



Commonwealth Environmental Associates, Inc.

**FINDINGS REPORT
LIMITED PHASE II ENVIRONMENTAL SITE ASSESSMENT REPORT
FORMER VDOT PROPERTY 626 WADDELL STREET LEXINGTON, VIRGINIA 24450**

Prepared for:

City of Lexington
Lexington, Virginia

Prepared by:

Commonwealth Environmental Associates, Inc.
Lexington, Virginia

June 22, 2020

Corporate: 7411 Iron Bridge Road., Richmond, Virginia 23237 – (804) 275-9320
Branch: 648 Waddell Street, Lexington, Virginia 24450 – (540) 462-6077



Commonwealth Environmental Associates, Inc.

June 22, 2020

City of Lexington
300 East Washington Street
Lexington, Virginia 24450

RE: Limited Phase II Environmental Site Assessment Services Report
Former VDOT Property
626 Waddell Street
Lexington, Virginia 24450
CEA Project No. L3720

Greetings:

Commonwealth Environmental Associates, Inc. (CEA) is pleased to submit this Limited Phase II Environmental Site Assessment (ESA) Services report prepared for the above referenced property. The completed scope of services was based on the information gathered during the preparation of a Phase I ESA by CEA. The services were completed in general conformance with CEA proposal number LEX200420 dated April 20, 2020 and the Virginia Department of Transportation (VDOT) Right-of-Entry Agreement dated May 13, 2020.

Purpose of Investigation

The purpose of this study was to determine if the subject site has been significantly impacted due to the historical and current presence of Underground Storage Tank (UST) systems and equipment repair activities.

Project Background

CEA completed a Phase I Environmental Site Assessment of the subject property with the findings presented within a report dated March 26, 2020. The following is a summary of the conclusions as presented within the Phase I ESA:

Corporate: 7411 Iron Bridge Road., Richmond, Virginia 23237 – (804) 275-9320
Branch: 648 Waddell Street, Lexington, Virginia 24450 – (540) 462-6077

The Environmental Site Assessment of the subject site identified as the former VDOT facility located at 626 Waddell Street in Lexington, Virginia was completed on March 26, 2020. CEA, Inc. performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Standard E 1527-13. Any exceptions to, or deletions from, this practice is described in Section 11.0 of this report. This assessment has revealed the following RECs:

- *Four (4) USTs were reportedly removed from the subsurface in the mid-1980s. The steel constructed USTs were identified as a 10,000-gallon gasoline UST originally installed in 1971, a 2,000-gallon diesel UST installed in 1976, a 2,000-gallon diesel UST installed in 1951 and a 1,000-gallon kerosene UST installed in 1951. The VDEQ located no closure documentation, including soil sampling, associated with the removal activities of these USTs. CEA recommends a subsurface investigation to include soil sampling within the former UST basin to determine if the presence of these historic tanks have adversely impacted the subject site.*
- *The VDEQ provided documentation indicating the current UST system is considered in temporary closure. The VDEQ has not inspected the site since this designation. Based on information obtained from the VDEQ, the facility is scheduled to be inspected in 2020. CEA recommends an assessment of the UST system to include soil sampling activities within the UST basin and adjacent to the dispenser island and gauging of the USTs to verify liquids have been removed from the USTs.*
- *CEA observed stained areas within the Pole Shed bays, Storage Shed No. 2 bays, and within the parking area currently utilized by the Rockbridge Farmer's Co-Op to store equipment. CEA recommends soil sampling activities in these areas to determine the impact to the subject site.*

- *Waste liquids and materials were noted within the Fuel Storage Building, in drums adjacent to the Dispenser Island, and within the floor drain in the Truck Repair Shop. CEA recommends characterizing these liquids and materials for eventual disposal activities.*
- *Due to historical vehicle and equipment repair activities within the Vehicle Repair Shop, CEA recommends collecting soil gas samples from beneath the concrete slab to identify potential vapor intrusion risk.*
- *One (1) HREC was identified in association with the subject property. A Tank Closure Report, dated July 21, 1997, documented the closure of one (1) 10,000-gallon gasoline UST and one (1) 10,000-gallon diesel UST. Per VDEQ guidelines, the analytical results reported for the gasoline basin soil sample, basin water sample, and dispenser island soil samples potentially indicate a release. The VDEQ approved the tank closure and did not issue the site a PC number or require corrective action.*

Following review of the Phase I ESA report, VDOT indicated they would evaluate the observed stained areas and determine whether a voluntary limited surface removal of the stained soils was warranted. VDOT noted that the City of Lexington may observe any soil removal activities and it may be prudent to delay evaluating those areas until soil removal has been completed. Additionally, VDOT indicated they would remove any waste liquid and material in drums and in the oil water separator.

Scope of Services

The scope of services provided toward the completion of this project included the following:

- CEA provided the personnel and project management required to complete the project.
- CEA coordinated with Virginia 811 to have the public underground utilities marked in the area of the proposed investigative activities.
- CEA performed an assessment of the current UST systems which included gauging the two (2) USTs and inspection of the dispenser sumps and UST spill buckets.
- Utilizing truck-mounted drilling equipment, CEA advanced two (2) soil borings within the former and current UST basin. The borings were advanced to auger refusal depths of 7.5 feet and 5 feet.

- CEA utilized a Photo-ionization Detector (PID) to field screen the soils encountered within the borings.
- CEA submitted two (2) soil samples collected from the boring locations to a certified laboratory for chemical analysis of Total Petroleum Hydrocarbons – Gasoline Range Organics (TPH-GRO, Method 8015C), Total Petroleum Hydrocarbons – Diesel Range Organics (TPH-DRO, Method 8015C), and Benzene, Toluene, Ethylbenzene, Xylenes, Methyl Tert-Butyl Ether, and Naphthalene (BTEXMN, Method 8260).
- CEA collected a soil vapor sample from a location adjacent to equipment repair shop for Volatile Organic Compounds (VOCs), Method TO-15. The soil vapor sample was collected at minimum depth of 5 feet per Environmental Protection Agency (EPA) protocol. CEA submitted one (1) soil vapor sample to a certified laboratory for chemical analysis that included VOCs (Method TO-15).
- CEA prepared this Phase II ESA findings report presenting the field and chemical analysis results, field observations, boring logs, pertinent maps and quality control documentation.

Field Activities

CEA mobilized to the subject site on June 4, 2020 to complete the subsurface investigative activities at the site. A cleared utility ticket via Virginia 811 was acquired prior to conducting subsurface work at the subject site. VDOT personnel were onsite to observe the subsurface investigative activities.

CEA personnel performed an inspection of the current UST system located on the subject site. One (1) 10,000-gallon gasoline UST, one (1) 10,000-gallon diesel UST, and associated piping and dispensers are located at the property. Per reviewed VDEQ documentation, the USTs are currently registered as Temporary Closed. CEA personnel gauged the USTs for liquids, reviewed the dispenser sumps, and examined the tank spill buckets. Approximately 1.5 inches of liquids were recorded in each UST. No evidence of liquids or staining were noted within the associated spill buckets or dispenser sumps.

Utilizing stainless steel hand auger equipment, CEA advanced soil boring T-1 near the northern end of the diesel UST. The boring was advanced to an auger refusal depth of 3.25 feet. The soils encountered within T-1 generally consisted of orange/brown stiff silty clay and gravel. Soils collected from this boring were field screened using a PID. PID concentrations ranging from 1.1 parts per million (ppm) to 1.7 ppm were noted in boring T-1. No petroleum staining or odors were noted in the boring. Due to shallow auger refusal, no samples were submitted for laboratory analysis from this boring.

Soil boring T-1A was offset 2 feet north of soil boring T-1. The boring was advanced to an auger refusal depth of 4.5 feet. The soils encountered within T-1A generally consisted of orange/brown stiff silty clay and gravel. Soils collected from this boring were field screened using a PID. PID concentrations ranging from 0.8 ppm to 1.2 ppm were noted in boring T-1A. No petroleum staining or odors were noted in the boring. Due to shallow auger refusal, no samples were submitted for laboratory analysis from this boring.

Soil boring T-2 was advanced adjacent to the northern end of the gasoline UST. The boring was advanced to an auger refusal depth of 1.5 feet. The soils encountered within T-2 generally consisted of orange/brown stiff silty clay and gravel. Soils collected from this boring were field screened using a PID. PID concentrations ranging from 0.4 ppm to 0.8 ppm were noted in boring T-1A. No petroleum staining or odors were noted in the boring. Due to shallow auger refusal, no samples were submitted for laboratory analysis from this boring.

CEA collected one (1) soil vapor sample adjacent to the equipment repair shop. The soil gas sample was collected using the TO-15 sampling method for VOCs. Teflon tubing was connected to the dedicated sampling tip prior to advancing to the sampling depth of 5 feet, then the tubing was connected to a 1 Liter summa canister. The summa canister was received from the laboratory with a negative pressure to facilitate collection and containment of the soil gas sample. The sample was collected over a 10-minute time period utilizing a flow controller. Vapor sample SG-1 was collected and transported under proper chain of custody to ESC Lab Sciences, located in Mt. Juliet, Tennessee, for analysis of VOCs (Method TO-15).

CEA personnel returned to the subject property on June 10, 2020 to complete the investigative activities. Due to encountering shallow auger refusal, CEA utilized truck-mounted drilling equipment. To advance two (2) additional borings in the area of the historical and current UST basin.

Utilizing hand auger equipment, CEA advanced soil boring T-1 near the northern end of the diesel UST. The boring was advanced to an auger refusal depth of 7.5 feet. The soils encountered within T-1 generally consisted of orange/brown silty clay and gravel. Soils collected from this boring were field screened using a PID. PID concentrations ranging from 0.2 ppm to 3.5 ppm were noted in boring T-1. Slight petroleum odors were noted within the near surface soils. No additional odors or staining was observed within the boring. Soil sample T-1 was collected at the auger refusal depth of 7.5 feet and submitted for chemical laboratory analysis of TPH/GRO/DRO (Method 8015C) and BTEXMN (Method 8260).

Soil boring T-2 was advanced adjacent to the northern end of the gasoline UST. The boring was advanced to an auger refusal depth of 5 feet. The soils encountered within T-2 generally consisted of brown/yellow silty clay and gravel. Soils collected from this boring were field screened using a PID. PID concentrations were noted as 0.0 for all the screened soils. No petroleum staining or odors were noted in the boring. Soil sample T-2 was collected at the auger refusal depth of 7.5 feet and submitted for chemical laboratory analysis of TPH/GRO/DRO (Method 8015C) and BTEXMN (Method 8260).

A Site Vicinity Map has been included as Attachment A, Figure 1. A General Site Map showing the boring locations has been included as Attachment A, Figure 1. Geologic Boring Logs are presented as Attachment B.

Laboratory Chemical Analysis

CEA collected a total of two (2) soil samples for chemical analysis of TPH/GRO/DRO (Method 8015C) and BTEXMN (Method 8260). Additionally, one (1) soil vapor sample was collected and submitted for chemical analysis of VOCs (Method TO-15). The collected soil samples were transferred to laboratory-supplied containers and immediately placed within an iced cooler. The soil vapor sample was transferred to a laboratory supplied canister and per laboratory instructions not placed on ice. The samples were delivered to Pace Analytical, located in Mt. Juliet, Tennessee, for chemical analysis. The laboratory chemical analysis results are summarized below within Table 1 and Table 2. A copy of the chain of custody and the analytical report are presented as Attachment C.

Table 1
Soil Laboratory Chemical Analysis Summary
626 Waddell Street
Lexington, Virginia June
10, 2020

Sample	TPH/GRO (mg/kg)	TPH/DRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)	MTBE (mg/kg)	Naphthalene (mg/kg)
T-1	ND	ND	0.00792	ND	0.00438	0.0171	ND	ND
T-2	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

TPH/GRO/DRO – Method 8015C

BTEXMN – Method 8260

Mg/kg – Milligrams per kilogram

Table 2
Soil Vapor Analysis - Volatile Organic Compounds
626 Waddell Street
Lexington, Virginia June
4, 2020

Parameter*	Result (ug/m ³)	VDEQ Tier III Residential Shallow / Subslab Soil Gas Screening Level (ug/m ³)	VDEQ Tier III Industrial Shallow / Subslab Soil Gas Screening Level (ug/m ³)	Exceeds VDEQ Tier III Residential Shallow / Subslab Soil Gas Screening Level	Exceeds VDEQ Tier III Industrial Shallow / Subslab Soil Gas Screening Level
Acetone	22.4	106,666.67	466,666.67	No	No
Benzene	1.43	103.33	433.333	No	No
Carbon Disulfide	1.45	2,433.33	10,333.33	No	No
Chloromethane	3.30	313.33	1,300	No	No
Cyclohexane	1.37	21,000	86,666.67	No	No
4-Ethyltoluene	1.51	-----	-----	-----	-----
Trichlorofluoromethane	1.15	-----	-----	-----	-----
Dichlorodifluoromethane	1.98	333.33	1,466.67	No	No
Heptane, N	3.51	1,400	6,000	No	No
Hexane, N	6.13	2,433.33	10,333.33	No	No
2-Butanone (MEK)	4.39	17,333	73,333.33		
2-Propanol	3.74	-----	-----	-----	-----
Propene	30.1	-----	-----	-----	-----
Toluene	3.70	17,333.33	73,333.33	No	No
Trimethylbenzene, 1,2,4	1.60	210	866.67	No	No
Xylene, O	1.48	333.33	1,466.67	No	No
Xylenes, (m&p)	2.54	333.33	1,466.67	No	No
Notes: ug/m ³ – micrograms per cubic meter *VOC's not listed in this table were reported as ND (Not Detected at the Reporting Limit)					

Conclusions / Recommendations

CEA completed the Limited Phase II ESA field services at the subject property on June 4 and June 10, 2020. Two (2) soil borings were advanced at the subject site to auger refusal depths of 7.5 feet and 5 feet. Soil samples were collected and submitted for laboratory analysis from the auger refusal depths within each boring. The PID concentrations for the submitted samples ranged from 0.0 ppm to 3.5 ppm. Light petroleum odors were noted in association with near surface soils within soil boring T-1. No field evidence of petroleum stained soils was noted within the site soil borings.

The collected soil vapor sample (SG-1) was analyzed for VOCs utilizing the TO-15 method. Multiple constituents were identified within the sample. To further evaluate potential soil vapor risk concerns, CEA compared the analytical results to VDEQ Tier III shallow / sub-slab soil gas screening levels. All reported concentrations were below both VDEQ Tier III Residential and Industrial screening levels. The laboratory chemical analysis results for the collected soil sample

T-1 were reported as ND (not detected at the detection limits) for TPH/GRO/DRO, Toluene, MTBE, and Naphthalene. Low-level concentrations of Benzene, Ethylbenzene, and Xylenes were reported within soil sample T-1. No detectable concentrations of TPH/GRO/DRO or BTEXMN were reported in association with soil sample T-2.

The VDEQ reporting requirement for TPH in soil associated with USTs systems is 100 mg/kg. No collected samples were reported to exceed the reporting requirement level. However, per the VDEQ Storage Tank Program Technical Manual, “a concentration of any other petroleum constituent (besides TPH) that is greater than the detection limit for that constituent indicates or potentially indicates a release from the tank.” Therefore, CEA recommends forwarding a copy of these findings to the VDEQ – Valley Regional Office (VRO) for comment and review. Additionally, CEA recommends that the client is present for potential future soil / liquid removal activities associated with the subject property.

CEA appreciates the opportunity to work with the City of Lexington on this project. Please do not hesitate to contact our office with any questions concerning this project at (540) 462-6077.

Sincerely,

COMMONWEALTH ENVIRONMENTAL ASSOCIATES, INC.

By: 

Josh Seaman
Project Manager

By: 

W. Fred Mayes
President

Attachments:

- A - Figures
- B - Geologic Boring Logs
- C – Analytical Report / Chain of Custody

Limitations

This report has been prepared for the exclusive use of the City of Lexington and/or their counsel, for specific application to the subject site. This report should in no way be construed as our recommendation to either, purchase, sell, or develop the project site.

The report was prepared in accordance with generally accepted standards of practice for environmental services. No other warranty, either expressed or implied, is made. This report is not to be reproduced, either in whole or in part, without written consent from Commonwealth Environmental Associates, Inc.

Our conclusions and recommendations are based upon information provided to us by others, our site observations, and professional judgment. To the best of our knowledge, information provided

by others is true and correct, unless otherwise noted; however, Commonwealth Environmental Associates, Inc. is not responsible for the accuracy of information provided by others.

Our on-site observations pertain only to specific locations at specific times on specific dates. Our observations and conclusions do not reflect variations in subsurface conditions that may exist between sampling locations, in unexplored areas of the site, or at times other than those represented by our observations.

In providing this report, Commonwealth Environmental Associates, Inc. does not assume any responsibilities of the party, or parties that are deemed legally responsible for the subject site. It is not the responsibility of Commonwealth Environmental Associates, Inc., to report our findings to any federal, state or local agency, including such conditions that may present a potential danger to public health, safety or the environment. It is the responsibility of the client to notify the appropriate federal, state and/or local agencies, in a timely manner, of such findings as may be required by law.

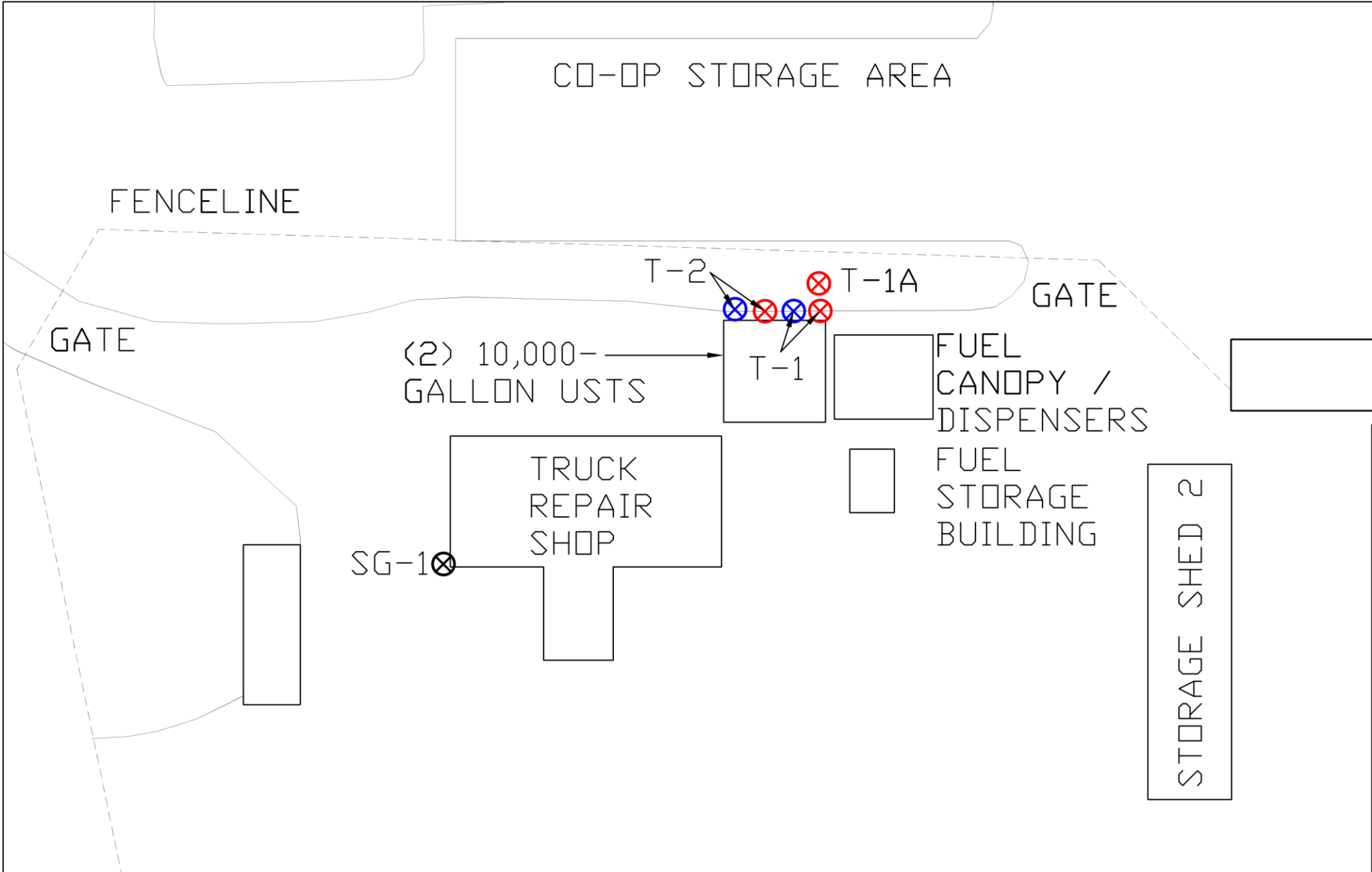
ATTACHMENT A
FIGURES



Commonwealth Environmental Associates, Inc.



Corporate: 7411 Iron Bridge Road., Richmond, Virginia 23237 – (804) 275-9320
Branch: 648 Waddell Street, Lexington, Virginia 24450 – (540) 462-6077



LEGEND

- ⊗ HAND AUGER BORINGS
- ⊗ TRUCK-MOUNTED DRILLING EQUIPMENT

	FORMER VDOT FACILITY			
	626 WADDELL STREET, LEXINGTON, VIRGINIA			
	BORING LOCATIONS			
PROJECT #: L3720	DATE: 6/22/20	DESIGN BY: JBM	CLIENT: LEXINGTON CITY	
APPROVED BY: WFM	DWG #: L3720.2	DRAWN BY: JBM	SCALE: NOT TO SCALE	

ATTACHMENT B

GEOLOGIC BORING LOGS

<u>Commonwealth Environmental Associates, Inc.</u> 648 Waddell Street, Lexington, Virginia 24450																																
Boring Log : T-1																																
Client: City of Lexington	Drilling Company: EDAC																															
Project Location : 626 Waddell Street, Lexington, VA	Project #: L3720																															
Field Personnel: Chris Young	Boring Method: Hollow Stem																															
Total Boring Depth: 7.5'	Date: 6/10/2020																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Depth</th> <th style="width: 65%;">Description</th> <th style="width: 20%;">PID (PPM)</th> </tr> </thead> <tbody> <tr> <td>0 - 2"</td> <td style="text-align: center;">Topsoil / Gravel</td> <td style="text-align: center;">--</td> </tr> <tr> <td>2" - 1'</td> <td style="text-align: center;">Brown / Grey Silty Clay</td> <td style="text-align: center;">1.5</td> </tr> <tr> <td>1'-2'</td> <td style="text-align: center;">Orange Brown Stiff Silty Clay With Gravel / Slight Odor</td> <td style="text-align: center;">3.5</td> </tr> <tr> <td>2'-3'</td> <td style="text-align: center;">Orange Brown Stiff Silty Clay With Gravel</td> <td style="text-align: center;">0.3</td> </tr> <tr> <td>3'-4'</td> <td style="text-align: center;">Brown Silty Clay With Gravel</td> <td style="text-align: center;">0.5</td> </tr> <tr> <td>4'-5'</td> <td style="text-align: center;">Brown Silty Clay With Gravel</td> <td style="text-align: center;">0.3</td> </tr> <tr> <td>5'-6'</td> <td style="text-align: center;">Brown Silty Clay With Gravel</td> <td style="text-align: center;">0.3</td> </tr> <tr> <td>6'-7'</td> <td style="text-align: center;">Brown Silty Clay With Gravel</td> <td style="text-align: center;">0.0</td> </tr> <tr> <td>7.5'</td> <td style="text-align: center;">Auger Refusal</td> <td style="text-align: center;">0.2</td> </tr> </tbody> </table>			Depth	Description	PID (PPM)	0 - 2"	Topsoil / Gravel	--	2" - 1'	Brown / Grey Silty Clay	1.5	1'-2'	Orange Brown Stiff Silty Clay With Gravel / Slight Odor	3.5	2'-3'	Orange Brown Stiff Silty Clay With Gravel	0.3	3'-4'	Brown Silty Clay With Gravel	0.5	4'-5'	Brown Silty Clay With Gravel	0.3	5'-6'	Brown Silty Clay With Gravel	0.3	6'-7'	Brown Silty Clay With Gravel	0.0	7.5'	Auger Refusal	0.2
Depth	Description	PID (PPM)																														
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7.5'	Auger Refusal	0.2																														
<u>Commonwealth Environmental Associates, Inc.</u> 648 Waddell Street, Lexington, Virginia 24450																																
Boring Log : T-2																																
Client: City of Lexington	Drilling Company: EDAC																															
Project Location : 626 Waddell Street, Lexington, VA	Project #: L3720																															
Field Personnel: Chris Young	Boring Method: Hollow Stem																															
Total Boring Depth: 5'	Date: 6/10/2020																															
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Depth</th> <th style="width: 65%;">Description</th> <th style="width: 20%;">PID (PPM)</th> </tr> </thead> <tbody> <tr> <td>0 - 2"</td> <td style="text-align: center;">Topsoil / Gravel</td> <td style="text-align: center;">--</td> </tr> </tbody> </table>			Depth	Description	PID (PPM)	0 - 2"	Topsoil / Gravel	--																								
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0 - 2"	Topsoil / Gravel	--																														

<u>Commonwealth Environmental Associates, Inc.</u> 648 Waddell Street, Lexington, Virginia 24450		2" - 1'	Brown / Grey Silty Clay	0.0
Boring Log : T-1		1'-2'	Orange Brown Stiff Silty Clay With Gravel	0.0
		2'-3'	Orange Brown Stiff Silty Clay With Gravel	0.0
		3'-4'	Brown Silty Clay With Gravel	0.0
		4'-5'	Brown Yellow Silty Clay With Gravel	0.0
		5'	Auger Refusal	0.0
Client: City of Lexington		Drilling Company: CEA		
Project Location : 626 Waddell Street, Lexington, VA		Project #: L3720		
Field Personnel: Chris Young		Boring Method: Hand Auger		
Total Boring Depth: 3.25'		Date: 6/4/2020		
Depth	Description	PID (PPM)		
0 - 2"	Topsoil / Gravel	--		
2" - 1.5'	Brown Loamy Clay With Gravel	1.7		
1.5' -2'	Brown Loamy Clay With Gravel	1.1		
2'-3'	Orange Brown Stiff Silty Clay With Gravel	1.2		
3'-3.5'	Orange Brown Stiff Silty Clay With Gravel	1.3		
3.5'	Auger Refusal	--		

<u>Commonwealth Environmental Associates, Inc.</u> 648 Waddell Street, Lexington, Virginia 24450		
Boring Log : T-1A		
Client: City of Lexington		
Drilling Company: CEA		
Project Location : 626 Waddell Street, Lexington, VA		
Project #: L3720		
Field Personnel: Chris Young		
Boring Method: Hand Auger		
Total Boring Depth: 4.5'		
Date: 6/4/2020		
Depth	Description	PID (PPM)
0 - 2"	Topsoil / Gravel	--
2" - 1.5'	Brown Loamy Clay With Gravel	0.8
1.5' -2'	Orange Stiff Clay With Gravel	0.9
2'-3'	Orange Stiff Clay With Gravel	1.1
3'-3.5'	Orange Stiff Clay With Gravel	1.2
3.5'-4.5'	Gray Brown Stiff Clay With Gravel	1.2
4.5'	Auger Refusal	--
<u>Commonwealth Environmental Associates, Inc.</u> 648 Waddell Street, Lexington, Virginia 24450		
Boring Log : T-2		

Client: City of Lexington		Drilling Company: CEA	
Project Location : 626 Waddell Street, Lexington, VA		Project #: L3720	
Field Personnel: Chris Young		Boring Method: Hand Auger	
Total Boring Depth: 1.5'		Date: 6/4/2020	
Depth	Description	PID (PPM)	
0 - 2"	Topsoil / Gravel	--	
2" - 8"	Brown Loamy Clay With Gravel	0.4	
8"-1.5'	Brown Orange Stiff Clay With Gravel	0.8	
1.5'	Auger Refusal	--	

□

ATTACHMENT C

ANALYTICAL REPORT / CHAIN OF CUSTODY □

ANALYTICAL REPORT

June 08, 2020

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

CEA, Inc. - Lexington, VA

Sample Delivery Group: L1226385
Samples Received: 06/06/2020
Project Number: L3720
Description: VDOT Property

Report To: Mr. John McCoy
648 Waddell Street
Lexington, VA 24450

Entire Report Reviewed By:



Pam Langford
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.



SAMPLE SUMMARY



SG-1 L1226385-01 Air

Collected by CJY	Collected date/time 06/04/20 11:50	Received date/time 06/06/20 08:45
---------------------	---------------------------------------	--------------------------------------

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1488452	1	06/08/20 01:08	06/08/20 01:08	MBF	Mt. Juliet, TN

1	Cp
2	Tc
3	Ss
4	Cn
5	Sr
6	Qc
7	Gl
8	Al
9	Sc

Cp: Cover Page	1
Tc: Table of Contents	2
Ss: Sample Summary	3
Cn: Case Narrative	4
Sr: Sample Results	5
SG-1 L1226385-01	5
Qc: Quality Control Summary	7
Volatile Organic Compounds (MS) by Method TO-15	7
Gl: Glossary of Terms	11
Al: Accreditations & Locations	12
Sc: Sample Chain of Custody	13



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Pam Langford
Project Manager

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc



Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
Acetone	67-64-1	58.10	1.25	2.97	9.42	22.4		1	WG1488452
Allyl chloride	107-05-1	76.53	0.200	0.626	ND	ND		1	WG1488452
Benzene	71-43-2	78.10	0.200	0.639	0.449	1.43		1	WG1488452
Benzyl Chloride	100-44-7	127	0.200	1.04	ND	ND		1	WG1488452
Bromodichloromethane	75-27-4	164	0.200	1.34	ND	ND		1	WG1488452
Bromoform	75-25-2	253	0.600	6.21	ND	ND		1	WG1488452
Bromomethane	74-83-9	94.90	0.200	0.776	ND	ND		1	WG1488452
1,3-Butadiene	106-99-0	54.10	2.00	4.43	ND	ND		1	WG1488452
Carbon disulfide	75-15-0	76.10	0.200	0.622	0.466	1.45		1	WG1488452
Carbon tetrachloride	56-23-5	154	0.200	1.26	ND	ND		1	WG1488452
Chlorobenzene	108-90-7	113	0.200	0.924	ND	ND		1	WG1488452
Chloroethane	75-00-3	64.50	0.200	0.528	ND	ND		1	WG1488452
Chloroform	67-66-3	119	0.200	0.973	ND	ND		1	WG1488452
Chloromethane	74-87-3	50.50	0.200	0.413	1.60	3.30		1	WG1488452
2-Chlorotoluene	95-49-8	126	0.200	1.03	ND	ND		1	WG1488452
Cyclohexane	110-82-7	84.20	0.200	0.689	0.398	1.37		1	WG1488452
Dibromochloromethane	124-48-1	208	0.200	1.70	ND	ND		1	WG1488452
1,2-Dibromoethane	106-93-4	188	0.200	1.54	ND	ND		1	WG1488452
1,2-Dichlorobenzene	95-50-1	147	0.200	1.20	ND	ND		1	WG1488452
1,3-Dichlorobenzene	541-73-1	147	0.200	1.20	ND	ND		1	WG1488452
1,4-Dichlorobenzene	106-46-7	147	0.200	1.20	ND	ND		1	WG1488452
1,2-Dichloroethane	107-06-2	99	0.200	0.810	ND	ND		1	WG1488452
1,1-Dichloroethane	75-34-3	98	0.200	0.802	ND	ND		1	WG1488452
1,1-Dichloroethene	75-35-4	96.90	0.200	0.793	ND	ND		1	WG1488452

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

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cis-1,2-Dichloroethene	156-59-2	96.90	0.200	0.793	ND	ND	1	WG1488452
trans-1,2-Dichloroethene	156-60-5	96.90	0.200	0.793	ND	ND	1	WG1488452
1,2-Dichloropropane	78-87-5	113	0.200	0.924	ND	ND	1	WG1488452
cis-1,3-Dichloropropene	10061-01-5	111	0.200	0.908	ND	ND	1	WG1488452
trans-1,3-Dichloropropene	10061-02-6	111	0.200	0.908	ND	ND	1	WG1488452
1,4-Dioxane	123-91-1	88.10	0.200	0.721	ND	ND	1	WG1488452
Ethanol	64-17-5	46.10	0.630	1.19	58.6	110	1	WG1488452
Ethylbenzene	100-41-4	106	0.200	0.867	ND	ND	1	WG1488452
4-Ethyltoluene	622-96-8	120	0.200	0.982	0.307	1.51	1	WG1488452
Trichlorofluoromethane	75-69-4	137.40	0.200	1.12	0.204	1.15	1	WG1488452
Dichlorodifluoromethane	75-71-8	120.92	0.200	0.989	0.400	1.98	1	WG1488452
1,1,2-Trichlorotrifluoroethane	76-13-1	187.40	0.200	1.53	ND	ND	1	WG1488452
1,2-Dichlorotetrafluoroethane	76-14-2	171	0.200	1.40	ND	ND	1	WG1488452
Heptane	142-82-5	100	0.200	0.818	0.859	3.51	1	WG1488452
Hexachloro-1,3-butadiene	87-68-3	261	0.630	6.73	ND	ND	1	WG1488452
n-Hexane	110-54-3	86.20	0.630	2.22	1.74	6.13	1	WG1488452
Isopropylbenzene	98-82-8	120.20	0.200	0.983	ND	ND	1	WG1488452
Methylene Chloride	75-09-2	84.90	0.200	0.694	ND	ND	1	WG1488452
Methyl Butyl Ketone	591-78-6	100	1.25	5.11	ND	ND	1	WG1488452
2-Butanone (MEK)	78-93-3	72.10	1.25	3.69	1.49	4.39	1	WG1488452
4-Methyl-2-pentanone (MIBK)	108-10-1	100.10	1.25	5.12	ND	ND	1	WG1488452
Methyl methacrylate	80-62-6	100.12	0.200	0.819	ND	ND	1	WG1488452
MTBE	1634-04-4	88.10	0.200	0.721	ND	ND	1	WG1488452
Naphthalene	91-20-3	128	0.630	3.30	ND	ND	1	WG1488452
2-Propanol	67-63-0	60.10	1.25	3.07	1.52	3.74	1	WG1488452
Propene	115-07-1	42.10	0.400	0.689	17.5	30.1	1	WG1488452



Styrene	100-42-5	104	0.200	0.851	ND	ND	1	WG1488452
1,1,2,2-Tetrachloroethane	79-34-5	168	0.200	1.37	ND	ND	1	WG1488452
Tetrachloroethylene	127-18-4	166	0.200	1.36	ND	ND	1	WG1488452
Tetrahydrofuran	109-99-9	72.10	0.200	0.590	ND	ND	1	WG1488452
Toluene	108-88-3	92.10	0.200	0.753	0.983	3.70	1	WG1488452
1,2,4-Trichlorobenzene	120-82-1	181	0.630	4.66	ND	ND	1	WG1488452

Collected date/time: 06/04/20 11:50

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Mol. Wt.	RDL1 ppbv	RDL2 ug/m3	Result ppbv	Result ug/m3	Qualifier	Dilution	Batch
1,1,1-Trichloroethane	71-55-6	133	0.200	1.09	ND	ND		1	WG1488452
1,1,2-Trichloroethane	79-00-5	133	0.200	1.09	ND	ND		1	WG1488452
Trichloroethylene	79-01-6	131	0.200	1.07	ND	ND		1	WG1488452
1,2,4-Trimethylbenzene	95-63-6	120	0.200	0.982	0.327	1.60		1	WG1488452
1,3,5-Trimethylbenzene	108-67-8	120	0.200	0.982	ND	ND		1	WG1488452
2,2,4-Trimethylpentane	540-84-1	114.22	0.200	0.934	ND	ND		1	WG1488452
Vinyl chloride	75-01-4	62.50	0.200	0.511	ND	ND		1	WG1488452
Vinyl Bromide	593-60-2	106.95	0.200	0.875	ND	ND		1	WG1488452
Vinyl acetate	108-05-4	86.10	0.200	0.704	ND	ND		1	WG1488452
m&p-Xylene	1330-20-7	106	0.400	1.73	0.587	2.54		1	WG1488452
o-Xylene	95-47-6	106	0.200	0.867	0.341	1.48		1	WG1488452
(S) 1,4-Bromofluorobenzene	460-00-4	175	60.0-140		97.1				

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 GI

8 AI

9 Sc



Method Blank (MB)

(MB) R3535889-3 06/07/20 10:01

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ppbv		ppbv	ppbv
Acetone	U		0.584	1.25
Allyl Chloride	U		0.114	0.200
Benzene	U		0.0715	0.200
Benzyl Chloride	U		0.0598	0.200
Bromodichloromethane	U		0.0702	0.200
Bromoform	U		0.0732	0.600
Bromomethane	U		0.0982	0.200
1,3-Butadiene	U		0.104	2.00
Carbon disulfide	U		0.102	0.200
Carbon tetrachloride	U		0.0732	0.200
Chlorobenzene	U		0.0832	0.200
Chloroethane	U		0.0996	0.200
Chloroform	U		0.0717	0.200
Chloromethane	U		0.103	0.200
2-Chlorotoluene	U		0.0828	0.200

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

1
Cp

Cyclohexane	U	0.0753	0.200
Dibromochloromethane	U	0.0727	0.200
1,2-Dibromoethane	U	0.0721	0.200
1,2-Dichlorobenzene	U	0.128	0.200
1,3-Dichlorobenzene	U	0.182	0.200
1,4-Dichlorobenzene	U	0.0557	0.200
1,2-Dichloroethane	U	0.0700	0.200
1,1-Dichloroethane	U	0.0723	0.200
1,1-Dichloroethene	U	0.0762	0.200
cis-1,2-Dichloroethene	U	0.0784	0.200
trans-1,2-Dichloroethene	U	0.0673	0.200
1,2-Dichloropropane	U	0.0760	0.200
cis-1,3-Dichloropropene	U	0.0689	0.200
trans-1,3-Dichloropropene	U	0.0728	0.200
1,4-Dioxane	U	0.0833	0.200
Ethylbenzene	U	0.0835	0.200
4-Ethyltoluene	U	0.0783	0.200



Volatile Organic Compounds (MS) by Method TO-15

[L1226385-01](#)

Trichlorofluoromethane	U	0.0819	0.200	1 Cp
Dichlorodifluoromethane	U	0.137	0.200	2 Tc
1,1,2-Trichlorotrifluoroethane	U	0.0793	0.200	3 Ss
1,2-Dichlorotetrafluoroethane	U	0.0890	0.200	4 Cn
Heptane	U	0.104	0.200	5 Sr
Hexachloro-1,3-butadiene	U	0.105	0.630	6 Qc
n-Hexane	U	0.206	0.630	7 Gl
Isopropylbenzene	U	0.0777	0.200	8 Al

Method Blank (MB)

(MB) R3535889-3 06/07/20 10:01

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL	9 Sc
	ppbv		ppbv	ppbv	
Methylene Chloride	U		0.0979	0.200	
Methyl Butyl Ketone	U		0.133	1.25	
2-Butanone (MEK)	U		0.0814	1.25	
4-Methyl-2-pentanone (MIBK)	U		0.0765	1.25	
Methyl Methacrylate	U		0.0876	0.200	
MTBE	U		0.0647	0.200	
Naphthalene	U		0.350	0.630	

1
Cp

2-Propanol	U	0.264	1.25
Propene	U	0.0932	0.400
Styrene	U	0.0788	0.200
1,1,2,2-Tetrachloroethane	U	0.0743	0.200
Tetrachloroethylene	U	0.0814	0.200
Tetrahydrofuran	U	0.0734	0.200
Toluene	U	0.0870	0.200
1,2,4-Trichlorobenzene	U	0.148	0.630
1,1,1-Trichloroethane	U	0.0736	0.200
1,1,2-Trichloroethane	U	0.0775	0.200
Trichloroethylene	U	0.0680	0.200
1,2,4-Trimethylbenzene	U	0.0764	0.200
1,3,5-Trimethylbenzene	U	0.0779	0.200
2,2,4-Trimethylpentane	U	0.133	0.200
Vinyl chloride	U	0.0949	0.200
Vinyl Bromide	U	0.0852	0.200
Vinyl acetate	U	0.116	0.200



Volatile Organic Compounds (MS) by Method TO-15

[L1226385-01](#)

m&p-Xylene	U	0.135	0.400
o-Xylene	U	0.0828	0.200
Ethanol	U	0.265	0.630
(S) 1,4-Bromofluorobenzene	93.6		60.0-140

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3535889-1 06/07/20 08:28 • (LCSD) R3535889-2 06/07/20 09:17

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Ethanol	3.75	3.66	3.68	97.6	98.1	55.0-148			0.545	25
Propene	3.75	3.65	3.62	97.3	96.5	64.0-144			0.825	25
Dichlorodifluoromethane	3.75	3.91	3.77	104	101	64.0-139			3.65	25
1,2-Dichlorotetrafluoroethane	3.75	3.76	3.74	100	99.7	70.0-130			0.533	25
Chloromethane	3.75	3.76	3.69	100	98.4	70.0-130			1.88	25

6 Qc

7 GI

8 AI

9 Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3535889-1 06/07/20 08:28 • (LCSD) R3535889-2 06/07/20 09:17

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Vinyl chloride	3.75	3.84	3.74	102	99.7	70.0-130			2.64	25
1,3-Butadiene	3.75	3.71	3.68	98.9	98.1	70.0-130			0.812	25



Volatile Organic Compounds (MS) by Method TO-15

[L1226385-01](#)

¹Cp

Bromomethane	3.75	3.74	3.69	99.7	98.4	70.0-130	1.35	25
Chloroethane	3.75	3.73	3.70	99.5	98.7	70.0-130	0.808	25
Trichlorofluoromethane	3.75	3.83	3.77	102	101	70.0-130	1.58	25
1,1,2-Trichlorotrifluoroethane	3.75	3.72	3.67	99.2	97.9	70.0-130	1.35	25
1,1-Dichloroethene	3.75	3.71	3.65	98.9	97.3	70.0-130	1.63	25
1,1-Dichloroethane	3.75	3.72	3.73	99.2	99.5	70.0-130	0.268	25
Acetone	3.75	3.80	3.76	101	100	70.0-130	1.06	25
2-Propanol	3.75	3.72	3.68	99.2	98.1	70.0-139	1.08	25
Carbon disulfide	3.75	3.60	3.54	96.0	94.4	70.0-130	1.68	25
Methylene Chloride	3.75	3.65	3.60	97.3	96.0	70.0-130	1.38	25
MTBE	3.75	3.61	3.57	96.3	95.2	70.0-130	1.11	25
trans-1,2-Dichloroethene	3.75	3.64	3.61	97.1	96.3	70.0-130	0.828	25
n-Hexane	3.75	3.62	3.60	96.5	96.0	70.0-130	0.554	25
Vinyl acetate	3.75	3.94	3.82	105	102	70.0-130	3.09	25
Methyl Ethyl Ketone	3.75	3.81	3.71	102	98.9	70.0-130	2.66	25
cis-1,2-Dichloroethene	3.75	3.74	3.71	99.7	98.9	70.0-130	0.805	25
Chloroform	3.75	3.74	3.70	99.7	98.7	70.0-130	1.08	25



Volatile Organic Compounds (MS) by Method TO-15

[L1226385-01](#)

¹Cp

Cyclohexane	3.75	3.64	3.63	97.1	96.8	70.0-130	0.275	25
1,1,1-Trichloroethane	3.75	3.77	3.71	101	98.9	70.0-130	1.60	25
Carbon tetrachloride	3.75	3.76	3.70	100	98.7	70.0-130	1.61	25
Benzene	3.75	3.72	3.69	99.2	98.4	70.0-130	0.810	25
1,2-Dichloroethane	3.75	3.84	3.68	102	98.1	70.0-130	4.26	25
Heptane	3.75	4.33	4.25	115	113	70.0-130	1.86	25
Trichloroethylene	3.75	3.68	3.60	98.1	96.0	70.0-130	2.20	25
1,2-Dichloropropane	3.75	3.66	3.61	97.6	96.3	70.0-130	1.38	25
1,4-Dioxane	3.75	3.71	3.68	98.9	98.1	70.0-140	0.812	25
Bromodichloromethane	3.75	3.80	3.70	101	98.7	70.0-130	2.67	25
cis-1,3-Dichloropropene	3.75	3.75	3.67	100	97.9	70.0-130	2.16	25
4-Methyl-2-pentanone (MIBK)	3.75	3.80	3.78	101	101	70.0-139	0.528	25
Toluene	3.75	3.72	3.67	99.2	97.9	70.0-130	1.35	25
trans-1,3-Dichloropropene	3.75	3.79	3.71	101	98.9	70.0-130	2.13	25
1,1,2-Trichloroethane	3.75	3.75	3.69	100	98.4	70.0-130	1.61	25
Tetrachloroethylene	3.75	3.84	3.73	102	99.5	70.0-130	2.91	25
Methyl Butyl Ketone	3.75	3.86	3.78	103	101	70.0-149	2.09	25



Volatile Organic Compounds (MS) by Method TO-15

[L1226385-01](#)

Dibromochloromethane	3.75	3.96	3.86	106	103	70.0-130	2.56	25
1,2-Dibromoethane	3.75	3.92	3.83	105	102	70.0-130	2.32	25
Chlorobenzene	3.75	3.98	3.92	106	105	70.0-130	1.52	25
Ethylbenzene	3.75	3.76	3.73	100	99.5	70.0-130	0.801	25

1 Cp

2 Tc

3 Ss

4 Cn

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3535889-1 06/07/20 08:28 • (LCSD) R3535889-2 06/07/20 09:17

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ppbv	ppbv	ppbv	%	%	%			%	%
m&p-Xylene	7.50	7.62	7.52	102	100	70.0-130			1.32	25
o-Xylene	3.75	3.69	3.65	98.4	97.3	70.0-130			1.09	25
Styrene	3.75	3.85	3.84	103	102	70.0-130			0.260	25
Bromoform	3.75	3.86	3.79	103	101	70.0-130			1.83	25
1,1,2,2-Tetrachloroethane	3.75	3.72	3.69	99.2	98.4	70.0-130			0.810	25
4-Ethyltoluene	3.75	4.07	3.99	109	106	70.0-130			1.99	25
1,3,5-Trimethylbenzene	3.75	3.81	3.77	102	101	70.0-130			1.06	25
1,2,4-Trimethylbenzene	3.75	3.85	3.80	103	101	70.0-130			1.31	25
1,3-Dichlorobenzene	3.75	4.08	4.07	109	109	70.0-130			0.245	25
1,4-Dichlorobenzene	3.75	4.27	4.19	114	112	70.0-130			1.89	25
Benzyl Chloride	3.75	3.68	3.67	98.1	97.9	70.0-152			0.272	25

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Volatile Organic Compounds (MS) by Method TO-15

[L1226385-01](#)



1,2-Dichlorobenzene	3.75	4.11	3.99	110	106	70.0-130	2.96	25
1,2,4-Trichlorobenzene	3.75	3.81	3.89	102	104	70.0-160	2.08	25
Hexachloro-1,3-butadiene	3.75	3.87	3.79	103	101	70.0-151	2.09	25
Naphthalene	3.75	3.67	3.69	97.9	98.4	70.0-159	0.543	25
Allyl Chloride	3.75	3.75	3.73	100	99.5	70.0-130	0.535	25
2-Chlorotoluene	3.75	3.85	3.78	103	101	70.0-130	1.83	25
Methyl Methacrylate	3.75	3.62	3.68	96.5	98.1	70.0-130	1.64	25
Tetrahydrofuran	3.75	3.73	3.72	99.5	99.2	70.0-137	0.268	25
2,2,4-Trimethylpentane	3.75	3.66	3.61	97.6	96.3	70.0-130	1.38	25
Vinyl Bromide	3.75	3.72	3.64	99.2	97.1	70.0-130	2.17	25
Isopropylbenzene	3.75	3.78	3.72	101	99.2	70.0-130	1.60	25
(S) 1,4-Bromofluorobenzene				97.9	97.5	60.0-140		



Guide to Reading and Understanding Your Laboratory Report

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Cp

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The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Tc Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier Description

Sr

6
Qc

8
Al

9
Sc

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE. * Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico ¹	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina ¹	DW21704
Georgia	NELAP	North Carolina ³	41
Georgia ¹	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky ^{1 6}	90010	South Carolina	84004
Kentucky ²	16	South Dakota	n/a
Louisiana	AI30792	Tennessee ^{1 4}	2006
Louisiana ¹	LA180010	Texas	T104704245-18-15
Maine	TN0002	Texas ⁵	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234

¹ Cp

² Tc

³ Ss

⁴ Cn

⁵ Sr

⁶ Qc

⁷ Gl

⁸ Al

⁹ Sc

State Accreditations

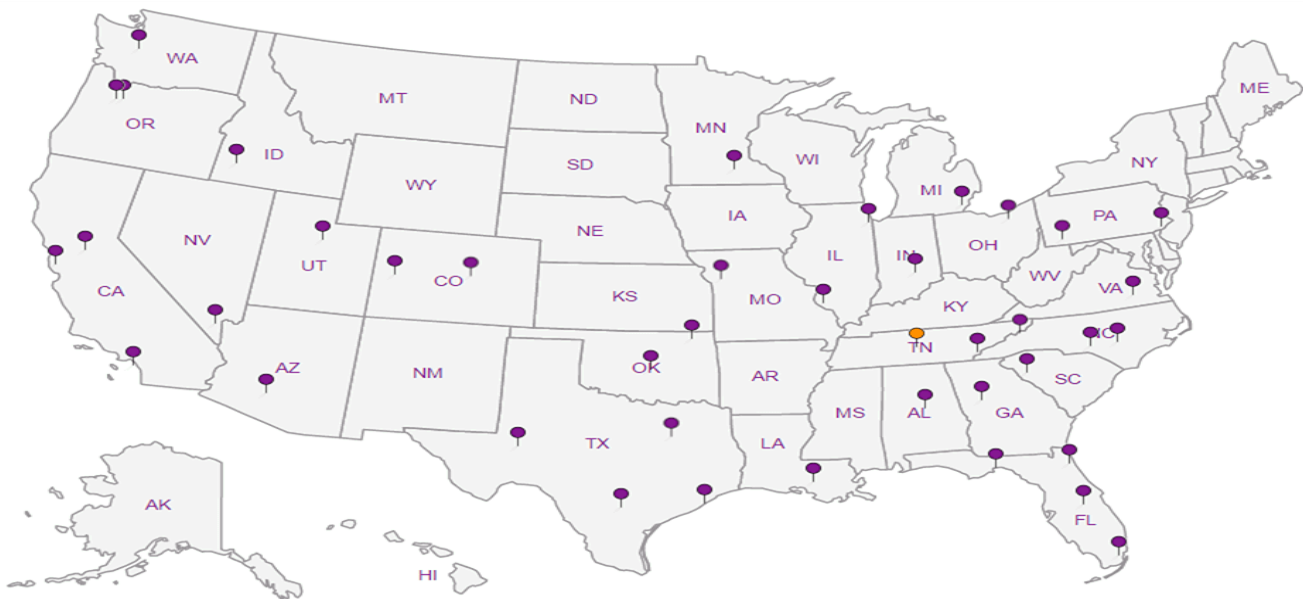
EPA-Crypto

TN00003

¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



ACCOUNT:

PROJECT:

SDG:

DATE/TIME:

PAGE:

ANALYTICAL REPORT

June 18, 2020

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

CEA, Inc. - Lexington, VA

Sample Delivery Group: L1228721
Samples Received: 06/12/2020
Project Number: L3720
Description: VDOT

Report To: Josh Seaman
648 Waddell Street
Lexington, VA 24450

Entire Report Reviewed By:



Pam Langford
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.





		1	¹Cp
Cp: Cover Page		1	²Tc
Tc: Table of Contents		2	³Ss
Ss: Sample Summary		3	⁴Cn
Cn: Case Narrative		4	⁵Sr
Sr: Sample Results		5	⁶Qc
T-1 (7.5') L1228721-01		5	⁷Gl
T-2 (5') L1228721-02		6	⁸Al
Qc: Quality Control Summary		7	⁹Sc
Total Solids by Method 2540 G-2011		7	
Volatile Organic Compounds (GC) by Method 8015D/GRO		8	
Volatile Organic Compounds (GC/MS) by Method 8260B		9	
Semi-Volatile Organic Compounds (GC) by Method 8015		10	
Gl: Glossary of Terms		11	
Al: Accreditations & Locations		12	
Sc: Sample Chain of Custody		13	

SAMPLE SUMMARY



date/time	Collected by	Collected date/time	Received
T-1 (7.5') L1228721-01 Solid	CJY	06/10/20 13:00	06/12/20 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Total Solids by Method 2540 G-2011	WG1493115	1	06/16/20 16:41	06/16/20 16:49	KBC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO	WG1493368	25	06/10/20 13:00	06/16/20 17:41	DWR	Mt. Juliet, TN
Volatile Organic Compounds (GC/MS) by Method 8260B	WG1492565	1	06/10/20 13:00	06/15/20 05:59	BMB	Mt. Juliet, TN
Semi-Volatile Organic Compounds (GC) by Method 8015	WG1493500	1	06/16/20 19:41	06/17/20 17:18	FM	Mt. Juliet, TN

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
T-2 (5') L1228721-02 Solid						
Total Solids by Method 2540 G-2011 TN	WG1493115	1	06/16/20 16:41	06/16/20 16:49	KBC	Mt. Juliet, TN
Volatile Organic Compounds (GC) by Method 8015D/GRO TN	WG1493368	25	06/10/20 13:30	06/16/20 18:02	DWR	Mt. Juliet, TN



Volatile Organic Compounds (GC/MS) by Method 8260B TN	WG1492565	1	06/10/20 13:30	06/15/20 06:18	BMB Mt. Juliet,
Semi-Volatile Organic Compounds (GC) by Method 8015 TN	WG1493500	1	06/16/20 19:41	06/17/20 17:31	FM Mt. Juliet,

- 1
Cp
- 2
Tc
- 3
Ss
- 4
Cn
- 5
Sr
- 6
Qc
- 7
Gl
- 8
Al
- 9
Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Pam Langford
Project Manager



Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
Total Solids	85.5		1	06/16/2020 16:49	WG1493115

Volatile Organic Compounds (GC) by Method 8015D/GRO

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		2.92	25	06/16/2020 17:41	WG1493368 WG1493368
(S) a,a,a-Trifluorotoluene(FID)	103		77.0-120		06/16/2020 17:41	

Volatile Organic Compounds (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	0.00792		0.00117	1	06/15/2020 05:59	
Toluene	ND		0.00585	1	06/15/2020 05:59	
Ethylbenzene	0.00438		0.00292	1	06/15/2020 05:59	
Total Xylenes	0.0171		0.00760	1	06/15/2020 05:59	

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 GI

8 AI

9 Sc



Methyl tert-butyl ether	ND	0.00117	1	06/15/2020 05:59	WG1492565 WG1492565 WG1492565 WG1492565 WG1492565 WG1492565 WG1492565
Naphthalene	ND	0.0146	1	06/15/2020 05:59	
(S) Toluene-d8	94.6	75.0-131		06/15/2020 05:59	
(S) 4-Bromofluorobenzene	97.4	67.0-138		06/15/2020 05:59	
(S) 1,2-Dichloroethane-d4	99.1	70.0-130		06/15/2020 05:59	WG1492565

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

Semi-Volatile Organic Compounds (G C) by Method 8015

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		4.68	1	06/17/2020 17:18	WG1493500 WG1493500
(S) o-Terphenyl	60.6		18.0-148		06/17/2020 17:18	

Total Solids by Method 2540 G-2011

Analyte	Result %	Qualifier	Dilution	Analysis date / time	Batch

Total Solids 70.6 1 06/16/2020 16:49 [WG1493115](#)

Volatiles (GC) by Method 8015D/GRO

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) Low Fraction	ND		3.54	25	06/16/2020 18:02	WG1493368 WG1493368
(S) a,a,a-Trifluorotoluene(FID)	107		77.0-120		06/16/2020 18:02	

Volatiles (GC/MS) by Method 8260B

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Benzene	ND		0.00142	1	06/15/2020 06:18	
Toluene	ND		0.00709	1	06/15/2020 06:18	
Ethylbenzene	ND		0.00354	1	06/15/2020 06:18	
Total Xylenes	ND		0.00921	1	06/15/2020 06:18	

Methyl tert-butyl ether	ND	0.00142	1	06/15/2020 06:18	WG1492565 WG1492565 WG1492565 WG1492565 WG1492565 WG1492565 WG1492565
Naphthalene	ND	0.0177	1	06/15/2020 06:18	
<i>(S) Toluene-d8</i>	94.6	75.0-131		06/15/2020 06:18	
<i>(S) 4-Bromofluorobenzene</i>	97.1	67.0-138		06/15/2020 06:18	
<i>(S) 1,2-Dichloroethane-d4</i>	97.6	70.0-130		06/15/2020 06:18	WG1492565

Semi-Volatile Organic Compounds (GC) by Method 8015

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
TPH (GC/FID) High Fraction	ND		5.67	1	06/17/2020 17:31	WG1493500 WG1493500
<i>(S) o-Terphenyl</i>	75.1		18.0-148		06/17/2020 17:31	

QUALITY CONTROL SUMMARY



[L1228721-01,02](#)

WG1493115

Total Solids by Method 2540 G-2011

Method Blank (MB)

(MB) R3539530-1 06/16/20 16:49

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	%		%	%
Total Solids	0.000			

L1228716-09 Origin il Sample (OS) • Duplicate (DUP)

(OS) L1228716-09 06/16/20 16:49 • (DUP) R3539530-3 6/16/20 16:49

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP RPD Limits
	%	%		%	%
Total Solids	87.9	88.4	1	0.612	10

Laboratory Control Sample (L S)

(LCS) R3539530-2 06/16/20 16:49

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	%	%	%	%	
Total Solids	50.0	50.0	100	85.0-115	

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

QUALITY CONTROL SUMMARY



[L1228721-01,02](#)

WG1493368

Volatile Organic Compounds (GC) by Method 8015D/GRO

Method Blank (MB)

(MB) R3539281-2 06/16/20 11:58

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg

TPH (GC/FID) Low Fraction U 0.0217 0.100

(S)
a,a,a-Trifluorotoluene(FID) 106 77.0-120

Laboratory Control Sample (LCS)

(LCS) R3539281-1 06/16/20 11:16

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/kg	mg/kg	%	%	

TPH (GC/FID) Low Fraction 5.50 5.95 108 72.0-127

(S)
a,a,a-Trifluorotoluene(FID) 99.9 77.0-120

L1228715-27 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1228715-27 06/16/20 17:21 • (MS) R3539281-3 06/17/20 08:45 • (MSD) R3539281-4 06/17/20 09:06

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%

TPH (GC/FID) Low Fraction 545 54.0 445 482 71.7 78.5 100 10.0-151 7.98 28

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

QUALITY CONTROL SUMMARY



[L1228721-01,02](#)

(S)	95.9 <i>a,a,a</i> -Trifluorotoluene(FID)	93.0	77.0-120
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- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

WG1492565

Volatile Organic Compounds (GC/MS) by Method 8260B

Method Blank (MB)

(MB) R3539413-2 06/14/20 23:10

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Benzene	U		0.000467	0.00100
Ethylbenzene	U		0.000737	0.00250
Methyl tert-butyl ether	U		0.000350	0.00100
Naphthalene	U		0.00488	0.0125
Toluene	U		0.00130	0.00500
Xylenes, Total	U		0.000880	0.00650
(S) Toluene-d8	98.7			75.0-131
(S) 4-Bromofluorobenzene	96.4			67.0-138
(S) 1,2-Dichloroethane-d4	91.9			70.0-130

Laboratory Control Sample (LCS)

(LCS) R3539413-1 06/14/20 22:12

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	mg/kg	mg/kg	%	%	

QUALITY CONTROL SUMMARY



[L1228721-01,02](#)

¹ Cp

Benzene	0.125	0.121	96.8	70.0-123
Ethylbenzene	0.125	0.123	98.4	74.0-126
Methyl tert-butyl ether	0.125	0.123	98.4	66.0-132
Naphthalene	0.125	0.114	91.2	59.0-130
Toluene	0.125	0.110	88.0	75.0-121
Xylenes, Total	0.375	0.335	89.3	72.0-127
<i>(S) Toluene-d8</i>			94.4	75.0-131
<i>(S) 4-Bromofluorobenzene</i>			99.0	67.0-138
<i>(S) 1,2-Dichloroethane-d4</i>			104	70.0-130

L1228377-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1228377-01 06/15/20 03:45 • (MS) R 3539413-3 06/15/20 06:55 • (MSD) R35394 13-4 06/15/2007:14

Analyte	Spike Amount mg/kg	Original Result mg/kg	MS Result mg/kg	MSD Result mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Benzene	0.124	ND	0.119	0.121	96.0	97.6	1	10.0-149			1.67	37
Ethylbenzene	0.124	ND	0.122	0.124	98.4	100	1	10.0-160			1.63	38
Methyl tert-butyl ether	0.124	ND	0.0964	0.0989	77.7	79.8	1	11.0-147			2.56	35
Naphthalene	0.124	ND	0.156	0.103	126	83.1	1	10.0-160	J3		40.9	36
Toluene	0.124	ND	0.108	0.112	87.1	90.3	1	10.0-156			3.64	38

QUALITY CONTROL SUMMARY



[L1228721-01,02](#)

Xylenes, Total	0.372	ND	0.355	0.334	95.4	89.8	1	10.0-160	6.10	38
<i>(S) Toluene-d8</i>					95.7	94.9		75.0-131		
<i>(S) 4-Bromofluorobenzene</i>					99.9	99.1		67.0-138		
<i>(S) 1,2-Dichloroethane-d4</i>					90.9	90.9		70.0-130		

1
Cp

2
Tc

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Ss

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Cn

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Sr

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Qc

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Gl

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Al

9
Sc

WG1493500

Semi-Volatile Organic Compounds (GC) by Method 8015

Method Blank (MB)

(MB) R3539880-1 06/17/20 13:43

Analyte	MB Result	<u>MB Qualifier</u>	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
TPH (GC/FID) High Fraction	U		0.769	4.00
<i>(S) o-Terphenyl</i>				
	85.3			18.0-148

Laboratory Control Sample (LCS)

(LCS) R3539880-2 06/17/20 13:56

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
	mg/kg	mg/kg	%	%	
TPH (GC/FID) High Fraction	50.0	42.6	85.2	50.0-150	
<i>(S) o-Terphenyl</i>					
			93.2	18.0-148	

L1228783-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

QUALITY CONTROL SUMMARY



[L1228721-01,02](#)

1
Cp

(OS) L1228783-06 06/17/20 14:08 • (MS) R3539880-3 06/17/20 14:21 • (MSD) R3539880-4 06/17/2014:34

Spike Amount (dry) Original Result (dry) MS Result (dry) MSD Result (dry) MS Rec.

Analyte	mg/kg	mg/kg	mg/kg	mg/kg	%	MSD Rec.	Dilution	Rec. Limits	<u>MS Qualifier</u>	<u>MSD Qualifier</u>	RPD	RPD Limits
								%			%	%
TPH (GC/FID) High Fraction	62.9	ND	47.3	46.1	75.3	73.2	1	50.0-150			2.75	20
<i>(S) o-Terphenyl</i>					74.2	81.0		18.0-148				



Guide to Reading and Understanding Your Laboratory Report

1

Cp

2

Tc

3

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Tc Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
RDL (dry)	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.

Abbreviations and Definitions

4

Cn

5

Sr

6

Qc

8

Ss

Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J3	The associated batch QC was outside the established quality control range for precision.

ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.



Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey--NELAP	TN002

California	2932
Colorado	TN00003
Connecticut	PH-0197
Florida	E87487
Georgia	NELAP
Georgia ¹	923
Idaho	TN00003
Illinois	200008
Indiana	C-TN-01
Iowa	364
Kansas	E-10277
Kentucky ^{1 6}	90010
Kentucky ²	16
Louisiana	AI30792
Louisiana ¹	LA180010
Maine	TN0002
Maryland	324
Massachusetts	M-TN003
Michigan	9958
Minnesota	047-999-395
Mississippi	TN00003
Missouri	340
Montana	CERT0086

New Mexico ¹	n/a	Pace
New York	11742	
North Carolina	Env375	
North Carolina ¹	DW21704	
North Carolina ³	41	
North Dakota	R-140	
Ohio-VAP	CL0069	
Oklahoma	9915	
Oregon	TN200002	
Pennsylvania	68-02979	
Rhode Island	LAO00356	
South Carolina	84004	
South Dakota	n/a	
Tennessee ^{1 4}	2006	
Texas	T104704245-18-15	
Texas ⁵	LAB0152	
Utah	TN00003	
Vermont	VT2006	
Virginia	460132	
Washington	C847	
West Virginia	233	
Wisconsin	9980939910	National is the only environmental laboratory
Wyoming	A2LA	

- 1 Cp
- 2 Tc
- 3 Ss
- 4 Cn
- 5 Sr
- 6 Qc
- 7 Gl
- 8 Al
- 9 Sc

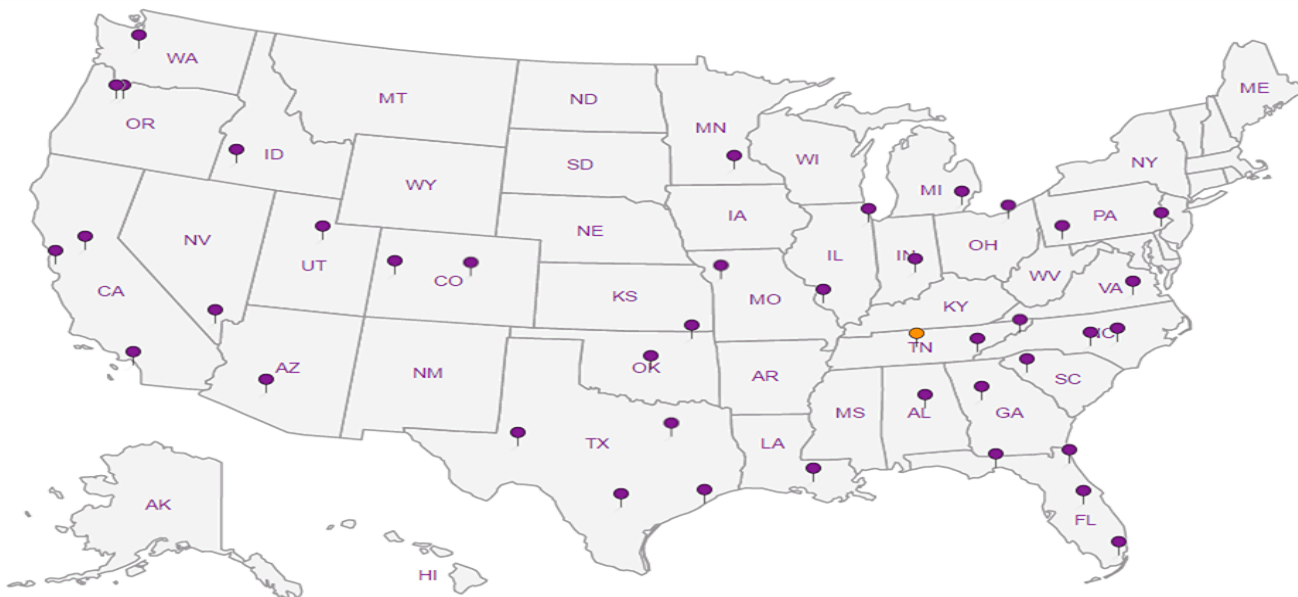
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 ⁵	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234

accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE. * Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations



¹ Drinking Water ² Underground Storage Tanks ³ Aquatic Toxicity ⁴ Chemical/Microbiological ⁵ Mold ⁶ Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.

