

**DES Waste Management Division
29 Hazen Drive; PO Box 95
Concord, NH 03302-0095**

**TECHNICAL MEMORANDUM
SITE MAINTENANCE AND SUPPLEMENTAL
INVESTIGATIONS
Troy Mills Landfill Superfund Site
Troy, Cheshire County, New Hampshire
NHDES Site #: 198405082
Project Type: Superfund
Project Number: 104**

Prepared For:
New Hampshire Department of Environmental Services
Waste Management Division
Hazardous Waste Remediation Bureau
29 Hazen Drive
Concord, NH 03302-0095
Phone Number: 603-271-3649
Contact Name: Mr. Michael Summerlin, P.E.
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04.0190325.16

Date of Report: September 13, 2017



Proactive by Design

GEOTECHNICAL

ENVIRONMENTAL

ECOLOGICAL

WATER

CONSTRUCTION
MANAGEMENT

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September 13, 2017
File No. 04.0190325.16

Mr. Michael Summerlin, P.E.
New Hampshire Department of Environmental Services
Waste Management Division
29 Hazen Drive, P.O. Box 95
Concord, New Hampshire 03301-0095

Re: Technical Memorandum – Site Maintenance and Supplemental Investigations
Troy Mills Landfill Superfund Site
Troy, Cheshire County, New Hampshire
NHDES No. 198405082
CERCLIS ID NO. NHD98052021

Dear Michael:

This memorandum summarizes the work completed by GZA GeoEnvironmental, Inc. (GZA) during 2017 at the Troy Mills Landfill Superfund Site referred to herein as “Troy” or “Site”. The work was conducted in accordance with our “Proposed Scope of Work and Budget Estimate” dated November 22, 2016, the Work Scope Authorization (WSA#2) issued by the New Hampshire Department of Environmental Services (NHDES) on February 9, 2017, and our Work Plan for Test Pit Explorations dated August 16, 2017. Work conducted at the Site during 2017 included Site security enhancements, a surficial geophysical survey, and test pit excavations.

This work was associated with our NHDES 2015 – 2019 *Contract for Site Investigations, Remediation Design and Implementation Oversight at Petroleum & Hazardous Waste Sites, and CERCLA and Brownfields Projects* as approved by the Governor and Council on August 26, 2015.

This memorandum presents GZA's field observations, results, and technical opinions. The opinions included in this report are subject to modification based on additional information obtained by GZA or provided to GZA by other parties and the attached **Limitations**.

OBJECTIVES OF THE 2017 SITE ACTIVITIES

The September 2015 Second Five Year Review (FYR) identified evidence of trespassing and recreational use of Site areas as an issue that could impact future protectiveness at the Site. The FYR recommended that EPA would work with State and Town officials to develop alternatives for limiting access, including to erect additional barriers and signage and relocate the northern gate to limit trespassing and access. Site security enhancements were performed during 2017 to fulfill the recommendation for the Site access issue identified during the second FYR.



As a component of the Second FYR, it was concluded that bis(2-ethylhexyl)phthalate (DEHP) is likely to persist in the aqueous phase in groundwater at the Site due to rate-limited mass transfer from remaining residual non-aqueous mass and general recalcitrance of this contaminant in anaerobic groundwater environments. This finding was supported by the results of the trend analyses included in the Second FYR that were performed using monitoring data collected prior to and during 2015. The trend analyses for DEHP included in the second FYR are currently considered unreliable due to the potential for biased data; however, relatively high concentrations of DEHP exceeding the New Hampshire Ambient Groundwater Quality Standards (AGQS)¹ were consistently observed at well TRY_MW-205 between 2005 and 2014. Because TRY_MW-205 is located outside and cross-gradient to the drum removal area, a recommendation was made in the Spring 2016 Monitoring Round Data Report to perform surficial geophysics (e.g., ground penetrating radar [GPR]) and focused test pit explorations in this area to explore whether a separate source may exist outside of the drum removal area.

A surficial geophysical survey was performed to identify potential locations of buried metal objects, thereby guiding the test pit investigation. The objectives of the test pit investigation were to: 1) evaluate any anomalies identified as part of the geophysical survey above the water table; and 2) observe and sample potentially impacted fill materials above the water table for volatile organic compounds (VOCs) and phthalates to evaluate if these materials have the potential to contribute measurably to the groundwater impacts observed in this area.

SITE MAINTENANCE AND SUPPLEMENTAL INVESTIGATIONS

SITE SECURITY ENHANCEMENTS

Between June 6 and 9, 2017 GZA's subcontractor, Edward Paige Corp. (Edward Paige) of Norwell, Massachusetts, performed Site improvements to enhance Site security and limit access by recreational users. Refer to **Figure 1A** and **Figure 1B** for approximate locations of Site security enhancements completed during 2017 and the attached **Photograph Log** for photographic documentation of the Site security enhancements.

Tasks completed include the following:

- Installation of wood posts and rails (guard rails) along areas of the wetland on the Lower Access Road to limit access to the wetland and create a visual boundary for pedestrian trespassers (**Photo 1**). Wooden posts consist of 6-inch by 6-inch Alkaline Copper Quaternary (ACQ) pressure-treated softwood installed extending at least 3.5 feet below grade. Posts extend approximately 2 to 3 feet above grade with rails shiplapped and bolted to the posts with 5/8-inch by 14-inch galvanized carbon steel bolts. The rails consist of 2-inch by 8-inch ACQ pressure treated, rough cut boards;
- Repair of the existing chain-link gate at the southern entrance point to the Site, and installation of a tamper-proof locking mechanism on the gate;
- Placement of large boulders (4-foot diameter, minimum) along the east side of the road leading to and from the southern access gate in order to prevent access by vehicles, including ATVs, around the gate;
- Removal of the chain-link gate at the northern entrance point to the Site at the intersection with the rail trail;
- Installation of a chain-link gate with a tamper-proof locking mechanism at the access road just north of the intersection of the Lower and Upper Access Roads, and placement of large boulders (4-foot diameter, minimum) on the east and west sides of the gate to meet the earthen berms on each side;

¹ The New Hampshire Ambient Groundwater Quality Standards are included in the New Hampshire Code of Administrative Rules Env-Or 600 Contaminated Site Management (Env-Or 603.03).



- Removal of the remnants of a pipe gate and concrete footings located at the brook crossing to the sand pit (**Photo 2**);
- Placement of the removed pipe gate and concrete footings and large boulders (4-foot diameter, minimum) between the existing earthen berm and trees at the entrance to the upper portion of the property (i.e., capped landfills), north of the intersection of the Lower and Upper Access Roads (**Photo 3**);
- Placement of boulders (4-foot diameter, minimum) across the clearing along the east side of the Lower Access Road, south of the newly installed northern gate, to limit access from the Lower Access Road to the Upper Access Road and cap area (**Photo 4**);
- Installation of nine wooden sign posts along the Lower Access Road adjacent to the wetland;
- Removal of a dead tree proximate to the access path from the Lower Access Road to monitoring wells TRY_MW-105S/D; and
- Excavation and cleaning of a 24-inch culvert north of the newly installed northern Site gate that had become blocked causing erosion of the Access Road. The Access Road was regraded.

Subcontractors to Edward Paige included Bear Excavation LLC of Oxford, Massachusetts and CWS Fence & Guardrail of Andover, New Hampshire for the installation of the guardrail.

In addition to the activities performed by Edward Paige and its subcontractors, GZA commissioned and purchased new signage for the Site. Signs purchased include the following:

- Troy Mills Landfill Superfund signs consisting of ten 36-inch by 60-inch Coroplast (corrugated plastic) signs from the Concord Prison (two installed; eight reserved);
- Wetland access warning signs consisting of fifteen 17-inch by 11-inch Max-metal (aluminum composite) signs from MaineLine Graphics of Antrim, New Hampshire (nine installed; six reserved); and
- Ten aluminum, No Trespassing/Private Property signs (three installed; seven reserved).

GZA installed the signs on August 8, 2017. A Troy Mills Landfill Superfund Site sign was attached to both the northern and southern Site access gates (**Photo 5**). Nine wetland access warning signs were installed on the wooden sign posts placed by Edward Paige (**Photo 6**). While installing signs, GZA observed that several boulders located near the northern Site access gate had been moved allowing all-terrain vehicles to access the Upper Access Road and landfill cap (**Photo 7**). GZA's subcontractor for the test pitting activities, NRC East Environmental Services, Inc. (NRC) of Pembroke, New Hampshire, dug a shallow trench and re-placed the boulders within the trench to block access to the Site and limit the ability of trespassers to move boulders in the future.

GROUND PENETRATING RADAR SURVEY

On May 30, 2017, Hager-Richter Geoscience, Inc. (H-R) of Salem, New Hampshire completed a geophysical study including a combination of time domain electromagnetic induction metal detection (EM), magnetics (Mag), and GPR with the objective of evaluating the potential presence of buried 55-gallon drums proximate to and upgradient of the TRY_MW-205, TRY_MW-803, and TRY_MW-804 area. The approximate area for the survey and the results of each geophysical method are depicted on **Figure 2**. EM has a depth limitation of approximately 10 feet, and Mag has a depth limitation of approximately 20 feet. The maximum GPR signal penetration was estimated by H-R to have been approximately 12 to 15 feet below ground surface.



Based on the results of their study, H-R identified two areas of unidentified buried metal objects within the triangle created by TRY_MW-205, TRY_MW-803, and TRY_MW-804 and several areas of possible buried metal within the geophysical study area. The GPR reflectors for the two areas of unidentified buried metal objects were present at depths of 5 feet to greater than 12 feet below ground surface.

Refer to the **attached** H-R report, *Surface Geophysical Services, Troy Mills Landfill Superfund Site, Troy, New Hampshire*, for additional details.

TEST PIT EXPLORATION PROGRAM – TRY_MW-205 AREA

Between August 21 and 22, 2017, GZA's subcontractor, NRC, excavated four test pits within the area delineated by monitoring wells TRY_MW-205, TRY_MW-803, and TRY_MW-804. Test pits were excavated by NRC using a Caterpillar 315D excavator with an approximate reach of 18 feet. In general, the approximate dimensions of the test pits were 10 to 18 feet long, 7 feet wide, and 15 to 17 feet deep.

A GZA field geologist observed and documented the excavations and soil conditions. GZA also screened soil within the excavator bucket and soil stockpiles for evidence of contamination including making observations of visual and olfactory conditions, and screening soil headspaces for total VOCs using a photoionization detector (PID) equipped with a 10.6 electron volt lamp. The PID was calibrated and checked each morning with a 100-parts-per-million (ppm) isobutylene in air standard and a response factor of one. A calibration check was also completed at the end of each day. The associated **PID Calibration Logs** are attached. The conditions encountered while excavating, soil descriptions, landfill material observations, and the results of field screening are summarized on GZA's attached **Test Pit Logs**. Refer to **Figure 2** for approximate test pit locations and approximate locations of features observed during excavation activities and the Photographic Log for photographic documentation of excavation activities.

The following summarizes the general conditions encountered during test pit excavations:

- A 1/2-foot to 2-foot layer of light gray, fine to medium sand with some silt and clay was observed at the ground surface in TRY_TP-3 and TRY_TP-4 and approximately 1 foot below ground surface in TRY_TP-1 and TRY_TP-2;
- A light brown, fine to medium sand, overlain by topsoil, was observed within the top 2 feet to 3 feet of each excavation;
- Fabric materials of varying color, composition, and length were mixed with light brown fine to medium sand from approximately 3 feet below ground surface to below the reach of the excavator;
- Occasional metal (e.g., drum lids and band saw blade bundles) and wood debris were observed within test pits TRY_TP-2, TRY_TP-3, and TRY_TP-4. With the exception of the drum and saw blade bundles, metal debris was removed from the Site by NRC for recycling;
- One partial, 55-gallon steel drum in poor condition was observed in the western end of TRY_TP-1 at approximately 16 feet below ground surface (**Photo 8** and **Photo 9**). The drum contents consisted of paint-like material including a tan partially-solidified material and black and bluish gray viscous liquids. The drum contents were observed to have discharged to the immediately surrounding soil. At the direction of NHDES and EPA, the drum was replaced in the test pit at the approximate depth at which it was encountered, and covered with excavated materials. Polyethylene sheeting was placed at approximately 2 feet below ground surface to serve as an indication of the drum's presence for potential future remedial activities (**Photo 10**);



- Geotextile fabric, the assumed cap from former removal activities, was observed in the southern sidewall of test pit TRY_TP-3 (**Photo 12**); and
- Potentially impacted, dark gray, fine to medium sand was observed on the southern sidewall of test pit TRY_TP-3 near the northern edge of the upper drum removal area (**Photo 13**). The dark-colored soil had a paint-like odor, and an elevated PID reading (70 ppm) was measured at 6 feet below ground surface.

Topsoil and clean cap soil removed from the test pits was stockpiled near each excavation on the ground surface. Apparent landfilled materials and impacted soil were stockpiled on polyethylene sheeting during excavation activities. Soil from each stockpile was screened periodically with a PID for total VOCs. Following the completion of each excavation, the test pit was backfilled with excavated materials. The excavator was used to regrade the excavation areas with the excavated topsoil and cap soil. Grass seed and straw were spread over the disturbed areas (**Photo 17** and **Photo 18**). The excavator bucket was rinsed over the last test pit with a solution of Simple Green prior to regrading activities.

Each excavation was located in the field with a global positioning system (GPS) unit and/or taped measurements from monitoring wells.

GZA collected a sample of the dark gray, potentially impacted soil from test pit TRY_TP-3 at 6 feet below ground surface and submitted the sample to the EPA Laboratory in Chelmsford, Massachusetts for analysis of VOCs by EPA Method 8260B and phthalates by EPA Method 8270C. A duplicate of the sample was collected for quality control purposes and submitted for analysis of VOCs and phthalates. GZA also collected waste characterization samples from the drum observed in test pit TRY_TP-1 and submitted the samples to ESS Laboratories in Cranston, Rhode Island for laboratory analysis including VOCs by EPA Method 8260B, semi-volatile organic compounds (SVOCs) by EPA Method 8270C, Pesticides by EPA Method 8081, Herbicides by EPA Method 8185, Resource Conservation and Recovery Act (RCRA) 8 Metals by EPA Method 6010, polychlorinated biphenyls (PCBs) by EPA Method 8082, corrosivity/pH by EPA Method 9045, reactivity by Method 7.3.3.2/7.3.4.1, and ignitability/flashpoint by Method 1010/7.1.2.

The waste characterization analyses indicate that the contents of the drum would be considered a hazardous waste for barium, cadmium, chromium, lead, and ignitability. In addition, the waste characterization analyses indicated the material in the drum contained relatively high concentrations of DEHP (1,200 milligrams per kilogram [mg/kg]), di-n-octyl phthalate (3,930 mg/kg), 1,2,4-trimethylbenzene (325 mg/kg), and 1,3,5-trimethylbenzene (195 mg/kg), the main contaminants detected within wells TRY_MW-205, TRY_MW-803, and TRY_MW-804. Concentrations of other VOCs and SVOCs were also detected.

Similarly, phthalates detected within the soil sample collected from impacted soil within TRY_TP-3 consisted of DEHP (210 mg/kg) and di-n-octyl phthalate (11 mg/kg), and detected VOCs consisted of 1,2,4-trimethylbenzene (1.6 mg/kg), 1,3,5-trimethylbenzene (1.3 mg/kg), and p-isopropyltoluene (1.2 mg/kg). The detected VOCs did not exceed regulatory standards. The detected concentration of DEHP exceeded the New Hampshire Soil Remediation Standard (SRS)² of 72 mg/kg; however, the concentrations are below the New Hampshire Risk Characterization and Management Policy (RCMP) S-3 value of 2,300 mg/kg used during EPA's removal action (*i.e.*, drum removal and soil excavation remediation program). Currently, there is not an established SRS for di-n-octyl phthalate. There is currently no leaching based soil value for DEHP included in the RCMP due to the presumed negligible contaminant migration potential for the contaminant. The S-3 value for DEHP of 2,300 mg/kg is a direct contact risk based value that is designed to be protective of human exposure based on limited accessibility, frequency, and intensity of site usage as the soils at the site are below an engineered cap and access is limited.

² New Hampshire Soil Remediation Standards are included in the New Hampshire Code of Administrative Rules Env-Or 600 Contaminated Site Management (Env-Or 606.19 Soil Remediation Criteria).



September 13, 2017

04.0190325.16

New Hampshire Department of Environmental Services

Page | 6

CONCLUSIONS

Site security enhancements were completed with the goal of limiting unauthorized access to the Site and conveying Site exposure concerns to potential trespassers.

Areas of possible buried metal were identified during the surficial geophysical survey and confirmed during test pit excavations. In general, the observed landfilled materials and soil impacts were relatively benign; however, the residual waste material from the 55-gallon drum observed in TRY_TP-1 indicates that a potential continuing source of contamination to groundwater is located within the area of monitoring wells TRY_MW-205, TRY_MW-803, and TRY_MW-804.

If you have any questions regarding this report, please do not hesitate to contact Ms. Tanya Justham at (603) 232-8765.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in black ink, appearing to read 'Tanya P. Justham'.

Tanya P. Justham
Project Manager

A handwritten signature in black ink, appearing to read 'Michael A. Mobile'.

Michael A. Mobile, Ph.D.
Consultant/Reviewer

A handwritten signature in black ink, appearing to read 'Steven R. Lamb'.

Steven R. Lamb, P.G., C.G.W.P.
Principal

TPJ/SRL/MAM:kr

\\GZAMAN1\Jobs\04Jobs\0190300s\04.0190325.00 NHDES 2015-2019 Contract\04.0190325.16 - Troy 2017 Site Activities\Report\Technical Memo\FINAL 04.0190325.16 Troy 2017 tech memo 091317.docx

Attachments: Limitations
 Figures
 Photograph Log
 H-R Report
 PID Calibration Logs
 Test Pit Logs
 Analytical Laboratory Reports



Limitations



USE OF REPORT

1. GZA GeoEnvironmental, Inc. (GZA) prepared this report on behalf of, and for the exclusive use of our Client for the stated purpose(s) and location(s) identified in the Proposal for Services and/or Report. Use of this report, in whole or in part, at other locations, or for other purposes, may lead to inappropriate conclusions; and we do not accept any responsibility for the consequences of such use(s). Further, reliance by any party not expressly identified in the agreement, for any use, without our prior written permission, shall be at that party's sole risk, and without any liability to GZA.

STANDARD OF CARE

2. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the Proposal for Services and/or Report and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).
3. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made. Specifically, GZA does not and cannot represent that the Site contains no hazardous material, oil, or other latent condition beyond that observed by GZA during its study. Additionally, GZA makes no warranty that any response action or recommended action will achieve all of its objectives or that the findings of this study will be upheld by a local, state or federal agency.
4. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the Report.

SUBSURFACE CONDITIONS

5. The generalized soil profile(s) provided in our Report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata, and the transitions between strata, may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location refer to the exploration logs. The nature and extent of variations between these explorations may not become evident until further exploration or construction. If variations or other latent conditions then become evident, it will be necessary to reevaluate the conclusions and recommendations of this report.
6. Water level readings have been made, as described in this Report, in and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this report. Fluctuations in the level of the groundwater however occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities, and/or natural or artificially induced perturbations. The observed water table may be other than indicated in the Report.

COMPLIANCE WITH CODES AND REGULATIONS

7. We used reasonable care in identifying and interpreting applicable codes and regulations necessary to execute our scope of work. These codes and regulations are subject to various, and possibly contradictory, interpretations. Interpretations and compliance with codes and regulations by other parties is beyond our control.



SCREENING AND ANALYTICAL TESTING

8. GZA collected environmental samples at the locations identified in the Report. These samples were analyzed for the specific parameters identified in the report. Additional constituents, for which analyses were not conducted, may be present in soil, groundwater, surface water, sediment and/or air. Future Site activities and uses may result in a requirement for additional testing.
9. Our interpretation of field screening and laboratory data is presented in the Report. Unless otherwise noted, we relied upon the laboratory's QA/QC program to validate these data.
10. Variations in the types and concentrations of contaminants observed at a given location or time may occur due to release mechanisms, disposal practices, changes in flow paths, and/or the influence of various physical, chemical, biological or radiological processes. Subsequently observed concentrations may be other than indicated in the Report.

INTERPRETATION OF DATA

11. Our opinions are based on available information as described in the Report, and on our professional judgment. Additional observations made over time, and/or space, may not support the opinions provided in the Report.

ADDITIONAL INFORMATION

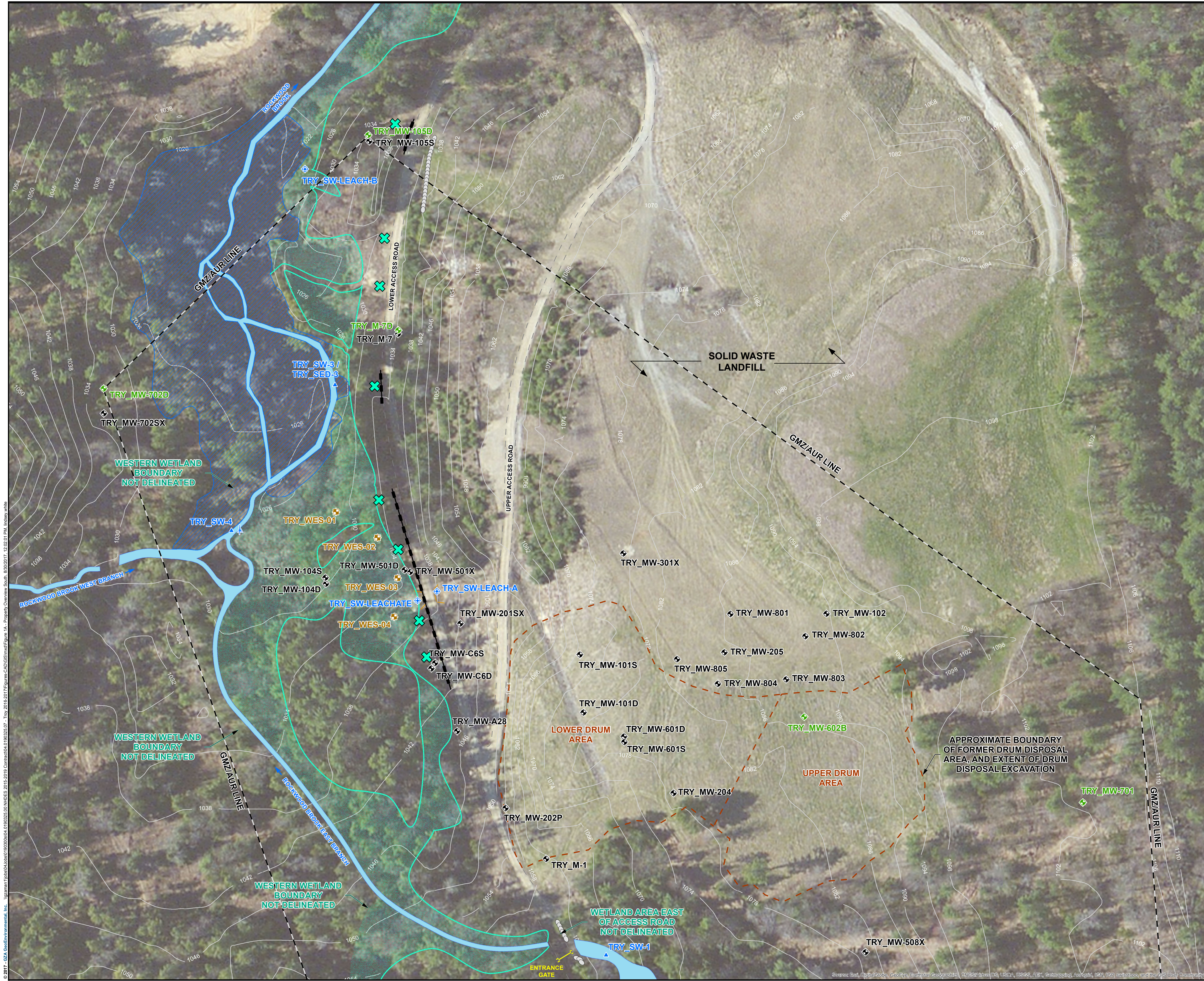
12. In the event that the Client or others authorized to use this report obtain additional information on environmental or hazardous waste issues at the Site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in this report.

ADDITIONAL SERVICES

13. GZA recommends that we be retained to provide services during any future investigations, design, implementation activities, construction, and/or property development/ redevelopment at the Site. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.



Figures



- LEGEND:**
- MW-701** BEDROCK MONITORING WELL
 - MW-601** OVERBURDEN MONITORING WELL
 - WES-01** WETLAND SOIL SAMPLE LOCATION
 - SW-1** SURFACE WATER AND/OR SEDIMENT SAMPLE LOCATION
 - SW-LEACH-A** LEACHATE SAMPLE LOCATION
 - PERMANENTLY INSTALLED STAFF GAUGE
 - STREAM FLOW DIRECTION
 - WETLAND ACCESS WARNING SIGNS
 - GUARDRAIL
 - BOULDER
 - APPROXIMATE LOCATION OF FORMER DRUM DISPOSAL AREA
 - APPROXIMATE WETLAND BOUNDARY
 - CULVERT
 - ENTRANCE GATE
 - GMZ/AUR
 - GRAVEL ACCESS ROAD
 - APPROXIMATE EXTENT OF FORMER PONDING
 - APPROXIMATE WETLAND AREA
 - SURFACE WATER
 - CONTOURS

- NOTES:**
1. BASE PLAN IS FROM NHDES GPS DATA POINTS TAKEN ON SEPTEMBER 29, 2011.
 2. THE GROUNDWATER MANAGEMENT ZONE (GMZ)/ACTIVITY AND USE RESTRICTION (AUR) LINE IS FROM "GROUNDWATER MANAGEMENT ZONE & ACTIVITY AND USE RESTRICTION PLAN, TROY MILLS LANDFILL, TROY, NEW HAMPSHIRE", PREPARED BY TF MORAN, INC., DATED DECEMBER 18, 2006, REVISED JANUARY 17, 2007 AND MARCH 19, 2007.
 3. A SURVEY OF THE SITE WELLS WAS CONDUCTED DURING FEBRUARY 2005 BY CONKLIN & SOROKA OF CHESHIRE, CONNECTICUT. THE BENCHMARK POINT USED FOR THIS SURVEY WAS MONITORING WELL TRY_M-3; ITS ELEVATION WAS ESTABLISHED AS 1037.65 (PVC) ACCORDING TO THE PLAN TITLED "TOPOGRAPHIC SURVEY DEPICTING MONITORING WELL LOCATIONS, LAND OF TROY MILLS LANDFILL." THE HORIZONTAL DATUM USED TO IDENTIFY SITE MONITORING WELLS IS NAD 83/96 PER NHDOT BASE STATION, FOLLOWING THE NEW HAMPSHIRE STATE PLANE PROJECTION, IN UNITS OF U.S. SURVEY FEET.

**TROY MILLS LANDFILL
SUPERFUND SITE
TROY, NEW HAMPSHIRE**

**ENGINEERING CONTROLS
SOUTH PORTION OF SITE**

PREPARED BY: **GZA GeoEnvironmental, Inc.**
Engineers and Scientists
www.gza.com

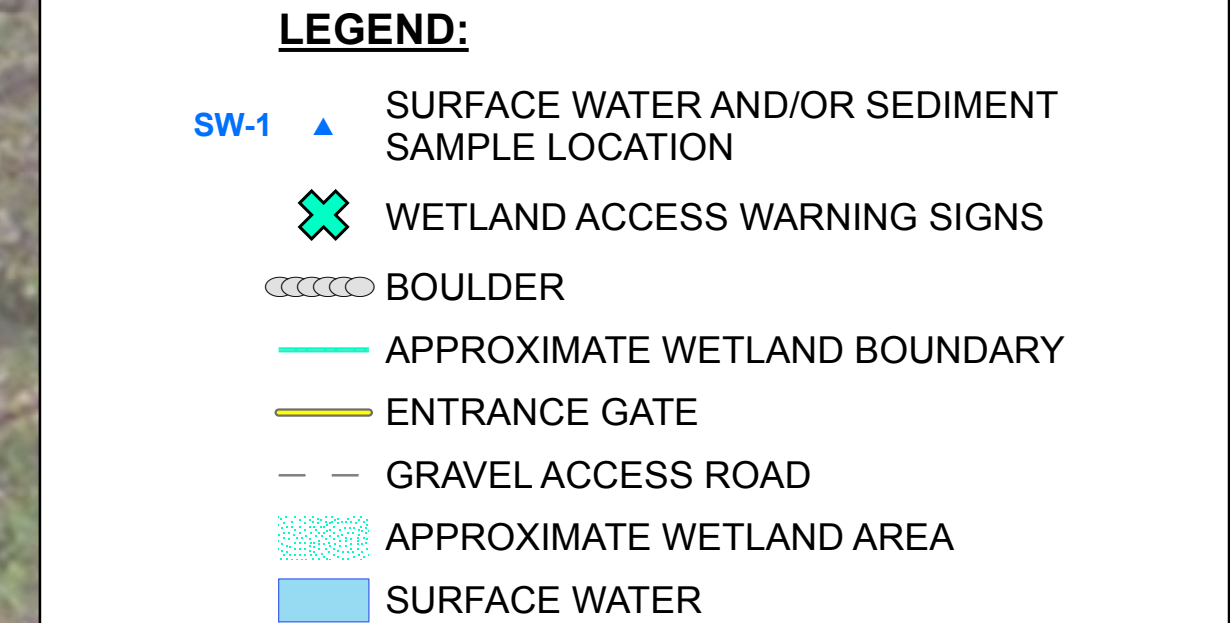
PREPARED FOR: NHDES/EPA

PROJ MGR: TPJ **REVIEWED BY:** SRL **CHECKED BY:** MAM **FIGURE**

DESIGNED BY: TPJ **DRAWN BY:** ADM **SCALE:** 1 in = 50 ft

DATE: AUG 2017 **PROJECT NO.:** 04.0190325.16 **REVISION NO.:**

1A



A graphic scale bar is shown, marked with 0, 25, 50, 100, and 150 feet. Below the scale bar is the text "GRAPHIC SCALE IN FEET". To the right of the scale bar is a compass rose with the cardinal directions labeled: N (North), S (South), E (East), and W (West).

	TROY MILLS LANDFILL SUPERFUND SITE TROY, NEW HAMPSHIRE
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PREPARED BY:  GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com	PREPARED FOR: NHDES/EPA
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PROJ MGR: TPJ	REVIEWED BY: SRL	CHECKED BY: MAM	FIGURE 1B
DESIGNED BY: TPJ	DRAWN BY: ADM	SCALE: 1 in = 50 ft	
DATE: AUG 2017	PROJECT NO. 04.0190325.16	REVISION NO.	

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Photograph Log



Client Name: New Hampshire Department of Environmental Services	Site Location: Troy Mills Landfill Superfund Site Troy, New Hampshire	Project No.: 04.0190352.16
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Photo No.: 1	Date: 6/8/2017	
Direction Photo Taken: Northwest		
Photographer: Sean Kellarson		
Description: View of finished guardrail by entrance to TRY_SW-3 location.		

Photo No.: 2	Date: 6/8/2017	
Direction Photo Taken: West		
Photographer: Sean Kellarson		
Description: View of Rockwood Brook crossing following removal of former gate and concrete base.		



Client Name: New Hampshire Department of Environmental Services	Site Location: Troy Mills Landfill Superfund Site Troy, New Hampshire	Project No.: 04.0190352.16
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Photo No.: 3	Date: / 5/26/2016/	
Direction Photo Taken: Southeast		
Photographer: Sean Kellarson		
Description: View of boulders placed across the northern access to the solid waste landfill.		

Photo No.: 4	Date: 6/8/2017
Direction Photo Taken: Northeast	
Photographer: Sean Kellarson	
Description: View of boulders placed along the bottom of the connection between the upper and lower access roads by TRY_MW-105S/D.	

A photograph of a dirt road in a forested area. The road is made of light brown soil and has visible tire tracks. Along the right side of the road, several large, light-colored boulders are placed in a line. The background is filled with dense green trees and foliage. The sky is partially visible at the top, showing some clouds.



Client Name: New Hampshire Department of Environmental Services	Site Location: Troy Mills Landfill Superfund Site Troy, New Hampshire	Project No.: 04.0190352.16
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Photo No.: 5	Date: 8/8/2017
Direction Photo Taken: South	
Photographer: Megan Murphy	
Description: View of north Site gate with tamper resistant latch and signage.	



Photo No.: 6	Date: 8/8/17	
Direction Photo Taken: West		
Photographer: Megan Murphy		
Description: Typical view of a wetland exposure warning sign.		



Client Name: New Hampshire Department of Environmental Services	Site Location: Troy Mills Landfill Superfund Site Troy, New Hampshire	Project No.: 04.0190352.16
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Photo No.: 7	Date: 8/8/2017	
Direction Photo Taken: East		
Photographer: Megan Murphy		
Description: View of boulders placed across the northern access to the solid waste landfill. Three boulders were moved by trespassers to provide ATV access to the Site.		

Photo No.: 8	Date: 8/21/2017	
Direction Photo Taken: N/A		
Photographer: Tanya Justham		
Description: TRY_TP-1 at end of excavation activities. The yellow box identifies the partial 55-gallon steel drum.		



Client Name: New Hampshire Department of Environmental Services	Site Location: Troy Mills Landfill Superfund Site Troy, New Hampshire	Project No.: 04.0190352.16
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Photo No.: 9	Date: 8/21/2017	
Direction Photo Taken: N/A		
Photographer: Christopher Melby		
Description: Close-up view of 55-gallon drum and contents in TRY_TP-1.		

Photo No.: 10	Date: 8/21/2017	
Direction Photo Taken: N/A		
Photographer: Christopher Melby		
Description: View of polyethylene sheeting placed in the top of TRY_TP-1 to identify the location of the drum for potential future removal activities.		



Client Name: New Hampshire Department of Environmental Services	Site Location: Troy Mills Landfill Superfund Site Troy, New Hampshire	Project No.: 04.0190352.16
------------------------------------------------------------------------	---------------------------------------------------------------------------------	--------------------------------------


Photo No.: 11	Date: 8/21/2017	
Direction Photo Taken: N/A		
Photographer: Christopher Melby		
Description: View of completed TRY_TP-2.		


Photo No.: 12	Date: 8/22/2017	
Direction Photo Taken: South		
Photographer: Christopher Melby		
Description: View of south wall of TRY_TP-3 depicting the dark gray cap soil layer and geotextile material (at arrow).		



Client Name: New Hampshire Department of Environmental Services	Site Location: Troy Mills Landfill Superfund Site Troy, New Hampshire	Project No.: 04.0190352.16
------------------------------------------------------------------------	---------------------------------------------------------------------------------	--------------------------------------

Photo No.: 13	Date: 8/22/2017	
Direction Photo Taken: South		
Photographer: Christopher Melby		
Description: View of south wall of TRY_TP-3 depicting the geotextile material and dark gray, potentially impacted soil approximately 1 foot below the geotextile.		

Photo No.: 14	Date: 8/22/2017
Direction Photo Taken: N/A	
Photographer: Christopher Melby	
Description: View of saw blade bundle in TRY_TP-4.	





Client Name: New Hampshire Department of Environmental Services	Site Location: Troy Mills Landfill Superfund Site Troy, New Hampshire	Project No.: 04.0190352.16
------------------------------------------------------------------------	---------------------------------------------------------------------------------	--------------------------------------

Photo No.: 15	Date: 8/22/2017
Direction Photo Taken: N/A	
Photographer: Tanya Justham	
Description: View of large saw blade bundle removed from TRY_TP-4.	



Photo No.: 16	Date: 8/22/2017	
Direction Photo Taken: N/A		
Photographer: Tanya Justham		
Description: View of bottom of completed TRY_TP-4.		



Client Name: New Hampshire Department of Environmental Services	Site Location: Troy Mills Landfill Superfund Site Troy, New Hampshire	Project No.: 04.0190352.16
------------------------------------------------------------------------	---------------------------------------------------------------------------------	--------------------------------------

Photo No.: 17	Date: 8/22/2017
Direction Photo Taken: Northeast	
Photographer: Christopher Melby	
Description: Site restoration east of monitoring well TRY_MW-205.	



Photo No.: 18	Date: 8/22/201
Direction Photo Taken: Southeast	
Photographer: Christopher Melby	
Description: Site restoration north of monitoring well TRY_MW-803.	





H-R Report

**SURFACE GEOPHYSICAL SERVICES
TROY MILLS LANDFILL SUPERFUND SITE
TROY, NEW HAMPSHIRE**

Prepared for:

GZA GeoEnvironmental, Inc.
5 Commerce Park North, Suite 201
Bedford, New Hampshire 03110

Prepared by:

Hager-Richter Geoscience, Inc.
8 Industrial Way - D10
Salem, New Hampshire 03079

File 17J49
June, 2017

HAGER-RICHTER GEOSCIENCE, INC.

GEOPHYSICISTS FOR THE ENGINEERING COMMUNITY

8 INDUSTRIAL WAY - D10
SALEM, NEW HAMPSHIRE 03079-5820

TELEPHONE (603) 893-9944
FAX (603) 893-8313

June 27, 2017
File 17J49

Tanya Justham
Project Manager / Geochemist
GZA GeoEnvironmental, Inc.
5 Commerce Park North, Suite 201
Bedford, New Hampshire 03110

Phn: 603-232-8765
Cell: 603-439-1548
Email: tanya.justham@gza.com

RE: Surface Geophysical Survey
Troy Mills Landfill Superfund Site
Troy, New Hampshire

Dear Ms. Justham:

In this letter, we report the results of a geophysical survey conducted by Hager-Richter Geoscience, Inc. (Hager-Richter) at the above referenced site located in Troy, New Hampshire for GZA GeoEnvironmental, Inc. (GZA) in May, 2017. The scope of the geophysical survey and the areas of interest were specified by GZA.

INTRODUCTION

The Troy Mills Landfill Superfund Site is located about 1.5 miles south of the center of Troy, New Hampshire. The general location of the site is shown in Figure 1. According to information provided by GZA, the 2-acre site was used from the late 60's to the late 70's by Troy Mills, Inc. as a drum disposal area. Reportedly, more than 6,000 drums were removed from the Site in 2005 by the US EPA. Immediately to the north of the former drum disposal area is a separate eight-acre solid waste landfill regulated by the New Hampshire Department of Environmental Services (NHDES), that was used until 2001 for the disposal of waste fabric scraps and other miscellaneous solid waste generated by manufacturing operations.

As part of an ongoing environmental investigation of the Site, GZA requested costs for conducting a surface geophysical survey in an approximately 260-foot by 90-foot area of the landfill to detect possible 55-gallon drums that could be a continuing source of contamination at the landfill. The area of interest is a grass-covered field located north of the former drum disposal area. Figure 2 shows the approximate location of the area of interest, and Photo 1 shows the typical site conditions.

OBJECTIVE

The objective of the surface geophysical survey was to detect, and if detected, to locate possible buried drums in the accessible portions of the specified area of interest at the Site.

THE SURVEY

Hager-Richter personnel conducted the field operations on May 30, 2017. The project was coordinated with Ms. Tanya Justham of GZA. Ms. Justham was present for the onset of the field work and specified the area of interest for the survey. Mr. Michael Summerlin of NHDES was present for a portion of the field work. The scope of work and the areas of interest were specified by GZA.

The surface geophysical survey was conducted using a combination of geophysical methods: time domain electromagnetic induction metal detection (EM), magnetics (Mag), and ground penetrating radar (GPR).



Photo 1. Typical site conditions in the geophysical survey area. GPR system at right.

The EM data were acquired along parallel traverses spaced 5 feet apart in the accessible portions of the specified area of interest at the Site. EM is an excellent method to screen areas for buried objects containing metal, but the method is affected by surface metal such as chain link fencing, dumpsters, parked vehicles, etc, and is limited to a depth of about 10 feet. The EM survey was conducted in substantial accordance with ASTM D 6820.

with data stations spaced at approximately 6-inch intervals across the accessible portions of the specified area of interest. Mag is also an excellent method to screen areas for buried objects containing ferrous metal, but can detect ferrous metal objects the size of a 55-gallon drum buried at a depth of about 20 feet. The magnetic survey was conducted in substantial accordance with ASTM D 6429.

Mag data were acquired along the same 5-foot traverses as the EM survey

The GPR survey was conducted along traverses oriented in two mutually perpendicular directions with lines spaced no more than 5 feet apart. The GPR method is capable of detecting both metal and nonmetal objects. The GPR survey was conducted in substantial accordance with ASTM D 6432.

Hager-Richter established a local survey grid for the acquisition of the geophysical data. The survey grid and other site features such as wells were georeferenced using a Trimble Geo7X CM GPS system utilizing a Zephyr-2 external antenna. The results of the survey are presented relative to the New Hampshire State Plane System NAD 1983.

EQUIPMENT

EM. The EM survey was conducted using a Geonics EM61-MK2A time domain electromagnetic induction metal detector. The EM61-MK2A instrument was designed specifically for detecting buried metal objects such as underground storage tanks (USTs), drums, and utilities. An air-cored transmitter coil generates a pulsed primary magnetic field in the earth, thereby inducing eddy currents in nearby metal objects. The eddy current produces a secondary magnetic field that is sensed by two receiver coils, one coincident with the transmitter and one positioned 40 cm above the main coil. By measuring the secondary magnetic field after the current in the ground has dissipated but before the current in metal objects has dissipated, the instrument responds only to the secondary magnetic field produced by metal objects. Four channels of secondary response are measured in mV and are recorded on a digital data logger. The system is generally operated by pushing the coils configured as a wagon with an odometer mounted on the axle to trigger the data logger automatically at approximately 8-inch intervals.

Magnetics. The magnetic survey was conducted using a Geometrics Model G858-G Cesium Vapor Magnetometer in gradient mode. The G-858-G uses two sensors with a vertical separation of 3.0 feet. The total magnetic field is measured at both sensors and the vertical magnetic gradient is calculated from those measurements. The G858-G can record data at 0.2 second cycle rates with a 0.05 gamma sensitivity. Magnetic data are most commonly presented as contour maps.

GPR. The GPR survey was conducted using a GSSI SIR 4000 GPR data acquisition system coupled with a 350 MHz hyper-stacking antenna. Data were recorded digitally, and the GPR data are reviewed in the field. The system includes a survey wheel that provides data at a uniform horizontal scale. Data were recorded using a 150 ns¹ time window.

¹ns, abbreviation for nanosecond, 1/1,000,000,000 second. Light and the GPR signal require about 1 ns to travel 1 ft in air. The GPR signal requires about 2.5 ns to travel 1 ft in concrete

Data from the GPR survey were processed using RADAN 7.4 GPR processing software from Geophysical Survey Systems, Inc. We reviewed profile images and created plan view time slice maps of the GPR data. Interpretation of the records is based on the nature and intensity of the reflected signals and on the resulting patterns.

LIMITATIONS OF THE METHODS

HAGER-RICHTER GEOSCIENCE, INC. MAKES NO GUARANTEE THAT ALL TARGETS OF INTEREST WERE DETECTED IN THIS SURVEY. HAGER-RICHTER GEOSCIENCE, INC. IS NOT RESPONSIBLE FOR DETECTING TARGETS THAT CANNOT BE DETECTED BY THE METHODS EMPLOYED OR BECAUSE OF SITE CONDITIONS.

EM. The EM survey cannot detect non-metallic objects. The data from an EM survey are adversely affected by surface metal. The EM61-MK2A has a depth sensitivity limited to about 10 feet. The instrument is relatively cumbersome, and works best where the transmit and receive coils can be hand pushed on a small wagon.

Detection and identification should be clearly differentiated. Detection is the recognition of the presence of a metal object, and the electromagnetic method is excellent for such purposes. Identification, on the other hand, is determination of the nature of the causative body (i.e., what is the body -- a cache of drums, UST, automobile, white goods, etc.). Although the EM61-MK2A data cannot be used to *identify* all buried metal objects, they provide excellent guides to the identification of some objects. For example, buried metal utilities produce anomalies with lengths many times their widths.

Magnetics. The data recorded in magnetic surveys are affected by *all* ferrous metal objects. In particular, steel objects above ground, such as trailers, fences, and buildings, can so influence the magnetic field that the effects of buried metal objects, if any, at the same location are "masked." Thus, where magnetic anomalies can be attributed to surface objects, the presence or absence of buried metal objects cannot be determined from the magnetic data alone.

Detection and identification should be clearly differentiated. Detection is the recognition of the presence of a magnetic object, and the magnetic method is excellent for such purposes. Identification, on the other hand, is determination of the nature of the causative body (i.e., what is the body -- a cache of drums, UST, automobile, white goods, etc.), and the magnetic method cannot identify the buried metal object.

GPR. There are limitations of the GPR technique as used to detect and/or locate targets such as those of the objectives of this survey. Limitations include: (1) surface conditions, (2)

electrical conductivity of the ground, (3) contrast of the electrical properties of the target and the surrounding soil, and (4) spacing of the traverses. Of these restrictions, only the last is controllable by us.

The condition of the ground surface can affect the quality of the GPR data and the depth of penetration of the GPR signal. Sites covered with snow piles, high grass, bushes, landscape structures, debris, obstacles, soil mounds, etc. limit the survey access and the coupling of the GPR antenna with the ground. In many cases, the GPR signal will not penetrate below concrete pavement, especially inside buildings, and a target may not be detectable. The GPR method also commonly does not provide useful data under canopies found at some facilities.

The electrical conductivity of the ground determines the attenuation of the GPR signal and thereby limits the maximum depth of exploration. For example, the GPR signal does not penetrate clay-rich soils, and targets buried in clay might not be detected.

A definite contrast in the electrical conductivities of the surrounding ground and the target material is required to obtain a reflection of the GPR signal. If the contrast is too small, possibly due to construction details or deeply corroded metal in the target, then the reflection may be too weak to recognize and the target can be missed.

Spacing of the traverses is limited by access at many sites, but where flexibility of traverse spacing is possible, the spacing is adjusted to the size of the target. The GPR operator controls the spacing between lines, and the design of the survey is based on the dimensions of the smallest feature of interest. Targets with dimensions smaller than the spacing between GPR survey lines can be missed.

RESULTS

General. The geophysical survey was conducted using time domain electromagnetic induction (EM), magnetic (Mag), and ground penetrating radar (GPR) methods in the accessible portions of the specified area of interest. Figure 2 is a site plan showing the area of interest. Figure 3 is color contour plot of the EM differential response data, Figure 4 is a color contour plot of the vertical magnetic gradient data, and Figure 5 shows the integrated interpretation of the EM, Mag, and GPR data.

EM. Interpretation of EM61-MK2A data is based on the *relative* response of the instrument in mV to local conditions. The instrument is not calibrated to provide an absolute measure of a particular property, such as the conductivity of the soil or the strength of the earth's magnetic field. Subsurface metal objects produce sharply defined positive anomalies when the EM61-MK2A is positioned directly over them. Acquiring data at short intervals along closely

spaced lines, as was done at the subject site, provides high spatial resolution of the location and footprint of the targets. Thus, buried metal is recognized in contour plots of EM61-MK2A data by positive anomalies roughly corresponding to the dimensions of the buried metal. The EM61-MK2A is capable of detecting an object the size of a steel drum to a depth of approximately 10 feet. Figure 3 is a color contour plot of the EM data.

Multiple EM anomalies are evident in the color contour plot presented in Figure 3. Three such anomalies are attributed to monitoring wells. The locations of anomalies attributed to surface objects are shown as blue hatched areas in Figure 6. We note that the presence or absence of subsurface metal objects in such areas cannot be determined on the basis of the or EM data alone due to the anomaly caused by the surface metal objects.

Several EM anomalies not attributed to surface metal objects are evident in the EM61 data plot for the subject Site, and we infer that buried metal is present at such locations within approximately 10 feet of the ground surface. The EM anomalies are “low amplitude” and although the causative objects are unknown, they are not likely caused by drums.

Mag. A Mag survey measures lateral variations in the earth’s magnetic field which can be caused by the presence of ferrous metal objects, geological changes, and man-made magnetic fields. When a magnetometer is used with two vertically separated sensors, as was done at the subject site, local variations in the earth’s vertical magnetic gradient are measured, and the locations of buried ferrous metal objects can be resolved more accurately than with total magnetic field data only. The magnetic method is capable of detecting a ferrous metal object roughly the size of a steel drum at a depth of approximately 20 feet. Figure 4 is a color contour plot of the vertical magnetic gradient data.

Multiple Mag anomalies are evident in the color contour plots presented in Figure 4. As with the EM survey, many such anomalies are attributed to monitoring wells. The locations of anomalies attributed to surface objects are shown as blue hatched areas in Figure 6. We note that the presence or absence of subsurface metal objects in such areas cannot be determined on the basis of the or Mag data alone due to the anomaly caused by the surface metal objects.

Several prominent areas of possible buried metal were detected on the basis of Magnetic gradient data, and are shown in Figure 6. Some such areas are located at or near areas of buried metal as indicated by the EM61 survey, and are likely present within 10 feet of the ground surface. Several other areas of buried metal detected by the magnetic gradient survey are located in areas with no anomalies present in the EM61 data, indicating that the objects causing the Mag anomalies are likely present at depths greater than 10 feet.

GPR and Integrated Interpretation. The locations of the GPR traverses and our integrated interpretation of the geophysical data are shown on Figure 5. The GPR data were acquired along traverses spaced 5 feet apart and oriented in two mutually perpendicular directions across the accessible portions of the area of interest.

Apparent GPR signal penetration was generally good, with two-way traveltime reflections received from about 100 to 125 ns of a 200 ns time-window. Based upon a site-specific time-to-depth conversions for the GPR signal, the GPR signal penetration is estimated to have been about 12 to as much as 15 feet.

GPR reflections from multiple unknown buried objects are evident in the records, as one would expect in fill, but much of the upper 5 feet is relatively featureless, probably because of the fabric scraps in the fill. Figure 6 is an example GPR record for the site. For the purposes of this survey, we focused on GPR reflections in areas of EM61 and Mag anomalies attributed to buried metal. We therefore show in Figure the locations of GPR reflectors present within areas of possible buried metal indicated by the EM61 or Mag data.

Two prominent areas having magnetic gradient anomalies and/or EM61 anomalies not attributed to surface metal were detected in the area of interest. Such areas also have GPR reflectors present at depths of 5 feet to greater than 12 feet below ground surface. The two prominent areas are designated here as Area A and Area B, and their locations are indicated in Figure 5.

CONCLUSIONS

Based on the geophysical survey conducted by Hager-Richter Geoscience, Inc. at the Troy Mills Superfund Site in Troy, New Hampshire for GZA, Inc., we conclude that:

- Several areas of possible buried metal are present in the area of interest at the Site.
- Two such areas of buried metal also have GPR reflectors consistent with the presence of buried objects. The identity of the objects causing the reflections cannot be determined on the basis of the geophysical data.

LIMITATIONS ON THE USE OF THIS REPORT

This letter report was prepared for the exclusive use of GZA, Inc. (Client). No other party shall be entitled to rely on this Report or any information, documents, records, data, interpretations, advice or opinions given to Client by Hager-Richter Geoscience, Inc. (Hager-Richter) in the performance of its work. The Report relates solely to the specific project for

which Hager-Richter has been retained and shall not be used or relied upon by Client or any third party for any variation or extension of this project, any other project or any other purpose without the express written permission of Hager-Richter. Any unpermitted use by Client or any third party shall be at Client's or such third party's own risk and without any liability to Hager-Richter.

Hager-Richter has used reasonable care, skill, competence and judgment in the performance of its services for this project consistent with professional standards for those providing similar services at the same time, in the same locale, and under like circumstances. Unless otherwise stated, the work performed by Hager-Richter should be understood to be exploratory and interpretational in character and any results, findings or recommendations contained in this Report or resulting from the work proposed may include decisions which are judgmental in nature and not necessarily based solely on pure science or engineering. It should be noted that our conclusions might be modified if subsurface conditions were better delineated with additional subsurface exploration including, but not limited to, test pits, soil borings with collection of soil and water samples, and laboratory testing.

Except as expressly provided in this limitations section, Hager-Richter makes no other representation or warranty of any kind whatsoever, oral or written, expressed or implied; and all implied warranties of merchantability and fitness for a particular purpose, are hereby disclaimed.

If you have any questions or comments on this letter report, please contact us at your convenience. We look forward to working with you again in the future.

Sincerely yours,
HAGER-RICHTER GEOSCIENCE, INC.

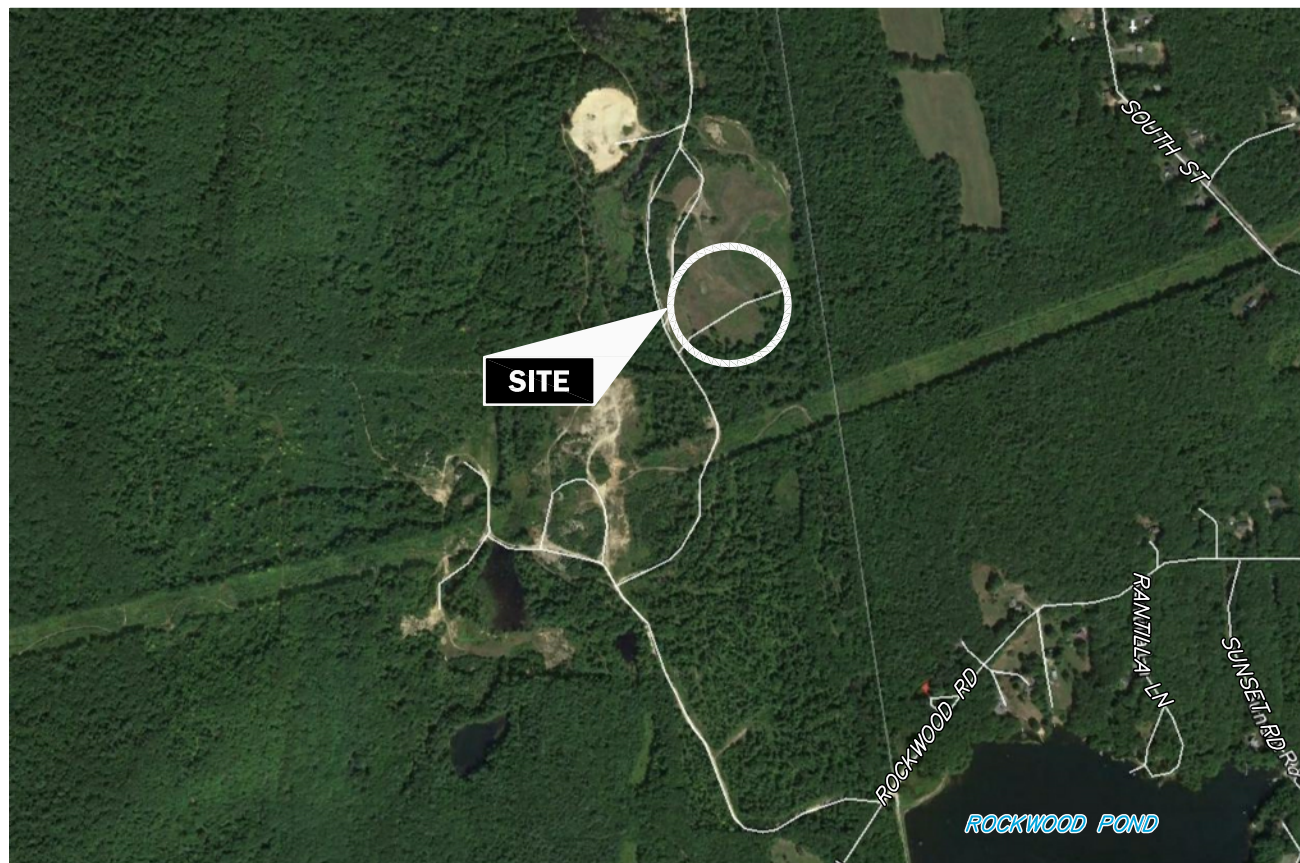


Michael Howley, P.G.
Geophysicist



Dorothy Richter, P.G.
President

Attachments: Figure 1 - General Site Location
Figure 2 - Site Plan
Figure 3 - EM61-MK2A Survey
Figure 4 - Magnetic Survey
Figure 5 - GPR Survey and Integrated Interpretation
Figure 6 - Example GPR Record



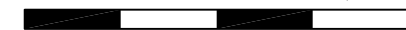
N



H-R



APPROXIMATE SCALE (feet)



0 1000 2000



NOTE:

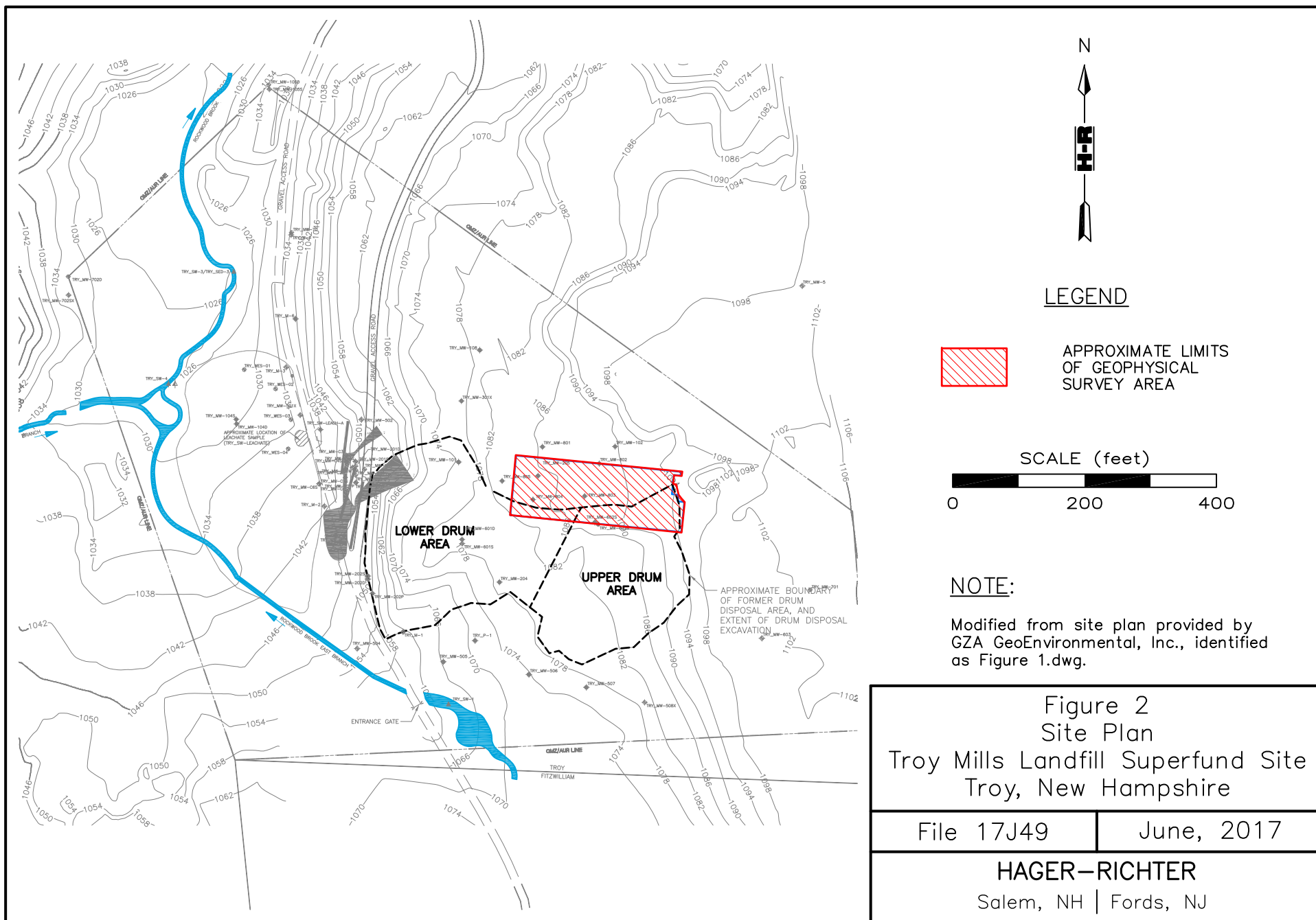
Modified from Google Earth Pro aerial photograph.

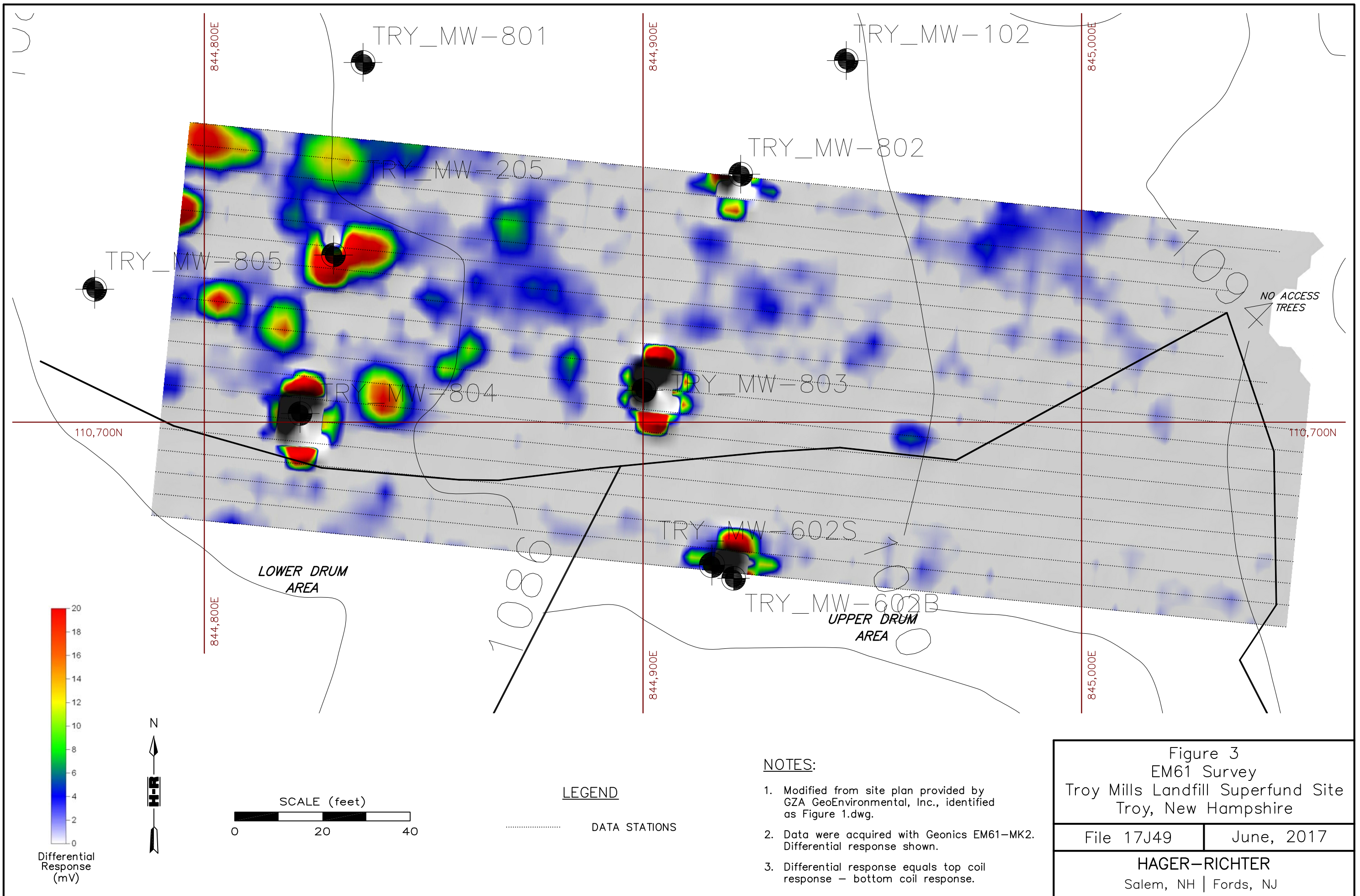
Figure 1
General Site Location
Troy Mills Landfill Superfund Site
Troy, New Hampshire

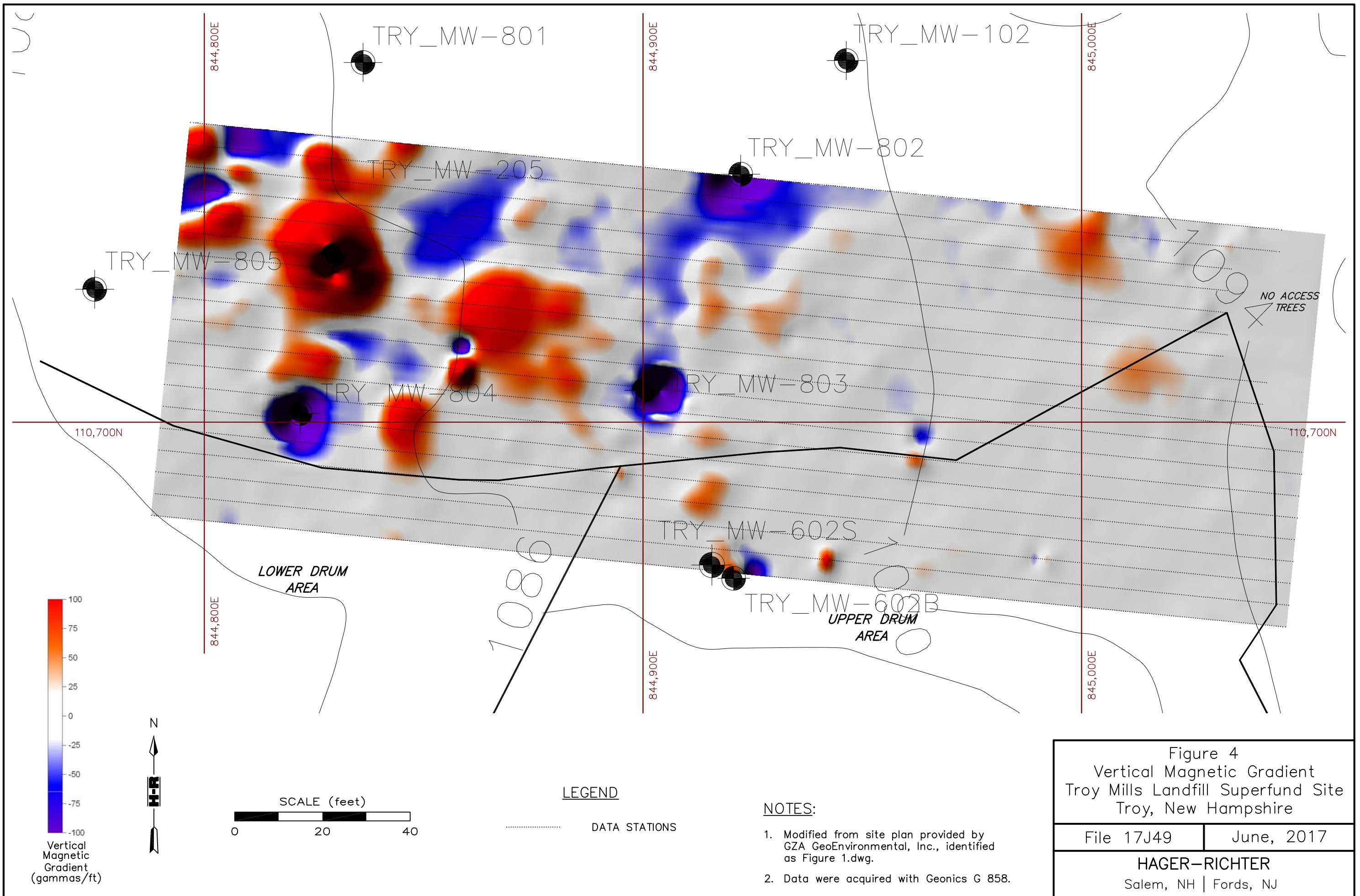
File 17J49

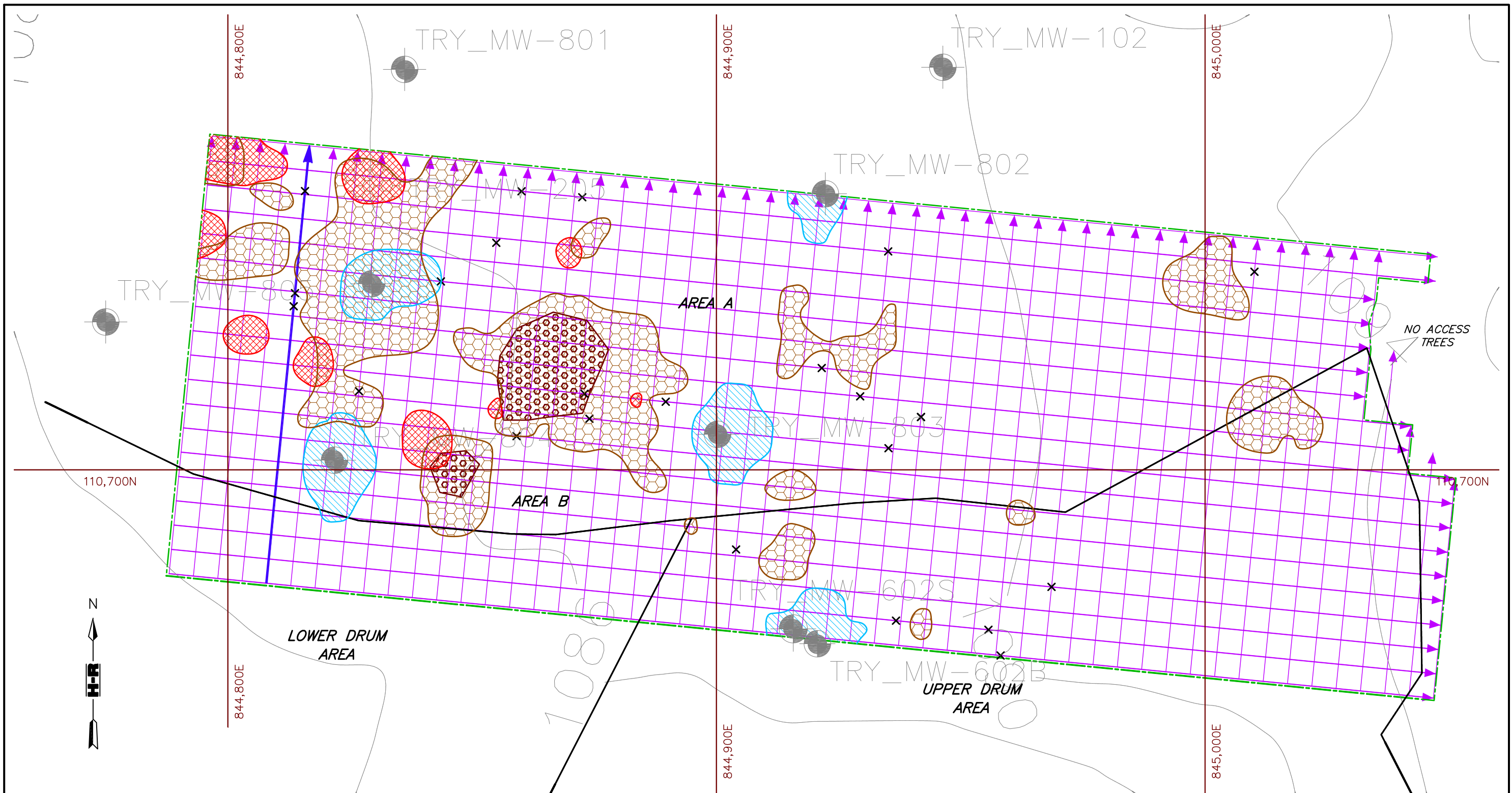
June, 2017

HAGER-RICHTER
Salem, NH | Fords, NJ







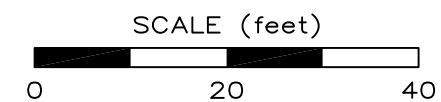


LEGEND

- APPROXIMATE LIMITS OF EM SURVEY AREA
- GPR TRAVERSE SHOWN IN FIGURE 6
- GPR TRAVERSE
- AREA OF POSSIBLE BURIED METAL - EM61 SURVEY

- AREA OF POSSIBLE BURIED METAL - VERTICAL MAGNETIC GRADIENT
- AREA OF UNIDENTIFIED BURIED METAL OBJECTS - GPR SURVEY
- UNIDENTIFIED BURIED OBJECT

EM ANOMALY ATTRIBUTED TO EFFECTS OF SURFACE OBJECTS. THE PRESENCE OR ABSENCE OF BURIED METAL WITHIN THIS AREA CANNOT BE DETERMINED ON THE BASIS OF THE EM61 DATA ALONE.

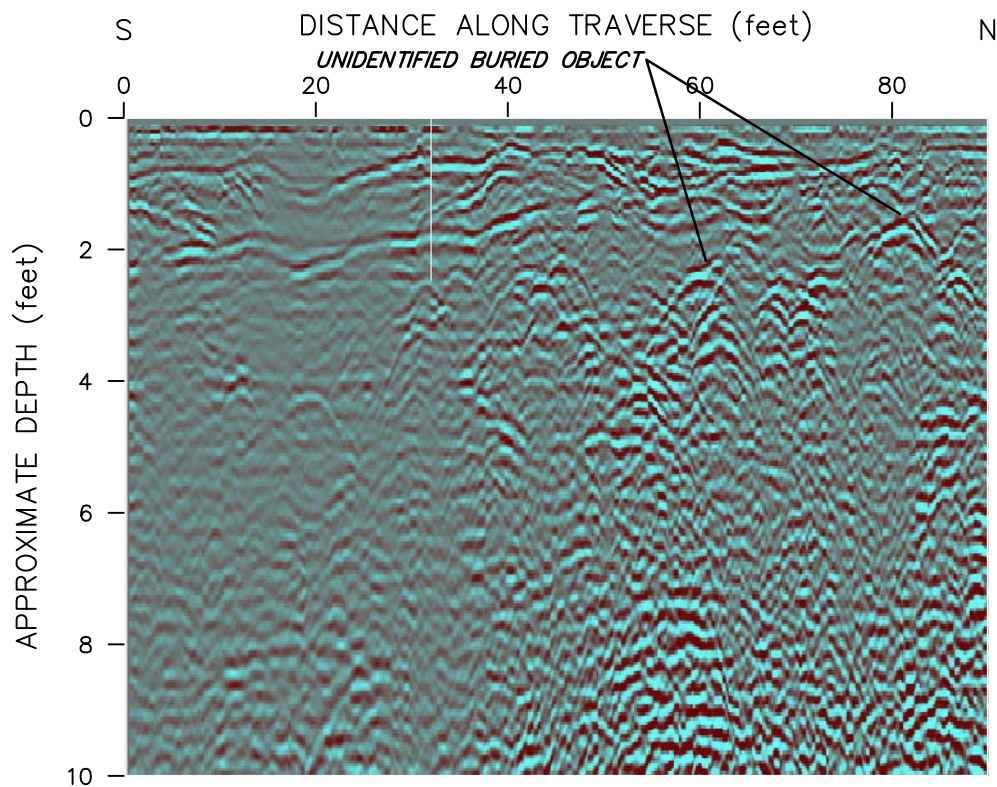


NOTE:

Modified from site plan provided by GZA GeoEnvironmental, Inc., identified as Figure 1.dwg.

Figure 5
GPR Survey &
Integrated Interpretation
Troy Mills Landfill Superfund Site
Troy, New Hampshire

File 17J49	June, 2017
HAGER-RICHTER Salem, NH Fords, NJ	



NOTES:

1. GPR data were acquired using a GSSI UtilityScan HS digital system using a 350 MHz hyper-stacking antenna with a 125 ns time window.
2. Location of GPR record shown in Figure 5.

Figure 6
Example GPR Record
Troy Mills Landfill Superfund Site
Troy, New Hampshire

File 17J49

June, 2017

HAGER-RICHTER
Salem, NH | Fords, NJ



PID Calibration Logs

TROY MILLS PID/FID DAILY CALIBRATION LOG

Site Name: <u>Troy Mills Superfund</u>	Location: <u>Troy, NH</u>	Job Number: <u>04.0190325.16</u>
Date: <u>8/21/17</u> Time: <u>0900</u>	Field Personnel: <u>C. Melby</u>	Weather: <u>Sunny, 70's-80's</u>
Detector (Make & Model): <u>MiniRae Plus</u>		Serial Number: <u>085-535357</u> Rental ID (if applicable):
Rental Company:		
Detector Calibration/Maintenance Certification Provided By (Personnel):		Date:

Beginning of Day Detector Calibration

Detector Calibration	Value of Standard (ppm)	Reading (ppm)	Lot #	Expiration Date	Comments
Ambient air or zero air standard (circle one)	0	0	—	—	
Calibration Standard #1	100 ppm	97.6	4720862	July, 2020	Note: When calibrating a FID, the default for calibration standard #1 is isobutylene and standard #2 is methane.
Calibration Standard #2 (if applicable)					

Additional Information

Range of Ionization Potentials for Site COCs (eV): up to 10.6 eV Detector Lamp (eV): 10.6 Correction Factor/Response Factor: 1


Battery fully charged (Yes/No): Yes Water trap installed (Yes/No): Yes

Post Calibration Check

Date: <u>8/21/17</u> Time: <u>0905</u>		Field Personnel: <u>C. Melby</u>					
Calibration Check	Value of Standard (ppm)	Check Results (ppm)	Acceptable Range (+/- 5%) (ppm)	Within Range (yes/no)	Lot #	Expiration Date	Comments
Ambient air or zero air standard (circle one)	0	0.6	0-5	Yes	—	—	
Calibration Standard #1	100	98.3	95-105	Yes	4720862	July, 2020	
Calibration Standard #2 (if applicable)							

Notes:

- 1.) All calibration checks must be made in the run mode, not the calibration mode.
- 2.) If the calibration check is performed with the standards utilized during calibration, write down "same" under the Lot # and expiration date columns.
- 3.) If the post calibration check is not within the acceptable range the meter must be recalibrated. If recalibration is attempted twice without success, replace the unit.

Calibration & Post Calibration Check Performed by: Christopher Melby (Print)  (Sign)

END OF DAY CALIBRATION CHECK

Calibration Check	Value of Standard (ppm)	Check Results (ppm)	Acceptable Range (+/- 5%) (ppm)	Within Range (yes/no)	Lot #	Expiration Date	Comments
Date: <u>8/21/17</u> Time: <u>1615</u>		Field Personnel:					
Ambient air (zero air)	0	0.3	0-5	Yes	—	—	
Calibration Standard #1	100	104	95-105	Yes	4720862	July, 2020	
Calibration Standard #2 (if applicable)							

Notes:

- 1.) All calibration checks must be made in the run mode, not the calibration mode.
- 2.) If the calibration check is performed with the standards utilized during calibration, write down "same" under the Lot # and expiration date columns.
- 3.) If the end of the day calibration check is not within the acceptable range, the data collected that day for that parameter shall be qualified in its use.
- 4.) If data needs to be qualified, list the applicable sampling locations below.
- 5.) If the end of the day calibration fails to be within the acceptable range for two consecutive days, replace the unit.

Calibration Check by Christopher Melby
Print Name


Signature

Sampling Locations:

TRY-TP-1

Sampling Locations:

TRY-TP-2

Sampling Locations:

TROY MILLS PID/FID DAILY CALIBRATION LOG

Site Name: <u>Troy Mills Superfund</u>	Location: <u>Troy, NH</u>	Job Number: <u>04.0190325.16</u>
Date: <u>8/22/17</u> Time: <u>0750</u>	Field Personnel: <u>C. Melby</u>	Weather: <u>Overcast, 70's - 80's</u>
Detector (Make & Model): <u>MultiRae</u>		Serial Number: <u>095-533359</u> Rental ID (if applicable):
Rental Company:		
Detector Calibration/Maintenance Certification Provided By (Personnel):		Date:

Beginning of Day Detector Calibration

Detector Calibration	Value of Standard (ppm)	Reading (ppm)	Lot #	Expiration Date	Comments
Ambient air or zero air standard (circle one)	0	0.0	-	-	
Calibration Standard #1	100	100.0	4720862	July 2020	Note: When calibrating a FID, the default for calibration standard #1 is isobutylene and standard #2 is methane.
Calibration Standard #2 (if applicable)					

Additional Information

Range of Ionization Potentials for Site COCs (eV) up to 10.6 Detector Lamp (eV): 10.6 Correction Factor/Response Factor 1

Battery fully charged (Yes/No): Yes Water trap installed (Yes/No): Yes

Post Calibration Check

Date: <u>8/22/17</u> Time: <u>0755</u>		Field Personnel: <u>C. Melby</u>					
Calibration Check	Value of Standard (ppm)	Check Results (ppm)	Acceptable Range (+/- 5%) (ppm)	Within Range (yes/no)	Lot #	Expiration Date	Comments
Ambient air or zero air standard (circle one)	0	0.3	0-5	Yes	-	-	
Calibration Standard #1	100.0	98.9	95-105	Yes	4720862	July 2020	
Calibration Standard #2 (if applicable)							

Notes:

- 1.) All calibration checks must be made in the run mode, not the calibration mode.
- 2.) If the calibration check is performed with the standards utilized during calibration, write down "same" under the Lot # and expiration date columns.
- 3.) If the post calibration check is not within the acceptable range the meter must be recalibrated. If recalibration is attempted twice without success, replace the unit.

Calibration & Post Calibration Check Performed by: Christopher Melby (Print) [Signature] (Sign)

END OF DAY CALIBRATION CHECK

Calibration Check	Value of Standard (ppm)	Check Results (ppm)	Acceptable Range (+/- 5%) (ppm)	Within Range (yes/no)	Lot #	Expiration Date	Comments
Date: <u>8/22/17</u> Time: <u>1540</u>		Field Personnel:					
Ambient air (zero air)	0	0.1	0-5	Yes	-	-	
Calibration Standard #1	100.0	97.3	95-105	Yes	4720862	July 2020	
Calibration Standard #2 (if applicable)							

Notes:

- 1.) All calibration checks must be made in the run mode, not the calibration mode.
- 2.) If the calibration check is performed with the standards utilized during calibration, write down "same" under the Lot # and expiration date columns.
- 3.) If the end of the day calibration check is not within the acceptable range, the data collected that day for that parameter shall be qualified in it's use.
- 4.) If data needs to be qualified, list the applicable sampling locations below.
- 5.) If the end of the day calibration fails to be within the acceptable range for two consecutive days, replace the unit.

Calibration Check by Christopher Melby
Print Name

[Signature]
Signature

Sampling Locations:

TRY-TP-3

Sampling Locations:

TRY-TP-4

Sampling Locations:



Test Pit Logs

LOG KEY



GZA
Geo Environmental, Inc.
Engineers and Scientists

BURMISTER SOIL CLASSIFICATION (INORGANIC)

COMPONENT	NAME	PROPORTIONAL TERM	PERCENT BY WEIGHT	IDENTIFICATION OF FINES		
				Material	PI	Atterberg Thread Dia.
MAJOR	GRAVEL, SAND, FINES*		>50	SILT	0	Cannot Roll
Minor	Gravel, Sand, Fines*	and some little	35 - 50 20-35 10-20	Clayey SILT	1-5	1/4"
		trace	0-10	SILT & CLAY	5-10	1/8"
	*See identification of fines table.			CLAY & SILT	10-20	1/16"
				Silty CLAY	20-40	1/32"
				CLAY	>40	1/64"

GRADATION DESIGNATION	PROPORTION OF COMPONENT	PLASTIC SOILS		GRAVEL & SAND	
		Consistency	Blows/Ft. SPT N-Value	Density	Blows/Ft. SPT N-Value
Fine to coarse	All fractions > 10%	Very Soft	< 2	Very Loose	< 4
Medium to coarse	<10% fine	Soft	2 - 4	Loose	4 - 10
Fine to medium	<10% coarse	Medium Stiff	4 - 8	Medium Dense	10 - 30
Coarse	<10% fine and medium	Stiff	8 - 15	Dense	30 - 50
Medium	<10% coarse and fine	Very Stiff	15 - 30	Very Dense	> 50
Fine	<10% coarse and medium	Hard	>30		

BURMISTER SOIL CLASSIFICATION (ORGANIC)

Fibrous PEAT (Pt) - Lightweight, spongy, mostly visible organic matter, water squeezes readily from sample. Typically near top of deposit.
 Fine Grained PEAT (Pt) - Lightweight, spongy, little visible organic matter, water squeezes readily from sample. Typically below fibrous peat.
 Organic Silt (OL) - Typically gray to dark gray, often has strong H₂S odor. Typically contains shells or shell fragments. Lightweight. Usually found near coastal regions. May contain wide range of sand fractions.
 Organic Clay (OH) - Typically gray to dark gray, high plasticity. Usually found near coastal regions. May contain wide range of sand fractions. Need organic content test for final identification.

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS) (ASTM D 2487)

MAJOR DIVISIONS			Group Symbols	
Coarse Grained Soils More than 50% of material larger than No. 200 sieve	Gravel More than 50% larger than No. 4 sieve	Clean Gravels (Little or no fines)	GW	GP
		Gravels with Fines (Appreciable amount of fines)	GM	GC
	Sand More than 50% smaller than No. 4 sieve	Clean Sands (Little or no fines)	SW	SP
		Sands with Fines (Appreciable amount of fines)	SM	SC
Fine Grained Soils More than 50% of material smaller than No. 200 sieve	Silts and Clays Liquid Limit <50		ML	CL
			OL	MH
	Silts and Clays Liquid Limit >50		CH	OH
	Highly Organic Soils		Pt	

ABBREVIATIONS

MR = Mud Rotary	Tv = Field Vane Shear Test (Torvane)
HSA = Hollow Stem Auger	PP = Pocket Penetrometer
SSA = Solid Stem Auger	PI = Plasticity Index
SS = Split Spoon Sampler	MC = Moisture Content
U = Undisturbed Sample (Shelby Tube)	CO = Consolidation
MC = Modified California Sampler	UC = Unconfined Compression Test
V = Vibracore	SI = Sieve Analysis
M = Macrocore	DS = Direct Shear
R = Refusal	PID = Photoionization Detector
USCS = Unified Soil Classification System (ASTM D2487)	ppm = Parts Per Million
NYCBC = New York City Building Code	REC = Recovery
WOR = Weight of Rods	RQD = Rock Quality Designation
WOH= Weight of Hammer	▼ = Measured Water Level
SPT = Standard Penetration Test (ASTM D1586)	
N-Value = Cumulative number of uncorrected blows for the middle two 6-inch intervals (blows/foot).	

TEST PIT LOG



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Troy Mills Landfill Superfund Site
Troy, New Hampshire

EXPLORATION NO.: TRY_TP-1
SHEET: 1 of 1
PROJECT NO: 04.0190325.16
REVIEWED BY: DMT

Logged By: C. Melby
Contractor: NRC
Foreman: George Reynolds

Boring Location: See Plan
Ground Surface Elev. (ft.):
Date Start: 8/21/2017
Date Finish: 8/21/2017

H. Datum:
V. Datum:

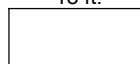
Equipment: Cat
Model: 315D
Reach (ft.): 18
Capacity (cu.yd.): ~1/2

Weather: Sunny, 70's-80's
Time Start: 1000
Time Finish: 1355

Groundwater			Seepage Depth (ft.)
Date	Time	Depth (ft.)	
Not Encountered			

Depth (ft)	Description and Identification (Modified Burmister Procedure)	Excavation Effort	Boulder Count Class/Qty.	Field Test Results	Sample No.	Depth (ft.)	Stratum Description	Elev. (ft.)	Remark
1	Brown, fine to medium SAND, some organic material.	E	B / I	ND		1	Brown Sand		1
2		E		ND			Light brown Sand		
3	Light brown, fine to medium SAND, trace Silt.	E		ND		3			
4	Gray, fine to medium SAND, some Silt and Clay.	E		~3 ppm		4	Gray Sand		2
5	Landfilled Fabric Material in light brown, fine to medium SAND, trace Silt.	E		ND			Light brown Sand		
6		D		ND					
7									
8		D		ND					
9		D		ND					
10		D		ND					
11	Light brown, fine to medium SAND, trace Silt.	D		ND					
12		D		ND					
13		D		ND					
14		D		ND					
15		D		ND					
16	(Drum encountered) No refusal encountered.	D		ND		16			3
17	End of exploration at 16 feet.								4
18									5
19									
20									

Test Pit Plan:
18 ft.



7 ft. Volume = **75 ±** cu.yd.

LEGEND:

Excavation Effort:	Boulder Size Range Designation:
Easy E	Diameter Letter Designation
Moderate M	6 to 16 in. A
Difficult D	16 to 36 in. B
	> 36 in. C

REMARKS

- Soil was screened for total volatile organic compounds (VOCs) using a MultiRAE photoionization detector (PID) with a 10.6 eV lamp referenced to an isobutylene-in-air standard. Total VOCs detected are reported in parts per million (ppm) in the "Field Test Results" column.
- Fabric was encountered from 4 to 5 feet below ground surface.
- Material in drum was solidified tan material, as well as viscous black and viscous gray materials.
- Material in the drum was screened in the field with the PID. Results were 365 ppm, 165 ppm, and 65 ppm for the black, gray and tan materials, respectively.
- Drum was replaced at bottom of test pit in the approximate location in which it was encountered. The test pit was backfilled with excavated material, and polyethylene sheeting placed at 2 to 3 feet below ground surface.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.:
TRY_TP-1

TEST PIT LOG



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Troy Mills Landfill Superfund Site
Troy, New Hampshire

EXPLORATION NO.: TRY_TP-2
SHEET: 1 of 1
PROJECT NO: 04.0190325.16
REVIEWED BY: DMT

Logged By: C. Melby
Contractor: NRC
Foreman: George Reynolds

Boring Location: See Plan
Ground Surface Elev. (ft.):
Date Start: 8/21/2017
Date Finish: 8/21/2017

H. Datum:
V. Datum:

Equipment: Cat
Model: 315D
Reach (ft.): 18
Capacity (cu.yd.): ~1/2

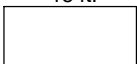
Weather: Sunny, 80's
Time Start: 1355
Time Finish: 1610

Groundwater			Seepage Depth (ft.)
Date	Time	Depth (ft.)	
Not Encountered			

Depth (ft)	Description and Identification (Modified Burmister Procedure)	Excavation Effort	Boulder Count Class/Qty.	Field Test Results	Sample No.	Depth (ft.)	Stratum Description	Elev. (ft.)	Remark
1	Dark brown, fine to medium SAND, some Silt, some organic material.	E		ND		1	Dark brown Sand		1
2	Light brown, fine to medium SAND, trace Silt. Gray, fine to medium SAND, little Silt & Clay, observed from 1 to 1.5 feet in the eastern portion of the test pit.	E		ND		1.5	Gray Sand		2
3		E		ND					3
4		M		ND					
5		D		ND					
6		D		ND					
7		D		ND					
8		D		ND					
9		D		ND					
10	Landfilled Fabric Material in light brown, fine to medium SAND.	D		ND			Light brown Sand		
11		E		ND					
12		D		ND					
13		D		ND					
14		D		ND					
15		D		ND					
16		D	A / III	ND					
17	No refusal encountered.	D		ND		17			
18	End of exploration at 17 feet.								
19									
20									

Test Pit Plan:

18 ft.



7 ft.



Volume = **79 ±** cu.yd.

LEGEND:

Excavation Effort:

Easy E
Moderate M
Difficult D

Boulder Size Range Designation:

Diameter Letter Designation
6 to 16 in. A
16 to 36 in. B
> 36 in. C

- REMARKS**
- Soil was screened for total volatile organic compounds (VOCs) using a MultiRAE photoionization detector (PID) with a 10.6 eV lamp referenced to an isobutylene-in-air standard. Total VOCs detected are reported in parts per million (ppm) in the "Field Test Results" column.
 - Metal pry bar/digging bar was observed in the top 3 feet. No other metal material encountered.
 - Stockpiled soils were screened with PID with no measurable detections of VOCs.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.:
TRY_TP-2

TEST PIT LOG



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Troy Mills Landfill Superfund Site
Troy, New Hampshire

EXPLORATION NO.: TRY_TP-3
SHEET: 1 of 1
PROJECT NO: 04.0190325.16
REVIEWED BY: DMT

Logged By: C. Melby
Contractor: NRC
Foreman: George Reynolds

Boring Location: See Plan
Ground Surface Elev. (ft.):
Date Start: 8/22/2017
Date Finish: 8/22/2017

H. Datum:
V. Datum:

Equipment: Cat
Model: 315D
Reach (ft.): 18
Capacity (cu.yd.): ~1/2


Weather: Overcast, 70's
Time Start: 0800
Time Finish: 1320

Groundwater			Seepage Depth (ft.)
Date	Time	Depth (ft.)	
Not Encountered			

Depth (ft)	Description and Identification (Modified Burmister Procedure)	Excavation Effort	Boulder Count Class/Qty.	Field Test Results	Sample No.	Depth (ft.)	Stratum Description	Elev. (ft.)	Remark
1	Light brown to light gray, fine to medium SAND, trace Silt. Geotextile fabric delineating edge of drum removal area.	E		ND		0.75	Gray Sand		1
2		E		ND					2
3		M							
4	Landfilled Fabric Material in light brown, fine to medium SAND, trace Silt. Gray color and solvent odor observed in southern portion of the test pit.								
5		D		ND					
6		D		--					3
7		D		70 ppm					4
8		D		--					5
9		D		--					6
10		D		--					
11		D		ND					
12									
13		D		--					
14									
15									
16		D		5 ppm					
17	No refusal encountered.	D		--		17			
18	End of exploration at 17 feet.								
19									
20									

Test Pit Plan:

15 - 19 ft

10 -  15 ft. Volume = **178±** cu.yd.

LEGEND:

Excavation Effort:

Easy E
Moderate M
Difficult D

Boulder Size Range Designation:

Diameter Letter Designation
6 to 16 in. A
16 to 36 in. B
> 36 in. C

- REMARKS**
- Soil was screened for total VOCs using a MultiRAE photoionization detector (PID) with a 10.6 eV lamp referenced to an isobutylene-in-air standard. Total VOCs detected are reported in parts per million (ppm) in the "Field Test Results" column.
 - Geotextile fabric begins at approximately 2.5 feet to 3.5 feet below ground surface on northern and southern sides of test pit, respectively.
 - Material debris (drum covers and rings) found in the northwest corner of the test pit at approximately 5 feet below ground surface.
 - Sample collected at 6 feet below ground surface from impacted soil.
 - Test pit has an irregular shape, dimensions provided in the Test Pit Plan provide the range of lengths for each side.
 - Impacted soils were observed on the southern edge of the test pit only, beneath the geotextile "cap" fabric, at approximately 5 feet below ground surface to the bottom of the exploration.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.:
TRY_TP-3

TEST PIT LOG



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Troy Mills Landfill Superfund Site
Troy, New Hampshire

EXPLORATION NO.: TRY_TP-4
SHEET: 1 of 1
PROJECT NO: 04.0190325.16
REVIEWED BY: DMT

Logged By: C. Melby
Contractor: NRC
Foreman: George Reynolds

Boring Location: See Plan
Ground Surface Elev. (ft.):
Date Start: 8/22/2017
Date Finish: 8/22/2017

H. Datum:
V. Datum:

Equipment: Cat
Model: 315D
Reach (ft.): 18
Capacity (cu.yd.): ~1/2

Weather: Sunny, 80's
Time Start: 1345
Time Finish: 1440

Groundwater			Seepage Depth (ft.)
Date	Time	Depth (ft.)	
Not Encountered			

Depth (ft)	Description and Identification (Modified Burmister Procedure)	Excavation Effort	Boulder Count Class/Qty.	Field Test Results	Sample No.	Depth (ft.)	Stratum Description	Elev. (ft.)	Remark
1	Gray, fine to medium SAND, little Silt.	E	A / III	ND		0.75	Gray Sand		1
2	Light brown, fine to medium SAND, trace Silt.	E		ND					2
3	Landfilled Fabric Material in light brown, fine to medium SAND, trace Silt.	M		ND					
4		D	A / I	ND			Light brown Sand		3
5		D		ND					
6		D		ND					
7		D		ND					
8		D		ND					
9		D		ND					
10		D		ND					
11		D		ND					
12		D		ND					
13		D		ND					
14		D		ND					
15	No refusal encountered.	D		ND		15			
16	End of exploration at 15 feet.								
17									
18									
19									
20									

Test Pit Plan:

8 ft. 14 ft. N ↑
Volume = **62 ±** cu.yd.

LEGEND:

Excavation Effort:	Boulder Size Range Designation:
Easy E	Diameter Letter Designation
Moderate M	6 to 16 in. A
Difficult D	16 to 36 in. B
	> 36 in. C

REMARKS

- Soil was screened for total volatile organic compounds (VOCs) using a MultiRAE photoionization detector (PID) with a 10.6 eV lamp referenced to an isobutylene-in-air standard. Total VOCs detected are reported in parts per million (ppm) in the "Field Test Results" column.
- Soil stockpile was periodically screened. No evidence of staining or impacted soils was observed.
- Wire saw blades were encountered at approximately 5 feet below ground surface in the middle of the test pit.

See Log Key for explanation of sample description and identification procedures. Stratification lines represent approximate boundaries between soil and bedrock types. Actual transitions may be gradual. Water level readings have been made at the times and under the conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the times the measurements were made.

Exploration No.:
TRY_TP-4



Analytical Laboratory Reports

CERTIFICATE OF ANALYSIS

Tanya Justham
GZA GeoEnvironmental, Inc.
5 Commerce Park North
Bedford, NH 03110

RE: Troy Mills Landfill Superfund (04.0190325.16)
ESS Laboratory Work Order Number: 1708564

This signed Certificate of Analysis is our approved release of your analytical results. These results are only representative of sample aliquots received at the laboratory. ESS Laboratory expects its clients to follow all regulatory sampling guidelines. Beginning with this page, the entire report has been paginated. This report should not be copied except in full without the approval of the laboratory. Samples will be disposed of thirty days after the final report has been delivered. If you have any questions or concerns, please feel free to call our Customer Service Department.



Laurel Stoddard
Laboratory Director

REVIEWED

By ESS Laboratory at 5:18 pm, Aug 30, 2017

Analytical Summary

The project as described above has been analyzed in accordance with the ESS Quality Assurance Plan. This plan utilizes the following methodologies: US EPA SW-846, US EPA Methods for Chemical Analysis of Water and Wastes per 40 CFR Part 136, APHA Standard Methods for the Examination of Water and Wastewater, American Society for Testing and Materials (ASTM), and other recognized methodologies. The analyses with these noted observations are in conformance to the Quality Assurance Plan. In chromatographic analysis, manual integration is frequently used instead of automated integration because it produces more accurate results.

The test results present in this report are in compliance with TNI and relative state standards, and/or client Quality Assurance Project Plans (QAPP). The laboratory has reviewed the following: Sample Preservations, Hold Times, Initial Calibrations, Continuing Calibrations, Method Blanks, Blank Spikes, Blank Spike Duplicates, Duplicates, Matrix Spikes, Matrix Spike Duplicates, Surrogates and Internal Standards. Any results which were found to be outside of the recommended ranges stated in our SOPs will be noted in the Project Narrative.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

SAMPLE RECEIPT

The following samples were received on August 23, 2017 for the analyses specified on the enclosed Chain of Custody Record.

Low Level VOA vials were frozen by client on August 22, 2017 at 16:30.

<u>Lab Number</u>	<u>Sample Name</u>	<u>Matrix</u>	<u>Analysis</u>
1708564-01	TRY_TP_1 DRUM	Sludge	1010, 6010C, 6020A, 7.3.3.2, 7.3.4.1, 7471B, 8081B, 8082A, 8151A, 8260B, 8270D, 9045

CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

PROJECT NARRATIVE

5035/8260B Volatile Organic Compounds / Methanol

C7H0406-CCV1 Continuing Calibration %Diff/Drift is below control limit (CD-).

1,4-Dioxane - Screen (32% @ 30%)

CH72921-BS1 Blank Spike recovery is above upper control limit (B+).

Tertiary-butyl Alcohol (158% @ 70-130%)

CH72921-BSD1 Relative percent difference for duplicate is outside of criteria (D+).

Tertiary-butyl Alcohol (32% @ 20%)

8081B Organochlorine Pesticides

1708564-01 Lower value is used due to matrix interferences (LC).

Hexachlorobenzene [2C], Methoxychlor

1708564-01 Percent difference between primary and confirmation results exceeds 40% (P).

Hexachlorobenzene [2C], Methoxychlor

1708564-01 Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).

Decachlorobiphenyl (369% @ 30-150%)

C7H0403-CCV5 Continuing Calibration %Diff/Drift is above control limit (CD+).

Alachlor (40% @ 20%), Alachlor [2C] (45% @ 20%)

8151A Chlorinated Herbicides

1708564-01 Elevated Method Reporting Limits due to sample matrix (EL).

1708564-01 Modified result

MCPP

1708564-01 Peaks found in the retention time window for MCPP did not confirm by GC/MS.

MCPP

1708564-01 Surrogate recovery(ies) diluted below the MRL (SD).

DCAA (% @ 30-150%), DCAA [2C] (% @ 30-150%)

CH72845-BS1 Blank Spike recovery is below lower control limit (B-).

2,4-DB (35% @ 40-140%), 2,4-DB [2C] (22% @ 40-140%), Dalapon (35% @ 40-140%)

CH72845-BSD1 Blank Spike recovery is below lower control limit (B-).

Dalapon (35% @ 40-140%)

CH72845-BSD1 Relative percent difference for duplicate is outside of criteria (D+).

2,4-DB (59% @ 30%), 2,4-DB [2C] (70% @ 30%)

8270D Semi-Volatile Organic Compounds

1708564-01 Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).

1,2-Dichlorobenzene-d4 (% @ 30-130%), 2-Fluorobiphenyl (% @ 30-130%), Nitrobenzene-d5 (162% @ 30-130%), p-Terphenyl-d14 (% @ 30-130%)

C7H0323-CCV1 Calibration required quadratic regression (Q).

2,4-Dinitrophenol (113% @ 80-120%), Benzidine (85% @ 0-200%), Benzoic Acid (109% @ 80-120%), Pentachlorophenol (96% @ 80-120%)

C7H0340-CCV1 Calibration required quadratic regression (Q).

4,6-Dinitro-2-Methylphenol (96% @ 80-120%), Benzoic Acid (87% @ 80-120%)



ESS Laboratory

Division of Thielsch Engineering, Inc.

BAL Laboratory

The Microbiology Division
of Thielsch Engineering, Inc.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.

Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

C7H0340-CCV1 [Continuing Calibration %Diff/Drift is below control limit \(CD-\).](#)

N-Nitrosodimethylamine (38% @ 20%), Pyridine (27% @ 20%)

C7H0340-CCV1 [Initial Calibration Verification recovery is below lower control limit \(ICV-\).](#)

Benzidine

No other observations noted.

End of Project Narrative.

DATA USABILITY LINKS

To ensure you are viewing the most current version of the documents below, please clear your internet cookies for www.ESSLaboratory.com. Consult your IT Support personnel for information on how to clear your internet cookies.

[Definitions of Quality Control Parameters](#)

[Semivolatile Organics Internal Standard Information](#)

[Semivolatile Organics Surrogate Information](#)

[Volatile Organics Internal Standard Information](#)

[Volatile Organics Surrogate Information](#)

[EPH and VPH Alkane Lists](#)



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

CURRENT SW-846 METHODOLOGY VERSIONS

Analytical Methods

1010A - Flashpoint
6010C - ICP
6020A - ICP MS
7010 - Graphite Furnace
7196A - Hexavalent Chromium
7470A - Aqueous Mercury
7471B - Solid Mercury
8011 - EDB/DBCP/TCP
8015C - GRO/DRO
8081B - Pesticides
8082A - PCB
8100M - TPH
8151A - Herbicides
8260B - VOA
8270D - SVOA
8270D SIM - SVOA Low Level
9014 - Cyanide
9038 - Sulfate
9040C - Aqueous pH
9045D - Solid pH (Corrosivity)
9050A - Specific Conductance
9056A - Anions (IC)
9060A - TOC
9095B - Paint Filter
MADEP 04-1.1 - EPH / VPH

Prep Methods

3005A - Aqueous ICP Digestion
3020A - Aqueous Graphite Furnace / ICP MS Digestion
3050B - Solid ICP / Graphite Furnace / ICP MS Digestion
3060A - Solid Hexavalent Chromium Digestion
3510C - Separatory Funnel Extraction
3520C - Liquid / Liquid Extraction
3540C - Manual Soxhlet Extraction
3541 - Automated Soxhlet Extraction
3546 - Microwave Extraction
3580A - Waste Dilution
5030B - Aqueous Purge and Trap
5030C - Aqueous Purge and Trap
5035 - Solid Purge and Trap

SW846 Reactivity Methods 7.3.3.2 (Reactive Cyanide) and 7.3.4.1 (Reactive Sulfide) have been withdrawn by EPA. These methods are reported per client request and are not NELAP accredited.



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund
Client Sample ID: TRY_TP_1 DRUM
Date Sampled: 08/21/17 12:20
Percent Solids: N/A

ESS Laboratory Work Order: 1708564
ESS Laboratory Sample ID: 1708564-01
Sample Matrix: Sludge
Units: mg/kg wet

Extraction Method: 3050B

Total Metals

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>I/V</u>	<u>F/V</u>	<u>Batch</u>
Arsenic	ND (2.03)		6010C		2	KJK	08/25/17 20:04	4.92	100	CH72425
Barium	103 (1.02)		6010C		1	KJK	08/24/17 21:55	4.92	100	CH72425
Cadmium	46.5 (0.20)		6010C		1	KJK	08/24/17 21:55	4.92	100	CH72425
Chromium	25.7 (0.41)		6010C		1	KJK	08/24/17 21:55	4.92	100	CH72425
Lead	155 (2.03)		6010C		1	KJK	08/24/17 21:55	4.92	100	CH72425
Mercury	ND (0.003)		7471B		1	MJV	08/24/17 15:05	5.9	40	CH72426
Selenium	ND (0.81)		6020A		20	NAR	08/28/17 14:38	4.92	100	CH72425
Silver	ND (0.20)		6010C		1	BJV	08/28/17 16:50	4.92	100	CH72425



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund
Client Sample ID: TRY_TP_1 DRUM
Date Sampled: 08/21/17 12:20
Percent Solids: N/A
Initial Volume: 14.8
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1708564
ESS Laboratory Sample ID: 1708564-01
Sample Matrix: Sludge
Units: mg/kg wet
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1,1,2-Tetrachloroethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,1,1-Trichloroethane	0.294 (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,1,2,2-Tetrachloroethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,1,2-Trichloroethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,1-Dichloroethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,1-Dichloroethene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,1-Dichloropropene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,2,3-Trichlorobenzene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,2,3-Trichloropropane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,2,4-Trichlorobenzene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,2,4-Trimethylbenzene	325 (4.05)		8260B		20	08/29/17 16:38	C7H0406	CH72921
1,2-Dibromo-3-Chloropropane	ND (1.01)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,2-Dibromoethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,2-Dichlorobenzene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,2-Dichloroethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,2-Dichloropropane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,3 Dichloropropene (Total)	ND (0.203)		8260B		1	08/29/17 17:05		[CALC]
1,3,5-Trichlorobenzene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,3,5-Trimethylbenzene	195 (4.05)		8260B		20	08/29/17 16:38	C7H0406	CH72921
1,3-Dichlorobenzene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,4-Dichlorobenzene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
1,4-Dioxane - Screen	ND (40.5)		8260B		1	08/29/17 17:05	C7H0406	CH72921
2,2-Dichloropropane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
2-Butanone	ND (1.01)		8260B		1	08/29/17 17:05	C7H0406	CH72921
2-Chlorotoluene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
2-Hexanone	ND (1.01)		8260B		1	08/29/17 17:05	C7H0406	CH72921
4-Chlorotoluene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
4-Isopropyltoluene	72.4 (4.05)		8260B		20	08/29/17 16:38	C7H0406	CH72921
4-Methyl-2-Pentanone	ND (1.01)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Acetone	ND (1.01)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Acrylonitrile	ND (1.01)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Allyl Chloride	ND (0.405)		8260B		1	08/29/17 17:05	C7H0406	CH72921



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund
Client Sample ID: TRY_TP_1 DRUM
Date Sampled: 08/21/17 12:20
Percent Solids: N/A
Initial Volume: 14.8
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1708564
ESS Laboratory Sample ID: 1708564-01
Sample Matrix: Sludge
Units: mg/kg wet
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Benzene	0.239 (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Bromobenzene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Bromochloromethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Bromodichloromethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Bromoform	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Bromomethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Carbon Disulfide	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Carbon Tetrachloride	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Chlorobenzene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Chloroethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Chloroform	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Chloromethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
cis-1,2-Dichloroethene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Dibromochloromethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Dibromomethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Dichlorodifluoromethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Diethyl Ether	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Di-isopropyl ether	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Ethyl tertiary-butyl ether	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Ethylbenzene	15.0 (4.05)		8260B		20	08/29/17 16:38	C7H0406	CH72921
Hexachlorobutadiene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Isopropylbenzene	14.3 (4.05)		8260B		20	08/29/17 16:38	C7H0406	CH72921
Methyl tert-Butyl Ether	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Methylene Chloride	ND (0.405)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Naphthalene	43.3 (4.05)		8260B		20	08/29/17 16:38	C7H0406	CH72921
n-Butylbenzene	98.6 (4.05)		8260B		20	08/29/17 16:38	C7H0406	CH72921
n-Propylbenzene	27.0 (4.05)		8260B		20	08/29/17 16:38	C7H0406	CH72921
sec-Butylbenzene	49.7 (4.05)		8260B		20	08/29/17 16:38	C7H0406	CH72921
Styrene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
tert-Butylbenzene	16.8 (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Tertiary-amyl methyl ether	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Tertiary-butyl Alcohol	ND (5.07)		8260B		1	08/29/17 17:05	C7H0406	CH72921



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund
Client Sample ID: TRY_TP_1 DRUM
Date Sampled: 08/21/17 12:20
Percent Solids: N/A
Initial Volume: 14.8
Final Volume: 15
Extraction Method: 5035

ESS Laboratory Work Order: 1708564
ESS Laboratory Sample ID: 1708564-01
Sample Matrix: Sludge
Units: mg/kg wet
Analyst: MD

5035/8260B Volatile Organic Compounds / Methanol

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Tetrachloroethene	0.276 (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Tetrahydrofuran	ND (1.01)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Toluene	6.31 (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
trans-1,2-Dichloroethene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Trichloroethene	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Trichlorofluoromethane	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Vinyl Chloride	ND (0.203)		8260B		1	08/29/17 17:05	C7H0406	CH72921
Xylenes (Total)	99.0 (8.11)		8260B		20	08/29/17 16:38		[CALC]

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichloroethane-d4	88 %		70-130
Surrogate: 4-Bromofluorobenzene	90 %		70-130
Surrogate: Dibromofluoromethane	93 %		70-130
Surrogate: Toluene-d8	73 %		70-130



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund
Client Sample ID: TRY_TP_1 DRUM
Date Sampled: 08/21/17 12:20
Percent Solids: N/A
Initial Volume: 1.02
Final Volume: 5
Extraction Method: 3546

ESS Laboratory Work Order: 1708564
ESS Laboratory Sample ID: 1708564-01
Sample Matrix: Sludge
Units: mg/kg wet
Analyst: TJ
Prepared: 8/29/17 14:00

8081B Organochlorine Pesticides

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
4,4'-DDD	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
4,4'-DDE	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
4,4'-DDT	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
Alachlor	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
Aldrin	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
alpha-BHC	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
alpha-Chlordane	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
beta-BHC	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
Chlordane (Total)	ND (0.588)		8081B		1	08/30/17 0:03	C7H0403	CH72913
Dieldrin	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
Endosulfan I [2C]	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
Endosulfan II	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
Endosulfan Sulfate	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
Endrin	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
gamma-BHC (Lindane)	ND (0.0294)		8081B		1	08/30/17 0:03	C7H0403	CH72913
gamma-Chlordane	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
Heptachlor	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
Heptachlor Epoxide	ND (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
Hexachlorobenzene [2C]	LC, P 0.0726 (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
Methoxychlor	LC, P 0.0562 (0.0490)		8081B		1	08/30/17 0:03	C7H0403	CH72913
Toxaphene	ND (2.45)		8081B		1	08/30/17 0:03	C7H0403	CH72913

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
<i>Surrogate: Decachlorobiphenyl</i>	369 %	SM	30-150
<i>Surrogate: Decachlorobiphenyl [2C]</i>	85 %		30-150
<i>Surrogate: Tetrachloro-m-xylene</i>	57 %		30-150
<i>Surrogate: Tetrachloro-m-xylene [2C]</i>	66 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund
Client Sample ID: TRY_TP_1 DRUM
Date Sampled: 08/21/17 12:20
Percent Solids: N/A
Initial Volume: 1.11
Final Volume: 10
Extraction Method: 3540C

ESS Laboratory Work Order: 1708564
ESS Laboratory Sample ID: 1708564-01
Sample Matrix: Sludge
Units: mg/kg wet
Analyst: CAD
Prepared: 8/25/17 15:35

8082A Polychlorinated Biphenyls (PCB)

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Aroclor 1016	ND (0.9)		8082A		1	08/28/17 14:53		CH72410
Aroclor 1221	ND (0.9)		8082A		1	08/28/17 14:53		CH72410
Aroclor 1232	ND (0.9)		8082A		1	08/28/17 14:53		CH72410
Aroclor 1242	ND (0.9)		8082A		1	08/28/17 14:53		CH72410
Aroclor 1248	ND (0.9)		8082A		1	08/28/17 14:53		CH72410
Aroclor 1254	ND (0.9)		8082A		1	08/28/17 14:53		CH72410
Aroclor 1260	ND (0.9)		8082A		1	08/28/17 14:53		CH72410
Aroclor 1262	ND (0.9)		8082A		1	08/28/17 14:53		CH72410
Aroclor 1268	ND (0.9)		8082A		1	08/28/17 14:53		CH72410

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: Decachlorobiphenyl	66 %		30-150
Surrogate: Decachlorobiphenyl [2C]	54 %		30-150
Surrogate: Tetrachloro-m-xylene	64 %		30-150
Surrogate: Tetrachloro-m-xylene [2C]	66 %		30-150



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund
Client Sample ID: TRY_TP_1 DRUM
Date Sampled: 08/21/17 12:20
Percent Solids: N/A
Initial Volume: 1.3
Final Volume: 40
Extraction Method: 3546

ESS Laboratory Work Order: 1708564
ESS Laboratory Sample ID: 1708564-01
Sample Matrix: Sludge
Units: mg/kg wet
Analyst: VSC
Prepared: 8/28/17 15:20

8151A Chlorinated Herbicides

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
2,4,5-T	ND (0.731)		8151A		1	08/29/17 21:28	C7H0419	CH72845
2,4,5-TP (Silvex)	ND (0.731)		8151A		1	08/29/17 21:28	C7H0419	CH72845
2,4-D	ND (14.5)		8151A		1	08/29/17 21:28	C7H0419	CH72845
2,4-DB	ND (14.6)		8151A		1	08/29/17 21:28	C7H0419	CH72845
Dalapon	ND (14.0)		8151A		1	08/29/17 21:28	C7H0419	CH72845
Dicamba	ND (0.723)		8151A		1	08/29/17 21:28	C7H0419	CH72845
Dichlorprop	ND (14.5)		8151A		1	08/29/17 21:28	C7H0419	CH72845
Dinoseb	ND (14.6)		8151A		1	08/29/17 21:28	C7H0419	CH72845
MCPA	ND (286)		8151A		1	08/29/17 21:28	C7H0419	CH72845
MCPP	#, XH ND (289)		8151A		1	08/29/17 21:28	C7H0419	CH72845

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: DCAA	%	SD	30-150
Surrogate: DCAA [2C]	%	SD	30-150



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund
Client Sample ID: TRY_TP_1 DRUM
Date Sampled: 08/21/17 12:20
Percent Solids: N/A
Initial Volume: 5.31
Final Volume: 10
Extraction Method: 3546

ESS Laboratory Work Order: 1708564
ESS Laboratory Sample ID: 1708564-01
Sample Matrix: Sludge
Units: mg/kg wet
Analyst: TJ
Prepared: 8/24/17 9:50

8270D Semi-Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
1,1-Biphenyl	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
1,2,4-Trichlorobenzene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
1,2-Dichlorobenzene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
1,2-Diphenylhydrazine as Azobenzene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
1,3-Dichlorobenzene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
1,4-Dichlorobenzene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2,3,4,6-Tetrachlorophenol	ND (94.4)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2,4,5-Trichlorophenol	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2,4,6-Trichlorophenol	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2,4-Dichlorophenol	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2,4-Dimethylphenol	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2,4-Dinitrophenol	ND (94.4)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2,4-Dinitrotoluene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2,6-Dinitrotoluene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2-Chloronaphthalene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2-Chlorophenol	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2-Methylnaphthalene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2-Methylphenol	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2-Nitroaniline	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
2-Nitrophenol	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
3,3'-Dichlorobenzidine	ND (37.7)		8270D		1	08/25/17 0:00	C7H0340	CH72324
3+4-Methylphenol	ND (37.7)		8270D		1	08/25/17 0:00	C7H0340	CH72324
3-Nitroaniline	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
4,6-Dinitro-2-Methylphenol	ND (94.4)		8270D		1	08/25/17 0:00	C7H0340	CH72324
4-Bromophenyl-phenylether	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
4-Chloro-3-Methylphenol	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
4-Chloroaniline	ND (37.7)		8270D		1	08/25/17 0:00	C7H0340	CH72324
4-Chloro-phenyl-phenyl ether	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
4-Nitroaniline	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
4-Nitrophenol	ND (94.4)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Acenaphthene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Acenaphthylene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund
Client Sample ID: TRY_TP_1 DRUM
Date Sampled: 08/21/17 12:20
Percent Solids: N/A
Initial Volume: 5.31
Final Volume: 10
Extraction Method: 3546

ESS Laboratory Work Order: 1708564
ESS Laboratory Sample ID: 1708564-01
Sample Matrix: Sludge
Units: mg/kg wet
Analyst: TJ
Prepared: 8/24/17 9:50

8270D Semi-Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Acetophenone	ND (37.7)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Aniline	ND (94.4)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Anthracene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Azobenzene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Benzidine	ND (37.7)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Benzo(a)anthracene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Benzo(a)pyrene	ND (9.44)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Benzo(b)fluoranthene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Benzo(g,h,i)perylene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Benzo(k)fluoranthene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Benzoic Acid	ND (94.4)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Benzyl Alcohol	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
bis(2-Chloroethoxy)methane	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
bis(2-Chloroethyl)ether	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
bis(2-chloroisopropyl)Ether	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
bis(2-Ethylhexyl)phthalate	12000 (1880)		8270D		100	08/26/17 2:59	C7H0340	CH72324
Butylbenzylphthalate	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Carbazole	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Chrysene	ND (9.44)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Dibenzo(a,h)Anthracene	ND (9.44)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Dibenzofuran	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Diethylphthalate	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Dimethylphthalate	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Di-n-butylphthalate	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Di-n-octylphthalate	3930 (1880)		8270D		100	08/26/17 2:59	C7H0340	CH72324
Fluoranthene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Fluorene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Hexachlorobenzene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Hexachlorobutadiene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Hexachlorocyclopentadiene	ND (94.4)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Hexachloroethane	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Indeno(1,2,3-cd)Pyrene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund
Client Sample ID: TRY_TP_1 DRUM
Date Sampled: 08/21/17 12:20
Percent Solids: N/A
Initial Volume: 5.31
Final Volume: 10
Extraction Method: 3546

ESS Laboratory Work Order: 1708564
ESS Laboratory Sample ID: 1708564-01
Sample Matrix: Sludge
Units: mg/kg wet
Analyst: TJ
Prepared: 8/24/17 9:50

8270D Semi-Volatile Organic Compounds

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyzed</u>	<u>Sequence</u>	<u>Batch</u>
Isophorone	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Naphthalene	52.9 (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Nitrobenzene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
N-Nitrosodimethylamine	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
N-Nitroso-Di-n-Propylamine	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
N-nitrosodiphenylamine	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Pentachlorophenol	ND (94.4)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Phenanthrene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Phenol	154 (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Pyrene	ND (18.8)		8270D		1	08/25/17 0:00	C7H0340	CH72324
Pyridine	ND (94.4)		8270D		1	08/25/17 0:00	C7H0340	CH72324

	<i>%Recovery</i>	<i>Qualifier</i>	<i>Limits</i>
Surrogate: 1,2-Dichlorobenzene-d4	%	SM	30-130
Surrogate: 2,4,6-Tribromophenol	91 %		30-130
Surrogate: 2-Chlorophenol-d4	50 %		30-130
Surrogate: 2-Fluorobiphenyl	%	SM	30-130
Surrogate: 2-Fluorophenol	53 %		30-130
Surrogate: Nitrobenzene-d5	162 %	SM	30-130
Surrogate: Phenol-d6	85 %		30-130
Surrogate: p-Terphenyl-d14	%	SM	30-130



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund
Client Sample ID: TRY_TP_1 DRUM
Date Sampled: 08/21/17 12:20
Percent Solids: N/A

ESS Laboratory Work Order: 1708564
ESS Laboratory Sample ID: 1708564-01
Sample Matrix: Sludge

Classical Chemistry

<u>Analyte</u>	<u>Results (MRL)</u>	<u>MDL</u>	<u>Method</u>	<u>Limit</u>	<u>DF</u>	<u>Analyst</u>	<u>Analyzed</u>	<u>Units</u>	<u>Batch</u>
Corrosivity (pH)	5.94 (N/A)		9045		1	JLK	08/23/17 21:43	S.U.	CH72347
Corrosivity (pH) Sample Temp	Soil pH measured in water at 20.2 °C.								
Flashpoint	140 (N/A)		1010		1	LAB	08/24/17 11:02	°F	CH72422
Reactive Cyanide	ND (2.0)		7.3.3.2		1	EEM	08/28/17 10:10	mg/kg	CH72805
Reactive Sulfide	ND (2.0)		7.3.4.1		1	EEM	08/28/17 10:10	mg/kg	CH72805



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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Total Metals

Batch CH72425 - 3050B

Blank

Arsenic	ND	2.50	mg/kg wet
Barium	ND	2.50	mg/kg wet
Cadmium	ND	0.50	mg/kg wet
Chromium	ND	1.00	mg/kg wet
Lead	ND	5.00	mg/kg wet
Selenium	ND	0.50	mg/kg wet
Silver	ND	0.50	mg/kg wet

LCS

Arsenic	116	7.94	mg/kg wet	123.0	94	80-120
Barium	208	7.94	mg/kg wet	253.0	82	80-120
Cadmium	186	1.59	mg/kg wet	224.0	83	80-120
Chromium	173	3.17	mg/kg wet	179.0	97	80-120
Lead	133	15.9	mg/kg wet	145.0	92	80-120
Selenium	47.4	3.97	mg/kg wet	42.40	112	80-120
Silver	73.6	1.59	mg/kg wet	81.60	90	80-120

LCS Dup

Arsenic	113	7.58	mg/kg wet	123.0	92	80-120	2	20
Barium	236	7.58	mg/kg wet	253.0	93	80-120	12	20
Cadmium	185	1.52	mg/kg wet	224.0	83	80-120	0.2	20
Chromium	172	3.03	mg/kg wet	179.0	96	80-120	0.4	20
Lead	132	15.2	mg/kg wet	145.0	91	80-120	1	20
Selenium	48.9	3.79	mg/kg wet	42.40	115	80-120	3	30
Silver	69.0	1.52	mg/kg wet	81.60	85	80-120	6	20

Batch CH72426 - 7471B

Blank

Mercury	ND	0.033	mg/kg wet
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LCS

Mercury	6.61	0.639	mg/kg wet	6.650	99	80-120
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LCS Dup

Mercury	6.64	0.591	mg/kg wet	6.650	100	80-120	0.5	20
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5035/8260B Volatile Organic Compounds / Methanol

Batch CH72921 - 5035

Blank

1,1,1,2-Tetrachloroethane	ND	0.200	mg/kg wet
1,1,1-Trichloroethane	ND	0.200	mg/kg wet
1,1,2,2-Tetrachloroethane	ND	0.200	mg/kg wet
1,1,2-Trichloroethane	ND	0.200	mg/kg wet
1,1-Dichloroethane	ND	0.200	mg/kg wet
1,1-Dichloroethene	ND	0.200	mg/kg wet
1,1-Dichloropropene	ND	0.200	mg/kg wet
1,2,3-Trichlorobenzene	ND	0.200	mg/kg wet



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

Batch CH72921 - 5035

1,2,3-Trichloropropane	ND	0.200	mg/kg wet
1,2,4-Trichlorobenzene	ND	0.200	mg/kg wet
1,2,4-Trimethylbenzene	ND	0.200	mg/kg wet
1,2-Dibromo-3-Chloropropane	ND	1.00	mg/kg wet
1,2-Dibromoethane	ND	0.200	mg/kg wet
1,2-Dichlorobenzene	ND	0.200	mg/kg wet
1,2-Dichloroethane	ND	0.200	mg/kg wet
1,2-Dichloropropane	ND	0.200	mg/kg wet
1,3 Dichloropropene (Total)	ND	0.200	mg/kg wet
1,3,5-Trichlorobenzene	ND	0.200	mg/kg wet
1,3,5-Trimethylbenzene	ND	0.200	mg/kg wet
1,3-Dichlorobenzene	ND	0.200	mg/kg wet
1,4-Dichlorobenzene	ND	0.200	mg/kg wet
1,4-Dioxane - Screen	ND	40.0	mg/kg wet
2,2-Dichloropropane	ND	0.200	mg/kg wet
2-Butanone	ND	1.00	mg/kg wet
2-Chlorotoluene	ND	0.200	mg/kg wet
2-Hexanone	ND	1.00	mg/kg wet
4-Chlorotoluene	ND	0.200	mg/kg wet
4-Isopropyltoluene	ND	0.200	mg/kg wet
4-Methyl-2-Pentanone	ND	1.00	mg/kg wet
Acetone	ND	1.00	mg/kg wet
Acrylonitrile	ND	1.00	mg/kg wet
Allyl Chloride	ND	0.400	mg/kg wet
Benzene	ND	0.200	mg/kg wet
Bromobenzene	ND	0.200	mg/kg wet
Bromochloromethane	ND	0.200	mg/kg wet
Bromodichloromethane	ND	0.200	mg/kg wet
Bromoform	ND	0.200	mg/kg wet
Bromomethane	ND	0.200	mg/kg wet
Carbon Disulfide	ND	0.200	mg/kg wet
Carbon Tetrachloride	ND	0.200	mg/kg wet
Chlorobenzene	ND	0.200	mg/kg wet
Chloroethane	ND	0.200	mg/kg wet
Chloroform	ND	0.200	mg/kg wet
Chloromethane	ND	0.200	mg/kg wet
cis-1,2-Dichloroethene	ND	0.200	mg/kg wet
Dibromochloromethane	ND	0.200	mg/kg wet
Dibromomethane	ND	0.200	mg/kg wet
Dichlorodifluoromethane	ND	0.200	mg/kg wet
Diethyl Ether	ND	0.200	mg/kg wet
Di-isopropyl ether	ND	0.200	mg/kg wet
Ethyl tertiary-butyl ether	ND	0.200	mg/kg wet
Ethylbenzene	ND	0.200	mg/kg wet
Hexachlorobutadiene	ND	0.200	mg/kg wet



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

Batch CH72921 - 5035

Isopropylbenzene	ND	0.200	mg/kg wet							
Methyl tert-Butyl Ether	ND	0.200	mg/kg wet							
Methylene Chloride	ND	0.400	mg/kg wet							
Naphthalene	ND	0.200	mg/kg wet							
n-Butylbenzene	ND	0.200	mg/kg wet							
n-Propylbenzene	ND	0.200	mg/kg wet							
sec-Butylbenzene	ND	0.200	mg/kg wet							
Styrene	ND	0.200	mg/kg wet							
tert-Butylbenzene	ND	0.200	mg/kg wet							
Tertiary-amyl methyl ether	ND	0.200	mg/kg wet							
Tertiary-butyl Alcohol	ND	5.00	mg/kg wet							
Tetrachloroethene	ND	0.200	mg/kg wet							
Tetrahydrofuran	ND	1.00	mg/kg wet							
Toluene	ND	0.200	mg/kg wet							
trans-1,2-Dichloroethene	ND	0.200	mg/kg wet							
Trichloroethene	ND	0.200	mg/kg wet							
Trichlorofluoromethane	ND	0.200	mg/kg wet							
Vinyl Chloride	ND	0.200	mg/kg wet							
Xylenes (Total)	ND	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	5.38		mg/kg wet	5.000		108	70-130			
Surrogate: 4-Bromofluorobenzene	4.28		mg/kg wet	5.000		86	70-130			
Surrogate: Dibromofluoromethane	5.26		mg/kg wet	5.000		105	70-130			
Surrogate: Toluene-d8	4.53		mg/kg wet	5.000		91	70-130			

LCS

1,1,1,2-Tetrachloroethane	2.08	0.200	mg/kg wet	2.000		104	70-130			
1,1,1-Trichloroethane	2.08	0.200	mg/kg wet	2.000		104	70-130			
1,1,2,2-Tetrachloroethane	1.96	0.200	mg/kg wet	2.000		98	70-130			
1,1,2-Trichloroethane	1.94	0.200	mg/kg wet	2.000		97	70-130			
1,1-Dichloroethane	2.08	0.200	mg/kg wet	2.000		104	70-130			
1,1-Dichloroethene	2.13	0.200	mg/kg wet	2.000		107	70-130			
1,1-Dichloropropene	2.06	0.200	mg/kg wet	2.000		103	70-130			
1,2,3-Trichlorobenzene	2.36	0.200	mg/kg wet	2.000		118	70-130			
1,2,3-Trichloropropane	2.08	0.200	mg/kg wet	2.000		104	70-130			
1,2,4-Trichlorobenzene	2.21	0.200	mg/kg wet	2.000		110	70-130			
1,2,4-Trimethylbenzene	2.20	0.200	mg/kg wet	2.000		110	70-130			
1,2-Dibromo-3-Chloropropane	1.99	1.00	mg/kg wet	2.000		100	70-130			
1,2-Dibromoethane	2.24	0.200	mg/kg wet	2.000		112	70-130			
1,2-Dichlorobenzene	2.16	0.200	mg/kg wet	2.000		108	70-130			
1,2-Dichloroethane	2.16	0.200	mg/kg wet	2.000		108	70-130			
1,2-Dichloropropane	2.22	0.200	mg/kg wet	2.000		111	70-130			
1,3 Dichloropropene (Total)	4.33	0.200	mg/kg wet							
1,3,5-Trichlorobenzene	2.26	0.200	mg/kg wet	2.000		113	70-130			
1,3,5-Trimethylbenzene	2.11	0.200	mg/kg wet	2.000		105	70-130			
1,3-Dichlorobenzene	2.13	0.200	mg/kg wet	2.000		106	70-130			
1,4-Dichlorobenzene	2.16	0.200	mg/kg wet	2.000		108	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

Batch CH72921 - 5035

1,4-Dioxane - Screen	87.2	40.0	mg/kg wet	40.00		218	44-241			
2,2-Dichloropropane	2.02	0.200	mg/kg wet	2.000		101	70-130			
2-Butanone	10.4	1.00	mg/kg wet	10.00		104	70-130			
2-Chlorotoluene	2.15	0.200	mg/kg wet	2.000		108	70-130			
2-Hexanone	10.7	1.00	mg/kg wet	10.00		107	70-130			
4-Chlorotoluene	2.14	0.200	mg/kg wet	2.000		107	70-130			
4-Isopropyltoluene	2.17	0.200	mg/kg wet	2.000		109	70-130			
4-Methyl-2-Pentanone	10.6	1.00	mg/kg wet	10.00		106	70-130			
Acetone	10.7	1.00	mg/kg wet	10.00		107	70-130			
Acrylonitrile	2.06	1.00	mg/kg wet	2.000		103	70-130			
Allyl Chloride	1.86	0.400	mg/kg wet	2.000		93	70-130			
Benzene	2.14	0.200	mg/kg wet	2.000		107	70-130			
Bromobenzene	2.14	0.200	mg/kg wet	2.000		107	70-130			
Bromochloromethane	2.13	0.200	mg/kg wet	2.000		106	70-130			
Bromodichloromethane	1.89	0.200	mg/kg wet	2.000		95	70-130			
Bromoform	1.97	0.200	mg/kg wet	2.000		98	70-130			
Bromomethane	2.25	0.200	mg/kg wet	2.000		112	70-130			
Carbon Disulfide	1.95	0.200	mg/kg wet	2.000		98	70-130			
Carbon Tetrachloride	2.16	0.200	mg/kg wet	2.000		108	70-130			
Chlorobenzene	2.18	0.200	mg/kg wet	2.000		109	70-130			
Chloroethane	2.06	0.200	mg/kg wet	2.000		103	70-130			
Chloroform	2.01	0.200	mg/kg wet	2.000		101	70-130			
Chloromethane	2.16	0.200	mg/kg wet	2.000		108	70-130			
cis-1,2-Dichloroethene	2.04	0.200	mg/kg wet	2.000		102	70-130			
Dibromochloromethane	2.19	0.200	mg/kg wet	2.000		110	70-130			
Dibromomethane	1.96	0.200	mg/kg wet	2.000		98	70-130			
Dichlorodifluoromethane	2.03	0.200	mg/kg wet	2.000		102	70-130			
Diethyl Ether	1.85	0.200	mg/kg wet	2.000		92	70-130			
Di-isopropyl ether	2.11	0.200	mg/kg wet	2.000		105	70-130			
Ethyl tertiary-butyl ether	2.10	0.200	mg/kg wet	2.000		105	70-130			
Ethylbenzene	2.11	0.200	mg/kg wet	2.000		105	70-130			
Hexachlorobutadiene	2.39	0.200	mg/kg wet	2.000		119	70-130			
Isopropylbenzene	2.08	0.200	mg/kg wet	2.000		104	70-130			
Methyl tert-Butyl Ether	1.91	0.200	mg/kg wet	2.000		96	70-130			
Methylene Chloride	2.02	0.400	mg/kg wet	2.000		101	70-130			
Naphthalene	2.21	0.200	mg/kg wet	2.000		111	70-130			
n-Butylbenzene	2.07	0.200	mg/kg wet	2.000		104	70-130			
n-Propylbenzene	2.19	0.200	mg/kg wet	2.000		110	70-130			
sec-Butylbenzene	2.22	0.200	mg/kg wet	2.000		111	70-130			
Styrene	2.14	0.200	mg/kg wet	2.000		107	70-130			
tert-Butylbenzene	2.19	0.200	mg/kg wet	2.000		110	70-130			
Tertiary-amyl methyl ether	2.02	0.200	mg/kg wet	2.000		101	70-130			
Tertiary-butyl Alcohol	15.8	5.00	mg/kg wet	10.00		158	70-130			B+
Tetrachloroethene	1.88	0.200	mg/kg wet	2.000		94	70-130			
Tetrahydrofuran	1.84	1.00	mg/kg wet	2.000		92	70-130			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

Batch CH72921 - 5035

Toluene	2.11	0.200	mg/kg wet	2.000		106	70-130			
trans-1,2-Dichloroethene	2.04	0.200	mg/kg wet	2.000		102	70-130			
Trichloroethene	2.10	0.200	mg/kg wet	2.000		105	70-130			
Trichlorofluoromethane	2.18	0.200	mg/kg wet	2.000		109	70-130			
Vinyl Chloride	2.26	0.200	mg/kg wet	2.000		113	70-130			
Xylenes (Total)	6.48	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	5.41		mg/kg wet	5.000		108	70-130			
Surrogate: 4-Bromofluorobenzene	5.29		mg/kg wet	5.000		106	70-130			
Surrogate: Dibromofluoromethane	5.21		mg/kg wet	5.000		104	70-130			
Surrogate: Toluene-d8	5.44		mg/kg wet	5.000		109	70-130			

LCS Dup

1,1,1,2-Tetrachloroethane	2.07	0.200	mg/kg wet	2.000		104	70-130	0.3	25	
1,1,1-Trichloroethane	1.93	0.200	mg/kg wet	2.000		96	70-130	8	25	
1,1,2,2-Tetrachloroethane	1.86	0.200	mg/kg wet	2.000		93	70-130	5	25	
1,1,2-Trichloroethane	1.82	0.200	mg/kg wet	2.000		91	70-130	6	25	
1,1-Dichloroethane	2.07	0.200	mg/kg wet	2.000		103	70-130	0.8	25	
1,1-Dichloroethene	2.00	0.200	mg/kg wet	2.000		100	70-130	6	25	
1,1-Dichloropropene	2.07	0.200	mg/kg wet	2.000		104	70-130	0.5	25	
1,2,3-Trichlorobenzene	2.07	0.200	mg/kg wet	2.000		104	70-130	13	25	
1,2,3-Trichloropropane	1.98	0.200	mg/kg wet	2.000		99	70-130	5	25	
1,2,4-Trichlorobenzene	2.05	0.200	mg/kg wet	2.000		102	70-130	8	25	
1,2,4-Trimethylbenzene	2.06	0.200	mg/kg wet	2.000		103	70-130	6	25	
1,2-Dibromo-3-Chloropropane	1.89	1.00	mg/kg wet	2.000		95	70-130	5	25	
1,2-Dibromoethane	2.05	0.200	mg/kg wet	2.000		103	70-130	9	25	
1,2-Dichlorobenzene	2.07	0.200	mg/kg wet	2.000		104	70-130	4	25	
1,2-Dichloroethane	2.07	0.200	mg/kg wet	2.000		104	70-130	4	25	
1,2-Dichloropropane	2.08	0.200	mg/kg wet	2.000		104	70-130	6	25	
1,3 Dichloropropene (Total)	4.10	0.200	mg/kg wet							
1,3,5-Trichlorobenzene	2.14	0.200	mg/kg wet	2.000		107	70-130	5	25	
1,3,5-Trimethylbenzene	2.08	0.200	mg/kg wet	2.000		104	70-130	2	25	
1,3-Dichlorobenzene	2.02	0.200	mg/kg wet	2.000		101	70-130	5	25	
1,4-Dichlorobenzene	2.10	0.200	mg/kg wet	2.000		105	70-130	3	25	
1,4-Dioxane - Screen	66.0	40.0	mg/kg wet	40.00		165	44-241	28	200	
2,2-Dichloropropane	1.96	0.200	mg/kg wet	2.000		98	70-130	3	25	
2-Butanone	10.1	1.00	mg/kg wet	10.00		101	70-130	3	25	
2-Chlorotoluene	2.10	0.200	mg/kg wet	2.000		105	70-130	3	25	
2-Hexanone	10.1	1.00	mg/kg wet	10.00		101	70-130	6	25	
4-Chlorotoluene	2.07	0.200	mg/kg wet	2.000		104	70-130	3	25	
4-Isopropyltoluene	2.06	0.200	mg/kg wet	2.000		103	70-130	5	25	
4-Methyl-2-Pentanone	10.3	1.00	mg/kg wet	10.00		103	70-130	3	25	
Acetone	9.57	1.00	mg/kg wet	10.00		96	70-130	11	25	
Acrylonitrile	1.86	1.00	mg/kg wet	2.000		93	70-130	10	25	
Allyl Chloride	1.78	0.400	mg/kg wet	2.000		89	70-130	4	25	
Benzene	2.09	0.200	mg/kg wet	2.000		104	70-130	3	25	
Bromobenzene	2.06	0.200	mg/kg wet	2.000		103	70-130	4	25	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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5035/8260B Volatile Organic Compounds / Methanol

Batch CH72921 - 5035

Bromochloromethane	2.04	0.200	mg/kg wet	2.000		102	70-130	4	25	
Bromodichloromethane	1.95	0.200	mg/kg wet	2.000		97	70-130	3	25	
Bromoform	1.84	0.200	mg/kg wet	2.000		92	70-130	7	25	
Bromomethane	2.15	0.200	mg/kg wet	2.000		108	70-130	4	25	
Carbon Disulfide	1.95	0.200	mg/kg wet	2.000		98	70-130	0	25	
Carbon Tetrachloride	2.02	0.200	mg/kg wet	2.000		101	70-130	7	25	
Chlorobenzene	2.04	0.200	mg/kg wet	2.000		102	70-130	7	25	
Chloroethane	2.02	0.200	mg/kg wet	2.000		101	70-130	2	25	
Chloroform	1.84	0.200	mg/kg wet	2.000		92	70-130	9	25	
Chloromethane	2.00	0.200	mg/kg wet	2.000		100	70-130	8	25	
cis-1,2-Dichloroethene	1.97	0.200	mg/kg wet	2.000		99	70-130	3	25	
Dibromochloromethane	1.97	0.200	mg/kg wet	2.000		98	70-130	11	25	
Dibromomethane	1.91	0.200	mg/kg wet	2.000		95	70-130	3	25	
Dichlorodifluoromethane	1.97	0.200	mg/kg wet	2.000		98	70-130	3	25	
Diethyl Ether	1.78	0.200	mg/kg wet	2.000		89	70-130	4	25	
Di-isopropyl ether	2.10	0.200	mg/kg wet	2.000		105	70-130	0.6	25	
Ethyl tertiary-butyl ether	2.04	0.200	mg/kg wet	2.000		102	70-130	3	25	
Ethylbenzene	2.05	0.200	mg/kg wet	2.000		103	70-130	3	25	
Hexachlorobutadiene	2.14	0.200	mg/kg wet	2.000		107	70-130	11	25	
Isopropylbenzene	2.02	0.200	mg/kg wet	2.000		101	70-130	3	25	
Methyl tert-Butyl Ether	1.84	0.200	mg/kg wet	2.000		92	70-130	4	25	
Methylene Chloride	1.96	0.400	mg/kg wet	2.000		98	70-130	3	25	
Naphthalene	2.02	0.200	mg/kg wet	2.000		101	70-130	9	25	
n-Butylbenzene	1.98	0.200	mg/kg wet	2.000		99	70-130	4	25	
n-Propylbenzene	2.08	0.200	mg/kg wet	2.000		104	70-130	5	25	
sec-Butylbenzene	2.06	0.200	mg/kg wet	2.000		103	70-130	7	25	
Styrene	2.06	0.200	mg/kg wet	2.000		103	70-130	4	25	
tert-Butylbenzene	2.08	0.200	mg/kg wet	2.000		104	70-130	5	25	
Tertiary-amyl methyl ether	1.96	0.200	mg/kg wet	2.000		98	70-130	3	25	
Tertiary-butyl Alcohol	11.4	5.00	mg/kg wet	10.00		114	70-130	32	20	D+
Tetrachloroethene	1.80	0.200	mg/kg wet	2.000		90	70-130	4	25	
Tetrahydrofuran	2.00	1.00	mg/kg wet	2.000		100	70-130	8	25	
Toluene	2.02	0.200	mg/kg wet	2.000		101	70-130	4	25	
trans-1,2-Dichloroethene	1.93	0.200	mg/kg wet	2.000		97	70-130	5	25	
Trichloroethene	1.96	0.200	mg/kg wet	2.000		98	70-130	7	25	
Trichlorofluoromethane	2.10	0.200	mg/kg wet	2.000		105	70-130	3	25	
Vinyl Chloride	2.01	0.200	mg/kg wet	2.000		100	70-130	12	25	
Xylenes (Total)	6.30	0.400	mg/kg wet							
Surrogate: 1,2-Dichloroethane-d4	5.26		mg/kg wet	5.000		105	70-130			
Surrogate: 4-Bromofluorobenzene	5.05		mg/kg wet	5.000		101	70-130			
Surrogate: Dibromofluoromethane	5.16		mg/kg wet	5.000		103	70-130			
Surrogate: Toluene-d8	5.32		mg/kg wet	5.000		106	70-130			

8081B Organochlorine Pesticides

Batch CH72913 - 3546



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8081B Organochlorine Pesticides

Batch CH72913 - 3546

Blank

4,4'-DDD	ND	0.0025	mg/kg wet
4,4'-DDD [2C]	ND	0.0025	mg/kg wet
4,4'-DDE	ND	0.0025	mg/kg wet
4,4'-DDE [2C]	ND	0.0025	mg/kg wet
4,4'-DDT	ND	0.0025	mg/kg wet
4,4'-DDT [2C]	ND	0.0025	mg/kg wet
Alachlor	ND	0.0025	mg/kg wet
Alachlor [2C]	ND	0.0025	mg/kg wet
Aldrin	ND	0.0025	mg/kg wet
Aldrin [2C]	ND	0.0025	mg/kg wet
alpha-BHC	ND	0.0025	mg/kg wet
alpha-BHC [2C]	ND	0.0025	mg/kg wet
alpha-Chlordane	ND	0.0025	mg/kg wet
alpha-Chlordane [2C]	ND	0.0025	mg/kg wet
beta-BHC	ND	0.0025	mg/kg wet
beta-BHC [2C]	ND	0.0025	mg/kg wet
Dieldrin	ND	0.0025	mg/kg wet
Dieldrin [2C]	ND	0.0025	mg/kg wet
Endosulfan I	ND	0.0025	mg/kg wet
Endosulfan I [2C]	ND	0.0025	mg/kg wet
Endosulfan II	ND	0.0025	mg/kg wet
Endosulfan II [2C]	ND	0.0025	mg/kg wet
Endosulfan Sulfate	ND	0.0025	mg/kg wet
Endosulfan Sulfate [2C]	ND	0.0025	mg/kg wet
Endrin	ND	0.0025	mg/kg wet
Endrin [2C]	ND	0.0025	mg/kg wet
gamma-BHC (Lindane)	ND	0.0015	mg/kg wet
gamma-BHC (Lindane) [2C]	ND	0.0015	mg/kg wet
gamma-Chlordane	ND	0.0025	mg/kg wet
gamma-Chlordane [2C]	ND	0.0025	mg/kg wet
Heptachlor	ND	0.0025	mg/kg wet
Heptachlor [2C]	ND	0.0025	mg/kg wet
Heptachlor Epoxide	ND	0.0025	mg/kg wet
Heptachlor Epoxide [2C]	ND	0.0025	mg/kg wet
Hexachlorobenzene	ND	0.0025	mg/kg wet
Hexachlorobenzene [2C]	ND	0.0025	mg/kg wet
Methoxychlor	ND	0.0025	mg/kg wet
Methoxychlor [2C]	ND	0.0025	mg/kg wet

Surrogate: Decachlorobiphenyl	0.00929	mg/kg wet	0.01250	74	30-150
Surrogate: Decachlorobiphenyl [2C]	0.00973	mg/kg wet	0.01250	78	30-150
Surrogate: Tetrachloro-m-xylene	0.00961	mg/kg wet	0.01250	77	30-150
Surrogate: Tetrachloro-m-xylene [2C]	0.0105	mg/kg wet	0.01250	84	30-150

LCS



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1708564

Quality Control Data

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8081B Organochlorine Pesticides

Batch CH72913 - 3546

4,4'-DDD	0.0106	0.0025	mg/kg wet	0.01250		84	40-140			
4,4'-DDD [2C]	0.0113	0.0025	mg/kg wet	0.01250		90	40-140			
4,4'-DDE	0.0109	0.0025	mg/kg wet	0.01250		87	40-140			
4,4'-DDE [2C]	0.0121	0.0025	mg/kg wet	0.01250		97	40-140			
4,4'-DDT	0.0115	0.0025	mg/kg wet	0.01250		92	40-140			
4,4'-DDT [2C]	0.0123	0.0025	mg/kg wet	0.01250		98	40-140			
Alachlor	0.0133	0.0025	mg/kg wet	0.01250		106	40-140			
Alachlor [2C]	0.0135	0.0025	mg/kg wet	0.01250		108	40-140			
Aldrin	0.0108	0.0025	mg/kg wet	0.01250		86	40-140			
Aldrin [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
alpha-BHC	0.0105	0.0025	mg/kg wet	0.01250		84	40-140			
alpha-BHC [2C]	0.0117	0.0025	mg/kg wet	0.01250		94	40-140			
alpha-Chlordane	0.0107	0.0025	mg/kg wet	0.01250		86	40-140			
alpha-Chlordane [2C]	0.0116	0.0025	mg/kg wet	0.01250		93	40-140			
beta-BHC	0.0109	0.0025	mg/kg wet	0.01250		87	40-140			
beta-BHC [2C]	0.0111	0.0025	mg/kg wet	0.01250		88	40-140			
Dieldrin	0.0115	0.0025	mg/kg wet	0.01250		92	40-140			
Dieldrin [2C]	0.0125	0.0025	mg/kg wet	0.01250		100	40-140			
Endosulfan I	0.0108	0.0025	mg/kg wet	0.01250		87	40-140			
Endosulfan I [2C]	0.0120	0.0025	mg/kg wet	0.01250		96	40-140			
Endosulfan II	0.0109	0.0025	mg/kg wet	0.01250		87	40-140			
Endosulfan II [2C]	0.0113	0.0025	mg/kg wet	0.01250		91	40-140			
Endosulfan Sulfate	0.0108	0.0025	mg/kg wet	0.01250		86	40-140			
Endosulfan Sulfate [2C]	0.0114	0.0025	mg/kg wet	0.01250		92	40-140			
Endrin	0.0111	0.0025	mg/kg wet	0.01250		89	40-140			
Endrin [2C]	0.0119	0.0025	mg/kg wet	0.01250		95	40-140			
gamma-BHC (Lindane)	0.0106	0.0015	mg/kg wet	0.01250		85	40-140			
gamma-BHC (Lindane) [2C]	0.0119	0.0015	mg/kg wet	0.01250		95	40-140			
gamma-Chlordane	0.0112	0.0025	mg/kg wet	0.01250		90	40-140			
gamma-Chlordane [2C]	0.0117	0.0025	mg/kg wet	0.01250		94	40-140			
Heptachlor	0.0102	0.0025	mg/kg wet	0.01250		82	40-140			
Heptachlor [2C]	0.0113	0.0025	mg/kg wet	0.01250		90	40-140			
Heptachlor Epoxide	0.0110	0.0025	mg/kg wet	0.01250		88	40-140			
Heptachlor Epoxide [2C]	0.0123	0.0025	mg/kg wet	0.01250		98	40-140			
Hexachlorobenzene	0.0123	0.0025	mg/kg wet	0.01250		98	40-140			
Hexachlorobenzene [2C]	0.0122	0.0025	mg/kg wet	0.01250		97	40-140			
Methoxychlor	0.0110	0.0025	mg/kg wet	0.01250		88	40-140			
Methoxychlor [2C]	0.0113	0.0025	mg/kg wet	0.01250		90	40-140			
Surrogate: Decachlorobiphenyl	0.0125		mg/kg wet	0.01250		100	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.0131		mg/kg wet	0.01250		104	30-150			
Surrogate: Tetrachloro-m-xylene	0.0111		mg/kg wet	0.01250		89	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0119		mg/kg wet	0.01250		95	30-150			

LCS Dup

4,4'-DDD	0.0090	0.0025	mg/kg wet	0.01250		72	40-140	16	30	
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CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8081B Organochlorine Pesticides

Batch CH72913 - 3546

4,4'-DDD [2C]	0.0093	0.0025	mg/kg wet	0.01250		75	40-140	19	30	
4,4'-DDE	0.0092	0.0025	mg/kg wet	0.01250		74	40-140	17	30	
4,4'-DDE [2C]	0.0102	0.0025	mg/kg wet	0.01250		81	40-140	17	30	
4,4'-DDT	0.0094	0.0025	mg/kg wet	0.01250		75	40-140	20	30	
4,4'-DDT [2C]	0.0099	0.0025	mg/kg wet	0.01250		79	40-140	22	30	
Alachlor	0.0120	0.0025	mg/kg wet	0.01250		96	40-140	10	30	
Alachlor [2C]	0.0121	0.0025	mg/kg wet	0.01250		97	40-140	11	30	
Aldrin	0.0096	0.0025	mg/kg wet	0.01250		77	40-140	12	30	
Aldrin [2C]	0.0105	0.0025	mg/kg wet	0.01250		84	40-140	13	30	
alpha-BHC	0.0095	0.0025	mg/kg wet	0.01250		76	40-140	10	30	
alpha-BHC [2C]	0.0104	0.0025	mg/kg wet	0.01250		83	40-140	12	30	
alpha-Chlordane	0.0093	0.0025	mg/kg wet	0.01250		75	40-140	14	30	
alpha-Chlordane [2C]	0.0100	0.0025	mg/kg wet	0.01250		80	40-140	15	30	
beta-BHC	0.0096	0.0025	mg/kg wet	0.01250		77	40-140	12	30	
beta-BHC [2C]	0.0097	0.0025	mg/kg wet	0.01250		77	40-140	13	30	
Dieldrin	0.0100	0.0025	mg/kg wet	0.01250		80	40-140	14	30	
Dieldrin [2C]	0.0107	0.0025	mg/kg wet	0.01250		86	40-140	15	30	
Endosulfan I	0.0095	0.0025	mg/kg wet	0.01250		76	40-140	13	30	
Endosulfan I [2C]	0.0103	0.0025	mg/kg wet	0.01250		83	40-140	15	30	
Endosulfan II	0.0092	0.0025	mg/kg wet	0.01250		74	40-140	16	30	
Endosulfan II [2C]	0.0095	0.0025	mg/kg wet	0.01250		76	40-140	18	30	
Endosulfan Sulfate	0.0089	0.0025	mg/kg wet	0.01250		72	40-140	19	30	
Endosulfan Sulfate [2C]	0.0094	0.0025	mg/kg wet	0.01250		75	40-140	20	30	
Endrin	0.0095	0.0025	mg/kg wet	0.01250		76	40-140	15	30	
Endrin [2C]	0.0100	0.0025	mg/kg wet	0.01250		80	40-140	17	30	
gamma-BHC (Lindane)	0.0094	0.0015	mg/kg wet	0.01250		75	40-140	12	30	
gamma-BHC (Lindane) [2C]	0.0103	0.0015	mg/kg wet	0.01250		83	40-140	14	30	
gamma-Chlordane	0.0098	0.0025	mg/kg wet	0.01250		78	40-140	14	30	
gamma-Chlordane [2C]	0.0101	0.0025	mg/kg wet	0.01250		81	40-140	15	30	
Heptachlor	0.0092	0.0025	mg/kg wet	0.01250		73	40-140	11	30	
Heptachlor [2C]	0.0099	0.0025	mg/kg wet	0.01250		80	40-140	12	30	
Heptachlor Epoxide	0.0098	0.0025	mg/kg wet	0.01250		78	40-140	12	30	
Heptachlor Epoxide [2C]	0.0107	0.0025	mg/kg wet	0.01250		86	40-140	14	30	
Hexachlorobenzene	0.0112	0.0025	mg/kg wet	0.01250		89	40-140	10	30	
Hexachlorobenzene [2C]	0.0109	0.0025	mg/kg wet	0.01250		87	40-140	11	30	
Methoxychlor	0.0089	0.0025	mg/kg wet	0.01250		71	40-140	22	30	
Methoxychlor [2C]	0.0089	0.0025	mg/kg wet	0.01250		71	40-140	24	30	

Surrogate: Decachlorobiphenyl	0.00934		mg/kg wet	0.01250		75	30-150			
Surrogate: Decachlorobiphenyl [2C]	0.00976		mg/kg wet	0.01250		78	30-150			
Surrogate: Tetrachloro-m-xylene	0.00975		mg/kg wet	0.01250		78	30-150			
Surrogate: Tetrachloro-m-xylene [2C]	0.0103		mg/kg wet	0.01250		82	30-150			

8082A Polychlorinated Biphenyls (PCB)

Batch CH72410 - 3540C



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

Quality Control Data

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8082A Polychlorinated Biphenyls (PCB)

Batch CH72410 - 3540C

Blank

Aroclor 1016	ND	0.05	mg/kg wet
Aroclor 1016 [2C]	ND	0.05	mg/kg wet
Aroclor 1221	ND	0.05	mg/kg wet
Aroclor 1221 [2C]	ND	0.05	mg/kg wet
Aroclor 1232	ND	0.05	mg/kg wet
Aroclor 1232 [2C]	ND	0.05	mg/kg wet
Aroclor 1242	ND	0.05	mg/kg wet
Aroclor 1242 [2C]	ND	0.05	mg/kg wet
Aroclor 1248	ND	0.05	mg/kg wet
Aroclor 1248 [2C]	ND	0.05	mg/kg wet
Aroclor 1254	ND	0.05	mg/kg wet
Aroclor 1254 [2C]	ND	0.05	mg/kg wet
Aroclor 1260	ND	0.05	mg/kg wet
Aroclor 1260 [2C]	ND	0.05	mg/kg wet
Aroclor 1262	ND	0.05	mg/kg wet
Aroclor 1262 [2C]	ND	0.05	mg/kg wet
Aroclor 1268	ND	0.05	mg/kg wet
Aroclor 1268 [2C]	ND	0.05	mg/kg wet

Surrogate: Decachlorobiphenyl	0.0169	mg/kg wet	0.02500	67	30-150
Surrogate: Decachlorobiphenyl [2C]	0.0170	mg/kg wet	0.02500	68	30-150
Surrogate: Tetrachloro-m-xylene	0.0165	mg/kg wet	0.02500	66	30-150
Surrogate: Tetrachloro-m-xylene [2C]	0.0184	mg/kg wet	0.02500	74	30-150

LCS

Aroclor 1016	0.4	0.05	mg/kg wet	0.5000	85	40-140
Aroclor 1016 [2C]	0.5	0.05	mg/kg wet	0.5000	91	40-140
Aroclor 1260	0.4	0.05	mg/kg wet	0.5000	88	40-140
Aroclor 1260 [2C]	0.4	0.05	mg/kg wet	0.5000	90	40-140

Surrogate: Decachlorobiphenyl	0.0200	mg/kg wet	0.02500	80	30-150
Surrogate: Decachlorobiphenyl [2C]	0.0197	mg/kg wet	0.02500	79	30-150
Surrogate: Tetrachloro-m-xylene	0.0180	mg/kg wet	0.02500	72	30-150
Surrogate: Tetrachloro-m-xylene [2C]	0.0187	mg/kg wet	0.02500	75	30-150

LCS Dup

Aroclor 1016	0.4	0.05	mg/kg wet	0.5000	81	40-140	5	30
Aroclor 1016 [2C]	0.4	0.05	mg/kg wet	0.5000	87	40-140	5	30
Aroclor 1260	0.4	0.05	mg/kg wet	0.5000	85	40-140	3	30
Aroclor 1260 [2C]	0.4	0.05	mg/kg wet	0.5000	86	40-140	4	30

Surrogate: Decachlorobiphenyl	0.0188	mg/kg wet	0.02500	75	30-150
Surrogate: Decachlorobiphenyl [2C]	0.0184	mg/kg wet	0.02500	74	30-150
Surrogate: Tetrachloro-m-xylene	0.0165	mg/kg wet	0.02500	66	30-150
Surrogate: Tetrachloro-m-xylene [2C]	0.0175	mg/kg wet	0.02500	70	30-150

8151A Chlorinated Herbicides



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8151A Chlorinated Herbicides

Batch CH72845 - 3546

Blank

2,4,5-T	ND	0.010	mg/kg wet
2,4,5-T [2C]	ND	0.010	mg/kg wet
2,4,5-TP (Silvex)	ND	0.010	mg/kg wet
2,4,5-TP (Silvex) [2C]	ND	0.010	mg/kg wet
2,4-D	ND	0.188	mg/kg wet
2,4-D [2C]	ND	0.188	mg/kg wet
2,4-DB	ND	0.190	mg/kg wet
2,4-DB [2C]	ND	0.190	mg/kg wet
Dalapon	ND	0.182	mg/kg wet
Dalapon [2C]	ND	0.182	mg/kg wet
Dicamba	ND	0.009	mg/kg wet
Dicamba [2C]	ND	0.009	mg/kg wet
Dichlorprop	ND	0.188	mg/kg wet
Dichlorprop [2C]	ND	0.188	mg/kg wet
Dinoseb	ND	0.190	mg/kg wet
Dinoseb [2C]	ND	0.190	mg/kg wet
MCPA	ND	3.72	mg/kg wet
MCPA [2C]	ND	3.72	mg/kg wet
MCPP	ND	3.76	mg/kg wet
MCPP [2C]	ND	3.76	mg/kg wet

Surrogate: DCAA	0.196	mg/kg wet	0.2000	98	30-150
Surrogate: DCAA [2C]	0.140	mg/kg wet	0.2000	70	30-150

LCS

2,4,5-T	0.012	0.010	mg/kg wet	0.01900	62	40-140	
2,4,5-T [2C]	0.009	0.010	mg/kg wet	0.01900	46	40-140	
2,4,5-TP (Silvex)	0.011	0.010	mg/kg wet	0.01900	56	40-140	
2,4,5-TP (Silvex) [2C]	0.008	0.010	mg/kg wet	0.01900	42	40-140	
2,4-D	0.105	0.188	mg/kg wet	0.1880	56	40-140	
2,4-D [2C]	0.096	0.188	mg/kg wet	0.1880	51	40-140	
2,4-DB	0.067	0.190	mg/kg wet	0.1900	35	40-140	B-
2,4-DB [2C]	0.043	0.190	mg/kg wet	0.1900	22	40-140	B-
Dalapon	0.159	0.182	mg/kg wet	0.4550	35	40-140	B-
Dalapon [2C]	0.182	0.182	mg/kg wet	0.4550	40	40-140	
Dicamba	0.012	0.009	mg/kg wet	0.01880	62	40-140	
Dicamba [2C]	0.008	0.009	mg/kg wet	0.01880	42	40-140	
Dichlorprop	0.101	0.188	mg/kg wet	0.1880	54	40-140	
Dichlorprop [2C]	0.082	0.188	mg/kg wet	0.1880	44	40-140	
Dinoseb	0.016	0.190	mg/kg wet	0.09500	17	10-100	
Dinoseb [2C]	0.014	0.190	mg/kg wet	0.09500	15	10-100	
MCPA	9.44	3.72	mg/kg wet	18.60	51	40-140	
MCPA [2C]	9.33	3.72	mg/kg wet	18.60	50	40-140	
MCPP	8.57	3.76	mg/kg wet	18.80	46	40-140	
MCPP [2C]	7.87	3.76	mg/kg wet	18.80	42	40-140	



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8151A Chlorinated Herbicides

Batch CH72845 - 3546

Surrogate: DCAA	0.156		mg/kg wet	0.2000		78	30-150			
Surrogate: DCAA [2C]	0.117		mg/kg wet	0.2000		59	30-150			

LCS Dup

2,4,5-T	0.013	0.010	mg/kg wet	0.01900		68	40-140	9	30	
2,4,5-T [2C]	0.009	0.010	mg/kg wet	0.01900		46	40-140	0	30	
2,4,5-TP (Silvex)	0.013	0.010	mg/kg wet	0.01900		66	40-140	16	30	
2,4,5-TP (Silvex) [2C]	0.009	0.010	mg/kg wet	0.01900		48	40-140	13	30	
2,4-D	0.109	0.188	mg/kg wet	0.1880		58	40-140	4	30	
2,4-D [2C]	0.104	0.188	mg/kg wet	0.1880		55	40-140	8	30	
2,4-DB	0.124	0.190	mg/kg wet	0.1900		65	40-140	59	30	D+
2,4-DB [2C]	0.089	0.190	mg/kg wet	0.1900		47	40-140	70	30	D+
Dalapon	0.160	0.182	mg/kg wet	0.4550		35	40-140	0.5	30	B-
Dalapon [2C]	0.182	0.182	mg/kg wet	0.4550		40	40-140	0.2	30	
Dicamba	0.014	0.009	mg/kg wet	0.01880		72	40-140	15	30	
Dicamba [2C]	0.009	0.009	mg/kg wet	0.01880		48	40-140	13	30	
Dichlorprop	0.123	0.188	mg/kg wet	0.1880		65	40-140	20	30	
Dichlorprop [2C]	0.099	0.188	mg/kg wet	0.1880		53	40-140	19	30	
Dinoseb	0.022	0.190	mg/kg wet	0.09500		23	10-100	30	30	
Dinoseb [2C]	0.017	0.190	mg/kg wet	0.09500		18	10-100	22	30	
MCPA	11.6	3.72	mg/kg wet	18.60		62	40-140	21	30	
MCPA [2C]	9.84	3.72	mg/kg wet	18.60		53	40-140	5	30	
MCPP	10.8	3.76	mg/kg wet	18.80		57	40-140	23	30	
MCPP [2C]	9.56	3.76	mg/kg wet	18.80		51	40-140	19	30	

Surrogate: DCAA	0.182		mg/kg wet	0.2000		91	30-150			
Surrogate: DCAA [2C]	0.136		mg/kg wet	0.2000		68	30-150			

8270D Semi-Volatile Organic Compounds

Batch CH72324 - 3546

Blank

1,1-Biphenyl	ND	0.333	mg/kg wet							
1,2,4-Trichlorobenzene	ND	0.333	mg/kg wet							
1,2-Dichlorobenzene	ND	0.333	mg/kg wet							
1,2-Diphenylhydrazine as Azobenzene	ND	0.333	mg/kg wet							
1,3-Dichlorobenzene	ND	0.333	mg/kg wet							
1,4-Dichlorobenzene	ND	0.333	mg/kg wet							
2,3,4,6-Tetrachlorophenol	ND	1.67	mg/kg wet							
2,4,5-Trichlorophenol	ND	0.333	mg/kg wet							
2,4,6-Trichlorophenol	ND	0.333	mg/kg wet							
2,4-Dichlorophenol	ND	0.333	mg/kg wet							
2,4-Dimethylphenol	ND	0.333	mg/kg wet							
2,4-Dinitrophenol	ND	1.67	mg/kg wet							
2,4-Dinitrotoluene	ND	0.333	mg/kg wet							
2,6-Dinitrotoluene	ND	0.333	mg/kg wet							



CERTIFICATE OF ANALYSIS

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ESS Laboratory Work Order: 1708564

Quality Control Data

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8270D Semi-Volatile Organic Compounds

Batch CH72324 - 3546

2-Chloronaphthalene	ND	0.333	mg/kg wet
2-Chlorophenol	ND	0.333	mg/kg wet
2-Methylnaphthalene	ND	0.333	mg/kg wet
2-Methylphenol	ND	0.333	mg/kg wet
2-Nitroaniline	ND	0.333	mg/kg wet
2-Nitrophenol	ND	0.333	mg/kg wet
3,3'-Dichlorobenzidine	ND	0.667	mg/kg wet
3+4-Methylphenol	ND	0.667	mg/kg wet
3-Nitroaniline	ND	0.333	mg/kg wet
4,6-Dinitro-2-Methylphenol	ND	1.67	mg/kg wet
4-Bromophenyl-phenylether	ND	0.333	mg/kg wet
4-Chloro-3-Methylphenol	ND	0.333	mg/kg wet
4-Chloroaniline	ND	0.667	mg/kg wet
4-Chloro-phenyl-phenyl ether	ND	0.333	mg/kg wet
4-Nitroaniline	ND	0.333	mg/kg wet
4-Nitrophenol	ND	1.67	mg/kg wet
Acenaphthene	ND	0.333	mg/kg wet
Acenaphthylene	ND	0.333	mg/kg wet
Acetophenone	ND	0.667	mg/kg wet
Aniline	ND	1.67	mg/kg wet
Anthracene	ND	0.333	mg/kg wet
Azobenzene	ND	0.333	mg/kg wet
Benzidine	ND	0.667	mg/kg wet
Benzo(a)anthracene	ND	0.333	mg/kg wet
Benzo(a)pyrene	ND	0.167	mg/kg wet
Benzo(b)fluoranthene	ND	0.333	mg/kg wet
Benzo(g,h,i)perylene	ND	0.333	mg/kg wet
Benzo(k)fluoranthene	ND	0.333	mg/kg wet
Benzoic Acid	ND	1.67	mg/kg wet
Benzyl Alcohol	ND	0.333	mg/kg wet
bis(2-Chloroethoxy)methane	ND	0.333	mg/kg wet
bis(2-Chloroethyl)ether	ND	0.333	mg/kg wet
bis(2-chloroisopropyl)Ether	ND	0.333	mg/kg wet
bis(2-Ethylhexyl)phthalate	ND	0.333	mg/kg wet
Butylbenzylphthalate	ND	0.333	mg/kg wet
Carbazole	ND	0.333	mg/kg wet
Chrysene	ND	0.167	mg/kg wet
Dibenzo(a,h)Anthracene	ND	0.167	mg/kg wet
Dibenzofuran	ND	0.333	mg/kg wet
Diethylphthalate	ND	0.333	mg/kg wet
Dimethylphthalate	ND	0.333	mg/kg wet
Di-n-butylphthalate	ND	0.333	mg/kg wet
Di-n-octylphthalate	ND	0.333	mg/kg wet
Fluoranthene	ND	0.333	mg/kg wet
Fluorene	ND	0.333	mg/kg wet



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Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Semi-Volatile Organic Compounds

Batch CH72324 - 3546

Hexachlorobenzene	ND	0.333	mg/kg wet							
Hexachlorobutadiene	ND	0.333	mg/kg wet							
Hexachlorocyclopentadiene	ND	1.67	mg/kg wet							
Hexachloroethane	ND	0.333	mg/kg wet							
Indeno(1,2,3-cd)Pyrene	ND	0.333	mg/kg wet							
Isophorone	ND	0.333	mg/kg wet							
Naphthalene	ND	0.333	mg/kg wet							
Nitrobenzene	ND	0.333	mg/kg wet							
N-Nitrosodimethylamine	ND	0.333	mg/kg wet							
N-Nitroso-Di-n-Propylamine	ND	0.333	mg/kg wet							
N-nitrosodiphenylamine	ND	0.333	mg/kg wet							
Pentachlorophenol	ND	1.67	mg/kg wet							
Phenanthrene	ND	0.333	mg/kg wet							
Phenol	ND	0.333	mg/kg wet							
Pyrene	ND	0.333	mg/kg wet							
Pyridine	ND	1.67	mg/kg wet							
Surrogate: 1,2-Dichlorobenzene-d4	1.77		mg/kg wet	3.333		53	30-130			
Surrogate: 2,4,6-Tribromophenol	3.73		mg/kg wet	5.000		75	30-130			
Surrogate: 2-Chlorophenol-d4	3.62		mg/kg wet	5.000		72	30-130			
Surrogate: 2-Fluorobiphenyl	1.88		mg/kg wet	3.333		56	30-130			
Surrogate: 2-Fluorophenol	3.51		mg/kg wet	5.000		70	30-130			
Surrogate: Nitrobenzene-d5	1.83		mg/kg wet	3.333		55	30-130			
Surrogate: Phenol-d6	3.72		mg/kg wet	5.000		74	30-130			
Surrogate: p-Terphenyl-d14	2.27		mg/kg wet	3.333		68	30-130			

LCS

1,1-Biphenyl	2.19	0.333	mg/kg wet	3.333		66	40-140			
1,2,4-Trichlorobenzene	2.25	0.333	mg/kg wet	3.333		67	40-140			
1,2-Dichlorobenzene	2.15	0.333	mg/kg wet	3.333		65	40-140			
1,2-Diphenylhydrazine as Azobenzene	2.32	0.333	mg/kg wet	3.333		70	40-140			
1,3-Dichlorobenzene	2.12	0.333	mg/kg wet	3.333		64	40-140			
1,4-Dichlorobenzene	2.10	0.333	mg/kg wet	3.333		63	40-140			
2,3,4,6-Tetrachlorophenol	3.14	1.67	mg/kg wet	3.333		94	30-130			
2,4,5-Trichlorophenol	2.87	0.333	mg/kg wet	3.333		86	30-130			
2,4,6-Trichlorophenol	2.68	0.333	mg/kg wet	3.333		80	30-130			
2,4-Dichlorophenol	2.42	0.333	mg/kg wet	3.333		72	30-130			
2,4-Dimethylphenol	2.35	0.333	mg/kg wet	3.333		71	30-130			
2,4-Dinitrophenol	3.07	1.67	mg/kg wet	3.333		92	30-130			
2,4-Dinitrotoluene	2.95	0.333	mg/kg wet	3.333		89	40-140			
2,6-Dinitrotoluene	2.85	0.333	mg/kg wet	3.333		85	40-140			
2-Chloronaphthalene	2.09	0.333	mg/kg wet	3.333		63	40-140			
2-Chlorophenol	2.08	0.333	mg/kg wet	3.333		63	30-130			
2-Methylnaphthalene	2.31	0.333	mg/kg wet	3.333		69	40-140			
2-Methylphenol	2.20	0.333	mg/kg wet	3.333		66	30-130			
2-Nitroaniline	2.93	0.333	mg/kg wet	3.333		88	40-140			
2-Nitrophenol	2.44	0.333	mg/kg wet	3.333		73	30-130			



CERTIFICATE OF ANALYSIS

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8270D Semi-Volatile Organic Compounds

Batch CH72324 - 3546

3,3'-Dichlorobenzidine	2.48	0.667	mg/kg wet	3.333		74	40-140			
3+4-Methylphenol	4.72	0.667	mg/kg wet	6.667		71	30-130			
3-Nitroaniline	2.90	0.333	mg/kg wet	3.333		87	40-140			
4,6-Dinitro-2-Methylphenol	2.82	1.67	mg/kg wet	3.333		85	30-130			
4-Bromophenyl-phenylether	2.58	0.333	mg/kg wet	3.333		77	40-140			
4-Chloro-3-Methylphenol	2.88	0.333	mg/kg wet	3.333		86	30-130			
4-Chloroaniline	2.11	0.667	mg/kg wet	3.333		63	40-140			
4-Chloro-phenyl-phenyl ether	2.68	0.333	mg/kg wet	3.333		80	40-140			
4-Nitroaniline	2.64	0.333	mg/kg wet	3.333		79	40-140			
4-Nitrophenol	3.27	1.67	mg/kg wet	3.333		98	30-130			
Acenaphthene	2.33	0.333	mg/kg wet	3.333		70	40-140			
Acenaphthylene	2.57	0.333	mg/kg wet	3.333		77	40-140			
Acetophenone	2.42	0.667	mg/kg wet	3.333		72	40-140			
Aniline	1.91	1.67	mg/kg wet	3.333		57	40-140			
Anthracene	2.76	0.333	mg/kg wet	3.333		83	40-140			
Azobenzene	2.32	0.333	mg/kg wet	3.333		70	40-140			
Benzidine	1.68	0.667	mg/kg wet	3.333		50	40-140			
Benzo(a)anthracene	2.83	0.333	mg/kg wet	3.333		85	40-140			
Benzo(a)pyrene	2.81	0.167	mg/kg wet	3.333		84	40-140			
Benzo(b)fluoranthene	3.00	0.333	mg/kg wet	3.333		90	40-140			
Benzo(g,h,i)perylene	2.77	0.333	mg/kg wet	3.333		83	40-140			
Benzo(k)fluoranthene	2.66	0.333	mg/kg wet	3.333		80	40-140			
Benzoic Acid	2.82	1.67	mg/kg wet	3.333		85	40-140			
Benzyl Alcohol	2.40	0.333	mg/kg wet	3.333		72	40-140			
bis(2-Chloroethoxy)methane	2.16	0.333	mg/kg wet	3.333		65	40-140			
bis(2-Chloroethyl)ether	2.02	0.333	mg/kg wet	3.333		61	40-140			
bis(2-chloroisopropyl)Ether	1.98	0.333	mg/kg wet	3.333		59	40-140			
bis(2-Ethylhexyl)phthalate	3.39	0.333	mg/kg wet	3.333		102	40-140			
Butylbenzylphthalate	3.20	0.333	mg/kg wet	3.333		96	40-140			
Carbazole	2.91	0.333	mg/kg wet	3.333		87	40-140			
Chrysene	2.76	0.167	mg/kg wet	3.333		83	40-140			
Dibenzo(a,h)Anthracene	2.85	0.167	mg/kg wet	3.333		85	40-140			
Dibenzofuran	2.46	0.333	mg/kg wet	3.333		74	40-140			
Diethylphthalate	2.95	0.333	mg/kg wet	3.333		89	40-140			
Dimethylphthalate	2.65	0.333	mg/kg wet	3.333		80	40-140			
Di-n-butylphthalate	3.24	0.333	mg/kg wet	3.333		97	40-140			
Di-n-octylphthalate	3.16	0.333	mg/kg wet	3.333		95	40-140			
Fluoranthene	2.99	0.333	mg/kg wet	3.333		90	40-140			
Fluorene	2.74	0.333	mg/kg wet	3.333		82	40-140			
Hexachlorobenzene	2.65	0.333	mg/kg wet	3.333		80	40-140			
Hexachlorobutadiene	2.18	0.333	mg/kg wet	3.333		65	40-140			
Hexachlorocyclopentadiene	2.21	1.67	mg/kg wet	3.333		66	40-140			
Hexachloroethane	2.04	0.333	mg/kg wet	3.333		61	40-140			
Indeno(1,2,3-cd)Pyrene	2.81	0.333	mg/kg wet	3.333		84	40-140			
Isophorone	2.22	0.333	mg/kg wet	3.333		67	40-140			



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8270D Semi-Volatile Organic Compounds

Batch CH72324 - 3546

Naphthalene	2.24	0.333	mg/kg wet	3.333		67	40-140			
Nitrobenzene	2.08	0.333	mg/kg wet	3.333		63	40-140			
N-Nitrosodimethylamine	2.03	0.333	mg/kg wet	3.333		61	40-140			
N-Nitroso-Di-n-Propylamine	2.19	0.333	mg/kg wet	3.333		66	40-140			
N-nitrosodiphenylamine	2.84	0.333	mg/kg wet	3.333		85	40-140			
Pentachlorophenol	3.01	1.67	mg/kg wet	3.333		90	30-130			
Phenanthrene	2.59	0.333	mg/kg wet	3.333		78	40-140			
Phenol	2.22	0.333	mg/kg wet	3.333		67	30-130			
Pyrene	2.84	0.333	mg/kg wet	3.333		85	40-140			
Pyridine	1.88	1.67	mg/kg wet	3.333		56	40-140			
Surrogate: 1,2-Dichlorobenzene-d4	1.59		mg/kg wet	3.333		48	30-130			
Surrogate: 2,4,6-Tribromophenol	4.20		mg/kg wet	5.000		84	30-130			
Surrogate: 2-Chlorophenol-d4	3.31		mg/kg wet	5.000		66	30-130			
Surrogate: 2-Fluorobiphenyl	1.72		mg/kg wet	3.333		52	30-130			
Surrogate: 2-Fluorophenol	3.14		mg/kg wet	5.000		63	30-130			
Surrogate: Nitrobenzene-d5	1.65		mg/kg wet	3.333		50	30-130			
Surrogate: Phenol-d6	3.34		mg/kg wet	5.000		67	30-130			
Surrogate: p-Terphenyl-d14	2.22		mg/kg wet	3.333		67	30-130			

LCS Dup

1,1-Biphenyl	2.19	0.333	mg/kg wet	3.333		66	40-140	0.02	30	
1,2,4-Trichlorobenzene	2.19	0.333	mg/kg wet	3.333		66	40-140	3	30	
1,2-Dichlorobenzene	2.07	0.333	mg/kg wet	3.333		62	40-140	4	30	
1,2-Diphenylhydrazine as Azobenzene	2.35	0.333	mg/kg wet	3.333		70	40-140	1	30	
1,3-Dichlorobenzene	2.06	0.333	mg/kg wet	3.333		62	40-140	3	30	
1,4-Dichlorobenzene	2.04	0.333	mg/kg wet	3.333		61	40-140	3	30	
2,3,4,6-Tetrachlorophenol	3.29	1.67	mg/kg wet	3.333		99	30-130	5	30	
2,4,5-Trichlorophenol	2.96	0.333	mg/kg wet	3.333		89	30-130	3	30	
2,4,6-Trichlorophenol	2.71	0.333	mg/kg wet	3.333		81	30-130	1	30	
2,4-Dichlorophenol	2.31	0.333	mg/kg wet	3.333		69	30-130	5	30	
2,4-Dimethylphenol	2.24	0.333	mg/kg wet	3.333		67	30-130	5	30	
2,4-Dinitrophenol	3.26	1.67	mg/kg wet	3.333		98	30-130	6	30	
2,4-Dinitrotoluene	3.09	0.333	mg/kg wet	3.333		93	40-140	4	30	
2,6-Dinitrotoluene	3.00	0.333	mg/kg wet	3.333		90	40-140	5	30	
2-Chloronaphthalene	2.08	0.333	mg/kg wet	3.333		62	40-140	0.5	30	
2-Chlorophenol	1.96	0.333	mg/kg wet	3.333		59	30-130	6	30	
2-Methylnaphthalene	2.20	0.333	mg/kg wet	3.333		66	40-140	5	30	
2-Methylphenol	2.00	0.333	mg/kg wet	3.333		60	30-130	10	30	
2-Nitroaniline	3.05	0.333	mg/kg wet	3.333		91	40-140	4	30	
2-Nitrophenol	2.37	0.333	mg/kg wet	3.333		71	30-130	3	30	
3,3'-Dichlorobenzidine	2.62	0.667	mg/kg wet	3.333		78	40-140	6	30	
3+4-Methylphenol	4.21	0.667	mg/kg wet	6.667		63	30-130	11	30	
3-Nitroaniline	3.06	0.333	mg/kg wet	3.333		92	40-140	5	30	
4,6-Dinitro-2-Methylphenol	2.90	1.67	mg/kg wet	3.333		87	30-130	3	30	
4-Bromophenyl-phenylether	2.61	0.333	mg/kg wet	3.333		78	40-140	1	30	
4-Chloro-3-Methylphenol	2.82	0.333	mg/kg wet	3.333		84	30-130	2	30	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Semi-Volatile Organic Compounds

Batch CH72324 - 3546

4-Chloroaniline	2.05	0.667	mg/kg wet	3.333		61	40-140	3	30	
4-Chloro-phenyl-phenyl ether	2.77	0.333	mg/kg wet	3.333		83	40-140	3	30	
4-Nitroaniline	2.68	0.333	mg/kg wet	3.333		80	40-140	2	30	
4-Nitrophenol	3.40	1.67	mg/kg wet	3.333		102	30-130	4	30	
Acenaphthene	2.37	0.333	mg/kg wet	3.333		71	40-140	2	30	
Acenaphthylene	2.62	0.333	mg/kg wet	3.333		79	40-140	2	30	
Acetophenone	2.19	0.667	mg/kg wet	3.333		66	40-140	10	30	
Aniline	1.82	1.67	mg/kg wet	3.333		55	40-140	5	30	
Anthracene	2.82	0.333	mg/kg wet	3.333		84	40-140	2	30	
Azobenzene	2.35	0.333	mg/kg wet	3.333		70	40-140	1	30	
Benzidine	1.87	0.667	mg/kg wet	3.333		56	40-140	10	30	
Benzo(a)anthracene	2.84	0.333	mg/kg wet	3.333		85	40-140	0.2	30	
Benzo(a)pyrene	2.84	0.167	mg/kg wet	3.333		85	40-140	1	30	
Benzo(b)fluoranthene	2.83	0.333	mg/kg wet	3.333		85	40-140	6	30	
Benzo(g,h,i)perylene	2.77	0.333	mg/kg wet	3.333		83	40-140	0.06	30	
Benzo(k)fluoranthene	2.80	0.333	mg/kg wet	3.333		84	40-140	5	30	
Benzoic Acid	2.74	1.67	mg/kg wet	3.333		82	40-140	3	30	
Benzyl Alcohol	2.20	0.333	mg/kg wet	3.333		66	40-140	9	30	
bis(2-Chloroethoxy)methane	2.07	0.333	mg/kg wet	3.333		62	40-140	4	30	
bis(2-Chloroethyl)ether	1.93	0.333	mg/kg wet	3.333		58	40-140	4	30	
bis(2-chloroisopropyl)Ether	1.88	0.333	mg/kg wet	3.333		56	40-140	5	30	
bis(2-Ethylhexyl)phthalate	3.26	0.333	mg/kg wet	3.333		98	40-140	4	30	
Butylbenzylphthalate	3.06	0.333	mg/kg wet	3.333		92	40-140	5	30	
Carbazole	2.94	0.333	mg/kg wet	3.333		88	40-140	1	30	
Chrysene	2.75	0.167	mg/kg wet	3.333		83	40-140	0.4	30	
Dibenzo(a,h)Anthracene	2.86	0.167	mg/kg wet	3.333		86	40-140	0.5	30	
Dibenzofuran	2.54	0.333	mg/kg wet	3.333		76	40-140	3	30	
Diethylphthalate	3.08	0.333	mg/kg wet	3.333		92	40-140	4	30	
Dimethylphthalate	2.75	0.333	mg/kg wet	3.333		83	40-140	4	30	
Di-n-butylphthalate	3.23	0.333	mg/kg wet	3.333		97	40-140	0.4	30	
Di-n-octylphthalate	3.06	0.333	mg/kg wet	3.333		92	40-140	3	30	
Fluoranthene	3.08	0.333	mg/kg wet	3.333		92	40-140	3	30	
Fluorene	2.85	0.333	mg/kg wet	3.333		86	40-140	4	30	
Hexachlorobenzene	2.68	0.333	mg/kg wet	3.333		80	40-140	1	30	
Hexachlorobutadiene	2.19	0.333	mg/kg wet	3.333		66	40-140	0.5	30	
Hexachlorocyclopentadiene	2.23	1.67	mg/kg wet	3.333		67	40-140	0.7	30	
Hexachloroethane	1.99	0.333	mg/kg wet	3.333		60	40-140	3	30	
Indeno(1,2,3-cd)Pyrene	2.82	0.333	mg/kg wet	3.333		85	40-140	0.2	30	
Isophorone	2.13	0.333	mg/kg wet	3.333		64	40-140	4	30	
Naphthalene	2.17	0.333	mg/kg wet	3.333		65	40-140	3	30	
Nitrobenzene	2.03	0.333	mg/kg wet	3.333		61	40-140	3	30	
N-Nitrosodimethylamine	1.95	0.333	mg/kg wet	3.333		59	40-140	4	30	
N-Nitroso-Di-n-Propylamine	1.96	0.333	mg/kg wet	3.333		59	40-140	11	30	
N-nitrosodiphenylamine	2.87	0.333	mg/kg wet	3.333		86	40-140	0.9	30	
Pentachlorophenol	3.05	1.67	mg/kg wet	3.333		91	30-130	1	30	



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

Quality Control Data

Analyte	Result	MRL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qualifier
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8270D Semi-Volatile Organic Compounds

Batch CH72324 - 3546

Phenanthrene	2.61	0.333	mg/kg wet	3.333		78	40-140	1	30	
Phenol	2.04	0.333	mg/kg wet	3.333		61	30-130	9	30	
Pyrene	2.62	0.333	mg/kg wet	3.333		79	40-140	8	30	
Pyridine	1.86	1.67	mg/kg wet	3.333		56	40-140	1	30	
Surrogate: 1,2-Dichlorobenzene-d4	1.51		mg/kg wet	3.333		45	30-130			
Surrogate: 2,4,6-Tribromophenol	4.16		mg/kg wet	5.000		83	30-130			
Surrogate: 2-Chlorophenol-d4	3.09		mg/kg wet	5.000		62	30-130			
Surrogate: 2-Fluorobiphenyl	1.68		mg/kg wet	3.333		50	30-130			
Surrogate: 2-Fluorophenol	3.04		mg/kg wet	5.000		61	30-130			
Surrogate: Nitrobenzene-d5	1.60		mg/kg wet	3.333		48	30-130			
Surrogate: Phenol-d6	3.05		mg/kg wet	5.000		61	30-130			
Surrogate: p-Terphenyl-d14	2.02		mg/kg wet	3.333		61	30-130			

Classical Chemistry

Batch CH72422 - General Preparation

Reference

Flashpoint	81		°F	81.00		100	97.9-102.1			
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Batch CH72805 - General Preparation

Blank
LCS

Reactive Cyanide	ND	2.0	mg/kg							
Reactive Sulfide	ND	2.0	mg/kg							
Reactive Cyanide	3.9	2.0	mg/kg	100.3		4	0.68-5.41			
Reactive Sulfide	ND	2.0	mg/kg	10.00		0	0-44			



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

Notes and Definitions

LC	Lower value is used due to matrix interferences (LC).
B-	Blank Spike recovery is below lower control limit (B-).
B+	Blank Spike recovery is above upper control limit (B+).
CD-	Continuing Calibration %Diff/Drift is below control limit (CD-).
CD+	Continuing Calibration %Diff/Drift is above control limit (CD+).
D	Diluted.
D+	Relative percent difference for duplicate is outside of criteria (D+).
#	Modified result
ICV-	Initial Calibration Verification recovery is below lower control limit (ICV-).
Z-10	Soil pH measured in water at 20.2 °C.
P	Percent difference between primary and confirmation results exceeds 40% (P).
Q	Calibration required quadratic regression (Q).
SD	Surrogate recovery(ies) diluted below the MRL (SD).
SM	Surrogate recovery(ies) outside of criteria due to matrix (UCM/coelution/matrix is present) (SM).
U	Analyte included in the analysis, but not detected
XH	Peaks found in the retention time window for MCPD did not confirm by GC/MS.
Z-09	ND
EL	Elevated Method Reporting Limits due to sample matrix (EL).
ND	Analyte NOT DETECTED at or above the MRL (LOQ), LOD for DoD Reports, MDL for J-Flagged Analytes
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
MDL	Method Detection Limit
MRL	Method Reporting Limit
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
I/V	Initial Volume
F/V	Final Volume
§	Subcontracted analysis; see attached report
1	Range result excludes concentrations of surrogates and/or internal standards eluting in that range.
2	Range result excludes concentrations of target analytes eluting in that range.
3	Range result excludes the concentration of the C9-C10 aromatic range.
Avg	Results reported as a mathematical average.
NR	No Recovery
[CALC]	Calculated Analyte
SUB	Subcontracted analysis; see attached report
RL	Reporting Limit
EDL	Estimated Detection Limit



CERTIFICATE OF ANALYSIS

Client Name: GZA GeoEnvironmental, Inc.
Client Project ID: Troy Mills Landfill Superfund

ESS Laboratory Work Order: 1708564

ESS LABORATORY CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

Rhode Island Potable and Non Potable Water: LAI00179
<http://www.health.ri.gov/find/labs/analytical/ESS.pdf>

Connecticut Potable and Non Potable Water, Solid and Hazardous Waste: PH-0750
http://www.ct.gov/dph/lib/dph/environmental_health/environmental_laboratories/pdf/OutofStateCommercialLaboratories.pdf

Maine Potable and Non Potable Water, and Solid and Hazardous Waste: RI00002
<http://www.maine.gov/dhhs/meedc/environmental-health/dwp/partners/labCert.shtml>

Massachusetts Potable and Non Potable Water: M-RI002
<http://public.dep.state.ma.us/Labcert/Labcert.aspx>

New Hampshire (NELAP accredited) Potable and Non Potable Water, Solid and Hazardous Waste: 2424
<http://des.nh.gov/organization/divisions/water/dwgb/nhelap/index.htm>

New York (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: 11313
<http://www.wadsworth.org/labcert/elap/comm.html>

New Jersey (NELAP accredited) Non Potable Water, Solid and Hazardous Waste: RI006
http://datamine2.state.nj.us/DEP_OPRA/OpraMain/pi_main?mode=pi_by_site&sort_order=PI_NAMEA&Select+a+Site:=58715

United States Department of Agriculture Soil Permit: P330-12-00139

Pennsylvania: 68-01752
<http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx>

ESS Laboratory Sample and Cooler Receipt Checklist

Client: GZA - Bedford, NH - GZA/HDM
 Shipped/Delivered Via: ESS Courier

ESS Project ID: 1708564
 Date Received: 8/23/2017
 Project Due Date: 8/30/2017
 Days for Project: 5 Day

1. Air bill manifest present? ☐ No
 Air No.: NA
2. Were custody seals present? ☐ No
3. Is radiation count <100 CPM? ☐ Yes
4. Is a Cooler Present? ☐ Yes
 Temp: 2.9 Iced with: Ice
5. Was COC signed and dated by client? ☐ Yes

6. Does COC match bottles? ☐ Yes
7. Is COC complete and correct? ☐ Yes
8. Were samples received intact? ☐ Yes
9. Were labs informed about short holds & rushes? ☒ Yes ☐ No / NA
10. Were any analyses received outside of hold time? ☒ Yes ☐ No low levels 8/23/17

11. Any Subcontracting needed? Yes ☒ No ☐
 ESS Sample IDs: _____
 Analysis: _____
 TAT: _____

12. Were VOAs received? ☒ Yes ☐ No
 a. Air bubbles in aqueous VOAs? ☒ Yes ☐ No
 b. Does methanol cover soil completely? ☒ Yes ☐ No / NA

13. Are the samples properly preserved? ☒ Yes ☐ No
 a. If metals preserved upon receipt: Date: 8/23/17
 b. Low Level VOA vials frozen: Date: 8/23/17

Time: 1813 By: EL

Sample Receiving Notes:

No indication low levels frozen by client 8/23/17

14. Was there a need to contact Project Manager? ☒ Yes ☐ No 8/23/17
 a. Was there a need to contact the client? ☒ Yes ☐ No
 Who was contacted? _____ Date: _____ Time: _____ By: _____

Sample Number	Container ID	Proper Container	Air Bubbles Present	Sufficient Volume	Container Type	Preservative	Record pH (Cyanide and 608 Pesticides)
01	156703	Yes	NA	Yes	VOA Vial - Methanol	MeOH	
01	156704	Yes	NA	Yes	VOA Vial - Other	Other	
01	156705	Yes	NA	Yes	VOA Vial - Other	Other	
01	156706	Yes	NA	Yes	4 oz. Jar - Unpres	NP	
01	156707	Yes	NA	Yes	8 oz. Jar - Unpres	NP	
01	156708	Yes	NA	Yes	8 oz. Jar - Unpres	NP	

2nd Review

Are barcode labels on correct containers?

Yes / No

Completed By: [Signature]

Date & Time: 8/23/17 1745

Reviewed By: [Signature]

Date & Time: 8/23/17 1813

Delivered By: [Signature]

Date & Time: 8/23/17 1813

www.esslaboratory.com

CHAIN OF CUSTODY

ESS Lab #

1708564

Turn Time	X	Standard	Other
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Regulatory State: MA RI CT NH NJ NY ME Other

Reporting Limits - NH ~~SPS~~

Is this project for any of the following: (please circle)

MA-MCP Navy USACE CT DEP Other *NH DES/EPA*

Electronic Deliverables Excel Access PDF

Co. Name	Project #	Project Name
G2A Geo Environmental, Inc.	04.0190325.16	Troy Mills Landfill Superfund

Contact Person	Tanya Justham	Address	5 Commerce Park North
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City Bedford	State NH	Zip 03410	PO #
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Tel. 603-232-8765	Fax.	email: tanya.isham@qza.com
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ESS Lab ID	Date	Collection Time	Grab-G Composite-C	Matrix	Sample ID	Pres Code	# of Containers	Type of Container
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1	8/21/17	1220	G+C	D	TRY TP-1 DRUM	1.6	6	G,V
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[illegible][illegible][illegible][illegible][illegible]

[illegible][illegible][illegible]

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Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA	Matrix: S-Soil SD-Solid D-Sludge WW-Wastewater GW-Groundwater SW-S
---------------------------------------------------------------	--------------------------------------------------------------------

Cooler Present ☒ Yes ☐ No Internal Use Only Preservation Code: 1-NP, 2-HCl, 3-H2SO4, 4-HNO3, 5-Seals Intact ____ Yes ____ No NA: NA [] Pickup Sampled by: C. Melby

Cooler Temperature: 2.8°F Technician Comments: Call PM w/ question

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)
<i>[Signature]</i> 5-13-67	<i>[Signature]</i> 5-13-67	<i>[Signature]</i> 5-13-67

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)
-------------------------------------------	---------------------------------------	-------------------------------------------

Planned for the latest small changes to *Clavis* 4.0, to be

Vol of Container	Analysis
VOCs 8260B	
SVOCs 8270C	
Pesticides 8081	
Herbicides 8151	
RCRA 8	
PCBs 8082	
Corrosivity/pH	
Reactivity	
Flashpoint/Eqn. 6.1	

Container Type: P-Poly G-Glass AG-Amber Glass S-Sterile V-VOA Matrix: S-Soil SD-Solid D-Sludge WWW-Wastewater GW-Groundwater SW-Surface Water DW-Drinking Water O-Oil W-Wides F-Filter

Cooler Present	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Internal Use Only	Preservation Code: 1-NP, 2-HCl, 3-H ₂ SO ₄ , 4-HNO ₃ , 5-NaOH, 6-MeOH, 7-Ascorbic Acid, 8-ZnAct, 9-
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Seals Intact	Yes	No	NA	[] Pickup	Sampled by: <i>C. N. L.</i>
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Cooler Temperature: <u>99°F</u>	Comments: <u>Call PM w/ questions; waste characterization of</u>
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Reinquished by: (Signature, Date & Time) _____ Received by: (Signature, Date & Time) _____

8/23/17 11:15	8/23/17 11:15	8/23/17 16:00	8/23/17
---------------	---------------	---------------	---------

Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)	Relinquished by: (Signature, Date & Time)	Received by: (Signature, Date & Time)
-------------------------------------------	---------------------------------------	-------------------------------------------	---------------------------------------

By circling MA-MCP, client acknowledges samples were Please fax to the laboratory all changes to Chain of Custody 1 (White) Lab Copy

collected in accordance with MADEP CAM VIIA



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Page 1 of 8

Laboratory Report

August 31, 2017

Richard Hull - Mail Code OSRR07-1
US EPA New England R1

Project Number: 17080042
Project: Troy Mills Landfill - Troy, NH
Analysis:BNAs in Soil Low Level
EPA Chemist: Dan Boudreau

Date Samples Received by the Laboratory: 08/23/2017

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-BNAS3.

Samples were prepared using pressurized fluid extraction. The samples were analyzed using high resolution capillary column chromatography and quadrupole mass spectrometry (GC/MS). The SOP for this analysis is based on US EPA SW-846 methods 3545A, 3640A, and 8270C and EIASOP-BNAGCMS9.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

17080042\$BNALS

Qualifiers:

RL = Reporting limit

ND = Not Detected above Reporting limit

NA = Not Applicable due to high sample dilutions or sample interferences

NC = Not calculated since analyte concentration is ND.

J = Estimated value

J1 = Estimated value due to MS recovery outside acceptance criteria

J2 = Estimated value due to LFB result outside acceptance criteria

J3 = Estimated value due to RPD result outside acceptance criteria

J4 = Estimated value due to LCS result outside acceptance criteria

E = Estimated value exceeds the calibration range

L = Estimated value is below the calibration range

B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.

R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.

C = The identification has been confirmed by GC/MS.

A = Suspected Aldol condensation product.

N = Tentatively identified compound.

Troy Mills Landfill - Troy, NH

BNAs in Soil Low Level

Client Sample ID: TRY_TP-3-6
Date of Collection: 8/22/2017
Date of Preparation: 8/24/2017
Date of Analysis: 8/24/2017
Dry Weight Prepared: 28.0 grams
Wet Weight Prepared: 30.3 grams
Volume Extracted: N/A
Final Volume: 1 mL

Lab Sample ID: AB69288
Matrix: Soil
Amount Prepared: N/A
Percent Solids: 92%
Extract Dilution: 100
pH: N/A
GPC Factor: N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
131-11-3	Dimethyl phthalate	ND	8930	
84-66-2	Diethylphthalate	ND	8930	
84-74-2	Di-n-butylphthalate	ND	8930	
85-68-7	Butylbenzylphthalate	ND	8930	
117-81-7	Bis(2-ethylhexyl)phthalate	210000	8930	
117-84-0	Di-n-octyl phthalate	11000	8930	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorophenol (SS1)	62	34 - 110
Phenol-d6 (SS2)	61	37 - 111
Nitrobenzene-d5 (SS3)	64	37 - 103
2-Fluorobiphenyl (SS4)	68	41 - 104
2,4,6-Tribromophenol (SS5)	34	36 - 122
p-Terphenyl-d14 (SS6)	66	44 - 115

Troy Mills Landfill - Troy, NH

Laboratory Blank

Client Sample ID: N/A
Date of Collection: N/A
Date of Preparation: 8/24/2017
Date of Analysis: 8/24/2017
Dry Weight Prepared: 30.4 grams
Wet Weight Prepared: 30.4 grams
Volume Extracted: N/A
Final Volume: 1 mL

Lab Sample ID: N/A
Matrix: Soil
Amount Prepared: N/A
Percent Solids: 100%
Extract Dilution: 1
pH: N/A
GPC Factor: N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
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Troy Mills Landfill - Troy, NH

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/24/2017	Amount Prepared:	N/A
Date of Analysis:	8/24/2017	Percent Solids:	100%
Dry Weight Prepared:	30.4 grams	Extract Dilution:	1
Wet Weight Prepared:	30.4 grams	pH:	N/A
Volume Extracted:	N/A	GPC Factor:	N/A
Final Volume:	1 mL		

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
131-11-3	Dimethyl phthalate	ND	82	
84-66-2	Diethylphthalate	ND	82	
84-74-2	Di-n-butylphthalate	ND	82	
85-68-7	Butylbenzylphthalate	ND	82	
117-81-7	Bis(2-ethylhexyl)phthalate	ND	82	
117-84-0	Di-n-octyl phthalate	ND	82	

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorophenol (SS1)	84	35 - 108
Phenol-d6 (SS2)	85	41 - 111
Nitrobenzene-d5 (SS3)	81	45 - 99
2-Fluorobiphenyl (SS4)	84	45 - 103
2,4,6-Tribromophenol (SS5)	82	27 - 123
p-Terphenyl-d14 (SS6)	99	49 - 111

131-11-3	Dimethyl phthalate	ND	9650	
84-66-2	Diethylphthalate	ND	9650	
100-01-6	4-Nitroaniline	ND	9650	
84-74-2	Di-n-butylphthalate	ND	9650	
85-68-7	Butylbenzylphthalate	ND	9650	
117-81-7	Bis(2-ethylhexyl)phthalate	180000	9650	
117-84-0	Di-n-octyl phthalate	9300	9650	L

Surrogate Compounds	Recoveries (%)	QC Ranges
2-Fluorophenol (SS1)	65	34 - 110
Phenol-d6 (SS2)	66	37 - 111
Nitrobenzene-d5 (SS3)	93	37 - 103
2-Fluorobiphenyl (SS4)	56	41 - 104
2,4,6-Tribromophenol (SS5)	53	36 - 122
p-Terphenyl-d14 (SS6)	60	44 - 115

Troy Mills Landfill - Troy, NH

Laboratory Duplicate Results

Sample ID: AB69289

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
Bis(2-ethylhexyl)phthalate	180000	230000	24.4	50
Butylbenzylphthalate	ND	ND	NC	50
Di-n-butylphthalate	ND	ND	NC	50
Di-n-octyl phthalate	9300	12000	25.4	50
Diethylphthalate	ND	ND	NC	50
Dimethyl phthalate	ND	ND	NC	50

Troy Mills Landfill - Troy, NH

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
Bis(2-ethylhexyl)phthalate	1312	1389	106	40 - 160
Butylbenzylphthalate	1312	1259	96	40 - 160
Di-n-butylphthalate	1312	1303	99	40 - 160
Di-n-octyl phthalate	1312	1347	103	40 - 160
Diethylphthalate	1312	1220	93	40 - 160
Dimethyl phthalate	1312	1171	89	40 - 160

Comments:

Samples in Batch: AB69288, AB69289

EPA LABORATORY SERVICES LOGIN AND CUSTODY SHEET

(Laboratory Policy: Samples not meeting method requirements will be analyzed at the discretion of the EPA Laboratory.) Page 8 of 8

Samples must be delivered in a cooler with loose ice.

LAB ACCOUNT (Billing) #04-0000307

One Stop (PROJECT) ID# SUPERFND

DES Site Number 198405082

Temp. °C. _____

Description: Troy Mills Landfill Superfund Site

Town: Troy NH

NHDES Contact: Michael Summerlin (603) 271- 3649, Sharon Perkins (603) 271- 6805
(Sharon's cell 419-9209)

Comments:

PN: 17080042

GZA Contact: Tanya Justham (603) 493-1548

Collected By & Phone#: Tanya Justham (603) 493-1548; Matt Bergen (603) 213-1138;
Megan Murphy, (603) 325-7296; Chris Melby (603) 493-3863; Matt Steel (978) 992-2157;
Matt Deane (603) 765-9720; Dawna Tousignant (603) 321-0898

Sample Location /ID	Date/Time Sampled	# of Containers	Matrix	8260B	Phthalates Method 8270C					Comments	Lab ID # (For Lab Use Only)
TRIP BLANK	8/22/17 0800	3	S	X							
TRY_TP-3-6	8/22/17 1245 CBW 1045	3	S	X	X						
TRY_TP-3-6 DUP	8/22/17 1245 CBW 1045	3	S	X	X						

Preservation: Soil VOCs: Methanol/4°C +/-2°C; Non-Preserved/ 4°C +/-2°C

Relinquished By [Signature] Date and Time 8/23/17 1100 Received By To Lab via Courier ☒ Temperature Blank Included in Cooler 20C
Matrix: S= Soil; SED = Sediments; AQ= Aqueous; O = Other

Relinquished By _____ Date and Time _____ Received By _____

Relinquished By [Signature] Date and Time 8/23/17 14:30 Received By [Signature] ESAT 14:30

Page 1 of 1

Data Reviewed By _____ Date _____

Section No.: 22.0
Revision No.: 5 (HWRB)
Date: 1-8-15



United States Environmental Protection Agency
Office of Environmental Measurement & Evaluation
11 Technology Drive
North Chelmsford, MA 01863-2431

Page 1 of 21

Laboratory Report

September 13, 2017

Richard Hull - Mail Code OSRR07-1
US EPA New England R1

Project Number: 17080042
Project: Troy Mills Landfill - Troy, NH
Analysis: VOAs in Soil High Level Method
EPA Chemist: Joseph Montanaro

Date Samples Received by the Laboratory: 08/23/2017

Analytical Procedure:

All samples were received and logged in by the laboratory according to the USEPA New England Laboratory SOP for Sample Log-in.

Sample preparation and analysis was done following the EPA Region I SOP, EIASOP-VOAGCMS9.

Samples were analyzed by GC/MS. Samples were introduced to the GC via a Tekmar preconcentrator and an Archon auto-sampler. The analysis SOP is based on US EPA Method 8260B, revision 2.0, 1996 and Method 5035A, draft revision 1, 2002, from SW-846.

Data were reviewed in accordance with the internal verification procedures described in the EPA New England Quality Manual for NERL.

Results relate only to the items tested or to the samples as received by the Laboratory. This analytical report shall not be reproduced except in full, without written approval of the laboratory.

If you have any questions please call me at 617-918-8340 .

Sincerely,

17080042\$VOAHS

Qualifiers:

RL = Reporting limit

ND = Not Detected above Reporting limit

NA = Not Applicable due to high sample dilutions or sample interferences

NC = Not calculated since analyte concentration is ND.

J = Estimated value

J1 = Estimated value due to MS recovery outside acceptance criteria

J2 = Estimated value due to LFB result outside acceptance criteria

J3 = Estimated value due to RPD result outside acceptance criteria

J4 = Estimated value due to LCS result outside acceptance criteria

E = Estimated value exceeds the calibration range

L = Estimated value is below the calibration range

B = Analyte is associated with the lab blank or trip blank contamination. Values are qualified when the observed concentration of the contamination in the sample extract is less than 10 times the concentration in the blank.

R = No recovery was calculated since the analyte concentration is greater than four times the spike level.

P = The confirmation value exceeded 35% difference and is less than 100%. The lower value is reported.

C = The identification has been confirmed by GC/MS.

A = Suspected Aldol condensation product.

N = Tentatively identified compound.

Troy Mills Landfill - Troy, NH
VOAs in Soil High Level Method

Client Sample ID: TRIP BLANK
Date of Collection: 8/22/2017
Date of Preparation: 8/24/2017
Date of Analysis: 8/24/2017
Dry Weight Prepared: N/A
Wet Weight Prepared: N/A
Volume Extracted: 5 mL
Final Volume: N/A

Lab Sample ID: AB69287
Matrix: BLANK
Amount Prepared: 5 mL
Percent Solids: N/A
Extract Dilution: 50
pH: N/A
GPC Factor: N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	50	
75-01-4	Vinyl Chloride	ND	50	
74-83-9	Bromomethane	ND	50	
75-00-3	Chloroethane	ND	50	
75-69-4	Trichlorofluoromethane	ND	50	
60-29-7	Ethyl Ether	ND	50	
67-64-1	2-Propanone (acetone)	ND	50	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	50	
75-35-4	1,1-Dichloroethylene	ND	50	
75-15-0	Carbon Disulfide	ND	50	
75-71-8	Dichlorodifluoromethane	ND	50	
75-09-2	Methylene Chloride	ND	50	
107-13-1	Acrylonitrile	ND	50	
1634-04-4	Methyl-t-Butyl Ether	ND	50	
156-60-5	Trans-1,2-Dichloroethylene	ND	50	
75-34-3	1,1-dichloroethane	ND	50	
108-05-4	Vinyl Acetate	ND	50	
78-93-3	2-Butanone (MEK)	ND	50	
594-20-7	2,2-Dichloropropane	ND	50	
156-59-2	cis-1,2-Dichloroethylene	ND	50	
67-66-3	Chloroform	ND	50	
74-97-5	Bromochloromethane	ND	50	
109-99-9	Tetrahydrofuran	ND	50	
71-55-6	1,1,1-Trichloroethane	ND	50	
107-06-2	1,2-Dichloroethane	ND	50	
56-23-5	Carbon tetrachloride	ND	50	
71-43-2	Benzene	ND	50	
10061-01-5	c-1,3-dichloropropene	ND	50	
108-88-3	Toluene	ND	50	
10061-02-6	t-1,3-Dichloropropene	ND	50	
79-00-5	1,1,2-Trichloroethane	ND	50	
124-48-1	Dibromochloromethane	ND	50	
108-90-7	Chlorobenzene	ND	50	
563-58-6	1,1-Dichloropropene	ND	50	
79-01-6	Trichloroethylene	ND	50	
78-87-5	1,2-Dichloropropane	ND	50	
75-27-4	Bromodichloromethane	ND	50	
74-95-3	Dibromomethane	ND	50	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	50	
142-28-9	1,3-Dichloropropane	ND	50	
127-18-4	Tetrachloroethylene	ND	50	
106-93-4	1,2-Dibromoethane	ND	50	

Troy Mills Landfill - Troy, NH
VOAs in Soil High Level Method

Client Sample ID: TRIP BLANK
Date of Collection: 8/22/2017
Date of Preparation: 8/24/2017
Date of Analysis: 8/24/2017
Dry Weight Prepared: N/A
Wet Weight Prepared: N/A
Volume Extracted: 5 mL
Final Volume: N/A

Lab Sample ID: AB69287
Matrix: BLANK
Amount Prepared: 5 mL
Percent Solids: N/A
Extract Dilution: 50
pH: N/A
GPC Factor: N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
591-78-6	2-Hexanone	ND	50	
630-20-6	1,1,1,2-Tetrachloroethane	ND	50	
100-41-4	Ethylbenzene	ND	50	
108-38-3/106-42-3	M/P Xylene	ND	100	
95-47-6	Ortho Xylene	ND	50	
100-42-5	Styrene	ND	50	
75-25-2	Bromoform	ND	50	
79-34-5	1,1,2,2-Tetrachloroethane	ND	50	
98-82-8	Isopropylbenzene	ND	50	
108-86-1	Bromobenzene	ND	50	
96-18-4	1,2,3-Trichloropropane	ND	50	
103-65-1	N-Propylbenzene	ND	50	
95-49-8	2-Chlorotoluene	ND	50	
106-43-4	4-Chlorotoluene	ND	50	
98-06-6	Tert-Butylbenzene	ND	50	
108-67-8	1,3,5-Trimethylbenzene	ND	50	
95-63-6	1,2,4-Trimethylbenzene	ND	50	
135-98-8	Sec-Butylbenzene	ND	50	
541-73-1	1,3-Dichlorobenzene	ND	50	
99-87-6	Para-Isopropyltoluene	ND	50	
106-46-7	1,4-Dichlorobenzene	ND	50	
95-50-1	1,2-Dichlorobenzene	ND	50	
104-51-8	N-Butylbenzene	ND	50	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	50	
120-82-1	1,2,4-Trichlorobenzene	ND	50	
87-68-3	Hexachlorobutadiene	ND	50	
91-20-3	Naphthalene	ND	50	
87-61-6	1,2,3-Trichlorobenzene	ND	50	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	104	74 - 136
Toluene-D8	97	85 - 118
1,4-Bromofluorobenzene	91	78 - 111

Comments: Methanol blank sample is reported in ug/L.

Troy Mills Landfill - Troy, NH
VOAs in Soil High Level Method

Client Sample ID: TRY_TP-3-6
Date of Collection: 8/22/2017
Date of Preparation: 8/24/2017
Date of Analysis: 8/24/2017
Dry Weight Prepared: 18.17 grams
Wet Weight Prepared: 19.75 grams
Volume Extracted: 5 mL
Final Volume: N/A

Lab Sample ID: AB69288
Matrix: Soil
Amount Prepared: 5 mL
Percent Solids: 92%
Extract Dilution: 500
pH: N/A
GPC Factor: N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	460	
75-01-4	Vinyl Chloride	ND	460	
74-83-9	Bromomethane	ND	460	
75-00-3	Chloroethane	ND	460	
75-69-4	Trichlorofluoromethane	ND	460	
60-29-7	Ethyl Ether	ND	460	
67-64-1	2-Propanone (acetone)	ND	460	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	460	
75-35-4	1,1-Dichloroethylene	ND	460	
75-15-0	Carbon Disulfide	ND	460	
75-71-8	Dichlorodifluoromethane	ND	460	
75-09-2	Methylene Chloride	ND	460	
107-13-1	Acrylonitrile	ND	460	
1634-04-4	Methyl-t-Butyl Ether	ND	460	
156-60-5	Trans-1,2-Dichloroethylene	ND	460	
75-34-3	1,1-dichloroethane	ND	460	
108-05-4	Vinyl Acetate	ND	460	
78-93-3	2-Butanone (MEK)	ND	460	
594-20-7	2,2-Dichloropropane	ND	460	
156-59-2	cis-1,2-Dichloroethylene	ND	460	
67-66-3	Chloroform	ND	460	
74-97-5	Bromochloromethane	ND	460	
109-99-9	Tetrahydrofuran	ND	460	
71-55-6	1,1,1-Trichloroethane	ND	460	
107-06-2	1,2-Dichloroethane	ND	460	
56-23-5	Carbon tetrachloride	ND	460	
71-43-2	Benzene	ND	460	
10061-01-5	c-1,3-dichloropropene	ND	460	
108-88-3	Toluene	ND	460	
10061-02-6	t-1,3-Dichloropropene	ND	460	
79-00-5	1,1,2-Trichloroethane	ND	460	
124-48-1	Dibromochloromethane	ND	460	
108-90-7	Chlorobenzene	ND	460	
563-58-6	1,1-Dichloropropene	ND	460	
79-01-6	Trichloroethylene	ND	460	
78-87-5	1,2-Dichloropropane	ND	460	
75-27-4	Bromodichloromethane	ND	460	
74-95-3	Dibromomethane	ND	460	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	460	
142-28-9	1,3-Dichloropropane	ND	460	
127-18-4	Tetrachloroethylene	ND	460	
106-93-4	1,2-Dibromoethane	ND	460	

Troy Mills Landfill - Troy, NH
VOAs in Soil High Level Method

Client Sample ID: TRY_TP-3-6
Date of Collection: 8/22/2017
Date of Preparation: 8/24/2017
Date of Analysis: 8/24/2017
Dry Weight Prepared: 18.17 grams
Wet Weight Prepared: 19.75 grams
Volume Extracted: 5 mL
Final Volume: N/A

Lab Sample ID: AB69288
Matrix: Soil
Amount Prepared: 5 mL
Percent Solids: 92%
Extract Dilution: 500
pH: N/A
GPC Factor: N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
591-78-6	2-Hexanone	ND	460	
630-20-6	1,1,1,2-Tetrachloroethane	ND	460	
100-41-4	Ethylbenzene	ND	460	
108-38-3/106-42-3	M/P Xylene	ND	910	
95-47-6	Ortho Xylene	ND	460	
100-42-5	Styrene	ND	460	
75-25-2	Bromoform	ND	460	
79-34-5	1,1,2,2-Tetrachloroethane	ND	460	
98-82-8	Isopropylbenzene	ND	460	
108-86-1	Bromobenzene	ND	460	
96-18-4	1,2,3-Trichloropropane	ND	460	
103-65-1	N-Propylbenzene	ND	460	
95-49-8	2-Chlorotoluene	ND	460	
106-43-4	4-Chlorotoluene	ND	460	
98-06-6	Tert-Butylbenzene	ND	460	
108-67-8	1,3,5-Trimethylbenzene	1300	460	
95-63-6	1,2,4-Trimethylbenzene	1600	460	
135-98-8	Sec-Butylbenzene	ND	460	
541-73-1	1,3-Dichlorobenzene	ND	460	
99-87-6	Para-Isopropyltoluene	1200	460	
106-46-7	1,4-Dichlorobenzene	ND	460	
95-50-1	1,2-Dichlorobenzene	ND	460	
104-51-8	N-Butylbenzene	ND	460	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	460	
120-82-1	1,2,4-Trichlorobenzene	ND	460	
87-68-3	Hexachlorobutadiene	ND	460	
91-20-3	Naphthalene	ND	460	
87-61-6	1,2,3-Trichlorobenzene	ND	460	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	106	74 - 136
Toluene-D8	98	85 - 118
1,4-Bromofluorobenzene	99	78 - 111

Comments: Hydrocarbons associated with oil observed.

Troy Mills Landfill - Troy, NH

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/24/2017	Amount Prepared:	5 mL
Date of Analysis:	8/24/2017	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6
Volume Extracted:	5 mL	GPC Factor:	N/A
Final Volume:	N/A		

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
74-87-3	Chloromethane	ND	1.0	
75-01-4	Vinyl Chloride	ND	1.0	
74-83-9	Bromomethane	ND	1.0	
75-00-3	Chloroethane	ND	1.0	
75-69-4	Trichlorofluoromethane	ND	1.0	
60-29-7	Ethyl Ether	ND	1.0	
67-64-1	2-Propanone (acetone)	ND	1.0	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	1.0	
75-35-4	1,1-Dichloroethylene	ND	1.0	
75-15-0	Carbon Disulfide	ND	1.0	
75-71-8	Dichlorodifluoromethane	ND	1.0	
75-09-2	Methylene Chloride	ND	1.0	
107-13-1	Acrylonitrile	ND	1.0	
1634-04-4	Methyl-t-Butyl Ether	ND	1.0	
156-60-5	Trans-1,2-Dichloroethylene	ND	1.0	
75-34-3	1,1-dichloroethane	ND	1.0	
108-05-4	Vinyl Acetate	ND	1.0	
78-93-3	2-Butanone (MEK)	ND	1.0	
594-20-7	2,2-Dichloropropane	ND	1.0	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	
67-66-3	Chloroform	ND	1.0	
74-97-5	Bromochloromethane	ND	1.0	
109-99-9	Tetrahydrofuran	ND	1.0	
71-55-6	1,1,1-Trichloroethane	ND	1.0	
107-06-2	1,2-Dichloroethane	ND	1.0	
56-23-5	Carbon tetrachloride	ND	1.0	
71-43-2	Benzene	ND	1.0	
10061-01-5	c-1,3-dichloropropene	ND	1.0	
108-88-3	Toluene	ND	1.0	
10061-02-6	t-1,3-Dichloropropene	ND	1.0	
79-00-5	1,1,2-Trichloroethane	ND	1.0	
124-48-1	Dibromochloromethane	ND	1.0	
108-90-7	Chlorobenzene	ND	1.0	
563-58-6	1,1-Dichloropropene	ND	1.0	
79-01-6	Trichloroethylene	ND	1.0	
78-87-5	1,2-Dichloropropane	ND	1.0	
75-27-4	Bromodichloromethane	ND	1.0	
74-95-3	Dibromomethane	ND	1.0	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	1.0	
142-28-9	1,3-Dichloropropane	ND	1.0	
127-18-4	Tetrachloroethylene	ND	1.0	
106-93-4	1,2-Dibromoethane	ND	1.0	

Troy Mills Landfill - Troy, NH

Laboratory Blank

Client Sample ID:	N/A	Lab Sample ID:	N/A
Date of Collection:	N/A	Matrix:	Soil
Date of Preparation:	8/24/2017	Amount Prepared:	5 mL
Date of Analysis:	8/24/2017	Percent Solids:	N/A
Dry Weight Prepared:	N/A	Extract Dilution:	1
Wet Weight Prepared:	N/A	pH:	~6
Volume Extracted:	5 mL	GPC Factor:	N/A
Final Volume:	N/A		

CAS Number	Compound	Concentration ug/L	RL ug/L	Qualifier
591-78-6	2-Hexanone	ND	1.0	
630-20-6	1,1,1,2-Tetrachloroethane	ND	1.0	
100-41-4	Ethylbenzene	ND	1.0	
108-38-3/106-42-3	M/P Xylene	ND	2.0	
95-47-6	Ortho Xylene	ND	1.0	
100-42-5	Styrene	ND	1.0	
75-25-2	Bromoform	ND	1.0	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	
98-82-8	Isopropylbenzene	ND	1.0	
108-86-1	Bromobenzene	ND	1.0	
96-18-4	1,2,3-Trichloropropane	ND	1.0	
103-65-1	N-Propylbenzene	ND	1.0	
95-49-8	2-Chlorotoluene	ND	1.0	
106-43-4	4-Chlorotoluene	ND	1.0	
98-06-6	Tert-Butylbenzene	ND	1.0	
108-67-8	1,3,5-Trimethylbenzene	ND	1.0	
95-63-6	1,2,4-Trimethylbenzene	ND	1.0	
135-98-8	Sec-Butylbenzene	ND	1.0	
541-73-1	1,3-Dichlorobenzene	ND	1.0	
99-87-6	Para-Isopropyltoluene	ND	1.0	
106-46-7	1,4-Dichlorobenzene	ND	1.0	
95-50-1	1,2-Dichlorobenzene	ND	1.0	
104-51-8	N-Butylbenzene	ND	1.0	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	1.0	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	
87-68-3	Hexachlorobutadiene	ND	1.0	
91-20-3	Naphthalene	ND	1.0	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	104	74 - 136
Toluene-D8	96	85 - 118
1,4-Bromofluorobenzene	92	78 - 111

Comments: Laboratory blank is reported in ug/L.

Laboratory blank is associated with all samples in this project.

Troy Mills Landfill - Troy, NH
VOAs in Soil High Level Method

Client Sample ID: TRY_TP-3-6 DUP
Date of Collection: 8/22/2017
Date of Preparation: 8/24/2017
Date of Analysis: 8/24/2017
Dry Weight Prepared: 16.44 grams
Wet Weight Prepared: 19.34 grams
Volume Extracted: 5 mL
Final Volume: N/A

Lab Sample ID: AB69289
Matrix: Soil
Amount Prepared: 5 mL
Percent Solids: 85%
Extract Dilution: 500
pH: N/A
GPC Factor: N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
74-87-3	Chloromethane	ND	540	
75-01-4	Vinyl Chloride	ND	540	
74-83-9	Bromomethane	ND	540	
75-00-3	Chloroethane	ND	540	
75-69-4	Trichlorofluoromethane	ND	540	
60-29-7	Ethyl Ether	ND	540	
67-64-1	2-Propanone (acetone)	ND	540	
76-13-1	1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	540	
75-35-4	1,1-Dichloroethylene	ND	540	
75-15-0	Carbon Disulfide	ND	540	
75-71-8	Dichlorodifluoromethane	ND	540	
75-09-2	Methylene Chloride	ND	540	
107-13-1	Acrylonitrile	ND	540	
1634-04-4	Methyl-t-Butyl Ether	ND	540	
156-60-5	Trans-1,2-Dichloroethylene	ND	540	
75-34-3	1,1-dichloroethane	ND	540	
108-05-4	Vinyl Acetate	ND	540	
78-93-3	2-Butanone (MEK)	ND	540	
594-20-7	2,2-Dichloropropane	ND	540	
156-59-2	cis-1,2-Dichloroethylene	ND	540	
67-66-3	Chloroform	ND	540	
74-97-5	Bromochloromethane	ND	540	
109-99-9	Tetrahydrofuran	ND	540	
71-55-6	1,1,1-Trichloroethane	ND	540	
107-06-2	1,2-Dichloroethane	ND	540	
56-23-5	Carbon tetrachloride	ND	540	
71-43-2	Benzene	ND	540	
10061-01-5	c-1,3-dichloropropene	ND	540	
108-88-3	Toluene	ND	540	
10061-02-6	t-1,3-Dichloropropene	ND	540	
79-00-5	1,1,2-Trichloroethane	ND	540	
124-48-1	Dibromochloromethane	ND	540	
108-90-7	Chlorobenzene	ND	540	
563-58-6	1,1-Dichloropropene	ND	540	
79-01-6	Trichloroethylene	ND	540	
78-87-5	1,2-Dichloropropane	ND	540	
75-27-4	Bromodichloromethane	ND	540	
74-95-3	Dibromomethane	ND	540	
108-10-1	4-Methyl-2-Pentanone(MIBK)	ND	540	
142-28-9	1,3-Dichloropropane	ND	540	
127-18-4	Tetrachloroethylene	ND	540	
106-93-4	1,2-Dibromoethane	ND	540	

Troy Mills Landfill - Troy, NH
VOAs in Soil High Level Method

Client Sample ID: TRY_TP-3-6 DUP
Date of Collection: 8/22/2017
Date of Preparation: 8/24/2017
Date of Analysis: 8/24/2017
Dry Weight Prepared: 16.44 grams
Wet Weight Prepared: 19.34 grams
Volume Extracted: 5 mL
Final Volume: N/A

Lab Sample ID: AB69289
Matrix: Soil
Amount Prepared: 5 mL
Percent Solids: 85%
Extract Dilution: 500
pH: N/A
GPC Factor: N/A

CAS Number	Compound	Concentration ug/Kg	RL ug/Kg	Qualifier
591-78-6	2-Hexanone	ND	540	
630-20-6	1,1,1,2-Tetrachloroethane	ND	540	
100-41-4	Ethylbenzene	ND	540	
108-38-3/106-42-3	M/P Xylene	ND	1100	
95-47-6	Ortho Xylene	ND	540	
100-42-5	Styrene	ND	540	
75-25-2	Bromoform	ND	540	
79-34-5	1,1,2,2-Tetrachloroethane	ND	540	
98-82-8	Isopropylbenzene	ND	540	
108-86-1	Bromobenzene	ND	540	
96-18-4	1,2,3-Trichloropropane	ND	540	
103-65-1	N-Propylbenzene	ND	540	
95-49-8	2-Chlorotoluene	ND	540	
106-43-4	4-Chlorotoluene	ND	540	
98-06-6	Tert-Butylbenzene	ND	540	
108-67-8	1,3,5-Trimethylbenzene	1500	540	
95-63-6	1,2,4-Trimethylbenzene	1800	540	
135-98-8	Sec-Butylbenzene	ND	540	
541-73-1	1,3-Dichlorobenzene	ND	540	
99-87-6	Para-Isopropyltoluene	1300	540	
106-46-7	1,4-Dichlorobenzene	ND	540	
95-50-1	1,2-Dichlorobenzene	ND	540	
104-51-8	N-Butylbenzene	ND	540	
96-12-8	1,2-Dibromo-3-Chloropropane	ND	540	
120-82-1	1,2,4-Trichlorobenzene	ND	540	
87-68-3	Hexachlorobutadiene	ND	540	
91-20-3	Naphthalene	ND	540	
87-61-6	1,2,3-Trichlorobenzene	ND	540	

Surrogate Compounds	Recoveries (%)	QC Ranges
1,2-Dichloroethane-D4	104	74 - 136
Toluene-D8	98	85 - 118
1,4-Bromofluorobenzene	104	78 - 111

Comments: Hydrocarbons associated with oil observed.

Troy Mills Landfill - Troy, NH

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB69288

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
1,1,1,2-Tetrachloroethane	9124	ND	9400	100	74 - 124
1,1,1-Trichloroethane	9124	ND	9100	100	76 - 132
1,1,2,2-Tetrachloroethane	9124	ND	9100	100	69 - 125
1,1,2-Trichloro-1,2,2-Trifluoroetha	9124	ND	9500	100	68 - 144
1,1,2-Trichloroethane	9124	ND	9100	100	75 - 126
1,1-Dichloroethylene	9124	ND	9100	100	65 - 140
1,1-Dichloropropene	9124	ND	9700	110	81 - 125
1,1-dichloroethane	9124	ND	9000	99	77 - 130
1,2,3-Trichlorobenzene	9124	ND	9900	110	64 - 125
1,2,3-Trichloropropane	9124	ND	9100	100	68 - 122
1,2,4-Trichlorobenzene	9124	ND	11000	120	72 - 120
1,2,4-Trimethylbenzene	9124	1600	11000	100	81 - 125
1,2-Dibromo-3-Chloropropane	9124	ND	8400	92	54 - 125
1,2-Dibromoethane	9124	ND	9300	100	73 - 124
1,2-Dichlorobenzene	9124	ND	9300	100	81 - 116
1,2-Dichloroethane	9124	ND	9500	100	74 - 130
1,2-Dichloropropane	9124	ND	9400	100	78 - 120
1,3,5-Trimethylbenzene	9124	1300	11000	110	81 - 125
1,3-Dichlorobenzene	9124	ND	9300	100	82 - 117
1,3-Dichloropropane	9124	ND	9200	100	76 - 123
1,4-Dichlorobenzene	9124	ND	9000	99	80 - 116
2,2-Dichloropropane	9124	ND	9800	110	57 - 147
2-Butanone (MEK)	9124	ND	9000	99	41 - 151
2-Chlorotoluene	9124	ND	9600	110	82 - 119
2-Hexanone	9124	ND	10000	110	51 - 148
2-Propanone (acetone)	9124	ND	9000	99	25 - 161
4-Chlorotoluene	9124	ND	9500	100	82 - 119
4-Methyl-2-Pentanone(MIBK)	9124	ND	9700	110	62 - 130
Acrylonitrile	9124	ND	8600	94	67 - 130
Benzene	9124	ND	9500	100	82 - 124
Bromobenzene	9124	ND	9100	100	79 - 119
Bromochloromethane	9124	ND	8500	93	79 - 125
Bromodichloromethane	9124	ND	9400	100	71 - 126
Bromoform	9124	ND	7900	87	56 - 119
Bromomethane	9124	ND	8000	88	37 - 161
Carbon Disulfide	9124	ND	8500	93	63 - 134
Carbon tetrachloride	9124	ND	9800	110	68 - 136
Chlorobenzene	9124	ND	9300	100	82 - 126
Chloroethane	9124	ND	8700	95	57 - 148
Chloroform	9124	ND	8900	98	78 - 130
Chloromethane	9124	ND	8200	90	56 - 147
Dibromochloromethane	9124	ND	9100	100	62 - 131
Dibromomethane	9124	ND	9000	99	75 - 122
Dichlorodifluoromethane	9124	ND	9200	100	59 - 131
Ethyl Ether	9124	ND	8400	92	65 - 138
Ethylbenzene	9124	ND	9500	100	82 - 122
Hexachlorobutadiene	9124	ND	11000	120	70 - 130

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Troy Mills Landfill - Troy, NH

MATRIX SPIKE (MS) RECOVERY

Sample ID: AB69288

PARAMETER	SPIKE ADDED ug/Kg	SAMPLE CONCENTRATION ug/Kg	MS CONCENTRATION ug/Kg	MS % REC	QC LIMITS (% REC)
Isopropylbenzene	9124	ND	9600	110	82 - 125
M/P Xylene	18248	ND	19000	100	85 - 120
Methyl-t-Butyl Ether	9124	ND	8900	98	74 - 125
Methylene Chloride	9124	ND	8600	94	67 - 139
N-Butylbenzene	9124	ND	12000	130	80 - 129
N-Propylbenzene	9124	ND	9600	110	81 - 122
Naphthalene	9124	ND	9000	99	59 - 129
Ortho Xylene	9124	ND	9700	110	84 - 122
Para-Isopropyltoluene	9124	1200	11000	110	79 - 129
Sec-Butylbenzene	9124	ND	10000	110	81 - 126
Styrene	9124	ND	9600	110	82 - 125
Tert-Butylbenzene	9124	ND	9800	110	81 - 126
Tetrachloroethylene	9124	ND	8900	98	74 - 133
Tetrahydrofuran	9124	ND	8800	96	60 - 132
Toluene	9124	ND	9400	100	82 - 124
Trans-1,2-Dichloroethylene	9124	ND	8800	96	79 - 127
Trichloroethylene	9124	ND	9300	100	76 - 124
Trichlorofluoromethane	9124	ND	9500	100	65 - 144
Vinyl Acetate	9124	ND	9100	100	14 - 152
Vinyl Chloride	9124	ND	7900	87	34 - 142
c-1,3-dichloropropene	9124	ND	10000	110	68 - 133
cis-1,2-Dichloroethylene	9124	ND	9000	99	79 - 131
t-1,3-Dichloropropene	9124	ND	9700	110	65 - 126

Troy Mills Landfill - Troy, NH

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB69288

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	9124	9000	99	1.0	40
1,1,1-Trichloroethane	9124	8700	95	5.1	40
1,1,2,2-Tetrachloroethane	9124	9100	100	0.0	40
1,1,2-Trichloro-1,2,2-Trifluoroetha	9124	8700	95	5.1	40
1,1,2-Trichloroethane	9124	8800	96	4.1	40
1,1-Dichloroethylene	9124	8500	93	7.3	52
1,1-Dichloropropene	9124	9300	100	9.5	40
1,1-dichloroethane	9124	8500	93	6.2	40
1,2,3-Trichlorobenzene	9124	9900	110	0.0	40
1,2,3-Trichloropropane	9124	9500	100	0.0	40
1,2,4-Trichlorobenzene	9124	10000	110	8.7	40
1,2,4-Trimethylbenzene	9124	11000	100	0.0	40
1,2-Dibromo-3-Chloropropane	9124	9000	99	7.3	40
1,2-Dibromoethane	9124	9300	100	0.0	40
1,2-Dichlorobenzene	9124	8700	95	5.1	40
1,2-Dichloroethane	9124	9100	100	0.0	40
1,2-Dichloropropane	9124	8900	98	2.0	40
1,3,5-Trimethylbenzene	9124	10000	95	14.6	40
1,3-Dichlorobenzene	9124	8700	95	5.1	40
1,3-Dichloropropane	9124	9000	99	1.0	40
1,4-Dichlorobenzene	9124	8500	93	6.2	40
2,2-Dichloropropane	9124	9100	100	9.5	40
2-Butanone (MEK)	9124	9300	100	1.0	40
2-Chlorotoluene	9124	9100	100	9.5	40
2-Hexanone	9124	10000	110	0.0	40
2-Propanone (acetone)	9124	8700	95	4.1	40
4-Chlorotoluene	9124	9000	99	1.0	40
4-Methyl-2-Pentanone(MIBK)	9124	10000	110	0.0	40
Acrylonitrile	9124	8300	91	3.2	40
Benzene	9124	8800	96	4.1	24
Bromobenzene	9124	8800	96	4.1	40
Bromochloromethane	9124	8300	91	2.2	40
Bromodichloromethane	9124	9000	99	1.0	40
Bromoform	9124	7900	87	0.0	40
Bromomethane	9124	7100	78	12.0	40
Carbon Disulfide	9124	8000	88	5.5	40
Carbon tetrachloride	9124	9100	100	9.5	40
Chlorobenzene	9124	8600	94	6.2	34
Chloroethane	9124	7500	82	14.7	40
Chloroform	9124	8300	91	7.4	40
Chloromethane	9124	7200	79	13.0	40
Dibromochloromethane	9124	8900	98	2.0	40
Dibromomethane	9124	9000	99	0.0	40
Dichlorodifluoromethane	9124	8400	92	8.3	40
Ethyl Ether	9124	8100	89	3.3	40
Ethylbenzene	9124	8900	98	2.0	40
Hexachlorobutadiene	9124	11000	120	0.0	40
Isopropylbenzene	9124	9400	100	9.5	40

Troy Mills Landfill - Troy, NH

MATRIX SPIKE DUPLICATE (MSD) RECOVERY

Sample ID:AB69288

PARAMETER	MSD SPIKE ADDED	MSD CONCENTRATION ug/Kg	MSD % REC	RPD %	QC LIMITS RPD
M/P Xylene	18248	18000	99	1.0	40
Methyl-t-Butyl Ether	9124	9600	110	11.5	40
Methylene Chloride	9124	7900	87	7.7	40
N-Butylbenzene	9124	11000	120	8.0	40
N-Propylbenzene	9124	9300	100	9.5	40
Naphthalene	9124	9600	110	10.5	40
Ortho Xylene	9124	9000	99	10.5	40
Para-Isopropyltoluene	9124	11000	110	0.0	40
Sec-Butylbenzene	9124	9700	110	0.0	40
Styrene	9124	9000	99	10.5	40
Tert-Butylbenzene	9124	9400	100	9.5	40
Tetrachloroethylene	9124	8500	93	5.2	40
Tetrahydrofuran	9124	8900	98	2.1	40
Toluene	9124	8800	96	4.1	33
Trans-1,2-Dichloroethylene	9124	8300	91	5.3	40
Trichloroethylene	9124	8900	98	2.0	27
Trichlorofluoromethane	9124	8600	94	6.2	40
Vinyl Acetate	9124	9000	99	1.0	40
Vinyl Chloride	9124	7300	80	8.4	40
c-1,3-dichloropropene	9124	9400	100	9.5	40
cis-1,2-Dichloroethylene	9124	8500	93	6.2	40
t-1,3-Dichloropropene	9124	9400	100	9.5	40

Troy Mills Landfill - Troy, NH

Laboratory Duplicate Results

Sample ID: AB69288

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
1,1,1,2-Tetrachloroethane	ND	ND	NC	40
1,1,1-Trichloroethane	ND	ND	NC	40
1,1,2,2-Tetrachloroethane	ND	ND	NC	40
1,1,2-Trichloro-1,2,2-Trifluoroetha	ND	ND	NC	40
1,1,2-Trichloroethane	ND	ND	NC	40
1,1-Dichloroethylene	ND	ND	NC	40
1,1-Dichloropropene	ND	ND	NC	40
1,1-dichloroethane	ND	ND	NC	40
1,2,3-Trichlorobenzene	ND	ND	NC	40
1,2,3-Trichloropropane	ND	ND	NC	40
1,2,4-Trichlorobenzene	ND	ND	NC	40
1,2,4-Trimethylbenzene	1600	1500	6.5	40
1,2-Dibromo-3-Chloropropane	ND	ND	NC	40
1,2-Dibromoethane	ND	ND	NC	40
1,2-Dichlorobenzene	ND	ND	NC	40
1,2-Dichloroethane	ND	ND	NC	40
1,2-Dichloropropane	ND	ND	NC	40
1,3,5-Trimethylbenzene	1300	1300	0.0	40
1,3-Dichlorobenzene	ND	ND	NC	40
1,3-Dichloropropane	ND	ND	NC	40
1,4-Dichlorobenzene	ND	ND	NC	40
2,2-Dichloropropane	ND	ND	NC	40
2-Butanone (MEK)	ND	ND	NC	40
2-Chlorotoluene	ND	ND	NC	40
2-Hexanone	ND	ND	NC	40
2-Propanone (acetone)	ND	ND	NC	40
4-Chlorotoluene	ND	ND	NC	40
4-Methyl-2-Pentanone(MIBK)	ND	ND	NC	40
Acrylonitrile	ND	ND	NC	40
Benzene	ND	ND	NC	40
Bromobenzene	ND	ND	NC	40
Bromochloromethane	ND	ND	NC	40
Bromodichloromethane	ND	ND	NC	40
Bromoform	ND	ND	NC	40
Bromomethane	ND	ND	NC	40
Carbon Disulfide	ND	ND	NC	40
Carbon tetrachloride	ND	ND	NC	40
Chlorobenzene	ND	ND	NC	40
Chloroethane	ND	ND	NC	40
Chloroform	ND	ND	NC	40
Chloromethane	ND	ND	NC	40
Dibromochloromethane	ND	ND	NC	40
Dibromomethane	ND	ND	NC	40
Dichlorodifluoromethane	ND	ND	NC	40
Ethyl Ether	ND	ND	NC	40
Ethylbenzene	ND	ND	NC	40
Hexachlorobutadiene	ND	ND	NC	40
Isopropylbenzene	ND	ND	NC	40
M/P Xylene	ND	ND	NC	40
Methyl-t-Butyl Ether	ND	ND	NC	40

Troy Mills Landfill - Troy, NH

Laboratory Duplicate Results

Sample ID: AB69288

PARAMETER	SAMPLE RESULT ug/Kg	SAMPLE DUPLICATE RESULT ug/Kg	PRECISION RPD %	QC LIMITS
Methylene Chloride	ND	ND	NC	40
N-Butylbenzene	ND	ND	NC	40
N-Propylbenzene	ND	ND	NC	40
Naphthalene	ND	ND	NC	40
Ortho Xylene	ND	ND	NC	40
Para-Isopropyltoluene	1200	1100	8.7	40
Sec-Butylbenzene	ND	ND	NC	40
Styrene	ND	ND	NC	40
Tert-Butylbenzene	ND	ND	NC	40
Tetrachloroethylene	ND	ND	NC	40
Tetrahydrofuran	ND	ND	NC	40
Toluene	ND	ND	NC	40
Trans-1,2-Dichloroethylene	ND	ND	NC	40
Trichloroethylene	ND	ND	NC	40
Trichlorofluoromethane	ND	ND	NC	40
Vinyl Acetate	ND	ND	NC	40
Vinyl Chloride	ND	ND	NC	40
c-1,3-dichloropropene	ND	ND	NC	40
cis-1,2-Dichloroethylene	ND	ND	NC	40
t-1,3-Dichloropropene	ND	ND	NC	40

Troy Mills Landfill - Troy, NH

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
1,1,1,2-Tetrachloroethane	20	20.0	100	77 - 122
1,1,1-Trichloroethane	20	20.0	101	80 - 128
1,1,2,2-Tetrachloroethane	20	19.0	93	73 - 118
1,1,2-Trichloro-1,2,2-Trifluoroeth	20	20.0	102	59 - 146
1,1,2-Trichloroethane	20	19.0	95	79 - 117
1,1-Dichloroethylene	20	20.0	100	70 - 130
1,1-Dichloropropene	20	20.0	101	79 - 123
1,1-dichloroethane	20	19.0	97	81 - 122
1,2,3-Trichlorobenzene	20	19.0	96	70 - 119
1,2,3-Trichloropropane	20	18.0	88	73 - 114
1,2,4-Trichlorobenzene	20	21.0	103	74 - 120
1,2,4-Trimethylbenzene	20	19.0	97	79 - 123
1,2-Dibromo-3-Chloropropane	20	17.0	87	63 - 124
1,2-Dibromoethane	20	20.0	98	79 - 116
1,2-Dichlorobenzene	20	20.0	99	77 - 117
1,2-Dichloroethane	20	19.0	95	75 - 124
1,2-Dichloropropane	20	19.0	95	80 - 117
1,3,5-Trimethylbenzene	20	19.0	95	80 - 122
1,3-Dichlorobenzene	20	19.0	97	78 - 117
1,3-Dichloropropane	20	19.0	94	79 - 116
1,4-Dichlorobenzene	20	19.0	95	77 - 115
2,2-Dichloropropane	20	21.0	107	64 - 152
2-Butanone (MEK)	20	19.0	96	55 - 144
2-Chlorotoluene	20	19.0	96	79 - 119
2-Hexanone	20	20.0	102	58 - 147
2-Propanone (acetone)	20	21.0	105	37 - 168
4-Chlorotoluene	20	19.0	96	78 - 120
4-Methyl-2-Pentanone(MIBK)	20	20.0	98	68 - 125
Acrylonitrile	20	19.0	94	68 - 124
Benzene	20	20.0	99	80 - 120
Bromobenzene	20	19.0	94	80 - 115
Bromochloromethane	20	19.0	96	81 - 120
Bromodichloromethane	20	20.0	99	77 - 125
Bromoform	20	17.0	87	62 - 127
Bromomethane	20	19.0	93	60 - 139
Carbon Disulfide	20	20.0	102	73 - 129
Carbon tetrachloride	20	21.0	103	73 - 136
Chlorobenzene	20	19.0	96	82 - 119
Chloroethane	20	19.0	94	69 - 130
Chloroform	20	20.0	98	80 - 122
Chloromethane	20	19.0	93	65 - 129
Dibromochloromethane	20	20.0	99	71 - 129
Dibromomethane	20	19.0	95	79 - 115
Dichlorodifluoromethane	20	20.0	101	69 - 126
Ethyl Ether	20	19.0	95	69 - 127
Ethylbenzene	20	20.0	99	80 - 121
Hexachlorobutadiene	20	21.0	105	72 - 124
Isopropylbenzene	20	20.0	98	79 - 124
M/P Xylene	40	40.0	100	81 - 120
Methyl-t-Butyl Ether	20	18.0	92	78 - 120
Methylene Chloride	20	19.0	97	73 - 129
N-Butylbenzene	20	21.0	104	78 - 126
N-Propylbenzene	20	19.0	96	78 - 122

Troy Mills Landfill - Troy, NH

Laboratory Fortified Blank (LFB) Results

PARAMETER	LFB AMOUNT SPIKED ug/Kg	LFB RESULT ug/Kg	LFB RECOVERY %	QC LIMITS %
Naphthalene	20	17.0	86	66 - 124
Ortho Xylene	20	20.0	102	81 - 121
Para-Isopropyltoluene	20	20.0	101	77 - 127
Sec-Butylbenzene	20	20.0	99	79 - 124
Styrene	20	20.0	102	82 - 122
Tert-Butylbenzene	20	20.0	98	78 - 124
Tetrachloroethylene	20	19.0	95	77 - 125
Tetrahydrofuran	20	18.0	92	67 - 124
Toluene	20	20.0	99	81 - 120
Trans-1,2-Dichloroethylene	20	20.0	99	80 - 121
Trichloroethylene	20	20.0	98	80 - 117
Trichlorofluoromethane	20	20.0	100	68 - 137
Vinyl Acetate	20	20.0	100	25 - 150
Vinyl Chloride	20	21.0	104	67 - 134
c-1,3-dichloropropene	20	20.0	102	73 - 133
cis-1,2-Dichloroethylene	20	20.0	99	82 - 122
t-1,3-Dichloropropene	20	20.0	101	69 - 127

Comments:

Troy Mills Landfill - Troy, NH

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
1,1,1,2-Tetrachloroethane	20.2	101	2	50
1,1,1-Trichloroethane	19.1	96	5	50
1,1,2,2-Tetrachloroethane	19.3	97	4	50
1,1,2-Trichloro-1,2,2-Trifluoroetha	19.2	96	6	50
1,1,2-Trichloroethane	19.7	99	4	50
1,1-Dichloroethylene	18.7	94	6	52
1,1-Dichloropropene	19.3	97	4	50
1,1-dichloroethane	18.8	94	3	50
1,2,3-Trichlorobenzene	19.5	98	2	50
1,2,3-Trichloropropane	19.7	99	12	50
1,2,4-Trichlorobenzene	19.9	100	4	50
1,2,4-Trimethylbenzene	19.8	99	2	50
1,2-Dibromo-3-Chloropropane	18.1	91	4	50
1,2-Dibromoethane	19.9	100	2	50
1,2-Dichlorobenzene	19.0	95	4	50
1,2-Dichloroethane	19.2	96	1	50
1,2-Dichloropropane	19.2	96	2	50
1,3,5-Trimethylbenzene	19.6	98	4	50
1,3-Dichlorobenzene	19.1	96	2	50
1,3-Dichloropropane	19.6	98	4	50
1,4-Dichlorobenzene	18.7	94	1	50
2,2-Dichloropropane	20.3	102	5	50
2-Butanone (MEK)	20.7	104	8	50
2-Chlorotoluene	19.3	97	1	50
2-Hexanone	22.9	115	12	50
2-Propanone (acetone)	22.2	111	6	50
4-Chlorotoluene	19.4	97	1	50
4-Methyl-2-Pentanone(MIBK)	21.8	109	11	50
Acrylonitrile	19.5	98	4	50
Benzene	19.3	97	2	50
Bromobenzene	19.5	98	4	50
Bromochloromethane	18.7	94	3	50
Bromodichloromethane	20.0	100	1	50
Bromoform	17.8	89	2	50
Bromomethane	17.4	87	7	50
Carbon Disulfide	19.1	96	6	50
Carbon tetrachloride	20.0	100	3	50
Chlorobenzene	18.5	93	4	34
Chloroethane	18.1	91	4	50
Chloroform	18.8	94	4	50
Chloromethane	18.4	92	1	50
Dibromochloromethane	21.0	105	6	50
Dibromomethane	19.7	99	4	50
Dichlorodifluoromethane	19.9	100	1	50
Ethyl Ether	19.0	95	1	50
Ethylbenzene	19.2	96	3	50
Hexachlorobutadiene	19.2	96	9	50
Isopropylbenzene	19.9	100	2	50
M/P Xylene	38.3	96	5	50
Methyl-t-Butyl Ether	19.0	95	4	50
Methylene Chloride	18.7	94	3	50

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Troy Mills Landfill - Troy, NH

LABORATORY FORTIFIED DUPLICATE (LFB Dup) RECOVERY

COMPOUND	LFB Dup CONCENTRATION ug/Kg	LFB Dup RECOVERY %	RPD %	QC LIMITS RPD
N-Butylbenzene	20.3	102	2	50
N-Propylbenzene	19.6	98	2	50
Naphthalene	18.1	91	5	50
Ortho Xylene	19.3	97	5	50
Para-Isopropyltoluene	19.8	99	2	50
Sec-Butylbenzene	19.9	100	1	50
Styrene	19.5	98	5	50
Tert-Butylbenzene	19.4	97	1	50
Tetrachloroethylene	18.4	92	3	50
Tetrahydrofuran	19.5	98	6	50
Toluene	19.4	97	2	50
Trans-1,2-Dichloroethylene	18.7	94	5	50
Trichloroethylene	19.0	95	3	27
Trichlorofluoromethane	19.3	97	3	50
Vinyl Acetate	20.6	103	3	50
Vinyl Chloride	19.2	96	8	50
c-1,3-dichloropropene	20.7	104	2	50
cis-1,2-Dichloroethylene	19.2	96	3	50
t-1,3-Dichloropropene	20.4	102	1	50

Samples in Batch: AB69287, AB69288, AB69289

EPA LABORATORY SERVICES LOGIN AND CUSTODY SHEET

(Laboratory Policy: Samples not meeting method requirements will be analyzed at the discretion of the EPA Laboratory.) Page 21 of 21

Samples must be delivered in a cooler with loose ice.

LAB ACCOUNT (Billing) #04-0000307

One Stop (PROJECT) ID# SUPERFND

DES Site Number 198405082

Temp. °C. _____

Description: Troy Mills Landfill Superfund Site

Town: Troy NH

NHDES Contact: Michael Summerlin (603) 271- 3649, Sharon Perkins (603) 271- 6805
(Sharon's cell 419-9209)

Comments:

PN: 17080042

GZA Contact: Tanya Justham (603) 493-1548

Collected By & Phone#: Tanya Justham (603) 493-1548; Matt Bergen (603) 213-1138;
Megan Murphy, (603) 325-7296; Chris Melby (603) 493-3863; Matt Steel (978) 992-2157;
Matt Deane (603) 765-9720; Dawna Tousignant (603) 321-0898

Sample Location /ID	Date/Time Sampled	# of Containers	Matrix	8260B	Phthalates Method 8270C					Comments	Lab ID # (For Lab Use Only)
TRIP BLANK	8/22/17 0800	3	S	X							
TRY_TP-3-6	8/22/17 1245 CBW 1045	3	S	X	X						
TRY_TP-3-6 DUP	8/22/17 1245 CBW 1045	3	S	X	X						

Preservation: Soil VOCs: Methanol/4°C +/-2°C; Non-Preserved/ 4°C +/-2°C

Relinquished By [Signature] Date and Time 8/23/17 1100 Received By To Lab via Courier ☒ Temperature Blank Included in Cooler 20C
Matrix: S= Soil; SED = Sediments; AQ= Aqueous; O = Other

Relinquished By _____ Date and Time _____ Received By _____

Relinquished By [Signature] Date and Time 8/23/17 14:30 Received By [Signature] ESAT 14:30

Section No.: 22.0
Revision No.: 5 (HWRB)
Date: 1-8-15

Page 1 of 1

Data Reviewed By _____ Date _____