



June 22, 2017

Maryland Department of the Environment
Oil Control Program
1800 Washington Boulevard
Baltimore, Maryland 21230-1719
Attn: Ms. Jeannette DeBartolomeo

RE: Dual-Phase Extraction System Remedial Action Progress Report

Calvert Citgo
2815 North East Road
North East, MD
MDE OCP Case No. 1992-2616CE
Facility No. 5678

REPSG Project Reference Number 5977.130.02

Regulatory Information

Regulatory Agency:	Maryland Department of the Environment
Agency Contact:	Jeannette DeBartolomeo
Case Number:	OCP Case No. 1992-2616CE
Facility ID:	5678
General Discharge Permit Number:	2017-OGR-25712
NPDES Permit Number:	MDG919013
Vacuum Extraction System Permit:	015-0173-9-0226
Current Case Status:	Quarterly groundwater sampling. On-Site and off-Site potable well monitoring. Vapor Extraction/Groundwater Extraction (DPE) system in operation.
Reporting Period:	April 24, 2017 to June 21, 2017
DPE System Operating Days:	58

Introduction

A Dual-Phase Extraction (DPE) system at the Site was initially started on April 24, 2017. The system consists of a network of monitoring wells that have been converted to extraction wells piped to a central remediation system. At this time the DPE system is operating on well MW-005R only. Details specific to the design and current configuration of the DEP system were previously provided in *REPSG's DPE System Start-Up Report* dated May 19, 2017.

DPE System Performance

The DPE system began operation on April 24, 2017. The DPE system utilizes extraction of vapor and groundwater for mass removal of petroleum-related regulated compounds in the unsaturated zone from the subsurface. **Figure 1** illustrates the Site vicinity and **Figure 2** depicts the groundwater monitoring well network, on-Site and off-Site potable wells, vapor extraction wells, vapor monitoring points, and the DPE system.

As planned in REPSG’s *DPE System Start-Up Report*, dated May 19, 2017, a privacy-screened fence was installed around the complete DPE system, including the catalytic oxidizer, frac tank, and electrical service panel on May 25, 2017. **Figure 2** illustrates the privacy-screened fence area.

During the quarterly groundwater monitoring event (performed on May 31 and June 1, 2017, depths to groundwater and subsequent groundwater elevations were recorded. **Figure 3** illustrates groundwater elevations and flow direction, in the shallow wells, as observed during the quarterly groundwater monitoring event while the DPE system was operating.

System performance has been monitored through readings taken from diagnostic gauges on system equipment. System monitoring worksheets are included in **Attachment 3**.

As of June 21, 2017, the DPE system had recovered approximately 8,250 gallons of liquid have been processed by the system. During this reporting period, the DPE system has been extracting vapor at an average rate of 38.2 standard cubic feet per minute (SCFM). **Table 1** shows the total liquid removed by the DPE system and **Table 2** shows the total vapor recovery by the DPE system during the reporting period. Since system startup, the DPE system has removed approximately 75 pounds of volatile organic compounds (VOCs). No light non-aqueous phase liquid was recovered during this reporting period.

Table 1 - Contaminant Mass Removed - Liquid

Monitoring Period		Operating Hours	GW Recovered, Period	Average Extraction Rate for System	Total Dissolved VOC Concentration in Recovered GW	VOC Recovery, Period
start	end	(hours)	(gallons)	(gpm)	(µg/l)	(lbs)
4/24/17	6/21/17	1,056	8,250	0.13	14,963	0.46

Table 2 - Contaminant Mass Removed - Vapor

Monitoring Period		Operating Hours	Avg. Vacuum, System Inlet	Airflow	Total VOC Concentration in Vapor	VOC Recovery, Period
start	end	(hours)	(in "Hg)	(cfm)	(ppmv)	(lbs)
4/24/17	6/21/17	1,056	9.14	38.22	134.46	76.41

DPE System Vapor Extraction

During extraction, REPSG measured concentrations of volatile organic compounds (VOCs) in the exhaust of the system to ensure acceptable levels were being emitted into the atmosphere. Measurements were made utilizing a photoionization detector (PID) at two discrete locations: pre-catalytic oxidizer and post-catalytic oxidizer. A summary of the observed PID readings is provided in **Table 3**:

Table 3 - DPE System PID Readings

	Pre-Catalytic Oxidizer (ppm)	Post-Catalytic Oxidizer (ppm)
May 10, 2017	280	0.4
May 12, 2017	370	4
May 16, 2017	344	70
May 24, 2017	362	24.3
May 25, 2017	450	0.5
May 31, 2017	340	0
June 13, 2017	30	0
June 21, 2017	4,400	0

All PID readings were in-line with REPSG’s expectations and demonstrated that the catalytic oxidizer has been effective in the removal of VOCs from the extracted vapor.

As discussed in REPSG’s *DPE System Start-Up Report*, dated May 19, 2017, vapor influent (pre-catalytic oxidizer, sample name “PRE-VES”) and effluent (post-catalytic oxidizer, sample name “POST-VES”) samples were collected on May 12, 2017. The vapor samples were analyzed for VOCs via EPA Method TO-15 at Alpha Analytical (Mansfield, MA). Analytical results were received and compared to the EPA’s Regional Screening Values for Composite Workers¹. The EPA provides both carcinogenic and noncarcinogenic screening levels for certain compounds due to differences in exposure. A composite worker is defined as a long-term receptor exposed during the work day who is a full time employee working on-Site and who spends most of the workday conducting maintenance activities outdoors. REPSG considers this screening value to be the most appropriate comparison criteria for the Site. This comparison

¹ United States Environmental Protection Agency. Regional Screening Levels for Chemical Contaminants at Superfund Sites. (May 31, 2017).

identified concentrations of benzene and n-Hexane above the composite worker screening levels. A summary of detections is provided in **Table 4**:

Table 4 - Effluent Vapor Analytical Results

Compound	Sample Name		PRE-VES	POST-VES
	CW Carcinogenic	CW Noncarcinogenic	(µg/m ³)	
2,2,4-Trimethylpentane	**	**	29000	546
Benzene	1.6	<i>130</i>	34800	119
Benzene, 1,2,4-trimethyl	**	<i>31</i>	<i>1310</i>	ND
Benzene, 1,3,5-trimethyl-	**	**	708	ND
Cyclohexane	**	<i>26000</i>	22300	247
Ethanol	**	**	6010	ND
Ethylbenzene	4.9	<i>4400</i>	5520	ND
m/p-xylene	**	<i>440</i>	<i>17700</i>	ND
n-Heptane	**	**	56600	367
n-Hexane	**	<i>3100</i>	253000	<i>5890</i>
o-Xylene	**	<i>440</i>	<i>5340</i>	ND
p-Ethyltoluene	**	**	624	ND
Toluene	**	<i>22000</i>	<i>67100</i>	ND
Xylene (total)	**	<i>440</i>	<i>23000</i>	ND
Total VOCs	**	**	490,012	7,169

Bold values exceed the Composite Worker carcinogenic screening level. *Italicized values* exceed the Composite worker Noncarcinogenic screening levels. ND = Compound not detected above laboratory method detection limit (MDL). ** = Screening level does not exist.

The complete laboratory analytical report is provided in **Attachment 2**.

The next set of influent and effluent vapor samples are scheduled to be collected in July 2017. Analytical results of this sampling will be provided in REPSG's July 2017 progress report.

DPE System Liquid Recovery

As discussed in REPSG's *DPE System Start-Up Report*, effluent water samples (Outfall 001) were collected on April 26, 2017 and also on May 12, 2017). Effluent water samples were collected via a sampling port attached to the piping run between the system trailer and the frac tank and were submitted under chain-of-custody to ALS Environmental Laboratories (Middletown, PA). Effluent water samples were collected to determine the concentrations of regulated compounds in extracted water, which allows for the determination of mass removal rates by water. This data collection will be utilized to inform future decisions in regards to increasing or decreasing water recovery rates, determining potential on-site water discharge ability, and/or the need for the addition of water treatment via liquid phase carbon or other

methods. Analytical results were compared to the MDE Groundwater Standards². This comparison identified the presence of 1,2-dichloroethane, benzene, and toluene at concentrations above the groundwater standards. A summary of detections from both effluent sampling events is provided in **Table 5**:

Table 5 - Effluent Liquid Analytical Results

Sample Location		OUTFALL 001	OUTFALL 001
Sample Date		04/26/2017	05/12/2017
Compound	MDE Groundwater Standards	(µg/L)	
1,2-Dichloroethane	5	<0.32U	8.6J
2-Hexanone	**	36.7	<13U
Acetone	550	170	164
Benzene	5	1300	867
Carbon disulfide	100	0.3J	<2.3U
Ethylbenzene	700	261	142
Isopropyl Ether	**	<0.25U	2.5J
m/p-xylene	**	1050	653
Methyl chloride	19	3	<3.1
Methyl ethyl ketone	700	257	65.9J
Methyl tert-butyl ether	20	7.8	5.5J
Methylene chloride	5	<0.45U	56.8
o-Xylene	**	495	297
Tert-Amyl alcohol	**	770	587
tert-Butylalcohol	**	344	340
Toluene	1000	2870	1710
Xylene (total)	10000	1550	950
Total VOCs	**	9,115	5,849

Bold values exceed MDE Groundwater standard. U = Compound was not detected above the laboratory reporting limit, the MDL is provided. J = Analytical result was above the MDL, but less than the laboratory reporting limit. ** = Standard does not exist.

The complete laboratory analytical report is provided in **Attachment 2**.

In addition, effluent liquid was collected for laboratory analysis on June 21, 2017. Analytical results of this sampling are currently pending and will be provided in REPSG's July 2017 progress report.

All liquid extracted from the DPE system has been stored on-Site in a frac tank since system startup. Recovered liquid has been collected for proper disposal from the frac tank twice since system startup. On May 25, 2017, Monarch Environmental Services, Inc. (Woodstown, NJ)

² Maryland Department of the Environment (MDE) Voluntary Cleanup Program (VCP): Generic Numeric Cleanup Standards for Groundwater for Type I & II Aquifers, Tables 1 and 2 (March 2008).

recovered approximately 2,886 gallons from the frac tank. Monarch returned to the Site on June 14, 2017 and recovered approximately 2,100 gallons of recovered liquid.

Ongoing Maintenance

Since startup, REPSG has worked to optimize the efficiency and performance of the DPE system. DPE system alarms have been triggered on several occasions, causing temporary system shutdowns. Most notably, on June 12, 2017, REPSG received a message that the system had been shut down due to a malfunctioning part on the catalytic oxidizer. REPSG mobilized to the Site with the DPE system manufacturers, Remedial Equipment & Services (RES), on June 13 and 14, 2017 to replace the malfunctioning part. As of June 14, 2017, the system is again performing as intended.

REPSG will continue to operate the system as indicated in the *DPE System Start-Up Report*, with withdrawal occurring at MW-005R only, throughout the month of July 2017. Next steps for system operation, including the potential commencement of extraction on additional wells as well as the potential usage of both vapor phase carbon and liquid phase carbon are continuing to be evaluated and will be discussed/presented as appropriate in upcoming remedial progress reports.

Sincerely,



David Bishop
Environmental Scientist



Suzanne Shourds
Project Manager

React Environmental Professional Services Group, Inc

Remedial Action Progress Report
June 22, 2017

Calvert Citgo
2815 North East Road
North East, MD
REPSG Project Reference No.5977.130.02

ATTACHMENT 1: FIGURES

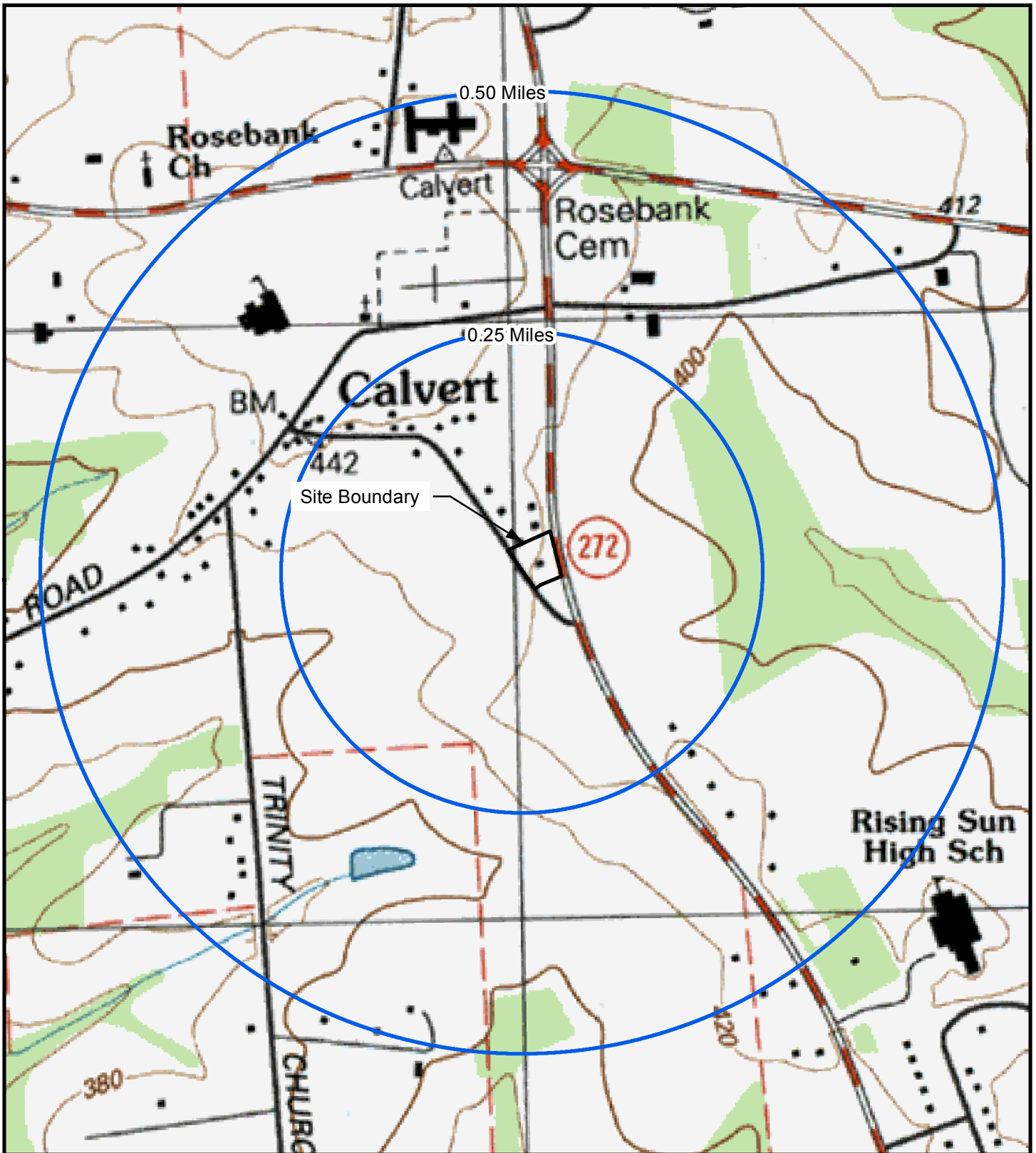


Figure 1: Site Location



REPSG
 React Environmental
 Professional Services Group, Inc.

MAP SCALE: 1 inch = 750 feet
 0 162.5 325 650 975 1,300
 Feet

PROJECT NAME: CALVERT CITGO
PROJECT ADDRESS: 2815 NORTH EAST ROAD, NORTH EAST, MD
PROJECT NUMBER: 005977
DATE: JUNE 2017



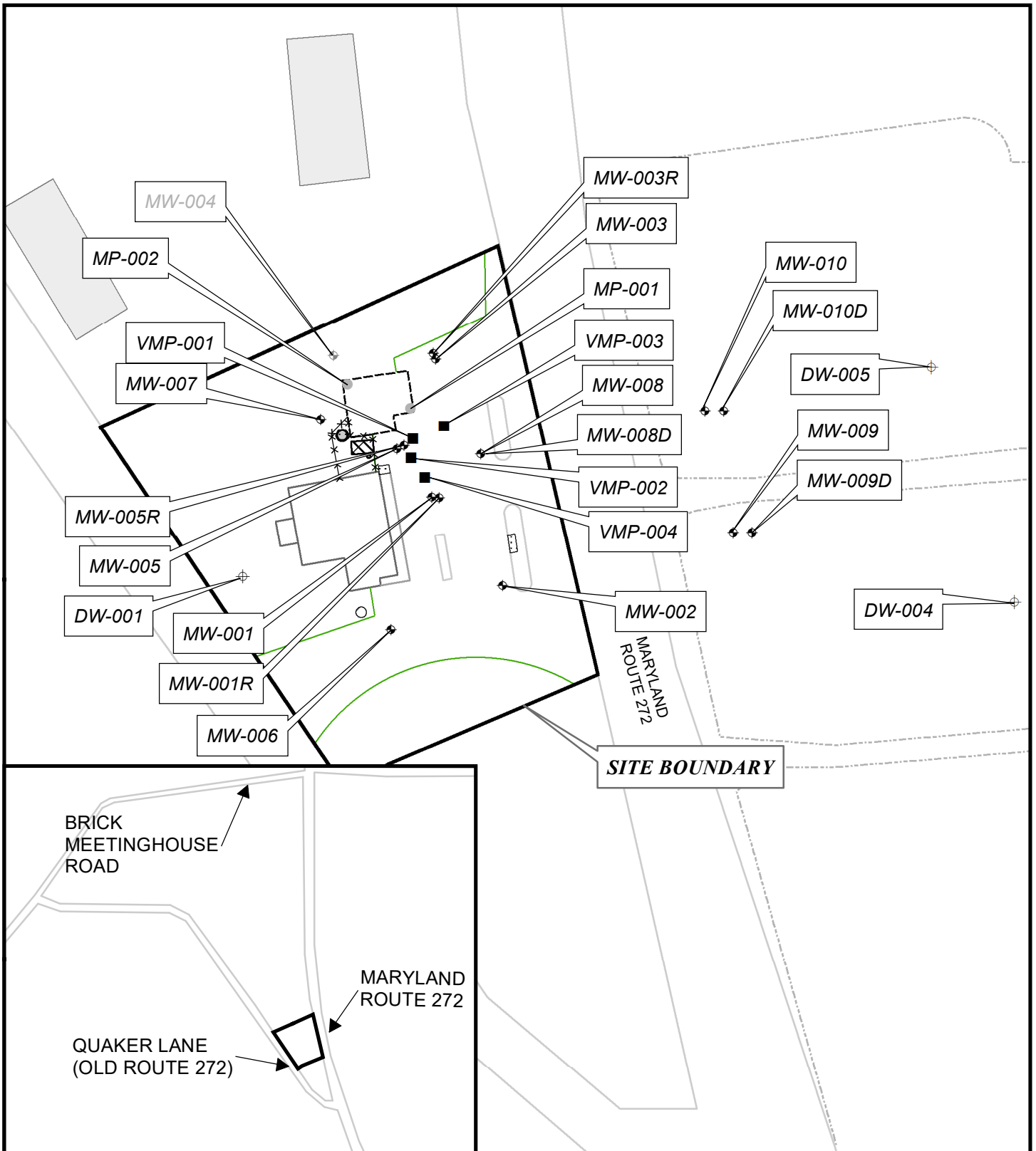


FIGURE 2:
SITE PLAN

- | | | | |
|----------------------------------|---------------------------|----------------------|---------------------|
| ◆ Monitoring Well | ● Leak Detection Well | ■ Catalytic Oxidizer | ▤ Kerosene Pump |
| ◆ Lost/Abandoned Monitoring Well | ■ Vapor Monitoring Points | ▤ Frac Tank | ▤ Off-Site Building |
| ⊕ On-Site Potable Well | ▤ Remediation Trailer | ▤ Diesel Pump | ▤ Septic Tank |
| | | | xxx Fencing |

REPSG
React Environmental
Professional Services Group, Inc.

MAP SCALE: 1 inch = 75 feet

0 15 30 60 90 120 Feet

PROJECT NAME: CALVERT CITGO
PROJECT ADDRESS: 2815 NORTH EAST ROAD, NORTH EAST, MD
PROJECT NUMBER: 005977
DATE: JUNE 2017



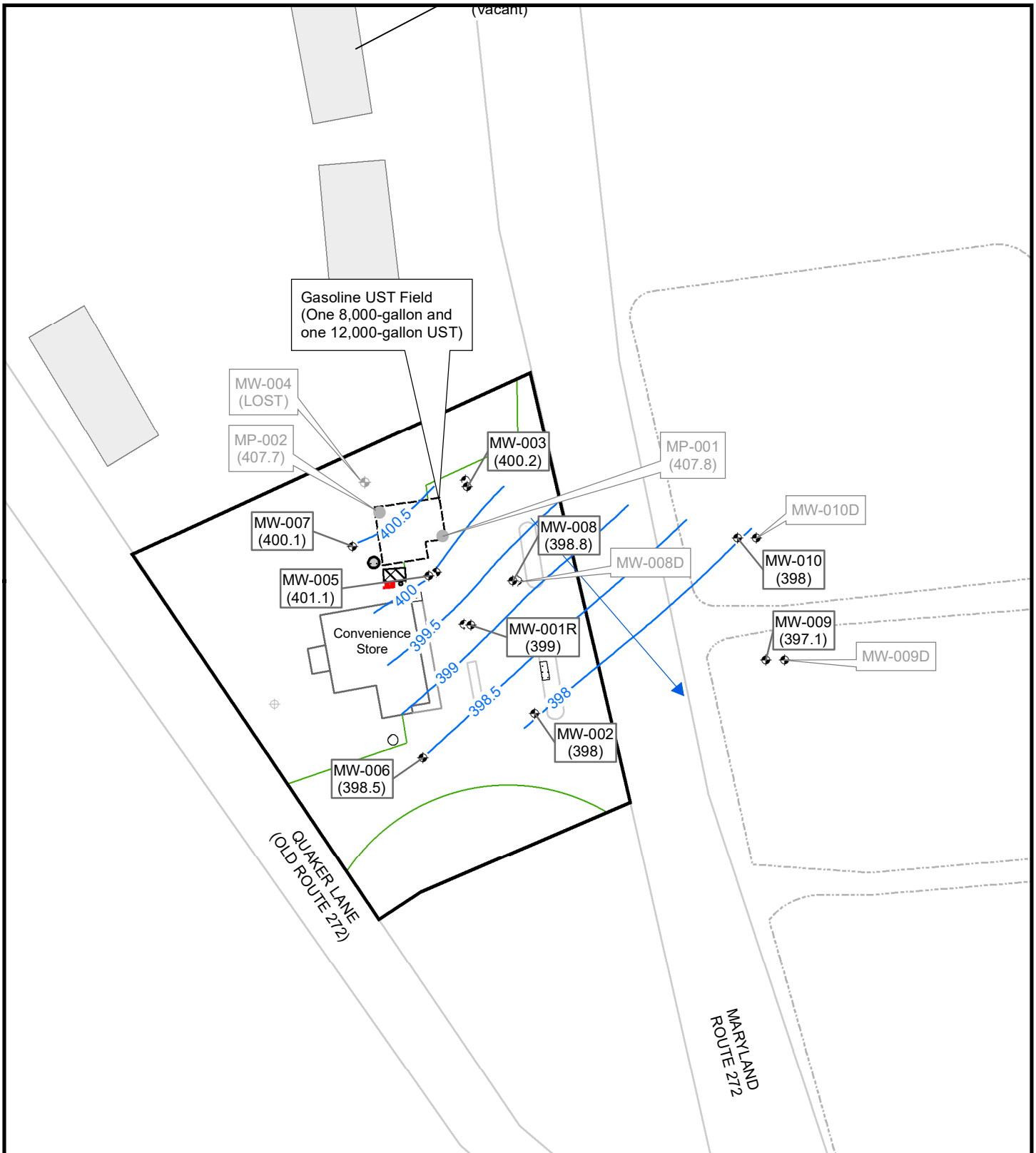
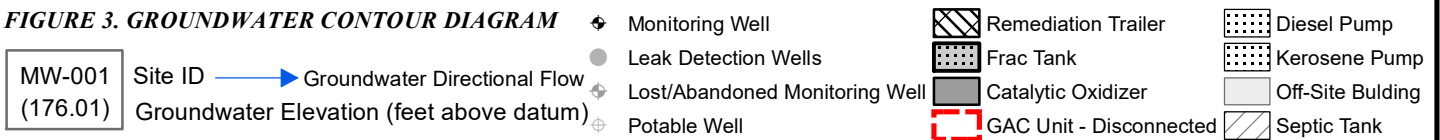


FIGURE 3. GROUNDWATER CONTOUR DIAGRAM



REPSG
 React Environmental
 Professional Services Group, Inc.

MAP SCALE: 1 inch = 75 feet

0 15 30 60 90 120 Feet

PROJECT NAME: CALVERT CITGO
PROJECT ADDRESS: 2815 NORTH EAST ROAD, NORTH EAST, MD
PROJECT NUMBER: 005977
DATE: JUNE 2017



Remedial Action Progress Report
June 22, 2017

Calvert Citgo
2815 North East Road
North East, MD
REPSG Project Reference No.5977.130.02

ATTACHMENT 2: LABORATORY ANALYTICAL REPORTS



ANALYTICAL REPORT

Lab Number:	L1715684
Client:	REPSG, Inc. 6901 Kingsessing Ave. Suite 201 Philadelphia, PA 19142-0377
ATTN:	Brenda MacPhail
Phone:	(215) 729-3220
Project Name:	5977-CALVERT CITGO
Project Number:	5977
Report Date:	05/22/17

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), NJ NELAP (MA015), CT (PH-0141), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-13-00067), USFWS (Permit #LE2069641).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: 5977-CALVERT CITGO
Project Number: 5977

Lab Number: L1715684
Report Date: 05/22/17

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L1715684-01	PRE-VES	SOIL_VAPOR	NORTH EAST, MD	05/12/17 11:02	05/12/17
L1715684-02	POST-VES	SOIL_VAPOR	NORTH EAST, MD	05/12/17 11:01	05/12/17

Project Name: 5977-CALVERT CITGO
Project Number: 5977

Lab Number: L1715684
Report Date: 05/22/17

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively. When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. All specific QC information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications. Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances the specific failure is not narrated but noted in the associated QC table. The information is also incorporated in the Data Usability format of our Data Merger tool where it can be reviewed along with any associated usability implications.

Please see the associated ADEx data file for a comparison of laboratory reporting limits that were achieved with the regulatory Numerical Standards requested on the Chain of Custody.

HOLD POLICY

For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Client Service Representative and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Client Services at 800-624-9220 with any questions.

Project Name: 5977-CALVERT CITGO
Project Number: 5977

Lab Number: L1715684
Report Date: 05/22/17

Case Narrative (continued)

Volatile Organics in Air

Canisters were released from the laboratory on May 4, 2017. The canister certification results are provided as an addendum.

Sample L1715684-01: The sample was diluted and re-analyzed to quantify the results within the calibration range. The result(s) should be considered estimated, and are qualified with an E flag, for any compound(s) that exceeded the calibration range in the initial analysis. The re-analysis was performed only for the compound(s) that exceeded the calibration range.

Sample L1715684-01 and -02: The samples have elevated detection limits due to the dilution required by the elevated concentrations of target compounds in the samples.

Sample L1715684-01 and -02: The presence of Acetone could not be determined in these samples due to a non-target compound interfering with the identification and quantification of this compound.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:  Christopher J. Anderson

Title: Technical Director/Representative

Date: 05/22/17

AIR

Project Name: 5977-CALVERT CITGO
Project Number: 5977

Lab Number: L1715684
Report Date: 05/22/17

SAMPLE RESULTS

Lab ID: L1715684-01 D
 Client ID: PRE-VES
 Sample Location: NORTH EAST, MD
 Matrix: Soil_Vapor
 Analytical Method: 48,TO-15
 Analytical Date: 05/19/17 08:26
 Analyst: RY

Date Collected: 05/12/17 11:02
 Date Received: 05/12/17
 Field Prep: Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab								
Propylene	ND	272	--	ND	468	--		543.5
Dichlorodifluoromethane	ND	109.	--	ND	539	--		543.5
Chloromethane	ND	109.	--	ND	225	--		543.5
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	109.	--	ND	762	--		543.5
Vinyl chloride	ND	109.	--	ND	279	--		543.5
1,3-Butadiene	ND	109.	--	ND	241	--		543.5
Bromomethane	ND	109.	--	ND	423	--		543.5
Chloroethane	ND	109.	--	ND	288	--		543.5
Ethyl Alcohol	3190	2720	--	6010	5130	--		543.5
Vinyl bromide	ND	109.	--	ND	477	--		543.5
Acetone	ND	544.	--	ND	1290	--		543.5
Trichlorofluoromethane	ND	109.	--	ND	613	--		543.5
iso-Propyl Alcohol	ND	272.	--	ND	669	--		543.5
1,1-Dichloroethene	ND	109.	--	ND	432	--		543.5
Methylene chloride	ND	272	--	ND	945	--		543.5
3-Chloropropene	ND	109.	--	ND	341	--		543.5
Carbon disulfide	ND	109.	--	ND	339	--		543.5
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	109.	--	ND	835	--		543.5
trans-1,2-Dichloroethene	ND	109.	--	ND	432	--		543.5
1,1-Dichloroethane	ND	109.	--	ND	441	--		543.5
Methyl tert butyl ether	ND	109.	--	ND	393	--		543.5
Vinyl acetate	ND	544.	--	ND	1920	--		543.5
2-Butanone	ND	272.	--	ND	802	--		543.5
cis-1,2-Dichloroethene	ND	109.	--	ND	432	--		543.5



Project Name: 5977-CALVERT CITGO
Project Number: 5977

Lab Number: L1715684
Report Date: 05/22/17

SAMPLE RESULTS

Lab ID: L1715684-01 D
 Client ID: PRE-VES
 Sample Location: NORTH EAST, MD

Date Collected: 05/12/17 11:02
 Date Received: 05/12/17
 Field Prep: Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab								
Ethyl Acetate	ND	272.	--	ND	980	--		543.5
Chloroform	ND	109.	--	ND	532	--		543.5
Tetrahydrofuran	ND	272.	--	ND	802	--		543.5
1,2-Dichloroethane	ND	109.	--	ND	441	--		543.5
n-Hexane	71700	109	--	253000	384	--	E	543.5
1,1,1-Trichloroethane	ND	109.	--	ND	595	--		543.5
Benzene	10900	109	--	34800	348	--		543.5
Carbon tetrachloride	ND	109.	--	ND	686	--		543.5
Cyclohexane	6490	109	--	22300	375	--		543.5
1,2-Dichloropropane	ND	109.	--	ND	504	--		543.5
Bromodichloromethane	ND	109.	--	ND	730	--		543.5
1,4-Dioxane	ND	109.	--	ND	393	--		543.5
Trichloroethene	ND	109.	--	ND	586	--		543.5
2,2,4-Trimethylpentane	6200	109	--	29000	509	--		543.5
Heptane	13800	109	--	56600	447	--		543.5
cis-1,3-Dichloropropene	ND	109.	--	ND	495	--		543.5
4-Methyl-2-pentanone	ND	272.	--	ND	1110	--		543.5
trans-1,3-Dichloropropene	ND	109.	--	ND	495	--		543.5
1,1,2-Trichloroethane	ND	109.	--	ND	595	--		543.5
Toluene	17800	109	--	67100	411	--		543.5
2-Hexanone	ND	109.	--	ND	447	--		543.5
Dibromochloromethane	ND	109.	--	ND	929	--		543.5
1,2-Dibromoethane	ND	109.	--	ND	838	--		543.5
Tetrachloroethene	ND	109.	--	ND	739	--		543.5
Chlorobenzene	ND	109.	--	ND	502	--		543.5
Ethylbenzene	1270	109	--	5520	473	--		543.5
p/m-Xylene	4070	217	--	17700	943	--		543.5
Bromoform	ND	109.	--	ND	1130	--		543.5



Project Name: 5977-CALVERT CITGO
Project Number: 5977

Lab Number: L1715684
Report Date: 05/22/17

SAMPLE RESULTS

Lab ID: L1715684-01 D
 Client ID: PRE-VES
 Sample Location: NORTH EAST, MD

Date Collected: 05/12/17 11:02
 Date Received: 05/12/17
 Field Prep: Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab								
Styrene	ND	109.	--	ND	464	--		543.5
1,1,2,2-Tetrachloroethane	ND	109.	--	ND	749	--		543.5
o-Xylene	1230	109	--	5340	473	--		543.5
4-Ethyltoluene	127	109	--	624	536	--		543.5
1,3,5-Trimethylbenzene	144	109	--	708	536	--		543.5
1,2,4-Trimethylbenzene	267	109	--	1310	536	--		543.5
Benzyl chloride	ND	109.	--	ND	564	--		543.5
1,3-Dichlorobenzene	ND	109.	--	ND	655	--		543.5
1,4-Dichlorobenzene	ND	109.	--	ND	655	--		543.5
1,2-Dichlorobenzene	ND	109.	--	ND	655	--		543.5
1,2,4-Trichlorobenzene	ND	109.	--	ND	809	--		543.5
Naphthalene	ND	109.	--	ND	572	--		543.5
Hexachlorobutadiene	ND	109.	--	ND	1160	--		543.5

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	79		60-140
Bromochloromethane	87		60-140
chlorobenzene-d5	80		60-140



Project Name: 5977-CALVERT CITGO**Lab Number:** L1715684**Project Number:** 5977**Report Date:** 05/22/17**SAMPLE RESULTS**

Lab ID: L1715684-01 D2

Date Collected: 05/12/17 11:02

Client ID: PRE-VES

Date Received: 05/12/17

Sample Location: NORTH EAST, MD

Field Prep: Not Specified

Matrix: Soil_Vapor

Analytical Method: 48,TO-15

Analytical Date: 05/20/17 03:58

Analyst: RY

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab								
n-Hexane	69000	217	--	243000	765	--		1087

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	94		60-140
Bromochloromethane	91		60-140
chlorobenzene-d5	93		60-140



Project Name: 5977-CALVERT CITGO
Project Number: 5977

Lab Number: L1715684
Report Date: 05/22/17

SAMPLE RESULTS

Lab ID: L1715684-02 D
 Client ID: POST-VES
 Sample Location: NORTH EAST, MD
 Matrix: Soil_Vapor
 Analytical Method: 48,TO-15
 Analytical Date: 05/19/17 07:17
 Analyst: RY

Date Collected: 05/12/17 11:01
 Date Received: 05/12/17
 Field Prep: Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab								
Propylene	ND	21.9	--	ND	37.7	--		43.86
Dichlorodifluoromethane	ND	8.77	--	ND	43.4	--		43.86
Chloromethane	ND	8.77	--	ND	18.1	--		43.86
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	8.77	--	ND	61.3	--		43.86
Vinyl chloride	ND	8.77	--	ND	22.4	--		43.86
1,3-Butadiene	ND	8.77	--	ND	19.4	--		43.86
Bromomethane	ND	8.77	--	ND	34.1	--		43.86
Chloroethane	ND	8.77	--	ND	23.1	--		43.86
Ethyl Alcohol	ND	219	--	ND	413	--		43.86
Vinyl bromide	ND	8.77	--	ND	38.3	--		43.86
Acetone	ND	43.9	--	ND	104	--		43.86
Trichlorofluoromethane	ND	8.77	--	ND	49.3	--		43.86
iso-Propyl Alcohol	ND	21.9	--	ND	53.8	--		43.86
1,1-Dichloroethene	ND	8.77	--	ND	34.8	--		43.86
Methylene chloride	ND	21.9	--	ND	76.1	--		43.86
3-Chloropropene	ND	8.77	--	ND	27.5	--		43.86
Carbon disulfide	ND	8.77	--	ND	27.3	--		43.86
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	8.77	--	ND	67.2	--		43.86
trans-1,2-Dichloroethene	ND	8.77	--	ND	34.8	--		43.86
1,1-Dichloroethane	ND	8.77	--	ND	35.5	--		43.86
Methyl tert butyl ether	ND	8.77	--	ND	31.6	--		43.86
Vinyl acetate	ND	43.9	--	ND	155	--		43.86
2-Butanone	ND	21.9	--	ND	64.6	--		43.86
cis-1,2-Dichloroethene	ND	8.77	--	ND	34.8	--		43.86



Project Name: 5977-CALVERT CITGO
Project Number: 5977

Lab Number: L1715684
Report Date: 05/22/17

SAMPLE RESULTS

Lab ID: L1715684-02 D
 Client ID: POST-VES
 Sample Location: NORTH EAST, MD

Date Collected: 05/12/17 11:01
 Date Received: 05/12/17
 Field Prep: Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab								
Ethyl Acetate	ND	21.9	--	ND	78.9	--		43.86
Chloroform	ND	8.77	--	ND	42.8	--		43.86
Tetrahydrofuran	ND	21.9	--	ND	64.6	--		43.86
1,2-Dichloroethane	ND	8.77	--	ND	35.5	--		43.86
n-Hexane	1670	8.77	--	5890	30.9	--		43.86
1,1,1-Trichloroethane	ND	8.77	--	ND	47.8	--		43.86
Benzene	37.1	8.77	--	119	28.0	--		43.86
Carbon tetrachloride	ND	8.77	--	ND	55.2	--		43.86
Cyclohexane	71.9	8.77	--	247	30.2	--		43.86
1,2-Dichloropropane	ND	8.77	--	ND	40.5	--		43.86
Bromodichloromethane	ND	8.77	--	ND	58.8	--		43.86
1,4-Dioxane	ND	8.77	--	ND	31.6	--		43.86
Trichloroethene	ND	8.77	--	ND	47.1	--		43.86
2,2,4-Trimethylpentane	117	8.77	--	546	41.0	--		43.86
Heptane	89.5	8.77	--	367	35.9	--		43.86
cis-1,3-Dichloropropene	ND	8.77	--	ND	39.8	--		43.86
4-Methyl-2-pentanone	ND	21.9	--	ND	89.7	--		43.86
trans-1,3-Dichloropropene	ND	8.77	--	ND	39.8	--		43.86
1,1,2-Trichloroethane	ND	8.77	--	ND	47.8	--		43.86
Toluene	ND	8.77	--	ND	33.0	--		43.86
2-Hexanone	ND	8.77	--	ND	35.9	--		43.86
Dibromochloromethane	ND	8.77	--	ND	74.7	--		43.86
1,2-Dibromoethane	ND	8.77	--	ND	67.4	--		43.86
Tetrachloroethene	ND	8.77	--	ND	59.5	--		43.86
Chlorobenzene	ND	8.77	--	ND	40.4	--		43.86
Ethylbenzene	ND	8.77	--	ND	38.1	--		43.86
p/m-Xylene	ND	17.5	--	ND	76.0	--		43.86
Bromoform	ND	8.77	--	ND	90.7	--		43.86



Project Name: 5977-CALVERT CITGO**Lab Number:** L1715684**Project Number:** 5977**Report Date:** 05/22/17**SAMPLE RESULTS**

Lab ID: L1715684-02 D
 Client ID: POST-VES
 Sample Location: NORTH EAST, MD

Date Collected: 05/12/17 11:01
 Date Received: 05/12/17
 Field Prep: Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab								
Styrene	ND	8.77	--	ND	37.3	--		43.86
1,1,2,2-Tetrachloroethane	ND	8.77	--	ND	60.2	--		43.86
o-Xylene	ND	8.77	--	ND	38.1	--		43.86
4-Ethyltoluene	ND	8.77	--	ND	43.1	--		43.86
1,3,5-Trimethylbenzene	ND	8.77	--	ND	43.1	--		43.86
1,2,4-Trimethylbenzene	ND	8.77	--	ND	43.1	--		43.86
Benzyl chloride	ND	8.77	--	ND	45.4	--		43.86
1,3-Dichlorobenzene	ND	8.77	--	ND	52.7	--		43.86
1,4-Dichlorobenzene	ND	8.77	--	ND	52.7	--		43.86
1,2-Dichlorobenzene	ND	8.77	--	ND	52.7	--		43.86
1,2,4-Trichlorobenzene	ND	8.77	--	ND	65.1	--		43.86
Naphthalene	ND	8.77	--	ND	46.0	--		43.86
Hexachlorobutadiene	ND	8.77	--	ND	93.5	--		43.86

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	85		60-140
Bromochloromethane	93		60-140
chlorobenzene-d5	82		60-140



Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15

Analytical Date: 05/18/17 14:23

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab for sample(s): 01-02 Batch: WG1004884-4								
Chlorodifluoromethane	ND	0.200	--	ND	0.707	--		1
Propylene	ND	0.500	--	ND	0.861	--		1
Propane	ND	0.500	--	ND	0.902	--		1
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.200	--	ND	1.40	--		1
Methanol	ND	5.00	--	ND	6.55	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Butane	ND	0.200	--	ND	0.475	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethyl Alcohol	ND	5.00	--	ND	9.42	--		1
Dichlorofluoromethane	ND	0.200	--	ND	0.842	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acrolein	ND	0.500	--	ND	1.15	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Acetonitrile	ND	0.200	--	ND	0.336	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
iso-Propyl Alcohol	ND	0.500	--	ND	1.23	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
Pentane	ND	0.200	--	ND	0.590	--		1
Ethyl ether	ND	0.200	--	ND	0.606	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
tert-Butyl Alcohol	ND	0.500	--	ND	1.52	--		1

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15

Analytical Date: 05/18/17 14:23

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab for sample(s): 01-02 Batch: WG1004884-4								
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
Vinyl acetate	ND	1.00	--	ND	3.52	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
2,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
Isopropyl Ether	ND	0.200	--	ND	0.836	--		1
Ethyl-Tert-Butyl-Ether	ND	0.200	--	ND	0.836	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
1,1-Dichloropropene	ND	0.200	--	ND	0.908	--		1
Benzene	ND	0.200	--	ND	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
Tertiary-Amyl Methyl Ether	ND	0.200	--	ND	0.836	--		1
Dibromomethane	ND	0.200	--	ND	1.42	--		1



Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15

Analytical Date: 05/18/17 14:23

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab for sample(s): 01-02 Batch: WG1004884-4								
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Methyl Methacrylate	ND	0.500	--	ND	2.05	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	ND	0.200	--	ND	0.754	--		1
1,3-Dichloropropane	ND	0.200	--	ND	0.924	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Butyl Acetate	ND	0.500	--	ND	2.38	--		1
Octane	ND	0.200	--	ND	0.934	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
1,1,1,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	ND	0.200	--	ND	0.869	--		1
p/m-Xylene	ND	0.400	--	ND	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15

Analytical Date: 05/18/17 14:23

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab for sample(s): 01-02 Batch: WG1004884-4								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	ND	0.200	--	ND	0.869	--		1
1,2,3-Trichloropropane	ND	0.200	--	ND	1.21	--		1
Nonane (C9)	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
o-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
n-Propylbenzene	ND	0.200	--	ND	0.983	--		1
p-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
tert-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
Decane (C10)	ND	0.200	--	ND	1.16	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2-Dibromo-3-chloropropane	ND	0.200	--	ND	1.93	--		1
Undecane	ND	0.200	--	ND	1.28	--		1
Dodecane (C12)	ND	0.200	--	ND	1.39	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15

Analytical Date: 05/18/17 14:23

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab for sample(s): 01-02 Batch: WG1004884-4								
Naphthalene	ND	0.200	--	ND	1.05	--		1
1,2,3-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

	Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds					

No Tentatively Identified Compounds

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15

Analytical Date: 05/19/17 16:37

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab for sample(s): 01 Batch: WG1004884-9								
Chlorodifluoromethane	ND	0.200	--	ND	0.707	--		1
Propylene	ND	0.500	--	ND	0.861	--		1
Propane	ND	0.500	--	ND	0.902	--		1
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	0.200	--	ND	1.40	--		1
Methanol	ND	5.00	--	ND	6.55	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Butane	ND	0.200	--	ND	0.475	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethyl Alcohol	ND	5.00	--	ND	9.42	--		1
Dichlorofluoromethane	ND	0.200	--	ND	0.842	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acrolein	ND	0.500	--	ND	1.15	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Acetonitrile	ND	0.200	--	ND	0.336	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
iso-Propyl Alcohol	ND	0.500	--	ND	1.23	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
Pentane	ND	0.200	--	ND	0.590	--		1
Ethyl ether	ND	0.200	--	ND	0.606	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
tert-Butyl Alcohol	ND	0.500	--	ND	1.52	--		1

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15

Analytical Date: 05/19/17 16:37

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab for sample(s): 01 Batch: WG1004884-9								
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
Vinyl acetate	ND	1.00	--	ND	3.52	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
2,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
Isopropyl Ether	ND	0.200	--	ND	0.836	--		1
Ethyl-Tert-Butyl-Ether	ND	0.200	--	ND	0.836	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
1,1-Dichloropropene	ND	0.200	--	ND	0.908	--		1
Benzene	ND	0.200	--	ND	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
Tertiary-Amyl Methyl Ether	ND	0.200	--	ND	0.836	--		1
Dibromomethane	ND	0.200	--	ND	1.42	--		1



Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15

Analytical Date: 05/19/17 16:37

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab for sample(s): 01 Batch: WG1004884-9								
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Methyl Methacrylate	ND	0.500	--	ND	2.05	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	ND	0.200	--	ND	0.754	--		1
1,3-Dichloropropane	ND	0.200	--	ND	0.924	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Butyl Acetate	ND	0.500	--	ND	2.38	--		1
Octane	ND	0.200	--	ND	0.934	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
1,1,1,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	ND	0.200	--	ND	0.869	--		1
p/m-Xylene	ND	0.400	--	ND	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1



Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15

Analytical Date: 05/19/17 16:37

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab for sample(s): 01 Batch: WG1004884-9								
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	ND	0.200	--	ND	0.869	--		1
1,2,3-Trichloropropane	ND	0.200	--	ND	1.21	--		1
Nonane (C9)	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1
o-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
n-Propylbenzene	ND	0.200	--	ND	0.983	--		1
p-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
tert-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
Decane (C10)	ND	0.200	--	ND	1.16	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2-Dibromo-3-chloropropane	ND	0.200	--	ND	1.93	--		1
Undecane	ND	0.200	--	ND	1.28	--		1
Dodecane (C12)	ND	0.200	--	ND	1.39	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Method Blank Analysis Batch Quality Control

Analytical Method: 48,TO-15

Analytical Date: 05/19/17 16:37

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab for sample(s): 01 Batch: WG1004884-9								
Naphthalene	ND	0.200	--	ND	1.05	--		1
1,2,3-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Lab Control Sample Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-02 Batch: WG1004884-3								
Chlorodifluoromethane	81		-		70-130	-		
Propylene	95		-		70-130	-		
Propane	78		-		70-130	-		
Dichlorodifluoromethane	97		-		70-130	-		
Chloromethane	88		-		70-130	-		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	94		-		70-130	-		
Methanol	89		-		70-130	-		
Vinyl chloride	91		-		70-130	-		
1,3-Butadiene	97		-		70-130	-		
Butane	88		-		70-130	-		
Bromomethane	89		-		70-130	-		
Chloroethane	91		-		70-130	-		
Ethyl Alcohol	86		-		70-130	-		
Dichlorofluoromethane	83		-		70-130	-		
Vinyl bromide	92		-		70-130	-		
Acrolein	86		-		70-130	-		
Acetone	103		-		70-130	-		
Acetonitrile	85		-		70-130	-		
Trichlorofluoromethane	90		-		70-130	-		
iso-Propyl Alcohol	86		-		70-130	-		
Acrylonitrile	88		-		70-130	-		
Pentane	86		-		70-130	-		
Ethyl ether	84		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-02 Batch: WG1004884-3								
1,1-Dichloroethene	92		-		70-130	-		
tert-Butyl Alcohol	84		-		70-130	-		
Methylene chloride	96		-		70-130	-		
3-Chloropropene	98		-		70-130	-		
Carbon disulfide	86		-		70-130	-		
1,1,2-Trichloro-1,2,2-Trifluoroethane	92		-		70-130	-		
trans-1,2-Dichloroethene	90		-		70-130	-		
1,1-Dichloroethane	92		-		70-130	-		
Methyl tert butyl ether	92		-		70-130	-		
Vinyl acetate	103		-		70-130	-		
2-Butanone	90		-		70-130	-		
cis-1,2-Dichloroethene	94		-		70-130	-		
Ethyl Acetate	101		-		70-130	-		
Chloroform	94		-		70-130	-		
Tetrahydrofuran	93		-		70-130	-		
2,2-Dichloropropane	83		-		70-130	-		
1,2-Dichloroethane	92		-		70-130	-		
n-Hexane	87		-		70-130	-		
Isopropyl Ether	81		-		70-130	-		
Ethyl-Tert-Butyl-Ether	79		-		70-130	-		
1,1,1-Trichloroethane	88		-		70-130	-		
1,1-Dichloropropene	84		-		70-130	-		
Benzene	87		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-02 Batch: WG1004884-3								
Carbon tetrachloride	88		-		70-130	-		
Cyclohexane	89		-		70-130	-		
Tertiary-Amyl Methyl Ether	80		-		70-130	-		
Dibromomethane	80		-		70-130	-		
1,2-Dichloropropane	86		-		70-130	-		
Bromodichloromethane	87		-		70-130	-		
1,4-Dioxane	84		-		70-130	-		
Trichloroethene	88		-		70-130	-		
2,2,4-Trimethylpentane	89		-		70-130	-		
Methyl Methacrylate	92		-		70-130	-		
Heptane	90		-		70-130	-		
cis-1,3-Dichloropropene	93		-		70-130	-		
4-Methyl-2-pentanone	88		-		70-130	-		
trans-1,3-Dichloropropene	80		-		70-130	-		
1,1,2-Trichloroethane	92		-		70-130	-		
Toluene	86		-		70-130	-		
1,3-Dichloropropane	79		-		70-130	-		
2-Hexanone	85		-		70-130	-		
Dibromochloromethane	92		-		70-130	-		
1,2-Dibromoethane	87		-		70-130	-		
Butyl Acetate	77		-		70-130	-		
Octane	79		-		70-130	-		
Tetrachloroethene	86		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-02 Batch: WG1004884-3								
1,1,1,2-Tetrachloroethane	81		-		70-130	-		
Chlorobenzene	86		-		70-130	-		
Ethylbenzene	88		-		70-130	-		
p/m-Xylene	88		-		70-130	-		
Bromoform	92		-		70-130	-		
Styrene	88		-		70-130	-		
1,1,1,2-Tetrachloroethane	90		-		70-130	-		
o-Xylene	89		-		70-130	-		
1,2,3-Trichloropropane	79		-		70-130	-		
Nonane (C9)	82		-		70-130	-		
Isopropylbenzene	84		-		70-130	-		
Bromobenzene	81		-		70-130	-		
o-Chlorotoluene	80		-		70-130	-		
n-Propylbenzene	81		-		70-130	-		
p-Chlorotoluene	81		-		70-130	-		
4-Ethyltoluene	86		-		70-130	-		
1,3,5-Trimethylbenzene	88		-		70-130	-		
tert-Butylbenzene	84		-		70-130	-		
1,2,4-Trimethylbenzene	93		-		70-130	-		
Decane (C10)	87		-		70-130	-		
Benzyl chloride	97		-		70-130	-		
1,3-Dichlorobenzene	91		-		70-130	-		
1,4-Dichlorobenzene	90		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Project Number: 5977

Lab Number: L1715684

Report Date: 05/22/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-02 Batch: WG1004884-3								
sec-Butylbenzene	84		-		70-130	-		
p-Isopropyltoluene	80		-		70-130	-		
1,2-Dichlorobenzene	90		-		70-130	-		
n-Butylbenzene	88		-		70-130	-		
1,2-Dibromo-3-chloropropane	84		-		70-130	-		
Undecane	94		-		70-130	-		
Dodecane (C12)	101		-		70-130	-		
1,2,4-Trichlorobenzene	96		-		70-130	-		
Naphthalene	85		-		70-130	-		
1,2,3-Trichlorobenzene	88		-		70-130	-		
Hexachlorobutadiene	90		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01 Batch: WG1004884-8								
Chlorodifluoromethane	78		-		70-130	-		
Propylene	92		-		70-130	-		
Propane	75		-		70-130	-		
Dichlorodifluoromethane	56	Q	-		70-130	-		
Chloromethane	87		-		70-130	-		
1,2-Dichloro-1,1,2,2-tetrafluoroethane	87		-		70-130	-		
Methanol	94		-		70-130	-		
Vinyl chloride	91		-		70-130	-		
1,3-Butadiene	94		-		70-130	-		
Butane	87		-		70-130	-		
Bromomethane	84		-		70-130	-		
Chloroethane	91		-		70-130	-		
Ethyl Alcohol	91		-		70-130	-		
Dichlorofluoromethane	82		-		70-130	-		
Vinyl bromide	88		-		70-130	-		
Acrolein	82		-		70-130	-		
Acetone	103		-		70-130	-		
Acetonitrile	86		-		70-130	-		
Trichlorofluoromethane	90		-		70-130	-		
iso-Propyl Alcohol	96		-		70-130	-		
Acrylonitrile	91		-		70-130	-		
Pentane	88		-		70-130	-		
Ethyl ether	90		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01 Batch: WG1004884-8								
1,1-Dichloroethene	89		-		70-130	-		
tert-Butyl Alcohol	81		-		70-130	-		
Methylene chloride	92		-		70-130	-		
3-Chloropropene	92		-		70-130	-		
Carbon disulfide	81		-		70-130	-		
1,1,2-Trichloro-1,2,2-Trifluoroethane	88		-		70-130	-		
trans-1,2-Dichloroethene	84		-		70-130	-		
1,1-Dichloroethane	88		-		70-130	-		
Methyl tert butyl ether	85		-		70-130	-		
Vinyl acetate	100		-		70-130	-		
2-Butanone	85		-		70-130	-		
cis-1,2-Dichloroethene	90		-		70-130	-		
Ethyl Acetate	92		-		70-130	-		
Chloroform	87		-		70-130	-		
Tetrahydrofuran	88		-		70-130	-		
2,2-Dichloropropane	78		-		70-130	-		
1,2-Dichloroethane	87		-		70-130	-		
n-Hexane	92		-		70-130	-		
Isopropyl Ether	83		-		70-130	-		
Ethyl-Tert-Butyl-Ether	82		-		70-130	-		
1,1,1-Trichloroethane	92		-		70-130	-		
1,1-Dichloropropene	86		-		70-130	-		
Benzene	90		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01 Batch: WG1004884-8								
Carbon tetrachloride	90		-		70-130	-		
Cyclohexane	93		-		70-130	-		
Tertiary-Amyl Methyl Ether	82		-		70-130	-		
Dibromomethane	82		-		70-130	-		
1,2-Dichloropropane	90		-		70-130	-		
Bromodichloromethane	91		-		70-130	-		
1,4-Dioxane	90		-		70-130	-		
Trichloroethene	90		-		70-130	-		
2,2,4-Trimethylpentane	94		-		70-130	-		
Methyl Methacrylate	97		-		70-130	-		
Heptane	94		-		70-130	-		
cis-1,3-Dichloropropene	96		-		70-130	-		
4-Methyl-2-pentanone	93		-		70-130	-		
trans-1,3-Dichloropropene	82		-		70-130	-		
1,1,2-Trichloroethane	94		-		70-130	-		
Toluene	86		-		70-130	-		
1,3-Dichloropropane	79		-		70-130	-		
2-Hexanone	86		-		70-130	-		
Dibromochloromethane	90		-		70-130	-		
1,2-Dibromoethane	87		-		70-130	-		
Butyl Acetate	74		-		70-130	-		
Octane	79		-		70-130	-		
Tetrachloroethene	84		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01 Batch: WG1004884-8								
1,1,1,2-Tetrachloroethane	81		-		70-130	-		
Chlorobenzene	87		-		70-130	-		
Ethylbenzene	87		-		70-130	-		
p/m-Xylene	88		-		70-130	-		
Bromoform	88		-		70-130	-		
Styrene	88		-		70-130	-		
1,1,1,2-Tetrachloroethane	91		-		70-130	-		
o-Xylene	90		-		70-130	-		
1,2,3-Trichloropropane	81		-		70-130	-		
Nonane (C9)	83		-		70-130	-		
Isopropylbenzene	84		-		70-130	-		
Bromobenzene	83		-		70-130	-		
o-Chlorotoluene	79		-		70-130	-		
n-Propylbenzene	82		-		70-130	-		
p-Chlorotoluene	82		-		70-130	-		
4-Ethyltoluene	99		-		70-130	-		
1,3,5-Trimethylbenzene	89		-		70-130	-		
tert-Butylbenzene	86		-		70-130	-		
1,2,4-Trimethylbenzene	95		-		70-130	-		
Decane (C10)	88		-		70-130	-		
Benzyl chloride	89		-		70-130	-		
1,3-Dichlorobenzene	90		-		70-130	-		
1,4-Dichlorobenzene	93		-		70-130	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01 Batch: WG1004884-8								
sec-Butylbenzene	86		-		70-130	-		
p-Isopropyltoluene	81		-		70-130	-		
1,2-Dichlorobenzene	89		-		70-130	-		
n-Butylbenzene	90		-		70-130	-		
1,2-Dibromo-3-chloropropane	83		-		70-130	-		
Undecane	97		-		70-130	-		
Dodecane (C12)	107		-		70-130	-		
1,2,4-Trichlorobenzene	97		-		70-130	-		
Naphthalene	89		-		70-130	-		
1,2,3-Trichlorobenzene	91		-		70-130	-		
Hexachlorobutadiene	89		-		70-130	-		

Lab Duplicate Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Project Number: 5977

Lab Number: L1715684

Report Date: 05/22/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1004884-5 QC Sample: L1715684-02 Client ID: POST-VES						
Propylene	ND	ND	ppbV	NC		25
Dichlorodifluoromethane	ND	ND	ppbV	NC		25
Chloromethane	ND	ND	ppbV	NC		25
1,2-Dichloro-1,1,2,2-tetrafluoroethane	ND	ND	ppbV	NC		25
Vinyl chloride	ND	ND	ppbV	NC		25
1,3-Butadiene	ND	ND	ppbV	NC		25
Bromomethane	ND	ND	ppbV	NC		25
Chloroethane	ND	ND	ppbV	NC		25
Ethyl Alcohol	ND	ND	ppbV	NC		25
Vinyl bromide	ND	ND	ppbV	NC		25
Acetone	ND	ND	ppbV	NC		25
Trichlorofluoromethane	ND	ND	ppbV	NC		25
iso-Propyl Alcohol	ND	ND	ppbV	NC		25
1,1-Dichloroethene	ND	ND	ppbV	NC		25
Methylene chloride	ND	ND	ppbV	NC		25
3-Chloropropene	ND	ND	ppbV	NC		25
Carbon disulfide	ND	ND	ppbV	NC		25
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	ND	ppbV	NC		25
trans-1,2-Dichloroethene	ND	ND	ppbV	NC		25
1,1-Dichloroethane	ND	ND	ppbV	NC		25
Methyl tert butyl ether	ND	ND	ppbV	NC		25

Lab Duplicate Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Project Number: 5977

Lab Number: L1715684

Report Date: 05/22/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1004884-5 QC Sample: L1715684-02 Client ID: POST-VES						
Vinyl acetate	ND	ND	ppbV	NC		25
2-Butanone	ND	ND	ppbV	NC		25
cis-1,2-Dichloroethene	ND	ND	ppbV	NC		25
Ethyl Acetate	ND	ND	ppbV	NC		25
Chloroform	ND	ND	ppbV	NC		25
Tetrahydrofuran	ND	ND	ppbV	NC		25
1,2-Dichloroethane	ND	ND	ppbV	NC		25
n-Hexane	1670	1760	ppbV	5		25
1,1,1-Trichloroethane	ND	ND	ppbV	NC		25
Benzene	37.1	39.3	ppbV	6		25
Carbon tetrachloride	ND	ND	ppbV	NC		25
Cyclohexane	71.9	76.6	ppbV	6		25
1,2-Dichloropropane	ND	ND	ppbV	NC		25
Bromodichloromethane	ND	ND	ppbV	NC		25
1,4-Dioxane	ND	ND	ppbV	NC		25
Trichloroethene	ND	ND	ppbV	NC		25
2,2,4-Trimethylpentane	117	128	ppbV	9		25
Heptane	89.5	96.3	ppbV	7		25
cis-1,3-Dichloropropene	ND	ND	ppbV	NC		25
4-Methyl-2-pentanone	ND	ND	ppbV	NC		25
trans-1,3-Dichloropropene	ND	ND	ppbV	NC		25

Lab Duplicate Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Project Number: 5977

Lab Number: L1715684

Report Date: 05/22/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1004884-5 QC Sample: L1715684-02 Client ID: POST-VES						
1,1,2-Trichloroethane	ND	ND	ppbV	NC		25
Toluene	ND	ND	ppbV	NC		25
2-Hexanone	ND	ND	ppbV	NC		25
Dibromochloromethane	ND	ND	ppbV	NC		25
1,2-Dibromoethane	ND	ND	ppbV	NC		25
Tetrachloroethene	ND	ND	ppbV	NC		25
Chlorobenzene	ND	ND	ppbV	NC		25
Ethylbenzene	ND	ND	ppbV	NC		25
p/m-Xylene	ND	ND	ppbV	NC		25
Bromoform	ND	ND	ppbV	NC		25
Styrene	ND	ND	ppbV	NC		25
1,1,1,2-Tetrachloroethane	ND	ND	ppbV	NC		25
o-Xylene	ND	ND	ppbV	NC		25
4-Ethyltoluene	ND	ND	ppbV	NC		25
1,3,5-Trimethylbenzene	ND	ND	ppbV	NC		25
1,2,4-Trimethylbenzene	ND	ND	ppbV	NC		25
Benzyl chloride	ND	ND	ppbV	NC		25
1,3-Dichlorobenzene	ND	ND	ppbV	NC		25
1,4-Dichlorobenzene	ND	ND	ppbV	NC		25
1,2-Dichlorobenzene	ND	ND	ppbV	NC		25
1,2,4-Trichlorobenzene	ND	ND	ppbV	NC		25

Lab Duplicate Analysis

Batch Quality Control

Project Name: 5977-CALVERT CITGO

Project Number: 5977

Lab Number: L1715684

Report Date: 05/22/17

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Volatile Organics in Air - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1004884-5 QC Sample: L1715684-02 Client ID: POST-VES						
Naphthalene	ND	ND	ppbV	NC		25
Hexachlorobutadiene	ND	ND	ppbV	NC		25

Project Name: 5977-CALVERT CITGO

Project Number: 5977

Serial_No:05221711:27
Lab Number: L1715684

Report Date: 05/22/17

Canister and Flow Controller Information

Samplenum	Client ID	Media ID	Media Type	Date Prepared	Bottle Order	Cleaning Batch ID	Can Leak Check	Initial Pressure (in. Hg)	Pressure on Receipt (in. Hg)	Flow Controller Leak Chk	Flow Out mL/min	Flow In mL/min	% RPD
L1715684-01	PRE-VES	0885	SV200	05/04/17	241004		-	-	-	Pass	216	214	1
L1715684-01	PRE-VES	1897	6.0L Can	05/04/17	241004	L1713165-02	Pass	-29.9	-2.7	-	-	-	-
L1715684-02	POST-VES	0535	SV200	05/04/17	241004		-	-	-	Pass	218	218	0
L1715684-02	POST-VES	985	6.0L Can	05/04/17	241004	L1713165-02	Pass	-30.0	-3.2	-	-	-	-

Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1713165
Report Date: 05/22/17

Air Canister Certification Results

Lab ID: L1713165-02
 Client ID: CAN 1989 SHELF 58
 Sample Location:
 Matrix: Air
 Analytical Method: 48,TO-15
 Analytical Date: 04/26/17 17:12
 Analyst: RY

Date Collected: 04/25/17 16:00
 Date Received: 04/26/17
 Field Prep: Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab								
Chlorodifluoromethane	ND	0.200	--	ND	0.707	--		1
Propylene	ND	0.500	--	ND	0.861	--		1
Propane	ND	0.500	--	ND	0.902	--		1
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.200	--	ND	1.40	--		1
Methanol	ND	5.00	--	ND	6.55	--		1
Vinyl chloride	ND	0.200	--	ND	0.511	--		1
1,3-Butadiene	ND	0.200	--	ND	0.442	--		1
Butane	ND	0.200	--	ND	0.475	--		1
Bromomethane	ND	0.200	--	ND	0.777	--		1
Chloroethane	ND	0.200	--	ND	0.528	--		1
Ethanol	ND	5.00	--	ND	9.42	--		1
Dichlorofluoromethane	ND	0.200	--	ND	0.842	--		1
Vinyl bromide	ND	0.200	--	ND	0.874	--		1
Acrolein	ND	0.500	--	ND	1.15	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Acetonitrile	ND	0.200	--	ND	0.336	--		1
Trichlorofluoromethane	ND	0.200	--	ND	1.12	--		1
Isopropanol	ND	0.500	--	ND	1.23	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
Pentane	ND	0.200	--	ND	0.590	--		1
Ethyl ether	ND	0.200	--	ND	0.606	--		1
1,1-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Tertiary butyl Alcohol	ND	0.500	--	ND	1.52	--		1



Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1713165
Report Date: 05/22/17

Air Canister Certification Results

Lab ID: L1713165-02 Date Collected: 04/25/17 16:00
 Client ID: CAN 1989 SHELF 58 Date Received: 04/26/17
 Sample Location: Field Prep: Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab								
Methylene chloride	ND	0.500	--	ND	1.74	--		1
3-Chloropropene	ND	0.200	--	ND	0.626	--		1
Carbon disulfide	ND	0.200	--	ND	0.623	--		1
Freon-113	ND	0.200	--	ND	1.53	--		1
trans-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
1,1-Dichloroethane	ND	0.200	--	ND	0.809	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
Vinyl acetate	ND	1.00	--	ND	3.52	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.200	--	ND	0.793	--		1
Ethyl Acetate	ND	0.500	--	ND	1.80	--		1
Chloroform	ND	0.200	--	ND	0.977	--		1
Tetrahydrofuran	ND	0.500	--	ND	1.47	--		1
2,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
1,2-Dichloroethane	ND	0.200	--	ND	0.809	--		1
n-Hexane	ND	0.200	--	ND	0.705	--		1
Diisopropyl ether	ND	0.200	--	ND	0.836	--		1
tert-Butyl Ethyl Ether	ND	0.200	--	ND	0.836	--		1
1,1,1-Trichloroethane	ND	0.200	--	ND	1.09	--		1
1,1-Dichloropropene	ND	0.200	--	ND	0.908	--		1
Benzene	ND	0.200	--	ND	0.639	--		1
Carbon tetrachloride	ND	0.200	--	ND	1.26	--		1
Cyclohexane	ND	0.200	--	ND	0.688	--		1
tert-Amyl Methyl Ether	ND	0.200	--	ND	0.836	--		1
Dibromomethane	ND	0.200	--	ND	1.42	--		1
1,2-Dichloropropane	ND	0.200	--	ND	0.924	--		1
Bromodichloromethane	ND	0.200	--	ND	1.34	--		1
1,4-Dioxane	ND	0.200	--	ND	0.721	--		1



Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1713165
Report Date: 05/22/17

Air Canister Certification Results

Lab ID: L1713165-02 Date Collected: 04/25/17 16:00
 Client ID: CAN 1989 SHELF 58 Date Received: 04/26/17
 Sample Location: Field Prep: Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab								
Trichloroethene	ND	0.200	--	ND	1.07	--		1
2,2,4-Trimethylpentane	ND	0.200	--	ND	0.934	--		1
Methyl Methacrylate	ND	0.500	--	ND	2.05	--		1
Heptane	ND	0.200	--	ND	0.820	--		1
cis-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.200	--	ND	0.908	--		1
1,1,2-Trichloroethane	ND	0.200	--	ND	1.09	--		1
Toluene	ND	0.200	--	ND	0.754	--		1
1,3-Dichloropropane	ND	0.200	--	ND	0.924	--		1
2-Hexanone	ND	0.200	--	ND	0.820	--		1
Dibromochloromethane	ND	0.200	--	ND	1.70	--		1
1,2-Dibromoethane	ND	0.200	--	ND	1.54	--		1
Butyl acetate	ND	0.500	--	ND	2.38	--		1
Octane	ND	0.200	--	ND	0.934	--		1
Tetrachloroethene	ND	0.200	--	ND	1.36	--		1
1,1,1,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
Chlorobenzene	ND	0.200	--	ND	0.921	--		1
Ethylbenzene	ND	0.200	--	ND	0.869	--		1
p/m-Xylene	ND	0.400	--	ND	1.74	--		1
Bromoform	ND	0.200	--	ND	2.07	--		1
Styrene	ND	0.200	--	ND	0.852	--		1
1,1,2,2-Tetrachloroethane	ND	0.200	--	ND	1.37	--		1
o-Xylene	ND	0.200	--	ND	0.869	--		1
1,2,3-Trichloropropane	ND	0.200	--	ND	1.21	--		1
Nonane	ND	0.200	--	ND	1.05	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
Bromobenzene	ND	0.200	--	ND	0.793	--		1



Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1713165
Report Date: 05/22/17

Air Canister Certification Results

Lab ID: L1713165-02
 Client ID: CAN 1989 SHELF 58
 Sample Location:

Date Collected: 04/25/17 16:00
 Date Received: 04/26/17
 Field Prep: Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab								
2-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
n-Propylbenzene	ND	0.200	--	ND	0.983	--		1
4-Chlorotoluene	ND	0.200	--	ND	1.04	--		1
4-Ethyltoluene	ND	0.200	--	ND	0.983	--		1
1,3,5-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
tert-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trimethylbenzene	ND	0.200	--	ND	0.983	--		1
Decane	ND	0.200	--	ND	1.16	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
1,4-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1
1,2-Dichlorobenzene	ND	0.200	--	ND	1.20	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2-Dibromo-3-chloropropane	ND	0.200	--	ND	1.93	--		1
Undecane	ND	0.200	--	ND	1.28	--		1
Dodecane	ND	0.200	--	ND	1.39	--		1
1,2,4-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Naphthalene	ND	0.200	--	ND	1.05	--		1
1,2,3-Trichlorobenzene	ND	0.200	--	ND	1.48	--		1
Hexachlorobutadiene	ND	0.200	--	ND	2.13	--		1

Results	Qualifier	Units	RDL	Dilution Factor
Tentatively Identified Compounds				

No Tentatively Identified Compounds



Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1713165
Report Date: 05/22/17

Air Canister Certification Results

Lab ID:	L1713165-02	Date Collected:	04/25/17 16:00
Client ID:	CAN 1989 SHELF 58	Date Received:	04/26/17
Sample Location:		Field Prep:	Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air - Mansfield Lab								

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-Difluorobenzene	89		60-140
Bromochloromethane	90		60-140
chlorobenzene-d5	81		60-140



Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1713165
Report Date: 05/22/17

Air Canister Certification Results

Lab ID: L1713165-02
 Client ID: CAN 1989 SHELF 58
 Sample Location:
 Matrix: Air
 Analytical Method: 48,TO-15-SIM
 Analytical Date: 04/26/17 17:12
 Analyst: RY

Date Collected: 04/25/17 16:00
 Date Received: 04/26/17
 Field Prep: Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air by SIM - Mansfield Lab								
Dichlorodifluoromethane	ND	0.200	--	ND	0.989	--		1
Chloromethane	ND	0.200	--	ND	0.413	--		1
Freon-114	ND	0.050	--	ND	0.349	--		1
Vinyl chloride	ND	0.020	--	ND	0.051	--		1
1,3-Butadiene	ND	0.020	--	ND	0.044	--		1
Bromomethane	ND	0.020	--	ND	0.078	--		1
Chloroethane	ND	0.020	--	ND	0.053	--		1
Acetone	ND	1.00	--	ND	2.38	--		1
Trichlorofluoromethane	ND	0.050	--	ND	0.281	--		1
Acrylonitrile	ND	0.500	--	ND	1.09	--		1
1,1-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Methylene chloride	ND	0.500	--	ND	1.74	--		1
Freon-113	ND	0.050	--	ND	0.383	--		1
Halothane	ND	0.050	--	ND	0.404	--		1
trans-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
1,1-Dichloroethane	ND	0.020	--	ND	0.081	--		1
Methyl tert butyl ether	ND	0.200	--	ND	0.721	--		1
2-Butanone	ND	0.500	--	ND	1.47	--		1
cis-1,2-Dichloroethene	ND	0.020	--	ND	0.079	--		1
Chloroform	ND	0.020	--	ND	0.098	--		1
1,2-Dichloroethane	ND	0.020	--	ND	0.081	--		1
1,1,1-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Benzene	ND	0.100	--	ND	0.319	--		1
Carbon tetrachloride	ND	0.020	--	ND	0.126	--		1
1,2-Dichloropropane	ND	0.020	--	ND	0.092	--		1



Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1713165
Report Date: 05/22/17

Air Canister Certification Results

Lab ID: L1713165-02 Date Collected: 04/25/17 16:00
 Client ID: CAN 1989 SHELF 58 Date Received: 04/26/17
 Sample Location: Field Prep: Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air by SIM - Mansfield Lab								
Bromodichloromethane	ND	0.020	--	ND	0.134	--		1
1,4-Dioxane	ND	0.100	--	ND	0.360	--		1
Trichloroethene	ND	0.020	--	ND	0.107	--		1
cis-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
4-Methyl-2-pentanone	ND	0.500	--	ND	2.05	--		1
trans-1,3-Dichloropropene	ND	0.020	--	ND	0.091	--		1
1,1,2-Trichloroethane	ND	0.020	--	ND	0.109	--		1
Toluene	ND	0.050	--	ND	0.188	--		1
Dibromochloromethane	ND	0.020	--	ND	0.170	--		1
1,2-Dibromoethane	ND	0.020	--	ND	0.154	--		1
Tetrachloroethene	ND	0.020	--	ND	0.136	--		1
1,1,1,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
Chlorobenzene	ND	0.100	--	ND	0.461	--		1
Ethylbenzene	ND	0.020	--	ND	0.087	--		1
p/m-Xylene	ND	0.040	--	ND	0.174	--		1
Bromoform	ND	0.020	--	ND	0.207	--		1
Styrene	ND	0.020	--	ND	0.085	--		1
1,1,2,2-Tetrachloroethane	ND	0.020	--	ND	0.137	--		1
o-Xylene	ND	0.020	--	ND	0.087	--		1
Isopropylbenzene	ND	0.200	--	ND	0.983	--		1
4-Ethyltoluene	ND	0.020	--	ND	0.098	--		1
1,3,5-Trimethylbenzene	ND	0.020	--	ND	0.098	--		1
1,2,4-Trimethylbenzene	ND	0.020	--	ND	0.098	--		1
Benzyl chloride	ND	0.200	--	ND	1.04	--		1
1,3-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
1,4-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
sec-Butylbenzene	ND	0.200	--	ND	1.10	--		1
p-Isopropyltoluene	ND	0.200	--	ND	1.10	--		1



Project Name: BATCH CANISTER CERTIFICATION
Project Number: CANISTER QC BAT

Lab Number: L1713165
Report Date: 05/22/17

Air Canister Certification Results

Lab ID: L1713165-02
 Client ID: CAN 1989 SHELF 58
 Sample Location:

Date Collected: 04/25/17 16:00
 Date Received: 04/26/17
 Field Prep: Not Specified

Parameter	ppbV			ug/m3			Qualifier	Dilution Factor
	Results	RL	MDL	Results	RL	MDL		
Volatile Organics in Air by SIM - Mansfield Lab								
1,2-Dichlorobenzene	ND	0.020	--	ND	0.120	--		1
n-Butylbenzene	ND	0.200	--	ND	1.10	--		1
1,2,4-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Naphthalene	ND	0.050	--	ND	0.262	--		1
1,2,3-Trichlorobenzene	ND	0.050	--	ND	0.371	--		1
Hexachlorobutadiene	ND	0.050	--	ND	0.533	--		1

Internal Standard	% Recovery	Qualifier	Acceptance Criteria
1,4-difluorobenzene	89		60-140
bromochloromethane	92		60-140
chlorobenzene-d5	84		60-140

Project Name: 5977-CALVERT CITGO

Lab Number: L1715684

Project Number: 5977

Report Date: 05/22/17

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information Custody Seal**Cooler**

N/A Absent

Container Information

Container ID	Container Type	Cooler	pH	Temp deg C	Pres	Seal	Analysis(*)
L1715684-01A	Canister - 6 Liter	N/A	N/A	N/A	Y	Absent	TO15-LL(30)
L1715684-02A	Canister - 6 Liter	N/A	N/A	N/A	Y	Absent	TO15-LL(30)

*Values in parentheses indicate holding time in days

Project Name: 5977-CALVERT CITGO
Project Number: 5977

Lab Number: L1715684
Report Date: 05/22/17

GLOSSARY

Acronyms

EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensation Product".
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the

Report Format: Data Usability Report



Project Name: 5977-CALVERT CITGO
Project Number: 5977

Lab Number: L1715684
Report Date: 05/22/17

Data Qualifiers

- reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
 - D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
 - E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
 - G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
 - H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
 - I** - The lower value for the two columns has been reported due to obvious interference.
 - M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
 - NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
 - P** - The RPD between the results for the two columns exceeds the method-specified criteria.
 - Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
 - R** - Analytical results are from sample re-analysis.
 - RE** - Analytical results are from sample re-extraction.
 - S** - Analytical results are from modified screening analysis.
 - J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
 - ND** - Not detected at the reporting limit (RL) for the sample.

Project Name: 5977-CALVERT CITGO
Project Number: 5977

Lab Number: L1715684
Report Date: 05/22/17

REFERENCES

- 48 Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Second Edition. EPA/625/R-96/010b, January 1999.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624: m/p-xylene, o-xylene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), Methyl methacrylate, 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.

EPA 300: DW: Bromide

EPA 6860: NPW and SCM: Perchlorate

EPA 9010: NPW and SCM: Amenable Cyanide Distillation

EPA 9012B: NPW: Total Cyanide

EPA 9050A: NPW: Specific Conductance

SM3500: NPW: Ferrous Iron

SM4500: NPW: Amenable Cyanide, Dissolved Oxygen; SCM: Total Phosphorus, TKN, NO₂, NO₃.

SM5310C: DW: Dissolved Organic Carbon

Mansfield Facility

SM 2540D: TSS

EPA 3005A NPW

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B**

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH, EPA 350.1: Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **SM4500NO3-F, EPA 353.2:** Nitrate-N, **EPA 351.1, SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D.**

EPA 624: Volatile Halocarbons & Aromatics,

EPA 608: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E.**

Mansfield Facility:

Drinking Water

EPA 200.7: Ba, Be, Cd, Cr, Cu, Ni, Na, Ca. **EPA 200.8:** Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Ni, Se, TL. **EPA 245.1 Hg.**

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



AIR ANALYSIS

CHAIN OF CUSTODY

PAGE 1 OF 1

320 Forbes Blvd, Mansfield, MA 02048
 TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: REPSG
 Address: 6901 Kingsessing Ave Philadelphia, PA 1
 Phone: 215-729-3120
 Fax:

Email: Sshwards@REPSG.com

These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments: Equis EDD Required
 Project-Specific Target Compound List:

Project Information

Project Name: 5977 - Calvert Citgo
 Project Location: North East, MD
 Project #: 5977
 Project Manager: Suzanne Shwards
 ALPHA Quote #:

Turn-Around Time

Standard RUSH (only confirmed if pre-approved!)
 Date Due: _____ Time: _____

Date Rec'd in Lab: 5/13/17

Report Information - Data Deliverables

FAX
 ADEx
 Criteria Checker: _____
 (Default based on Regulatory Criteria Indicated)
 Other Formats: _____
 EMAIL (standard pdf report)
 Additional Deliverables: _____
 Report to: (if different than Project Manager) _____

ALPHA Job #: 01715687

Billing Information

Same as Client info PO #: 14197

Regulatory Requirements/Report Limits

State/Fed	Program	Res / Comm
<u>MD</u>	<u>MDE</u>	

ANALYSIS

TO-15
 TO-15 SIM
 APH Subtract Non-petroleum HCs
 Fixed Gases
 Sulfides & Mercaptans by TO-15

All Columns Below Must Be Filled Out

ALPHA Lab ID (Lab Use Only)	Sample ID	COLLECTION						Sample Matrix*	Sampler's Initials	Can Size	ID Can	ID - Flow Controller	TO-15	TO-15 SIM	APH Subtract Non-petroleum HCs	Fixed Gases	Sulfides & Mercaptans by TO-15	Sample Comments (i.e. PID)
		End Date	Start Time	End Time	Initial Vacuum	Final Vacuum												
<u>15089-01</u>	<u>PRE-VES</u>	<u>5/12/17</u>	<u>10:36</u>	<u>11:02</u>	<u>-29.66</u>	<u>-3.15</u>	<u>SV</u>	<u>GM</u>	<u>6L</u>	<u>1897</u>	<u>0585</u>	<input checked="" type="checkbox"/>						
<u>02</u>	<u>POST-VES</u>	<u>5/12/17</u>	<u>10:35</u>	<u>11:01</u>	<u>-29.35</u>	<u>-3.25</u>	<u>SV</u>	<u>GM</u>	<u>6L</u>	<u>985</u>	<u>0535</u>	<input checked="" type="checkbox"/>						

***SAMPLE MATRIX CODES**

AA = Ambient Air (Indoor/Outdoor)
 SV = Soil Vapor/Landfill Gas/SVE
 Other = Please Specify

Container Type

Relinquished By:	Date/Time	Received By:	Date/Time
<u>Natalie [Signature]</u>	<u>5/12/17 15:40</u>	<u>[Signature]</u>	<u>5/12/17 15:40</u>
<u>[Signature]</u>	<u>5/12/17 17:33</u>	<u>[Signature]</u>	<u>5/12/17 17:33</u>
<u>[Signature]</u>	<u>5/12/17 2:10</u>	<u>[Signature]</u>	<u>5/12/17 2:10</u>
<u>[Signature]</u>	<u>5/13/17</u>	<u>[Signature]</u>	<u>5/13/17 02:05</u>

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

May 8, 2017

Ms. Natalie Griffith
REPSG
6901 Kingsessing Ave
Suite 201
Philadelphia, PA 19142

Certificate of Analysis

Project Name:	2017-CALVERT CITGO/5977	Workorder:	2226371
Purchase Order:	14114	Workorder ID:	2017-CALVERT CITGO/5977

Dear Ms. Griffith:

Enclosed are the analytical results for samples received by the laboratory on Monday, May 1, 2017.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

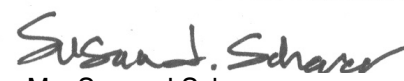
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. S Shourds , Mr. James Manuel

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.



Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 2226371 2017-CALVERT CITGO/5977

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2226371001	Outfall 001	Ground Water	4/26/2017 11:00	5/1/2017 19:00	Collected by Client

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 2226371 2017-CALVERT CITGO/5977

Lab ID: **2226371001**

Date Collected: 4/26/2017 11:00

Matrix: Ground Water

Sample ID: **Outfall 001**

Date Received: 5/1/2017 19:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Acetone	170		ug/L	10.0	3.1	SW846 8260B		5/2/17 16:07	TMP	A
tert-Amyl methyl ether	ND		ug/L	1.0	0.20	SW846 8260B		5/2/17 16:07	TMP	A
tert-Amyl Alcohol	770		ug/L	10.0	6.6	SW846 8260B		5/2/17 16:07	TMP	A
tert-Amyl Ethylether	ND		ug/L	1.0	0.29	SW846 8260B		5/2/17 16:07	TMP	A
Benzene	1300		ug/L	10.0	2.3	SW846 8260B		5/4/17 13:53	TMP	B
Bromochloromethane	ND		ug/L	1.0	0.32	SW846 8260B		5/2/17 16:07	TMP	A
Bromodichloromethane	ND		ug/L	1.0	0.27	SW846 8260B		5/2/17 16:07	TMP	A
Bromoform	ND		ug/L	1.0	0.40	SW846 8260B		5/2/17 16:07	TMP	A
Bromomethane	ND		ug/L	1.0	0.39	SW846 8260B		5/2/17 16:07	TMP	A
2-Butanone	257		ug/L	10.0	1.8	SW846 8260B		5/2/17 16:07	TMP	A
tert-Butyl Alcohol	344		ug/L	10.0	2.2	SW846 8260B		5/2/17 16:07	TMP	A
Carbon Disulfide	0.30J	J	ug/L	1.0	0.23	SW846 8260B		5/2/17 16:07	TMP	A
Carbon Tetrachloride	ND		ug/L	1.0	0.31	SW846 8260B		5/2/17 16:07	TMP	A
Chlorobenzene	ND		ug/L	1.0	0.19	SW846 8260B		5/2/17 16:07	TMP	A
Chlorodibromomethane	ND		ug/L	1.0	0.45	SW846 8260B		5/2/17 16:07	TMP	A
Chloroethane	ND		ug/L	1.0	0.33	SW846 8260B		5/2/17 16:07	TMP	A
Chloroform	ND		ug/L	1.0	0.21	SW846 8260B		5/2/17 16:07	TMP	A
Chloromethane	3.0		ug/L	1.0	0.31	SW846 8260B		5/2/17 16:07	TMP	A
1,2-Dibromo-3-chloropropane	ND		ug/L	7.0	1.5	SW846 8260B		5/2/17 16:07	TMP	A
1,2-Dibromoethane	ND		ug/L	1.0	0.28	SW846 8260B		5/2/17 16:07	TMP	A
Dichlorodifluoromethane	ND		ug/L	1.0	0.33	SW846 8260B		5/2/17 16:07	TMP	A
1,1-Dichloroethane	ND		ug/L	1.0	0.28	SW846 8260B		5/2/17 16:07	TMP	A
1,2-Dichloroethane	ND		ug/L	1.0	0.32	SW846 8260B		5/2/17 16:07	TMP	A
1,1-Dichloroethene	ND		ug/L	1.0	0.29	SW846 8260B		5/2/17 16:07	TMP	A
cis-1,2-Dichloroethene	ND		ug/L	1.0	0.32	SW846 8260B		5/2/17 16:07	TMP	A
trans-1,2-Dichloroethene	ND		ug/L	1.0	0.26	SW846 8260B		5/2/17 16:07	TMP	A
Dichlorofluoromethane	ND		ug/L	1.0	0.37	SW846 8260B		5/2/17 16:07	TMP	A
1,2-Dichloropropane	ND		ug/L	1.0	0.24	SW846 8260B		5/2/17 16:07	TMP	A
cis-1,3-Dichloropropene	ND		ug/L	1.0	0.31	SW846 8260B		5/2/17 16:07	TMP	A
trans-1,3-Dichloropropene	ND		ug/L	1.0	0.29	SW846 8260B		5/2/17 16:07	TMP	A
Diisopropyl ether	ND		ug/L	1.0	0.25	SW846 8260B		5/2/17 16:07	TMP	A
Ethyl tert-butyl ether	ND		ug/L	1.0	0.19	SW846 8260B		5/2/17 16:07	TMP	A
Ethylbenzene	261		ug/L	10.0	3.4	SW846 8260B		5/4/17 13:53	TMP	B
2-Hexanone	36.7		ug/L	5.0	1.3	SW846 8260B		5/2/17 16:07	TMP	A
Methyl t-Butyl Ether	7.8		ug/L	1.0	0.33	SW846 8260B		5/2/17 16:07	TMP	A
4-Methyl-2-Pentanone(MIBK)	ND		ug/L	5.0	1.5	SW846 8260B		5/2/17 16:07	TMP	A

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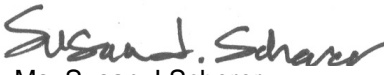
Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
Vancouver Waterloo · Winnipeg · Yellowknife United States: Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York Mexico: Monterrey

ANALYTICAL RESULTS

Workorder: 2226371 2017-CALVERT CITGO/5977

Lab ID: 2226371001 **Date Collected:** 4/26/2017 11:00 **Matrix:** Ground Water
Sample ID: Outfall 001 **Date Received:** 5/1/2017 19:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr	
Methylene Chloride	ND		ug/L	1.0	0.45	SW846 8260B		5/2/17 16:07	TMP	A	
Styrene	ND		ug/L	1.0	0.24	SW846 8260B		5/2/17 16:07	TMP	A	
1,1,2,2-Tetrachloroethane	ND		ug/L	1.0	0.34	SW846 8260B		5/2/17 16:07	TMP	A	
Tetrachloroethene	ND		ug/L	1.0	0.35	SW846 8260B		5/2/17 16:07	TMP	A	
Toluene	2870		ug/L	100	23.0	SW846 8260B		5/5/17 18:12	DD	D	
Total Xylenes	1550		ug/L	30.0	6.6	SW846 8260B		5/4/17 13:53	TMP	B	
1,1,1-Trichloroethane	ND		ug/L	1.0	0.22	SW846 8260B		5/2/17 16:07	TMP	A	
1,1,2-Trichloroethane	ND		ug/L	1.0	0.33	SW846 8260B		5/2/17 16:07	TMP	A	
Trichloroethene	ND		ug/L	1.0	0.33	SW846 8260B		5/2/17 16:07	TMP	A	
Vinyl Chloride	ND		ug/L	1.0	0.30	SW846 8260B		5/2/17 16:07	TMP	A	
o-Xylene	495		ug/L	10.0	3.3	SW846 8260B		5/4/17 13:53	TMP	B	
mp-Xylene	1050		ug/L	20.0	5.2	SW846 8260B		5/4/17 13:53	TMP	B	
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>		<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	87.6		%	62 - 133		SW846 8260B		5/4/17 13:53	TMP	B	
1,2-Dichloroethane-d4 (S)	93.7		%	62 - 133		SW846 8260B		5/2/17 16:07	TMP	A	
1,2-Dichloroethane-d4 (S)	97.4		%	62 - 133		SW846 8260B		5/5/17 18:12	DD	D	
4-Bromofluorobenzene (S)	97.6		%	79 - 114		SW846 8260B		5/5/17 18:12	DD	D	
4-Bromofluorobenzene (S)	104		%	79 - 114		SW846 8260B		5/2/17 16:07	TMP	A	
4-Bromofluorobenzene (S)	100		%	79 - 114		SW846 8260B		5/4/17 13:53	TMP	B	
Dibromofluoromethane (S)	101		%	78 - 116		SW846 8260B		5/4/17 13:53	TMP	B	
Dibromofluoromethane (S)	85		%	78 - 116		SW846 8260B		5/5/17 18:12	DD	D	
Dibromofluoromethane (S)	92.5		%	78 - 116		SW846 8260B		5/2/17 16:07	TMP	A	
Toluene-d8 (S)	91.3		%	76 - 127		SW846 8260B		5/2/17 16:07	TMP	A	
Toluene-d8 (S)	105		%	76 - 127		SW846 8260B		5/4/17 13:53	TMP	B	
Toluene-d8 (S)	91		%	76 - 127		SW846 8260B		5/5/17 18:12	DD	D	


Ms. Susan J Scherer
Project Coordinator

ALS Environmental Laboratory Locations Across North America

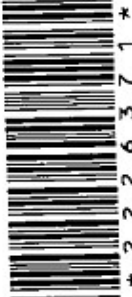
Canada: Burlington · Calgary · Centre of Excellence · Edmonton · Fort McMurray · Fort St. John · Grande Prairie · London · Mississauga · Richmond Hill · Saskatoon · Thunder Bay
Vancouver Waterloo · Winnipeg · Yellowknife **United States:** Cincinnati · Everett · Fort Collins · Holland · Houston · Middletown · Salt Lake City · Spring City · York **Mexico:** Monterrey



34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

**CHAIN OF CUSTODY/
REQUEST FOR ANALYSIS**
ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT /
SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1
Courier: _____
Tracking #: _____



* 2 2 2 6 3 7 1 *

Co. Name: **REPS6, Inc.**
Contact (Report to):
Address: **6901 Kingessing Ave
Philadelphia PA, 19142**
Phone: **215-744-3220**
Bill to (if different than Report to): **Same**
PO#: **14114**
Project Name#: **Calvert City 5977** ALS Quote #:
Normal-Standard TAT is 10-12 business days.
Date Required:
Rush-Subject to ALS approval and surcharges.
Approved By:

Email: Y N **Schenck@reps6.com**
Fax: Y N
Sample Description/Location
(as it will appear on the lab report)

Sample No.	Sample Date	Military Time	COC Comments	Received By / Company Name	Date	Time
1	4-27-11	1100	6 AW	2 Chem Service	5-17	1305
2				4 Exact	5-1	1600
3				6 <i>[Signature]</i>	5-1	1706
4				8		
5				10		
6						
7						
8						

SAMPLED BY (Please Print): **Carin Mahusky + James -**
Relinquished By / Company Name
1 **Natasha Williams / REPS6**
3 **Chris Decker**
5 **Exact**

Container		Type		Size		Preservative		Matrix		Enter Number of Containers Per Analysis	
10A	10A	60ml	60ml	ATC							

Performed by: *[Signature]*
Cooler Temp: *[Signature]*
Therm. ID: *[Signature]*
No. of Coolers: *[Signature]*
Notes:

Correct containers?	Y	N
(if present) Seals Intact?	Y	N
Received on Ice?	Y	N
COCLabels complete/accurate?	Y	N
Headspace/Volatiles?	Y	N
Container in good condition?	Y	N

Circle appropriate Y or N.

ALS FIELD SERVICES
 Pickup
 Labor
 Composite Sampling
 Rental Equipment
 Other:

SDWA Form? MD NJ NY PA
 Standard
 CLP-like
 NJ-Reduced
 NJ-Full
 If yes, format type: Other: *[Signature]*

Data Deliverables
 EDs
 DOD Criteria Required?

Matrix: A=Air; DW=Drinking Water; GW=Groundwater; O=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WY=Wastewater
 Container Type: AG=Amber Glass; CG=Clear Glass; PL=Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.
 Copies: WHITE - ORIGINAL, CANARY - CUSTOMER COPY
 Rev 01-2013

May 22, 2017

Ms. Natalie Griffith
REPSG
6901 Kingsessing Ave
Suite 201
Philadelphia, PA 19142

Certificate of Analysis

Project Name:	2017-CALVERT CITGO/5977	Workorder:	2230159
Purchase Order:	14198	Workorder ID:	Calvert Citgo 5977

Dear Ms. Griffith:

Enclosed are the analytical results for samples received by the laboratory on Monday, May 15, 2017.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Ms. Susan J Scherer (Project Coordinator) at (717) 944-5541.

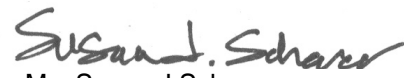
Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Ms. S Shourds , Mr. James Manuel

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.


Ms. Susan J Scherer
Project Coordinator

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SAMPLE SUMMARY

Workorder: 2230159 Calvert Citgo 5977

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
2230159001	Outfall 001	Ground Water	5/12/2017 11:00	5/15/2017 19:00	Collected by Client

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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ANALYTICAL RESULTS

Workorder: 2230159 Calvert Citgo 5977

Lab ID: **2230159001**

Date Collected: 5/12/2017 11:00

Matrix: Ground Water

Sample ID: **Outfall 001**

Date Received: 5/15/2017 19:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS										
Acetone	164		ug/L	100	31.0	SW846 8260B		5/19/17 14:48	DD	B
tert-Amyl methyl ether	ND		ug/L	10.0	2.0	SW846 8260B		5/19/17 14:48	DD	B
tert-Amyl Alcohol	587		ug/L	100	66.0	SW846 8260B		5/19/17 14:48	DD	B
tert-Amyl Ethylether	ND		ug/L	10.0	2.9	SW846 8260B		5/19/17 14:48	DD	B
Benzene	867		ug/L	10.0	2.3	SW846 8260B		5/19/17 14:48	DD	B
Bromochloromethane	ND		ug/L	10.0	3.2	SW846 8260B		5/19/17 14:48	DD	B
Bromodichloromethane	ND		ug/L	10.0	2.7	SW846 8260B		5/19/17 14:48	DD	B
Bromoform	ND		ug/L	10.0	4.0	SW846 8260B		5/19/17 14:48	DD	B
Bromomethane	ND		ug/L	10.0	3.9	SW846 8260B		5/19/17 14:48	DD	B
2-Butanone	65.9J	J	ug/L	100	18.0	SW846 8260B		5/19/17 14:48	DD	B
tert-Butyl Alcohol	340		ug/L	100	22.0	SW846 8260B		5/19/17 14:48	DD	B
Carbon Disulfide	ND		ug/L	10.0	2.3	SW846 8260B		5/19/17 14:48	DD	B
Carbon Tetrachloride	ND		ug/L	10.0	3.1	SW846 8260B		5/19/17 14:48	DD	B
Chlorobenzene	ND		ug/L	10.0	1.9	SW846 8260B		5/19/17 14:48	DD	B
Chlorodibromomethane	ND		ug/L	10.0	4.5	SW846 8260B		5/19/17 14:48	DD	B
Chloroethane	ND		ug/L	10.0	3.3	SW846 8260B		5/19/17 14:48	DD	B
Chloroform	ND		ug/L	10.0	2.1	SW846 8260B		5/19/17 14:48	DD	B
Chloromethane	ND		ug/L	10.0	3.1	SW846 8260B		5/19/17 14:48	DD	B
1,2-Dibromo-3-chloropropane	ND		ug/L	70.0	15.0	SW846 8260B		5/19/17 14:48	DD	B
1,2-Dibromoethane	ND		ug/L	10.0	2.8	SW846 8260B		5/19/17 14:48	DD	B
Dichlorodifluoromethane	ND		ug/L	10.0	3.3	SW846 8260B		5/19/17 14:48	DD	B
1,1-Dichloroethane	ND		ug/L	10.0	2.8	SW846 8260B		5/19/17 14:48	DD	B
1,2-Dichloroethane	8.6J	J	ug/L	10.0	3.2	SW846 8260B		5/19/17 14:48	DD	B
1,1-Dichloroethene	ND		ug/L	10.0	2.9	SW846 8260B		5/19/17 14:48	DD	B
cis-1,2-Dichloroethene	ND		ug/L	10.0	3.2	SW846 8260B		5/19/17 14:48	DD	B
trans-1,2-Dichloroethene	ND		ug/L	10.0	2.6	SW846 8260B		5/19/17 14:48	DD	B
Dichlorofluoromethane	ND		ug/L	10.0	3.7	SW846 8260B		5/19/17 14:48	DD	B
1,2-Dichloropropane	ND		ug/L	10.0	2.4	SW846 8260B		5/19/17 14:48	DD	B
cis-1,3-Dichloropropene	ND		ug/L	10.0	3.1	SW846 8260B		5/19/17 14:48	DD	B
trans-1,3-Dichloropropene	ND		ug/L	10.0	2.9	SW846 8260B		5/19/17 14:48	DD	B
Diisopropyl ether	2.5J	J	ug/L	10.0	2.5	SW846 8260B		5/19/17 14:48	DD	B
Ethyl tert-butyl ether	ND		ug/L	10.0	1.9	SW846 8260B		5/19/17 14:48	DD	B
Ethylbenzene	142		ug/L	10.0	3.4	SW846 8260B		5/19/17 14:48	DD	B
2-Hexanone	ND		ug/L	50.0	13.0	SW846 8260B		5/19/17 14:48	DD	B
Methyl t-Butyl Ether	5.5J	J	ug/L	10.0	3.3	SW846 8260B		5/19/17 14:48	DD	B
4-Methyl-2-Pentanone(MIBK)	ND		ug/L	50.0	15.0	SW846 8260B		5/19/17 14:48	DD	B

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ANALYTICAL RESULTS

Workorder: 2230159 Calvert Citgo 5977

Lab ID: **2230159001**

Date Collected: 5/12/2017 11:00

Matrix: Ground Water

Sample ID: **Outfall 001**

Date Received: 5/15/2017 19:00

Parameters	Results	Flag	Units	RDL	MDL	Method	Prepared By	Analyzed	By	Cntr	
Methylene Chloride	56.8		ug/L	10.0	4.5	SW846 8260B		5/19/17 14:48	DD	B	
Styrene	ND		ug/L	10.0	2.4	SW846 8260B		5/19/17 14:48	DD	B	
1,1,2,2-Tetrachloroethane	ND		ug/L	10.0	3.4	SW846 8260B		5/19/17 14:48	DD	B	
Tetrachloroethene	ND		ug/L	10.0	3.5	SW846 8260B		5/19/17 14:48	DD	B	
Toluene	1710		ug/L	100	23.0	SW846 8260B		5/17/17 19:48	TMP	A	
Total Xylenes	950		ug/L	30.0	6.6	SW846 8260B		5/19/17 14:48	DD	B	
1,1,1-Trichloroethane	ND		ug/L	10.0	2.2	SW846 8260B		5/19/17 14:48	DD	B	
1,1,2-Trichloroethane	ND		ug/L	10.0	3.3	SW846 8260B		5/19/17 14:48	DD	B	
Trichloroethene	ND		ug/L	10.0	3.3	SW846 8260B		5/19/17 14:48	DD	B	
Vinyl Chloride	ND		ug/L	10.0	3.0	SW846 8260B		5/19/17 14:48	DD	B	
o-Xylene	297		ug/L	10.0	3.3	SW846 8260B		5/19/17 14:48	DD	B	
mp-Xylene	653		ug/L	20.0	5.2	SW846 8260B		5/19/17 14:48	DD	B	
<i>Surrogate Recoveries</i>	<i>Results</i>	<i>Flag</i>	<i>Units</i>	<i>Limits</i>		<i>Method</i>	<i>Prepared</i>	<i>By</i>	<i>Analyzed</i>	<i>By</i>	<i>Cntr</i>
1,2-Dichloroethane-d4 (S)	96.3		%	62 - 133		SW846 8260B		5/19/17 14:48	DD	B	
1,2-Dichloroethane-d4 (S)	89.8		%	62 - 133		SW846 8260B		5/17/17 19:48	TMP	A	
4-Bromofluorobenzene (S)	94.8		%	79 - 114		SW846 8260B		5/19/17 14:48	DD	B	
4-Bromofluorobenzene (S)	97		%	79 - 114		SW846 8260B		5/17/17 19:48	TMP	A	
Dibromofluoromethane (S)	97.5		%	78 - 116		SW846 8260B		5/17/17 19:48	TMP	A	
Dibromofluoromethane (S)	85.4		%	78 - 116		SW846 8260B		5/19/17 14:48	DD	B	
Toluene-d8 (S)	92.1		%	76 - 127		SW846 8260B		5/19/17 14:48	DD	B	
Toluene-d8 (S)	99.6		%	76 - 127		SW846 8260B		5/17/17 19:48	TMP	A	
Library Search - Volatiles											
Library Search - Volatiles						SW846 8260B		5/17/17 19:48	TMP	A	



Ms. Susan J Scherer
Project Coordinator

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F. 717-944-1430

Environmental

**CHAIN OF CUSTODY/
REQUEST FOR ANALYSIS**
ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT /
SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1
Courier: _____
Tracking #: _____



★ 2 2 3 0 1 5 9 ★

Co. Name: **REPSG, Inc**
Contact (Report to):
Address: **6901 Kingessing Ave
Philadelphia, PA 19142**
Phone: **215-729-3220**

Bill to (if different than Report to):
SAME
PO#: **14198**

Project Name#: **Calvert City 5977** ALS Quote #:
TAT: Normal-Standard TAT is 10-12 business days.
 Rush-Subject to ALS approval and surcharges.

Email? Y N
Fax? Y N
Approved By: _____
Date Required: _____
Approved By: _____
Date Required: _____

Sample Description/Location
(as it will appear on the lab report)

1 **outfall-001**

2

3

4

5

6

7

8

9

10

11

12

13

14

15

Container Type: **VGA**
Container Size: **40mL**
Preservative: **HCl**

ANALYSES/METHOD REQUESTED

**VOCs including fuel
hydrocarbons via 8260 B**

Enter Number of Containers Per Analysis

1 **X**

2 **X**

3 **X**

4 **X**

5 **X**

6 **X**

7 **X**

8 **X**

9 **X**

10 **X**

11 **X**

12 **X**

13 **X**

14 **X**

15 **X**

Performed by: _____
Cooler Temp: _____
Therm. ID: **318**
No. of Coolers: _____
Notes: _____

Correct containers? Y N
Correct sample volume? Y N
Received on ice? Y N
COCLabels complete/accurate? Y N
Container in good condition? Y N

Circle appropriate Y or N.

Headspace/Volatiles? Y N

(if present) Seals intact? Y N

Custody seals Present? Y N

ALS FIELD SERVICES

Pickup

Labor

Composite Sampling

Rental Equipment

Other:

SWA Form? yes no

State Samples Collected in? MD NJ NY PA

Standard CLP-like NJ-Reduced NJ-Full Other

Data Deliverables EDS EDS EDS

DD Criteria Required?

Project Comments: **Equis EDD Required**

Relinquished By / Company Name: **Garth Mahasky**

Date: **5/17/17** Time: **11:00**

Date: **5/15/17** Time: **1900**

Date: **5/15/17** Time: **1045**

Date: **5-15** Time: **1045**

Remedial Action Progress Report
June 22, 2017

Calvert Citgo
2815 North East Road
North East, MD
REPSG Project Reference No.5977.130.02

ATTACHMENT 3: SYSTEM MONITORING WORKSHEETS

