Field Sample ID	Collection Date/Time	Matrix	No. of Containers					Test Parameters					Comments/Preservation	
				NWTPH-G	NWTPH-D	BTEX	Archive (Chassy)								
1	SVCA-TP-100-0-1-170823	8/23/17 0946	SO	9	X	X	X	X							
2	SVCA-TP-101-0-2-170823	" 1059	SO	9	X	X	X	X							
3	SVCA-TP-101-2-35-170823	" 1115	SO	1	X	X	X	X							
4	SVCA-TP-102-0-2-170823	" 1302	SO	9	X	X	X	X							
5	SVCA-TP-102-3-4-170823	" 1330	SO	1	X	X	X	X							
6	SVCA-TP-103-0-2-170823	" 1445	SO	9	X	X	X	X							
7	SVCA-TP-103-3-4-170823	" 1530	SO	1	X	X	X	X							
8	SVCA-MW-4-(170823)	8/23/17 1700	GW	9	X	X	X	X							
9	SVCA-Trip Blank-170823	8/23/17 1600		4											
10															
11															
12															
13															
14															
15															

Notes: NWTPH-D extended analyzed with and without silica gel cleanup. See contract for analysis details + 5 day TAT

Email sample confirmation report to labdata@anchorage.com

Relinquished By: Jennifer Allen Company: Anchor QEA, LLC
 Signature/Printed Name Date/Time
 Relinquished By: _____ Company: _____
 Signature/Printed Name Date/Time

Received By: ARI Company: Anchor QEA, LLC
 Signature/Printed Name Date/Time
 Received By: _____ Company: _____
 Signature/Printed Name Date/Time



Cooler Receipt Form

ARI Client: Anchor QEA

Project Name: SVCA Area 2 remediation

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 17H0298

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time: _____

5.1 5.4 2.8 4.4

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D005206

Cooler Accepted by: BF Date: 8/25/17 Time: 946

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____ YES NO

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? B.H. YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? B.H. YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI: _____ NA

Was Sample Split by ARI: NA YES Date/Time: _____ Equipment: _____ Split by: _____

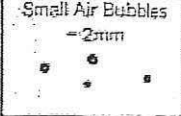
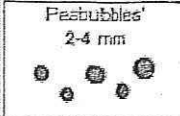
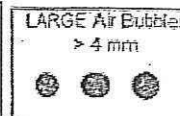
Samples Logged by: B.H. Date: 8/25/17 Time: 10:40

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:
B.H. Missing one methanol vial for SVCA TP-101-0-2-170823
Four vials of SVCA-MW-4-170824 had peabubbles. For vials of SVCA-TripBlank-170823 had lg bubbles.

By: B.H. Date: 8/25/17

			Small → "sm" (< 2 mm)
			Peabubbles → "pb" (2 to < 4 mm)
			Large → "lg" (4 to < 6 mm)
			Headspace → "hs" (> 6 mm)



Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle WA, 98101

Project: SCVA Area Z Remediation
Project Number: [none]
Project Manager: Cheronne Oreiro

Reported:
07-Sep-2017 12:30

Case Narrative

Sample receipt

Samples as listed on the preceding page were received August 25, 2017 under ARI workorder 17H0298. For details regarding sample receipt, please refer to the Cooler Receipt Form.

BETX - EPA Method SW8260C

The samples were run within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

There were no target compounds detected in the method blanks.

The LCS/LCSD percent recoveries and RPD were within control limits.

Gasoline by NWTPH-g (GC/MS)

The samples were run within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

There were no target compounds detected in the method blanks.

The LCS/LCSD percent recoveries and RPD were within control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx (Ac/Si cleaned and standard without Ac/Si Cleaning)

The samples were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

Method blank BFH0600 (waters) has motor oil range organics (C24-C38) detected above the reporting limits. This is likely due to carryover from a previously analyzed sample. The sample is non-detect for RRO and DRO. No corrective action was taken.

The LCS percent recoveries were within control limits.



Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101

Project: SCVA Area Z Remediation
Project Number: [none]
Project Manager: Cheronne Oreiro

Reported:
09/07/2017 12:30

ANALYTICAL REPORT FOR SAMPLES

Laboratory ID	Sample ID	Matrix	Date Sampled	Date Received
17H0298-01	SVCA-TP-100-0-4-170823	Solid	08/23/17 09:46	08/25/17 09:46
17H0298-02	SVCA-TP-100-0-4-170823	Solid	08/23/17 09:46	08/25/17 09:46
17H0298-03	SVCA-TP-101-0-2-170823	Solid	08/23/17 10:59	08/25/17 09:46
17H0298-04	SVCA-TP-101-0-2-170823	Solid	08/23/17 10:59	08/25/17 09:46
17H0298-05	SVCA-TP-101-2-3.5-170823	Solid	08/23/17 11:15	08/25/17 09:46
17H0298-06	SVCA-TP-102-0-2-170823	Solid	08/23/17 13:02	08/25/17 09:46
17H0298-07	SVCA-TP-102-0-2-170823	Solid	08/23/17 13:02	08/25/17 09:46
17H0298-08	SVCA-TP-102-3-4-170823	Solid	08/23/17 13:30	08/25/17 09:46
17H0298-09	SVCA-TP-103-0-2-170823	Solid	08/23/17 14:45	08/25/17 09:46
17H0298-10	SVCA-TP-103-0-2-170823	Solid	08/23/17 14:45	08/25/17 09:46
17H0298-11	SVCA-TP-103-3-4-170823	Solid	08/23/17 15:30	08/25/17 09:46
17H0298-12	SVCA-MW-4-170824	Water	08/24/17 17:00	08/25/17 09:46
17H0298-13	SVCA-MW-4-170824	Water	08/24/17 17:00	08/25/17 09:46
17H0298-14	SVCA-TripBlank-170823	Water	08/23/17 00:00	08/25/17 09:46



QUALIFIERS AND NOTES

<u>Qualifier</u>	<u>Definition</u>
U	This analyte is not detected above the applicable reporting or detection limit.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
J	Estimated concentration value detected below the reporting limit.
H	Hold time violation - Hold time was exceeded.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
D1	Surrogate was not detected due to sample extract dilution
D	The reported value is from a dilution
B	This analyte was detected in the method blank.
*	Flagged value is not within established control limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-01 SDG: 17H0298
 Sampled: 08/23/17 09:46 Prepared: 08/31/17 17:01 File ID: NT1508311719.D
 % Solids: 91.07 Preparation: EPA 5035 (Sodium Bisulfate) Analyzed: 08/31/17 18:26
 Batch: BFH0747 Sequence: SFI0010 Initial/Final: 9.93 g Wet / 5 mL
 Instrument: NT15 Column: RTX-VMS Calibration: AI00004

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg dry)	Q	DL	RL
71-43-2	Benzene	1	0.42	J	0.16	0.55
108-88-3	Toluene	1	13.4		0.08	0.55
100-41-4	Ethylbenzene	1	0.55	U	0.11	0.55
179601-23-1	m,p-Xylene	1	1.11	U	0.22	1.11
95-47-6	o-Xylene	1	0.55	U	0.12	0.55

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	50.000	56.4	113	80 - 149	
Toluene-d8	50.000	50.8	102	77 - 120	
4-Bromofluorobenzene	50.000	46.0	92.0	80 - 120	
1,2-Dichlorobenzene-d4	50.000	48.5	97.0	80 - 120	



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-03 SDG: 17H0298
 Sampled: 08/23/17 10:59 Prepared: 08/31/17 17:01 File ID: NT1508311720.D
 % Solids: 95.13 Preparation: EPA 5035 (Sodium Bisulfate) Analyzed: 08/31/17 18:51
 Batch: BFH0747 Sequence: SFI0010 Initial/Final: 10.28 g Wet / 5 mL
 Instrument: NT15 Column: RTX-VMS Calibration: AI00004

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg dry)	Q	DL	RL
71-43-2	Benzene	1	0.20	J	0.15	0.51
108-88-3	Toluene	1	0.32	J	0.08	0.51
100-41-4	Ethylbenzene	1	0.51	U	0.10	0.51
179601-23-1	m,p-Xylene	1	1.02	U	0.20	1.02
95-47-6	o-Xylene	1	0.51	U	0.11	0.51

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	50.000	56.9	114	80 - 149	
Toluene-d8	50.000	50.6	101	77 - 120	
4-Bromofluorobenzene	50.000	48.9	97.9	80 - 120	
1,2-Dichlorobenzene-d4	50.000	51.5	103	80 - 120	



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-06 SDG: 17H0298
 Sampled: 08/23/17 13:02 Prepared: 08/31/17 17:01 File ID: NT1508311721.D
 % Solids: 95.38 Preparation: EPA 5035 (Sodium Bisulfate) Analyzed: 08/31/17 19:15
 Batch: BFH0747 Sequence: SFI0010 Initial/Final: 11.06 g Wet / 5 mL
 Instrument: NT15 Column: RTX-VMS Calibration: AI00004

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg dry)	Q	DL	RL
71-43-2	Benzene	1	0.95		0.14	0.47
108-88-3	Toluene	1	0.41	J	0.07	0.47
100-41-4	Ethylbenzene	1	0.47	U	0.10	0.47
179601-23-1	m,p-Xylene	1	0.95	U	0.19	0.95
95-47-6	o-Xylene	1	0.47	U	0.11	0.47

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	50.000	56.0	112	80 - 149	
Toluene-d8	50.000	50.6	101	77 - 120	
4-Bromofluorobenzene	50.000	46.9	93.8	80 - 120	
1,2-Dichlorobenzene-d4	50.000	50.1	100	80 - 120	



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-09 SDG: 17H0298
 Sampled: 08/23/17 14:45 Prepared: 08/31/17 17:01 File ID: NT1508311722.D
 % Solids: 91.53 Preparation: EPA 5035 (Sodium Bisulfate) Analyzed: 08/31/17 19:40
 Batch: BFH0747 Sequence: SFI0010 Initial/Final: 9.01 g Wet / 5 mL
 Instrument: NT15 Column: RTX-VMS Calibration: AI00004

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg dry)	Q	DL	RL
71-43-2	Benzene	1	0.25	J	0.18	0.61
108-88-3	Toluene	1	0.34	J	0.09	0.61
100-41-4	Ethylbenzene	1	0.23	J	0.12	0.61
179601-23-1	m,p-Xylene	1	0.62	J	0.24	1.21
95-47-6	o-Xylene	1	0.24	J	0.14	0.61

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	50.000	58.0	116	80 - 149	
Toluene-d8	50.000	50.4	101	77 - 120	
4-Bromofluorobenzene	50.000	48.8	97.6	80 - 120	
1,2-Dichlorobenzene-d4	50.000	51.3	103	80 - 120	



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 17H0298-12 SDG: 17H0298
 Sampled: 08/24/17 17:00 Prepared: 08/30/17 09:11 File ID: V208301714.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 08/30/17 11:42
 Batch: BFH0705 Sequence: SFH0365 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AH00024

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
71-43-2	Benzene	1	0.20	U	0.03	0.20
108-88-3	Toluene	1	0.04	J	0.04	0.20
100-41-4	Ethylbenzene	1	0.20	U	0.04	0.20
179601-23-1	m,p-Xylene	1	0.40	U	0.05	0.40
95-47-6	o-Xylene	1	0.20	U	0.03	0.20

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	5.0000	5.57	111	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	5.04	101	80 - 120	
Toluene-d8	5.0000	4.88	97.6	80 - 120	
4-Bromofluorobenzene	5.0000	4.93	98.6	80 - 120	



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Water Laboratory ID: 17H0298-14 SDG: 17H0298
 Sampled: 08/23/17 00:00 Prepared: 08/30/17 09:11 File ID: V208301710.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 08/30/17 10:21
 Batch: BFH0705 Sequence: SFH0365 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AH00024

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
71-43-2	Benzene	1	0.20	U	0.03	0.20
108-88-3	Toluene	1	0.20	U	0.04	0.20
100-41-4	Ethylbenzene	1	0.20	U	0.04	0.20
179601-23-1	m,p-Xylene	1	0.40	U	0.05	0.40
95-47-6	o-Xylene	1	0.20	U	0.03	0.20

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	5.0000	5.33	107	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	5.00	99.9	80 - 120	
Toluene-d8	5.0000	4.95	98.9	80 - 120	
4-Bromofluorobenzene	5.0000	5.04	101	80 - 120	



PREPARATION BATCH SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFH0705 Batch Matrix: Water

Preparation: EPA 5030 (Purge and Trap)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-MW-4-170824	17H0298-12	V208301714.D	08/30/17 09:11	
SVCA-TripBlank-170823	17H0298-14	V208301710.D	08/30/17 09:11	
Blank	BFH0705-BLK2	V208301709.D	08/30/17 07:11	
LCS	BFH0705-BS2	V208301704LCS.D	08/30/17 07:11	
LCS Dup	BFH0705-BSD2	V208301706.D	08/30/17 07:11	



PREPARATION BATCH SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc. SDG: 17H0298
 Client: Anchor QEA, LLC Project: SCVA Area Z Remediation
 Batch: BFH0747 Batch Matrix: Solid Preparation: EPA 5035 (Sodium Bisulfate)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-TP-100-0-4-170823	17H0298-01	NT1508311719.D	08/31/17 17:01	
SVCA-TP-101-0-2-170823	17H0298-03	NT1508311720.D	08/31/17 17:01	
SVCA-TP-102-0-2-170823	17H0298-06	NT1508311721.D	08/31/17 17:01	
SVCA-TP-103-0-2-170823	17H0298-09	NT1508311722.D	08/31/17 17:01	
Blank	BFH0747-BLK1	NT1508311716A.D	08/31/17 07:01	
LCS	BFH0747-BS1	NT1508311709lcsA.D	08/31/17 07:01	
LCS Dup	BFH0747-BSD1	NT1508311714A.D	08/31/17 07:01	



Form I
METHOD BLANK DATA SHEET
EPA 8260C

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Water</u>	Laboratory ID:	<u>BFH0705-BLK2</u>
Sampled:	<u>N/A</u>	File ID:	<u>V208301709.D</u>
Solids:		Prepared:	<u>08/30/17 07:11</u>
Batch:	<u>BFH0705</u>	Analyzed:	<u>08/30/17 10:00</u>
Instrument:	<u>NT2</u>	Preparation:	<u>EPA 5030 (Purge and Trap)</u>
		Initial/Final:	<u>10 mL / 10 ml</u>
		Sequence:	<u>SFH0365</u>
		Calibration:	<u>AH00024</u>
		Column:	<u>RTX-VMS</u>

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
71-43-2	Benzene	1	0.20	U	0.03	0.20
108-88-3	Toluene	1	0.20	U	0.04	0.20
100-41-4	Ethylbenzene	1	0.20	U	0.04	0.20
179601-23-1	m,p-Xylene	1	0.40	U	0.05	0.40
95-47-6	o-Xylene	1	0.20	U	0.03	0.20

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	5.0000	5.40	108	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	4.99	99.8	80 - 120	
Toluene-d8	5.0000	4.96	99.3	80 - 120	
4-Bromofluorobenzene	5.0000	4.92	98.4	80 - 120	



Form I
METHOD BLANK DATA SHEET
EPA 8260C

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Solid</u>	Laboratory ID:	<u>BFH0747-BLK1</u>
Sampled:	<u>N/A</u>	File ID:	<u>NT1508311716A.D</u>
Solids:		Prepared:	<u>08/31/17 07:01</u>
Batch:	<u>BFH0747</u>	Analyzed:	<u>08/31/17 17:12</u>
Instrument:	<u>NT15</u>	Preparation:	<u>EPA 5035 (Sodium Bisulfate</u> Initial/Final: <u>5 g / 5 mL</u>
		Sequence:	<u>SFI0010</u>
		Calibration:	<u>AI00004</u>
		Column:	<u>RTX-VMS</u>

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg wet)	Q	DL	RL
71-43-2	Benzene	1	1.00	U	0.30	1.00
108-88-3	Toluene	1	1.00	U	0.15	1.00
100-41-4	Ethylbenzene	1	1.00	U	0.20	1.00
179601-23-1	m,p-Xylene	1	2.00	U	0.39	2.00
95-47-6	o-Xylene	1	1.00	U	0.22	1.00

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	50.000	47.0	94.0	80 - 149	
Toluene-d8	50.000	50.4	101	77 - 120	
4-Bromofluorobenzene	50.000	48.8	97.5	80 - 120	
1,2-Dichlorobenzene-d4	50.000	49.6	99.2	80 - 120	



LCS / LCS DUPLICATE RECOVERY
EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Water

Analyzed: 08/30/17 08:18

Batch: BFH0705

Laboratory ID: BFH0705-BS2

Preparation: EPA 5030 (Purge and Trap)

Sequence Name: LCS

Initial/Final: 10 mL / 10 ml

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	Q	LCS % REC. #	QC LIMITS REC.
Benzene	10.0	9.45		94.5	80 - 120
Toluene	10.0	9.62		96.2	80 - 120
Ethylbenzene	10.0	9.51		95.1	80 - 120
m,p-Xylene	20.0	19.6		98.0	80 - 121
o-Xylene	10.0	9.41		94.1	80 - 121

* Indicates values outside of QC limits

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	Q	LCSD % REC. #	% RPD #	QC LIMITS	
						RPD	REC.
Benzene	10.0	9.95		99.5	5.13	30	80 - 120
Toluene	10.0	9.66		96.6	0.441	30	80 - 120
Ethylbenzene	10.0	10.0		100	5.02	30	80 - 120
m,p-Xylene	20.0	20.7		103	5.23	30	80 - 121
o-Xylene	10.0	9.75		97.5	3.59	30	80 - 121

* Indicates values outside of QC limits



LCS / LCS DUPLICATE RECOVERY
EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Analyzed: 08/31/17 13:45

Batch: BFH0747

Laboratory ID: BFH0747-BS1

Preparation: EPA 5035 (Sodium Bisulfate)

Sequence Name: LCS

Initial/Final: 5 g / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	Q	LCS % REC. #	QC LIMITS REC.
Benzene	50.0	51.1		102	80 - 120
Toluene	50.0	48.9		97.8	75 - 120
Ethylbenzene	50.0	53.6		107	80 - 125
m,p-Xylene	100	102		102	76 - 121
o-Xylene	50.0	50.3		101	67 - 132

* Indicates values outside of QC limits

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	Q	LCSD % REC. #	% RPD #	QC LIMITS	
						RPD	REC.
Benzene	50.0	55.1		110	7.54	30	80 - 120
Toluene	50.0	53.0		106	7.95	30	75 - 120
Ethylbenzene	50.0	59.1		118	9.74	30	80 - 125
m,p-Xylene	100	112		112	9.73	30	76 - 121
o-Xylene	50.0	54.2		108	7.52	30	67 - 132

* Indicates values outside of QC limits



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
EPA 8260C**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Lab File ID:	<u>V208071702.D</u>	Injection Date:	<u>08/07/17</u>
Instrument ID:	<u>NT2</u>	Injection Time:	<u>11:25</u>
Sequence:	<u>SFH0101</u>	Lab Sample ID:	<u>SFH0101-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	16.7	PASS
75	30 - 80% of 95	45	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.87	PASS
173	Less than 2% of 174	0.603	PASS
174	50 - 120% of 95	64.1	PASS
175	5 - 9% of 174	6.99	PASS
176	95 - 101% of 174	96.7	PASS
177	5 - 9% of 176	6.6	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SFH0101-TUN1	V208071702.D	08/07/2017	11:25
Cal Standard	SFH0101-CAL1	V208071703.D	08/07/2017	12:06
Cal Standard	SFH0101-CAL2	V208071704.D	08/07/2017	12:27
Cal Standard	SFH0101-CAL3	V208071705.D	08/07/2017	12:47
Cal Standard	SFH0101-CAL4	V208071706.D	08/07/2017	13:08
Cal Standard	SFH0101-CAL5	V208071707.D	08/07/2017	13:28
Cal Standard	SFH0101-CAL6	V208071708.D	08/07/2017	13:48
Cal Standard	SFH0101-CAL7	V208071709.D	08/07/2017	14:09
Cal Standard	SFH0101-CAL8	V208071710.D	08/07/2017	14:29
Secondary Cal Check	SFH0101-SCV1	V208071712.D	08/07/2017	15:10



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
EPA 8260C**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Lab File ID:	<u>V208301702.D</u>	Injection Date:	<u>08/30/17</u>
Instrument ID:	<u>NT2</u>	Injection Time:	<u>07:21</u>
Sequence:	<u>SFH0365</u>	Lab Sample ID:	<u>SFH0365-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	16.5	PASS
75	30 - 80% of 95	45	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.09	PASS
173	Less than 2% of 174	0.499	PASS
174	50 - 120% of 95	76.2	PASS
175	5 - 9% of 174	7.19	PASS
176	95 - 101% of 174	100	PASS
177	5 - 9% of 176	6.54	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SFH0365-TUN1	V208301702.D	08/30/2017	7:21
LCS	BFH0705-BS2	V208301704LCS.D	08/30/2017	8:18
Initial Cal Check	SFH0365-ICV1	V208301704.D	08/30/2017	8:18
LCS Dup	BFH0705-BSD2	V208301706.D	08/30/2017	8:59
Low Cal Check	SFH0365-LCV1	V208301707.D	08/30/2017	9:19
Low Cal Check	SFH0365-LCV2	V208301708.D	08/30/2017	9:39
Blank	BFH0705-BLK2	V208301709.D	08/30/2017	10:00
SVCA-TripBlank-170823	17H0298-14	V208301710.D	08/30/2017	10:21
ZZZZZ	17H0310-05	V208301711.D	08/30/2017	10:41
ZZZZZ	17H0310-06	V208301712.D	08/30/2017	11:02
ZZZZZ	17H0333-03	V208301713.D	08/30/2017	11:22
SVCA-MW-4-170824	17H0298-12	V208301714.D	08/30/2017	11:42
ZZZZZ	17H0310-01	V208301715.D	08/30/2017	12:03
ZZZZZ	17H0310-03	V208301716.D	08/30/2017	12:23
ZZZZZ	17H0333-01	V208301717.D	08/30/2017	12:44
ZZZZZ	17H0351-01	V208301727.D	08/30/2017	16:07
Calibration Check	SFH0365-CCV1	V208301729.D	08/30/2017	16:48



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
EPA 8260C**

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Lab File ID: <u>NT1508311702.D</u>	Injection Date: <u>08/31/17</u>
Instrument ID: <u>NT15</u>	Injection Time: <u>09:33</u>
Sequence: <u>SFI0010</u>	Lab Sample ID: <u>SFI0010-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	15.7	PASS
75	30 - 80% of 95	44.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.71	PASS
173	Less than 2% of 174	0.59	PASS
174	50 - 120% of 95	61.7	PASS
175	5 - 9% of 174	7.34	PASS
176	95 - 101% of 174	96.2	PASS
177	5 - 9% of 176	6.18	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SFI0010-TUN1	NT1508311702.D	08/31/2017	9:33
Cal Standard	SFI0010-CAL1	NT1508311705.D	08/31/2017	12:07
Cal Standard	SFI0010-CAL2	NT1508311706.D	08/31/2017	12:31
Cal Standard	SFI0010-CAL3	NT1508311707.D	08/31/2017	12:56
Cal Standard	SFI0010-CAL4	NT1508311708.D	08/31/2017	13:21
LCS	BFH0746-BS1	NT1508311709lcs.D	08/31/2017	13:45
LCS	BFH0747-BS1	NT1508311709lcsA.D	08/31/2017	13:45
Cal Standard	SFI0010-CAL5	NT1508311709.D	08/31/2017	13:45
Initial Cal Check	SFI0010-ICV1	NT1508311709A.D	08/31/2017	13:45
Cal Standard	SFI0010-CAL6	NT1508311710.D	08/31/2017	14:10
Cal Standard	SFI0010-CAL7	NT1508311711.D	08/31/2017	14:35
Cal Standard	SFI0010-CAL8	NT1508311712.D	08/31/2017	14:59
Secondary Cal Check	SFI0010-SCV1	NT1508311713.D	08/31/2017	15:27
LCS Dup	BFH0746-BSD1	NT1508311714.D	08/31/2017	16:01
LCS Dup	BFH0747-BSD1	NT1508311714A.D	08/31/2017	16:01
Blank	BFH0747-BLK1	NT1508311716A.D	08/31/2017	17:12
Blank	BFH0746-BLK1	NT1508311716.D	08/31/2017	17:12
ZZZZZ	17H0327-01	NT1508311717.D	08/31/2017	17:37
ZZZZZ	17H0327-01RE1	NT1508311718.D	08/31/2017	18:01
SVCA-TP-100-0-4-170823	17H0298-01	NT1508311719.D	08/31/2017	18:26
SVCA-TP-101-0-2-170823	17H0298-03	NT1508311720.D	08/31/2017	18:51
SVCA-TP-102-0-2-170823	17H0298-06	NT1508311721.D	08/31/2017	19:15
SVCA-TP-103-0-2-170823	17H0298-09	NT1508311722.D	08/31/2017	19:40
Calibration Check	SFI0010-CCV1	NT1508311723.D	08/31/2017	20:04



INITIAL CALIBRATION DATA
EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AH00024	Instrument:	NT2
Calibration Date:	08/07/2017 14:35	Column (1):	RTX-VMS

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Benzene	0.2	1.578415	0.5	1.595052	1	1.725575	2	1.603797	10	1.483817	20	1.548514
Toluene	0.2	1.015265	0.5	0.9939104	1	1.058589	2	1.002853	10	0.9480534	20	0.985885
Ethylbenzene	0.2	0.6678154	0.5	0.6671431	1	0.6788568	2	0.655998	10	0.6303632	20	0.6531721
m,p-Xylene	0.4	0.7959265	1	0.7955669	2	0.8544915	4	0.8232006	20	0.7742577	40	0.7833273
o-Xylene	0.2	0.8088586	0.5	0.7785149	1	0.8302388	2	0.8023594	10	0.7589353	20	0.7787932
1,2-Dichloroethane-d4	5	0.5187725	5	0.5475693	5	0.5288858	5	0.5406129	5	0.5145082	5	0.517329
1,2-Dichlorobenzene-d4	5	0.9806029	5	0.9801597	5	0.9470243	5	0.976804	5	0.9799771	5	0.9881275
Toluene-d8	5	1.185534	5	1.17883	5	1.174819	5	1.163869	5	1.180543	5	1.193585
4-Bromofluorobenzene	5	0.3703407	5	0.369717	5	0.3741109	5	0.3690632	5	0.3776575	5	0.3769642
Dibromofluoromethane	5	0.4779475	5	0.4620528	5	0.4744173	5	0.4838013	5	0.4863135	5	0.4882249



INITIAL CALIBRATION DATA
EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AH00024	Instrument:	NT2
Calibration Date:	08/07/2017 14:35	Column (1):	RTX-VMS

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Benzene	40	1.374083	80	1.148818								
Toluene	40	0.9045752	80	0.7881622								
Ethylbenzene	40	0.6042336	80	0.5425127								
m,p-Xylene	80	0.679671	160	0.5396864								
o-Xylene	40	0.7207994	80	0.6522896								
1,2-Dichloroethane-d4	5	0.5225286	5	0.4944955								
1,2-Dichlorobenzene-d4	5	0.9625604	5	0.9487159								
Toluene-d8	5	1.191815	5	1.16984								
4-Bromofluorobenzene	5	0.3763317	5	0.3751297								
Dibromofluoromethane	5	0.50152	5	0.4915158								



INITIAL CALIBRATION DATA EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AH00024	Instrument:	NT2
Calibration Date:	08/07/2017 14:35	Column (1):	RTX-VMS

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Benzene	1.507259	11.7			RSD (20)	
Toluene	0.9621617	8.7			RSD (20)	
Ethylbenzene	0.6375119	7.1			RSD (20)	
m,p-Xylene	0.755766	13.3			RSD (20)	
o-Xylene	0.7663486	7.4			RSD (20)	
1,2-Dichloroethane-d4	0.5230877	3.1			RSD (20)	
1,2-Dichlorobenzene-d4	0.9704965	1.6			RSD (20)	
Toluene-d8	1.179854	0.9			RSD (20)	
4-Bromofluorobenzene	0.3736644	0.9			RSD (20)	
Dibromofluoromethane	0.4832241	2.5			RSD (20)	



**INITIAL CALIBRATION DATA
EPA 8260C**

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00004	Instrument:	NT15
Calibration Date:	08/01/2017 0:35	Column (1):	RTX-VMS

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Benzene	1	2.652026	2	2.755095	5	2.680056	10	2.860245	50	2.677686	100	2.565695
Toluene	1	1.694346	2	1.680602	5	1.653995	10	1.760324	50	1.617566	100	1.550766
Ethylbenzene	1	3.026706	2	3.11876	5	3.229321	10	3.373345	50	3.16791	100	3.02061
m,p-Xylene	2	1.115783	4	1.19635	10	1.216083	20	1.277124	100	1.182809	200	1.125096
o-Xylene	1	1.042431	2	1.131162	5	1.141788	10	1.21657	50	1.159526	100	1.121895
4-Bromofluorobenzene											50	0.5530064



INITIAL CALIBRATION DATA
EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00004	Instrument:	NT15
Calibration Date:	08/01/2017 0:35	Column (1):	RTX-VMS

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Benzene	150	2.552204	200	2.223105								
Toluene	150	1.62734	200	1.642018								
Ethylbenzene	150	2.425805	200	2.289541								
m,p-Xylene	300	1.144037	400	1.013848								
o-Xylene	150	1.179367	200	1.228152								



INITIAL CALIBRATION DATA
EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00004	Instrument:	NT15
Calibration Date:	08/01/2017 0:35	Column (1):	RTX-VMS

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Benzene	2.620764	7.2			RSD (20)	
Toluene	1.65337	3.7			RSD (20)	
Ethylbenzene	2.9565	13.1			RSD (20)	
m,p-Xylene	1.158891	6.8			RSD (20)	
o-Xylene	1.152611	5.1			RSD (20)	
4-Bromofluorobenzene	0.5530064	0.0			RSD (20)	



INITIAL CALIBRATION CHECK

EPA 8260C

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>NT2</u>	Calibration: <u>AH00024</u>
Lab File ID: <u>V208301704.D</u>	Calibration Date: <u>08/07/17 14:35</u>
Sequence: <u>SFH0365</u>	Injection Date: <u>08/30/17</u>
Lab Sample ID: <u>SFH0365-ICV1</u>	Injection Time: <u>08:18</u>
Sequence Name: <u>VOA 10</u>	

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Benzene	A	10.000	9.45	1.5072590	1.4241590		-5.5	20
Toluene	A	10.000	9.62	0.9621617	0.9253699		-3.8	20
Ethylbenzene	A	10.000	9.51	0.6375119	0.6060179		-4.9	20
m,p-Xylene	A	20.000	19.6	0.7557660	0.7409706		-2.0	20
o-Xylene	A	10.000	9.41	0.7663486	0.7208376		-5.9	20
Dibromofluoromethane	A	5.0000	5.23	0.4832241	0.5057154		4.7	20
1,2-Dichloroethane-d4	A	5.0000	5.02	0.5230877	0.5251317		0.4	20
Toluene-d8	A	5.0000	5.08	1.1798540	1.1987960		1.6	20
4-Bromofluorobenzene	A	5.0000	5.30	0.3736644	0.3962180		6.0	20
1,2-Dichlorobenzene-d4	A	5.0000	5.00	0.9704965	0.9697991		-0.08	20

* Values outside of QC limits



SURROGATE RECOVERY SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Sequence: SFI0010
Calibration: AI00004

SDG/WO: 17H0298
Project: SCVA Area Z Remediation
Instrument: NT15
Calibration Date: 08/31/2017

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
BFH0747-BS1 (Solid) Lab File ID: NT1508311709lcsA.D Analyzed: 08/31/17 13:45				
Dibromofluoromethane	50.000	102	80 - 120	
1,2-Dichloroethane-d4	50.000	101	80 - 149	
Toluene-d8	50.000	100	77 - 120	
4-Bromofluorobenzene	50.000	100	80 - 120	
1,2-Dichlorobenzene-d4	50.000	100	80 - 120	
SFI0010-ICV1 (Solid) Lab File ID: NT1508311709A.D Analyzed: 08/31/17 13:45				
Dibromofluoromethane	50.000	102	80 - 120	
1,2-Dichloroethane-d4	50.000	101	80 - 120	
Toluene-d8	50.000	100	80 - 120	
4-Bromofluorobenzene	50.000	100	80 - 120	
1,2-Dichlorobenzene-d4	50.000	100	80 - 120	
SFI0010-SCV1 (Solid) Lab File ID: NT1508311713.D Analyzed: 08/31/17 15:27				
Dibromofluoromethane	50.000	101	80 - 120	
1,2-Dichloroethane-d4	50.000	96.6	80 - 120	
Toluene-d8	50.000	100	80 - 120	
4-Bromofluorobenzene	50.000	99.0	80 - 120	
1,2-Dichlorobenzene-d4	50.000	99.3	80 - 120	
BFH0747-BSD1 (Solid) Lab File ID: NT1508311714A.D Analyzed: 08/31/17 16:01				
Dibromofluoromethane	50.000	104	80 - 120	
1,2-Dichloroethane-d4	50.000	97.6	80 - 149	
Toluene-d8	50.000	101	77 - 120	
4-Bromofluorobenzene	50.000	99.9	80 - 120	
1,2-Dichlorobenzene-d4	50.000	99.9	80 - 120	
BFH0747-BLK1 (Solid) Lab File ID: NT1508311716A.D Analyzed: 08/31/17 17:12				
1,2-Dichloroethane-d4	50.000	94.0	80 - 149	
Toluene-d8	50.000	101	77 - 120	
4-Bromofluorobenzene	50.000	97.5	80 - 120	
1,2-Dichlorobenzene-d4	50.000	99.2	80 - 120	



SURROGATE RECOVERY SUMMARY

EPA 8260C

Laboratory: <u>Analytical Resources, Inc.</u>	SDG/WO: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Sequence: <u>SFI0010</u>	Instrument: <u>NT15</u>
Calibration: <u>AI00004</u>	Calibration Date: <u>08/31/2017</u>

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
17H0298-01 (Solid) Lab File ID: NT1508311719.D Analyzed: 08/31/17 18:26				
1,2-Dichloroethane-d4	50.000	113	80 - 149	
Toluene-d8	50.000	102	77 - 120	
4-Bromofluorobenzene	50.000	92.0	80 - 120	
1,2-Dichlorobenzene-d4	50.000	97.0	80 - 120	
17H0298-03 (Solid) Lab File ID: NT1508311720.D Analyzed: 08/31/17 18:51				
1,2-Dichloroethane-d4	50.000	114	80 - 149	
Toluene-d8	50.000	101	77 - 120	
4-Bromofluorobenzene	50.000	97.9	80 - 120	
1,2-Dichlorobenzene-d4	50.000	103	80 - 120	
17H0298-06 (Solid) Lab File ID: NT1508311721.D Analyzed: 08/31/17 19:15				
1,2-Dichloroethane-d4	50.000	112	80 - 149	
Toluene-d8	50.000	101	77 - 120	
4-Bromofluorobenzene	50.000	93.8	80 - 120	
1,2-Dichlorobenzene-d4	50.000	100	80 - 120	
17H0298-09 (Solid) Lab File ID: NT1508311722.D Analyzed: 08/31/17 19:40				
1,2-Dichloroethane-d4	50.000	116	80 - 149	
Toluene-d8	50.000	101	77 - 120	
4-Bromofluorobenzene	50.000	97.6	80 - 120	
1,2-Dichlorobenzene-d4	50.000	103	80 - 120	



ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0101

Instrument: NT2

Calibration: AH00024

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SFH0101-TUN1	V208071702.D	NA	08/07/17 11:25
8260C 0.2	SFH0101-CAL1	V208071703.D	NA	08/07/17 12:06
8260C 0.5	SFH0101-CAL2	V208071704.D	NA	08/07/17 12:27
8260C 1.0	SFH0101-CAL3	V208071705.D	NA	08/07/17 12:47
8260C 2.0	SFH0101-CAL4	V208071706.D	NA	08/07/17 13:08
8260C 10	SFH0101-CAL5	V208071707.D	NA	08/07/17 13:28
8260C 20	SFH0101-CAL6	V208071708.D	NA	08/07/17 13:48
8260C 40	SFH0101-CAL7	V208071709.D	NA	08/07/17 14:09
8260C 80	SFH0101-CAL8	V208071710.D	NA	08/07/17 14:29
8260C SCV 10	SFH0101-SCV1	V208071712.D	NA	08/07/17 15:10



ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0365

Instrument: NT2

Calibration: AH00024

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SFH0365-TUN1	V208301702.D	NA	08/30/17 07:21
VOA 10	SFH0365-ICV1	V208301704.D	NA	08/30/17 08:18
LCS	BFH0705-BS2	V208301704LCS.D	Water	08/30/17 08:18
LCS Dup	BFH0705-BSD2	V208301706.D	Water	08/30/17 08:59
VOA 1.0	SFH0365-LCV1	V208301707.D	NA	08/30/17 09:19
VOA 0.2	SFH0365-LCV2	V208301708.D	NA	08/30/17 09:39
Blank	BFH0705-BLK2	V208301709.D	Water	08/30/17 10:00
SVCA-TripBlank-170823	17H0298-14	V208301710.D	Water	08/30/17 10:21
ZZZZZ	17H0310-05	V208301711.D	Water	08/30/17 10:41
ZZZZZ	17H0310-06	V208301712.D	Water	08/30/17 11:02
ZZZZZ	17H0333-03	V208301713.D	Water	08/30/17 11:22
SVCA-MW-4-170824	17H0298-12	V208301714.D	Water	08/30/17 11:42
ZZZZZ	17H0310-01	V208301715.D	Water	08/30/17 12:03
ZZZZZ	17H0310-03	V208301716.D	Water	08/30/17 12:23
ZZZZZ	17H0333-01	V208301717.D	Water	08/30/17 12:44
ZZZZZ	17H0351-01	V208301727.D	Water	08/30/17 16:07
CCV	SFH0365-CCV1	V208301729.D	NA	08/30/17 16:48



ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0010

Instrument: NT15

Calibration: AI00004

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SFI0010-TUN1	NT1508311702.D	NA	08/31/17 09:33
8260C 0.2	SFI0010-CAL1	NT1508311705.D	NA	08/31/17 12:07
8260C 0.5	SFI0010-CAL2	NT1508311706.D	NA	08/31/17 12:31
8260C 1.0	SFI0010-CAL3	NT1508311707.D	NA	08/31/17 12:56
8260C 2.0	SFI0010-CAL4	NT1508311708.D	NA	08/31/17 13:21
8260C 10	SFI0010-CAL5	NT1508311709.D	NA	08/31/17 13:45
VOA 10	SFI0010-ICV1	NT1508311709A.D	NA	08/31/17 13:45
ZZZZZ	BFH0746-BS1	NT1508311709lcs.D	Solid	08/31/17 13:45
LCS	BFH0747-BS1	NT1508311709lcsA.D	Solid	08/31/17 13:45
8260C 20	SFI0010-CAL6	NT1508311710.D	NA	08/31/17 14:10
8260C 40	SFI0010-CAL7	NT1508311711.D	NA	08/31/17 14:35
8260C 80	SFI0010-CAL8	NT1508311712.D	NA	08/31/17 14:59
8260C SCV 10	SFI0010-SCV1	NT1508311713.D	NA	08/31/17 15:27
ZZZZZ	BFH0746-BSD1	NT1508311714.D	Solid	08/31/17 16:01
LCS Dup	BFH0747-BSD1	NT1508311714A.D	Solid	08/31/17 16:01
ZZZZZ	BFH0746-BLK1	NT1508311716.D	Solid	08/31/17 17:12
Blank	BFH0747-BLK1	NT1508311716A.D	Solid	08/31/17 17:12
ZZZZZ	17H0327-01	NT1508311717.D	Solid	08/31/17 17:37
ZZZZZ	17H0327-01RE1	NT1508311718.D	Solid	08/31/17 18:01
SVCA-TP-100-0-4-170823	17H0298-01	NT1508311719.D	Solid	08/31/17 18:26
SVCA-TP-101-0-2-170823	17H0298-03	NT1508311720.D	Solid	08/31/17 18:51
SVCA-TP-102-0-2-170823	17H0298-06	NT1508311721.D	Solid	08/31/17 19:15
SVCA-TP-103-0-2-170823	17H0298-09	NT1508311722.D	Solid	08/31/17 19:40
CCV	SFI0010-CCV1	NT1508311723.D	NA	08/31/17 20:04



SURROGATE RECOVERY SUMMARY

EPA 8260C

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG/WO:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Sequence:	<u>SFH0101</u>	Instrument:	<u>NT2</u>
Calibration:	<u>AH00024</u>	Calibration Date:	<u>08/07/2017</u>

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
SFH0101-SCV1 (Water)		Lab File ID: V208071712.D		Analyzed: 08/07/17 15:10
1,2-Dichloroethane-d4	5.0000	99.6	80 - 120	
1,2-Dichlorobenzene-d4	5.0000	100	80 - 120	
Toluene-d8	5.0000	101	80 - 120	
4-Bromofluorobenzene	5.0000	100	80 - 120	
Dibromofluoromethane	5.0000	103	80 - 120	



SURROGATE RECOVERY SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Sequence: SFH0365
Calibration: AH00024

SDG/WO: 17H0298
Project: SCVA Area Z Remediation
Instrument: NT2
Calibration Date: 08/07/2017

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
BFH0705-BS2 (Water) Lab File ID: V208301704LCS.D Analyzed: 08/30/17 08:18				
1,2-Dichloroethane-d4	5.0000	100	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	99.9	80 - 120	
Toluene-d8	5.0000	102	80 - 120	
4-Bromofluorobenzene	5.0000	106	80 - 120	
Dibromofluoromethane	5.0000	105	80 - 120	
SFH0365-ICV1 (Water) Lab File ID: V208301704.D Analyzed: 08/30/17 08:18				
1,2-Dichloroethane-d4	5.0000	100	80 - 120	
1,2-Dichlorobenzene-d4	5.0000	99.9	80 - 120	
Toluene-d8	5.0000	102	80 - 120	
4-Bromofluorobenzene	5.0000	106	80 - 120	
Dibromofluoromethane	5.0000	105	80 - 120	
BFH0705-BSD2 (Water) Lab File ID: V208301706.D Analyzed: 08/30/17 08:59				
1,2-Dichloroethane-d4	5.0000	98.7	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	101	80 - 120	
Toluene-d8	5.0000	102	80 - 120	
4-Bromofluorobenzene	5.0000	104	80 - 120	
Dibromofluoromethane	5.0000	101	80 - 120	
SFH0365-LCV1 (Water) Lab File ID: V208301707.D Analyzed: 08/30/17 09:19				
1,2-Dichloroethane-d4	5.0000	103	0 - 200	
1,2-Dichlorobenzene-d4	5.0000	101	0 - 200	
Toluene-d8	5.0000	99.3	0 - 200	
4-Bromofluorobenzene	5.0000	102	0 - 200	
Dibromofluoromethane	5.0000	100	0 - 200	
SFH0365-LCV2 (Water) Lab File ID: V208301708.D Analyzed: 08/30/17 09:39				
1,2-Dichloroethane-d4	5.0000	105	0 - 200	
1,2-Dichlorobenzene-d4	5.0000	101	0 - 200	
Toluene-d8	5.0000	100	0 - 200	
4-Bromofluorobenzene	5.0000	106	0 - 200	
Dibromofluoromethane	5.0000	101	0 - 200	



SURROGATE RECOVERY SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.
 Client: Anchor QEA, LLC
 Sequence: SFH0365
 Calibration: AH00024

SDG/WO: 17H0298
 Project: SCVA Area Z Remediation
 Instrument: NT2
 Calibration Date: 08/07/2017

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
BFH0705-BLK2 (Water) Lab File ID: V208301709.D Analyzed: 08/30/17 10:00				
1,2-Dichloroethane-d4	5.0000	108	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	99.8	80 - 120	
Toluene-d8	5.0000	99.3	80 - 120	
4-Bromofluorobenzene	5.0000	98.4	80 - 120	
17H0298-14 (Water) Lab File ID: V208301710.D Analyzed: 08/30/17 10:21				
1,2-Dichloroethane-d4	5.0000	107	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	99.9	80 - 120	
Toluene-d8	5.0000	98.9	80 - 120	
4-Bromofluorobenzene	5.0000	101	80 - 120	
17H0298-12 (Water) Lab File ID: V208301714.D Analyzed: 08/30/17 11:42				
1,2-Dichloroethane-d4	5.0000	111	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	101	80 - 120	
Toluene-d8	5.0000	97.6	80 - 120	
4-Bromofluorobenzene	5.0000	98.6	80 - 120	



SURROGATE RECOVERY SUMMARY

EPA 8260C

Laboratory: <u>Analytical Resources, Inc.</u>	SDG/WO: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Sequence: <u>SFI0010</u>	Instrument: <u>NT15</u>
Calibration: <u>AI00004</u>	Calibration Date: <u>08/31/2017</u>

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
BFH0747-BS1 (Solid) Lab File ID: NT1508311709csA.D Analyzed: 08/31/17 13:45				
Dibromofluoromethane	50.000	102	80 - 120	
1,2-Dichloroethane-d4	50.000	101	80 - 149	
Toluene-d8	50.000	100	77 - 120	
4-Bromofluorobenzene	50.000	100	80 - 120	
1,2-Dichlorobenzene-d4	50.000	100	80 - 120	
SFI0010-ICV1 (Solid) Lab File ID: NT1508311709A.D Analyzed: 08/31/17 13:45				
Dibromofluoromethane	50.000	102	80 - 120	
1,2-Dichloroethane-d4	50.000	101	80 - 120	
Toluene-d8	50.000	100	80 - 120	
4-Bromofluorobenzene	50.000	100	80 - 120	
1,2-Dichlorobenzene-d4	50.000	100	80 - 120	
SFI0010-SCV1 (Solid) Lab File ID: NT1508311713.D Analyzed: 08/31/17 15:27				
Dibromofluoromethane	50.000	101	80 - 120	
1,2-Dichloroethane-d4	50.000	96.6	80 - 120	
Toluene-d8	50.000	100	80 - 120	
4-Bromofluorobenzene	50.000	99.0	80 - 120	
1,2-Dichlorobenzene-d4	50.000	99.3	80 - 120	
BFH0747-BSD1 (Solid) Lab File ID: NT1508311714A.D Analyzed: 08/31/17 16:01				
Dibromofluoromethane	50.000	104	80 - 120	
1,2-Dichloroethane-d4	50.000	97.6	80 - 149	
Toluene-d8	50.000	101	77 - 120	
4-Bromofluorobenzene	50.000	99.9	80 - 120	
1,2-Dichlorobenzene-d4	50.000	99.9	80 - 120	
BFH0747-BLK1 (Solid) Lab File ID: NT1508311716A.D Analyzed: 08/31/17 17:12				
1,2-Dichloroethane-d4	50.000	94.0	80 - 149	
Toluene-d8	50.000	101	77 - 120	
4-Bromofluorobenzene	50.000	97.5	80 - 120	
1,2-Dichlorobenzene-d4	50.000	99.2	80 - 120	



SURROGATE RECOVERY SUMMARY

EPA 8260C

Laboratory: <u>Analytical Resources, Inc.</u>	SDG/WO: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Sequence: <u>SFI0010</u>	Instrument: <u>NT15</u>
Calibration: <u>AI00004</u>	Calibration Date: <u>08/31/2017</u>

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
17H0298-01 (Solid) Lab File ID: NT1508311719.D Analyzed: 08/31/17 18:26				
1,2-Dichloroethane-d4	50.000	113	80 - 149	
Toluene-d8	50.000	102	77 - 120	
4-Bromofluorobenzene	50.000	92.0	80 - 120	
1,2-Dichlorobenzene-d4	50.000	97.0	80 - 120	
17H0298-03 (Solid) Lab File ID: NT1508311720.D Analyzed: 08/31/17 18:51				
1,2-Dichloroethane-d4	50.000	114	80 - 149	
Toluene-d8	50.000	101	77 - 120	
4-Bromofluorobenzene	50.000	97.9	80 - 120	
1,2-Dichlorobenzene-d4	50.000	103	80 - 120	
17H0298-06 (Solid) Lab File ID: NT1508311721.D Analyzed: 08/31/17 19:15				
1,2-Dichloroethane-d4	50.000	112	80 - 149	
Toluene-d8	50.000	101	77 - 120	
4-Bromofluorobenzene	50.000	93.8	80 - 120	
1,2-Dichlorobenzene-d4	50.000	100	80 - 120	
17H0298-09 (Solid) Lab File ID: NT1508311722.D Analyzed: 08/31/17 19:40				
1,2-Dichloroethane-d4	50.000	116	80 - 149	
Toluene-d8	50.000	101	77 - 120	
4-Bromofluorobenzene	50.000	97.6	80 - 120	
1,2-Dichlorobenzene-d4	50.000	103	80 - 120	



INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0101

Instrument: NT2

Calibration: AH00024

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (SFH0101-SCV1)		(Water)	Lab File ID: V208071712.D			Analyzed: 08/07/17 15:10			
Pentafluorobenzene	327126	5.27	324955	5.267	101	50 - 200	-0.0030	+/-0.50	
Chlorobenzene-d5	505542	7.707	498584	7.704	101	50 - 200	-0.0030	+/-0.50	
1,4-Difluorobenzene	575365	5.66	576284	5.657	100	50 - 200	-0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	245669	9.399	240275	9.396	102	50 - 200	-0.0030	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY EPA 8260C

Laboratory: Analytical Resources, Inc.
Client: Anchor OEA, LLC
Sequence: SFH0365

SDG: 17H0298
Project: SCVA Area Z Remediation
Instrument: NT2
Calibration: AH00024

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (BFH0705-BS2)		(Water)	Lab File ID: V208301704LCS.D			Analyzed: 08/30/17 08:18			
Pentafluorobenzene	368041	5.268	324955	5.267	113	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	580963	7.705	498584	7.704	117	50 - 200	-0.0010	+/-0.50	
1,4-Difluorobenzene	643534	5.658	576284	5.657	112	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	298004	9.397	240275	9.396	124	50 - 200	-0.0010	+/-0.50	
Initial Cal Check (SFH0365-ICV1)		(Water)	Lab File ID: V208301704.D			Analyzed: 08/30/17 08:18			
Pentafluorobenzene	368041	5.268	324955	5.267	113	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	580963	7.705	498584	7.704	117	50 - 200	-0.0010	+/-0.50	
1,4-Difluorobenzene	643534	5.658	576284	5.657	112	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	298004	9.397	240275	9.396	124	50 - 200	-0.0010	+/-0.50	
LCS Dup (BFH0705-BSD2)		(Water)	Lab File ID: V208301706.D			Analyzed: 08/30/17 08:59			
Pentafluorobenzene	369493	5.267	324955	5.267	114	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	571114	7.705	498584	7.704	115	50 - 200	-0.0010	+/-0.50	
1,4-Difluorobenzene	636475	5.657	576284	5.657	110	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	290990	9.397	240275	9.396	121	50 - 200	-0.0010	+/-0.50	
Low Cal Check (SFH0365-LCV1)		(Water)	Lab File ID: V208301707.D			Analyzed: 08/30/17 09:19			
Pentafluorobenzene	359188	5.266	324955	5.267	111	50 - 200	0.0010	+/-0.50	
Chlorobenzene-d5	569858	7.704	498584	7.704	114	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	631484	5.657	576284	5.657	110	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	282058	9.396	240275	9.396	117	50 - 200	0.0000	+/-0.50	
Low Cal Check (SFH0365-LCV2)		(Water)	Lab File ID: V208301708.D			Analyzed: 08/30/17 09:39			
Pentafluorobenzene	354057	5.268	324955	5.267	109	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	565847	7.706	498584	7.704	113	50 - 200	-0.0020	+/-0.50	
1,4-Difluorobenzene	626072	5.659	576284	5.657	109	50 - 200	-0.0020	+/-0.50	
1,4-Dichlorobenzene-d4	287750	9.398	240275	9.396	120	50 - 200	-0.0020	+/-0.50	
Blank (BFH0705-BLK2)		(Water)	Lab File ID: V208301709.D			Analyzed: 08/30/17 10:00			
Pentafluorobenzene	351663	5.267	324955	5.267	108	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	573494	7.705	498584	7.704	115	50 - 200	-0.0010	+/-0.50	
1,4-Difluorobenzene	626255	5.658	576284	5.657	109	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	282845	9.397	240275	9.396	118	50 - 200	-0.0010	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0365

Instrument: NT2

Calibration: AH00024

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
SVCA-TripBlank-170823 (17H0298-14)		(Water)	Lab File ID: V208301710.D		Analyzed: 08/30/17 10:21				
Pentafluorobenzene	353962	5.268	324955	5.267	109	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	561341	7.705	498584	7.704	113	50 - 200	-0.0010	+/-0.50	
1,4-Difluorobenzene	620271	5.658	576284	5.657	108	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	277808	9.397	240275	9.396	116	50 - 200	-0.0010	+/-0.50	
SVCA-MW-4-170824 (17H0298-12)		(Water)	Lab File ID: V208301714.D		Analyzed: 08/30/17 11:42				
Pentafluorobenzene	329300	5.267	324955	5.267	101	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	545654	7.704	498584	7.704	109	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	606279	5.657	576284	5.657	105	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	273422	9.396	240275	9.396	114	50 - 200	0.0000	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.
Client: Anchor OEA, LLC
Sequence: SFI0010

SDG: 17H0298
Project: SCVA Area Z Remediation
Instrument: NT15
Calibration: AI00004

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (BFH0747-BS1)		(Solid)	Lab File ID: NT1508311709LcsA.D			Analyzed: 08/31/17 13:45			
Pentafluorobenzene	646933	5.359	646933	5.359	100	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1707558	8.213	1707558	8.213	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	1809174	5.792	1809174	5.792	100	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	775484	10.267	775484	10.267	100	50 - 200	0.0000	+/-0.50	
Initial Cal Check (SFI0010-ICV1)		(Solid)	Lab File ID: NT1508311709A.D			Analyzed: 08/31/17 13:45			
Pentafluorobenzene	646933	5.359	646933	5.359	100	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1707558	8.213	1707558	8.213	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	1809174	5.792	1809174	5.792	100	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	775484	10.267	775484	10.267	100	50 - 200	0.0000	+/-0.50	
Secondary Cal Check (SFI0010-SCV1)		(Solid)	Lab File ID: NT1508311713.D			Analyzed: 08/31/17 15:27			
Pentafluorobenzene	789982	5.354	646933	5.359	122	50 - 200	0.0050	+/-0.50	
Chlorobenzene-d5	2047773	8.213	1707558	8.213	120	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2182575	5.787	1809174	5.792	121	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	921577	10.267	775484	10.267	119	50 - 200	0.0000	+/-0.50	
LCS Dup (BFH0747-BSD1)		(Solid)	Lab File ID: NT1508311714A.D			Analyzed: 08/31/17 16:01			
Pentafluorobenzene	693196	5.36	646933	5.359	107	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	1823287	8.213	1707558	8.213	107	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	1949586	5.798	1809174	5.792	108	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	836124	10.273	775484	10.267	108	50 - 200	-0.0060	+/-0.50	
Blank (BFH0747-BLK1)		(Solid)	Lab File ID: NT1508311716A.D			Analyzed: 08/31/17 17:12			
Pentafluorobenzene	719755	5.359	646933	5.359	111	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1901817	8.213	1707558	8.213	111	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2001425	5.798	1809174	5.792	111	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	855274	10.267	775484	10.267	110	50 - 200	0.0000	+/-0.50	
SVCA-TP-100-0-4-170823 (17H0298-01)		(Solid)	Lab File ID: NT1508311719.D			Analyzed: 08/31/17 18:26			
Pentafluorobenzene	676671	5.354	646933	5.359	105	50 - 200	0.0050	+/-0.50	
Chlorobenzene-d5	1791950	8.213	1707558	8.213	105	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	1918068	5.792	1809174	5.792	106	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	657226	10.268	775484	10.267	85	50 - 200	-0.0010	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0010

Instrument: NT15

Calibration: AI00004

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
SVCA-TP-101-0-2-170823 (17H0298-03)		(Solid)	Lab File ID: NT1508311720.D			Analyzed: 08/31/17 18:51			
Pentafluorobenzene	670310	5.354	646933	5.359	104	50 - 200	0.0050	+/-0.50	
Chlorobenzene-d5	1808406	8.213	1707558	8.213	106	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	1896386	5.792	1809174	5.792	105	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	790368	10.268	775484	10.267	102	50 - 200	-0.0010	+/-0.50	
SVCA-TP-102-0-2-170823 (17H0298-06)		(Solid)	Lab File ID: NT1508311721.D			Analyzed: 08/31/17 19:15			
Pentafluorobenzene	760808	5.354	646933	5.359	118	50 - 200	0.0050	+/-0.50	
Chlorobenzene-d5	1995797	8.214	1707558	8.213	117	50 - 200	-0.0010	+/-0.50	
1,4-Difluorobenzene	2146036	5.792	1809174	5.792	119	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	799130	10.268	775484	10.267	103	50 - 200	-0.0010	+/-0.50	
SVCA-TP-103-0-2-170823 (17H0298-09)		(Solid)	Lab File ID: NT1508311722.D			Analyzed: 08/31/17 19:40			
Pentafluorobenzene	712300	5.354	646933	5.359	110	50 - 200	0.0050	+/-0.50	
Chlorobenzene-d5	1919653	8.213	1707558	8.213	112	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2029932	5.792	1809174	5.792	112	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	814388	10.267	775484	10.267	105	50 - 200	0.0000	+/-0.50	



HOLDING TIME SUMMARY

Analysis: EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
SVCA-TP-100-0-4-170823 17H0298-01	08/23/17 09:46	08/25/17 09:46	08/31/17 17:01	8	14	08/31/17 18:26	8	14	
SVCA-TP-101-0-2-170823 17H0298-03	08/23/17 10:59	08/25/17 09:46	08/31/17 17:01	8	14	08/31/17 18:51	8	14	
SVCA-TP-102-0-2-170823 17H0298-06	08/23/17 13:02	08/25/17 09:46	08/31/17 17:01	8	14	08/31/17 19:15	8	14	
SVCA-TP-103-0-2-170823 17H0298-09	08/23/17 14:45	08/25/17 09:46	08/31/17 17:01	8	14	08/31/17 19:40	8	14	
SVCA-MW-4-170824 17H0298-12	08/24/17 17:00	08/25/17 09:46	08/30/17 09:11	5	14	08/30/17 11:42	6	14	
SVCA-TripBlank-170823 17H0298-14	08/23/17 00:00	08/25/17 09:46	08/30/17 09:11	7	14	08/30/17 10:21	7	14	

* Indicates hold time exceedance.



METHOD DETECTION AND REPORTING LIMITS

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Instrument: NT15

Analyte	MDL	RL	Units
Benzene	0.30	1.00	ug/kg
Toluene	0.15	1.00	ug/kg
Ethylbenzene	0.20	1.00	ug/kg
m,p-Xylene	0.39	2.00	ug/kg
o-Xylene	0.22	1.00	ug/kg



METHOD DETECTION AND REPORTING LIMITS

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Water

Instrument: NT2

Analyte	MDL	RL	Units
Benzene	0.03	0.20	ug/L
Toluene	0.04	0.20	ug/L
Ethylbenzene	0.04	0.20	ug/L
m,p-Xylene	0.05	0.40	ug/L
o-Xylene	0.03	0.20	ug/L



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-01 SDG: 17H0298
 Sampled: 08/23/17 09:46 Prepared: 08/30/17 09:18 File ID: V208301718G.D
 % Solids: 91.07 Preparation: EPA 5035 (Methanol Extract) Analyzed: 08/30/17 13:04
 Batch: BFH0706 Sequence: SFH0366 Initial/Final: 11.019 g Wet / 5 mL
 Instrument: NT2 Column: RTX-VMS Calibration: AH00025

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg dry)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	50	2980	U	1490	2980

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	4.97	99.4	80 - 120	
4-Bromofluorobenzene	5.0000	5.02	100	78 - 123	

Data File: \\target\share\chend\nt2.1\20170830g.b\208301718G.D

Date: 30-AUG-2017 13:04

Client ID:

Sample Info: 17H0298-01

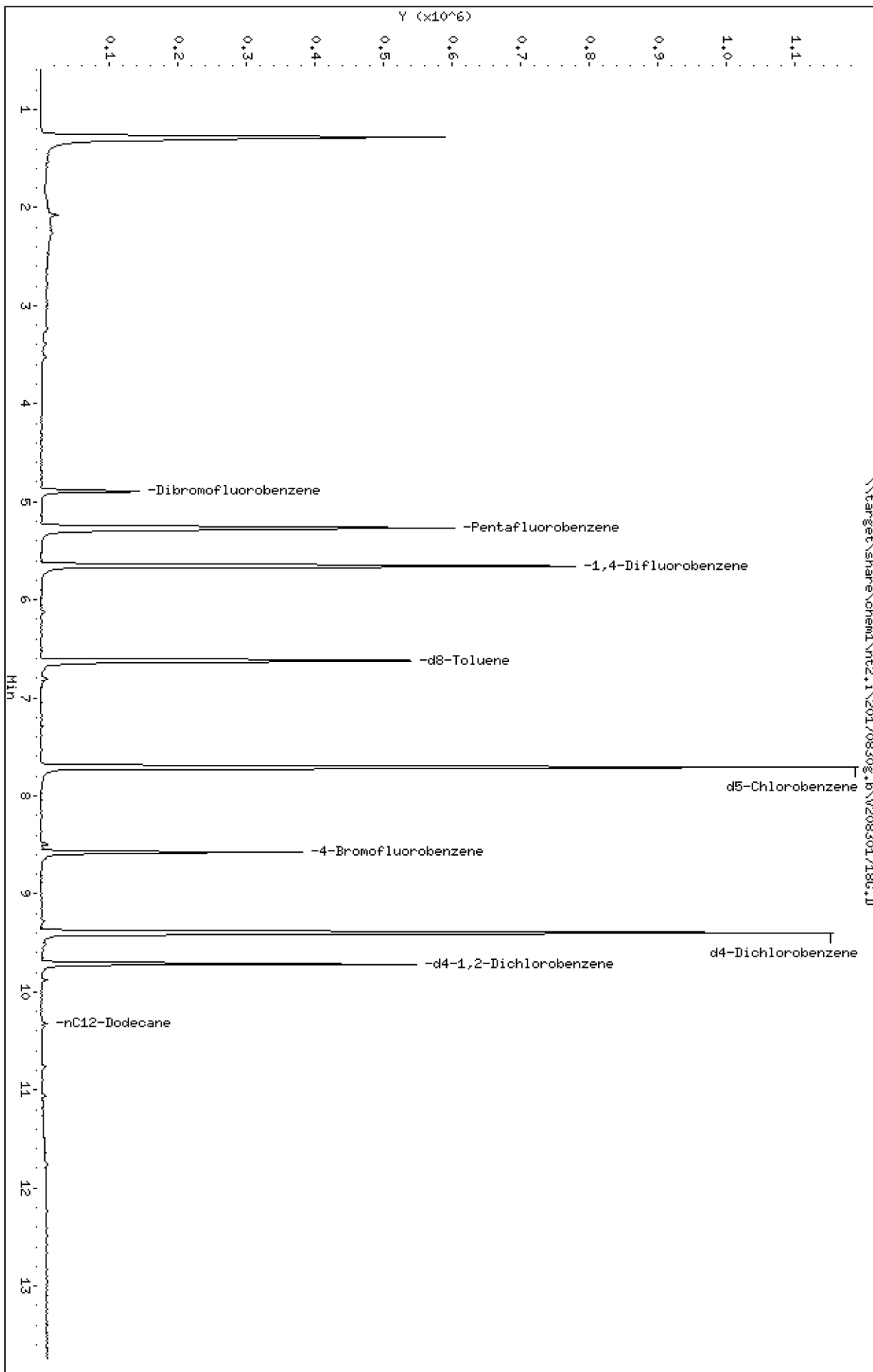
Column phase: RTXWMS

Instrument: nt2.1

Operator: LH

Column diameter: 0.18

Page 1



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20170830g.b/V208301718G.D
Method: \20170830g.b\GAS061217.m
Instrument: nt2.i
Gas Ical Date: 12-JUN-2017
Injection Date: 30-AUG-2017 13:04

ARI ID: 17H0298-01
Client ID:
Matrix: NONE
Dilution Factor: 1.000
Operator: LH

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	-----	-----	-----
WAGas Tol-C12 (6.56 to 10.42)	61968270	53757	0.001
8015C 2MP-TMB (2.99 to 9.26)	22222222	21988	0.001
AK101 nC6-nC10 (3.43 to 8.54)	81728088	21987	0.000
NWTPHG Tol-Nap (6.56 to 11.21)	63840589	53757	0.001
mod8015 nC6-nC12 (3.43 to 10.42)	22222222	53758	0.002

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

6.629	967685	d8-Toluene
8.581	621199	4-Bromofluorobenzene
9.398	1711901	d4-Dichlorobenzene
7.705	1675698	d5-Chlorobenzene
9.717	805929	d4-1,2-Dichlorobenzene



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-03 SDG: 17H0298
 Sampled: 08/23/17 10:59 Prepared: 08/30/17 09:18 File ID: V208301719G.D
 % Solids: 95.13 Preparation: EPA 5035 (Methanol Extract) Analyzed: 08/30/17 13:25
 Batch: BFH0706 Sequence: SFH0366 Initial/Final: 9.91 g Wet / 5 mL
 Instrument: NT2 Column: RTX-VMS Calibration: AH00025

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg dry)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	50	2910	U	1450	2910

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	4.98	99.6	80 - 120	
4-Bromofluorobenzene	5.0000	5.16	103	78 - 123	

Data File: \\target\share\chemd\nt2.1\20170830g.b\208301719G.D

Date: 30-AUG-2017 13:25

Client ID:

Sample Info: 17H0298-03

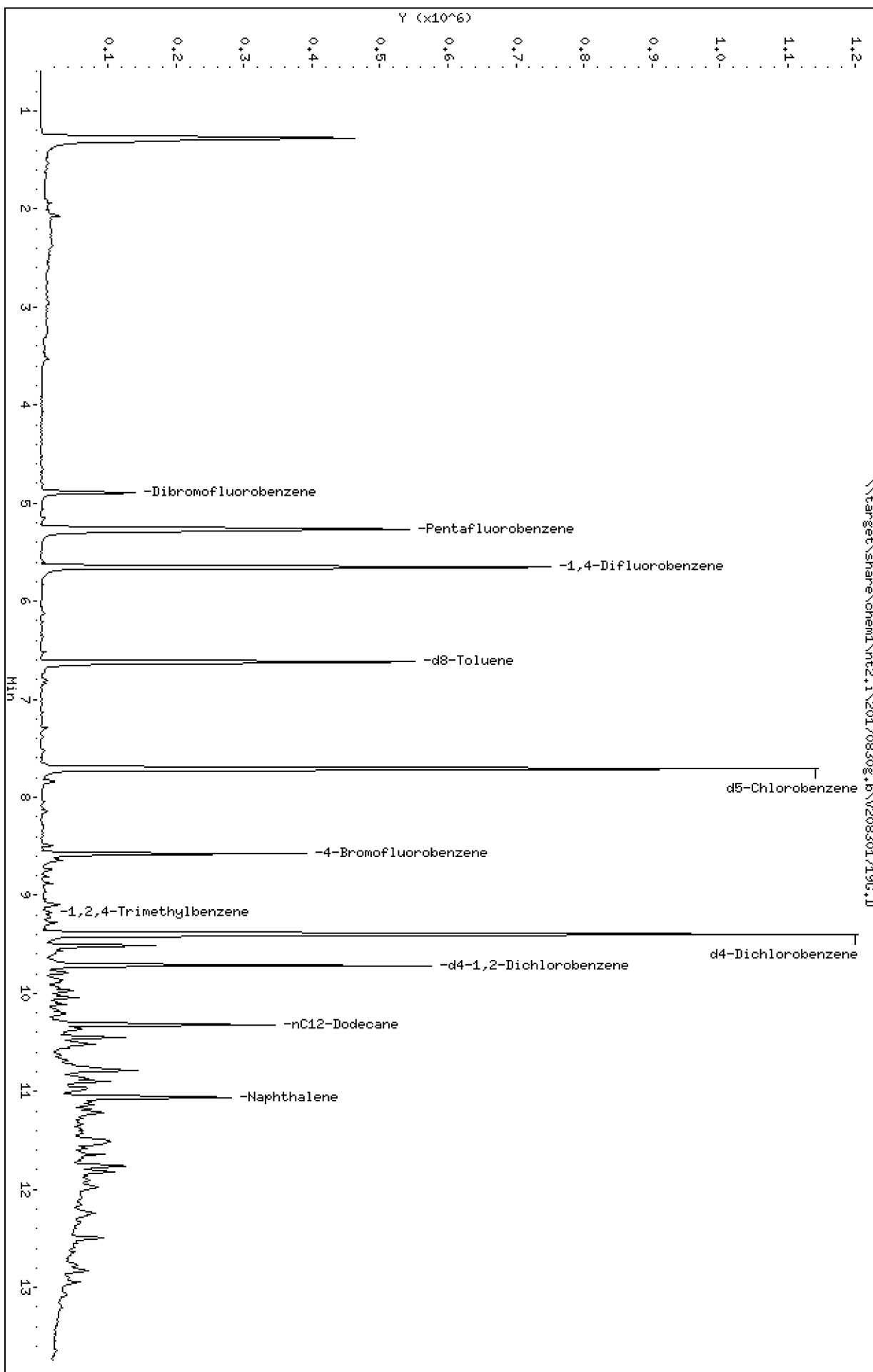
Column phase: RTXWMS

Instrument: nt2.1

Operator: LH

Column diameter: 0.18

Page 1



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20170830g.b/V208301719G.D
Method: \20170830g.b\GAS061217.m
Instrument: nt2.i
Gas Ical Date: 12-JUN-2017
Injection Date: 30-AUG-2017 13:25

ARI ID: 17H0298-03
Client ID:
Matrix: NONE
Dilution Factor: 1.000
Operator: LH

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	----	-----	-----
WAGas Tol-C12 (6.56 to 10.42)	61968270	1890512	0.031 M
8015C 2MP-TMB (2.99 to 9.26)	22222222	356542	0.016 M
AK101 nC6-nC10 (3.43 to 8.54)	81728088	102133	0.001 M
NWTPHG Tol-Nap (6.56 to 11.21)	63840589	4788846	0.075 M
mod8015 nC6-nC12 (3.43 to 10.42)	22222222	1890513	0.085 M

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

6.617	929039	d8-Toluene
8.581	631239	4-Bromofluorobenzene
9.397	1740241	d4-Dichlorobenzene
7.705	1690153	d5-Chlorobenzene
9.717	892105	d4-1,2-Dichlorobenzene



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-06 SDG: 17H0298
 Sampled: 08/23/17 13:02 Prepared: 08/30/17 09:18 File ID: V208301720G.D
 % Solids: 95.38 Preparation: EPA 5035 (Methanol Extract) Analyzed: 08/30/17 13:45
 Batch: BFH0706 Sequence: SFH0366 Initial/Final: 11.085 g Wet / 5 mL
 Instrument: NT2 Column: RTX-VMS Calibration: AH00025

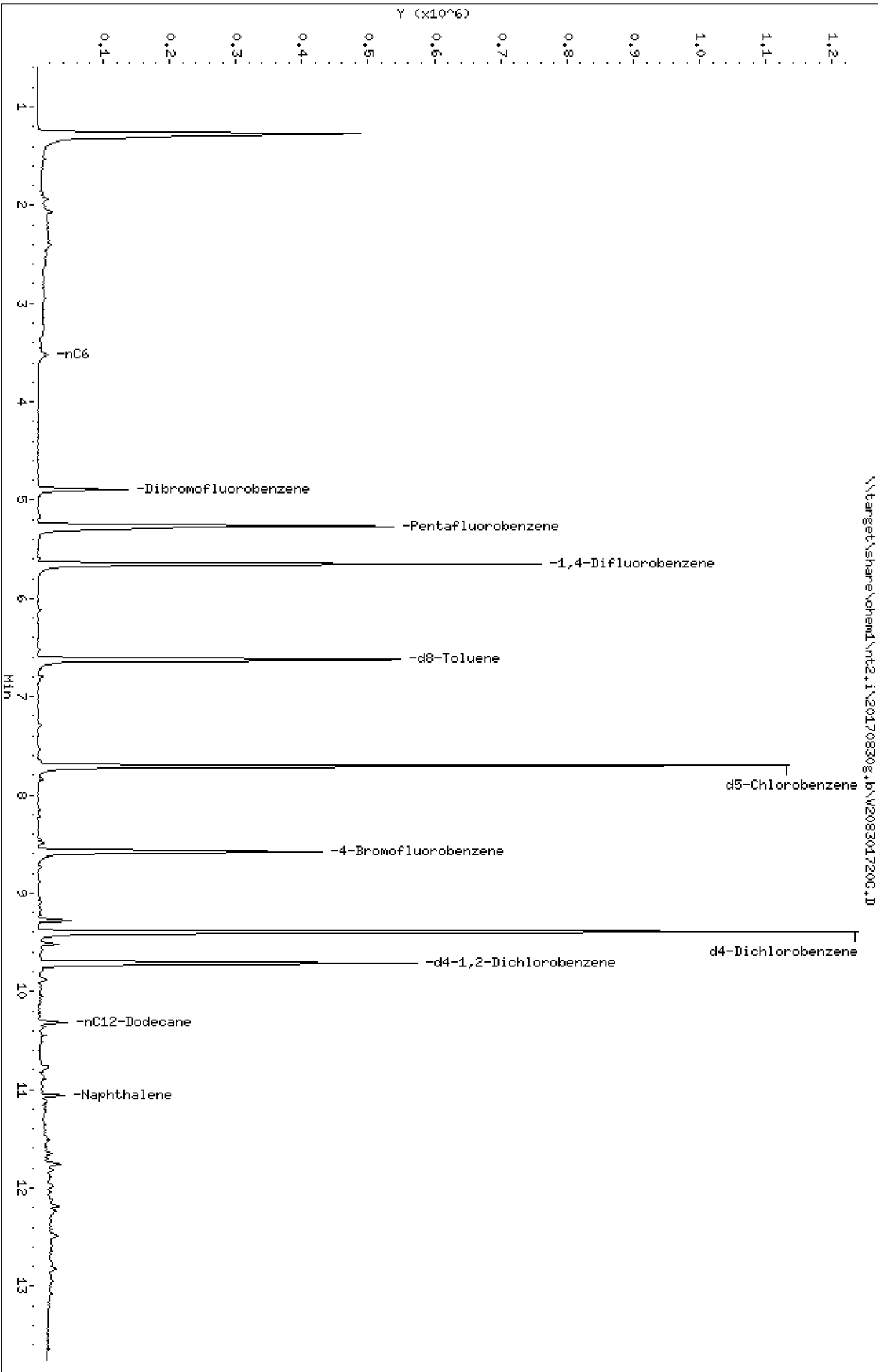
CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg dry)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	50	2610	U	1300	2610

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	5.16	103	80 - 120	
4-Bromofluorobenzene	5.0000	5.23	105	78 - 123	

Data File: \\target\share\chemd\nt2.1\20170830g.b\208301720G.D
Date: 30-AUG-2017 13:45
Client ID:
Sample Info: 17H0298-06

Column phase: RTXWMS

Instrument: nt2.1
Operator: LH
Column diameter: 0.18



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20170830g.b/V208301720G.D
Method: \20170830g.b\GAS061217.m
Instrument: nt2.i
Gas Ical Date: 12-JUN-2017
Injection Date: 30-AUG-2017 13:45

ARI ID: 17H0298-06
Client ID:
Matrix: NONE
Dilution Factor: 1.000
Operator: LH

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	-----	-----	-----
WAGas Tol-C12 (6.56 to 10.42)	61968270	247846	0.004
8015C 2MP-TMB (2.99 to 9.26)	22222222	79556	0.004
AK101 nC6-nC10 (3.43 to 8.54)	81728088	79555	0.001
NWTPHG Tol-Nap (6.56 to 11.21)	63840589	319053	0.005
mod8015 nC6-nC12 (3.43 to 10.42)	22222222	283037	0.013

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

6.616	962653	d8-Toluene
8.581	672991	4-Bromofluorobenzene
9.397	1719046	d4-Dichlorobenzene
7.705	1686393	d5-Chlorobenzene
9.717	819548	d4-1,2-Dichlorobenzene



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-09 SDG: 17H0298
 Sampled: 08/23/17 14:45 Prepared: 08/30/17 09:18 File ID: V208301721G.D
 % Solids: 91.53 Preparation: EPA 5035 (Methanol Extract) Analyzed: 08/30/17 14:06
 Batch: BFH0706 Sequence: SFH0366 Initial/Final: 11.087 g Wet / 5 mL
 Instrument: NT2 Column: RTX-VMS Calibration: AH00025

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg dry)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	50	2930	U	1460	2930

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	5.15	103	80 - 120	
4-Bromofluorobenzene	5.0000	5.14	103	78 - 123	

Data File: \\target\share\chem\nt2.1\20170830g.b\208301721G.D

Date: 30-AUG-2017 14:06

Client ID:

Sample Info: 17H0298-09

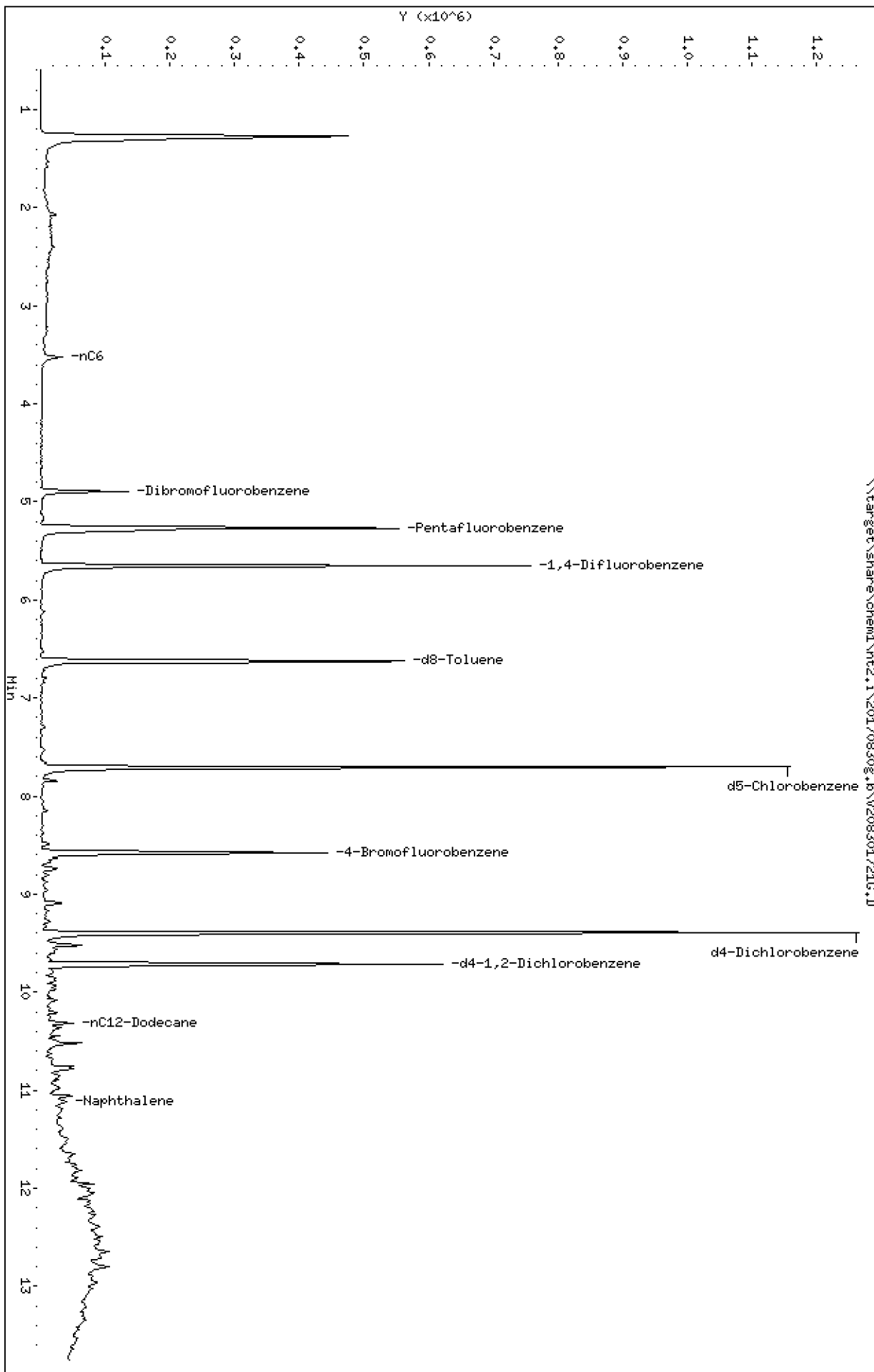
Column phase: RTXWMS

Instrument: nt2.1

Operator: LH

Column diameter: 0.18

\\target\share\chem\nt2.1\20170830g.b\208301721G.D



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20170830g.b/V208301721G.D
Method: \20170830g.b\GAS061217.m
Instrument: nt2.i
Gas Ical Date: 12-JUN-2017
Injection Date: 30-AUG-2017 14:06

ARI ID: 17H0298-09
Client ID:
Matrix: NONE
Dilution Factor: 1.000
Operator: LH

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	-----	-----	-----
WAGas Tol-C12 (6.56 to 10.42)	61968270	546873	0.009
8015C 2MP-TMB (2.99 to 9.26)	22222222	230112	0.010
AK101 nC6-nC10 (3.43 to 8.54)	81728088	114136	0.001
NWTPHG Tol-Nap (6.56 to 11.21)	63840589	966090	0.015
mod8015 nC6-nC12 (3.43 to 10.42)	22222222	620405	0.028

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

6.616	970891	d8-Toluene
8.581	723409	4-Bromofluorobenzene
9.397	1815497	d4-Dichlorobenzene
7.705	1792368	d5-Chlorobenzene
9.717	880340	d4-1,2-Dichlorobenzene



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 17H0298-12 SDG: 17H0298
 Sampled: 08/24/17 17:00 Prepared: 08/30/17 09:11 File ID: V208301714G.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 08/30/17 11:42
 Batch: BFH0705 Sequence: SFH0366 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AH00025

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	1	100	U	13.6	100

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	4.88	97.6	80 - 120	
4-Bromofluorobenzene	5.0000	4.93	98.6	80 - 120	

Data File: \\target\share\chend\nt2.1\20170830g.b\208301714G.D

Date: 30-AUG-2017 11:42

Client ID:

Sample Info: 17H0298-12

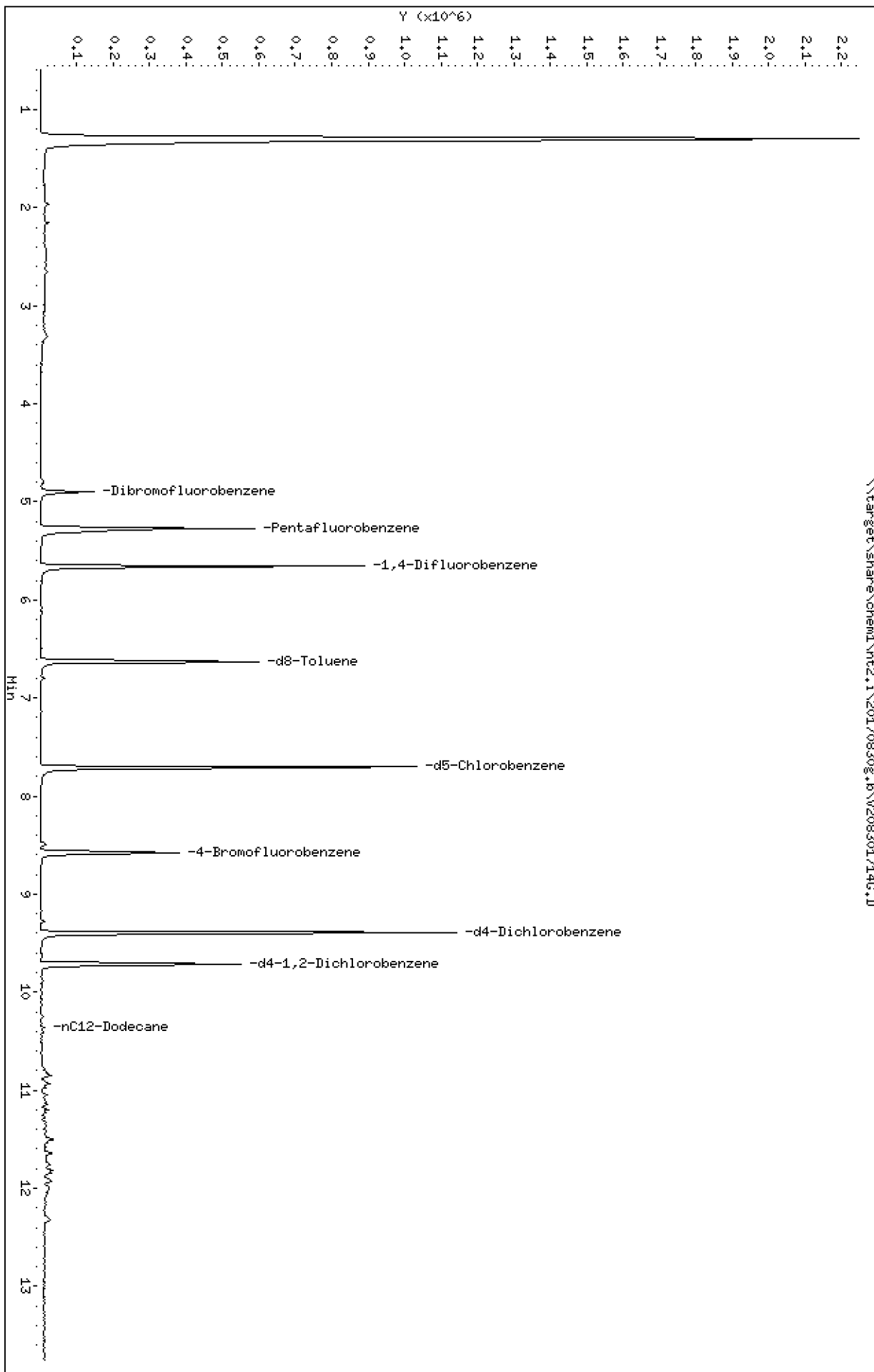
Instrument: nt2.1

Operator: LH

Column diameter: 0.18

Column phase: RTXWMS

\\target\share\chend\nt2.1\20170830g.b\208301714G.D



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20170830g.b/V208301714G.D
Method: \20170830g.b\GAS061217.m
Instrument: nt2.i
Gas Ical Date: 12-JUN-2017
Injection Date: 30-AUG-2017 11:42

ARI ID: 17H0298-12
Client ID:
Matrix: NONE
Dilution Factor: 1.000
Operator: LH

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	-----	-----	-----
WAGas Tol-C12 (6.56 to 10.42)	61968270	75175	0.001
8015C 2MP-TMB (2.99 to 9.26)	22222222	55890	0.003
AK101 nC6-nC10 (3.43 to 8.54)	81728088	55890	0.001
NWTPHG Tol-Nap (6.56 to 11.21)	63840589	282072	0.004
mod8015 nC6-nC12 (3.43 to 10.42)	22222222	93360	0.004

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

6.628	913249	d8-Toluene
8.580	582027	4-Bromofluorobenzene
9.397	1622053	d4-Dichlorobenzene
7.705	1619111	d5-Chlorobenzene
9.716	786333	d4-1,2-Dichlorobenzene



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Water Laboratory ID: 17H0298-14 SDG: 17H0298
 Sampled: 08/23/17 00:00 Prepared: 08/30/17 09:11 File ID: V208301710G.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 08/30/17 10:21
 Batch: BFH0705 Sequence: SFH0366 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AH00025

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	1	100	U	13.6	100

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	4.95	98.9	80 - 120	
4-Bromofluorobenzene	5.0000	5.04	101	80 - 120	

Data File: \\target\share\chemd\nt2.1\20170830g.b\208301714G.D

Date: 30-AUG-2017 11:42

Client ID:

Sample Info: 17H0298-12

Page 1

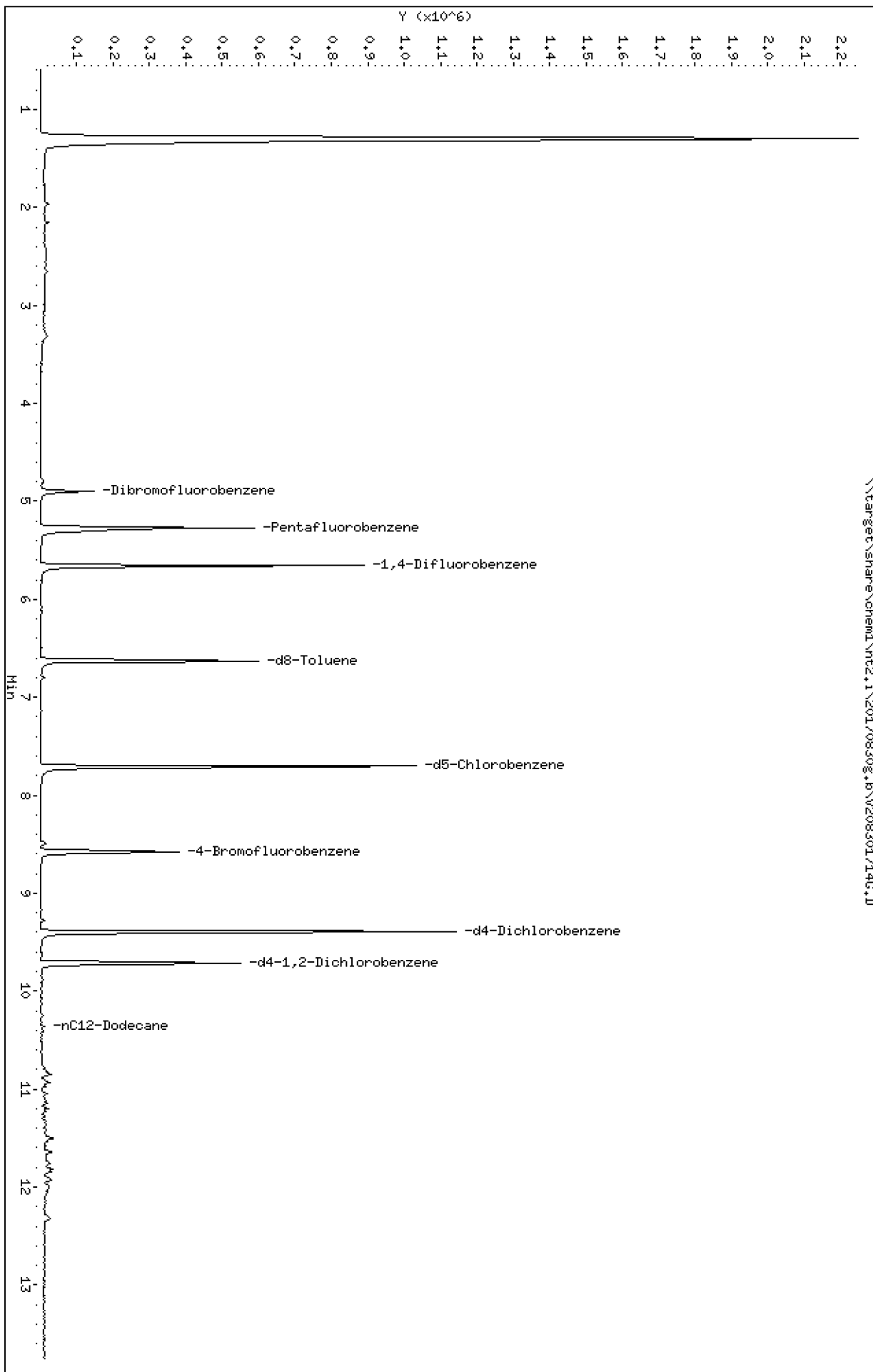
Column phase: RTXWMS

Instrument: nt2.1

Operator: LH

Column diameter: 0.18

\\target\share\chemd\nt2.1\20170830g.b\208301714G.D



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20170830g.b/V208301714G.D
Method: \20170830g.b\GAS061217.m
Instrument: nt2.i
Gas Ical Date: 12-JUN-2017
Injection Date: 30-AUG-2017 11:42

ARI ID: 17H0298-12
Client ID:
Matrix: NONE
Dilution Factor: 1.000
Operator: LH

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
WAGas Tol-C12 (6.56 to 10.42)	61968270	75175	0.001
8015C 2MP-TMB (2.99 to 9.26)	22222222	55890	0.003
AK101 nC6-nC10 (3.43 to 8.54)	81728088	55890	0.001
NWTPHG Tol-Nap (6.56 to 11.21)	63840589	282072	0.004
mod8015 nC6-nC12 (3.43 to 10.42)	22222222	93360	0.004

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

6.628	913249	d8-Toluene
8.580	582027	4-Bromofluorobenzene
9.397	1622053	d4-Dichlorobenzene
7.705	1619111	d5-Chlorobenzene
9.716	786333	d4-1,2-Dichlorobenzene



PREPARATION BATCH SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFH0705 Batch Matrix: Water

Preparation: EPA 5030 (Purge and Trap)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-MW-4-170824	17H0298-12	V208301714G.D	08/30/17 09:11	
SVCA-TripBlank-170823	17H0298-14	V208301710G.D	08/30/17 09:11	
Blank	BFH0705-BLK1	V208301709G.D	08/30/17 07:11	
LCS	BFH0705-BS1	V208301703LCSG.D	08/30/17 07:11	
LCS Dup	BFH0705-BSD1	V208301705G.D	08/30/17 07:11	



Form I
METHOD BLANK DATA SHEET
NWTPHg

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Water</u>	Laboratory ID:	<u>BFH0705-BLK1</u>
Sampled:	<u>N/A</u>	File ID:	<u>V208301709G.D</u>
Solids:		Prepared:	<u>08/30/17 07:11</u>
Batch:	<u>BFH0705</u>	Analyzed:	<u>08/30/17 10:00</u>
Instrument:	<u>NT2</u>	Preparation:	<u>EPA 5030 (Purge and Trap)</u>
		Initial/Final:	<u>10 mL / 10 ml</u>
		Sequence:	<u>SFH0366</u>
		Calibration:	<u>AH00025</u>
		Column:	<u>RTX-VMS</u>

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	1	100	U	13.6	100
SURROGATES		ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
	Toluene-d8	5.0000	4.96	99.3	80 - 120	
	4-Bromofluorobenzene	5.0000	4.92	98.4	80 - 120	



Form I
METHOD BLANK DATA SHEET
NWTPHg

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Solid</u>	Laboratory ID:	<u>BFH0706-BLK1</u>
Sampled:	<u>N/A</u>	File ID:	<u>V208301709MBSG.D</u>
Solids:		Prepared:	<u>08/30/17 07:18</u>
Batch:	<u>BFH0706</u>	Analyzed:	<u>08/30/17 10:00</u>
Instrument:	<u>NT2</u>	Preparation:	<u>EPA 5035 (Methanol Extract)</u>
		Initial/Final:	<u>5 g / 5 mL</u>
		Sequence:	<u>SFH0366</u>
		Calibration:	<u>AH00025</u>
		Column:	<u>RTX-VMS</u>

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg wet)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	50	5000	U	2500	5000
SURROGATES		ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
	Toluene-d8	5.0000	4.96	99.3	80 - 120	
	4-Bromofluorobenzene	5.0000	4.92	98.4	78 - 123	



LCS / LCS DUPLICATE RECOVERY NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Water

Analyzed: 08/30/17 07:57

Batch: BFH0705

Laboratory ID: BFH0705-BS1

Preparation: EPA 5030 (Purge and Trap)

Sequence Name: LCS

Initial/Final: 10 mL / 10 ml

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	Q	LCS % REC. #	QC LIMITS REC.
Gasoline Range Organics (Tol-Nap)	1000	983		98.3	72 - 128

* Indicates values outside of QC limits

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	Q	LCSD % REC. #	% RPD #	QC LIMITS	
						RPD	REC.
Gasoline Range Organics (Tol-Nap)	1000	984		98.4	0.0671	30	72 - 128

* Indicates values outside of QC limits



LCS / LCS DUPLICATE RECOVERY
NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Analyzed: 08/30/17 07:57

Batch: BFH0706

Laboratory ID: BFH0706-BS1

Preparation: EPA 5035 (Methanol Extraction)

Sequence Name: LCS

Initial/Final: 5 g / 5 mL

COMPOUND	SPIKE ADDED (ug/kg wet)	LCS CONCENTRATION (ug/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Gasoline Range Organics (Tol-Nap)	50000	49100		98.3	70 - 121

* Indicates values outside of QC limits

COMPOUND	SPIKE ADDED (ug/kg wet)	LCSD CONCENTRATION (ug/kg wet)	Q	LCSD % REC. #	% RPD #	QC LIMITS	
						RPD	REC.
Gasoline Range Organics (Tol-Nap)	50000	49200		98.4	0.0671	30	70 - 121

* Indicates values outside of QC limits



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
NWTPHg**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Lab File ID:	<u>V217061204G.D</u>	Injection Date:	<u>06/12/17</u>
Instrument ID:	<u>NT2</u>	Injection Time:	<u>09:58</u>
Sequence:	<u>SFF0153</u>	Lab Sample ID:	<u>SFF0153-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	22.2	PASS
75	30 - 80% of 95	48.8	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.22	PASS
173	Less than 2% of 174	0	PASS
174	50 - 120% of 95	82.5	PASS
175	5 - 9% of 174	7.54	PASS
176	95 - 101% of 174	96.1	PASS
177	5 - 9% of 176	7.06	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Cal Standard	SFF0153-CAL9	V217061216G.D	06/12/2017	14:26
Cal Standard	SFF0153-CALA	V217061217G.D	06/12/2017	14:45
Cal Standard	SFF0153-CALB	V217061218G.D	06/12/2017	15:05
Cal Standard	SFF0153-CALC	V217061219G.D	06/12/2017	15:25
Cal Standard	SFF0153-CALD	V217061220G.D	06/12/2017	15:45
Cal Standard	SFF0153-CALE	V217061221G.D	06/12/2017	16:05
Secondary Cal Check	SFF0153-SCV1	V217061223G.D	06/12/2017	16:45



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
NWTPHg**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor OEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Lab File ID:	<u>V208071702G.D</u>	Injection Date:	<u>08/07/17</u>
Instrument ID:	<u>NT2</u>	Injection Time:	<u>11:25</u>
Sequence:	<u>SFH0112</u>	Lab Sample ID:	<u>SFH0112-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	16.7	PASS
75	30 - 80% of 95	45	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.87	PASS
173	Less than 2% of 174	0.603	PASS
174	50 - 120% of 95	64.1	PASS
175	5 - 9% of 174	6.99	PASS
176	95 - 101% of 174	96.7	PASS
177	5 - 9% of 176	6.6	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SFH0112-TUN1	V208071702G.D	08/07/2017	11:25



MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK NWTPHg

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Lab File ID:	<u>V208301702G.D</u>	Injection Date:	<u>08/30/17</u>
Instrument ID:	<u>NT2</u>	Injection Time:	<u>07:21</u>
Sequence:	<u>SFH0366</u>	Lab Sample ID:	<u>SFH0366-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	16.5	PASS
75	30 - 80% of 95	45	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.09	PASS
173	Less than 2% of 174	0.499	PASS
174	50 - 120% of 95	76.2	PASS
175	5 - 9% of 174	7.19	PASS
176	95 - 101% of 174	100	PASS
177	5 - 9% of 176	6.54	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SFH0366-TUN1	V208301702G.D	08/30/2017	7:21
LCS	BFH0706-BS1	V208301703LCSSG.D	08/30/2017	7:57
LCS	BFH0705-BS1	V208301703LCSG.D	08/30/2017	7:57
Initial Cal Check	SFH0366-ICV1	V208301703G.D	08/30/2017	7:57
LCS Dup	BFH0706-BSD1	V208301705LCSDSG.D	08/30/2017	8:38
LCS Dup	BFH0705-BSD1	V208301705G.D	08/30/2017	8:38
Blank	BFH0706-BLK1	V208301709MBSG.D	08/30/2017	10:00
Blank	BFH0705-BLK1	V208301709G.D	08/30/2017	10:00
SVCA-TripBlank-170823	17H0298-14	V208301710G.D	08/30/2017	10:21
SVCA-MW-4-170824	17H0298-12	V208301714G.D	08/30/2017	11:42
SVCA-TP-100-0-4-170823	17H0298-01	V208301718G.D	08/30/2017	13:04
SVCA-TP-101-0-2-170823	17H0298-03	V208301719G.D	08/30/2017	13:25
SVCA-TP-102-0-2-170823	17H0298-06	V208301720G.D	08/30/2017	13:45
SVCA-TP-103-0-2-170823	17H0298-09	V208301721G.D	08/30/2017	14:06
ZZZZZ	17H0308-01	V208301722G.D	08/30/2017	14:26
ZZZZZ	17H0308-02	V208301723G.D	08/30/2017	14:47
ZZZZZ	17H0308-03	V208301724G.D	08/30/2017	15:07
Calibration Check	SFH0366-CCV1	V208301728G.D	08/30/2017	16:27



INITIAL CALIBRATION DATA
NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AF00043	Instrument:	NT2
Calibration Date:	06/13/2017 10:45	Column (1):	RTX-VMS

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Gasoline Range Organics (Tol-Nap)	100	71249.69	250	67843.76			1000	64114.48	2500	59222.56	5000	56772.46



INITIAL CALIBRATION DATA

NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AF00043	Instrument:	NT2
Calibration Date:	06/13/2017 10:45	Column (1):	RTX-VMS

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Toluene-d8	5	1.070644	5	1.045473	5	1.109125	5	1.108631	5	1.112117	5	1.123529
4-Bromofluorobenzene	5	0.3997239	5	0.4200901	5	0.4152498	5	0.4189429	5	0.4204776	5	0.4273876



INITIAL CALIBRATION DATA NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AF00043	Instrument:	NT2
Calibration Date:	06/13/2017 10:45	Column (1):	RTX-VMS

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
		RF		RF		RF		RF		RF		RF
Toluene-d8	5	1.166297	5	1.163406								
4-Bromofluorobenzene	5	0.4573217	5	0.4889769								



INITIAL CALIBRATION DATA NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AF00043	Instrument:	NT2
Calibration Date:	06/13/2017 10:45	Column (1):	RTX-VMS

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Gasoline Range Organics (Tol-Nap)	63840.59	9.3			RSD (20)	
Toluene-d8	1.112403	3.7			RSD (20)	
4-Bromofluorobenzene	0.4310213	6.6			RSD (20)	



INITIAL CALIBRATION DATA
NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AH00025	Instrument:	NT2
Calibration Date:	08/09/2017 9:30	Column (1):	RTX-VMS

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Gasoline Range Organics (Tol-Nap)	100	71249.69	250	67843.76			1000	64114.48	2500	59222.56	5000	56772.46



INITIAL CALIBRATION DATA
NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AH00025	Instrument:	NT2
Calibration Date:	08/09/2017 9:30	Column (1):	RTX-VMS

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Toluene-d8	5	1.185534	5	1.17883	5	1.174819	5	1.163869	5	1.180543	5	1.193585
4-Bromofluorobenzene	5	0.3703407	5	0.369717	5	0.3741109	5	0.3690632	5	0.3776575	5	0.3769642



INITIAL CALIBRATION DATA

NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AH00025	Instrument:	NT2
Calibration Date:	08/09/2017 9:30	Column (1):	RTX-VMS

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
		RF		RF		RF		RF		RF		RF
Toluene-d8	5	1.191815	5	1.16984								
4-Bromofluorobenzene	5	0.3763317	5	0.3751297								



INITIAL CALIBRATION DATA NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AH00025	Instrument:	NT2
Calibration Date:	08/09/2017 9:30	Column (1):	RTX-VMS

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Gasoline Range Organics (Tol-Nap)	63840.59	9.3			RSD (20)	
Toluene-d8	1.179854	0.9			RSD (20)	
4-Bromofluorobenzene	0.3736644	0.9			RSD (20)	



INITIAL CALIBRATION CHECK

NWTPHg

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>NT2</u>	Calibration: <u>AH00025</u>
Lab File ID: <u>V208301703G.D</u>	Calibration Date: <u>08/09/17 09:30</u>
Sequence: <u>SFH0366</u>	Injection Date: <u>08/30/17</u>
Lab Sample ID: <u>SFH0366-ICV1</u>	Injection Time: <u>07:57</u>
Sequence Name: <u>ICV</u>	

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Gasoline Range Organics (Tol-Nap)	A	1000.0	983	63840.5900	62747.7200		-1.7	20
Toluene-d8	A	5.0000	4.97	1.1798540	1.1720310		-0.7	
4-Bromofluorobenzene	A	5.0000	5.08	0.3736644	0.3796228		1.6	

* Values outside of QC limits



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFF0153

Instrument: NT2

Calibration: AF00043

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Gas 0.1	SFF0153-CAL9	V217061216G.D	NA	06/12/17 14:26
Gas 0.25	SFF0153-CALA	V217061217G.D	NA	06/12/17 14:45
Gas 0.5	SFF0153-CALB	V217061218G.D	NA	06/12/17 15:05
Gas 1.0	SFF0153-CALC	V217061219G.D	NA	06/12/17 15:25
Gas 2.5	SFF0153-CALD	V217061220G.D	NA	06/12/17 15:45
Gas 5.0	SFF0153-CALE	V217061221G.D	NA	06/12/17 16:05
GAS SCV	SFF0153-SCV1	V217061223G.D	NA	06/12/17 16:45



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0112

Instrument: NT2

Calibration: AH00025

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SFH0112-TUN1	V208071702G.D	NA	08/07/17 11:25



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0366

Instrument: NT2

Calibration: AH00025

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
BFB	SFH0366-TUN1	V208301702G.D	NA	08/30/17 07:21
ICV	SFH0366-ICV1	V208301703G.D	NA	08/30/17 07:57
LCS	BFH0705-BS1	V208301703LCSG.D	Water	08/30/17 07:57
LCS	BFH0706-BS1	V208301703LCSSG.D	Solid	08/30/17 07:57
LCS Dup	BFH0705-BSD1	V208301705G.D	Water	08/30/17 08:38
LCS Dup	BFH0706-BSD1	V208301705LCSDSG.D	Solid	08/30/17 08:38
Blank	BFH0705-BLK1	V208301709G.D	Water	08/30/17 10:00
Blank	BFH0706-BLK1	V208301709MBSG.D	Solid	08/30/17 10:00
SVCA-TripBlank-170823	17H0298-14	V208301710G.D	Water	08/30/17 10:21
SVCA-MW-4-170824	17H0298-12	V208301714G.D	Water	08/30/17 11:42
SVCA-TP-100-0-4-170823	17H0298-01	V208301718G.D	Solid	08/30/17 13:04
SVCA-TP-101-0-2-170823	17H0298-03	V208301719G.D	Solid	08/30/17 13:25
SVCA-TP-102-0-2-170823	17H0298-06	V208301720G.D	Solid	08/30/17 13:45
SVCA-TP-103-0-2-170823	17H0298-09	V208301721G.D	Solid	08/30/17 14:06
ZZZZZ	17H0308-01	V208301722G.D	Solid	08/30/17 14:26
ZZZZZ	17H0308-02	V208301723G.D	Solid	08/30/17 14:47
ZZZZZ	17H0308-03	V208301724G.D	Solid	08/30/17 15:07
CCV	SFH0366-CCV1	V208301728G.D	NA	08/30/17 16:27



SURROGATE RECOVERY SUMMARY

NWTPHg

Laboratory: <u>Analytical Resources, Inc.</u>	SDG/WO: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Sequence: <u>SFH0366</u>	Instrument: <u>NT2</u>
Calibration: <u>AH00025</u>	Calibration Date: <u>08/07/2017</u>

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
BFH0705-BS1 (Water) Lab File ID: V208301703LCSG.D Analyzed: 08/30/17 07:57				
Toluene-d8	5.0000	99.3	80 - 120	
4-Bromofluorobenzene	5.0000	102	80 - 120	
BFH0706-BS1 (Solid) Lab File ID: V208301703LCSSG.D Analyzed: 08/30/17 07:57				
Toluene-d8	5.0000	99.3	80 - 120	
4-Bromofluorobenzene	5.0000	102	78 - 123	
SFH0366-ICV1 (Water) Lab File ID: V208301703G.D Analyzed: 08/30/17 07:57				
Toluene-d8	5.0000	99.3	0 - 200	
4-Bromofluorobenzene	5.0000	102	0 - 200	
BFH0705-BSD1 (Water) Lab File ID: V208301705G.D Analyzed: 08/30/17 08:38				
Toluene-d8	5.0000	100	80 - 120	
4-Bromofluorobenzene	5.0000	100	80 - 120	
BFH0706-BSD1 (Solid) Lab File ID: V208301705LCSDSG.D Analyzed: 08/30/17 08:38				
Toluene-d8	5.0000	100	80 - 120	
4-Bromofluorobenzene	5.0000	100	78 - 123	
BFH0705-BLK1 (Water) Lab File ID: V208301709G.D Analyzed: 08/30/17 10:00				
Toluene-d8	5.0000	99.3	80 - 120	
4-Bromofluorobenzene	5.0000	98.4	80 - 120	
BFH0706-BLK1 (Solid) Lab File ID: V208301709MBSG.D Analyzed: 08/30/17 10:00				
Toluene-d8	5.0000	99.3	80 - 120	
4-Bromofluorobenzene	5.0000	98.4	78 - 123	
17H0298-14 (Water) Lab File ID: V208301710G.D Analyzed: 08/30/17 10:21				
Toluene-d8	5.0000	98.9	80 - 120	
4-Bromofluorobenzene	5.0000	101	80 - 120	
17H0298-12 (Water) Lab File ID: V208301714G.D Analyzed: 08/30/17 11:42				
Toluene-d8	5.0000	97.6	80 - 120	
4-Bromofluorobenzene	5.0000	98.6	80 - 120	
17H0298-01 (Solid) Lab File ID: V208301718G.D Analyzed: 08/30/17 13:04				
Toluene-d8	5.0000	99.4	80 - 120	
4-Bromofluorobenzene	5.0000	100	78 - 123	



SURROGATE RECOVERY SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.
 Client: Anchor QEA, LLC
 Sequence: SFH0366
 Calibration: AH00025

SDG/WO: 17H0298
 Project: SCVA Area Z Remediation
 Instrument: NT2
 Calibration Date: 08/07/2017

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
17H0298-03 (Solid) Lab File ID: V208301719G.D Analyzed: 08/30/17 13:25				
Toluene-d8	5.0000	99.6	80 - 120	
4-Bromofluorobenzene	5.0000	103	78 - 123	
17H0298-06 (Solid) Lab File ID: V208301720G.D Analyzed: 08/30/17 13:45				
Toluene-d8	5.0000	103	80 - 120	
4-Bromofluorobenzene	5.0000	105	78 - 123	
17H0298-09 (Solid) Lab File ID: V208301721G.D Analyzed: 08/30/17 14:06				
Toluene-d8	5.0000	103	80 - 120	
4-Bromofluorobenzene	5.0000	103	78 - 123	



INTERNAL STANDARD AREA AND RT SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.
Client: Anchor OEA, LLC
Sequence: SFH0366

SDG: 17H0298
Project: SCVA Area Z Remediation
Instrument: NT2
Calibration: AH00025

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (BFH0705-BS1)		(Water)	Lab File ID: V208301703LCSG.D			Analyzed: 08/30/17 07:57			
Pentafluorobenzene	373419	5.269	342682	5.269	109	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	598826	7.706	537424	7.707	111	50 - 200	0.0010	+/-0.50	
1,4-Difluorobenzene	668607	5.659	602503	5.648	111	50 - 200	-0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	295945	9.399	254574	9.399	116	50 - 200	0.0000	+/-0.50	
LCS (BFH0706-BS1)		(Solid)	Lab File ID: V208301703LCSSG.D			Analyzed: 08/30/17 07:57			
Pentafluorobenzene	373419	5.269	342682	5.269	109	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	598826	7.706	537424	7.707	111	50 - 200	0.0010	+/-0.50	
1,4-Difluorobenzene	668607	5.659	602503	5.648	111	50 - 200	-0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	295945	9.399	254574	9.399	116	50 - 200	0.0000	+/-0.50	
Initial Cal Check (SFH0366-ICV1)		(Water)	Lab File ID: V208301703G.D			Analyzed: 08/30/17 07:57			
Pentafluorobenzene	373419	5.269	342682	5.269	109	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	598826	7.706	537424	7.707	111	50 - 200	0.0010	+/-0.50	
1,4-Difluorobenzene	668607	5.659	602503	5.648	111	50 - 200	-0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	295945	9.399	254574	9.399	116	50 - 200	0.0000	+/-0.50	
LCS Dup (BFH0705-BSD1)		(Water)	Lab File ID: V208301705G.D			Analyzed: 08/30/17 08:38			
Pentafluorobenzene	365478	5.267	342682	5.269	107	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	583538	7.704	537424	7.707	109	50 - 200	0.0030	+/-0.50	
1,4-Difluorobenzene	644374	5.657	602503	5.648	107	50 - 200	-0.0090	+/-0.50	
1,4-Dichlorobenzene-d4	284913	9.396	254574	9.399	112	50 - 200	0.0030	+/-0.50	
LCS Dup (BFH0706-BSD1)		(Solid)	Lab File ID: V208301705LCSDSG.D			Analyzed: 08/30/17 08:38			
Pentafluorobenzene	365478	5.267	342682	5.269	107	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	583538	7.704	537424	7.707	109	50 - 200	0.0030	+/-0.50	
1,4-Difluorobenzene	644374	5.657	602503	5.648	107	50 - 200	-0.0090	+/-0.50	
1,4-Dichlorobenzene-d4	284913	9.396	254574	9.399	112	50 - 200	0.0030	+/-0.50	
Blank (BFH0705-BLK1)		(Water)	Lab File ID: V208301709G.D			Analyzed: 08/30/17 10:00			
Pentafluorobenzene	351663	5.267	342682	5.269	103	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	573494	7.705	537424	7.707	107	50 - 200	0.0020	+/-0.50	
1,4-Difluorobenzene	626255	5.658	602503	5.648	104	50 - 200	-0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	282845	9.397	254574	9.399	111	50 - 200	0.0020	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.
Client: Anchor OEA, LLC
Sequence: SFH0366

SDG: 17H0298
Project: SCVA Area Z Remediation
Instrument: NT2
Calibration: AH00025

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (BFH0706-BLK1)		(Solid)	Lab File ID: V208301709MBSG.D			Analyzed: 08/30/17 10:00			
Pentafluorobenzene	351663	5.267	342682	5.269	103	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	573494	7.705	537424	7.707	107	50 - 200	0.0020	+/-0.50	
1,4-Difluorobenzene	626255	5.658	602503	5.648	104	50 - 200	-0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	282845	9.397	254574	9.399	111	50 - 200	0.0020	+/-0.50	
SVCA-TripBlank-170823 (17H0298-14)		(Water)	Lab File ID: V208301710G.D			Analyzed: 08/30/17 10:21			
Pentafluorobenzene	353962	5.268	342682	5.269	103	50 - 200	0.0010	+/-0.50	
Chlorobenzene-d5	561341	7.705	537424	7.707	104	50 - 200	0.0020	+/-0.50	
1,4-Difluorobenzene	620271	5.658	602503	5.648	103	50 - 200	-0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	277808	9.397	254574	9.399	109	50 - 200	0.0020	+/-0.50	
SVCA-MW-4-170824 (17H0298-12)		(Water)	Lab File ID: V208301714G.D			Analyzed: 08/30/17 11:42			
Pentafluorobenzene	329300	5.267	342682	5.269	96	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	545654	7.704	537424	7.707	102	50 - 200	0.0030	+/-0.50	
1,4-Difluorobenzene	606279	5.657	602503	5.648	101	50 - 200	-0.0090	+/-0.50	
1,4-Dichlorobenzene-d4	273422	9.396	254574	9.399	107	50 - 200	0.0030	+/-0.50	
SVCA-TP-100-0-4-170823 (17H0298-01)		(Solid)	Lab File ID: V208301718G.D			Analyzed: 08/30/17 13:04			
Pentafluorobenzene	339278	5.267	342682	5.269	99	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	573423	7.705	537424	7.707	107	50 - 200	0.0020	+/-0.50	
1,4-Difluorobenzene	613306	5.658	602503	5.648	102	50 - 200	-0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	286299	9.397	254574	9.399	112	50 - 200	0.0020	+/-0.50	
SVCA-TP-101-0-2-170823 (17H0298-03)		(Solid)	Lab File ID: V208301719G.D			Analyzed: 08/30/17 13:25			
Pentafluorobenzene	329690	5.267	342682	5.269	96	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	558114	7.705	537424	7.707	104	50 - 200	0.0020	+/-0.50	
1,4-Difluorobenzene	596869	5.658	602503	5.648	99	50 - 200	-0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	278560	9.397	254574	9.399	109	50 - 200	0.0020	+/-0.50	
SVCA-TP-102-0-2-170823 (17H0298-06)		(Solid)	Lab File ID: V208301720G.D			Analyzed: 08/30/17 13:45			
Pentafluorobenzene	337022	5.267	342682	5.269	98	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	566468	7.704	537424	7.707	105	50 - 200	0.0030	+/-0.50	
1,4-Difluorobenzene	593858	5.657	602503	5.648	99	50 - 200	-0.0090	+/-0.50	
1,4-Dichlorobenzene-d4	284345	9.397	254574	9.399	112	50 - 200	0.0020	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY
NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0366

Instrument: NT2

Calibration: AH00025

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
SVCA-TP-103-0-2-170823 (17H0298-09)		(Solid)	Lab File ID: V208301721G.D			Analyzed: 08/30/17 14:06			
Pentafluorobenzene	340283	5.267	342682	5.269	99	50 - 200	0.0020	+/-0.50	
Chlorobenzene-d5	584718	7.704	537424	7.707	109	50 - 200	0.0030	+/-0.50	
1,4-Difluorobenzene	603265	5.657	602503	5.648	100	50 - 200	-0.0090	+/-0.50	
1,4-Dichlorobenzene-d4	296884	9.397	254574	9.399	117	50 - 200	0.0020	+/-0.50	



HOLDING TIME SUMMARY

Analysis: NWTPhg

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
SVCA-TP-100-0-4-170823 17H0298-01	08/23/17 09:46	08/25/17 09:46	08/30/17 09:18	6	14	08/30/17 13:04	7	14	
SVCA-TP-101-0-2-170823 17H0298-03	08/23/17 10:59	08/25/17 09:46	08/30/17 09:18	6	14	08/30/17 13:25	7	14	
SVCA-TP-102-0-2-170823 17H0298-06	08/23/17 13:02	08/25/17 09:46	08/30/17 09:18	6	14	08/30/17 13:45	7	14	
SVCA-TP-103-0-2-170823 17H0298-09	08/23/17 14:45	08/25/17 09:46	08/30/17 09:18	6	14	08/30/17 14:06	7	14	
SVCA-MW-4-170824 17H0298-12	08/24/17 17:00	08/25/17 09:46	08/30/17 09:11	5	14	08/30/17 11:42	6	14	
SVCA-TripBlank-170823 17H0298-14	08/23/17 00:00	08/25/17 09:46	08/30/17 09:11	7	14	08/30/17 10:21	7	14	

* Indicates hold time exceedance.



METHOD DETECTION AND REPORTING LIMITS

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Instrument: NT2

Analyte	MDL	RL	Units
Gasoline Range Organics (Tol-Nap)	2500	5000	ug/kg



METHOD DETECTION AND REPORTING LIMITS

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Water

Instrument: NT2

Analyte	MDL	RL	Units
Gasoline Range Organics (Tol-Nap)	13.6	100	ug/L



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-01 SDG: 17H0298
 Sampled: 08/23/17 09:46 Prepared: 08/28/17 10:20 File ID: 17083008.D
 % Solids: 91.07 Preparation: EPA 3546 (Microwave) Analyzed: 08/30/17 11:21
 Batch: BFH0597 Sequence: SFH0356 Initial/Final: 10 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AH00054
 Cleanups: Silica Gel, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	22.2		2.57	5.49
	Motor Oil Range Organics (C24-C38)	1	174		3.28	11.0

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	24.706	25.0	101	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170830_b\17083008.D

Date: 30-AUG-2017 11:21

Client ID:

Sample Info: 17H0298-01

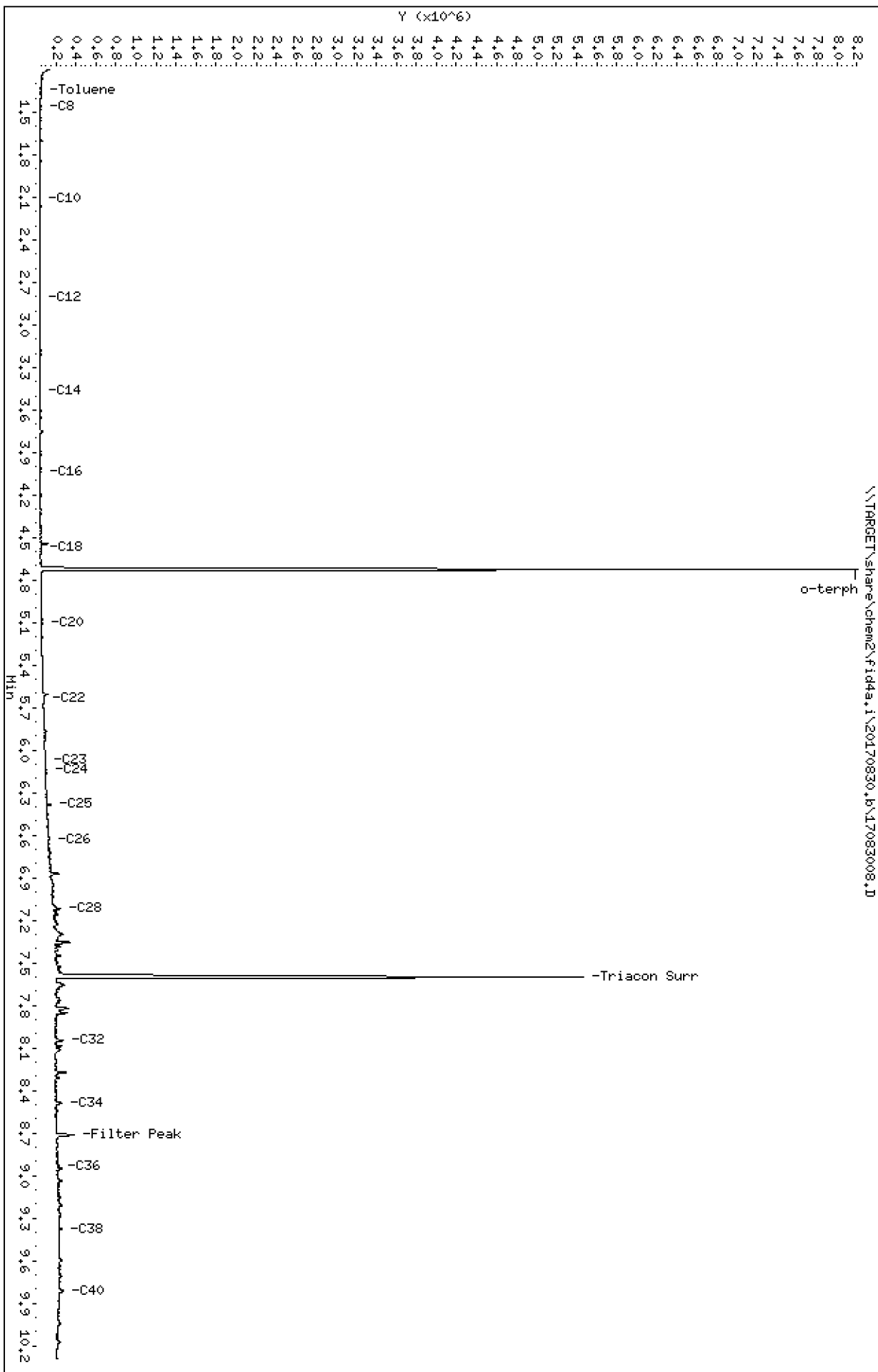
Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25

Page 1



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170830.b/17083008.D
Method: 20170830.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 08/30/2017
Macro: 16-AUG-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:16-AUG-2017 M.Oil:16-AUG-2017

ARI ID: 17H0298-01
Client ID:
Injection: 30-AUG-2017 11:21
Dilution Factor: 1

FID:4A RESULTS

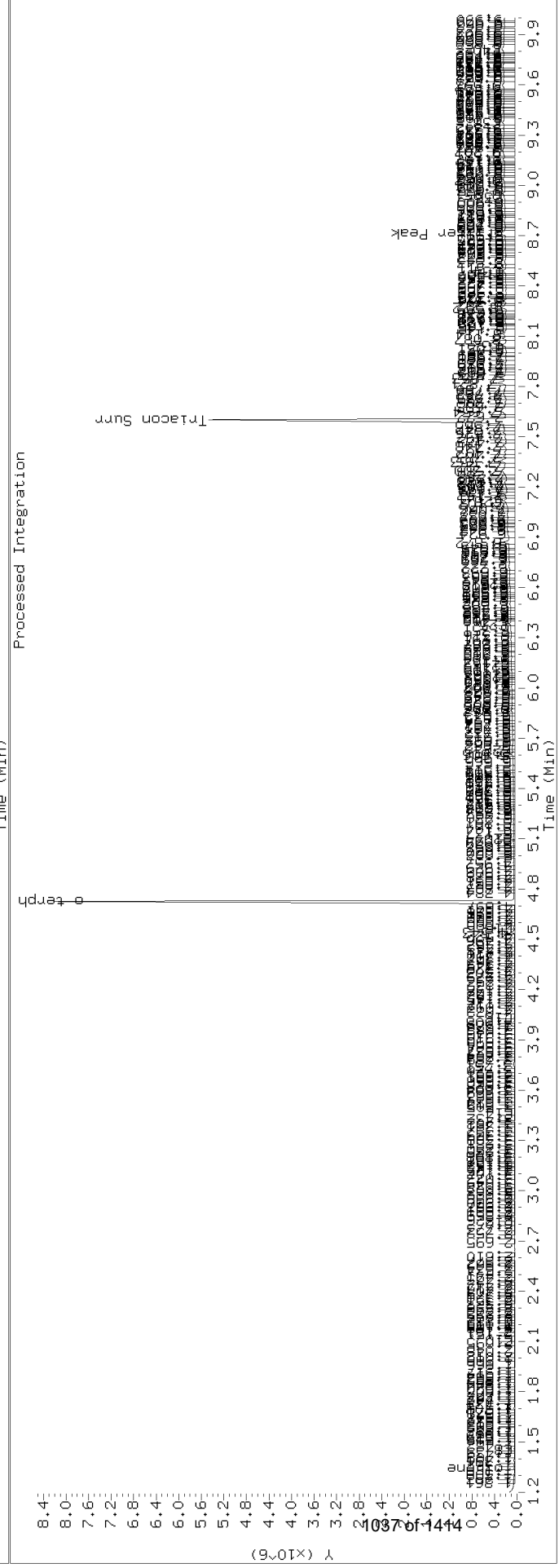
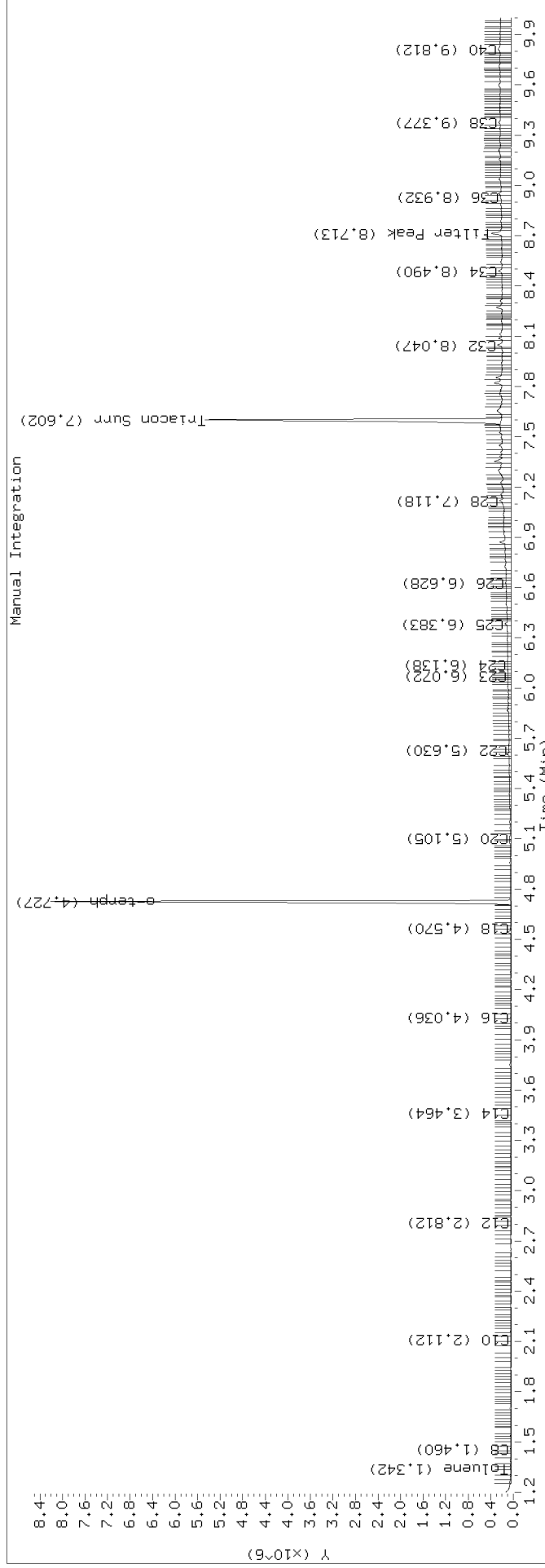
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.342	-0.001	11269	9732	WATPHG	(Tol-C12)	242415	161.6
C8	1.460	0.009	10541	8870	WATPHD	(C12-C24)	3164811	201.9
C10	2.112	0.001	2198	2065	WATPHM	(C24-C38)	29375667	1585.4
C12	2.812	-0.003	1604	1245	AK102	(C10-C25)	3728701	206.0
C14	3.464	0.006	5705	6034				
C16	4.036	0.002	9843	9062	OR.DIES	(C10-C28)	8869444	487.8
C18	4.570	-0.000	17529	14062				
C20	5.105	0.001	23132	38016				
C22	5.630	-0.000	42451	34966				
C24	6.138	-0.001	64924	66066				
C25	6.383	-0.003	109459	146721				
C26	6.628	-0.003	95557	124701				
C28	7.118	0.004	198816	280174				
C32	8.047	-0.001	235562	443673				
C34	8.490	-0.003	215454	358629				
Filter Peak	8.713	0.001	345325	517030				
C36	8.932	-0.004	192971	316650				
C38	9.377	0.001	213790	521864				
C40	9.812	-0.003	227543	577886				
o-terph	4.727	-0.002	8155130	5244543				
Triacon Surr	7.602	-0.004	5259076	4417436	NAS DIES	(C10-C24)	3218533	178.2

Range Times: NW Diesel(2.815 - 6.139) AK102(2.11 - 6.39) Jet A(2.11 - 4.57)
NW M.Oil(6.14 - 9.38) AK103(6.39 - 8.94) OR Diesel(2.11 - 7.11)

Surrogate	Area	Amount
o-Terphenyl	5244543	228.1 M
Triacontane	4417436	172.8 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	22995.5	16-AUG-2017
Triacon Surr	25564.0	16-AUG-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15673.0	16-AUG-2017
Motor Oil	18529.0	16-AUG-2017
AK102	18101.0	16-AUG-2017
OR Diesel	18182.0	16-AUG-2017
NAS Diesel	18058.0	16-AUG-2017





Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-02 SDG: 17H0298
 Sampled: 08/23/17 09:46 Prepared: 08/28/17 10:15 File ID: 17082819.D
 % Solids: 91.07 Preparation: EPA 3546 (Microwave) Analyzed: 08/28/17 18:18
 Batch: BFH0596 Sequence: SFH0319 Initial/Final: 10.07 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AH00054

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	14.5		2.55	5.45
	Motor Oil Range Organics (C24-C38)	1	130		3.26	10.9

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	24.535	19.5	79.4	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170828.b\17082819.D

Date: 28-AUG-2017 18:18

Client ID:

Sample Info: 17H0298-02

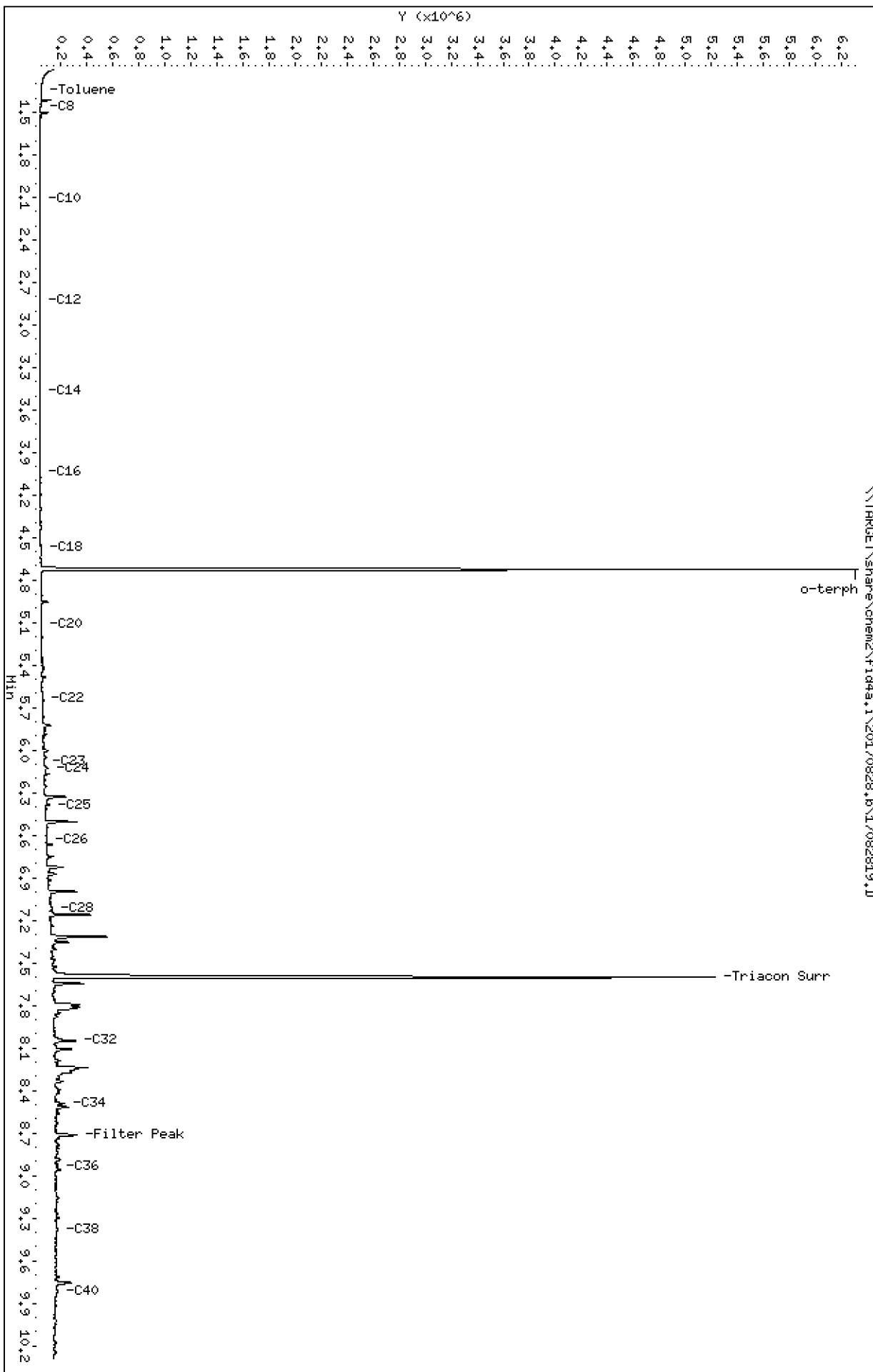
Column Phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25

Page 1



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170828.b/17082819.D
Method: 20170828.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 08/29/2017
Macro: 16-AUG-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:16-AUG-2017 M.Oil:16-AUG-2017

ARI ID: 17H0298-02
Client ID:
Injection: 28-AUG-2017 18:18
Dilution Factor: 1

FID:4A RESULTS

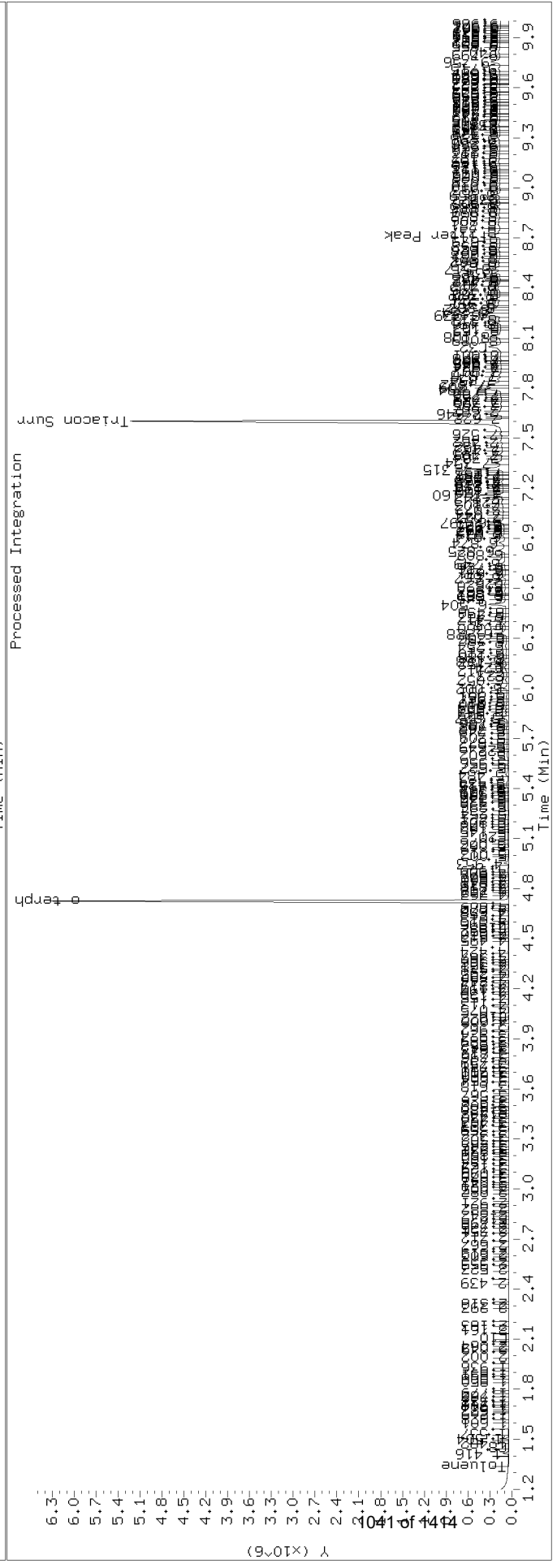
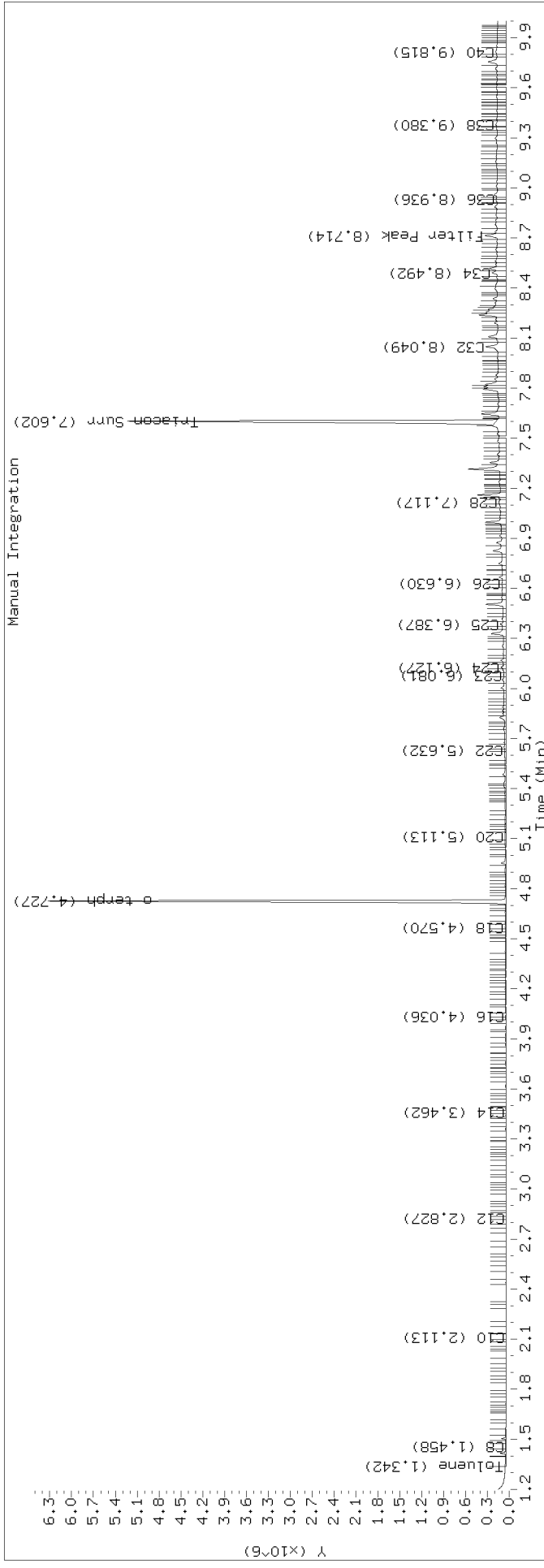
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.342	0.001	13308	33436	WATPHG	(Tol-C12)	196760	131.2
C8	1.458	0.010	6832	10315	WATPHD	(C12-C24)	2086969	133.2
C10	2.113	0.001	1316	989	WATPHM	(C24-C38)	22165401	1196.3
C12	2.827	0.010	1425	1040	AK102	(C10-C25)	2604052	143.9
C14	3.462	0.004	2422	2278				
C16	4.036	0.002	3795	4035	OR.DIES	(C10-C28)	6275937	345.2
C18	4.570	0.000	11692	11289				
C20	5.113	0.010	15771	32163				
C22	5.632	0.001	19458	16272				
C24	6.127	-0.012	67648	75304				
C25	6.387	0.000	77284	91536				
C26	6.630	-0.000	54121	71197				
C28	7.117	0.003	98991	151066				
C32	8.049	0.000	276227	560318				
C34	8.492	-0.001	190374	288899				
Filter Peak	8.714	0.000	283299	418782				
C36	8.936	-0.000	132368	97639				
C38	9.380	0.001	139400	253233				
C40	9.815	0.000	141771	328422				
o-terph	4.727	0.000	6280512	4109480				
Triacon Surr	7.602	-0.002	5057248	4046671	NAS DIES	(C10-C24)	2113969	117.1

Range Times: NW Diesel(2.816 - 6.139) AK102(2.11 - 6.39) Jet A(2.11 - 4.57)
NW M.Oil(6.14 - 9.38) AK103(6.39 - 8.94) OR Diesel(2.11 - 7.11)

Surrogate	Area	Amount
o-Terphenyl	4109480	178.7
Triacotane	4046671	158.3 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	22995.5	16-AUG-2017
Triacon Surr	25564.0	16-AUG-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15673.0	16-AUG-2017
Motor Oil	18529.0	16-AUG-2017
AK102	18101.0	16-AUG-2017
OR Diesel	18182.0	16-AUG-2017
NAS Diesel	18058.0	16-AUG-2017





Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-03 SDG: 17H0298
 Sampled: 08/23/17 10:59 Prepared: 08/28/17 10:20 File ID: 17083009.D
 % Solids: 95.13 Preparation: EPA 3546 (Microwave) Analyzed: 08/30/17 11:44
 Batch: BFH0597 Sequence: SFH0356 Initial/Final: 10 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AH00054
 Cleanups: Silica Gel, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	29.2		2.46	5.26
	Motor Oil Range Organics (C24-C38)	1	36.9		3.14	10.5

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	23.652	22.3	94.4	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170830_b\17083009.D

Date: 30-AUG-2017 11:44

Client ID:

Sample Info: 17H0298-03

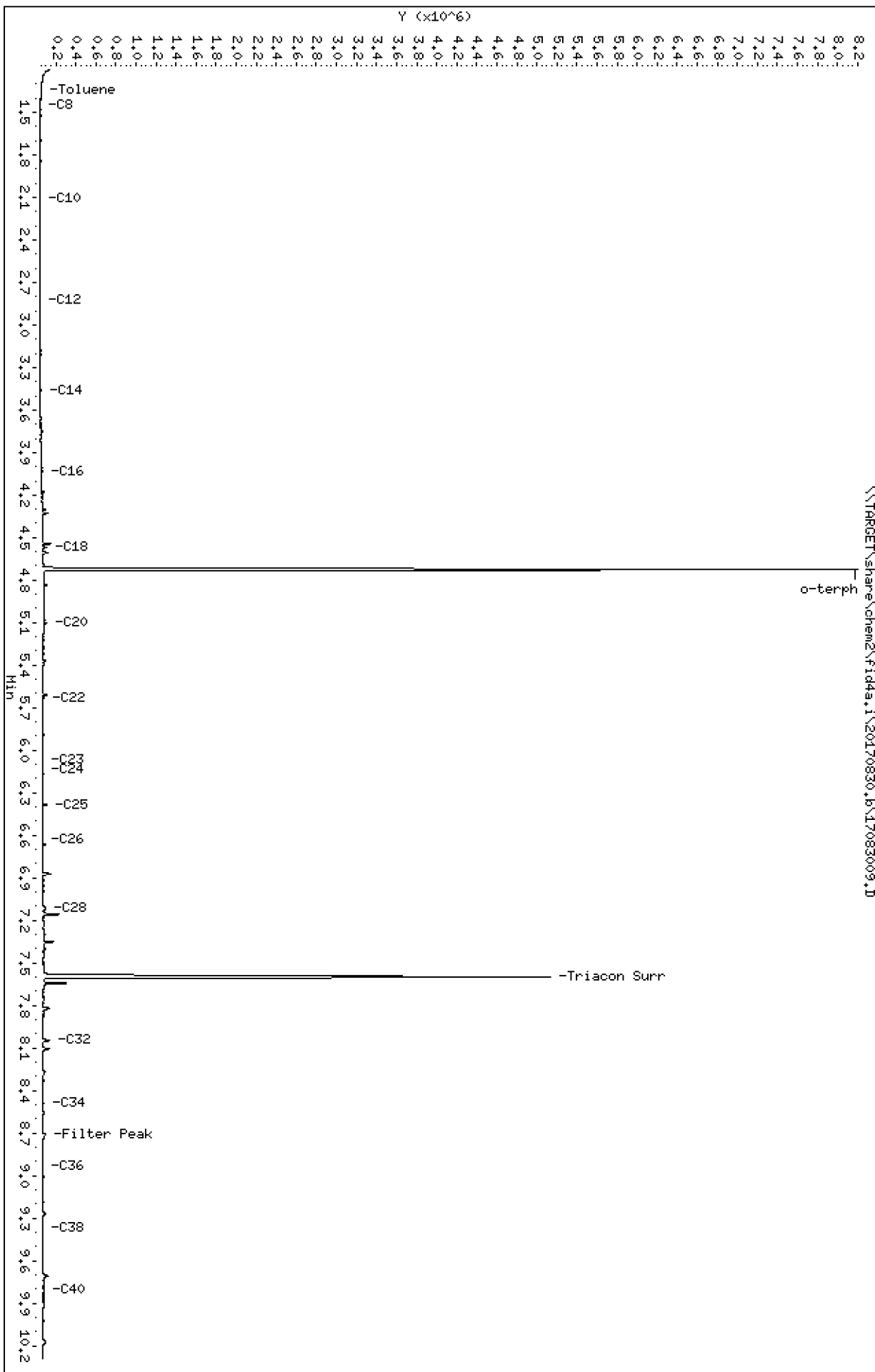
Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25

Page 1



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170830.b/17083009.D
Method: 20170830.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 08/30/2017
Macro: 16-AUG-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:16-AUG-2017 M.Oil:16-AUG-2017

ARI ID: 17H0298-03
Client ID:
Injection: 30-AUG-2017 11:44
Dilution Factor: 1

FID:4A RESULTS

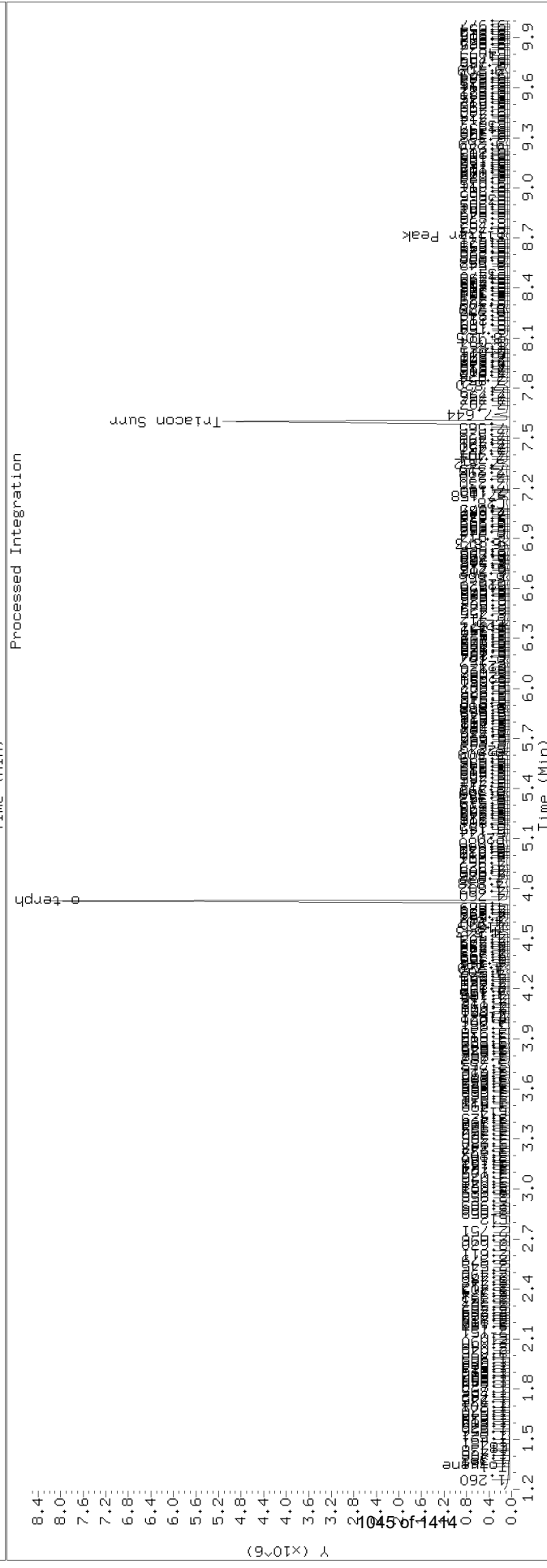
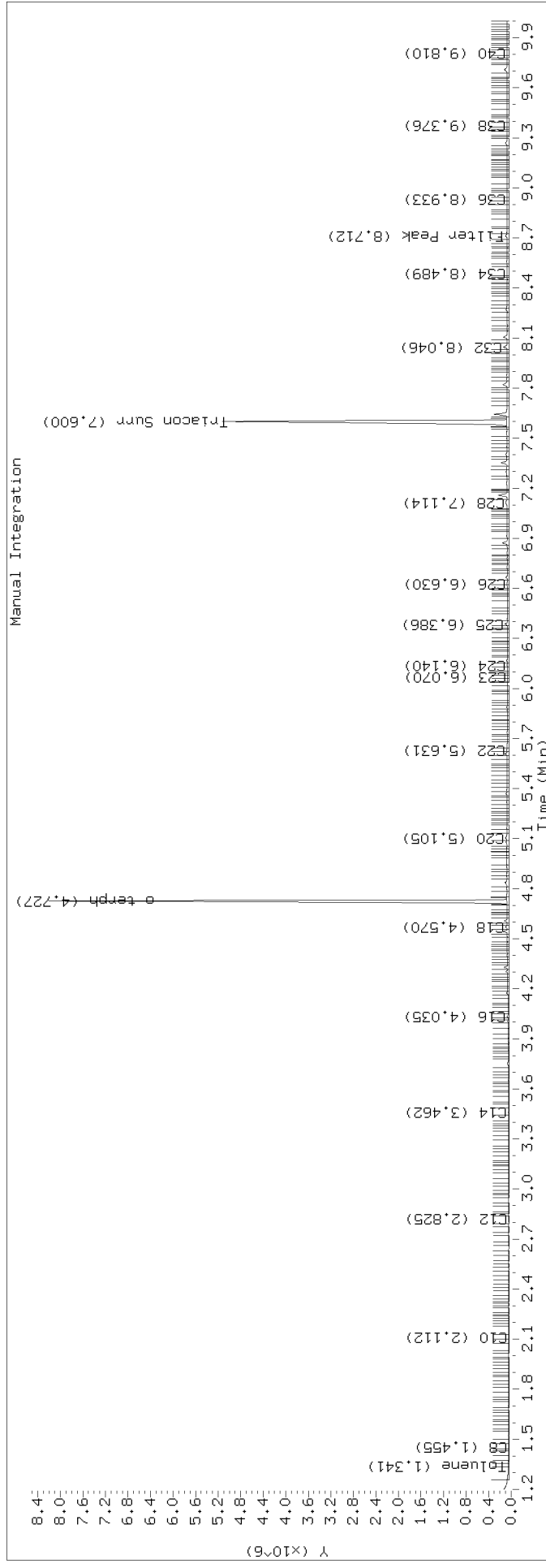
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.341	-0.002	12669	14091	WATPHG	(Tol-C12)	196874	131.2
C8	1.455	0.004	6094	9257	WATPHD	(C12-C24)	4352477	277.7
C10	2.112	0.000	2562	2019	WATPHM	(C24-C38)	6503184	351.0
C12	2.825	0.009	4696	3391	AK102	(C10-C25)	4591745	253.7
C14	3.462	0.004	10674	10590				
C16	4.035	0.001	33105	28993	OR.DIES	(C10-C28)	6235441	342.9
C18	4.570	0.000	63946	67888				
C20	5.105	0.000	63937	113262				
C22	5.631	0.001	42382	47052				
C24	6.140	0.001	32717	38209				
C25	6.386	0.000	67360	72890				
C26	6.630	-0.002	33346	51424				
C28	7.114	-0.001	53870	137140				
C32	8.046	-0.002	92507	123192				
C34	8.489	-0.004	36358	101270				
Filter Peak	8.712	-0.001	59512	86694				
C36	8.933	-0.003	31119	37848				
C38	9.376	-0.001	32658	52687				
C40	9.810	-0.006	36476	75669				
o-terph	4.727	-0.002	8121525	4884664				
Triacon Surr	7.600	-0.005	5045030	4392223	NAS DIES	(C10-C24)	4391298	243.2

Range Times: NW Diesel(2.815 - 6.139) AK102(2.11 - 6.39) Jet A(2.11 - 4.57)
NW M.Oil(6.14 - 9.38) AK103(6.39 - 8.94) OR Diesel(2.11 - 7.11)

Surrogate	Area	Amount
o-Terphenyl	4884664	212.4 M
Triacotane	4392223	171.8 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	22995.5	16-AUG-2017
Triacon Surr	25564.0	16-AUG-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15673.0	16-AUG-2017
Motor Oil	18529.0	16-AUG-2017
AK102	18101.0	16-AUG-2017
OR Diesel	18182.0	16-AUG-2017
NAS Diesel	18058.0	16-AUG-2017





Form I
ORGANIC ANALYSIS DATA SHEET
NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-04 SDG: 17H0298
 Sampled: 08/23/17 10:59 Prepared: 08/28/17 10:15 File ID: 17082816.D
 % Solids: 95.13 Preparation: EPA 3546 (Microwave) Analyzed: 08/28/17 17:10
 Batch: BFH0596 Sequence: SFH0319 Initial/Final: 10.14 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AH00054

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	30.8		2.43	5.18
	Motor Oil Range Organics (C24-C38)	1	56.0		3.10	10.4

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	23.325	17.0	72.7	50 - 150	

Data File: \\TARGET\share\chem2\fid4a,1\20170828,8\17082816.D

Date: 28-AUG-2017 17:10

Client ID:

Sample Info: 17H0298-04

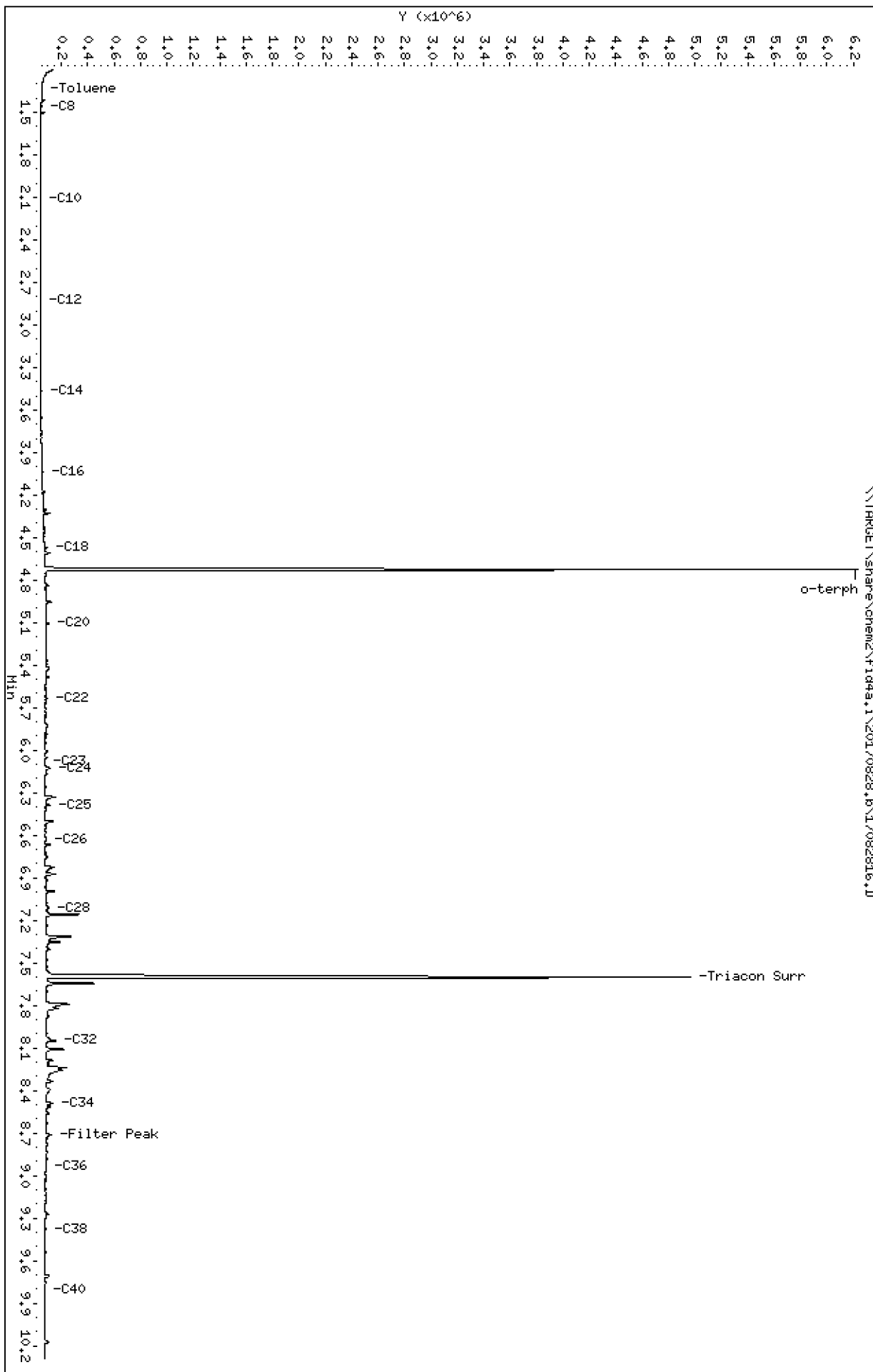
Column Phase: RTX-1

Instrument: fid4a,1

Operator: ML

Column diameter: 0.25

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Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170828.b/17082816.D
Method: 20170828.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 08/29/2017
Macro: 16-AUG-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:16-AUG-2017 M.Oil:16-AUG-2017

ARI ID: 17H0298-04
Client ID:
Injection: 28-AUG-2017 17:10
Dilution Factor: 1

FID:4A RESULTS

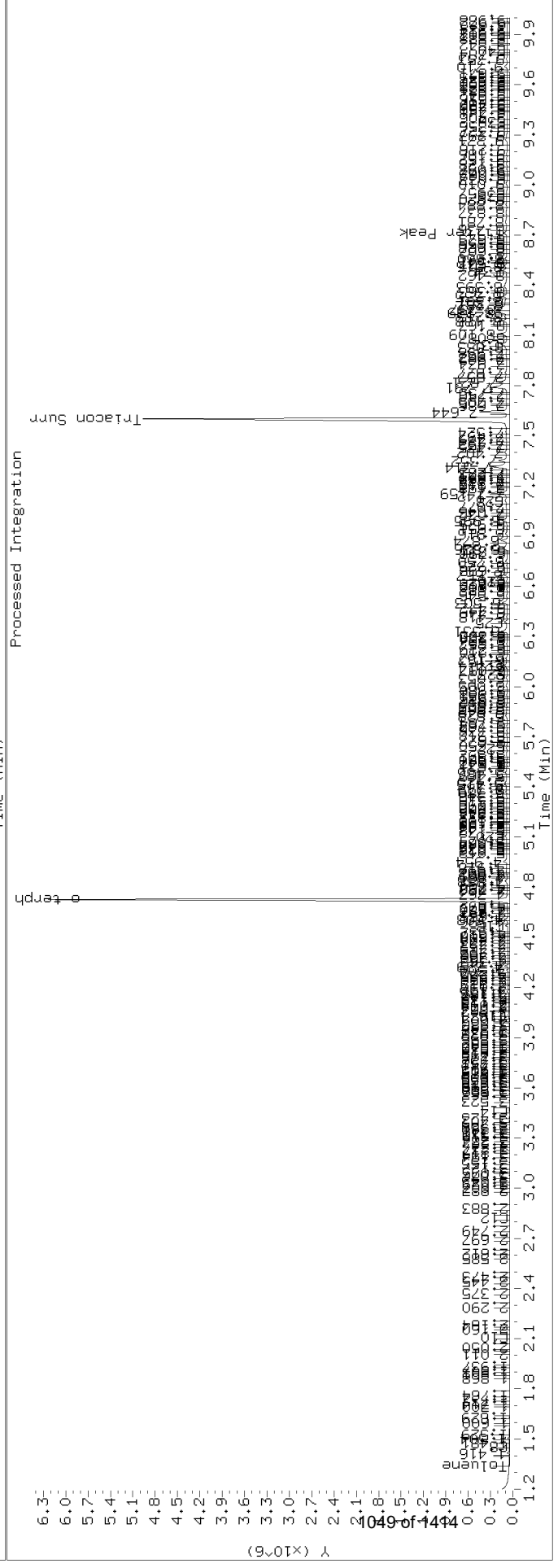
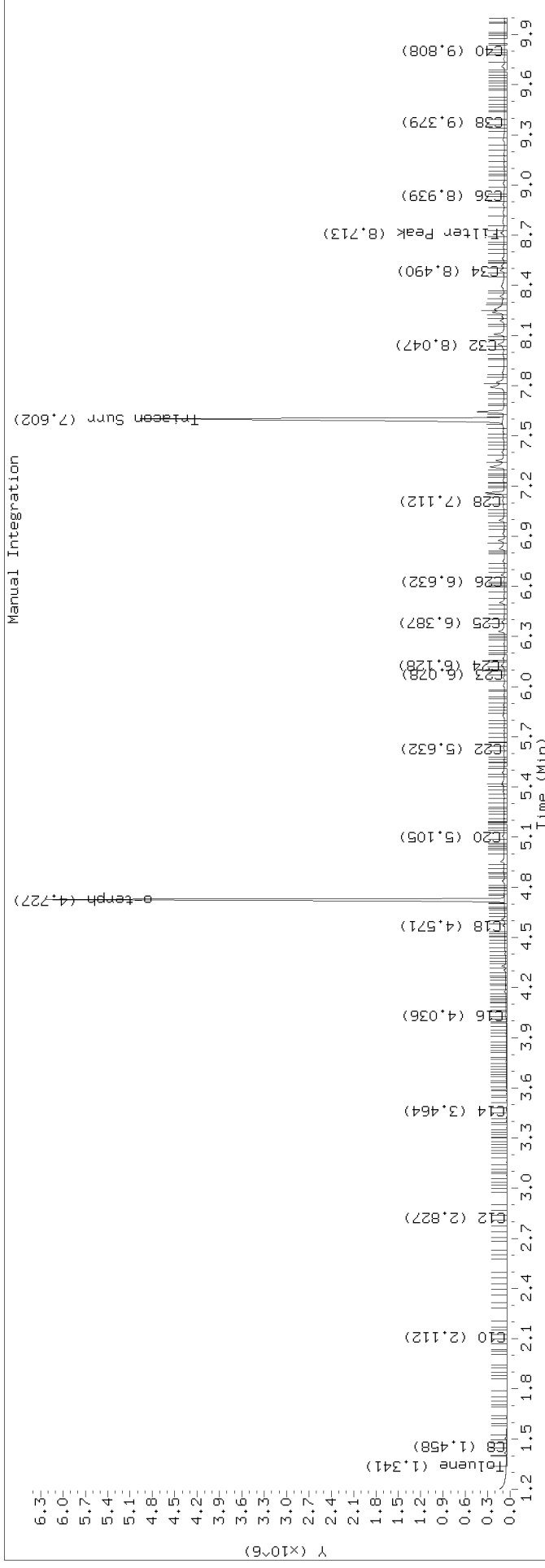
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.341	0.000	10788	29126	WATPHG	(Tol-C12)	129519	86.3
C8	1.458	0.010	6941	9263	WATPHD	(C12-C24)	4653600	296.9
C10	2.112	0.000	1386	897	WATPHM	(C24-C38)	10009546	540.2
C12	2.827	0.010	1895	1771	AK102	(C10-C25)	5097119	281.6
C14	3.464	0.005	7011	7418				
C16	4.036	0.002	24364	23152	OR.DIES	(C10-C28)	7395285	406.7
C18	4.571	0.001	54218	90130				
C20	5.105	0.001	61886	108487				
C22	5.632	0.002	47863	65509				
C24	6.128	-0.011	75536	102467				
C25	6.387	0.000	71264	87616				
C26	6.632	0.001	41607	62897				
C28	7.112	-0.002	59382	114753				
C32	8.047	-0.001	115803	161312				
C34	8.490	-0.003	90776	117721				
Filter Peak	8.713	-0.000	81352	123423				
C36	8.939	0.003	39116	34776				
C38	9.379	0.000	36930	69050				
C40	9.808	-0.006	34872	35330				
o-terph	4.727	0.000	6158486	3762317				
Triacon Surr	7.602	-0.003	4866361	4034108	NAS DIES	(C10-C24)	4666997	258.4

Range Times: NW Diesel(2.816 - 6.139) AK102(2.11 - 6.39) Jet A(2.11 - 4.57)
NW M.Oil(6.14 - 9.38) AK103(6.39 - 8.94) OR Diesel(2.11 - 7.11)

Surrogate	Area	Amount
o-Terphenyl	3762317	163.6 M
Triacotane	4034108	157.8 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	22995.5	16-AUG-2017
Triacon Surr	25564.0	16-AUG-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15673.0	16-AUG-2017
Motor Oil	18529.0	16-AUG-2017
AK102	18101.0	16-AUG-2017
OR Diesel	18182.0	16-AUG-2017
NAS Diesel	18058.0	16-AUG-2017





Form I
ORGANIC ANALYSIS DATA SHEET
NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-06 SDG: 17H0298
 Sampled: 08/23/17 13:02 Prepared: 08/28/17 10:20 File ID: 17083010.D
 % Solids: 95.38 Preparation: EPA 3546 (Microwave) Analyzed: 08/30/17 12:07
 Batch: BFH0597 Sequence: SFH0356 Initial/Final: 10 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AH00054
 Cleanups: Silica Gel, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	36.4		2.45	5.24
	Motor Oil Range Organics (C24-C38)	1	469		3.13	10.5

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	23.590	24.8	105	50 - 150	

Data File: \\TARGET\share\chem2\Fid4a.1\20170830_b\17083010.D

Date: 30-AUG-2017 12:07

Client ID:

Sample Info: 17H0298-06

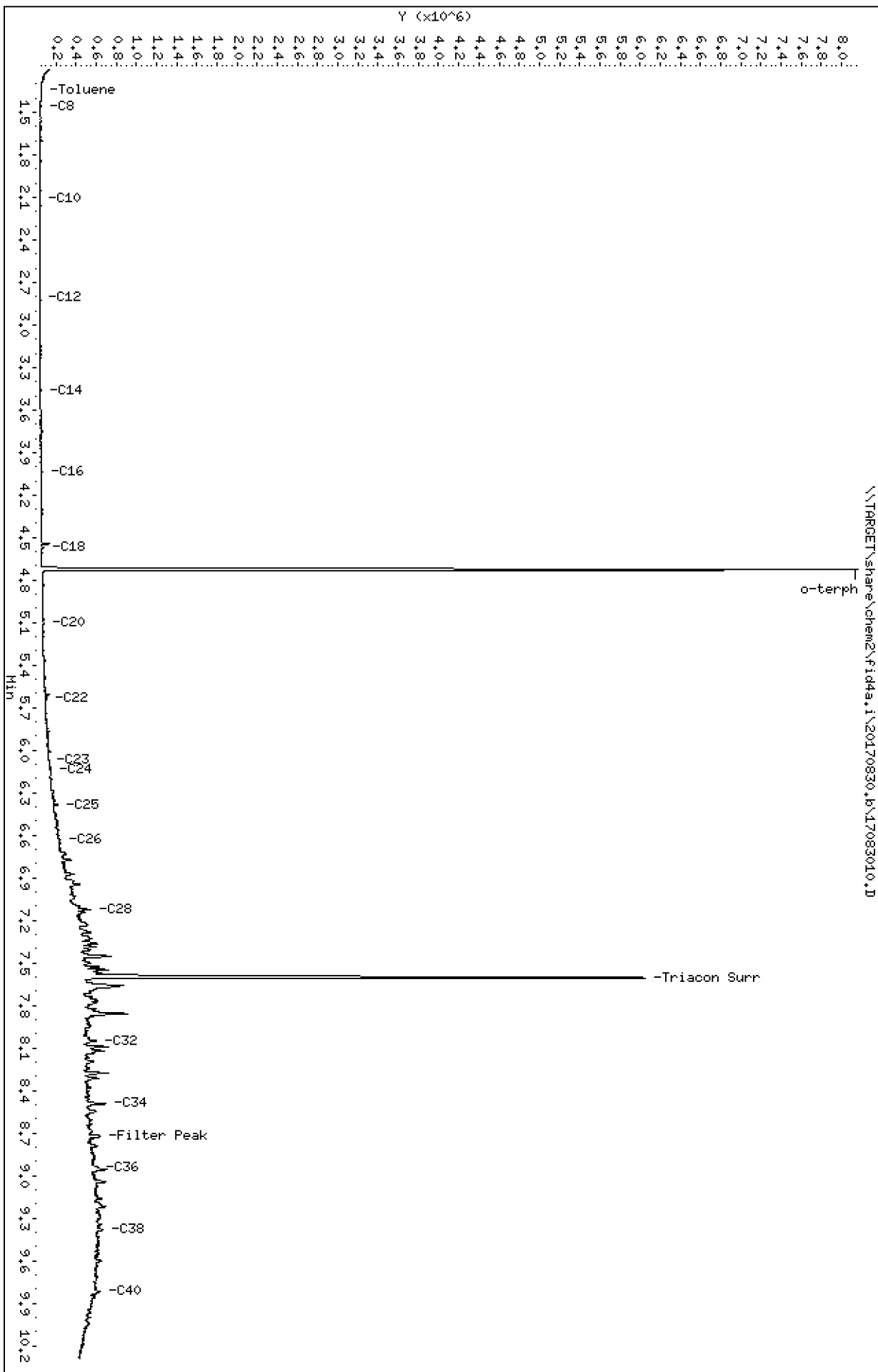
Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25

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Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170830.b/17083010.D
Method: 20170830.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 08/30/2017
Macro: 16-AUG-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:16-AUG-2017 M.Oil:16-AUG-2017

ARI ID: 17H0298-06
Client ID:
Injection: 30-AUG-2017 12:07
Dilution Factor: 1

FID:4A RESULTS

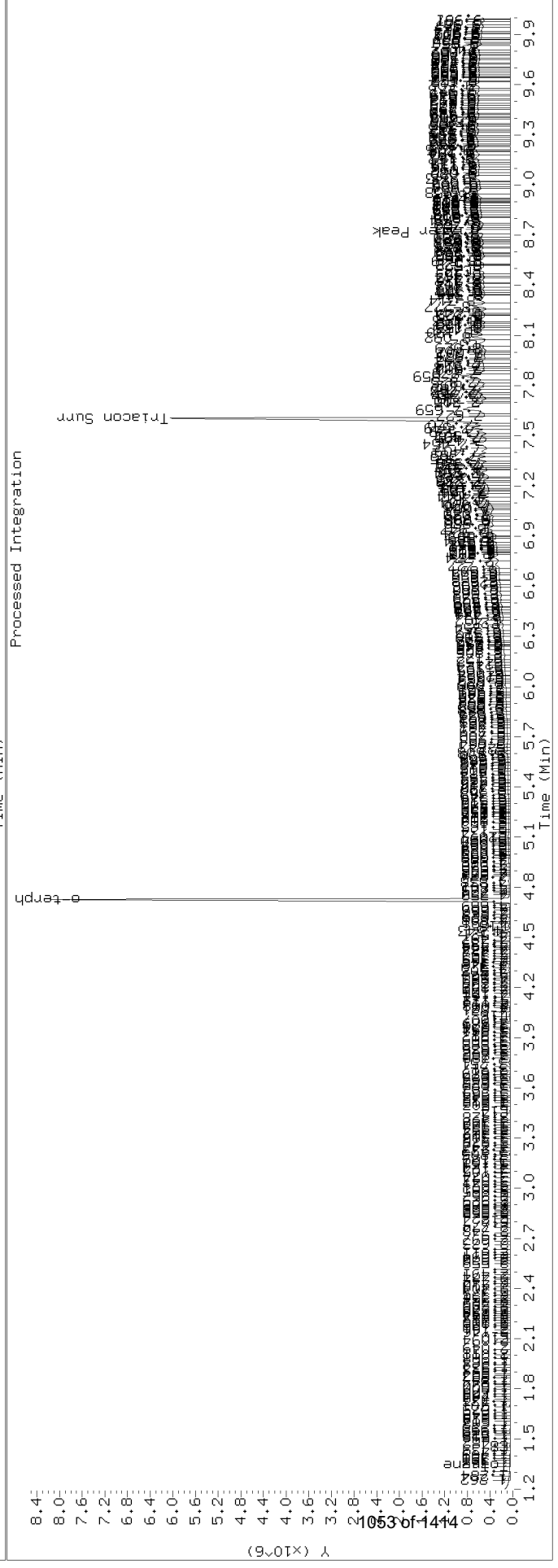
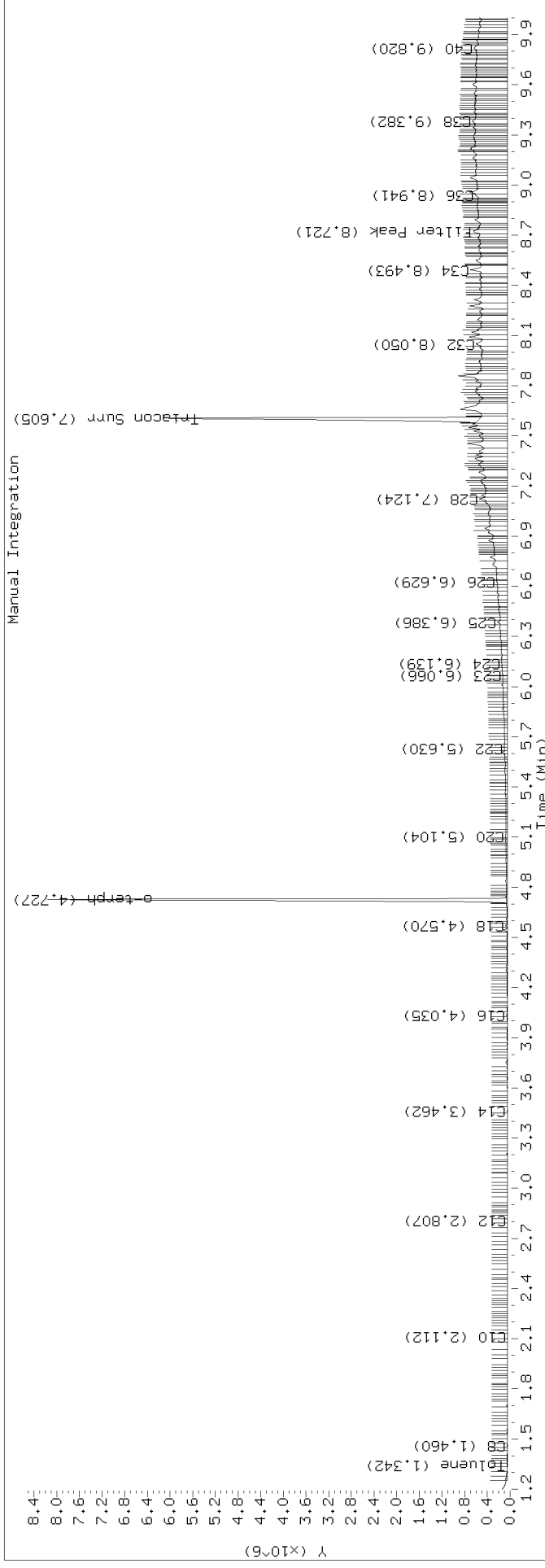
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.342	-0.001	17766	17349	WATPHG	(Tol-C12)	271075	180.7
C8	1.460	0.009	12336	11740	WATPHD	(C12-C24)	5437138	346.9
C10	2.112	0.000	2730	2257	WATPHM	(C24-C38)	82877121	4472.8
C12	2.807	-0.008	3228	2768	AK102	(C10-C25)	6515390	359.9
C14	3.462	0.004	15552	14778				
C16	4.035	0.002	25131	23448	OR.DIES	(C10-C28)	18733867	1030.4
C18	4.570	0.000	36261	30704				
C20	5.104	0.000	44400	70993				
C22	5.630	0.000	62168	63099				
C24	6.139	-0.001	106231	97698				
C25	6.386	0.000	177140	240844				
C26	6.629	-0.002	200761	262774				
C28	7.124	0.009	500577	650625				
C32	8.050	0.002	559946	1127826				
C34	8.493	0.000	654365	1519995				
Filter Peak	8.721	0.008	605913	972140				
C36	8.941	0.005	573824	766660				
C38	9.382	0.005	624351	1018928				
C40	9.820	0.005	595569	997782				
o-terph	4.727	-0.002	8099297	5450889				
Triacon Surr	7.605	0.000	5515234	4832318	NAS DIES	(C10-C24)	5494027	304.2

Range Times: NW Diesel(2.815 - 6.139) AK102(2.11 - 6.39) Jet A(2.11 - 4.57)
NW M.Oil(6.14 - 9.38) AK103(6.39 - 8.94) OR Diesel(2.11 - 7.11)

Surrogate	Area	Amount
o-Terphenyl	5450889	237.0 M
Triacotane	4832318	189.0 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	22995.5	16-AUG-2017
Triacon Surr	25564.0	16-AUG-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15673.0	16-AUG-2017
Motor Oil	18529.0	16-AUG-2017
AK102	18101.0	16-AUG-2017
OR Diesel	18182.0	16-AUG-2017
NAS Diesel	18058.0	16-AUG-2017





Form I
ORGANIC ANALYSIS DATA SHEET
NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-07 SDG: 17H0298
 Sampled: 08/23/17 13:02 Prepared: 08/28/17 10:15 File ID: 17082820.D
 % Solids: 95.38 Preparation: EPA 3546 (Microwave) Analyzed: 08/28/17 18:42
 Batch: BFH0596 Sequence: SFH0319 Initial/Final: 10.21 g Wet / 5 mL
 Instrument: FID4 Column: RTX-1 Calibration: AH00054

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	65.4		12.0	25.7
	Motor Oil Range Organics (C24-C38)	1	889		15.4	51.3

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	23.105	21.8	94.2	50 - 150	

Data File: \\TARGET\share\chem2\fid4a,1\20170828,b\17082820.D

Date: 28-AUG-2017 18:42

Client ID:

Sample Info: 17H0298-07

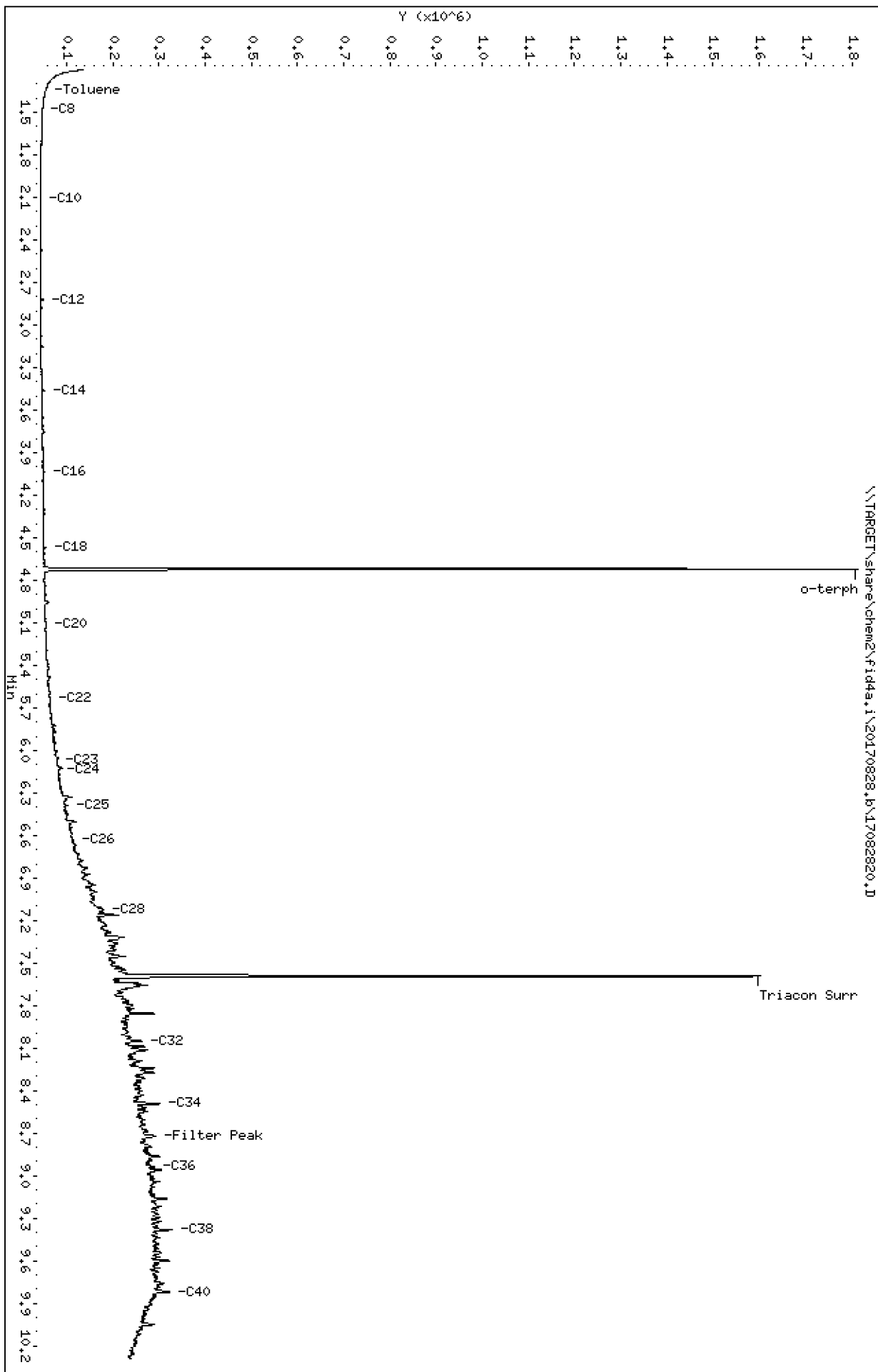
Column phase: RTX-1

Instrument: fid4a,1

Operator: ML

Column diameter: 0.25

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Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170828.b/17082820.D
Method: 20170828.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 08/29/2017
Macro: 16-AUG-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:16-AUG-2017 M.Oil:16-AUG-2017

ARI ID: 17H0298-07
Client ID:
Injection: 28-AUG-2017 18:42
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.342	0.002	12116	35214	WATPHG	(Tol-C12)	92245	61.5
C8	1.480	0.032	4400	8626	WATPHD	(C12-C24)	1995049	127.3
C10	2.114	0.002	1111	656	WATPHM	(C24-C38)	32091534	1732.0
C12	2.824	0.008	5755	3428	AK102	(C10-C25)	2455157	135.6
C14	3.463	0.004	7858	8643				
C16	4.036	0.003	7728	9808	OR.DIES	(C10-C28)	6708694	369.0
C18	4.571	0.002	10884	13813				
C20	5.106	0.003	12413	23332				
C22	5.632	0.002	20504	19470				
C24	6.141	0.002	39908	35193				
C25	6.388	0.002	58637	80740				
C26	6.633	0.003	70806	55621				
C28	7.120	0.006	136384	178704				
C32	8.050	0.002	218552	380906				
C34	8.493	0.000	258855	392337				
Filter Peak	8.720	0.007	248540	626702				
C36	8.939	0.003	247504	393496				
C38	9.381	0.003	283903	441372				
C40	9.820	0.006	279662	560601				
o-terph	4.722	-0.004	1761759	975475				
Triacon Surr	7.594	-0.011	1385541	943771	NAS DIES	(C10-C24)	2006512	111.1

Range Times: NW Diesel(2.816 - 6.139) AK102(2.11 - 6.39) Jet A(2.11 - 4.57)
NW M.Oil(6.14 - 9.38) AK103(6.39 - 8.94) OR Diesel(2.11 - 7.11)

Surrogate	Area	Amount
o-Terphenyl	975475	42.4 M
Triacotane	943771	36.9 M

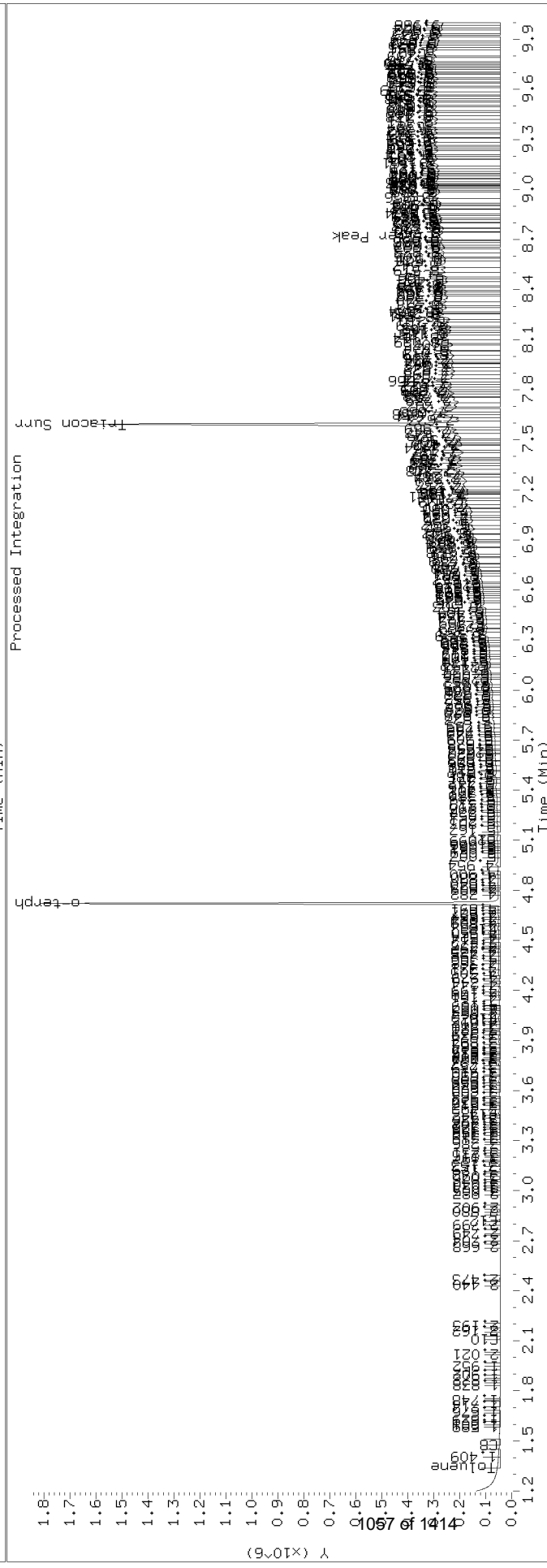
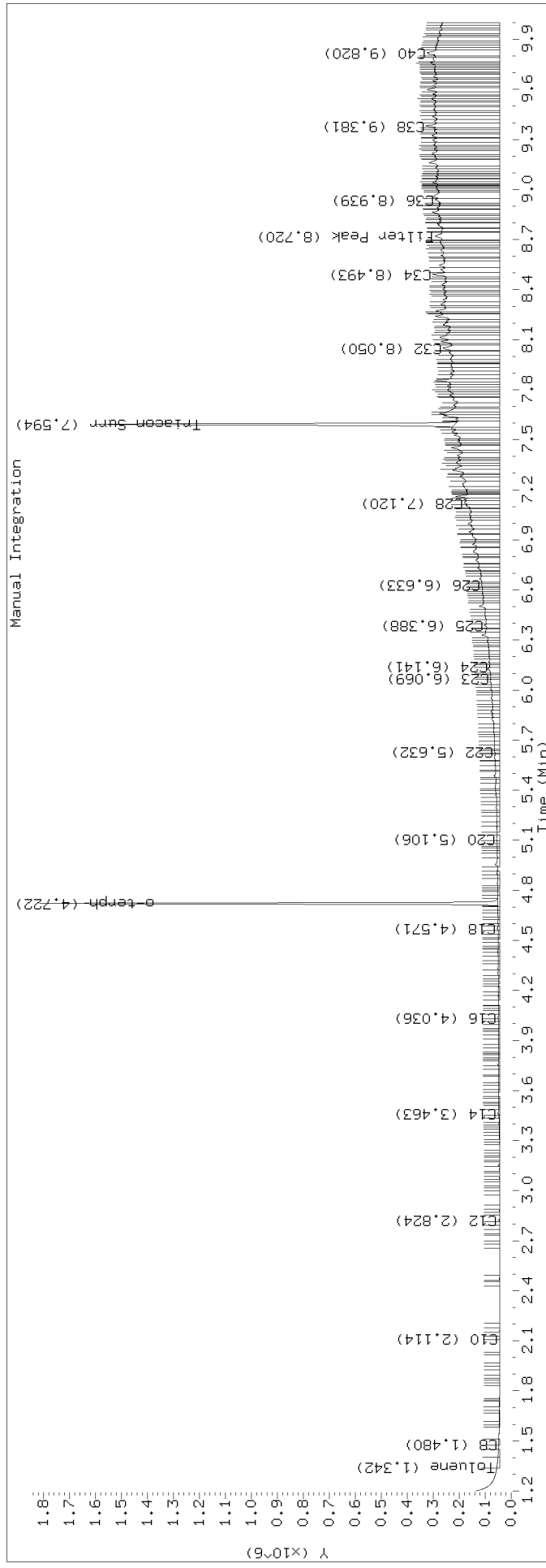
M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	22995.5	16-AUG-2017
Triacon Surr	25564.0	16-AUG-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15673.0	16-AUG-2017
Motor Oil	18529.0	16-AUG-2017
AK102	18101.0	16-AUG-2017
OR Diesel	18182.0	16-AUG-2017
NAS Diesel	18058.0	16-AUG-2017

TPH Manual Integrations Report

Datafile: FID4A, 20170828.b/17082820.D Injection: 28-AUG-2017 18:42

Lab ID:17H0298-07





Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-09 SDG: 17H0298
 Sampled: 08/23/17 14:45 Prepared: 08/28/17 10:20 File ID: 17083011.D
 % Solids: 91.53 Preparation: EPA 3546 (Microwave) Analyzed: 08/30/17 12:29
 Batch: BFH0597 Sequence: SFH0356 Initial/Final: 10 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AH00054
 Cleanups: Silica Gel, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	278	E	2.56	5.46
	Motor Oil Range Organics (C24-C38)	1	82.6		3.27	10.9

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	24.582	26.3	107	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170830_b\17083011.D

Date: 30-AUG-2017 12:29

Client ID:

Sample Info: 17H0298-09

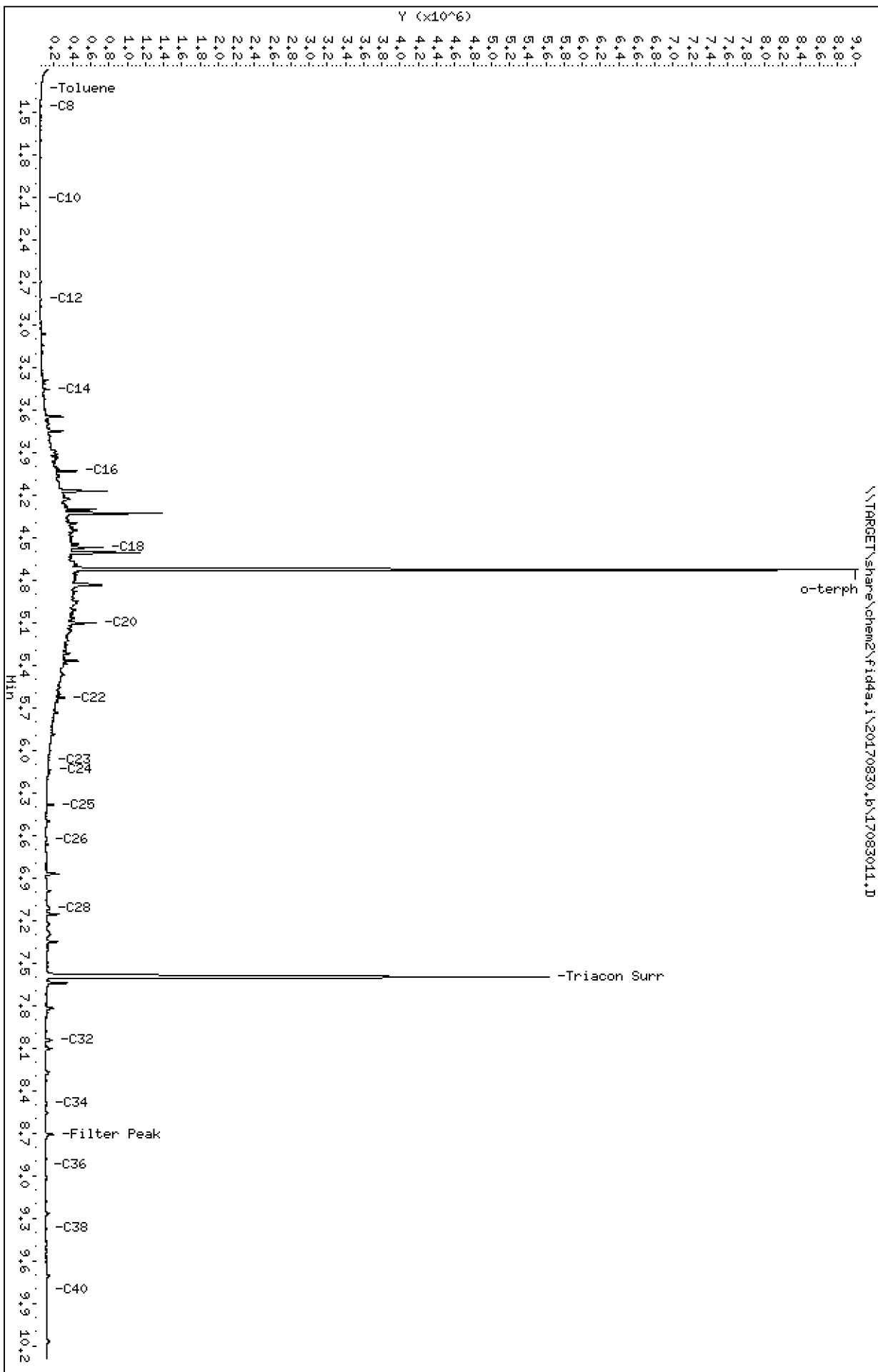
Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25

Page 1



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170830.b/17083011.D
Method: 20170830.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 08/30/2017
Macro: 16-AUG-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:16-AUG-2017 M.Oil:16-AUG-2017

ARI ID: 17H0298-09
Client ID:
Injection: 30-AUG-2017 12:29
Dilution Factor: 1

FID:4A RESULTS

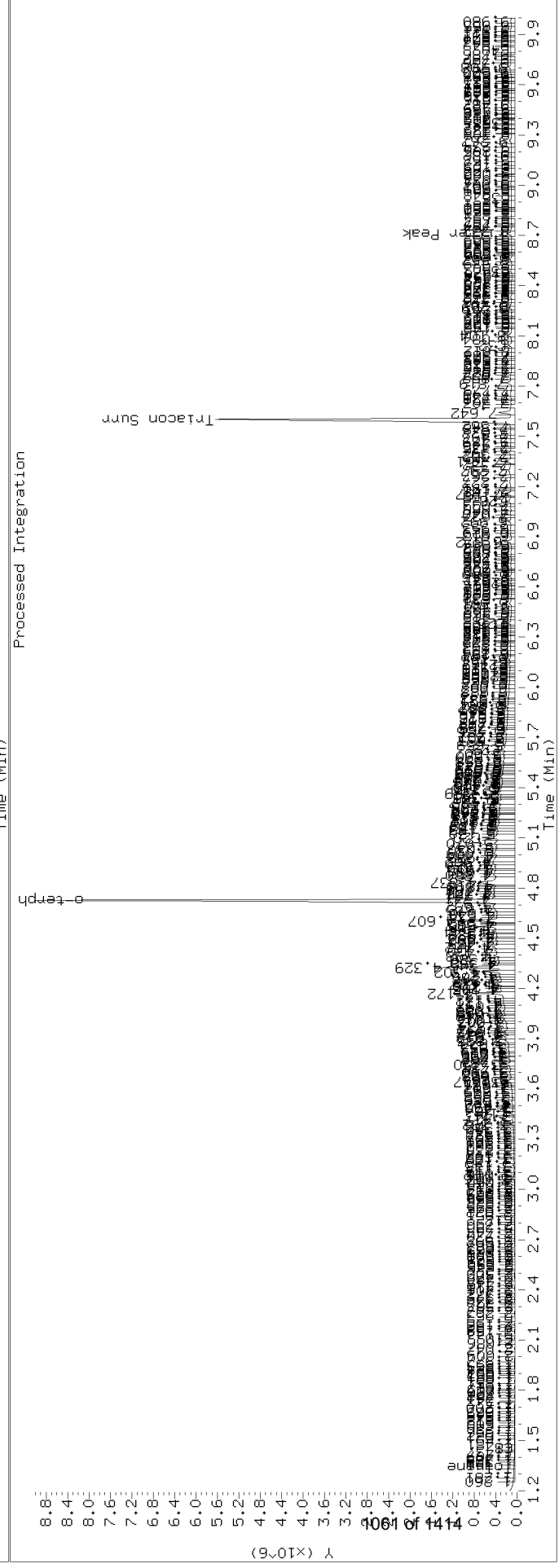
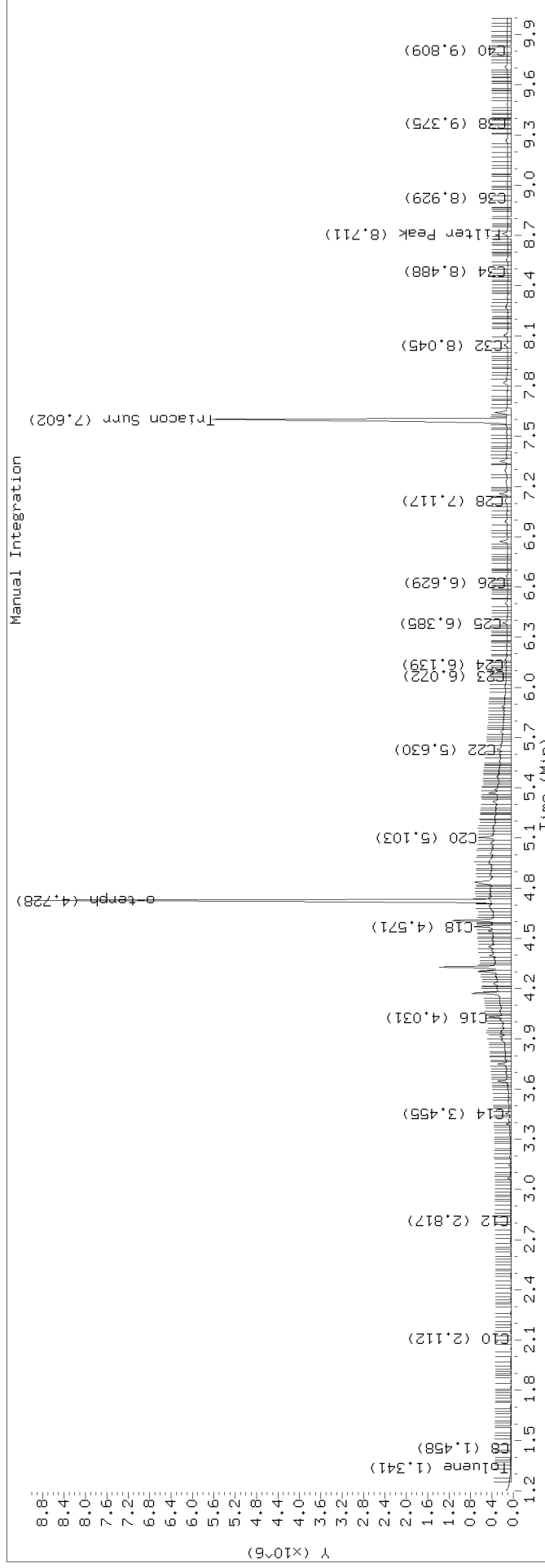
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.341	-0.002	19177	18498	WATPHG	(Tol-C12)	289334	192.9
C8	1.458	0.007	9566	12108	WATPHD	(C12-C24)	39821710	2540.8
C10	2.112	-0.000	4467	2349	WATPHM	(C24-C38)	14015566	756.4
C12	2.817	0.002	19520	13618	AK102	(C10-C25)	40565519	2241.1
C14	3.455	-0.003	102522	75248				
C16	4.031	-0.003	413727	302540	OR.DIES	(C10-C28)	44467923	2445.7
C18	4.571	0.000	689994	740702				
C20	5.103	-0.001	610789	875936				
C22	5.630	-0.000	264900	428193				
C24	6.139	-0.000	113394	127193				
C25	6.385	-0.001	151535	177236				
C26	6.629	-0.002	78312	83077				
C28	7.117	0.003	109683	213780				
C32	8.045	-0.004	128833	205866				
C34	8.488	-0.005	76025	110223				
Filter Peak	8.711	-0.002	152364	178294				
C36	8.929	-0.007	64595	106852				
C38	9.375	-0.002	68266	87700				
C40	9.809	-0.006	75506	152638				
o-terph	4.728	-0.000	8591268	5542856				
Triacon Surr	7.602	-0.004	5509980	4844743	NAS DIES	(C10-C24)	39921529	2210.7

Range Times: NW Diesel(2.815 - 6.139) AK102(2.11 - 6.39) Jet A(2.11 - 4.57)
NW M.Oil(6.14 - 9.38) AK103(6.39 - 8.94) OR Diesel(2.11 - 7.11)

Surrogate	Area	Amount
o-Terphenyl	5542856	241.0 M
Triacontane	4844743	189.5 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	22995.5	16-AUG-2017
Triacon Surr	25564.0	16-AUG-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15673.0	16-AUG-2017
Motor Oil	18529.0	16-AUG-2017
AK102	18101.0	16-AUG-2017
OR Diesel	18182.0	16-AUG-2017
NAS Diesel	18058.0	16-AUG-2017





Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-09RE1 SDG: 17H0298
 Sampled: 08/23/17 14:45 Prepared: 08/28/17 10:20 File ID: 17083014.D
 % Solids: 91.53 Preparation: EPA 3546 (Microwave) Analyzed: 08/30/17 13:37
 Batch: BFH0597 Sequence: SFH0356 Initial/Final: 10 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AH00054
 Cleanups: Silica Gel, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	5	256	D	12.8	27.3
	Motor Oil Range Organics (C24-C38)	5	91.2	D	16.3	54.6

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	24.582	24.7	101	50 - 150	

Data File: \\TARGET\share\chem2\fid4a,1\20170830,8\17083014.D

Date: 30-AUG-2017 13:37

Client ID:

Sample Info: 17H0298-09REL1,5

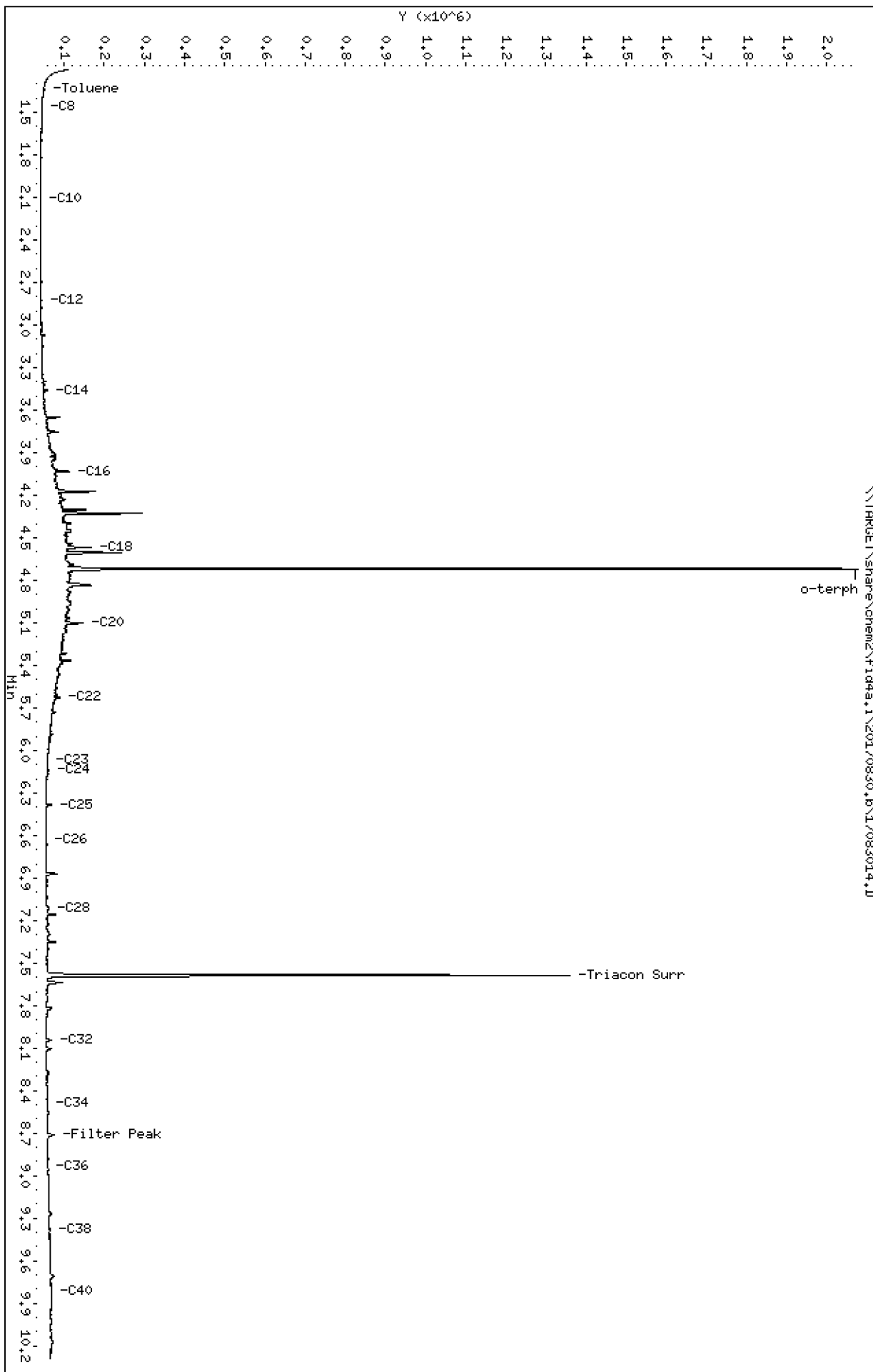
Column phase: RTX-1

Instrument: fid4a,1

Operator: ML

Column diameter: 0.25

Page 1



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170830.b/17083014.D
Method: 20170830.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 08/30/2017
Macro: 16-AUG-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:16-AUG-2017 M.Oil:16-AUG-2017

ARI ID: 17H0298-09RE1
Client ID:
Injection: 30-AUG-2017 13:37
Dilution Factor: 5

FID:4A RESULTS

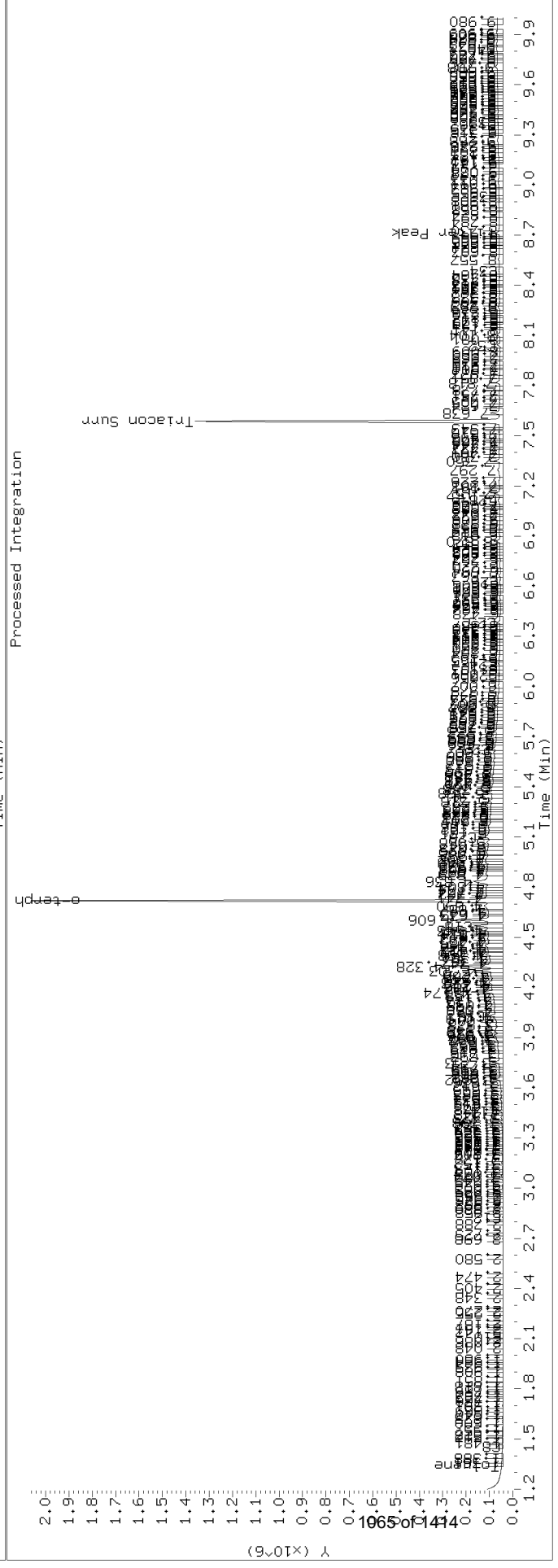
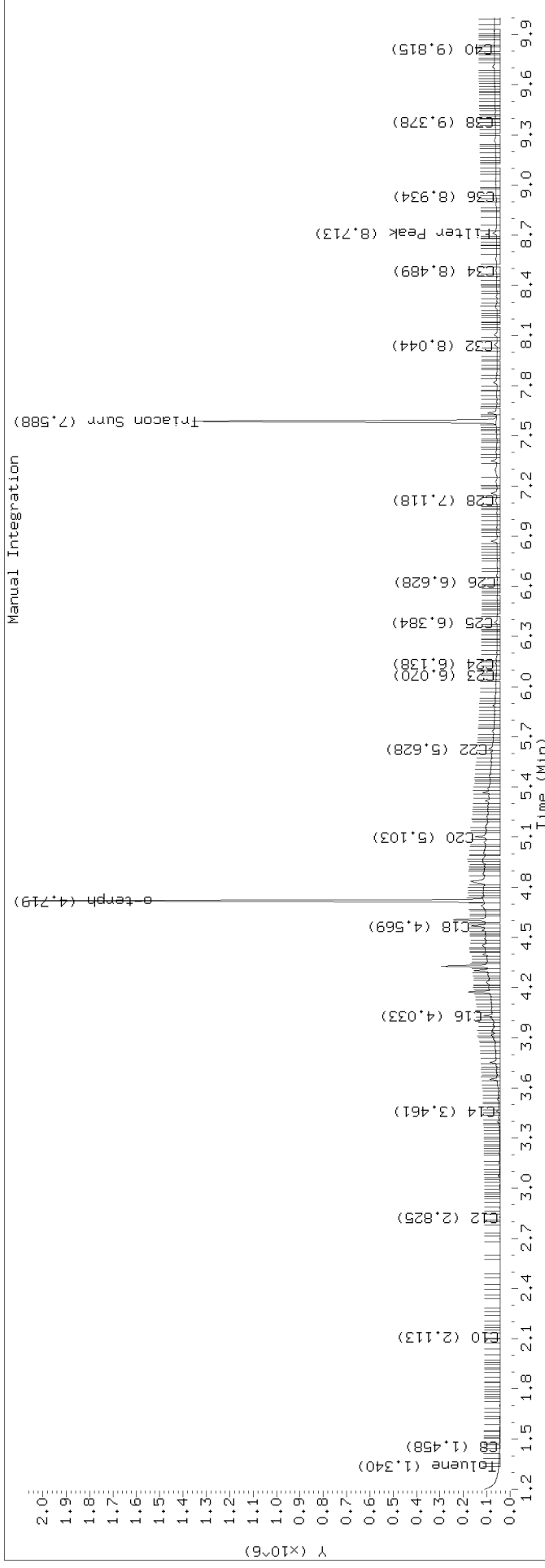
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.340	-0.003	8812	10050	WATPHG	(Tol-C12)	97645	65.1
C8	1.458	0.007	4431	5225	WATPHD	(C12-C24)	7346491	468.7
C10	2.113	0.001	930	790	WATPHM	(C24-C38)	3092407	166.9
C12	2.825	0.010	3068	2584	AK102	(C10-C25)	7482685	413.4
C14	3.461	0.003	16927	12426				
C16	4.033	-0.001	72254	77399	OR.DIES	(C10-C28)	8214435	451.8
C18	4.569	-0.001	126316	129012				
C20	5.103	-0.002	107380	179497				
C22	5.628	-0.002	49418	77705				
C24	6.138	-0.001	20490	26441				
C25	6.384	-0.002	26170	46495				
C26	6.628	-0.004	14958	34510				
C28	7.118	0.003	21492	43595				
C32	8.044	-0.004	25660	43445				
C34	8.489	-0.004	18749	45611				
Filter Peak	8.713	-0.000	32930	46621				
C36	8.934	-0.002	18453	20618				
C38	9.378	0.001	22345	28978				
C40	9.815	-0.000	27167	45452				
o-terph	4.719	-0.009	1964271	1042043				
Triacon Surr	7.588	-0.018	1300189	909874	NAS DIES	(C10-C24)	7361088	407.6

Range Times: NW Diesel(2.815 - 6.139) AK102(2.11 - 6.39) Jet A(2.11 - 4.57)
NW M.Oil(6.14 - 9.38) AK103(6.39 - 8.94) OR Diesel(2.11 - 7.11)

Surrogate	Area	Amount
o-Terphenyl	1042043	45.3 M
Triacontane	909874	35.6 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	22995.5	16-AUG-2017
Triacon Surr	25564.0	16-AUG-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15673.0	16-AUG-2017
Motor Oil	18529.0	16-AUG-2017
AK102	18101.0	16-AUG-2017
OR Diesel	18182.0	16-AUG-2017
NAS Diesel	18058.0	16-AUG-2017





Form I
ORGANIC ANALYSIS DATA SHEET
NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor QEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-10 SDG: 17H0298
 Sampled: 08/23/17 14:45 Prepared: 08/28/17 10:15 File ID: 17082818.D
 % Solids: 91.53 Preparation: EPA 3546 (Microw Analyzed: 08/28/17 17:55
 Batch: BFH0596 Sequence: SFH0319 Initial/Final: 10.26 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AH00054

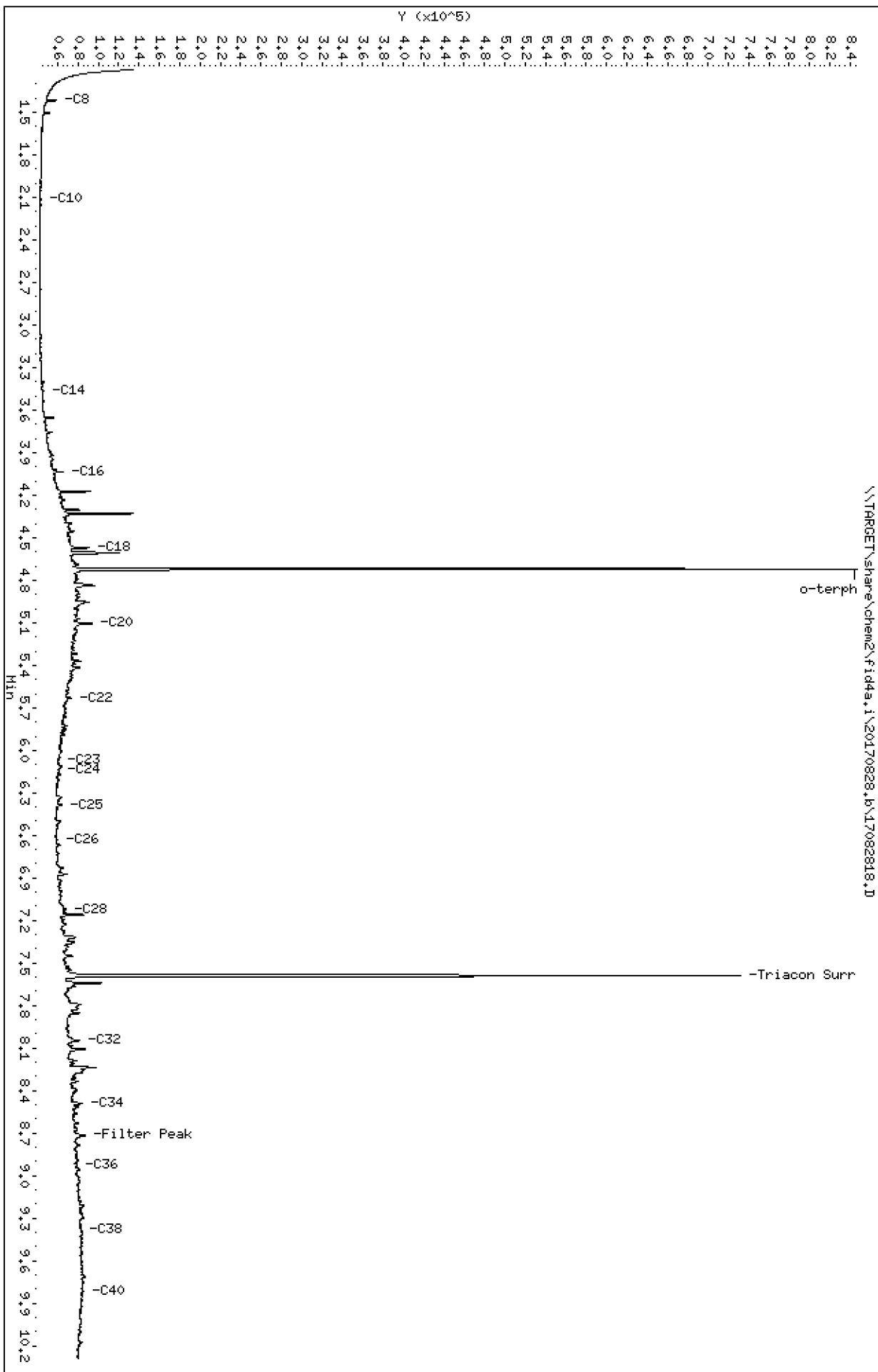
CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	10	265	D	24.9	53.2
	Motor Oil Range Organics (C24-C38)	10	315	D	31.8	106

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	23.959	19.3	80.4	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170828.b\17082818.D
Date: 28-AUG-2017 17:55
Client ID:
Sample Info: 17H0298-10

Column phase: RTX-1

Instrument: fid4a.1
Operator: ML
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170828.b/17082818.D
Method: 20170828.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 08/29/2017
Macro: 16-AUG-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:16-AUG-2017 M.Oil:16-AUG-2017

ARI ID: 17H0298-10
Client ID:
Injection: 28-AUG-2017 17:55
Dilution Factor: 10

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	----				| WATPHG	(Tol-C12)	53294	35.5
C8	1.417	-0.032	16380	24866	| WATPHD	(C12-C24)	3899035	248.8
C10	2.113	0.001	750	642	| WATPHM	(C24-C38)	5487968	296.2
C12	----				| AK102	(C10-C25)	4083595	225.6
C14	3.463	0.005	4191	3428	|			
C16	4.036	0.002	23072	26296	|OR.DIES	(C10-C28)	4975993	273.7
C18	4.573	0.003	48352	71276	|			
C20	5.105	0.001	51698	128677	|			
C22	5.632	0.001	30945	34172	|			
C24	6.142	0.002	19517	11391	|			
C25	6.386	-0.000	21975	40264	|			
C26	6.632	0.001	16966	27911	|			
C28	7.122	0.007	26014	32678	|			
C32	8.048	-0.001	38724	72462	|			
C34	8.490	-0.003	42505	57226	|			
Filter Peak	8.716	0.002	45118	114590	|			
C36	8.924	-0.012	36650	55536	|			
C38	9.377	-0.002	40917	24234	|			
C40	9.813	-0.002	42943	56779	|			
o-terph	4.722	-0.004	769520	416489	|			
Triacon Surr	7.589	-0.015	660663	453209	|NAS DIES	(C10-C24)	3902482	216.1

Range Times: NW Diesel(2.816 - 6.139) AK102(2.11 - 6.39) Jet A(2.11 - 4.57)
NW M.Oil(6.14 - 9.38) AK103(6.39 - 8.94) OR Diesel(2.11 - 7.11)

Surrogate	Area	Amount
o-Terphenyl	416489	18.1 M
Triacotane	453209	17.7 M

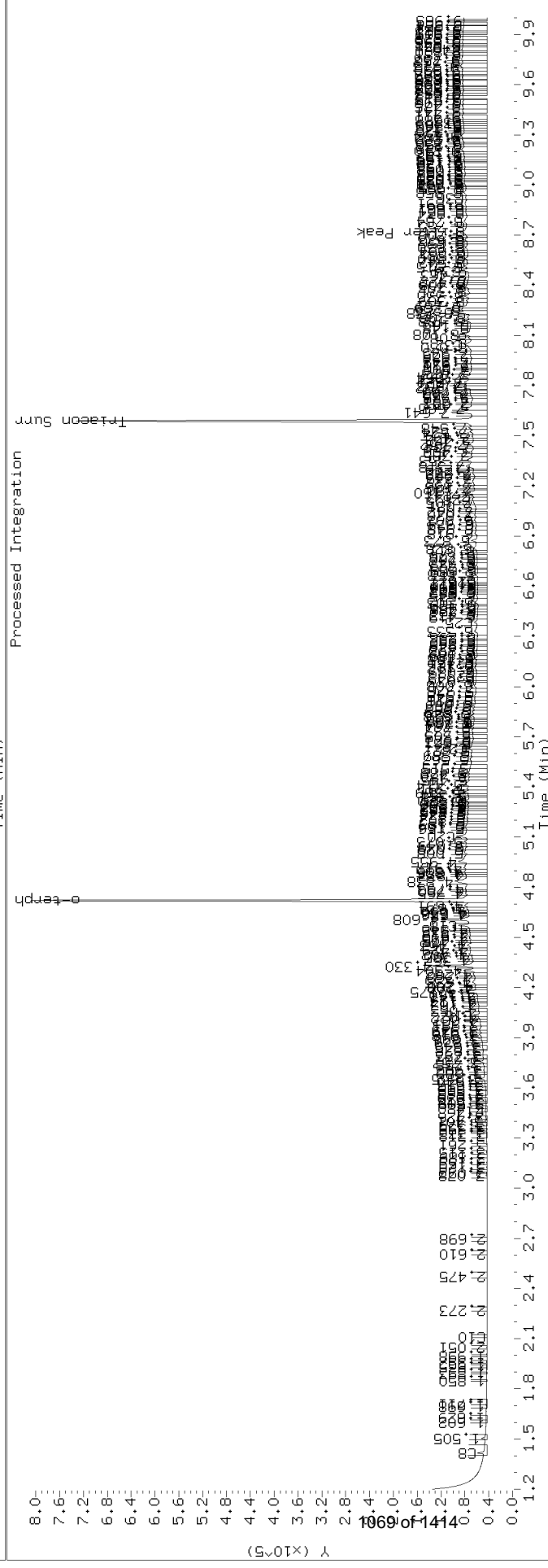
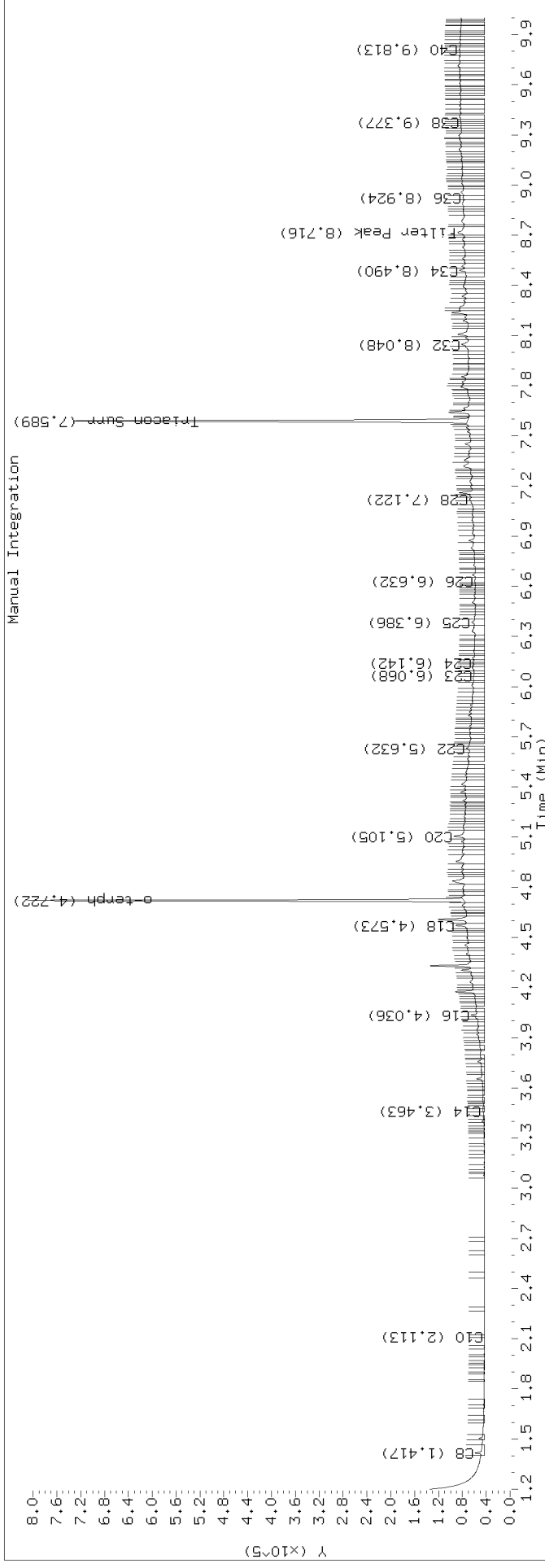
M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	22995.5	16-AUG-2017
Triacon Surr	25564.0	16-AUG-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15673.0	16-AUG-2017
Motor Oil	18529.0	16-AUG-2017
AK102	18101.0	16-AUG-2017
OR Diesel	18182.0	16-AUG-2017
NAS Diesel	18058.0	16-AUG-2017

TPH Manual Integrations Report

Datafile: FID4A, 20170828.b/17082818.D Injection: 28-AUG-2017 17:55

Lab ID:17H0298-10





Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17H0298-10 SDG: 17H0298
 Sampled: 08/23/17 14:45 Prepared: 08/28/17 10:15 File ID: 17082818.D
 % Solids: 91.53 Preparation: EPA 3546 (Microwave) Analyzed: 08/28/17 17:55
 Batch: BFH0596 Sequence: SFH0319 Initial/Final: 10.26 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AH00054

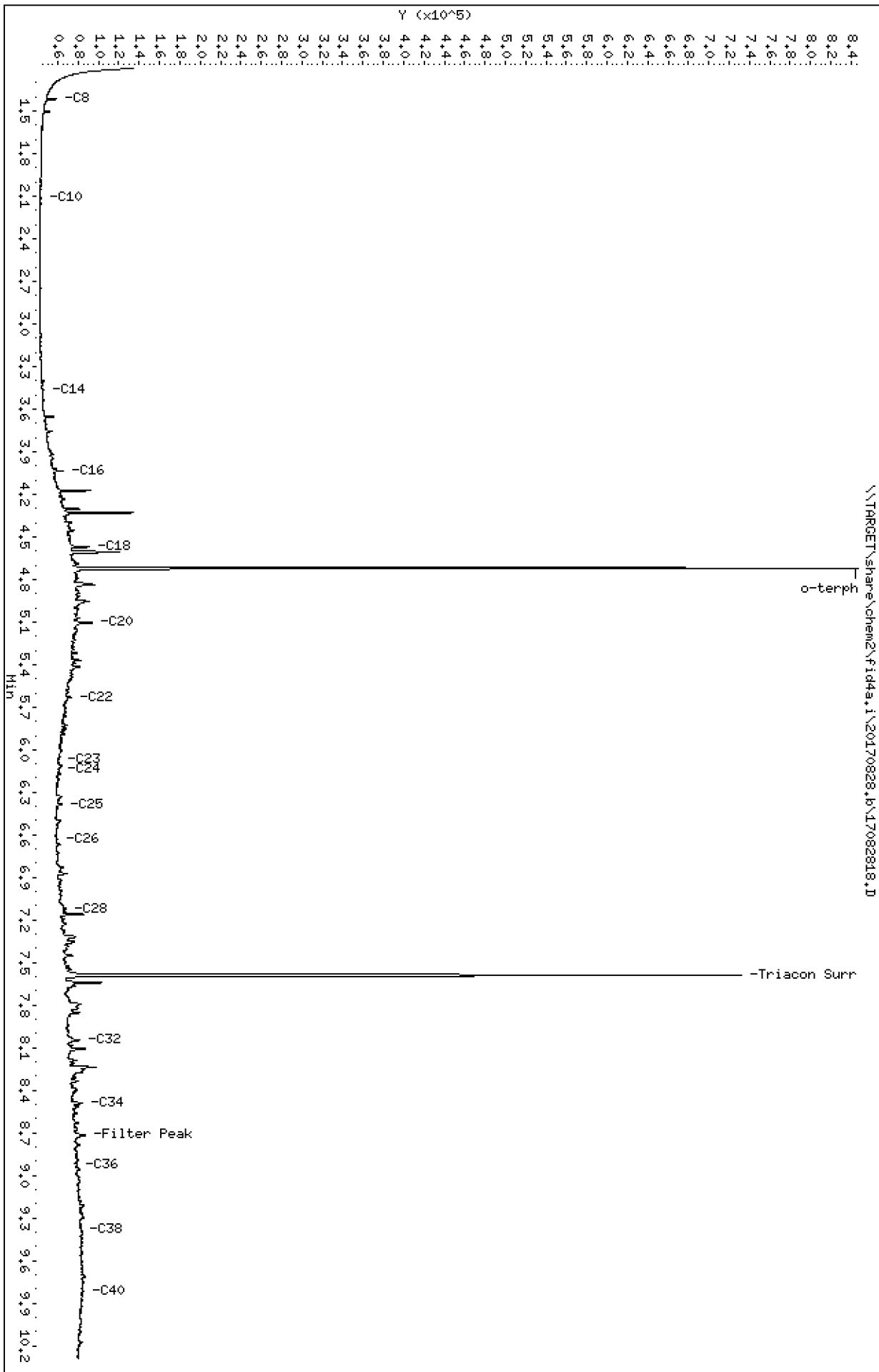
CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	10	265	D	24.9	53.2
	Motor Oil Range Organics (C24-C38)	10	315	D	31.8	106

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	23.959	19.3	80.4	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170828.b\17082818.D
Date: 28-AUG-2017 17:55
Client ID:
Sample Info: 17H0298-10

Column phase: RTX-1

Instrument: fid4a.1
Operator: ML
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170828.b/17082818.D
Method: 20170828.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 08/29/2017
Macro: 16-AUG-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:16-AUG-2017 M.Oil:16-AUG-2017

ARI ID: 17H0298-10
Client ID:
Injection: 28-AUG-2017 17:55
Dilution Factor: 10

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	----				| WATPHG	(Tol-C12)	53294	35.5
C8	1.417	-0.032	16380	24866	| WATPHD	(C12-C24)	3899035	248.8
C10	2.113	0.001	750	642	| WATPHM	(C24-C38)	5487968	296.2
C12	----				| AK102	(C10-C25)	4083595	225.6
C14	3.463	0.005	4191	3428	|			
C16	4.036	0.002	23072	26296	|OR.DIES	(C10-C28)	4975993	273.7
C18	4.573	0.003	48352	71276	|			
C20	5.105	0.001	51698	128677	|			
C22	5.632	0.001	30945	34172	|			
C24	6.142	0.002	19517	11391	|			
C25	6.386	-0.000	21975	40264	|			
C26	6.632	0.001	16966	27911	|			
C28	7.122	0.007	26014	32678	|			
C32	8.048	-0.001	38724	72462	|			
C34	8.490	-0.003	42505	57226	|			
Filter Peak	8.716	0.002	45118	114590	|			
C36	8.924	-0.012	36650	55536	|			
C38	9.377	-0.002	40917	24234	|			
C40	9.813	-0.002	42943	56779	|			
o-terph	4.722	-0.004	769520	416489	|			
Triacon Surr	7.589	-0.015	660663	453209	|NAS DIES	(C10-C24)	3902482	216.1

Range Times: NW Diesel(2.816 - 6.139) AK102(2.11 - 6.39) Jet A(2.11 - 4.57)
NW M.Oil(6.14 - 9.38) AK103(6.39 - 8.94) OR Diesel(2.11 - 7.11)

Surrogate	Area	Amount
o-Terphenyl	416489	18.1 M
Triacotane	453209	17.7 M

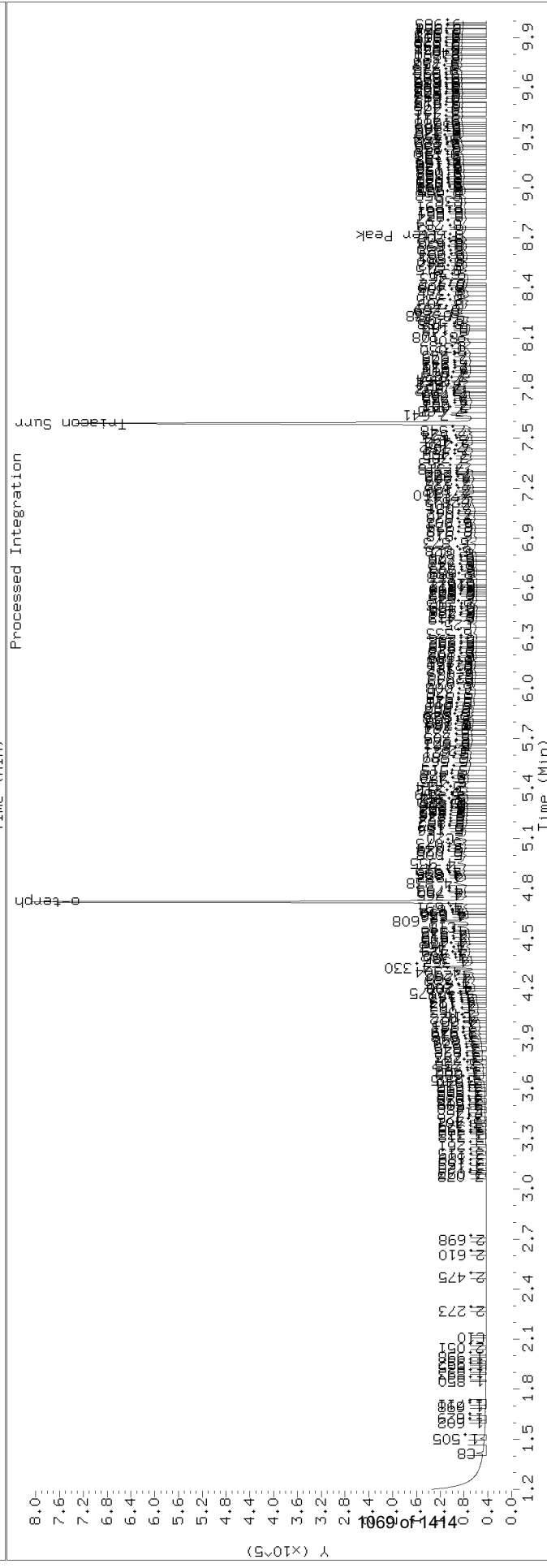
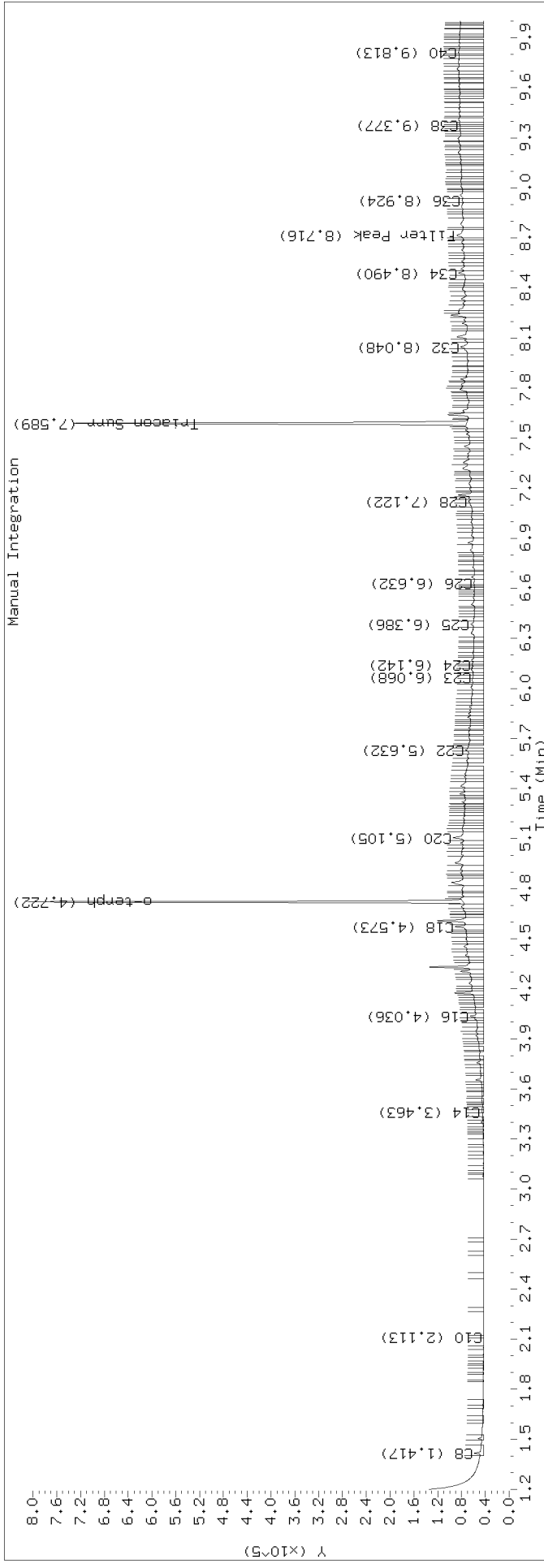
M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	22995.5	16-AUG-2017
Triacon Surr	25564.0	16-AUG-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15673.0	16-AUG-2017
Motor Oil	18529.0	16-AUG-2017
AK102	18101.0	16-AUG-2017
OR Diesel	18182.0	16-AUG-2017
NAS Diesel	18058.0	16-AUG-2017

TPH Manual Integrations Report

Datafile: FID4A, 20170828.b/17082818.D Injection: 28-AUG-2017 17:55

Lab ID:17H0298-10





Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Ground Water

Laboratory ID: 17H0298-12

SDG: 17H0298

Sampled: 08/24/17 17:00

Prepared: 08/28/17 10:54

File ID: 17083141.D

% Solids:

Preparation: EPA 3510C SepF

Analyzed: 09/01/17 04:47

Batch: BFH0600

Sequence: SFH0381

Initial/Final: 500 mL / 1 mL

Instrument: FID4

Column: RTX-1

Calibration: AI00005

Cleanups: Silica Gel, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200

SURROGATES	ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl	0.45000	0.512	114	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170831.b\17083141.D

Date : 01-SEP-2017 04:47

Client ID:

Sample Info: 17H0298-12

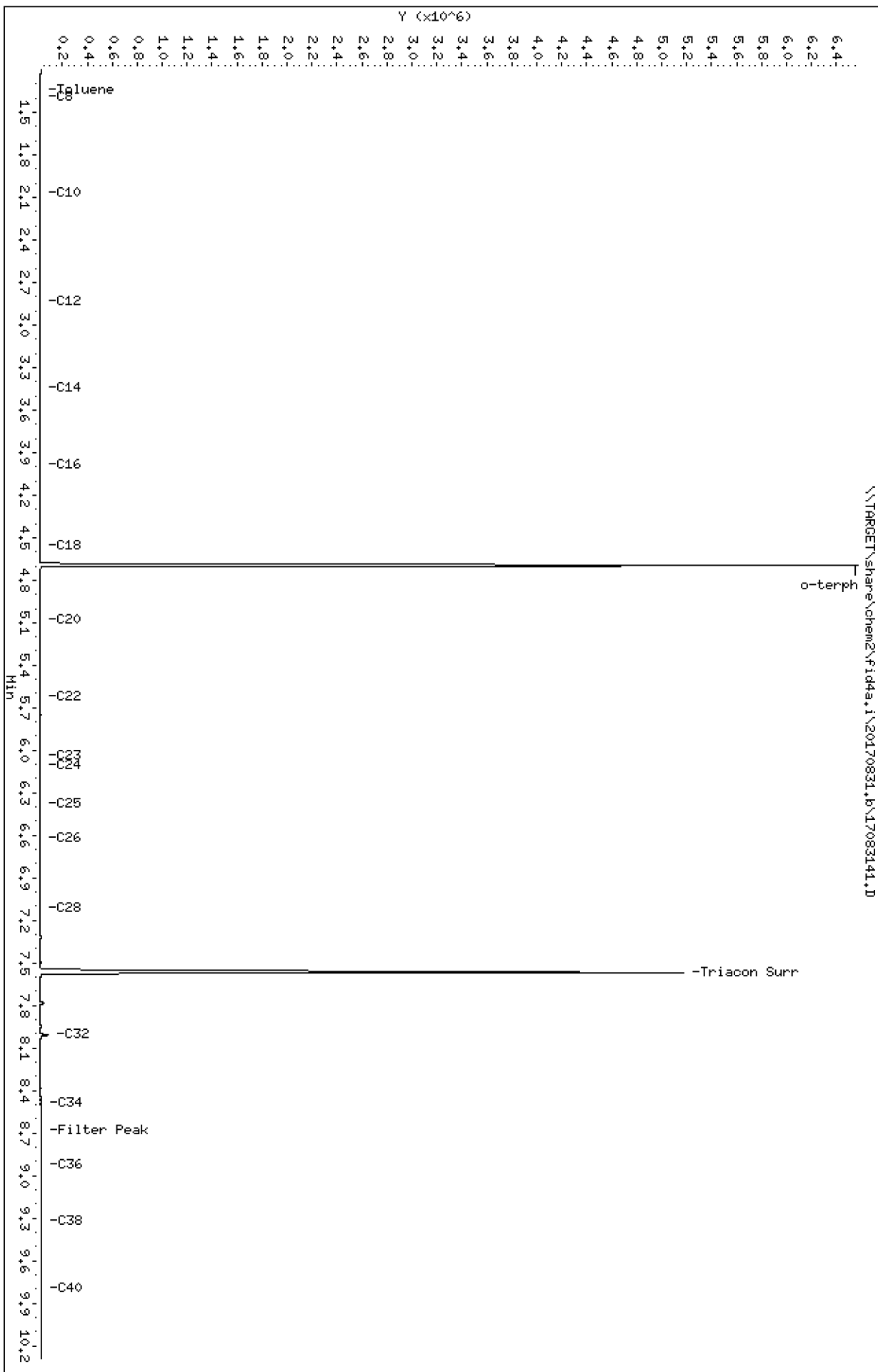
Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25

Page 1



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170831.b/17083141.D
Method: 20170831.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/01/2017
Macro: 31-AUG-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:31-AUG-2017 M.Oil:31-AUG-2017

ARI ID: 17H0298-12
Client ID:
Injection: 01-SEP-2017 04:47
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.348	0.024	1925	4084	WATPHG	(Tol-C12)	47594	31.7
C8	1.395	0.028	2970	3283	WATPHD	(C12-C24)	257048	21.6
C10	2.068	-0.005	781	745	WATPHM	(C24-C38)	584191	39.1
C12	2.834	0.003	1910	2141	AK102	(C10-C25)	288446	20.7
C14	3.448	0.007	1809	1749				
C16	3.987	0.046	1836	1804	OR.DIES	(C10-C28)	349356	24.9
C18	4.558	0.001	1660	1860				
C20	5.080	-0.012	2034	3403				
C22	5.620	0.001	1261	548				
C24	6.112	-0.016	1500	765				
C25	6.382	0.008	2279	3086				
C26	6.622	0.005	1561	753				
C28	7.115	0.016	2176	1499				
C32	8.009	-0.018	64977	67935				
C34	8.492	0.024	5521	1644				
Filter Peak	8.688	-0.001	6235	3044				
C36	8.923	0.016	7090	3493				
C38	9.318	0.006	9073	13336				
C40	9.802	0.021	12542	9269				
o-terph	4.698	-0.014	6552366	4407628				
Triacon Surr	7.570	-0.017	5153058	4953515	NAS DIES	(C10-C24)	284169	20.5

Range Times: NW Diesel(2.831 - 6.128) AK102(2.07 - 6.37) Jet A(2.07 - 4.56)
NW M.Oil(6.13 - 9.31) AK103(6.37 - 8.91) OR Diesel(2.07 - 7.10)

Surrogate	Area	Amount
o-Terphenyl	4407628	256.1
Triacontane	4953515	229.2 M

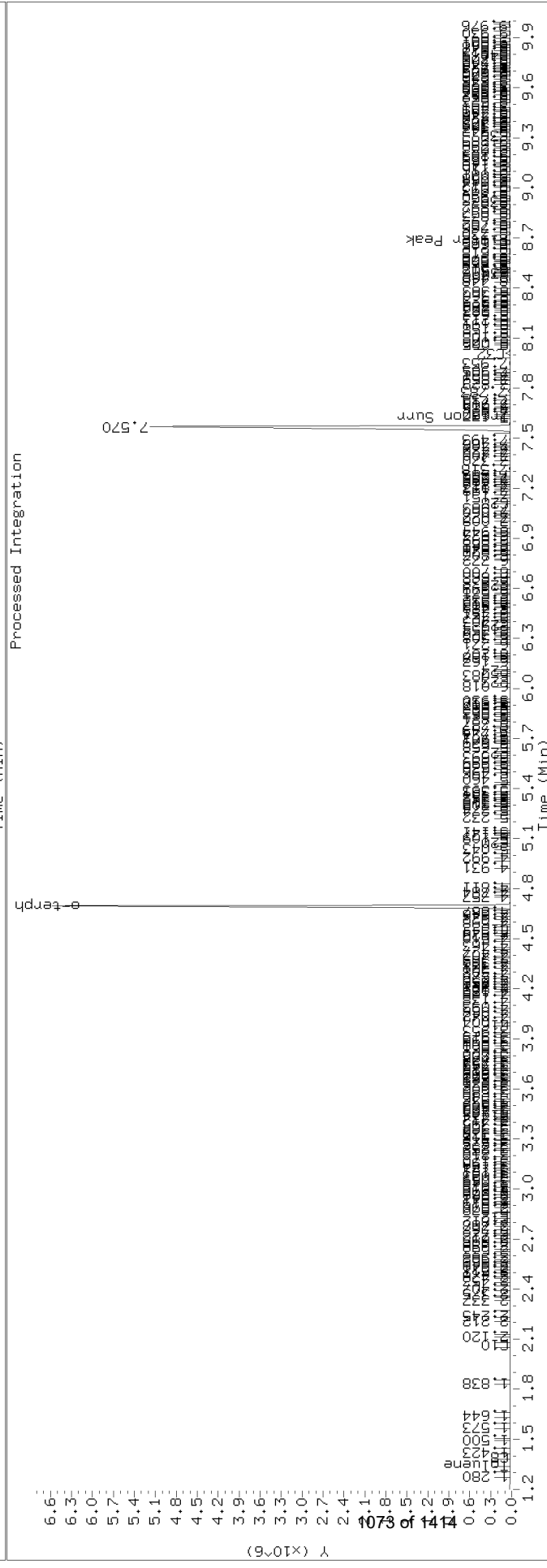
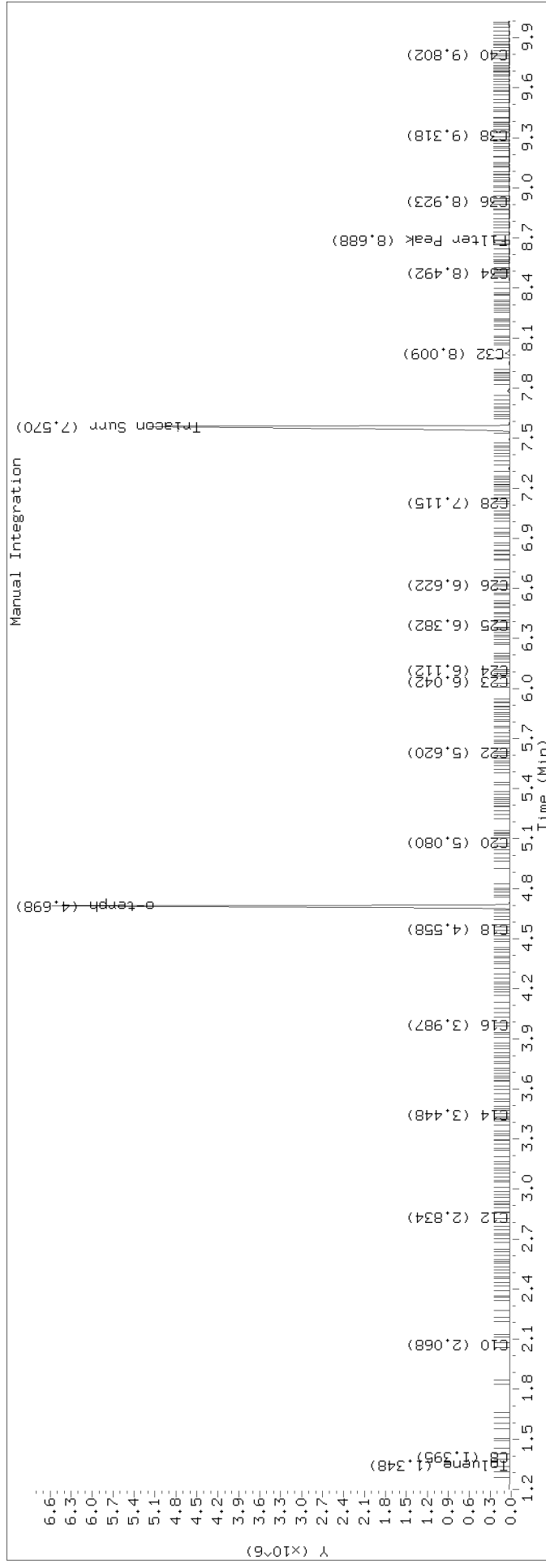
M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	17211.9	31-AUG-2017
Triacon Surr	21612.9	31-AUG-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	11886.0	31-AUG-2017
Motor Oil	14933.0	31-AUG-2017
AK102	13946.0	31-AUG-2017
OR Diesel	14030.0	31-AUG-2017
NAS Diesel	13885.0	31-AUG-2017

TPH Manual Integrations Report

Datafile: FID4A, 20170831.b/17083141.D Injection: 01-SEP-2017 04:47

Lab ID:17H0298-12





Form I
ORGANIC ANALYSIS DATA SHEET
NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 17H0298-13 SDG: 17H0298
 Sampled: 08/24/17 17:00 Prepared: 08/25/17 13:34 File ID: 17083161.D
 % Solids: Preparation: EPA 3510C SepF Analyzed: 09/01/17 12:02
 Batch: BFH0589 Sequence: SFH0381 Initial/Final: 500 mL / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00005

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.374		0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.282		0.056	0.200

SURROGATES	ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl	0.45000	0.535	119	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170831.b\17083161.D

Date: 01-SEP-2017 12:02

Client ID:

Sample Info: 17H0298-13

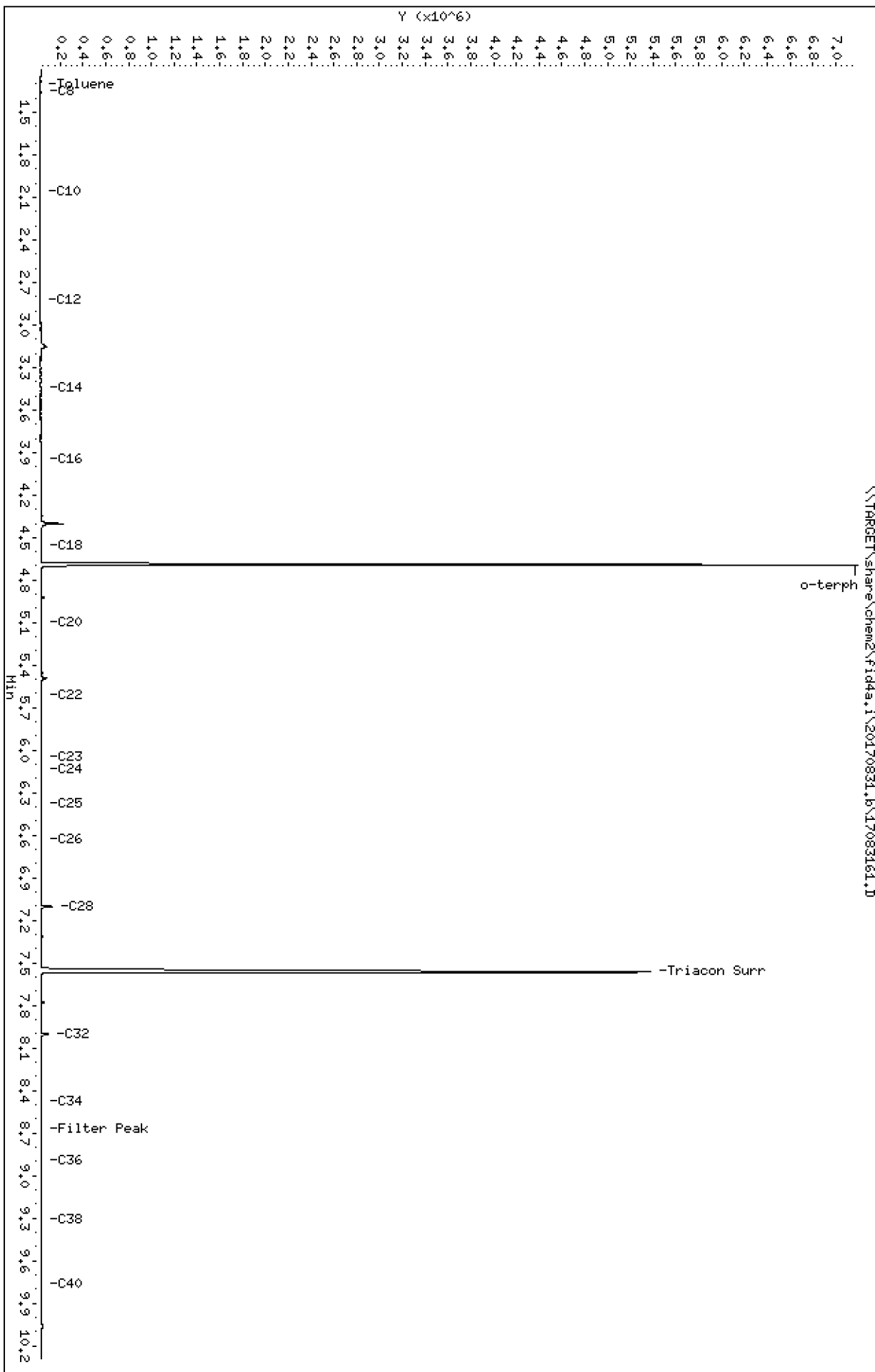
Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25

Page 1



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170831.b/17083161.D
Method: 20170831.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/01/2017
Macro: 31-AUG-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:31-AUG-2017 M.Oil:31-AUG-2017

ARI ID: 17H0298-13
Client ID:
Injection: 01-SEP-2017 12:02
Dilution Factor: 1

FID:4A RESULTS

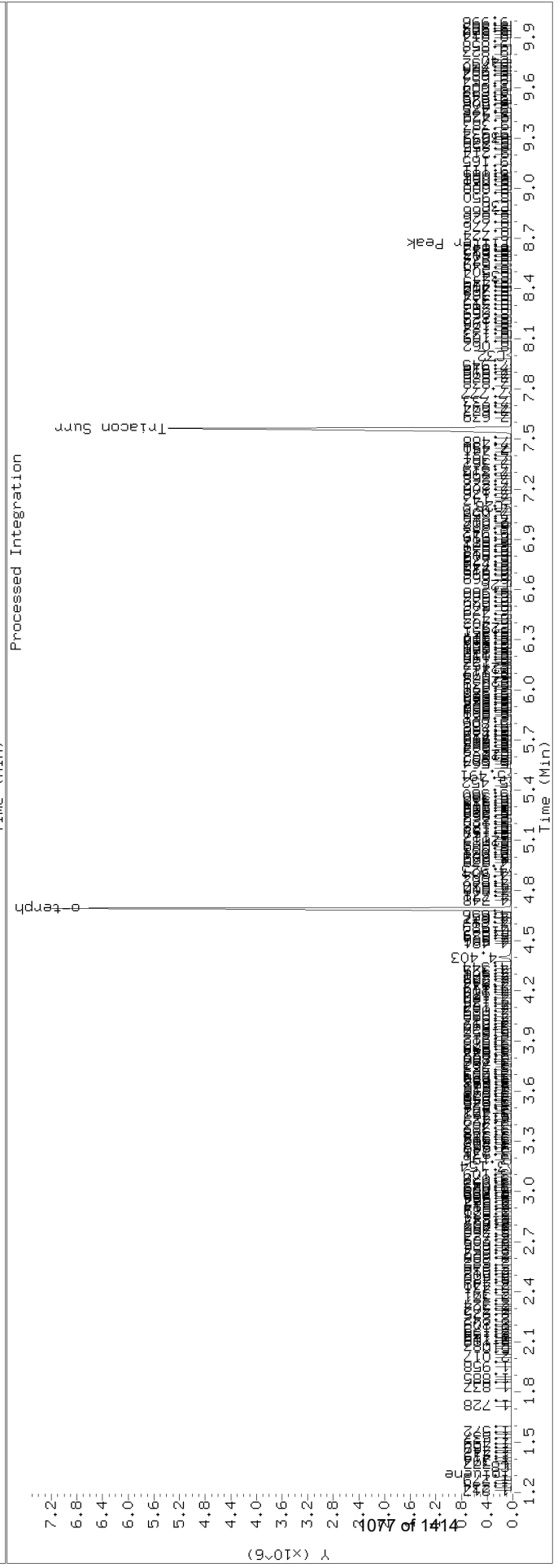
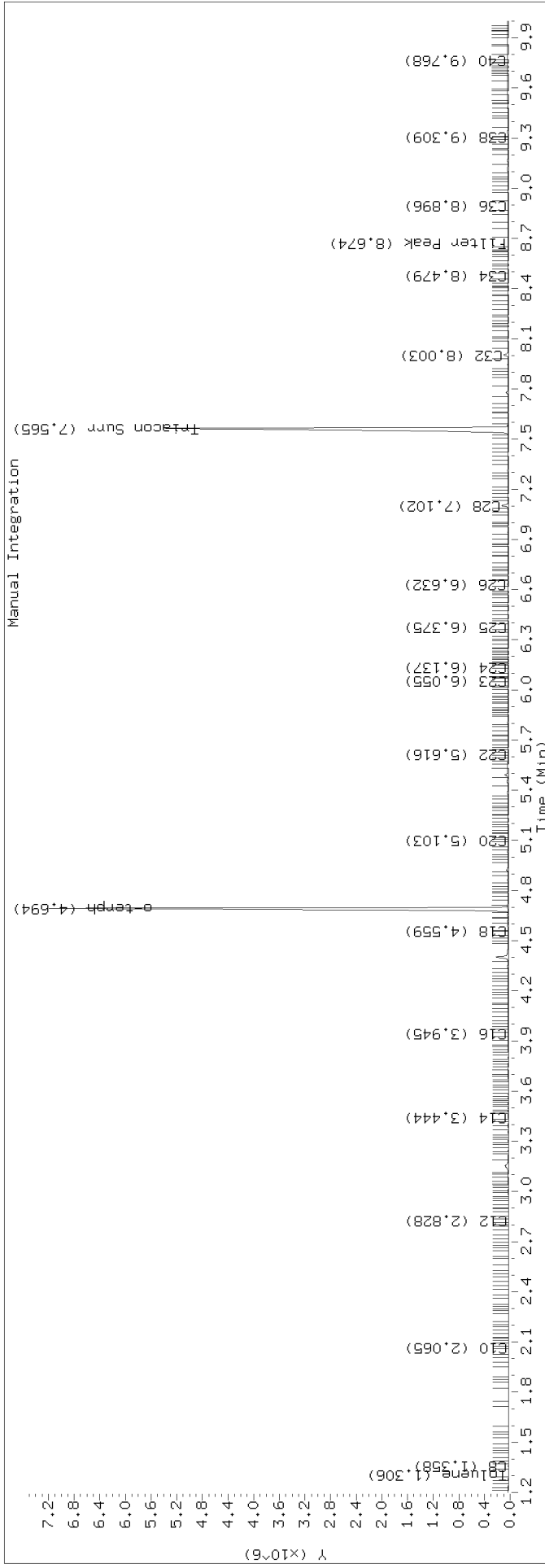
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.306	-0.018	4495	8749	WATPHG	(Tol-C12)	133366	88.9
C8	1.358	-0.009	7329	7407	WATPHD	(C12-C24)	222238	187.0
C10	2.065	-0.008	1180	919	WATPHM	(C24-C38)	2105143	141.0
C12	2.828	-0.003	4126	4124	AK102	(C10-C25)	2389278	171.3
C14	3.444	0.003	8820	14747				
C16	3.945	0.004	9370	12300	OR.DIES	(C10-C28)	2935814	209.3
C18	4.559	0.002	11427	3970				
C20	5.103	0.011	11402	11323				
C22	5.616	-0.003	14025	13797				
C24	6.137	0.009	13186	15565				
C25	6.375	0.002	14014	26255				
C26	6.632	0.015	15872	24883				
C28	7.102	0.002	104169	92345				
C32	8.003	-0.024	76784	90462				
C34	8.479	0.011	12619	23906				
Filter Peak	8.674	-0.015	13126	41890				
C36	8.896	-0.012	13773	43308				
C38	9.309	-0.003	13607	6101				
C40	9.768	-0.013	16555	14558				
o-terph	4.694	-0.018	7158682	4602199				
Triacon Surr	7.565	-0.022	5343586	4986407	NAS DIES	(C10-C24)	2312106	166.5

Range Times: NW Diesel(2.831 - 6.128) AK102(2.07 - 6.37) Jet A(2.07 - 4.56)
NW M.Oil(6.13 - 9.31) AK103(6.37 - 8.91) OR Diesel(2.07 - 7.10)

Surrogate	Area	Amount
o-Terphenyl	4602199	267.4 M
Triacotane	4986407	230.7 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	17211.9	31-AUG-2017
Triacon Surr	21612.9	31-AUG-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	11886.0	31-AUG-2017
Motor Oil	14933.0	31-AUG-2017
AK102	13946.0	31-AUG-2017
OR Diesel	14030.0	31-AUG-2017
NAS Diesel	13885.0	31-AUG-2017





PREPARATION BATCH SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFH0589

Batch Matrix: Water

Preparation: EPA 3510C SepF

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-MW-4-170824	17H0298-13	17083161.D	08/25/17 13:34	
Blank	BFH0589-BLK1	17083142.D	08/25/17 13:34	
LCS	BFH0589-BS1	17083143.D	08/25/17 13:34	



PREPARATION BATCH SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFH0596 Batch Matrix: Solid

Preparation: EPA 3546 (Microwave)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-TP-100-0-4-170823	17H0298-02	17082819.D	08/28/17 10:15	
SVCA-TP-101-0-2-170823	17H0298-04	17082816.D	08/28/17 10:15	
SVCA-TP-102-0-2-170823	17H0298-07	17082820.D	08/28/17 10:15	
SVCA-TP-103-0-2-170823	17H0298-10	17082818.D	08/28/17 10:15	
Blank	BFH0596-BLK1	17082813.D	08/28/17 10:15	
LCS	BFH0596-BS1	17082814.D	08/28/17 10:15	



PREPARATION BATCH SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFH0597 Batch Matrix: Solid

Preparation: EPA 3546 (Microwave)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-TP-100-0-4-170823	17H0298-01	17083008.D	08/28/17 10:20	
SVCA-TP-101-0-2-170823	17H0298-03	17083009.D	08/28/17 10:20	
SVCA-TP-102-0-2-170823	17H0298-06	17083010.D	08/28/17 10:20	
SVCA-TP-103-0-2-170823	17H0298-09	17083011.D	08/28/17 10:20	
SVCA-TP-103-0-2-170823	17H0298-09RE1	17083014.D	08/28/17 10:20	Added 8/30/2017 by MDL
Blank	BFH0597-BLK1	17083006.D	08/28/17 10:20	
LCS	BFH0597-BS1	17083007.D	08/28/17 10:20	



PREPARATION BATCH SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFH0600

Batch Matrix: Water

Preparation: EPA 3510C SepF

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-MW-4-170824	17H0298-12	17083141.D	08/28/17 10:54	
Blank	BFH0600-BLK1	17083139.D	08/28/17 10:54	
LCS	BFH0600-BS1	17083140.D	08/28/17 10:54	



Form I
METHOD BLANK DATA SHEET
NWTPH-Dx

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Water</u>	Laboratory ID:	<u>BFH0589-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>08/25/17 13:34</u>
Solids:		Preparation:	<u>EPA 3510C SepF</u>
Batch:	<u>BFH0589</u>	Sequence:	<u>SFH0381</u>
Instrument:	<u>FID4</u>	Column:	<u>RTX-1</u>
		File ID:	<u>17083142.D</u>
		Analyzed:	<u>09/01/17 05:08</u>
		Initial/Final:	<u>500 mL / 1 mL</u>
		Calibration:	<u>AI00005</u>

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200
SURROGATES		ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl		0.45000	0.528	117	50 - 150	



Form I
METHOD BLANK DATA SHEET
NWTPH-Dx

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Solid</u>	Laboratory ID:	<u>BFH0596-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>08/28/17 10:15</u>
Solids:		Preparation:	<u>EPA 3546 (Microwave)</u>
Batch:	<u>BFH0596</u>	Sequence:	<u>SFH0319</u>
Instrument:	<u>FID4</u>	Column:	<u>RTX-1</u>
		File ID:	<u>17082813.D</u>
		Analyzed:	<u>08/28/17 16:01</u>
		Initial/Final:	<u>10 g / 1 mL</u>
		Calibration:	<u>AH00054</u>

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg wet)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	5.00	U	2.34	5.00
	Motor Oil Range Organics (C24-C38)	1	10.0	U	2.99	10.0
SURROGATES		ADDED (mg/kg wet)	CONC (mg/kg wet)	% REC	QC LIMITS	Q
	o-Terphenyl	22.500	18.1	80.4	50 - 150	



Form I
METHOD BLANK DATA SHEET
NWTPH-Dx

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Solid</u>	Laboratory ID:	<u>BFH0597-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>08/28/17 10:20</u>
Solids:		Preparation:	<u>EPA 3546 (Microwave)</u>
Batch:	<u>BFH0597</u>	Sequence:	<u>SFH0356</u>
Instrument:	<u>FID4</u>	Column:	<u>RTX-1</u>
		Cleanups:	<u>Silica Gel, Sulfuric Acid</u>

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg wet)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	5.00	U	2.34	5.00
	Motor Oil Range Organics (C24-C38)	1	10.0	U	2.99	10.0
SURROGATES		ADDED (mg/kg wet)	CONC (mg/kg wet)	% REC	QC LIMITS	Q
	o-Terphenyl	22.500	21.0	93.2	50 - 150	



Form I
METHOD BLANK DATA SHEET
NWTPH-Dx

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Water</u>	Laboratory ID:	<u>BFH0600-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>08/28/17 10:54</u>
Solids:		Preparation:	<u>EPA 3510C SepF</u>
Batch:	<u>BFH0600</u>	Sequence:	<u>SFH0381</u>
Instrument:	<u>FID4</u>	Column:	<u>RTX-1</u>
		Cleanups:	<u>Silica Gel, Sulfuric Acid</u>

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.288		0.056	0.200
SURROGATES		ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl		0.45000	0.542	121	50 - 150	



LCS / LCS DUPLICATE RECOVERY
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Water

Analyzed: 09/01/17 05:31

Batch: BFH0589

Laboratory ID: BFH0589-BS1

Preparation: EPA 3510C SepF

Sequence Name: LCS

Initial/Final: 500 mL / 1 mL

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	Q	LCS % REC. #	QC LIMITS REC.
Diesel Range Organics (C12-C24)	3.00	3.39		113	56 - 120

* Indicates values outside of QC limits



LCS / LCS DUPLICATE RECOVERY
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Analyzed: 08/28/17 16:23

Batch: BFH0596

Laboratory ID: BFH0596-BS1

Preparation: EPA 3546 (Microwave)

Sequence Name: LCS

Initial/Final: 10 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Diesel Range Organics (C12-C24)	150	114		76.1	63 - 120

* Indicates values outside of QC limits



LCS / LCS DUPLICATE RECOVERY
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Analyzed: 08/30/17 10:59

Batch: BFH0597

Laboratory ID: BFH0597-BS1

Preparation: EPA 3546 (Microwave)

Sequence Name: LCS

Initial/Final: 10 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Diesel Range Organics (C12-C24)	150	130		86.5	63 - 120

* Indicates values outside of QC limits



LCS / LCS DUPLICATE RECOVERY
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Water

Analyzed: 09/01/17 04:26

Batch: BFH0600

Laboratory ID: BFH0600-BS1

Preparation: EPA 3510C SepF

Sequence Name: LCS

Initial/Final: 500 mL / 1 mL

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	Q	LCS % REC. #	QC LIMITS REC.
Diesel Range Organics (C12-C24)	3.00	3.09		103	56 - 120

* Indicates values outside of QC limits



CLEANUP BATCH SUMMARY

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Cleanup Batch: CFH0146

Cleanup Type: Sulfuric Acid

Cleanup Method: EPA 3665A Sulfuric Acid Cleanup

Analysis: NWTPH-Dx

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARE	OBSERVATIONS
SVCA-TP-100-0-4-170823	17H0298-01	17083008.D	08/28/2017	
SVCA-TP-103-0-2-170823	17H0298-09RE1	17083014.D	08/28/2017	Added 8/30/2017 by MDL
SVCA-TP-103-0-2-170823	17H0298-09	17083011.D	08/28/2017	
SVCA-TP-102-0-2-170823	17H0298-06	17083010.D	08/28/2017	
SVCA-TP-101-0-2-170823	17H0298-03	17083009.D	08/28/2017	



CLEANUP BATCH SUMMARY

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Cleanup Batch: CFH0147

Cleanup Type: Silica Gel

Cleanup Method: EPA 3630C Silica Gel Cleanup

Analysis: NWTPH-Dx

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARE	OBSERVATIONS
SVCA-TP-103-0-2-170823	17H0298-09	17083011.D	08/28/2017	
SVCA-TP-102-0-2-170823	17H0298-06	17083010.D	08/28/2017	
SVCA-TP-101-0-2-170823	17H0298-03	17083009.D	08/28/2017	
SVCA-TP-100-0-4-170823	17H0298-01	17083008.D	08/28/2017	
SVCA-TP-103-0-2-170823	17H0298-09RE1	17083014.D	08/28/2017	Added 8/30/2017 by MDL



CLEANUP BATCH SUMMARY

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Cleanup Batch: CFH0154

Cleanup Type: Sulfuric Acid

Cleanup Method: EPA 3665A Sulfuric Acid Cleanup

Analysis: NWTPH-Dx

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARE	OBSERVATIONS
SVCA-MW-4-170824	17H0298-12	17083141.D	08/29/2017	



CLEANUP BATCH SUMMARY

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Cleanup Batch: CFH0155

Cleanup Type: Silica Gel

Cleanup Method: EPA 3630C Silica Gel Cleanup

Analysis: NWTPH-Dx

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARE	OBSERVATIONS
SVCA-MW-4-170824	17H0298-12	17083141.D	08/29/2017	



INITIAL CALIBRATION DATA NWTPH-Dx

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AH00054	Instrument:	FID4
Calibration Date:	08/16/2017 15:22	Column (1):	RTX-1

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Diesel Range Organics (C12-C24)	50	14230.7	100	14518.03	250	15531.87	500	16646.47	1000	16694.89	2500	16417.42
o-Terphenyl	9	22700.67	18	21007.72	45	22582.38	90	23843.62	180	24004.38	450	23834.4



INITIAL CALIBRATION DATA NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Calibration: AH00054

Instrument: FID4

Calibration Date: 08/16/2017 15:22

Column (1): RTX-1

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Motor Oil Range Organics (C24-C38)	100	18461.3	250	19398.11	500	18611.88	1000	19384.63	2500	17759.74	5000	17556.58



INITIAL CALIBRATION DATA

NWTPH-Dx

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AH00054	Instrument:	FID4
Calibration Date:	08/16/2017 15:22	Column (1):	RTX-1

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Diesel Range Organics (C12-C24)	15673.23	7.0			RSD (20)	
Motor Oil Range Organics (C24-C38)	18528.71	4.2			RSD (20)	
o-Terphenyl	22995.53	5.0			RSD (20)	



INITIAL CALIBRATION DATA
NWTPH-Dx

Laboratory:	Analytical Resources, Inc.	SDG:	17H0298
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00005	Instrument:	FID4
Calibration Date:	08/31/2017 11:56	Column (1):	RTX-1

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Diesel Range Organics (C12-C24)	11885.51	1.8			RSD (20)	
Motor Oil Range Organics (C24-C38)	14932.72	2.0			RSD (20)	
o-Terphenyl	17211.94	2.4			RSD (20)	



SECOND-SOURCE CALIBRATION VERIFICATION
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Calibration: AH00054

Laboratory ID: SFH0196-SCV1

Sequence: SFH0196

Sequence Name: DIES SCV 500

Standard ID: F006358

ANALYTE	EXPECTED (mg/L)	FOUND (mg/L)	% DRIFT	QC LIMIT
Diesel Range Organics (C12-C24)	500.00	444	-11.3	30.00
o-Terphenyl	90.000	87.9	-2.3	

* Indicates values outside of QC limits



SECOND-SOURCE CALIBRATION VERIFICATION
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Calibration: AH00054

Laboratory ID: SFH0196-SCV2

Sequence: SFH0196

Sequence Name: Moil SCV 1000

Standard ID: F007427

ANALYTE	EXPECTED (mg/L)	FOUND (mg/L)	% DRIFT	QC LIMIT
Motor Oil Range Organics (C24-C38)	1000.0	934	-6.6	30.00

* Indicates values outside of QC limits



SECOND-SOURCE CALIBRATION VERIFICATION
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Calibration: AI00005

Laboratory ID: SFH0381-SCV1

Sequence: SFH0381

Sequence Name: DIES SCV 500

Standard ID: F006358

ANALYTE	EXPECTED (mg/L)	FOUND (mg/L)	% DRIFT	QC LIMIT
Diesel Range Organics (C12-C24)	500.00	472	-5.7	30.00
o-Terphenyl	90.000	91.8	2.0	

* Indicates values outside of QC limits



SECOND-SOURCE CALIBRATION VERIFICATION
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Calibration: AI00005

Laboratory ID: SFH0381-SCV2

Sequence: SFH0381

Sequence Name: Moil SCV 1000

Standard ID: F007427

ANALYTE	EXPECTED (mg/L)	FOUND (mg/L)	% DRIFT	QC LIMIT
Motor Oil Range Organics (C24-C38)	1000.0	919	-8.2	30.00

* Indicates values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>AH00054</u>
Lab File ID: <u>17082804.D</u>	Calibration Date: <u>08/16/17 15:22</u>
Sequence: <u>SFH0319</u>	Injection Date: <u>08/28/17</u>
Lab Sample ID: <u>SFH0319-ICV1</u>	Injection Time: <u>12:04</u>
Sequence Name: <u>Diesel ICV</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	508	15673.2300	15926.8100		1.6	20
o-Terphenyl	A	90.000	86.6	22995.5300	22117.3100		-3.8	20

* Values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AH00054</u>
Lab File ID:	<u>17082805.D</u>	Calibration Date:	<u>08/16/17 15:22</u>
Sequence:	<u>SFH0319</u>	Injection Date:	<u>08/28/17</u>
Lab Sample ID:	<u>SFH0319-ICV2</u>	Injection Time:	<u>12:26</u>
Sequence Name:	<u>MOIL ICV</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1030	18528.7100	19144.1800		3.3	20

* Values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AH00054</u>
Lab File ID:	<u>17083003.D</u>	Calibration Date:	<u>08/16/17 15:22</u>
Sequence:	<u>SFH0356</u>	Injection Date:	<u>08/30/17</u>
Lab Sample ID:	<u>SFH0356-ICV1</u>	Injection Time:	<u>09:28</u>
Sequence Name:	<u>Diesel ICV</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	551	15673.2300	17267.2200		10.2	20
o-Terphenyl	A	90.000	98.0	22995.5300	25028.4800		8.9	20

* Values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AH00054</u>
Lab File ID:	<u>17083004.D</u>	Calibration Date:	<u>08/16/17 15:22</u>
Sequence:	<u>SFH0356</u>	Injection Date:	<u>08/30/17</u>
Lab Sample ID:	<u>SFH0356-ICV2</u>	Injection Time:	<u>09:51</u>
Sequence Name:	<u>MOIL ICV</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1040	18528.7100	19177.9800		3.5	20

* Values outside of QC limits



CONTINUING CALIBRATION CHECK NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>AH00054</u>
Lab File ID: <u>17082811.D</u>	Calibration Date: <u>08/16/17 15:22</u>
Sequence: <u>SFH0319</u>	Injection Date: <u>08/28/17</u>
Lab Sample ID: <u>SFH0319-CCV1</u>	Injection Time: <u>14:56</u>
Sequence Name: <u>Diesel CCV1</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	479	15673.23	14999.34		-4.3	15
o-Terphenyl	A	90.000	83.1	22995.53	21226.99		-7.7	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AH00054</u>
Lab File ID:	<u>17082812.D</u>	Calibration Date:	<u>08/16/17 15:22</u>
Sequence:	<u>SFH0319</u>	Injection Date:	<u>08/28/17</u>
Lab Sample ID:	<u>SFH0319-CCV2</u>	Injection Time:	<u>15:19</u>
Sequence Name:	<u>MOIL CCV1</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1010	18528.71	18781.05		1.4	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AH00054</u>
Lab File ID:	<u>17082821.D</u>	Calibration Date:	<u>08/16/17 15:22</u>
Sequence:	<u>SFH0319</u>	Injection Date:	<u>08/28/17</u>
Lab Sample ID:	<u>SFH0319-CCV3</u>	Injection Time:	<u>19:06</u>
Sequence Name:	<u>Diesel CCV2</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	514	15673.23	16107.86		2.8	15
o-Terphenyl	A	90.000	92.4	22995.53	23597.08		2.7	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AH00054</u>
Lab File ID:	<u>17082822.D</u>	Calibration Date:	<u>08/16/17 15:22</u>
Sequence:	<u>SFH0319</u>	Injection Date:	<u>08/28/17</u>
Lab Sample ID:	<u>SFH0319-CCV4</u>	Injection Time:	<u>19:30</u>
Sequence Name:	<u>MOILCCV2</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1040	18528.71	19243.26		3.9	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AH00054</u>
Lab File ID:	<u>17082833.D</u>	Calibration Date:	<u>08/16/17 15:22</u>
Sequence:	<u>SFH0319</u>	Injection Date:	<u>08/28/17</u>
Lab Sample ID:	<u>SFH0319-CCV5</u>	Injection Time:	<u>23:42</u>
Sequence Name:	<u>Diesel CCV3</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	566	15673.23	17753.48		13.3	15
o-Terphenyl	A	90.000	102	22995.53	25922.91		12.8	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AH00054</u>
Lab File ID:	<u>17082834.D</u>	Calibration Date:	<u>08/16/17 15:22</u>
Sequence:	<u>SFH0319</u>	Injection Date:	<u>08/29/17</u>
Lab Sample ID:	<u>SFH0319-CCV6</u>	Injection Time:	<u>00:05</u>
Sequence Name:	<u>MOIL CCV3</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1020	18528.71	18811.51		1.5	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AH00054</u>
Lab File ID:	<u>17083012.D</u>	Calibration Date:	<u>08/16/17 15:22</u>
Sequence:	<u>SFH0356</u>	Injection Date:	<u>08/30/17</u>
Lab Sample ID:	<u>SFH0356-CCV1</u>	Injection Time:	<u>12:52</u>
Sequence Name:	<u>Diesel CCV1</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	562	15673.23	17630.13		12.5	15
o-Terphenyl	A	90.000	98.9	22995.53	25274.26		9.9	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AH00054</u>
Lab File ID:	<u>17083013.D</u>	Calibration Date:	<u>08/16/17 15:22</u>
Sequence:	<u>SFH0356</u>	Injection Date:	<u>08/30/17</u>
Lab Sample ID:	<u>SFH0356-CCV2</u>	Injection Time:	<u>13:14</u>
Sequence Name:	<u>MOIL CCV1</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1000	18528.71	18614.03		0.5	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>AH00054</u>
Lab File ID: <u>17083026.D</u>	Calibration Date: <u>08/16/17 15:22</u>
Sequence: <u>SFH0356</u>	Injection Date: <u>08/30/17</u>
Lab Sample ID: <u>SFH0356-CCV3</u>	Injection Time: <u>18:10</u>
Sequence Name: <u>Diesel CCV2</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	583	15673.23	18272.04		16.6	15 *
o-Terphenyl	A	90.000	110	22995.53	28002.79		21.8	15 *

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AH00054</u>
Lab File ID:	<u>17083027.D</u>	Calibration Date:	<u>08/16/17 15:22</u>
Sequence:	<u>SFH0356</u>	Injection Date:	<u>08/30/17</u>
Lab Sample ID:	<u>SFH0356-CCV4</u>	Injection Time:	<u>18:34</u>
Sequence Name:	<u>MOILCCV2</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	968	18528.71	17940.13		-3.2	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>AH00054</u>
Lab File ID: <u>17083037.D</u>	Calibration Date: <u>08/16/17 15:22</u>
Sequence: <u>SFH0356</u>	Injection Date: <u>08/30/17</u>
Lab Sample ID: <u>SFH0356-CCV5</u>	Injection Time: <u>22:20</u>
Sequence Name: <u>Diesel CCV3</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	607	15673.23	19025.47		21.4	15 *
o-Terphenyl	A	90.000	114	22995.53	29073.63		26.4	15 *

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AH00054</u>
Lab File ID:	<u>17083038.D</u>	Calibration Date:	<u>08/16/17 15:22</u>
Sequence:	<u>SFH0356</u>	Injection Date:	<u>08/30/17</u>
Lab Sample ID:	<u>SFH0356-CCV6</u>	Injection Time:	<u>22:41</u>
Sequence Name:	<u>MOIL CCV3</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1000	18528.71	18532.71		0.02	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100005</u>
Lab File ID:	<u>17083131.D</u>	Calibration Date:	<u>08/31/17 11:56</u>
Sequence:	<u>SFH0381</u>	Injection Date:	<u>09/01/17</u>
Lab Sample ID:	<u>SFH0381-CCV1</u>	Injection Time:	<u>01:12</u>
Sequence Name:	<u>Diesel CCV1</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	491	11885.51	11674.49		-1.8	15
o-Terphenyl	A	90.000	87.5	17211.94	16728.89		-2.8	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100005</u>
Lab File ID:	<u>17083132.D</u>	Calibration Date:	<u>08/31/17 11:56</u>
Sequence:	<u>SFH0381</u>	Injection Date:	<u>09/01/17</u>
Lab Sample ID:	<u>SFH0381-CCV2</u>	Injection Time:	<u>01:33</u>
Sequence Name:	<u>MOIL CCV1</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1020	14932.72	15229.82		2.0	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>A100005</u>
Lab File ID: <u>17083150.D</u>	Calibration Date: <u>08/31/17 11:56</u>
Sequence: <u>SFH0381</u>	Injection Date: <u>09/01/17</u>
Lab Sample ID: <u>SFH0381-CCV3</u>	Injection Time: <u>08:01</u>
Sequence Name: <u>Diesel CCV2</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	556	11885.51	13209.95		11.1	15
o-Terphenyl	A	90.000	104	17211.94	19948.23		15.9	15 *

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100005</u>
Lab File ID:	<u>17083151.D</u>	Calibration Date:	<u>08/31/17 11:56</u>
Sequence:	<u>SFH0381</u>	Injection Date:	<u>09/01/17</u>
Lab Sample ID:	<u>SFH0381-CCV4</u>	Injection Time:	<u>08:22</u>
Sequence Name:	<u>MOILCCV2</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1060	14932.72	15758.91		5.5	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>A100005</u>
Lab File ID: <u>17083163.D</u>	Calibration Date: <u>08/31/17 11:56</u>
Sequence: <u>SFH0381</u>	Injection Date: <u>09/01/17</u>
Lab Sample ID: <u>SFH0381-CCV5</u>	Injection Time: <u>12:47</u>
Sequence Name: <u>Diesel CCV3</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	566	11885.51	13454.45		13.2	15
o-Terphenyl	A	90.000	98.2	17211.94	18782.76		9.1	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100005</u>
Lab File ID:	<u>17083164.D</u>	Calibration Date:	<u>08/31/17 11:56</u>
Sequence:	<u>SFH0381</u>	Injection Date:	<u>09/01/17</u>
Lab Sample ID:	<u>SFH0381-CCV6</u>	Injection Time:	<u>13:08</u>
Sequence Name:	<u>MOIL CCV3</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1040	14932.72	15553.69		4.2	15

* Values outside of QC limits



**SECOND-SOURCE
CONTINUING CALIBRATION CHECK
NWTPH-Dx**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100005</u>
Lab File ID:	<u>17083111.D</u>	Calibration Date:	<u>08/31/17 11:56</u>
Sequence:	<u>SFH0381</u>	Injection Date:	<u>08/31/17</u>
Lab Sample ID:	<u>SFH0381-SCV1</u>	Injection Time:	<u>17:53</u>
Sequence Name:	<u>DIES SCV 500</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	472	11885.51	11214.18		-5.7	30
o-Terphenyl	A	90.000	91.8	17211.94	17547.69		2.0	

* Values outside of QC limits



**SECOND-SOURCE
CONTINUING CALIBRATION CHECK
NWTPH-Dx**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17H0298</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100005</u>
Lab File ID:	<u>17083118.D</u>	Calibration Date:	<u>08/31/17 11:56</u>
Sequence:	<u>SFH0381</u>	Injection Date:	<u>08/31/17</u>
Lab Sample ID:	<u>SFH0381-SCV2</u>	Injection Time:	<u>20:28</u>
Sequence Name:	<u>Moil SCV 1000</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	919	14932.72	13716.33		-8.2	30

* Values outside of QC limits



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0196

Instrument: FID4

Calibration: AH00054

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Retention Time Std	SFH0196-IBL1	17081603.D	NA	08/16/17 11:02
Instrument Blank	SFH0196-IBL2	17081604.D	NA	08/16/17 11:25
Diesel 50	SFH0196-CAL1	17081607.D	NA	08/16/17 14:21
Diesel 100	SFH0196-CAL2	17081608.D	NA	08/16/17 14:42
DIES 250	SFH0196-CAL3	17081609.D	NA	08/16/17 15:06
DIES 500	SFH0196-CAL4	17081610.D	NA	08/16/17 15:27
DIES 1000	SFH0196-CAL5	17081611.D	NA	08/16/17 15:50
DIES 2500	SFH0196-CAL6	17081612.D	NA	08/16/17 16:13
MOIL 100	SFH0196-CAL7	17081613.D	NA	08/16/17 16:35
Moil 250	SFH0196-CAL8	17081614.D	NA	08/16/17 16:59
Moil 500	SFH0196-CAL9	17081615.D	NA	08/16/17 17:20
Moil 1000	SFH0196-CALA	17081616.D	NA	08/16/17 17:43
Moil 2500	SFH0196-CALB	17081617.D	NA	08/16/17 18:07
Moil 5000	SFH0196-CALC	17081618.D	NA	08/16/17 18:28
DIES SCV 500	SFH0196-SCV1	17081619.D	NA	08/16/17 18:52
Moil SCV 1000	SFH0196-SCV2	17081620.D	NA	08/16/17 19:15
ZZZZZ	BFH0158-BLK1	17081621.D	Water	08/16/17 19:38
ZZZZZ	17H0064-01	17081622.D	Water	08/16/17 20:00
ZZZZZ	17H0048-06RE1	17081623.D	Water	08/16/17 20:24
ZZZZZ	17H0048-07RE1	17081624.D	Water	08/16/17 20:47
ZZZZZ	17H0063-01RE1	17081625.D	Water	08/16/17 21:09
Diesel CCV1	SFH0196-CCV1	17081626.D	NA	08/16/17 21:32
MOIL CCV1	SFH0196-CCV2	17081627.D	NA	08/16/17 21:55
ZZZZZ	BFH0301-BLK1	17081628.D	Solid	08/16/17 22:17
ZZZZZ	BFH0301-BS1	17081629.D	Solid	08/16/17 22:40
ZZZZZ	BFH0301-MRL1	17081630.D	Solid	08/16/17 23:02
ZZZZZ	17H0127-01	17081631.D	Solid	08/16/17 23:25
ZZZZZ	17H0127-02	17081632.D	Solid	08/16/17 23:48
Diesel CCV2	SFH0196-CCV3	17081633.D	NA	08/17/17 00:10
MOILCCV2	SFH0196-CCV4	17081634.D	NA	08/17/17 00:33



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0319

Instrument: FID4

Calibration: AH00054

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Retention Time Std	SFH0319-IBL1	17082802.D	NA	08/28/17 11:18
Instrument Blank	SFH0319-IBL2	17082803.D	NA	08/28/17 11:41
Diesel ICV	SFH0319-ICV1	17082804.D	NA	08/28/17 12:04
MOIL ICV	SFH0319-ICV2	17082805.D	NA	08/28/17 12:26
ZZZZZ	BFH0489-BLK1	17082806.D	Solid	08/28/17 12:49
ZZZZZ	BFH0489-BS1	17082807.D	Solid	08/28/17 13:13
ZZZZZ	17H0220-01	17082808.D	Solid	08/28/17 13:34
ZZZZZ	17H0220-02	17082809.D	Solid	08/28/17 13:58
ZZZZZ	17H0220-03	17082810.D	Solid	08/28/17 14:21
Diesel CCV1	SFH0319-CCV1	17082811.D	NA	08/28/17 14:56
MOIL CCV1	SFH0319-CCV2	17082812.D	NA	08/28/17 15:19
Blank	BFH0596-BLK1	17082813.D	Solid	08/28/17 16:01
LCS	BFH0596-BS1	17082814.D	Solid	08/28/17 16:23
SVCA-TP-101-0-2-170823	17H0298-04	17082816.D	Solid	08/28/17 17:10
SVCA-TP-103-0-2-170823	17H0298-10	17082818.D	Solid	08/28/17 17:55
SVCA-TP-100-0-4-170823	17H0298-02	17082819.D	Solid	08/28/17 18:18
SVCA-TP-102-0-2-170823	17H0298-07	17082820.D	Solid	08/28/17 18:42
Diesel CCV2	SFH0319-CCV3	17082821.D	NA	08/28/17 19:06
MOILCCV2	SFH0319-CCV4	17082822.D	NA	08/28/17 19:30
ZZZZZ	BFH0488-BLK1	17082823.D	Solid	08/28/17 19:53
ZZZZZ	BFH0488-BS1	17082824.D	Solid	08/28/17 20:15
ZZZZZ	17H0218-01	17082825.D	Solid	08/28/17 20:39
ZZZZZ	17H0218-02	17082826.D	Solid	08/28/17 21:03
ZZZZZ	17H0218-03	17082827.D	Solid	08/28/17 21:25
ZZZZZ	17H0218-04	17082828.D	Solid	08/28/17 21:48
ZZZZZ	17H0218-05	17082831.D	Solid	08/28/17 22:56
ZZZZZ	17H0218-06	17082832.D	Solid	08/28/17 23:20
Diesel CCV3	SFH0319-CCV5	17082833.D	NA	08/28/17 23:42
MOIL CCV3	SFH0319-CCV6	17082834.D	NA	08/29/17 00:05



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0356

Instrument: FID4

Calibration: AH00054

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Retention Time Std	SFH0356-IBL1	17083001.D	NA	08/30/17 08:43
Instrument Blank	SFH0356-IBL2	17083002.D	NA	08/30/17 09:06
Diesel ICV	SFH0356-ICV1	17083003.D	NA	08/30/17 09:28
MOIL ICV	SFH0356-ICV2	17083004.D	NA	08/30/17 09:51
Blank	BFH0597-BLK1	17083006.D	Solid	08/30/17 10:36
LCS	BFH0597-BS1	17083007.D	Solid	08/30/17 10:59
SVCA-TP-100-0-4-170823	17H0298-01	17083008.D	Solid	08/30/17 11:21
SVCA-TP-101-0-2-170823	17H0298-03	17083009.D	Solid	08/30/17 11:44
SVCA-TP-102-0-2-170823	17H0298-06	17083010.D	Solid	08/30/17 12:07
SVCA-TP-103-0-2-170823	17H0298-09	17083011.D	Solid	08/30/17 12:29
Diesel CCV1	SFH0356-CCV1	17083012.D	NA	08/30/17 12:52
MOIL CCV1	SFH0356-CCV2	17083013.D	NA	08/30/17 13:14
SVCA-TP-103-0-2-170823	17H0298-09RE1	17083014.D	Solid	08/30/17 13:37
Diesel CCV2	SFH0356-CCV3	17083026.D	NA	08/30/17 18:10
MOILCCV2	SFH0356-CCV4	17083027.D	NA	08/30/17 18:34
Diesel CCV3	SFH0356-CCV5	17083037.D	NA	08/30/17 22:20
MOIL CCV3	SFH0356-CCV6	17083038.D	NA	08/30/17 22:41



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0381

Instrument: FID4

Calibration: A100005

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Retention Time Std	SFH0381-IBL1	17083102.D	NA	08/31/17 14:35
Instrument Blank	SFH0381-IBL2	17083103.D	NA	08/31/17 14:57
Diesel 50	SFH0381-CAL1	17083105.D	NA	08/31/17 15:41
Diesel 100	SFH0381-CAL2	17083106.D	NA	08/31/17 16:04
DIES 250	SFH0381-CAL3	17083107.D	NA	08/31/17 16:25
DIES 500	SFH0381-CAL4	17083108.D	NA	08/31/17 16:48
DIES 1000	SFH0381-CAL5	17083109.D	NA	08/31/17 17:09
DIES 2500	SFH0381-CAL6	17083110.D	NA	08/31/17 17:31
DIES SCV 500	SFH0381-SCV1	17083111.D	NA	08/31/17 17:53
MOIL 100	SFH0381-CAL7	17083112.D	NA	08/31/17 18:15
Moil 250	SFH0381-CAL8	17083113.D	NA	08/31/17 18:38
Moil 500	SFH0381-CAL9	17083114.D	NA	08/31/17 18:59
Moil 1000	SFH0381-CALA	17083115.D	NA	08/31/17 19:22
Moil 2500	SFH0381-CALB	17083116.D	NA	08/31/17 19:43
Moil 5000	SFH0381-CALC	17083117.D	NA	08/31/17 20:07
Moil SCV 1000	SFH0381-SCV2	17083118.D	NA	08/31/17 20:28
ZZZZZ	BFH0643-BLK1	17083120.D	Solid	08/31/17 21:12
ZZZZZ	BFH0643-BS1	17083121.D	Solid	08/31/17 21:34
ZZZZZ	17H0325-01	17083122.D	Solid	08/31/17 21:56
ZZZZZ	17H0325-02	17083123.D	Solid	08/31/17 22:17
ZZZZZ	17H0325-03	17083124.D	Solid	08/31/17 22:40
ZZZZZ	17H0325-04	17083125.D	Solid	08/31/17 23:01
ZZZZZ	17H0325-05	17083126.D	Solid	08/31/17 23:23
ZZZZZ	17H0325-06	17083127.D	Solid	08/31/17 23:45
ZZZZZ	17H0325-07	17083128.D	Solid	09/01/17 00:06
ZZZZZ	17H0325-08	17083129.D	Solid	09/01/17 00:28
ZZZZZ	17H0325-09	17083130.D	Solid	09/01/17 00:51
Diesel CCV1	SFH0381-CCV1	17083131.D	NA	09/01/17 01:12
MOIL CCV1	SFH0381-CCV2	17083132.D	NA	09/01/17 01:33
ZZZZZ	17H0325-10	17083133.D	Solid	09/01/17 01:56



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0381

Instrument: FID4

Calibration: A100005

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	BFH0662-BLK1	17083134.D	Solid	09/01/17 02:17
ZZZZZ	BFH0662-BS1	17083135.D	Solid	09/01/17 02:38
ZZZZZ	17H0319-01	17083136.D	Solid	09/01/17 03:01
ZZZZZ	17H0319-02	17083137.D	Solid	09/01/17 03:22
ZZZZZ	17H0327-01	17083138.D	Solid	09/01/17 03:43
Blank	BFH0600-BLK1	17083139.D	Water	09/01/17 04:04
LCS	BFH0600-BS1	17083140.D	Water	09/01/17 04:26
SVCA-MW-4-170824	17H0298-12	17083141.D	Water	09/01/17 04:47
Blank	BFH0589-BLK1	17083142.D	Water	09/01/17 05:08
LCS	BFH0589-BS1	17083143.D	Water	09/01/17 05:31
ZZZZZ	17H0271-02	17083144.D	Water	09/01/17 05:52
ZZZZZ	17H0271-03	17083147.D	Water	09/01/17 06:57
ZZZZZ	17H0271-04	17083148.D	Water	09/01/17 07:17
ZZZZZ	17H0271-05	17083149.D	Water	09/01/17 07:39
Diesel CCV2	SFH0381-CCV3	17083150.D	NA	09/01/17 08:01
MOILCCV2	SFH0381-CCV4	17083151.D	NA	09/01/17 08:22
ZZZZZ	17H0273-01	17083152.D	Water	09/01/17 08:43
ZZZZZ	17H0273-03	17083153.D	Water	09/01/17 09:06
ZZZZZ	17H0273-05	17083154.D	Water	09/01/17 09:27
ZZZZZ	17H0273-07	17083155.D	Water	09/01/17 09:50
ZZZZZ	17H0292-01	17083156.D	Water	09/01/17 10:11
ZZZZZ	17H0292-02	17083157.D	Water	09/01/17 10:33
ZZZZZ	17H0292-03	17083158.D	Water	09/01/17 10:55
ZZZZZ	17H0292-04	17083159.D	Water	09/01/17 11:17
ZZZZZ	17H0292-06	17083160.D	Water	09/01/17 11:39
SVCA-MW-4-170824	17H0298-13	17083161.D	Water	09/01/17 12:02
Diesel CCV3	SFH0381-CCV5	17083163.D	NA	09/01/17 12:47
MOIL CCV3	SFH0381-CCV6	17083164.D	NA	09/01/17 13:08



SURROGATE RECOVERY AND RT SUMMARY

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG/WO: <u>17H0298</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Sequence: <u>SFH0196</u>	Instrument: <u>FID4</u>
Calibration: <u>AH00054</u>	Calibration Date: <u>08/16/2017</u>

Surrogate Compound	Spike Level mg/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SFH0196-SCV1 (Water)			Lab File ID: 17081619.D			Analyzed: 08/16/17 18:52		
o-Terphenyl	90.000	97.7	0 - 200	4.72	4.736667	-0.0167	N/A	



SURROGATE RECOVERY AND RT SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG/WO: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0319

Instrument: FID4

Calibration: AH00054

Calibration Date: 08/16/2017

Surrogate Compound	Spike Level mg/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SFH0319-IBL1 (Solid)			Lab File ID: 17082802.D		Analyzed: 08/28/17 11:18			
o-Terphenyl	225.00	90.3	50 - 150	4.73	4.736667	-0.0067	N/A	
SFH0319-IBL2 (Solid)			Lab File ID: 17082803.D		Analyzed: 08/28/17 11:41			
o-Terphenyl	225.00	87.0	50 - 150	4.73	4.736667	-0.0067	N/A	
SFH0319-ICV1 (Solid)			Lab File ID: 17082804.D		Analyzed: 08/28/17 12:04			
o-Terphenyl	90.000	96.2	80 - 120	4.72	4.736667	-0.0167	N/A	
BFH0596-BLK1 (Solid)			Lab File ID: 17082813.D		Analyzed: 08/28/17 16:01			
o-Terphenyl	22.500	80.4	50 - 150	4.74	4.736667	0.0033	N/A	
BFH0596-BS1 (Solid)			Lab File ID: 17082814.D		Analyzed: 08/28/17 16:23			
o-Terphenyl	22.500	80.4	50 - 150	4.73	4.736667	-0.0067	N/A	
17H0298-04 (Solid)			Lab File ID: 17082816.D		Analyzed: 08/28/17 17:10			
o-Terphenyl	23.325	72.7	50 - 150	4.73	4.736667	-0.0067	N/A	
17H0298-10 (Solid)			Lab File ID: 17082818.D		Analyzed: 08/28/17 17:55			
o-Terphenyl	23.959	80.4	50 - 150	4.72	4.736667	-0.0167	N/A	
17H0298-02 (Solid)			Lab File ID: 17082819.D		Analyzed: 08/28/17 18:18			
o-Terphenyl	24.535	79.4	50 - 150	4.73	4.736667	-0.0067	N/A	
17H0298-07 (Solid)			Lab File ID: 17082820.D		Analyzed: 08/28/17 18:42			
o-Terphenyl	23.105	94.2	50 - 150	4.72	4.736667	-0.0167	N/A	



SURROGATE RECOVERY AND RT SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG/WO: 17H0298

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFH0356

Instrument: FID4

Calibration: AH00054

Calibration Date: 08/16/2017

Surrogate Compound	Spike Level mg/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SFH0356-IBL1 (Solid)			Lab File ID: 17083001.D		Analyzed: 08/30/17 08:43			
o-Terphenyl	225.00	130	50 - 150	4.73	4.736667	-0.0067	N/A	
SFH0356-IBL2 (Solid)			Lab File ID: 17083002.D		Analyzed: 08/30/17 09:06			
o-Terphenyl	225.00	124	50 - 150	4.73	4.736667	-0.0067	N/A	
SFH0356-ICV1 (Solid)			Lab File ID: 17083003.D		Analyzed: 08/30/17 09:28			
o-Terphenyl	90.000	109	80 - 120	4.72	4.736667	-0.0167	N/A	
BFH0597-BLK1 (Solid)			Lab File ID: 17083006.D		Analyzed: 08/30/17 10:36			
o-Terphenyl	22.500	93.2	50 - 150	4.73	4.736667	-0.0067	N/A	
BFH0597-BS1 (Solid)			Lab File ID: 17083007.D		Analyzed: 08/30/17 10:59			
o-Terphenyl	22.500	99.0	50 - 150	4.73	4.736667	-0.0067	N/A	
17H0298-01 (Solid)			Lab File ID: 17083008.D		Analyzed: 08/30/17 11:21			
o-Terphenyl	24.706	101	50 - 150	4.73	4.736667	-0.0067	N/A	
17H0298-03 (Solid)			Lab File ID: 17083009.D		Analyzed: 08/30/17 11:44			
o-Terphenyl	23.652	94.4	50 - 150	4.73	4.736667	-0.0067	N/A	
17H0298-06 (Solid)			Lab File ID: 17083010.D		Analyzed: 08/30/17 12:07			
o-Terphenyl	23.590	105	50 - 150	4.73	4.736667	-0.0067	N/A	
17H0298-09 (Solid)			Lab File ID: 17083011.D		Analyzed: 08/30/17 12:29			
o-Terphenyl	24.582	107	50 - 150	4.73	4.736667	-0.0067	N/A	
17H0298-09RE1 (Solid)			Lab File ID: 17083014.D		Analyzed: 08/30/17 13:37			
o-Terphenyl	24.582	101	50 - 150	4.72	4.736667	-0.0167	N/A	



SURROGATE RECOVERY AND RT SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.
 Client: Anchor QEA, LLC
 Sequence: SFH0381
 Calibration: AI00005

SDG/WO: 17H0298
 Project: SCVA Area Z Remediation
 Instrument: FID4
 Calibration Date: 08/31/2017

Surrogate Compound	Spike Level mg/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SFH0381-IBL1 (Solid)			Lab File ID: 17083102.D		Analyzed: 08/31/17 14:35			
o-Terphenyl	225.00	109	50 - 150	4.71	4.7	0.0100	N/A	
SFH0381-IBL2 (Solid)			Lab File ID: 17083103.D		Analyzed: 08/31/17 14:57			
o-Terphenyl	225.00	105	50 - 150	4.7	4.7	0.0000	N/A	
SFH0381-SCV1 (Solid)			Lab File ID: 17083111.D		Analyzed: 08/31/17 17:53			
o-Terphenyl	90.000	102	0 - 200	4.7	4.7	0.0000	N/A	
BFH0600-BLK1 (Water)			Lab File ID: 17083139.D		Analyzed: 09/01/17 04:04			
o-Terphenyl	0.45000	121	50 - 150	4.7	4.7	0.0000	N/A	
BFH0600-BS1 (Water)			Lab File ID: 17083140.D		Analyzed: 09/01/17 04:26			
o-Terphenyl	0.45000	121	50 - 150	4.7	4.7	0.0000	N/A	
17H0298-12 (Water)			Lab File ID: 17083141.D		Analyzed: 09/01/17 04:47			
o-Terphenyl	0.45000	114	50 - 150	4.7	4.7	0.0000	N/A	
BFH0589-BLK1 (Water)			Lab File ID: 17083142.D		Analyzed: 09/01/17 05:08			
o-Terphenyl	0.45000	117	50 - 150	4.7	4.7	0.0000	N/A	
BFH0589-BS1 (Water)			Lab File ID: 17083143.D		Analyzed: 09/01/17 05:31			
o-Terphenyl	0.45000	123	50 - 150	4.7	4.7	0.0000	N/A	
17H0298-13 (Water)			Lab File ID: 17083161.D		Analyzed: 09/01/17 12:02			
o-Terphenyl	0.45000	119	50 - 150	4.69	4.7	-0.0100	N/A	



HOLDING TIME SUMMARY

Analysis: NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
SVCA-TP-100-0-4-170823 17H0298-01	08/23/17 09:46	08/25/17 09:46	08/28/17 10:20	5	14	08/30/17 11:21	2	40	
SVCA-TP-100-0-4-170823 17H0298-02	08/23/17 09:46	08/25/17 09:46	08/28/17 10:15	5	14	08/28/17 18:18	0	40	
SVCA-TP-101-0-2-170823 17H0298-03	08/23/17 10:59	08/25/17 09:46	08/28/17 10:20	4	14	08/30/17 11:44	2	40	
SVCA-TP-101-0-2-170823 17H0298-04	08/23/17 10:59	08/25/17 09:46	08/28/17 10:15	4	14	08/28/17 17:10	0	40	
SVCA-TP-102-0-2-170823 17H0298-06	08/23/17 13:02	08/25/17 09:46	08/28/17 10:20	4	14	08/30/17 12:07	2	40	
SVCA-TP-102-0-2-170823 17H0298-07	08/23/17 13:02	08/25/17 09:46	08/28/17 10:15	4	14	08/28/17 18:42	0	40	
SVCA-TP-103-0-2-170823 17H0298-09	08/23/17 14:45	08/25/17 09:46	08/28/17 10:20	4	14	08/30/17 12:29	2	40	
SVCA-TP-103-0-2-170823 17H0298-09RE1	08/23/17 14:45	08/25/17 09:46	08/28/17 10:20	4	14	08/30/17 13:37	2	40	
SVCA-TP-103-0-2-170823 17H0298-10	08/23/17 14:45	08/25/17 09:46	08/28/17 10:15	4	14	08/28/17 17:55	0	40	
SVCA-MW-4-170824 17H0298-12	08/24/17 17:00	08/25/17 09:46	08/28/17 10:54	3	7	09/01/17 04:47	4	40	
SVCA-MW-4-170824 17H0298-13	08/24/17 17:00	08/25/17 09:46	08/25/17 13:34	0	7	09/01/17 12:02	7	40	

* Indicates hold time exceedance.



METHOD DETECTION AND REPORTING LIMITS

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Instrument: FID4

Analyte	MDL	RL	Units
Diesel Range Organics (C12-C24)	2.34	5.00	mg/kg
Motor Oil Range Organics (C24-C38)	2.99	10.0	mg/kg



METHOD DETECTION AND REPORTING LIMITS

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17H0298

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Water

Instrument: FID4

Analyte	MDL	RL	Units
Diesel Range Organics (C12-C24)	0.033	0.100	mg/L
Motor Oil Range Organics (C24-C38)	0.056	0.200	mg/L



08 June 2018

Cheronne Oreiro
Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101

RE: SCVA Area Z Remediation

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
17I0040

Associated SDG ID(s)
N/A

Amanda Volgardsen

Digitally signed by Amanda Volgardsen
DN: c=US, st=Washington, l=Tukwila,
o=Analytical Resources, Inc., ou=Project
Manager, cn=Amanda Volgardsen,
email=amanda.volgardsen@arilabs.com
Date: 2018.06.08 14:23:04 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Amanda Volgardsen, Project Manager



PJLA Testing
Accreditation # 66169



CHANGE ORDER

17710040

Client: Anchor
Project No: SCVA Area 2

ARI Job No: 17710098	Change order Date:
VTSR: 8/25/94	

Change made by: Barbara Bennidelle Wehner
Submitted by: AR

Change Acknowledged

Project Coordinator:
Extractions:
Volatiles:
GC/MS Extractions Lab:
GC Lab:
Metals:
Conventionals:
Data Section:

Please pull highlighted samples
log on new work order for both
regular & acid cleaned desci
(sep. sample numbers will be a samples instead of 3)
Submitted TAT 5 day TAT

Triggering archive samples

1710040

Bernadette Wright <bwright@anchorqea.com>

Tue 9/5/2017 4:01 PM

To: Amanda Volgardsen <amandav@arilabs.com>;

Cc: Cheronne Oreiro <coreiro@anchorqea.com>; Jennifer Allen <jallen@anchorqea.com>;

📎 1 attachments (119 KB)

COC_archiverequest.pdf;

Hi Amanda –

Please trigger the following archived samples for NWTPH-D extended, with and without silica gel clean up (also see attached COC for reference):

- SVCA-TP-101-2-3.5-170823
- SVCA-TP-102-3-4-170823
- SVCA-TP-103-3-4-170823

I believe the hold time for this analysis is 14 days, which ends tomorrow, so please make sure the samples get processed within that hold time limit. No need for rush TAT, standard 5-day will be fine.

Let me know if you have any questions.

Thanks!

Bernadette

Bernadette Wright

Geologist

ANCHOR QEA, LLC

bwright@anchorqea.com

720 Olive Way, Suite 1900

Seattle, WA 98101

T 206.287.9130

D 206.971.2686

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1710040

Chain of Custody Record & Laboratory Analysis Request

Line	Field Sample ID	Collection Date/Time	Matrix	No. of Containers	Test Parameters				Comments/Preservation
					NWTPH-G	NWTPH-D	BTEX	Archive	
1	SVCA-TP-100-0-1-170823	8/23/17 0946	SO	9	X	X	X	X	
2	SVCA-TP-101-0-2-170823	8/23/17 1059	SO	9	X	X	X	X	
3	SVCA-TP-101-2-35-170823	8/23/17 1115	SO	1	X	X	X	X	
4	SVCA-TP-102-0-2-170823	8/23/17 1302	SO	9	X	X	X	X	
5	SVCA-TP-102-3-4-170823	8/23/17 1350	SO	1	X	X	X	X	
6	SVCA-TP-103-0-2-170823	8/23/17 1445	SO	9	X	X	X	X	
7	SVCA-TP-103-3-4-170823	8/23/17 1530	SO	1	X	X	X	X	
8	SVCA-TP-104-4-170824	8/24/17 1700	SO	9	X	X	X	X	
9	SVCA-TP-104-10-170823	8/23/17 1600	SO	4					
10									
11									
12									
13									
14									
15									



Notes: NWTPH-D extended analyzed with and without silica gel cleanup. See contract for analysis details + sending TAT
 Email sample confirmation report to labdata@anchorqea.com

Relinquished By: [Signature] Company: Anchor OEA, LLC Date/Time: 8/25/17 0946

Received By: [Signature] Company: Frederick Fisk Date/Time: 8/25/17 946

Relinquished By: [Signature] Company: Anchor OEA, LLC Date/Time: 8/25/17 0946

Received By: [Signature] Company: Anchor OEA, LLC Date/Time:



Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle WA, 98101

Project: SCVA Area Z Remediation
Project Number: [none]
Project Manager: Cheronne Oreiro

Reported:
11-Sep-2017 12:30

Case Narrative

Sample receipt

Samples as listed on the preceding page were received August 25, 2017, and removed from archive on September 5, 2017 under ARI workorder 1710040. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx (Ac/Si cleaned and not Ac/Si cleaned)

The samples were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The initial calibration verification (ICV) SF10079-ICV1 is outside of control limits high for the surrogate o- Terphenyl. All other analytes were within control limits. No corrective action was taken.

The surrogate percent recoveries were within control limits.

Method blank BF10079 has Diesel Range Organics C8-C24 detected above the reporting limit. Associated detected results have been flagged with a "B" qualifier. No further corrective action was taken.

The LCS percent recoveries were within control limits.



Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101

Project: SCVA Area Z Remediation
Project Number: [none]
Project Manager: Cheronne Oreiro

Reported:
09/11/2017 12:30

ANALYTICAL REPORT FOR SAMPLES

Laboratory ID	Sample ID	Matrix	Date Sampled	Date Received
17I0040-01	SVCA-TP-101-2-3.5-170823	Solid	08/23/17 11:15	08/25/17 09:46
17I0040-02	SVCA-TP-101-2-3.5-170823	Solid	08/23/17 11:15	08/25/17 09:46
17I0040-03	SVCA-TP-102-3-4-170823	Solid	08/23/17 13:30	08/25/17 09:46
17I0040-04	SVCA-TP-102-3-4-170823	Solid	08/23/17 13:30	08/25/17 09:46
17I0040-05	SVCA-TP-103-3-4-170823	Solid	08/23/17 15:30	08/25/17 09:46
17I0040-06	SVCA-TP-103-3-4-170823	Solid	08/23/17 15:30	08/25/17 09:46



QUALIFIERS AND NOTES

<u>Qualifier</u>	<u>Definition</u>
U	This analyte is not detected above the applicable reporting or detection limit.
D	The reported value is from a dilution
B	This analyte was detected in the method blank.
*	Flagged value is not within established control limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference



Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Solid Laboratory ID: 1710040-01 SDG: 1710040
 Sampled: 08/23/17 11:15 Prepared: 09/06/17 10:05 File ID: 17090708.D
 % Solids: 91.24 Preparation: EPA 3546 (Microwave) Analyzed: 09/07/17 15:31
 Batch: BFI0078 Sequence: SFI0079 Initial/Final: 10.29 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00012

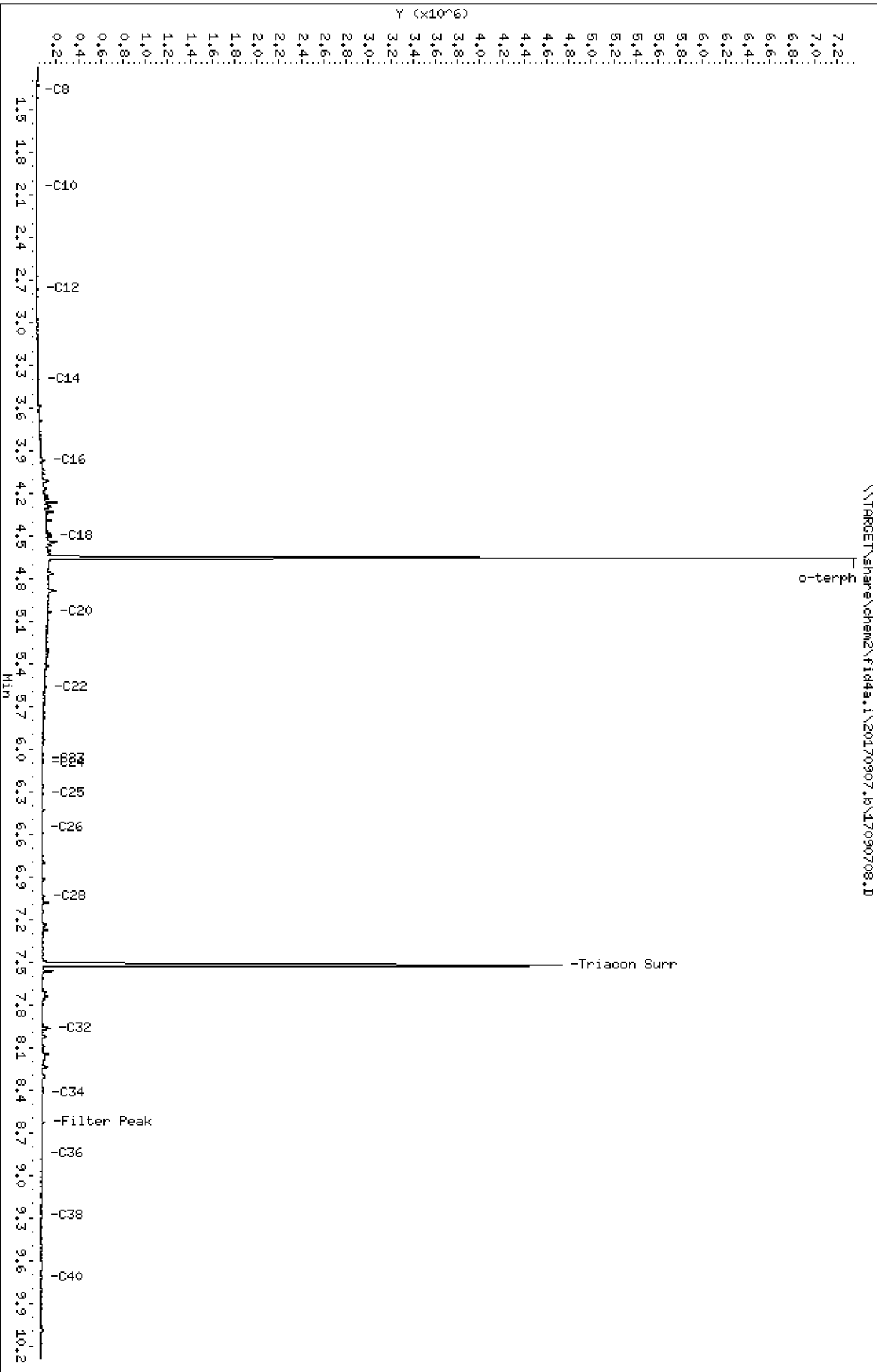
CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	80.8		2.49	5.33
	Motor Oil Range Organics (C24-C38)	1	58.5		3.18	10.7

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	23.965	24.3	102	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170907.8\17090708.D
Date : 07-SEP-2017 15:31
Client ID:
Sample Info: 1710040-01

Column phase: RTX-1

Instrument: fid4a.1
Operator: ML
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170907.b/17090708.D
Method: 20170907.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/08/2017
Macro: 04-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:04-SEP-2017 M.Oil:04-SEP-2017

ARI ID: 17I0040-01
Client ID:
Injection: 07-SEP-2017 15:31
Dilution Factor: 1

FID:4A RESULTS

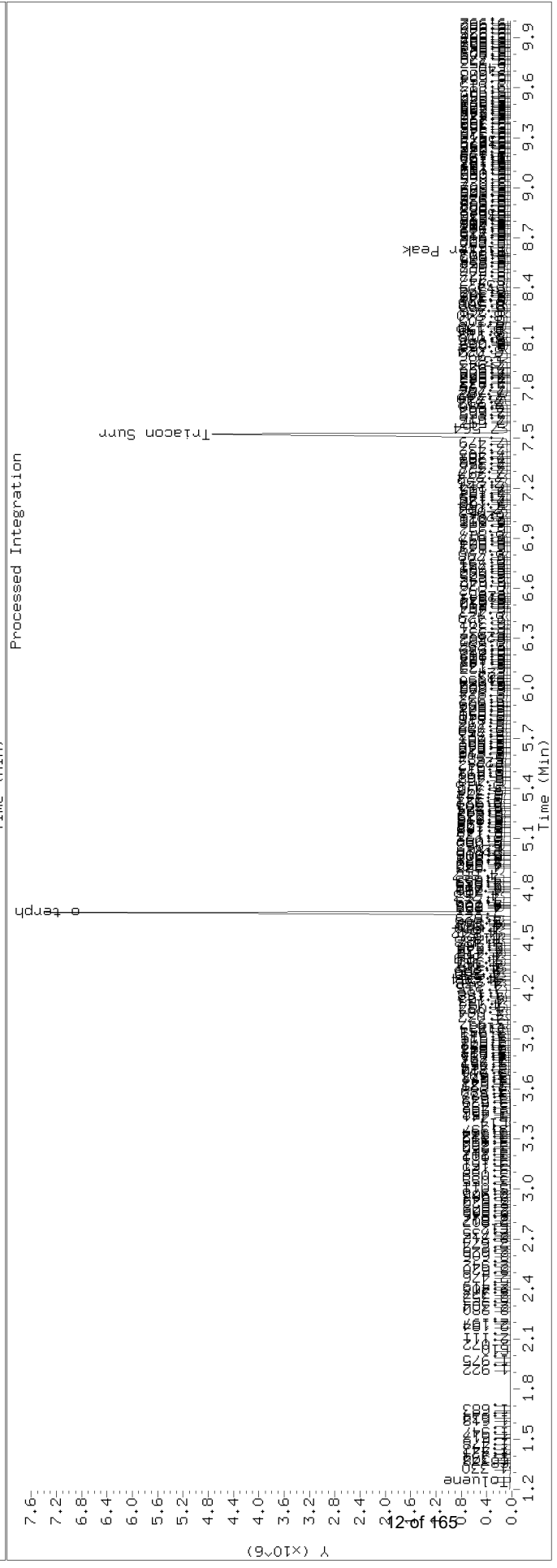
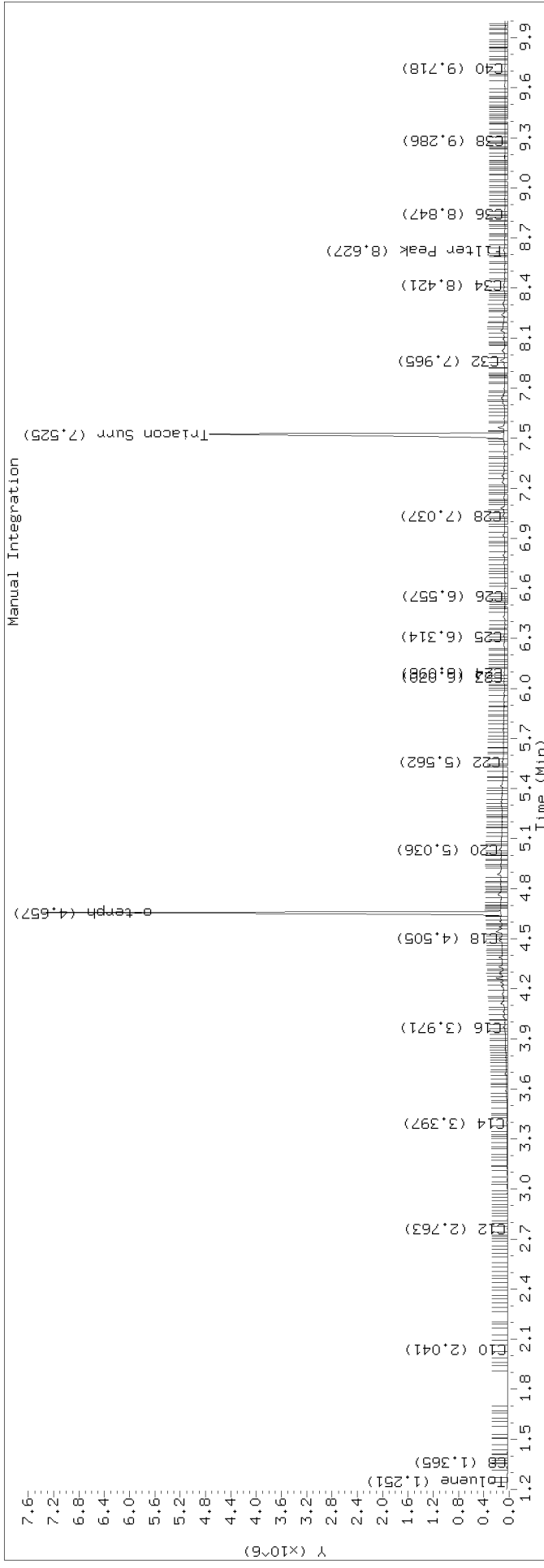
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.251	-0.001	10876	14129	WATPHG	(Tol-C12)	149333	99.6
C8	1.365	0.001	4219	3649	WATPHD	(C12-C24)	12140276	759.0
C10	2.041	-0.000	2075	1522	WATPHM	(C24-C38)	9967386	549.3
C12	2.763	0.010	6741	10961	AK102	(C10-C25)	12599339	676.2
C14	3.397	-0.001	23804	40739				
C16	3.971	-0.005	74932	81121	OR.DIES	(C10-C28)	15065886	797.4
C18	4.505	-0.005	136703	124587				
C20	5.036	-0.005	135643	200441				
C22	5.562	-0.004	90565	147842				
C24	6.096	-0.005	57543	123026				
C25	6.314	-0.005	64072	68261				
C26	6.557	-0.005	51868	58499				
C28	7.037	-0.005	76390	99979				
C32	7.965	-0.005	117406	153767				
C34	8.421	0.009	66853	123693				
Filter Peak	8.627	-0.005	69289	117994				
C36	8.847	-0.002	47373	46210				
C38	9.286	-0.002	45705	68133				
C40	9.718	-0.003	48570	115056				
o-terph	4.657	-0.005	7241373	4422486				
Triacon Surr	7.525	-0.005	4656838	4285084	NAS DIES	(C10-C24)	12214725	656.9

Range Times: NW Diesel(2.753 - 6.101) AK102(2.04 - 6.32) Jet A(2.04 - 4.51)
NW M.Oil(6.10 - 9.29) AK103(6.32 - 8.85) OR Diesel(2.04 - 7.04)

Surrogate	Area	Amount
o-Terphenyl	4422486	228.4 M
Triacotane	4285084	177.5 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	19364.3	04-SEP-2017
Triacon Surr	24141.7	04-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15996.0	04-SEP-2017
Motor Oil	18145.0	04-SEP-2017
AK102	18632.0	04-SEP-2017
OR Diesel	18894.0	04-SEP-2017
NAS Diesel	18594.0	04-SEP-2017





Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Solid Laboratory ID: 1710040-02 SDG: 1710040
 Sampled: 08/23/17 11:15 Prepared: 09/06/17 10:10 File ID: 17090713.D
 % Solids: 91.24 Preparation: EPA 3546 (Microwave) Analyzed: 09/07/17 17:24
 Batch: BFI0079 Sequence: SFI0079 Initial/Final: 10.02 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00012
 Cleanups: Silica Gel, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	70.2	B	2.56	5.47
	Motor Oil Range Organics (C24-C38)	1	42.3		3.27	10.9

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	24.611	24.2	98.4	50 - 150	

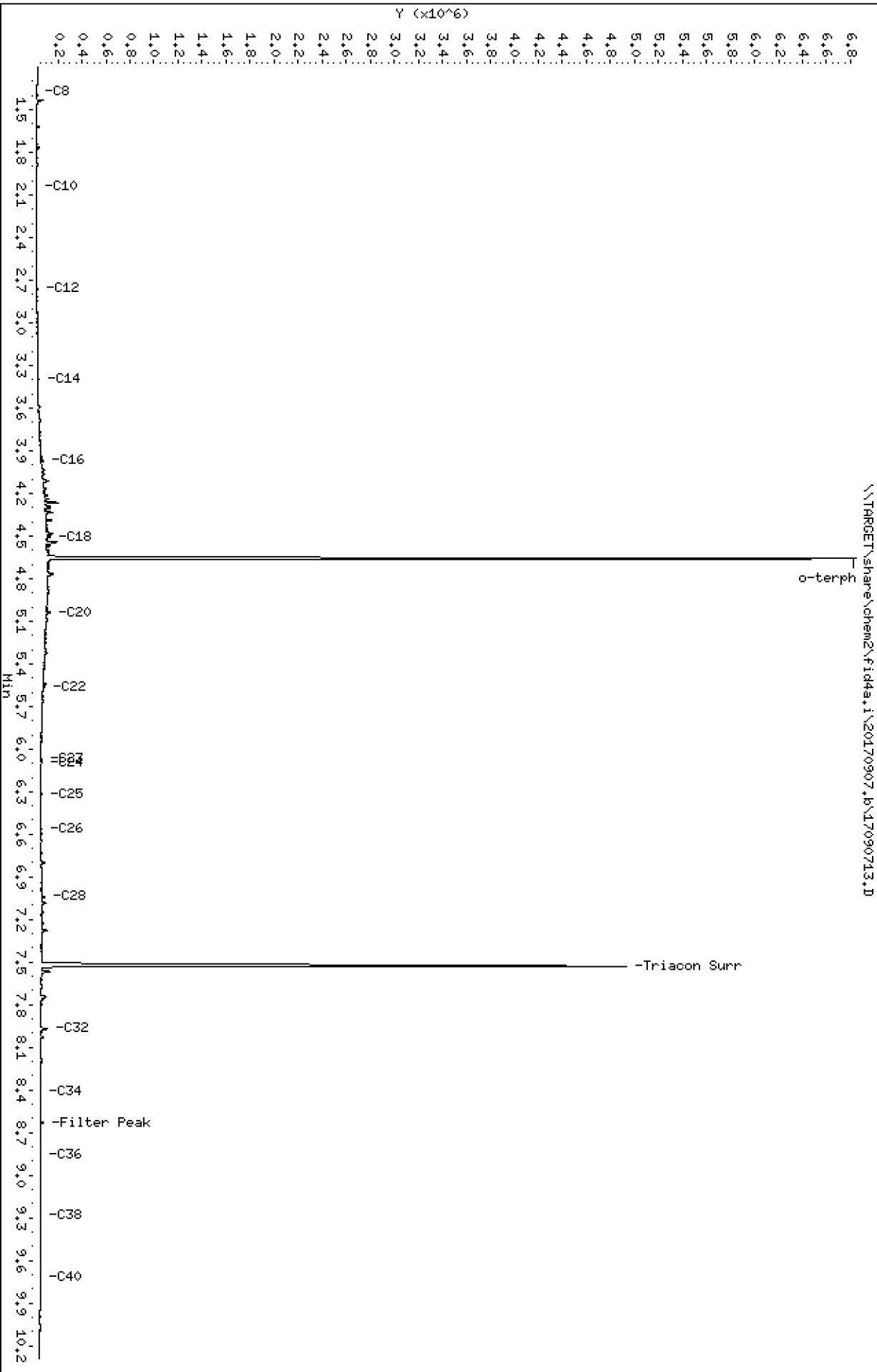
Data File: \\TARGET\share\chem2\fid4a.1\20170907_b\17090713.D
Date : 07-SEP-2017 17:24
Client ID:
Sample Info: 1710040-02

Instrument: fid4a.1

Page 1

Column phase: RTX-1

Operator: ML
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170907.b/17090713.D
Method: 20170907.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/08/2017
Macro: 04-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:04-SEP-2017 M.Oil:04-SEP-2017

ARI ID: 17I0040-02
Client ID:
Injection: 07-SEP-2017 17:24
Dilution Factor: 1

FID:4A RESULTS

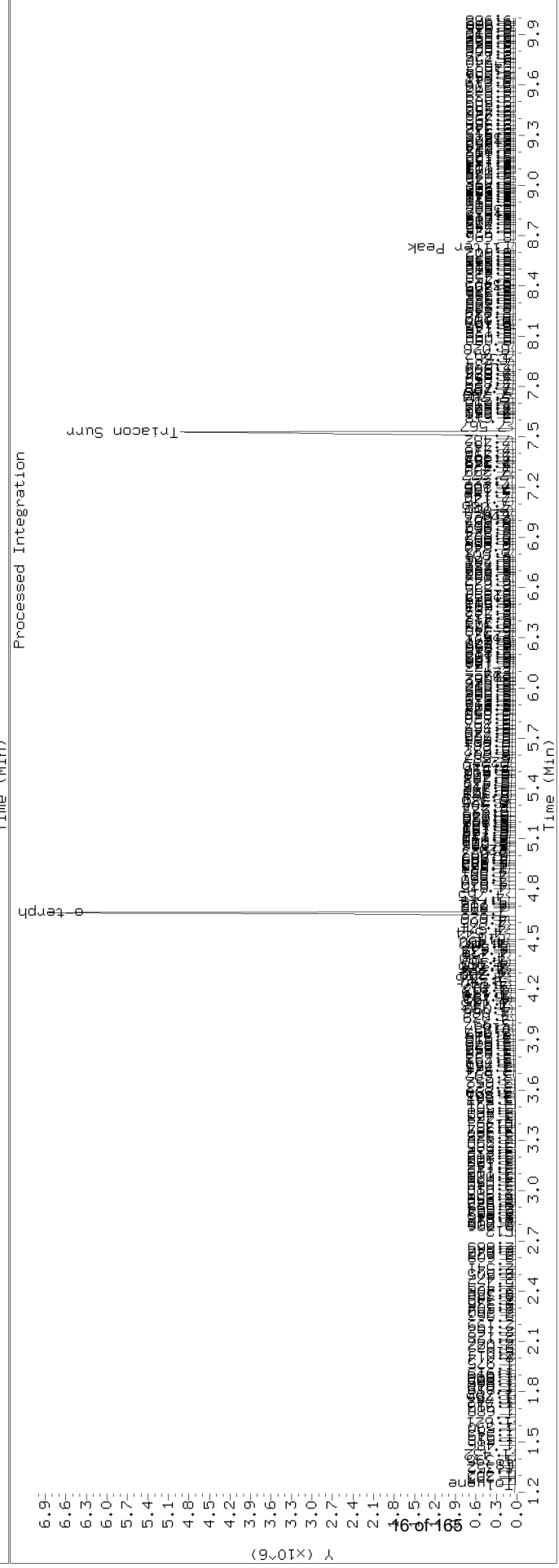
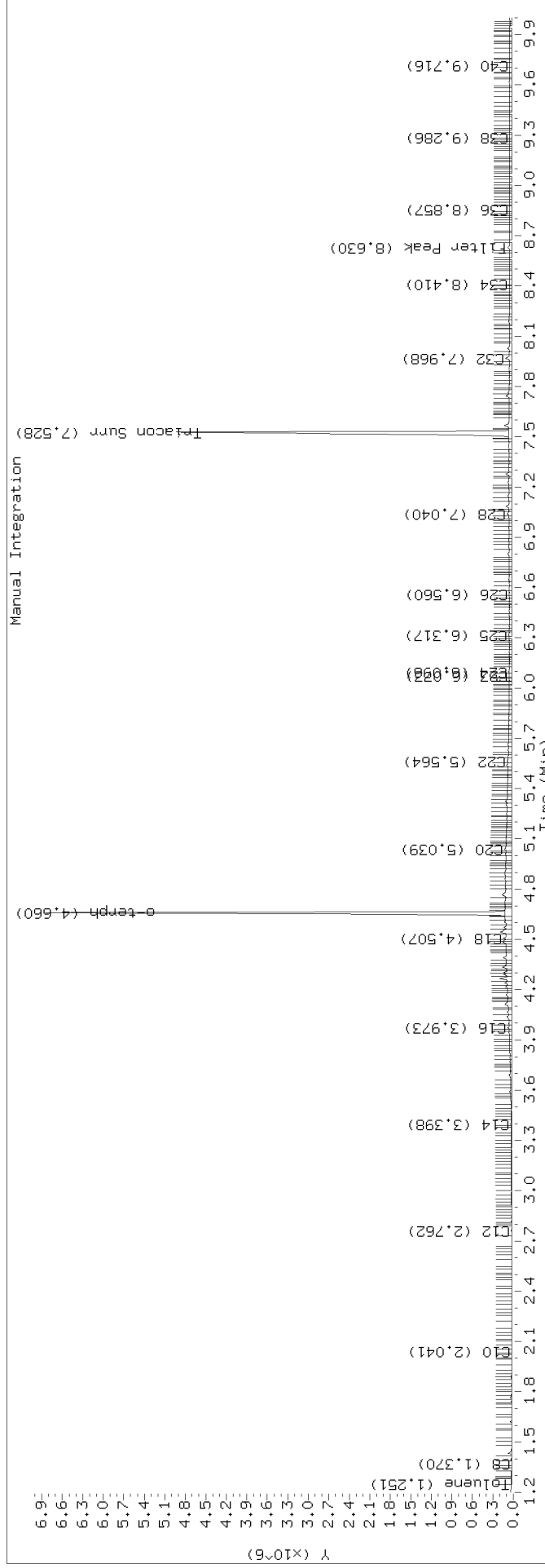
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.251	-0.001	11092	19736	WATPHG	(Tol-C12)	266184	177.5
C8	1.370	0.007	5281	7334	WATPHD	(C12-C24)	10261774	641.5
C10	2.041	0.000	2331	1518	WATPHM	(C24-C38)	7014446	386.6
C12	2.762	0.009	7664	17102	AK102	(C10-C25)	10560059	566.8
C14	3.398	0.000	20163	27511				
C16	3.973	-0.002	59651	66680	OR.DIES	(C10-C28)	12592108	666.5
C18	4.507	-0.002	119997	179600				
C20	5.039	-0.002	110625	168124				
C22	5.564	-0.001	69088	102035				
C24	6.096	-0.005	43852	86243				
C25	6.317	-0.001	51190	70964				
C26	6.560	-0.001	41392	62476				
C28	7.040	-0.001	66619	82594				
C32	7.968	-0.002	90674	126274				
C34	8.410	-0.002	36741	71551				
Filter Peak	8.630	-0.001	57784	121594				
C36	8.857	0.008	33665	62327				
C38	9.286	-0.001	31101	39267				
C40	9.716	-0.005	32793	57757				
o-terph	4.660	-0.003	6725558	4290127				
Triacon Surr	7.528	-0.002	4865007	4168039	NAS DIES	(C10-C24)	10338961	556.0

Range Times: NW Diesel(2.753 - 6.101) AK102(2.04 - 6.32) Jet A(2.04 - 4.51)
NW M.Oil(6.10 - 9.29) AK103(6.32 - 8.85) OR Diesel(2.04 - 7.04)

Surrogate	Area	Amount
o-Terphenyl	4290127	221.5 M
Triacontane	4168039	172.6 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	19364.3	04-SEP-2017
Triacon Surr	24141.7	04-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15996.0	04-SEP-2017
Motor Oil	18145.0	04-SEP-2017
AK102	18632.0	04-SEP-2017
OR Diesel	18894.0	04-SEP-2017
NAS Diesel	18594.0	04-SEP-2017





Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Solid Laboratory ID: 1710040-03 SDG: 1710040
 Sampled: 08/23/17 13:30 Prepared: 09/06/17 10:05 File ID: 17090709.D
 % Solids: 84.31 Preparation: EPA 3546 (Microwave) Analyzed: 09/07/17 15:53
 Batch: BFI0078 Sequence: SFI0079 Initial/Final: 10.08 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00012

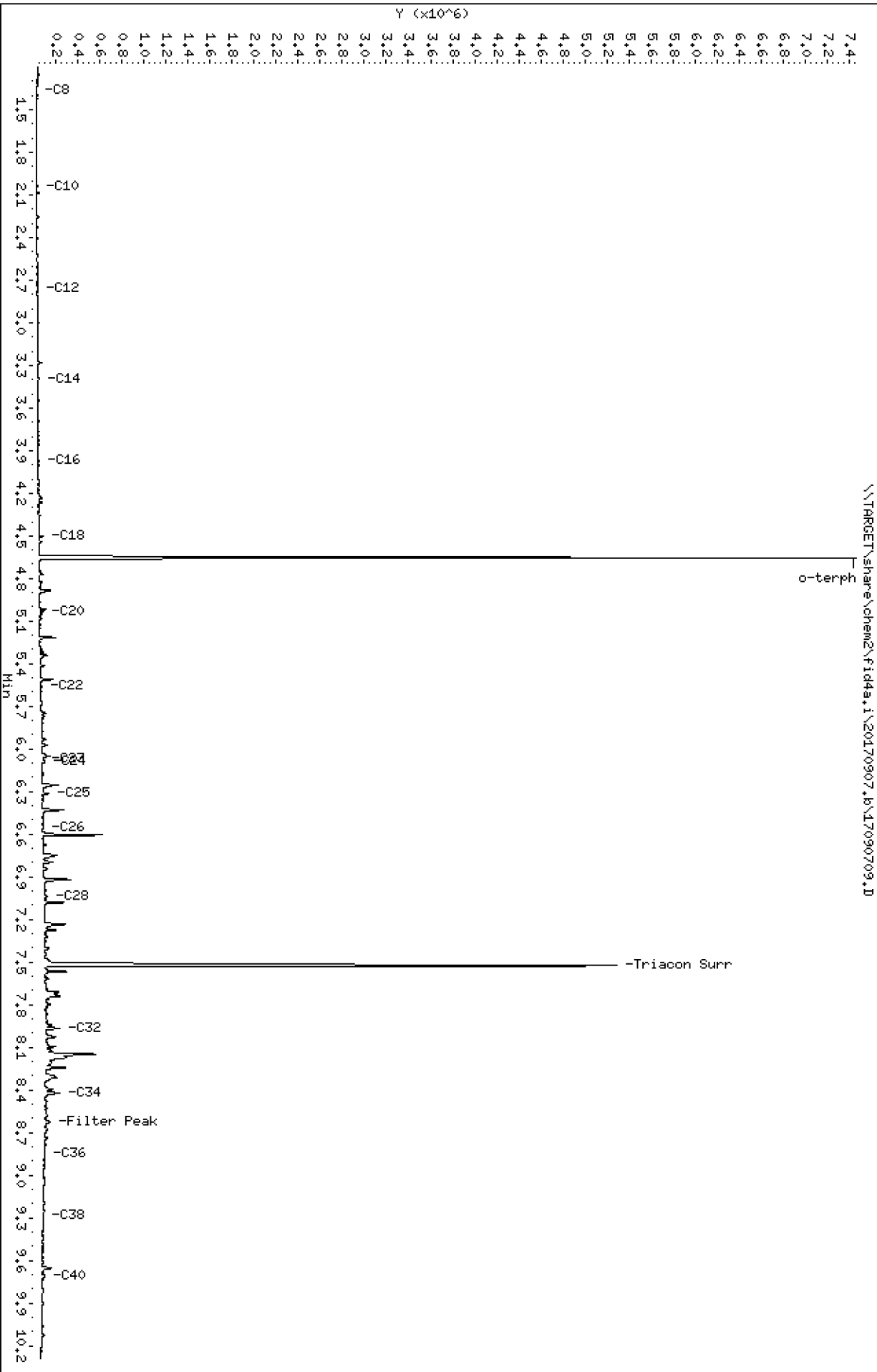
CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	42.0		2.75	5.88
	Motor Oil Range Organics (C24-C38)	1	114		3.52	11.8

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	26.475	29.2	110	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170907_b\17090709.D
Date: 07-SEP-2017 15:53
Client ID:
Sample Info: 1710040-03

Column phase: RTX-1

Instrument: fid4a.1
Operator: ML
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170907.b/17090709.D
Method: 20170907.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/08/2017
Macro: 04-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:04-SEP-2017 M.Oil:04-SEP-2017

ARI ID: 17I0040-03
Client ID:
Injection: 07-SEP-2017 15:53
Dilution Factor: 1

FID:4A RESULTS

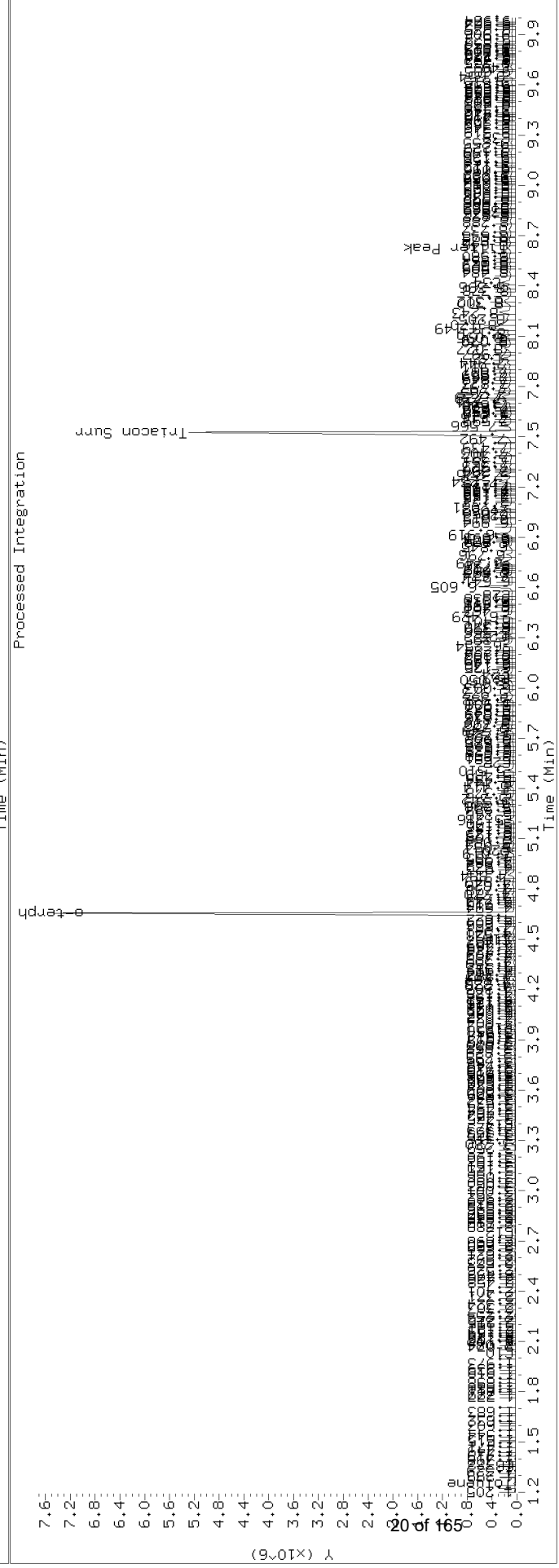
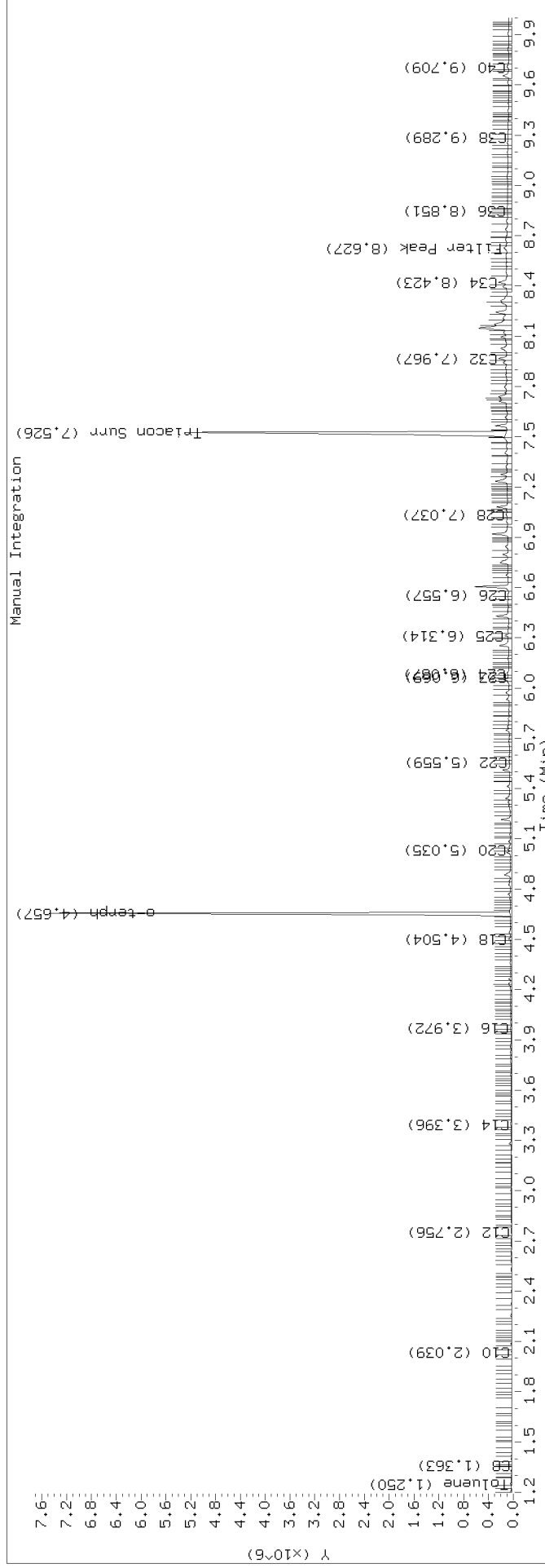
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.250	-0.002	26537	28862	WATPHG	(Tol-C12)	373738	249.2
C8	1.363	-0.001	3901	2187	WATPHD	(C12-C24)	5709260	356.9
C10	2.039	-0.002	8317	4988	WATPHM	(C24-C38)	17530698	966.1
C12	2.756	0.003	13769	23321	AK102	(C10-C25)	6509301	349.4
C14	3.396	-0.002	21999	37372				
C16	3.972	-0.003	28802	29234	OR.DIES	(C10-C28)	10627872	562.5
C18	4.504	-0.006	62454	45983				
C20	5.035	-0.006	67263	56879				
C22	5.559	-0.006	48798	55380				
C24	6.087	-0.014	77270	155381				
C25	6.314	-0.005	109581	114531				
C26	6.557	-0.004	64938	102523				
C28	7.037	-0.005	95898	146696				
C32	7.967	-0.003	209422	267435				
C34	8.423	0.011	215366	378232				
Filter Peak	8.627	-0.004	129273	250164				
C36	8.851	0.002	73841	72278				
C38	9.289	0.001	63210	105407				
C40	9.709	-0.012	79114	127968				
o-terph	4.657	-0.006	7408506	4808499				
Triacon Surr	7.526	-0.004	5171353	4497964	NAS DIES	(C10-C24)	5936236	319.3

Range Times: NW Diesel(2.753 - 6.101) AK102(2.04 - 6.32) Jet A(2.04 - 4.51)
NW M.Oil(6.10 - 9.29) AK103(6.32 - 8.85) OR Diesel(2.04 - 7.04)

Surrogate	Area	Amount
o-Terphenyl	4808499	248.3 M
Triacontane	4497964	186.3 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	19364.3	04-SEP-2017
Triacon Surr	24141.7	04-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15996.0	04-SEP-2017
Motor Oil	18145.0	04-SEP-2017
AK102	18632.0	04-SEP-2017
OR Diesel	18894.0	04-SEP-2017
NAS Diesel	18594.0	04-SEP-2017





Form I
ORGANIC ANALYSIS DATA SHEET
NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Solid Laboratory ID: 1710040-04 SDG: 1710040
 Sampled: 08/23/17 13:30 Prepared: 09/06/17 10:10 File ID: 17090714.D
 % Solids: 84.31 Preparation: EPA 3546 (Microwave) Analyzed: 09/07/17 17:46
 Batch: BFI0079 Sequence: SFI0079 Initial/Final: 10.06 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00012
 Cleanups: Silica Gel, Sulfuric Acid

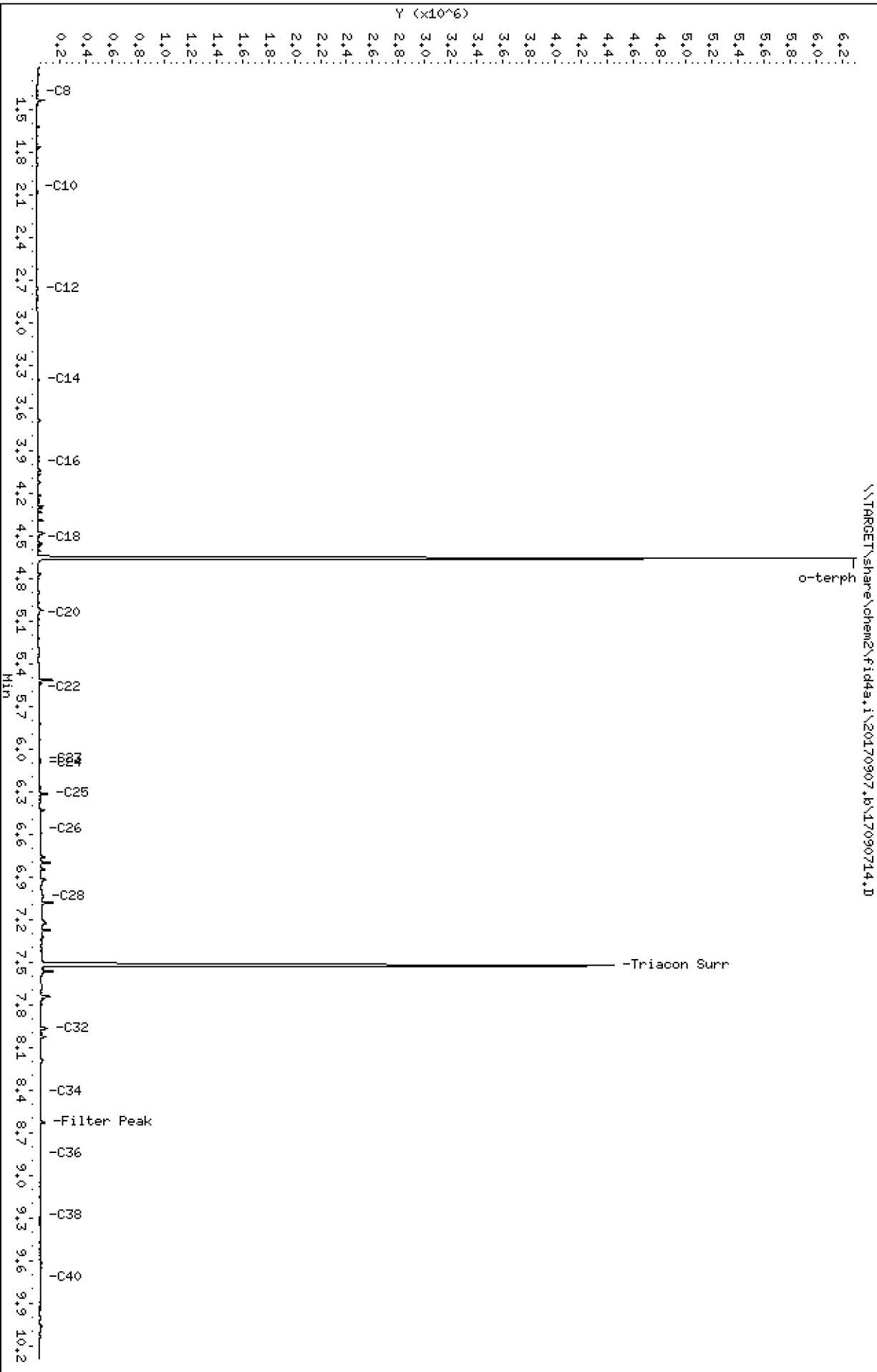
CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	20.5	B	2.76	5.90
	Motor Oil Range Organics (C24-C38)	1	42.5		3.53	11.8

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	26.528	24.1	90.9	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170907_b\17090714.D
Date : 07-SEP-2017 17:46
Client ID:
Sample Info: 1710040-04

Column phase: RTX-1

Instrument: fid4a.1
Operator: ML
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170907.b/17090714.D
Method: 20170907.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/08/2017
Macro: 04-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:04-SEP-2017 M.Oil:04-SEP-2017

ARI ID: 17I0040-04
Client ID:
Injection: 07-SEP-2017 17:46
Dilution Factor: 1

FID:4A RESULTS

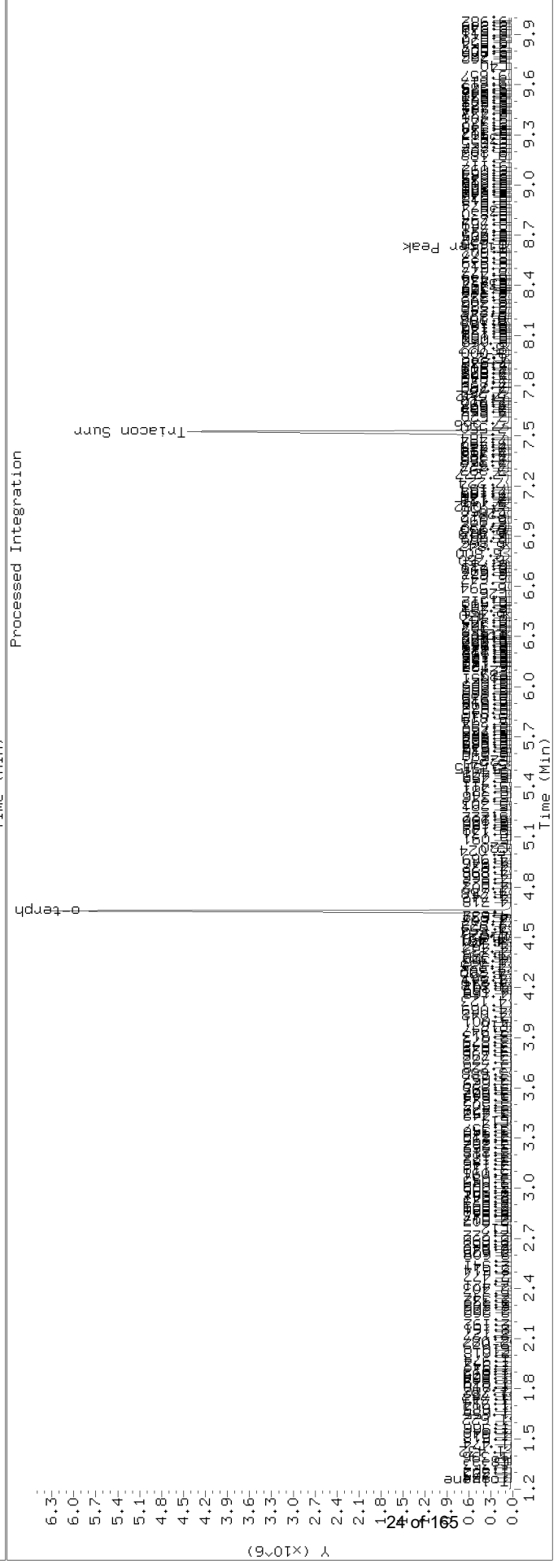
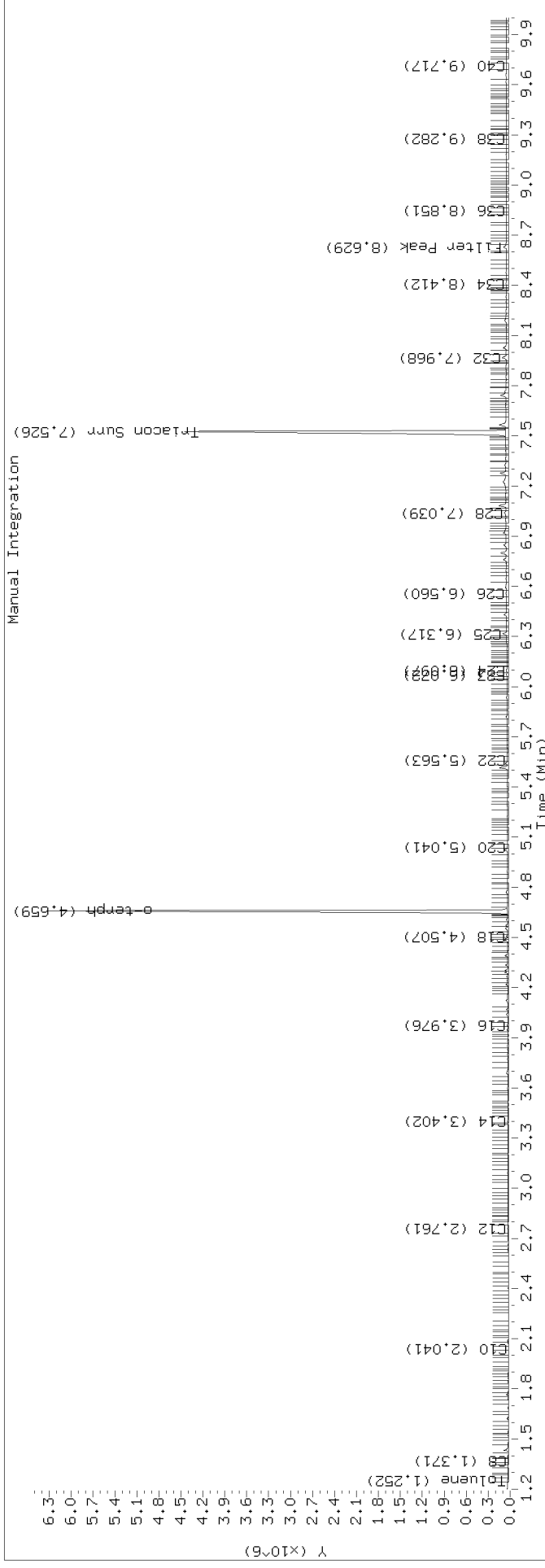
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.252	0.001	17756	17676	WATPHG	(Tol-C12)	320741	213.8
C8	1.371	0.007	5366	6832	WATPHD	(C12-C24)	2783101	174.0
C10	2.041	-0.000	3166	2098	WATPHM	(C24-C38)	6538458	360.3
C12	2.761	0.008	12209	17442	AK102	(C10-C25)	3060458	164.3
C14	3.402	0.005	17806	22545				
C16	3.976	0.001	19789	19693	OR.DIES	(C10-C28)	4844807	256.4
C18	4.507	-0.002	25637	19856				
C20	5.041	-0.000	23244	25276				
C22	5.563	-0.002	25053	37550				
C24	6.097	-0.003	29819	52789				
C25	6.317	-0.002	80326	74551				
C26	6.560	-0.001	35877	73113				
C28	7.039	-0.003	57574	90042				
C32	7.968	-0.002	84523	108923				
C34	8.412	-0.000	34845	58469				
Filter Peak	8.629	-0.002	66603	95264				
C36	8.851	0.001	31401	44520				
C38	9.282	-0.006	29107	35430				
C40	9.717	-0.004	30433	66525				
o-terph	4.659	-0.004	6271883	3960059				
Triacon Surr	7.526	-0.004	4387463	3841508	NAS DIES	(C10-C24)	2884663	155.1

Range Times: NW Diesel(2.753 - 6.101) AK102(2.04 - 6.32) Jet A(2.04 - 4.51)
NW M.Oil(6.10 - 9.29) AK103(6.32 - 8.85) OR Diesel(2.04 - 7.04)

Surrogate	Area	Amount
o-Terphenyl	3960059	204.5 M
Triacotane	3841508	159.1 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	19364.3	04-SEP-2017
Triacon Surr	24141.7	04-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15996.0	04-SEP-2017
Motor Oil	18145.0	04-SEP-2017
AK102	18632.0	04-SEP-2017
OR Diesel	18894.0	04-SEP-2017
NAS Diesel	18594.0	04-SEP-2017





Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Solid Laboratory ID: 1710040-05 SDG: 1710040
 Sampled: 08/23/17 15:30 Prepared: 09/06/17 10:05 File ID: 17090710.D
 % Solids: 90.99 Preparation: EPA 3546 (Microwave) Analyzed: 09/07/17 16:16
 Batch: BFI0078 Sequence: SFI0079 Initial/Final: 10.25 g Wet / 5 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00012

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	10	754	D	125	268
	Motor Oil Range Organics (C24-C38)	10	2300	D	160	536

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	24.125	30.0	124	50 - 150	

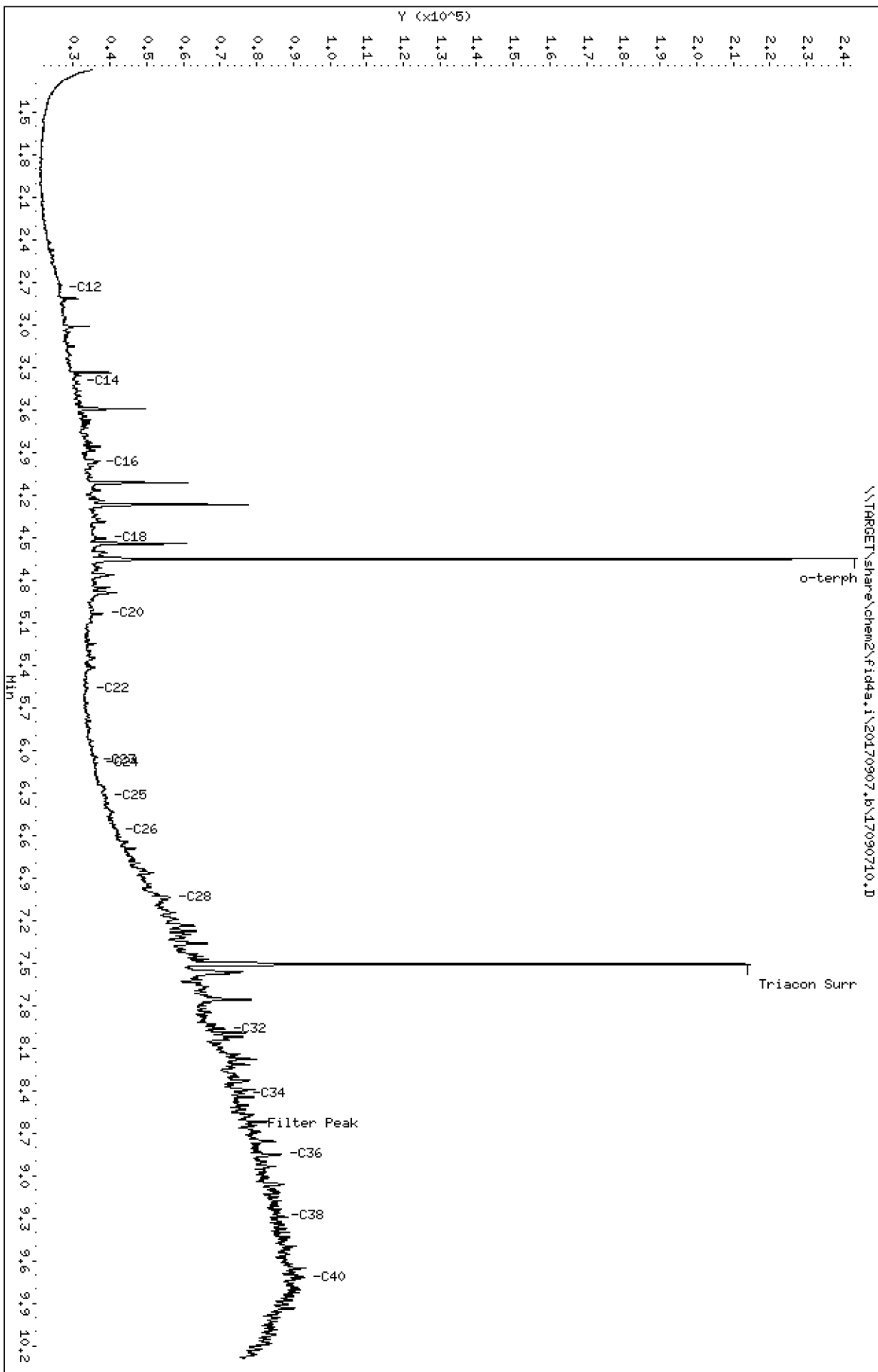
Data File: \\TARGET\share\chem2\fid4a.1\20170907.b\17090710.D
Date : 07-SEP-2017 16:16
Client ID:
Sample Info: 1710040-05,10

Instrument: fid4a.1

Page 1

Column phase: RTX-1

Operator: ML
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170907.b/17090710.D
Method: 20170907.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/08/2017
Macro: 04-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:04-SEP-2017 M.Oil:04-SEP-2017

ARI ID: 17I0040-05
Client ID:
Injection: 07-SEP-2017 16:16
Dilution Factor: 10

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	----				WATPHG	(Tol-C12)	68782	45.9
C8	----				WATPHD	(C12-C24)	2250632	140.7
C10	----				WATPHM	(C24-C38)	7785319	429.1
C12	2.736	-0.017	5482	3460	AK102	(C10-C25)	2407671	129.2
C14	3.398	0.000	10357	10599				
C16	3.974	-0.001	15546	14155	OR.DIES	(C10-C28)	3460693	183.2
C18	4.507	-0.003	18102	28795				
C20	5.037	-0.004	17152	18396				
C22	5.563	-0.002	13211	34283				
C24	6.094	-0.007	15524	17436				
C25	6.317	-0.001	17864	19108				
C26	6.560	-0.001	21097	16616				
C28	7.036	-0.006	35545	49052				
C32	7.964	-0.006	50429	62507				
C34	8.424	0.012	55592	75869				
Filter Peak	8.636	0.005	57493	28477				
C36	8.852	0.003	65811	109109				
C38	9.286	-0.002	66288	48737				
C40	9.715	-0.006	71993	52566				
o-terph	4.651	-0.012	207814	107853				
Triacon Surr	7.508	-0.022	152561	111199	NAS DIES	(C10-C24)	2319415	124.7

Range Times: NW Diesel(2.753 - 6.101) AK102(2.04 - 6.32) Jet A(2.04 - 4.51)
NW M.Oil(6.10 - 9.29) AK103(6.32 - 8.85) OR Diesel(2.04 - 7.04)

Surrogate	Area	Amount
o-Terphenyl	107853	5.6 M
Triacontane	111199	4.6 M

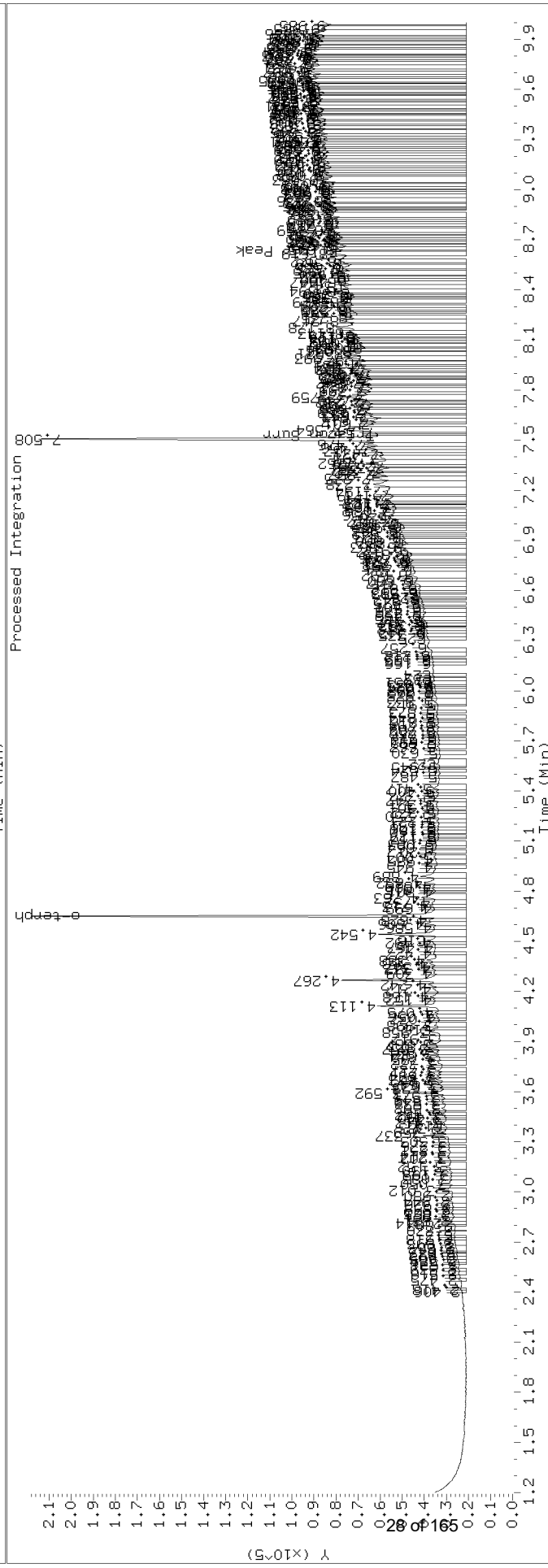
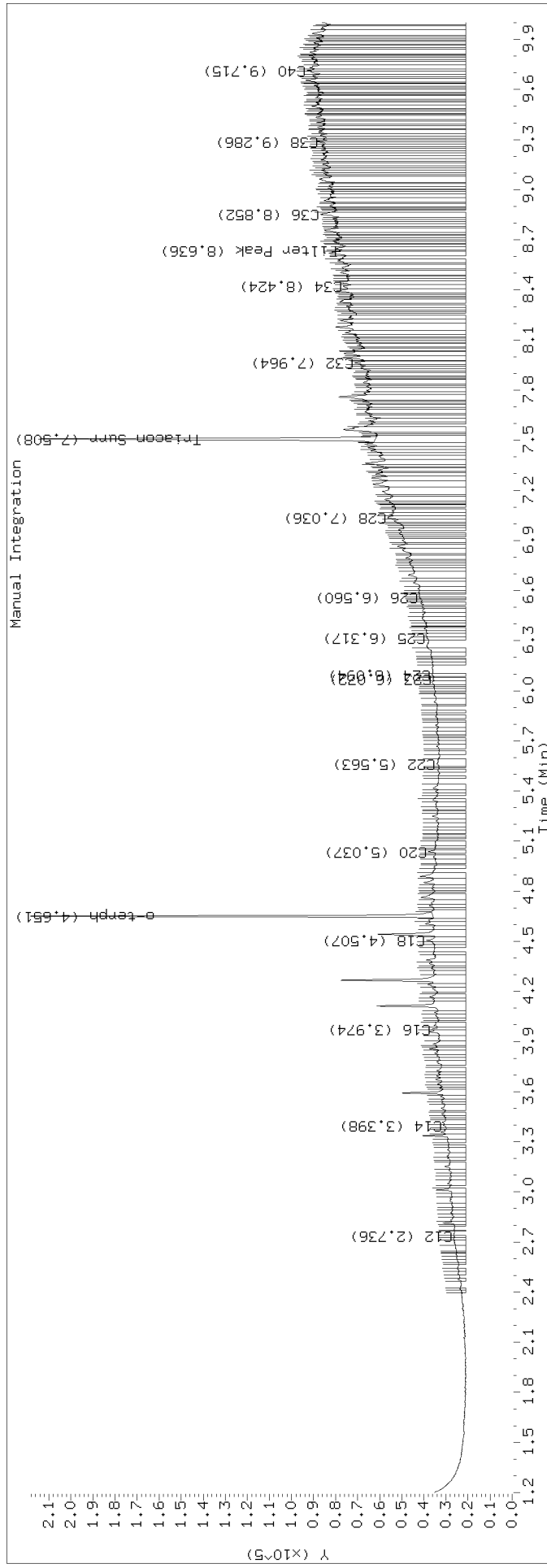
M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	19364.3	04-SEP-2017
Triacon Surr	24141.7	04-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15996.0	04-SEP-2017
Motor Oil	18145.0	04-SEP-2017
AK102	18632.0	04-SEP-2017
OR Diesel	18894.0	04-SEP-2017
NAS Diesel	18594.0	04-SEP-2017

TPH Manual Integrations Report

Datafile: FID4A, 20170907.b/17090710.D Injection: 07-SEP-2017 16:16

Lab ID:17I0040-05





Form I
ORGANIC ANALYSIS DATA SHEET
NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Solid Laboratory ID: 1710040-06 SDG: 1710040
 Sampled: 08/23/17 15:30 Prepared: 09/06/17 10:10 File ID: 17090715.D
 % Solids: 90.99 Preparation: EPA 3546 (Microwave) Analyzed: 09/07/17 18:09
 Batch: BFI0079 Sequence: SFI0079 Initial/Final: 10.17 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00012
 Cleanups: Silica Gel, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	10	447	D, B	25.3	54.0
	Motor Oil Range Organics (C24-C38)	10	861	D	32.3	108

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	24.315	27.6	113	50 - 150	

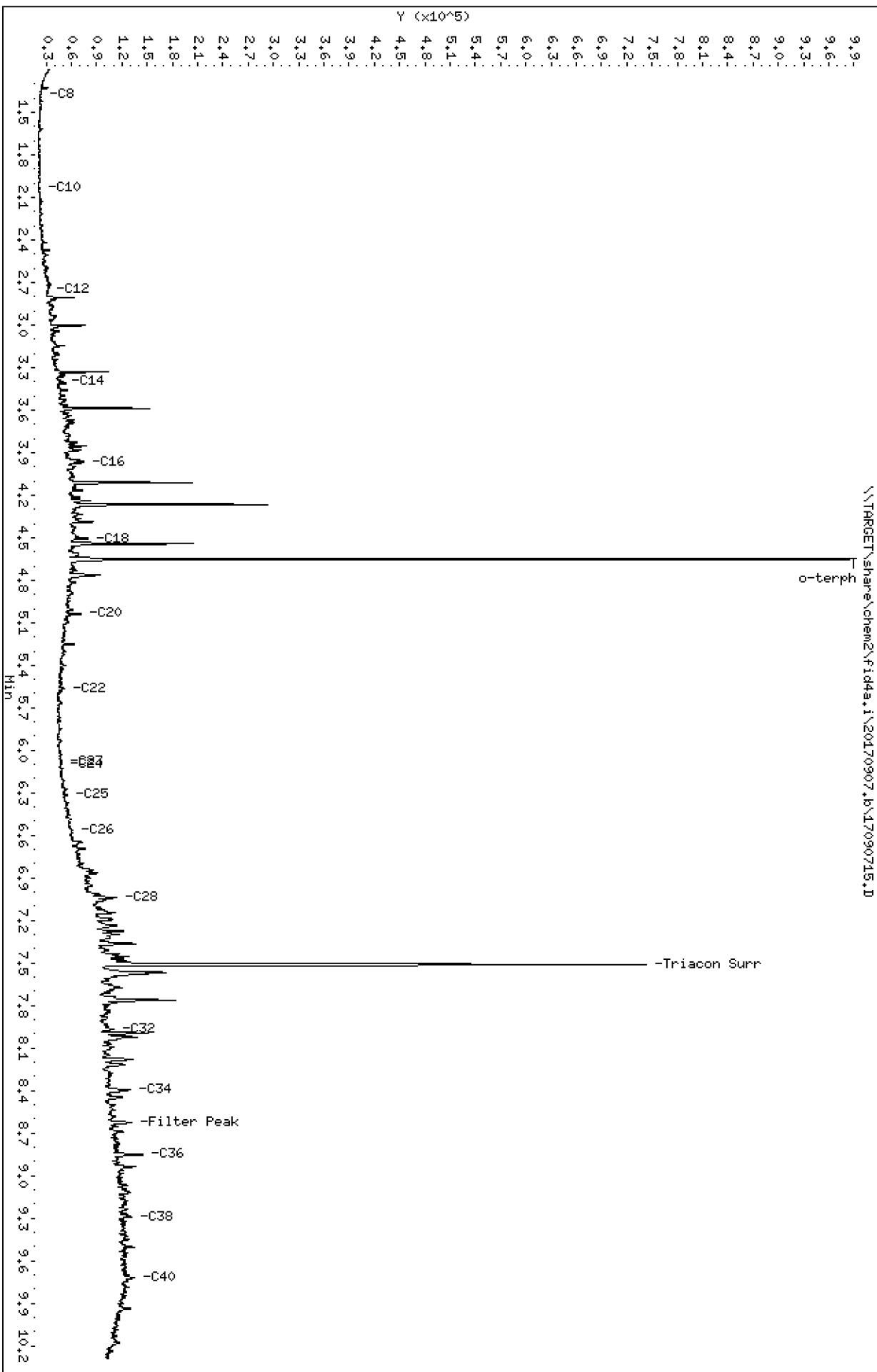
Data File: \\TARGET\share\chem2\fid4a.1\20170907.8\17090715.D
Date: 07-SEP-2017 18:09
Client ID:
Sample Info: 1710040-06,10

Instrument: fid4a.1

Page 1

Column phase: RTX-1

Operator: ML
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170907.b/17090715.D
Method: 20170907.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/08/2017
Macro: 04-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:04-SEP-2017 M.Oil:04-SEP-2017

ARI ID: 17I0040-06
Client ID:
Injection: 07-SEP-2017 18:09
Dilution Factor: 10

FID:4A RESULTS

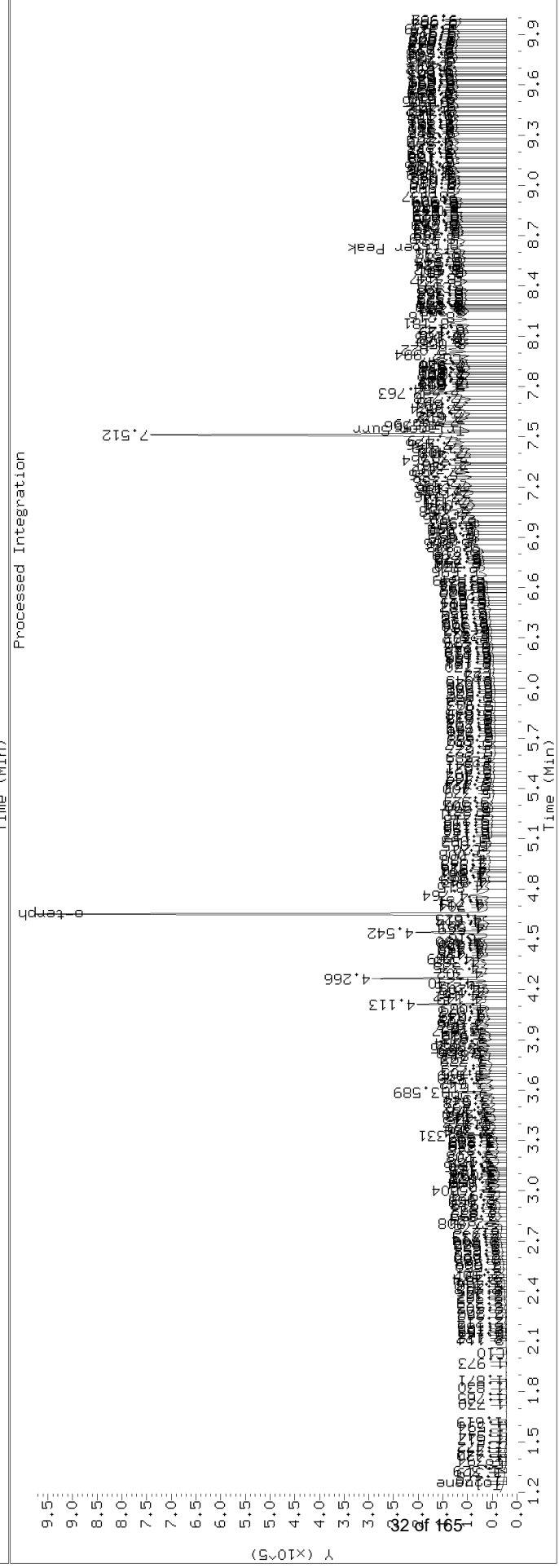
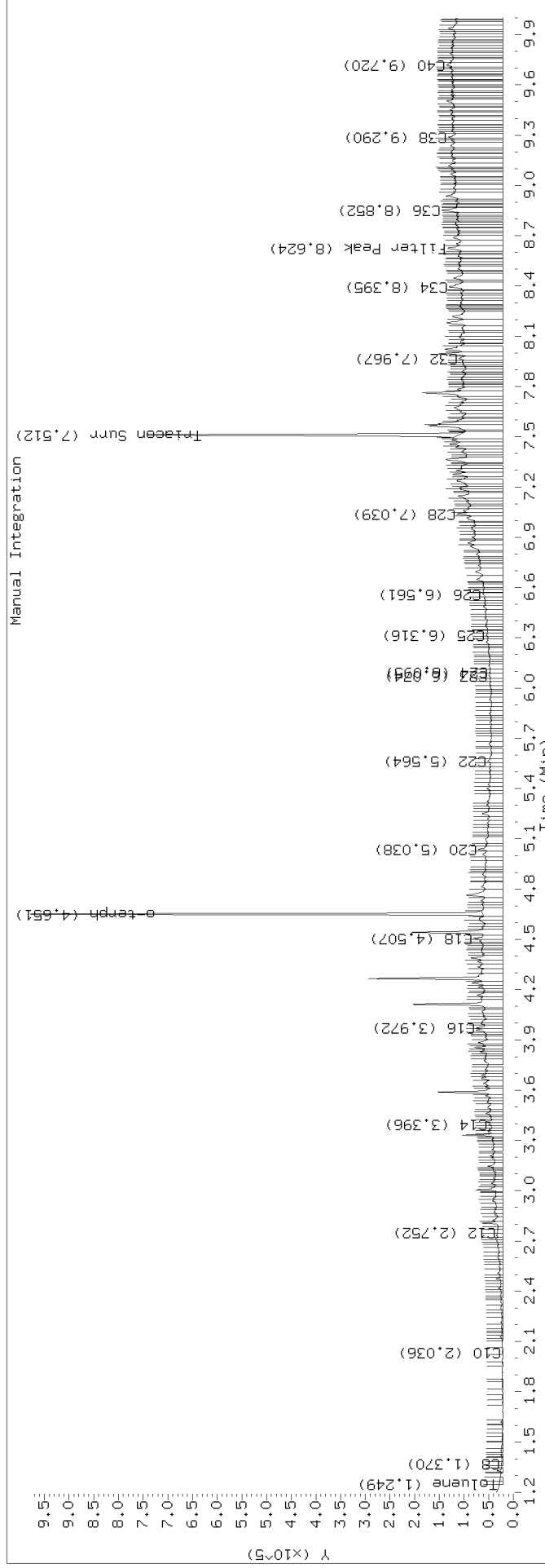
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.249	-0.003	7828	8129	WATPHG	(Tol-C12)	299260	199.5
C8	1.370	0.007	3469	4072	WATPHD	(C12-C24)	6609866	413.2
C10	2.036	-0.005	1367	1747	WATPHM	(C24-C38)	14451318	796.4
C12	2.752	-0.001	11342	15444	AK102	(C10-C25)	7038182	377.7
C14	3.396	-0.002	28520	29646				
C16	3.972	-0.003	53516	59935	OR.DIES	(C10-C28)	9371658	496.0
C18	4.507	-0.002	59191	72716				
C20	5.038	-0.003	50299	72370				
C22	5.564	-0.001	31113	43896				
C24	6.095	-0.006	27591	39365				
C25	6.316	-0.002	33792	43065				
C26	6.561	0.000	40961	53942				
C28	7.039	-0.002	93230	104525				
C32	7.967	-0.003	89170	129312				
C34	8.395	-0.017	108725	251316				
Filter Peak	8.624	-0.007	111444	207099				
C36	8.852	0.003	123590	192048				
C38	9.290	0.003	110749	183911				
C40	9.720	-0.001	113989	179261				
o-terph	4.651	-0.012	931014	494245				
Triacon Surr	7.512	-0.018	632993	447523	NAS DIES	(C10-C24)	6848395	368.3

Range Times: NW Diesel(2.753 - 6.101) AK102(2.04 - 6.32) Jet A(2.04 - 4.51)
NW M.Oil(6.10 - 9.29) AK103(6.32 - 8.85) OR Diesel(2.04 - 7.04)

Surrogate	Area	Amount
o-Terphenyl	494245	25.5 M
Triacontane	447523	18.5 M

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	19364.3	04-SEP-2017
Triacon Surr	24141.7	04-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	15996.0	04-SEP-2017
Motor Oil	18145.0	04-SEP-2017
AK102	18632.0	04-SEP-2017
OR Diesel	18894.0	04-SEP-2017
NAS Diesel	18594.0	04-SEP-2017





PREPARATION BATCH SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0040

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFI0078 Batch Matrix: Solid

Preparation: EPA 3546 (Microwave)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-TP-101-2-3.5-170823	17I0040-01	17090708.D	09/06/17 10:05	
SVCA-TP-102-3-4-170823	17I0040-03	17090709.D	09/06/17 10:05	
SVCA-TP-103-3-4-170823	17I0040-05	17090710.D	09/06/17 10:05	
Blank	BFI0078-BLK1	17090706.D	09/06/17 10:05	
LCS	BFI0078-BS1	17090707.D	09/06/17 10:05	



PREPARATION BATCH SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0040

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFI0079

Batch Matrix: Solid

Preparation: EPA 3546 (Microwave)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-TP-101-2-3.5-170823	17I0040-02	17090713.D	09/06/17 10:10	
SVCA-TP-102-3-4-170823	17I0040-04	17090714.D	09/06/17 10:10	
SVCA-TP-103-3-4-170823	17I0040-06	17090715.D	09/06/17 10:10	
Blank	BFI0079-BLK1	17090711.D	09/06/17 10:10	
LCS	BFI0079-BS1	17090712.D	09/06/17 10:10	



Form I
METHOD BLANK DATA SHEET
NWTPH-Dx

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>1710040</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Solid</u>	Laboratory ID:	<u>BFI0078-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>09/06/17 10:05</u>
Solids:		Preparation:	<u>EPA 3546 (Microwave)</u>
Batch:	<u>BFI0078</u>	Sequence:	<u>SFI0079</u>
Instrument:	<u>FID4</u>	Column:	<u>RTX-1</u>
		File ID:	<u>17090706.D</u>
		Analyzed:	<u>09/07/17 14:47</u>
		Initial/Final:	<u>10 g / 1 mL</u>
		Calibration:	<u>AI00012</u>

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg wet)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	5.00	U	2.34	5.00
	Motor Oil Range Organics (C24-C38)	1	10.0	U	2.99	10.0
SURROGATES		ADDED (mg/kg wet)	CONC (mg/kg wet)	% REC	QC LIMITS	Q
o-Terphenyl		22.500	26.0	116	50 - 150	



Form I
METHOD BLANK DATA SHEET
NWTPH-Dx

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>1710040</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Solid</u>	Laboratory ID:	<u>BFI0079-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>09/06/17 10:10</u>
Solids:		Preparation:	<u>EPA 3546 (Microwave)</u>
Batch:	<u>BFI0079</u>	Sequence:	<u>SFI0079</u>
Instrument:	<u>FID4</u>	Column:	<u>RTX-1</u>
		Cleanups:	<u>Silica Gel, Sulfuric Acid</u>

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg wet)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	6.11		2.34	5.00
	Motor Oil Range Organics (C24-C38)	1	10.0	U	2.99	10.0
SURROGATES		ADDED (mg/kg wet)	CONC (mg/kg wet)	% REC	QC LIMITS	
o-Terphenyl		22.500	23.9	106	50 - 150	



LCS / LCS DUPLICATE RECOVERY
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0040

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Analyzed: 09/07/17 15:08

Batch: BFI0078

Laboratory ID: BFI0078-BS1

Preparation: EPA 3546 (Microwave)

Sequence Name: LCS

Initial/Final: 10 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Diesel Range Organics (C12-C24)	150	138		92.2	63 - 120

* Indicates values outside of QC limits



LCS / LCS DUPLICATE RECOVERY
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0040

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Analyzed: 09/07/17 17:01

Batch: BFI0079

Laboratory ID: BFI0079-BS1

Preparation: EPA 3546 (Microwave)

Sequence Name: LCS

Initial/Final: 10 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Diesel Range Organics (C12-C24)	150	130	B	86.8	63 - 120

* Indicates values outside of QC limits



CLEANUP BATCH SUMMARY

Laboratory: Analytical Resources, Inc.

SDG: 17I0040

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Cleanup Batch: CFI0026

Cleanup Type: Sulfuric Acid

Cleanup Method: EPA 3665A Sulfuric Acid Cleanup

Analysis: NWTPH-Dx

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARE	OBSERVATIONS
SVCA-TP-101-2-3.5-170823	17I0040-02	17090713.D	09/07/2017	
SVCA-TP-102-3-4-170823	17I0040-04	17090714.D	09/07/2017	
SVCA-TP-103-3-4-170823	17I0040-06	17090715.D	09/07/2017	



CLEANUP BATCH SUMMARY

Laboratory: Analytical Resources, Inc.

SDG: 17I0040

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Cleanup Batch: CFI0027

Cleanup Type: Silica Gel

Cleanup Method: EPA 3630C Silica Gel Cleanup

Analysis: NWTPH-Dx

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARE	OBSERVATIONS
SVCA-TP-101-2-3.5-170823	17I0040-02	17090713.D	09/07/2017	
SVCA-TP-102-3-4-170823	17I0040-04	17090714.D	09/07/2017	
SVCA-TP-103-3-4-170823	17I0040-06	17090715.D	09/07/2017	



INITIAL CALIBRATION DATA
NWTPH-Dx

Laboratory:	Analytical Resources, Inc.	SDG:	17I0040
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00012	Instrument:	FID4
Calibration Date:	09/04/2017 9:23	Column (1):	RTX-1

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Diesel Range Organics (C12-C24)	50	20132.42	100	16908.25	250	15273.05	500	15056.87	1000	14605.19	2500	14002.66
o-Terphenyl	9	17813.89	18	18392.45	45	19219.69	90	20287.08	180	20342.84	450	20129.63



INITIAL CALIBRATION DATA
NWTPH-Dx

Laboratory:	Analytical Resources, Inc.	SDG:	17I0040
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00012	Instrument:	FID4
Calibration Date:	09/04/2017 9:23	Column (1):	RTX-1

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Motor Oil Range Organics (C24-C38)	100	18834.71	250	20008.62	500	18590.04	1000	17203.71	2500	17206.08	5000	17029.57



INITIAL CALIBRATION DATA NWTPH-Dx

Laboratory:	Analytical Resources, Inc.	SDG:	17I0040
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00012	Instrument:	FID4
Calibration Date:	09/04/2017 9:23	Column (1):	RTX-1

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Diesel Range Organics (C12-C24)	15996.41	14.0			RSD (20)	
Motor Oil Range Organics (C24-C38)	18145.46	6.6			RSD (20)	
o-Terphenyl	19364.26	5.5			RSD (20)	



SECOND-SOURCE CALIBRATION VERIFICATION
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0040

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Calibration: AI00012

Laboratory ID: SFI0017-SCV1

Sequence: SFI0017

Sequence Name: DIES SCV 500

Standard ID: F006358

ANALYTE	EXPECTED (mg/L)	FOUND (mg/L)	% DRIFT	QC LIMIT
Diesel Range Organics (C12-C24)	500.00	472	-5.6	30.00
o-Terphenyl	90.000	100	11.2	

* Indicates values outside of QC limits



SECOND-SOURCE CALIBRATION VERIFICATION
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0040

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Calibration: AI00012

Laboratory ID: SFI0017-SCV2

Sequence: SFI0017

Sequence Name: Moil SCV 1000

Standard ID: F007427

ANALYTE	EXPECTED (mg/L)	FOUND (mg/L)	% DRIFT	QC LIMIT
Motor Oil Range Organics (C24-C38)	1000.0	1010	0.6	30.00

* Indicates values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0040</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>AI00012</u>
Lab File ID: <u>17090704.D</u>	Calibration Date: <u>09/04/17 09:23</u>
Sequence: <u>SFI0079</u>	Injection Date: <u>09/07/17</u>
Lab Sample ID: <u>SFI0079-ICV1</u>	Injection Time: <u>12:56</u>
Sequence Name: <u>Diesel ICV</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	555	15996.4100	17767.8300		11.1	20
o-Terphenyl	A	90.000	110	19364.2600	23716.2100		22.4	20 *

* Values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0040</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>AI00012</u>
Lab File ID: <u>17090705.D</u>	Calibration Date: <u>09/04/17 09:23</u>
Sequence: <u>SFI0079</u>	Injection Date: <u>09/07/17</u>
Lab Sample ID: <u>SFI0079-ICV2</u>	Injection Time: <u>13:19</u>
Sequence Name: <u>MOIL ICV</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	958	18145.4600	17383.3900		-4.2	20

* Values outside of QC limits



CONTINUING CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0040</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>A100012</u>
Lab File ID: <u>17090716.D</u>	Calibration Date: <u>09/04/17 09:23</u>
Sequence: <u>SFI0079</u>	Injection Date: <u>09/07/17</u>
Lab Sample ID: <u>SFI0079-CCV1</u>	Injection Time: <u>18:31</u>
Sequence Name: <u>Diesel CCV1</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	510	15996.41	16326.77		2.1	15
o-Terphenyl	A	90.000	96.6	19364.26	20782.68		7.3	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0040</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100012</u>
Lab File ID:	<u>17090717.D</u>	Calibration Date:	<u>09/04/17 09:23</u>
Sequence:	<u>SFI0079</u>	Injection Date:	<u>09/07/17</u>
Lab Sample ID:	<u>SFI0079-CCV2</u>	Injection Time:	<u>18:54</u>
Sequence Name:	<u>MOIL CCV1</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1020	18145.46	18468.3		1.8	15

* Values outside of QC limits



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0040

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0017

Instrument: FID4

Calibration: AI00012

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Retention Time Std	SFI0017-IBL1	17090409.D	NA	09/04/17 12:58
Instrument Blank	SFI0017-IBL2	17090410.D	NA	09/04/17 13:19
Diesel 50	SFI0017-CAL1	17090413.D	NA	09/04/17 14:46
Diesel 100	SFI0017-CAL2	17090414.D	NA	09/04/17 15:07
DIES 250	SFI0017-CAL3	17090415.D	NA	09/04/17 15:30
DIES 500	SFI0017-CAL4	17090416.D	NA	09/04/17 15:51
DIES 1000	SFI0017-CAL5	17090417.D	NA	09/04/17 16:15
DIES 2500	SFI0017-CAL6	17090418.D	NA	09/04/17 16:36
DIES SCV 500	SFI0017-SCV1	17090419.D	NA	09/04/17 16:58
MOIL 100	SFI0017-CAL7	17090420.D	NA	09/04/17 17:21
Moil 250	SFI0017-CAL8	17090421.D	NA	09/04/17 17:43
Moil 500	SFI0017-CAL9	17090422.D	NA	09/04/17 18:05
Moil 1000	SFI0017-CALA	17090423.D	NA	09/04/17 18:29
Moil 2500	SFI0017-CALB	17090424.D	NA	09/04/17 18:50
Moil 5000	SFI0017-CALC	17090425.D	NA	09/04/17 19:14
Moil SCV 1000	SFI0017-SCV2	17090426.D	NA	09/04/17 19:35
ZZZZZ	17H0273-01RE1	17090427.D	Water	09/04/17 19:59
ZZZZZ	17H0273-03RE1	17090428.D	Water	09/04/17 20:20
ZZZZZ	17H0273-05RE1	17090429.D	Water	09/04/17 20:43
ZZZZZ	BFH0584-BLK1	17090430.D	Solid	09/04/17 21:05
ZZZZZ	BFH0584-BS1	17090431.D	Solid	09/04/17 21:28
ZZZZZ	17H0291-01	17090434.D	Solid	09/04/17 22:36
ZZZZZ	17H0291-02	17090435.D	Solid	09/04/17 22:58
ZZZZZ	17H0291-03	17090436.D	Solid	09/04/17 23:21
ZZZZZ	17H0291-04	17090437.D	Solid	09/04/17 23:42
Diesel CCV1	SFI0017-CCV1	17090438.D	NA	09/05/17 00:06
MOIL CCV1	SFI0017-CCV2	17090439.D	NA	09/05/17 00:27



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0040

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0079

Instrument: FID4

Calibration: AI00012

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Retention Time Std	SFI0079-IBL1	17090702.D	NA	09/07/17 12:03
Instrument Blank	SFI0079-IBL2	17090703.D	NA	09/07/17 12:27
Diesel ICV	SFI0079-ICV1	17090704.D	NA	09/07/17 12:56
MOIL ICV	SFI0079-ICV2	17090705.D	NA	09/07/17 13:19
Blank	BFI0078-BLK1	17090706.D	Solid	09/07/17 14:47
LCS	BFI0078-BS1	17090707.D	Solid	09/07/17 15:08
SVCA-TP-101-2-3.5-170823	17I0040-01	17090708.D	Solid	09/07/17 15:31
SVCA-TP-102-3-4-170823	17I0040-03	17090709.D	Solid	09/07/17 15:53
SVCA-TP-103-3-4-170823	17I0040-05	17090710.D	Solid	09/07/17 16:16
Blank	BFI0079-BLK1	17090711.D	Solid	09/07/17 16:39
LCS	BFI0079-BS1	17090712.D	Solid	09/07/17 17:01
SVCA-TP-101-2-3.5-170823	17I0040-02	17090713.D	Solid	09/07/17 17:24
SVCA-TP-102-3-4-170823	17I0040-04	17090714.D	Solid	09/07/17 17:46
SVCA-TP-103-3-4-170823	17I0040-06	17090715.D	Solid	09/07/17 18:09
Diesel CCV1	SFI0079-CCV1	17090716.D	NA	09/07/17 18:31
MOIL CCV1	SFI0079-CCV2	17090717.D	NA	09/07/17 18:54



SURROGATE RECOVERY AND RT SUMMARY

NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG/WO:	<u>17I0040</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Sequence:	<u>SFI0017</u>	Instrument:	<u>FID4</u>
Calibration:	<u>AI00012</u>	Calibration Date:	<u>09/04/2017</u>

Surrogate Compound	Spike Level mg/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SFI0017-SCV1 (Water)			Lab File ID: 17090419.D			Analyzed: 09/04/17 16:58		
o-Terphenyl	90.000	111	0 - 200	4.68	4.683333	-0.0033	N/A	



SURROGATE RECOVERY AND RT SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG/WO: 17I0040

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0079

Instrument: FID4

Calibration: AI00012

Calibration Date: 09/04/2017

Surrogate Compound	Spike Level mg/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SFI0079-IBL1 (Solid)			Lab File ID: 17090702.D		Analyzed: 09/07/17 12:03			
o-Terphenyl	225.00	122	50 - 150	4.66	4.683333	-0.0233	N/A	
SFI0079-IBL2 (Solid)			Lab File ID: 17090703.D		Analyzed: 09/07/17 12:27			
o-Terphenyl	225.00	124	50 - 150	4.66	4.683333	-0.0233	N/A	
SFI0079-ICV1 (Solid)			Lab File ID: 17090704.D		Analyzed: 09/07/17 12:56			
o-Terphenyl	90.000	122	80 - 120	4.66	4.683333	-0.0233	N/A	*
BFI0078-BLK1 (Solid)			Lab File ID: 17090706.D		Analyzed: 09/07/17 14:47			
o-Terphenyl	22.500	116	50 - 150	4.67	4.683333	-0.0133	N/A	
BFI0078-BS1 (Solid)			Lab File ID: 17090707.D		Analyzed: 09/07/17 15:08			
o-Terphenyl	22.500	117	50 - 150	4.66	4.683333	-0.0233	N/A	
17I0040-01 (Solid)			Lab File ID: 17090708.D		Analyzed: 09/07/17 15:31			
o-Terphenyl	23.965	102	50 - 150	4.66	4.683333	-0.0233	N/A	
17I0040-03 (Solid)			Lab File ID: 17090709.D		Analyzed: 09/07/17 15:53			
o-Terphenyl	26.475	110	50 - 150	4.66	4.683333	-0.0233	N/A	
17I0040-05 (Solid)			Lab File ID: 17090710.D		Analyzed: 09/07/17 16:16			
o-Terphenyl	24.125	124	50 - 150	4.65	4.683333	-0.0333	N/A	
BFI0079-BLK1 (Solid)			Lab File ID: 17090711.D		Analyzed: 09/07/17 16:39			
o-Terphenyl	22.500	106	50 - 150	4.66	4.683333	-0.0233	N/A	
BFI0079-BS1 (Solid)			Lab File ID: 17090712.D		Analyzed: 09/07/17 17:01			
o-Terphenyl	22.500	114	50 - 150	4.657	4.683333	-0.0263	N/A	
17I0040-02 (Solid)			Lab File ID: 17090713.D		Analyzed: 09/07/17 17:24			
o-Terphenyl	24.611	98.4	50 - 150	4.66	4.683333	-0.0233	N/A	
17I0040-04 (Solid)			Lab File ID: 17090714.D		Analyzed: 09/07/17 17:46			
o-Terphenyl	26.528	90.9	50 - 150	4.66	4.683333	-0.0233	N/A	
17I0040-06 (Solid)			Lab File ID: 17090715.D		Analyzed: 09/07/17 18:09			
o-Terphenyl	24.315	113	50 - 150	4.65	4.683333	-0.0333	N/A	



HOLDING TIME SUMMARY

Analysis: NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0040

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
SVCA-TP-101-2-3.5-170823 17I0040-01	08/23/17 11:15	08/25/17 09:46	09/06/17 10:05	13	14	09/07/17 15:31	1	40	
SVCA-TP-101-2-3.5-170823 17I0040-02	08/23/17 11:15	08/25/17 09:46	09/06/17 10:10	13	14	09/07/17 17:24	1	40	
SVCA-TP-102-3-4-170823 17I0040-03	08/23/17 13:30	08/25/17 09:46	09/06/17 10:05	13	14	09/07/17 15:53	1	40	
SVCA-TP-102-3-4-170823 17I0040-04	08/23/17 13:30	08/25/17 09:46	09/06/17 10:10	13	14	09/07/17 17:46	1	40	
SVCA-TP-103-3-4-170823 17I0040-05	08/23/17 15:30	08/25/17 09:46	09/06/17 10:05	13	14	09/07/17 16:16	1	40	
SVCA-TP-103-3-4-170823 17I0040-06	08/23/17 15:30	08/25/17 09:46	09/06/17 10:10	13	14	09/07/17 18:09	1	40	

* Indicates hold time exceedance.



METHOD DETECTION AND REPORTING LIMITS

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 1710040

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Instrument: FID4

Analyte	MDL	RL	Units
Diesel Range Organics (C12-C24)	2.34	5.00	mg/kg
Motor Oil Range Organics (C24-C38)	2.99	10.0	mg/kg



METHOD DETECTION AND REPORTING LIMITS

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 1710040

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Water

Instrument: FID4

Analyte	MDL	RL	Units
Diesel Range Organics (C12-C24)	0.033	0.100	mg/L
Motor Oil Range Organics (C24-C38)	0.056	0.200	mg/L



08 June 2018

Cheronne Oreiro
Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101

RE: SCVA Area Z Remediation

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
17I0171

Associated SDG ID(s)
N/A

Amanda Volgardsen

Digitally signed by Amanda Volgardsen
DN: c=US, st=Washington, l=Tukwila,
o=Analytical Resources, Inc., ou=Project
Manager, cn=Amanda Volgardsen,
email=amanda.volgardsen@arilabs.com
Date: 2018.06.08 14:24:42 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Amanda Volgardsen, Project Manager



PJLA Testing
Accreditation # 66169

1710171

Chain of Custody Record & Laboratory Analysis Request

Laboratory: Analytical Resources, Inc.
 Date: 9/13/17
 Project Name: SVCA Area Z Remediation
 Project Manager: Jennifer Allen
 Phone Number: 360-715-2724
 Shipment Method:



Line	Field Sample ID	Collection Date/Time	Matrix	No. of Containers			Test Parameters				Comments/Preservation	
				NWTPH-G	NWTPH-D	BTEX	Archive					
1	SVCA-SB-109-14-16-170913	9/15/17 10:55	SD				X					
2	SVCA-SB-110-14-16-170913	11:48	SD				X					
3	SVCA-SB-111-8-10-170913	14:00	SD				X					
4	SVCA-SB-111-8-10-170913	14:20	SD				X					
5	SVCA-SB-111-16-18-170913	14:30	SD	X	X		X					take TS from TPH-D jar
6	SVCA-SB-111-16-18-170913	14:40	SD				X					
7	SVCA-SB-111-16-20-170913	14:50	SD				X					
8	SVCA-SB-112-3-5-170913	15:50	SD				X					
9	SVCA-SB-112-8-10-170913	16:00	SD				X					
10	SVCA-SB-112-12-5-170913	16:10	SD	X	X		X					
11	SVCA-SB-112-14-5-170913	16:20	SD				X					
12	SVCA-SB-120W-170913	17:30	SD				X					
13	SVCA-GW-109-14-19-170913	11:10	WG					X				
14	SVCA-GW-110-14-19-170913	12:57	WG					X				
15	SVCA-GW-111-14-19-170913	15:45	WG					X				sample volume limited; 3 TPH-D bottles

Notes: NWTPH-D extended analyzed with and without silica gel cleanup. See contract for analysis details

Email sample confirmation report to labdata@anchorqea.com

SVCA-GW-111-14-19-170913 has high turbidity due to clay particulate

Relinquished By: Brenda Wright Company: Anchor QEA, LLC
 Signature/Printed Name: Brenda Wright Date/Time: 9/14/17 09:00

Received By: [Signature] Company: ARI
 Signature/Printed Name: Brenda Fisk Date/Time: 9/14/17 09:58

Relinquished By: _____ Company: _____
 Signature/Printed Name: _____ Date/Time: _____

Received By: _____ Company: _____
 Signature/Printed Name: _____ Date/Time: _____

1710171

Chain of Custody Record & Laboratory Analysis Request

Laboratory: Analytical Resources, Inc.
 Date: 9/13/17
 Project Name: SVCA Area Z Remediation
 Project Manager: Jennifer Allen
 Phone Number: 360-715-2724
 Shipment Method:



Line	Field Sample ID	Collection Date/Time	Matrix	No. of Containers	Test Parameters				Comments/Preservation
					NWTPH-G	NWTPH-D	BTEX	Archive	
1	SVCA-GW-112-12-S-170413	9/13/17	WG	9	X	X	X		
2		↑ 1703							
3	TRIP BLANK	9/13/17	WG	1					
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

Notes: NWTPH-D extended analyzed with and without silica gel cleanup. See contract for analysis details
 Email sample confirmation report to labdata@anchorqea.com

Relinquished By: *[Signature]* Company: Anchor OEA, LLC
 Date/Time: 9/14/17 0900

Received By: *[Signature]* Company: ARJ
 Signature/Printed Name: Brandon Fisk Date/Time: 9/14/17 858

Relinquished By: _____ Company: _____
 Signature/Printed Name: _____ Date/Time: _____

Received By: _____ Company: _____
 Signature/Printed Name: _____ Date/Time: _____



Cooler Receipt Form

ARI Client: Anchor

Project Name: SVCA Area 2 Remediation

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 17I0171

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) #1 #2

Time: 8:58 4.6 3.7

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D005206

Cooler Accepted by: BF (BA) Date: 9/14/17 Time: 8:58

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI NA 8/18/17

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: B.H. Date: 9/15/17 Time: 12:39

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC
SVCA-MW-111-14-19-170913	↳ SVCA-GW-111-14-19-170913		
SVCA-MW-112-12.5-17.5-170913	↳ SVCA-GW-112-12.5-17.5-170913		

Additional Notes, Discrepancies, & Resolutions:
Trip blank had 1g bubble.

By: B.H. Date: 9/15/17

			Small → "sm" (<2 mm)
			Peabubbles → "pb" (2 to <4 mm)
			Large → "lg" (4 to <6 mm)
			Headspace → "hs" (>6 mm)



Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle WA, 98101

Project: SCVA Area Z Remediation
Project Number: [none]
Project Manager: Cheronne Oreiro

Reported:
27-Sep-2017 17:30

Case Narrative

Sample receipt

Samples as listed on the preceding page were received September 14, 2017 under ARI workorder 1710171. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volatiles - EPA Method SW8260C

The samples were run within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

There were no target compounds detected in the method blank.

The LCS/LCSD percent recoveries and RPD were within control limits.

Gasoline by NWTPH-g (GC/MS)

The samples were run within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

There were no target compounds detected in the method blank.

The LCS/LCSD percent recoveries and RPD were within control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx (Ac/Si cleaned and not Ac/Si cleaned)

The samples were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

There were no target compounds detected in the method blanks.

The LCS percent recoveries were within control limits.



Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101

Project: SCVA Area Z Remediation
Project Number: [none]
Project Manager: Cheronne Oreiro

Reported:
09/27/2017 17:30

ANALYTICAL REPORT FOR SAMPLES

Laboratory ID	Sample ID	Matrix	Date Sampled	Date Received
17I0171-01	SVCA-SB-109-14-16-170913	Solid	09/13/17 10:45	09/14/17 08:58
17I0171-02	SVCA-SB-110-14-16-170913	Solid	09/13/17 11:48	09/14/17 08:58
17I0171-03	SVCA-SB-111-3-5-170913	Solid	09/13/17 14:00	09/14/17 08:58
17I0171-04	SVCA-SB-111-8-10-170913	Solid	09/13/17 14:10	09/14/17 08:58
17I0171-05	SVCA-SB-111-14-16-170913	Solid	09/13/17 14:30	09/14/17 08:58
17I0171-06	SVCA-SB-111-14-16-170913	Solid	09/13/17 14:30	09/14/17 08:58
17I0171-07	SVCA-SB-111-16-18-170913	Solid	09/13/17 14:40	09/14/17 08:58
17I0171-08	SVCA-SB-111-18-20-170913	Solid	09/13/17 14:50	09/14/17 08:58
17I0171-09	SVCA-SB-112-3-5-170913	Solid	09/13/17 15:50	09/14/17 08:58
17I0171-10	SVCA-SB-112-8-10-170913	Solid	09/13/17 16:00	09/14/17 08:58
17I0171-11	SVCA-SB-112-12.5-14.5-170913	Solid	09/13/17 16:10	09/14/17 08:58
17I0171-12	SVCA-SB-112-12.5-14.5-170913	Solid	09/13/17 16:10	09/14/17 08:58
17I0171-13	SVCA-SB-112-14.5-18.5-170913	Solid	09/13/17 16:20	09/14/17 08:58
17I0171-14	SVCA-SB-IDW-170913	Solid	09/13/17 17:30	09/14/17 08:58
17I0171-15	SVCA-GW-109-14-19-170913	Water	09/13/17 11:10	09/14/17 08:58
17I0171-16	SVCA-GW-109-14-19-170913	Water	09/13/17 11:10	09/14/17 08:58
17I0171-17	SVCA-GW-110-14-19-170913	Water	09/13/17 12:57	09/14/17 08:58
17I0171-18	SVCA-GW-110-14-19-170913	Water	09/13/17 12:57	09/14/17 08:58
17I0171-19	SVCA-GW-111-14-19-170913	Water	09/13/17 15:45	09/14/17 08:58
17I0171-20	SVCA-GW-111-14-19-170913	Water	09/13/17 15:45	09/14/17 08:58
17I0171-21	SVCA-GW-112-12.5-17.5-170913	Water	09/13/17 17:03	09/14/17 08:58
17I0171-22	SVCA-GW-112-12.5-17.5-170913	Water	09/13/17 17:03	09/14/17 08:58
17I0171-23	TRIP BLANK	Water	09/13/17 00:00	09/14/17 08:58



QUALIFIERS AND NOTES

<u>Qualifier</u>	<u>Definition</u>
U	This analyte is not detected above the applicable reporting or detection limit.
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
J	Estimated concentration value detected below the reporting limit.
D	The reported value is from a dilution
B	This analyte was detected in the method blank.
*	Flagged value is not within established control limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 1710171-05 SDG: 1710171
 Sampled: 09/13/17 14:30 Prepared: 09/18/17 15:57 File ID: NT509181725.D
 % Solids: 89.53 Preparation: EPA 5035 (Sodium Bisulfate) Analyzed: 09/18/17 23:41
 Batch: BFI0373 Sequence: SFI0222 Initial/Final: 5.71 g Wet / 5 mL
 Instrument: NT5 Column: RTX-VMS Calibration: AI00044

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg dry)	Q	DL	RL
71-43-2	Benzene	1	0.98	U	0.29	0.98
108-88-3	Toluene	1	0.98	U	0.15	0.98
100-41-4	Ethylbenzene	1	0.98	U	0.20	0.98
179601-23-1	m,p-Xylene	1	1.96	U	0.38	1.96
95-47-6	o-Xylene	1	0.98	U	0.22	0.98

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	50.000	68.7	137	80 - 149	
Toluene-d8	50.000	50.0	100	77 - 120	
4-Bromofluorobenzene	50.000	48.9	97.9	80 - 120	
1,2-Dichlorobenzene-d4	50.000	53.6	107	80 - 120	



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 1710171-11 SDG: 1710171
 Sampled: 09/13/17 16:10 Prepared: 09/18/17 15:57 File ID: NT509181726.D
 % Solids: 89.96 Preparation: EPA 5035 (Sodium Bisulfate) Analyzed: 09/19/17 00:03
 Batch: BFI0373 Sequence: SFI0222 Initial/Final: 6.33 g Wet / 5 mL
 Instrument: NT5 Column: RTX-VMS Calibration: AI00044

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg dry)	Q	DL	RL
71-43-2	Benzene	1	0.88	U	0.26	0.88
108-88-3	Toluene	1	0.88	U	0.13	0.88
100-41-4	Ethylbenzene	1	0.88	U	0.18	0.88
179601-23-1	m,p-Xylene	1	1.76	U	0.34	1.76
95-47-6	o-Xylene	1	0.88	U	0.20	0.88

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	50.000	69.1	138	80 - 149	
Toluene-d8	50.000	50.1	100	77 - 120	
4-Bromofluorobenzene	50.000	48.7	97.3	80 - 120	
1,2-Dichlorobenzene-d4	50.000	52.9	106	80 - 120	



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 1710171-15 SDG: 1710171
 Sampled: 09/13/17 11:10 Prepared: 09/20/17 12:51 File ID: V209201712.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 09/20/17 14:07
 Batch: BFI0454 Sequence: SFI0240 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AI00047

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
71-43-2	Benzene	1	0.20	U	0.03	0.20
108-88-3	Toluene	1	0.20	U	0.04	0.20
100-41-4	Ethylbenzene	1	0.20	U	0.04	0.20
179601-23-1	m,p-Xylene	1	0.40	U	0.05	0.40
95-47-6	o-Xylene	1	0.20	U	0.03	0.20

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	5.0000	4.50	90.0	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	5.11	102	80 - 120	
Toluene-d8	5.0000	4.66	93.2	80 - 120	
4-Bromofluorobenzene	5.0000	4.78	95.5	80 - 120	



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 1710171-17 SDG: 1710171
 Sampled: 09/13/17 12:57 Prepared: 09/20/17 12:51 File ID: V209201713.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 09/20/17 14:28
 Batch: BFI0454 Sequence: SFI0240 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AI00047

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
71-43-2	Benzene	1	0.20	U	0.03	0.20
108-88-3	Toluene	1	0.20	U	0.04	0.20
100-41-4	Ethylbenzene	1	0.20	U	0.04	0.20
179601-23-1	m,p-Xylene	1	0.40	U	0.05	0.40
95-47-6	o-Xylene	1	0.20	U	0.03	0.20

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	5.0000	4.63	92.6	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	5.05	101	80 - 120	
Toluene-d8	5.0000	4.75	94.9	80 - 120	
4-Bromofluorobenzene	5.0000	4.67	93.4	80 - 120	



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 1710171-19 SDG: 1710171
 Sampled: 09/13/17 15:45 Prepared: 09/20/17 12:51 File ID: V209201714.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 09/20/17 14:48
 Batch: BFI0454 Sequence: SFI0240 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AI00047

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
71-43-2	Benzene	1	0.04	J	0.03	0.20
108-88-3	Toluene	1	0.05	J	0.04	0.20
100-41-4	Ethylbenzene	1	0.20	U	0.04	0.20
179601-23-1	m,p-Xylene	1	0.40	U	0.05	0.40
95-47-6	o-Xylene	1	0.20	U	0.03	0.20

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	5.0000	4.70	94.0	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	5.06	101	80 - 120	
Toluene-d8	5.0000	4.78	95.7	80 - 120	
4-Bromofluorobenzene	5.0000	4.83	96.7	80 - 120	



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 1710171-21 SDG: 1710171
 Sampled: 09/13/17 17:03 Prepared: 09/20/17 12:51 File ID: V209201715.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 09/20/17 15:08
 Batch: BFI0454 Sequence: SFI0240 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AI00047

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
71-43-2	Benzene	1	0.20	U	0.03	0.20
108-88-3	Toluene	1	0.20	U	0.04	0.20
100-41-4	Ethylbenzene	1	0.20	U	0.04	0.20
179601-23-1	m,p-Xylene	1	0.40	U	0.05	0.40
95-47-6	o-Xylene	1	0.20	U	0.03	0.20

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	5.0000	4.83	96.6	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	4.96	99.2	80 - 120	
Toluene-d8	5.0000	4.88	97.7	80 - 120	
4-Bromofluorobenzene	5.0000	4.79	95.7	80 - 120	



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Water Laboratory ID: 1710171-23 SDG: 1710171
 Sampled: 09/13/17 00:00 Prepared: 09/20/17 12:51 File ID: V209201710.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 09/20/17 13:27
 Batch: BFI0454 Sequence: SFI0240 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AI00047

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
71-43-2	Benzene	1	0.20	U	0.03	0.20
108-88-3	Toluene	1	0.20	U	0.04	0.20
100-41-4	Ethylbenzene	1	0.20	U	0.04	0.20
179601-23-1	m,p-Xylene	1	0.40	U	0.05	0.40
95-47-6	o-Xylene	1	0.20	U	0.03	0.20

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	5.0000	4.45	89.0	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	4.96	99.2	80 - 120	
Toluene-d8	5.0000	4.80	96.0	80 - 120	
4-Bromofluorobenzene	5.0000	4.89	97.8	80 - 120	



PREPARATION BATCH SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc. SDG: 17I0171
Client: Anchor QEA, LLC Project: SCVA Area Z Remediation
Batch: BFI0373 Batch Matrix: Solid Preparation: EPA 5035 (Sodium Bisulfate)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-SB-111-14-16-170913	17I0171-05	NT509181725.D	09/18/17 15:57	
SVCA-SB-112-12.5-14.5-170913	17I0171-11	NT509181726.D	09/18/17 15:57	
Blank	BFI0373-BLK1	NT509181704.D	09/18/17 07:57	
LCS	BFI0373-BS1	NT509181702A.D	09/18/17 07:57	
LCS Dup	BFI0373-BSD1	NT509181703.D	09/18/17 07:57	



PREPARATION BATCH SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFI0454 Batch Matrix: Water

Preparation: EPA 5030 (Purge and Trap)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-GW-109-14-19-170913	17I0171-15	V209201712.D	09/20/17 12:51	
SVCA-GW-110-14-19-170913	17I0171-17	V209201713.D	09/20/17 12:51	
SVCA-GW-111-14-19-170913	17I0171-19	V209201714.D	09/20/17 12:51	
SVCA-GW-112-12.5-17.5-170913	17I0171-21	V209201715.D	09/20/17 12:51	
TRIP BLANK	17I0171-23	V209201710.D	09/20/17 12:51	
Blank	BFI0454-BLK2	V209201709.D	09/20/17 10:51	
LCS	BFI0454-BS2	V209201705LCS.D	09/20/17 10:51	
LCS Dup	BFI0454-BSD2	V209201706.D	09/20/17 10:51	



Form I
METHOD BLANK DATA SHEET
EPA 8260C

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>1710171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Solid</u>	Laboratory ID:	<u>BFI0373-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>09/18/17 07:57</u>
Solids:		Preparation:	<u>EPA 5035 (Sodium Bisulfate)</u>
Batch:	<u>BFI0373</u>	Sequence:	<u>SFI0222</u>
Instrument:	<u>NT5</u>	Column:	<u>RTX-VMS</u>
		File ID:	<u>NT509181704.D</u>
		Analyzed:	<u>09/18/17 15:22</u>
		Initial/Final:	<u>5 g / 5 mL</u>
		Calibration:	<u>AI00044</u>

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg wet)	Q	DL	RL
71-43-2	Benzene	1	1.00	U	0.30	1.00
108-88-3	Toluene	1	1.00	U	0.15	1.00
100-41-4	Ethylbenzene	1	1.00	U	0.20	1.00
179601-23-1	m,p-Xylene	1	2.00	U	0.39	2.00
95-47-6	o-Xylene	1	1.00	U	0.22	1.00

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	50.000	60.2	120	80 - 149	
Toluene-d8	50.000	49.7	99.4	77 - 120	
4-Bromofluorobenzene	50.000	47.5	95.1	80 - 120	
1,2-Dichlorobenzene-d4	50.000	51.6	103	80 - 120	



Form I
METHOD BLANK DATA SHEET
EPA 8260C

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>1710171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Water</u>	Laboratory ID:	<u>BFI0454-BLK2</u>
Sampled:	<u>N/A</u>	Prepared:	<u>09/20/17 10:51</u>
Solids:		Preparation:	<u>EPA 5030 (Purge and Trap)</u>
Batch:	<u>BFI0454</u>	Sequence:	<u>SFI0240</u>
Instrument:	<u>NT2</u>	Column:	<u>RTX-VMS</u>
		File ID:	<u>V209201709.D</u>
		Analyzed:	<u>09/20/17 13:05</u>
		Initial/Final:	<u>10 mL / 10 ml</u>
		Calibration:	<u>AI00047</u>

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
71-43-2	Benzene	1	0.20	U	0.03	0.20
108-88-3	Toluene	1	0.20	U	0.04	0.20
100-41-4	Ethylbenzene	1	0.20	U	0.04	0.20
179601-23-1	m,p-Xylene	1	0.40	U	0.05	0.40
95-47-6	o-Xylene	1	0.20	U	0.03	0.20

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	5.0000	4.41	88.3	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	4.91	98.2	80 - 120	
Toluene-d8	5.0000	4.74	94.9	80 - 120	
4-Bromofluorobenzene	5.0000	5.02	100	80 - 120	



LCS / LCS DUPLICATE RECOVERY
EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Analyzed: 09/18/17 14:05

Batch: BFI0373

Laboratory ID: BFI0373-BS1

Preparation: EPA 5035 (Sodium Bisulfate)

Sequence Name: LCS

Initial/Final: 5 g / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	Q	LCS % REC. #	QC LIMITS REC.
Benzene	50.0	47.8		95.6	80 - 120
Toluene	50.0	48.2		96.3	75 - 120
Ethylbenzene	50.0	49.6		99.1	80 - 125
m,p-Xylene	100	99.4		99.4	76 - 121
o-Xylene	50.0	48.9		97.7	67 - 132

* Indicates values outside of QC limits

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	Q	LCSD % REC. #	% RPD #	QC LIMITS	
						RPD	REC.
Benzene	50.0	46.0		92.1	3.75	30	80 - 120
Toluene	50.0	47.5		94.9	1.49	30	75 - 120
Ethylbenzene	50.0	49.9		99.8	0.669	30	80 - 125
m,p-Xylene	100	102		102	2.92	30	76 - 121
o-Xylene	50.0	49.5		99.0	1.32	30	67 - 132

* Indicates values outside of QC limits



LCS / LCS DUPLICATE RECOVERY
EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Water

Analyzed: 09/20/17 11:38

Batch: BFI0454

Laboratory ID: BFI0454-BS2

Preparation: EPA 5030 (Purge and Trap)

Sequence Name: LCS

Initial/Final: 10 mL / 10 ml

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	Q	LCS % REC. #	QC LIMITS REC.
Benzene	10.0	9.95		99.5	80 - 120
Toluene	10.0	9.93		99.3	80 - 120
Ethylbenzene	10.0	10.5		105	80 - 120
m,p-Xylene	20.0	22.8		114	80 - 121
o-Xylene	10.0	11.4		114	80 - 121

* Indicates values outside of QC limits

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	Q	LCSD % REC. #	% RPD #	QC LIMITS	
						RPD	REC.
Benzene	10.0	9.63		96.3	3.29	30	80 - 120
Toluene	10.0	9.63		96.3	3.09	30	80 - 120
Ethylbenzene	10.0	10.1		101	3.94	30	80 - 120
m,p-Xylene	20.0	21.9		110	3.78	30	80 - 121
o-Xylene	10.0	10.9		109	3.70	30	80 - 121

* Indicates values outside of QC limits



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
EPA 8260C**

Laboratory: Analytical Resources, Inc.
Client: Anchor OEA, LLC
Lab File ID: NT509151703.D
Instrument ID: NT5
Sequence: SFI0182

SDG: 17I0171
Project: SCVA Area Z Remediation
Injection Date: 09/15/17
Injection Time: 11:15
Lab Sample ID: SFI0182-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	20.8	PASS
75	30 - 80% of 95	48.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.6	PASS
173	Less than 2% of 174	0.309	PASS
174	50 - 120% of 95	65.5	PASS
175	5 - 9% of 174	7.83	PASS
176	95 - 101% of 174	95.2	PASS
177	5 - 9% of 176	6.17	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SFI0182-TUN1	NT509151703.D	09/15/2017	11:15
Cal Standard	SFI0182-CAL1	NT509151705.D	09/15/2017	12:22
Cal Standard	SFI0182-CAL2	NT509151706.D	09/15/2017	12:45
Cal Standard	SFI0182-CAL3	NT509151707.D	09/15/2017	13:08
Cal Standard	SFI0182-CAL4	NT509151708.D	09/15/2017	13:30
Cal Standard	SFI0182-CAL5	NT509151709.D	09/15/2017	13:52
Cal Standard	SFI0182-CAL6	NT509151710.D	09/15/2017	14:15
Cal Standard	SFI0182-CAL7	NT509151711.D	09/15/2017	14:38
Cal Standard	SFI0182-CAL8	NT509151712.D	09/15/2017	15:00
Secondary Cal Check	SFI0182-SCV1	NT509151713.D	09/15/2017	15:54
Initial Cal Check	SFI0182-ICV1	NT509151714.D	09/15/2017	16:50
LCS	BF10337-BS1	NT509151715.D	09/15/2017	17:12
LCS Dup	BF10337-BSD1	NT509151716.D	09/15/2017	17:34
Blank	BF10337-BLK1	NT509151717.D	09/15/2017	17:56
ZZZZZ	1710121-02	NT509151718.D	09/15/2017	18:34
ZZZZZ	1710121-03	NT509151719.D	09/15/2017	18:57
ZZZZZ	1710121-05	NT509151720.D	09/15/2017	19:19
ZZZZZ	1710121-07	NT509151721.D	09/15/2017	19:42
ZZZZZ	1710121-09	NT509151722.D	09/15/2017	20:04
ZZZZZ	1710121-10	NT509151723.D	09/15/2017	20:26
ZZZZZ	1710125-08	NT509151724.D	09/15/2017	20:48
ZZZZZ	1710125-10	NT509151725.D	09/15/2017	21:10
ZZZZZ	1710125-12	NT509151726.D	09/15/2017	21:32
ZZZZZ	1710125-14	NT509151727.D	09/15/2017	21:54
Calibration Check	SFI0182-CCV1	NT509151730.D	09/15/2017	23:00
Low Cal Check	SFI0182-LCV1	NT509151731.D	09/15/2017	23:22



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
EPA 8260C**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Lab File ID:	<u>V209151702.D</u>	Injection Date:	<u>09/15/17</u>
Instrument ID:	<u>NT2</u>	Injection Time:	<u>09:35</u>
Sequence:	<u>SFI0188</u>	Lab Sample ID:	<u>SFI0188-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	19.1	PASS
75	30 - 80% of 95	49.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.79	PASS
173	Less than 2% of 174	0.443	PASS
174	50 - 120% of 95	69.6	PASS
175	5 - 9% of 174	7.29	PASS
176	95 - 101% of 174	97.1	PASS
177	5 - 9% of 176	6.64	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SFI0188-TUN1	V209151702.D	09/15/2017	9:35
Cal Standard	SFI0188-CAL1	V209151704.D	09/15/2017	10:44
Cal Standard	SFI0188-CAL2	V209151705.D	09/15/2017	11:04
Cal Standard	SFI0188-CAL3	V209151706.D	09/15/2017	11:25
Cal Standard	SFI0188-CAL4	V209151707.D	09/15/2017	11:45
Cal Standard	SFI0188-CAL5	V209151708.D	09/15/2017	12:06
Initial Cal Check	SFI0188-ICV1	V209151708a.D	09/15/2017	12:06
Cal Standard	SFI0188-CAL6	V209151709.D	09/15/2017	12:26
Cal Standard	SFI0188-CAL7	V209151710.D	09/15/2017	12:47
Cal Standard	SFI0188-CAL8	V209151711.D	09/15/2017	13:07
Secondary Cal Check	SFI0188-SCV1	V209151713.D	09/15/2017	14:11
LCS	BF10331-BS1	V209151716.D	09/15/2017	15:13
LCS Dup	BF10331-BSD1	V209151717.D	09/15/2017	15:34
Blank	BF10331-BLK1	V209151718.D	09/15/2017	15:54
ZZZZZ	17I0121-25	V209151719.D	09/15/2017	16:14
ZZZZZ	17I0125-20	V209151720.D	09/15/2017	16:34
Calibration Check	SFI0188-CCV1	V209151737.D	09/15/2017	22:15



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
EPA 8260C**

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0171</u>
Client: <u>Anchor OEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Lab File ID: <u>NT509181701.D</u>	Injection Date: <u>09/18/17</u>
Instrument ID: <u>NT5</u>	Injection Time: <u>12:36</u>
Sequence: <u>SFI0222</u>	Lab Sample ID: <u>SFI0222-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	PASS
50	15 - 40% of 95	20.4	PASS
75	30 - 80% of 95	50	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.8	PASS
173	Less than 2% of 174	0.766	PASS
174	50 - 120% of 95	67.5	PASS
175	5 - 9% of 174	7.37	PASS
176	95 - 101% of 174	96.6	PASS
177	5 - 9% of 176	7.92	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SFI0222-TUN1	NT509181701.D	09/18/2017	12:36
LCS	BF10373-BS1	NT509181702A.D	09/18/2017	14:05
Initial Cal Check	SFI0222-ICV1	NT509181702.D	09/18/2017	14:05
LCS Dup	BF10373-BSD1	NT509181703.D	09/18/2017	15:01
Blank	BF10373-BLK1	NT509181704.D	09/18/2017	15:22
ZZZZZ	17I0125-09	NT509181706.D	09/18/2017	16:48
ZZZZZ	17I0125-15	NT509181707.D	09/18/2017	17:09
ZZZZZ	17I0146-01	NT509181708.D	09/18/2017	17:31
ZZZZZ	17I0146-03	NT509181709.D	09/18/2017	17:53
ZZZZZ	17I0146-04	NT509181710.D	09/18/2017	18:14
ZZZZZ	17I0146-07	NT509181711.D	09/18/2017	18:36
ZZZZZ	17I0146-08	NT509181712.D	09/18/2017	18:58
ZZZZZ	17I0146-09	NT509181713.D	09/18/2017	19:19
ZZZZZ	17I0146-12	NT509181715.D	09/18/2017	20:03
VCA-SB-111-14-16-17091	17I0171-05	NT509181725.D	09/18/2017	23:41
CA-SB-112-12.5-14.5-1709	17I0171-11	NT509181726.D	09/19/2017	0:03
Calibration Check	SFI0222-CCV1	NT509181727.D	09/19/2017	0:25
Low Cal Check	SFI0222-LCV1	NT509181728.D	09/19/2017	0:47



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
EPA 8260C**

Laboratory: Analytical Resources, Inc. SDG: 17I0171
 Client: Anchor OEA, LLC Project: SCVA Area Z Remediation
 Lab File ID: V209201702.D Injection Date: 09/20/17
 Instrument ID: NT2 Injection Time: 10:15
 Sequence: SFI0240 Lab Sample ID: SFI0240-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	17.8	PASS
75	30 - 80% of 95	46.9	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.84	PASS
173	Less than 2% of 174	0.321	PASS
174	50 - 120% of 95	72.1	PASS
175	5 - 9% of 174	7.08	PASS
176	95 - 101% of 174	97.1	PASS
177	5 - 9% of 176	6.33	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SFI0240-TUN1	V209201702.D	09/20/2017	10:15
LCS	BF10454-BS2	V209201705LCS.D	09/20/2017	11:38
Initial Cal Check	SFI0240-ICV1	V209201705.D	09/20/2017	11:38
LCS Dup	BF10454-BSD2	V209201706.D	09/20/2017	11:58
Low Cal Check	SFI0240-LCV1	V209201707.D	09/20/2017	12:24
Low Cal Check	SFI0240-LCV2	V209201708.D	09/20/2017	12:44
Blank	BF10454-BLK2	V209201709.D	09/20/2017	13:05
TRIP BLANK	17I0171-23	V209201710.D	09/20/2017	13:27
ZZZZZ	17I0182-05	V209201711.D	09/20/2017	13:47
VCA-GW-109-14-19-1709	17I0171-15	V209201712.D	09/20/2017	14:07
VCA-GW-110-14-19-1709	17I0171-17	V209201713.D	09/20/2017	14:28
VCA-GW-111-14-19-1709	17I0171-19	V209201714.D	09/20/2017	14:48
CA-GW-112-12.5-17.5-170	17I0171-21	V209201715.D	09/20/2017	15:08
ZZZZZ	17I0182-01	V209201716.D	09/20/2017	15:28
ZZZZZ	17I0182-02	V209201717.D	09/20/2017	15:51
ZZZZZ	17I0182-03	V209201718.D	09/20/2017	16:12
ZZZZZ	17I0182-04	V209201719.D	09/20/2017	16:32
Calibration Check	SFI0240-CCV1	V209201729.D	09/20/2017	19:55



INITIAL CALIBRATION DATA
EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00044	Instrument:	NT5
Calibration Date:	09/15/2017 7:48	Column (1):	RTX-VMS

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Benzene	1	1.018925	2	0.9185812	5	0.9438549	10	0.9639813	50	0.7027687	100	0.7169388
Toluene	1	0.5792259	2	0.5914292	5	0.5660767	10	0.5979069	50	0.4453508	100	0.4636371
Ethylbenzene	1	1.301858	2	1.255718	5	1.300198	10	1.344558	50	0.9601686	100	1.0043
m,p-Xylene	2	0.4877095	4	0.4631044	10	0.4789072	20	0.4960158	100	0.3681509	200	0.367703
o-Xylene	1	0.4490664	2	0.4333709	5	0.463731	10	0.4698833	50	0.36439	100	0.3806638
Dibromofluoromethane	50	0.3472964	50	0.3656006	50	0.3794206	50	0.3754919	50	0.3777647	50	0.3697016
1,2-Dichloroethane-d4	50	0.4798618	50	0.4971974	50	0.5138378	50	0.528464	50	0.5309572	50	0.5218459
Toluene-d8	50	1.225093	50	1.232733	50	1.236449	50	1.264329	50	1.250331	50	1.240977
4-Bromofluorobenzene	50	0.3738188	50	0.3714357	50	0.362441	50	0.3706623	50	0.36609	50	0.3673601
1,2-Dichlorobenzene-d4	50	0.8940389	50	0.9053069	50	0.9114415	50	0.9095485	50	0.9263553	50	0.9328296



INITIAL CALIBRATION DATA
EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00044	Instrument:	NT5
Calibration Date:	09/15/2017 7:48	Column (1):	RTX-VMS

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Benzene	150	0.8703779	200	0.9210598								
Toluene	150	0.5512618	200	0.5909873								
Ethylbenzene	150	1.196587	200	1.268543								
m,p-Xylene	300	0.4353243	400	0.4501726								
o-Xylene	150	0.4592644	200	0.4867316								
Dibromofluoromethane	50	0.4021021	50	0.379145								
1,2-Dichloroethane-d4	50	0.5480244	50	0.5249759								
Toluene-d8	50	1.241503	50	1.25424								
4-Bromofluorobenzene	50	0.3717458	50	0.370917								
1,2-Dichlorobenzene-d4	50	0.9325445	50	0.9157219								



INITIAL CALIBRATION DATA EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00044	Instrument:	NT5
Calibration Date:	09/15/2017 7:48	Column (1):	RTX-VMS

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Benzene	0.8820609	13.0			RSD (20)	
Toluene	0.5482345	10.9			RSD (20)	
Ethylbenzene	1.203991	11.9			RSD (20)	
m,p-Xylene	0.443386	11.4			RSD (20)	
o-Xylene	0.4383877	10.0			RSD (20)	
Dibromofluoromethane	0.3745654	4.1			RSD (20)	
1,2-Dichloroethane-d4	0.5181456	4.1			RSD (20)	
Toluene-d8	1.243207	1.0			RSD (20)	
4-Bromofluorobenzene	0.3693088	1.0			RSD (20)	
1,2-Dichlorobenzene-d4	0.9159734	1.5			RSD (20)	



INITIAL CALIBRATION DATA
EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00047	Instrument:	NT2
Calibration Date:	09/15/2017 8:20	Column (1):	RTX-VMS

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Benzene	0.2	1.444879	0.5	1.607331	1	1.687637	2	1.627295	10	1.585004	20	1.642497
Toluene	0.2	0.9328447	0.5	0.9696614	1	0.9813036	2	0.9751219	10	0.9657501	20	1.038763
Ethylbenzene	0.2	0.5388003	0.5	0.6103128	1	0.6173489	2	0.6202384	10	0.6502201	20	0.664503
m,p-Xylene	0.4	0.6193096	1	0.6659757	2	0.7228447	4	0.7596048	20	0.7981989	40	0.8005963
o-Xylene	0.2	0.5612702	0.5	0.6057281	1	0.6445858	2	0.6738848	10	0.7581366	20	0.7865931
1,2-Dichloroethane-d4	5	0.6677408	5	0.6738775	5	0.7156822	5	0.7006539	5	0.6481359	5	0.6696135
1,2-Dichlorobenzene-d4	5	0.9735369	5	0.9435335	5	0.9835784	5	0.9815935	5	0.977751	5	0.9804789
Toluene-d8	5	1.145872	5	1.168241	5	1.186762	5	1.194053	5	1.206906	5	1.226348
4-Bromofluorobenzene	5	0.3237353	5	0.3304114	5	0.3515908	5	0.3522024	5	0.3628115	5	0.3633586
Dibromofluoromethane	5	0.5682088	5	0.5419423	5	0.5640578	5	0.5450814	5	0.5507838	5	0.5658229



INITIAL CALIBRATION DATA
EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00047	Instrument:	NT2
Calibration Date:	09/15/2017 8:20	Column (1):	RTX-VMS

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Benzene	40	1.524811	80	1.286574								
Toluene	40	1.002463	80	0.9189422								
Ethylbenzene	40	0.6531787	80	0.6081053								
m,p-Xylene	80	0.7579271	160	0.6068033								
o-Xylene	40	0.7727704	80	0.7140973								
1,2-Dichloroethane-d4	5	0.6613816	5	0.6280056								
1,2-Dichlorobenzene-d4	5	0.9669531	5	0.966631								
Toluene-d8	5	1.228283	5	1.24493								
4-Bromofluorobenzene	5	0.3659569	5	0.3581294								
Dibromofluoromethane	5	0.5525164	5	0.5707711								



INITIAL CALIBRATION DATA
EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00047	Instrument:	NT2
Calibration Date:	09/15/2017 8:20	Column (1):	RTX-VMS

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Benzene	1.550754	8.4			RSD (20)	
Toluene	0.9731062	3.9			RSD (20)	
Ethylbenzene	0.6203384	6.3			RSD (20)	
m,p-Xylene	0.7164076	10.7			RSD (20)	
o-Xylene	0.6896333	11.9			RSD (20)	
1,2-Dichloroethane-d4	0.6706364	4.1			RSD (20)	
1,2-Dichlorobenzene-d4	0.971757	1.3			RSD (20)	
Toluene-d8	1.200174	2.8			RSD (20)	
4-Bromofluorobenzene	0.3510245	4.5			RSD (20)	
Dibromofluoromethane	0.5573981	2.0			RSD (20)	



INITIAL CALIBRATION CHECK EPA 8260C

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>1710171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>NT5</u>	Calibration: <u>AI00044</u>
Lab File ID: <u>NT509151714.D</u>	Calibration Date: <u>09/15/17 07:48</u>
Sequence: <u>SFI0182</u>	Injection Date: <u>09/15/17</u>
Lab Sample ID: <u>SFI0182-ICV1</u>	Injection Time: <u>16:50</u>
Sequence Name: <u>VOA 10</u>	

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Benzene	A	50.000	45.3	0.8820609	0.7985376		-9.5	20
Toluene	A	50.000	45.7	0.5482345	0.5013119		-8.6	20
Ethylbenzene	A	50.000	48.3	1.2039910	1.1636650		-3.4	20
m,p-Xylene	A	100.00	97.5	0.4433860	0.4321797		-2.5	20
o-Xylene	A	50.000	48.8	0.4383877	0.4277163		-2.4	20
Dibromofluoromethane	A	50.000	56.6	0.3745654	0.4243776		13.3	20
1,2-Dichloroethane-d4	A	50.000	53.2	0.5181456	0.5514721		6.4	20
Toluene-d8	A	50.000	49.6	1.2432070	1.2325870		-0.9	20
4-Bromofluorobenzene	A	50.000	49.3	0.3693088	0.3637823		-1.5	20
1,2-Dichlorobenzene-d4	A	50.000	49.1	0.9159734	0.9002994		-1.7	20

* Values outside of QC limits



INITIAL CALIBRATION CHECK EPA 8260C

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>NT2</u>	Calibration: <u>AI00047</u>
Lab File ID: <u>V209151708a.D</u>	Calibration Date: <u>09/15/17 08:20</u>
Sequence: <u>SFI0188</u>	Injection Date: <u>09/15/17</u>
Lab Sample ID: <u>SFI0188-ICV1</u>	Injection Time: <u>12:06</u>
Sequence Name: <u>VOA 10</u>	

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Benzene	A	10.000	10.2	1.5507540	1.5850040		2.2	20
Toluene	A	10.000	9.92	0.9731062	0.9657501		-0.8	20
Ethylbenzene	A	10.000	10.5	0.6203384	0.6502201		4.8	20
m,p-Xylene	A	20.000	22.3	0.7164076	0.7981989		11.4	20
o-Xylene	A	10.000	11.0	0.6896333	0.7581366		9.9	20
Dibromofluoromethane	A	5.0000	4.94	0.5573981	0.5507838		-1.2	20
1,2-Dichloroethane-d4	A	5.0000	4.83	0.6706364	0.6481359		-3.4	20
Toluene-d8	A	5.0000	5.03	1.2001740	1.2069060		0.6	20
4-Bromofluorobenzene	A	5.0000	5.17	0.3510245	0.3628115		3.4	20
1,2-Dichlorobenzene-d4	A	5.0000	5.03	0.9717570	0.9777510		0.6	20

* Values outside of QC limits



INITIAL CALIBRATION CHECK

EPA 8260C

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>NT5</u>	Calibration: <u>AI00044</u>
Lab File ID: <u>NT509181702.D</u>	Calibration Date: <u>09/15/17 07:48</u>
Sequence: <u>SFI0222</u>	Injection Date: <u>09/18/17</u>
Lab Sample ID: <u>SFI0222-ICV1</u>	Injection Time: <u>14:05</u>
Sequence Name: <u>VOA 10</u>	

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Benzene	A	50.000	47.8	0.8820609	0.8429519		-4.4	20
Toluene	A	50.000	48.2	0.5482345	0.5280765		-3.7	20
Ethylbenzene	A	50.000	49.6	1.2039910	1.1935420		-0.9	20
m,p-Xylene	A	100.00	99.4	0.4433860	0.4408141		-0.6	20
o-Xylene	A	50.000	48.9	0.4383877	0.4283580		-2.3	20
Dibromofluoromethane	A	50.000	69.3	0.3745654	0.5188239		38.5	20 *
1,2-Dichloroethane-d4	A	50.000	58.1	0.5181456	0.6016729		16.1	20
Toluene-d8	A	50.000	51.7	1.2432070	1.2862550		3.5	20
4-Bromofluorobenzene	A	50.000	48.3	0.3693088	0.3569501		-3.3	20
1,2-Dichlorobenzene-d4	A	50.000	51.0	0.9159734	0.9339002		2.0	20

* Values outside of QC limits



INITIAL CALIBRATION CHECK

EPA 8260C

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>NT2</u>	Calibration: <u>AI00047</u>
Lab File ID: <u>V209201705.D</u>	Calibration Date: <u>09/15/17 08:20</u>
Sequence: <u>SFI0240</u>	Injection Date: <u>09/20/17</u>
Lab Sample ID: <u>SFI0240-ICV1</u>	Injection Time: <u>11:38</u>
Sequence Name: <u>VOA 10</u>	

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Benzene	A	10.000	9.95	1.5507540	1.5429230		-0.5	20
Toluene	A	10.000	9.93	0.9731062	0.9662560		-0.7	20
Ethylbenzene	A	10.000	10.5	0.6203384	0.6527170		5.2	20
m,p-Xylene	A	20.000	22.8	0.7164076	0.8157955		13.9	20
o-Xylene	A	10.000	11.4	0.6896333	0.7833798		13.6	20
Dibromofluoromethane	A	5.0000	4.53	0.5573981	0.5045671		-9.5	20
1,2-Dichloroethane-d4	A	5.0000	4.12	0.6706364	0.5519080		-17.7	20
Toluene-d8	A	5.0000	4.96	1.2001740	1.1906700		-0.8	20
4-Bromofluorobenzene	A	5.0000	5.43	0.3510245	0.3812281		8.6	20
1,2-Dichlorobenzene-d4	A	5.0000	4.79	0.9717570	0.9299321		-4.3	20

* Values outside of QC limits



ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0182

Instrument: NT5

Calibration: AI00044

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SFI0182-TUN1	NT509151703.D	NA	09/15/17 11:15
8260C 1	SFI0182-CAL1	NT509151705.D	NA	09/15/17 12:22
8260C 2	SFI0182-CAL2	NT509151706.D	NA	09/15/17 12:45
8260C 5	SFI0182-CAL3	NT509151707.D	NA	09/15/17 13:08
8260C 10	SFI0182-CAL4	NT509151708.D	NA	09/15/17 13:30
8260C 50	SFI0182-CAL5	NT509151709.D	NA	09/15/17 13:52
8260C 100	SFI0182-CAL6	NT509151710.D	NA	09/15/17 14:15
8260C 150	SFI0182-CAL7	NT509151711.D	NA	09/15/17 14:38
8260C 200	SFI0182-CAL8	NT509151712.D	NA	09/15/17 15:00
8260C SCV 50	SFI0182-SCV1	NT509151713.D	NA	09/15/17 15:54
VOA 10	SFI0182-ICV1	NT509151714.D	NA	09/15/17 16:50
ZZZZZ	BFI0337-BS1	NT509151715.D	Solid	09/15/17 17:12
ZZZZZ	BFI0337-BSD1	NT509151716.D	Solid	09/15/17 17:34
ZZZZZ	BFI0337-BLK1	NT509151717.D	Solid	09/15/17 17:56
ZZZZZ	17I0121-02	NT509151718.D	Solid	09/15/17 18:34
ZZZZZ	17I0121-03	NT509151719.D	Solid	09/15/17 18:57
ZZZZZ	17I0121-05	NT509151720.D	Solid	09/15/17 19:19
ZZZZZ	17I0121-07	NT509151721.D	Solid	09/15/17 19:42
ZZZZZ	17I0121-09	NT509151722.D	Solid	09/15/17 20:04
ZZZZZ	17I0121-10	NT509151723.D	Solid	09/15/17 20:26
ZZZZZ	17I0125-08	NT509151724.D	Solid	09/15/17 20:48
ZZZZZ	17I0125-10	NT509151725.D	Solid	09/15/17 21:10
ZZZZZ	17I0125-12	NT509151726.D	Solid	09/15/17 21:32
ZZZZZ	17I0125-14	NT509151727.D	Solid	09/15/17 21:54
CCV	SFI0182-CCV1	NT509151730.D	NA	09/15/17 23:00
VOA 0.2	SFI0182-LCV1	NT509151731.D	NA	09/15/17 23:22



ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0188

Instrument: NT2

Calibration: AI00047

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SFI0188-TUN1	V209151702.D	NA	09/15/17 09:35
8260C 0.2	SFI0188-CAL1	V209151704.D	NA	09/15/17 10:44
8260C 0.5	SFI0188-CAL2	V209151705.D	NA	09/15/17 11:04
8260C 1.0	SFI0188-CAL3	V209151706.D	NA	09/15/17 11:25
8260C 2.0	SFI0188-CAL4	V209151707.D	NA	09/15/17 11:45
8260C 10	SFI0188-CAL5	V209151708.D	NA	09/15/17 12:06
VOA 10	SFI0188-ICV1	V209151708a.D	NA	09/15/17 12:06
8260C 20	SFI0188-CAL6	V209151709.D	NA	09/15/17 12:26
8260C 40	SFI0188-CAL7	V209151710.D	NA	09/15/17 12:47
8260C 80	SFI0188-CAL8	V209151711.D	NA	09/15/17 13:07
8260C SCV 10	SFI0188-SCV1	V209151713.D	NA	09/15/17 14:11
ZZZZZ	BFI0331-BS1	V209151716.D	Water	09/15/17 15:13
ZZZZZ	BFI0331-BSD1	V209151717.D	Water	09/15/17 15:34
ZZZZZ	BFI0331-BLK1	V209151718.D	Water	09/15/17 15:54
ZZZZZ	17I0121-25	V209151719.D	Water	09/15/17 16:14
ZZZZZ	17I0125-20	V209151720.D	Water	09/15/17 16:34
CCV	SFI0188-CCV1	V209151737.D	NA	09/15/17 22:15



ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0222

Instrument: NT5

Calibration: AI00044

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SFI0222-TUN1	NT509181701.D	NA	09/18/17 12:36
VOA 10	SFI0222-ICV1	NT509181702.D	NA	09/18/17 14:05
LCS	BFI0373-BS1	NT509181702A.D	Solid	09/18/17 14:05
LCS Dup	BFI0373-BSD1	NT509181703.D	Solid	09/18/17 15:01
Blank	BFI0373-BLK1	NT509181704.D	Solid	09/18/17 15:22
ZZZZZ	17I0125-09	NT509181706.D	Solid	09/18/17 16:48
ZZZZZ	17I0125-15	NT509181707.D	Solid	09/18/17 17:09
ZZZZZ	17I0146-01	NT509181708.D	Solid	09/18/17 17:31
ZZZZZ	17I0146-03	NT509181709.D	Solid	09/18/17 17:53
ZZZZZ	17I0146-04	NT509181710.D	Solid	09/18/17 18:14
ZZZZZ	17I0146-07	NT509181711.D	Solid	09/18/17 18:36
ZZZZZ	17I0146-08	NT509181712.D	Solid	09/18/17 18:58
ZZZZZ	17I0146-09	NT509181713.D	Solid	09/18/17 19:19
ZZZZZ	17I0146-12	NT509181715.D	Solid	09/18/17 20:03
SVCA-SB-111-14-16-170913	17I0171-05	NT509181725.D	Solid	09/18/17 23:41
SVCA-SB-112-12.5-14.5-170913	17I0171-11	NT509181726.D	Solid	09/19/17 00:03
CCV	SFI0222-CCV1	NT509181727.D	NA	09/19/17 00:25
VOA 0.2	SFI0222-LCV1	NT509181728.D	NA	09/19/17 00:47



ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0240

Instrument: NT2

Calibration: AI00047

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SFI0240-TUN1	V209201702.D	NA	09/20/17 10:15
VOA 10	SFI0240-ICV1	V209201705.D	NA	09/20/17 11:38
LCS	BFI0454-BS2	V209201705LCS.D	Water	09/20/17 11:38
LCS Dup	BFI0454-BSD2	V209201706.D	Water	09/20/17 11:58
VOA 0.2	SFI0240-LCV1	V209201707.D	NA	09/20/17 12:24
VOA 1.0	SFI0240-LCV2	V209201708.D	NA	09/20/17 12:44
Blank	BFI0454-BLK2	V209201709.D	Water	09/20/17 13:05
TRIP BLANK	17I0171-23	V209201710.D	Water	09/20/17 13:27
ZZZZZ	17I0182-05	V209201711.D	Water	09/20/17 13:47
SVCA-GW-109-14-19-170913	17I0171-15	V209201712.D	Water	09/20/17 14:07
SVCA-GW-110-14-19-170913	17I0171-17	V209201713.D	Water	09/20/17 14:28
SVCA-GW-111-14-19-170913	17I0171-19	V209201714.D	Water	09/20/17 14:48
SVCA-GW-112-12.5-17.5-170913	17I0171-21	V209201715.D	Water	09/20/17 15:08
ZZZZZ	17I0182-01	V209201716.D	Water	09/20/17 15:28
ZZZZZ	17I0182-02	V209201717.D	Water	09/20/17 15:51
ZZZZZ	17I0182-03	V209201718.D	Water	09/20/17 16:12
ZZZZZ	17I0182-04	V209201719.D	Water	09/20/17 16:32
CCV	SFI0240-CCV1	V209201729.D	NA	09/20/17 19:55



SURROGATE RECOVERY SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG/WO: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0182

Instrument: NT5

Calibration: AI00044

Calibration Date: 09/15/2017

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
SFI0182-SCV1 (Solid) Lab File ID: NT509151713.D Analyzed: 09/15/17 15:54				
Dibromofluoromethane	50.000	132	80 - 120	
1,2-Dichloroethane-d4	50.000	105	80 - 120	
Toluene-d8	50.000	98.4	80 - 120	
4-Bromofluorobenzene	50.000	99.6	80 - 120	
1,2-Dichlorobenzene-d4	50.000	100	80 - 120	
SFI0182-ICV1 (Solid) Lab File ID: NT509151714.D Analyzed: 09/15/17 16:50				
Dibromofluoromethane	50.000	113	80 - 120	
1,2-Dichloroethane-d4	50.000	106	80 - 120	
Toluene-d8	50.000	99.1	80 - 120	
4-Bromofluorobenzene	50.000	98.5	80 - 120	
1,2-Dichlorobenzene-d4	50.000	98.3	80 - 120	
SFI0182-LCV1 (Solid) Lab File ID: NT509151731.D Analyzed: 09/15/17 23:22				
Dibromofluoromethane	50.000	143	0 - 200	
1,2-Dichloroethane-d4	50.000	121	0 - 200	
Toluene-d8	50.000	107	0 - 200	
4-Bromofluorobenzene	50.000	92.3	0 - 200	
1,2-Dichlorobenzene-d4	50.000	103	0 - 200	



SURROGATE RECOVERY SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.
 Client: Anchor QEA, LLC
 Sequence: SFI0188
 Calibration: AI00047

SDG/WO: 17I0171
 Project: SCVA Area Z Remediation
 Instrument: NT2
 Calibration Date: 09/15/2017

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
SFI0188-ICV1 (Water) Lab File ID: V209151708a.D Analyzed: 09/15/17 12:06				
1,2-Dichloroethane-d4	5.0000	96.6	80 - 120	
1,2-Dichlorobenzene-d4	5.0000	101	80 - 120	
Toluene-d8	5.0000	101	80 - 120	
4-Bromofluorobenzene	5.0000	103	80 - 120	
Dibromofluoromethane	5.0000	98.8	80 - 120	
SFI0188-SCV1 (Water) Lab File ID: V209151713.D Analyzed: 09/15/17 14:11				
1,2-Dichloroethane-d4	5.0000	92.3	80 - 120	
1,2-Dichlorobenzene-d4	5.0000	99.4	80 - 120	
Toluene-d8	5.0000	101	80 - 120	
4-Bromofluorobenzene	5.0000	104	80 - 120	
Dibromofluoromethane	5.0000	99.2	80 - 120	



SURROGATE RECOVERY SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Sequence: SFI0222
Calibration: AI00044

SDG/WO: 17I0171
Project: SCVA Area Z Remediation
Instrument: NT5
Calibration Date: 09/15/2017

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
BF10373-BS1 (Solid) Lab File ID: NT509181702A.D Analyzed: 09/18/17 14:05				
Dibromofluoromethane	50.000	139	80 - 120	
1,2-Dichloroethane-d4	50.000	116	80 - 149	
Toluene-d8	50.000	103	77 - 120	
4-Bromofluorobenzene	50.000	96.7	80 - 120	
1,2-Dichlorobenzene-d4	50.000	102	80 - 120	
SFI0222-ICV1 (Solid) Lab File ID: NT509181702.D Analyzed: 09/18/17 14:05				
Dibromofluoromethane	50.000	139	80 - 120	*
1,2-Dichloroethane-d4	50.000	116	80 - 120	
Toluene-d8	50.000	103	80 - 120	
4-Bromofluorobenzene	50.000	96.7	80 - 120	
1,2-Dichlorobenzene-d4	50.000	102	80 - 120	
BF10373-BSD1 (Solid) Lab File ID: NT509181703.D Analyzed: 09/18/17 15:01				
Dibromofluoromethane	50.000	136	80 - 120	
1,2-Dichloroethane-d4	50.000	114	80 - 149	
Toluene-d8	50.000	101	77 - 120	
4-Bromofluorobenzene	50.000	96.1	80 - 120	
1,2-Dichlorobenzene-d4	50.000	102	80 - 120	
BF10373-BLK1 (Solid) Lab File ID: NT509181704.D Analyzed: 09/18/17 15:22				
1,2-Dichloroethane-d4	50.000	120	80 - 149	
Toluene-d8	50.000	99.4	77 - 120	
4-Bromofluorobenzene	50.000	95.1	80 - 120	
1,2-Dichlorobenzene-d4	50.000	103	80 - 120	
17I0171-05 (Solid) Lab File ID: NT509181725.D Analyzed: 09/18/17 23:41				
1,2-Dichloroethane-d4	50.000	137	80 - 149	
Toluene-d8	50.000	100	77 - 120	
4-Bromofluorobenzene	50.000	97.9	80 - 120	
1,2-Dichlorobenzene-d4	50.000	107	80 - 120	



SURROGATE RECOVERY SUMMARY

EPA 8260C

Laboratory: <u>Analytical Resources, Inc.</u>	SDG/WO: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Sequence: <u>SFI0222</u>	Instrument: <u>NT5</u>
Calibration: <u>AI00044</u>	Calibration Date: <u>09/15/2017</u>

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
17I0171-11 (Solid) Lab File ID: NT509181726.D Analyzed: 09/19/17 00:03				
1,2-Dichloroethane-d4	50.000	138	80 - 149	
Toluene-d8	50.000	100	77 - 120	
4-Bromofluorobenzene	50.000	97.3	80 - 120	
1,2-Dichlorobenzene-d4	50.000	106	80 - 120	
SFI0222-LCV1 (Solid) Lab File ID: NT509181728.D Analyzed: 09/19/17 00:47				
Dibromofluoromethane	50.000	151	0 - 200	
1,2-Dichloroethane-d4	50.000	124	0 - 200	
Toluene-d8	50.000	99.4	0 - 200	
4-Bromofluorobenzene	50.000	96.7	0 - 200	
1,2-Dichlorobenzene-d4	50.000	106	0 - 200	



SURROGATE RECOVERY SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Sequence: SFI0240
Calibration: AI00047

SDG/WO: 17I0171
Project: SCVA Area Z Remediation
Instrument: NT2
Calibration Date: 09/15/2017

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
BF10454-BS2 (Water) Lab File ID: V209201705LCS.D Analyzed: 09/20/17 11:38				
1,2-Dichloroethane-d4	5.0000	82.3	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	95.7	80 - 120	
Toluene-d8	5.0000	99.2	80 - 120	
4-Bromofluorobenzene	5.0000	109	80 - 120	
Dibromofluoromethane	5.0000	90.5	80 - 120	
SFI0240-ICV1 (Water) Lab File ID: V209201705.D Analyzed: 09/20/17 11:38				
1,2-Dichloroethane-d4	5.0000	82.3	80 - 120	
1,2-Dichlorobenzene-d4	5.0000	95.7	80 - 120	
Toluene-d8	5.0000	99.2	80 - 120	
4-Bromofluorobenzene	5.0000	109	80 - 120	
Dibromofluoromethane	5.0000	90.5	80 - 120	
BF10454-BSD2 (Water) Lab File ID: V209201706.D Analyzed: 09/20/17 11:58				
1,2-Dichloroethane-d4	5.0000	84.9	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	99.7	80 - 120	
Toluene-d8	5.0000	98.8	80 - 120	
4-Bromofluorobenzene	5.0000	108	80 - 120	
Dibromofluoromethane	5.0000	90.6	80 - 120	
SFI0240-LCV1 (Water) Lab File ID: V209201707.D Analyzed: 09/20/17 12:24				
1,2-Dichloroethane-d4	5.0000	88.2	0 - 200	
1,2-Dichlorobenzene-d4	5.0000	100	0 - 200	
Toluene-d8	5.0000	96.3	0 - 200	
4-Bromofluorobenzene	5.0000	101	0 - 200	
Dibromofluoromethane	5.0000	87.4	0 - 200	
SFI0240-LCV2 (Water) Lab File ID: V209201708.D Analyzed: 09/20/17 12:44				
1,2-Dichloroethane-d4	5.0000	88.5	0 - 200	
1,2-Dichlorobenzene-d4	5.0000	100	0 - 200	
Toluene-d8	5.0000	96.8	0 - 200	
4-Bromofluorobenzene	5.0000	98.8	0 - 200	
Dibromofluoromethane	5.0000	87.7	0 - 200	



SURROGATE RECOVERY SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG/WO: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0240

Instrument: NT2

Calibration: AI00047

Calibration Date: 09/15/2017

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
BFI0454-BLK2 (Water) Lab File ID: V209201709.D Analyzed: 09/20/17 13:05				
1,2-Dichloroethane-d4	5.0000	88.3	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	98.2	80 - 120	
Toluene-d8	5.0000	94.9	80 - 120	
4-Bromofluorobenzene	5.0000	100	80 - 120	
17I0171-23 (Water) Lab File ID: V209201710.D Analyzed: 09/20/17 13:27				
1,2-Dichloroethane-d4	5.0000	89.0	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	99.2	80 - 120	
Toluene-d8	5.0000	96.0	80 - 120	
4-Bromofluorobenzene	5.0000	97.8	80 - 120	
17I0171-15 (Water) Lab File ID: V209201712.D Analyzed: 09/20/17 14:07				
1,2-Dichloroethane-d4	5.0000	90.0	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	102	80 - 120	
Toluene-d8	5.0000	93.2	80 - 120	
4-Bromofluorobenzene	5.0000	95.5	80 - 120	
17I0171-17 (Water) Lab File ID: V209201713.D Analyzed: 09/20/17 14:28				
1,2-Dichloroethane-d4	5.0000	92.6	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	101	80 - 120	
Toluene-d8	5.0000	94.9	80 - 120	
4-Bromofluorobenzene	5.0000	93.4	80 - 120	
17I0171-19 (Water) Lab File ID: V209201714.D Analyzed: 09/20/17 14:48				
1,2-Dichloroethane-d4	5.0000	94.0	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	101	80 - 120	
Toluene-d8	5.0000	95.7	80 - 120	
4-Bromofluorobenzene	5.0000	96.7	80 - 120	
17I0171-21 (Water) Lab File ID: V209201715.D Analyzed: 09/20/17 15:08				
1,2-Dichloroethane-d4	5.0000	96.6	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	99.2	80 - 120	
Toluene-d8	5.0000	97.7	80 - 120	
4-Bromofluorobenzene	5.0000	95.7	80 - 120	



INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.
Client: Anchor OEA, LLC
Sequence: SFI0182

SDG: 17I0171
Project: SCVA Area Z Remediation
Instrument: NT5
Calibration: AI00044

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (SFI0182-SCV1)		(Solid)	Lab File ID: NT509151713.D			Analyzed: 09/15/17 15:54			
Pentafluorobenzene	727808	4.961	772584	4.967	94	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1106325	7.875	1102950	7.881	100	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	1320200	5.405	1264803	5.411	104	50 - 200	0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	548799	9.968	553292	9.968	99	50 - 200	0.0000	+/-0.50	
Initial Cal Check (SFI0182-ICV1)		(Solid)	Lab File ID: NT509151714.D			Analyzed: 09/15/17 16:50			
Pentafluorobenzene	736389	4.961	772584	4.967	95	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1085729	7.875	1102950	7.881	98	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	1303861	5.405	1264803	5.411	103	50 - 200	0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	537008	9.968	553292	9.968	97	50 - 200	0.0000	+/-0.50	
Low Cal Check (SFI0182-LCV1)		(Solid)	Lab File ID: NT509151731.D			Analyzed: 09/15/17 23:22			
Pentafluorobenzene	555526	4.967	772584	4.967	72	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	934017	7.881	1102950	7.881	85	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	1002324	5.411	1264803	5.411	79	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	433866	9.968	553292	9.968	78	50 - 200	0.0000	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0188

Instrument: NT2

Calibration: AI00047

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Initial Cal Check (SFI0188-ICV1)		(Water)	Lab File ID: V209151708a.D			Analyzed: 09/15/17 12:06			
Pentafluorobenzene	319541	5.267	319541	5.267	100	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	518892	7.705	518892	7.705	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	590046	5.658	590046	5.658	100	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	268551	9.397	268551	9.397	100	50 - 200	0.0000	+/-0.50	
Secondary Cal Check (SFI0188-SCV1)		(Water)	Lab File ID: V209151713.D			Analyzed: 09/15/17 14:11			
Pentafluorobenzene	372129	5.269	319541	5.267	116	50 - 200	-0.0020	+/-0.50	
Chlorobenzene-d5	587135	7.707	518892	7.705	113	50 - 200	-0.0020	+/-0.50	
1,4-Difluorobenzene	680137	5.648	590046	5.658	115	50 - 200	0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	293798	9.399	268551	9.397	109	50 - 200	-0.0020	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.
Client: Anchor OEA, LLC
Sequence: SFI0222

SDG: 17I0171
Project: SCVA Area Z Remediation
Instrument: NT5
Calibration: AI00044

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (BFI0373-BS1)		(Solid)	Lab File ID: NT509181702A.D			Analyzed: 09/18/17 14:05			
Pentafluorobenzene	763365	4.973	772584	4.967	99	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	1208564	7.887	1102950	7.881	110	50 - 200	-0.0060	+/-0.50	
1,4-Difluorobenzene	1378450	5.417	1264803	5.411	109	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	571696	9.974	553292	9.968	103	50 - 200	-0.0060	+/-0.50	
Initial Cal Check (SFI0222-ICV1)		(Solid)	Lab File ID: NT509181702.D			Analyzed: 09/18/17 14:05			
Pentafluorobenzene	763365	4.973	772584	4.967	99	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	1208564	7.887	1102950	7.881	110	50 - 200	-0.0060	+/-0.50	
1,4-Difluorobenzene	1378450	5.417	1264803	5.411	109	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	571696	9.974	553292	9.968	103	50 - 200	-0.0060	+/-0.50	
LCS Dup (BFI0373-BSD1)		(Solid)	Lab File ID: NT509181703.D			Analyzed: 09/18/17 15:01			
Pentafluorobenzene	740830	4.973	772584	4.967	96	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	1152276	7.887	1102950	7.881	104	50 - 200	-0.0060	+/-0.50	
1,4-Difluorobenzene	1369349	5.417	1264803	5.411	108	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	545784	9.974	553292	9.968	99	50 - 200	-0.0060	+/-0.50	
Blank (BFI0373-BLK1)		(Solid)	Lab File ID: NT509181704.D			Analyzed: 09/18/17 15:22			
Pentafluorobenzene	700652	4.985	772584	4.967	91	50 - 200	-0.0180	+/-0.50	
Chlorobenzene-d5	1168289	7.887	1102950	7.881	106	50 - 200	-0.0060	+/-0.50	
1,4-Difluorobenzene	1373643	5.423	1264803	5.411	109	50 - 200	-0.0120	+/-0.50	
1,4-Dichlorobenzene-d4	548160	9.974	553292	9.968	99	50 - 200	-0.0060	+/-0.50	
SVCA-SB-111-14-16-170913 (17I0171-05)		(Solid)	Lab File ID: NT509181725.D			Analyzed: 09/18/17 23:41			
Pentafluorobenzene	800898	4.985	772584	4.967	104	50 - 200	-0.0180	+/-0.50	
Chlorobenzene-d5	1445602	7.893	1102950	7.881	131	50 - 200	-0.0120	+/-0.50	
1,4-Difluorobenzene	1609953	5.429	1264803	5.411	127	50 - 200	-0.0180	+/-0.50	
1,4-Dichlorobenzene-d4	690105	9.974	553292	9.968	125	50 - 200	-0.0060	+/-0.50	
SVCA-SB-112-12.5-14.5-170913 (17I0171-11)		(Solid)	Lab File ID: NT509181726.D			Analyzed: 09/19/17 00:03			
Pentafluorobenzene	785285	4.979	772584	4.967	102	50 - 200	-0.0120	+/-0.50	
Chlorobenzene-d5	1411208	7.893	1102950	7.881	128	50 - 200	-0.0120	+/-0.50	
1,4-Difluorobenzene	1580486	5.423	1264803	5.411	125	50 - 200	-0.0120	+/-0.50	
1,4-Dichlorobenzene-d4	671163	9.974	553292	9.968	121	50 - 200	-0.0060	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0222

Instrument: NT5

Calibration: AI00044

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Low Cal Check (SFI0222-LCV1)		(Solid)	Lab File ID: NT509181728.D			Analyzed: 09/19/17 00:47			
Pentafluorobenzene	768961	4.985	772584	4.967	100	50 - 200	-0.0180	+/-0.50	
Chlorobenzene-d5	1338747	7.893	1102950	7.881	121	50 - 200	-0.0120	+/-0.50	
1,4-Difluorobenzene	1549041	5.429	1264803	5.411	122	50 - 200	-0.0180	+/-0.50	
1,4-Dichlorobenzene-d4	614254	9.974	553292	9.968	111	50 - 200	-0.0060	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.
Client: Anchor OEA, LLC
Sequence: SFI0240

SDG: 17I0171
Project: SCVA Area Z Remediation
Instrument: NT2
Calibration: AI00047

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (BFI0454-BS2)		(Water)	Lab File ID: V209201705LCS.D			Analyzed: 09/20/17 11:38			
Pentafluorobenzene	380770	5.268	319541	5.267	119	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	568211	7.706	518892	7.705	110	50 - 200	-0.0010	+/-0.50	
1,4-Difluorobenzene	667201	5.658	590046	5.658	113	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	290675	9.398	268551	9.397	108	50 - 200	-0.0010	+/-0.50	
Initial Cal Check (SFI0240-ICV1)		(Water)	Lab File ID: V209201705.D			Analyzed: 09/20/17 11:38			
Pentafluorobenzene	380770	5.268	319541	5.267	119	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	568211	7.706	518892	7.705	110	50 - 200	-0.0010	+/-0.50	
1,4-Difluorobenzene	667201	5.658	590046	5.658	113	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	290675	9.398	268551	9.397	108	50 - 200	-0.0010	+/-0.50	
LCS Dup (BFI0454-BSD2)		(Water)	Lab File ID: V209201706.D			Analyzed: 09/20/17 11:58			
Pentafluorobenzene	387653	5.267	319541	5.267	121	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	583196	7.705	518892	7.705	112	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	678421	5.658	590046	5.658	115	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	289016	9.397	268551	9.397	108	50 - 200	0.0000	+/-0.50	
Low Cal Check (SFI0240-LCV1)		(Water)	Lab File ID: V209201707.D			Analyzed: 09/20/17 12:24			
Pentafluorobenzene	383113	5.268	319541	5.267	120	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	593389	7.706	518892	7.705	114	50 - 200	-0.0010	+/-0.50	
1,4-Difluorobenzene	665710	5.659	590046	5.658	113	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	281808	9.398	268551	9.397	105	50 - 200	-0.0010	+/-0.50	
Low Cal Check (SFI0240-LCV2)		(Water)	Lab File ID: V209201708.D			Analyzed: 09/20/17 12:44			
Pentafluorobenzene	373760	5.267	319541	5.267	117	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	595988	7.704	518892	7.705	115	50 - 200	0.0010	+/-0.50	
1,4-Difluorobenzene	648245	5.657	590046	5.658	110	50 - 200	0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	273282	9.396	268551	9.397	102	50 - 200	0.0010	+/-0.50	
Blank (BFI0454-BLK2)		(Water)	Lab File ID: V209201709.D			Analyzed: 09/20/17 13:05			
Pentafluorobenzene	345233	5.267	319541	5.267	108	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	534665	7.705	518892	7.705	103	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	612911	5.658	590046	5.658	104	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	255547	9.397	268551	9.397	95	50 - 200	0.0000	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0240

Instrument: NT2

Calibration: AI00047

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
TRIP BLANK (17I0171-23)		(Water)	Lab File ID: V209201710.D			Analyzed: 09/20/17 13:27			
Pentafluorobenzene	369697	5.267	319541	5.267	116	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	577112	7.705	518892	7.705	111	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	658338	5.658	590046	5.658	112	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	272381	9.397	268551	9.397	101	50 - 200	0.0000	+/-0.50	
SVCA-GW-109-14-19-170913 (17I0171-15)		(Water)	Lab File ID: V209201712.D			Analyzed: 09/20/17 14:07			
Pentafluorobenzene	339172	5.268	319541	5.267	106	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	539792	7.705	518892	7.705	104	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	617134	5.658	590046	5.658	105	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	248962	9.397	268551	9.397	93	50 - 200	0.0000	+/-0.50	
SVCA-GW-110-14-19-170913 (17I0171-17)		(Water)	Lab File ID: V209201713.D			Analyzed: 09/20/17 14:28			
Pentafluorobenzene	331710	5.267	319541	5.267	104	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	527200	7.716	518892	7.705	102	50 - 200	-0.0110	+/-0.50	
1,4-Difluorobenzene	589173	5.657	590046	5.658	100	50 - 200	0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	246499	9.396	268551	9.397	92	50 - 200	0.0010	+/-0.50	
SVCA-GW-111-14-19-170913 (17I0171-19)		(Water)	Lab File ID: V209201714.D			Analyzed: 09/20/17 14:48			
Pentafluorobenzene	331223	5.267	319541	5.267	104	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	516876	7.717	518892	7.705	100	50 - 200	-0.0120	+/-0.50	
1,4-Difluorobenzene	591191	5.658	590046	5.658	100	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	244756	9.397	268551	9.397	91	50 - 200	0.0000	+/-0.50	
SVCA-GW-112-12.5-17.5-170913 (17I0171-21)		(Water)	Lab File ID: V209201715.D			Analyzed: 09/20/17 15:08			
Pentafluorobenzene	328464	5.27	319541	5.267	103	50 - 200	-0.0030	+/-0.50	
Chlorobenzene-d5	532216	7.708	518892	7.705	103	50 - 200	-0.0030	+/-0.50	
1,4-Difluorobenzene	589362	5.661	590046	5.658	100	50 - 200	-0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	250884	9.4	268551	9.397	93	50 - 200	-0.0030	+/-0.50	



HOLDING TIME SUMMARY

Analysis: EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
SVCA-SB-111-14-16-170913 17I0171-05	09/13/17 14:30	09/14/17 08:58	09/18/17 15:57	5	14	09/18/17 23:41	5	14	
SVCA-SB-112-12.5-14.5-170913 17I0171-11	09/13/17 16:10	09/14/17 08:58	09/18/17 15:57	4	14	09/19/17 00:03	5	14	
SVCA-GW-109-14-19-170913 17I0171-15	09/13/17 11:10	09/14/17 08:58	09/20/17 12:51	7	14	09/20/17 14:07	7	14	
SVCA-GW-110-14-19-170913 17I0171-17	09/13/17 12:57	09/14/17 08:58	09/20/17 12:51	6	14	09/20/17 14:28	7	14	
SVCA-GW-111-14-19-170913 17I0171-19	09/13/17 15:45	09/14/17 08:58	09/20/17 12:51	6	14	09/20/17 14:48	7	14	
SVCA-GW-112-12.5-17.5-170913 17I0171-21	09/13/17 17:03	09/14/17 08:58	09/20/17 12:51	6	14	09/20/17 15:08	7	14	
TRIP BLANK 17I0171-23	09/13/17 00:00	09/14/17 08:58	09/20/17 12:51	7	14	09/20/17 13:27	8	14	

* Indicates hold time exceedance.



METHOD DETECTION AND REPORTING LIMITS

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 1710171

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Instrument: NT5

Analyte	MDL	RL	Units
Benzene	0.30	1.00	ug/kg
Toluene	0.15	1.00	ug/kg
Ethylbenzene	0.20	1.00	ug/kg
m,p-Xylene	0.39	2.00	ug/kg
o-Xylene	0.22	1.00	ug/kg



METHOD DETECTION AND REPORTING LIMITS

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 1710171

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Water

Instrument: NT2

Analyte	MDL	RL	Units
Benzene	0.03	0.20	ug/L
Toluene	0.04	0.20	ug/L
Ethylbenzene	0.04	0.20	ug/L
m,p-Xylene	0.05	0.40	ug/L
o-Xylene	0.03	0.20	ug/L



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17I0171-05 SDG: 17I0171
 Sampled: 09/13/17 14:30 Prepared: 09/20/17 13:03 File ID: V209201726G.D
 % Solids: 89.53 Preparation: EPA 5035 (Methanol Extract) Analyzed: 09/20/17 18:54
 Batch: BFI0456 Sequence: SFI0241 Initial/Final: 5.365 g Wet / 5 mL
 Instrument: NT2 Column: RTX-VMS Calibration: AI00052

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg dry)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	50	5790	U	2890	5790

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	4.90	97.9	80 - 120	
4-Bromofluorobenzene	5.0000	5.40	108	78 - 123	

Data File: \\target\share\chend\nt2.1\20170920g.b\209201726G.D

Date: 20-SEP-2017 18:54

Client ID:

Sample Info: 1710171-05

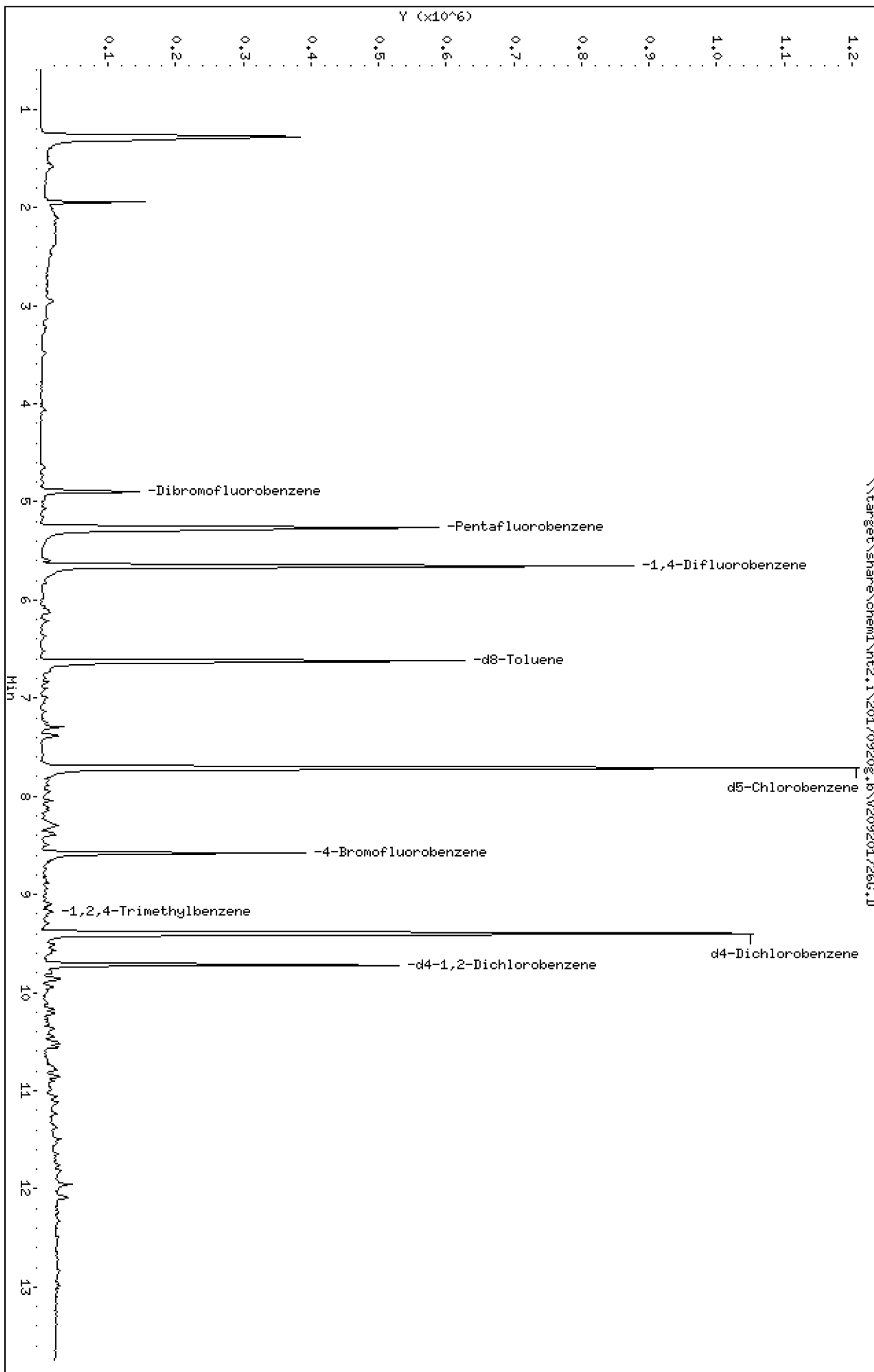
Column phase: RTXWMS

Instrument: nt2.1

Operator: PC

Column diameter: 0.18

Page 1



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20170920g.b/V209201726G.D
Method: \20170920g.b\GAS061217.m
Instrument: nt2.i
Gas Ical Date: 12-JUN-2017
Injection Date: 20-SEP-2017 18:54

ARI ID: 17I0171-05
Client ID:
Matrix: NONE
Dilution Factor: 1.000
Operator: PC

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	----	-----	-----
WAGas Tol-C12 (6.56 to 10.42)	61968270	573316	0.009
8015C 2MP-TMB (2.99 to 9.26)	22222222	478640	0.022
AK101 nC6-nC10 (3.43 to 8.54)	81728088	397833	0.005
NWTPHG Tol-Nap (6.56 to 11.21)	63840589	768892	0.012
mod8015 nC6-nC12 (3.43 to 10.42)	22222222	676625	0.030

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

6.620	1020294	d8-Toluene
8.585	724811	4-Bromofluorobenzene
9.401	1814320	d4-Dichlorobenzene
7.709	1846076	d5-Chlorobenzene
9.721	869099	d4-1,2-Dichlorobenzene



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 17I0171-11 SDG: 17I0171
 Sampled: 09/13/17 16:10 Prepared: 09/20/17 13:03 File ID: V209201727G.D
 % Solids: 89.96 Preparation: EPA 5035 (Methanol Extract) Analyzed: 09/20/17 19:14
 Batch: BFI0456 Sequence: SFI0241 Initial/Final: 5.156 g Wet / 5 mL
 Instrument: NT2 Column: RTX-VMS Calibration: AI00052

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg dry)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	50	5950	U	2970	5950

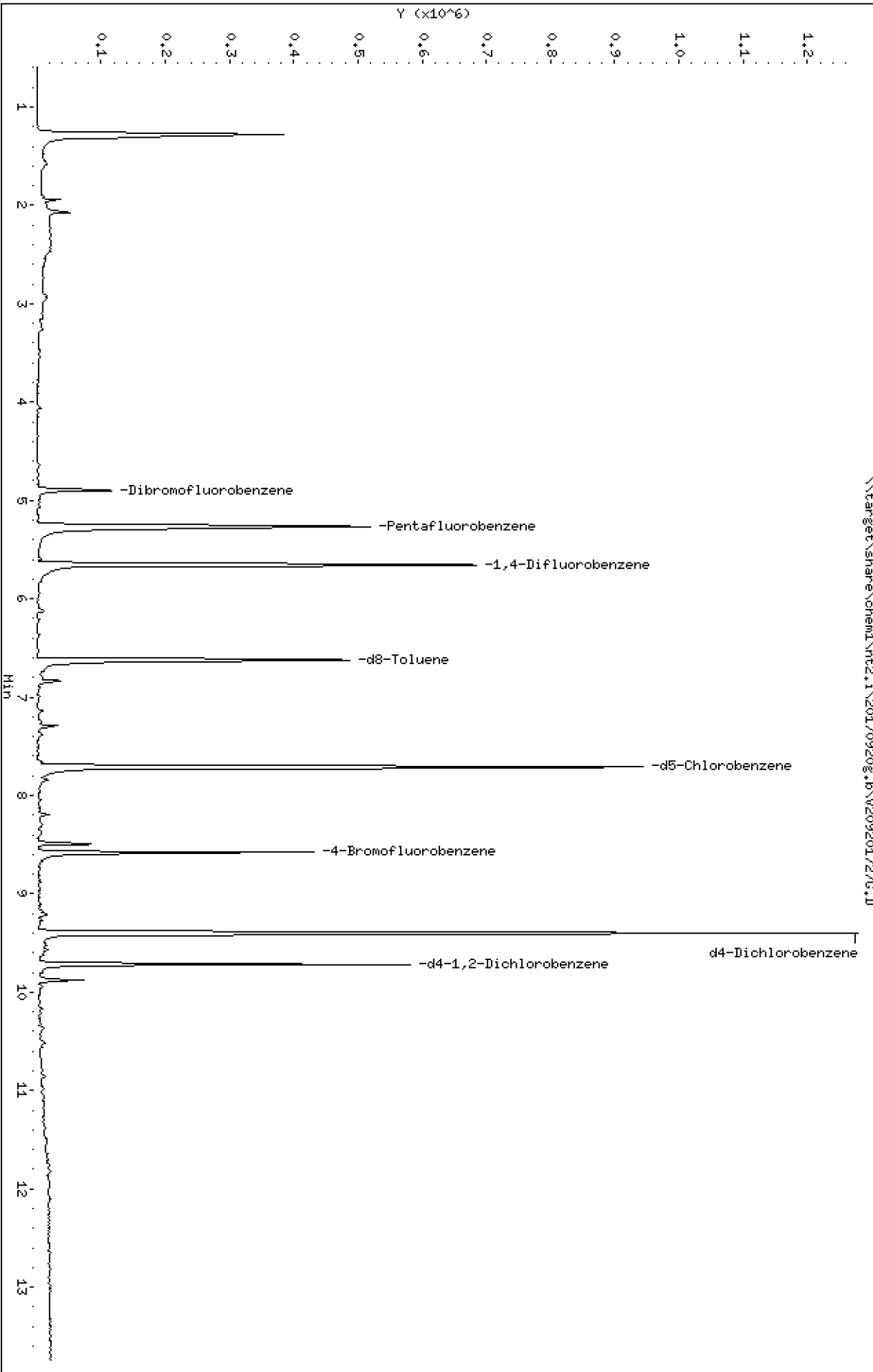
SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	4.97	99.4	80 - 120	
4-Bromofluorobenzene	5.0000	5.50	110	78 - 123	

Data File: \\target\share\chend\nt2.1\20170920g.b\209201727G.D
Date : 20-SEP-2017 19:14
Client ID:
Sample Info: 1710171-11

Column phase: RTXWMS

Instrument: nt2.1
Operator: PC
Column diameter: 0.18

\\target\share\chend\nt2.1\20170920g.b\209201727G.D



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20170920g.b/V209201727G.D
Method: \20170920g.b\GAS061217.m
Instrument: nt2.i
Gas Ical Date: 12-JUN-2017
Injection Date: 20-SEP-2017 19:14

ARI ID: 17I0171-11
Client ID:
Matrix: NONE
Dilution Factor: 1.000
Operator: PC

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	-----	-----	-----
WAGas Tol-C12 (6.56 to 10.42)	61968270	475779	0.008
8015C 2MP-TMB (2.99 to 9.26)	22222222	329819	0.015
AK101 nC6-nC10 (3.43 to 8.54)	81728088	329819	0.004
NWTPHG Tol-Nap (6.56 to 11.21)	63840589	501272	0.008
mod8015 nC6-nC12 (3.43 to 10.42)	22222222	475780	0.021

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

6.629	964451	d8-Toluene
8.581	670482	4-Bromofluorobenzene
9.398	1772065	d4-Dichlorobenzene
7.705	1748597	d5-Chlorobenzene
9.717	385739	d4-1,2-Dichlorobenzene



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 17I0171-15 SDG: 17I0171
 Sampled: 09/13/17 11:10 Prepared: 09/20/17 12:51 File ID: V209201712G.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 09/20/17 14:07
 Batch: BFI0454 Sequence: SFI0241 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AI00052

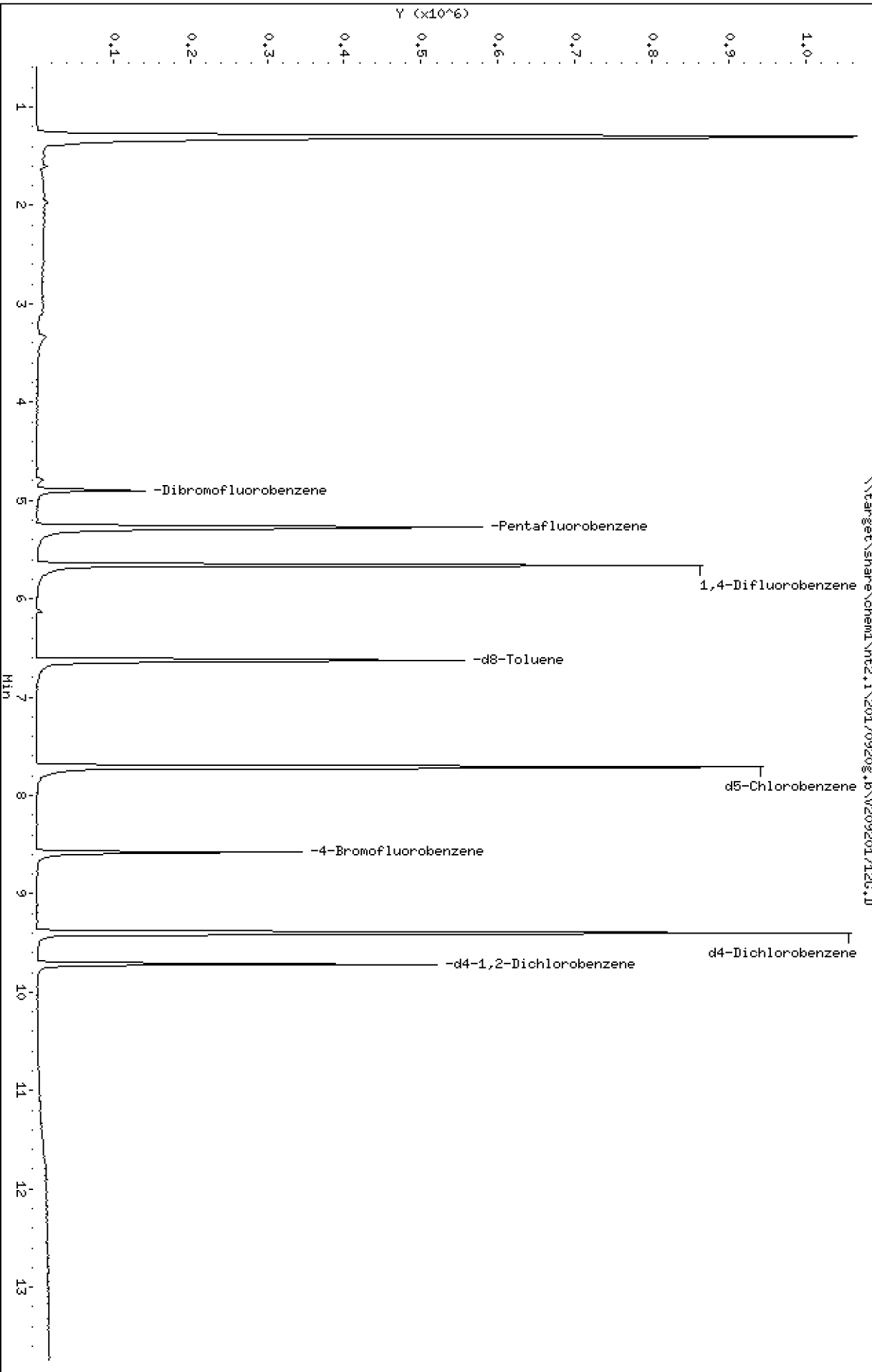
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	1	100	U	13.6	100

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	4.66	93.2	80 - 120	
4-Bromofluorobenzene	5.0000	4.78	95.5	80 - 120	

Data File: \\target\share\chend\nt2.1\20170920g.b\209201712G.D
Date: 20-SEP-2017 14:07
Client ID:
Sample Info: 1710171-15

Column phase: RTXWMS

Instrument: nt2.1
Operator: PC
Column diameter: 0.18



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20170920g.b/V209201712G.D
Method: \20170920g.b\GAS061217.m
Instrument: nt2.i
Gas Ical Date: 12-JUN-2017
Injection Date: 20-SEP-2017 14:07

ARI ID: 17I0171-15
Client ID:
Matrix: NONE
Dilution Factor: 1.000
Operator: PC

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	-----	-----	-----
WAGas Tol-C12 (6.56 to 10.42)	61968270	2	0.000
8015C 2MP-TMB (2.99 to 9.26)	22222222	49632	0.002
AK101 nC6-nC10 (3.43 to 8.54)	81728088	30188	0.000
NWTPHG Tol-Nap (6.56 to 11.21)	63840589	2	0.000
mod8015 nC6-nC12 (3.43 to 10.42)	22222222	30190	0.001

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

6.629	906666	d8-Toluene
8.582	548707	4-Bromofluorobenzene
9.398	1545990	d4-Dichlorobenzene
7.706	1637444	d5-Chlorobenzene
9.717	743838	d4-1,2-Dichlorobenzene



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 17I0171-17 SDG: 17I0171
 Sampled: 09/13/17 12:57 Prepared: 09/20/17 12:51 File ID: V209201713G.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 09/20/17 14:28
 Batch: BFI0454 Sequence: SFI0241 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AI00052

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	1	100	U	13.6	100

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	4.75	94.9	80 - 120	
4-Bromofluorobenzene	5.0000	4.67	93.4	80 - 120	

Data File: \\target\share\chend\nt2.1\20170920g.b\209201713G.D

Date: 20-SEP-2017 14:28

Client ID:

Sample Info: 1710171-17

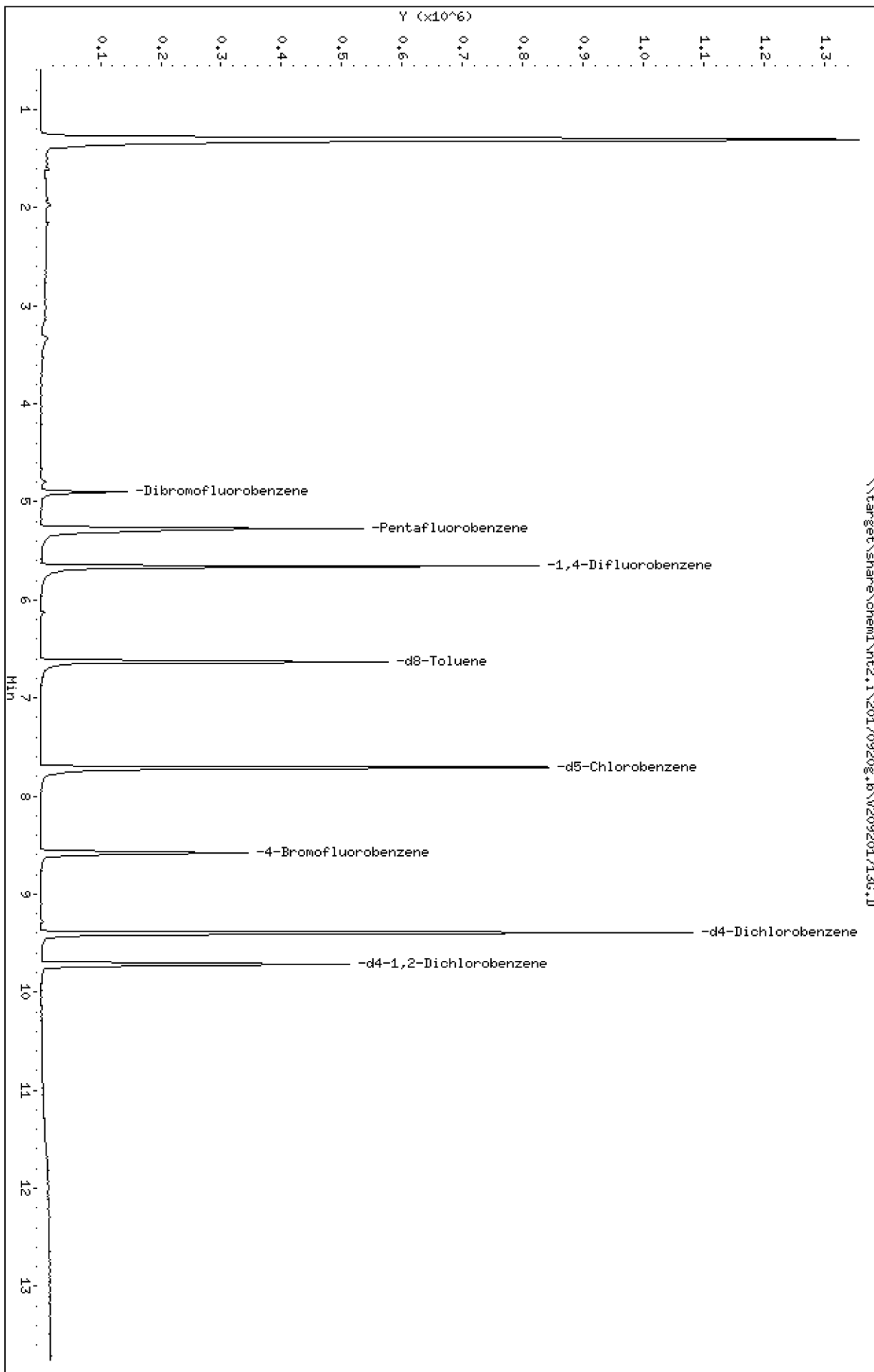
Column phase: RTXWMS

Instrument: nt2.1

Operator: PC

Column diameter: 0.18

\\target\share\chend\nt2.1\20170920g.b\209201713G.D



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20170920g.b/V209201713G.D
Method: \20170920g.b\GAS061217.m
Instrument: nt2.i
Gas Ical Date: 12-JUN-2017
Injection Date: 20-SEP-2017 14:28

ARI ID: 17I0171-17
Client ID:
Matrix: NONE
Dilution Factor: 1.000
Operator: PC

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	-----	-----	-----
WAGas Tol-C12 (6.56 to 10.42)	61968270	3	0.000
8015C 2MP-TMB (2.99 to 9.26)	22222222	43814	0.002
AK101 nC6-nC10 (3.43 to 8.54)	81728088	24709	0.000
NWTPHG Tol-Nap (6.56 to 11.21)	63840589	3	0.000
mod8015 nC6-nC12 (3.43 to 10.42)	22222222	24711	0.001

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

6.628	895596	d8-Toluene
8.580	535638	4-Bromofluorobenzene
9.397	1533814	d4-Dichlorobenzene
7.717	1602348	d5-Chlorobenzene
9.716	734337	d4-1,2-Dichlorobenzene



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 17I0171-19 SDG: 17I0171
 Sampled: 09/13/17 15:45 Prepared: 09/20/17 12:51 File ID: V209201714G.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 09/20/17 14:48
 Batch: BFI0454 Sequence: SFI0241 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AI00052

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	1	100	U	13.6	100

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	4.78	95.7	80 - 120	
4-Bromofluorobenzene	5.0000	4.83	96.7	80 - 120	

Data File: \\target\share\chemd\nt2.1\20170920g.b\209201714G.D

Date: 20-SEP-2017 14:48

Client ID:

Sample Info: 1710171-19

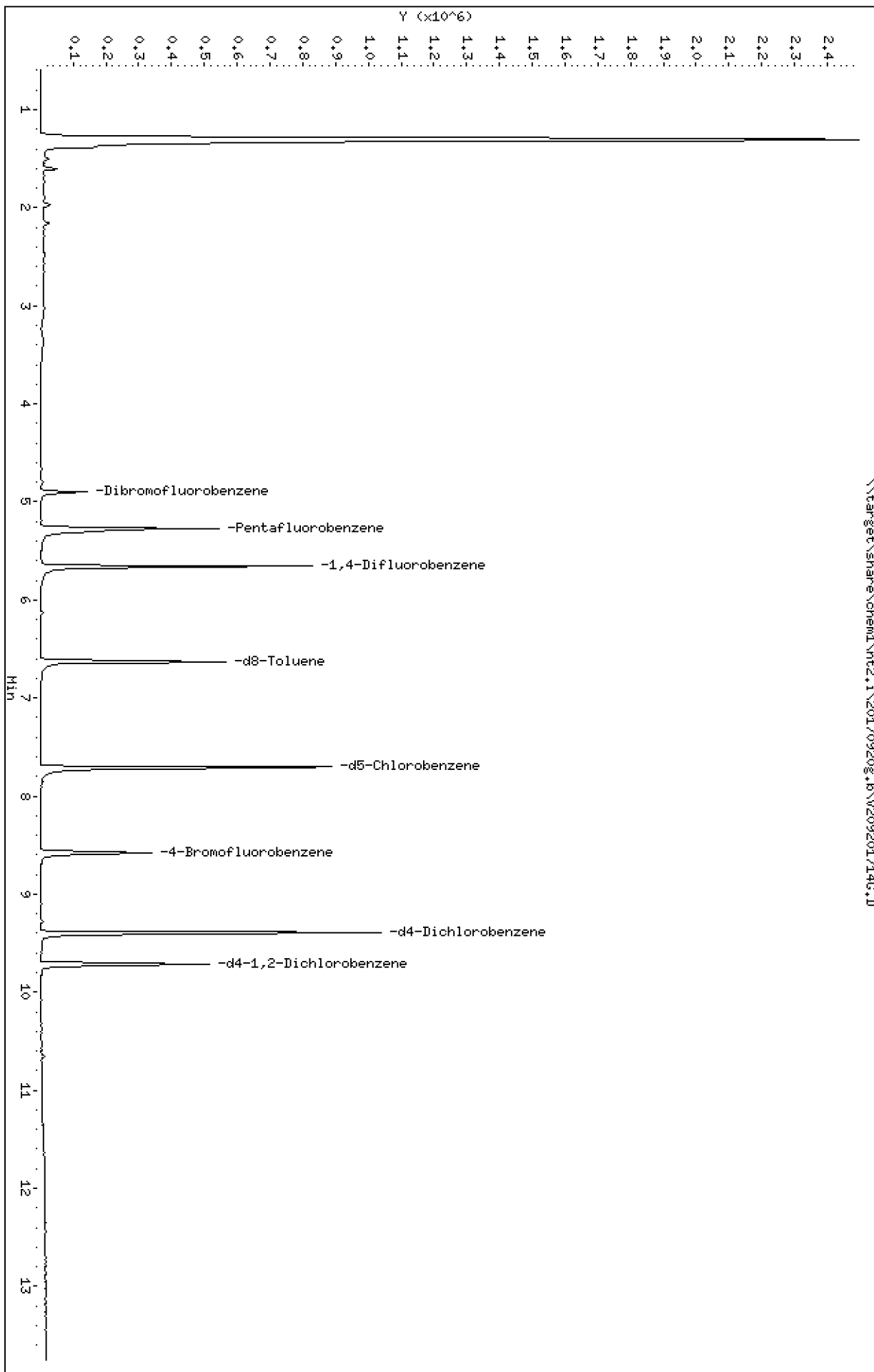
Column phase: RTXWMS

Instrument: nt2.1

Operator: PC

Column diameter: 0.18

\\target\share\chemd\nt2.1\20170920g.b\209201714G.D



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20170920g.b/V209201714G.D
Method: \20170920g.b\GAS061217.m
Instrument: nt2.i
Gas Ical Date: 12-JUN-2017
Injection Date: 20-SEP-2017 14:48

ARI ID: 17I0171-19
Client ID:
Matrix: NONE
Dilution Factor: 1.000
Operator: PC

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	----	-----	-----
WAGas Tol-C12 (6.56 to 10.42)	61968270	3	0.000
8015C 2MP-TMB (2.99 to 9.26)	22222222	10038	0.000
AK101 nC6-nC10 (3.43 to 8.54)	81728088	10037	0.000
NWTPHG Tol-Nap (6.56 to 11.21)	63840589	17911	0.000
mod8015 nC6-nC12 (3.43 to 10.42)	22222222	10039	0.000

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

6.629	913602	d8-Toluene
8.581	541162	4-Bromofluorobenzene
9.397	1524997	d4-Dichlorobenzene
7.705	1609917	d5-Chlorobenzene
9.717	737240	d4-1,2-Dichlorobenzene



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 17I0171-21 SDG: 17I0171
 Sampled: 09/13/17 17:03 Prepared: 09/20/17 12:51 File ID: V209201715G.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 09/20/17 15:08
 Batch: BFI0454 Sequence: SFI0241 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AI00052

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	1	100	U	13.6	100

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	4.88	97.7	80 - 120	
4-Bromofluorobenzene	5.0000	4.79	95.7	80 - 120	

Data File: \\target\share\chend\nt2.1\20170920g.b\209201715G.D

Date: 20-SEP-2017 15:08

Client ID:

Sample Info: 1710171-21

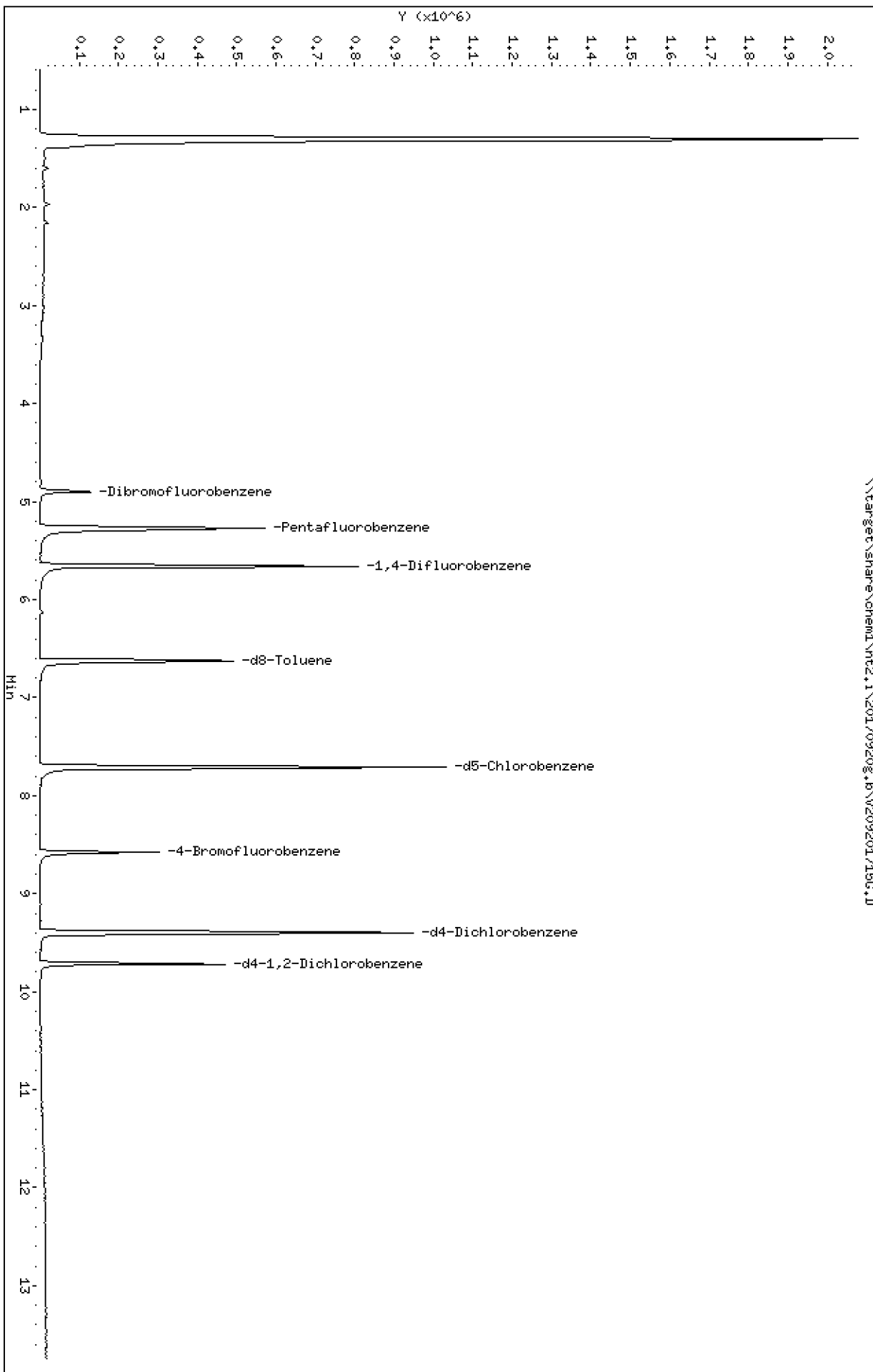
Column phase: RTXWMS

Instrument: nt2.1

Operator: PC

Column diameter: 0.18

\\target\share\chend\nt2.1\20170920g.b\209201715G.D



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20170920g.b/V209201715G.D
Method: \20170920g.b\GAS061217.m
Instrument: nt2.i
Gas Ical Date: 12-JUN-2017
Injection Date: 20-SEP-2017 15:08

ARI ID: 17I0171-21
Client ID:
Matrix: NONE
Dilution Factor: 1.000
Operator: PC

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	-----	-----	-----
WAGas Tol-C12 (6.56 to 10.42)	61968270	2	0.000
8015C 2MP-TMB (2.99 to 9.26)	22222222	3	0.000
AK101 nC6-nC10 (3.43 to 8.54)	81728088	3	0.000
NWTPHG Tol-Nap (6.56 to 11.21)	63840589	2	0.000
mod8015 nC6-nC12 (3.43 to 10.42)	22222222	3	0.000

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

6.632	898314	d8-Toluene
8.584	544609	4-Bromofluorobenzene
9.400	1554447	d4-Dichlorobenzene
7.708	1627486	d5-Chlorobenzene
9.720	749840	d4-1,2-Dichlorobenzene



TRIP BLANK

Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Water Laboratory ID: 17I0171-23 SDG: 17I0171
 Sampled: 09/13/17 00:00 Prepared: 09/20/17 12:51 File ID: V209201710G.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 09/20/17 13:27
 Batch: BFI0454 Sequence: SFI0241 Initial/Final: 10 mL / 10 ml
 Instrument: NT2 Column: RTX-VMS Calibration: AI00052

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	1	100	U	13.6	100

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	4.80	96.0	80 - 120	
4-Bromofluorobenzene	5.0000	4.89	97.8	80 - 120	

Data File: \\target\share\chend\nt2.1\20170920g.b\209201710g.D

Date: 20-SEP-2017 13:27

Client ID:

Sample Info: 1710171-23

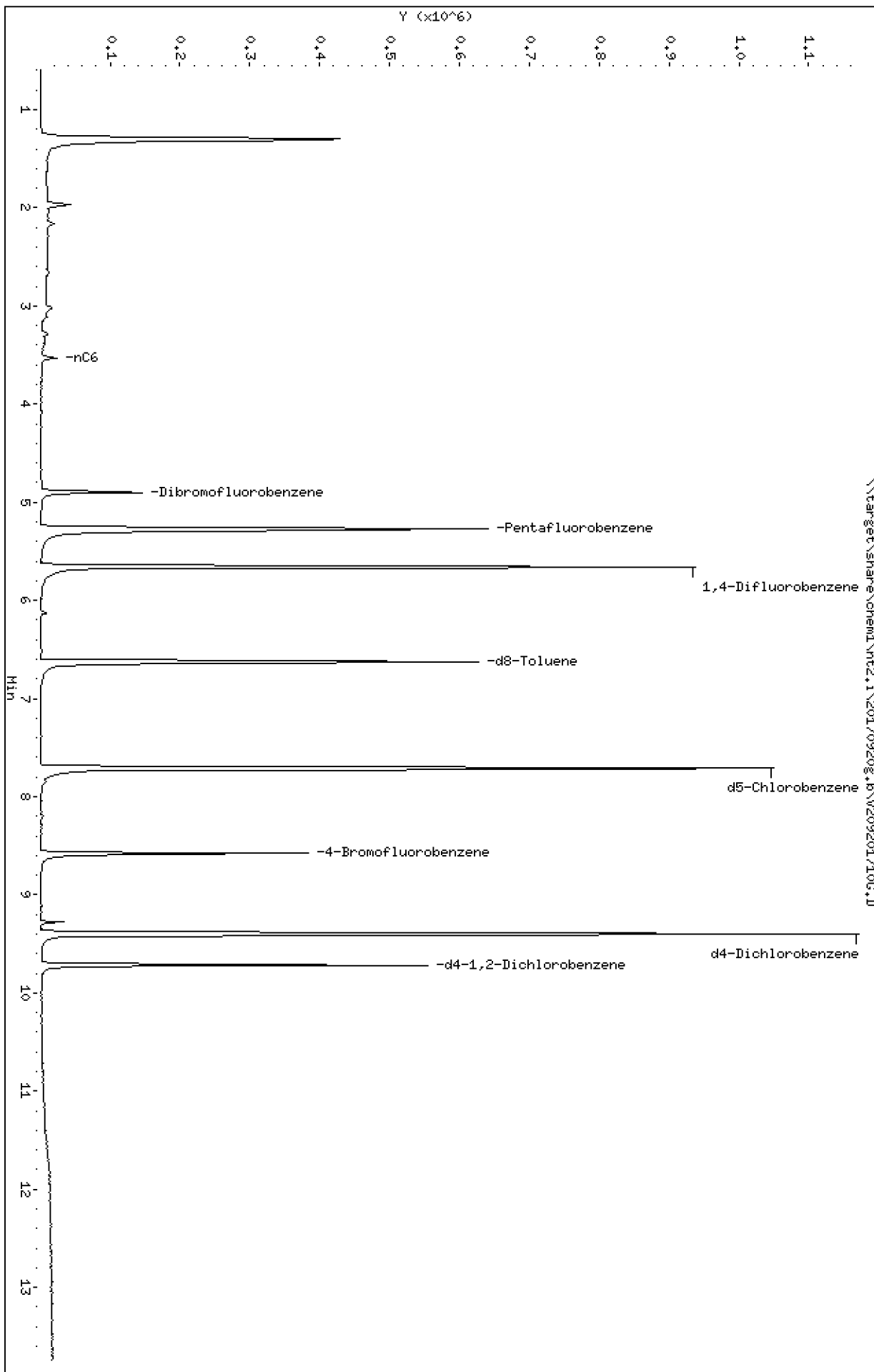
Column phase: RTXWMS

Instrument: nt2.1

Operator: PC

Column diameter: 0.18

Page 1



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20170920g.b/V209201710G.D
Method: \20170920g.b\GAS061217.m
Instrument: nt2.i
Gas Ical Date: 12-JUN-2017
Injection Date: 20-SEP-2017 13:27

ARI ID: 17I0171-23
Client ID:
Matrix: NONE
Dilution Factor: 1.000
Operator: PC

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	-----	-----	-----
WAGas Tol-C12 (6.56 to 10.42)	61968270	40471	0.001
8015C 2MP-TMB (2.99 to 9.26)	22222222	109969	0.005
AK101 nC6-nC10 (3.43 to 8.54)	81728088	54450	0.001
NWTPHG Tol-Nap (6.56 to 11.21)	63840589	40471	0.001
mod8015 nC6-nC12 (3.43 to 10.42)	22222222	94920	0.004

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

6.629	1000195	d8-Toluene
8.581	606783	4-Bromofluorobenzene
9.397	1694057	d4-Dichlorobenzene
7.705	1780889	d5-Chlorobenzene
9.717	799236	d4-1,2-Dichlorobenzene



PREPARATION BATCH SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFI0454 Batch Matrix: Water

Preparation: EPA 5030 (Purge and Trap)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-GW-109-14-19-170913	17I0171-15	V209201712G.D	09/20/17 12:51	
SVCA-GW-110-14-19-170913	17I0171-17	V209201713G.D	09/20/17 12:51	
SVCA-GW-111-14-19-170913	17I0171-19	V209201714G.D	09/20/17 12:51	
SVCA-GW-112-12.5-17.5-170913	17I0171-21	V209201715G.D	09/20/17 12:51	
TRIP BLANK	17I0171-23	V209201710G.D	09/20/17 12:51	
Blank	BFI0454-BLK1	V209201709G.D	09/20/17 10:51	
LCS	BFI0454-BS1	V209201703LCSG.D	09/20/17 10:51	
LCS Dup	BFI0454-BSD1	V209201704G.D	09/20/17 10:51	



PREPARATION BATCH SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc. SDG: 17I0171
Client: Anchor QEA, LLC Project: SCVA Area Z Remediation
Batch: BFI0456 Batch Matrix: Solid Preparation: EPA 5035 (Methanol Extraction)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-SB-111-14-16-170913	17I0171-05	V209201726G.D	09/20/17 13:03	
SVCA-SB-112-12.5-14.5-170913	17I0171-11	V209201727G.D	09/20/17 13:03	
Blank	BFI0456-BLK1	V209201709MBSG.D	09/20/17 10:03	
LCS	BFI0456-BS1	V209201703LCSSG.D	09/20/17 10:03	
LCS Dup	BFI0456-BSD1	V209201704LCSDSG.D	09/20/17 10:03	



Form I
METHOD BLANK DATA SHEET
NWTPHg

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>1710171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Water</u>	Laboratory ID:	<u>BFI0454-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>09/20/17 10:51</u>
Solids:		Preparation:	<u>EPA 5030 (Purge and Trap)</u>
Batch:	<u>BFI0454</u>	Sequence:	<u>SFI0241</u>
Instrument:	<u>NT2</u>	Column:	<u>RTX-VMS</u>
		File ID:	<u>V209201709G.D</u>
		Analyzed:	<u>09/20/17 13:05</u>
		Initial/Final:	<u>10 mL / 10 ml</u>
		Calibration:	<u>AI00052</u>

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	1	100	U	13.6	100
SURROGATES		ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
	Toluene-d8	5.0000	4.74	94.9	80 - 120	
	4-Bromofluorobenzene	5.0000	5.02	100	80 - 120	



Form I
METHOD BLANK DATA SHEET
NWTPHg

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>1710171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Solid</u>	Laboratory ID:	<u>BFI0456-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>09/20/17 10:03</u>
Solids:		Preparation:	<u>EPA 5035 (Methanol Extract)</u>
Batch:	<u>BFI0456</u>	Sequence:	<u>SFI0241</u>
Instrument:	<u>NT2</u>	Column:	<u>RTX-VMS</u>
		File ID:	<u>V209201709MBSG.D</u>
		Analyzed:	<u>09/20/17 13:05</u>
		Initial/Final:	<u>5 g / 5 mL</u>
		Calibration:	<u>AI00052</u>

CAS NO.	COMPOUND	DILUTION	CONC. (ug/kg wet)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	50	5000	U	2500	5000
SURROGATES		ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
	Toluene-d8	5.0000	4.74	94.9	80 - 120	
	4-Bromofluorobenzene	5.0000	5.02	100	78 - 123	



LCS / LCS DUPLICATE RECOVERY
NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Water

Analyzed: 09/20/17 10:57

Batch: BFI0454

Laboratory ID: BFI0454-BS1

Preparation: EPA 5030 (Purge and Trap)

Sequence Name: LCS

Initial/Final: 10 mL / 10 ml

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	Q	LCS % REC. #	QC LIMITS REC.
Gasoline Range Organics (Tol-Nap)	1000	1100		110	72 - 128

* Indicates values outside of QC limits

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	Q	LCSD % REC. #	% RPD #	QC LIMITS	
						RPD	REC.
Gasoline Range Organics (Tol-Nap)	1000	1130		113	2.32	30	72 - 128

* Indicates values outside of QC limits



LCS / LCS DUPLICATE RECOVERY
NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Analyzed: 09/20/17 10:57

Batch: BFI0456

Laboratory ID: BFI0456-BS1

Preparation: EPA 5035 (Methanol Extraction)

Sequence Name: LCS

Initial/Final: 5 g / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	Q	LCS % REC. #	QC LIMITS REC.
Gasoline Range Organics (Tol-Nap)	50000	55200		110	70 - 121

* Indicates values outside of QC limits

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	Q	LCSD % REC. #	% RPD #	QC LIMITS	
						RPD	REC.
Gasoline Range Organics (Tol-Nap)	50000	56500		113	2.32	30	70 - 121

* Indicates values outside of QC limits



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
NWTPHg**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Lab File ID:	<u>V217061204G.D</u>	Injection Date:	<u>06/12/17</u>
Instrument ID:	<u>NT2</u>	Injection Time:	<u>09:58</u>
Sequence:	<u>SFF0153</u>	Lab Sample ID:	<u>SFF0153-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	22.2	PASS
75	30 - 80% of 95	48.8	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.22	PASS
173	Less than 2% of 174	0	PASS
174	50 - 120% of 95	82.5	PASS
175	5 - 9% of 174	7.54	PASS
176	95 - 101% of 174	96.1	PASS
177	5 - 9% of 176	7.06	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Cal Standard	SFF0153-CAL9	V217061216G.D	06/12/2017	14:26
Cal Standard	SFF0153-CALA	V217061217G.D	06/12/2017	14:45
Cal Standard	SFF0153-CALB	V217061218G.D	06/12/2017	15:05
Cal Standard	SFF0153-CALC	V217061219G.D	06/12/2017	15:25
Cal Standard	SFF0153-CALD	V217061220G.D	06/12/2017	15:45
Cal Standard	SFF0153-CALE	V217061221G.D	06/12/2017	16:05
Secondary Cal Check	SFF0153-SCV1	V217061223G.D	06/12/2017	16:45



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
NWTPHg**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Lab File ID:	<u>V209151702G.D</u>	Injection Date:	<u>09/15/17</u>
Instrument ID:	<u>NT2</u>	Injection Time:	<u>09:35</u>
Sequence:	<u>SFI0189</u>	Lab Sample ID:	<u>SFI0189-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	19.1	PASS
75	30 - 80% of 95	49.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.79	PASS
173	Less than 2% of 174	0.443	PASS
174	50 - 120% of 95	69.6	PASS
175	5 - 9% of 174	7.29	PASS
176	95 - 101% of 174	97.1	PASS
177	5 - 9% of 176	6.64	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SFI0189-TUN1	V209151702G.D	09/15/2017	9:35
Initial Cal Check	SFI0189-ICV1	V209151714G.D	09/15/2017	14:32
Calibration Check	SFI0189-CCV1	V209151736G.D	09/15/2017	21:55



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
NWTPHg**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Lab File ID:	<u>V209201702G.D</u>	Injection Date:	<u>09/20/17</u>
Instrument ID:	<u>NT2</u>	Injection Time:	<u>10:15</u>
Sequence:	<u>SFI0241</u>	Lab Sample ID:	<u>SFI0241-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	17.8	PASS
75	30 - 80% of 95	46.9	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.84	PASS
173	Less than 2% of 174	0.321	PASS
174	50 - 120% of 95	72.1	PASS
175	5 - 9% of 174	7.08	PASS
176	95 - 101% of 174	97.1	PASS
177	5 - 9% of 176	6.33	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SFI0241-TUN1	V209201702G.D	09/20/2017	10:15
LCS	BF10456-BS1	V209201703LCSSG.D	09/20/2017	10:57
LCS	BF10454-BS1	V209201703LCSG.D	09/20/2017	10:57
Initial Cal Check	SFI0241-ICV1	V209201703G.D	09/20/2017	10:57
LCS Dup	BF10454-BSD1	V209201704G.D	09/20/2017	11:17
LCS Dup	BF10456-BSD1	V209201704LCSDSG.D	09/20/2017	11:17
Blank	BF10456-BLK1	V209201709MBSG.D	09/20/2017	13:05
Blank	BF10454-BLK1	V209201709G.D	09/20/2017	13:05
TRIP BLANK	17I0171-23	V209201710G.D	09/20/2017	13:27
VCA-GW-109-14-19-17091	17I0171-15	V209201712G.D	09/20/2017	14:07
VCA-GW-110-14-19-17091	17I0171-17	V209201713G.D	09/20/2017	14:28
VCA-GW-111-14-19-17091	17I0171-19	V209201714G.D	09/20/2017	14:48
CA-GW-112-12.5-17.5-17091	17I0171-21	V209201715G.D	09/20/2017	15:08
ZZZZZ	17I0185-02RE1	V209201724G.D	09/20/2017	18:13
ZZZZZ	17I0116-06RE1	V209201725G.D	09/20/2017	18:34
VCA-SB-111-14-16-17091	17I0171-05	V209201726G.D	09/20/2017	18:54
CA-SB-112-12.5-14.5-17091	17I0171-11	V209201727G.D	09/20/2017	19:14
Calibration Check	SFI0241-CCV1	V209201728G.D	09/20/2017	19:34



INITIAL CALIBRATION DATA NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AF00043	Instrument:	NT2
Calibration Date:	06/13/2017 10:45	Column (1):	RTX-VMS

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Gasoline Range Organics (Tol-Nap)	100	71249.69	250	67843.76			1000	64114.48	2500	59222.56	5000	56772.46



INITIAL CALIBRATION DATA

NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AF00043	Instrument:	NT2
Calibration Date:	06/13/2017 10:45	Column (1):	RTX-VMS

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Gasoline Range Organics (Tol-Nap)	63840.59	9.3			RSD (20)	
Toluene-d8	1.112403	3.7			RSD (20)	
4-Bromofluorobenzene	0.4310213	6.6			RSD (20)	



INITIAL CALIBRATION DATA
NWTPHg

Laboratory: Analytical Resources, Inc.	SDG: 17I0171
Client: Anchor QEA, LLC	Project: SCVA Area Z Remediation
Calibration: AI00052	Instrument: NT2
Calibration Date: 09/15/2017 14:07	Column (1): RTX-VMS

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Toluene-d8	5	1.145872	5	1.168241	5	1.186762	5	1.194053	5	1.206906	5	1.226348
4-Bromofluorobenzene	5	0.3237353	5	0.3304114	5	0.3515908	5	0.3522024	5	0.3628115	5	0.3633586



INITIAL CALIBRATION DATA
NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00052	Instrument:	NT2
Calibration Date:	09/15/2017 14:07	Column (1):	RTX-VMS

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Gasoline Range Organics (Tol-Nap)					100	71249.69	250	67843.76			1000	64114.48
Toluene-d8	5	1.228283	5	1.24493								
4-Bromofluorobenzene	5	0.3659569	5	0.3581294								



INITIAL CALIBRATION DATA
NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00052	Instrument:	NT2
Calibration Date:	09/15/2017 14:07	Column (1):	RTX-VMS

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
		RF		RF		RF		RF		RF		RF
Gasoline Range Organics (Tol-Nap)	2500	59222.56	5000	56772.46								



INITIAL CALIBRATION DATA

NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00052	Instrument:	NT2
Calibration Date:	09/15/2017 14:07	Column (1):	RTX-VMS

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Gasoline Range Organics (Tol-Nap)	63840.59	9.3			RSD (20)	
Toluene-d8	1.200174	2.8			RSD (20)	
4-Bromofluorobenzene	0.3510245	4.5			RSD (20)	



INITIAL CALIBRATION CHECK

NWTPHg

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>NT2</u>	Calibration: <u>AI00052</u>
Lab File ID: <u>V209151714G.D</u>	Calibration Date: <u>09/15/17 14:07</u>
Sequence: <u>SFI0189</u>	Injection Date: <u>09/15/17</u>
Lab Sample ID: <u>SFI0189-ICV1</u>	Injection Time: <u>14:32</u>
Sequence Name: <u>ICV</u>	

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Gasoline Range Organics (Tol-Nap)	A	1000.0	1090	63840.5900	69801.2800		9.3	20
Toluene-d8	A	5.0000	4.98	1.2001740	1.1955970		-0.4	
4-Bromofluorobenzene	A	5.0000	5.02	0.3510245	0.3522882		0.4	

* Values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPHg

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>NT2</u>	Calibration: <u>AI00052</u>
Lab File ID: <u>V209201703G.D</u>	Calibration Date: <u>09/15/17 14:07</u>
Sequence: <u>SFI0241</u>	Injection Date: <u>09/20/17</u>
Lab Sample ID: <u>SFI0241-ICV1</u>	Injection Time: <u>10:57</u>
Sequence Name: <u>ICV</u>	

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Gasoline Range Organics (Tol-Nap)	A	1000.0	1100	63840.5900	70479.6500		10.4	20
Toluene-d8	A	5.0000	4.69	1.2001740	1.1264190		-6.1	
4-Bromofluorobenzene	A	5.0000	5.19	0.3510245	0.3644238		3.8	

* Values outside of QC limits



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFF0153

Instrument: NT2

Calibration: AF00043

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Gas 0.1	SFF0153-CAL9	V217061216G.D	NA	06/12/17 14:26
Gas 0.25	SFF0153-CALA	V217061217G.D	NA	06/12/17 14:45
Gas 0.5	SFF0153-CALB	V217061218G.D	NA	06/12/17 15:05
Gas 1.0	SFF0153-CALC	V217061219G.D	NA	06/12/17 15:25
Gas 2.5	SFF0153-CALD	V217061220G.D	NA	06/12/17 15:45
Gas 5.0	SFF0153-CALE	V217061221G.D	NA	06/12/17 16:05
GAS SCV	SFF0153-SCV1	V217061223G.D	NA	06/12/17 16:45



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0189

Instrument: NT2

Calibration: AI00052

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SFI0189-TUN1	V209151702G.D	NA	09/15/17 09:35
ICV	SFI0189-ICV1	V209151714G.D	NA	09/15/17 14:32
CCV	SFI0189-CCV1	V209151736G.D	NA	09/15/17 21:55



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0241

Instrument: NT2

Calibration: AI00052

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
BFB	SFI0241-TUN1	V209201702G.D	NA	09/20/17 10:15
ICV	SFI0241-ICV1	V209201703G.D	NA	09/20/17 10:57
LCS	BFI0454-BS1	V209201703LCSG.D	Water	09/20/17 10:57
LCS	BFI0456-BS1	V209201703LCSSG.D	Solid	09/20/17 10:57
LCS Dup	BFI0454-BSD1	V209201704G.D	Water	09/20/17 11:17
LCS Dup	BFI0456-BSD1	V209201704LCSDSG.D	Solid	09/20/17 11:17
Blank	BFI0454-BLK1	V209201709G.D	Water	09/20/17 13:05
Blank	BFI0456-BLK1	V209201709MBSG.D	Solid	09/20/17 13:05
TRIP BLANK	17I0171-23	V209201710G.D	Water	09/20/17 13:27
SVCA-GW-109-14-19-170913	17I0171-15	V209201712G.D	Water	09/20/17 14:07
SVCA-GW-110-14-19-170913	17I0171-17	V209201713G.D	Water	09/20/17 14:28
SVCA-GW-111-14-19-170913	17I0171-19	V209201714G.D	Water	09/20/17 14:48
SVCA-GW-112-12.5-17.5-170913	17I0171-21	V209201715G.D	Water	09/20/17 15:08
ZZZZZ	17I0185-02RE1	V209201724G.D	Solid	09/20/17 18:13
ZZZZZ	17I0116-06RE1	V209201725G.D	Solid	09/20/17 18:34
SVCA-SB-111-14-16-170913	17I0171-05	V209201726G.D	Solid	09/20/17 18:54
SVCA-SB-112-12.5-14.5-170913	17I0171-11	V209201727G.D	Solid	09/20/17 19:14
CCV	SFI0241-CCV1	V209201728G.D	NA	09/20/17 19:34



SURROGATE RECOVERY SUMMARY

NWTPHg

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG/WO:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Sequence:	<u>SFI0189</u>	Instrument:	<u>NT2</u>
Calibration:	<u>AI00052</u>	Calibration Date:	<u>09/15/2017</u>

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
SFI0189-ICV1 (Water)				
Lab File ID: V209151714G.D		Analyzed: 09/15/17 14:32		
Toluene-d8	5.0000	99.6	0 - 200	
4-Bromofluorobenzene	5.0000	100	0 - 200	



SURROGATE RECOVERY SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc. SDG/WO: 17I0171
 Client: Anchor QEA, LLC Project: SCVA Area Z Remediation
 Sequence: SFI0241 Instrument: NT2
 Calibration: AI00052 Calibration Date: 09/15/2017

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
BFI0454-BS1 (Water) Lab File ID: V209201703LCSG.D Analyzed: 09/20/17 10:57				
Toluene-d8	5.0000	93.9	80 - 120	
4-Bromofluorobenzene	5.0000	104	80 - 120	
BFI0456-BS1 (Solid) Lab File ID: V209201703LCSSG.D Analyzed: 09/20/17 10:57				
Toluene-d8	5.0000	93.9	80 - 120	
4-Bromofluorobenzene	5.0000	104	78 - 123	
SFI0241-ICV1 (Water) Lab File ID: V209201703G.D Analyzed: 09/20/17 10:57				
Toluene-d8	5.0000	93.9	0 - 200	
4-Bromofluorobenzene	5.0000	104	0 - 200	
BFI0454-BSD1 (Water) Lab File ID: V209201704G.D Analyzed: 09/20/17 11:17				
Toluene-d8	5.0000	97.3	80 - 120	
4-Bromofluorobenzene	5.0000	103	80 - 120	
BFI0456-BSD1 (Solid) Lab File ID: V209201704LCSDSG.D Analyzed: 09/20/17 11:17				
Toluene-d8	5.0000	97.3	80 - 120	
4-Bromofluorobenzene	5.0000	103	78 - 123	
BFI0454-BLK1 (Water) Lab File ID: V209201709G.D Analyzed: 09/20/17 13:05				
Toluene-d8	5.0000	94.9	80 - 120	
4-Bromofluorobenzene	5.0000	100	80 - 120	
BFI0456-BLK1 (Solid) Lab File ID: V209201709MBSG.D Analyzed: 09/20/17 13:05				
Toluene-d8	5.0000	94.9	80 - 120	
4-Bromofluorobenzene	5.0000	100	78 - 123	
17I0171-23 (Water) Lab File ID: V209201710G.D Analyzed: 09/20/17 13:27				
Toluene-d8	5.0000	96.0	80 - 120	
4-Bromofluorobenzene	5.0000	97.8	80 - 120	
17I0171-15 (Water) Lab File ID: V209201712G.D Analyzed: 09/20/17 14:07				
Toluene-d8	5.0000	93.2	80 - 120	
4-Bromofluorobenzene	5.0000	95.5	80 - 120	
17I0171-17 (Water) Lab File ID: V209201713G.D Analyzed: 09/20/17 14:28				
Toluene-d8	5.0000	94.9	80 - 120	
4-Bromofluorobenzene	5.0000	93.4	80 - 120	



SURROGATE RECOVERY SUMMARY

NWTPHg

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG/WO:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Sequence:	<u>SFI0241</u>	Instrument:	<u>NT2</u>
Calibration:	<u>AI00052</u>	Calibration Date:	<u>09/15/2017</u>

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
17I0171-19 (Water) Lab File ID: V209201714G.D Analyzed: 09/20/17 14:48				
Toluene-d8	5.0000	95.7	80 - 120	
4-Bromofluorobenzene	5.0000	96.7	80 - 120	
17I0171-21 (Water) Lab File ID: V209201715G.D Analyzed: 09/20/17 15:08				
Toluene-d8	5.0000	97.7	80 - 120	
4-Bromofluorobenzene	5.0000	95.7	80 - 120	
17I0171-05 (Solid) Lab File ID: V209201726G.D Analyzed: 09/20/17 18:54				
Toluene-d8	5.0000	97.9	80 - 120	
4-Bromofluorobenzene	5.0000	108	78 - 123	
17I0171-11 (Solid) Lab File ID: V209201727G.D Analyzed: 09/20/17 19:14				
Toluene-d8	5.0000	99.4	80 - 120	
4-Bromofluorobenzene	5.0000	110	78 - 123	



INTERNAL STANDARD AREA AND RT SUMMARY
NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0189

Instrument: NT2

Calibration: AI00052

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Initial Cal Check (SFI0189-ICV1)		(Water)	Lab File ID: V209151714G.D			Analyzed: 09/15/17 14:32			
Pentafluorobenzene	337779	5.267	319541	5.267	106	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	555494	7.704	518892	7.705	107	50 - 200	0.0010	+/-0.50	
1,4-Difluorobenzene	613451	5.657	590046	5.658	104	50 - 200	0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	264394	9.396	268551	9.397	98	50 - 200	0.0010	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.
Client: Anchor OEA, LLC
Sequence: SFI0241

SDG: 17I0171
Project: SCVA Area Z Remediation
Instrument: NT2
Calibration: AI00052

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (BFI0454-BS1)		(Water)	Lab File ID: V209201703LCSG.D			Analyzed: 09/20/17 10:57			
Pentafluorobenzene	416627	5.267	319541	5.267	130	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	640282	7.705	518892	7.705	123	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	733061	5.658	590046	5.658	124	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	305952	9.397	268551	9.397	114	50 - 200	0.0000	+/-0.50	
LCS (BFI0456-BS1)		(Solid)	Lab File ID: V209201703LCSSG.D			Analyzed: 09/20/17 10:57			
Pentafluorobenzene	416627	5.267	319541	5.267	130	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	640282	7.705	518892	7.705	123	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	733061	5.658	590046	5.658	124	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	305952	9.397	268551	9.397	114	50 - 200	0.0000	+/-0.50	
Initial Cal Check (SFI0241-ICV1)		(Water)	Lab File ID: V209201703G.D			Analyzed: 09/20/17 10:57			
Pentafluorobenzene	416627	5.267	319541	5.267	130	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	640282	7.705	518892	7.705	123	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	733061	5.658	590046	5.658	124	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	305952	9.397	268551	9.397	114	50 - 200	0.0000	+/-0.50	
LCS Dup (BFI0454-BSD1)		(Water)	Lab File ID: V209201704G.D			Analyzed: 09/20/17 11:17			
Pentafluorobenzene	392573	5.267	319541	5.267	123	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	608122	7.705	518892	7.705	117	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	681723	5.658	590046	5.658	116	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	290725	9.397	268551	9.397	108	50 - 200	0.0000	+/-0.50	
LCS Dup (BFI0456-BSD1)		(Solid)	Lab File ID: V209201704LCSDSG.D			Analyzed: 09/20/17 11:17			
Pentafluorobenzene	392573	5.267	319541	5.267	123	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	608122	7.705	518892	7.705	117	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	681723	5.658	590046	5.658	116	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	290725	9.397	268551	9.397	108	50 - 200	0.0000	+/-0.50	
Blank (BFI0454-BLK1)		(Water)	Lab File ID: V209201709G.D			Analyzed: 09/20/17 13:05			
Pentafluorobenzene	345233	5.267	319541	5.267	108	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	534665	7.705	518892	7.705	103	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	612911	5.658	590046	5.658	104	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	255547	9.397	268551	9.397	95	50 - 200	0.0000	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.
Client: Anchor OEA, LLC
Sequence: SFI0241

SDG: 17I0171
Project: SCVA Area Z Remediation
Instrument: NT2
Calibration: AI00052

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Blank (BFI0456-BLK1)		(Solid)	Lab File ID: V209201709MBSG.D			Analyzed: 09/20/17 13:05			
Pentafluorobenzene	345233	5.267	319541	5.267	108	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	534665	7.705	518892	7.705	103	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	612911	5.658	590046	5.658	104	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	255547	9.397	268551	9.397	95	50 - 200	0.0000	+/-0.50	
TRIP BLANK (17I0171-23)		(Water)	Lab File ID: V209201710G.D			Analyzed: 09/20/17 13:27			
Pentafluorobenzene	369697	5.267	319541	5.267	116	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	577112	7.705	518892	7.705	111	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	658338	5.658	590046	5.658	112	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	272381	9.397	268551	9.397	101	50 - 200	0.0000	+/-0.50	
SVCA-GW-109-14-19-170913 (17I0171-15)		(Water)	Lab File ID: V209201712G.D			Analyzed: 09/20/17 14:07			
Pentafluorobenzene	339172	5.268	319541	5.267	106	50 - 200	-0.0010	+/-0.50	
Chlorobenzene-d5	539792	7.705	518892	7.705	104	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	617134	5.658	590046	5.658	105	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	248962	9.397	268551	9.397	93	50 - 200	0.0000	+/-0.50	
SVCA-GW-110-14-19-170913 (17I0171-17)		(Water)	Lab File ID: V209201713G.D			Analyzed: 09/20/17 14:28			
Pentafluorobenzene	331710	5.267	319541	5.267	104	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	527200	7.716	518892	7.705	102	50 - 200	-0.0110	+/-0.50	
1,4-Difluorobenzene	589173	5.657	590046	5.658	100	50 - 200	0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	246499	9.396	268551	9.397	92	50 - 200	0.0010	+/-0.50	
SVCA-GW-111-14-19-170913 (17I0171-19)		(Water)	Lab File ID: V209201714G.D			Analyzed: 09/20/17 14:48			
Pentafluorobenzene	331223	5.267	319541	5.267	104	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	516876	7.717	518892	7.705	100	50 - 200	-0.0120	+/-0.50	
1,4-Difluorobenzene	591191	5.658	590046	5.658	100	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	244756	9.397	268551	9.397	91	50 - 200	0.0000	+/-0.50	
SVCA-GW-112-12.5-17.5-170913 (17I0171-21)		(Water)	Lab File ID: V209201715G.D			Analyzed: 09/20/17 15:08			
Pentafluorobenzene	328464	5.27	319541	5.267	103	50 - 200	-0.0030	+/-0.50	
Chlorobenzene-d5	532216	7.708	518892	7.705	103	50 - 200	-0.0030	+/-0.50	
1,4-Difluorobenzene	589362	5.661	590046	5.658	100	50 - 200	-0.0030	+/-0.50	
1,4-Dichlorobenzene-d4	250884	9.4	268551	9.397	93	50 - 200	-0.0030	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY
NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0241

Instrument: NT2

Calibration: AI00052

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
SVCA-SB-111-14-16-170913 (17I0171-05)		(Solid)	Lab File ID: V209201726G.D			Analyzed: 09/20/17 18:54			
Pentafluorobenzene	370164	5.259	319541	5.267	116	50 - 200	0.0080	+/-0.50	
Chlorobenzene-d5	609865	7.708	518892	7.705	118	50 - 200	-0.0030	+/-0.50	
1,4-Difluorobenzene	650028	5.65	590046	5.658	110	50 - 200	0.0080	+/-0.50	
1,4-Dichlorobenzene-d4	290739	9.401	268551	9.397	108	50 - 200	-0.0040	+/-0.50	
SVCA-SB-112-12.5-14.5-170913 (17I0171-11)		(Solid)	Lab File ID: V209201727G.D			Analyzed: 09/20/17 19:14			
Pentafluorobenzene	333160	5.267	319541	5.267	104	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	566538	7.705	518892	7.705	109	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	595422	5.658	590046	5.658	101	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	288455	9.397	268551	9.397	107	50 - 200	0.0000	+/-0.50	



HOLDING TIME SUMMARY

Analysis: NWTPhg

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
SVCA-SB-111-14-16-170913 17I0171-05	09/13/17 14:30	09/14/17 08:58	09/20/17 13:03	6	14	09/20/17 18:54	7	14	
SVCA-SB-112-12.5-14.5-170913 17I0171-11	09/13/17 16:10	09/14/17 08:58	09/20/17 13:03	6	14	09/20/17 19:14	7	14	
SVCA-GW-109-14-19-170913 17I0171-15	09/13/17 11:10	09/14/17 08:58	09/20/17 12:51	7	14	09/20/17 14:07	7	14	
SVCA-GW-110-14-19-170913 17I0171-17	09/13/17 12:57	09/14/17 08:58	09/20/17 12:51	6	14	09/20/17 14:28	7	14	
SVCA-GW-111-14-19-170913 17I0171-19	09/13/17 15:45	09/14/17 08:58	09/20/17 12:51	6	14	09/20/17 14:48	7	14	
SVCA-GW-112-12.5-17.5-170913 17I0171-21	09/13/17 17:03	09/14/17 08:58	09/20/17 12:51	6	14	09/20/17 15:08	7	14	
TRIP BLANK 17I0171-23	09/13/17 00:00	09/14/17 08:58	09/20/17 12:51	7	14	09/20/17 13:27	8	14	

* Indicates hold time exceedance.



METHOD DETECTION AND REPORTING LIMITS

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 1710171

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Instrument: NT2

Analyte	MDL	RL	Units
Gasoline Range Organics (Tol-Nap)	2500	5000	ug/kg



METHOD DETECTION AND REPORTING LIMITS

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 1710171

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Water

Instrument: NT2

Analyte	MDL	RL	Units
Gasoline Range Organics (Tol-Nap)	13.6	100	ug/L



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 1710171-05 SDG: 1710171
 Sampled: 09/13/17 14:30 Prepared: 09/18/17 13:50 File ID: 17092630.D
 % Solids: 89.53 Preparation: EPA 3546 (Microwave) Analyzed: 09/26/17 21:02
 Batch: BFI0365 Sequence: SFI0326 Initial/Final: 10.03 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00084
 Cleanups: Silica Gel, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	5.57	U	2.61	5.57
	Motor Oil Range Organics (C24-C38)	1	11.1	U	3.33	11.1

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	25.056	19.2	76.4	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170926.b\17092630.D

Date: 26-SEP-2017 21:02

Client ID:

Sample Info: 1710171-05

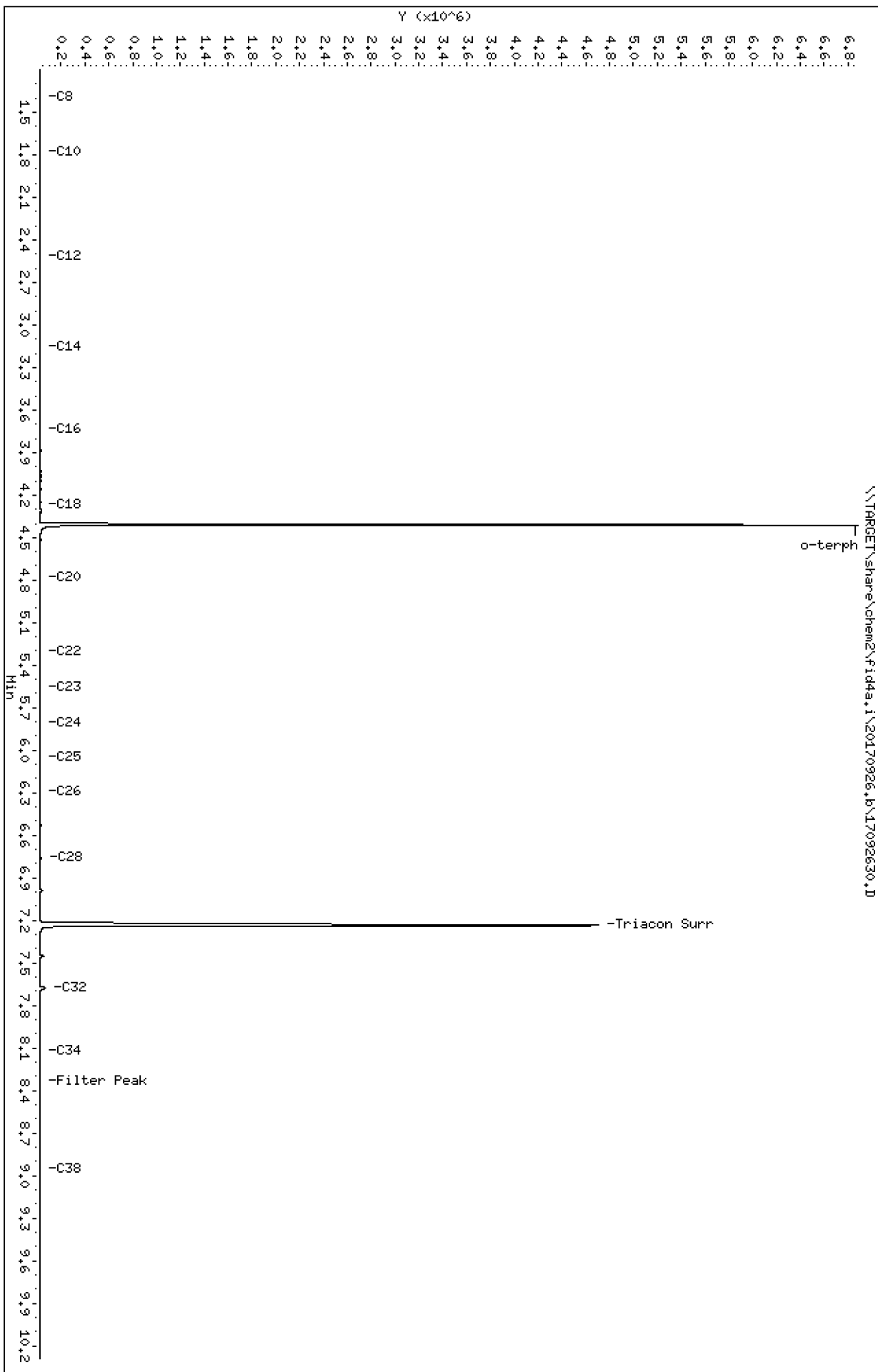
Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25

Page 1



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170926.b/17092630.D
Method: 20170926.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/27/2017
Macro: 26-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:18-SEP-2017 M.Oil:18-SEP-2017

ARI ID: 17I0171-05
Client ID:
Injection: 26-SEP-2017 21:02
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.284	-0.011	1332	1203	WATPHG	(Tol-C12)	23590	15.7
C8	1.392	0.002	4683	2915	WATPHD	(C12-C24)	251838	14.2
C10	1.779	0.002	4167	1999	WATPHM	(C24-C38)	208498	11.9
C12	2.512	0.003	1648	1318	AK102	(C10-C25)	266812	12.5
C14	3.161	0.001	2811	4068				
C16	3.742	0.000	3950	4441				
C18	4.269	-0.000	5292	5574				
C20	4.786	0.000	4241	6423				
C22	5.302	0.000	2795	3672				
C24	5.808	0.000	3359	4277				
C25	6.053	0.000	4579	5166				
C26	6.292	0.001	4287	6278				
C28	6.760	-0.000	7158	8595				
C32	7.676	-0.000	44657	50448				
C34	8.117	0.000	2584	3808				
Filter Peak	8.331	-0.007	3928	8707	BUNKERC	(C10-C38)	473413	71.8
C36	----							
C38	8.956	-0.014	2979	2329				
C40	----							
o-terph	4.412	-0.003	6861089	4334736				
Triacon Surr	7.236	-0.003	4689488	4284959	NAS DIES	(C10-C24)	264915	12.5

Range Times: NW Diesel(2.510 - 5.808) AK102(1.78 - 6.05) Jet A(1.78 - 4.27)
NW M.Oil(5.81 - 8.97) AK103(6.05 - 8.54) OR Diesel(1.78 - 6.76)

Surrogate	Area	Amount
o-Terphenyl	4334736	172.0
Triacontane	4284959	165.6

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25203.0	18-SEP-2017
Triacon Surr	25873.7	18-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	17783.0	18-SEP-2017
Motor Oil	17571.0	18-SEP-2017
AK102	21299.0	18-SEP-2017
NAS Diesel	21261.0	18-SEP-2017
Bunker C	6591.0	26-SEP-2017



Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 1710171-06 SDG: 1710171
 Sampled: 09/13/17 14:30 Prepared: 09/19/17 10:20 File ID: 17092019.D
 % Solids: 89.53 Preparation: EPA 3546 (Microwave) Analyzed: 09/20/17 16:35
 Batch: BFI0364 Sequence: SFI0211 Initial/Final: 10.19 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00051

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	5.48	U	2.56	5.48
	Motor Oil Range Organics (C24-C38)	1	11.0	U	3.28	11.0

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	24.663	17.7	72.0	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170920.8\17092019.D

Date: 20-SEP-2017 16:35

Client ID:

Sample Info: 1710171-06

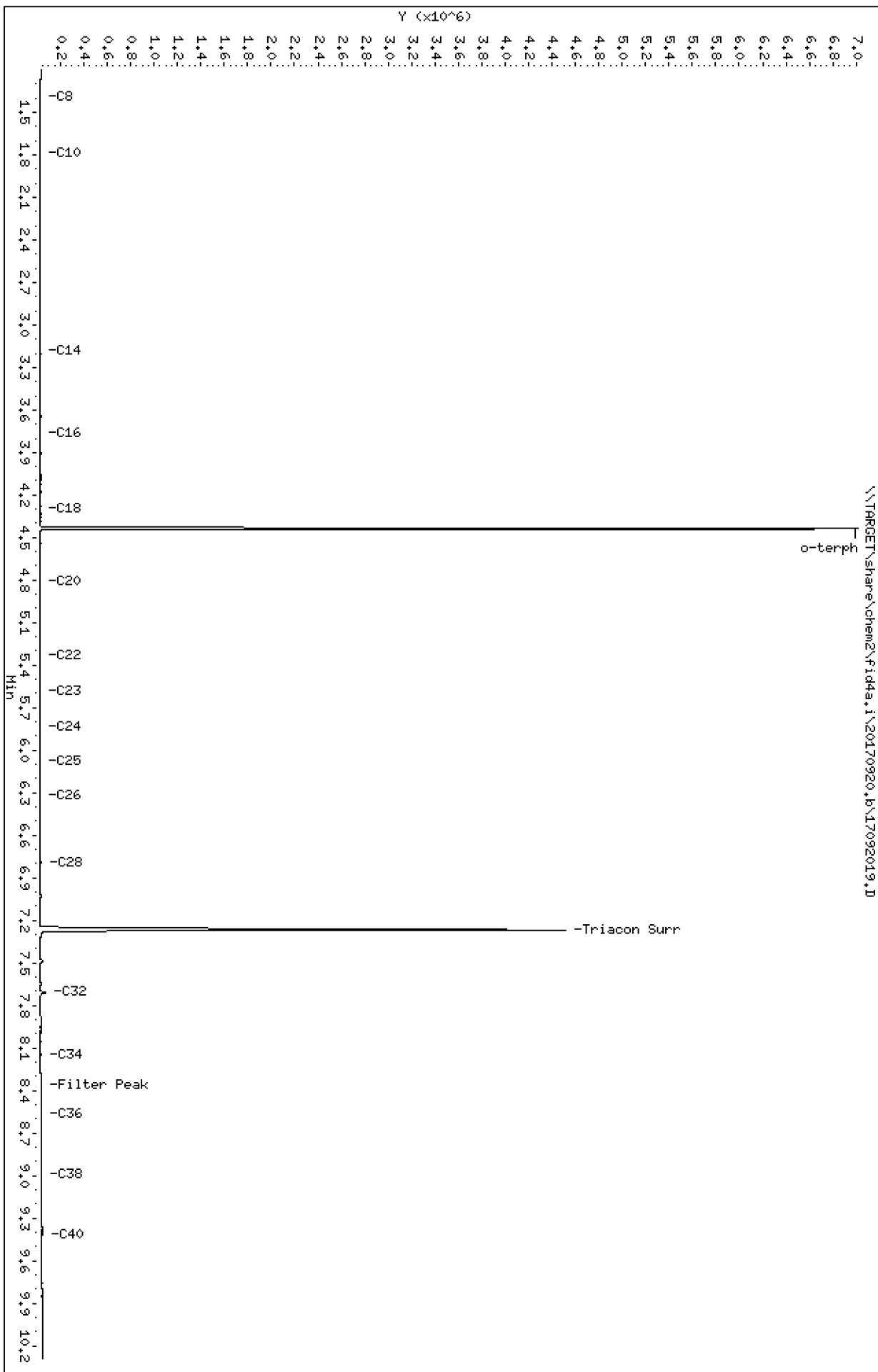
Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25

Page 1



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170920.b/17092019.D
Method: 20170920.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/21/2017
Macro: 18-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:18-SEP-2017 M.Oil:18-SEP-2017

ARI ID: 17I0171-06
Client ID:
Injection: 20-SEP-2017 16:35
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.234	-0.028	7154	6832	WATPHG	(Tol-C12)	35493	23.7
C8	1.399	-0.003	4178	7109	WATPHD	(C12-C24)	236218	13.3
C10	1.792	-0.002	2158	2030	WATPHM	(C24-C38)	571278	32.5
C12	----				AK102	(C10-C25)	247021	11.6
C14	3.182	0.001	2097	1772				
C16	3.765	0.002	2205	2232	OR.DIES	(C10-C28)	306729	14.3
C18	4.295	0.001	3160	3645				
C20	4.812	0.002	3425	4383				
C22	5.330	0.002	2742	2889				
C24	5.839	0.003	2853	3322				
C25	6.084	0.003	4038	3911				
C26	6.325	0.005	3910	4770				
C28	6.792	0.002	6278	8374				
C32	7.710	0.002	47978	55542				
C34	8.148	0.002	6222	9989				
Filter Peak	8.365	0.004	7146	16236				
C36	8.569	-0.005	6985	5747				
C38	8.990	-0.010	9014	9276				
C40	9.416	-0.010	18021	36290				
o-terph	4.438	-0.002	6990017	4079123				
Triacon Surr	7.268	-0.001	4492258	3982086	NAS DIES	(C10-C24)	244967	11.5

Range Times: NW Diesel(2.530 - 5.836) AK102(1.79 - 6.08) Jet A(1.79 - 4.29)
NW M.Oil(5.84 - 9.00) AK103(6.08 - 8.57) OR Diesel(1.79 - 6.79)

Surrogate	Area	Amount
o-Terphenyl	4079123	161.9
Triacontane	3982086	153.9

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25203.0	18-SEP-2017
Triacon Surr	25873.7	18-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	17783.0	18-SEP-2017
Motor Oil	17571.0	18-SEP-2017
AK102	21299.0	18-SEP-2017
OR Diesel	21383.0	18-SEP-2017
NAS Diesel	21261.0	18-SEP-2017



Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 1710171-11 SDG: 1710171
 Sampled: 09/13/17 16:10 Prepared: 09/18/17 13:50 File ID: 17092631.D
 % Solids: 89.96 Preparation: EPA 3546 (Microwave) Analyzed: 09/26/17 21:23
 Batch: BFI0365 Sequence: SFI0326 Initial/Final: 10.11 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00084
 Cleanups: Silica Gel, Sulfuric Acid

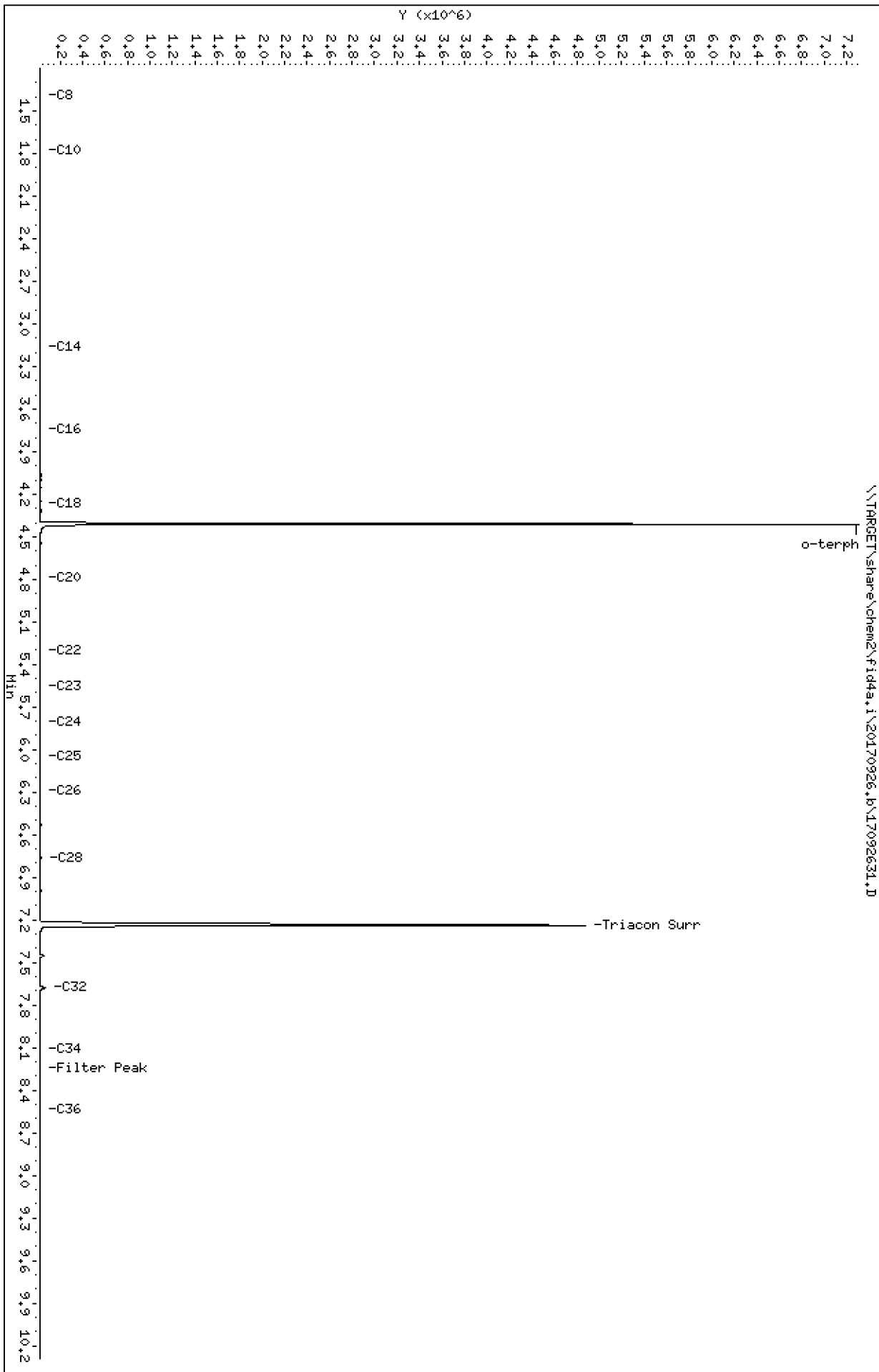
CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	5.50	U	2.57	5.50
	Motor Oil Range Organics (C24-C38)	1	11.0	U	3.29	11.0

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	24.739	19.5	79.0	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170926.b\17092631.D
Date: 26-SEP-2017 21:23
Client ID:
Sample Info: 1710171-11

Column phase: RTX-1

Instrument: fid4a.1
Operator: ML
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170926.b/17092631.D
Method: 20170926.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/27/2017
Macro: 26-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:18-SEP-2017 M.Oil:18-SEP-2017

ARI ID: 17I0171-11
Client ID:
Injection: 26-SEP-2017 21:23
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.285	-0.011	1196	1181	WATPHG	(Tol-C12)	20731	13.8
C8	1.392	0.003	2118	2130	WATPHD	(C12-C24)	153257	8.6
C10	1.780	0.003	2004	1237	WATPHM	(C24-C38)	173270	9.9
C12	----				AK102	(C10-C25)	160377	7.5
C14	3.162	0.002	1788	1847				
C16	3.743	0.002	2264	2105				
C18	4.270	0.000	3151	2826				
C20	4.787	0.002	2265	2334				
C22	5.304	0.002	1443	1909				
C24	5.810	0.002	1990	2346				
C25	6.055	0.002	3492	3680				
C26	6.294	0.003	2673	3359				
C28	6.762	0.002	6354	7646				
C32	7.677	0.001	48563	52789				
C34	8.117	-0.001	1857	1926				
Filter Peak	8.243	-0.095	1613	1138	BUNKERC	(C10-C38)	333647	50.6
C36	8.541	-0.001	1879	2477				
C38	----							
C40	----							
o-terph	4.413	-0.002	7288290	4477425				
Triacon Surr	7.238	-0.001	4851673	4674505	NAS DIES	(C10-C24)	160377	7.5

Range Times: NW Diesel(2.510 - 5.808) AK102(1.78 - 6.05) Jet A(1.78 - 4.27)
NW M.Oil(5.81 - 8.97) AK103(6.05 - 8.54) OR Diesel(1.78 - 6.76)

Surrogate	Area	Amount
o-Terphenyl	4477425	177.7
Triacontane	4674505	180.7

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25203.0	18-SEP-2017
Triacon Surr	25873.7	18-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	17783.0	18-SEP-2017
Motor Oil	17571.0	18-SEP-2017
AK102	21299.0	18-SEP-2017
NAS Diesel	21261.0	18-SEP-2017
Bunker C	6591.0	26-SEP-2017



Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: SO Laboratory ID: 1710171-12 SDG: 1710171
 Sampled: 09/13/17 16:10 Prepared: 09/19/17 10:20 File ID: 17092015.D
 % Solids: 89.96 Preparation: EPA 3546 (Microwave) Analyzed: 09/20/17 14:55
 Batch: BFI0364 Sequence: SFI0211 Initial/Final: 10.08 g Wet / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00051

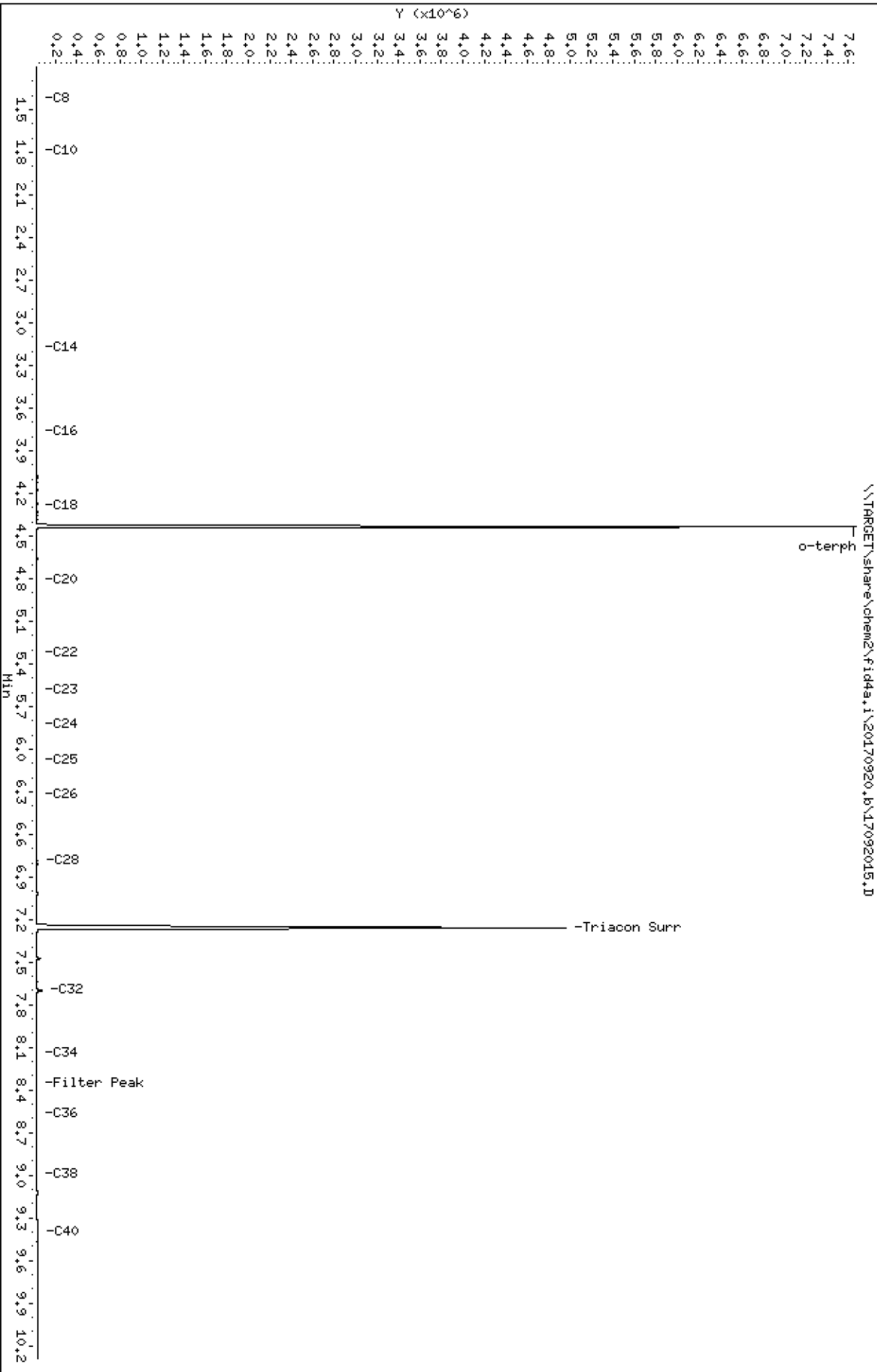
CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg dry)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	5.51	U	2.58	5.51
	Motor Oil Range Organics (C24-C38)	1	11.0	U	3.30	11.0

SURROGATES	ADDED (mg/kg dry)	CONC (mg/kg dry)	% REC	QC LIMITS	Q
o-Terphenyl	24.813	20.7	83.6	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170920.8\17092015.D
Date: 20-SEP-2017 14:55
Client ID:
Sample Info: 1710171-12

Column Phase: RTX-1

Instrument: fid4a.1
Operator: ML
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170920.b/17092015.D
Method: 20170920.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/21/2017
Macro: 18-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:18-SEP-2017 M.Oil:18-SEP-2017

ARI ID: 17I0171-12
Client ID:
Injection: 20-SEP-2017 14:55
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.250	-0.012	1341	1039	WATPHG	(Tol-C12)	7017	4.7
C8	1.419	0.016	1192	1385	WATPHD	(C12-C24)	166573	9.4
C10	1.793	-0.001	1119	831	WATPHM	(C24-C38)	352662	20.1
C12	----				AK102	(C10-C25)	169650	8.0
C14	3.179	-0.002	1154	999				
C16	3.762	-0.002	1217	763	OR.DIES	(C10-C28)	217607	10.2
C18	4.290	-0.004	2401	1905				
C20	4.808	-0.003	2623	4030				
C22	5.326	-0.003	2209	3310				
C24	5.831	-0.004	2531	3157				
C25	6.075	-0.005	3661	3626				
C26	6.316	-0.004	3683	4887				
C28	6.784	-0.006	6661	8540				
C32	7.699	-0.008	56694	58872				
C34	8.140	-0.006	4513	8332				
Filter Peak	8.355	-0.006	4277	7096				
C36	8.562	-0.012	5633	11961				
C38	8.993	-0.008	5723	4503				
C40	9.395	-0.031	7851	19349				
o-terph	4.436	-0.004	7647842	4739441				
Triacon Surr	7.260	-0.009	4941940	4634687	NAS DIES	(C10-C24)	169650	8.0

Range Times: NW Diesel(2.530 - 5.836) AK102(1.79 - 6.08) Jet A(1.79 - 4.29)
NW M.Oil(5.84 - 9.00) AK103(6.08 - 8.57) OR Diesel(1.79 - 6.79)

Surrogate	Area	Amount
o-Terphenyl	4739441	188.1
Triacontane	4634687	179.1

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25203.0	18-SEP-2017
Triacon Surr	25873.7	18-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	17783.0	18-SEP-2017
Motor Oil	17571.0	18-SEP-2017
AK102	21299.0	18-SEP-2017
OR Diesel	21383.0	18-SEP-2017
NAS Diesel	21261.0	18-SEP-2017



Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Ground Water

Laboratory ID: 1710171-15

SDG: 1710171

Sampled: 09/13/17 11:10

Prepared: 09/18/17 15:27

File ID: 17092043.D

% Solids:

Preparation: EPA 3510C SepF

Analyzed: 09/21/17 01:32

Batch: BFI0366

Sequence: SFI0211

Initial/Final: 500 mL / 1 mL

Instrument: FID4

Column: RTX-1

Calibration: AI00051

Cleanups: Silica Gel, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200

SURROGATES	ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl	0.45000	0.386	85.9	50 - 150	

Data File: \\TARGET\share\chem2\Fid4a.1\20170920.B\17092043.D

Date: 21-SEP-2017 01:32

Client ID:

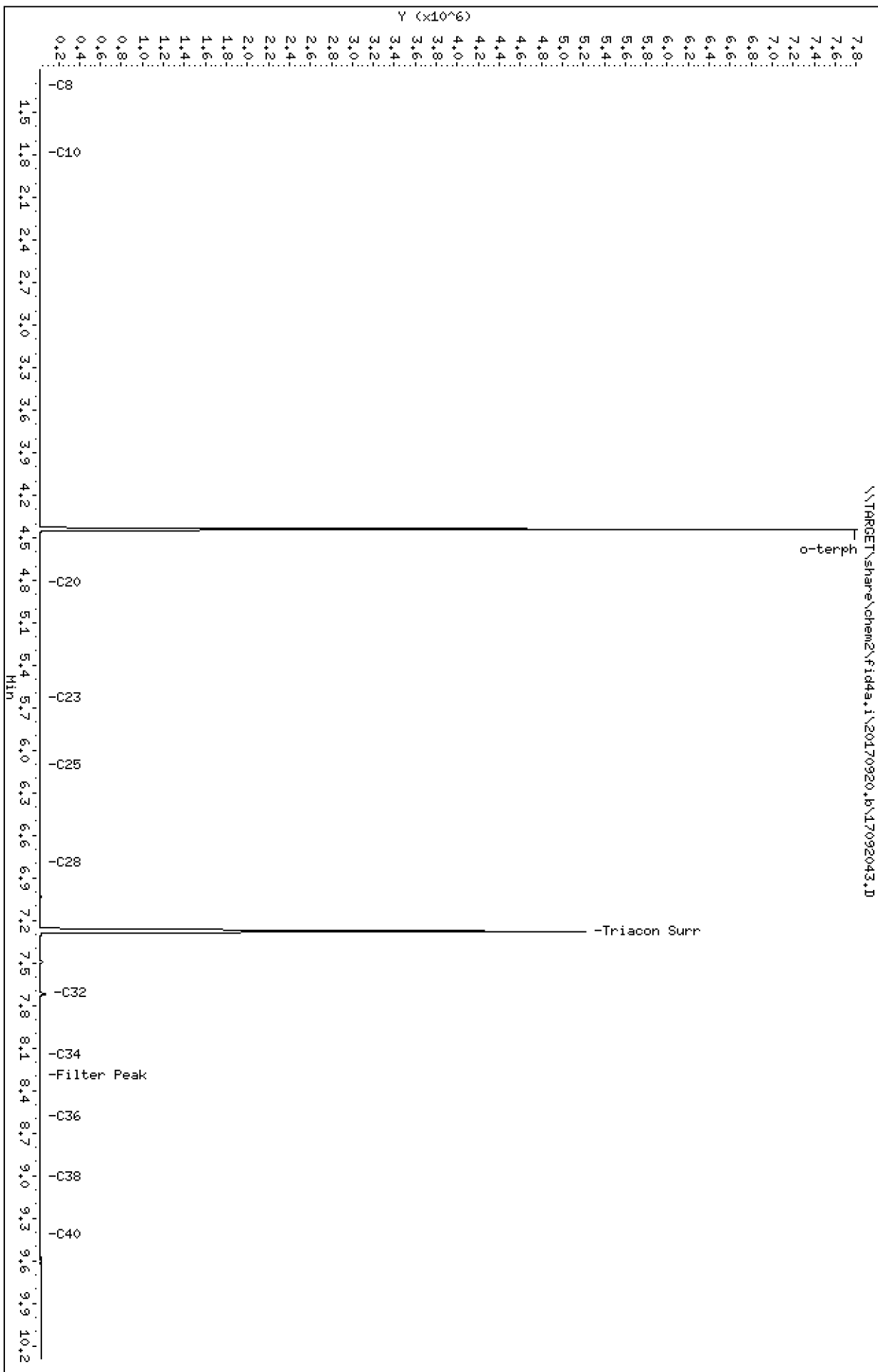
Sample Info: 1710171-15

Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170920.b/17092043.D
Method: 20170920.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/21/2017
Macro: 18-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:18-SEP-2017 M.Oil:18-SEP-2017

ARI ID: 17I0171-15
Client ID:
Injection: 21-SEP-2017 01:32
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.239	-0.023	1541	1629	WATPHG	(Tol-C12)	9364	6.2
C8	1.318	-0.084	1239	758	WATPHD	(C12-C24)	7083	0.4
C10	1.796	0.002	732	894	WATPHM	(C24-C38)	168197	9.6
C12	----					AK102 (C10-C25)	8849	0.4
C14	----							
C16	----							
C18	----					OR.DIES (C10-C28)	17119	0.8
C20	4.818	0.008	699	899				
C22	----							
C24	----							
C25	6.110	0.029	1141	1120				
C26	----							
C28	6.799	0.009	4151	4303				
C32	7.718	0.011	58221	57515				
C34	8.148	0.002	2614	2165				
Filter Peak	8.293	-0.068	2806	2022				
C36	8.584	0.010	3525	5266				
C38	9.012	0.011	4519	7105				
C40	9.422	-0.005	6201	13988				
o-terph	4.444	0.004	7787419	4869286				
Triacon Surr	7.280	0.011	5199898	4977793	NAS DIES	(C10-C24)	8849	0.4

Range Times: NW Diesel(2.530 - 5.836) AK102(1.79 - 6.08) Jet A(1.79 - 4.29)
NW M.Oil(5.84 - 9.00) AK103(6.08 - 8.57) OR Diesel(1.79 - 6.79)

Surrogate	Area	Amount
o-Terphenyl	4869286	193.2
Triacontane	4977793	192.4

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25203.0	18-SEP-2017
Triacon Surr	25873.7	18-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	17783.0	18-SEP-2017
Motor Oil	17571.0	18-SEP-2017
AK102	21299.0	18-SEP-2017
OR Diesel	21383.0	18-SEP-2017
NAS Diesel	21261.0	18-SEP-2017



Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 17I0171-16 SDG: 17I0171
 Sampled: 09/13/17 11:10 Prepared: 09/18/17 12:07 File ID: 17092122.D
 % Solids: Preparation: EPA 3510C SepF Analyzed: 09/21/17 18:20
 Batch: BFI0345 Sequence: SFI0239 Initial/Final: 430 mL / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00051

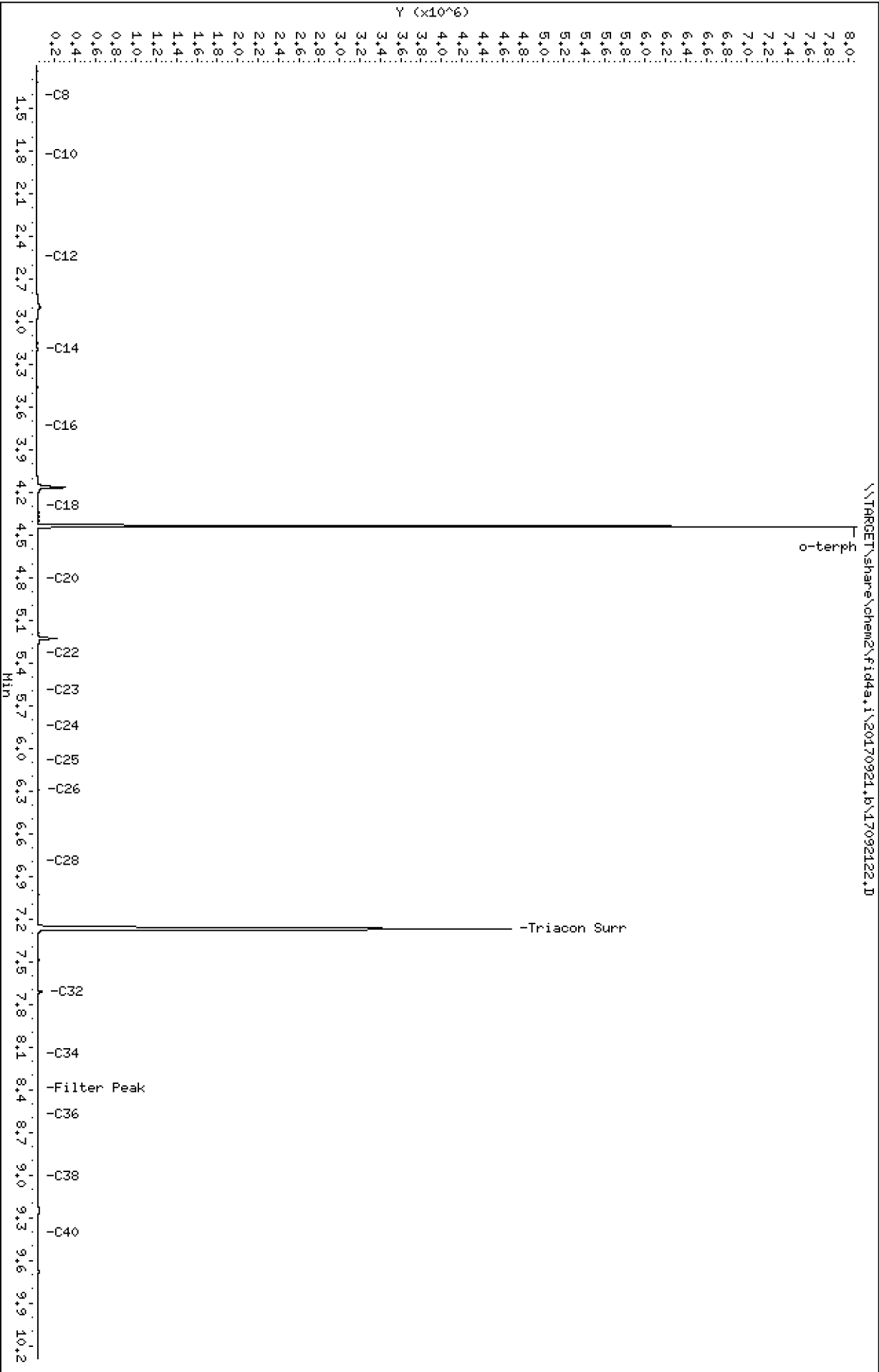
CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.225		0.038	0.116
	Motor Oil Range Organics (C24-C38)	1	0.233	U	0.065	0.233

SURROGATES	ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl	0.52326	0.475	90.8	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170921.b\17092122.D
Date: 21-SEP-2017 18:20
Client ID:
Sample Info: 1710171-16

Column phase: RTX-1

Instrument: fid4a.1
Operator: ML
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170921.b/17092122.D
Method: 20170921.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/22/2017
Macro: 18-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:18-SEP-2017 M.Oil:18-SEP-2017

ARI ID: 17I0171-16
Client ID:
Injection: 21-SEP-2017 18:20
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.237	-0.024	10157	6830	WATPHG	(Tol-C12)	48821	32.5
C8	1.411	0.009	3668	2912	WATPHD	(C12-C24)	1723040	96.9
C10	1.831	0.037	1201	796	WATPHM	(C24-C38)	1329231	75.6
C12	2.547	0.018	1284	1394	AK102	(C10-C25)	1803108	84.7
C14	3.197	0.015	8953	18099				
C16	3.739	-0.025	2931	3700	OR.DIES	(C10-C28)	2190159	102.4
C18	4.296	0.002	10990	15996				
C20	4.813	0.003	7553	12812				
C22	5.332	0.004	15536	38267				
C24	5.845	0.009	12526	8666				
C25	6.085	0.004	12730	7576				
C26	6.291	-0.029	23275	74237				
C28	6.794	0.004	15730	23836				
C32	7.711	0.004	57823	92889				
C34	8.151	0.004	12389	18737				
Filter Peak	8.390	0.029	12403	17892				
C36	8.576	0.002	15063	51733				
C38	9.007	0.007	14016	15249				
C40	9.412	-0.015	18699	56406				
o-terph	4.442	0.003	8055488	5152511				
Triacon Surr	7.271	0.002	4660160	4331479	NAS DIES	(C10-C24)	1744884	82.1

Range Times: NW Diesel(2.530 - 5.836) AK102(1.79 - 6.08) Jet A(1.79 - 4.29)
NW M.Oil(5.84 - 9.00) AK103(6.08 - 8.57) OR Diesel(1.79 - 6.79)

Surrogate	Area	Amount
o-Terphenyl	5152511	204.4
Triacontane	4331479	167.4

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25203.0	18-SEP-2017
Triacon Surr	25873.7	18-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	17783.0	18-SEP-2017
Motor Oil	17571.0	18-SEP-2017
AK102	21299.0	18-SEP-2017
OR Diesel	21383.0	18-SEP-2017
NAS Diesel	21261.0	18-SEP-2017



Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Ground Water

Laboratory ID: 1710171-17

SDG: 1710171

Sampled: 09/13/17 12:57

Prepared: 09/18/17 15:27

File ID: 17092044.D

% Solids:

Preparation: EPA 3510C SepF

Analyzed: 09/21/17 01:56

Batch: BFI0366

Sequence: SFI0211

Initial/Final: 500 mL / 1 mL

Instrument: FID4

Column: RTX-1

Calibration: AI00051

Cleanups: Silica Gel, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200

SURROGATES	ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl	0.45000	0.424	94.2	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170920.8\17092044.D

Date: 21-SEP-2017 01:56

Client ID:

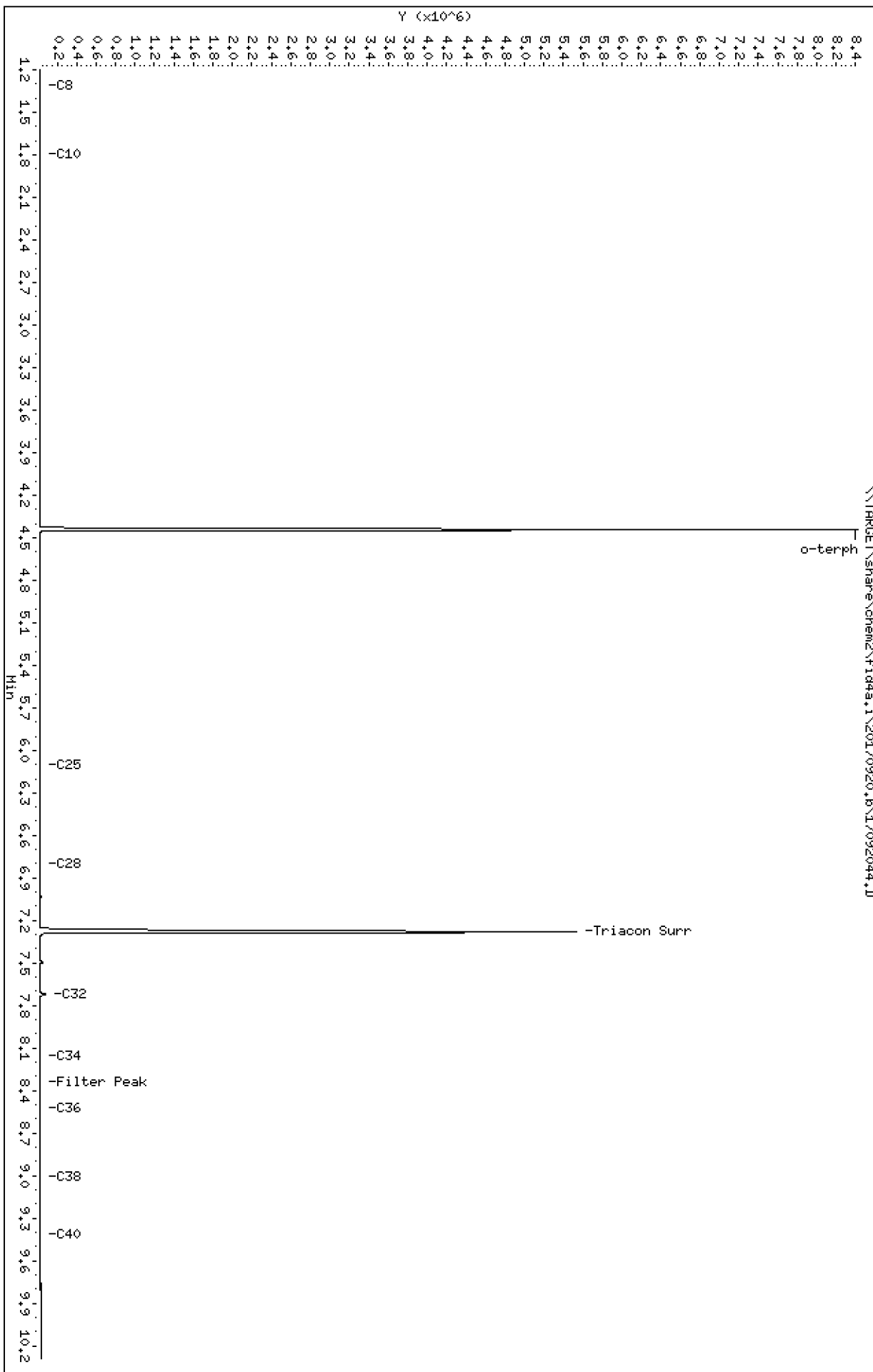
Sample Info: 1710171-17

Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170920.b/17092044.D
Method: 20170920.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/21/2017
Macro: 18-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:18-SEP-2017 M.Oil:18-SEP-2017

ARI ID: 17I0171-17
Client ID:
Injection: 21-SEP-2017 01:56
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.239	-0.023	2609	3356	WATPHG	(Tol-C12)	21791	14.5
C8	1.321	-0.081	1989	2079	WATPHD	(C12-C24)	3273	0.2
C10	1.797	0.003	3853	2060	WATPHM	(C24-C38)	155817	8.9
C12	----				AK102	(C10-C25)	10326	0.5
C14	----							
C16	----				OR.DIES	(C10-C28)	17419	0.8
C18	----							
C20	----							
C22	----							
C24	----							
C25	6.110	0.029	876	1120				
C26	----							
C28	6.802	0.012	4466	4117				
C32	7.721	0.014	60116	58519				
C34	8.159	0.013	2415	2970				
Filter Peak	8.345	-0.016	2500	3374				
C36	8.530	-0.044	3266	6383				
C38	9.014	0.014	4125	2811				
C40	9.421	-0.006	5788	5947				
o-terph	4.445	0.005	8401261	5341858				
Triacon Surr	7.282	0.013	5510122	5226559	NAS DIES	(C10-C24)	10326	0.5

Range Times: NW Diesel(2.530 - 5.836) AK102(1.79 - 6.08) Jet A(1.79 - 4.29)
NW M.Oil(5.84 - 9.00) AK103(6.08 - 8.57) OR Diesel(1.79 - 6.79)

Surrogate	Area	Amount
o-Terphenyl	5341858	212.0
Triacontane	5226559	202.0

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25203.0	18-SEP-2017
Triacon Surr	25873.7	18-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	17783.0	18-SEP-2017
Motor Oil	17571.0	18-SEP-2017
AK102	21299.0	18-SEP-2017
OR Diesel	21383.0	18-SEP-2017
NAS Diesel	21261.0	18-SEP-2017



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 17I0171-18 SDG: 17I0171
 Sampled: 09/13/17 12:57 Prepared: 09/18/17 12:07 File ID: 17092123.D
 % Solids: Preparation: EPA 3510C SepF Analyzed: 09/21/17 18:41
 Batch: BFI0345 Sequence: SFI0239 Initial/Final: 500 mL / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00051

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200

SURROGATES	ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl	0.45000	0.422	93.9	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170921.b\17092123.D

Date : 21-SEP-2017 18:41

Client ID:

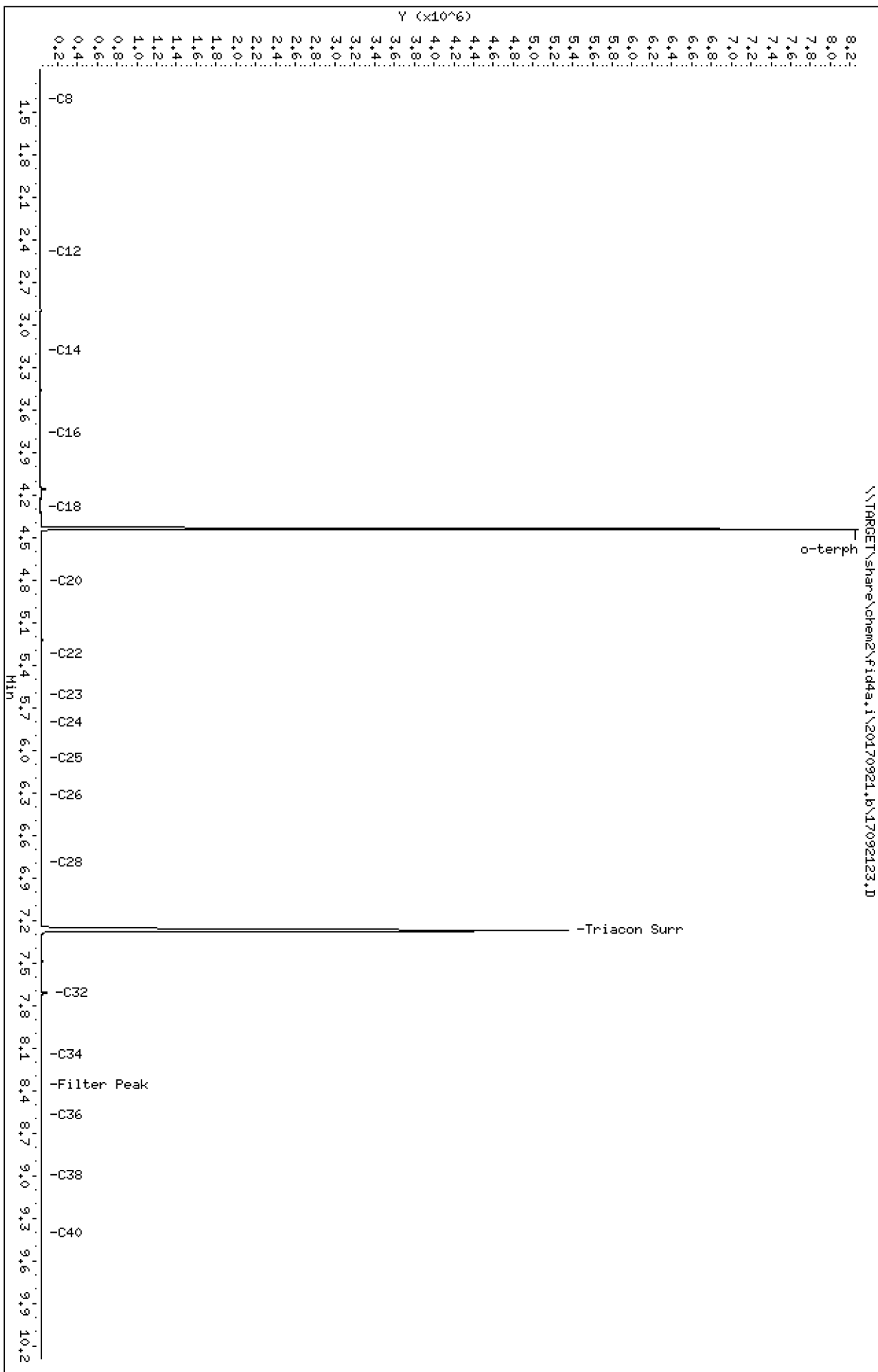
Sample Info: 1710171-18

Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170921.b/17092123.D
Method: 20170921.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/22/2017
Macro: 18-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:18-SEP-2017 M.Oil:18-SEP-2017

ARI ID: 17I0171-18
Client ID:
Injection: 21-SEP-2017 18:41
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.238	-0.024	3676	3591	WATPHG	(Tol-C12)	18949	12.6
C8	1.413	0.011	3489	2686	WATPHD	(C12-C24)	801013	45.0
C10	----				WATPHM	(C24-C38)	983437	56.0
C12	2.488	-0.041	1459	1067	AK102	(C10-C25)	871733	40.9
C14	3.182	0.001	2240	2825				
C16	3.766	0.002	2525	2356	OR.DIES	(C10-C28)	1192573	55.8
C18	4.292	-0.002	6717	5937				
C20	4.813	0.003	8503	11515				
C22	5.329	0.000	11223	7746				
C24	5.812	-0.023	12286	14876				
C25	6.062	-0.018	12013	4773				
C26	6.326	0.006	11731	20629				
C28	6.794	0.004	13839	17421				
C32	7.712	0.004	63651	88633				
C34	8.152	0.006	8995	20216				
Filter Peak	8.367	0.006	9304	21755				
C36	8.579	0.005	9894	21556				
C38	9.006	0.005	9957	11227				
C40	9.411	-0.016	12779	35745				
o-terph	4.442	0.002	8255645	5323748				
Triacon Surr	7.272	0.003	5333773	5146947	NAS DIES	(C10-C24)	803986	37.8

Range Times: NW Diesel(2.530 - 5.836) AK102(1.79 - 6.08) Jet A(1.79 - 4.29)
NW M.Oil(5.84 - 9.00) AK103(6.08 - 8.57) OR Diesel(1.79 - 6.79)

Surrogate	Area	Amount
o-Terphenyl	5323748	211.2
Triacontane	5146947	198.9

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25203.0	18-SEP-2017
Triacon Surr	25873.7	18-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	17783.0	18-SEP-2017
Motor Oil	17571.0	18-SEP-2017
AK102	21299.0	18-SEP-2017
OR Diesel	21383.0	18-SEP-2017
NAS Diesel	21261.0	18-SEP-2017



Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Ground Water

Laboratory ID: 1710171-19

SDG: 1710171

Sampled: 09/13/17 15:45

Prepared: 09/18/17 15:27

File ID: 17092045.D

% Solids:

Preparation: EPA 3510C SepF

Analyzed: 09/21/17 02:17

Batch: BFI0366

Sequence: SFI0211

Initial/Final: 500 mL / 1 mL

Instrument: FID4

Column: RTX-1

Calibration: AI00051

Cleanups: Silica Gel, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200

SURROGATES	ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl	0.45000	0.399	88.6	50 - 150	

Data File: \\TARGET\share\chem2\Fid4a.1\20170920_b\17092045.D

Date: 21-SEP-2017 02:17

Client ID:

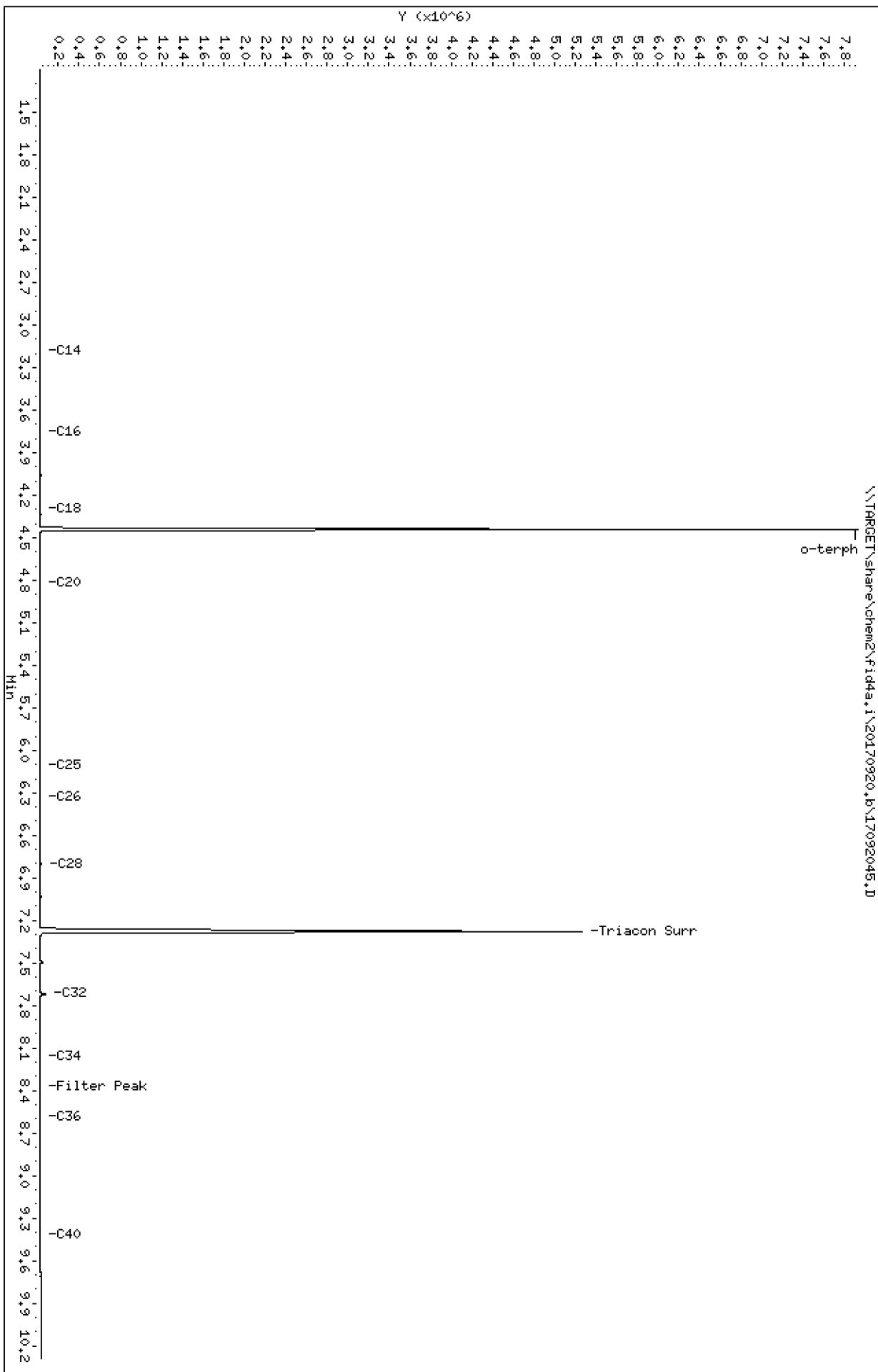
Sample Info: 1710171-19

Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170920.b/17092045.D
Method: 20170920.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/21/2017
Macro: 18-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:18-SEP-2017 M.Oil:18-SEP-2017

ARI ID: 17I0171-19
Client ID:
Injection: 21-SEP-2017 02:17
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.279	0.017	968	1288	WATPHG	(Tol-C12)	9210	6.1
C8	----				WATPHD	(C12-C24)	133279	7.5
C10	----				WATPHM	(C24-C38)	182397	10.4
C12	----				AK102	(C10-C25)	135048	6.3
C14	3.187	0.006	1127	1287				
C16	3.753	-0.011	2333	3607	OR.DIES	(C10-C28)	152213	7.1
C18	4.298	0.004	2421	2278				
C20	4.817	0.007	2087	2604				
C22	----							
C24	----							
C25	6.110	0.029	948	939				
C26	6.329	0.009	853	814				
C28	6.800	0.011	10556	9499				
C32	7.719	0.012	56913	56005				
C34	8.160	0.014	2758	5032				
Filter Peak	8.370	0.009	2699	1956				
C36	8.587	0.013	3628	6183				
C38	----							
C40	9.420	-0.006	5681	6665				
o-terph	4.445	0.005	7909843	5023419				
Triacon Surr	7.280	0.011	5238429	5007035	NAS DIES	(C10-C24)	135048	6.4

Range Times: NW Diesel(2.530 - 5.836) AK102(1.79 - 6.08) Jet A(1.79 - 4.29)
NW M.Oil(5.84 - 9.00) AK103(6.08 - 8.57) OR Diesel(1.79 - 6.79)

Surrogate	Area	Amount
o-Terphenyl	5023419	199.3
Triacontane	5007035	193.5

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25203.0	18-SEP-2017
Triacon Surr	25873.7	18-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	17783.0	18-SEP-2017
Motor Oil	17571.0	18-SEP-2017
AK102	21299.0	18-SEP-2017
OR Diesel	21383.0	18-SEP-2017
NAS Diesel	21261.0	18-SEP-2017



Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 1710171-20 SDG: 1710171
 Sampled: 09/13/17 15:45 Prepared: 09/18/17 12:07 File ID: 17092124.D
 % Solids: Preparation: EPA 3510C SepF Analyzed: 09/21/17 19:04
 Batch: BFI0345 Sequence: SFI0239 Initial/Final: 500 mL / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00051

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.138		0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200

SURROGATES	ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl	0.45000	0.306	68.0	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170921.b\17092124.D

Date: 21-SEP-2017 19:04

Client ID:

Sample Info: 1710171-20

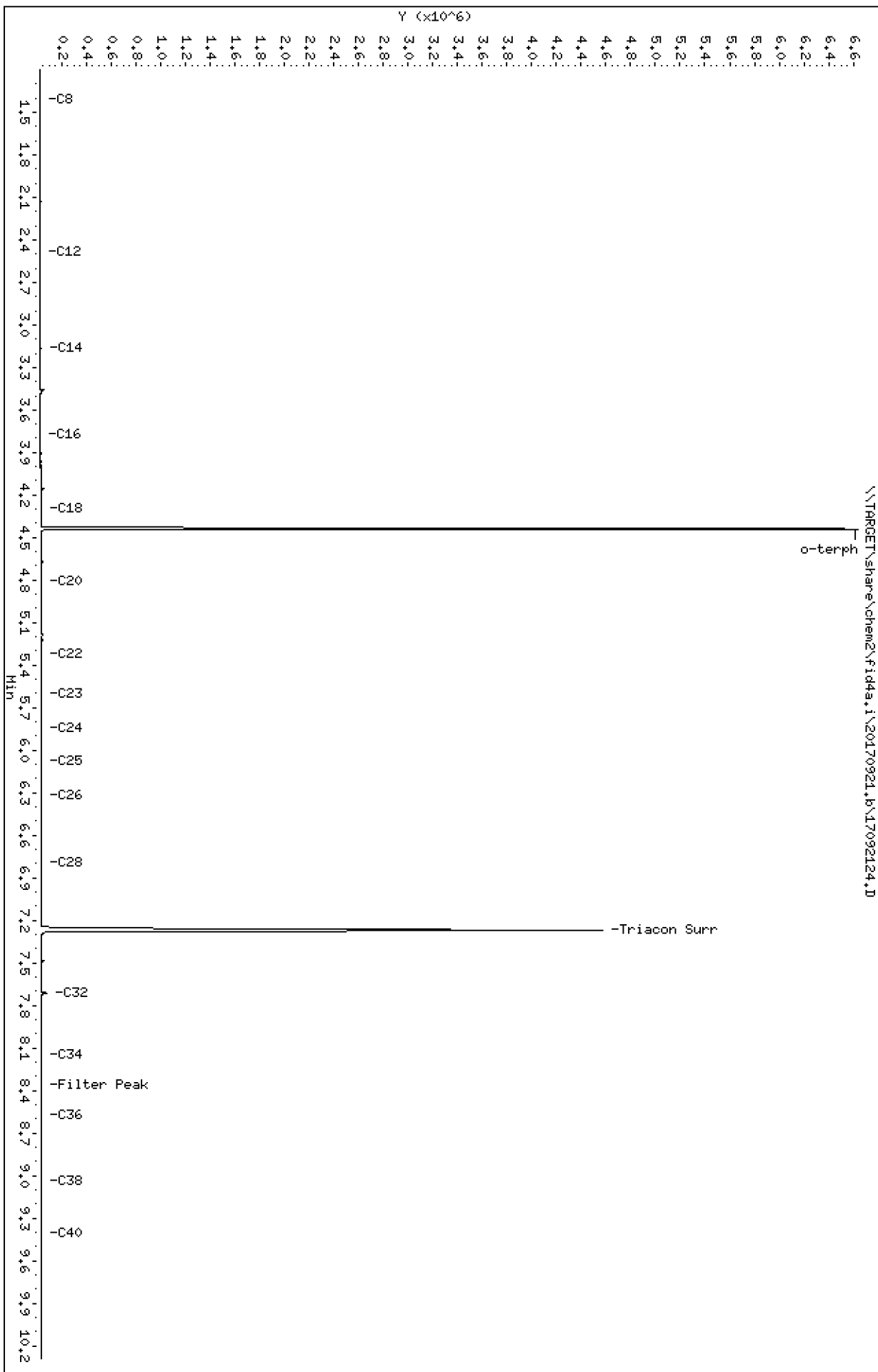
Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25

Page 1



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170921.b/17092124.D
Method: 20170921.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/22/2017
Macro: 18-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:18-SEP-2017 M.Oil:18-SEP-2017

ARI ID: 17I0171-20
Client ID:
Injection: 21-SEP-2017 19:04
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.238	-0.024	1462	1259	WATPHG	(Tol-C12)	29672	19.8
C8	1.413	0.011	3833	2586	WATPHD	(C12-C24)	1226053	68.9
C10	----				WATPHM	(C24-C38)	712577	40.6
C12	2.487	-0.042	1174	1059	AK102	(C10-C25)	1275473	59.9
C14	3.164	-0.017	6958	6989				
C16	3.775	0.011	4224	1243	OR.DIES	(C10-C28)	1518031	71.0
C18	4.295	0.001	8775	9785				
C20	4.812	0.002	11669	15321				
C22	5.329	0.000	12231	18257				
C24	5.846	0.011	11289	6632				
C25	6.085	0.004	10354	13182				
C26	6.326	0.006	9523	13436				
C28	6.795	0.005	10410	14531				
C32	7.714	0.007	50594	67678				
C34	8.155	0.008	7576	23664				
Filter Peak	8.366	0.005	7455	12395				
C36	8.580	0.006	8195	20661				
C38	9.044	0.043	8257	3670				
C40	9.415	-0.012	10565	28165				
o-terph	4.440	0.000	6603024	3859374				
Triacon Surr	7.272	0.003	4548808	4152676	NAS DIES	(C10-C24)	1241677	58.4

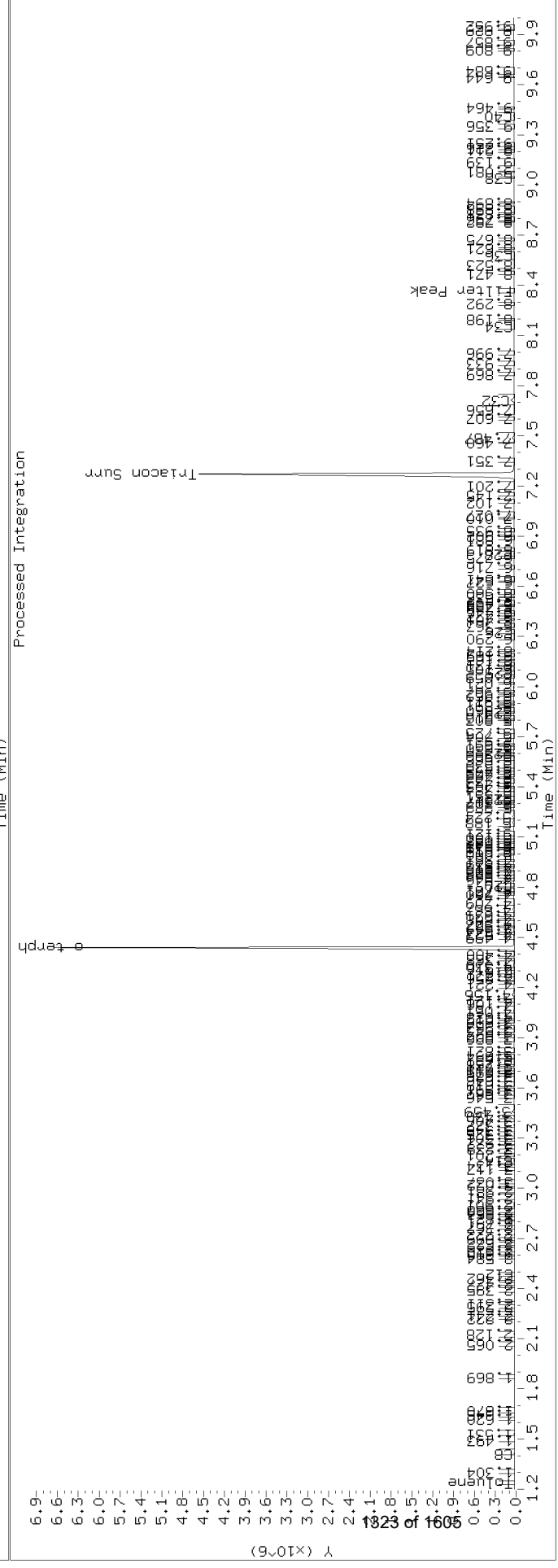
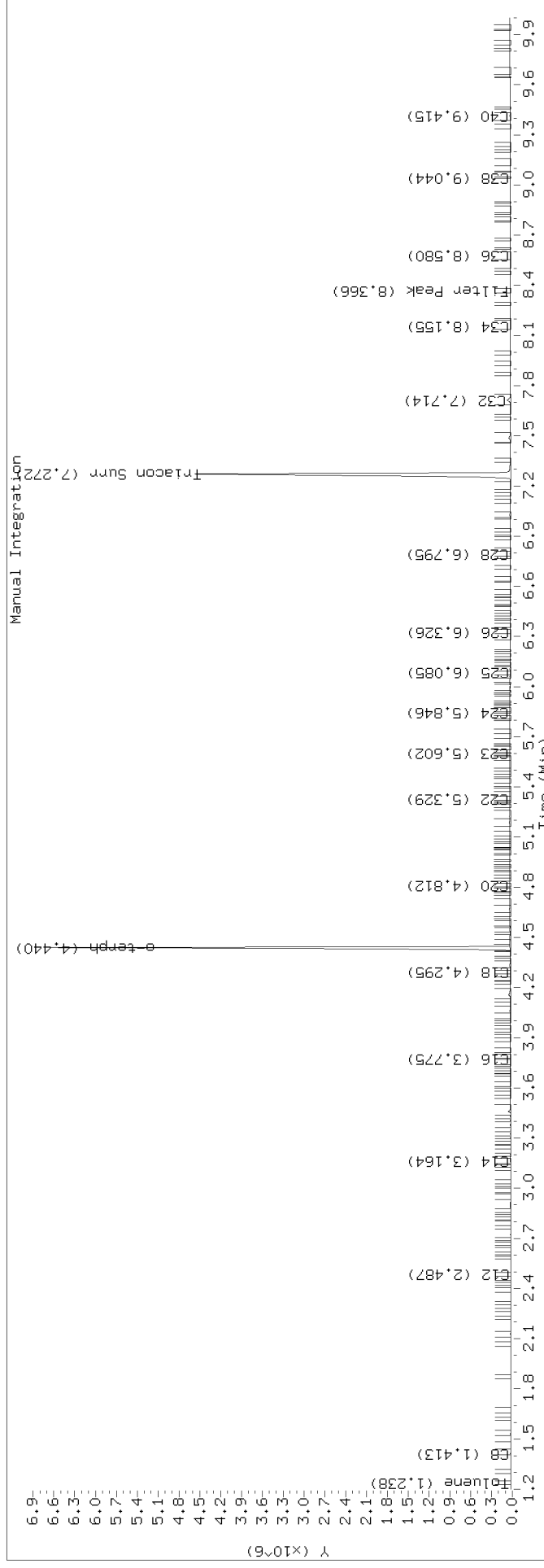
Range Times: NW Diesel(2.530 - 5.836) AK102(1.79 - 6.08) Jet A(1.79 - 4.29)
NW M.Oil(5.84 - 9.00) AK103(6.08 - 8.57) OR Diesel(1.79 - 6.79)

Surrogate	Area	Amount
o-Terphenyl	3859374	153.1 M
Triacontane	4152676	160.5

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25203.0	18-SEP-2017
Triacon Surr	25873.7	18-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	17783.0	18-SEP-2017
Motor Oil	17571.0	18-SEP-2017
AK102	21299.0	18-SEP-2017
OR Diesel	21383.0	18-SEP-2017
NAS Diesel	21261.0	18-SEP-2017

TPH Manual Integrations Report





Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 1710171-21 SDG: 1710171
 Sampled: 09/13/17 17:03 Prepared: 09/18/17 15:27 File ID: 17092046.D
 % Solids: Preparation: EPA 3510C SepF Analyzed: 09/21/17 02:40
 Batch: BFI0366 Sequence: SFI0211 Initial/Final: 500 mL / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00051
 Cleanups: Silica Gel, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200

SURROGATES	ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl	0.45000	0.418	92.8	50 - 150	

Data File: \\TARGET\share\chem2\Fid4a.1\20170920.B\17092046.D

Date: 21-SEP-2017 02:40

Client ID:

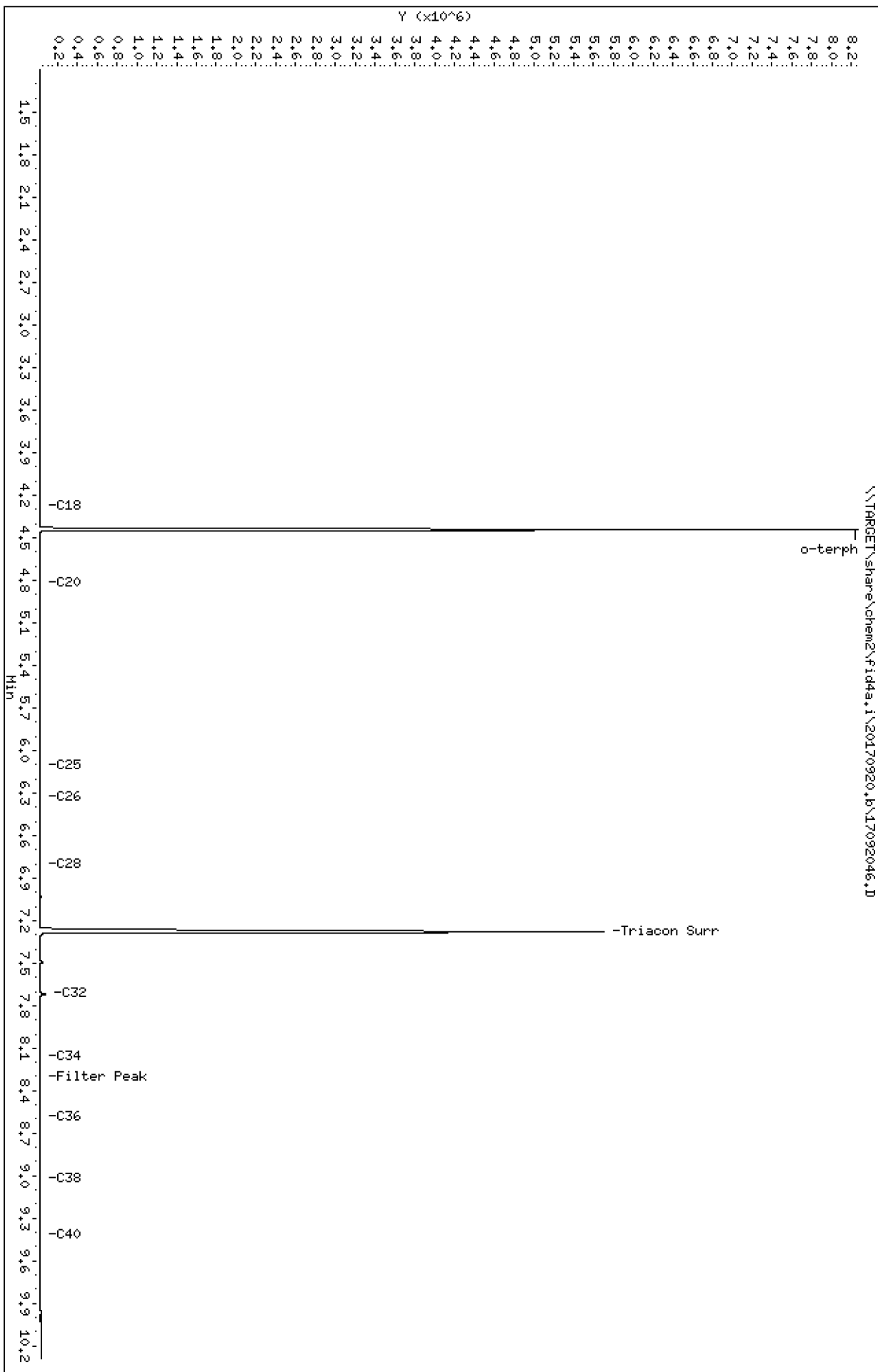
Sample Info: 1710171-21

Column phase: RTX-1

Instrument: fid4a.1

Operator: ML

Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170920.b/17092046.D
Method: 20170920.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/21/2017
Macro: 18-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:18-SEP-2017 M.Oil:18-SEP-2017

ARI ID: 17I0171-21
Client ID:
Injection: 21-SEP-2017 02:40
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	----				| WATPHG (Tol-C12)		4065	2.7
C8	----				| WATPHD (C12-C24)		7548	0.4
C10	----				| WATPHM (C24-C38)		174678	9.9
C12	----				| AK102 (C10-C25)		8656	0.4
C14	----				|			
C16	----				|OR.DIES (C10-C28)		24539	1.1
C18	4.280	-0.014	568	992	|			
C20	4.819	0.009	867	803	|			
C22	----				|			
C24	----				|			
C25	6.110	0.029	6510	5012	|			
C26	6.332	0.012	788	879	|			
C28	6.801	0.011	4580	5184	|			
C32	7.719	0.012	58257	57238	|			
C34	8.157	0.010	2265	1587	|			
Filter Peak	8.301	-0.060	2425	3475	|			
C36	8.588	0.014	3058	7655	|			
C38	9.023	0.023	3841	4849	|			
C40	9.419	-0.007	5504	5461	|			
o-terph	4.445	0.005	8242680	5263680	|			
Triacon Surr	7.281	0.012	5684254	5292718	|NAS DIES (C10-C24)		8656	0.4

Range Times: NW Diesel(2.530 - 5.836) AK102(1.79 - 6.08) Jet A(1.79 - 4.29)
NW M.Oil(5.84 - 9.00) AK103(6.08 - 8.57) OR Diesel(1.79 - 6.79)

Surrogate	Area	Amount
o-Terphenyl	5263680	208.9
Triacontane	5292718	204.6

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25203.0	18-SEP-2017
Triacon Surr	25873.7	18-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	17783.0	18-SEP-2017
Motor Oil	17571.0	18-SEP-2017
AK102	21299.0	18-SEP-2017
OR Diesel	21383.0	18-SEP-2017
NAS Diesel	21261.0	18-SEP-2017



Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SCVA Area Z Remediation
 Matrix: Ground Water Laboratory ID: 1710171-22 SDG: 1710171
 Sampled: 09/13/17 17:03 Prepared: 09/18/17 12:07 File ID: 17092125.D
 % Solids: Preparation: EPA 3510C SepF Analyzed: 09/21/17 19:25
 Batch: BFI0345 Sequence: SFI0239 Initial/Final: 500 mL / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: AI00051

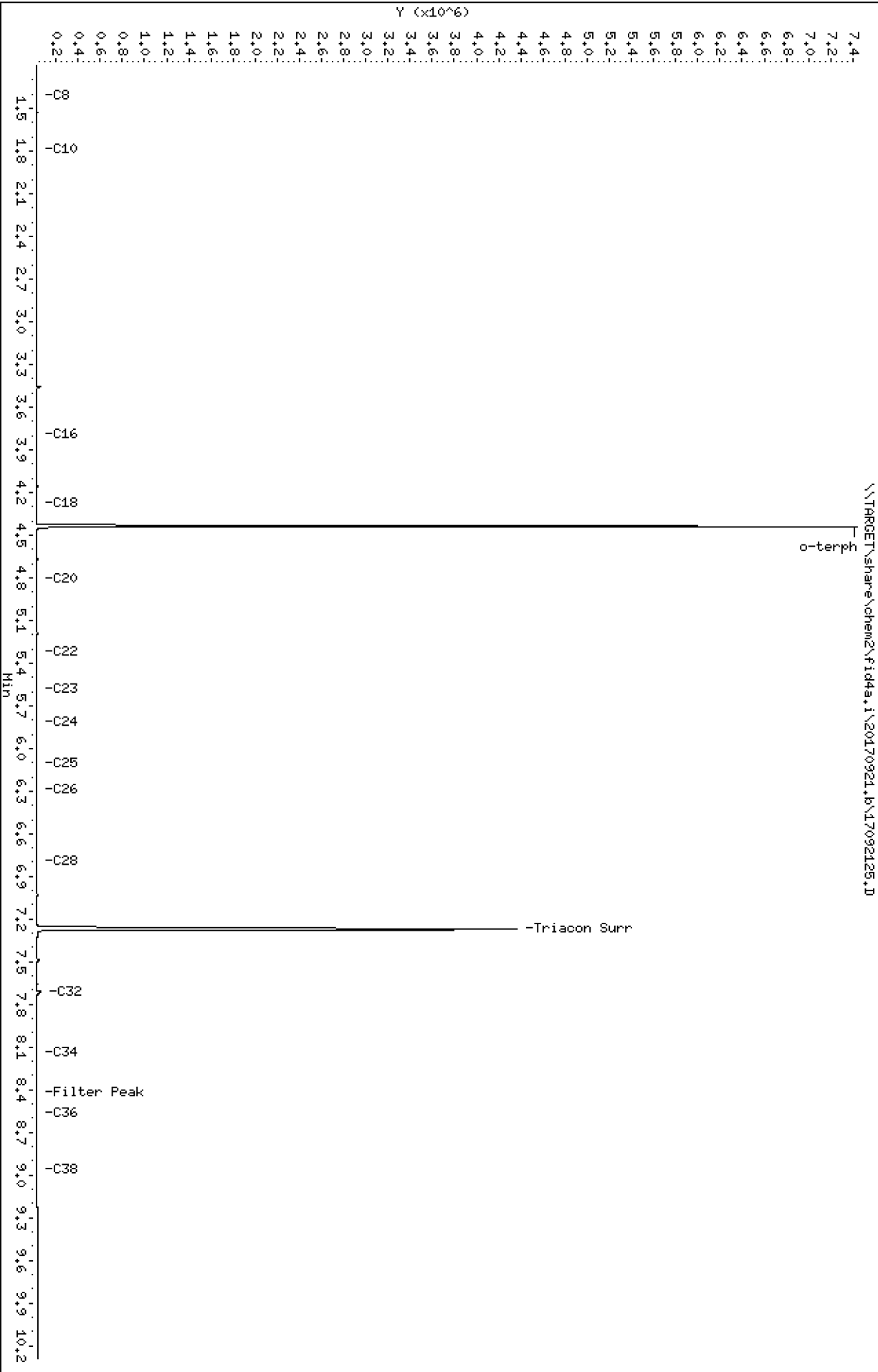
CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200

SURROGATES	ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl	0.45000	0.367	81.6	50 - 150	

Data File: \\TARGET\share\chem2\fid4a.1\20170921.b\17092125.D
Date: 21-SEP-2017 19:25
Client ID:
Sample Info: 1710171-22

Column phase: RTX-1

Instrument: fid4a.1
Operator: ML
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20170921.b/17092125.D
Method: 20170921.b\FID4TPH.m
Instrument: fid4a.i, ML
Report Date: 09/22/2017
Macro: 18-SEP-2017
Calibration Dates: Gas:XX-XXX-XXXX Diesel:18-SEP-2017 M.Oil:18-SEP-2017

ARI ID: 17I0171-22
Client ID:
Injection: 21-SEP-2017 19:25
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg per L)
Toluene	1.240	-0.022	4952	6086	WATPHG	(Tol-C12)	49096	32.7
C8	1.415	0.013	5521	7699	WATPHD	(C12-C24)	213253	12.0
C10	1.795	0.001	877	863	WATPHM	(C24-C38)	266007	15.1
C12	----				AK102	(C10-C25)	222228	10.4
C14	----							
C16	3.794	0.030	1468	1576	OR.DIES	(C10-C28)	288682	13.5
C18	4.277	-0.017	2240	2632				
C20	4.813	0.002	2995	4145				
C22	5.322	-0.007	3228	3842				
C24	5.816	-0.019	3594	3292				
C25	6.105	0.024	4056	7754				
C26	6.291	-0.028	3799	6275				
C28	6.795	0.006	5507	7388				
C32	7.714	0.007	43187	53736				
C34	8.145	-0.002	3737	2190				
Filter Peak	8.423	0.062	4085	2197				
C36	8.569	-0.005	4317	4933				
C38	8.960	-0.041	5019	3700				
C40	----							
o-terph	4.441	0.002	7415614	4630016				
Triacon Surr	7.272	0.003	4347393	3785011	NAS DIES	(C10-C24)	218296	10.3

Range Times: NW Diesel(2.530 - 5.836) AK102(1.79 - 6.08) Jet A(1.79 - 4.29)
NW M.Oil(5.84 - 9.00) AK103(6.08 - 8.57) OR Diesel(1.79 - 6.79)

Surrogate	Area	Amount
o-Terphenyl	4630016	183.7
Triacontane	3785011	146.3

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25203.0	18-SEP-2017
Triacon Surr	25873.7	18-SEP-2017
Gas	1500.0	XX-XXX-XXXX
Diesel	17783.0	18-SEP-2017
Motor Oil	17571.0	18-SEP-2017
AK102	21299.0	18-SEP-2017
OR Diesel	21383.0	18-SEP-2017
NAS Diesel	21261.0	18-SEP-2017



PREPARATION BATCH SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFI0345 Batch Matrix: Water

Preparation: EPA 3510C SepF

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-GW-109-14-19-170913	17I0171-16	17092122.D	09/18/17 12:07	
SVCA-GW-110-14-19-170913	17I0171-18	17092123.D	09/18/17 12:07	
SVCA-GW-111-14-19-170913	17I0171-20	17092124.D	09/18/17 12:07	
SVCA-GW-112-12.5-17.5-170913	17I0171-22	17092125.D	09/18/17 12:07	
Blank	BFI0345-BLK1	17092112.D	09/18/17 12:07	
LCS	BFI0345-BS1	17092113.D	09/18/17 12:07	



PREPARATION BATCH SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFI0364 Batch Matrix: Solid

Preparation: EPA 3546 (Microwave)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-SB-111-14-16-170913	17I0171-06	17092019.D	09/19/17 10:20	
SVCA-SB-112-12.5-14.5-170913	17I0171-12	17092015.D	09/19/17 10:20	
Blank	BFI0364-BLK1	17092010.D	09/19/17 10:20	
LCS	BFI0364-BS1	17092011.D	09/19/17 10:20	



PREPARATION BATCH SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFI0365 Batch Matrix: Solid

Preparation: EPA 3546 (Microwave)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-SB-111-14-16-170913	17I0171-05	17092630.D	09/18/17 13:50	
SVCA-SB-112-12.5-14.5-170913	17I0171-11	17092631.D	09/18/17 13:50	
Blank	BFI0365-BLK1	17092628.D	09/18/17 13:50	
LCS	BFI0365-BS1	17092629.D	09/18/17 13:50	



PREPARATION BATCH SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Batch: BFI0366 Batch Matrix: Water

Preparation: EPA 3510C SepF

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
SVCA-GW-109-14-19-170913	17I0171-15	17092043.D	09/18/17 15:27	
SVCA-GW-110-14-19-170913	17I0171-17	17092044.D	09/18/17 15:27	
SVCA-GW-111-14-19-170913	17I0171-19	17092045.D	09/18/17 15:27	
SVCA-GW-112-12.5-17.5-170913	17I0171-21	17092046.D	09/18/17 15:27	
Blank	BFI0366-BLK1	17092041.D	09/18/17 15:27	
LCS	BFI0366-BS1	17092042.D	09/18/17 15:27	



Form I
METHOD BLANK DATA SHEET
NWTPH-Dx

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>1710171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Water</u>	Laboratory ID:	<u>BFI0345-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>09/18/17 12:07</u>
Solids:		Preparation:	<u>EPA 3510C SepF</u>
Batch:	<u>BFI0345</u>	Sequence:	<u>SFI0239</u>
Instrument:	<u>FID4</u>	Column:	<u>RTX-1</u>
		File ID:	<u>17092112.D</u>
		Analyzed:	<u>09/21/17 14:38</u>
		Initial/Final:	<u>500 mL / 1 mL</u>
		Calibration:	<u>AI00051</u>

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200
SURROGATES		ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl		0.45000	0.334	74.3	50 - 150	



Form I
METHOD BLANK DATA SHEET
NWTPH-Dx

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>1710171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Solid</u>	Laboratory ID:	<u>BFI0364-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>09/19/17 10:20</u>
Solids:		Preparation:	<u>EPA 3546 (Microwave)</u>
Batch:	<u>BFI0364</u>	Sequence:	<u>SFI0211</u>
Instrument:	<u>FID4</u>	Column:	<u>RTX-1</u>
		File ID:	<u>17092010.D</u>
		Analyzed:	<u>09/20/17 13:02</u>
		Initial/Final:	<u>10 g / 1 mL</u>
		Calibration:	<u>AI00051</u>

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg wet)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	5.00	U	2.34	5.00
	Motor Oil Range Organics (C24-C38)	1	10.0	U	2.99	10.0
SURROGATES		ADDED (mg/kg wet)	CONC (mg/kg wet)	% REC	QC LIMITS	Q
o-Terphenyl		22.500	20.7	92.0	50 - 150	



Form I
METHOD BLANK DATA SHEET
NWTPH-Dx

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>1710171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Solid</u>	Laboratory ID:	<u>BFI0365-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>09/18/17 13:50</u>
Solids:		Preparation:	<u>EPA 3546 (Microwave)</u>
Batch:	<u>BFI0365</u>	Sequence:	<u>SFI0326</u>
Instrument:	<u>FID4</u>	Column:	<u>RTX-1</u>
		Cleanups:	<u>Silica Gel, Sulfuric Acid</u>

CAS NO.	COMPOUND	DILUTION	CONC. (mg/kg wet)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	5.00	U	2.34	5.00
	Motor Oil Range Organics (C24-C38)	1	10.0	U	2.99	10.0
SURROGATES		ADDED (mg/kg wet)	CONC (mg/kg wet)	% REC	QC LIMITS	Q
	o-Terphenyl	22.500	17.3	76.9	50 - 150	



Form I
METHOD BLANK DATA SHEET
NWTPH-Dx

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>1710171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Water</u>	Laboratory ID:	<u>BFI0366-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>09/18/17 15:27</u>
Solids:		Preparation:	<u>EPA 3510C SepF</u>
Batch:	<u>BFI0366</u>	Sequence:	<u>SFI0211</u>
Instrument:	<u>FID4</u>	Column:	<u>RTX-1</u>
		Cleanups:	<u>Silica Gel, Sulfuric Acid</u>

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200
SURROGATES		ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl		0.45000	0.394	87.6	50 - 150	



LCS / LCS DUPLICATE RECOVERY
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Water</u>	Analyzed:	<u>09/21/17 15:01</u>
Batch:	<u>BFI0345</u>	Laboratory ID:	<u>BFI0345-BS1</u>
Preparation:	<u>EPA 3510C SepF</u>	Sequence Name:	<u>LCS</u>
Initial/Final:	<u>500 mL / 1 mL</u>		

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	Q	LCS % REC. #	QC LIMITS REC.
Diesel Range Organics (C12-C24)	3.00	2.49		82.9	56 - 120

* Indicates values outside of QC limits



LCS / LCS DUPLICATE RECOVERY
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Analyzed: 09/20/17 13:24

Batch: BFI0364

Laboratory ID: BFI0364-BS1

Preparation: EPA 3546 (Microwave)

Sequence Name: LCS

Initial/Final: 10 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Diesel Range Organics (C12-C24)	150	126		84.0	63 - 120

* Indicates values outside of QC limits



LCS / LCS DUPLICATE RECOVERY
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Analyzed: 09/26/17 20:39

Batch: BFI0365

Laboratory ID: BFI0365-BS1

Preparation: EPA 3546 (Microwave)

Sequence Name: LCS

Initial/Final: 10 g / 1 mL

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Diesel Range Organics (C12-C24)	150	124		82.8	63 - 120

* Indicates values outside of QC limits



LCS / LCS DUPLICATE RECOVERY
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Matrix:	<u>Water</u>	Analyzed:	<u>09/21/17 01:11</u>
Batch:	<u>BFI0366</u>	Laboratory ID:	<u>BFI0366-BS1</u>
Preparation:	<u>EPA 3510C SepF</u>	Sequence Name:	<u>LCS</u>
Initial/Final:	<u>500 mL / 1 mL</u>		

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	Q	LCS % REC. #	QC LIMITS REC.
Diesel Range Organics (C12-C24)	3.00	2.69		89.7	56 - 120

* Indicates values outside of QC limits



CLEANUP BATCH SUMMARY

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Cleanup Batch: CFI0090

Cleanup Type: Sulfuric Acid

Cleanup Method: EPA 3665A Sulfuric Acid Cleanup

Analysis: NWTPH-Dx

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARE	OBSERVATIONS
SVCA-GW-109-14-19-170913	17I0171-15	17092043.D	09/19/2017	
SVCA-GW-112-12.5-17.5-170913	17I0171-21	17092046.D	09/19/2017	
SVCA-GW-111-14-19-170913	17I0171-19	17092045.D	09/19/2017	
SVCA-GW-110-14-19-170913	17I0171-17	17092044.D	09/19/2017	



CLEANUP BATCH SUMMARY

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Cleanup Batch: CFI0091

Cleanup Type: Silica Gel

Cleanup Method: EPA 3630C Silica Gel Cleanup

Analysis: NWTPH-Dx

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARE	OBSERVATIONS
SVCA-GW-112-12.5-17.5-170913	17I0171-21	17092046.D	09/19/2017	
SVCA-GW-111-14-19-170913	17I0171-19	17092045.D	09/19/2017	
SVCA-GW-110-14-19-170913	17I0171-17	17092044.D	09/19/2017	
SVCA-GW-109-14-19-170913	17I0171-15	17092043.D	09/19/2017	



CLEANUP BATCH SUMMARY

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Cleanup Batch: CFI0120

Cleanup Type: Sulfuric Acid

Cleanup Method: EPA 3665A Sulfuric Acid Cleanup

Analysis: NWTPH-Dx

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARE	OBSERVATIONS
SVCA-SB-111-14-16-170913	17I0171-05	17092630.D	09/26/2017	
SVCA-SB-112-12.5-14.5-170913	17I0171-11	17092631.D	09/26/2017	



CLEANUP BATCH SUMMARY

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Cleanup Batch: CFI0121

Cleanup Type: Silica Gel

Cleanup Method: EPA 3630C Silica Gel Cleanup

Analysis: NWTPH-Dx

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARE	OBSERVATIONS
SVCA-SB-111-14-16-170913	17I0171-05	17092630.D	09/26/2017	
SVCA-SB-112-12.5-14.5-170913	17I0171-11	17092631.D	09/26/2017	



INITIAL CALIBRATION DATA
NWTPH-Dx

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00051	Instrument:	FID4
Calibration Date:	09/18/2017 13:20	Column (1):	RTX-1

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Diesel Range Organics (C12-C24)	50	17442.66	100	17695.96	250	17995.68	500	17994.26	1000	17817.35	2500	17750.95
o-Terphenyl	9	26040.89	18	25639.95	45	24951.49	90	25082.38	180	24776.26	450	24726.96



INITIAL CALIBRATION DATA
NWTPH-Dx

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00051	Instrument:	FID4
Calibration Date:	09/18/2017 13:20	Column (1):	RTX-1

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Motor Oil Range Organics (C24-C38)	100	15002.1	250	18819.81	500	18007.26	1000	18079.94	2500	17744.16	5000	17774.91



INITIAL CALIBRATION DATA **NWTPH-Dx**

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00051	Instrument:	FID4
Calibration Date:	09/18/2017 13:20	Column (1):	RTX-1

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
		RF		RF		RF		RF		RF		RF



INITIAL CALIBRATION DATA
NWTPH-Dx

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00051	Instrument:	FID4
Calibration Date:	09/18/2017 13:20	Column (1):	RTX-1

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Diesel Range Organics (C12-C24)	17782.81	1.2			RSD (20)	
Motor Oil Range Organics (C24-C38)	17571.36	7.5			RSD (20)	
o-Terphenyl	25202.99	2.1			RSD (20)	



INITIAL CALIBRATION DATA NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Calibration: AI00084

Instrument: FID4

Calibration Date: 09/27/2017 14:47

Column (1): RTX-1

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF



INITIAL CALIBRATION DATA
NWTPH-Dx

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00084	Instrument:	FID4
Calibration Date:	09/27/2017 14:47	Column (1):	RTX-1

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Diesel Range Organics (C12-C24)	50	17442.66	100	17695.96	250	17995.68	500	17994.26	1000	17817.35	2500	17750.95
o-Terphenyl	9	26040.89	18	25639.95	45	24951.49	90	25082.38	180	24776.26	450	24726.96



INITIAL CALIBRATION DATA
NWTPH-Dx

Laboratory:	Analytical Resources, Inc.	SDG:	17I0171
Client:	Anchor QEA, LLC	Project:	SCVA Area Z Remediation
Calibration:	AI00084	Instrument:	FID4
Calibration Date:	09/27/2017 14:47	Column (1):	RTX-1

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Diesel Range Organics (C12-C24)	17782.81	1.2			RSD (20)	
Motor Oil Range Organics (C24-C38)	17571.36	7.5			RSD (20)	
o-Terphenyl	25202.99	2.1			RSD (20)	



SECOND-SOURCE CALIBRATION VERIFICATION
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Calibration: AI00051

Laboratory ID: SFI0194-SCV1

Sequence: SFI0194

Sequence Name: DIES SCV 500

Standard ID: F006358

ANALYTE	EXPECTED (mg/L)	FOUND (mg/L)	% DRIFT	QC LIMIT
Diesel Range Organics (C12-C24)	500.00	588	17.5	30.00
o-Terphenyl	90.000	112	24.3	

* Indicates values outside of QC limits



SECOND-SOURCE CALIBRATION VERIFICATION
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Calibration: AI00051

Laboratory ID: SFI0194-SCV2

Sequence: SFI0194

Sequence Name: Moil SCV 1000

Standard ID: F007427

ANALYTE	EXPECTED (mg/L)	FOUND (mg/L)	% DRIFT	QC LIMIT
Motor Oil Range Organics (C24-C38)	1000.0	968	-3.2	30.00

* Indicates values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>AI00051</u>
Lab File ID: <u>17092003.D</u>	Calibration Date: <u>09/18/17 13:20</u>
Sequence: <u>SFI0211</u>	Injection Date: <u>09/20/17</u>
Lab Sample ID: <u>SFI0211-ICV1</u>	Injection Time: <u>10:25</u>
Sequence Name: <u>Diesel ICV</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	512	17782.8100	18207.3500		2.4	20
o-Terphenyl	A	90.000	92.6	25202.9900	25920.1800		2.9	20

* Values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AI00051</u>
Lab File ID:	<u>17092004.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0211</u>	Injection Date:	<u>09/20/17</u>
Lab Sample ID:	<u>SFI0211-ICV2</u>	Injection Time:	<u>10:47</u>
Sequence Name:	<u>MOIL ICV</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1050	17571.3600	18362.5000		4.5	20

* Values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>AI00051</u>
Lab File ID: <u>17092103.D</u>	Calibration Date: <u>09/18/17 13:20</u>
Sequence: <u>SFI0239</u>	Injection Date: <u>09/21/17</u>
Lab Sample ID: <u>SFI0239-ICV1</u>	Injection Time: <u>11:15</u>
Sequence Name: <u>Diesel ICV</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	503	17782.8100	17874.2900		0.5	20
o-Terphenyl	A	90.000	90.4	25202.9900	25309.1300		0.4	20

* Values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>AI00051</u>
Lab File ID: <u>17092104.D</u>	Calibration Date: <u>09/18/17 13:20</u>
Sequence: <u>SFI0239</u>	Injection Date: <u>09/21/17</u>
Lab Sample ID: <u>SFI0239-ICV2</u>	Injection Time: <u>11:38</u>
Sequence Name: <u>MOIL ICV</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1050	17571.3600	18429.0800		4.9	20

* Values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>AI00051</u>
Lab File ID: <u>17092510.D</u>	Calibration Date: <u>09/18/17 13:20</u>
Sequence: <u>SFI0294</u>	Injection Date: <u>09/25/17</u>
Lab Sample ID: <u>SFI0294-ICV1</u>	Injection Time: <u>15:01</u>
Sequence Name: <u>Diesel ICV</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	500	17782.8100	17797.6900		0.08	20
o-Terphenyl	A	90.000	91.7	25202.9900	25674.8600		1.9	20

* Values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>AI00051</u>
Lab File ID: <u>17092511.D</u>	Calibration Date: <u>09/18/17 13:20</u>
Sequence: <u>SFI0294</u>	Injection Date: <u>09/25/17</u>
Lab Sample ID: <u>SFI0294-ICV2</u>	Injection Time: <u>15:23</u>
Sequence Name: <u>MOIL ICV</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1030	17571.3600	18035.2300		2.6	20

* Values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>AI00084</u>
Lab File ID:	<u>17092611.D</u>	Calibration Date:	<u>09/27/17 14:47</u>
Sequence:	<u>SFI0326</u>	Injection Date:	<u>09/26/17</u>
Lab Sample ID:	<u>SFI0326-ICV1</u>	Injection Time:	<u>13:43</u>
Sequence Name:	<u>Diesel ICV</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	472	17782.8100	16775.8700		-5.7	20
o-Terphenyl	A	90.000	85.8	25202.9900	24037.9400		-4.7	20

* Values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>AI00084</u>
Lab File ID: <u>17092612.D</u>	Calibration Date: <u>09/27/17 14:47</u>
Sequence: <u>SFI0326</u>	Injection Date: <u>09/26/17</u>
Lab Sample ID: <u>SFI0326-ICV2</u>	Injection Time: <u>14:06</u>
Sequence Name: <u>MOIL ICV</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1030	17571.3600	18035.8000		2.7	20

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100051</u>
Lab File ID:	<u>17092013.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0211</u>	Injection Date:	<u>09/20/17</u>
Lab Sample ID:	<u>SFI0211-CCV1</u>	Injection Time:	<u>14:10</u>
Sequence Name:	<u>Diesel CCV1</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	529	17782.81	18825.08		5.9	15
o-Terphenyl	A	90.000	94.3	25202.99	26420.89		4.8	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100051</u>
Lab File ID:	<u>17092014.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0211</u>	Injection Date:	<u>09/20/17</u>
Lab Sample ID:	<u>SFI0211-CCV2</u>	Injection Time:	<u>14:32</u>
Sequence Name:	<u>MOIL CCV1</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1040	17571.36	18358.1		4.5	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>A100051</u>
Lab File ID: <u>17092025.D</u>	Calibration Date: <u>09/18/17 13:20</u>
Sequence: <u>SFI0211</u>	Injection Date: <u>09/20/17</u>
Lab Sample ID: <u>SFI0211-CCV3</u>	Injection Time: <u>18:54</u>
Sequence Name: <u>Diesel CCV2</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	508	17782.81	18083.1		1.7	15
o-Terphenyl	A	90.000	90.9	25202.99	25447.11		1.0	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100051</u>
Lab File ID:	<u>17092026.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0211</u>	Injection Date:	<u>09/20/17</u>
Lab Sample ID:	<u>SFI0211-CCV4</u>	Injection Time:	<u>19:17</u>
Sequence Name:	<u>MOILCCV2</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1090	17571.36	19213.06		9.4	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100051</u>
Lab File ID:	<u>17092039.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0211</u>	Injection Date:	<u>09/21/17</u>
Lab Sample ID:	<u>SFI0211-CCV5</u>	Injection Time:	<u>00:04</u>
Sequence Name:	<u>Diesel CCV3</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	475	17782.81	16877.41		-5.1	15
o-Terphenyl	A	90.000	86.4	25202.99	24181.69		-4.0	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100051</u>
Lab File ID:	<u>17092040.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0211</u>	Injection Date:	<u>09/21/17</u>
Lab Sample ID:	<u>SFI0211-CCV6</u>	Injection Time:	<u>00:27</u>
Sequence Name:	<u>MOIL CCV3</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1000	17571.36	17648.24		0.4	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100051</u>
Lab File ID:	<u>17092050.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0211</u>	Injection Date:	<u>09/21/17</u>
Lab Sample ID:	<u>SFI0211-CCV7</u>	Injection Time:	<u>04:07</u>
Sequence Name:	<u>Diesel CCV4</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	470	17782.81	16708.52		-6.0	15
o-Terphenyl	A	90.000	85.7	25202.99	23994.1		-4.8	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100051</u>
Lab File ID:	<u>17092051.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0211</u>	Injection Date:	<u>09/21/17</u>
Lab Sample ID:	<u>SFI0211-CCV8</u>	Injection Time:	<u>04:30</u>
Sequence Name:	<u>Moil CCV4</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	980	17571.36	17210.86		-2.1	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100051</u>
Lab File ID:	<u>17092119.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0239</u>	Injection Date:	<u>09/21/17</u>
Lab Sample ID:	<u>SFI0239-CCV1</u>	Injection Time:	<u>17:13</u>
Sequence Name:	<u>Diesel CCV1</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	545	17782.81	19397.28		9.1	15
o-Terphenyl	A	90.000	96.7	25202.99	27079.7		7.4	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100051</u>
Lab File ID:	<u>17092120.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0239</u>	Injection Date:	<u>09/21/17</u>
Lab Sample ID:	<u>SFI0239-CCV2</u>	Injection Time:	<u>17:36</u>
Sequence Name:	<u>MOIL CCV1</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1000	17571.36	17651.11		0.5	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100051</u>
Lab File ID:	<u>17092132.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0239</u>	Injection Date:	<u>09/21/17</u>
Lab Sample ID:	<u>SFI0239-CCV3</u>	Injection Time:	<u>22:00</u>
Sequence Name:	<u>Diesel CCV2</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	526	17782.81	18719.61		5.3	15
o-Terphenyl	A	90.000	93.9	25202.99	26303.1		4.3	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100051</u>
Lab File ID:	<u>17092133.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0239</u>	Injection Date:	<u>09/21/17</u>
Lab Sample ID:	<u>SFI0239-CCV4</u>	Injection Time:	<u>22:21</u>
Sequence Name:	<u>MOILCCV2</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1080	17571.36	18959.11		7.9	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100051</u>
Lab File ID:	<u>17092144.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0239</u>	Injection Date:	<u>09/22/17</u>
Lab Sample ID:	<u>SFI0239-CCV5</u>	Injection Time:	<u>02:23</u>
Sequence Name:	<u>Diesel CCV3</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	559	17782.81	19879.58		11.8	15
o-Terphenyl	A	90.000	96.1	25202.99	26921.77		6.8	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100051</u>
Lab File ID:	<u>17092145.D</u>	Calibration Date:	<u>09/18/17 13:20</u>
Sequence:	<u>SFI0239</u>	Injection Date:	<u>09/22/17</u>
Lab Sample ID:	<u>SFI0239-CCV6</u>	Injection Time:	<u>02:46</u>
Sequence Name:	<u>MOIL CCV3</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1100	17571.36	19332.03		10.0	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100084</u>
Lab File ID:	<u>17092632.D</u>	Calibration Date:	<u>09/27/17 14:47</u>
Sequence:	<u>SFI0326</u>	Injection Date:	<u>09/26/17</u>
Lab Sample ID:	<u>SFI0326-CCV1</u>	Injection Time:	<u>21:47</u>
Sequence Name:	<u>Diesel CCV1</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	466	17782.81	16561.44		-6.9	15
o-Terphenyl	A	90.000	85.0	25202.99	23808.28		-5.6	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>17I0171</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SCVA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>A100084</u>
Lab File ID:	<u>17092633.D</u>	Calibration Date:	<u>09/27/17 14:47</u>
Sequence:	<u>SFI0326</u>	Injection Date:	<u>09/26/17</u>
Lab Sample ID:	<u>SFI0326-CCV2</u>	Injection Time:	<u>22:08</u>
Sequence Name:	<u>MOIL CCV1</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1010	17571.36	17794.04		1.3	15

* Values outside of QC limits



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0194

Instrument: FID4

Calibration: AI00051

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Retention Time Std	SFI0194-IBL1	17091802.D	NA	09/18/17 14:32
Instrument Blank	SFI0194-IBL2	17091803.D	NA	09/18/17 14:53
Diesel 50	SFI0194-CAL1	17091804.D	NA	09/18/17 15:16
Diesel 100	SFI0194-CAL2	17091805.D	NA	09/18/17 15:37
DIES 250	SFI0194-CAL3	17091806.D	NA	09/18/17 16:01
DIES 500	SFI0194-CAL4	17091807.D	NA	09/18/17 16:22
DIES 1000	SFI0194-CAL5	17091808.D	NA	09/18/17 16:45
DIES 2500	SFI0194-CAL6	17091809.D	NA	09/18/17 17:06
MOIL 100	SFI0194-CAL7	17091810.D	NA	09/18/17 17:30
Moil 250	SFI0194-CAL8	17091811.D	NA	09/18/17 17:51
Moil 500	SFI0194-CAL9	17091812.D	NA	09/18/17 18:14
Moil 1000	SFI0194-CALA	17091813.D	NA	09/18/17 18:35
Moil 2500	SFI0194-CALB	17091814.D	NA	09/18/17 18:58
Moil 5000	SFI0194-CALC	17091815.D	NA	09/18/17 19:20
DIES SCV 500	SFI0194-SCV1	17091816.D	NA	09/18/17 19:42
ZZZZZ	BFI0232-BLK1	17091818.D	Water	09/18/17 20:26
ZZZZZ	BFI0232-BS1	17091819.D	Water	09/18/17 20:48
ZZZZZ	BFI0232-MRL1	17091820.D	Water	09/18/17 21:10
ZZZZZ	17I0113-01	17091823.D	Water	09/18/17 22:18
ZZZZZ	17I0117-04	17091824.D	Water	09/18/17 22:39
ZZZZZ	17I0117-05	17091825.D	Water	09/18/17 23:02
ZZZZZ	17I0117-07	17091826.D	Water	09/18/17 23:24
ZZZZZ	17I0117-08	17091827.D	Water	09/18/17 23:47
ZZZZZ	17I0117-11	17091828.D	Water	09/19/17 00:08
ZZZZZ	17I0117-12	17091829.D	Water	09/19/17 00:31
ZZZZZ	17I0117-13	17091830.D	Water	09/19/17 00:52
ZZZZZ	17I0117-14	17091831.D	Water	09/19/17 01:15
Diesel CCV1	SFI0194-CCV1	17091832.D	NA	09/19/17 01:37
MOIL CCV1	SFI0194-CCV2	17091833.D	NA	09/19/17 02:00
ZZZZZ	17I0117-15	17091834.D	Water	09/19/17 02:21



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0194

Instrument: FID4

Calibration: AI00051

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	17I0117-16	17091835.D	Water	09/19/17 02:44
ZZZZZ	17I0117-17	17091836.D	Water	09/19/17 03:06
ZZZZZ	17I0117-18	17091837.D	Water	09/19/17 03:29
ZZZZZ	17I0117-19	17091838.D	Water	09/19/17 03:51
ZZZZZ	17I0117-20	17091839.D	Water	09/19/17 04:13
ZZZZZ	17I0117-21	17091840.D	Water	09/19/17 04:37
ZZZZZ	17I0117-22	17091841.D	Water	09/19/17 04:58
ZZZZZ	BFI0231-BLK1	17091842.D	Water	09/19/17 05:21
ZZZZZ	BFI0231-BS1	17091843.D	Water	09/19/17 05:42
ZZZZZ	17I0117-28	17091844.D	Water	09/19/17 06:06
ZZZZZ	17I0117-29	17091845.D	Water	09/19/17 06:27
Diesel CCV2	SFI0194-CCV3	17091846.D	NA	09/19/17 06:51
MOILCCV2	SFI0194-CCV4	17091847.D	NA	09/19/17 07:14
Moil SCV 1000	SFI0194-SCV2	17091906.D	NA	09/19/17 12:27



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0211

Instrument: FID4

Calibration: AI00051

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Retention Time Std	SFI0211-IBL1	17092001.D	NA	09/20/17 09:40
Instrument Blank	SFI0211-IBL2	17092002.D	NA	09/20/17 10:01
Diesel ICV	SFI0211-ICV1	17092003.D	NA	09/20/17 10:25
MOIL ICV	SFI0211-ICV2	17092004.D	NA	09/20/17 10:47
ZZZZZ	BFI0386-BLK1	17092005.D	Water	09/20/17 11:09
ZZZZZ	BFI0386-BS1	17092006.D	Water	09/20/17 11:33
ZZZZZ	17I0202-01	17092007.D	Water	09/20/17 11:54
ZZZZZ	17I0202-02	17092008.D	Water	09/20/17 12:17
ZZZZZ	17I0202-03	17092009.D	Water	09/20/17 12:39
Blank	BFI0364-BLK1	17092010.D	Solid	09/20/17 13:02
LCS	BFI0364-BS1	17092011.D	Solid	09/20/17 13:24
ZZZZZ	17I0125-09	17092012.D	Solid	09/20/17 13:47
Diesel CCV1	SFI0211-CCV1	17092013.D	NA	09/20/17 14:10
MOIL CCV1	SFI0211-CCV2	17092014.D	NA	09/20/17 14:32
SVCA-SB-112-12.5-14.5-170913	17I0171-12	17092015.D	Solid	09/20/17 14:55
ZZZZZ	17I0184-01	17092016.D	Solid	09/20/17 15:18
ZZZZZ	17I0184-02	17092017.D	Solid	09/20/17 15:40
ZZZZZ	17I0184-03	17092018.D	Solid	09/20/17 16:03
SVCA-SB-111-14-16-170913	17I0171-06	17092019.D	Solid	09/20/17 16:35
ZZZZZ	17I0185-01	17092022.D	Solid	09/20/17 17:49
ZZZZZ	17I0185-02	17092023.D	Solid	09/20/17 18:11
ZZZZZ	17I0185-03	17092024.D	Solid	09/20/17 18:33
Diesel CCV2	SFI0211-CCV3	17092025.D	NA	09/20/17 18:54
MOILCCV2	SFI0211-CCV4	17092026.D	NA	09/20/17 19:17
ZZZZZ	BFI0312-BLK1	17092027.D	Solid	09/20/17 19:38
ZZZZZ	BFI0312-BS1	17092028.D	Solid	09/20/17 20:02
ZZZZZ	17I0146-01	17092031.D	Solid	09/20/17 21:07
ZZZZZ	17I0146-03	17092032.D	Solid	09/20/17 21:30
ZZZZZ	17I0146-04	17092033.D	Solid	09/20/17 21:52
ZZZZZ	17I0146-07	17092034.D	Solid	09/20/17 22:13



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0211

Instrument: FID4

Calibration: AI00051

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	17I0146-08	17092035.D	Solid	09/20/17 22:36
ZZZZZ	17I0146-09	17092036.D	Solid	09/20/17 22:58
ZZZZZ	17I0146-11	17092037.D	Solid	09/20/17 23:21
ZZZZZ	17I0146-12	17092038.D	Solid	09/20/17 23:42
Diesel CCV3	SFI0211-CCV5	17092039.D	NA	09/21/17 00:04
MOIL CCV3	SFI0211-CCV6	17092040.D	NA	09/21/17 00:27
Blank	BFI0366-BLK1	17092041.D	Water	09/21/17 00:48
LCS	BFI0366-BS1	17092042.D	Water	09/21/17 01:11
SVCA-GW-109-14-19-170913	17I0171-15	17092043.D	Water	09/21/17 01:32
SVCA-GW-110-14-19-170913	17I0171-17	17092044.D	Water	09/21/17 01:56
SVCA-GW-111-14-19-170913	17I0171-19	17092045.D	Water	09/21/17 02:17
SVCA-GW-112-12.5-17.5-170913	17I0171-21	17092046.D	Water	09/21/17 02:40
ZZZZZ	17I0194-01	17092047.D	Water	09/21/17 03:01
ZZZZZ	17I0194-03	17092048.D	Water	09/21/17 03:25
ZZZZZ	17I0194-05	17092049.D	Water	09/21/17 03:46
Diesel CCV4	SFI0211-CCV7	17092050.D	NA	09/21/17 04:07
Moil CCV4	SFI0211-CCV8	17092051.D	NA	09/21/17 04:30



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0239

Instrument: FID4

Calibration: AI00051

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Retention Time Std	SFI0239-IBL1	17092101.D	NA	09/21/17 10:31
Instrument Blank	SFI0239-IBL2	17092102.D	NA	09/21/17 10:53
Diesel ICV	SFI0239-ICV1	17092103.D	NA	09/21/17 11:15
MOIL ICV	SFI0239-ICV2	17092104.D	NA	09/21/17 11:38
ZZZZZ	BFI0164-BLK1	17092107.D	Water	09/21/17 12:47
ZZZZZ	BFI0164-BS1	17092108.D	Water	09/21/17 13:08
ZZZZZ	17I0077-02	17092109.D	Water	09/21/17 13:32
ZZZZZ	17I0077-04	17092110.D	Water	09/21/17 13:53
ZZZZZ	17I0077-06	17092111.D	Water	09/21/17 14:17
Blank	BFI0345-BLK1	17092112.D	Water	09/21/17 14:38
LCS	BFI0345-BS1	17092113.D	Water	09/21/17 15:01
ZZZZZ	17I0126-01	17092114.D	Water	09/21/17 15:22
ZZZZZ	17I0126-04	17092115.D	Water	09/21/17 15:45
ZZZZZ	17I0126-05	17092116.D	Water	09/21/17 16:07
ZZZZZ	17I0130-01	17092117.D	Water	09/21/17 16:30
ZZZZZ	17I0130-02	17092118.D	Water	09/21/17 16:51
Diesel CCV1	SFI0239-CCV1	17092119.D	NA	09/21/17 17:13
MOIL CCV1	SFI0239-CCV2	17092120.D	NA	09/21/17 17:36
ZZZZZ	17I0137-02	17092121.D	Water	09/21/17 17:57
SVCA-GW-109-14-19-170913	17I0171-16	17092122.D	Water	09/21/17 18:20
SVCA-GW-110-14-19-170913	17I0171-18	17092123.D	Water	09/21/17 18:41
SVCA-GW-111-14-19-170913	17I0171-20	17092124.D	Water	09/21/17 19:04
SVCA-GW-112-12.5-17.5-170913	17I0171-22	17092125.D	Water	09/21/17 19:25
ZZZZZ	17I0182-01	17092126.D	Water	09/21/17 19:47
ZZZZZ	17I0182-02	17092127.D	Water	09/21/17 20:10
ZZZZZ	17I0182-03	17092128.D	Water	09/21/17 20:31
ZZZZZ	17I0182-04	17092131.D	Water	09/21/17 21:37
Diesel CCV2	SFI0239-CCV3	17092132.D	NA	09/21/17 22:00
MOILCCV2	SFI0239-CCV4	17092133.D	NA	09/21/17 22:21
ZZZZZ	BFI0459-BLK1	17092134.D	Water	09/21/17 22:44



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0239

Instrument: FID4

Calibration: AI00051

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	BFI0459-BS1	17092135.D	Water	09/21/17 23:06
ZZZZZ	17I0237-01	17092136.D	Water	09/21/17 23:27
ZZZZZ	17I0240-01	17092137.D	Water	09/21/17 23:50
ZZZZZ	17I0255-01	17092138.D	Water	09/22/17 00:11
ZZZZZ	17I0077-02RE1	17092139.D	Water	09/22/17 00:33
ZZZZZ	17I0077-04RE1	17092140.D	Water	09/22/17 00:56
ZZZZZ	17I0126-01RE1	17092141.D	Water	09/22/17 01:17
ZZZZZ	17I0126-04RE1	17092142.D	Water	09/22/17 01:40
ZZZZZ	17I0137-02RE1	17092143.D	Water	09/22/17 02:02
Diesel CCV3	SFI0239-CCV5	17092144.D	NA	09/22/17 02:23
MOIL CCV3	SFI0239-CCV6	17092145.D	NA	09/22/17 02:46



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0294

Instrument: FID4

Calibration: AI00051

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Instrument Blank	SFI0294-IBL1	17092502.D	NA	09/25/17 12:00
Instrument Blank	SFI0294-IBL2	17092503.D	NA	09/25/17 12:21
Diesel ICV	SFI0294-ICV1	17092510.D	NA	09/25/17 15:01
MOIL ICV	SFI0294-ICV2	17092511.D	NA	09/25/17 15:23
ZZZZZ	BFI0281-BLK1	17092512.D	Water	09/25/17 15:46
ZZZZZ	BFI0281-BS1	17092513.D	Water	09/25/17 16:09
ZZZZZ	17I0122-01	17092514.D	Water	09/25/17 16:32
ZZZZZ	17I0122-02	17092515.D	Water	09/25/17 16:55
ZZZZZ	17I0122-03	17092516.D	Water	09/25/17 17:17
ZZZZZ	17I0122-04	17092517.D	Water	09/25/17 17:41
ZZZZZ	17I0122-05	17092518.D	Water	09/25/17 18:03
ZZZZZ	17I0122-06	17092519.D	Water	09/25/17 18:26
ZZZZZ	17I0122-07	17092520.D	Water	09/25/17 18:49
ZZZZZ	17I0122-08	17092521.D	Water	09/25/17 19:11
ZZZZZ	17I0122-09	17092522.D	Water	09/25/17 19:34
ZZZZZ	17I0122-10	17092523.D	Water	09/25/17 19:56
Diesel CCV1	SFI0294-CCV1	17092524.D	NA	09/25/17 20:19
MOIL CCV1	SFI0294-CCV2	17092525.D	NA	09/25/17 20:42
Bunker C CCV1	SFI0294-CCV3	17092526.D	NA	09/25/17 21:04
ZZZZZ	BFI0577-BLK1	17092534.D	Solid	09/26/17 00:05
ZZZZZ	BFI0577-BS1	17092535.D	Solid	09/26/17 00:26
ZZZZZ	17I0328-01	17092536.D	Solid	09/26/17 00:48
ZZZZZ	17I0328-02	17092537.D	Solid	09/26/17 01:11
Diesel CCV2	SFI0294-CCV4	17092538.D	NA	09/26/17 01:32
MOIL CCV2	SFI0294-CCV5	17092539.D	NA	09/26/17 01:55
Bunker C CCV2	SFI0294-CCV6	17092540.D	NA	09/26/17 02:18



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sequence: SFI0326

Instrument: FID4

Calibration: A100084

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Retention Time Standard	SFI0326-IBL1	17092609.D	NA	09/26/17 12:56
Instrument Blank	SFI0326-IBL2	17092610.D	NA	09/26/17 13:20
Diesel ICV	SFI0326-ICV1	17092611.D	NA	09/26/17 13:43
MOIL ICV	SFI0326-ICV2	17092612.D	NA	09/26/17 14:06
Blank	BFI0365-BLK1	17092628.D	Solid	09/26/17 20:17
LCS	BFI0365-BS1	17092629.D	Solid	09/26/17 20:39
SVCA-SB-111-14-16-170913	17I0171-05	17092630.D	Solid	09/26/17 21:02
SVCA-SB-112-12.5-14.5-170913	17I0171-11	17092631.D	Solid	09/26/17 21:23
Diesel CCV1	SFI0326-CCV1	17092632.D	NA	09/26/17 21:47
MOIL CCV1	SFI0326-CCV2	17092633.D	NA	09/26/17 22:08



SURROGATE RECOVERY AND RT SUMMARY

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG/WO: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Sequence: <u>SFI0194</u>	Instrument: <u>FID4</u>
Calibration: <u>AI00051</u>	Calibration Date: <u>09/25/2017</u>

Surrogate Compound	Spike Level mg/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SFI0194-SCV1 (Water)			Lab File ID: 17091816.D			Analyzed: 09/18/17 19:42		
o-Terphenyl	90.000	124	0 - 200	4.44	4.44	0.0000	N/A	



SURROGATE RECOVERY AND RT SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.
 Client: Anchor QEA, LLC
 Sequence: SFI0211
 Calibration: AI00051

SDG/WO: 17I0171
 Project: SCVA Area Z Remediation
 Instrument: FID4
 Calibration Date: 09/25/2017

Surrogate Compound	Spike Level mg/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SFI0211-IBL1 (Water)			Lab File ID: 17092001.D		Analyzed: 09/20/17 09:40			
o-Terphenyl	225.00	98.8	50 - 150	4.44	4.44	0.0000	N/A	
SFI0211-IBL2 (Water)			Lab File ID: 17092002.D		Analyzed: 09/20/17 10:01			
o-Terphenyl	225.00	106	50 - 150	4.44	4.44	0.0000	N/A	
SFI0211-ICV1 (Water)			Lab File ID: 17092003.D		Analyzed: 09/20/17 10:25			
o-Terphenyl	90.000	103	80 - 120	4.43	4.44	-0.0100	N/A	
BFI0364-BLK1 (Solid)			Lab File ID: 17092010.D		Analyzed: 09/20/17 13:02			
o-Terphenyl	22.500	92.0	50 - 150	4.44	4.44	0.0000	N/A	
BFI0364-BS1 (Solid)			Lab File ID: 17092011.D		Analyzed: 09/20/17 13:24			
o-Terphenyl	22.500	87.1	50 - 150	4.44	4.44	0.0000	N/A	
17I0171-12 (Solid)			Lab File ID: 17092015.D		Analyzed: 09/20/17 14:55			
o-Terphenyl	24.813	83.6	50 - 150	4.44	4.44	0.0000	N/A	
17I0171-06 (Solid)			Lab File ID: 17092019.D		Analyzed: 09/20/17 16:35			
o-Terphenyl	24.663	72.0	50 - 150	4.44	4.44	0.0000	N/A	
BFI0366-BLK1 (Water)			Lab File ID: 17092041.D		Analyzed: 09/21/17 00:48			
o-Terphenyl	0.45000	87.6	50 - 150	4.44	4.44	0.0000	N/A	
BFI0366-BS1 (Water)			Lab File ID: 17092042.D		Analyzed: 09/21/17 01:11			
o-Terphenyl	0.45000	95.5	50 - 150	4.44	4.44	0.0000	N/A	
17I0171-15 (Water)			Lab File ID: 17092043.D		Analyzed: 09/21/17 01:32			
o-Terphenyl	0.45000	85.9	50 - 150	4.44	4.44	0.0000	N/A	
17I0171-17 (Water)			Lab File ID: 17092044.D		Analyzed: 09/21/17 01:56			
o-Terphenyl	0.45000	94.2	50 - 150	4.45	4.44	0.0100	N/A	
17I0171-19 (Water)			Lab File ID: 17092045.D		Analyzed: 09/21/17 02:17			
o-Terphenyl	0.45000	88.6	50 - 150	4.44	4.44	0.0000	N/A	
17I0171-21 (Water)			Lab File ID: 17092046.D		Analyzed: 09/21/17 02:40			
o-Terphenyl	0.45000	92.8	50 - 150	4.45	4.44	0.0100	N/A	



SURROGATE RECOVERY AND RT SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.
 Client: Anchor QEA, LLC
 Sequence: SFI0239
 Calibration: AI00051

SDG/WO: 17I0171
 Project: SCVA Area Z Remediation
 Instrument: FID4
 Calibration Date: 09/25/2017

Surrogate Compound	Spike Level mg/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SFI0239-IBL1 (Water)			Lab File ID: 17092101.D		Analyzed: 09/21/17 10:31			
o-Terphenyl	225.00	97.6	50 - 150	4.45	4.44	0.0100	N/A	
SFI0239-IBL2 (Water)			Lab File ID: 17092102.D		Analyzed: 09/21/17 10:53			
o-Terphenyl	225.00	103	50 - 150	4.44	4.44	0.0000	N/A	
SFI0239-ICV1 (Water)			Lab File ID: 17092103.D		Analyzed: 09/21/17 11:15			
o-Terphenyl	90.000	100	80 - 120	4.44	4.44	0.0000	N/A	
BFI0345-BLK1 (Water)			Lab File ID: 17092112.D		Analyzed: 09/21/17 14:38			
o-Terphenyl	0.45000	74.3	50 - 150	4.44	4.44	0.0000	N/A	
BFI0345-BS1 (Water)			Lab File ID: 17092113.D		Analyzed: 09/21/17 15:01			
o-Terphenyl	0.45000	89.2	50 - 150	4.44	4.44	0.0000	N/A	
17I0171-16 (Water)			Lab File ID: 17092122.D		Analyzed: 09/21/17 18:20			
o-Terphenyl	0.52326	90.8	50 - 150	4.44	4.44	0.0000	N/A	
17I0171-18 (Water)			Lab File ID: 17092123.D		Analyzed: 09/21/17 18:41			
o-Terphenyl	0.45000	93.9	50 - 150	4.44	4.44	0.0000	N/A	
17I0171-20 (Water)			Lab File ID: 17092124.D		Analyzed: 09/21/17 19:04			
o-Terphenyl	0.45000	68.0	50 - 150	4.44	4.44	0.0000	N/A	
17I0171-22 (Water)			Lab File ID: 17092125.D		Analyzed: 09/21/17 19:25			
o-Terphenyl	0.45000	81.6	50 - 150	4.44	4.44	0.0000	N/A	



SURROGATE RECOVERY AND RT SUMMARY

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG/WO: <u>17I0171</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SCVA Area Z Remediation</u>
Sequence: <u>SFI0294</u>	Instrument: <u>FID4</u>
Calibration: <u>AI00051</u>	Calibration Date: <u>09/18/2017</u>

Surrogate Compound	Spike Level mg/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SFI0294-ICV1 (Water)			Lab File ID: 17092510.D			Analyzed: 09/25/17 15:01		
o-Terphenyl	90.000	102	80 - 120	4.41	4.44	-0.0300	N/A	



SURROGATE RECOVERY AND RT SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.
 Client: Anchor QEA, LLC
 Sequence: SFI0326
 Calibration: AI00084

SDG/WO: 17I0171
 Project: SCVA Area Z Remediation
 Instrument: FID4
 Calibration Date: 09/26/2017

Surrogate Compound	Spike Level mg/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SFI0326-IBL1 (Solid)			Lab File ID: 17092609.D		Analyzed: 09/26/17 12:56			
o-Terphenyl	225.00	105	50 - 150	4.42	4.44	-0.0200	N/A	
SFI0326-IBL2 (Solid)			Lab File ID: 17092610.D		Analyzed: 09/26/17 13:20			
o-Terphenyl	225.00	104	50 - 150	4.41	4.44	-0.0300	N/A	
SFI0326-ICV1 (Solid)			Lab File ID: 17092611.D		Analyzed: 09/26/17 13:43			
o-Terphenyl	90.000	95.3	80 - 120	4.41	4.44	-0.0300	N/A	
BFI0365-BLK1 (Solid)			Lab File ID: 17092628.D		Analyzed: 09/26/17 20:17			
o-Terphenyl	22.500	76.9	50 - 150	4.41	4.44	-0.0300	N/A	
BFI0365-BS1 (Solid)			Lab File ID: 17092629.D		Analyzed: 09/26/17 20:39			
o-Terphenyl	22.500	93.6	50 - 150	4.42	4.44	-0.0200	N/A	
17I0171-05 (Solid)			Lab File ID: 17092630.D		Analyzed: 09/26/17 21:02			
o-Terphenyl	25.056	76.4	50 - 150	4.41	4.44	-0.0300	N/A	
17I0171-11 (Solid)			Lab File ID: 17092631.D		Analyzed: 09/26/17 21:23			
o-Terphenyl	24.739	79.0	50 - 150	4.41	4.44	-0.0300	N/A	



HOLDING TIME SUMMARY

Analysis: NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 17I0171

Client: Anchor QEA, LLC

Project: SCVA Area Z Remediation

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
SVCA-SB-111-14-16-170913 17I0171-05	09/13/17 14:30	09/14/17 08:58	09/18/17 13:50	4	14	09/26/17 21:02	8	40	
SVCA-SB-111-14-16-170913 17I0171-06	09/13/17 14:30	09/14/17 08:58	09/19/17 10:20	5	14	09/20/17 16:35	1	40	
SVCA-SB-112-12.5-14.5-170913 17I0171-11	09/13/17 16:10	09/14/17 08:58	09/18/17 13:50	4	14	09/26/17 21:23	8	40	
SVCA-SB-112-12.5-14.5-170913 17I0171-12	09/13/17 16:10	09/14/17 08:58	09/19/17 10:20	5	14	09/20/17 14:55	1	40	
SVCA-GW-109-14-19-170913 17I0171-15	09/13/17 11:10	09/14/17 08:58	09/18/17 15:27	5	7	09/21/17 01:32	2	40	
SVCA-GW-109-14-19-170913 17I0171-16	09/13/17 11:10	09/14/17 08:58	09/18/17 12:07	5	7	09/21/17 18:20	3	40	
SVCA-GW-110-14-19-170913 17I0171-17	09/13/17 12:57	09/14/17 08:58	09/18/17 15:27	5	7	09/21/17 01:56	2	40	
SVCA-GW-110-14-19-170913 17I0171-18	09/13/17 12:57	09/14/17 08:58	09/18/17 12:07	4	7	09/21/17 18:41	3	40	
SVCA-GW-111-14-19-170913 17I0171-19	09/13/17 15:45	09/14/17 08:58	09/18/17 15:27	4	7	09/21/17 02:17	2	40	
SVCA-GW-111-14-19-170913 17I0171-20	09/13/17 15:45	09/14/17 08:58	09/18/17 12:07	4	7	09/21/17 19:04	3	40	
SVCA-GW-112-12.5-17.5-170913 17I0171-21	09/13/17 17:03	09/14/17 08:58	09/18/17 15:27	4	7	09/21/17 02:40	2	40	
SVCA-GW-112-12.5-17.5-170913 17I0171-22	09/13/17 17:03	09/14/17 08:58	09/18/17 12:07	4	7	09/21/17 19:25	3	40	

* Indicates hold time exceedance.



METHOD DETECTION AND REPORTING LIMITS

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 1710171

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Solid

Instrument: FID4

Analyte	MDL	RL	Units
Diesel Range Organics (C12-C24)	2.34	5.00	mg/kg
Motor Oil Range Organics (C24-C38)	2.99	10.0	mg/kg



METHOD DETECTION AND REPORTING LIMITS

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 1710171

Client: Anchor OEA, LLC

Project: SCVA Area Z Remediation

Matrix: Water

Instrument: FID4

Analyte	MDL	RL	Units
Diesel Range Organics (C12-C24)	0.033	0.100	mg/L
Motor Oil Range Organics (C24-C38)	0.056	0.200	mg/L

EARTHWORM TOXICITY TESTING RESULTS

SVCA AREA Z REMEDIATION

BELLINGHAM, WA

Prepared for

Anchor QEA, LLC
Seattle, WA

On behalf of:

Sudden Valley Community Association
Bellingham, WA

Prepared by

EcoAnalysts, Inc.
4770 NE View Drive
PO Box 216
Port Gamble, WA 98364

Client Contract Reference:

Port Gamble Earthworm Bioaccumulation Tests 2015. 130388-01.03

Report ID

101017.01

Submittal Date

October 11, 2017

All testing reported herein was performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and EcoAnalysts is not responsible for use of less than the complete report. The test results summarized in this report apply only to the sample(s) evaluated.

PREPARED BY

Brian Hester

Brian Hester

Laboratory Director

Authors:

Brian Hester

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APPENDICES

- Appendix A: Laboratory Documents and Organism Receipt Logs
- Appendix B: Chain of Custody Logs

ACRONYMS AND ABBREVIATIONS

cm:	Centimeter
°C:	Degrees Celsius
G:	Grams
in:	Inch
L:	Liter
µm:	micrometer
mg/L:	milligrams per liter
mL:	Milliliter
mm:	millimeter
NELAP:	National Environmental Laboratory Accreditation Program
SOP:	Standard operation procedure
WA:	Washington State
WDOE:	Washington Department of Ecology

1. INTRODUCTION

Anchor QEA, Inc. (Anchor) requested EcoAnalysts to evaluate soil samples in support of an environmental remediation program being conducted for the Sudden Valley Community Association (SVCA) Site in Bellingham, Washington. EcoAnalysts was requested to perform a 14-day earthworm soil toxicity test in support of the Washington Department of Ecology's (WDOE) terrestrial risk evaluation process. Soils samples evaluated were from a site identified as Area Z.

2. METHODS

This section summarizes the test methods that were followed for this biological characterization. Soils were evaluated using a 14-day earthworm toxicity test. Test method followed guidance provided by the Washington Department of Ecology Publication No. 96-327 (Earthworm Bioassay Protocol for Soil Toxicity Screening) and the project specific scope of services (Anchor QEA 2017).

2.1 Sample and Test Biota Receipt

Three test soils were collected by Anchor QEA personnel on August 23, 2017. The soil samples were delivered by courier from Analytical Resources, Inc (ARI) and received on September 1 and 5, 2017. The three samples include one sample (SVCA-TP-100-0-4-170823) that was identified as project reference samples to which the responses of the other two treatments would be compared to. A fabricated soil matrix was prepared following ASTM guidance to be used as control material. Sample descriptions and nomenclature are summarized in Table 2-1.

Table 2-1. Sample Identification

Sample ID	Matrix	Type
SVCA-TP-102-0-2-170823	Terrestrial Soil	Project (Test) Soil
SVCA-TP-103-0-2-170823	Terrestrial Soil	Project (Test) Soil
SVCA-TP-100-0-4-170823	Terrestrial Soil	Project (Reference) Soil
Control	Fabricated Soil Matrix	Control

The earthworms *Eisenia foetida* were supplied by Aquatic Research Organisms in Hampton, New Hampshire and were held in moist peat moss at 22°C prior to test initiation.

2.2 Earthworm Toxicity Test

The 14-day earthworm toxicity test was performed on three soil samples collected from the project site.

Test exposures were prepared with approximately 200 grams (g) of soil placed inside of a 470 milliliter (mL) glass beaker. Three replicate chambers were prepared for each test treatment. The laboratory control soil was a fabricated (artificial) soil prepared following procedures detailed in the WDOE guidance document (WDOE 1996). All soils were hydrated with deionized laboratory water to approximately 35-45 percent moisture prior to organism addition.

Test chambers were placed in randomly assigned positions in a temperature controlled environmental space at 22°C under continuous lighting. The soil pH was measured on each treatment prior to test initiation and at test termination. Soil pH was measured by combining 20mL of soil with 20mL of deionized laboratory water and mixing thoroughly. Measurements were taken immediately upon mixing and again after approximately 30 minutes. Temperature of the environmental space was monitored daily until test termination.

The tests were initiated by randomly allocating ten (10) *Eisenia foetida* worms into each test chamber, ensuring that each of the worms successfully buried into the soil. Worms that did not bury within approximately one hour were replaced with healthy animals. The 14-day bioassay was not fed during the exposure period.

At test termination, soil from each test chamber was wet-sieved through a 0.5-mm screen and all recovered animals transferred to a Petri dish. The number of surviving and dead worms was determined.

2.3 Data Management and Analysis

Endpoint data were calculated for each replicate and the mean value and standard deviation were determined for each test treatment. All hand-entered data were reviewed for data entry errors, which were corrected prior to summary calculations. A minimum of 10% of all calculations and data sorting were reviewed for errors.

Experiment-wide survival data was analyzed using one-way analysis of variance (ANOVA). When ANOVA showed a significant difference, multiple comparison t-tests then compared survival in each of the control and test sediments against survival in the reference sediments. Prior to analyses, normality and homogeneity of variance was assessed. When necessary to satisfy these assumptions, proportional survival data were arcsine square-root transformed. Solid-phase analyses were performed with GraphPad Prism, Version 7.03. Statistical analyses of all dose-response tests were performed using CETIS Comprehensive Toxicity Data Analysis and Database Software version 1.9.2.6. Comparisons between the lab control and each test concentration were performed following recommended USEPA decision matrices (USEPA 2002).

3. RESULTS

The results of the bioassay, including summaries of test results and observations are presented in this section. Laboratory documents and organism receipt logs are provided in Appendix A and chain of custody logs are provided in Appendix B.

3.1 Earthworm Bioassay

The soil toxicity test with *E. foetida* was initiated on September 6, 2017 and was validated by 100% survival in the laboratory control. These values met the desired acceptability benchmark of $\geq 90\%$ survival. Mean survival results for all samples were greater than 90% and are summarized in Table 3-1. The test conditions are summarized in Table 3-2.

Temperature and soil pH values were within the acceptable limits throughout the duration of the test.

Table 3-1. Earthworm Bioaccumulation Survival Results

Sample ID	Rep	Initial #	Final #	% Survival	Mean % Survival
Control	1	10	10	100	100
	2	10	10	100	
	3	10	10	100	
SVCA-TP-100-0-4-170823 (Reference)	1	10	10	100	100
	2	10	10	100	
	3	10	10	100	
SVCA-TP-102-0-2-170823	1	10	10	100	100
	2	10	10	100	
	3	10	10	100	
SVCA-TP-103-0-2-170823	1	10	9	90	96.7
	2	10	10	100	
	3	10	10	100	

Table 3-2. Test Condition Summary for the 14-Day *Eisenia foetida* Bioaccumulation Test.

Test Duration / Type	14-Day; Static	
Date sampled	August 23, 2017	
Date received	September 1, 5, 2017	
Sample storage conditions	4°C, dark	
Test dates	September 6 – 20, 2017	
Species	<i>Eisenia foetida</i>	
Supplier	Aquatic Research Organisms, Hampton, New Hampshire	
Date acquired	September 6, 2017	
Age at test initiation	Adult	
Test Procedures	WDOE Publication No. 96-327	
Test location	EcoAnalysts, Port Gamble, WA	
Control soil	Artificial Soil	
Test lighting	24-hour light; 400 lux	
Test chamber	470 mL Beaker	
Exposure volume	200 g soil	
Replicates/treatment	3	
Organisms/replicate	10	
Feeding	None	
Test renewal	None	
Test Observations		
Test temperature	Targeted: 22 ± 2°C	Actual: 21.2 – 23.6 °C
Test soil pH	Recommended: 5 – 9	Actual: 5.5 – 7.9
Quality Assurance		
Control performance standard (Fabricated Control)	Recommended: ≥ 90% survival	Actual: 100%, Pass
Reference Toxicant Date	September 21, 2017	
Reference Toxicant LC50	11.7 mg 2-chloroacetamide / kg	
Laboratory Mean LC50	13.3 mg 2-chloroacetamide / kg	
Acceptable Range LC50 (± sd)	7.8 – 18.7 mg 2-chloroacetamide / kg (Within Range)	
Deviations from Test Protocol	None	

4. CONCLUSION

The 14-day earthworm toxicity test summarized in this report resulted in greater than 90% survival amongst all soils evaluated. This finding suggests that the organisms used in this study were healthy and capable of surviving for the 14 day exposure period. This also indicates that the project soils were capable of supporting adequate worm survival within the acceptability criterion established for a valid test control. Statistically significant reduction in survival was not detected in the two project sediments when compared to the reference soil (SVCA-TP-100-0-4-170823). These results are summarized in the table below. Temperature and soil pH was measured within the acceptable ranges during the course of the test. No significant deviations were observed.

Table 4-1. Statistical Comparison for *Eisenia foetida* 14 Day Survival.

Sample ID	Mean Survival (%)	Compared To:	Statistically Different than Reference? (P=0.05)
Control	100		
SVCA-TP-100-0-4-170823 (Reference)	100		
SVCA-TP-102-0-2-170823	100	SVCA-TP-100-0-4-170823 (Reference)	No
SVCA-TP-103-0-2-170823	96.7	SVCA-TP-100-0-4-170823 (Reference)	No

5. REFERENCES

- WDOE 1996. Earthworm Bioassay Protocol for Soil Toxicity Screening. Washington State Department of Ecology (WDOE) Environmental Investigation and Laboratory Services Program Publication No. 96-327. 1996
- Anchor QEA 2017. Scope of Services for Sudden Valley Community Association – Area Z Remediation (Revision 1). Anchor QEA, LLC. Prepared for: Wilson Engineering, LLC. May 4, 2017
- ASTM E1676-12, Standard Guide for Conducting Laboratory Soil Toxicity or Bioaccumulation Tests with the Lumbricid Earthworm *Eisenia Fetida* (sic) and the Enchytraeid Potworm *Enchytraeus albidus*, ASTM International, West Conshohocken, PA, 2012, www.astm.org

APPENDIX

APPENDIX A. Test Data, Statistical Analyses, and Reference Toxicant Test Results

1. *Eisensia foetida* 14-Day Soil Toxicity Test

1.1 *Eisensia foetida* Test Data

1.2 *Eisensia foetida* Statistical Results

1.3 *Eisensia foetida* Reference Toxicant Test Results

APPENDIX B. Chain-of-Custody Log and Pre-Test Documents

**APPENDIX A. TEST DATA, STATISTICAL ANALYSES, AND REFERENCE
TOXICANT TEST RESULTS**

1. *Eisensia foetida* 14-Day Soil Toxicity Test

1.1 *Eisensia foetida* Test Data

CLIENT		PROJECT			JOB NO.	PROJECT MANAGER			LABORATORY		PROTOCOL		SPECIES								
Anchor QEA		SVCA Area Z Remediation			PG1094	B. Hester			Test Room		WDOE 96-327		Eisinia foetida								
Observation Key				ENDPOINT DATA & OBSERVATIONS																	
#S# Number on the Surface (surface of soil) #M# Number of Mortality (Dead on surface) #A# Avoidance (Avoiding soil, on sides or top chamber) N=Normal				INITIAL # OF ORGANISMS 10		DATE / TECHN.	9/7/17 UB	9/8/17 JK	9/9/17 UB	9/10/17 LA	9/11/17 JK	9/12/17 UB	9/13/17 JK	9/14/17 JK	9/15/17 JK	9/16/17 UB	9/17/17 JK	9/18/17 JK	9/19/17 JK	9/20/17 MK	Number Remaining
CLIENT ID	REP	INITIAL # IF DIFF	Jar #	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14			
Control	1				N	N	N	N	N	N	N	N	N	N	N	N	N	N	10		
Control	2				↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	10		
Control	3				↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	10		
SVCA-TP-100-0-4-170823	1				↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	10		
SVCA-TP-100-0-4-170823	2				↓	↓	↓	↓	↓	↓	↓	↓	⊙	⊙	⊙	⊙	⊙	⊙	10		
SVCA-TP-100-0-4-170823	3				↓	↓	↓	↓	↓	↓	↓	↓	⊙	⊙	⊙	⊙	⊙	⊙	10		
SVCA-TP-102-0-2-170823	1				↓	↓	↓	↓	↓	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	10		
SVCA-TP-102-0-2-170823	2				↓	↓	↓	↓	↓	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	10		
SVCA-TP-102-0-2-170823	3				↓	↓	↓	↓	↓	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	10		
SVCA-TP-103-0-2-170823	1				↓	↓	↓	↓	↓	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	10		
SVCA-TP-103-0-2-170823	2				↓	↓	↓	↓	↓	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	10		
SVCA-TP-103-0-2-170823	3				↓	↓	↓	↓	↓	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	10		
SVCA-TP-103-0-2-170823	2				↓	↓	↓	↓	↓	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	10		
SVCA-TP-103-0-2-170823	3				↓	↓	↓	↓	↓	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	10		

Initial 10 worms = 4.8 g

⊙ small plant sprouted in jar, UB 9/12

14-DAY SOIL TOXICITY DATA SHEET

End time: 1410 9/20/17
Start time: 1455

CLIENT Anchor QEA	PROJECT SVCA Area Z Remediation	SPECIES 1 <i>Eisinia foetida</i>	LABORATORY Port Gamble Test Room	PROTOCOL WDOE 96-327
JOB NUMBER PG1094	PROJECT MANAGER B. Hester		TEST START DATE 6-Sep-2017	TEST END DATE 20-Sep-2017

SOIL QUALITY DATA

TEST CONDITIONS		pH			TEMP (°C)				
		5 - 9			22±2				
CLIENT ID	DAY	pH			TEMP		Tech	Date	Comments
		meter	T _{0min}	T _{30min}	meter	°C			
Control / .	0	9	7.8	7.8	Therm. #2	21.2	ME	9/06/17	T ₀ = 1330
Control / .	1					23.2	UB	9/7/17	—
Control / .	2					23.3	u	9/08/17	
Control / .	3					23.2	UB	9/9/17	—
Control / .	4					23.1	ME	9/10/17	—
Control / .	5					23.6	ME	9/11/17	—
Control / .	6					23.1	UB	9/12/17	—
Control / .	7					22.9	ME	9/13/17	—
Control / .	8					23.3	ME	9/14/17	—
Control / .	9					23.3	JL	9/15/17	—
Control / .	10					23.1	UB	9/16/17	—
Control / .	11					23.3	ME	9/17/17	—
Control / .	12					23.1	ME	9/18/17	—
Control / .	13					23.4	ME	9/19/17	—
Control / .	14	9	7.9	7.7	↓	23.2	ME	9/20/17	T ₀ = 1455

14-DAY SOIL TOXICITY DATA SHEET

CLIENT Anchor QEA	PROJECT SVCA Area Z Remediation	SPECIES 1 <i>Eisinia foetida</i>	LABORATORY Port Gamble Test Room	PROTOCOL WDOE 96-327
JOB NUMBER PG1094	PROJECT MANAGER B. Hester		TEST START DATE 6-Sep-2017	TEST END DATE 20-Sep-2017

SOIL QUALITY DATA

TEST CONDITIONS		pH			TEMP (°C)				
		5 - 9			22±2				
CLIENT ID	DAY	pH			TEMP		Tech	Date	Comments
		meter	T ^{0min}	T ^{30min}	meter	°C			
SVCA-TP-100-0-4-170823 /	0	9	5.8	5.8			HE	9/06/17	T ₀ = 1418
SVCA-TP-100-0-4-170823 /	1						UB	9/7	—
SVCA-TP-100-0-4-170823 /	2						/		
SVCA-TP-100-0-4-170823 /	3								
SVCA-TP-100-0-4-170823 /	4								
SVCA-TP-100-0-4-170823 /	5								
SVCA-TP-100-0-4-170823 /	6								
SVCA-TP-100-0-4-170823 /	7								
SVCA-TP-100-0-4-170823 /	8								
SVCA-TP-100-0-4-170823 /	9								
SVCA-TP-100-0-4-170823 /	10								
SVCA-TP-100-0-4-170823 /	11								
SVCA-TP-100-0-4-170823 /	12								
SVCA-TP-100-0-4-170823 /	13								
SVCA-TP-100-0-4-170823 /	14	9	5.7	5.8				MK	9/20/17	T_{0} = 1455

14-DAY SOIL TOXICITY DATA SHEET

CLIENT Anchor QEA	PROJECT SVCA Area Z Remediation	SPECIES 1 <i>Eisinia foetida</i>	LABORATORY Port Gamble Test Room	PROTOCOL WDOE 96-327
JOB NUMBER PG1094	PROJECT MANAGER B. Hester		TEST START DATE 6-Sep-2017	TEST END DATE 20-Sep-2017

SOIL QUALITY DATA

TEST CONDITIONS		pH			TEMP (°C)				
		5 - 9			22±2				
CLIENT ID	DAY	pH			TEMP		Tech	Date	Comments
		meter	T ^{0min}	T ^{30min}	meter	°C			
SVCA-TP-102-0-2-170823 /	0	9	6.3	6.1			HE	9/06/17	T ₀ = 1402
SVCA-TP-102-0-2-170823 /	1						MS	9/7	→
SVCA-TP-102-0-2-170823 /	2						/		
SVCA-TP-102-0-2-170823 /	3								
SVCA-TP-102-0-2-170823 /	4								
SVCA-TP-102-0-2-170823 /	5								
SVCA-TP-102-0-2-170823 /	6								
SVCA-TP-102-0-2-170823 /	7								
SVCA-TP-102-0-2-170823 /	8								
SVCA-TP-102-0-2-170823 /	9								
SVCA-TP-102-0-2-170823 /	10								
SVCA-TP-102-0-2-170823 /	11								
SVCA-TP-102-0-2-170823 /	12								
SVCA-TP-102-0-2-170823 /	13								
SVCA-TP-102-0-2-170823 /	14	9	6.0	6.1				MK	9/20/17	T_{0} = 1500

14-DAY SOIL TOXICITY DATA SHEET

CLIENT Anchor QEA	PROJECT SVCA Area Z Remediation	SPECIES 1 <i>Eisinia foetida</i>	LABORATORY Port Gamble Test Room	PROTOCOL WDOE 96-327
JOB NUMBER PG1094	PROJECT MANAGER B. Hester		TEST START DATE 6-Sep-2017	TEST END DATE 20-Sep-2017

SOIL QUALITY DATA

TEST CONDITIONS		pH			TEMP (°C)				
		5 - 9			22±2				
CLIENT ID	DAY	pH			TEMP		Tech	Date	Comments
		meter	T ^{0min}	T ^{30min}	meter	°C			
SVCA-TP-103-0-3-170823 /	0	9	5.8	5.7			ME	9/06/17	T ₀ = 1413
SVCA-TP-103-0-3-170823 /	1						UB	9/7	—
SVCA-TP-103-0-3-170823 /	2								
SVCA-TP-103-0-3-170823 /	3								
SVCA-TP-103-0-3-170823 /	4								
SVCA-TP-103-0-3-170823 /	5								
SVCA-TP-103-0-3-170823 /	6								
SVCA-TP-103-0-3-170823 /	7								
SVCA-TP-103-0-3-170823 /	8								
SVCA-TP-103-0-3-170823 /	9								
SVCA-TP-103-0-3-170823 /	10								
SVCA-TP-103-0-3-170823 /	11								
SVCA-TP-103-0-3-170823 /	12								
SVCA-TP-103-0-3-170823 /	13								
SVCA-TP-103-0-3-170823 /	14	9	5.5	5.6			MK	9/20/17	T ₀ = 1500

2 BH

ORGANISM RECEIPT LOG

Date: 9/6/17		Time: 1230		Batch No. ⁵⁸ AR074670			
Organism: Eisenia Foetida							
Source / Supplier: ARO							
No. Ordered: 500		No. Received: 500 +		Source Batch: Collection date, hatch date, etc.): 090517EF			
Condition of Organisms: good			Approximate Size or Age: (Days from hatch, life stage, size class, etc.): 790 days				
Shipper: Fedex			B of L (Tracking No.): 7876 2467 7458				
Condition of Container: good			Received By: AK				
Container	D.O. (mg/L)	Temp. (°C)	Cond. or Sal. (Include Units)	pH (Units)	# Dead	% Dead*	Tech. (Initials)
1 (2)	—	20.0	—	—			AK
*if >10% contact lab manager							
Notes: DIE AK 9/6 (2) shipped dry no w/g AK 9/6							



Aquatic Research Organisms

DATA SHEET

I. Organism History

Species: EISENIA foetida

Source: Lab reared _____ Hatchery reared Field collected _____

Hatch date mixed age Adults Receipt date _____
> 90 DAYS

Lot number 090517 EF Strain _____

Brood Origination F1

II. Water Quality NOT applicable

Temperature _____ °C Salinity _____ ppt DO _____

pH _____ Hardness _____ ppm

III. Culture Conditions

System: TOPSOIL/PEAT MASS

Diet: Flake Food _____ Phytoplankton _____ Trout Chow _____

Brine Shrimp _____ Rotifers _____ Other _____

Prophylactic Treatments: _____

Comments: KEEP WORMS MOIST, NOT WET
KEEP COOL, PLACE FEED ON TOP OF SOIL

IV. Shipping Information

Client: ECO ANALYSTS # of Organisms: 500+

Carrier: FED. EX Date Shipped: 09/05/17

Biologist: Stan Simitok

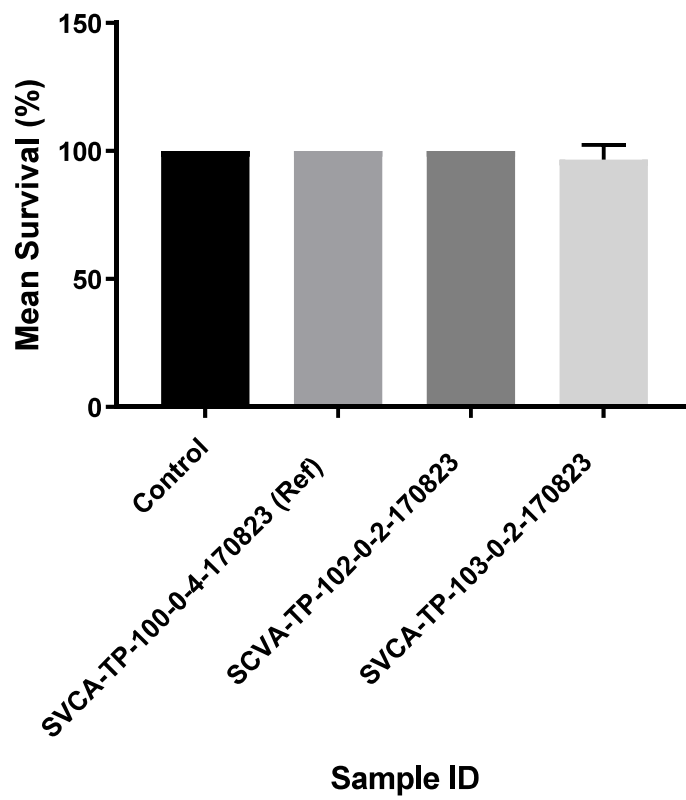
1 - 800 - 927 - 1650

PO Box 1271 • One Lafayette Road • Hampton, NH 03842 • (603) 926-1650

1.2 *Eisensia foetida* Statistical Results

Constant	Value
Experiment Date	9/6/2017
Client	Anchor QEA
Project	SVCA Area Z Remediation
Project Number	PG1094
Species	Survival
Test Type	14-Day Survival

E. foetida Mean Survival



1way ANOVA Multiple comparisons					
1	Number of families	1			
2	Number of comparisons per family	3			
3	Alpha	0.05			
4					
5	Holm-Sidak's multiple comparisons test	Mean Diff.	Significant?	Summary	Adjusted P Value
6					
7	SVCA-TP-100-0-4-170823 (Ref) vs. Cc	0	No	ns	>0.9999
8	SVCA-TP-100-0-4-170823 (Ref) vs. SC	0	No	ns	>0.9999
9	SVCA-TP-100-0-4-170823 (Ref) vs. SV	0.1073	No	ns	0.4784
10					
11					
12	Test details	Mean 1	Mean 2	Mean Diff.	SE of diff.
13					
14	SVCA-TP-100-0-4-170823 (Ref) vs. Cc	1.571	1.571	0	0.07584
15	SVCA-TP-100-0-4-170823 (Ref) vs. SC	1.571	1.571	0	0.07584
16	SVCA-TP-100-0-4-170823 (Ref) vs. SV	1.571	1.464	0.1073	0.07584

1				
2				
3				
4				
5	B-?			
6				
7	A	Control		
8	C	SCVA-TP-102-0-2-170823		
9	D	SVCA-TP-103-0-2-170823		
10				
11				
12	n1	n2	t	DF
13				
14	3	3	0	8
15	3	3	0	8
16	3	3	1.414	8

1way ANOVA Descriptive Statistics		Control	SVCA-TP-100-0-4-170823 (Ref)	SCVA-TP-102-0-2-170823	SVCA-TP-103-0-2-170823
1	Number of values	3	3	3	3
2					
3	Minimum	1.571	1.571	1.571	1.249
4	25% Percentile	1.571	1.571	1.571	1.249
5	Median	1.571	1.571	1.571	1.571
6	75% Percentile	1.571	1.571	1.571	1.571
7	Maximum	1.571	1.571	1.571	1.571
8					
9	Mean	1.571	1.571	1.571	1.464
10	Std. Deviation	0	0	0	0.1858
11	Std. Error of Mean	0	0	0	0.1073
12					
13	Lower 95% CI	1.571	1.571	1.571	1.002
14	Upper 95% CI	1.571	1.571	1.571	1.925

	Group A	Group B	Group C	Group D
	Control	SVCA-TP-100-0-4-170823 (Ref)	SCVA-TP-102-0-2-170823	SVCA-TP-103-0-2-170823
	Y	Y	Y	Y
1	100	100	100	90
2	100	100	100	100
3	100	100	100	100

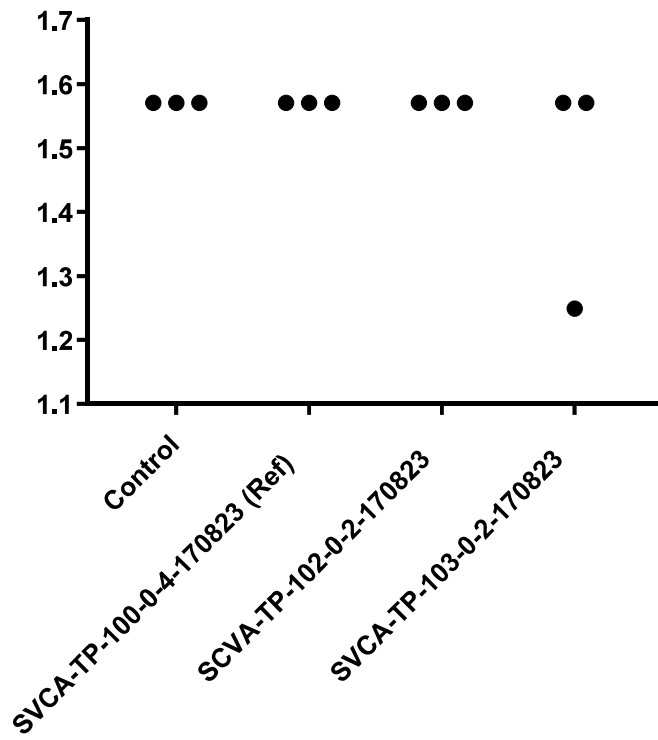
Transform	A	B	C	D
	Control	SVCA-TP-100-0-4-170823 (Ref)	SCVA-TP-102-0-2-170823	SVCA-TP-103-0-2-170823
	Y	Y	Y	Y
1	1.571	1.571	1.571	1.249
2	1.571	1.571	1.571	1.571
3	1.571	1.571	1.571	1.571

1way ANOVA ANOVA		
1	Table Analyzed	Transform of Data 1
2	Data sets analyzed	A : Control
3		
4	ANOVA summary	
5	F	1
6	P value	0.4411
7	P value summary	ns
8	Significant diff. among means (P < 0.05)?	No
9	R square	0.2727
10		
11	Brown-Forsythe test	
12	F (DFn, DFd)	1 (3, 8)
13	P value	0.4411
14	P value summary	ns
15	Are SDs significantly different (P < 0.05)?	No
16		
17	Bartlett's test	
18	Bartlett's statistic (corrected)	
19	P value	
20	P value summary	
21	Are SDs significantly different (P < 0.05)?	
22		
23	ANOVA table	SS
24	Treatment (between columns)	0.02588
25	Residual (within columns)	0.06902
26	Total	0.0949
27		
28	Data summary	
29	Number of treatments (columns)	4
30	Number of values (total)	12

1			
2	B : SVCA-TP-100-0-4-170823 (Ref)	C : SCVA-TP-102-0-2-170823	D : SVCA-TP-103-0-2-170823
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23	DF	MS	F (DFn, DFd)
24	3	0.008627	F (3, 8) = 1
25	8	0.008627	
26	11		
27			
28			
29			
30			

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	
22	
23	P value
24	P=0.4411
25	
26	
27	
28	
29	
30	

Transform of Data 1



1.3 *Eisensia foetida* Reference Toxicant Test Results

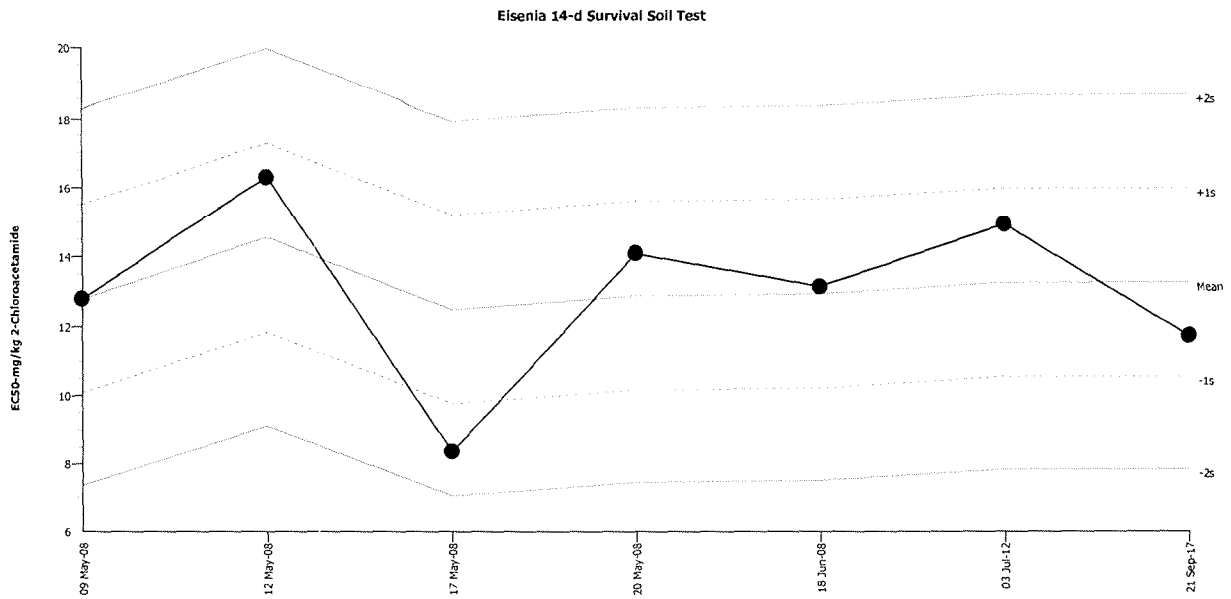
Eisenia 14-d Survival Soil Test

All Matching Labs

Test Type: Survival
Protocol: WDOE 1996

Organism: Eisenia fetida (Red worm)
Endpoint: Proportion Survived

Material: 2-Chloroacetamide
Source: Reference Toxicant-REF



Mean: 13.28 Count: 6 -1s Warning Limit: 10.56 -2s Action Limit: 7.848
 Sigma: 2.716 CV: 20.50% +1s Warning Limit: 16 +2s Action Limit: 18.71

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2008	May	9	0:00	12.8	-0.4808	-0.177			03-7045-3312	08-0293-7348	NewFields
2			12	0:00	16.3	3.024	1.113	(+)		06-6813-2369	06-8879-9526	NewFields
3			17	0:00	8.375	-4.905	-1.806	(-)		04-0646-2279	11-4335-9796	NewFields
4			20	0:00	14.1	0.8227	0.3029			02-7999-0777	20-6103-4174	NewFields
5		Jun	18	0:00	13.16	-0.123	-0.04528			15-7464-3863	11-8764-3791	NewFields
6	2012	Jul	3	16:30	14.94	1.661	0.6115			13-0900-8909	14-6931-2807	NewFields
7	2017	Sep	21	14:30	11.74	-1.539	-0.5667			16-6998-9740	06-6437-4456	EcoAnalysts

CETIS Analytical Report

Report Date: 10 Oct-17 10:58 (p 1 of 2)
 Test Code: 638A056C | 16-6998-9740

Eisenia 14-d Survival Soil Test EcoAnalysts

Analysis ID: 09-2205-6810	Endpoint: Proportion Survived	CETIS Version: CETISv1.9.2
Analyzed: 10 Oct-17 10:53	Analysis: Parametric-Multiple Comparison	Official Results: Yes
Batch ID: 16-0369-5534	Test Type: Survival	Analyst: Brian Hester
Start Date: 21 Sep-17 14:30	Protocol: WDOE 1996	Diluent: Deionized Water
Ending Date: 05 Oct-17 13:00	Species: Eisenia fetida	Brine: Not Applicable
Duration: 13d 22h	Source: Aquatic Research Organisms, NH	Age:
Sample ID: 05-2561-5541	Code: 1F5441B5	Client: Internal Lab
Sample Date: 18 Feb-09 14:19	Material: 2-Chloroacetamide	Project: Reference Toxicant
Receipt Date: 18 Feb-09 14:19	Source: Reference Toxicant	
Sample Age: 3137d 0h	Station: P170911.01	

Data Transform	Alt Hyp	Comparison Result	PMSD
Angular (Corrected)	C > T	10mg/kg passed proportion survived	59.72%

Bonferroni Adj t Test

Control	vs	Conc-mg/kg	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Negative Control		10	1.767	2.132	0.684	4	CDF	0.0760	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.799	1.887	0.1214	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.481667	0.481667	1	3.121	0.1520	Non-Significant Effect
Error	0.617308	0.154327	4			
Total	1.09897		5			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	10.66	21.2	0.0309	Equal Variances
Variances	Mod Levene Equality of Variance Test	0.6662	98.5	0.5001	Equal Variances
Variances	Variance Ratio F Test	33.86	199	0.0574	Equal Variances
Distribution	Kolmogorov-Smirnov D Test	0.2281	0.3704	0.5364	Normal Distribution
Distribution	Shapiro-Wilk W Normality Test	0.8609	0.43	0.1924	Normal Distribution

Proportion Survived Summary

Conc-mg/kg	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	0.9667	0.8232	1.0000	1.0000	0.9000	1.0000	0.0333	5.97%	0.00%
10		3	0.5333	0.0000	1.0000	0.8000	0.0000	0.8000	0.2667	86.60%	44.83%
15		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%
20		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%
30		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%
40		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%

Angular (Corrected) Transformed Summary

Conc-mg/kg	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	N	3	1.358	1.124	1.591	1.412	1.249	1.412	0.05432	6.93%	0.00%
10		3	0.791	-0.5691	2.151	1.107	0.1588	1.107	0.3161	69.22%	41.74%
15		3	0.1588	0.1588	0.1588	0.1588	0.1588	0.1588	0	0.00%	88.31%
20		3	0.1588	0.1588	0.1588	0.1588	0.1588	0.1588	0	0.00%	88.31%
30		3	0.1588	0.1588	0.1588	0.1588	0.1588	0.1588	0	0.00%	88.31%
40		3	0.1588	0.1588	0.1588	0.1588	0.1588	0.1588	0	0.00%	88.31%

CETIS Analytical Report

Report Date: 10 Oct-17 10:58 (p 2 of 2)
 Test Code: 638A056C | 16-6998-9740

Eisenia 14-d Survival Soil Test

EcoAnalysts

Analysis ID: 09-2205-6810 Endpoint: Proportion Survived
 Analyzed: 10 Oct-17 10:53 Analysis: Parametric-Multiple Comparison

CETIS Version: CETISv1.9.2
 Official Results: Yes

Proportion Survived Detail

Conc-mg/kg	Code	Rep 1	Rep 2	Rep 3
0	N	1.0000	1.0000	0.9000
10		0.0000	0.8000	0.8000
15		0.0000	0.0000	0.0000
20		0.0000	0.0000	0.0000
30		0.0000	0.0000	0.0000
40		0.0000	0.0000	0.0000

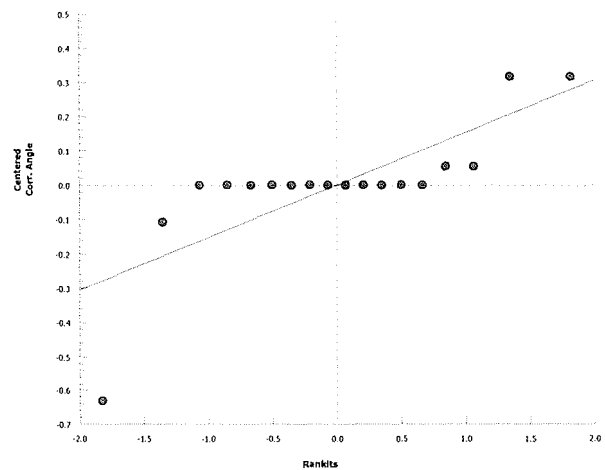
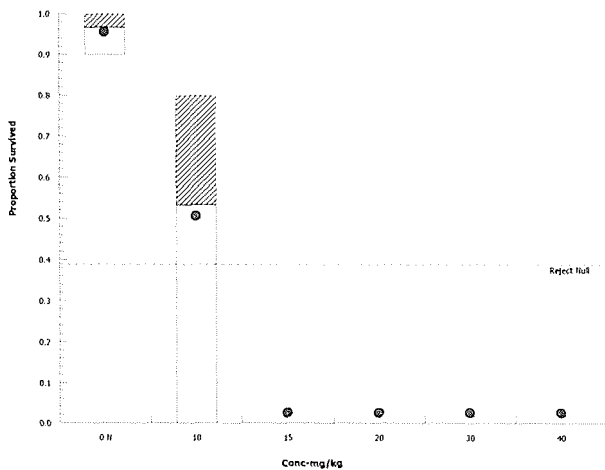
Angular (Corrected) Transformed Detail

Conc-mg/kg	Code	Rep 1	Rep 2	Rep 3
0	N	1.412	1.412	1.249
10		0.1588	1.107	1.107
15		0.1588	0.1588	0.1588
20		0.1588	0.1588	0.1588
30		0.1588	0.1588	0.1588
40		0.1588	0.1588	0.1588

Proportion Survived Binomials

Conc-mg/kg	Code	Rep 1	Rep 2	Rep 3
0	N	10/10	10/10	9/10
10		0/10	8/10	8/10
15		0/10	0/10	0/10
20		0/10	0/10	0/10
30		0/10	0/10	0/10
40		0/10	0/10	0/10

Graphics



CETIS Analytical Report

Report Date: 10 Oct-17 10:58 (p 1 of 2)
 Test Code: 638A056C | 16-6998-9740

Eisenia 14-d Survival Soil Test

EcoAnalysts

Analysis ID: 06-6437-4456	Endpoint: Proportion Survived	CETIS Version: CETISv1.9.2
Analyzed: 10 Oct-17 10:53	Analysis: Trimmed Spearman-Kärber	Official Results: Yes
Batch ID: 16-0369-5534	Test Type: Survival	Analyst: Brian Hester
Start Date: 21 Sep-17 14:30	Protocol: WDOE 1996	Diluent: Deionized Water
Ending Date: 05 Oct-17 13:00	Species: Eisenia fetida	Brine: Not Applicable
Duration: 13d 22h	Source: Aquatic Research Organisms, NH	Age:
Sample ID: 05-2561-5541	Code: 1F5441B5	Client: Internal Lab
Sample Date: 18 Feb-09 14:19	Material: 2-Chloroacetamide	Project: Reference Toxicant
Receipt Date: 18 Feb-09 14:19	Source: Reference Toxicant	
Sample Age: 3137d 0h	Station: P170911.01	

Trimmed Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	EC50	95% LCL	95% UCL
Control Threshold	0.03333	17.24%	1.07	0.01086	11.74	11.17	12.34

Proportion Survived Summary

Calculated Variate(A/B)

Conc-mg/kg	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	N	3	0.9667	0.9000	1.0000	0.0333	0.0577	5.97%	0.0%	29	30
10		2	0.8000	0.8000	0.8000	0.0000	0.0000	0.00%	17.24%	16	20
15		3	0.0000	0.0000	0.0000	0.0000	0.0000		100.0%	0	30
20		3	0.0000	0.0000	0.0000	0.0000	0.0000		100.0%	0	30
30		3	0.0000	0.0000	0.0000	0.0000	0.0000		100.0%	0	30
40		3	0.0000	0.0000	0.0000	0.0000	0.0000		100.0%	0	30

Proportion Survived Detail

Conc-mg/kg	Code	Rep 1	Rep 2	Rep 3
0	N	1.0000	1.0000	0.9000
10		Outlier	0.8000	0.8000
15		0.0000	0.0000	0.0000
20		0.0000	0.0000	0.0000
30		0.0000	0.0000	0.0000
40		0.0000	0.0000	0.0000

Proportion Survived Binomials

Conc-mg/kg	Code	Rep 1	Rep 2	Rep 3
0	N	10/10	10/10	9/10
10		0/10	8/10	8/10
15		0/10	0/10	0/10
20		0/10	0/10	0/10
30		0/10	0/10	0/10
40		0/10	0/10	0/10

CETIS Analytical Report

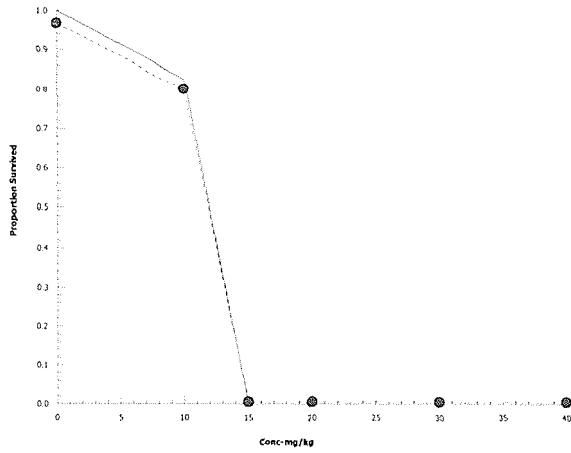
Report Date: 10 Oct-17 10:58 (p 2 of 2)
Test Code: 638A056C | 16-6998-9740

Eisenia 14-d Survival Soil Test

EcoAnalysts

Analysis ID: 06-6437-4456	Endpoint: Proportion Survived	CETIS Version: CETISv1.9.2
Analyzed: 10 Oct-17 10:53	Analysis: Trimmed Spearman-Kärber	Official Results: Yes

Graphics



CETIS Test Data Worksheet

Report Date: 10 Oct-17 10:57 (p 1 of 1)
 Test Code/ID: 16-6998-9740/638A056C

Eisenia 14-d Survival Soil Test				EcoAnalysts	
Start Date:	21 Sep-17 14:30	Species:	Eisenia fetida	Sample Code:	1F5441B5
End Date:	05 Oct-17 13:00	Protocol:	WDOE 1996	Sample Source:	Reference Toxicant
Sample Date:	18 Feb-09 14:19	Material:	2-Chloroacetamide	Sample Station:	P170911.01

Conc-mg/kg	Code	Rep	Pos	# Exposed	# Survived	Notes
0	N	1	5	10	10	
0	N	2	15	10	10	
0	N	3	11	10	9	
10		1	18	10	0	
10		2	1	10	8	
10		3	6	10	8	
15		1	14	10	0	
15		2	10	10	0	
15		3	17	10	0	
20		1	2	10	0	
20		2	8	10	0	
20		3	16	10	0	
30		1	7	10	0	
30		2	13	10	0	
30		3	12	10	0	
40		1	4	10	0	
40		2	9	10	0	
40		3	3	10	0	

Eisinia foetida
Reference Toxicant Test

Test ID: P170911.01	Replicates: 3	Study Director: J. Bdum	Location: Test Room
Dry Weight of Soil: 600g (200g/rep)	Organism Batch:	Associated Test(s):	No. of Organisms: 10
Toxicant: 2-Chloroacetamide	Lot Number: M100009	Date Dilutions Prepared: 9.21.17	Initials: JL, LB
Stock Preparation: 4.5g of 2-Chloroacetamide / 200mL DI → 2.3 g / 100 mL DI			
Target Concentration: 10 mg/kg	Quantity of Artificial Soil: 600 g	Quantity of Stock Target: 0.27 mL	Quantity of Diluent (DI) Target: (270 mL – Stock Soln.) 269.73 mL
	Actual: 600.0	Actual: 0.27 mL	Actual: 269.7 mL
Target Concentration: 15 mg/kg	Quantity of Artificial Soil: 600 g	Quantity of Stock Target: 0.40 mL	Quantity of Diluent (DI) Target: (270 mL – Stock Soln.) 269.60 mL
	Actual: 600.0	Actual: 0.40 mL	Actual: 269.6 mL
Target Concentration: 20 mg/kg	Quantity of Artificial Soil: 600 g	Quantity of Stock Target: 0.53 mL	Quantity of Diluent (DI) Target: (270 mL – Stock Soln.) 269.47 mL
	Actual: 600.0	Actual: 0.53 mL	Actual: 269.5 mL
Target Concentration: 30 mg/kg	Quantity of Artificial Soil: 600 g	Quantity of Stock Target: 0.80 mL	Quantity of Diluent (DI) Target: (270 mL – Stock Soln.) 269.20 mL
	Actual: 600.0	Actual: 0.80 mL	Actual: 269.2 mL
Target Concentration: 40 mg/kg	Quantity of Artificial Soil: 600 g	Quantity of Stock Target: 1.07 mL	Quantity of Diluent (DI) Target: (270 mL – Stock Soln.) 268.93 mL
	Actual: 600.0	Actual: 1.07 mL	Actual: 268.9 mL

Activity:	Date:	Time:	Technician:
Test Initiation:	9/21/17	1430	JL/LB
Test Termination:	10/5/17	1300	LB

pH Measurement: 5 – 9; (6.5 – 7.5 Ideal) 50% soil/DI slurry	Control		Highest Concentration (40mg/kg)	
	Initial (Day 0)	T₀: 7.8 T: 7.6	T₀: 7.9 T: 7.7	
	Final (Day 14)	T₀: 7.4 T: 7.3	T₀: 8.3 T: 8.3	

Initial Worm Wet Weight (subsample of 10)	4
Mean Wet Weight: Recommended (3 – 6 g)	3.5 g

Eisinia foetida
Reference Toxicant Test

③ surface dry, disintegrated worms on surface, unable to determine # dead, US 9/27

④ wrong date 9/28 US

⑤ one worm crawling on jar, out of sed

Observations	Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14 (# Alive)
Treatment	Rep				9/27	9/26	9/27	9/28	9/29	9/30	10/1	10/2	10/3	10/4	
Control	1	4S	5S	4S	4S	3S	5S	3S	3S	3S	N	N	N	N	10
Control	2	5S	3S	3S	2S	N	N	N	N	N	N	N	N	N	10
Control	3	6S	5S	3S	N	1S	2S	N	↓	N	2S	N	1S	↓	9
10 mg/kg	1	7S	7S	5S	2S	4S	2S	4S	②	5S	3S ^⑤	5S	3S	3S	0
10 mg/kg	2	7S	6S	5S	6S	5S	4S	4S	②	5S	4S	3S	N	4S	8
10 mg/kg	3	5S	6S	8S	3S	4S	6S	3S	3S	3S	2S	2S	N	3S	8
15 mg/kg	1	8S	9S	9S ^⑥	3S	5S	②	②	②	②	②	②	②	③	0
15 mg/kg	2	8S	8S	10S	2S	②	↓	↓	↓	↓	↓	↓	②	②	0
15 mg/kg	3	10S	6S	9S, 1M	1S	1S	↓	↓	↓	↓	↓	↓	③	③	0
20 mg/kg	1	10S	10S	10S	2S	5S	↓	↓	↓	↓	↓	↓	②	②	0
20 mg/kg	2	10S	10S	10S	4S	②	↓	↓	↓	↓	↓	↓	②	↓	0
20mg/kg	3	10S	10S	10S	3S	②	↓	↓	↓	↓	↓	↓	②	↓	0
30mg/kg	1	10S	10S	10S	2S	1S, ②	↓	↓	↓	↓	↓	↓	②	↓	0
30mg/kg	2	10S	10S	10S	3S	②	↓	↓	↓	↓	↓	↓	②	↓	0
30mg/kg	3	10S	10S	10S	3S	②	↓	↓	↓	↓	↓	↓	②	↓	0
40mg/kg	1	10S	10S	3 ^{1S} 3M	2S	②	③	③	③	③	③	③	③	③	0
40mg/kg	2	10S	10S	6S	2S	②	③	↓	↓	↓	↓	↓	③	↓	0
40mg/kg	3	10S	10S	4S	3S	②	③	↓	↓	↓	↓	↓	③	↓	0
Initials		UB	UB	H	BH	UB	UB	UB	MK	UB	H	H	UB	UB	LBS

Observation Key: #S: # on surface, #M: # mortality on surface, B: worms balled on surface

① filmy layer on surface H 9/24 ② watery surface w/ ~~disintegrated~~ worms on surface, unable to determine # dead, US 9/26

APPENDIX B. CHAIN-OF-CUSTODY LOG AND PRE-TEST DOCUMENTS

Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

ARI Assigned Number:		Turn-around Requested:			Page: _____ of _____		
ARI Client Company: Anchor OEA		Phone: 360-715-2724			Date:	Ice Present?	
Client Contact: Jennifer Allen					No. of Coolers:	Cooler Temps:	
Client Project Name: SVCA Area Z Remediation		Analysis Requested				Notes/Comments	
Client Project #:		Samplers:			BLOSSAU		
Sample ID	Date	Time	Matrix	No. Containers			
SVCA-TR-102-0-2-170823	8/23/17	1302	SO	2	X		4.4°C
SVCA-TR-103-0-2-170823	8/23/17	1445	SO	2	X		↓
Comments/Special Instructions email results + EDD to labdata@anchoroea.com	Relinquished by: (Signature)	Received by: (Signature)		Relinquished by: (Signature)		Received by: (Signature)	
	Printed Name:	Printed Name:		Printed Name:		Printed Name:	
	Company:	Company:		Company:		Company:	
	Date & Time:	Date & Time:		Date & Time:		Date & Time:	

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Chain of Custody Record & Laboratory Analysis Request



Analytical Resources, Incorporated
 Analytical Chemists and Consultants
 4611 South 134th Place, Suite 100
 Tukwila, WA 98168
 206-695-6200 206-695-6201 (fax)
 www.arilabs.com

ARI Assigned Number:		Turn-around Requested:			Page: _____ of _____	
ARI Client Company: Anchor OEA		Phone:			Date:	Ice Present?
Client Contact: Jennifer Allen		Client Project Name: SVCA Area Z Remediation			No. of Coolers:	Cooler Temps:
Client Project #:		Samplers:			Analysis Requested	
					Notes/Comments	
Sample ID	Date	Time	Matrix	No. Containers	Biossay	
SVCA-TP-100-0-4-170823 ^{9/15/17}						
SVCA-TP-100-0-4-170823	8/23/17	946	SO	2	X	
Comments/Special Instructions Data + login go to labdata@anchorage.com	Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) <i>[Signature]</i>	Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature) <i>[Signature]</i>		
	Printed Name: Billy Bellen	Printed Name: YARED LISANAWORK	Printed Name: YARED LISANAWORK	Printed Name: Jubaum		
	Company: ASI	Company: TL #736	Company: TL #736	Company: EcoAnalysts		
	Date & Time: 9/5/17 7:10	Date & Time: 09/05/17 7:10AM	Date & Time: 09/05/17 9:38AM	Date & Time: 9/5/17 0938		

Limits of Liability: ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, notwithstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.



08 June 2018

Jennifer Allen
Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle, WA 98101

RE: SVCA Area Z Remediation

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)
18C0424

Associated SDG ID(s)
N/A

**Amanda
Volgardsen**

Digitally signed by Amanda
Volgardsen
DN: c=US, st=Washington,
l=Tukwila, o=Analytical Resources,
Inc., ou=Project Manager,
cn=Amanda Volgardsen,
email=amanda.volgardsen@arilabs.
com
Date: 2018.06.08 14:43:15 -07'00'

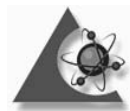
I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Amanda Volgardsen, Project Manager



1860474

Chain of Custody Record & Laboratory Analysis Request

Laboratory: Analytical Resources, Inc.
 Date: _____
 Project Name: SVCA Area Z Remediation
 Project Manager: Jennifer Allen
 Phone Number: 360-715-2724
 Shipment Method: _____



Line	Field Sample ID	Collection Date/Time	Matrix	No. of Containers				Test Parameters				Comments/Preservation		
				NWTPH-G	NWTPH-D	BTEX	Archive							
1	VAW-4-180326	3/26/18 1142	GW 9	X	X	X								
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
14														
15														

Notes: NWTPH-D extended analyzed with and without silica gel cleanup. See contract for analysis details
 Email sample confirmation report to labdata@anchorqea.com

Relinquished By: _____ Company: Anchor QEA, LLC
 Signature/Printed Name: Jennifer Allen Date/Time: 3/27/18 8:27

Relinquished By: _____ Company: _____
 Signature/Printed Name: _____ Date/Time: _____

Received By: _____ Company: AR+
 Signature/Printed Name: Michael Jacobowitz Date/Time: 03/27/18 0827

Received By: _____ Company: _____
 Signature/Printed Name: _____ Date/Time: _____

3.4C



Cooler Receipt Form

ARI Client: Anchar

Project Name: _____

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 18C0424

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 3.4°C

Time: 0827

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D005206

Cooler Accepted by: JSW Date: 03/27/18 Time: 0827

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? JSW YES NO

Did all bottle labels and tags agree with custody papers? JSW YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI..... NA 3/27/18

Was Sample Split by ARI : NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JSW Date: 03/27/18 Time: 0835

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

Trip Blank has 1 peabubble, no other vials have airbubbles
Trip Blank is not on COC.

By: JSW Date: 03/27/18

<p>Small Air Bubbles ~ 2mm</p>	<p>Peabubbles 2-4 mm</p>	<p>LARGE Air Bubbles > 4 mm</p>	<p>Small → "sm" (< 2 mm)</p> <p>Peabubbles → "pb" (2 to < 4 mm)</p> <p>Large → "lg" (4 to < 6 mm)</p> <p>Headspace → "hs" (> 6 mm)</p>
------------------------------------	------------------------------	--	--



Anchor QEA, LLC
720 Olive Way, Suite 1900
Seattle WA, 98101

Project: SVCA Area Z Remediation
Project Number: [none]
Project Manager: Jennifer Allen

Reported:
08-Jun-2018 14:27

Case Narrative

Sample receipt

Samples as listed on the preceding page were received March 27, 2018 under ARI work order 18C0424. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Volatiles - EPA Method SW8260C

The samples were run within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank was clean at the reporting limits.

The LCS/LCSD percent recoveries and RPD were within control limits.

Gasoline by NWTPH-g (GC/MS)

The samples were run within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank was clean at the reporting limits.

The LCS/LCSD percent recoveries and RPD were within control limits.

Diesel/Heavy Oil Range Organics - WA-Ecology Method NW-TPHDx (with and without Ac/Si cleaned)

The samples were extracted and analyzed within the recommended holding times.

Batch BGC0819 is in association with the acid silica cleaned portion of the analysis for sample 18C0424-02.

Initial and continuing calibrations were within method requirements.

The surrogate percent recoveries were within control limits.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.



Anchor QEA, LLC

720 Olive Way, Suite 1900

Seattle, WA 98101

Project: SVCA Area Z Remediation

Project Number: [none]

Project Manager: Jennifer Allen

Reported:

06/08/2018 14:27

ANALYTICAL REPORT FOR SAMPLES

Laboratory ID	Sample ID	Matrix	Date Sampled	Date Received
18C0424-01	MW-4-180326	Water	03/26/18 11:42	03/27/18 08:27
18C0424-02	MW-4-180326	Water	03/26/18 11:42	03/27/18 08:27
18C0424-03	Trip Blank	Water	03/26/18 11:42	03/27/18 08:27



QUALIFIERS AND NOTES

<u>Qualifier</u>	<u>Definition</u>
U	This analyte is not detected above the applicable reporting or detection limit.
J	Estimated concentration value detected below the reporting limit.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
D	The reported value is from a dilution
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SVCA Area Z Remediation
 Matrix: Groundwater Laboratory ID: 18C0424-01 SDG: 18C0424
 Sampled: 03/26/18 11:42 Prepared: 03/27/18 10:48 File ID: V303271823.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 03/27/18 17:41
 Batch: BGC0717 Sequence: SGC0407 Initial/Final: 10 mL / 10 ml
 Instrument: NT3 Column: RTX-VMS Calibration: AK00023

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
71-43-2	Benzene	1	0.20	U	0.03	0.20
108-88-3	Toluene	1	0.20	U	0.04	0.20
100-41-4	Ethylbenzene	1	0.20	U	0.04	0.20
179601-23-1	m,p-Xylene	1	0.40	U	0.05	0.40
95-47-6	o-Xylene	1	0.20	U	0.03	0.20

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	5.0000	5.23	105	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	5.08	102	80 - 120	
Toluene-d8	5.0000	4.96	99.2	80 - 120	
4-Bromofluorobenzene	5.0000	4.87	97.5	80 - 120	



Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8260C
Volatile Organic Compounds

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SVCA Area Z Remediation
 Matrix: Water Laboratory ID: 18C0424-03 SDG: 18C0424
 Sampled: 03/26/18 11:42 Prepared: 03/27/18 10:48 File ID: V303271822.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 03/27/18 17:15
 Batch: BGC0717 Sequence: SGC0407 Initial/Final: 10 mL / 10 ml
 Instrument: NT3 Column: RTX-VMS Calibration: AK00023

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
71-43-2	Benzene	1	0.20	U	0.03	0.20
108-88-3	Toluene	1	0.20	U	0.04	0.20
100-41-4	Ethylbenzene	1	0.20	U	0.04	0.20
179601-23-1	m,p-Xylene	1	0.40	U	0.05	0.40
95-47-6	o-Xylene	1	0.20	U	0.03	0.20

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	5.0000	5.19	104	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	4.97	99.5	80 - 120	
Toluene-d8	5.0000	4.88	97.7	80 - 120	
4-Bromofluorobenzene	5.0000	4.72	94.4	80 - 120	



PREPARATION BATCH SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Batch: BGC0717 Batch Matrix: Water

Preparation: EPA 5030 (Purge and Trap)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
MW-4-180326	18C0424-01	V303271823.D	03/27/18 10:48	
Trip Blank	18C0424-03	V303271822.D	03/27/18 10:48	PB
Blank	BGC0717-BLK1	V303271808.D	03/27/18 11:22	
LCS	BGC0717-BS1	V303271803LCS.D	03/27/18 09:15	
LCS Dup	BGC0717-BSD1	V303271804.D	03/27/18 09:40	



Form I
METHOD BLANK DATA SHEET
EPA 8260C

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Matrix:	<u>Water</u>	Laboratory ID:	<u>BGC0717-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>03/27/18 11:22</u>
Solids:		Preparation:	<u>EPA 5030 (Purge and Trap)</u>
Batch:	<u>BGC0717</u>	Sequence:	<u>SGC0407</u>
Instrument:	<u>NT3</u>	Column:	<u>RTX-VMS</u>
		File ID:	<u>V303271808.D</u>
		Analyzed:	<u>03/27/18 11:22</u>
		Initial/Final:	<u>10 mL / 10 ml</u>
		Calibration:	<u>AK00023</u>

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
71-43-2	Benzene	1	0.20	U	0.03	0.20
108-88-3	Toluene	1	0.20	U	0.04	0.20
100-41-4	Ethylbenzene	1	0.20	U	0.04	0.20
179601-23-1	m,p-Xylene	1	0.40	U	0.05	0.40
95-47-6	o-Xylene	1	0.20	U	0.03	0.20

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
1,2-Dichloroethane-d4	5.0000	5.15	103	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	5.14	103	80 - 120	
Toluene-d8	5.0000	4.86	97.1	80 - 120	
4-Bromofluorobenzene	5.0000	4.81	96.2	80 - 120	



LCS / LCS DUPLICATE RECOVERY
EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Matrix: Water

Analyzed: 03/27/18 09:15

Batch: BGC0717

Laboratory ID: BGC0717-BS1

Preparation: EPA 5030 (Purge and Trap)

Sequence Name: LCS

Initial/Final: 10 mL / 10 ml

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	Q	LCS % REC. #	QC LIMITS REC.
Benzene	10.0	10.4		104	80 - 120
Toluene	10.0	10.1		101	80 - 120
Ethylbenzene	10.0	9.90		99.0	80 - 120
m,p-Xylene	20.0	20.3		102	80 - 121
o-Xylene	10.0	9.86		98.6	80 - 121

* Indicates values outside of QC limits

COMPOUND	SPIKE ADDED (ug/L)	LCSD CONCENTRATION (ug/L)	Q	LCSD % REC. #	% RPD #	QC LIMITS	
						RPD	REC.
Benzene	10.0	9.97		99.7	4.43	30	80 - 120
Toluene	10.0	9.73		97.3	4.12	30	80 - 120
Ethylbenzene	10.0	9.68		96.8	2.25	30	80 - 120
m,p-Xylene	20.0	19.2		96.0	5.73	30	80 - 121
o-Xylene	10.0	9.62		96.2	2.41	30	80 - 121

* Indicates values outside of QC limits



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
EPA 8260C**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor OEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Lab File ID:	<u>V311071702.D</u>	Injection Date:	<u>11/07/17</u>
Instrument ID:	<u>NT3</u>	Injection Time:	<u>08:48</u>
Sequence:	<u>SFK0116</u>	Lab Sample ID:	<u>SFK0116-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	28.7	PASS
75	30 - 80% of 95	49.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.56	PASS
173	Less than 2% of 174	0.378	PASS
174	50 - 120% of 95	84	PASS
175	5 - 9% of 174	7.52	PASS
176	95 - 101% of 174	100	PASS
177	5 - 9% of 176	6.66	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SFK0116-TUN1	V311071702.D	11/07/2017	8:48
Cal Standard	SFK0116-CAL1	V311071707.D	11/07/2017	11:33
Cal Standard	SFK0116-CAL2	V311071708.D	11/07/2017	11:58
Cal Standard	SFK0116-CAL3	V311071709.D	11/07/2017	12:24
Cal Standard	SFK0116-CAL4	V311071710.D	11/07/2017	12:49
Cal Standard	SFK0116-CAL5	V311071711.D	11/07/2017	13:14
Cal Standard	SFK0116-CAL6	V311071712.D	11/07/2017	13:40
Cal Standard	SFK0116-CAL7	V311071713.D	11/07/2017	14:05
Cal Standard	SFK0116-CAL8	V311071714.D	11/07/2017	14:30
Secondary Cal Check	SFK0116-SCV1	V311071716.D	11/07/2017	15:21



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
EPA 8260C**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor OEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Lab File ID:	<u>V303271802.D</u>	Injection Date:	<u>03/27/18</u>
Instrument ID:	<u>NT3</u>	Injection Time:	<u>08:39</u>
Sequence:	<u>SGC0407</u>	Lab Sample ID:	<u>SGC0407-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	29.9	PASS
75	30 - 80% of 95	49.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.15	PASS
173	Less than 2% of 174	0.497	PASS
174	50 - 120% of 95	93.9	PASS
175	5 - 9% of 174	6.32	PASS
176	95 - 101% of 174	95.3	PASS
177	5 - 9% of 176	7.15	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SGC0407-TUN1	V303271802.D	03/27/2018	8:39
LCS	BGC0717-BS1	V303271803LCS.D	03/27/2018	9:15
Initial Cal Check	SGC0407-ICV1	V303271803.D	03/27/2018	9:15
LCS Dup	BGC0717-BSD1	V303271804.D	03/27/2018	9:40
Blank	BGC0717-BLK1	V303271808.D	03/27/2018	11:22
ZZZZZ	18C0313-01	V303271809.D	03/27/2018	11:47
ZZZZZ	18C0346-13	V303271810.D	03/27/2018	12:12
ZZZZZ	18C0346-01	V303271814.D	03/27/2018	13:53
ZZZZZ	18C0346-03	V303271815.D	03/27/2018	14:19
ZZZZZ	18C0346-05	V303271816.D	03/27/2018	14:44
ZZZZZ	18C0346-07	V303271817.D	03/27/2018	15:09
ZZZZZ	18C0346-09	V303271818.D	03/27/2018	15:34
ZZZZZ	18C0346-11	V303271819.D	03/27/2018	16:00
ZZZZZ	18C0415-01	V303271820.D	03/27/2018	16:25
Trip Blank	18C0424-03	V303271822.D	03/27/2018	17:15
MW-4-180326	18C0424-01	V303271823.D	03/27/2018	17:41
ZZZZZ	18C0439-01	V303271826.D	03/27/2018	18:56
Calibration Check	SGC0407-CCV1	V303271828.D	03/27/2018	19:47



INITIAL CALIBRATION DATA
EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	18C0424
Client:	Anchor QEA, LLC	Project:	SVCA Area Z Remediation
Calibration:	AK00023	Instrument:	NT3
Calibration Date:	11/07/2017 8:29	Column (1):	RTX-VMS

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Benzene	0.2	1.534118	0.5	1.691154	1	1.73921	2	1.723779	10	1.67823	20	1.656835
Toluene	0.2	1.107448	0.5	1.100914	1	1.05754	2	1.099855	10	1.078923	20	1.083634
Ethylbenzene	0.2	0.7165266	0.5	0.7547535	1	0.7192388	2	0.7576026	10	0.7497727	20	0.7432643
m,p-Xylene	0.4	0.8603468	1	0.9181545	2	0.9118829	4	0.9404862	20	0.9283311	40	0.9101724
o-Xylene	0.2	0.875278	0.5	0.889669	1	0.8721321	2	0.9119626	10	0.9162476	20	0.8938697
1,2-Dichloroethane-d4	5	0.4997185	5	0.548195	5	0.5338033	5	0.5334251	5	0.503194	5	0.5068851
1,2-Dichlorobenzene-d4	5	0.9267921	5	0.9197239	5	0.9385696	5	0.9198744	5	0.9470961	5	0.9427683
Toluene-d8	5	1.173696	5	1.169665	5	1.14211	5	1.178434	5	1.171955	5	1.190068
4-Bromofluorobenzene	5	0.4090535	5	0.4122882	5	0.4304876	5	0.417143	5	0.4223918	5	0.4200208
Dibromofluoromethane	5	0.4280672	5	0.4384611	5	0.4351639	5	0.4385926	5	0.4288546	5	0.4232471



INITIAL CALIBRATION DATA
EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	18C0424
Client:	Anchor QEA, LLC	Project:	SVCA Area Z Remediation
Calibration:	AK00023	Instrument:	NT3
Calibration Date:	11/07/2017 8:29	Column (1):	RTX-VMS

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Benzene	40	1.623229	80	1.552999								
Toluene	40	1.069762	80	1.038459								
Ethylbenzene	40	0.7546636	80	0.7367876								
m,p-Xylene	80	0.9274587	160	0.8765513								
o-Xylene	40	0.9189333	80	0.9016569								
1,2-Dichloroethane-d4	5	0.5071411	5	0.5234326								
1,2-Dichlorobenzene-d4	5	0.9161146	5	0.9481817								
Toluene-d8	5	1.179228	5	1.174522								
4-Bromofluorobenzene	5	0.4216929	5	0.4314252								
Dibromofluoromethane	5	0.4365348	5	0.4471342								



INITIAL CALIBRATION DATA EPA 8260C

Laboratory:	Analytical Resources, Inc.	SDG:	18C0424
Client:	Anchor QEA, LLC	Project:	SVCA Area Z Remediation
Calibration:	AK00023	Instrument:	NT3
Calibration Date:	11/07/2017 8:29	Column (1):	RTX-VMS

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Benzene	1.649944	4.6			RSD (15)	
Toluene	1.079567	2.2			RSD (15)	
Ethylbenzene	0.7415762	2.2			RSD (15)	
m,p-Xylene	0.909173	3.0			RSD (15)	
o-Xylene	0.8974687	2.0			RSD (15)	
1,2-Dichloroethane-d4	0.5194743	3.4			RSD (15)	
1,2-Dichlorobenzene-d4	0.9323901	1.4			RSD (15)	
Toluene-d8	1.17246	1.2			RSD (15)	
4-Bromofluorobenzene	0.4205629	1.9			RSD (15)	
Dibromofluoromethane	0.4345069	1.7			RSD (15)	



INITIAL CALIBRATION CHECK

EPA 8260C

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>18C0424</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SVCA Area Z Remediation</u>
Instrument ID: <u>NT3</u>	Calibration: <u>AK00023</u>
Lab File ID: <u>V303271803.D</u>	Calibration Date: <u>11/07/17 08:29</u>
Sequence: <u>SGC0407</u>	Injection Date: <u>03/27/18</u>
Lab Sample ID: <u>SGC0407-ICV1</u>	Injection Time: <u>09:15</u>
Sequence Name: <u>VOA 10</u>	

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Benzene	A	10.000	10.4	1.6499440	1.7201760		4.3	20
Toluene	A	10.000	10.1	1.0795670	1.0947970		1.4	20
Ethylbenzene	A	10.000	9.90	0.7415762	0.7338350		-1.0	20
m,p-Xylene	A	20.000	20.3	0.9091730	0.9242612		1.7	20
o-Xylene	A	10.000	9.86	0.8974687	0.8847421		-1.4	20
Dibromofluoromethane	A	5.0000	4.92	0.4345069	0.4273920		-1.6	20
1,2-Dichloroethane-d4	A	5.0000	4.80	0.5194743	0.4988433		-4.0	20
Toluene-d8	A	5.0000	5.03	1.1724600	1.1785070		0.5	20
4-Bromofluorobenzene	A	5.0000	5.06	0.4205629	0.4256859		1.2	20
1,2-Dichlorobenzene-d4	A	5.0000	4.96	0.9323901	0.9255097		-0.7	20

* Values outside of QC limits



ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Sequence: SFK0116

Instrument: NT3

Calibration: AK00023

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SFK0116-TUN1	V311071702.D	NA	11/07/17 08:48
8260C 0.2	SFK0116-CAL1	V311071707.D	NA	11/07/17 11:33
8260C 0.5	SFK0116-CAL2	V311071708.D	NA	11/07/17 11:58
8260C 1.0	SFK0116-CAL3	V311071709.D	NA	11/07/17 12:24
8260C 2.0	SFK0116-CAL4	V311071710.D	NA	11/07/17 12:49
8260C 10	SFK0116-CAL5	V311071711.D	NA	11/07/17 13:14
8260C 20	SFK0116-CAL6	V311071712.D	NA	11/07/17 13:40
8260C 40	SFK0116-CAL7	V311071713.D	NA	11/07/17 14:05
8260C 80	SFK0116-CAL8	V311071714.D	NA	11/07/17 14:30
8260C SCV 10	SFK0116-SCV1	V311071716.D	NA	11/07/17 15:21



ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Sequence: SGC0407

Instrument: NT3

Calibration: AK00023

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SGC0407-TUN1	V303271802.D	NA	03/27/18 08:39
VOA 10	SGC0407-ICV1	V303271803.D	NA	03/27/18 09:15
LCS	BGC0717-BS1	V303271803LCS.D	Water	03/27/18 09:15
LCS Dup	BGC0717-BSD1	V303271804.D	Water	03/27/18 09:40
Blank	BGC0717-BLK1	V303271808.D	Water	03/27/18 11:22
ZZZZZ	18C0313-01	V303271809.D	Water	03/27/18 11:47
ZZZZZ	18C0346-13	V303271810.D	Water	03/27/18 12:12
ZZZZZ	18C0346-01	V303271814.D	Water	03/27/18 13:53
ZZZZZ	18C0346-03	V303271815.D	Water	03/27/18 14:19
ZZZZZ	18C0346-05	V303271816.D	Water	03/27/18 14:44
ZZZZZ	18C0346-07	V303271817.D	Water	03/27/18 15:09
ZZZZZ	18C0346-09	V303271818.D	Water	03/27/18 15:34
ZZZZZ	18C0346-11	V303271819.D	Water	03/27/18 16:00
ZZZZZ	18C0415-01	V303271820.D	Water	03/27/18 16:25
Trip Blank	18C0424-03	V303271822.D	Water	03/27/18 17:15
MW-4-180326	18C0424-01	V303271823.D	Water	03/27/18 17:41
ZZZZZ	18C0439-01	V303271826.D	Water	03/27/18 18:56
CCV	SGC0407-CCV1	V303271828.D	NA	03/27/18 19:47



SURROGATE RECOVERY SUMMARY
EPA 8260C

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG/WO:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Sequence:	<u>SFK0116</u>	Instrument:	<u>NT3</u>
Calibration:	<u>AK00023</u>	Calibration Date:	<u>11/07/2017</u>

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
SFK0116-SCV1 (Water)				
Lab File ID: V311071716.D		Analyzed: 11/07/17 15:21		
1,2-Dichloroethane-d4	5.0000	100	80 - 120	
1,2-Dichlorobenzene-d4	5.0000	100	80 - 120	
Toluene-d8	5.0000	98.8	80 - 120	
4-Bromofluorobenzene	5.0000	102	80 - 120	
Dibromofluoromethane	5.0000	103	80 - 120	



SURROGATE RECOVERY SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Sequence: SGC0407
Calibration: AK00023

SDG/WO: 18C0424
Project: SVCA Area Z Remediation
Instrument: NT3
Calibration Date: 11/07/2017

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
BGC0717-BS1 (Water) Lab File ID: V303271803LCS.D Analyzed: 03/27/18 09:15				
1,2-Dichloroethane-d4	5.0000	96.0	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	99.3	80 - 120	
Toluene-d8	5.0000	101	80 - 120	
4-Bromofluorobenzene	5.0000	101	80 - 120	
Dibromofluoromethane	5.0000	98.4	80 - 120	
SGC0407-ICV1 (Water) Lab File ID: V303271803.D Analyzed: 03/27/18 09:15				
1,2-Dichloroethane-d4	5.0000	96.0	80 - 120	
1,2-Dichlorobenzene-d4	5.0000	99.3	80 - 120	
Toluene-d8	5.0000	101	80 - 120	
4-Bromofluorobenzene	5.0000	101	80 - 120	
Dibromofluoromethane	5.0000	98.4	80 - 120	
BGC0717-BSD1 (Water) Lab File ID: V303271804.D Analyzed: 03/27/18 09:40				
1,2-Dichloroethane-d4	5.0000	97.6	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	99.6	80 - 120	
Toluene-d8	5.0000	102	80 - 120	
4-Bromofluorobenzene	5.0000	103	80 - 120	
Dibromofluoromethane	5.0000	99.9	80 - 120	
BGC0717-BLK1 (Water) Lab File ID: V303271808.D Analyzed: 03/27/18 11:22				
1,2-Dichloroethane-d4	5.0000	103	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	103	80 - 120	
Toluene-d8	5.0000	97.1	80 - 120	
4-Bromofluorobenzene	5.0000	96.2	80 - 120	
18C0424-03 (Water) Lab File ID: V303271822.D Analyzed: 03/27/18 17:15				
1,2-Dichloroethane-d4	5.0000	104	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	99.5	80 - 120	
Toluene-d8	5.0000	97.7	80 - 120	
4-Bromofluorobenzene	5.0000	94.4	80 - 120	



SURROGATE RECOVERY SUMMARY
EPA 8260C

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG/WO:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Sequence:	<u>SGC0407</u>	Instrument:	<u>NT3</u>
Calibration:	<u>AK00023</u>	Calibration Date:	<u>11/07/2017</u>

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
18C0424-01 (Water)				
		Lab File ID: V303271823.D	Analyzed: 03/27/18 17:41	
1,2-Dichloroethane-d4	5.0000	105	80 - 129	
1,2-Dichlorobenzene-d4	5.0000	102	80 - 120	
Toluene-d8	5.0000	99.2	80 - 120	
4-Bromofluorobenzene	5.0000	97.5	80 - 120	



INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor OEA, LLC

Project: SVCA Area Z Remediation

Sequence: SFK0116

Instrument: NT3

Calibration: AK00023

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (SFK0116-SCV1)		(Water)	Lab File ID: V311071716.D			Analyzed: 11/07/17 15:21			
Pentafluorobenzene	212374	5.414	208826	5.415	102	50 - 200	0.0010	+/-0.50	
Chlorobenzene-d5	291732	7.833	290356	7.833	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	332609	5.797	319374	5.798	104	50 - 200	0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	153105	9.523	151501	9.524	101	50 - 200	0.0010	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor OEA, LLC

Project: SVCA Area Z Remediation

Sequence: SGC0407

Instrument: NT3

Calibration: AK00023

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (BGC0717-BS1)		(Water)	Lab File ID: V303271803LCS.D			Analyzed: 03/27/18 09:15			
Pentafluorobenzene	223481	5.399	208826	5.415	107	50 - 200	0.0160	+/-0.50	
Chlorobenzene-d5	303233	7.822	290356	7.833	104	50 - 200	0.0110	+/-0.50	
1,4-Difluorobenzene	325422	5.781	319374	5.798	102	50 - 200	0.0170	+/-0.50	
1,4-Dichlorobenzene-d4	171190	9.513	151501	9.524	113	50 - 200	0.0110	+/-0.50	
Initial Cal Check (SGC0407-ICV1)		(Water)	Lab File ID: V303271803.D			Analyzed: 03/27/18 09:15			
Pentafluorobenzene	223481	5.399	208826	5.415	107	50 - 200	0.0160	+/-0.50	
Chlorobenzene-d5	303233	7.822	290356	7.833	104	50 - 200	0.0110	+/-0.50	
1,4-Difluorobenzene	325422	5.781	319374	5.798	102	50 - 200	0.0170	+/-0.50	
1,4-Dichlorobenzene-d4	171190	9.513	151501	9.524	113	50 - 200	0.0110	+/-0.50	
LCS Dup (BGC0717-BS1)		(Water)	Lab File ID: V303271804.D			Analyzed: 03/27/18 09:40			
Pentafluorobenzene	221778	5.398	208826	5.415	106	50 - 200	0.0170	+/-0.50	
Chlorobenzene-d5	307072	7.827	290356	7.833	106	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	326250	5.781	319374	5.798	102	50 - 200	0.0170	+/-0.50	
1,4-Dichlorobenzene-d4	169932	9.518	151501	9.524	112	50 - 200	0.0060	+/-0.50	
Blank (BGC0717-BLK1)		(Water)	Lab File ID: V303271808.D			Analyzed: 03/27/18 11:22			
Pentafluorobenzene	206539	5.398	208826	5.415	99	50 - 200	0.0170	+/-0.50	
Chlorobenzene-d5	289501	7.822	290356	7.833	100	50 - 200	0.0110	+/-0.50	
1,4-Difluorobenzene	307456	5.78	319374	5.798	96	50 - 200	0.0180	+/-0.50	
1,4-Dichlorobenzene-d4	152124	9.512	151501	9.524	100	50 - 200	0.0120	+/-0.50	
Trip Blank (18C0424-03)		(Water)	Lab File ID: V303271822.D			Analyzed: 03/27/18 17:15			
Pentafluorobenzene	179337	5.398	208826	5.415	86	50 - 200	0.0170	+/-0.50	
Chlorobenzene-d5	256546	7.822	290356	7.833	88	50 - 200	0.0110	+/-0.50	
1,4-Difluorobenzene	271958	5.78	319374	5.798	85	50 - 200	0.0180	+/-0.50	
1,4-Dichlorobenzene-d4	133490	9.517	151501	9.524	88	50 - 200	0.0070	+/-0.50	
MW-4-180326 (18C0424-01)		(Water)	Lab File ID: V303271823.D			Analyzed: 03/27/18 17:41			
Pentafluorobenzene	182756	5.399	208826	5.415	88	50 - 200	0.0160	+/-0.50	
Chlorobenzene-d5	253318	7.823	290356	7.833	87	50 - 200	0.0100	+/-0.50	
1,4-Difluorobenzene	267350	5.781	319374	5.798	84	50 - 200	0.0170	+/-0.50	
1,4-Dichlorobenzene-d4	135680	9.513	151501	9.524	90	50 - 200	0.0110	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor OEA, LLC

Project: SVCA Area Z Remediation

Sequence: SGC0407

Instrument: NT3

Calibration: AK00023

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (SGC0407-CCV1)		(Water)	Lab File ID: V303271828.D			Analyzed: 03/27/18 19:47			
Pentafluorobenzene	192265	5.399	208826	5.415	92	50 - 200	0.0160	+/-0.50	
Chlorobenzene-d5	273936	7.823	290356	7.833	94	50 - 200	0.0100	+/-0.50	
1,4-Difluorobenzene	283980	5.781	319374	5.798	89	50 - 200	0.0170	+/-0.50	
1,4-Dichlorobenzene-d4	154593	9.513	151501	9.524	102	50 - 200	0.0110	+/-0.50	



HOLDING TIME SUMMARY

Analysis: EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor OEA, LLC

Project: SVCA Area Z Remediation

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
MW-4-180326 18C0424-01	03/26/18 11:42	03/27/18 08:27	03/27/18 10:48	0	14	03/27/18 17:41	1	14	
Trip Blank 18C0424-03	03/26/18 11:42	03/27/18 08:27	03/27/18 10:48	0	14	03/27/18 17:15	1	14	

* Indicates hold time exceedance.



METHOD DETECTION AND REPORTING LIMITS

EPA 8260C

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor OEA, LLC

Project: SVCA Area Z Remediation

Matrix: Water

Instrument: NT3

Analyte	MDL	RL	Units
Benzene	0.03	0.20	ug/L
Toluene	0.04	0.20	ug/L
Ethylbenzene	0.04	0.20	ug/L
m,p-Xylene	0.05	0.40	ug/L
o-Xylene	0.03	0.20	ug/L



Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SVCA Area Z Remediation
 Matrix: Groundwater Laboratory ID: 18C0424-01 SDG: 18C0424
 Sampled: 03/26/18 11:42 Prepared: 03/27/18 10:48 File ID: V303271823G.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 03/27/18 17:41
 Batch: BGC0717 Sequence: SGC0408 Initial/Final: 10 mL / 10 ml
 Instrument: NT3 Column: RTX-VMS Calibration: BA00063

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	1	100	U	13.6	100

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	4.96	99.2	80 - 120	
4-Bromofluorobenzene	5.0000	4.87	97.5	80 - 120	

Data File: \\target\share\chend\nt3.1\20180327g.b\3032718230.D

Date : 27-MAR-2018 17:41

Client ID:

Sample Info: 18C0424-01

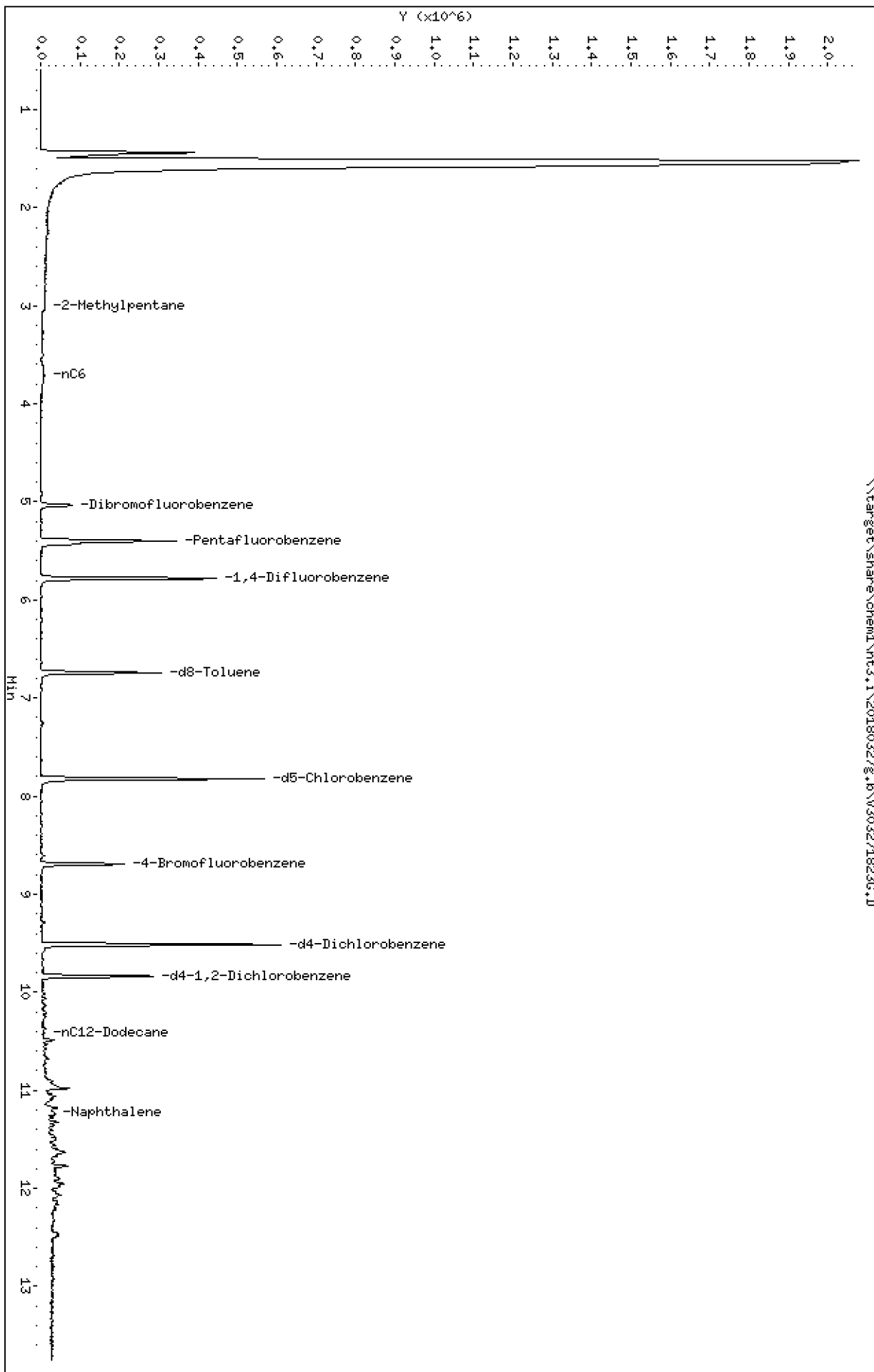
Column phase: RTXWMS

Instrument: nt3.1

Operator: PKC

Column diameter: 0.18

\\target\share\chend\nt3.1\20180327g.b\3032718230.D



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20180327g.b/V303271823G.D
Method: \20180327g.b\NWTPHG.m
Instrument: nt3.i
Gas Ical Date: 27-JAN-2018
Injection Date: 27-MAR-2018 17:41

ARI ID: 18C0424-01
Client ID:
Matrix: WATER
Dilution Factor: 1.000
Operator: PKC

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GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	----	-----	-----
WAGas Tol-C12 (6.68 to 10.55)	31991220	215361	0.007
8015C 2MP-TMB (2.88 to 9.51)	70557112	121284	0.002
AK101 nC6-nC10 (3.63 to 8.66)	48812322	65885	0.001
NWTPHG Tol-Nap (6.68 to 11.34)	34228300	623655	0.018
mod8015 nC7-nC12 (5.20 to 10.55)	52022420	232531	0.004

M Indicates manual integration within range

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

7.823	849761	d5-Chlorobenzene
6.744	469495	d8-Toluene
9.513	880909	d4-Dichlorobenzene
8.695	317633	4-Bromofluorobenzene
9.838	416354	d4-1,2-Dichlorobenzene



Trip Blank

Form I
ORGANIC ANALYSIS DATA SHEET
NWTPHg
Gasoline Range Organics (GC/MS)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SVCA Area Z Remediation
 Matrix: Water Laboratory ID: 18C0424-03 SDG: 18C0424
 Sampled: 03/26/18 11:42 Prepared: 03/27/18 10:48 File ID: V303271822G.D
 % Solids: Preparation: EPA 5030 (Purge and Trap) Analyzed: 03/27/18 17:15
 Batch: BGC0717 Sequence: SGC0408 Initial/Final: 10 mL / 10 ml
 Instrument: NT3 Column: RTX-VMS Calibration: BA00063

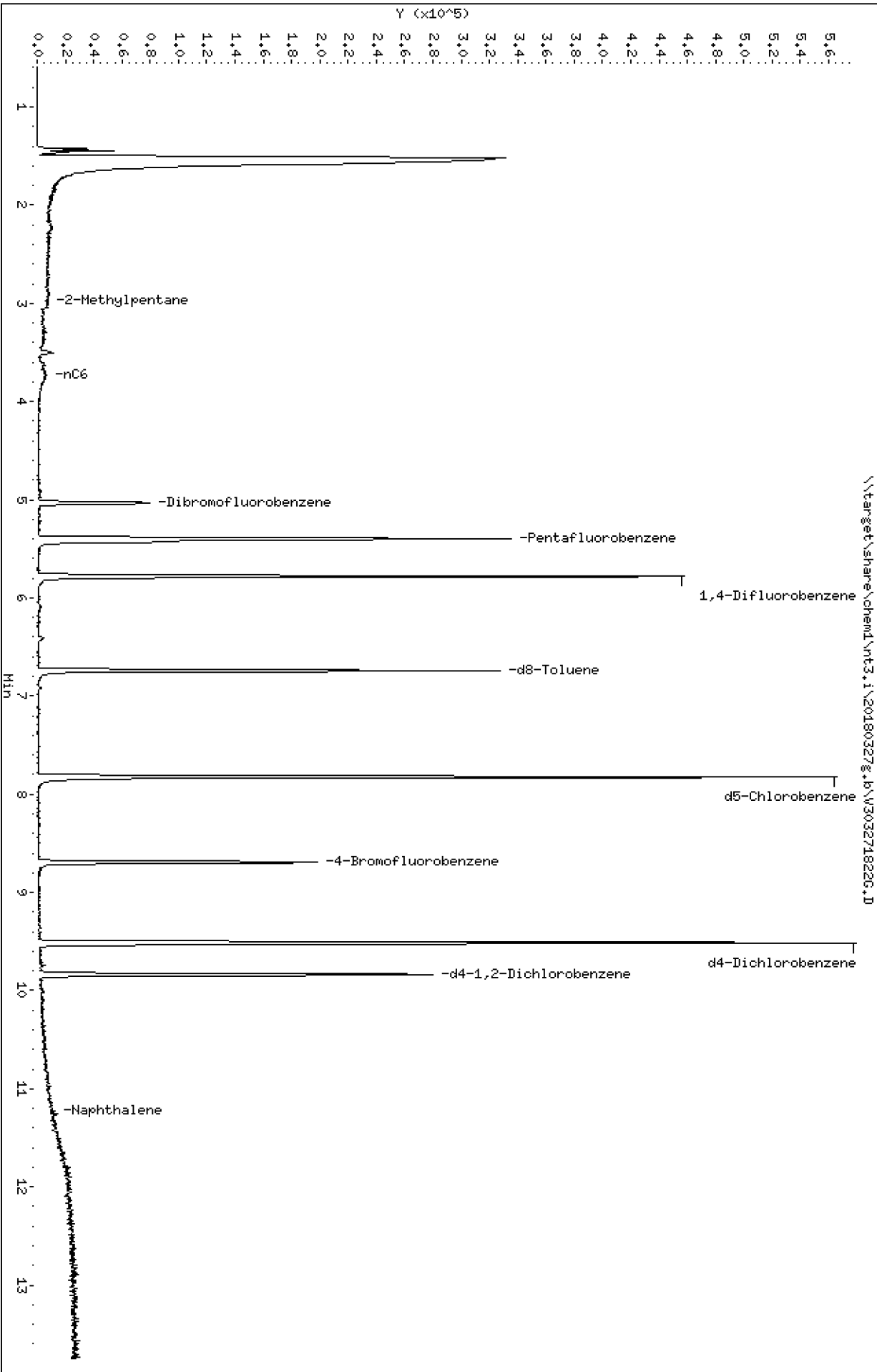
CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	1	100	U	13.6	100

SURROGATES	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Toluene-d8	5.0000	4.88	97.7	80 - 120	
4-Bromofluorobenzene	5.0000	4.72	94.4	80 - 120	

Data File: \\target\shane\chend\nt3.1\20180327g.b\W303271822G.D
Date: 27-MAR-2018 17:15
Client ID:
Sample Info: 18C0424-03

Column phase: RTXWMS

Instrument: nt3.1
Operator: PKC
Column diameter: 0.18



Analytical Resources Inc.
GC/MS Gas Quantitation Report

Data file: 20180327g.b/V303271822G.D
Method: \20180327g.b\NWTPHG.m
Instrument: nt3.i
Gas Ical Date: 27-JAN-2018
Injection Date: 27-MAR-2018 17:15

ARI ID: 18C0424-03
Client ID:
Matrix: WATER
Dilution Factor: 1.000
Operator: PKC

=====

GASOLINE HYDROCARBONS

Range	RF	Total Area*	Amount (ug/mL)
-----	----	-----	-----
WAGas Tol-C12 (6.68 to 10.55)	31991220	10515	0.000
8015C 2MP-TMB (2.88 to 9.51)	70557112	51358	0.001
AK101 nC6-nC10 (3.63 to 8.66)	48812322	16873	0.000
NWTPHG Tol-Nap (6.68 to 11.34)	34228300	22282	0.001
mod8015 nC7-nC12 (5.20 to 10.55)	52022420	17316	0.000

M Indicates manual integration within range

* Surrogate areas are subtracted from Total Area

NW Gas Range Subtracted Peaks

7.822	851485	d5-Chlorobenzene
6.743	468561	d8-Toluene
9.518	866523	d4-Dichlorobenzene
8.694	309398	4-Bromofluorobenzene
9.837	411092	d4-1,2-Dichlorobenzene



PREPARATION BATCH SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Batch: BGC0717 Batch Matrix: Water

Preparation: EPA 5030 (Purge and Trap)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
MW-4-180326	18C0424-01	V303271823G.D	03/27/18 10:48	
Trip Blank	18C0424-03	V303271822G.D	03/27/18 10:48	PB
Blank	BGC0717-BLK2	V303271808G.D	03/27/18 11:22	
LCS	BGC0717-BS2	V303271805LCSG.D	03/27/18 10:05	
LCS Dup	BGC0717-BSD2	V303271806G.D	03/27/18 10:31	



Form I
METHOD BLANK DATA SHEET
NWTPHg

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Matrix:	<u>Water</u>	Laboratory ID:	<u>BGC0717-BLK2</u>
Sampled:	<u>N/A</u>	Prepared:	<u>03/27/18 11:22</u>
Solids:		Preparation:	<u>EPA 5030 (Purge and Trap)</u>
Batch:	<u>BGC0717</u>	Sequence:	<u>SGC0408</u>
Instrument:	<u>NT3</u>	Column:	<u>RTX-VMS</u>
		File ID:	<u>V303271808G.D</u>
		Analyzed:	<u>03/27/18 11:22</u>
		Initial/Final:	<u>10 mL / 10 ml</u>
		Calibration:	<u>BA00063</u>

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	DL	RL
	Gasoline Range Organics (Tol-Nap)	1	100	U	13.6	100
SURROGATES		ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
	Toluene-d8	5.0000	4.86	97.1	80 - 120	
	4-Bromofluorobenzene	5.0000	4.81	96.2	80 - 120	



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
NWTPHg**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Lab File ID:	<u>V301271802G.D</u>	Injection Date:	<u>01/27/18</u>
Instrument ID:	<u>NT3</u>	Injection Time:	<u>11:09</u>
Sequence:	<u>SGA0305</u>	Lab Sample ID:	<u>SGA0305-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	30	PASS
75	30 - 80% of 95	50.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.81	PASS
173	Less than 2% of 174	0.644	PASS
174	50 - 120% of 95	90.1	PASS
175	5 - 9% of 174	8.28	PASS
176	95 - 101% of 174	98.7	PASS
177	5 - 9% of 176	6.37	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SGA0305-TUN1	V301271802G.D	01/27/2018	11:09
Cal Standard	SGA0305-CAL1	V301271803G.D	01/27/2018	11:59
Cal Standard	SGA0305-CAL2	V301271804G.D	01/27/2018	12:24
Cal Standard	SGA0305-CAL3	V301271805G.D	01/27/2018	12:49
Cal Standard	SGA0305-CAL4	V301271806G.D	01/27/2018	13:15
Cal Standard	SGA0305-CAL5	V301271807G.D	01/27/2018	13:40
Cal Standard	SGA0305-CAL6	V301271808G.D	01/27/2018	14:05
Secondary Cal Check	SGA0305-SCV1	V301271810G.D	01/27/2018	14:55



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
NWTPHg**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Lab File ID:	<u>V311071702G.D</u>	Injection Date:	<u>11/07/17</u>
Instrument ID:	<u>NT3</u>	Injection Time:	<u>08:48</u>
Sequence:	<u>SFK0117</u>	Lab Sample ID:	<u>SFK0117-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	28.7	PASS
75	30 - 80% of 95	49.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.56	PASS
173	Less than 2% of 174	0.378	PASS
174	50 - 120% of 95	84	PASS
175	5 - 9% of 174	7.52	PASS
176	95 - 101% of 174	100	PASS
177	5 - 9% of 176	6.66	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
Cal Standard	SFK0117-CAL9	V311071717G.D	11/07/2017	15:46
Cal Standard	SFK0117-CALA	V311071718G.D	11/07/2017	16:11
Cal Standard	SFK0117-CALB	V311071719G.D	11/07/2017	16:36
Cal Standard	SFK0117-CALC	V311071720G.D	11/07/2017	17:02
Cal Standard	SFK0117-CALD	V311071721G.D	11/07/2017	17:27
Cal Standard	SFK0117-CALE	V311071722G.D	11/07/2017	17:53
Secondary Cal Check	SFK0117-SCV2	V311071724G.D	11/07/2017	18:43



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
NWTPHg**

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Lab File ID:	<u>V301271802G.D</u>	Injection Date:	<u>01/27/18</u>
Instrument ID:	<u>NT3</u>	Injection Time:	<u>11:09</u>
Sequence:	<u>SGA0305</u>	Lab Sample ID:	<u>SGA0305-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	30	PASS
75	30 - 80% of 95	50.3	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.81	PASS
173	Less than 2% of 174	0.644	PASS
174	50 - 120% of 95	90.1	PASS
175	5 - 9% of 174	8.28	PASS
176	95 - 101% of 174	98.7	PASS
177	5 - 9% of 176	6.37	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SGA0305-TUN1	V301271802G.D	01/27/2018	11:09
Cal Standard	SGA0305-CAL1	V301271803G.D	01/27/2018	11:59
Cal Standard	SGA0305-CAL2	V301271804G.D	01/27/2018	12:24
Cal Standard	SGA0305-CAL3	V301271805G.D	01/27/2018	12:49
Cal Standard	SGA0305-CAL4	V301271806G.D	01/27/2018	13:15
Cal Standard	SGA0305-CAL5	V301271807G.D	01/27/2018	13:40
Cal Standard	SGA0305-CAL6	V301271808G.D	01/27/2018	14:05
Secondary Cal Check	SGA0305-SCV1	V301271810G.D	01/27/2018	14:55



**MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
NWTPHg**

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>18C0424</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SVCA Area Z Remediation</u>
Lab File ID: <u>V303271802G.D</u>	Injection Date: <u>03/27/18</u>
Instrument ID: <u>NT3</u>	Injection Time: <u>08:39</u>
Sequence: <u>SGC0408</u>	Lab Sample ID: <u>SGC0408-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	29.9	PASS
75	30 - 80% of 95	49.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.15	PASS
173	Less than 2% of 174	0.497	PASS
174	50 - 120% of 95	93.9	PASS
175	5 - 9% of 174	6.32	PASS
176	95 - 101% of 174	95.3	PASS
177	5 - 9% of 176	7.15	PASS

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SGC0408-TUN1	V303271802G.D	03/27/2018	8:39
Initial Cal Check	SGC0408-ICV1	V303271805G.D	03/27/2018	10:05
LCS	BGC0717-BS2	V303271805LCSG.D	03/27/2018	10:05
LCS	BGC0716-BS1	V303271805LCSSG.D	03/27/2018	10:05
LCS Dup	BGC0717-BSD2	V303271806G.D	03/27/2018	10:31
LCS Dup	BGC0716-BSD1	V303271806LCSDSG.D	03/27/2018	10:31
Blank	BGC0717-BLK2	V303271808G.D	03/27/2018	11:22
Blank	BGC0716-BLK1	V303271808MBSG.D	03/27/2018	11:22
ZZZZZ	18C0314-01	V303271811G.D	03/27/2018	12:37
ZZZZZ	18C0314-02	V303271812G.D	03/27/2018	13:03
ZZZZZ	18C0335-03	V303271813G.D	03/27/2018	13:28
Trip Blank	18C0424-03	V303271822G.D	03/27/2018	17:15
MW-4-180326	18C0424-01	V303271823G.D	03/27/2018	17:41
Calibration Check	SGC0408-CCV1	V303271827G.D	03/27/2018	19:21



INITIAL CALIBRATION DATA
NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	18C0424
Client:	Anchor QEA, LLC	Project:	SVCA Area Z Remediation
Calibration:	AK00026	Instrument:	NT3
Calibration Date:	11/07/2017 10:33	Column (1):	RTX-VMS

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Gasoline Range Organics (Tol-Nap)					100	33307.65	250	32174.58	500	34838.34	1000	30276.92
Toluene-d8	5	1.179228	5	1.174522								
4-Bromofluorobenzene	5	0.4216929	5	0.4314252								



INITIAL CALIBRATION DATA
NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	18C0424
Client:	Anchor QEA, LLC	Project:	SVCA Area Z Remediation
Calibration:	AK00026	Instrument:	NT3
Calibration Date:	11/07/2017 10:33	Column (1):	RTX-VMS

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
		RF		RF		RF		RF		RF		RF
Gasoline Range Organics (Tol-Nap)	2500	32684.44	5000	45085.22								



INITIAL CALIBRATION DATA

NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	18C0424
Client:	Anchor QEA, LLC	Project:	SVCA Area Z Remediation
Calibration:	AK00026	Instrument:	NT3
Calibration Date:	11/07/2017 10:33	Column (1):	RTX-VMS

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Gasoline Range Organics (Tol-Nap)	34727.86	15.2			RSD (20)	
Toluene-d8	1.176875	0.3			RSD (20)	
4-Bromofluorobenzene	0.4265591	1.6			RSD (20)	



INITIAL CALIBRATION DATA
NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	18C0424
Client:	Anchor QEA, LLC	Project:	SVCA Area Z Remediation
Calibration:	BA00063	Instrument:	NT3
Calibration Date:	01/27/2018 14:18	Column (1):	RTX-VMS

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Gasoline Range Organics (Tol-Nap)	100	40450.82	250	29216.08	500	30043.32	1000	33925.44	2500	37505.86		



INITIAL CALIBRATION DATA
NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	18C0424
Client:	Anchor QEA, LLC	Project:	SVCA Area Z Remediation
Calibration:	BA00063	Instrument:	NT3
Calibration Date:	01/27/2018 14:18	Column (1):	RTX-VMS

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF



INITIAL CALIBRATION DATA

NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	18C0424
Client:	Anchor QEA, LLC	Project:	SVCA Area Z Remediation
Calibration:	BA00063	Instrument:	NT3
Calibration Date:	01/27/2018 14:18	Column (1):	RTX-VMS

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
		RF		RF		RF		RF		RF		RF
Toluene-d8	5	1.179228	5	1.174522								
4-Bromofluorobenzene	5	0.4216929	5	0.4314252								



INITIAL CALIBRATION DATA
NWTPHg

Laboratory:	Analytical Resources, Inc.	SDG:	18C0424
Client:	Anchor QEA, LLC	Project:	SVCA Area Z Remediation
Calibration:	BA00063	Instrument:	NT3
Calibration Date:	01/27/2018 14:18	Column (1):	RTX-VMS

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Gasoline Range Organics (Tol-Nap)	34228.3	14.0			RSD (15)	
Toluene-d8	1.176875	0.3			RSD (15)	
4-Bromofluorobenzene	0.4265591	1.6			RSD (15)	



INITIAL CALIBRATION CHECK

NWTPHg

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>18C0424</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SVCA Area Z Remediation</u>
Instrument ID: <u>NT3</u>	Calibration: <u>BA00063</u>
Lab File ID: <u>V303271805G.D</u>	Calibration Date: <u>01/27/18 14:18</u>
Sequence: <u>SGC0408</u>	Injection Date: <u>03/27/18</u>
Lab Sample ID: <u>SGC0408-ICV1</u>	Injection Time: <u>10:05</u>
Sequence Name: <u>ICV</u>	

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Gasoline Range Organics (Tol-Nap)	A	1000.0	1020	34228.3000	34995.7300		2.2	20
Toluene-d8	A	5.0000	5.02	1.1768750	1.1776410		0.4	
4-Bromofluorobenzene	A	5.0000	5.08	0.4265591	0.4273406		1.6	

* Values outside of QC limits



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Sequence: SFK0117

Instrument: NT3

Calibration: AK00026

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Gas 0.1	SFK0117-CAL9	V311071717G.D	NA	11/07/17 15:46
Gas 0.25	SFK0117-CALA	V311071718G.D	NA	11/07/17 16:11
Gas 0.5	SFK0117-CALB	V311071719G.D	NA	11/07/17 16:36
Gas 1.0	SFK0117-CALC	V311071720G.D	NA	11/07/17 17:02
Gas 2.5	SFK0117-CALD	V311071721G.D	NA	11/07/17 17:27
Gas 5.0	SFK0117-CALE	V311071722G.D	NA	11/07/17 17:53
Gas SCV 1	SFK0117-SCV2	V311071724G.D	NA	11/07/17 18:43



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Sequence: SGA0305

Instrument: NT3

Calibration: BA00063

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SGA0305-TUN1	V301271802G.D	NA	01/27/18 11:09
Gas 0.1	SGA0305-CAL1	V301271803G.D	NA	01/27/18 11:59
Gas 0.25	SGA0305-CAL2	V301271804G.D	NA	01/27/18 12:24
Gas 0.5	SGA0305-CAL3	V301271805G.D	NA	01/27/18 12:49
Gas 1.0	SGA0305-CAL4	V301271806G.D	NA	01/27/18 13:15
Gas 2.5	SGA0305-CAL5	V301271807G.D	NA	01/27/18 13:40
Gas 5.0	SGA0305-CAL6	V301271808G.D	NA	01/27/18 14:05
Gas SCV 1	SGA0305-SCV1	V301271810G.D	NA	01/27/18 14:55



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Sequence: SGC0408

Instrument: NT3

Calibration: BA00063

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
BFB	SGC0408-TUN1	V303271802G.D	NA	03/27/18 08:39
ICV	SGC0408-ICV1	V303271805G.D	NA	03/27/18 10:05
LCS	BGC0717-BS2	V303271805LCSG.D	Water	03/27/18 10:05
ZZZZZ	BGC0716-BS1	V303271805LCSSG.D	Solid	03/27/18 10:05
LCS Dup	BGC0717-BSD2	V303271806G.D	Water	03/27/18 10:31
ZZZZZ	BGC0716-BSD1	V303271806LCSDSG.D	Solid	03/27/18 10:31
Blank	BGC0717-BLK2	V303271808G.D	Water	03/27/18 11:22
ZZZZZ	BGC0716-BLK1	V303271808MBSG.D	Solid	03/27/18 11:22
ZZZZZ	18C0314-01	V303271811G.D	Solid	03/27/18 12:37
ZZZZZ	18C0314-02	V303271812G.D	Solid	03/27/18 13:03
ZZZZZ	18C0335-03	V303271813G.D	Solid	03/27/18 13:28
Trip Blank	18C0424-03	V303271822G.D	Water	03/27/18 17:15
MW-4-180326	18C0424-01	V303271823G.D	Water	03/27/18 17:41
CCV	SGC0408-CCV1	V303271827G.D	NA	03/27/18 19:21



SURROGATE RECOVERY SUMMARY

NWTPHg

Laboratory: <u>Analytical Resources, Inc.</u>	SDG/WO: <u>18C0424</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SVCA Area Z Remediation</u>
Sequence: <u>SGA0305</u>	Instrument: <u>NT3</u>
Calibration: <u>BA00063</u>	Calibration Date: <u>01/27/2018</u>

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
SGA0305-SCV1 (Solid)				
Lab File ID: V301271810G.D				
Analyzed: 01/27/18 14:55				
Toluene-d8	5.0000	99.5	0 - 200	
4-Bromofluorobenzene	5.0000	112	0 - 200	



SURROGATE RECOVERY SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.
 Client: Anchor QEA, LLC
 Sequence: SGC0408
 Calibration: BA00063

SDG/WO: 18C0424
 Project: SVCA Area Z Remediation
 Instrument: NT3
 Calibration Date: 01/27/2018

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	Q
BGC0717-BS2 (Water) Lab File ID: V303271805LCSG.D Analyzed: 03/27/18 10:05				
Toluene-d8	5.0000	100	80 - 120	
4-Bromofluorobenzene	5.0000	102	80 - 120	
SGC0408-ICV1 (Water) Lab File ID: V303271805G.D Analyzed: 03/27/18 10:05				
Toluene-d8	5.0000	100	0 - 200	
4-Bromofluorobenzene	5.0000	102	0 - 200	
BGC0717-BSD2 (Water) Lab File ID: V303271806G.D Analyzed: 03/27/18 10:31				
Toluene-d8	5.0000	101	80 - 120	
4-Bromofluorobenzene	5.0000	102	80 - 120	
BGC0717-BLK2 (Water) Lab File ID: V303271808G.D Analyzed: 03/27/18 11:22				
Toluene-d8	5.0000	97.1	80 - 120	
4-Bromofluorobenzene	5.0000	96.2	80 - 120	
18C0424-03 (Water) Lab File ID: V303271822G.D Analyzed: 03/27/18 17:15				
Toluene-d8	5.0000	97.7	80 - 120	
4-Bromofluorobenzene	5.0000	94.4	80 - 120	
18C0424-01 (Water) Lab File ID: V303271823G.D Analyzed: 03/27/18 17:41				
Toluene-d8	5.0000	99.2	80 - 120	
4-Bromofluorobenzene	5.0000	97.5	80 - 120	



INTERNAL STANDARD AREA AND RT SUMMARY NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor OEA, LLC

Project: SVCA Area Z Remediation

Sequence: SGA0305

Instrument: NT3

Calibration: BA00063

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (SGA0305-SCV1)		(Solid)	Lab File ID: V301271810G.D			Analyzed: 01/27/18 14:55			
Pentafluorobenzene	212081	5.404	208826	5.415	102	50 - 200	0.0110	+/-0.50	
Chlorobenzene-d5	287301	7.828	290356	7.833	99	50 - 200	0.0050	+/-0.50	
1,4-Difluorobenzene	319095	5.786	319374	5.798	100	50 - 200	0.0120	+/-0.50	
1,4-Dichlorobenzene-d4	155942	9.518	151501	9.524	103	50 - 200	0.0060	+/-0.50	



INTERNAL STANDARD AREA AND RT SUMMARY

NWTPHg

Laboratory: Analytical Resources, Inc.
Client: Anchor OEA, LLC
Sequence: SGC0408

SDG: 18C0424
Project: SVCA Area Z Remediation
Instrument: NT3
Calibration: BA00063

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (BGC0717-BS2)		(Water)	Lab File ID: V303271805LCSG.D			Analyzed: 03/27/18 10:05			
Pentafluorobenzene	224624	5.399	208826	5.415	108	50 - 200	0.0160	+/-0.50	
Chlorobenzene-d5	315107	7.823	290356	7.833	109	50 - 200	0.0100	+/-0.50	
1,4-Difluorobenzene	336860	5.782	319374	5.798	105	50 - 200	0.0160	+/-0.50	
1,4-Dichlorobenzene-d4	169123	9.513	151501	9.524	112	50 - 200	0.0110	+/-0.50	
Initial Cal Check (SGC0408-ICV1)		(Water)	Lab File ID: V303271805G.D			Analyzed: 03/27/18 10:05			
Pentafluorobenzene	224624	5.399	208826	5.415	108	50 - 200	0.0160	+/-0.50	
Chlorobenzene-d5	315107	7.823	290356	7.833	109	50 - 200	0.0100	+/-0.50	
1,4-Difluorobenzene	336860	5.782	319374	5.798	105	50 - 200	0.0160	+/-0.50	
1,4-Dichlorobenzene-d4	169123	9.513	151501	9.524	112	50 - 200	0.0110	+/-0.50	
LCS Dup (BGC0717-BSD2)		(Water)	Lab File ID: V303271806G.D			Analyzed: 03/27/18 10:31			
Pentafluorobenzene	221035	5.399	208826	5.415	106	50 - 200	0.0160	+/-0.50	
Chlorobenzene-d5	307909	7.822	290356	7.833	106	50 - 200	0.0110	+/-0.50	
1,4-Difluorobenzene	330844	5.781	319374	5.798	104	50 - 200	0.0170	+/-0.50	
1,4-Dichlorobenzene-d4	167231	9.513	151501	9.524	110	50 - 200	0.0110	+/-0.50	
Blank (BGC0717-BLK2)		(Water)	Lab File ID: V303271808G.D			Analyzed: 03/27/18 11:22			
Pentafluorobenzene	206539	5.398	208826	5.415	99	50 - 200	0.0170	+/-0.50	
Chlorobenzene-d5	289501	7.822	290356	7.833	100	50 - 200	0.0110	+/-0.50	
1,4-Difluorobenzene	307456	5.78	319374	5.798	96	50 - 200	0.0180	+/-0.50	
1,4-Dichlorobenzene-d4	152124	9.512	151501	9.524	100	50 - 200	0.0120	+/-0.50	
Trip Blank (18C0424-03)		(Water)	Lab File ID: V303271822G.D			Analyzed: 03/27/18 17:15			
Pentafluorobenzene	179337	5.398	208826	5.415	86	50 - 200	0.0170	+/-0.50	
Chlorobenzene-d5	256546	7.822	290356	7.833	88	50 - 200	0.0110	+/-0.50	
1,4-Difluorobenzene	271958	5.78	319374	5.798	85	50 - 200	0.0180	+/-0.50	
1,4-Dichlorobenzene-d4	133490	9.517	151501	9.524	88	50 - 200	0.0070	+/-0.50	
MW-4-180326 (18C0424-01)		(Water)	Lab File ID: V303271823G.D			Analyzed: 03/27/18 17:41			
Pentafluorobenzene	182756	5.399	208826	5.415	88	50 - 200	0.0160	+/-0.50	
Chlorobenzene-d5	253318	7.823	290356	7.833	87	50 - 200	0.0100	+/-0.50	
1,4-Difluorobenzene	267350	5.781	319374	5.798	84	50 - 200	0.0170	+/-0.50	
1,4-Dichlorobenzene-d4	135680	9.513	151501	9.524	90	50 - 200	0.0110	+/-0.50	



HOLDING TIME SUMMARY

Analysis: NWTPhg

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor OEA, LLC

Project: SVCA Area Z Remediation

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
MW-4-180326 18C0424-01	03/26/18 11:42	03/27/18 08:27	03/27/18 10:48	0	14	03/27/18 17:41	1	14	
Trip Blank 18C0424-03	03/26/18 11:42	03/27/18 08:27	03/27/18 10:48	0	14	03/27/18 17:15	1	14	

* Indicates hold time exceedance.



METHOD DETECTION AND REPORTING LIMITS

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor OEA, LLC

Project: SVCA Area Z Remediation

Matrix: Solid

Instrument: NT3

Analyte	MDL	RL	Units
Gasoline Range Organics (Tol-Nap)	2500	5000	ug/kg



METHOD DETECTION AND REPORTING LIMITS

NWTPHg

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor OEA, LLC

Project: SVCA Area Z Remediation

Matrix: Water

Instrument: NT3

Analyte	MDL	RL	Units
Gasoline Range Organics (Tol-Nap)	13.6	100	ug/L



Form I
ORGANIC ANALYSIS DATA SHEET

NWTPH-Dx
TPH (Extractables)

Laboratory:	<u>Analytical Resources, Inc.</u>	Laboratory ID:	<u>18C0424-01</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor OEA, LLC</u>	Prepared:	<u>04/02/18 10:12</u>	File ID:	<u>418D0416.D</u>
Project:	<u>SVCA Area Z Remediation</u>	Preparation:	<u>EPA 3510C SepF</u>	Analyzed:	<u>04/04/18 16:41</u>
Matrix:	<u>Groundwater</u>	Sequence:	<u>SGD0044</u>	Initial/Final:	<u>500 mL / 1 mL</u>
Sampled:	<u>03/26/18 11:42</u>	Column:	<u>RTX-1</u>	Calibration:	<u>BC00067</u>
% Solids:					
Batch:	<u>BGC0815</u>				
Instrument:	<u>FID4</u>				

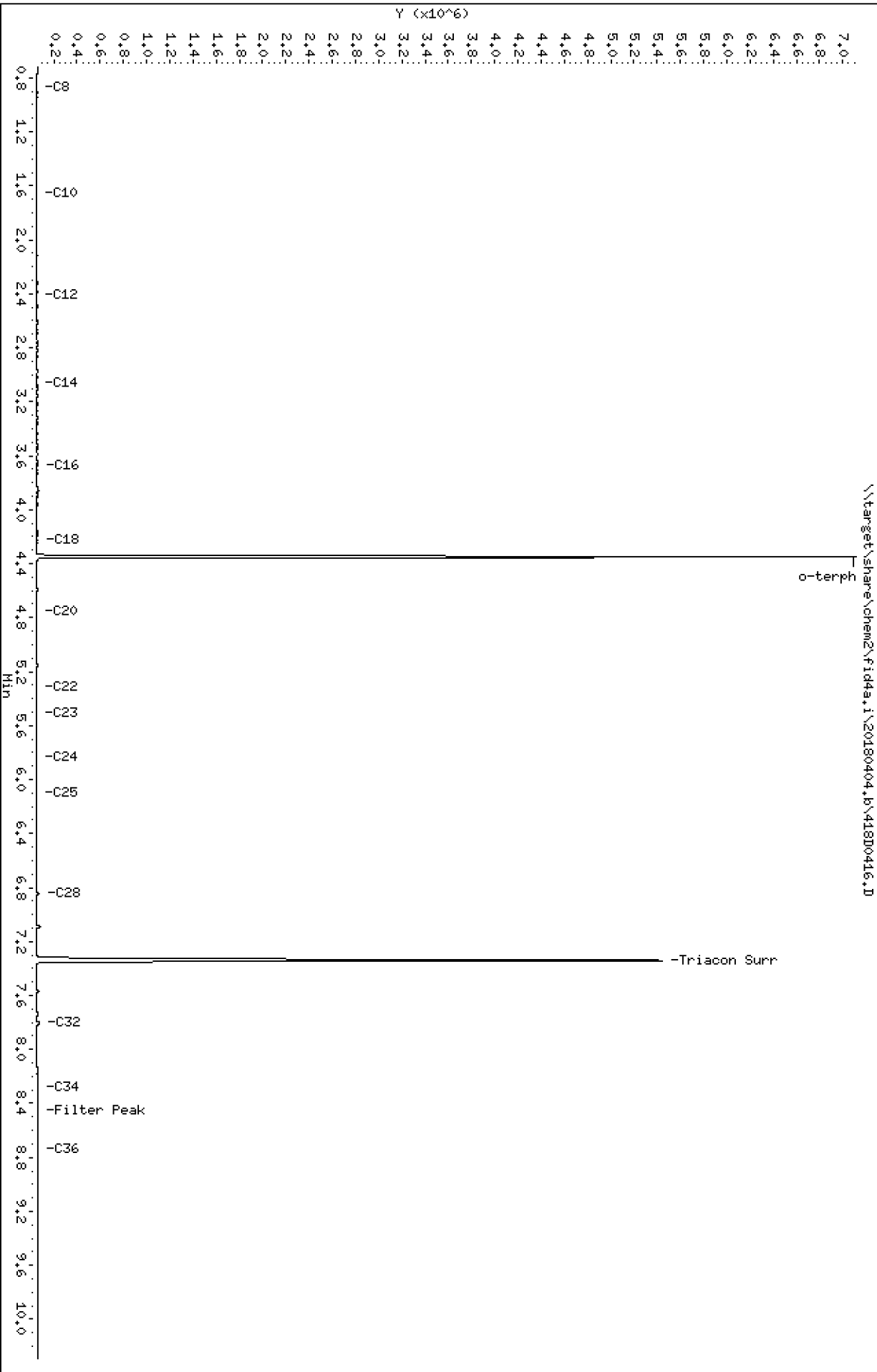
CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200

SURROGATES	ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl	0.45000	0.392	87.2	50 - 150	

Data File: \\target\share\chem2\fid4a.1\20180404_b\418D0416.D
Date : 04-APR-2018 16:41
Client ID:
Sample Info: 18C0424-01

Column phase: RTX-1

Instrument: fid4a.1
Operator: HDL
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20180404.b/418D0416.D
Method: 20180404.b\FID4TPH.m
Instrument: fid4a.i, MDL
Report Date: 04/05/2018
Macro: 27-MAR-2018
Calibration Dates: Gas:XX-XXX-XXXX Diesel:27-MAR-2018 M.Oil:27-MAR-2018

ARI ID: 18C0424-01
Client ID:
Injection: 04-APR-2018 16:41
Dilution Factor: 1

FID:4A RESULTS

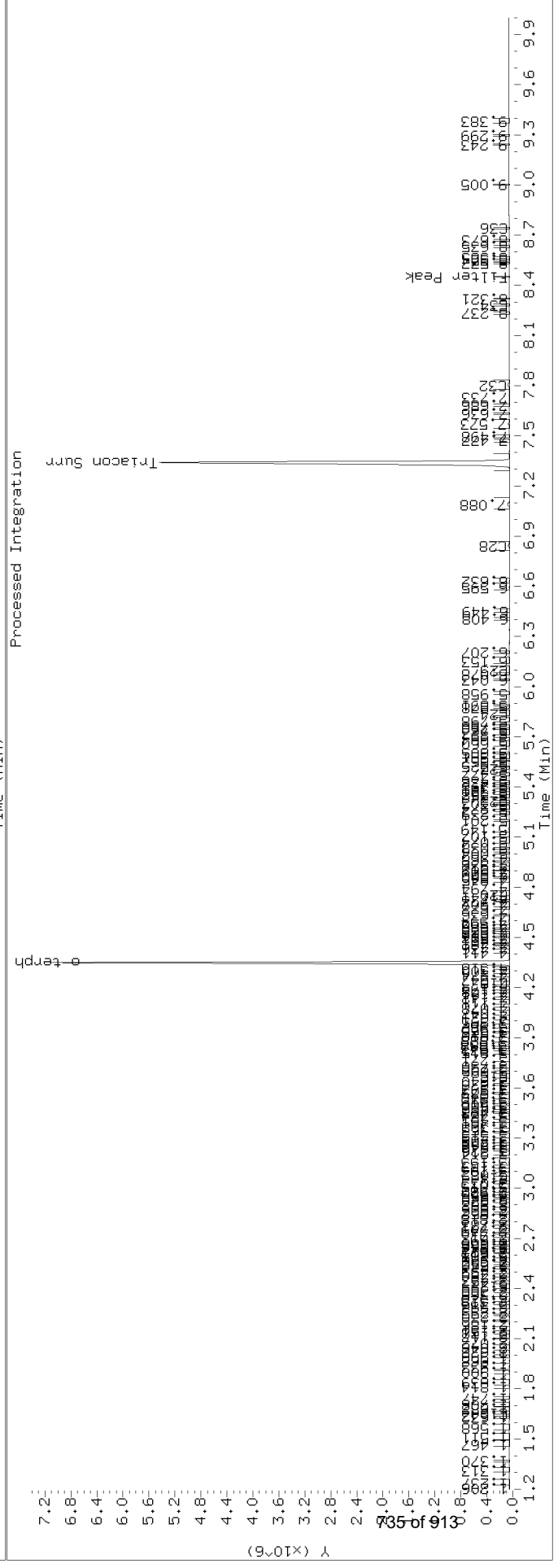
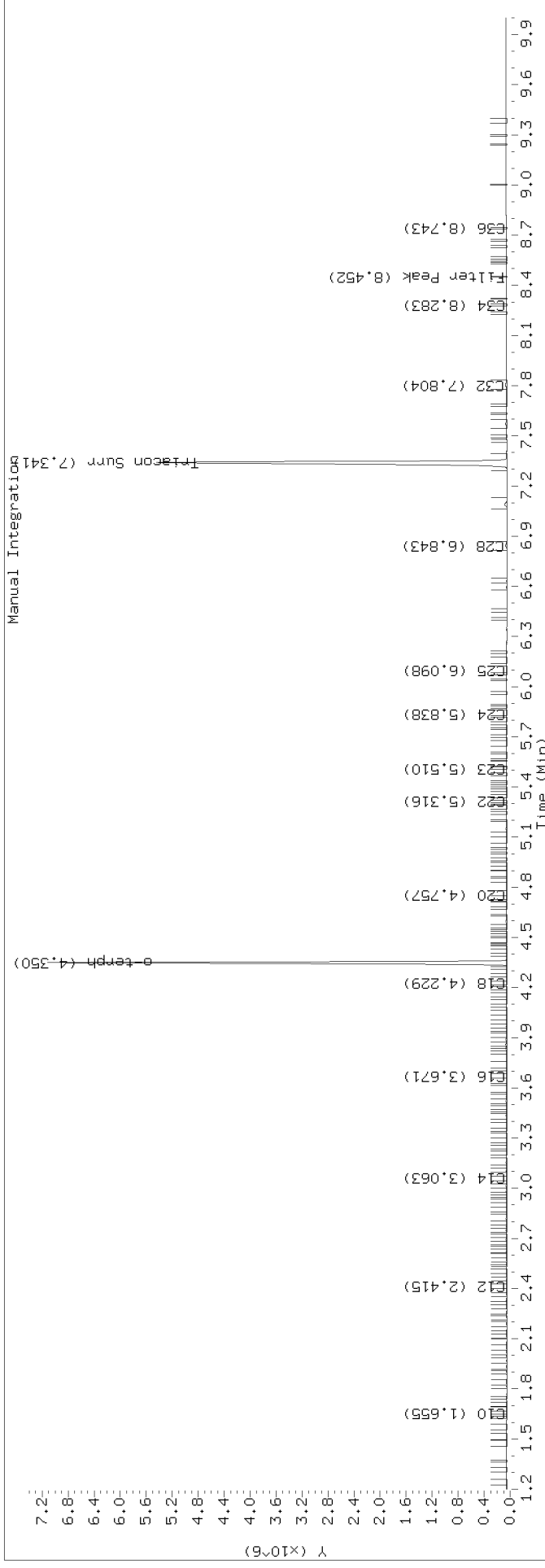
Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg/L)
C8	0.868	-0.015	5139	7886	WATPHD	(C12-C24)	830416	49.0
C10	1.655	0.002	2436	2088	WATPHM	(C24-C38)	234576	12.0
C12	2.415	0.013	3822	4138	AK102	(C10-C25)	923619	46.4
C14	3.063	-0.004	5430	7304	AK103	(C25-C36)	225629	13.7
C16	3.671	0.008	9009	10125	OR.DIES	(C10-C28)	967355	48.5
C18	4.229	0.016	6336	6369				
C20	4.757	-0.012	4621	8134				
C22	5.316	-0.001	4222	3035				
C24	5.838	-0.006	3192	5730				
C25	6.098	0.003	5824	8326				
C26	----							
C28	6.843	-0.002	20187	21300				
C32	7.804	-0.002	25284	37827				
C34	8.283	0.020	6627	4887				
Filter Peak	8.452	-0.042	7371	2906	BUNKERC	(C10-C38)	1154384	205.3
C36	8.743	0.021	9147	5424				
C38	----							
C40	----							
o-terph	4.350	-0.002	7060997	4934742				
Triacon Surr	7.341	-0.003	5389628	5575848	NAS DIES	(C10-C24)	919807	46.3

Range Times: NW Diesel(2.402 - 5.843) AK102(1.65 - 6.10) Jet A(1.65 - 4.21)
NW M.Oil(5.84 - 9.18) AK103(6.10 - 8.72) OR Diesel(1.65 - 6.84)

Surrogate	Area	Amount
o-Terphenyl	4934742	196.1 M
Triacontane	5575848	188.1

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25166.0	27-MAR-2018
Triacon Surr	29646.7	27-MAR-2018
Gas	15000.0	XX-XXX-XXXX
Diesel	16949.0	27-MAR-2018
Motor Oil	19499.0	27-MAR-2018
AK102	19895.0	27-MAR-2018
AK103	16514.0	27-MAR-2018
OR Diesel	19953.0	27-MAR-2018
NAS Diesel	19874.0	27-MAR-2018
Bunker C	5623.4	30-MAR-2018





Form I
ORGANIC ANALYSIS DATA SHEET
NWTPH-Dx
TPH (Extractables)

Laboratory: Analytical Resources, Inc.
 Client: Anchor OEA, LLC
 Project: SVCA Area Z Remediation
 Matrix: Groundwater Laboratory ID: 18C0424-02 SDG: 18C0424
 Sampled: 03/26/18 11:42 Prepared: 04/02/18 11:55 File ID: 418D0433.D
 % Solids: Preparation: EPA 3510C SepF Analyzed: 04/04/18 22:35
 Batch: BGC0819 Sequence: SGD0044 Initial/Final: 500 mL / 1 mL
 Instrument: FID4 Column: RTX-1 Calibration: BC00067
 Cleanups: Silica Gel, Sulfuric Acid

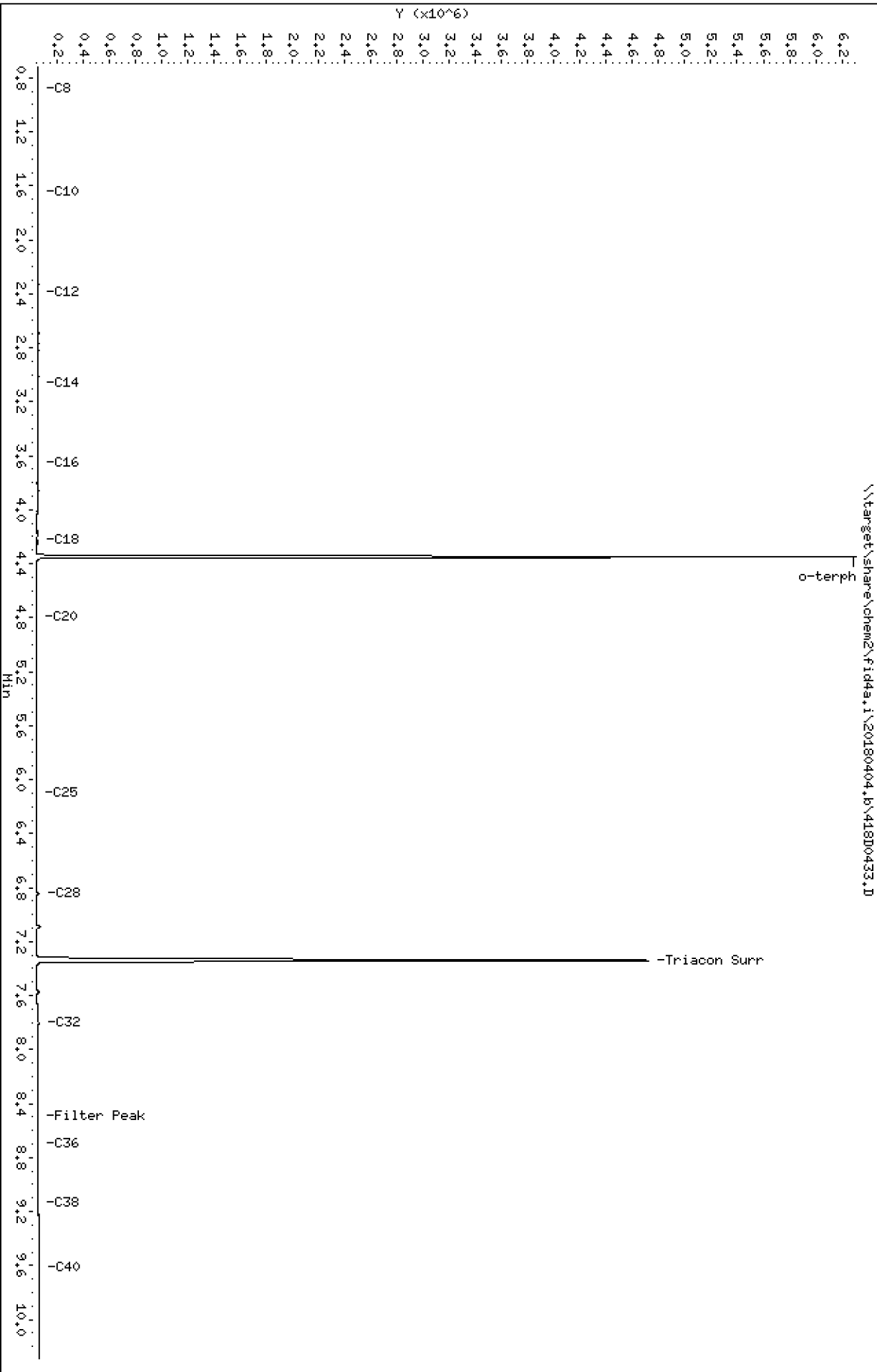
CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.119		0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200

SURROGATES	ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl	0.45000	0.346	76.8	50 - 150	

Data File: \\target\share\chem2\fid4a.1\20180404.b\418D0433.D
Date : 04-APR-2018 22:35
Client ID:
Sample Info: 18C0424-02

Column phase: RTX-1

Instrument: fid4a.1
Operator: HDL
Column diameter: 0.25



Analytical Resources Inc.
TPH Quantitation Report

Data file: 20180404.b/418D0433.D
Method: 20180404.b\FID4TPH.m
Instrument: fid4a.i, MDL
Report Date: 04/05/2018
Macro: 27-MAR-2018
Calibration Dates: Gas:XX-XXX-XXXX Diesel:27-MAR-2018 M.Oil:27-MAR-2018

ARI ID: 18C0424-02
Client ID:
Injection: 04-APR-2018 22:35
Dilution Factor: 1

FID:4A RESULTS

Compound	RT	Shift	Height	Area	Method	Range	Total Area	Conc (mg/L)
C8	0.881	-0.002	8747	13943	WATPHD	(C12-C24)	1007777	59.5
C10	1.645	-0.008	9003	6672	WATPHM	(C24-C38)	268741	13.8
C12	2.388	-0.013	15092	16733	AK102	(C10-C25)	1363700	68.5
C14	3.062	-0.005	10848	10998	AK103	(C25-C36)	232260	14.1
C16	3.655	-0.007	9419	10114	OR.DIES	(C10-C28)	1391649	69.7
C18	4.228	0.014	5649	5273				
C20	4.794	0.026	2241	1387				
C22	----							
C24	----							
C25	6.099	0.003	867	1066				
C26	----							
C28	6.843	-0.002	17300	24014				
C32	7.808	0.002	25510	48130				
C34	----							
Filter Peak	8.496	0.003	11398	10102	BUNKERC	(C10-C38)	1632441	290.3
C36	8.702	-0.021	12405	8021				
C38	9.141	-0.037	15173	14331				
C40	9.620	-0.014	17976	7172				
o-terph	4.350	-0.002	6264063	4350448				
Triacon Surr	7.339	-0.005	4679413	4949635	NAS DIES	(C10-C24)	1363700	68.6

Range Times: NW Diesel(2.402 - 5.843) AK102(1.65 - 6.10) Jet A(1.65 - 4.21)
NW M.Oil(5.84 - 9.18) AK103(6.10 - 8.72) OR Diesel(1.65 - 6.84)

Surrogate	Area	Amount
o-Terphenyl	4350448	172.9
Triacontane	4949635	167.0

M Indicates the peak was manually integrated

Analyte	RF	Curve Date
o-Terph Surr	25166.0	27-MAR-2018
Triacon Surr	29646.7	27-MAR-2018
Gas	15000.0	XX-XXX-XXXX
Diesel	16949.0	27-MAR-2018
Motor Oil	19499.0	27-MAR-2018
AK102	19895.0	27-MAR-2018
AK103	16514.0	27-MAR-2018
OR Diesel	19953.0	27-MAR-2018
NAS Diesel	19874.0	27-MAR-2018
Bunker C	5623.4	30-MAR-2018



PREPARATION BATCH SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Batch: BGC0815 Batch Matrix: Water

Preparation: EPA 3510C SepF

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
MW-4-180326	18C0424-01	418D0416.D	04/02/18 10:12	
Blank	BGC0815-BLK1	418D0414.D	04/02/18 10:12	
LCS	BGC0815-BS1	418D0415.D	04/02/18 10:12	



PREPARATION BATCH SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Batch: BGC0819 Batch Matrix: Water

Preparation: EPA 3510C SepF

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
MW-4-180326	18C0424-02	418D0433.D	04/02/18 11:55	
Blank	BGC0819-BLK1	418D0431.D	04/02/18 11:55	
LCS	BGC0819-BS1	418D0432.D	04/02/18 11:55	



CLEANUP BATCH SUMMARY

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Cleanup Batch: CGD0028

Cleanup Type: Sulfuric Acid

Cleanup Method: EPA 3665A Sulfuric Acid Cleanup

Analysis: NWTPH-Dx

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARE	OBSERVATIONS
MW-4-180326	18C0424-02	418D0433.D	04/04/2018	



CLEANUP BATCH SUMMARY

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Cleanup Batch: CGD0029

Cleanup Type: Silica Gel

Cleanup Method: EPA 3630C Silica Gel Cleanup

Analysis: NWTPH-Dx

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARE	OBSERVATIONS
MW-4-180326	18C0424-02	418D0433.D	04/04/2018	



Form I
METHOD BLANK DATA SHEET
NWTPH-Dx

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Matrix:	<u>Water</u>	Laboratory ID:	<u>BGC0815-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>04/02/18 10:12</u>
Solids:		Preparation:	<u>EPA 3510C SepF</u>
Batch:	<u>BGC0815</u>	Sequence:	<u>SGD0044</u>
Instrument:	<u>FID4</u>	Column:	<u>RTX-1</u>
		File ID:	<u>418D0414.D</u>
		Analyzed:	<u>04/04/18 15:58</u>
		Initial/Final:	<u>500 mL / 1 mL</u>
		Calibration:	<u>BC00067</u>

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200
SURROGATES		ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl		0.45000	0.365	81.2	50 - 150	



Form I
METHOD BLANK DATA SHEET
NWTPH-Dx

Blank

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Matrix:	<u>Water</u>	Laboratory ID:	<u>BGC0819-BLK1</u>
Sampled:	<u>N/A</u>	Prepared:	<u>04/02/18 11:55</u>
Solids:		Preparation:	<u>EPA 3510C SepF</u>
Batch:	<u>BGC0819</u>	Sequence:	<u>SGD0044</u>
Instrument:	<u>FID4</u>	Column:	<u>RTX-1</u>
		Cleanups:	<u>Silica Gel, Sulfuric Acid</u>

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	DL	RL
	Diesel Range Organics (C12-C24)	1	0.100	U	0.033	0.100
	Motor Oil Range Organics (C24-C38)	1	0.200	U	0.056	0.200
SURROGATES		ADDED (mg/L)	CONC (mg/L)	% REC	QC LIMITS	Q
o-Terphenyl		0.45000	0.368	81.8	50 - 150	



LCS / LCS DUPLICATE RECOVERY
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Matrix: Water

Analyzed: 04/04/18 16:20

Batch: BGC0815

Laboratory ID: BGC0815-BS1

Preparation: EPA 3510C SepF

Sequence Name: LCS

Initial/Final: 500 mL / 1 mL

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	Q	LCS % REC. #	QC LIMITS REC.
Diesel Range Organics (C12-C24)	3.00	2.82		94.1	56 - 120

* Indicates values outside of QC limits



LCS / LCS DUPLICATE RECOVERY
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Matrix: Water

Analyzed: 04/04/18 22:14

Batch: BGC0819

Laboratory ID: BGC0819-BS1

Preparation: EPA 3510C SepF

Sequence Name: LCS

Initial/Final: 500 mL / 1 mL

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	Q	LCS % REC. #	QC LIMITS REC.
Diesel Range Organics (C12-C24)	3.00	2.31		76.9	56 - 120

* Indicates values outside of QC limits



INITIAL CALIBRATION DATA NWTPH-D_x

Laboratory:	Analytical Resources, Inc.	SDG:	18C0424
Client:	Anchor QEA, LLC	Project:	SVCA Area Z Remediation
Calibration:	BC00067	Instrument:	FID4
Calibration Date:	03/27/2018 15:31	Column (1):	RTX-1

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	50	RF	100	RF	250	RF	500	RF	1000	RF	2500	RF
Diesel Range Organics (C12-C24)	50	21089.68	100	15492.66	250	14177.5	500	17224.78	1000	16364.48	2500	17347.12
o-Terphenyl	9	29967.67	18	25280.11	45	23405.67	90	25034.7	180	23200.24	450	24107.67



INITIAL CALIBRATION DATA NWTPH-Dx

Laboratory:	Analytical Resources, Inc.	SDG:	18C0424
Client:	Anchor QEA, LLC	Project:	SVCA Area Z Remediation
Calibration:	BC00067	Instrument:	FID4
Calibration Date:	03/27/2018 15:31	Column (1):	RTX-1

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Motor Oil Range Organics (C24-C38)	100	13260.15	250	24375.63	500	20067.88	1000	18850.14	2500	20941.59	5000	19499.82



INITIAL CALIBRATION DATA
NWTPH-Dx

Laboratory:	Analytical Resources, Inc.	SDG:	18C0424
Client:	Anchor QEA, LLC	Project:	SVCA Area Z Remediation
Calibration:	BC00067	Instrument:	FID4
Calibration Date:	03/27/2018 15:31	Column (1):	RTX-1

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Diesel Range Organics (C12-C24)	16949.37	13.8			RSD (20)	
Motor Oil Range Organics (C24-C38)	19499.2	18.6			RSD (20)	
o-Terphenyl	25166.01	9.9			RSD (20)	



SECOND-SOURCE CALIBRATION VERIFICATION
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Calibration: BC00067

Laboratory ID: SGC0396-SCV1

Sequence: SGC0396

Sequence Name: DIES SCV 500

Standard ID: F011649

ANALYTE	EXPECTED (mg/L)	FOUND (mg/L)	% DRIFT	QC LIMIT
Diesel Range Organics (C12-C24)	500.00	522	4.5	30.00
o-Terphenyl	90.000	90.3	0.3	

* Indicates values outside of QC limits



SECOND-SOURCE CALIBRATION VERIFICATION
NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Calibration: BC00067

Laboratory ID: SGC0396-SCV2

Sequence: SGC0396

Sequence Name: Moil SCV 1000

Standard ID: G002331

ANALYTE	EXPECTED (mg/L)	FOUND (mg/L)	% DRIFT	QC LIMIT
Motor Oil Range Organics (C24-C38)	1000.0	1160	16.1	30.00

* Indicates values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>18C0424</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SVCA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>BC00067</u>
Lab File ID: <u>418D0404.D</u>	Calibration Date: <u>03/27/18 15:31</u>
Sequence: <u>SGD0044</u>	Injection Date: <u>04/04/18</u>
Lab Sample ID: <u>SGD0044-ICV1</u>	Injection Time: <u>12:21</u>
Sequence Name: <u>Diesel CCV1</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	556	16949.3700	18855.4000		11.2	15
o-Terphenyl	A	90.000	90.0	25166.0100	25162.2900		0.0	15

* Values outside of QC limits



INITIAL CALIBRATION CHECK

NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>18C0424</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SVCA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>BC00067</u>
Lab File ID: <u>418D0405.D</u>	Calibration Date: <u>03/27/18 15:31</u>
Sequence: <u>SGD0044</u>	Injection Date: <u>04/04/18</u>
Lab Sample ID: <u>SGD0044-ICV2</u>	Injection Time: <u>12:41</u>
Sequence Name: <u>MOIL CCV2</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1020	19499.2000	19969.0300		2.4	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>BC00067</u>
Lab File ID:	<u>418D0412.D</u>	Calibration Date:	<u>03/27/18 15:31</u>
Sequence:	<u>SGD0044</u>	Injection Date:	<u>04/04/18</u>
Lab Sample ID:	<u>SGD0044-CCV1</u>	Injection Time:	<u>15:17</u>
Sequence Name:	<u>Diesel CCV1</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	557	16949.37	18882.9		11.4	15
o-Terphenyl	A	90.000	88.8	25166.01	24830.78		-1.3	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>18C0424</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SVCA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>BC00067</u>
Lab File ID: <u>418D0413.D</u>	Calibration Date: <u>03/27/18 15:31</u>
Sequence: <u>SGD0044</u>	Injection Date: <u>04/04/18</u>
Lab Sample ID: <u>SGD0044-CCV2</u>	Injection Time: <u>15:38</u>
Sequence Name: <u>MOIL CCV2</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1060	19499.2	20743.9		6.4	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>BC00067</u>
Lab File ID:	<u>418D0428.D</u>	Calibration Date:	<u>03/27/18 15:31</u>
Sequence:	<u>SGD0044</u>	Injection Date:	<u>04/04/18</u>
Lab Sample ID:	<u>SGD0044-CCV3</u>	Injection Time:	<u>20:51</u>
Sequence Name:	<u>Diesel CCV3</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	518	16949.37	17569.39		3.7	15
o-Terphenyl	A	90.000	89.7	25166.01	25070.1		-0.3	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK NWTPH-Dx

Laboratory: <u>Analytical Resources, Inc.</u>	SDG: <u>18C0424</u>
Client: <u>Anchor QEA, LLC</u>	Project: <u>SVCA Area Z Remediation</u>
Instrument ID: <u>FID4</u>	Calibration: <u>BC00067</u>
Lab File ID: <u>418D0429.D</u>	Calibration Date: <u>03/27/18 15:31</u>
Sequence: <u>SGD0044</u>	Injection Date: <u>04/04/18</u>
Lab Sample ID: <u>SGD0044-CCV4</u>	Injection Time: <u>21:11</u>
Sequence Name: <u>MOIL CCV4</u>	

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1070	19499.2	20828.1		6.8	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>BC00067</u>
Lab File ID:	<u>418D0441.D</u>	Calibration Date:	<u>03/27/18 15:31</u>
Sequence:	<u>SGD0044</u>	Injection Date:	<u>04/05/18</u>
Lab Sample ID:	<u>SGD0044-CCV5</u>	Injection Time:	<u>01:22</u>
Sequence Name:	<u>Diesel CCV5</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Diesel Range Organics (C12-C24)	A	500.00	559	16949.37	18960.85		11.9	15
o-Terphenyl	A	90.000	92.1	25166.01	25754.99		2.3	15

* Values outside of QC limits



CONTINUING CALIBRATION CHECK
NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Instrument ID:	<u>FID4</u>	Calibration:	<u>BC00067</u>
Lab File ID:	<u>418D0442.D</u>	Calibration Date:	<u>03/27/18 15:31</u>
Sequence:	<u>SGD0044</u>	Injection Date:	<u>04/05/18</u>
Lab Sample ID:	<u>SGD0044-CCV6</u>	Injection Time:	<u>01:42</u>
Sequence Name:	<u>MOIL CCV6</u>		

COMPOUND	TYPE	CONC. (mg/L)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Motor Oil Range Organics (C24-C38)	A	1000.0	1040	19499.2	20213.55		3.7	15

* Values outside of QC limits



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Sequence: SGC0396

Instrument: FID4

Calibration: BC00067

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Retention Time Std	SGC0396-IBL1	418C2714.D	NA	03/27/18 14:59
Instrument Blank	SGC0396-IBL2	418C2715.D	NA	03/27/18 15:20
Diesel 50	SGC0396-CAL1	418C2718.D	NA	03/27/18 17:18
Diesel 100	SGC0396-CAL2	418C2719.D	NA	03/27/18 17:39
Diesel 250	SGC0396-CAL3	418C2720.D	NA	03/27/18 18:00
Diesel 500	SGC0396-CAL4	418C2721.D	NA	03/27/18 18:21
Diesel 1000	SGC0396-CAL5	418C2722.D	NA	03/27/18 18:42
Diesel 2500	SGC0396-CAL6	418C2723.D	NA	03/27/18 19:03
MOIL 100	SGC0396-CAL7	418C2724.D	NA	03/27/18 19:23
Moil 250	SGC0396-CAL8	418C2725.D	NA	03/27/18 19:44
Moil 500	SGC0396-CAL9	418C2726.D	NA	03/27/18 20:04
Moil 1000	SGC0396-CALA	418C2727.D	NA	03/27/18 20:25
Moil 2500	SGC0396-CALB	418C2728.D	NA	03/27/18 20:47
Moil 5000	SGC0396-CALC	418C2729.D	NA	03/27/18 21:07
DIES SCV 500	SGC0396-SCV1	418C2730.D	NA	03/27/18 21:28
Moil SCV 1000	SGC0396-SCV2	418C2731.D	NA	03/27/18 21:48



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Sequence: SGC0447

Instrument: FID4

Calibration: BC00067

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Retention Time Std	SGC0447-IBL1	418C3001.D	NA	03/30/18 11:49
Instrument Blank	SGC0447-IBL2	418C3002.D	NA	03/30/18 12:09



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Sequence: SGD0044

Instrument: FID4

Calibration: BC00067

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Retention Time Std	SGD0044-IBL1	418D0402.D	NA	04/04/18 11:39
Instrument Blank	SGD0044-IBL2	418D0403.D	NA	04/04/18 12:01
Diesel CCV1	SGD0044-ICV1	418D0404.D	NA	04/04/18 12:21
MOIL CCV2	SGD0044-ICV2	418D0405.D	NA	04/04/18 12:41
ZZZZZ	18C0363-03RE1	418D0406.D	Water	04/04/18 13:02
ZZZZZ	18C0363-04RE1	418D0407.D	Water	04/04/18 13:23
ZZZZZ	BGD0036-BLK1	418D0408.D	Solid	04/04/18 13:45
ZZZZZ	BGD0036-BS1	418D0409.D	Solid	04/04/18 14:05
ZZZZZ	18C0403-01	418D0410.D	Solid	04/04/18 14:26
ZZZZZ	18C0403-02	418D0411.D	Solid	04/04/18 14:46
Diesel CCV1	SGD0044-CCV1	418D0412.D	NA	04/04/18 15:17
MOIL CCV2	SGD0044-CCV2	418D0413.D	NA	04/04/18 15:38
Blank	BGC0815-BLK1	418D0414.D	Water	04/04/18 15:58
LCS	BGC0815-BS1	418D0415.D	Water	04/04/18 16:20
MW-4-180326	18C0424-01	418D0416.D	Water	04/04/18 16:41
ZZZZZ	18C0445-01	418D0417.D	Water	04/04/18 17:01
ZZZZZ	18C0445-02	418D0418.D	Water	04/04/18 17:22
ZZZZZ	18C0457-01	418D0419.D	Water	04/04/18 17:43
ZZZZZ	18C0457-02	418D0420.D	Water	04/04/18 18:05
ZZZZZ	18C0457-03	418D0421.D	Water	04/04/18 18:25
ZZZZZ	18C0457-04	418D0422.D	Water	04/04/18 18:46
ZZZZZ	18C0457-05	418D0425.D	Water	04/04/18 19:47
ZZZZZ	18C0457-06	418D0426.D	Water	04/04/18 20:10
ZZZZZ	18C0457-07	418D0427.D	Water	04/04/18 20:30
Diesel CCV3	SGD0044-CCV3	418D0428.D	NA	04/04/18 20:51
MOIL CCV4	SGD0044-CCV4	418D0429.D	NA	04/04/18 21:11
ZZZZZ	18C0474-01	418D0430.D	Water	04/04/18 21:32
Blank	BGC0819-BLK1	418D0431.D	Water	04/04/18 21:52
LCS	BGC0819-BS1	418D0432.D	Water	04/04/18 22:14
MW-4-180326	18C0424-02	418D0433.D	Water	04/04/18 22:35



ANALYSIS BATCH (SEQUENCE) SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Sequence: SGD0044

Instrument: FID4

Calibration: BC00067

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	BGD0040-BLK1	418D0434.D	Water	04/04/18 22:56
ZZZZZ	BGD0040-BS1	418D0435.D	Water	04/04/18 23:16
ZZZZZ	18D0001-01	418D0436.D	Water	04/04/18 23:37
ZZZZZ	18D0001-02	418D0437.D	Water	04/04/18 23:57
ZZZZZ	18D0001-03	418D0438.D	Water	04/05/18 00:19
ZZZZZ	18D0027-01	418D0440.D	Water	04/05/18 01:01
Diesel CCV5	SGD0044-CCV5	418D0441.D	NA	04/05/18 01:22
MOIL CCV6	SGD0044-CCV6	418D0442.D	NA	04/05/18 01:42



SURROGATE RECOVERY AND RT SUMMARY

NWTPH-Dx

Laboratory:	<u>Analytical Resources, Inc.</u>	SDG/WO:	<u>18C0424</u>
Client:	<u>Anchor QEA, LLC</u>	Project:	<u>SVCA Area Z Remediation</u>
Sequence:	<u>SGC0396</u>	Instrument:	<u>FID4</u>
Calibration:	<u>BC00067</u>	Calibration Date:	<u>03/30/2018</u>

Surrogate Compound	Spike Level mg/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SGC0396-SCV1 (Water)		Lab File ID: 418C2730.D			Analyzed: 03/27/18 21:28			
o-Terphenyl	90.000	100	0 - 200	4.35	4.353333	-0.0033	N/A	



SURROGATE RECOVERY AND RT SUMMARY

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG/WO: 18C0424

Client: Anchor QEA, LLC

Project: SVCA Area Z Remediation

Sequence: SGD0044

Instrument: FID4

Calibration: BC00067

Calibration Date: 03/30/2018

Surrogate Compound	Spike Level mg/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SGD0044-IBL1 (Water)			Lab File ID: 418D0402.D			Analyzed: 04/04/18 11:39		
o-Terphenyl	225.00	105	50 - 150	4.35	4.353333	-0.0033	N/A	
SGD0044-IBL2 (Water)			Lab File ID: 418D0403.D			Analyzed: 04/04/18 12:01		
o-Terphenyl	225.00	99.6	50 - 150	4.35	4.353333	-0.0033	N/A	
SGD0044-ICV1 (Water)			Lab File ID: 418D0404.D			Analyzed: 04/04/18 12:21		
o-Terphenyl	90.000	100	85 - 115	4.35	4.353333	-0.0033	N/A	
BGC0815-BLK1 (Water)			Lab File ID: 418D0414.D			Analyzed: 04/04/18 15:58		
o-Terphenyl	0.45000	81.2	50 - 150	4.35	4.353333	-0.0033	N/A	
BGC0815-BS1 (Water)			Lab File ID: 418D0415.D			Analyzed: 04/04/18 16:20		
o-Terphenyl	0.45000	91.2	50 - 150	4.35	4.353333	-0.0033	N/A	
18C0424-01 (Water)			Lab File ID: 418D0416.D			Analyzed: 04/04/18 16:41		
o-Terphenyl	0.45000	87.2	50 - 150	4.35	4.353333	-0.0033	N/A	
BGC0819-BLK1 (Water)			Lab File ID: 418D0431.D			Analyzed: 04/04/18 21:52		
o-Terphenyl	0.45000	81.8	50 - 150	4.35	4.353333	-0.0033	N/A	
BGC0819-BS1 (Water)			Lab File ID: 418D0432.D			Analyzed: 04/04/18 22:14		
o-Terphenyl	0.45000	73.2	50 - 150	4.35	4.353333	-0.0033	N/A	
18C0424-02 (Water)			Lab File ID: 418D0433.D			Analyzed: 04/04/18 22:35		
o-Terphenyl	0.45000	76.8	50 - 150	4.35	4.353333	-0.0033	N/A	



HOLDING TIME SUMMARY

Analysis: NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor OEA, LLC

Project: SVCA Area Z Remediation

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
MW-4-180326 18C0424-01	03/26/18 11:42	03/27/18 08:27	04/02/18 10:12	6	7	04/04/18 16:41	2	40	
MW-4-180326 18C0424-02	03/26/18 11:42	03/27/18 08:27	04/02/18 11:55	7	7	04/04/18 22:35	2	40	

* Indicates hold time exceedance.



METHOD DETECTION AND REPORTING LIMITS

NWTPH-Dx

Laboratory: Analytical Resources, Inc.

SDG: 18C0424

Client: Anchor OEA, LLC

Project: SVCA Area Z Remediation

Matrix: Water

Instrument: FID4

Analyte	MDL	RL	Units
Diesel Range Organics (C12-C24)	0.033	0.100	mg/L
Motor Oil Range Organics (C24-C38)	0.056	0.200	mg/L

Appendix E

Analysis of Petroleum Chromatograms



June 2018
Sudden Valley Area Z Remediation



Appendix E

Analysis of Petroleum Chromatograms

Prepared for Wilson Engineering, LLC
And Sudden Valley Community Association

June 2018
Sudden Valley Area Z Remediation

Appendix E

Analysis of Petroleum Chromatograms

Prepared for
Wilson Engineering, LLC
805 Dupont Street, Suite 7
Bellingham, Washington 98225

Prepared by
Anchor QEA, LLC
1605 Cornwall Avenue
Bellingham, Washington 98225

and:

Sudden Valley Community Association
4 Clubhouse Circle
Bellingham, Washington 98229

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ABBREVIATIONS

Ecology	Washington State Department of Ecology
GC-FID	Gas Chromatography – Flame Ionization Detector
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
NWTPH-d	Northwest Total Petroleum Hydrocarbon-diesel range
NWTPH-dx	Northwest Total Petroleum Hydrocarbon-diesel range extended
TPH	total petroleum hydrocarbon
UCM	unresolved complex mixture

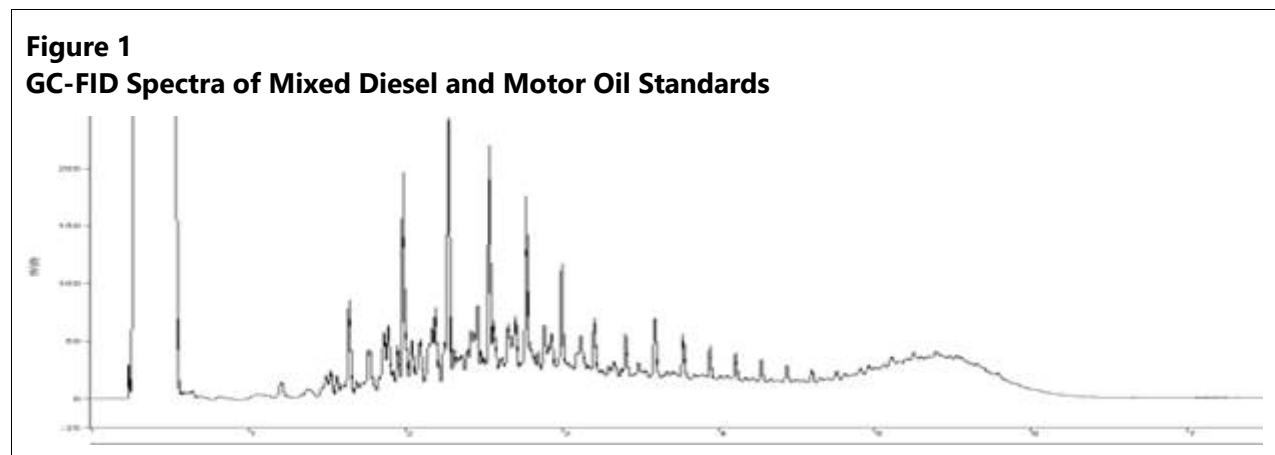
1 Introduction

This report evaluates the composition of petroleum hydrocarbons detected within soils and groundwater of Area Z. That contamination consists of diesel fuel released from a historical aboveground storage tank.

Characterization of total petroleum hydrocarbons (TPH) within Area Z has included testing for gasoline-, diesel-, and motor oil-range hydrocarbons. Gasoline-range hydrocarbons have not been detected during recent sampling.

Analyses of diesel- and oil-range hydrocarbons have been performed with and without silica gel cleanup to evaluate the contribution of non-petroleum hydrocarbons to reported diesel- and oil-range hydrocarbon concentrations. Chromatogram review as described in this report is used along with quantitative information to assess the relative makeup of petroleum and non-petroleum constituents.

The characteristic chromatogram of a diesel and motor oil standard analyzed by method NWTPH-dx is shown in Figure 1.



Source: Robinson and Heron 2015

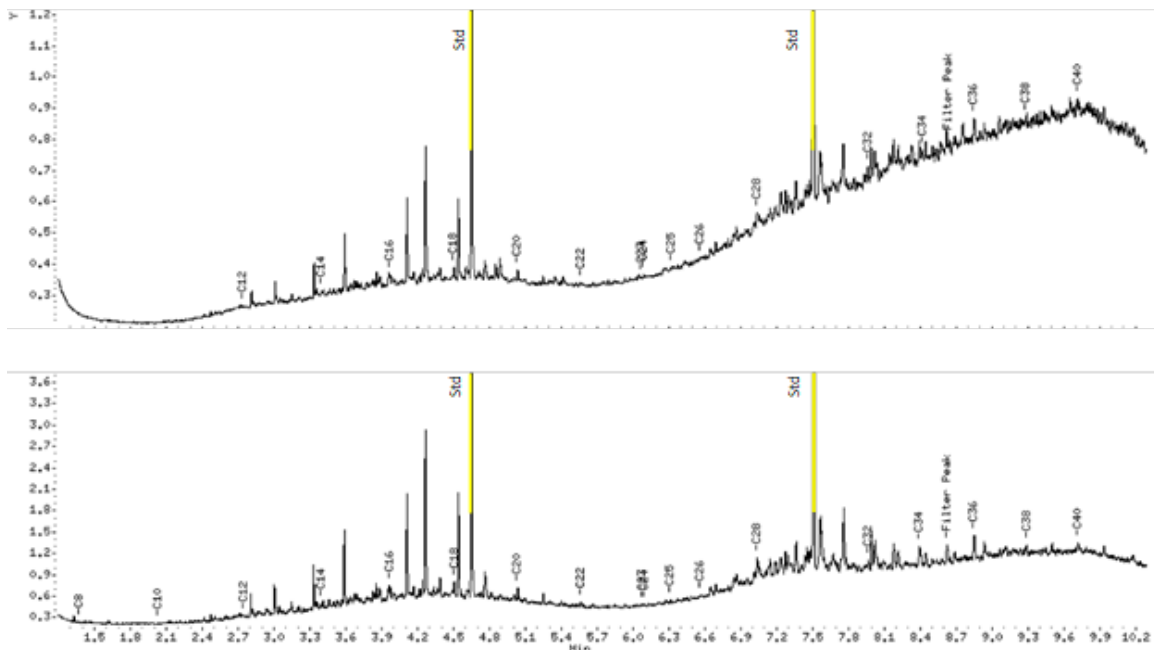
2 Soil Chromatogram Review

The soil Gas Chromatography – Flame Ionization Detector (GC-FID) spectra from petroleum testing performed within the treated soil stockpile area (Figure 2; TP-103, 3-4 ft) are dominated by an unresolved complex mixture (UCM) located in the motor oil range of the chromatogram. The greatest hydrocarbon concentrations are present at the heavy end of the motor oil range (diesel-range concentration of 754 milligrams per kilogram [mg/kg]; motor oil range concentration of 2,300 mg/kg).

The spectra do contain some amount of diesel. This is evident when comparing the chromatograms for the diesel range with and without silica gel cleanup. However, there is extensive noise in this chromatogram that is not consistent with the expected pattern for diesel or motor oil.

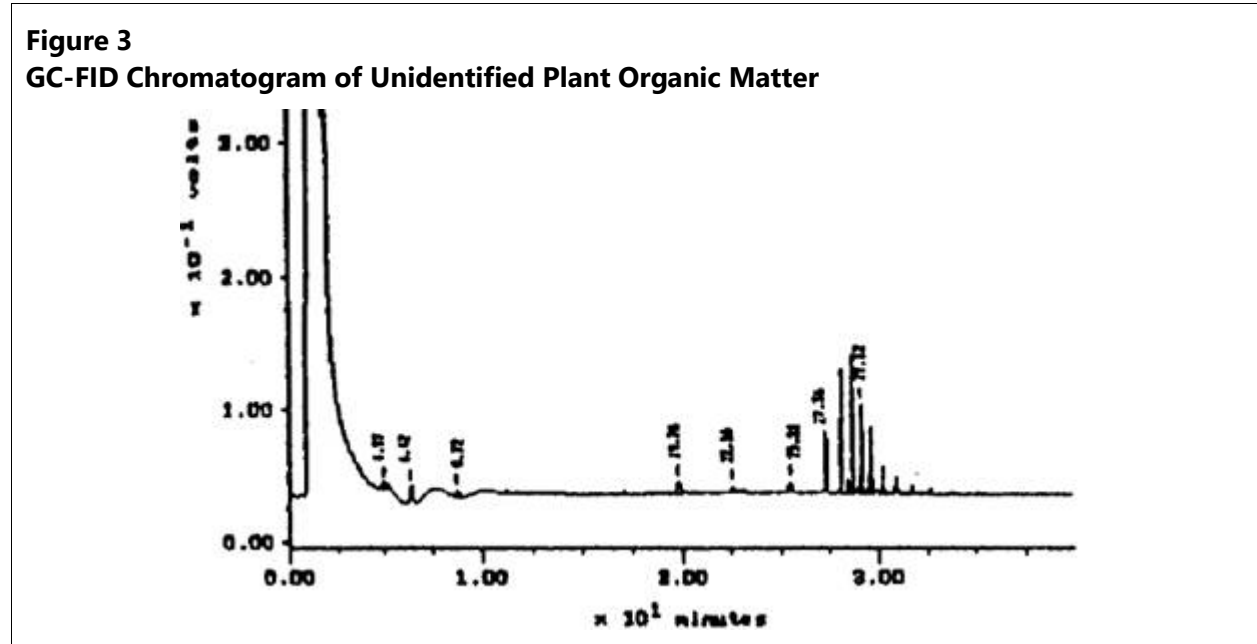
After silica gel cleanup (lower chromatogram in Figure 2), the extensive UCM hump in the motor oil range is decreased. Though the sample is still dominated by motor oil-range hydrocarbons, their concentration has been reduced 63 percent (from 2,300 mg/kg to 861 mg/kg) by the silica gel cleanup step. Diesel concentrations were reduced less, only 41 percent (from 754 to 447 mg/kg).

Figure 2
GC-FID Chromatograms Without (top) and With (bottom) Silica Gel Cleanup for Soil Sample SVCA-TP-103-3-4-170823



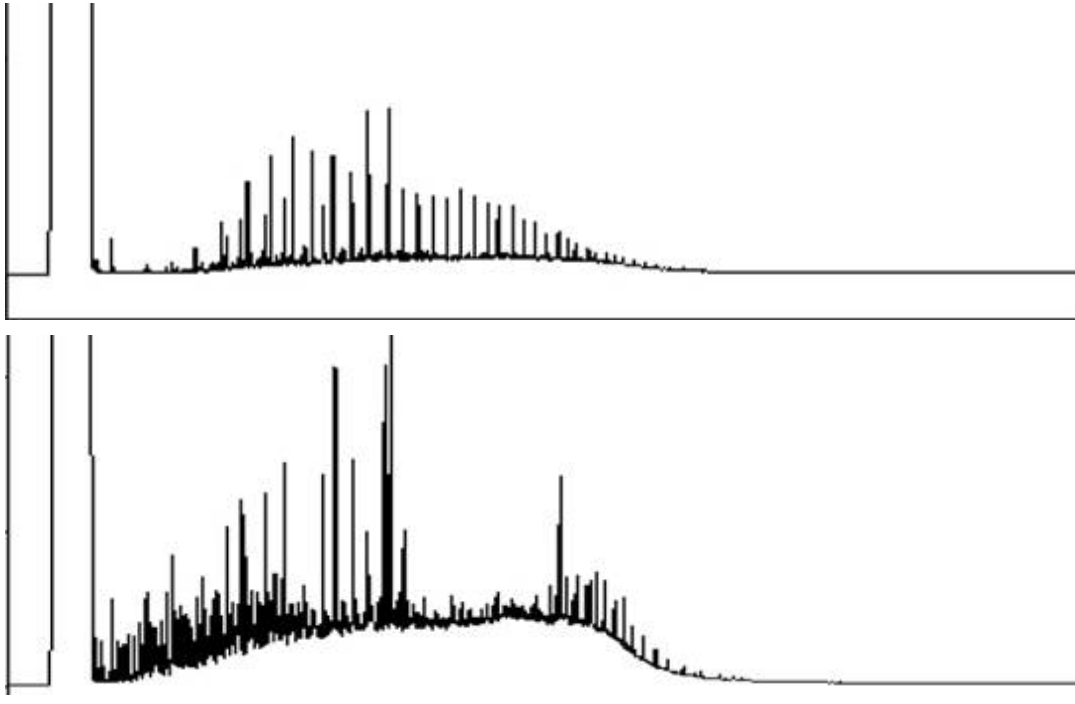
Silica gel cleanup is recommended by the Washington State Department of Ecology (Ecology) for application to soils containing elevated organic debris (Ecology TPH guidance). This is based on the contribution of non-petroleum plant matter to estimated hydrocarbons in the TPH range (Figures 3 and 4).

The very strong motor oil-range UCM for the peat soil in Figure 4 is consistent with the UCM observed in the stockpile soil samples analyzed without silica gel cleanup.



Source: Zemo et al. 1995

Figure 4
GC-FID Chromatogram of Diesel and Oil Contaminated Soil (top) and Organic Rich (peat) Diesel and Oil Contaminated Soil



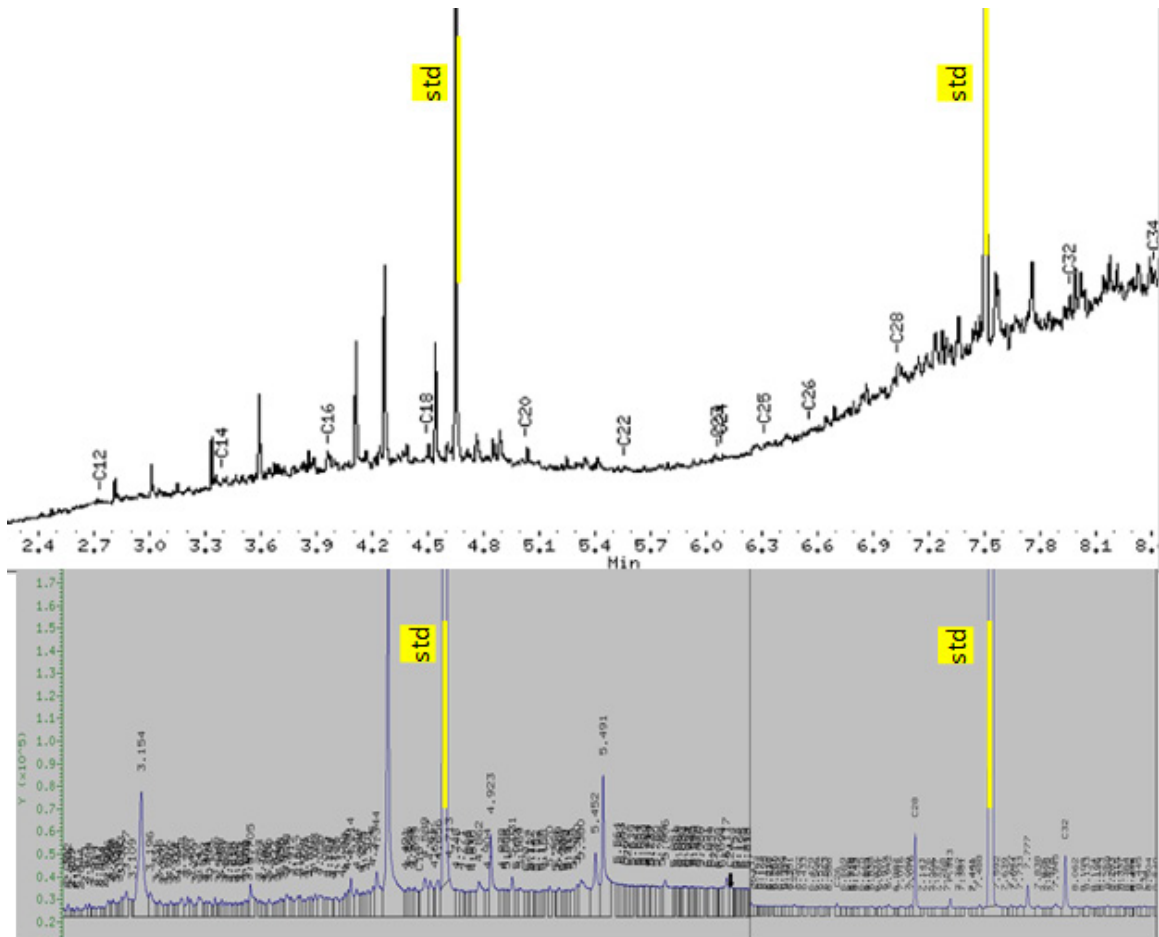
Source: Wang et al. 2012

3 Groundwater Chromatogram Review

Low levels of diesel-range and oil-range hydrocarbons were present in groundwater samples collected from MW-4 and analyzed without silica gel cleanup. Groundwater diesel-range and oil-range petroleum concentrations decreased from 0.65 milligrams per liter (mg/L) to below method detection limits when silica gel cleanup was included in the analysis.

Figure 5 compares the chromatogram of soils from the treated soil stockpile to a chromatogram of the groundwater from MW-4. Both chromatograms are from analyses performed without silica gel cleanup. The observed peaks in the MW-4 groundwater are not consistent with those observed in soil. Neither is the GC-FID chromatogram consistent with dissolved diesel spectra.

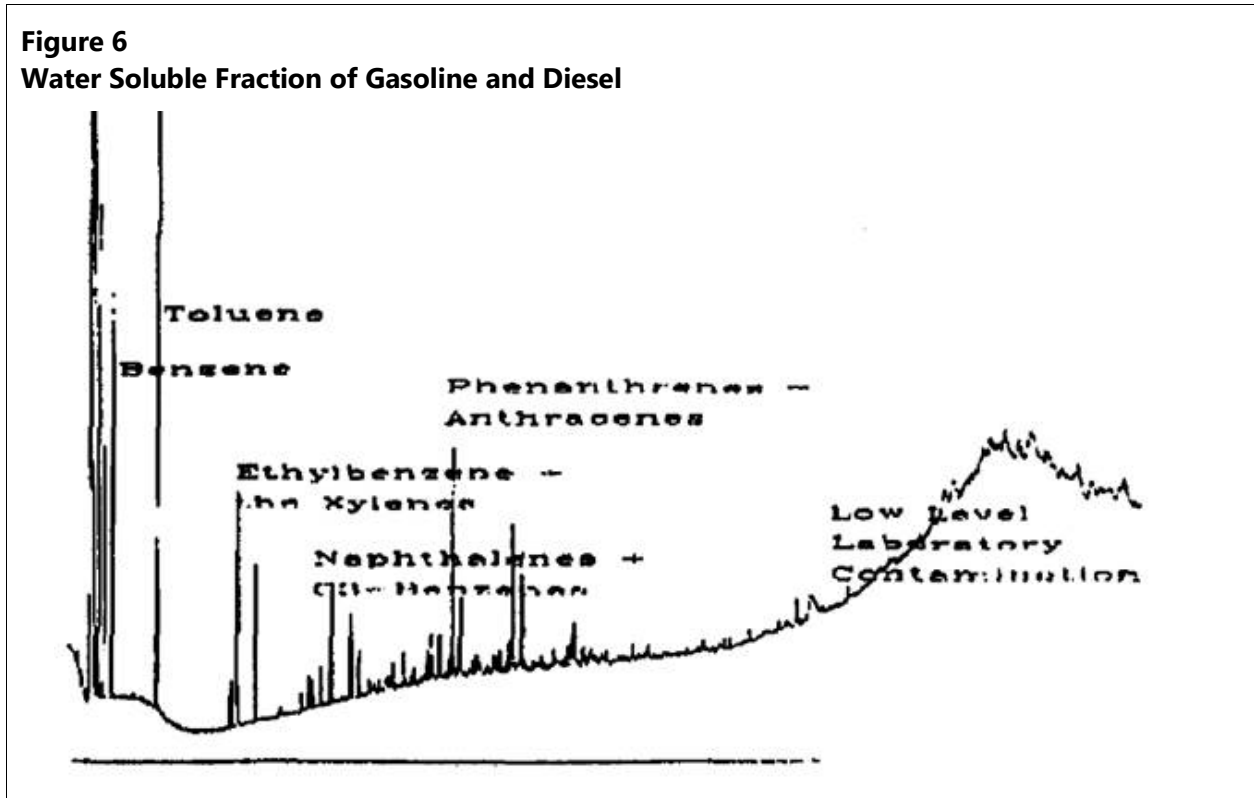
Figure 5
Comparison of GC-FID Chromatograms for Soil (TP-103 3-4 ft) and MW-4 Groundwater (analyzed without silica gel cleanup)



Boring logs wells and temporary soil borings placed near MW-4 noted the presence of organic matter (roots, etc.) in the saturated zone. Leaching of organic matter may contribute to the measured petroleum concentrations in test samples analyzed without silica gel.

In contrast to what was observed in the Area Z samples, dissolution of diesel into groundwater normally generates a similar peak pattern as the diesel in corresponding contaminated soils (Figure 6). The lack of corresponding peak patterns in the Area Z groundwater and soil samples further suggests the contribution of natural organic matter to the reported petroleum concentrations in samples analyzed without silica gel cleanup.

Figure 6
Water Soluble Fraction of Gasoline and Diesel



Source: Zemo et al. 1995

4 Discussion

Ecology guidance for performance of the NWTPH-d analysis recommends the use of silica gel cleanup when natural organic matter or other non-petroleum hydrocarbons may produce a high bias in the analysis. The silica gel cleanup removes polar (non-petroleum) hydrocarbons from the extract, removing the bias from the test results.

Based on the results of paired analyses performed with and without silica gel cleanup, a significant fraction of the reported diesel and oil concentrations is due to the presence of non-petroleum hydrocarbons in the samples:

- Introducing the silica gel cleanup step reduced reported TPH concentrations by between 40 and 60 percent.
- Introducing the silica gel cleanup step into the analysis of MW-4 groundwater reduced reported petroleum concentrations from 0.65 mg/L to below method reporting limits.

In both cases, chromatogram review indicated the presence of non-petroleum organic matter in the samples. This observation corresponds to the presence of extensive organic matter (saplings, roots, grasses) in the treated soil stockpile, and to the presence of natural organic matter in saturated zone boring logs near MW-4.

Based on the above-described observations, soil analyses for diesel- and oil-range petroleum should utilize silica gel cleanup as part of the NWTPH-d analysis. This is recommended also for analysis of groundwater samples.

5 References

- Robinson, P., and A. Heron, 2015. *TPH Reference Chromatograms*. Hill Laboratories (Hamilton, New Zealand); November 3, 2015.
- Wang, Z., C. Yang, Z. Yang, B. Hollebone, C.E. Brown, M. Landriault, J. Sun, S.M. Mudge, F. Kelly-Hooper, and D.G. Dixon, 2012. "Fingerprinting of petroleum hydrocarbons (PHC) and other biogenic organic compounds (BOC) in oil-contaminated and background soil samples." *Journal of Environmental Monitoring* 14(9):2367-2381.
- Zemo, D.A., J.E. Bruya, and T.E. Graf, 1995. "The application of petroleum hydrocarbon fingerprint characterization in site investigation and remediation." *Groundwater Monitoring and Remediation* 15(2):147-156.