CORRECTIVE ACTION PLAN DEVELOPMENT (COST PROPOSAL NO. 50)

RUSSELL PETROLEUM CORPORATION
KWIK SHOP NO. 110
33066 U.S. HIGHWAY 280
CHILDERSBURG, TALLADEGA COUNTY, ALABAMA

FACILITY I.D. NO. 14249-121-005202
INCIDENT NO. UST10-08-08

PPM PROJECT NO. 422603-CAPD

MAY 19, 2025

PPM CONSULTANTS

CORRECTIVE ACTION PLAN DEVEOPMENT
(COST PROPOSAL NO. 50)

FOR

KWIK SHOP NO. 110
33066 U.S. HIGHWAY 280
CHILDERSBURG, ALABAMA

FACILITY I.D. NO. 14249-121-005202
INCIDENT NO. UST10-08-08

PREPARED FOR:

RUSSELL PETROLEUM CORP.
P.O. BOX 250330
MONTGOMERY, ALABAMA 36125

PPM PROJECT NO. 422603-CAPD

MAY 19, 2025

PREPARED BY:

JEFFREY M. SCHEXNAYDER, P.G.
SENIOR GEOLOGIST /
PROJECT MANAGER

REVIEWED BY:

MATTHEW J. EBBERT, P.G.
SENIOR GEOLOGIST

PPM CONSULTANTS, INC.
5555 BANKHEAD HIGHWAY
BIRMINGHAM, ALABAMA 35210
(205) 836-5650

TABLE OF CONTENTS

PAGE

CERTIFICATION PAGE III

UST RELEASE FACT SHEET III

UST SITE CLASSIFICATION SYSTEM CHECKLIST IV

1.0 INTRODUCTION 1

2.0 SITE BACKGROUND 1

2.1 Site Location 1

2.2 Adjacent Properties 1

2.3 Site Description 2

2.4 Site History 2

2.5 Site Conditions 4

2.5.1 Soil 4
2.5.2 Groundwater 5
2.5.3 COCs in Soil 6
2.5.4 COCs in Groundwater 6

3.0 REMEDIAL APPROACH 7

3.1 Remedial Objectives 7

3.2 Corrective Action Overview 7

3.2.1 Overview of Ozone Sparge 8
3.2.2 Overview of Soil Vapor Extraction 8
3.2.3 Overview of Remediation by Natural Attenuation 9

3.3 Ozone/Oxygen Sparge and SVE Design Considerations 9

3.3.1 Ozone Sparge Unit 10
3.3.2 Fail-safe Components 11
3.3.3 Sparge Points 11
3.3.4 SVE Unit 13
3.3.5 Extraction Points for SVE 13

3.4 Ozone Sparge / SVE System Electrical Components 13

3.5 System Telemetry 13

3.6 Anticipated Site Response 13

3.6.1 Oxidation of COC 14
3.6.2 Removal of Soil Vapors 14

TABLE OF CONTENTS (continued)

PAGE

3.6.3 Remediation by Natural Attenuation 14

3.7 Permits 14

3.8 Ozone Sparge / SVE System Installation 15

3.8.1 General 15
3.8.2 Soil Borings 15
3.8.3 Ozone Sparge Point Installation 16
3.8.4 SVE Extraction Piping 16
3.8.5 Electrical Hookup 17
3.8.6 Sparge Point Configuration 17
3.8.7 Protective Piping 18
3.8.8 Security 18

3.9 Groundwater Monitoring 18

3.10 Ozone Sparge / SVE System Start-up / Initial Optimization 20

3.11 System Operations and Maintenance 20

3.12 Effectiveness Monitoring 21

3.12.1 System Monitoring 21
3.12.2 Groundwater Sampling 22

4.0 REPORTING 22

5.0 CLOSURE EVALUATION 23

6.0 SITE HEALTH AND SAFETY 23

7.0 PROJECT SCHEDULE 24

7.1 Estimated Schedule for System Installation 24

7.2 Estimated Cleanup Time 24

8.0 COST ESTIMATE 25

TABLE OF CONTENTS (continued)

FIGURES

Figure 1 Site Location Map
Figure 2 Area Map
Figure 3 Site Map
Figure 4A Geologic Cross-Section A – A'
Figure 4B Geologic Cross-Section B – B'
Figure 5 Groundwater Elevation Map (March 1, 2023)
Figure 6 Detected COC Concentrations in Soil above the SSCALs
Figure 7 Dissolved Benzene Isoconcentration Map (March 1, 2023 & July 2023)
Figure 8 Dissolved MTBE Isoconcentration Map (March 1, 2023 & July 2023)
Figure 9 Dissolved Naphthalene Isoconcentration Map (March 1, 2023 & July 2023)
Figure 10 Proposed System Layout
Figure 11 Ozone Sparge Point and SVE Construction Details

TABLES

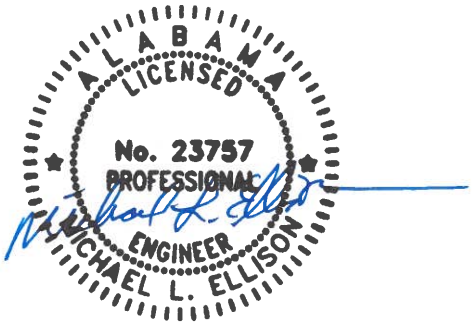
Table 1 Groundwater Elevation Survey Data
Table 2 Soil Analytical Summary
Table 3 Groundwater Analytical Summary

APPENDICES

Appendix A Soil Boring/Monitoring Well Construction Logs
Appendix B Design Calculations
Appendix C Equipment Specifications and Quotations
Appendix D Subcontractor Specifications and Quotations
Appendix E Waste Disposal Quote
Appendix F Technical Sampling and QA/QC Plan
Appendix G Remediation Monitoring Forms
Appendix H Site Health and Safety Plan

CERTIFICATION PAGE

I certify under penalty of law that this Corrective Action Plan for the Kwik Shop No. 110 facility located at 33066 U.S. Highway 280 in Childersburg, Alabama, and the plans, specifications, and technical data submitted within were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiring of the person or persons who directly gathered the enclosed information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information.



Michael L. Ellison, P.E.
AL No. 23757

05/19/25
Date

UST RELEASE FACT SHEET

GENERAL INFORMATION:

SITE NAME: Kwik Shop No. 110

ADDRESS: 33066 U.S. Highway 280, Childersburg, Alabama

FACILITY I.D. NO.: 14249-121-005202

INCIDENT NO.: UST10-08-08

RESULTS OF EXPOSURE ASSESSMENT:

How many private drinking water wells are located within 1,000 ft. of site?	0
How many public water supply wells are located within 1 mile of the site?	0
Have any drinking water supply wells been impacted by contamination from this release?	{ } Yes { X } No
Is there an imminent threat of contamination to any drinking water wells?	{ } Yes { X } No
Have vapors or contaminated groundwater posed a threat to the public?	{ } Yes { X } No
Are any underground utilities impacted or imminently threatened by the release?	{ } Yes { X } No
Have surface waters been impacted by the release?	{ } Yes { X } No
Is there an imminent threat of contamination to surface waters?	{ } Yes { X } No
What is the type of surrounding population?	Commercial/Residential

CONTAMINATION DESCRIPTION:

Type of contamination at site: {X} Gasoline, {X} Diesel, { } Waste Oil { } Kerosene, { } Other __

Free product present in wells? { } Yes {X} No

Maximum COC concentration measured in soil:

Benzene 4.20 mg/kg (SB-3421-23)
BTEX 222.546 mg/kg (SB-32-13-15)
MTBE <0.267 mg/kg (SB-35-15-17)
Naph 16.4 mg/kg (SB-32-13-15)

Current maximum COC concentrations measured in groundwater:

Monitoring Wells - March 1, 2023
Temporary Monitoring Wells - July 31, 2023

Benzene 13.6 mg/L (MW-10R)
BTEX 89.00 mg/L (TMW-3)
MTBE 0.166 mg/L (TMW-1)
Naph 1.68 mg/L (MW-10R)

ADEM Form 479 8/02

ADEM GROUNDWATER BRANCH
UST SITE CLASSIFICATION SYSTEM CHECKLIST

Please read all of the following statements and mark either yes or no if the statement applies to your site. If you have conducted a Preliminary or Secondary Investigation, all questions should be answered. Closure site assessment reports may not provide you with all the necessary information, but answer the statements with the knowledge obtained during the closure site assessment.

SITE NAME: Kwik Shop No. 110
SITE ADDRESS: 33066 U.S. Highway 280, Childersburg, Alabama

FACILITY I.D. NO.: 14249-121-005202
INCIDENT NO.: UST10-08-08

OWNER NAME: Russell Petroleum Corp.
OWNER ADDRESS: P.O. Box 250330, Montgomery, Alabama 36125

NAME & ADDRESS OF PERSON COMPLETING THIS FORM: Jeffrey M. Schexnayder, P.G., PPM Consultants, Inc.
5555 Bankhead Highway, Birmingham, Alabama 35210

CLASSIFICATION	***DESCRIPTION***	***YES***	***NO***
CLASS A	IMMEDIATE THREAT TO HUMAN HEALTH, HUMAN SAFETY OR SENSITIVE ENVIRONMENTAL RECEPTOR		
A.1	Vapor concentrations at or approaching explosive levels that could cause health effects, are present in a residence or building.	☐	☒
A.2	Vapor concentrations at or approaching explosive levels are present in subsurface utility system(s), but no buildings or residences are impacted.	☐	☒
CLASS B	IMMEDIATE THREAT TO HUMAN HEALTH, HUMAN SAFETY OR SENSITIVE ENVIRONMENTAL RECEPTOR		
B.1	An active public water supply well, public water supply line, or public surface water intake is impacted or immediately threatened.	☐	☒
B.2	An active domestic water supply well, domestic water supply line or domestic surface water intake is impacted or immediately threatened.	☐	☒
B.3	The release is located within a designated Wellhead Protection Area I.	☐	☒
CLASS C	IMMEDIATE THREAT TO HUMAN HEALTH, HUMAN SAFETY OR SENSITIVE ENVIRONMENTAL RECEPTOR		
C.1	Ambient vapor/particulate concentrations exceed concentrations of concern from an acute exposure, or safety viewpoint.	☐	☒
C.2	Free product is present on the groundwater, at ground surface, on surface water bodies, in utilities other than water supply lines, or in surface water runoff.	☐	☒
CLASS D	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
D.1	There is a potential for explosive levels, or concentrations of vapors that could cause acute effects, to accumulate in a residence or other building.	☐	☒
D.2	A non-potable water supply well is impacted or immediately threatened.	☐	☒

ADEM GROUNDWATER BRANCH
UST SITE CLASSIFICATION SYSTEM CHECKLIST (continued)

CLASSIFICATION	*DESCRIPTION*	*YES*	*NO*
D.3	Shallow contaminated surface soils are open to public access, and dwellings, parks, playgrounds, day care centers, schools or similar use facilities are within 500 feet of those soils.	☐	☒
CLASS E	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
E.1	A sensitive habitat or sensitive resources (sport fish, economically important species, threatened and endangered species, etc.) are impacted and affected.	☐	☒
CLASS F	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
F.1	Groundwater is impacted and a public well is located within 1 mile of the site.	☐	☒
F.2	Groundwater is impacted and a domestic well is located within 1,000 feet of the site.	☐	☒
F.3	Contaminated soils and/or groundwater are located within designated Wellhead Protection Areas (Areas II or III).	☐	☒
CLASS G	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
G.1	Contaminated soils and/or groundwater are located within areas vulnerable to contamination from surface sources.	☒	☐
GLASS H	SHORT TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
H.1	Impacted surface water, stormwater or groundwater discharges within 500 feet of a surface water body used for human drinking water, whole body water-contact sports, or habitat to a protected or listed endangered plant and animal species.	☐	☒
CLASS I	LONG TERM THREAT TO HUMAN HEALTH, SAFETY, OR SENSITIVE ENVIRONMENTAL RECEPTORS		
I.1	Site has contaminated soils and/or groundwater but does not meet any of the above-mentioned criteria.	☐	☒

ADDITIONAL COMMENTS:

Information obtained by CTE Environmental; however, PPM updated the Class G category.

Complete the classification evaluation questions listed above. Upon completion, determine the highest rank of the site (A.1 is the highest rank) based on the statements answered with a yes.

Enter the determined classification ranking:	**G.1**

ADEM GROUNDWATER BRANCH
SITE CLASSIFICATION CHECKLIST
(5/8/95)

1.0 INTRODUCTION

PPM Consultants, Inc. (PPM) was retained Russell Petroleum Corp. (Russell) to prepare this Corrective Action Plan (CAP) for the former Kwik Shop No. 110 facility located at 33066 U.S. Highway 280 in Childersburg, Talladega County, Alabama. The work was approved by the Alabama Department of Environmental Management (ADEM) via approval of Cost Proposal No. 50 in correspondence dated January 17, 2024.

The purpose of this CAP is to provide an approach to decrease constituent-of-concern (COC) concentrations in soil and groundwater to below Site-Specific Corrective Action Levels (SSCALs). The COCs for the site include benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tertiary butyl ether (MTBE), and naphthalene.

This CAP provides a summary of pertinent environmental activities conducted to date at the facility and a detailed description of the proposed approach for site remediation. A schedule and cost estimates are included for the implementation of the CAP and associated effectiveness monitoring.

2.0 SITE BACKGROUND

2.1 SITE LOCATION

Kwik Shop No. 110 facility is no longer in operation and is currently used as a firework stand. The facility is located at 33066 U.S. Highway 280, in Childersburg, Alabama and is situated in the southeast ¼ of the southwest ¼ of Section 20, Township 20 South, Range 3 East, *Childersburg, Alabama, Quadrangle*. More specifically, the site is located at approximately 33° 16’ 22” north latitude and 86° 21’ 26” west longitude. The site location is shown in **Figure 1**, **Site Location Map** in **Figures**.

2.2 ADJACENT PROPERTIES

The site is located on the northwest corner of the intersection of U.S. Highway 280 and 5th Street SW in a commercial and residential area of Childersburg, Alabama. A vacant dentist office is located north-northwest of the site. An outdoor storage sales facility is located east, across Highway 280. South-southeast of the site is a former restaurant that now operates as a used car sales lot. A residential property is located south-southwest of the site, across 5th Street SW and another residential property is located adjacent to the west-

southwest of the facility. A vacant parcel, followed by residential properties is located west of the site. Adjacent property information is shown in **Figure 2, Area Map**.

2.3 SITE DESCRIPTION

The former Kwik Shop No. 110 facility operated on an approximate 0.8-acre parcel of land that is currently operated as a fireworks store. The former convenience store building is located in the approximate center of the property. A canopy is located northeast of the building that formerly covered the dispenser islands. The western half of the property contains a residence and is wooded. An unnamed tributary to Tallaseehatchee Creek traverses across the western portion of the property.

The former underground storage tank (UST) system consisted of three 10,000-gallon gasoline USTs and two dispensers. The USTs were in a single tank pit located north of the store and the dispensers were located east of the store. A second UST pit was located between 5th Street and the south side of the store building. Site features are shown in **Figure 3, Site Map**.

Underground utilities identified at the site include a water line, natural gas line, and telephone line. The water main transects east to west on the south side of 5th Street SW and a lateral to the store extends north and then northeast to the west side of the store building on site. A natural gas line transects along the north side of 5th Street SW and an underground telephone line transects north to south, along the west side of U.S. Highway 280.

2.4 SITE HISTORY

The following provides a brief summary of pertinent events conducted at the site provided by CTE:

- January 2010 – UST Closure Assessment performed by CTE.
- October to November 2010 – Preliminary Investigation completed by CTE. Monitoring wells MW-1 though MW-4 were installed. Soil and groundwater samples were collected.
- April to May 2011 – Secondary Investigation completed by CTE. Monitoring wells MW-5 through MW-10 were installed. Soil and groundwater samples were collected.

- April to June 2012 – Off-site Secondary Investigation completed by CTE. Monitoring wells MW-11 through MW-15 were installed. Soil and groundwater samples were collected.
- November to December 2012 – CTE completed an Alabama Risk-Based Corrective Action (ARBCA) evaluation.
- January 2013 – CTE revised Off-Site Secondary Investigation Report.
- March 2013 – CTE revised ARBCA evaluation.
- April 2013 to December 2013 – Groundwater monitoring performed by CTE.
- May to July 2014 – CTE installed recovery wells RW-1 through RW-3 and performed mobile enhanced multi-phase extraction (MEME) events.
- August 2014 to October 2019 – CTE performed quarterly groundwater monitoring and MEME events.
- January 2020 – Russell Petroleum retained PPM as their environmental contractor.
- July 13, 2020 – PPM recalculated SSCALs for groundwater at the site. The revised SSCALs were approved by ADEM in July 2020.
- April 2020 to present – PPM began quarterly groundwater monitoring in April 2020. Reports are typically submitted to ADEM on a quarterly basis.

Additional Monitoring Well Installation: Soil borings SB-22 through SB-30 were advanced at the site in September 2021. The adsorbed benzene concentration exceeded the SSCAL in SB-29 from 16.5 to 17.5 feet below ground surface (BGS). Soil borings SB-22 through SB-25 were converted to Type II monitoring wells MW-22 through MW-25 and soil boring SB-26 was converted to a Type III monitoring well. The findings were submitted to ADEM on October 22, 2021.

Corrective Action Plan Evaluation: PPM submitted a Corrective Action Plan Evaluation (CAPE) to ADEM on October 31, 2022, to identify remedial strategies to effectively decrease COC concentrations in soil and groundwater to below SSCALs established for the site. Based on the results of the subsurface investigations and recent groundwater monitoring results, PPM was of the opinion that an aggressive remedial approach would be necessary to successfully bring this incident to closure. PPM recommended the use of a fixed-based ozone sparge system to reduce COC impact in soil and groundwater. ADEM correspondence dated November 10, 2022, agreed with PPM's recommendation for a fix-based ozone sparge system and requested a workplan and cost proposal to conduct a soil

and groundwater study to identify intervals to target ozone sparging efforts. The Workplan and Cost Proposal No. 49 were approved by ADEM on March 21, 2023, and approved on March 28, 2023, respectively.

Soil and Groundwater Study: A soil and groundwater study was performed in July 2023 to further assess the source area and off-site locations for elevated COCs in soil and groundwater. Twelve soil borings (SB-31 through SB-42 were advanced and six temporary monitoring wells (TMW-1 through TWM-6) were installed and abandoned after sampling.

Elevated COC-impact in soil was observed in soil borings SB-31 through SB-36. Deeper impacts were observed in SB-31 through SB-34 and SB-36. Therefore, PPM concluded that treatment should be performed from the groundwater interface to at least 25 feet BGS. For off-site boring SB-40, the elevated benzene was only observed in the deeper zone and not near the groundwater interface; however, the shallower sample contained a higher total BTEX concentration which indicates that the COC mass in this area is likely more weathered.

Groundwater samples from each of the temporary monitoring wells contained at least one COC concentration that exceeds an SSCAL, with the exception of TMW-6. Therefore, PPM recommended that groundwater treatment was needed both on the subject property and on the adjacent parcel to the south. It was noted that the ground-penetrating radar (GPR) survey identified an anomaly, similar to a UST or a former UST pit on the northwest portion of the adjacent parcel to the south. It was not known if this potential UST has contributed to the COC impact or not. PPM recommended the development of an engineered CAP that addresses COC-impact both on the subject property and on the adjacent parcel to the south.

2.5 SITE CONDITIONS

2.5.1 Soil

Subsurface lithology was identified from visual inspection of soil and rock encountered in borings advanced during the Preliminary, Secondary, and Additional Secondary Investigations conducted by previous consultants and PPM. Based on this information and a review of literature sources, the site is located within the Coosa Valley district of the Alabama Valley and Ridge Province. Folded and thrust-faulted sedimentary units underlie this area, and the resulting topography is characterized by a series of sub-parallel ridges and valleys that trend generally northeast-southwest. Geologic structures in the area are

primarily faults and fault systems, and these correspond to the fold and thrust structural belt of the southern Appalachian orogeny. A circular thrust fault surrounds the site. The middle and Upper Cambrian Conasauga Formation is the predominant bedrock unit in the Talladega County area of the Coosa Valley. The Conasauga Formation consists of limestone and dolomite, interbedded with dark gray shales in varying proportions.

The general lithology of the site consists of gray, purple laminated weathered shale, between intervals of soft, homogenous tan, orange silty to sandy/gravelly clay. The weathered shale was generally observed at various depths across the site. The gravelly clay was typically observed from just below the ground surface to approximately 22 feet BGS. The sandy clay was generally observed below the weathered shale at a depth of approximately 25 feet BGS. This is consistent with soils that make up the Conasauga Formation. Representative cross sections of the lithology encountered at the site are presented in **Figure 4A, Geologic Cross-Section A -A'** and **Figure 4B, Geologic Cross-Section B -B'**. Soil borings and monitoring well construction logs from previous site investigations are provided in **Appendix A Soil Boring/Monitoring Well Construction Logs**.

2.5.2 Groundwater

Static groundwater levels were last measured on March 1, 2023. Water levels in the shallow monitoring wells ranged from 2.14 feet below top of casing (BTOC) in MW-21 to 10.19 feet BTOC in MW-16. The depths to water in deep wells MW-10R, MW-13, MW-22, MW-23, MW-25, and MW-26 ranged from 4.34 feet BTOC in MW-13 to 8.97 feet BTOC in MW-26. The shallow and deep zones appear to be hydraulically connected based on potentiometric elevations.

Based on the calculated groundwater elevations, groundwater flow was generally to the northeast across the site, except for where it was influenced by groundwater mounding, associated with the former UST pit. The hydraulic gradient measured from MW-11 toward MW-8 on March 1, 2023, was 0.22 feet/foot (ft/ft). Groundwater elevation data are shown in **Table 1**, **Groundwater Elevation Survey Data**. **Figure 5, Groundwater Elevation Map (March 1, 2023)** depicts the groundwater flow direction and potentiometric surface.

2.5.3 COCs in Soil

Analytical data for soil samples obtained during prior investigations conducted at the site indicate that benzene concentrations or detection limits exceed the approved SSCAL in soil samples collected from MW-10, MW-11, MW-15, SB-29, SB-32 through SB-34, SB-36, and SB-40. Analytical data also indicated adsorbed toluene concentrations exceeded SSCAL in the soil samples collected from MW-11, MW-15, and SB-33 through SB-36. Adsorbed ethylbenzene concentrations in soil exceeded the SSCAL in soil samples collected from MW-15, and SB-32 through SB-35. With the exception of SB-40, each of these borings are located on the southern third of the property. The remaining COC concentrations were below their respective SSCALs in the soil samples collected.

A summary of COC concentrations in soil is provided in **Table 2, Soil Analytical Summary** and detected COCs in soil above the SSCALs are shown in **Figure 6, Detected COC Concentrations in Soil above the SSCALs**.

2.5.4 COCs in Groundwater

Analytical results from the last groundwater sampling event of the monitoring wells on March 1, 2023 (limited sampling event), and groundwater samples from the temporary monitoring wells in July 2023, indicate the following ranges of dissolved COC concentrations:

Benzene: <0.001 – 13.6 milligrams per liter (mg/L)
Toluene: <0.001 – 35.0 mg/L
Ethylbenzene: <0.001 – 8.20 mg/L
Total Xylenes: <0.003 – 34.5 mg/L
Total BTEX: below detection limits (BDL) – 89.0 mg/L
MTBE: <0.001 – 0.052 mg/L
Naphthalene: <0.005 – 1.68 mg/L.

Dissolved benzene concentrations exceeded SSCALs in samples collected from MW-7, MW-10R, MW-11, MW-13, and TMW-1 through TMW-5. The toluene concentrations in MW-10R, MW-11, and TMW-1 through TMW-4 exceeded the SSCALs. The ethylbenzene concentrations in MW-10R and TWM-1 through TMW-3 exceeded the SSCALs. The dissolved naphthalene concentration at TMW-5 also exceeded the SSCAL. Groundwater impact above the SSCALs is located in the upper zone (wells drilled to 20 to 23 feet BGS) and the lower zone (29 to 40 feet BGS).

Groundwater analytical results are summarized in **Table 3, Groundwater Analytical Summary**. The apparent horizontal extent of dissolved COC impact is shown on the following figures:

- **Figure 7, Dissolved Benzene Isoconcentration Map (March 1, 2023 and July 2023)**
- **Figure 8, Dissolved MTBE Isoconcentration Map (March 1, 2023 and July 2023)**
- **Figure 9, Dissolved Naphthalene Isoconcentration Map (March 1, 2023 and July 2023)**.

3.0 REMEDIAL APPROACH

3.1 REMEDIAL OBJECTIVES

This CAP has been prepared to achieve the following objectives:

- Reduce the potential for further migration of dissolved COCs
- Reduce COC concentrations in soil and groundwater to below SSCALs
- Accomplish site objectives in a safe, timely, and cost-effective manner.

3.2 CORRECTIVE ACTION OVERVIEW

Continued corrective action will consist of soil vapor extraction (SVE) and ozone sparge techniques to provide more rapid COC mass reduction. Once ozone sparge efforts are discontinued, RNA monitoring will resume at the site.

A baseline groundwater monitoring event should be conducted to provide site conditions just prior to initiating continual ozone sparge. Subsequent groundwater monitoring events are recommended throughout corrective action activities to assess the overall effectiveness of the remedial approach and to aid in selecting the future course of actions at the site. The following provides a description of the proposed corrective actions and associated effectiveness monitoring.

3.2.1 Overview of Ozone Sparge

Ozone (O_3) is an allotrope of oxygen, consisting of three oxygen atoms that are less stable than diatomic oxygen (O_2). Ozone is more soluble than oxygen in water and is commonly used in municipal water treatment applications for disinfectant purposes. The use of ozone for soil and groundwater remediation projects has increased over the two decades as alternative methods have been pursued and the technology has subsequently evolved.

In general, the ozone-based process for site remediation is similar to other chemical oxidation techniques in which the oxidant of choice is sparged into the desired treatment area. However, the use of ozone is different from most oxidation processes as the ozone can be injected as a gas or liquid (as ozonated water). This approach provides the opportunity to deliver more continuous oxidation as opposed to batch applications typically associated with other techniques.

An ozone generator uses electrical current to convert O_2 (readily available in atmospheric air) to O_3. A compressor is then used to sparge the ozone into the subsurface using one or more sparge points. Once delivered to the subsurface, the ozone facilitates deconstruction of COC molecules and other oxidizable substances. As an added benefit, the reaction results in the release of oxygen that is beneficial in producing conditions that are conducive to aerobic degradation of select contaminants. As COC concentrations decrease over time, the volume of ozone sparged into the subsurface can be decreased accordingly and individual sparge points gradually taken offline.

It is noted that based on past experience with similar projects, potential vapor escape at the surface is not anticipated given the relatively low air flow rates used to sparge ozone into the subsurface and the depth at which the ozone will be sparged.

3.2.2 Overview of Soil Vapor Extraction

SVE is a common in-situ remedial technology that has proven to be effective at treating the vadose zone. This technology involves the application of vacuum to the soil matrix, creating a negative pressure gradient that causes movement of vapors toward an extraction point. Higher vacuums and airflow are also capable of physically removing adsorbed COC impact. In addition, the increased flow of oxygen that occurs in the subsurface resulting from the SVE process promotes increased biological degradation, aiding in potential shorter cleanup duration.

For this site, the SVE system will be used to recover soil vapors and adsorbed impact as well as potential vapors that may be produced during deconstruction of hydrocarbons in the subsurface. However, PPM anticipates that the majority of ozone sparged into the subsurface will be consumed during the oxidation of targeted contaminants.

3.2.3 Overview of Remediation by Natural Attenuation

Natural attenuation is a term applied to the natural processes that help reduce contaminant concentrations and, in some cases, reduce the potential for contaminant migration. There are multiple components that comprise natural attenuation including: biodegradation; sorption; dispersion and dilution; and volatilization. Biodegradation is often considered the most important component of RNA as it results in chemical changes to the contaminant often rendering it less harmful to the environment.

RNA is typically not considered for sites with elevated contaminant concentrations or free product, as it alone will not achieve site objectives within a reasonable time frame. However, RNA is often selected for sites with low to moderate impact that show indications that it may be effective. In addition, RNA may be used in conjunction with other remedial methods that address contaminant source control and, in the case of ozone and oxygen sparge, to gauge the effectiveness of the ozone/oxygen sparging by monitoring the level of dissolved oxygen.

If dissolved COC concentrations appear to be stable and near SSCALs, RNA monitoring without active remedial techniques may be implemented at the site. It is anticipated that ozone sparge will not only reduce the overall contaminant mass but will also create conditions conducive to microbial activity. If so, an RNA monitoring program may be necessary to ensure that active remediation is no longer warranted at the site.

Select water quality parameters [pH, temperature, specific conductance, oxidation reduction potential (ORP), and dissolved oxygen, etc.] will also be monitored during the RNA groundwater monitoring events.

3.3 OZONE/OXYGEN SPARGE AND SVE DESIGN CONSIDERATIONS

PPM has selected a remedial approach that should achieve site objectives in a cost effective and timely manner. One of the most important aspects of any chemical oxidation program is providing adequate contact with the substance to be oxidized. Typically, most applications deliver the oxidant throughout the area of impact in an effort to provide a

greater amount of destruction. Sparge points are strategically placed across the area of impact and along suspected natural migration pathways (i.e., relict joints) to provide overlap of the oxidant injections.

PPM used existing COC concentration data to estimate the mass of contaminants requiring treatment. In addition, consideration was also given to other oxidizable materials known or suspected to be present in the subsurface. A site oxidant demand was then estimated using this information. Based on the oxidant demand, an ozone sparge system was selected capable of producing a sufficient mass of ozone per day so that site objectives could be achieved within a reasonable time frame. A summary of these calculations is provided in **Appendix B, Design Calculations**.

Ozone sparge materials consisting of delivery tubing and sparge points are required to be resistant to corrosion because of contact with the ozone gas. At this site, Teflon delivery tubing and stainless steel sparge points will be utilized. PPM requested quotes for the ozone sparge materials and ozone-producing equipment from both Newterra/H_2O Engineering, Inc. (Newterra) and MK Environmental (MK).

The SVE system, in addition to removing adsorbed COCs from the soil, will be required at this site to recover potential vapors that may be produced during deconstruction of hydrocarbons in the subsurface. SVE will be performed from four 2-inch nominal diameter extraction wells placed in the area near the southern former UST pit and monitoring wells MW-10 and MW-26 where the highest soil and groundwater impacts have been identified by previous investigations. PPM requested quotes for the SVE equipment from both Newterra and MK. Copies of the quotes are included in **Appendix C, Equipment Specifications and Quotations**.

To monitor the effectiveness of the system, PPM proposes to conduct groundwater monitoring events prior to and on a quarterly basis after implementation of this CAP. Groundwater sampling methodology and recommended sampling frequency are discussed further in **Section 3.9**. Based on the results of these events, the decision will be made to continue with ozone sparging and SVE or potentially proceeding with RNA alone.

3.3.1 Ozone Sparge Unit

PPM recommends that a skid-mounted MK ozone unit, or comparable system, be used at the site. The unit is capable of producing up to 10 pounds per day (ppd) of ozone for remedial efforts. The ozone delivery pump can sparge ozone at a rate up to 43 standard

cubic feet per minute (scfm) at a maximum pressure of 125 pounds per square inch (psi) for up to 50 ozone sparge points.

The unit has a field programmable controller with an interface panel viewer. Independent time duration control for each sparge point is available ranging from 1 to 30 minutes per location. A programmable cycle lag time is used to control the time duration between each sparge cycle.

System components that are in contact with ozone are manufactured of ozone resistant material to maintain acceptable runtime during the project. Components can be easily replaced during maintenance intervals recommended by the equipment manufacturer. More detailed information regarding the unit is provided in **Appendix C**.

3.3.2 Fail-safe Components

The ozone unit will contain a fail-safe automatic shutdown device to stop ozone production and sparging in the event that an ozone leak is detected within the unit or within the trailer. Finally, inside the ozone unit, an ambient ozone monitor sensor, a built-in high limit pressure switch, and a pressure relief valve are provided to protect against equipment damage.

The unit will be equipped with a telemetry system to provide remote system monitoring. A programmable logic controller will be connected to the telemetry system to allow the ozone system to be monitored and manipulated remotely through the internet. A router will be installed to provide a firewall for system internet security. A wireless cellular provider, or similar, will be utilized to facilitate communication with the telemetry system.

Although it is anticipated that ozone sparged into the subsurface will be depleted during the oxidation process, it is possible that some residual ozone may remain after the oxidant demand has been met. If this should occur, ozone escape is not anticipated to be an issue for outdoor inhalation or indoor inhalation within surface structures, primarily due to dilution effects with ambient air and the SVE system.

3.3.3 Sparge Points

PPM recommends that ozone be applied to the subsurface by means of 26 single and nested sparge points strategically placed in the area of groundwater impact on and off-site properties. The shallow proposed sparge points (PSP-1A through SP-26A) will be installed

to a depth of approximately 20 feet BGS and the deep proposed sparge points (PSP-1B, PSP-3B and PSP-5B through PSP-26B) will be installed to a depth of up to 40 feet BGS. Ozone sparging will be performed through sparge points PSP-1 through PSP-26, which are located within the zone of highest dissolved benzene concentrations in the upper and lower aquifers. Ozone sparge at these locations should achieve an overall decrease of COC concentrations within the vicinity of each sparge point. An estimate of approximately 10 feet was chosen as the design radius of influence. The actual points will be placed closer to each other than the design radius of influence so that overlapping areas of influence can be achieved. The placement of the proposed sparge points is provided on **Figure 10, Proposed System Layout**.

The ozone/oxygen sparge points will be constructed of 1-inch inside diameter (I.D.) Schedule (SCH) 80 polyvinyl chloride (PVC) risers connected to a 1.5-inch outside diameter (O.D.) stainless steel oxidation point approximately 15 inches long at the base of the riser pipe. The risers and oxidation points will be joined using threaded, flush joint connections complete with ozone-resistant fittings.

Sand will be placed in the boring annulus for each proposed sparge point from the bottom of the boring to approximately 2 to 4 feet above the top of the deep oxidation point, depending on lithology observed. A bentonite seal will be emplaced above the sand pack and extended to approximately 22 feet BGS, which is 2 feet below the bottom of the shallow oxidation point. A second sand pack will be emplaced above the bentonite and will extend 2 to 10 feet above the top of the shallow oxidation point, based on the lithology encountered. A cement/bentonite grout will be placed above the upper bentonite seal to within approximately 2 feet BGS. The bentonite seals and grout are intended to reduce the potential for ozone escaping up the boring and to the land surface.

The proposed sparge points will be set within 18-inch diameter steel manhole covers surrounded by concrete pads. The larger diameter manhole covers are necessary to facilitate easy access to the well head connections. The manhole covers will extend slightly above the existing land surface in an effort to reduce the potential for inflow from the land surface. Each sparge point will be completed with a well head connection that will facilitate ozone delivery and measurement of sparge pressures. An illustration of the wellhead and sparging point construction is provided in **Figure 11, Ozone Sparge Point and SVE Construction Details**.

Existing monitoring wells will be used to monitor site response and to serve as locations for measuring pressure gradients once the system is operational. Should the radius of

influence from these sparge points be deemed insufficient to contact the majority of COC impact over time, additional sparge points may be added as needed.

3.3.4 SVE Unit

PPM recommends using a SVE unit manufactured by MK that utilizes a 60 scfm at 89 inches of water column, regenerative vacuum blower to recover potential vapors that may be generated during the oxidation process, and to remove adsorbed COC impact in soil. The blower produces negative pressure at select areas on site to transfer vapors through a 500-pound granulated activated carbon (GAC) vessel prior to discharge to the atmosphere. More detailed information regarding the unit is provided in **Appendix C**.

3.3.5 Extraction Points for SVE

PPM recommends vacuum be applied to the subsurface by means of four SVE points. Two SVE points (PSVE-1 and PSVE-3) will be placed in the former UST pit on the southern portion of the property and two (PSVE-2 and PSVE-4) will be placed near monitoring wells MW-10 and MW-26 were elevated adsorbed COC concentrations were observed. The locations of the SVE points are shown in **Figure 10**. The details of the piping connections at the wellhead of each recovery well are provided in **Figure 11**. The SVE piping will be connected to a manifold at the SVE system.

3.4 OZONE SPARGE / SVE SYSTEM ELECTRICAL COMPONENTS

The ozone sparge unit and SVE unit will utilize three-phase, 230-volt, 400-amp electrical service. Power will be connected to a power supply provided by Alabama Power Company.

3.5 SYSTEM TELEMETRY

The system will be equipped with a programmable logic controller (PLC) connected to a cellular based telemetry system with a modem that allows the system to be monitored and controlled remotely through the internet.

3.6 ANTICIPATED SITE RESPONSE

The following provides information regarding the anticipated site response to treatment based on actual and assumed site conditions.

3.6.1 Oxidation of COC

Ozone sparged into the subsurface will rapidly react with oxidizable substances that it comes in contact with, essentially deconstructing the molecules in a short time period. An important factor in this process is providing an adequate mass of ozone based on oxidant demand. The actual oxidant demand for the site is unknown but has been estimated using the assumptions outlined in **Appendix B**. Twenty-four nested ozone sparge points and two typical sparge points are proposed to provide sufficient contact in the treatment area.

3.6.2 Removal of Soil Vapors

The SVE extraction points are designed to capture vapors in the former southern UST pit and the area near MW-10 and MW-26 where the highest soil and groundwater impacts were observed.

3.6.3 Remediation by Natural Attenuation

The final phase of effectiveness monitoring will be initiated once active remediation efforts have ceased at the site. Anticipated site response to RNA cannot be adequately predicted at this time, as it is unknown what site conditions will be on completion of the active remediation efforts. However, efforts will be made to obtain site remedial objectives within two years of implementing corrective action activities outlined in this CAP.

3.7 PERMITS

Once the CAP and associated cost proposals are approved, PPM will apply for an Underground Injection Control (UIC) permit, which is required prior to sparging ozone or oxygen at the site. Notification to the ADEM Air Division will be required for the emissions from the SVE system. A waste profile will be required to be approved for disposal of solid waste generated during the installation process.

PPM spoke with the City of Childersburg building inspector Mr. Steve Yarnell. According to Mr. Yarnell, the City will require a building permit for the construction activities. Upon approval of the CAP by ADEM, the building permit application will be submitted to the City of Childersburg. A permit to horizontally drill and install ozone piping conduit beneath 5th Street will need to be obtained from the City of Childersburg.

3.8 OZONE SPARGE / SVE SYSTEM INSTALLATION

3.8.1 General

The ozone sparge unit and SVE unit will be located inside a fence southwest of the store building in a grassy area. The primary reasons for selecting this area are proximity to the sparge field, locations of utilities, security, property access, and pedestrian and vehicular traffic. The proposed location of the units is shown on **Figure 11**.

CAP implementation dates will be based on the approval date of this CAP by ADEM, issuance of a building permit by the City of Childersburg, equipment availability, and subcontractor scheduling. Initial implementation activities will consist of the following:

- Installation of 30 borings using hollow stem augers
- Construction of 50 ozone sparge points (PSP-1A through PSP-26A and PSP-1B, PSP-3B and PSP-5B through PSP-26B)
- Installation of four SVE extraction points (PSVE-1 through PSVE-4)
- Installation of protective piping and ozone/oxygen delivery tubing from sparge points PSP-1 through PSP-26 to the ozone system location
- Installation of SVE piping from the SVE points to the SVE unit location
- Mobilization of the ozone system and SVE unit to the site
- Installation of required electrical power supply equipment and lines
- Preliminary testing of the ozone system and SVE unit.

3.8.2 Soil Borings

Alabama One Call will be notified so that underground utilities will be marked prior to soil boring advancement and subsurface disturbance. Additionally, the first 4 feet of each new boring will be advanced with hand-held equipment to check for the presence of unmarked utilities.

The borings for the proposed sparge points will be advanced with hollow stem auger drilling equipment using a minimum of 4.25-inch I.D. hollow-stem augers. Borings for sparge points PSP-2 and PSP-4 will be advanced to approximately 20 feet BGS and the borings for sparge point PSP-1, PSP-3 and PSP-5 through PSP-25 will be advanced to approximately 40 feet BGS. The borings for the proposed soil vapor extraction points will be advanced with hollow stem auger drilling equipment using a minimum of 4.25-inch I.D.

hollow-stem augers. The borings for SVE points SVE-1 through SVE-4 will each be advanced to approximately 10 to 15 feet BGS.

Soil cuttings generated during boring advancement will be hauled to the Shelby County Landfill in Columbiana, Alabama. A waste profile will be required to be submitted to ADEM for approval of the waste disposal.

3.8.3 Ozone Sparge Point Installation

Ozone sparge points will be constructed of a 1-inch I.D. SCH 80 PVC riser connected to 1.5-inch O.D. stainless steel oxidation point approximately 15 inches long. The risers and oxidation points will be joined using threaded, flush joint connections complete with ozone-resistant fittings.

Sand will be placed in the boring annulus for each proposed sparge point from the bottom of the boring to approximately 2 to 10 feet above the top of the deep oxidation point, depending on lithology observed. A bentonite seal will be emplaced above the sand pack and extended to approximately 22 feet BGS, which is 2 feet below the bottom of the shallow oxidation point. A second sand pack will be emplaced above the bentonite and will extend 2 to 10 feet above the top of the shallow oxidation point, based on the lithology encountered. A cement/bentonite grout will be placed above the upper bentonite seal to within approximately 2 feet BGS. The bentonite seals and grout are intended to reduce the potential for ozone escaping up the boring and to the land surface.

The proposed sparge points will be set within 18-inch diameter steel manhole covers surrounded by concrete pads. The larger diameter manhole covers are necessary to facilitate easy access to the well head connections. The manhole covers will extend slightly above the existing land surface in an effort to reduce the potential for inflow from the land surface. Each sparge point will be completed with a well head connection that will facilitate ozone delivery. Sparging well construction details are shown in **Figure 11**.

3.8.4 SVE Extraction Piping

Each of the four proposed extraction wells will be constructed of a 2-inch I.D. SCH 40 PVC riser connected to 2-inch I.D. SCH 40 PVC screen with 0.01-inch slots. The screen length in each recovery well will be 10 feet.

Sand will be placed in the boring annulus for each proposed recovery well from the bottom of the boring to approximately 1 to 2 feet above the top of the screen. A bentonite seal approximately 1 to 2 feet thick will be constructed at the top of the sand pack. A cement/bentonite grout will be placed above the bentonite seal to within approximately 1-foot BGS.

The proposed SVE wells will be set within 18-inch diameter steel manhole covers surrounded by concrete pads. The larger diameter manhole covers are necessary to facilitate easy access to the well head connections. The manhole covers will extend slightly above the existing land surface in an effort to reduce the potential for inflow from the land surface. SVE well construction details are shown in **Figure 11**.

Complete Environmental and Walker-Hill Environmental provided quotes for the system installation. Complete Environmental was the lowest quote for the system installation and in an estimated shorter time to complete the work. A bid comparison and the subcontractor quotes are provided in **Appendix D**, **Subcontractor Specifications and Quotations**.

3.8.5 Electrical Hookup

An electrical subcontractor will provide the connection from the service provider to the main disconnect for the system. The electrical supply will be from a new, temporary power pole and meter. The pole will be set near the system enclosure by the electrical subcontractor. The electrical service line will be dropped to the pole and a meter set by Alabama Power Company. Electrical work will be performed in accordance with applicable local codes.

3.8.6 Sparge Point Configuration

Sparge point locations were strategically selected so that remedial objectives can be obtained within a reasonable time period. The area selected for treatment at the site is focused in and around the known extent of dissolved COC impact above SSCALs at the site. Placement of sparge points is intended to reduce existing COC impact in these areas and reduce the potential for further COC migration.

Sparge point specifications will consist of the following:

- Installation of an 18-inch diameter by 12-inch deep manhole cover at each proposed sparge point

- Installation of a well head connection including a SCH 80 flush threaded cap, a type 316 stainless steel tee, and a compression fitting
- Connection of the delivery tubing to the well head via the compression fitting
- Installation of an independent 1-inch I.D., SCH 40 PVC piping from the manhole to the ozone sparge system.

Typical construction details of sparge points are presented on **Figure 11**.

3.8.7 Protective Piping

Ozone resistant tubing (1/2-inch O.D. by 3/8-inch I.D.) will be used to convey the ozone from the system to each sparge point. The tubing will be placed inside 2-inch I.D. SCH 40 PVC for protection. A horizontal drill rig will be used to install PVC piping to connect the sparge points south of 5th Street to the ozone unit. The piping beneath concrete pavement will be installed to a depth of approximately 6 inches below the base of the concrete. Efforts will be made to ensure that the piping does not interfere with existing underground utilities. Construction details are depicted on **Figure 11**.

Concrete and asphalt generated during the installation of manhole covers and trenching will be disposed of at the Shelby County landfill. A quote from the landfill is included as **Appendix E, Waste Disposal Quote**. Soil excavated from the area where concrete will not be replaced will be used as backfill material since it is not anticipated to be impacted by petroleum constituents.

3.8.8 Security

The ozone sparge system will be contained in a trailer-mounted enclosure. The SVE system will be contained in an aluminum, sound-proofed enclosure. Both units will be surrounded by an 8-foot tall, four-sided, privacy fence. Appropriate warning signs and emergency contact information will be installed on the fence.

3.9 GROUNDWATER MONITORING

A groundwater monitoring event will be conducted at the site prior to system start-up to establish baseline conditions prior to initiating corrective actions. Samples will be collected from each accessible well on-site, including the new recovery wells, for analysis of COCs per Environmental Protection Agency (EPA) Method 8260.

The following provides a detailed description of the fieldwork methodology for effectiveness monitoring events.

A groundwater elevation survey will be performed prior to sampling the wells. Depth to groundwater measurements will be accomplished at each well location to be sampled with an oil/water interface probe capable of measuring the water depth to within +/- 0.01 feet. The interface probe will be cleaned prior to use at each well location by means of a phosphate free soap rinse, an isopropyl rinse, and a rinse of distilled water. Rinse fluids will be discharged to the land surface in areas that do not drain back to the respective well locations.

Each monitoring well scheduled for sampling will be sampled in general accordance with PPM's internal Quality Assurance/Quality Control (QA/QC) plan. Prior to sampling, each well will be purged of approximately three well-casing volumes (or to near dryness) utilizing single use, disposable PVC bailers and nylon rope. Purge water from sampled monitoring wells will be contained in 55-gallon drums and transported to PPM's office in Birmingham for temporary storage. Environmental Products and Services of Vermont, Inc. (EPS) will mobilize to PPM's office to collect the purge water for final disposal at Green Environmental facility in Bella Mina, Alabama. It is estimated that less than 100 gallons of purge water will be generated during each sampling event.

Each sample for COC analysis will be transferred from the bailer into 40-milliliter (ml) glass vials containing hydrochloric acid (HCl) as a preservative. Each container will be filled with the sample, promptly capped, and appropriately labeled to indicate the sample origin. A duplicate sample from one well will be collected for QA/QC protocol. Containers will then be placed in an iced cooler for preservation during shipment to the laboratory.

PPM personnel will wear disposable nitrile gloves during well purge and sample collection activities in an effort to reduce the potential for cross-contamination and as part of personal protective equipment (PPE) for the project. Gloves will be changed and discarded between each sample acquisition.

Select water quality parameters (pH, temperature, specific conductance, ORP, and dissolved oxygen) will be measured during sample collection. Measurements will be performed for each well sampled and will be representative of the water collected from the well. Instrument readings will be documented in the project field book.

On completion of sampling activities, sample coolers will be transported or shipped under standard chain-of-custody protocol to an independent testing laboratory for analysis. A copy of PPM's **Technical Sampling and QA/QC Plan** is provided in **Appendix F**.

3.10 OZONE SPARGE / SVE SYSTEM START-UP / INITIAL OPTIMIZATION

PPM personnel will be on site during system startup and initial operation. System components will be monitored to ensure that the system is operating properly prior to their departure from the site. During the first day of operation, oxygen will be gradually sparged to the various points. Connections, piping, and well heads will be checked for the presence of leaks and modifications/repairs will be promptly made upon discovery. Data will be collected to evaluate the initial pressure gradient generated throughout the sparge areas and fluctuations in groundwater elevations (if any). In addition, vacuum will be applied to the SVE points to ensure that adequate recovery efforts are produced by monitoring influent vapors and induced pressures at nearby monitoring wells.

The initial startup period is anticipated to be completed in approximately two days. Once it has been determined that the ozone sparge system is functioning properly, ozone will be sparged into the subsurface.

System information will be collected and recorded on a daily basis during the first two days of the optimization study. These measurements will be used to make modifications and adjustments to the system as needed to enhance the remedial efforts.

3.11 SYSTEM OPERATIONS AND MAINTENANCE

Following completion of the optimization study, PPM will periodically visit the site to conduct operations and maintenance (O&M) and monitoring activities. These activities will be conducted by a PPM engineer, geologist, or technician experienced in subsurface investigations and remediation.

PPM anticipates visiting the site approximately two times per month during normal system operation. Additional visits may be required based on site-specific conditions encountered. O&M and monitoring activities to be conducted during these routine visits are discussed in the following sections.

Normal operations will include O&M of the system and continuing optimization of system performance as needed. Scheduled visits will be made to maintain the system components

and ensure the system is operating as intended. Minor system components will be regularly inspected and replaced or repaired as required. If a shutdown of the system occurs, PPM will attempt to provide personnel to restart/repair the system within 72 hours of receiving notification of shutdown.

Typical ozone sparge and SVE O&M activities will include the following:

- Visual inspection of system components and their condition (including tubing connections for potential leaks)
- Monitoring of pressure/vacuum readings and air flow
- Monitoring of SVE effluent concentrations
- Monitoring of sparge times
- Checking SVE blower oil level and air filter conditions
- Greasing equipment fittings
- Remove and transport accumulated water in SVE knock-out tank to temporary holding tank at PPM office.

3.12 EFFECTIVENESS MONITORING

The progress of corrective action activities will be monitored to evaluate if the remedial objectives are being met. Results from baseline groundwater sampling will be used to gauge the progress of groundwater remediation efforts.

3.12.1 System Monitoring

System monitoring will include routine measurements of parameters discussed in **Section 3.12** and will coincide with O&M activities. Additional parameters to be measured, recorded, or calculated during the routine activities are as follows:

- Date of each site visit
- Measuring groundwater elevations in select monitoring wells (minimum of once per quarter)
- Measurement of dissolved oxygen and ORP in select monitoring wells to aid in evaluation the radius of influence (minimum of once per month)

- Total system runtimes and explanations of unscheduled shutdowns
- O&M activities and system condition
- Progress of the remedial system toward achieving site cleanup objectives.

An example of a monitoring form to be used is included in **Appendix G**, **Remediation Monitoring Forms**.

3.12.2 Groundwater Sampling

PPM recommends groundwater samples be collected from all monitoring wells on a quarterly basis for the first year of operation. Following four quarters of sampling, PPM may recommend reducing the number of wells sampled each quarter. Groundwater samples will be analyzed for BTEX, MTBE, and naphthalene per EPA Method 8260. Analytical data obtained during these events will be evaluated to ascertain if modifications to the ozone sparge program are warranted. This may include removing the ozone system, performing alternating months of sparging, adjusting the ozone sparge cycle time or modifying the number of sparge points used.

The system will be shut down at least 48 to 72 hours in advance of each scheduled monitoring event. Sampling activities will be conducted in accordance with the methodology outlined in **Section 3.9**.

4.0 REPORTING

PPM will submit reports in accordance with ADEM requirements. These reports will include:

1. System Delivery

2. Report of Corrective Action Implementation
   This report will be submitted within 60 days of system start-up and will include as-built drawings of the system layout, and a description of the work performed.

3. Reporting of Corrective Action Effectiveness
   PPM proposes submitting quarterly progress reports, which summarize field activities and progress of the system toward reducing COC concentrations to below

SSCALs. These reports will include an evaluation of the system's effectiveness and recommendations concerning any additional modifications or changes in remedial approaches that may be necessary. ADEM Corrective Action System Effectiveness Monitoring Report (CASEMR) forms will be included with each report.

4. Site Closure Report/Monitoring Well Abandonment
This report will describe in detail the closure of the site and removal of all remediation equipment.

5.0 CLOSURE EVALUATION

The data collected during site monitoring activities will be evaluated on a quarterly basis or more frequently if needed. Criteria for considering termination of remedial activities will include reduction of COC concentrations to at or below SSCALs or a determination that asymptotic levels have been reached.

Remedial measures will be terminated following approval from ADEM. The site will be monitored for potential increases in COC concentrations (rebound) once corrective actions have ceased. Recommendations will be made concerning further remedial action should COC concentrations rebound.

6.0 SITE HEALTH AND SAFETY

A site-specific Health and Safety Plan (HASP) for proposed corrective action activities at the facility is included in **Appendix H**, **Site Health and Safety Plan**. The HASP was specifically designed to address the proposed corrective actions and monitoring activities at the site. Project personnel will be familiar with the HASP prior to performing any work at the site. The HASP will be kept on site throughout the duration of the project.

7.0 PROJECT SCHEDULE

PPM will notify ADEM five days in advance of any planned drilling, trenching, system installation, or start-up activities to allow department personnel the opportunity to visit the site during work activities if possible. If rescheduling is necessary, PPM will notify ADEM by email or telephone of the new date and reason for rescheduling.

7.1 ESTIMATED SCHEDULE FOR SYSTEM INSTALLATION

Upon approval of the CAP by ADEM, PPM will prepare the applications for the UIC permit, the building permit, and horizontal drilling permit beneath 5th Street SW. The permits may require six to eight weeks for approval. PPM estimates that sparge point installation activities will be completed in ten workdays. Trenching and system installation will require approximately 15 workdays to complete, pending site and weather conditions encountered. This includes installing the ozone system and SVE system, connection of power, ozone tubing connection, and construction of the fence. A baseline groundwater monitoring event will be completed less than one month prior to completion of system installation activities.

System start-up activities will require approximately two days for adequate system monitoring prior to departing from the site. A site visit will be conducted approximately one week following start-up activities to further optimize system operation. Based on this anticipated schedule, PPM estimates that well installation, system installation, start-up, and initial optimization efforts can be completed within 30 days of initiating site activities. A report can be prepared within 30 days of start-up. Therefore, the report can be submitted within 120 days of authorization from ADEM.

7.2 ESTIMATED CLEANUP TIME

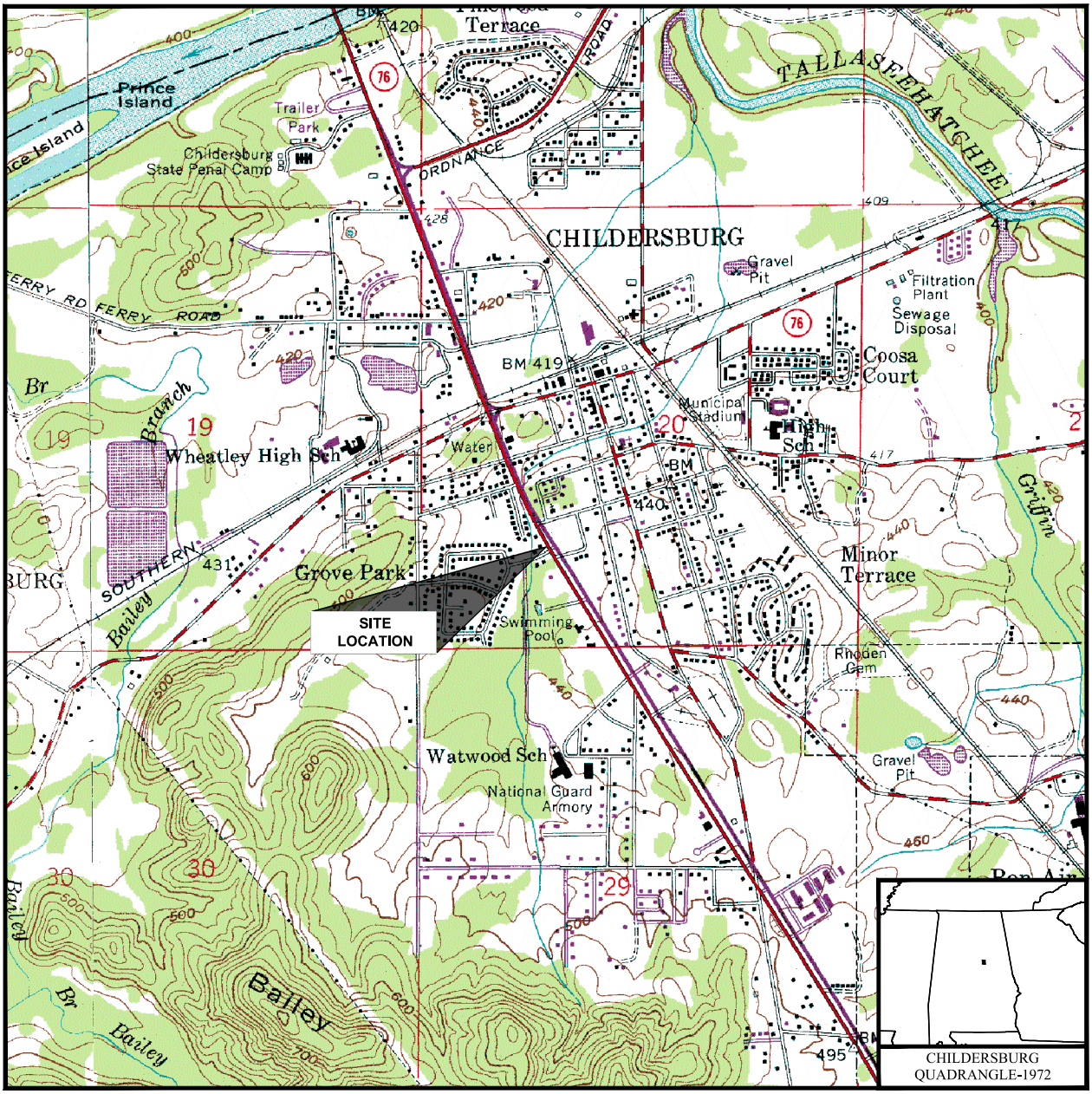
Although the length of time required to obtain cleanup objectives from ozone sparging cannot be accurately predicted, it is anticipated that active remedial efforts will be required for at least two years. This time frame is based on several factors including, but not limited to: estimated mass of COC in soil and groundwater; estimated mass of oxidizable substances in the subsurface (non-COC material); estimated radii of influence for sparge points; estimated ozone delivery rate from the system; and estimated system runtime. A summary of design calculations, including estimated cleanup time, is provided in **Appendix B**. It is noted that this is a theoretical estimate only and the actual cleanup time can be expected to vary from that predicted.

A more accurate prediction of cleanup time can be provided once the system has been in operation long enough to establish trends for dissolved COC concentrations during system operation.

8.0 COST ESTIMATE

The work elements for this CAP are eligible for reimbursement from the Alabama Tank Trust Fund (ATTF). Cost proposals for completion of the activities associated with implementation of the CAP will be submitted to AEPACS once all revised estimates are received from vendors and subcontractors.

FIGURES



SCALE: 1 : 24,000

1 .5 0 1 MILES

1000 0 1000 5000 10,000 FEET

1 0 KILOMETER 1 2

1000 0 METER 1000 2000

PPM CONSULTANTS, INC. www.ppmco.com		RUSSELL PETROLEUM CORPORATION **KWIK SHOP NO. 110** 33066 U.S. HIGHWAY 280 CHILDERSBURG, ALABAMA	SITE LOCATION MAP	FIGURE NUMBER 1
DRAWN BY: BWH	DRAWN DATE: 08/19/24			
PROJECT NUMBER: 422603	PHASE: CAPD			

SOURCE: TALLADEGA COUNTY

PPM CONSULTANTS, INC. www.ppmco.com			
DRAWN BY: BWH	DRAWN DATE: 08/19/24	RUSSELL PETROLEUM CORPORATION **KWIK SHOP NO. 110** 33066 U.S. HIGHWAY 280 CHILDERSBURG, ALABAMA	AREA MAP
PROJECT NUMBER: 422603	PHASE: CAPD		FIGURE NUMBER 2

N

0 15 30

SCALE: 1"=30'
(Approximate)

MW-16

U.S. HIGHWAY 280

U.S. HIGHWAY 280

VACANT

MW-17

MW-4

MW-1

MW-9

MW-5

FORMER UST PIT

SB-22/ MW-22

MW-8

MW-3

FORMER DISPENSER ISLAND (TYP. 2)

MW-2

APPROXIMATE PROPERTY BOUNDARY

MW-7 ® RW-1

CANOPY

MW-15 ® RW-3

MW-6

STORE

SB-35

MW-11 ® RW-2

SB-34/ TMW-2

MW-10R

SB-38/ TMW-4

SB-33

SB-26/ MW-26

SB-37

SB-23/ MW-23

SB-32/ TMW-1

SB-30

SB-36/ TMW-3

SB-31

FORMER UST PIT

SB-29

SB-27

SB-28

MW-12

FIRE HYDRANT

RESIDENCE

5TH STREET SOUTHWEST

MW-14

SB-40/ TMW-5

SUBSURFACE ANOMALY - SUSPECTED UST

MW-13

SB-42

SB-39

SB-41/ TMW-6

MW-18

MW-21

MW-19

USED CAR LOT

SB-24/ MW-24

MW-20

SB-25/ MW-25

LEGEND:

- SOIL BORING / TYPE II MONITORING WELL LOCATION
- SOIL BORING / TYPE III MONITORING WELL LOCATION
- SOIL BORING / TEMPORARY MONITORING WELL LOCATION
- ® RECOVERY WELL LOCATION
- SOIL BORING LOCATION
- FENCE
- POWER POLE

PPM CONSULTANTS, INC. www.ppmco.com		RUSSELL PETROLEUM CORPORATION **KWIK SHOP NO. 110** 33066 U.S. HIGHWAY 280 CHILDERSBURG, ALABAMA	SITE MAP
DRAWN BY: BWH	DRAWN DATE: 08/19/24		FIGURE NUMBER 3
PROJECT NUMBER: 422603	PHASE: CAPD		

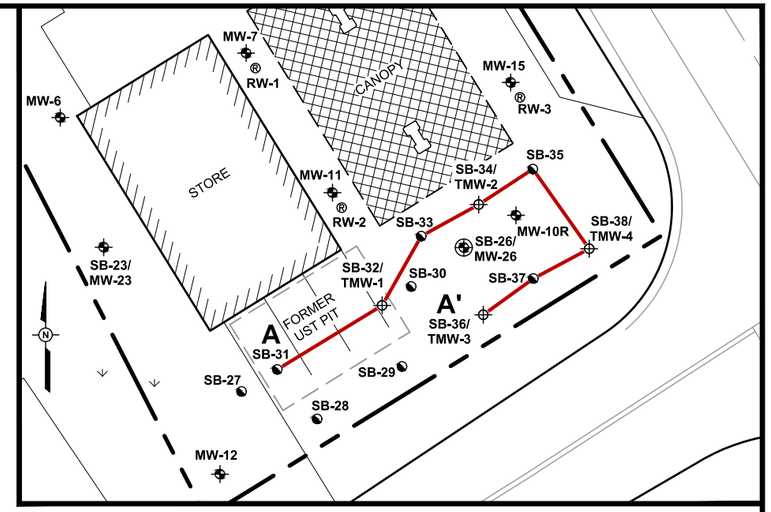
LEGEND:

- GRAVELLY CLAY
- CLAYEY SILT
- SHALE
- CONCRETE

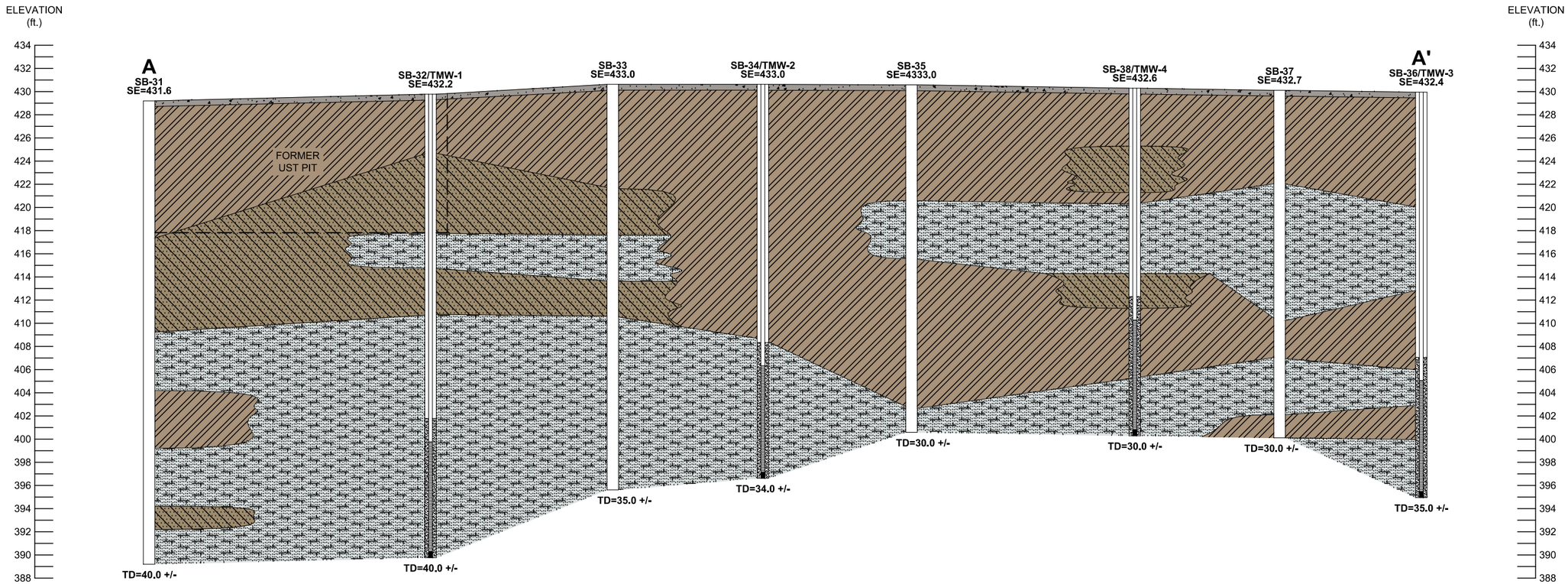
SE=432.2 SURFACE ELEVATION (ft.)

TD=40.0 +/- TOTAL DEPTH OF BORING (ft.)

SCREENED INTERVAL W/SUMP



HORIZ. SCALE: 1"=10'
VERT. SCALE: 1"=10'



PPM CONSULTANTS, INC. www.ppmco.com	
DRAWN BY: BWH	DRAWN DATE: 08/19/24
PROJECT NUMBER: 422603	PHASE: CAPD

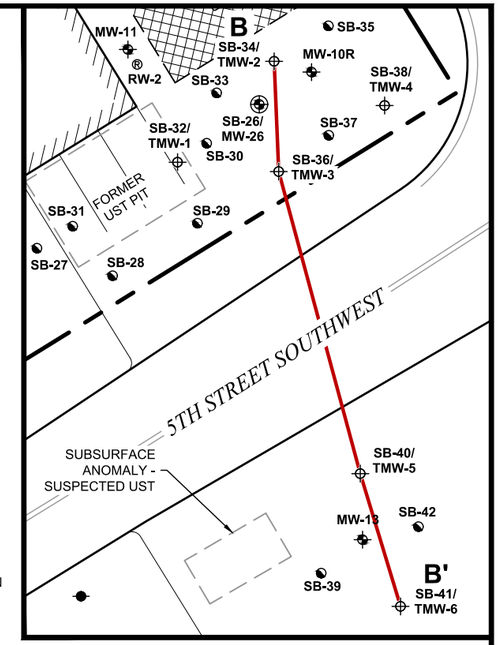
RUSSELL PETROLEUM CORPORATION
KWIK SHOP NO. 110
33066 U.S. HIGHWAY 280
CHILDERSBURG, ALABAMA

GEOLOGIC CROSS-SECTION
A-A'

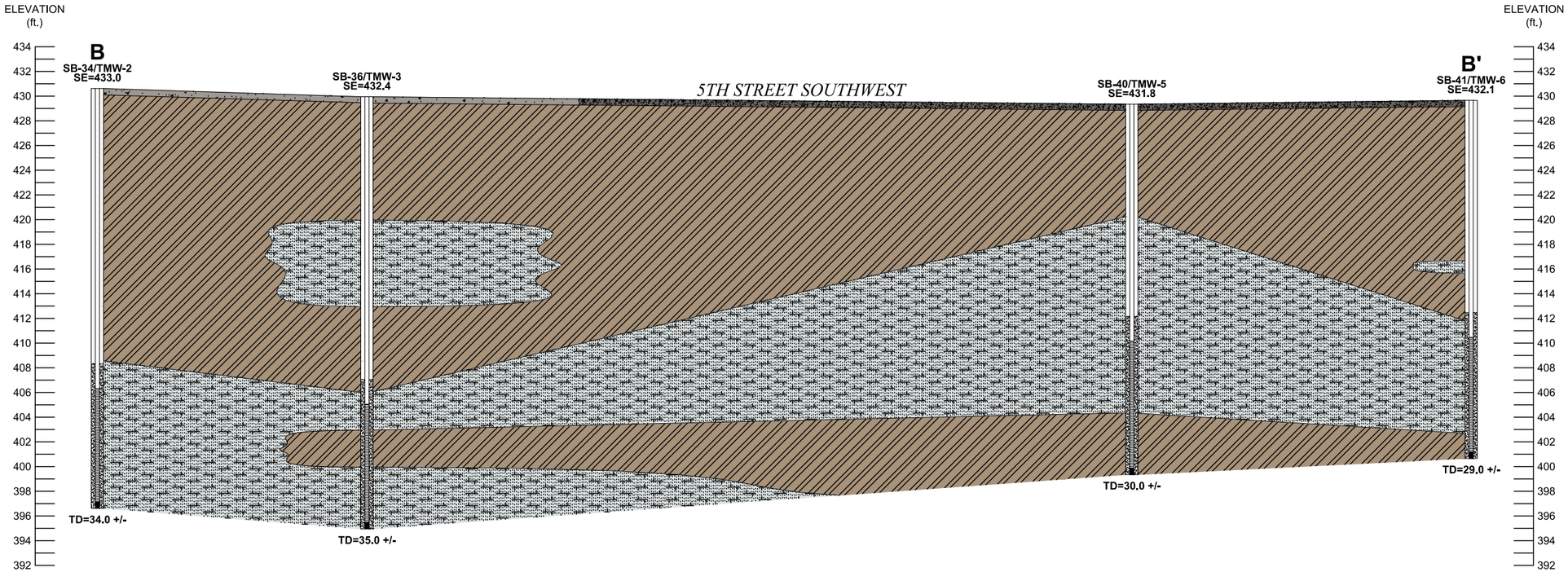
FIGURE NUMBER
4A

LEGEND:

- GRAVELLY CLAY
- SHALE
- ASPHALT
- CONCRETE
- **SE=433.0** SURFACE ELEVATION (ft.)
- **TD=34.0 +/-** TOTAL DEPTH OF BORING (ft.)
- SCREENED INTERVAL W/SUMP



HORIZ. SCALE: 1"=10'
VERT. SCALE: 1"=10'



PPM CONSULTANTS, INC. www.ppmco.com	
DRAWN BY: BWH	DRAWN DATE: 08/19/24
PROJECT NUMBER: 422603	PHASE: CAPD

RUSSELL PETROLEUM CORPORATION
KWIK SHOP NO. 110
33066 U.S. HIGHWAY 280
CHILDERSBURG, ALABAMA

GEOLOGIC CROSS-SECTION
B-B'

FIGURE NUMBER
4B

N

0 15 30

SCALE: 1"=30'
(Approximate)

U.S. HIGHWAY 280

U.S. HIGHWAY 280

5TH STREET SOUTHWEST

VACANT

STORE

CANOPY

FORMER UST PIT

FORMER UST PIT

RESIDENCE

USED CAR LOT

MW-1 424.93

MW-2 427.75

MW-3 NOT LOCATED

MW-4 424.91

MW-5 NOT LOCATED

MW-6 427.62

MW-7 425.71

MW-8 424.90

MW-9 424.76

MW-10R 425.89

MW-11 426.19

MW-12 428.59

MW-13 426.69

MW-14 426.60

MW-15 428.00

MW-16 422.24

MW-17 424.54

MW-18 NM

MW-19 427.67

MW-20 NOT LOCATED

MW-21 428.20

MW-22 424.80

MW-23 425.73

MW-24 427.29

MW-25 426.68

MW-26 423.63

RW-1 426.25

RW-2 427.23

RW-3 427.93

423.00

424.00

425.00

426.00

427.00

428.00

NOTE:
MONITORING WELLS MW-10R, MW-13, MW-22, MW-23, MW-25, AND MW-26 WERE NOT USED FOR CONTOUR INTERPOLATION AS THEY ARE SCREENED AT A DEEPER INTERVAL.

LEGEND:

⊕	TYPE II MONITORING WELL LOCATION
◎	TYPE III MONITORING WELL LOCATION
®	RECOVERY WELL LOCATION
424.93	GROUNDWATER ELEVATION (ft.)
423.00	GROUNDWATER ELEVATION CONTOUR (ft.)
←	GROUNDWATER FLOW DIRECTION
NM	NOT MEASURED

PPM CONSULTANTS, INC.
www.ppmco.com

DRAWN BY:	DRAWN DATE:
BWH	08/19/24
PROJECT NUMBER:	PHASE:
422603	CAPD

RUSSELL PETROLEUM CORPORATION
KWIK SHOP NO. 110
33066 U.S. HIGHWAY 280
CHILDERSBURG, ALABAMA

GROUNDWATER ELEVATION MAP
(MARCH 1, 2023)

FIGURE NUMBER
5

N

0 15 30

SCALE: 1"=30'
(Approximate)

SB-33	07/10/23	
	13'-15'	21'-23'
BENZENE (mg/kg)	0.182	0.378
TOLUENE (mg/kg)	20.4	-
ETHYLBENZENE (mg/kg)	22.6	-

SB-34/TMW-2	07/10/23	
	13'-15'	21'-23'
BENZENE (mg/kg)	0.537	4.20
TOLUENE (mg/kg)	39.1	42.2
ETHYLBENZENE (mg/kg)	31.0	18.2

SB-32/TMW-1	07/10/23	
	13'-15'	38'-40'
BENZENE (mg/kg)	0.268	0.143
ETHYLBENZENE (mg/kg)	56.4	-

SB-35	07/11/23
	15'-17'
TOLUENE (mg/kg)	28.3
ETHYLBENZENE (mg/kg)	23.3

SB-36/TMW-3	07/11/23	
	9'-11'	17'-19'
BENZENE (mg/kg)	0.351	0.552
TOLUENE (mg/kg)	7.63	5.39

SB-29	09/13/21
	16.5'-17.5'
BENZENE (mg/kg)	0.632

SB-40/TMW-5	07/12/23
	15'-17'
BENZENE (mg/kg)	1.36

VACANT
RESIDENCE
STORE
CANOPY
FORMER UST PIT
FORMER UST PIT
USED CAR LOT
U.S. HIGHWAY 280

MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7 ® RW-1, MW-8, MW-9, MW-10R, MW-11 ® RW-2, MW-12, MW-13, MW-14, MW-15 ® RW-3, MW-16, MW-17, MW-18, MW-19, MW-20, MW-21, SB-22/MW-22, SB-23/MW-23, SB-24/MW-24, SB-25/MW-25, SB-26/MW-26, SB-27, SB-28, SB-30, SB-31, SB-37, SB-38/TMW-4, SB-39, SB-41/TMW-6, SB-42

LEGEND:

- SOIL BORING / TYPE II MONITORING WELL LOCATION
- SOIL BORING / TYPE III MONITORING WELL LOCATION
- SOIL BORING / TEMPORARY MONITORING WELL LOCATION
- ® RECOVERY WELL LOCATION
- SOIL BORING LOCATION
- 4.20 VALUE IN RED EXCEEDS SSCAL-GRP/SP VALUE
- BDL BELOW DETECTION LIMIT

PPM CONSULTANTS, INC.
www.ppmco.com

DRAWN BY:	DRAWN DATE:
BWH	08/19/24
PROJECT NUMBER:	PHASE:
422603	CAPD

RUSSELL PETROLEUM CORPORATION
KWIK SHOP NO. 110
33066 U.S. HIGHWAY 280
CHILDERSBURG, ALABAMA

DETECTED COC CONCENTRATIONS IN SOIL ABOVE THE SSCALs

FIGURE NUMBER
6

N

0 15 30

SCALE: 1"=30'
(Approximate)

U.S. HIGHWAY 280

U.S. HIGHWAY 280

5TH STREET SOUTHWEST

VACANT

FORMER UST PIT

STORE

CANOPY

FORMER UST PIT

RESIDENCE

USED CAR LOT

MW-1 NS
MW-2 <0.001
MW-3 NS
MW-4 NS
MW-5 NS
MW-6 <0.001
MW-7 0.087
MW-8 <0.001
MW-9 NS
MW-10R 13.6
MW-11 0.160
MW-12 <0.001
MW-13 1.52
MW-14 <0.001
MW-15 <0.001
MW-16 NS
MW-17 NS
MW-18 NS
MW-19 NS
MW-20 NS
MW-21 NS
MW-22 <0.001
MW-23 0.005
MW-24 <0.001
MW-25 <0.001
MW-26 0.004
RW-1 NS
RW-2 NS
RW-3 NS
TMW-1 7.03
TMW-2 5.28
TMW-3 11.3
TMW-4 4.56
TMW-5 4.20
TMW-6 0.010

0.005
0.1
1.0
10
0.10
0.005

NOTES:

1. MONITORING WELL MW-26 WAS NOT USED FOR CONTOUR INTERPOLATION AS IT IS SCREENED AT A DEEPER INTERVAL.
2. TEMPORARY MONITORING WELL GROUNDWATER SAMPLES WERE COLLECTED IN JULY 2023.

LEGEND:

	TYPE II MONITORING WELL LOCATION
	TYPE III MONITORING WELL LOCATION
	TEMPORARY MONITORING WELL LOCATION
®	RECOVERY WELL LOCATION
0.087	BENZENE CONCENTRATION (mg/L) (VALUES IN RED EXCEED SSCALs)
0.005	BENZENE CONCENTRATION CONTOUR (mg/L) (UPPER ZONE)
0.005	BENZENE CONCENTRATION CONTOUR (mg/L) (LOWER ZONE)
NS	NOT SAMPLED

PPM CONSULTANTS, INC.
www.ppmco.com

DRAWN BY:	DRAWN DATE:
BWH	08/19/24
PROJECT NUMBER:	PHASE:
422603	CAPD

RUSSELL PETROLEUM CORPORATION
KWIK SHOP NO. 110
33066 U.S. HIGHWAY 280
CHILDERSBURG, ALABAMA

DISSOLVED BENZENE ISOCONCENTRATION MAP
(MARCH 1, 2023 & JULY 2023)

FIGURE NUMBER
7

N

0 15 30

SCALE: 1"=30'
(Approximate)

VACANT

MW-17
NS

MW-4
NS

MW-1
NS

MW-5
NS

MW-9
NS

FORMER
UST PIT

MW-22
<0.001

MW-8
<0.001

MW-3
NS

MW-2
<0.001

MW-7
0.002

® RW-1
NS

CANOPY

MW-15
<0.001

® RW-3
NS

MW-6
<0.001

STORE

MW-11
<0.050

® RW-2
NS

TMW-2
0.006

MW-10R
0.034

TMW-4
0.030

MW-23
0.004

MW-26
0.052

TMW-3
0.016

FORMER
UST PIT

TMW-1
0.166

0.10

MW-12
<0.001

RESIDENCE

0.020

MW-21
NS

5TH STREET SOUTHWEST

TMW-5
0.026

MW-13
0.019

TMW-6
<0.001

MW-14
<0.001

MW-18
NS

MW-19
NS

USED
CAR LOT

MW-24
<0.001

MW-20
NS

MW-25
<0.001

U.S. HIGHWAY 280

U.S. HIGHWAY 280

MW-16
NS

NOTE:
TEMPORARY MONITORING WELL GROUNDWATER SAMPLES WERE COLLECTED IN JULY 2023.

LEGEND:

- TYPE II MONITORING WELL LOCATION
- TYPE III MONITORING WELL LOCATION
- TEMPORARY MONITORING WELL LOCATION
- ® RECOVERY WELL LOCATION
- 0.002 MTBE CONCENTRATION (mg/L)
- 0.020 MTBE CONCENTRATION CONTOUR (mg/L) (LOWER ZONE)
- NS NOT SAMPLED

PPM CONSULTANTS, INC.
www.ppmco.com

DRAWN BY:	DRAWN DATE:
BWH	08/19/24
PROJECT NUMBER:	PHASE:
422603	CAPD

RUSSELL PETROLEUM CORPORATION
KWIK SHOP NO. 110
33066 U.S. HIGHWAY 280
CHILDERSBURG, ALABAMA

DISSOLVED MTBE
ISOCONCENTRATION MAP
(MARCH 1, 2023 & JULY 2023)

FIGURE NUMBER
8

N

0 15 30

SCALE: 1"=30'
(Approximate)

VACANT

FORMER UST PIT

STORE

CANOPY

RESIDENCE

USED CAR LOT

U.S. HIGHWAY 280

5TH STREET SOUTHWEST

MW-1 NS
MW-2 <0.005
MW-3 NS
MW-4 NS
MW-5 NS
MW-6 <0.005
MW-7 0.114
RW-1 NS
MW-8 <0.005
MW-9 NS
MW-10R 1.68
MW-11 0.760
RW-2 NS
MW-12 <0.005
MW-13 0.052
MW-14 <0.005
MW-15 <0.005
RW-3 NS
MW-16 NS
MW-17 NS
MW-18 NS
MW-19 NS
MW-20 NS
MW-21 NS
MW-22 0.063
MW-23 <0.005
MW-24 <0.005
MW-25 <0.005
MW-26 <0.005
TMW-1 1.53
TMW-2 0.744
TMW-3 1.51
TMW-4 0.659
TMW-5 0.585
TMW-6 <0.005

0.1
0.020
1.0
0.10
0.020

NOTES:

1. MONITORING WELL MW-26 WAS NOT USED FOR CONTOUR INTERPOLATION AS IT IS SCREENED AT A DEEPER INTERVAL.
2. TEMPORARY MONITORING WELL GROUNDWATER SAMPLES WERE COLLECTED IN JULY 2023.

LEGEND:

	TYPE II MONITORING WELL LOCATION
	TYPE III MONITORING WELL LOCATION
	TEMPORARY MONITORING WELL LOCATION
®	RECOVERY WELL LOCATION
0.585	NAPHTHALENE CONCENTRATION (mg/L) (VALUES IN RED EXCEED SSCALs)
0.020	NAPHTHALENE CONCENTRATION CONTOUR (mg/L) (UPPER ZONE)
0.020	NAPHTHALENE CONCENTRATION CONTOUR (mg/L) (LOWER ZONE)
NS	NOT SAMPLED

PPM CONSULTANTS, INC.
www.ppmco.com

DRAWN BY:	DRAWN DATE:
BWH	12/13/22
PROJECT NUMBER:	PHASE:
422603	RNA11

RUSSELL PETROLEUM CORPORATION
KWIK SHOP NO. 110
33066 U.S. HIGHWAY 280
CHILDERSBURG, ALABAMA

DISSOLVED NAPHTHALENE ISOCONCENTRATION MAP
(MARCH 1, 2023 & JULY 2023)

FIGURE NUMBER
9

N

0 15 30

SCALE: 1"=30'
(Approximate)

U.S. HIGHWAY 280

U.S. HIGHWAY 280

5TH STREET SOUTHWEST

MW-16

VACANT

MW-17

MW-4

MW-1

MW-9

MW-5

FORMER UST PIT

MW-22

MW-8

MW-3

FORMER DISPENSER ISLAND (TYP. 2)

MW-2

PSP-1

APPROXIMATE PROPERTY BOUNDARY

MW-7 ® RW-1

PSP-2

CANOPY

MW-15 ® RW-3

MW-6

PSP-3

PSP-8

PSP-9

PSP-15

PSVE-2

STORE

MW-11 ® RW-2

PSP-7

PSP-4

MW-10R

PSP-14

PSP-20

PROPOSED SVE SYTEM

MW-23

MW-26

PSP-13

PSP-6

PSVE-1

PSVE-4

PROPOSED 500 lb GRANULAR ACTIVATED CARBON VESSEL

PSP-5

PSP-12

PSP-19

FORMER UST PIT

PSP-11

PSP-18

PROPOSED 10' GATE

PSVE-3

PSP-17

PSP-10

PSP-16

PROPOSED SYSTEM COMPOUND

PROPOSED OZONE SYSTEM

MW-12

PROPOSED SYSTEM LINE

PROPOSED DIRECTIONAL BORE UNDER ROAD

FIRE HYDRANT

RESIDENCE

MW-14

PSP-23

PSP-22

PSP-26

MW-13

MW-21

PSP-21

PSP-25

PSP-24

SUBSURFACE ANOMALY - SUSPECTED UST

MW-18

MW-19

USED CAR LOT

MW-24

MW-20

MW-25

LEGEND:

- TYPE II MONITORING WELL LOCATION
- TYPE III MONITORING WELL LOCATION
- ® RECOVERY WELL LOCATION
- PROPOSED SPARGE POINT LOCATION (~20')
- PROPOSED NESTED SPARGE POINT LOCATION (20' & 40')
- PROPOSED SOIL VAPOR POINT LOCATION
- FENCE
- POWER POLE

PPM CONSULTANTS, INC.
www.ppmco.com

DRAWN BY:	DRAWN DATE:
BWH	08/19/24
PROJECT NUMBER:	PHASE:
422603	CAPD

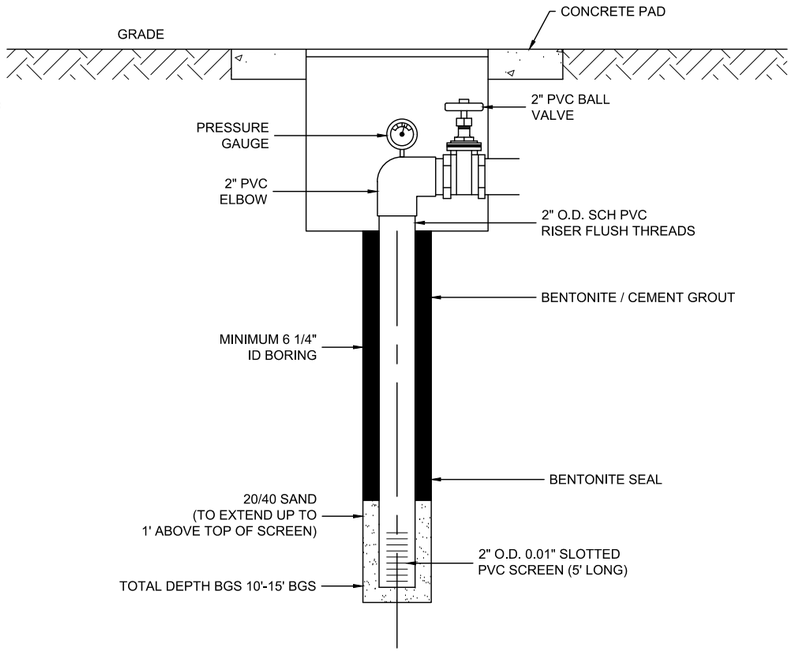
RUSSELL PETROLEUM CORPORATION
KWIK SHOP NO. 110
33066 U.S. HIGHWAY 280
CHILDERSBURG, ALABAMA

PROPOSED SYSTEM LAYOUT

FIGURE NUMBER
10

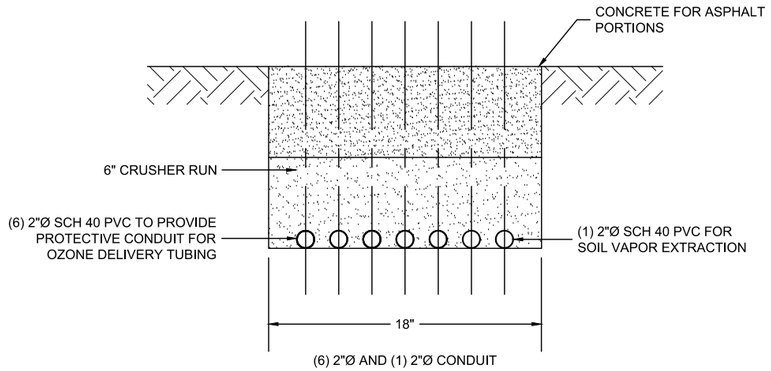
NOTES:

1. WELLHEAD CONNECTIONS, RISER AND OXIDATION POINTS TO BE PROVIDED BY EQUIPMENT MANUFACTURER.
2. OZONE DELIVERY TUBING TO BE PROVIDED BY EQUIPMENT MANUFACTURER.
3. OZONE DELIVERY TUBING TO BE INSTALLED DURING PLACEMENT OF 2"Ø SCHEDULE 40 PVC CONDUIT.
4. MANHOLE COVERING TO BE PROVIDED AND INSTALLED BY SYSTEM INSTALLATION CONTRACTOR.



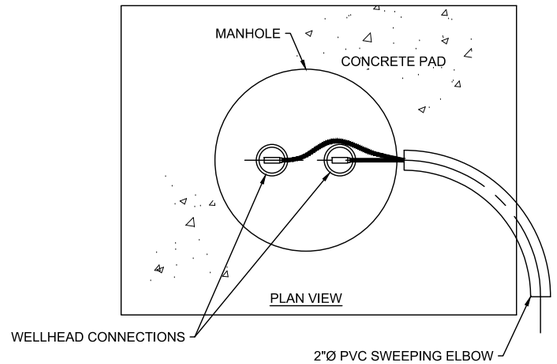
TYPICAL SVE POINT DETAIL

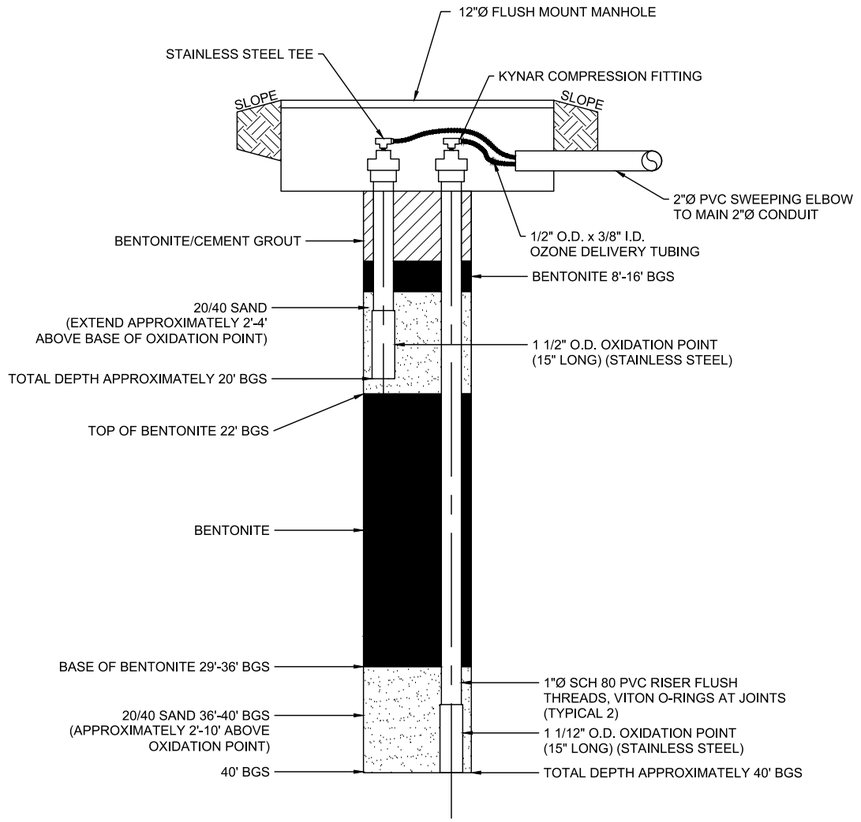
NOT TO SCALE



TYPICAL TRENCH DETAIL

NOT TO SCALE





TYPICAL NESTED SPARGE POINT DETAIL

NOT TO SCALE

PPM CONSULTANTS, INC. www.ppmco.com	RUSSELL PETROLEUM CORPORATION **KWIK SHOP NO. 110** 33066 U.S. HIGHWAY 280 CHILDERSBURG, ALABAMA
DRAWN BY: BWH / DRAWN DATE: 08/19/24 PROJECT NUMBER: 422603 / PHASE: CAPD	OZONE SPARGE POINT AND SVE CONSTRUCTION DETAILS

FIGURE NUMBER 11

TABLES

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-1 (Upper Zone)	10/21/10	432.38	NM	5 - 20	17.40	--	--	414.98
	05/11/11				11.10	--	--	421.28
	05/17/12				9.21	--	--	423.17
	06/14/12				12.30	--	--	420.08
	11/05/12				16.03	--	--	416.35
	04/10/13				6.78	--	--	425.60
	08/07/13				7.43	--	--	424.95
	12/12/13				6.90	--	--	425.48
	06/04/14				8.60	--	--	423.78
	10/07/14				14.07	--	--	418.31
	01/20/15				8.03	--	--	424.35
	04/13/15				6.83	--	--	425.55
	06/05/15				6.44	--	--	425.94
	08/24/15				12.06	--	--	420.32
	12/01/15				8.01	--	--	424.37
	03/02/16				5.63	--	--	426.75
	05/31/16				12.35	--	--	420.03
	08/03/16				10.03	--	--	422.35
	11/16/16				DRY	--	--	DRY
	02/22/17				9.03	--	--	423.35
	05/23/17				10.45	--	--	421.93
	08/14/17				12.58	--	--	419.80
	11/29/07				15.01	--	--	417.37
	02/22/18				8.12	--	--	424.26
	05/24/18				10.39	--	--	421.99
	08/20/18				11.71	--	--	420.67
	11/29/18				9.55	--	--	422.83
	02/26/19				4.70	--	--	427.68
	06/25/19				12.04	--	--	420.34
	09/24/19				15.69	--	--	416.69
	04/20/20	432.39	20.1		5.74	--	--	426.65
	07/24/20		20.1		10.94	--	--	421.45
	10/06/20		20.2		10.84	--	--	421.55
	01/22/21		20.1		9.70	--	--	422.69
	04/16/21		20.2		6.65	--	--	425.74
	08/30/21		20.2		11.20	--	--	421.19
	10/29/21		20.1		12.70	--	--	419.69
	01/31/22		20.2		8.72	--	--	423.67
	06/02/22		20.1		7.72	--	--	424.67
	09/07/22		20.1		12.50	--	--	419.89
	12/01/22		20.2		13.65	--	--	418.74
	03/01/23		20.0		7.46	--	--	424.93

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-2 (Upper Zone)	10/21/10	432.84	NM	5 - 20	17.62	--	--	415.22
	05/11/11				10.50	--	--	422.34
	05/17/12				6.90	--	--	425.94
	06/14/12				9.31	--	--	423.53
	11/05/12				16.08	--	--	416.76
	04/10/13				4.69	--	--	428.15
	08/07/13				4.92	--	--	427.92
	12/13/13				4.42	--	--	428.42
	06/04/14				5.97	--	--	426.87
	10/07/14				14.56	--	--	418.28
	01/20/15				5.93	--	--	426.91
	04/13/15				4.81	--	--	428.03
	06/05/15				4.75	--	--	428.09
	08/24/15				6.22	--	--	426.62
	12/01/15				5.32	--	--	427.52
	03/02/16				3.86	--	--	428.98
	05/31/16				12.12	--	--	420.72
	08/03/16				7.87	--	--	424.97
	11/16/16				18.64	--	--	414.20
	02/22/17				3.90	--	--	428.94
	05/23/17				3.92	--	--	428.92
	08/14/17				6.40	--	--	426.44
	11/29/17				15.30	--	--	417.54
	02/22/18				5.06	--	--	427.78
	05/24/18				5.35	--	--	427.49
	08/20/18				6.95	--	--	425.89
	11/29/18				5.60	--	--	427.24
	02/26/19				3.84	--	--	429.00
	06/25/19				6.55	--	--	426.29
	09/24/19				16.08	--	--	416.76
	04/20/20		20.1		2.33	--	--	430.51
	07/24/20		20.0		6.70	--	--	426.14
	10/06/20		20.1		6.36	--	--	426.48
	01/22/21		20.1		5.50	--	--	427.34
	04/16/21		20.1		4.80	--	--	428.04
	08/30/21		20.1		9.50	--	--	423.34
	10/29/21		20.1		12.78	--	--	420.06
	01/31/22		20.2		5.68	--	--	427.16
	06/02/22		20.2		5.24	--	--	427.60
	09/07/22		20.2		6.38	--	--	426.46
	12/01/22		20.2		5.35	--	--	427.49
	03/01/23		20.1		5.09	--	--	427.75

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-3 (Upper Zone)	10/21/10	432.35	NM	5 - 20	17.28	--	--	415.07
	05/11/11				10.48	--	--	421.87
	05/17/12				8.73	--	--	423.62
	06/14/12				11.50	--	--	420.85
	11/05/12				15.65	--	--	416.70
	04/10/13				6.84	--	--	425.51
	08/07/13				7.15	--	--	425.20
	12/12/13				6.97	--	--	425.38
	06/04/14				8.34	--	--	424.01
	10/07/14				14.12	--	--	418.23
	01/20/15				7.96	--	--	424.39
	04/13/15				6.92	--	--	425.43
	06/05/15				6.25	--	--	426.10
	08/24/15				11.28	--	--	421.07
	12/07/15				8.17	--	--	424.18
	03/02/16				5.26	--	--	427.09
	05/31/16				11.87	--	--	420.48
	08/03/16				8.31	--	--	424.04
	11/16/16				18.14	--	--	414.21
	02/22/17				8.69	--	--	423.66
	05/23/17				10.57	--	--	421.78
	08/14/17				12.20	--	--	420.15
	11/29/07				14.68	--	--	417.67
	02/22/18				7.95	--	--	424.40
	05/21/18				11.38	--	--	420.97
	08/20/18				11.28	--	--	421.07
	11/29/18				9.33	--	--	423.02
	02/26/19				4.71	--	--	427.64
	06/25/19				11.32	--	--	421.03
	09/24/19				15.35	--	--	417.00
	04/20/20		NL		NL	--	--	NL
	07/24/20		NL		NL	--	--	NL
	10/06/20		NL		NL	--	--	NL
	01/22/21		NL		NL	--	--	NL
	04/16/21		NL		NL	--	--	NL
	08/30/21		NL		NL	--	--	NL
	10/29/21		NL		NL	--	--	NL
	01/31/22		NL		NL	--	--	NL
	06/02/22		NL		NL	--	--	NL
	09/07/22		NL		NL	--	--	NL
	12/01/22		NM		NM	--	--	NM
	03/01/23		NL		NL	--	--	NL

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-4 (Upper Zone)	10/21/10	432.65	NM	20-May	17.55	--	--	415.10
	05/11/11				10.94	--	--	421.71
	05/17/12				9.10	--	--	423.55
	06/14/12				12.07	--	--	420.58
	11/05/12				16.02	--	--	416.63
	04/10/13				7.25	--	--	425.40
	08/07/13				7.50	--	--	425.15
	12/12/13				7.17	--	--	425.48
	06/04/14				8.61	--	--	424.04
	10/07/14				14.67	--	--	417.98
	01/20/15				8.56	--	--	424.09
	04/13/15				7.38	--	--	425.27
	06/05/15				7.09	--	--	425.56
	08/24/15				11.67	--	--	420.98
	12/07/15				9.06	--	--	423.59
	03/02/16				6.32	--	--	426.33
	05/31/16				12.30	--	--	420.35
	08/03/16				10.11	--	--	422.54
	11/16/16				19.02	--	--	413.63
	02/22/17				9.17	--	--	423.48
	05/23/17				10.42	--	--	422.23
	08/14/17				12.57	--	--	420.08
	11/29/17				14.95	--	--	417.70
	02/22/18				8.31	--	--	424.34
	05/21/18				11.70	--	--	420.95
	08/20/18				11.56	--	--	421.09
	11/29/18				9.64	--	--	423.01
	02/26/19				5.02	--	--	427.63
	06/21/19				11.82	--	--	420.83
	09/24/19				16.64	--	--	416.01
	04/20/20	432.61	20.4		5.88	--	--	426.73
	07/24/20		20.5		10.91	--	--	421.70
	10/06/20		20.6		10.65	--	--	421.96
	01/22/21		20.4		9.30	--	--	423.31
	04/16/21		20.4		6.70	--	--	425.91
	08/30/21		20.5		11.15	--	--	421.46
	10/29/21		20.4		12.72	--	--	419.89
	01/31/22		NM		NM	--	--	NM
	06/02/22		20.2		7.87	--	--	424.74
	09/07/22		20.4		12.58	--	--	420.03
	12/01/22		20.5		13.46	--	--	419.15
	03/01/23		20.4		7.70	--	--	424.91

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-5 (Upper Zone)	05/11/11	432.67	NM	5 - 20	10.95	--	--	421.72
	05/17/12				8.90	--	--	423.77
	06/14/12				12.08	--	--	420.59
	01/15/12				16.19	--	--	416.48
	04/10/13				6.89	--	--	425.78
	08/07/13				7.33	--	--	425.34
	12/12/13				6.39	--	--	426.28
	06/04/14				8.22	--	--	424.45
	10/07/14				14.26	--	--	418.41
	01/20/15				8.27	--	--	424.40
	04/13/15				6.61	--	--	426.06
	06/05/15				6.24	--	--	426.43
	08/24/15				11.41	--	--	421.26
	12/07/15				8.52	--	--	424.15
	03/02/16				5.71	--	--	426.96
	05/31/16				12.33	--	--	420.34
	08/03/16				10.24	--	--	422.43
	11/06/16				18.14	--	--	414.53
	02/22/17				8.72	--	--	423.95
	05/24/17				8.45	--	--	424.22
	08/14/17				12.75	--	--	419.92
	11/29/17				15.10	--	--	417.57
	02/22/18				8.32	--	--	424.35
	05/21/18				11.80	--	--	420.87
	08/20/18				11.83	--	--	420.84
	11/29/18				9.67	--	--	423.00
	02/26/19				Covered	--	--	NM
	06/25/19				Covered	--	--	NM
	09/24/19				Covered	--	--	NM
	04/20/20		NL		NL	--	--	NL
	07/24/20		NL		NL	--	--	NL
	10/06/20		NL		NL	--	--	NL
	01/22/21		NL		NL	--	--	NL
	04/16/21		NL		NL	--	--	NL
	08/30/21		NL		NL	--	--	NL
	10/29/21		NL		NL	--	--	NL
	01/31/22		NL		NL	--	--	NL
	06/02/22		NL		NL	--	--	NL
	09/07/22		NL		NL	--	--	NL
	12/01/22		NL		NL	--	--	NL
	03/01/23		NL		NL	--	--	NL

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-6 (Upper Zone)	05/11/11	433.01	NM	5 - 20	10.97	--	--	422.04
	05/17/12				5.10	--	--	427.91
	06/14/12				12.25	--	--	420.76
	01/15/12				15.96	--	--	417.05
	04/10/13				4.74	--	--	428.27
	08/07/13				5.45	--	--	427.56
	12/12/13				4.22	--	--	428.79
	06/04/14				6.17	--	--	426.84
	10/07/14				14.44	--	--	418.57
	01/20/15				6.00	--	--	427.01
	04/13/15				4.83	--	--	428.18
	06/05/15				4.29	--	--	428.72
	08/24/15				9.32	--	--	423.69
	12/07/15				6.84	--	--	426.17
	03/02/16				3.68	--	--	429.33
	05/31/16				12.21	--	--	420.80
	08/03/16				7.76	--	--	425.25
	11/16/16				18.53	--	--	414.48
	02/22/17				7.22	--	--	425.79
	05/23/07				4.62	--	--	428.39
	08/14/17				12.62	--	--	420.39
	11/29/17				15.12	--	--	417.89
	02/22/18				5.35	--	--	427.66
	05/21/18				11.61	--	--	421.40
	08/20/18				11.68	--	--	421.33
	11/29/08				9.24	--	--	423.77
	02/26/19				3.85	--	--	429.16
	06/25/19				12.34	--	--	420.67
	09/24/19				16.43	--	--	416.58
	04/20/20	432.97	20.1		2.72	--	--	430.25
	07/24/20		20.1		10.90	--	--	422.07
	10/06/20		20.1		10.25	--	--	422.72
	01/22/21		20.1		5.50	--	--	427.47
	04/16/21		20.1		4.91	--	--	428.06
	08/30/21		20.1		11.04	--	--	421.93
	10/29/21		20.0		12.68	--	--	420.29
	01/31/22		19.8		6.00	--	--	426.97
	06/02/22		19.1		6.46	--	--	426.51
	09/07/22		20.0		13.05	--	--	419.92
	12/01/22		20.1		13.92	--	--	419.05
	03/01/23		19.9		5.35	--	--	427.62

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-7 (Upper Zone)	05/11/11	433.13	NM	5 - 20	11.23	--	--	421.90
	05/17/12				9.60	--	--	423.53
	06/14/12				12.50	--	--	420.63
	11/05/12				16.19	--	--	416.94
	04/10/13				7.63	--	--	425.50
	08/07/13				7.50	--	--	425.63
	12/13/13				7.62	--	--	425.51
	06/04/14				8.74	--	--	424.39
	10/07/14				14.91	--	--	418.22
	01/20/15				9.15	--	--	423.98
	04/13/15				7.70	--	--	425.43
	06/05/15				7.12	--	--	426.01
	06/24/15				12.26	--	--	420.87
	12/01/15				8.82	--	--	424.31
	03/02/16				6.15	--	--	426.98
	05/31/16				12.56	--	--	420.57
	08/03/16				11.93	--	--	421.20
	11/16/16				18.92	--	--	414.21
	02/22/17				9.91	--	--	423.22
	05/23/17				11.14	--	--	421.99
	08/14/17				12.95	--	--	420.18
	11/29/17				15.65	--	--	417.48
	02/22/18				8.87	--	--	424.26
	05/24/18				11.27	--	--	421.86
	08/20/18				12.00	--	--	421.13
	11/29/18				10.70	--	--	422.43
	02/26/19				5.14	--	--	427.99
	06/25/19				12.49	--	--	420.64
	09/24/19				18.42	--	--	414.71
	04/20/20	433.10	20.1		5.77	--	--	427.33
	07/24/20		20.2		11.09	--	--	422.01
	10/06/20		20.2		10.95	--	--	422.15
	01/22/21		20.1		8.40	--	--	424.70
	04/16/21		20.1		7.38	--	--	425.72
	08/30/21		NM		NM	--	--	NM
	10/29/21		20.1		12.90	--	--	420.20
	01/31/22		20.1		7.86	--	--	425.24
	06/02/22		20.1		7.51	--	--	425.59
	09/07/22		20.1		13.22	--	--	419.88
	12/01/22		20.1		14.86	--	--	418.24
	03/01/23		20.1		7.39	--	--	425.71

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-8 (Upper Zone)	05/11/11	432.53	NM	5 - 20	11.18	--	--	421.35
	05/17/12				9.50	--	--	423.03
	06/14/12				12.23	--	--	420.30
	11/05/12				15.85	--	--	416.68
	04/10/13				7.57	--	--	424.96
	08/07/13				6.98	--	--	425.55
	12/13/13				7.00	--	--	425.53
	06/04/14				8.09	--	--	424.44
	10/07/14				14.53	--	--	418.00
	01/20/15				9.12	--	--	423.41
	04/13/15				7.59	--	--	424.94
	06/05/15				7.03	--	--	425.50
	08/24/15				12.87	--	--	419.66
	12/07/15				9.16	--	--	423.37
	03/02/16				6.51	--	--	426.02
	05/31/16				12.36	--	--	420.17
	06/03/16				9.64	--	--	422.89
	11/16/16				17.96	--	--	414.57
	02/22/17				9.23	--	--	423.30
	05/23/17				11.30	--	--	421.23
	08/14/17				12.65	--	--	419.88
	11/29/17				15.22	--	--	417.31
	02/22/18				8.80	--	--	423.73
	05/24/18				11.07	--	--	421.46
	08/20/18				11.80	--	--	420.73
	11/29/18				10.28	--	--	422.25
	02/26/19				4.51	--	--	428.02
	06/25/09				12.31	--	--	420.22
	09/24/19				15.92	--	--	416.61
	04/20/20	432.53	19.8		4.91	--	--	427.62
	07/24/20		19.6		11.05	--	--	421.48
	10/06/20		19.6		10.86	--	--	421.67
	01/22/21		19.5		9.83	--	--	422.70
	04/16/21		19.6		6.65	--	--	425.88
	08/30/21		19.5		11.15	--	--	421.38
	10/29/21		19.4		12.71	--	--	419.82
	01/31/22		19.5		9.13	--	--	423.40
	06/02/22		19.4		7.87	--	--	424.66
	09/07/22		19.5		12.75	--	--	419.78
	12/01/22		19.5		14.30	--	--	418.23
	03/01/23		19.4		7.63	--	--	424.90

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-9 (Upper Zone)	05/11/11	432.52	NM	5 - 20	11.10	--	--	421.42
	05/17/12				9.38	--	--	423.14
	06/14/12				12.30	--	--	420.22
	11/05/12				15.93	--	--	416.59
	04/10/13				7.47	--	--	425.05
	08/07/13				7.20	--	--	425.32
	12/12/13				7.29	--	--	425.23
	06/04/14				8.70	--	--	423.82
	10/07/14				14.14	--	--	418.38
	01/20/15				9.19	--	--	423.33
	04/13/15				7.62	--	--	424.90
	06/05/15				7.18	--	--	425.34
	08/24/15				11.44	--	--	421.08
	12/07/15				9.10	--	--	423.42
	03/02/16				6.21	--	--	426.31
	05/03/16				12.37	--	--	420.15
	08/03/16				9.82	--	--	422.70
	11/16/16				DRY	--	--	DRY
	02/22/17				9.88	--	--	422.64
	05/23/17				11.28	--	--	421.24
	08/14/17				12.65	--	--	419.87
	11/29/17				15.07	--	--	417.45
	02/22/18				8.74	--	--	423.78
	05/24/18				10.90	--	--	421.62
	08/20/18				11.78	--	--	420.74
	11/29/18				9.95	--	--	422.57
	02/26/19				5.05	--	--	427.47
	06/25/19				12.11	--	--	420.41
	09/24/19				15.68	--	--	416.84
	04/20/20	432.53	18.0		6.72	--	--	425.81
	07/24/20		18.0		11.05	--	--	421.48
	10/06/20		18.1		10.87	--	--	421.66
	01/22/21		18.0		9.87	--	--	422.66
	04/16/21		18.0		6.90	--	--	425.63
	08/30/21		18.0		11.25	--	--	421.28
	10/29/21		17.9		12.77	--	--	419.76
	01/31/22		18.0		8.99	--	--	423.54
	06/02/22		17.9		8.09	--	--	424.44
	09/07/22		18.0		12.55	--	--	419.98
	12/01/22		18.0		13.82	--	--	418.71
	03/01/23		18.0		7.77	--	--	424.76

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-10	05/11/11	432.73	NM	35 - 40	10.28	--	--	422.45
	05/17/12				9.94	--	--	422.79
	06/14/12				11.84	--	--	420.89
	11/07/12				15.41	--	--	417.32
	04/10/13				6.92	--	--	425.81
	08/07/13				7.45	--	--	425.28
	12/13/13				7.33	--	--	425.40
	06/04/14				8.74	--	--	423.99
	10/07/14				14.15	--	--	418.58
	01/20/15				8.81	--	--	423.92
	04/13/15				7.13	--	--	425.60
	06/05/15				5.78	--	--	426.95
	08/24/15				12.66	--	--	420.07
	12/08/15				9.20	--	--	423.53
	03/02/16				5.95	--	--	426.78
	05/31/16				11.65	--	--	421.08
	08/04/16				11.83	--	--	420.90
	11/16/16				17.16	--	--	415.57
	02/22/17				8.37	--	--	424.36
	05/23/17				10.36	--	--	422.37
	08/14/17				12.20	--	--	420.53
	11/29/17				15.08	--	--	417.65
	02/22/18				8.62	--	--	424.11
	05/24/18				10.75	--	--	421.98
	08/20/18				11.32	--	--	421.41
	11/29/18				10.94	--	--	421.79
	02/26/19				5.01	--	--	427.72
	06/25/19				11.95	--	--	420.78
	09/24/19				16.00	--	--	416.73
	04/20/20	432.70	39.2		6.54	--	--	426.16
MW-10R (Lower Zone)	07/24/20	432.41	39.7	34.7 - 39.1	9.85	--	--	422.56
	10/06/20		39.9		9.76	--	--	422.65
	01/22/21		40.2		8.54	--	--	423.87
	04/16/21		39.7		6.35	--	--	426.06
	08/30/21		40.4		9.91	--	--	422.50
	10/29/21		39.7		11.63	--	--	420.78
	01/31/22		38.9		8.73	--	--	423.68
	06/02/22		39.7		6.67	--	--	425.74
	09/07/22		39.8		12.14	--	--	420.27
	12/01/22		40.1		12.90	--	--	419.51
	03/01/23		39.7		6.52	--	--	425.89

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-11 (Upper Zone)	05/17/12	433.14	NM	5 - 20	9.60	--	--	423.54
	06/14/12				11.93	--	--	421.21
	11/07/12				15.34	--	--	417.80
	04/10/13				7.10	--	--	426.04
	08/07/13				7.48	--	--	425.66
	12/13/13				7.91	--	--	425.23
	06/04/14				8.02	--	--	425.12
	10/07/14				14.80	--	--	418.34
	01/20/15				8.71	--	--	424.43
	04/11/15				7.24	--	--	425.90
	06/05/15				6.64	--	--	426.50
	08/24/15				12.20	--	--	420.94
	12/07/15				9.20	--	--	423.94
	03/02/16				5.73	--	--	427.41
	05/31/16				7.82	--	--	425.32
	08/03/16				12.06	--	--	421.08
	11/16/16				18.79	--	--	414.35
	02/22/17				9.33	--	--	423.81
	05/23/17				9.31	--	--	423.83
	08/14/17				12.48	--	--	420.66
	11/29/17				15.35	--	--	417.79
	02/22/18				8.63	--	--	424.51
	05/24/18				10.97	--	--	422.17
	08/20/18				11.60	--	--	421.54
	01/29/18				10.83	--	--	422.31
	02/26/19				5.50	--	--	427.64
	06/25/19				12.39	--	--	420.75
	09/24/19				16.51	--	--	416.63
	04/20/20	433.10	19.8		5.71	--	--	427.39
	07/24/20		20.0		10.52	--	--	422.58
	10/06/20		20.0		10.39	--	--	422.71
	01/22/21		20.0		8.94	--	--	424.16
	04/16/21		19.9		6.04	--	--	427.06
	08/30/21		20.0		10.55	--	--	422.55
	10/29/21		19.9		12.35	--	--	420.75
	01/31/22		19.9		8.21	--	--	424.89
	06/02/22		19.9		6.99	--	--	426.11
	09/07/22		20.0		13.11	--	--	419.99
	12/01/22		20.1		15.18	--	--	417.92
	03/01/23		19.9		6.91	--	--	426.19

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-12 (Upper Zone)	05/17/12	432.56	NM	5 - 20	4.07	--	--	428.49
	06/14/12				6.75	--	--	425.81
	01/17/12				14.63	--	--	417.93
	04/10/13				3.53	--	--	429.03
	08/07/13				4.29	--	--	428.27
	12/12/13				3.77	--	--	428.79
	06/04/14				5.56	--	--	427.00
	10/07/14				13.86	--	--	418.70
	01/20/15				5.72	--	--	426.84
	04/13/15				3.60	--	--	428.96
	06/05/15				3.36	--	--	429.20
	08/24/15				11.30	--	--	421.26
	12/08/15				4.12	--	--	428.44
	03/02/16				3.31	--	--	429.25
	05/31/16				7.28	--	--	425.28
	08/04/16				9.34	--	--	423.22
	11/16/16				17.91	--	--	414.65
	02/22/17				5.68	--	--	426.88
	05/24/17				5.05	--	--	427.51
	08/14/17				9.84	--	--	422.72
	11/29/17				13.92	--	--	418.64
	02/22/18				3.80	--	--	428.76
	05/21/18				6.07	--	--	426.49
	08/20/18				9.25	--	--	423.31
	11/29/18				5.81	--	--	426.75
	02/26/19				2.90	--	--	429.66
	06/25/19				9.84	--	--	422.72
	09/24/19				19.34	--	--	413.22
	04/20/20	432.05	20.0		2.57	--	--	429.48
	07/24/20		20.1		6.69	--	--	425.36
	10/06/20		20.1		5.30	--	--	426.75
	01/22/21		20.0		3.95	--	--	428.10
	04/16/21		20.0		3.63	--	--	428.42
	08/30/21		20.1		6.04	--	--	426.01
	10/29/21		20.0		7.20	--	--	424.85
	01/31/22		20.0		3.93	--	--	428.12
	06/02/22		20.0		4.20	--	--	427.85
	09/07/22		20.1		10.73	--	--	421.32
	12/01/22		20.1		14.40	--	--	417.65
	03/01/23		20.0		3.46	--	--	428.59

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-13 (Lower Zone)	05/17/12	431.56	NM	35 - 40	6.81	--	--	424.75
	06/14/12				8.15	--	--	423.41
	11/07/12				12.30	--	--	419.26
	04/10/13				4.91	--	--	426.65
	08/07/13				5.98	--	--	425.58
	12/12/13				6.65	--	--	424.91
	06/04/14				6.86	--	--	424.70
	10/07/14				14.66	--	--	416.90
	01/20/15				6.08	--	--	425.48
	04/13/15				5.06	--	--	426.50
	06/05/15				4.82	--	--	426.74
	08/24/15				11.29	--	--	420.27
	12/08/15				7.02	--	--	424.54
	03/02/16				4.67	--	--	426.89
	05/31/16				7.64	--	--	423.92
	08/04/16				10.71	--	--	420.85
	11/16/16				17.03	--	--	414.53
	02/22/17				7.10	--	--	424.46
	05/24/17				8.17	--	--	423.39
	08/14/17				9.42	--	--	422.14
	11/29/17				12.60	--	--	418.96
	02/22/18				6.40	--	--	425.16
	05/21/18				7.55	--	--	424.01
	08/20/18				8.79	--	--	422.77
	11/29/18				8.40	--	--	423.16
	02/26/19				3.93	--	--	427.63
	06/25/19				8.72	--	--	422.84
	09/24/19				14.41	--	--	417.15
	04/20/20	431.43	39.7		5.17	--	--	426.26
	07/24/20		39.9		7.45	--	--	423.98
	10/06/20		40.8		7.76	--	--	423.67
	01/22/21		40.8		6.10	--	--	425.33
	04/16/21		40.2		4.37	--	--	427.06
	08/30/21		40.9		7.04	--	--	424.39
	10/29/21		40.2		8.43	--	--	423.00
	01/31/22		40.3		5.45	--	--	425.98
	06/02/22		40.1		4.55	--	--	426.88
	09/07/22		40.3		9.70	--	--	421.73
	12/01/22		40.5		11.90	--	--	419.53
	03/01/23		40.2		4.74	--	--	426.69

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-14 (Upper Zone)	05/17/12	432.25	NM	5 - 20	7.31	--	--	424.94
	06/14/12				8.56	--	--	423.69
	11/07/12				12.54	--	--	419.71
	04/10/13				5.47	--	--	426.78
	08/07/13				6.53	--	--	425.72
	12/12/13				7.04	--	--	425.21
	06/04/14				7.41	--	--	424.84
	10/07/14				14.61	--	--	417.64
	01/20/15				7.84	--	--	424.41
	04/13/15				5.66	--	--	426.59
	06/05/15				5.04	--	--	427.21
	08/24/15				12.33	--	--	419.92
	12/08/15				7.51	--	--	424.74
	03/02/16				5.10	--	--	427.15
	05/31/16				8.06	--	--	424.19
	08/04/16				11.16	--	--	421.09
	11/16/16				18.90	--	--	413.35
	02/22/17				7.26	--	--	424.99
	05/24/17				8.37	--	--	423.88
	08/14/17				9.88	--	--	422.37
	11/29/17				13.12	--	--	419.13
	02/22/18				6.99	--	--	425.26
	05/21/18				7.90	--	--	424.35
	08/20/18				9.19	--	--	423.06
	11/29/18				8.75	--	--	423.50
	02/26/19				4.60	--	--	427.65
	06/25/19				9.02	--	--	423.23
	09/24/19				14.60	--	--	417.65
	04/20/20	432.11	19.8		5.55	--	--	426.56
	07/24/20		19.8		7.93	--	--	424.18
	10/06/20		19.9		8.38	--	--	423.73
	01/22/21		19.8		6.65	--	--	425.46
	04/16/21		19.8		4.94	--	--	427.17
	08/30/21		19.9		7.60	--	--	424.51
	10/29/21		19.8		8.94	--	--	423.17
	01/31/22		19.8		6.21	--	--	425.90
	06/02/22		19.8		4.98	--	--	427.13
	09/07/22		19.8		10.02	--	--	422.09
	12/01/22		19.9		12.53	--	--	419.58
	03/01/23		20.7		5.51	--	--	426.60

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-15 (Upper Zone)	05/17/12	432.97	NM	5 - 20	9.32	9.12	0.20	423.80
	06/14/12				14.30	10.82	3.48	421.30
	11/07/12				17.31	14.35	2.96	417.89
	04/10/13				6.97	6.32	0.65	426.49
	08/07/13				6.13	5.70	0.43	427.16
	12/13/13				6.65	--	--	426.32
	06/04/14				7.30	--	--	425.67
	10/07/14				14.32	--	--	418.65
	01/20/15				8.82	--	--	424.15
	04/13/15				6.42	--	--	426.55
	06/05/15				5.20	--	--	427.77
	08/24/15				11.34	--	--	421.63
	12/07/15				7.96	--	--	425.01
	03/02/16				5.10	--	--	427.87
	05/31/16				11.70	--	--	421.27
	08/04/16				10.92	--	--	422.05
	11/16/16				18.38	--	--	414.59
	02/22/17				8.35	--	--	424.62
	05/23/17				6.65	--	--	426.32
	08/14/17				12.07	--	--	420.90
	11/29/17				15.15	--	--	417.82
	02/22/18				7.89	--	--	425.08
	05/24/18				10.20	--	--	422.77
	08/20/18				11.21	--	--	421.76
	11/29/18				9.89	--	--	423.08
	02/26/19				4.32	--	--	428.65
	06/25/19				12.00	--	--	420.97
	09/24/19				16.05	--	--	416.92
	04/20/20	432.91	19.5		4.25	--	--	428.66
	07/24/20		19.6		9.52	--	--	423.39
	10/06/20		19.5		8.60	--	--	424.31
	01/22/21		19.6		5.25	--	--	427.66
	04/16/21		19.5		4.65	--	--	428.26
	08/30/21		22.5		9.55	--	--	423.36
	10/29/21		19.5		12.00	--	--	420.91
	01/31/22		19.5		7.04	--	--	425.87
	06/02/22		19.4		5.27	--	--	427.64
	09/07/22		19.6		11.77	--	--	421.14
	12/01/22		19.7		10.88	--	--	422.03
	03/01/23		19.6		4.91	--	--	428.00

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-16 (Upper Zone)	11/07/12	432.63	NM	20-May	18.06	--	--	414.57
	04/10/13				9.87	--	--	422.76
	08/07/13				7.26	--	--	425.37
	12/13/13				9.86	--	--	422.77
	06/04/14				8.12	--	--	424.51
	10/07/14				14.92	--	--	417.71
	01/20/15				10.34	--	--	422.29
	04/13/15				9.93	--	--	422.70
	06/05/15				8.30	--	--	424.33
	08/24/15				11.93	--	--	420.70
	12/08/15				10.16	--	--	422.47
	03/02/16				7.49	--	--	425.14
	05/31/16				14.73	--	--	417.90
	08/04/16				11.61	--	--	421.02
	11/16/16				18.55	--	--	414.08
	02/22/17				10.39	--	--	422.24
	05/24/17				13.61	--	--	419.02
	08/14/17				13.64	--	--	418.99
	11/29/17				17.80	--	--	414.83
	02/22/18				11.57	--	--	421.06
	05/21/18				14.72	--	--	417.91
	08/20/18				12.98	--	--	419.65
	11/29/18				12.57	--	--	420.06
	02/26/19				7.37	--	--	425.26
	06/25/19				15.35	--	--	417.28
	09/24/19				18.31	--	--	414.32
	04/20/20	432.43	23.3		7.33	--	--	425.10
	07/24/20		23.3		13.64	--	--	418.79
	10/06/20		23.3		12.65	--	--	419.78
	01/22/21		23.3		12.35	--	--	420.08
	04/16/21		23.3		6.91	--	--	425.52
	08/30/21		22.3		15.66	--	--	416.77
	10/29/21		23.3		14.80	--	--	417.63
	01/31/22		23.3		11.41	--	--	421.02
	06/02/22		NL		NL	--	--	NL
	09/07/22		NL		NL	--	--	NL
	12/01/22		NL		NL	--	--	NL
	03/01/23		23.3		10.19	--	--	422.24

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-17 (Upper Zone)	05/17/12	433.22	NM	5 - 20	10.65	--	--	422.57
	06/14/12				13.60	--	--	419.62
	01/15/12				17.22	--	--	416.00
	04/10/13				8.52	--	--	424.70
	08/07/13				8.36	--	--	424.86
	12/12/13				8.64	--	--	424.58
	06/04/14				9.72	--	--	423.50
	10/07/14				15.36	--	--	417.86
	01/20/15				10.15	--	--	423.07
	04/13/15				8.65	--	--	424.57
	06/05/15				5.91	--	--	427.31
	08/24/15				12.82	--	--	420.40
	12/07/15				9.90	--	--	423.32
	03/02/16				7.28	--	--	425.94
	05/31/16				13.35	--	--	419.87
	08/03/16				10.16	--	--	423.06
	11/16/16				19.00	--	--	414.22
	02/22/17				10.61	--	--	422.61
	05/02/17				12.50	--	--	420.72
	08/14/17				13.81	--	--	419.41
	11/29/17				16.03	--	--	417.19
	02/22/18				9.55	--	--	423.67
	05/21/18				12.83	--	--	420.39
	08/20/18				12.78	--	--	420.44
	11/29/18				11.00	--	--	422.22
	02/26/19				6.08	--	--	427.14
	06/25/19				13.30	--	--	419.92
	09/24/19				16.64	--	--	416.58
	04/20/20	433.27	19.9		7.26	--	--	426.01
	07/24/20		20.0		11.95	--	--	421.32
	10/06/20		20.0		11.90	--	--	421.37
	01/22/21		20.0		10.82	--	--	422.45
	04/16/21		19.9		7.85	--	--	425.42
	08/30/21		20.0		12.30	--	--	420.97
	10/29/21		19.9		13.74	--	--	419.53
	01/31/22		20.0		9.95	--	--	423.32
	06/02/22		20.0		9.07	--	--	424.20
	09/07/22		20.0		13.90	--	--	419.37
	12/01/22		20.0		15.35	--	--	417.92
	03/01/23		20.0		8.73	--	--	424.54

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-18 (Upper Zone)	11/07/12	432.53	NM	5 - 20	13.80	--	--	418.73
	04/10/13				5.83	--	--	426.70
	08/07/13				7.01	--	--	425.52
	12/12/13				7.91	--	--	424.62
	06/04/14				8.14	--	--	424.39
	10/07/14				14.78	--	--	417.75
	01/20/15				6.11	--	--	426.42
	04/13/15				5.94	--	--	426.59
	06/05/15				5.21	--	--	427.32
	08/24/15				12.76	--	--	419.77
	12/08/15				8.07	--	--	424.46
	03/02/16				5.06	--	--	427.47
	05/31/16				8.61	--	--	423.92
	08/04/16				11.57	--	--	420.96
	11/16/16				18.79	--	--	413.74
	02/22/17				8.03	--	--	424.50
	05/24/17				8.97	--	--	423.56
	08/14/17				10.74	--	--	421.79
	11/29/17				13.88	--	--	418.65
	02/22/18				7.45	--	--	425.08
	05/02/18				8.31	--	--	424.22
	08/20/18				9.70	--	--	422.83
	11/29/18				9.38	--	--	423.15
	02/26/19				4.72	--	--	427.81
	06/25/19				9.84	--	--	422.69
	09/24/19				15.51	--	--	417.02
	04/20/20	432.39	20.3		5.83	--	--	426.56
	07/24/20		20.3		8.69	--	--	423.70
	10/06/20		20.4		9.38	--	--	423.01
	01/22/21		20.3		7.48	--	--	424.91
	04/16/21		20.3		5.01	--	--	427.38
	08/30/21		20.4		8.14	--	--	424.25
	10/29/21		20.3		9.84	--	--	422.55
	01/31/22		20.3		6.71	--	--	425.68
	06/02/22		20.3		6.24	--	--	426.15
	09/07/22		NM		NM	--	--	NM
	12/01/22		NM		NM	--	--	NM
	03/01/23		NM		NM	--	--	NM

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-19 (Upper Zone)	11/07/12	432.35	NM	5 - 20	10.65	--	--	421.70
	04/10/13				5.00	--	--	427.35
	08/07/13				6.89	--	--	425.46
	12/12/13				7.20	--	--	425.15
	06/04/14				7.72	--	--	424.63
	10/07/14				14.87	--	--	417.48
	01/20/15				7.14	--	--	425.21
	04/13/15				5.21	--	--	427.14
	06/05/15				5.16	--	--	427.19
	08/24/15				12.81	--	--	419.54
	12/08/15				7.82	--	--	424.53
	03/02/16				5.03	--	--	427.32
	05/31/16				8.22	--	--	424.13
	08/04/16				11.23	--	--	421.12
	11/16/16				18.61	--	--	413.74
	02/22/17				7.62	--	--	424.73
	05/24/17				7.80	--	--	424.55
	08/14/17				10.11	--	--	422.24
	11/29/17				13.74	--	--	418.61
	02/22/18				6.12	--	--	426.23
	05/21/18				7.33	--	--	425.02
	08/20/18				9.35	--	--	423.00
	11/29/18				8.62	--	--	423.73
	02/26/19				3.98	--	--	428.37
	06/25/19				9.35	--	--	423.00
	09/24/19				15.85	--	--	416.50
	04/20/20	432.24	20.2		3.50	--	--	428.74
	07/24/20		20.1		8.28	--	--	423.96
	10/06/20		20.2		9.01	--	--	423.23
	01/22/21		20.2		6.50	--	--	425.74
	04/16/21		20.2		4.04	--	--	428.20
	08/30/21		20.3		7.70	--	--	424.54
	10/29/21		20.2		8.88	--	--	423.36
	01/31/22		20.2		5.75	--	--	426.49
	06/02/22		20.1		5.48	--	--	426.76
	09/07/22		20.2		10.58	--	--	421.66
	12/01/22		20.2		13.10	--	--	419.14
	03/01/23		20.1		4.57	--	--	427.67

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-20 (Upper Zone)	04/10/13	431.44	NM	5 - 20	3.24	--	--	428.20
	08/07/13				6.77	--	--	424.67
	12/12/13				5.23	--	--	426.21
	06/04/14				7.49	--	--	423.95
	10/07/14				13.72	--	--	417.72
	01/20/15				5.87	--	--	425.57
	04/13/15				3.36	--	--	428.08
	06/05/15				3.12	--	--	428.32
	08/24/15				12.11	--	--	419.33
	12/08/15				5.34	--	--	426.10
	03/02/16				3.46	--	--	427.98
	05/31/16				7.13	--	--	424.31
	08/04/16				11.04	--	--	420.40
	11/16/16				19.19	--	--	412.25
	02/22/17				5.46	--	--	425.98
	05/24/17				6.62	--	--	424.82
	08/14/17				10.36	--	--	421.08
	11/29/17				12.95	--	--	418.49
	02/22/18				4.05	--	--	427.39
	05/21/18				6.22	--	--	425.22
	06/20/18				8.30	--	--	423.14
	11/29/18				6.88	--	--	424.56
	02/26/19				1.50	--	--	429.94
	06/25/19				8.08	--	--	423.36
	09/24/19				13.73	--	--	417.71
	04/20/20		NL		NL	--	--	NL
	07/24/20		NL		NL	--	--	NL
	10/06/20		NL		NL	--	--	NL
	01/22/21		NL		NL	--	--	NL
	04/16/21		NL		NL	--	--	NL
	08/30/21		NL		NL	--	--	NL
	10/29/21		NL		NL	--	--	NL
	01/31/22		NL		NL	--	--	NL
	06/02/22		NL		NL	--	--	NL
	09/07/22		NL		NL	--	--	NL
	12/01/22		NL		NL	--	--	NL
	03/01/23		NL		NL	--	--	NL

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-21 (Upper Zone)	04/10/13	430.46	NM	5 - 20	2.73	--	--	427.73
	08/07/13				4.38	--	--	426.08
	12/12/13				7.52	--	--	422.94
	06/04/14				5.44	--	--	425.02
	10/07/14				13.43	--	--	417.03
	01/20/15				4.22	--	--	426.24
	04/13/15				3.03	--	--	427.43
	06/05/15				2.47	--	--	427.99
	08/24/15				10.54	--	--	419.92
	12/08/15				7.43	--	--	423.03
	03/02/16				2.25	--	--	428.21
	05/31/16				8.26	--	--	422.20
	08/04/16				9.12	--	--	421.34
	11/16/16				18.90	--	--	411.56
	02/22/17				4.17	--	--	426.29
	05/24/17				7.98	--	--	422.48
	08/14/17				10.22	--	--	420.24
	11/29/17				14.40	--	--	416.06
	02/22/18				3.07	--	--	427.39
	05/21/18				6.85	--	--	423.61
	08/20/18				10.01	--	--	420.45
	11/29/18				10.62	--	--	419.84
	02/26/19				1.35	--	--	429.11
	06/25/19				10.26	--	--	420.20
	09/24/19				19.69	--	--	410.77
	04/20/20	430.34	19.8		1.07	--	--	429.27
	07/24/20		19.9		8.73	--	--	421.61
	10/06/20		19.9		9.80	--	--	420.54
	01/22/21		19.9		2.84	--	--	427.50
	04/16/21		19.9		2.50	--	--	427.84
	08/30/21		20.0		7.88	--	--	422.46
	10/29/21		19.8		9.92	--	--	420.42
	01/31/22		19.8		3.08	--	--	427.26
	06/02/22		19.8		4.19	--	--	426.15
	09/07/22		19.8		11.51	--	--	418.83
	12/01/22		19.9		13.66	--	--	416.68
	03/01/23		19.8		2.14	--	--	428.20
MW-22 (Lower Zone)	10/29/21	432.51	35.2	34.8 - 39.1	12.74	--	--	419.77
	01/31/22		40.7		8.95	--	--	423.56
	06/02/22		40.4		7.97	--	--	424.54
	09/07/22		40.4		12.45	--	--	420.06
	12/01/22		40.6		13.45	--	--	419.06
	03/01/23		40.3		7.71	--	--	424.80
MW-23 (Lower Zone)	10/29/21	432.56	37.6	32.5 - 36.8	12.31	--	--	420.25
	01/31/22		37.5		7.92	--	--	424.64
	06/02/22		37.5		7.29	--	--	425.27
	09/07/22		37.5		13.12	--	--	419.44
	12/01/22		37.7		15.13	--	--	417.43
	03/01/23		37.4		6.83	--	--	425.73
MW-24 (Upper Zone)	10/29/21	430.63	23.3	13.3 - 22.6	6.89	--	--	423.74
	01/31/22		23.2		3.79	--	--	426.84
	06/02/22		23.1		3.84	--	--	426.79
	09/07/22		23.2		7.27	--	--	423.36
	12/01/22		23.3		10.26	--	--	420.37
	03/01/23		23.2		3.34	--	--	427.29

TABLE 1
GROUNDWATER ELEVATION SURVEY DATA
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

WELL I.D.	DATE	TOP OF CASING ELEVATION (ft)	WELL DEPTH (ft-BTOC)	SCREENED INTERVAL (ft-BGS)	DEPTH TO WATER (ft-BTOC)	DEPTH TO FREE PRODUCT (ft-BTOC)	FREE PRODUCT THICKNESS (ft)	GROUND-WATER ELEVATION (ft)
MW-25 (Lower Zone)	10/29/21	432.95	40.2	35.3 - 39.6	10.77	--	--	422.18
	01/31/22		40.3		6.59	--	--	426.36
	06/02/22		40.2		6.11	--	--	426.84
	09/07/22		40.6		9.07	--	--	423.88
	12/01/22		40.6		15.91	--	--	417.04
	03/01/23		40.3		6.27	--	--	426.68
MW-26 (Deep Zone)	10/29/21	432.60	59.0	54.3 - 58.6	13.41	--	--	419.19
	01/31/22		59.8		10.01	--	--	422.59
	06/02/22		59.2		10.00	--	--	422.60
	09/07/22		59.2		12.68	--	--	419.92
	12/01/22		60.1		15.32	--	--	417.28
	03/01/23		59.6		8.97	--	--	423.63
RW-1 (Upper Zone)	04/20/20	433.07	19.2	5 - 20	2.81	--	--	430.26
	07/24/20		19.6		11.00	--	--	422.07
	10/06/20		19.7		10.86	--	--	422.21
	01/22/21		19.8		5.85	--	--	427.22
	04/16/21		14.4		5.19	--	--	427.88
	08/30/21		19.0		10.70	--	--	422.37
	10/29/21		19.6		12.80	--	--	420.27
	01/31/22		19.9		8.31	--	--	424.76
	06/02/22		19.6		6.27	--	--	426.80
	09/07/22		19.9		13.15	--	--	419.92
	12/01/22		19.7		14.81	--	--	418.26
	03/01/23		19.5		6.82	--	--	426.25
RW-2 (Upper Zone)	04/20/20	433.03	19.1	5 - 20	2.54	--	--	430.49
	07/24/20		19.2		10.33	--	--	422.70
	10/06/20		19.2		10.15	--	--	422.88
	01/22/21		19.6		8.25	--	--	424.78
	04/16/21		19.5		5.00	--	--	428.03
	08/30/21		19.4		10.37	--	--	422.66
	10/29/21		19.3		12.25	--	--	420.78
	01/31/22		19.3		7.89	--	--	425.14
	06/02/22		19.3		6.13	--	--	426.90
	09/07/22		19.3		12.97	--	--	420.06
	12/01/22		19.6		13.65	--	--	419.38
	03/01/23		19.2		5.80	--	--	427.23
RW-3 (Upper Zone)	04/20/20	432.53	19.2	5 - 20	3.93	--	--	428.60
	07/24/20		19.5		9.70	--	--	422.83
	10/06/20		19.7		9.20	--	--	423.33
	01/22/21		19.6		5.80	--	--	426.73
	04/16/21		17.9		4.35	--	--	428.18
	08/30/21		19.6		9.55	--	--	422.98
	10/29/21		19.6		11.60	--	--	420.93
	01/31/22		20.7		6.74	--	--	425.79
	06/02/22		19.5		4.91	--	--	427.62
	09/07/22		19.6		11.84	--	--	420.69
	12/01/22		19.6		11.76	--	--	420.77
	03/01/23		19.4		4.60	--	--	427.93

Notes: *ft-BTOC - feet below top of casing*
ft-AMSL - feet above mean sea level
ft-BGS - feet below ground surface
NM - Not measured
NL - Not located

Sources: *CTE Environmental*
PPM Consultants, Inc.
PPM Project No. 422603-RNA12

TABLE 2
SOIL ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DEPTH (ft BGS)	SAMPLE DATE	HEADSPACE READING (ppmv)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL-BENZENE (mg/kg)	XYLENES (mg/kg)	TOTAL BTEX (mg/kg)	MTBE (mg/kg)	NAPH-THALENE (mg/kg)
MW-1	5	10/20/10	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	10/20/10	NA	<0.05	0.185	0.872	5.14	6.197	<0.05	0.945
MW-2	10	10/20/10	NA	<0.005	0.008	0.010	0.009	0.027	<0.005	0.905
	15	10/20/10	NA	<0.005	<0.005	0.263	0.056	0.319	0.030	<0.005
MW-3	5	10/20/10	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	10/20/10	NA	<0.005	<0.005	0.0260	<0.005	0.0260	<0.005	<0.005
MW-4	5	10/20/10	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	10/20/10	NA	<0.005	<0.005	0.328	0.164	0.492	<0.005	0.415
MW-5	10	04/26/11	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	04/26/11	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
MW-6	5	04/26/11	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	10	04/26/11	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
MW-7	10	05/10/11	NA	<0.005	<0.005	0.041	0.089	0.130	<0.005	0.290
	15	05/10/11	NA	0.009	0.008	0.041	0.200	0.258	<0.005	0.265
MW-8	10	04/25/11	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	04/25/11	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
MW-9	5	04/25/11	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	04/25/11	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
MW-10	5	05/10/11	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	0.014
	15	05/10/11	NA	0.080	3.41	2.47	12.4	18.36	<0.05	1.31
	25	05/10/11	NA	**0.372**	1.27	0.328	1.59	3.56	<0.05	0.187
MW-11	5	04/11/12	NA	0.027	0.099	6.33	10.4	16.856	<0.005	2.92
	15	04/11/12	NA	**0.190**	**8.79**	7.31	19.7	35.990	<0.005	8.61
MW-12	5	04/11/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	04/11/12	NA	<0.005	0.016	0.046	0.302	0.364	<0.005	0.324
MW-13	5	05/10/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	05/10/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	25	05/10/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	35	05/10/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
MW-14	10	05/10/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	05/10/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
MW-15	5	05/11/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	05/11/12	NA	**2.88**	**44.4**	**22.8**	107	177.08	<0.002	8.82
MW-16	5	10/31/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	10/31/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
MW-17	10	04/11/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	05/11/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005

TABLE 2
SOIL ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DEPTH (ft BGS)	SAMPLE DATE	HEADSPACE READING (ppmv)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL-BENZENE (mg/kg)	XYLENES (mg/kg)	TOTAL BTEX (mg/kg)	MTBE (mg/kg)	NAPH-THALENE (mg/kg)
MW-18	5	10/31/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	10/31/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
MW-19	10	10/31/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
	15	10/31/12	NA	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.005
SB-22 (17-18)	17-18	09/15/21	210	<0.008	<0.008	<0.008	<0.024	BDL	<0.008	<0.040
SB-22 (23-24)	23-24	09/15/21	220	<0.012	<0.012	0.036	<0.036	0.036	<0.012	0.095
SB-23 (7-8)	7-8	09/16/21	15	<0.007	<0.007	<0.007	<0.021	BDL	<0.007	<0.035
SB-23 (11-12)	11-12	09/16/21	10	0.011	0.033	<0.008	<0.024	0.044	<0.008	<0.040
SB-24 (7-8)	7-8	09/15/21	55	<0.006	<0.006	<0.006	<0.018	BDL	<0.006	<0.030
SB-25 (7-8)	7-8	09/16/21	5	<0.005	0.006	<0.005	<0.015	0.006	<0.005	<0.025
SB-25 (11-12)	11-12	09/16/21	20	<0.006	<0.006	<0.006	<0.018	BDL	<0.006	<0.030
SB-26 (13-14)	13-14	09/13/21	230	*0.053*	0.088	3.28	8.61	12.031	<0.059	1.03
SB-27 (11-12)	11-12	09/13/21	11,000	*0.050*	0.636	8.97	28.1	37.756	<0.148	2.18
SB-27 (14-15)	14-15	09/13/21	6,000	0.278	5.14	1.30	5.42	12.138	<0.048	0.384
SB-28 (7-8)	7-8	09/13/21	240	0.010	0.028	<0.006	<0.018	0.038	<0.006	<0.030
SB-28 (13-14)	13-14	09/13/21	1,200	0.008	0.085	0.338	1.20	1.631	<0.007	0.0174
SB-29 (7-8)	7-8	09/13/21	7,700	0.202	*0.041*	16.7	22.8	39.743	<0.170	4.73
SB-29 (16.5-17.5)	16.5-17.5	09/13/21	11,000	**0.632**	1.67	0.162	0.798	3.262	<0.008	0.103
SB-30 (7-8)	7-8	09/13/21	9,400	*0.149*	*0.036*	6.64	17.0	23.825	<0.162	2.19
SB-30 (13-14)	13-14	09/13/21	6,450	0.077	0.786	0.705	3.06	4.628	<0.008	0.350
SB-31-9-11	9-11	07/10/23	>11,000	*0.080*	0.401	52.7	118	171.181	*0.007*	14.3
SB-31-19-21	19-21	07/10/23	>11,000	0.381	3.13	0.419	2.01	5.940	<0.135	*0.147*
SB-32-13-15	13-15	07/10/23	>11,000	**0.268**	0.878	**56.4**	165	222.546	<0.233	16.4
SB-32-38-40	38-40	07/10/23	140	**0.143**	0.666	0.097	0.455	1.361	<0.006	0.069
SB-33-13-15	13-15	07/10/23	>11,000	**0.182**	**20.4**	**22.6**	74.7	117.882	<0.137	6.89
SB-33-21-23	21-23	07/10/23	670	**0.378**	2.26	0.878	3.66	7.176	<0.157	*0.568*
SB-34-13-15	13-15	07/10/23	>11,000	**0.537**	**39.1**	**31.0**	93.8	164.437	<0.129	12.8
SB-34-21-23	21-23	07/10/23	710	**4.20**	**42.2**	**18.2**	75.5	140.1	*0.006*	7.41
SB-35-15-17	15-17	07/11/23	>11,000	*0.085*	**28.3**	**23.3**	93.5	145.185	<0.267	9.18
SB-35-20-22	20-22	07/11/23	175	0.077	0.022	0.071	0.115	0.285	<0.007	0.055
SB-36-9-11	9-11	07/11/23	>11,000	**0.351**	**7.63**	4.92	21.2	34.101	<0.247	1.54
SB-36-17-19	17-19	07/11/23	3,600	**0.552**	**5.39**	0.794	3.88	10.616	<0.263	*0.358*
SB-37-9-11	9-11	07/11/23	230	<0.007	0.066	0.546	2.10	2.712	<0.007	0.319
SB-37-17-19	17-19	07/11/23	180	0.046	0.179	0.209	0.986	1.420	<0.008	0.119
SB-38-9-11	9-11	07/11/23	80	<0.007	<0.007	0.011	0.028	0.039	<0.007	<0.035
SB-38-21.23	21-23	07/11/23	200	0.045	0.007	0.107	0.188	0.347	<0.007	0.095

TABLE 2
SOIL ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DEPTH (ft BGS)	SAMPLE DATE	HEADSPACE READING (ppmv)	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL-BENZENE (mg/kg)	XYLENES (mg/kg)	TOTAL BTEX (mg/kg)	MTBE (mg/kg)	NAPH-THALENE (mg/kg)
SB-39-9-11	9-11	07/11/23	30	<0.008	<0.008	<0.008	<0.024	BDL	<0.008	<0.040
SB-39-21.23	21-23	07/11/23	45	0.009	<0.008	<0.008	<0.024	0.009	<0.008	<0.040
SB-40-9-11	9-11	07/12/23	5,400	*0.125*	*0.067*	19.0	15.0	34.192	<0.256	9.60
SB-40-21.23	21-23	07/12/23	340	**1.36**	1.15	0.461	2.12	5.091	*0.028*	*0.084*
SB-41-9-11	9-11	07/12/23	90	<0.009	<0.009	<0.009	<0.027	BDL	<0.009	<0.045
SB-41-21.23	21-23	07/12/23	100	<0.009	<0.009	<0.009	<0.027	BDL	<0.009	<0.045
SB-42-9-11	9-11	07/12/23	0	<0.017	<0.017	<0.017	<0.051	BDL	<0.017	<0.085
SB-42-21.23	21-23	07/12/23	30	<0.007	<0.007	<0.007	<0.021	BDL	<0.007	<0.035
SSCAL - Indoor Inhalation (Commercial Worker)				*0.593*	*114*	*384*	*171*	--	*1,060*	*153*
SSCAL - GRP/SP (MW-7, 8, 10, 11, & 15 and SB-32 to 37)				*0.114*	*3.69*	*13.5*	*171*	--	*0.850*	*39.7*

Notes:
ft BGS - feet below ground surface (approximate)
ppmv - parts per million by volume
mg/kg - milligrams per kilogram
BDL - below detection limit
BTEX/MTBE/Naphthalene analyses conducted per EPA Method 8260/5035
SSCAL - GRP/SP - Site-Specific Corrective Action Level for Groundwater Resource Protection/Stream Protection
***Bold** indicates concentration exceeds SSCAL*
Values in italics are estimated below the detection limit

Sources:
CTE Environmental
PPM Consultants, Inc.
PPM Project No. 422603-SBI

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-1	10/21/10	<0.050	3.40	2.87	9.95	16.22	<0.050	0.241
	05/11/11	0.017	1.59	0.830	3.56	5.997	0.034	0.316
	05/17/12	<0.001	0.029	0.030	0.109	0.168	0.006	0.025
	01/15/12	0.044	5.26	2.43	10.5	18.234	0.033	0.302
	04/10/13	<0.001	<0.001	0.001	<0.003	0.001	0.003	<0.005
	08/07/13	<0.001	<0.001	<0.001	<0.003	BDL	0.003	<0.005
	12/12/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/13/15	<0001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/15/15	NS						
	06/24/15	NS						
	12/07/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/02/16	NS						
	05/31/16	NS						
	08/03/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/23/17	<0.001	<0001	0.011	0.024	0.035	<0.001	<0.005
	06/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/24/18	<0.001	<0.001	0.003	0.008	0.011	<0.001	<0005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	<0.001	0.016	0.133	0.499	0.648	<0.001	0.043
	09/24/19	NS						
	04/20/20	<0.001	0.014	0.044	0.152	0.210	<0.001	0.009
	07/24/20	<0.001	0.011	0.129	0.380	0.520	<0.001	0.095
	10/06/20	<0.001	0.029	0.154	0.222	0.405	<0.001	0.138
	01/22/21	<0.001	0.137	0.580	2.320	3.037	<0.001	0.232
	04/16/21	<0.005	0.022	0.107	0.427	0.556	<0.005	0.039
	08/30/21	<0.001	0.204	0.514	2.23	2.948	<0.001	0.228
	10/29/21	*0.003*	0.770	1.74	6.62	9.133	<0.020	0.710
	01/31/22	<0.001	0.035	0.079	0.328	0.442	<0.001	0.054
	06/02/22	<0.002	0.029	0.077	0.284	0.390	<0.002	0.024
	09/07/22	NS						
	12/01/22	NS						
	03/01/23	NS						
SSCALs - GRP POC		***0.3094***	***61.87***	***43.31***	***175***	**--**	***1.237***	***1.237***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-2	10/21/10	0.064	0.161	0.481	0.456	1.162	0.055	0.073
	05/11/11	0.069	0.019	0.147	0.050	0.285	0.019	0.415
	05/17/12	0.026	0.003	0.067	0.030	0.126	<0.005	0.135
	01/15/12	0.044	0.005	0.082	0.016	0.147	0.010	0.186
	04/10/13	0.020	0.004	0.052	0.026	0.102	0.003	0.670
	08/07/13	0.016	0.003	0.025	0.011	0.055	0.003	0.191
	12/13/13	0.019	0.004	0.057	0.010	0.090	0.002	0.304
	06/04/14	0.018	0.003	0.019	0.008	0.048	0.003	0.296
	10/07/14	0.023	0.002	0.016	0.007	0.048	0.002	0.174
	01/20/15	0.017	0.003	0.037	0.007	0.064	0.001	0.395
	04/13/15	0.014	0.003	0.025	0.006	0.048	<0.001	0.671
	06/05/15	0.012	0.003	0.030	0.007	0.052	<0.001	0.200
	08/24/15	0.014	0.004	0.059	0.015	0.092	<0.001	0.240
	12/07/15	0.010	0.002	0.038	0.006	0.056	<0.001	0.068
	03/02/16	0.005	<0001	0.015	0.003	0.023	<0.001	0.028
	05/31/16	0.009	*0.002*	0.032	*0.005*	0.048	<0.001	0.102
	06/03/16	<0.001	<0.001	0.005	<0.003	0.005	<0.001	<0.005
	11/16/16	0.007	<0.001	0.012	0.003	0.022	<0.001	<0.005
	02/22/17	0.001	<0.001	0.006	<0003	0.007	<0.001	0.005
	05/23/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	0.006
	08/14/17	0.004	<0.001	0.012	<0.003	0.016	<0.001	0.021
	11/29/17	<0.001	<0.001	0.004	<0.003	0.004	<0.001	<0.005
	02/22/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/24/18	<0.001	<0.001	0.001	<0.003	0.001	<0.001	<0.005
	08/20/18	0.003	<0.001	0.010	<0.003	0.013	<0.001	0.052
	11/29/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/26/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/25/19	0.003	<0.001	0.002	<0.003	0.005	<0.001	0.017
	09/24/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	04/20/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	07/24/20	0.002	<0.001	0.002	<0.003	0.004	<0.001	0.015
	10/06/20	0.003	<0.001	0.003	<0.003	0.006	<0.001	0.013
	01/22/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	04/16/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/30/21	0.001	<0.001	0.002	0.003	0.006	<0.001	<0.005
	10/29/21	<0.001	<0.001	0.001	<0.003	0.001	<0.001	<0.005
	01/31/22	0.001	<0.001	<0.001	<0.003	0.001	<0.001	<0.005
	06/02/22	<0.001	<0.001	0.001	<0.003	0.001	<0.001	<0.005
	09/07/22	<0.001	<0.001	0.001	<0.003	0.001	<0.001	<0.005
	12/01/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/01/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
SSCALs - GRP/SP POC		***0.0755***	***1.201***	***3.110***	***175***	**--**	***1.655***	***1.655***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW·3	10/21/10	<0.001	0.002	0.009	<0.005	0.011	<0.005	<0.005
	05/11/11	<0.001	<0.001	0.023	<0.005	0.023	<0.005	0.011
	05/17/12	<0.001	<0.001	0.012	<0.005	0.012	<0.005	<0005
	11/05/12	0.005	0.003	0.021	0.005	0.034	<0.005	<0.001
	04/10/13	<0.001	<0.001	0.004	<0.003	0.004	<0.001	0.010
	08/07/13	0.002	0.001	<0.001	0.011	0.014	<0.001	<0.005
	12/12/13	<0.001	<0.001	0.008	<0.001	0.008	<0001	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/13/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/05/15	NS						
	08/24/15	NS						
	12/07/15	<0.001	<0001	<0.001	<0.003	BDL	<0.001	<0.005
	03/02/16	NS						
	05/31/16	NS						
	08/03/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/23/17	<0.001	<0.001	0.023	<0.001	0.023	<0.001	<0.005
	08/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/21/18	<0.001	<0.001	0.004	<0.001	0.004	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	<0.001	<0001	0.005	<0.003	0.005	<0001	<0.005
	09/12/19	NS						
	04/20/20	NS						
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	NS						
	08/30/21	NS						
	10/29/21	NS						
	01/31/22	NS						
	06/02/22	NS						
	09/07/22	NS						
	12/01/22	NS						
	03/01/23	NS						
SSCALs - GRP/SP POC		***0.0437***	***0.6955***	***1.800***	***175***	***--***	***0.9578***	***0.9578***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW·4	10/21/10	<0.001	0.002	0.223	0.048	0.273	<0.005	0.010
	05/11/11	<0.001	<0.001	0.055	0.017	0.072	<0.005	0.019
	05/17/12	<0.001	<0.001	0.011	<0.005	0.011	<0.005	<0.005
	01/15/12	<0.001	0.002	0.335	0.209	0.546	<0.005	0.177
	04/10/13	<0.001	<0.001	0.022	0.005	0.027	<0.001	0.009
	08/07/13	<0.001	<0.001	0000	<0.003	0.004	<0.001	0.006
	12/12/13	<0.001	<0.001	0.012	<0.003	0.012	<0.001	0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/13/15	<0.001	<0.001	0.001	<0.003	0.001	<0.001	<0.005
	06/05/15	NS						
	08/24/15	NS						
	12/07/15	<0.001	<0.001	0.017	0.003	0.020	<0.001	0.005
	03/02/16	NS						
	05/31/16	NS						
	08/03/16	<0001	<0.001	0.003	<0.003	0.003	<0.001	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/23/17	<0.001	<0.001	0.003	<0.003	0.003	<0.001	<0.005
	08/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/21/18	<0.001	<0.001	0.088	0.012	0.100	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	<0.001	<0.001	0.048	0.006	0.054	<0.001	0.031
	09/24/19	NS						
	04/20/20	<0.001	<0.001	0.003	<0.003	0.003	<0.001	<0.005
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	<0.001	<0.001	0.003	<0.003	0.003	<0.001	<0.005
	08/30/21	<0.001	<0.001	0.030	<0.003	0.030	<0.001	0.016
	10/29/21	NS						
	01/31/22	NS						
	06/02/22	<0.001	<0.001	0.007	<0.003	0.007	<0.001	<0.005
	09/07/22	NS						
	12/01/22	NS						
	03/01/23	NS						
SSCALs - GRP/SP POC		***0.0366***	***0.5819***	***1.506***	***175***	***--***	***0.8015***	***0.8015***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-5	05/11/11	<0.001	<0.001	<0.001	<0.005	BDL	<0.005	<0.005
	05/17/12	<0.001	<0.001	<0.001	<0.005	BDL	<0.005	<0.005
	11/05/12	<0.001	<0.001	<0.001	<0.005	BDL	<0.005	<0.001
	04/10/13	NS						
	08/07/13	NS						
	12/12/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/13/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/05/15	NS						
	08/24/15	NS						
	12/07/15	<0001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/02/16	NS						
	05/31/16	NS						
	08/03/16	<0.001	<0001	0.002	<0.003	0.002	<0001	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/24/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/21/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	NS						
	09/24/19	NS						
	04/20/20	NS						
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	NS						
	08/30/21	NS						
	10/29/21	NS						
	01/31/22	NS						
	06/02/22	NS						
	09/07/22	NS						
	12/01/22	NS						
	03/01/23	NS						
SSCALs - GRP/SP POC		***0.0314***	***0.4991***	***1.292***	***175***	**--**	***0.6874***	***0.6874***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-6	05/11/11	<0.001	<0.001	<0.001	<0.005	BDL	<0.005	<0.005
	05/17/12	<0.001	<0.001	<0.001	<0.005	BDL	<0.005	<0.005
	11/05/12	<0.001	<0.001	<0.001	<0.003	BDL	<0.005	<0.001
	04/10/13	NS						
	08/07/13	<0.001	<0001	<0.001	<0.003	BDL	<0.001	<0.005
	12/12/13	<0.001	<0001	<0.001	<0.003	BDL	<0.001	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/13/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/05/15	NS						
	08/24/15	NS						
	12/07/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/02/16	NS						
	05/31/16	NS						
	08/03/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/23/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/21/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	0.002	<0.001	<0.001	<0.003	0.002	<0.001	<0.005
	09/24/19	NS						
	04/20/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/30/21	0.003	<0.001	<0.001	<0.003	0.003	<0.001	<0.005
	10/29/21	0.002	<0.001	<0.001	<0.003	0.002	<0.001	<0.005
	01/31/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/02/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/07/22	0.002	<0.001	<0.001	<0.003	0.002	<0.001	<0.005
	12/01/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/01/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
SSCALs - GRP/SP POC		***0.0533***	***0.8482***	***2.196***	***175***	**--**	***1.168***	***1.168***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-7	05/11/11	**4.85**	1.186	2.30	6.47	14.806	0.182	0.770
	05/17/12	**2.54**	**2.34**	2.23	7.03	14.140	0.103	0.501
	11/05/12	**10.8**	**11.7**	3.05	11.0	36.550	0.313	0.469
	04/10/13	**7.26**	**11.9**	**4.64**	17.5	41.300	0.206	0.496
	08/07/13	**0.398**	0.100	0.510	0.936	1.944	0.026	0.296
	12/13/13	**1.11**	0.980	0.448	1.88	4.418	0.057	0.231
	06/04/14	**0.635**	0.326	0.935	1.96	3.856	0.047	0.343
	10/07/14	**9.82**	**16.6**	**4.72**	19.0	50.14	0.168	0.669
	01/20/15	**1.64**	1.14	2.84	8.18	13.80	0.067	0.110
	04/13/15	**1.83**	1.08	2.60	6.83	12.340	*0.045*	<0.005
	06/05/15	**0.808**	0.318	1.56	4.54	7.226	0.046	0.464
	08/24/15	**2.04**	1.16	1.17	2.62	6.990	0.068	0.368
	12/07/15	**0.464**	0.221	0.936	2.89	4.511	*0.034*	0.444
	03/02/16	**0.278**	0.124	0.556	1.34	2.298	<0.001	0.272
	05/31/16	**0.948**	0.386	1.19	2.95	5.474	*0.024*	0.656
	08/03/16	**0.530**	0.066	0.312	0.538	1.446	0.021	0.042
	11/16/16	**1.01**	0.117	0.760	0.858	2.745	0.040	0.388
	02/22/17	**0.627**	0.372	1.01	2.52	4.529	0.028	0.348
	05/23/17	**0.471**	0.208	0.693	2.23	3.602	0.027	0.544
	08/14/17	**0.446**	0.188	0.488	1.26	2.382	*0.017*	0.274
	11/29/17	**0.486**	0.015	0.872	0.745	2.118	0.020	0.496
	02/22/18	**0.278**	0.108	0.489	1.08	1.955	0.012	0.185
	05/24/18	**0.355**	0.199	0.975	2.68	4.209	0.016	0.803
	08/20/18	**0.553**	0.298	1.49	3.83	6.171	0.031	0.889
	11/29/18	**0.528**	0.119	1.34	2.33	4.317	0.019	0.496
	02/26/19	**0.133**	0.025	0.243	0.497	0.898	0.003	0.077
	06/25/19	**0.432**	0.079	1.17	2.45	4.131	0.015	0.446
	09/24/19	**0.129**	0.017	0.414	0.327	0.887	<0.001	0.121
	04/20/20	**0.108**	0.019	0.324	0.466	0.917	*0.003*	0.124
	07/24/20	**0.119**	0.016	0.341	0.398	0.874	*0.003*	0.150
	10/06/20	**0.119**	0.019	0.349	0.417	0.904	*0.003*	0.193
	01/22/21	**0.135**	0.023	0.443	0.693	1.294	0.005	0.166
	04/16/21	**0.161**	0.027	0.498	0.674	1.360	0.006	0.176
	08/30/21	NS						
	10/29/21	**0.100**	0.012	0.339	0.322	0.773	*0.003*	0.154
	01/31/22	**0.093**	0.010	0.256	0.245	0.604	*0.003*	0.147
	06/02/22	**0.127**	0.015	0.375	0.413	0.930	0.005	0.191
	09/07/22	0.027	0.002	0.051	0.069	0.149	<0.001	0.054
	12/01/22	0.035	0.002	0.054	0.040	0.131	0.001	0.041
	03/01/23	**0.087**	0.007	0.239	0.239	0.572	0.002	0.114
SSCALs - GRP/SP SOURCE		***0.0784***	***1.247***	***3.227***	***175***	**--**	***1.717***	***1.717***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-8	05/11/11	0.004	0.005	0000	0.075	0.154	0.033	0.050
	05/17/12	0.001	0.002	0.007	0000	0.018	0.006	0.011
	11/05/12	0.024	0.036	0.090	0.117	0.267	0.017	0.046
	04/10/13	0.006	0.019	0.032	0.056	0.113	0.006	0.009
	08/07/13	<0.001	<0.001	<0.001	<0.003	BDL	0.001	<0.005
	12/13/13	<0.001	<0.001	<0.001	<0.003	BDL	0.003	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/13/15	0.006	0.006	0.041	0.033	0.086	0.007	0.016
	06/05/15	NS						
	08/24/15	NS						
	12/07/15	<0.001	<0.001	0.002	<0.003	0.002	<0.001	<0.005
	03/02/16	NS						
	05/31/16	NS						
	08/03/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/23/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/24/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	0.002	0.006	0.028	0.077	0.113	0.003	0.023
	09/24/19	NS						
	04/20/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	07/24/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/06/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	01/22/21	<0.001	0.002	0.008	0.012	0.022	<0.001	0.006
	04/16/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/30/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/29/21	NS						
	01/31/22	NS						
	06/02/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/07/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/01/22	0.002	<0.001	0.015	<0.003	0.017	<0.001	0.011
	03/01/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
SSCALs - GRP/SP SOURCE		***0.0784***	***1.247***	***3.227***	***175***	--	***1.717***	***1.717***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-9	05/11/11	0.040	0.059	0.092	0.273	0.464	0.059	0.037
	05/17/12	<0.001	0.002	0.022	0.030	0.054	0.024	0.008
	11/05/12	0.036	3.88	2.46	10.20	16.576	0.041	0.222
	04/10/13	<0.001	0.005	0.011	0.019	0.035	0.005	<0.005
	08/07/13	<0.001	<0.001	<0.001	<0.003	BDL	0.004	<0.005
	12/12/13	0.002	0.095	0.278	0.800	1.175	0.020	0.054
	06/04/14	<0.001	<0.001	<0.001	<0.003	BDL	0.002	<0.005
	10/07/14	0.024	3.57	2.52	11.2	17.314	0.037	*0.484*
	01/20/15	*0.002*	0.042	1.40	4.84	6.284	*0.029*	0.012
	04/13/15	*0.016*	1.81	1.18	4.46	7.466	0.023	0.131
	06/05/15	*0.003*	0.391	0.292	1.02	1.706	0.013	0.090
	08/24/15	0.020	2.72	1.84	6.57	11.15	0.034	0.571
	12/07/15	*0.023*	1.86	1.44	4.72	8.043	*0.008*	0.330
	03/02/16	*0.008*	0.664	0.628	2.28	3.580	<0.001	*0.043*
	05/31/16	0.014	1.82	1.47	5.54	8.844	0.019	0.724
	08/03/16	*0.033*	4.16	2.57	9.24	16.00	<0.001	0.254
	11/16/16	NS						
	02/22/17	*0.014*	1.78	1.61	5.03	8.434	*0.001*	0.286
	05/23/17	*0.005*	0 240	0.884	2.71	3.599	*0.012*	0.161
	08/14/17	*0.006*	0.530	1.22	4.31	6.066	<0.001	0.338
	11/29/17	0.010	0.671	1.52	5.02	7.221	0.018	0.805
	02/22/18	0.010	1.26	1.12	3.20	5.590	*0.002*	0.268
	05/24/18	*0.004*	0.449	0.773	2.22	3.446	*0.004*	0.278
	08/20/18	0.003	0.318	0.775	2.36	3.456	0.005	0.221
	11/29/18	0.003	0.193	0.308	1.17	1.674	<0.001	0.069
	02/26/19	0.002	0.285	0.392	2.10	2.779	0.001	0.090
	06/25/19	0.002	0.345	0.580	2.08	3.007	0.002	0.151
	09/24/19	0.006	2.79	4.10	18.4	25.296	<0.001	0.852
	04/20/20	*0.007*	1.02	1.82	6.80	9.647	*0.002*	0.408
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	*0.003*	0.394	0.986	3.820	5.203	<0.020	0.262
	08/30/21	*0.002*	0.270	0.987	3.340	4.599	<0.010	0.291
	10/29/21	NS						
	01/31/22	NS						
	06/02/22	<0.001	0.709	2.59	10.3	13.599	<0.001	0.631
	09/07/22	*0.005*	0.700	2.37	9.00	12.075	<0.001	1.23
	12/01/22	<0.001	0.423	1.43	4.49	6.343	<0.001	0.483
	03/01/23	NS						
SSCALs - GRP POC		***0.3681***	***73.61***	***51.53***	***175***	**--**	***1.472***	***1.472***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-10	05/11/11	**10.6**	**8.32**	1.28	5.76	25.96	0.178	0.826
	05/17/12	**4.85**	**3.67**	0.597	2.91	12.027	<0.100	0.426
	11/07/12	**4.79**	**3.10**	0.696	3.25	11.836	<0.100	0.128
	04/10/13	**3.84**	**2.44**	0.292	2.72	9.292	0.049	0.288
	08/07/13	0.058	0.104	0.009	0.211	0.382	<0.001	0.029
	12/13/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/13/15	0.010	0.006	<0.001	0.008	0.024	0.013	<0.005
	06/05/15	NS						
	08/24/15	NS						
	12/08/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/02/16	NS						
	05/31/16	NS						
	08/04/16	**0.230**	0.116	0.017	0.049	0.412	<0.001	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/23/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/24/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	0.011	0.003	0.003	0.023	0.040	0.002	<0.005
	09/24/19	NS						
	04/20/20	NS						
MW-10R	07/24/20	**11.4**	**17.3**	3.18	15.3	47.18	0.101	0.514
	10/06/20	**13.1**	**21.4**	**3.23**	15.2	52.93	*0.081*	1.03
	01/22/21	**12.2**	**23.0**	**3.86**	18.7	57.76	*0.093*	0.925
	04/16/21	**18.9**	**27.2**	**3.82**	18.1	68.02	0.101	1.12
	08/30/21	**14.3**	**28.0**	**3.97**	19.5	65.77	*0.068*	1.33
	10/29/21	**13.5**	**29.2**	**4.80**	24.3	71.80	*0.070*	1.64
	01/31/22	**13.0**	**26.2**	**3.90**	19.0	62.10	*0.056*	1.38
	06/02/22	**14.3**	**24.2**	**4.52**	21.1	64.12	*0.060*	1.04
	09/07/22	**11.7**	**26.0**	**4.36**	19.9	61.96	<0.200	*0.854*
	12/01/22	NS						
	03/01/23	**13.6**	**27.6**	**5.96**	27.3	74.460	*0.034*	1.68
SSCALs - GRP/SP SOURCE		***0.0784***	***1.247***	***3.227***	***175***	--	***1.717***	***1.717***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-11	05/17/12	**0.800**	**9.73**	**4.95**	17.9	33.38	<0.100	1.06
	11/17/12	**7.62**	**35.5**	**5.91**	26.6	75.63	<0.100	0.711
	04/10/13	**0.905**	**7.55**	**3.53**	11.1	23.085	<0.001	1.34
	08/07/13	**1.09**	**9.93**	**5.81**	18.6	35.43	<0.001	1.09
	12/13/13	**0.504**	**4.61**	2.95	10.9	18.964	*0.003*	1.01
	06/04/14	**1.18**	**9.31**	**3.33**	15.7	29.52	*0.001*	1.49
	10/07/14	**3.84**	**53.1**	**23.3**	142	222.24	*0.001*	**11.2**
	01/20/15	***0.128***	**7.04**	**16.1**	73.2	96.468	<0.001	0.740
	04/13/15	**0.961**	**17.4**	**6.04**	33.9	58.301	<0.001	**11.9**
	06/05/15	**0.792**	**11.5**	**4.08**	17.7	34.072	<0.001	1.68
	08/24/15	**0.756**	**16.2**	**15.6**	78.8	111.356	<0.001	**35.0**
	12/07/15	**0.678**	**13.6**	**3.48**	16.2	33.958	<0.001	**1.84**
	03/02/16	**0.310**	**9.36**	2.82	13.2	25.690	<0.001	1.28
	05/31/16	**0.752**	**20.6**	**3.68**	25.7	50.732	<0.001	**7.04**
	08/03/16	**0.536**	**14.4**	2.12	14.7	31.756	<0.001	*0.518*
	11/16/16	**0.678**	**7.66**	1.82	12.4	22.558	<0.001	**5.28**
	02/22/17	**0.335**	**7.39**	2.32	10.4	20.445	<0.001	1.30
	05/23/17	**0.366**	**12.0**	3.02	16.6	31.986	<0.001	*0.516*
	08/14/17	**0.380**	**14.5**	2.46	15.4	32.740	<0.001	1.58
	11/29/17	**0.430**	**11.5**	1.20	10.9	24.030	<0.001	**2.44**
	02/22/18	**0.096**	**2.95**	1.02	4.80	8.866	<0.001	0.258
	05/24/18	**0.187**	**3.30**	1.30	5.40	10.187	<0.001	1.03
	08/20/18	**0.350**	**18.4**	**4.68**	25.0	48.430	<0.001	1.48
	11/29/18	**0.338**	**13.0**	**4.38**	2.33	20.048	0.019	0.876
	02/26/19	**0.151**	**7.31**	2.23	11.0	20.691	<0.001	0.462
	06/25/19	**0.420**	**20.8**	**4.90**	25.6	51.720	<0.001	1.68
	09/24/19	**0.748**	**18.6**	**5.35**	27.5	52.198	<0.001	1.71
	04/20/20	**0.201**	**5.94**	2.40	11.1	19.641	<0.10	0.756
	07/24/20	**0.270**	**10.7**	**5.42**	26.4	42.79	<0.200	0.670
	10/06/20	**0.253**	**8.24**	**3.55**	17.0	29.043	<0.100	1.56
	01/22/21	**0.281**	**8.16**	**3.93**	18.2	30.571	<0.100	1.08
	04/16/21	**0.254**	**6.95**	3.00	14.0	24.204	<0.050	0.785
	08/30/21	**0.240**	**7.41**	**3.63**	15.5	26.780	<0.100	1.09
	10/29/21	**0.397**	**11.3**	**4.19**	19.2	35.087	<0.100	1.42
	01/31/22	**0.330**	**10.3**	**3.82**	19.1	33.550	<0.200	1.50
	06/02/22	**0.300**	**5.92**	**2.56**	10.8	19.580	*0.001*	0.749
	09/07/22	**0.371**	**14.1**	**3.44**	15.0	32.911	<0.100	**2.17**
	12/01/22	**0.315**	**6.44**	2.96	13.0	22.715	<0.040	1.08
	03/01/23	**0.160**	**4.06**	2.34	10.1	16.660	<0.050	0.760
SSCALs - GRP/SP SOURCE		***0.0784***	***1.247***	***3.227***	***175***	*--*	***1.717***	***1.717***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-12	05/17/12	<0.001	<0.001	0.005	0.005	0.010	<0.005	0.013
	11/07/12	**1.16**	0.041	0.650	0.017	1.868	0.038	0.075
	04/10/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/07/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/12/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/14/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/05/15	NS						
	08/24/15	NS						
	12/08/15	<0.001	<0.001	0.001	<0.003	0.001	<0.001	<0.005
	03/02/16	NS						
	05/31/16	NS						
	08/04/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/24/17	<0001	<0.001	0.002	<0.003	0.002	<0.001	<0.005
	08/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/21/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	0.003	<0.001	<0.001	<0.003	0.003	<0.001	<0.005
	09/24/19	NS						
	04/20/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	07/24/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/06/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	01/22/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	04/16/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/30/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/29/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	01/31/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/02/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/07/22	NS						
	12/01/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/01/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
SSCALs - GRP/SP POC		***0.0388***	***0.6173***	***1.598***	***175***	**--**	***0.8501***	***0.8501***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-13	05/17/12	**8.34**	8.61	2.93	10.7	30.58	0.229	**2.00**
	11/07/12	**9.29**	12.2	2.41	9.89	33.79	0.381	0.257
	04/10/13	**11.9**	11.5	2.22	10.7	36.32	0.231	0.101
	08/07/13	0.002	0.001	<0.001	0.011	0.014	<0.001	<0.005
	12/12/13	0.005	0.001	<0.001	<0.003	0.006	0.002	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/14/15	<0.001	<0.001	<0.001	<0.003	BDL	0.099	<0.005
	06/05/15	NS						
	08/24/15	NS						
	12/08/15	0.009	0.008	0.001	0.005	0.023	0.066	<0.005
	03/02/16	NS						
	05/31/16	NS						
	08/04/16	0.007	0.003	<0.001	<0.003	0.010	0.002	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/24/17	0.099	0.047	0.007	0.037	0.190	0.033	<0.005
	08/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/21/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	**0.846**	0.848	0.150	0.554	2.398	0.038	0.033
	09/24/19	NS						
	04/20/20	**10.4**	13.0	2.52	11.1	37.02	0.128	0.418
	07/24/20	**8.77**	13.0	2.44	11.7	35.91	0.124	0.370
	10/06/20	**6.60**	8.40	1.29	6.30	22.59	0.090	0.308
	01/22/21	**7.10**	9.95	1.95	9.29	28.29	0.133	0.453
	04/16/21	**11.7**	15.4	2.16	10.2	39.46	0.158	0.272
	08/30/21	**8.36**	10.7	1.63	8.04	28.73	*0.089*	*0.313*
	10/29/21	**15.0**	22.2	4.28	20.8	62.28	*0.136*	***0.596***
	01/31/22	**10.1**	14.5	1.12	10.1	35.82	*0.106*	*0.246*
	06/02/22	**5.16**	7.74	0.848	6.6	20.358	*0.046*	*0.255*
	09/07/22	**11.7**	20.7	2.81	12.8	48.01	*0.083*	**0.902**
	12/01/22	NS						
	03/01/23	**1.52**	1.66	0.284	1.66	5.124	*0.019*	*0.052*
SSCALs - GRP POC		***0.1165***	***23.30***	***16.31***	***175***	**--**	***0.4660***	***0.4660***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-14	05/17/12	0.119	0.004	0.026	0.105	0.254	<0.005	0.043
	11/07/12	0.002	<0.001	<0.001	<0.005	0.002	<0.005	<0.001
	04/10/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/07/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/12/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/14/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/05/15	NS						
	08/24/15	NS						
	12/08/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/02/16	NS						
	05/31/16	NS						
	08/04/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/24/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/21/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/24/19	NS						
	04/20/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	07/24/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/06/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	01/22/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	04/16/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/30/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/29/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	01/31/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/02/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/07/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/01/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/01/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
SSCALs - GRP POC		***0.1334***	***26.68***	***18.67***	***175***	**--**	***0.5336***	***0.5336***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-15	05/17/12	**Free Product**						
	11/07/12	**Free Product**						
	04/10/13	**Free Product**						
	08/07/13	**Free Product**						
	12/13/13	0.045	0.860	0.396	2.49	3.791	*0.002*	0.232
	06/04/14	<0.001	0.047	0.163	1.63	1.840	<0.001	0.430
	10/07/14	0.017	0.183	0.016	1.16	1.376	<0.001	0.563
	01/20/15	0.017	0.071	0.016	0.215	0.319	<0.001	0.138
	04/13/15	<0.001	0.005	0.001	0.029	0.035	<0.001	0.057
	06/05/15	<0.001	<0.001	0.002	0.003	0.005	<0.001	<0005
	08/24/15	0.003	0.029	0.006	0.059	0.097	<0.001	0.005
	12/07/15	0.001	0.011	0.002	0.017	0.031	<0.001	<0.005
	03/02/16	<0.001	0.003	0.014	0.065	0.082	<0.001	0.092
	05/31/16	0.020	0.055	0.011	0.076	0.162	<0.001	0.033
	08/04/16	0.003	0.024	0.016	0.107	0.150	<0001	0.006
	11/16/16	**0.822**	**1.60**	0.122	0.736	3.280	<0.001	0.046
	02/22/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	05/23/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/14/17	0.008	0.070	0.015	0.119	0.212	<0.001	<0.005
	11/29/17	0.054	0.215	0.032	0.184	0.485	<0.001	0.032
	02/22/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	05/24/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/29/18	0.001	0.002	<0.001	0.005	0.008	<0.001	<0.005
	02/26/19	<0.001	<0.001	<0 001	<0.003	BDL	<0.001	<0.005
	06/25/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/24/19	0.008	0.003	0.003	0.010	0.024	<0.001	<0.005
	04/20/20	0.001	0.004	0.005	0.008	0.018	<0.001	<0.005
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/30/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/29/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	01/31/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/02/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/07/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/01/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/01/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
SSCALs - GRP/SP SOURCE		***0.0784***	***1.247***	***3.227***	***175***	*--*	***1.717***	***1.717***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-16	01/17/12	<0.001	<0.001	<0.001	<0.005	BDL	<0.005	<0.001
	04/10/13	NS						
	08/07/13	NS						
	12/13/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/14/15	NS						
	06/05/15	NS						
	08/24/15	NS						
	12/08/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/02/16	NS						
	05/31/16	NS						
	08/04/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/24/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/21/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/24/19	NS						
	04/20/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/30/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/29/21	NS						
	01/31/22	NS						
	06/02/22	NL						
	09/07/22	NL						
	12/01/22	NL						
	03/01/23	NS						
SSCALs - GRP POC		***0.0362***	***7.249***	***5.074***	***72.49***	**--**	***0.1450***	***0.1450***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-17	05/17/12	<0.001	<0.001	<0.001	<0005	BDL	<0005	<0.005
	11/05/12	<0.001	<0.001	0.013	0.006	0.019	0.008	<0.005
	04/10/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/17/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/12/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/04/14	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/07/14	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	01/20/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	04/13/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/05/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/24/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/07/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/02/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	05/31/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/03/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/16/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/22/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	05/23/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/14/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/29/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/22/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	05/21/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/29/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/26/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/25/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/24/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	04/20/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/30/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/29/21	NS						
	01/31/22				NS			
	06/02/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/07/22	NS						
	12/01/22	NS						
	03/01/23	NS						
SSCALs - GRP POC		***0.2004***	***40.07***	***28.05***	***175***	***--***	***0.8015***	***0.8015***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-18	01/17/12	<0.001	<0.001	<0.001	<0.005	BDL	<0.005	<0001
	04/10/13	NS						
	08/07/13	NS						
	12/12/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/14/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/05/15	NS						
	08/24/15	NS						
	12/08/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0005
	03/02/16	NS						
	05/31/16	NS						
	08/04/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/24/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/21/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/02/19	NS						
	04/20/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/30/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/29/21	NS						
	01/31/22	NS						
	06/02/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/07/22	NS						
	12/01/22	NS						
	03/01/23	NS						
SSCALs - GRP POC		***0.0603***	***12.05***	***8.435***	***120.5***	**--**	***0.2410***	***0.2410***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-19	11/07/12	<0.001	<0.001	<0.001	<0.005	BDL	<0.005	<0.001
	04/10/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/07/13	NS						
	12/12/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/14/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/05/15	NS						
	08/24/15	NS						
	12/08/15	NS						
	03/02/16	NS						
	05/31/16	NS						
	08/04/16	<0.001	<0.001	<0.001	<0.001	BDL	<0.001	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/24/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/21/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/24/19	NS						
	04/20/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	07/24/20	<0.001	0.001	<0.001	<0.003	0.001	<0.001	<0.005
	10/06/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	01/22/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	04/16/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/30/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/29/21	NS						
	01/31/22	NS						
	06/02/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/07/22	NS						
	12/01/22	NS						
	03/01/23	NS						
SSCALs - GRP POC		***0.0603***	***12.05***	***8.435***	***120.5***	**--**	***0.2410***	***0.2410***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-20	04/10/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/07/13	NS						
	12/12/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/14/15	NS						
	06/05/15	NS						
	08/24/15	NS						
	12/08/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/02/16	NS						
	05/31/16	NS						
	08/04/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/24/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/14/17	NS						
	11/29/17	NS						
	02/22/18	NS						
	05/21/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/24/19	NS						
	04/20/20	NS						
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	NS						
	08/30/21	NS						
	10/29/21	NS						
	01/31/22	NS						
	06/02/22	NS						
	09/07/22	NL						
	12/01/22	NL						
	03/01/23	NL						
SSCALs - GRP POC		***0.0455***	***9.106***	***6.375***	***91.06***	**--**	***0.1821***	***0.1821***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-21	04/10/13	<0.001	<0.001	<0.001	<0.003	BDL	0.005	<0.005
	08/07/13	NS						
	12/12/13	<0.001	<0.001	<0.001	<0.003	BDL	0.009	<0.005
	06/04/14	NS						
	10/07/14	NS						
	01/20/15	NS						
	04/14/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/05/15	NS						
	08/24/15	NS						
	12/08/15	NS						
	03/02/16	NS						
	05/31/16	NS						
	08/04/16	<0.001	<0.001	<0.001	<0.003	BDL	0.008	<0.005
	11/16/16	NS						
	02/22/17	NS						
	05/24/17	<0.001	<0.001	<0.001	<0.003	BDL	0.001	<0.005
	08/14/17	NS						
	01/29/17	NS						
	02/22/18	NS						
	05/21/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/20/18	NS						
	11/29/18	NS						
	02/26/19	NS						
	06/25/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/24/19	NS						
	04/20/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	08/30/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/29/21	NS						
	01/31/22	NS						
	06/02/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/07/22	NS						
	12/01/22	NS						
	03/01/23	NS						
SSCALs - GRP/SP POC		***0.0156***	***0.2483***	***0.6426***	***171.0***	**--**	***0.3419***	***0.3419***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
MW-22	10/29/21	<0.001	0.001	0.071	0.015	0.087	<0.001	0.075
	01/31/22	<0.001	0.002	0.050	0.012	0.064	<0.001	0.060
	06/02/22	<0.001	0.001	0.060	0.012	0.073	<0.001	0.079
	09/07/22	<0.001	0.001	0.066	0.011	0.077	<0.001	0.063
	12/01/22	<0.001	0.001	0.061	0.011	0.072	<0.001	0.061
	03/01/23	<0.001	0.001	0.059	0.010	0.069	<0.001	0.063
SSCALs - GRP/SP SOURCE		***0.0784***	***1.247***	***3.227***	***175***	--	***1.717***	***1.717***
MW-23	10/29/21	0.002	<0.001	<0.001	<0.003	0.002	0.004	<0.005
	01/31/22	0.023	0.063	0.010	0.055	0.151	0.003	<0.005
	06/02/22	0.002	<0.001	<0.001	<0.003	0.002	0.003	<0.005
	09/07/22	0.004	<0.001	<0.001	<0.003	0.004	0.004	<0.005
	12/01/22	0.002	<0.001	<0.001	<0.003	0.002	0.005	<0.005
	03/01/23	0.005	<0.001	0.004	<0.003	0.009	0.004	<0.005
MW-24	10/29/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	01/31/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/02/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	09/07/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/01/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/01/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
MW-25	10/29/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	01/31/22	0.016	0.055	0.010	0.049	0.130	<0.001	<0.005
	06/02/22	0.034	0.069	0.006	0.044	0.153	<0.001	<0.005
	09/07/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/01/22	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/01/23	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
MW-26	10/29/21	0.199	0.293	0.050	0.251	0.793	0.068	0.024
	01/31/22	0.100	0.104	0.012	0.063	0.279	0.062	<0.005
	06/02/22	0.051	0.277	0.107	0.449	0.884	0.020	0.067
	09/07/22	0.037	0.026	0.004	0.031	0.098	0.037	<0.005
	12/01/22	0.021	0.008	0.001	0.008	0.038	0.046	<0.005
	03/01/23	0.004	0.005	0.001	0.007	0.017	0.052	<0.005
SSCALs - GRP/SP SOURCE		***0.0784***	***1.247***	***3.227***	***175***	--	***1.717***	***1.717***
RW-1	04/20/20	0.001	<0.001	0.006	0.004	0.011	<0.001	0.011
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	0.004	0.001	0.010	0.017	0.032	<0.001	0.005
	08/30/21	0.002	<0.001	0.007	0.004	0.013	<0.001	<0.005
	10/29/21	NS						
	01/31/22	NS						
	06/02/22	0.004	0.002	0.010	0.016	0.032	<0.001	0.006
	09/07/22	NS						
	12/01/22	NS						
	03/01/23	NS						
SSCALs - GRP/SP SOURCE		***0.0784***	***1.247***	***3.227***	***175***	--	***1.717***	***1.717***
RW-2	04/20/20	<0.001	<0.001	0.021	0.010	0.031	<0.001	0.018
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	0.028	0.758	0.160	0.704	1.650	<0.010	*0.044*
	08/30/21	0.005	0.067	0.047	0.184	0.303	<0.005	*0.062*
	10/29/21				NS			
	01/31/22				NS			
	06/02/22	0.036	0.576	0.141	0.577	1.330	<0.010	0.052
	09/07/22	NS						
	12/01/22	NS						
	03/01/23	NS						
SSCALs - GRP/SP SOURCE		***0.0784***	***1.247***	***3.227***	***175***	--	***1.717***	***1.717***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
FORMER KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

SAMPLE I.D.	SAMPLE DATE	BENZENE (mg/L)	TOLUENE (mg/L)	ETHYL-BENZENE (mg/L)	XYLENES (mg/L)	TOTAL BTEX (mg/L)	MTBE (mg/L)	NAPH-THALENE (mg/L)
RW-3	04/20/20	0.015	0.122	0.026	0.166	0.329	<0.001	0.018
	07/24/20	NS						
	10/06/20	NS						
	01/22/21	NS						
	04/16/21	0.005	0.048	0.012	0.081	0.146	<0.001	0.009
	08/30/21	<0.001	0.002	<0.001	0.005	0.007	<0.001	<0.005
	10/29/21	NS						
	01/31/22	NS						
	06/02/22	<0.001	0.002	<0.001	0.006	0.008	<0.001	<0.005
	09/07/22	NS						
	12/01/22	NS						
	03/01/23	NS						
SSCALs - GRP/SP SOURCE		***0.0784***	***1.247***	***3.227***	***175***	--	***1.717***	***1.717***
TMW-1	7/10/2023	**7.03**	**21.8**	**7.02**	21.6	57.45	0.166	1.53
TMW-2	7/10/2023	**5.28**	**15.8**	**3.24**	13.3	37.62	*0.006*	0.744
TMW-3	7/11/2023	**11.3**	**35.0**	**8.20**	34.5	89.00	*0.016*	1.51
TMW-4	7/11/2023	**4.56**	**7.02**	2.61	10.3	24.49	0.030	0.659
SSCALs - GRP/SP SOURCE		***0.0784***	***1.247***	***3.227***	***175***	--	***1.717***	***1.717***
TMW-5	7/12/2023	**4.20**	7.85	2.67	8.50	23.22	0.026	**0.585**
TMW-6	7/12/2023	0.010	0.005	<0.001	<0.003	0.015	<0.001	<0.005
SSCALs - GRP POC (MW-13)		***0.1165***	***23.30***	***16.31***	***175***	--	***0.4660***	***0.4660***
DUPLICATES								
DUP (MW-2)	04/20/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
DUP (MW-11)	07/24/20	0.252	10.9	5.42	26.8	43.372	<0.200	0.636
DUP (MW-11)	10/06/20	0.229	7.67	3.05	14.6	25.549	<0.100	1.32
DUP (MW-11)	01/22/21	0.259	7.83	3.93	18.1	30.119	<0.100	1.06
DUP (MW-11)	04/16/21	0.245	6.85	2.81	13.0	22.905	<0.050	0.845
DUP (MW-11)	08/30/21	0.236	7.48	3.62	15.4	26.736	<0.100	1.17
DUP (MW-7)	10/29/21	0.106	0.015	0.344	0.319	0.784	*0.003*	0.160
DUP (MW-7)	01/31/22	0.097	0.011	0.273	0.265	0.646	*0.003*	*0.146*
DUP (MW-11)	06/02/22	0.308	6.33	2.79	12.2	21.628	<0.100	0.756
DUP (MW-7)	09/07/22	0.025	0.002	0.049	0.068	0.144	<0.001	0.053
DUP (MW-7)	12/01/22	0.034	0.002	0.054	0.039	0.129	0.001	0.037
DUP (MW-7)	03/01/23	0.088	0.007	0.237	0.234	0.566	0.002	0.110

Notes: *mg/L - milligrams per liter*
BTEX, MTBE, and Naphthalene analysis conducted per EPA Method 8260
Values in italics are estimated below the detection limit
NS - Not sampled
SSCAL - Site Specific Corrective Action Level
POC - Point of Compliance
GRP - Groundwater Resource Protection
SP - Stream Protection
Bold *type indicates concentration exceeds SSCAL*

Sources: *CTE Environmental*
PPM Consultants, Inc.
PPM Project No. 422603-RNA12

APPENDICES

APPENDIX A – SOIL BORING/MONITORING WELL CONSTRUCTION LOGS

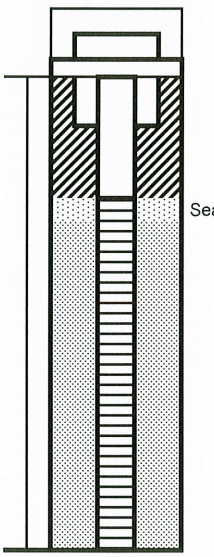
CTE

MW-1

Project	Kwik Shop #110	Measuring Point Elev:	432.70	Date Started:	10/20/2010
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	10/20/2010
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
2	concrete					
4	Reddish Tan Silty Sand	<0.005	<0.005	<0.005		
6						
8						
10						
12	Dark Tan Clay Silt	6.197	*<0.050	0.945		
14						
16					17.40'	
18					19.10'	
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



*= Practical Quantitation Limit elevated due to matrix

Boring terminated at 21.0 feet

Weather:	Sunny, Warm
Operation	Time
Start	9:21
Stop	10:40

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

Static Water Level

Initial Water Level

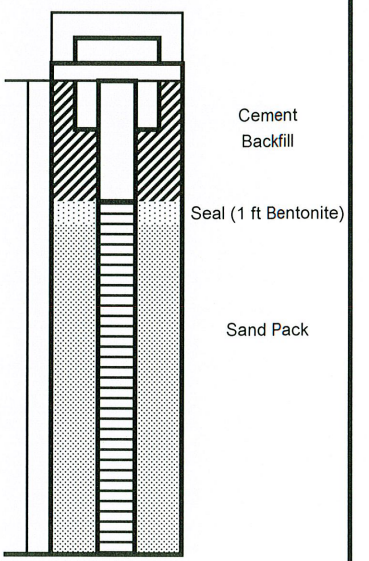
CTE

MW-2

Project	Kwik Shop #110	Measuring Point Elev:	432.93	Date Started:	10/20/2010
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	10/20/2010
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
2	concrete					
4	Reddish Tan Silty Sand					
6						
8						
10		0.027	<0.005	0.905		
12						
14	Dark Tan Clay Silt	0.319	<0.005	<0.005		
16						
18					17.62'	
20					19.80'	
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



Boring terminated at 20.0 feet

Weather:	Sunny, Warm
Operation	Time
Start	11:00
Stop	12:40

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

Static Water Level

Initial Water Level

CTE

MW-3

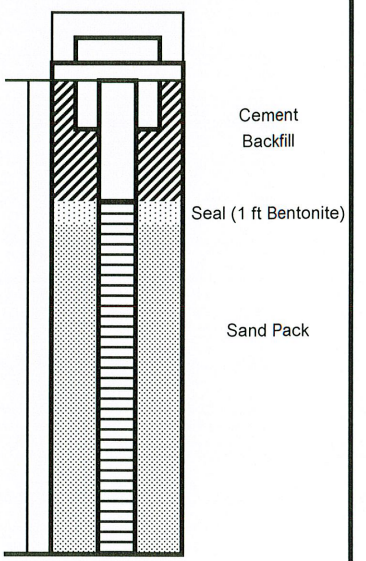
Project	Kwik Shop #110	Measuring Point Elev:	432.71	Date Started:	10/20/2010
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	10/20/2010
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
2	concrete					
4	Reddish Tan Silty Sand	<0.005	<0.005	<0.005		
6						
8						
10	Dark Tan Clay Silt	0.026	<0.005	<0.005	17.28'	
12					18.50'	
14						
16						
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Riser
5 ft 0 in PVC
0 to 5 ft

Screen
15 ft 0 in PVC
5 to 20 ft

Monitoring Well Installation



Boring terminated at 20.0 feet

Weather:	Sunny, Warm
Operation	Time
Start	13:45
Stop	14:55

Static Water Level

Initial Water Level

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

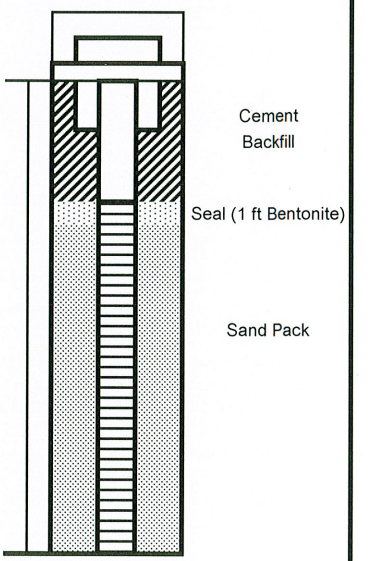
CTE

MW-4

Project	Kwik Shop #110	Measuring Point Elev:	433.15	Date Started:	10/20/2010
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	10/20/2010
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
2	Top Soil					
4	Reddish Tan Silty Sand	<0.005	<0.005	<0.005		
6						
8						
10	Dark Tan Clay Silt	0.492	<0.005	<0.005	17.55' 19.32'	
12						
14						
16						
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



Boring terminated at 20.0 feet

Weather:	Sunny, Warm
Operation	Time
Start	15:00
Stop	15:45

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

Static Water Level

Initial Water Level

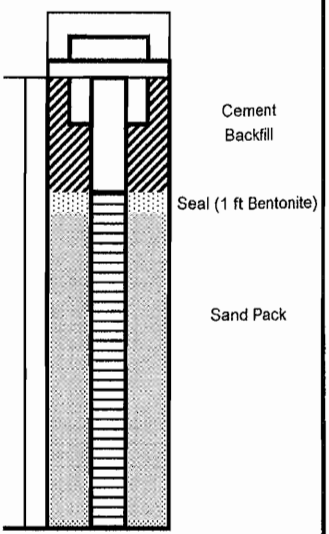
CTE

MW-5

Project	Kwik Shop #110	Measuring Point Elev:	433.05	Date Started:	4/26/2011
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	4/26/2011
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
2	Top Soil					
4	Reddish Tan Silty Sand					
6						
8						
10		<0.005	<0.005	<0.005	10.95	
12						
14		<0.005	<0.005	<0.005		
16	Dark Tan Clay Silt				16.87	
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



Boring terminated at 20.0 feet

Weather:	Sunny, Warm
Operation	Time
Start	9:35
Stop	10:57

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

..... Static Water Level

..... Initial Water Level

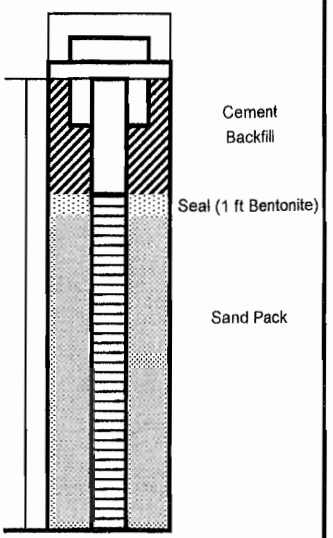
CTE

MW-6

Project	Kwik Shop #110	Measuring Point Elev:	433.21	Date Started:	4/26/2011
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	4/26/2011
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
2	Top Soil					
4	Reddish Tan Silty Sand	<0.005	<0.005	<0.005		
6						
8						
10	Dark Tan Clay Silt	<0.005	<0.005	<0.005	10.97	
12						
14						
16					16.76	
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



Boring terminated at 20.0 feet

Weather:	Sunny, Warm
Operation	Time
Start	11:13
Stop	12:36

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

Static Water Level

Initial Water Level

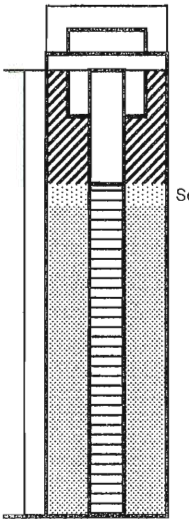
CTE

MW-7

Project	Kwik Shop #110				
Location	Childersburg, AL UST10-08-08	Measuring Point Elev:	433.33	Date Started:	5/10/2011
		Logged by:		Date Finished:	5/10/2011
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	concrete					
2						
4	Reddish Tan Silty Sand					
6						
8						
10		0.130	<0.005	0.290	11.23	
12						
14		0.258	<0.005	0.265		
16	Dark Tan Clay Silt				16.05	
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



*= Practical Quantitation Limit elevated due to matrix

Boring terminated at 20.0 feet

Weather:	Sunny, Warm
Operation	Time
Start	9:22
Stop	10:49

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

..... Static Water Level

..... Initial Water Level

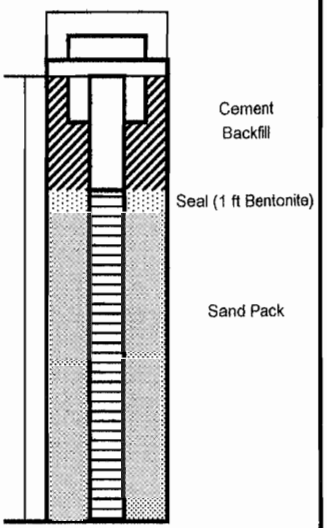
CTE

MW-8

Project	Kwik Shop #110	Measuring Point Elev:	432.80	Date Started:	4/25/2011
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	4/25/2011
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	concrete					
2						
4	Reddish Tan Silty Sand					
6						
8						
10		<0.005	<0.005	<0.005	11.18	
12						
14		<0.005	<0.005	<0.005		
16	Dark Tan Clay Silt				16.05	
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



*= Practical Quantitation Limit elevated due to matrix

Boring terminated at 20.0 feet

Weather:	Sunny, Warm
Operation	Time
Start	9:22
Stop	10:49

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

..... Static Water Level

..... Initial Water Level

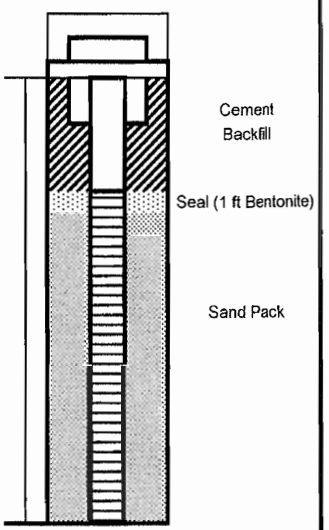
CTE

MW-9

Project	Kwik Shop #110	Measuring Point Elev:	432.75	Date Started:	4/25/2011
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	4/25/2011
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	concrete					
2						
4	Reddish Tan Silty Sand	<0.005	<0.005	<0.005		
6						
8						
10					11.10	
12						
14		<0.005	<0.005	<0.005		
16	Dark Tan Clay Silt				16.20	
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



*= Practical Quantitation Limit elevated due to matrix

Boring terminated at 20.0 feet

Weather:	Sunny, Warm
Operation	Time
Start	11:05
Stop	12:13

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

Static Water Level

Initial Water Level

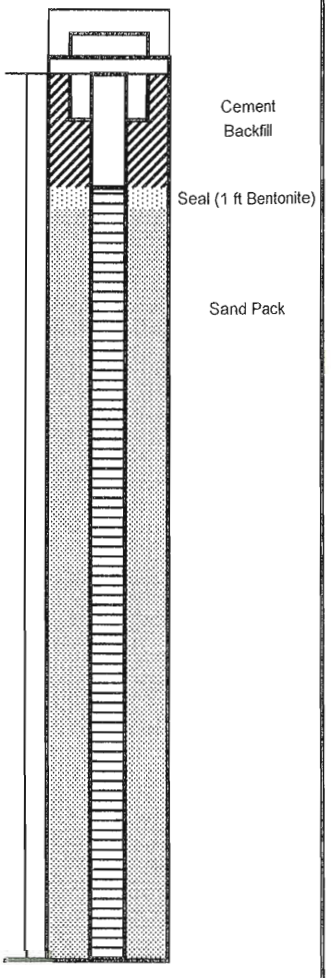
CTE

MW-10

Project	Kwik Shop #110	Measuring Point Elev:	432.90	Date Started:	5/10/2011
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	5/10/2011
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	concrete					
2						
4	Reddish Tan Silty Sand	<0.005	<0.005	0.014		
6						
8						
10					10.28	
12						
14		18.360	*<0.050	1.310		
16						
18						
20						
22						
24	Dark Tan Clay Silt	3.560	*<0.020	0.187		
26						
28					28.20	
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



*= Practical Quantitation Limit elevated due to matrix

Boring terminated at 40.0 feet

Weather:	Sunny, Warm
Operation	Time
Start	9:22
Stop	10:49

The boring was advanced to a depth of 40 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Thirty five feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 35 feet and the remainder of the annular space was back-filled with neat portland cement.

..... Static Water Level

..... Initial Water Level

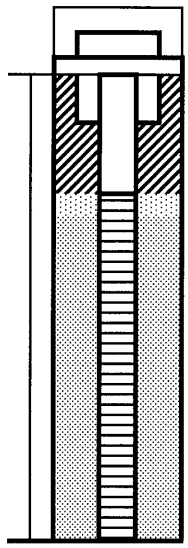
CTE

MW-11

Project	Kwik Shop #110	Measuring Point Elev:	433.14	Date Started:	4/11/2012
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	4/11/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	concrete					
2						
4	Reddish Tan Silty Sand	16.86	<0.005	2.92		
6						
8						
10					11.93	
12						
14	Dark Tan Clay Silt	35.99	<0.005	8.61		
16					16.07	
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



*= Practical Quantitation Limit elevated due to matrix

Boring terminated at 20.0 feet

Weather:	Clear
Operation	Time
Start	9:22
Stop	10:51

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

..... Static Water Level

..... Initial Water Level

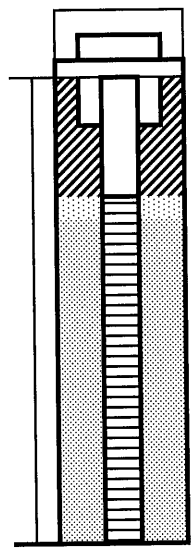
CTE

MW-12

Project	Kwik Shop #110	Measuring Point Elev:	432.12	Date Started:	4/11/2012
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	4/11/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	concrete					
2						
4	Reddish Tan Silty Sand	<0.005	<0.005	<0.025		
6						
8					8.75	
10						
12					13.21	
14	Dark Tan Clay Silt	0.364	<0.005	0.324		
16						
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



*= Practical Quantitation Limit elevated due to matrix

Boring terminated at 20.0 feet

Weather:	Clear
Operation	Time
Start	11:00
Stop	11:42

Static Water Level

Initial Water Level

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

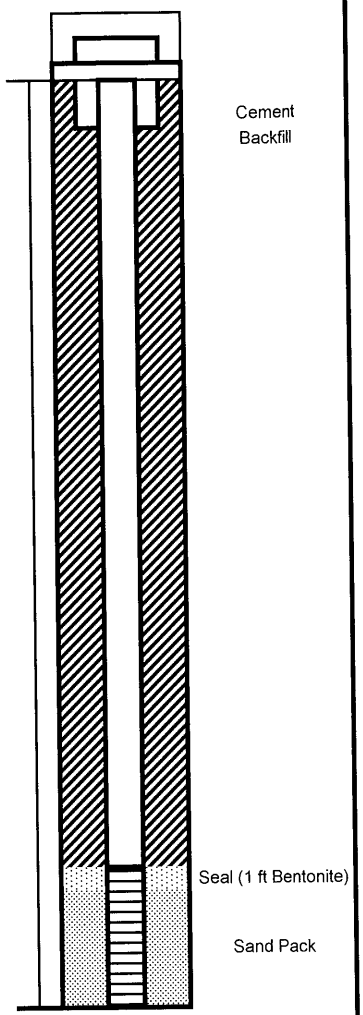
CTE

MW-13

Project	Kwik Shop #110	Measuring Point Elev:	431.56	Date Started:	5/10/2012
Location	Childersburg, AL UST10-08-08	Logged by: Drilling Method:	 Hollow Stem Auger	Date Finished: Job Number:	5/10/2012 09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	concrete					
2						
4	Reddish Tan Silty Sand	0.130	<0.005	<0.025		
6						
8					8.15	
10						
12						
14		<0.005	<0.005	<0.025		
16					17.12	
18						
20						
22						
24	Dark Tan Clay Silt	<0.005	<0.005	<0.025		
26						
28						
30						
32						
34		<0.005	<0.005	<0.025		
36						
38						
40						
42						

Monitoring Well Installation



Boring terminated at 40.0 feet

Weather:	P. Cloudy
Operation	Time
Start	9:06
Stop	10:28

The boring was advanced to a depth of 40 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Thirty five feet of PVC riser and five feet of PVC screen were then installed. A sand pack was installed from 35 to 40 feet and the remainder of the annular space was back-filled with neat portland cement.

..... Static Water Level

..... Initial Water Level

CTE

MW-14

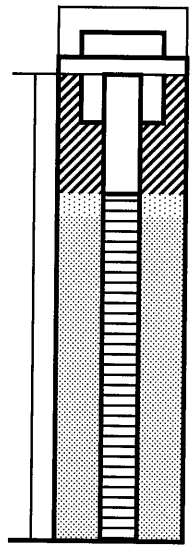
Project	Kwik Shop #110	Measuring Point Elev:	432.25	Date Started:	5/10/2012
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	5/10/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	concrete					
2						
4	Reddish Tan Silty Sand					
6						
8					8.56	
10		<0.005	<0.005	<0.005		
12						
14		<0.005	<0.005	<0.005		
16	Dark Tan Clay Silt				16.26	
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Riser
5 ft 0 in PVC
0 to 5 ft

Screen
15 ft 0 in PVC
5 to 20 ft

Monitoring Well Installation



*= Practical Quantitation Limit elevated due to matrix

Boring terminated at 20.0 feet

Weather:	Clear
Operation	Time
Start	11:03
Stop	12:15

Static Water Level

Initial Water Level

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

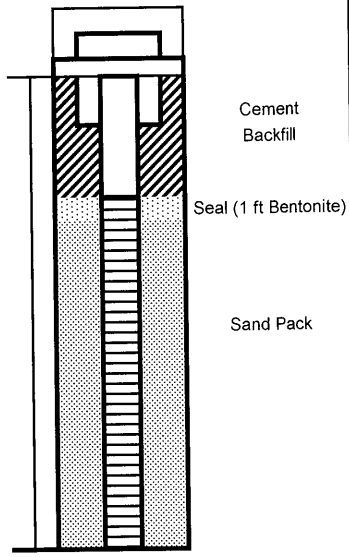
CTE

MW-15

Project	Kwik Shop #110	Measuring Point Elev:	432.97	Date Started:	5/11/2012
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	5/11/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
2	Top Soil					
4	Reddish Tan Silty Sand	<0.005	<0.005	<0.005		
6						
8						
10					11.36	
12						
14	Dark Tan Clay Silt	177.08	*<0.200	8.82		
16					16.56	
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



* = Practical Quantitation Limit elevated due to matrix

Boring terminated at 20.0 feet

Weather:	Sunny, Warm
Operation	Time
Start	9:09
Stop	10:21

Static Water Level

Initial Water Level

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

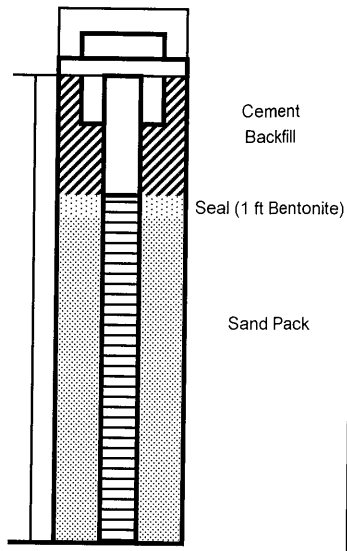
CTE

MW-16

Project	Kwik Shop #110	Measuring Point Elev:	432.63	Date Started:	10/31/2012
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	10/31/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level (feet)	Graphic Log
	Top Soil					
2						
4		<0.005	<0.005	<0.005		
6						
8	Reddish Tan Silty Sand					
10						
12						
14		<0.005	<0.005	<0.005		
16	Dark Tan Clay Silt					
18					18.06	
20					19.00	
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



*= Practical Quantitation Limit elevated due to matrix

Boring terminated at 20.0 feet

Weather:	Clear
Operation	Time
Start	9:12
Stop	10:45

Static Water Level

Initial Water Level

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

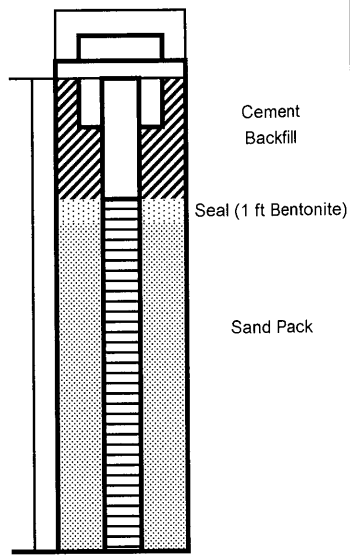
CTE

MW-17

Project	Kwik Shop #110	Measuring Point Elev:	433.05	Date Started:	4/11/2012
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	4/11/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
2	Top Soil					
4	Reddish Tan Silty Sand					
6						
8						
10		<0.005	<0.005	<0.025		
12						
14		<0.005	<0.005	<0.025	13.6	
16	Dark Tan Clay Silt				16.71	
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



Boring terminated at 20.0 feet

Weather:	Sunny
Operation	Time
Start	12:59
Stop	13:50

Static Water Level

Initial Water Level

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

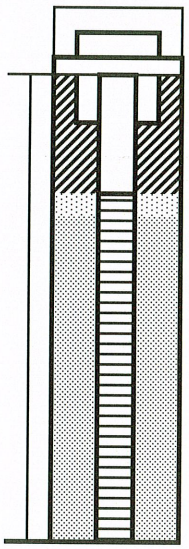
CTE

MW-18

Project	Kwik Shop #110	Measuring Point Elev:	432.53	Date Started:	10/31/2012
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	10/31/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level (feet)	Graphic Log
0	Top Soil					
2						
4		<0.005	<0.005	<0.005		
6	Reddish Tan Silty Sand					
8						
10						
12						
14	Dark Tan Clay Silt	<0.005	<0.005	<0.005	13.80	
16					14.91	
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



*= Practical Quantitation Limit elevated due to matrix

Boring terminated at 20.0 feet

Weather:	Clear
Operation	Time
Start	11:30
Stop	12:35

Static Water Level

Initial Water Level

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

CTE

MW-19

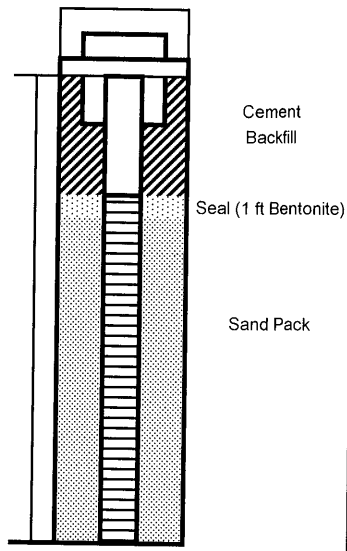
Project	Kwik Shop #110
Location	Childersburg, AL UST10-08-08

Measuring Point Elev: 432.35
Logged by:
Drilling Method: Hollow Stem Auger

Date Started: 10/31/2012
Date Finished: 10/31/2012
Job Number: 09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level (feet)	Graphic Log
0	Top Soil					
2						
4						
6	Reddish Tan Silty Sand					
8						
10		<0.005	<0.005	<0.005	10.65	
12					11.40	
14	Dark Tan Clay Silt	<0.005	<0.005	<0.005		
16						
18						
20						
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



*= Practical Quantitation Limit elevated due to matrix

Boring terminated at 20.0 feet

Weather:	Clear
Operation	Time
Start	1:00
Stop	1:45

Static Water Level

Initial Water Level

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Five feet of 2 inch PVC casing. Fifteen feet of PVC screen and five feet of PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

CTE

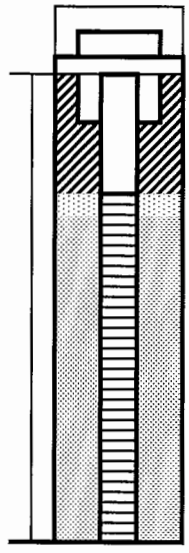
RW-1

Project	Kwik Shop #110	Measuring Point Elev:		Date Started:	5/5/2014
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	5/5/2014
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	concrete					
2						
4	Reddish Tan Silty Sand					
6						
8						
10						
12						
14	Dark Tan Clay Silt				15.25	
16						
18						
20	Boring terminated at 20.0 feet					
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

*= Practical Quantitation Limit elevated due to matrix (diluted sample)

Recovery Well Installation



Static Water Level

Initial Water Level

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Fifteen feet of 4" PVC screen and five feet of 4" PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

CTE

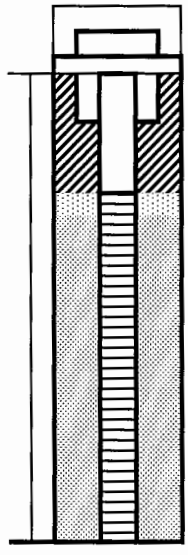
RW-2

Project	Kwik Shop #110	Measuring Point Elev:		Date Started:	5/5/2014
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	5/5/2014
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	concrete					
2						
4	Reddish Tan Silty Sand					
6						
8						
10						
12						
14						
16	Dark Tan Clay Silt				15.00	
18						
20	Boring terminated at 20.0 feet					
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

*= Practical Quantitation Limit elevated due to matrix

Monitoring Well Installation



Static Water Level

Initial Water Level

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Fifteen feet of 4" PVC screen and five feet of 4" PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

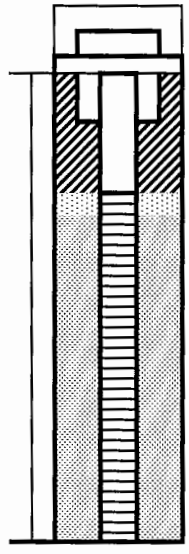
CTE

RW-3

Project	Kwik Shop #110	Measuring Point Elev:		Date Started:	5/5/2014
Location	Childersburg, AL UST10-08-08	Logged by:		Date Finished:	5/5/2014
		Drilling Method:	Hollow Stem Auger	Job Number:	09-1331

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
2	Top Soil					
4						
6	Reddish Tan Silty Sand					
8						
10						
12						
14						
16	Dark Tan Clay Silt				16.50	
18						
20	Boring terminated at 20.0 feet					
22						
24						
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



* = Practical Quantitation Limit elevated due to matrix

..... Static Water Level

..... Initial Water Level

The boring was advanced to a depth of 20 ft using a 6 5/8 in hollow stem auger. Fifteen feet of 4" PVC screen and five feet of 4" PVC riser were then installed. A sand pack was installed from 5 to 20 feet and the remainder of the annular space was back-filled with neat portland cement.

LOG OF BORING: SB-22 / MW-22

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-AWI
Project Type:	Additional Well Installation

Boring Information:

Date / Time:	09-15-21 / 09:36-11:17
Logged By:	SE
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	4.25" HSA
Total Boring Depth:	40.1 ft BGS
Initial Saturation (ft)/Date:	20.0 ft BGS / 09-15-21
Static GW level (ft)/Date:	34.30 ft BTOC / 09-27-21
Surface Elevation (ft):	432.9 ft
Sampling Interval:	2' every 5'

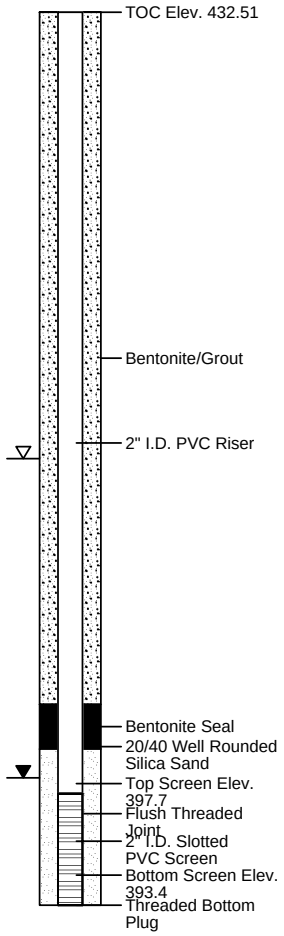
Well Information:

Well Type:	Type II
Well Purpose:	Monitoring
Well Construction Date:	09-15-21
Total Well Depth:	39.8 ft BTOC
Screened Interval:	34.8 ft - 39.1 ft
Screen Slot Size:	0.01-in.
Development Method:	Sub Pump
Gallons Purged:	7 gal

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev.432.9	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery
0	432				GRAVELLY CLAY, low to moderate plasticity, soft to firm, homogeneous, moist, olive brown, no odor, gravel is fine to medium grained, subangular	1	N/A	25	100%
					CLAYEY some GRAVEL, low to moderate plasticity, soft to firm, homogeneous, moist, grayish brown, slight petroleum-like odor, gravel is fine to medium grained, subangular	2	N/A	--	100%
5	427				CLAY some GRAVEL, low to moderate plasticity, soft to firm, homogeneous, moist, grayish brown, slight petroleum-like odor, gravel is fine to medium grained, subangular	3	N/A	40	100%
10	422		CL		CLAY with SHALE LENSE, moderate to high plasticity, hard, homogeneous, lensed, moist, light tan, slight petroleum-like odor	4	N/A	150	40%
15	417				CLAY with SHALE LENSE, moderate plasticity, firm, homogeneous, lensed, moist to wet, light tan, strong petroleum-like odor	5	N/A	210*	10%
20	412	▽			CLAY with SHALE LENSE, low plasticity, soft, homogeneous, lensed, saturated, grayish tan, strong petroleum-like odor	6	N/A	220*	100%
25	407				SHALE with some CLAY, low to moderate plasticity, soft to firm, homogeneous, fissile, saturated, purplish gray, slight to strong petroleum-like odor	7	N/A	210	100%
30	402		SH		SHALE with some CLAY, low to moderate plasticity, soft to firm, homogeneous, fissile, saturated, purplsih gray, slight to strong petroleum-like odor	8	N/A	80	100%
35	397	▼			SHALE with some CLAY, low to moderate plasticity, soft to firm, homgeneous, fissile, saturated, purplish gray, slight to strong petroleum-like odor	9	N/A	75	100%
40	392				*(Boring terminated @ 40.1 ft BGS)*				
45	387								
50									

Well Schematic: MW-22



NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

10-21-2021 \\PPMBHAM03\PPM_Projects_Overhead_Boring Log Drafts\422603-AWI\SB-22.bor

LOG OF BORING: SB-23 / MW-23

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-AWI
Project Type:	Additional Well Installation

Boring Information:

Date / Time:	09/16-17/21 / 09:33-10:42
Logged By:	SE
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	4.25" HSA
Total Boring Depth:	39.5 ft BGS
Initial Saturation (ft)/Date:	15.0 ft BGS / 09-15-21
Static GW level (ft)/Date:	32.70 ft BTOC / 09-27-21
Surface Elevation (ft):	432.9 ft
Sampling Interval:	2' every 5'

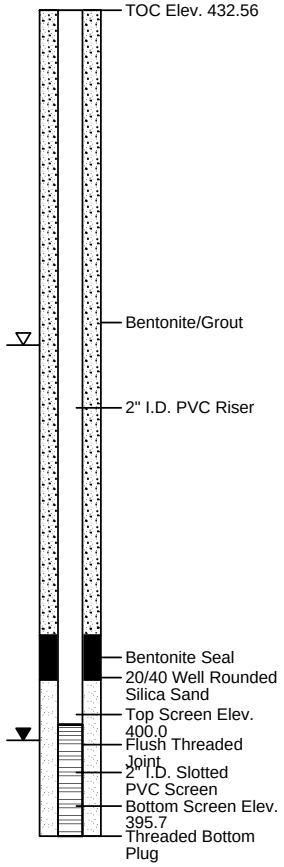
Well Information:

Well Type:	Type II
Well Purpose:	Monitoring
Well Construction Date:	09-17-21
Total Well Depth:	37.5 ft BTOC
Screened Interval:	32.5 ft - 36.8 ft
Screen Slot Size:	0.01-in.
Development Method:	Sub Pump
Gallons Purged:	14 gal

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev.432.9	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery
0	432		CL		GRAVELLY CLAY, moderate plasticity, firm, homogeneous, moist, reddish brown, no odor, gravel is medium grained, subangular	1	N/A	20	100%
					GRAVELLY CLAY, moderate to high plasticity, firm to hard, homogeneous, moist, reddish brown, no odor, gravel is medium grained, subangular, chert	2	N/A	--	100%
5	427				CLAY with SHALE LENSES, moderate to high plasticity, hard, homogeneous, lensed, moist, purplish gray, no odor, fissile	3	N/A	15*	100%
10	422				CLAY with SHALE LENSES, low to moderate plasticity, soft to firm, homogeneous, moist to wet, purplish gray, slight petroleum-like odor, fissile	4	N/A	10*	100%
15	417	▽			CLAY with SHALE LENSES, low to moderate plasticity, soft to firm, homogeneous, saturated, purplish gray, slight petroleum-like odor	5	N/A	25	90%
20	412		SH		SHALE, high plasticity, very hard, fissile, moist, purplish gray, no odor	6	N/A	10	100%
25	407				SHALE, high plasticity, hard, homogeneous, fissile, moist, purplish gray, no odor	7	N/A	20	100%
30	402	▼			SHALE with interbedded metamorphic siltstone and sandstone, moderate to high plasticity, hard, lensed, moist, purplish gray to orange, no odor	8	N/A	10	100%
35	397				SHALE with interbedded metamorphic siltstone and sandstone, moderate plasticity, soft to firm, moist, purplish gray to orange, no odor	9	N/A	5	100%
40	392				*(Boring terminated @ 39.5 ft BGS)*				
45	387								
50									

Well Schematic: MW-23



NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

10-21-2021 \\PPMBHAM03\PPM_Projects_Overhead_Boring Log Drafts\422603-AWI\SB-23.bor

LOG OF BORING: SB-24 / MW-24

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-AWI
Project Type:	Additional Well Installation

Boring Information:

Date / Time:	09/15-16/21 / 13:50-14:35
Logged By:	SE
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	4.25" HSA
Total Boring Depth:	40.0 ft BGS
Initial Saturation (ft)/Date:	23.0 ft BGS / 09-15-21
Static GW level (ft)/Date:	15.65 ft BTOC / 09-27-21
Surface Elevation (ft):	431.1 ft
Sampling Interval:	2' every 5'

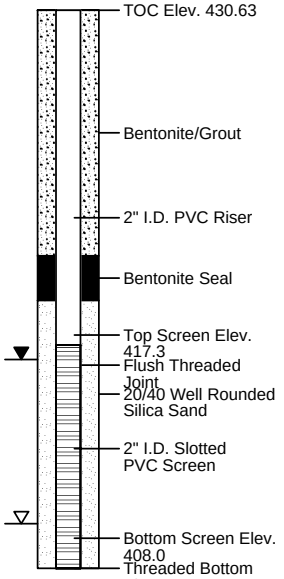
Well Information:

Well Type:	Type II
Well Purpose:	Monitoring
Well Construction Date:	09-16-21
Total Well Depth:	23.3 ft BTOC
Screened Interval:	13.3 ft - 22.6 ft
Screen Slot Size:	0.01-in.
Development Method:	Sub Pump
Gallons Purged:	35 gal

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev.431.1	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery
0	431				GRAVELLY CLAY, low to moderate plasticity, soft, homogeneous, moist, olive brown, no odor, gravel is medium grained, subangular	1	N/A	20	100%
5	426		CL		CLAY with some GRAVEL, low to moderate plasticity, soft to firm, homogeneous, moist, olive brown, no odor, gravel is medium grained, subangular	2	N/A	--	100%
					CLAY with some SHALE, moderate plasticity, soft to firm, homogeneous, lensed, moist, purplish gray, no odor, fissile shale	3	N/A	55*	100%
10	421				SHALE with some CLAY, moderate plasticity, firm, homogeneous, fissile, moist, purplish gray, no odor	4	N/A	0	100%
15	416	▼			SHALE with some CLAY, moderate plasticity, firm, homogeneous, fissile, moist to wet, orange/gray, no odor	5	N/A	0	100%
20	411	▽			SHALE with some CLAY, moderate plasticity, firm, homogeneous, fissile, saturated, orange/brown, no odor	6	N/A	15	100%
25	406		SH		SHALE, moderate to high plasticity, hard, homogeneous, fissile, moist, greenish gray, no odor	7	N/A	5	60%
30	401				SHALE, moderate to high plasticity, hard, homogeneous, fissile, moist, greenish gray, no odor	8	N/A	0	60%
35	396				SHALE, moderate to high plasticity, hard, homogeneous, fissile, moist, dark gray, no odor	9	N/A	0	70%
40	391				*(Boring terminated @ 40.0 ft BGS and back filled with sand to ~25 ft BGS)*				
45	386								
50									

Well Schematic: MW-24



NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- Soil sample submitted for laboratory analysis
- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

10-21-2021 \\PPMBHAM03\PPM_Projects_Overhead_Boring Log Drafts\422603-AWI\SB-24.bor

LOG OF BORING: SB-25 / MW-25

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-AWI
Project Type:	Additional Well Installation

Boring Information:

Date / Time:	09/16/21 / 11:34-13:20
Logged By:	SE
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	4.25" HSA
Total Boring Depth:	40.0 ft BGS
Initial Saturation (ft)/Date:	23.0 ft BGS / 09-16-21
Static GW level (ft)/Date:	36.06 ft BTOC / 09-27-21
Surface Elevation (ft):	433.2 ft
Sampling Interval:	2' every 5'

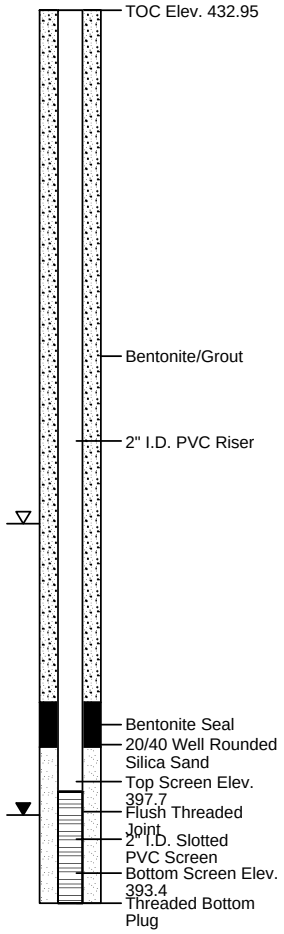
Well Information:

Well Type:	Type II
Well Purpose:	Monitoring
Well Construction Date:	09-16-21
Total Well Depth:	40.3 ft BTOC
Screened Interval:	35.3 ft - 39.6 ft
Screen Slot Size:	0.01-in.
Development Method:	Sub Pump
Gallons Purged:	12 gal

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev.433.2	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery
0	433				GRAVELLY CLAY, low plasticity, soft, homogeneous, moist, olive brown, no odor, gravel is medium grained, subangular, chert	1	N/A	0	100%
					CLAY with some GRAVEL, low to moderate plasticity, soft, homogeneous, moist, olive brown, no odor, gravel is fine to medium grained, subangular, chert	2	N/A	--	60%
5	428		CL		CLAY with SHALE LENSES, moderate to high plasticity, hard, homogeneous, lensed, moist, purplish gray, no odor	3	N/A	5*	100%
10	423				CLAY with SHALE LENSES, moderate to high plasticity, hard, homogeneous, lensed, moist, purplish gray, no odor	4	N/A	20*	100%
15	418				SHALE with some CLAY, low to moderate plasticity, soft to firm, homogeneous, fissile, moist to wet, purplish gray, no odor	5	N/A	0	100%
20	413	▽			SHALE with some CLAY, low to moderate plasticity, soft to firm, homogeneous, fissile, wet to satrated, purplish gray, no odor	6	N/A	0	100%
25	408		SH		SHALE with some interbedded metamorphic siltstone, low to moderate plasticity, soft to firm, homogeneous, moist, purplish gray, no odor	7	N/A	5	70%
30	403				SHALE with some interbedded metamorphic siltstone, low to moderate plasticity, soft to firm, homogeneous, moist, purplish gray, no odor	8	N/A	5	90%
35	398	▼			SHALE with some interbedded siltstone, low to moderate plasticity, soft to firm, homogeneous, moist, purplish gray, no odor	9	N/A	5	100%
40	393				*(Boring terminated @ 40.0 ft BGS)*				
45	388								
50									

Well Schematic: MW-25



NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- Soil sample submitted for laboratory analysis
- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

10-21-2021 \\PPMBHAM03\PPM_Projects_Overhead_Boring Log Drafts\422603-AWI\SB-25.bor

LOG OF BORING: SB-26 / MW-26

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-AWI
Project Type:	Additional Well Installation

Boring Information:

Date / Time:	09/17/21 / 11:46-14:30
Logged By:	SE
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	4.25" HSA
Total Boring Depth:	60.0 ft BGS
Initial Saturation (ft)/Date:	18.0 ft BGS / 09-17-21
Static GW level (ft)/Date:	56.80 ft BTOC / 09-27-21
Surface Elevation (ft):	433.0 ft
Sampling Interval:	2' every 5'

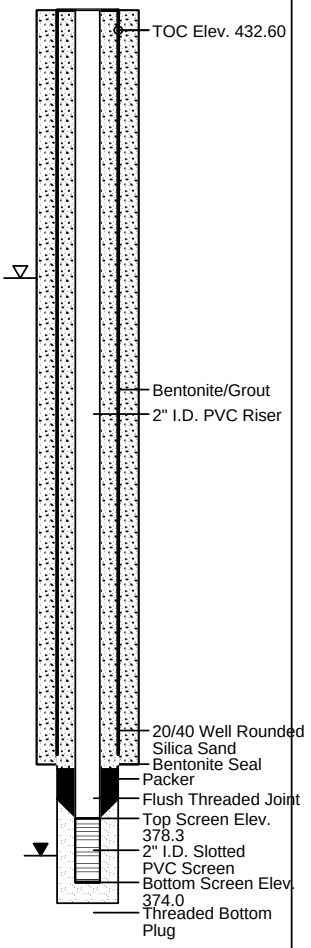
Well Information:

Well Type:	Type III
Well Purpose:	Monitoring
Well Construction Date:	09-17-21
Total Well Depth:	59.3 ft BTOC
Screened Interval:	54.3 ft - 58.6 ft
Screen Slot Size:	0.01-in.
Development Method:	Sub Pump
Gallons Purged:	9 gal

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev.433.0	USCS	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	DESCRIPTION
0	433	CL	1	N/A	250	100%	GRAVELLY CLAY, low plasticity, soft, homogeneous, olive brown, no odor, gravel is fine to medium grained, subangular
5	428						GRAVELLY CLAY, moderate plasticity, firm, homogeneous, moist, reddish brown, slight petroleum-like odor, gravel is medium grained, subangular
10	423		2	N/A	120	100%	
15	418		3	N/A	230*	100%	CLAY, moderate plasticity, firm, homogeneous, moist, reddish gray, slight petroleum-like odor, orange mottle
20	413		4	N/A	11,000	100%	CLAY with SHALE LENSES, moderate to high plasticity, firm to hard, lensed, saturated, gray, slight petroleum-like odor
25	408	SH	5	N/A	260	100%	SHALE, high plasticity, very hard, homogeneous, fissile, saturated, purplish gray, slight petroleum-like odor
30	403		6	N/A	940	100%	SHALE, high plasticity, very hard, homogeneous, fissile, saturated, purplish gray, slight petroleum-like odor
35	398		7	N/A	500	100%	SHALE, high plasticity, very hard, homogeneous, fissile, wet, purplish gray, slight petroleum-like odor
40	393		8	N/A	750	100%	SHALE, high plasticity, very hard, homogeneous, fissile, moist, purplish gray, slight petroleum-like odor
45	388		9	N/A	370	100%	SHALE with some CLAY, moderate to high plasticity, hard, homogeneous, fissile, saturated, purplish gray, slight petroleum-like odor
50	383		10	N/A	160	60%	SHALE with some saporolite, moderate plasticity, firm, homogeneous, fissile, saturated, purplish gray, slight petroleum-like odor
55	378						
60	373						*(Boring terminated @ 60.0 ft BGS)*
65	368						
70	363						
75							

Well Schematic: MW-26



NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- Soil sample submitted for laboratory analysis
- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

10-21-2021 \\PPMBHAM03\PPM_Projects_Overhead_Boring Log Drafts\422603-AWI\SB-26.bor

LOG OF BORING: SB-27

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-AWI
Project Type:	Additional Well Installation

Boring Information:

Date / Time:	09/13/21 / 09:15-10:04
Logged By:	SE
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	Geoprobe
Total Boring Depth:	17.5 ft BGS
Initial Saturation (ft)/Date:	16.0 ft BGS / 09-13-21
Static GW level (ft)/Date:	NA
Surface Elevation (ft):	NA
Sampling Interval:	2' every 5'

Well Information:

Well Type:	NA
Well Purpose:	NA
Well Construction Date:	NA
Total Well Depth:	NA
Screened Interval:	NA
Screen Slot Size:	NA
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev.	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
0					GRAVELLY CLAY, low to moderate plasticity, soft to firm, homogeneous, moist, olive brown, no odor, gravel is fine to medium grained, subangular	1	N/A	80	100%	0
5			CL		CLAY with some GRAVEL, low to moderate plasticity, soft to firm, homogeneous, moist, gray/brown, no odor, gravel is fine to medium grained, subangular	2	N/A	400	100%	5
10					CLAY, moderate to high plasticity, firm to hard, moist, dark gray, orange mottled, no odor CLAY with SHALE LENSE, moderate to high plasticity, firm to hard, fissile, lensed, moist, dark gray, slight petroleum-like odor	3	N/A	11,000*	100%	10
						4	N/A	6,000*	100%	
15		▽	SH		SHALE, high plasticity, hard to very hard, homogeneous, fissile, wet to saturated, light gray, slight petroleum-like odor	5	N/A	540	100%	15 ▽
20					*(Boring terminated @ 17.5 ft BGS)*					20
25										25
30										30

Well Schematic: NA

NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

10-19-2021 \\PPMBHAM03\PPM_Projects_Overhead_Boring Log Drafts\422603-AWI\SB-27.bor

LOG OF BORING: SB-28

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-AWI
Project Type:	Additional Well Installation

Boring Information:

Date / Time:	09/13/21 / 10:16-11:24
Logged By:	SE
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	Geoprobe
Total Boring Depth:	17.5 ft BGS
Initial Saturation (ft)/Date:	16.0 ft BGS / 09-13-21
Static GW level (ft)/Date:	NA
Surface Elevation (ft):	NA
Sampling Interval:	2' every 5'

Well Information:

Well Type:	NA
Well Purpose:	NA
Well Construction Date:	NA
Total Well Depth:	NA
Screened Interval:	NA
Screen Slot Size:	NA
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev.	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
0					GRAVELLY CLAY, low to moderate plasticity, soft, homogeneous, moist, olive brown, no odor, gravel is medium grained, subangular	1	N/A	640	100%	0
5			CL		CLAY, moderate to high plasticity, firm to hard, homogeneous, moist, reddish gray, slight petroleum-like odor	2	N/A	240*	100%	5
10					CLAY with SHALE LENSE, high plasticity, hard, homogeneous, fissile, lensed, moist, purplish gray, slight petroleum-like odor	3	N/A	1,200*	100%	10
15		▽	SH		SHALE, high plasticity, very hard, homogeneous, fissile, wet to saturated, purplish gray, slight petroleum-like odor	4	N/A	5,950	100%	15
20					*(Boring terminated @ 17.5 ft BGS)*					20
25										25
30										30

Well Schematic: NA

NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

10-19-2021 \\PPMBHAM03\PPM_Projects_Overhead_Boring Log Drafts\422603-AWI\SB-28.bor

LOG OF BORING: SB-29

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-AWI
Project Type:	Additional Well Installation

Boring Information:

Date / Time:	09/13/21 / 14:00-14:50
Logged By:	SE
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	Geoprobe
Total Boring Depth:	17.5 ft BGS
Initial Saturation (ft)/Date:	17.5 ft BGS / 09-13-21
Static GW level (ft)/Date:	NA
Surface Elevation (ft):	NA
Sampling Interval:	2' every 5'

Well Information:

Well Type:	NA
Well Purpose:	NA
Well Construction Date:	NA
Total Well Depth:	NA
Screened Interval:	NA
Screen Slot Size:	NA
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev.	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
0					GRAVELLY CLAY, moderate plasticity, firm, homogeneous, moist, olive brown, no odor, gravel is medium grained, subangular	1	N/A	1,650	100%	0
					CLAY, moderate to high plasticity, firm to hard, homogeneous, moist, olive brown, slight petroleum-like odor	2	N/A	--	40%	
5					CLAY, moderate to high plasticity, firm to hard, homogeneous, moist, reddish gray, slight petroleum-like odor	3	N/A	7,700*	75%	5
			CL							
10					CLAY with SHALE LENSES, high plasticity, hard, homogeneous, fissile, lensed, moist to wet, purplish gray, strong petroleum-like odor	4	N/A	8,350	100%	10
15		▽	SH		SHALE, high plasticity, hard to very hard, homogeneous, fissile, wet to saturated, purplish gray, strong petroleum-like odor	5	N/A	11,000*	100%	15
					(Boring terminated @ 17.5 ft BGS)					
20										20
25										25
30										30

Well Schematic: NA

▽

NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

10-19-2021 \\PPMBHAM03\PPM_Projects_Overhead_Boring Log Drafts\422603-AWI\SB-29.bor

LOG OF BORING: SB-30

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-AWI
Project Type:	Additional Well Installation

Boring Information:

Date / Time:	09/13/21 / 11:21-13:43
Logged By:	SE
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	Geoprobe
Total Boring Depth:	19.0 ft BGS
Initial Saturation (ft)/Date:	17.0 ft BGS / 09-13-21
Static GW level (ft)/Date:	NA
Surface Elevation (ft):	NA
Sampling Interval:	2' every 5'

Well Information:

Well Type:	NA
Well Purpose:	NA
Well Construction Date:	NA
Total Well Depth:	NA
Screened Interval:	NA
Screen Slot Size:	NA
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev.	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
0					GRAVELLY CLAY, low to moderate plasticity, soft to firm, homogeneous, moist, olive brown, no odor, gravel is medium grained, subangular	1	N/A	710	100%	0
					CLAY, moderate to high plasticity, firm to hard, homogeneous, moist, olive brown, slight petroleum-like odor	2	N/A	--	100%	
5					CLAY, moderate to high plasticity, firm to hard, homogeneous, moist, reddish gray, slight petroleum-like odor					5
			CL			3	N/A	9,400*	100%	
10					CLAY with SHALE LENSES, high plasticity, hard, homogeneous, fissile, lensed, moist to wet, purplish gray, slight petroleum-like odor					10
						4	N/A	6,450*	70%	
15		▽	SH		SHALE, high plasticity, hard to very hard, homogeneous, fissile, wet to saturated, purplish gray, slight petroleum-like odor					15
						5	N/A	11,000	100%	
20					*(Boring terminated @ 19.0 ft BGS)*					20
25										25
30										30

Well Schematic: NA

NOTES:

- Hand cleared to 4.0' BGS prior to drilling
- Soil smaple submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

10-19-2021 \\PPMBHAM03\PPM_Projects_Overhead_Boring Log Drafts\422603-AWI\SB-30.bor

LOG OF BORING: SB-31

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-SBI
Project Type:	Soil Study

Boring Information:

Date / Time:	07-10-23 / 10:00
Logged By:	AP / FS
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	DPT
Total Boring Depth:	40.0 ft BGS
Initial Saturation (ft)/Date:	35.0 ft BGS
Static GW level (ft)/Date:	NA
Surface Elevation (ft):	431.6 ft
Sampling Interval:	Continuous

Well Information:

Well Type:	NA
Well Purpose:	NA
Well Construction Date:	NA
Total Well Depth:	NA
Screened Interval:	NA
Screen Slot Size:	NA
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev. 431.6	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
0	431				CONCRETE					0
					CLAY, low plasticity, firm, homogeneous, moist, red brown, no odor, fill					
5	426		CL		CLAY, low plasticity, firm, homogeneous, moist, red brown, no odor, fill	1	N/A	--	--	5
					GRAVELLY CLAY, high plasticity, very soft, homogeneous, moist, light brown, no odor, gravel is fine, angular to subangular, limestone	2	N/A	150	50%	
10	421				CLAY, moderate plasticity, firm, homogeneous, moist, gray to tan, strong petroleum-like odor	3	N/A	>11,000*	100%	10
					CLAY, moderate plasticity, firm, homogeneous, moist, gray tan, strong petroleum-like odor	4	N/A	1,100	100%	
15	416		ML		CLAYEY SILT, no plasticity, hard, homogeneous, moist, gray, mild petroleum-like odor					15
					CLAYEY SILT, no plasticity, hard, homogeneous, moist, gray, strong petroleum-like odor	5	N/A	>11,000*	100%	
20	411		SH		WEATHERED SHALE, no plasticity, hard, laminated, moist, gray, moderate petroleum-like odor					20
					WEATHERED SHALE, no plasticity, hard, laminated, moist, gray tan, mild petroleum-like odor					
25	406		CL		CLAY, high plasticity, hard, homogeneous, moist, tan white, mild petroleum-like odor	6	N/A	830	100%	25
30	401		SH		WEATHERED SHALE, no plasticity, hard, laminated, gray purple, mild petroleum-like odor	7	N/A	370	100%	30
		▽				8	N/A	380	100%	
35	396		ML		GRAVELLY SILT, no plasticity, hard, homogeneous, saturated, tan white, mild petroleum-like odor, gravel is fine to coarse, angular to subangular					35 ▽
			SH		WEATHERED SHALE, no plasticity, hard, laminated, moist, gray purple, mild petroleum-like odor	9	N/A	140	100%	
40	391				*(Boring terminated @ 40.0 ft BGS)*					40
45	386									45
50										50

Well Schematic: NA

NOTES:
- Hand cleared to 4.0' BGS prior to drilling
- * Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

11-01-2023 O:_Overhead_Boring Log Drafts\422603-SBI\SB-31.bor

LOG OF BORING: SB-32 / TMW-1

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-SBI
Project Type:	Soil Study

Boring Information:

Date / Time:	07-10-23 / 12:15
Logged By:	AP / FS
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	DPT
Total Boring Depth:	40.0 ft BGS
Initial Saturation (ft)/Date:	NA
Static GW level (ft)/Date:	8.9 ft BGS (07-10-23)
Surface Elevation (ft):	432.2 ft
Sampling Interval:	Continuous

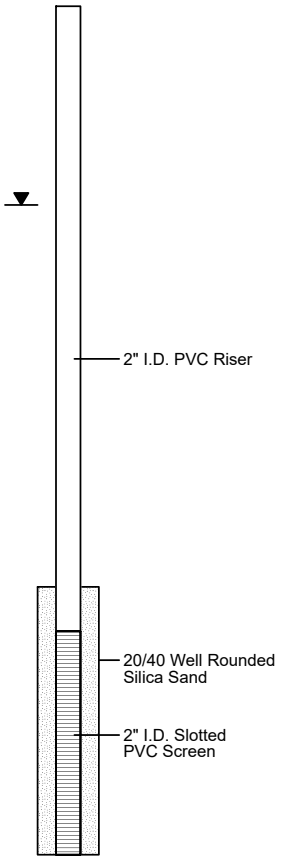
Well Information:

Well Type:	Temporary Type II
Well Purpose:	Sampling
Well Construction Date:	07-10-23
Total Well Depth:	37.5 ft
Screened Interval:	28.0 ft - 38.0 ft
Screen Slot Size:	0.01 in
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev. 432.2	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery
0	432				CONCRETE				
			CL		GRAVELLY CLAY, moderate plasticity, very soft, homogeneous, wet, red, mild petroleum-like odor, gravel is fine to coarse, angular to subangular, limestone	1	N/A	--	--
5	427				GRAVELLY CLAY, moderate plasticity, very soft, homogeneous, wet, red, mild petroleum-like odor, gravel is fine to coarse, angular to subangular	2	N/A	2,450	60%
		▼	ML		GRAVELLY SILT, homogeneous, moist, tan white, strong petroleum-like odor	3	N/A	9,750	80%
10	422				GRAVELLY SILT, homogeneous, moist, tan white, strong petroleum-like odor, gravel is fine to coarse, angular to subangular	4	N/A	>11,000*	80%
			SH		WEATHERED SHALE, laminated, moist, brown purple, mild petroleum-like odor				
15	417		ML		GRAVELLY SILT, soft, laminated, moist, tan orange, mild petroleum-like odor	5	N/A	740	60%
					WEATHERED SHALE, laminted, moist, gray purple, mild petroleum-like odor				
20	412				WEATHERED SHALE, laminated, moist, gray purple, mild petroleum-like odor	6	N/A	3,600	90%
25	407				WEATHERED SHALE, laminted, moist, gray purple, mild petroleum-like odor	7	N/A	810	100%
			SH		WEATHERED SHALE, homogeneous, moist, gray purple, mild petroleum-like odor	8	N/A	350	100%
30	402					9	N/A	280	100%
35	397				WEATHERED SHALE, homogeneous, moist, purple gray, no odor				
						10	N/A	140*	100%
40	392				*(Boring terminated @ 40.0 ft BGS)*				
45	387								
50									

Well Schematic: TMW-1



NOTES:
- Hand cleared to 4.0' BGS prior to drilling
- * Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

11-01-2023 O:_Overhead_Boring Log Drafts\422603-SBI\SB-32.bor

LOG OF BORING: SB-33

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-SBI
Project Type:	Soil Study

Boring Information:

Date / Time:	07-10-23 / 13:40
Logged By:	AP / FS
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	DPT
Total Boring Depth:	35.0 ft BGS
Initial Saturation (ft)/Date:	NA
Static GW level (ft)/Date:	NA
Surface Elevation (ft):	433.0 ft
Sampling Interval:	Continuous

Well Information:

Well Type:	NA
Well Purpose:	NA
Well Construction Date:	NA
Total Well Depth:	NA
Screened Interval:	NA
Screen Slot Size:	NA
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev. 433.0	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
0	433				CONCRETE					0
					GRAVELLY CLAY, low plasticity, very soft, homogeneous, moist, red brown, mild petroleum-like odor, gravel is fine to coarse, angular to subangular, chert	1	N/A	--	--	
5	428		CL		GRAVELLY CLAY, low plasticity, very soft, homogeneous, moist, red brown, mild petroleum-like odor, gravel is fine to coarse, angular to subangular, chert	2	N/A	100	100%	5
					GRAVELLY CLAY, moderate plasticity, hard, homogeneous, moist, tan, mild petroleum-like odor, gravel is fine, angular to subangular, chert	3	N/A	85	100%	
10	423		ML		GRAVELLY SILT, no plasticity, homogeneous, moist, tan white, strong petroleum-like odor, gravel is fine, angular to subangular	4	N/A	>11,000*	100%	10
					GRAVELLY SILT, no plasticity, homogeneous, moist, strong petroleum-like odor, gravel is fine to coarse, angular to subangular, slight cohesive	5	N/A	6,350	100%	
15	418		SH		WEATHERED SHALE, homogeneous, moist, gray purple, strong petroleum-like odor	6	N/A	670*	100%	15
					WEATHERED SHALE, homogeneous, moist, gray purple, strong petroleum-like odor	7	N/A	460	100%	
20	413		ML		GRAVELLY SILT, no plasticity, hard, homogeneous, moist, orange tan, moderate petroleum-like odor, gravel is fine, angular to subangular	8	N/A	430	50%	20
					WEATHERED SHALE, homogeneous, moist, gray purple, mild petroleum-like odor	9	N/A	290	50%	
25	408		SH		WEATHERED SHALE, homogeneous, moist, gray purple, mild petroleum-like odor					25
30	403				WEATHERED SHALE, homogeneous, moist, light purple, mild petroleum-like odor					30
35	398				*(Boring refusal @ 35.0 ft BGS)*					35
40										40

Well Schematic: NA

NOTES:
- Hand cleared to 4.0' BGS prior to drilling
- * Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

11-01-2023 O:_Overhead_Boring Log Drafts\422603-SBI\SB-33.bor

LOG OF BORING: SB-34 / TMW-2

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-SBI
Project Type:	Soil Study

Boring Information:

Date / Time:	07-10-23 / 15:00
Logged By:	AP / FS
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	DPT
Total Boring Depth:	34.0 ft BGS
Initial Saturation (ft)/Date:	NA
Static GW level (ft)/Date:	9.9 ft BGS (07-10-23)
Surface Elevation (ft):	433.0 ft
Sampling Interval:	Continuous

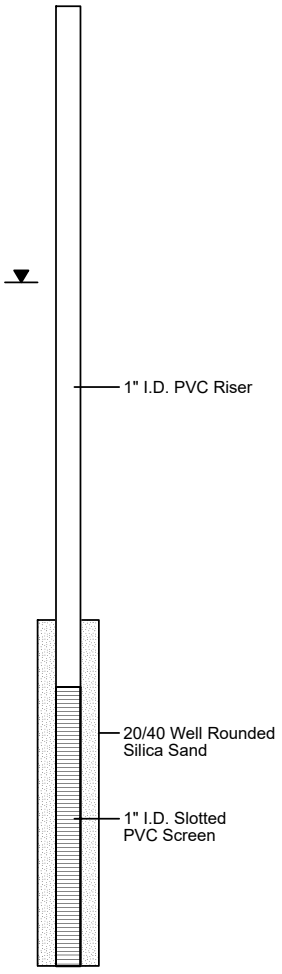
Well Information:

Well Type:	Temp Type II
Well Purpose:	Sampling
Well Construction Date:	7-10-23
Total Well Depth:	34.3 ft
Screened Interval:	24.3 ft - 34.4 ft
Screen Slot Size:	0.01-in.
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev. 433.0	USCS	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	DESCRIPTION
0	433						CONCRETE
							GRAVELLY CLAY, moderate plasticity, soft, homogeneous, moist, tan orange, mild petroleum-like odor, gravel is fine to coarse, angular to subangular
5	428		1	N/A	--	--	GRAVELLY CLAY, moderate plasticity, soft, homogeneous, moist, tan orange, mild petroleum-like odor, gravel is fine to coarse, angular to subangular
			2	N/A	310	100%	GRAVELLY CLAY, moderate plasticity, soft, homogenous, moist, tan orange, moderat petroleum-like odor, gravel is fine to coarse, angular to subangular, chert
10	423	CL	3	N/A	75	100%	GRAVELLY CLAY, low plasticity, hard, homogeneous, moist, tan, strong petroleum-like odor, gravel is fine to coarse, angular to subangular
			4	N/A	>11,000*	100%	GRAVELLY CLAY, low plasticity, hard, homogeneous, moist, red orange, moderate petroleum-like odor, gravel is fine, angular to subangular
15	418		5	N/A	640	100%	SANDY CLAY, low plasticity, soft, homogeneous, moist, tan orange, moderate petroleum-like odor, sand is poorly graded, medium to fine, medium dense, angular to subangular, some gravel
20	413		6	N/A	710*	100%	SANDY CLAY, low plasticity, soft, homogeneous, moist, tan orange, mild petroleum-like odor, sand is poorly graded, medium to fine, medium dense, angular to subangular, some gravel
25	408		7	N/A	290	100%	WEATHERED SHALE, hard, laminated, moist, gray purple, mild petroleum-like odor
		SH					WEATHERED SHALE, hard, laminated, moist, gray purple, mild petroleum-like odor
30	403		8	N/A	150	100%	WEATHERED SHALE, hard, laminated, moist, gray purple, mild petroleum-like odor
			9	N/A	50	100%	
35	398						*(Boring refusal @ 34.0 ft BGS)*
40							

Well Schematic: TMW-2



NOTES:
- Hand cleared to 4.0' BGS prior to drilling
- * Soil sample submitted for laboratory analysis
- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

11-01-2023 O:_Overhead_Boring Log Drafts\422603-SBI\SB-34.bor

LOG OF BORING: SB-35

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-SBI
Project Type:	Soil Study

Boring Information:

Date / Time:	07-11-23 / 08:30
Logged By:	AP / FS
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	DPT
Total Boring Depth:	30.0 ft BGS
Initial Saturation (ft)/Date:	22.0 ft BGS (07-11-23)
Static GW level (ft)/Date:	NA
Surface Elevation (ft):	433.0 ft
Sampling Interval:	Continuous

Well Information:

Well Type:	NA
Well Purpose:	NA
Well Construction Date:	NA
Total Well Depth:	NA
Screened Interval:	NA
Screen Slot Size:	NA
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev. 433.0	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
0	433				CONCRETE					0
					GRAVELLY CLAY, moderate plasticity, hard, homogeneous, moist, brown red, no odor, gravel is fine to coarse, angular to subangular					
5	428		CL		GRAVELLY CLAY, moderate plasticity, hard, homogeneous, moist, brown red, no odor, gravel is fine to coarse, angular to subangular	1	N/A	--	--	5
						2	N/A	15	100%	
					GRAVELLY CLAY, moderate plasticity, hard, homogeneous, moist, tan orange, no odor, gravel is fine to coarse, angular to subangular					
10	423				GRAVELLY CLAY, moderate plasticity, hard, homogeneous, moist, tan orange, no odor, gravel is fine to coarse, angular to subangular	3	N/A	0	100%	10
			SH		WEATHERED SHALE, laminated, moist, gray purple, mild petroleum-like odor	4	N/A	50	100%	
15	418				GRAVELLY CLAY, low plasticity, firm, homogeneous, moist, dark brown/black, strong petroleum-like odor, gravel is fine to coarse, angular to subangular	5	N/A	>11,000*	100%	15
					SANDY CLAY, low plasticity, soft, homogeneous, moist, tan white, mild petroleum-like odor, sand is fine to coarse, angular to subangular, chert	6	N/A	75	100%	
20	413	▽	CL		SANDY CLAY, low plasticity, soft, homogeneous, moist, tan white, mild petroleum-like odor, sand is fine to coarse, angular to subangular, chert	7	N/A	175*	100%	20
					SANDY CLAY, low plasticity, very soft, homogeneous, saturated, tan white, no odor, sand is fine to coarse, angular to subangular, gravel	8	N/A	30	100%	
25	408				SANDY CLAY, low plasticity, very soft, homogeneous, saturated, tan white, no odor, sand is fine to coarse, angular to subangular, gravel	9	N/A	20	100%	25
			SH		WEATHERED SHALE, laminated, wet, gray purple, no odor	10	N/A	15	100%	
30	403				*(Boring refusal @ 30.0 ft BGS)*					30
35	398									35
40										40

Well Schematic: NA

NOTES:
- Hand cleared to 4.0' BGS prior to drilling
- * Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

11-01-2023 O:_Overhead_Boring Log Drafts\422603-SBI\SB-35.bor

LOG OF BORING: SB-36 / TMW-3

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-SBI
Project Type:	Soil Study

Boring Information:

Date / Time:	07-11-23 / 09:43
Logged By:	AP / FS
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	DPT
Total Boring Depth:	35.0 ft BGS
Initial Saturation (ft)/Date:	25.0 ft BGS (07-11-23)
Static GW level (ft)/Date:	10.2 ft BGS (07-11-23)
Surface Elevation (ft):	432.4 ft
Sampling Interval:	Continuous

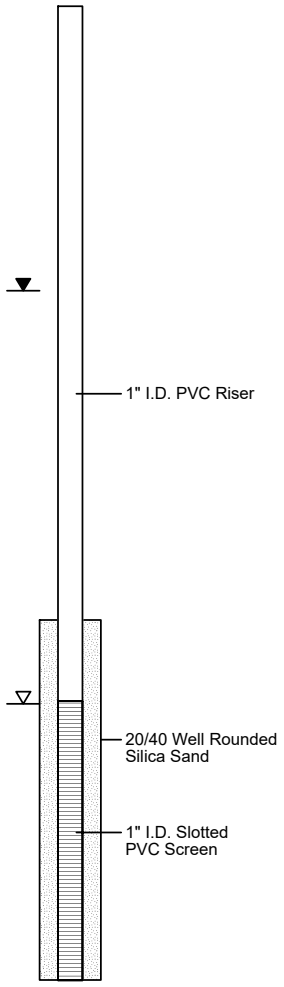
Well Information:

Well Type:	Temp Type II
Well Purpose:	Sampling
Well Construction Date:	07-11-23
Total Well Depth:	34.9 ft
Screened Interval:	24.9 ft - 34.9 ft
Screen Slot Size:	0.01-in.
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev. 432.4	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery
0	432				CONCRETE				
					GRAVELLY CLAY, moderate plasticity, firm, homogeneous, moist, brown red, petroleum-like odor, gravel is fine to coarse, angular to subangular, chert				
					No Recovery				
5	427		CL		GRAVELLY CLAY, moderate plasticity, firm, homogeneous, moist, tan orange, strong petroleum-like odor, gravel is fine to coarse, angular to subangular	1	N/A	2,000	100%
10	422	▼			GRAVELLY CLAY, moderate plasticity, firm, homogeneous, moist, tan orange, strong petroleum-like odor, gravel is fine to coarse, angular to subangular	2	N/A	>11,000*	100%
			SH		WEATHERED SHALE, laminated, moist, gray purple, strong petroleum-like odor	3	N/A	3,300	100%
15	417				WEATHERED SHALE, laminated, moist, gray purple, mild petroleum-like odor				
					SANDY CLAY, lhomogeneous, moist, tan orange, mild petroleum-like odor, sand is fine, angular to subangular, some gravel	4	N/A	3,600*	60%
20	412		CL		SANDY CLAY, homogeneous, wet, tan orange, mild petroleum-like odor, sand is fine to coarse, dense, angular to subangular, some gravel	5	N/A	630	100%
25	407	▽	SH		WEATHERED SHALE, laminated, moist, gray purple, moderate petroleum-like odor	6	N/A	420	90%
					WEATHERED SHALE, laminated, moist, light gray, mild petroleum-like odor				
			CL		SANDY CLAY, homogeneous, saturated, tan white, mild petroleum-like odor, sand is poorly graded, fine to coarse, angular to subangular, some gravel	7	N/A	390	90%
30	402		SH		WEATHERED SHALE. laminated, moist, gray purple, mild petroleum-like odor				
35	397				*(Boring terminated @ 35.0 ft BGS)*	8	N/A	125	100%
40									

Well Schematic: TMW-3



NOTES:
- Hand cleared to 4.0' BGS prior to drilling
- * Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

11-01-2023 O:_Overhead_Boring Log Drafts\422603-SBI\SB-36.bor

LOG OF BORING: SB-37

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-SBI
Project Type:	Soil Study

Boring Information:

Date / Time:	07-11-23 / 11:30
Logged By:	AP / FS
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	DPT
Total Boring Depth:	30.0 ft BGS
Initial Saturation (ft)/Date:	28.0 ft BGS (07-11-23)
Static GW level (ft)/Date:	NA
Surface Elevation (ft):	432.5 ft
Sampling Interval:	Continuous

Well Information:

Well Type:	NA
Well Purpose:	NA
Well Construction Date:	NA
Total Well Depth:	NA
Screened Interval:	NA
Screen Slot Size:	NA
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev. 432.5	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
0	432				CONCRETE					0
			CL		GRAVELLY CLAY, low plasticity, firm, homogeneous, moist, tan red, mild petroleum-like odor, gravel is fine to coarse, angular to subangular, chert					
5	427				GRAVELLY CLAY, low plasticity, firm, homogeneous, moist, tan red, mild petroleum-like odor, gravel is fine to coarse, angular to subangular	1	N/A	80	100%	5
					GRAVELLY CLAY, moderate plasticity, soft, homogeneous, moist, tan orange, strong petroleum-like odor, gravel is fine to coarse, angular to subangular					
10	422		SH		WEATHERED SHALE, laminated, moist, gray purple, strong petroleum-like odor	2	N/A	230*	100%	10
					WEATHERED SHALE, laminated, moist, gray purple, strong petroleum-like odor	3	N/A	260	100%	
15	417				WEATHERED SHALE, laminated, moist, gray purple, mild petroleum-like odor					15
					WEATHERED SHALE, laminated, wet, tan red orange, mild petroleum-like odor	4	N/A	180*	60%	
20	412		CL		SANDY CLAY, low plasticity, soft, homogeneous, wet, tan yellow, mild petroleum-like odor	5	N/A	175	100%	20
			SH		WEATHERED SHALE, laminated, moist, gray purple, mild petroleum-like odor					
25	407	▽			WEATHERED SHALE, laminated, wet, brown purple, mild petroleum-like odor	6	N/A	65	90%	25
			CL		SANDY CLAY, low plasticity, soft, homogeneous, saturated, white tan pink, mild petroleum-like odor, sand is fine to coarse, angular to subangular, some gravel	7	N/A	80	90%	▽
30	402				*(Boring terminated @ 30.0 ft BGS)*					30
35	397									35
40										40

Well Schematic: NA

NOTES:
- Hand cleared to 4.0' BGS prior to drilling
- * Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

11-01-2023 O:_Overhead_Boring Log Drafts\422603-SBI\SB-37.bor

LOG OF BORING: SB-38 / TMW-4

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-SBI
Project Type:	Soil Study

Boring Information:

Date / Time:	07-11-23 / 14:00
Logged By:	AP / FS
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	DPT
Total Boring Depth:	30.0 ft BGS
Initial Saturation (ft)/Date:	23.0 ft BGS (07-11-23)
Static GW level (ft)/Date:	10.9 ft BGS (07-11-23)
Surface Elevation (ft):	432.7 ft
Sampling Interval:	Continuous

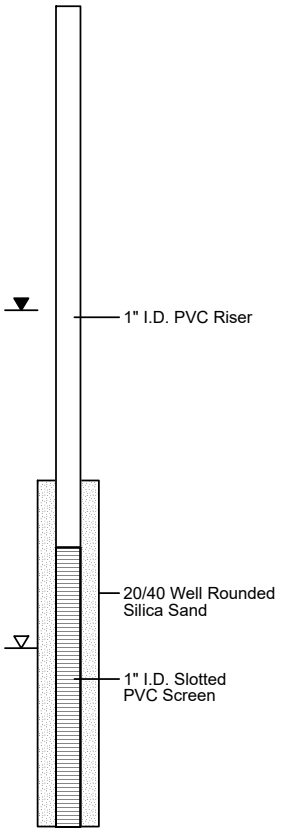
Well Information:

Well Type:	Temporary Type II
Well Purpose:	Sampling
Well Construction Date:	07-11-23
Total Well Depth:	29.4 ft
Screened Interval:	19.4 ft - 29.4 ft
Screen Slot Size:	0.01-in
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev. 432.7	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery
0	432				CONCRETE				
			CL		GRAVELLY CLAY, moderate plasticity, hard, homogeneous, moist, red brown, no odor, gravel is fine to coarse, angular to subangular, chert				
5	427				GRAVELLY CLAY, moderate plasticity, hard, homogeneous, moist,red brown, no odor, gravel is fine to coarse, angular to subangular, chert	1	N/A	100	100%
			ML		GRAVELLY SILT, no plasticity, hard, homogeneous, moist, tan brown, mild petroleum-like odor, gravel is fine, angular to subangular				
			CL			2	N/A	80*	100%
10	422	▼			GRAVELLY CLAY, low plasticity, hard, homogeneous, moist, tan orange, mild petroleum-like odor, gravel is fine to coarse, angular to subangular, shale				
			SH		WEATHERED SHALE, laminated, moist, gray purple, mild petroleum-like odor	3	N/A	85	100%
15	417				WEATHERED SHALE, laminated, moist, gray purple, mild petroleum-like odor				
			ML		GRAVELLY SILT, hard, homogeneous, wet, tan brown, no odor, gravel is fine, angular to subangular	4	N/A	65	100%
20	412				SANDY CLAY, low plasticity, hard, homogeneous, moist, orange red, no odor, sand is fine to coarse, angular to subangular, some gravel				
		▽	CL		SANDY CLAY, low plasticity, soft, homogeneous, wet, orange red, no odor, sand is fine to coarse, angular to subangular, some gravel	5	N/A	200*	100%
25	407				SANDY CLAY, low plasticity, very soft, homogeneous, saturated, orange tan, no odor, sand is fine to coarse, angular to subangular, some gravel	6	N/A	75	100%
			SH		WEATHERED SHALE, laminated, moist, gray purple, no odor	7	N/A	80	100%
30	402				*(Boring terminated @ 30.0 ft BGS)*				
35	397								
40									

Well Schematic: TMW-4



NOTES:
- Hand cleared to 4.0' BGS prior to drilling
- * Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

11-01-2023 O:_Overhead_Boring Log Drafts\422603-SBI\SB-38.bor

LOG OF BORING: SB-39

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-SBI
Project Type:	Soil Study

Boring Information:

Date / Time:	07-11-23 / 15:30
Logged By:	AP / FS
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	DPT
Total Boring Depth:	28.0 ft BGS
Initial Saturation (ft)/Date:	23.0 ft BGS (07-11-23)
Static GW level (ft)/Date:	NA
Surface Elevation (ft):	431.8 ft
Sampling Interval:	Continuous

Well Information:

Well Type:	NA
Well Purpose:	NA
Well Construction Date:	NA
Total Well Depth:	NA
Screened Interval:	NA
Screen Slot Size:	NA
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev. 431.8	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
0	431		CL		ASPHALT					0
			ML		GRAVELLY CLAY, moderate plasticity, hard, homogeneous, moist, red brown, no odor, gravel is fine to coarse, angular to subangular, chert					
5	426		CL		SILT, no plasticity, hard, homogeneous, moist, gray tan, no odor	1	N/A	65	100%	5
					SILT, no plasticity, hard, homogeneous, moist, gray tan, no odor					
					CLAY, high plasticity, soft, homogeneous, moist, red, no odor	2	N/A	30*	100%	
10	421		SH		WEATHERED SHALE, laminated, moist, gray purple, no odor					10
					WEATHERED SHALE, laminated, moist, gray purple, no odor	3	N/A	15	100%	
15	416				WEATHERED SHALE, laminated, moist, purple gray, no odor					15
			CL		SANDY CLAY, low plasticity, firm, homogeneous, moist, tan, no odor	4	N/A	0	100%	
20	411		SH		WEATHERED SHALE, laminated, moist, gray purple, no odor					20
		▽			WEATHERED SHALE, laminated, moist, gray purple, no odor	5	N/A	45*	100%	▽
			CL		SANDY CLAY, low plasticity, very soft, homogeneous, saturated, gray white, no odor	6	N/A	20	100%	
25	406				CLAY, weathered, laminated, moist, gray purple, no odor	7	N/A	--	50%	25
					(Boring refusal @ 28.0 ft BGS)					
30	401									30
35	396									35
40										40

Well Schematic: NA

NOTES:
- Hand cleared to 4.0' BGS prior to drilling
- * Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

11-01-2023 O:_Overhead_Boring Log Drafts\422603-SBI\SB-39.bor

LOG OF BORING: SB-40 / TMW-5

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-SBI
Project Type:	Soil Study

Boring Information:

Date / Time:	07-12-23 / 07:35
Logged By:	AP / FS
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	DPT
Total Boring Depth:	30.0 ft BGS
Initial Saturation (ft)/Date:	26.0 ft BGS (07-12-23)
Static GW level (ft)/Date:	11.7 ft BGS (07-12-23)
Surface Elevation (ft):	431.8 ft
Sampling Interval:	Continuous

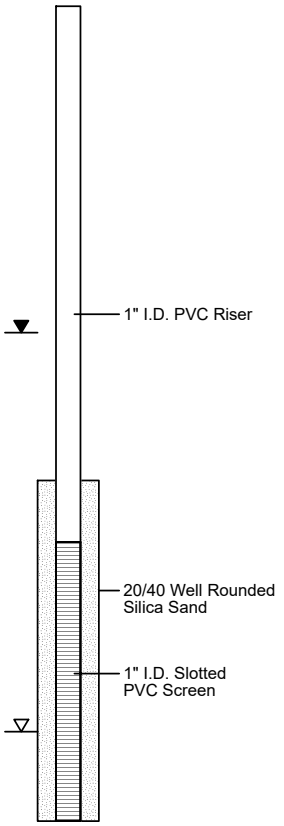
Well Information:

Well Type:	Temp Type II
Well Purpose:	Sampling
Well Construction Date:	07-12-23
Total Well Depth:	29.2 ft
Screened Interval:	19.2 ft - 29.2 ft
Screen Slot Size:	0.01-in.
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev. 431.8	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery
0	431				ASPHALT				
			CL		GRAVELLY CLAY, moderate plasticity, soft, homogeneous, moist, brown red, no odor, gravel is fine to coarse, angular to subangular				
5	426				CLAY, high plasticity, soft, homogeneous, moist, light brown, mild petroleum-like odor	1	N/A	190	100%
					CLAY, high plasticity, soft, homogeneous, moist, light brown, mild petroleum-like odor				
					CLAY, high plasticity, firm, homogeneous, moist, light brown, mild petroleum-like odor				
10	421	▼			WEATHERED SHALE, laminated, moist, gray purple, moderate petroleum-like odor	2	N/A	5,400*	100%
					WEATHERED SHALE, laminated, moist, gray purple, moderate petroleum-like odor				
						3	N/A	670	100%
15	416		SH		WEATHERED SHALE, laminated, moist, purple gray, mild petroleum-like odor				
					WEATHERED SHALE, laminated, moist, light brown tan, moderate petroleum-like odor	4	N/A	240	100%
20	411				WEATHERED SHALE, laminated, moist, light brown tan, moderate petroleum-like odor				
					WEATHERED SHALE, laminated, moist, gray purple, mild petroleum-like odor	5	N/A	340*	100%
25	406	▽			WEATHERED SHALE, laminated, moist, gray purple, mild petroleum-like odor	6	N/A	330	100%
			CL		SANDY CLAY, low plasticity, very soft, homogeneous, moist to saturated, tan white, mild petroleum-like odor				
30	401				*(Boring refusal @ 30.0 ft BGS)*				
35	396								
40									

Well Schematic: TMW-5



NOTES:
- Hand cleared to 4.0' BGS prior to drilling
- * Soil sample submitted for laboratory analysis
- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

11-01-2023 O:_Overhead_Boring Log Drafts\422603-SBI\SB-40.bor

LOG OF BORING: SB-41 / TMW-6

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-SBI
Project Type:	Soil Study

Boring Information:

Date / Time:	07-12-23 / 09:45
Logged By:	AP / FS
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	DPT
Total Boring Depth:	29.0 ft BGS
Initial Saturation (ft)/Date:	25.0 ft BGS (07-12-23)
Static GW level (ft)/Date:	7.9 ft BGS (07-12-23)
Surface Elevation (ft):	432.1 ft
Sampling Interval:	Continuous

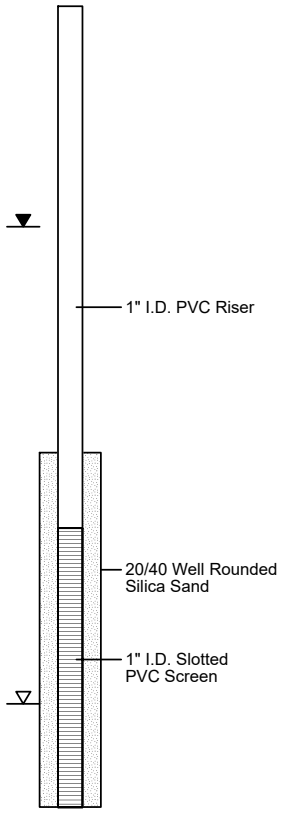
Well Information:

Well Type:	Temp Type II
Well Purpose:	Sampling
Well Construction Date:	07-12-23
Total Well Depth:	28.7 ft
Screened Interval:	19.2 ft - 29.2 ft
Screen Slot Size:	0.01-in.
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev. 432.1	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery
0	432				ASPHALT				
					GRAVELLY CLAY, low plasticity, soft, homogeneous, moist, brown red, no odor, gravel is fine to coarse, angular to subangular				
5	427		CL		GRAVELLY CLAY, low plasticity, soft, homogeneous, moist, brown red, no odor, gravel is fine to coarse, angular to subangular	1	N/A	50	75%
		▼			GRAVELLY CLAY, low plasticity, soft, homogeneous, moist, brown red, no odor, gravel is fine to coarse, angular to subangular				
10	422				CLAY, high plasticity, soft, homogeneous, moist, light brown tan, no odor	2	N/A	90*	75%
					CLAY, high plasticity, soft, homogeneous, moist, light brown tan, no odor				
			SH		WEATHERED SHALE, laminated, moist, gray purple, no odor	3	N/A	90	100%
15	417		CL		GRAVELLY CLAY, low plasticity, soft, homogeneous, wet, brown, no odor, gravel is fine to coarse, angular to subangular				
					CLAY, high plasticity, soft, homogeneous, moist, white tan, no odor	4	N/A	110	100%
20	412				WEATHERED SHALE, laminated, moist, tan orange, no odor				
			SH		WEATHERED SHALE, laminated, moist, gray purple, no odor	5	N/A	100*	100%
25	407	▽			WEATHERED SHALE, laminated, moist, gray purple, no odor	6	N/A	130	100%
			CL		SANDY CLAY, low plasticity, soft, homogeneous, moist, tan white, no odor				
30	402				*(Boring terminated @ 29.0 ft BGS)*				
35	397								
40									

Well Schematic: TMW-6



NOTES:
- Hand cleared to 4.0' BGS prior to drilling
- * Soil sample submitted for laboratory analysis
- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

11-01-2023 O:_Overhead_Boring Log Drafts\422603-SBI\SB-41.bor

LOG OF BORING: SB-42

PPM CONSULTANTS

Client / Site Information:

Client:	Russell Petroleum Corp.
Site:	Kwik Shop No. 110
Location:	Childersburg, AL
Agency Interest No.:	UST10-08-08
PPM Project No.:	422603-SBI
Project Type:	Soil Study

Boring Information:

Date / Time:	07-12-23 / 10:45
Logged By:	AP / FS
Drilling Company / Driller:	Technical Drilling Service
Drilling Method:	DPT
Total Boring Depth:	30.0 ft BGS
Initial Saturation (ft)/Date:	25.0 ft BGS (07-12-23)
Static GW level (ft)/Date:	NA
Surface Elevation (ft):	432.0 ft
Sampling Interval:	Continuous

Well Information:

Well Type:	NA
Well Purpose:	NA
Well Construction Date:	NA
Total Well Depth:	NA
Screened Interval:	NA
Screen Slot Size:	NA
Development Method:	NA
Gallons Purged:	NA

Water Levels
▼ Static GW level
▽ Initial Saturation

Depth in Feet	Surf. Elev. 432.0	Water Level	USCS	GRAPHIC	DESCRIPTION	Sample	Blow Count	Headspace Concentration (ppmv)	Percent Recovery	Depth in Feet
0	432				ASPHALT					0
					GRAVELLY CLAY, low plasticity, soft, homogeneous, moist, red orange, no odor, gravel is fine to coarse, angular to subangular					
5	427		CL		GRAVELLY CLAY, low plasticity, soft, homogeneous, moist, red orange, no odor, gravel is fine to coarse, angular to subangular	1	N/A	50	100%	5
					GRAVELLY CLAY, low plasticity, soft, homogeneous, moist, red orange, no odor, gravel is fine to coarse, anguarl to subangular					
10	422				CLAY, high plasticity, soft, homogeneous, moist, white tan, no odor	2	N/A	0*	100%	10
					CLAY, high plasticity, soft, homogeneous, moist, whtie tan, no odor	3	N/A	0	100%	
15	417				WEATHERED SHALE, laminated, moist, gray purple, no odor					15
					WEATHERED SHALE, laminated, moist, gray purple, no odor	4	N/A	0	100%	
20	412		SH		WEATHERED SHALE, laminated, moist, purple gray, no odor	5	N/A	30*	100%	20
25	407	▽			WEATHERED SHALE, laminated, moist, gray purple, no odor	6	N/A	95	50%	25 ▽
			CL		SANDY CLAY, low plasticity, soft, homogeneous, wet, tan white, no odor					
30	402					7	N/A	--	50%	30
					(Boring terminated @ 30.0 ft BGS)					
35	397									35
40										40

Well Schematic: NA

NOTES:
- Hand cleared to 4.0' BGS prior to drilling
- * Soil sample submitted for laboratory analysis

- Soil descriptions generally based on visual inspection/professional judgment as described in ASTM D2488-09a: Standard Practice for Description and Identification of Soils (Visual-Manual Procedure). Laboratory testing not conducted, and the data should not be used for engineering purposes.

11-01-2023 O:_Overhead_Boring Log Drafts\422603-SBI\SB-42.bor

APPENDIX B – DESIGN CALCULATIONS

PPM Consultants, Inc.

MASS REDUCTION ESTIMATE

Geologist: Jeff Schexnayder
Site Name: Former Kwik Shop No. 110

1) Dissolved COC Reduction Required in Groundwater:

Data from the last year of groundwater monitoring events were averaged to represent COC concentrations in groundwater.

Sample ID	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	MTBE (mg/L)	Naphthalene (mg/L)
MW-7	0.069	0.007	0.180	0.190	0.003	0.100
MW-10R	13.20	25.93	4.95	22.77	0.047	1.191
MW-11	0.287	7.63	2.83	12.23	0.001	1.190
MW-13	6.13	10.03	1.31	7.023	0.049	0.403
TMW-1	7.03	21.80	7.02	21.6	0.166	1.530
TMW-2	5.28	15.80	3.24	13.30	0.006	0.744
TMW-3	11.30	35.00	8.20	34.50	0.016	1.510
TMW-4	4.56	7.02	2.61	10.30	0.030	0.659
Average	**5.98**	**15.4029**	**3.792**	**15.24**	**0.0398**	**0.916**
SSCAL (Source)	**0.078**	**1.247**	**3.227**	**175**	**4.643**	**4.643**
Reduction Goal	**5.90**	**12.3223**	**3.034**	**12.19**	**0.0318**	**0.733**

Note: where average COC cocentration is below SSCAL, an 80% reduction target is utilized for the reduction goal.
COC concentrations for TMW-1 through TMW-4 are from a one time sampling event.

2) Adsorbed COC Reduction Required in Soil:

COC concentrations in soil are based on the average soil concentrations from borings within the area of proposed ozone treatment.

Sample ID	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Total Xylenes (mg/kg)	MTBE (mg/kg)	Naphthalene (mg/kg)
MW-7	0.009	0.008	0.041	0.145	0.005	0.28
MW-10	0.226	2.340	1.399	6.995	0.004	0.749
MW-11	0.009	0.008	0.041	0.145	0.004	0.278
MW-15	2.88	44.4	22.8	107.0	0.004	8.82
SB-32	0.206	0.772	28.25	82.73	0.004	8.23
SB-33	0.280	11.33	11.74	39.18	0.004	3.73
SB-34	2.369	40.65	24.60	84.65	0.006	10.11
SB-35	0.081	14.16	11.69	46.81	0.004	4.618
SB-36	0.452	6.51	2.86	12.54	0.004	0.949
SB-40	0.743	0.609	9.73	8.560	0.028	4.842
Average	**0.725**	**12.08**	**11.31**	**38.87**	**0.0067**	**4.260**
Lowest SSCAL	**0.114**	**3.69**	**13.50**	**171.0**	**0.850**	**39.70**
Reduction Goal	**0.580**	**9.66**	**9.051**	**31.10**	**0.0054**	**3.408**

Note: where average COC concentration is below SSCAL, an 80% reduction target is utilized for the reduction goal.

3) Groundwater Treatment Volume:

The areal extent of hydrocarbon-impacts will be estimated using the equation for an ellipsoid:

$$V = (4/3) \times \pi \times L \times W \times D \times P$$

Where:

L = Length (feet)
W = Width (feet)
D = Depth/Thickness (feet)
P = Porosity

Length (ft) =	160	
Width (ft) =	110	
Thickness (ft) =	8	
Porosity =	0.2955	From ARBCA Evaluation

Total Treatment Volume, GW =	174,280	ft^3
Total Treatment Volume, GW =	4,934,734	L

Notes:

1. COC impacts are estimated to be present within a water-bearing zone with an average thickness of 8 feet in the water bearing zone.

2. Areal extent of the groundwater treatment area is estimated based upon an elliptical area of the benzene plume exceeding the SSCALs in the sparge field.

PPM Consultants, Inc.

MASS REDUCTION ESTIMATE

Geologist: Jeff Schexnayder
Site Name: Former Kwik Shop No. 110

4) Soil Treatment Volume:

The areal extent of hydrocarbon-impacts will be estimated using the equation for a rectangle:

V = L x W x D

Where:

L= Length (feet)
W= Width (feet)
D= Depth/Thickness (feet)

Length (ft) =	80	
Width (ft) =	40	
Thickness (ft) =	8	
Soil Density (lb/ft^3) =	116.7	From ARBCA Evaluation
Total Treatment Volume, Soil =	25,600	ft^3
Soil Weight =	2,987,520	lb
Soil Mass =	1,354,840	kg

Notes:
1. Areal extent of the soil treatment area is estimated based on area immediately around and between gasoline dispensers.

5) Dissolved COC Mass to be Removed

	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene
Conc., mg/L	5.90	12.3223	3.034	12.19	0.0318	0.733
mass, mg	2.91E+07	6.08E+07	1.50E+07	6.02E+07	1.57E+05	3.62E+06
Weight, lb	64.2	134.080	33.01	132.6	0.346	7.97
Total lbs.	372					

6) Adsorbed Hydrocarbon Mass to be Removed

	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Naphthalene
Conc., mg/kg	0.580	9.66	9.051	31.10	0.0054	3.408
mass, mg	7.86E+05	1.31E+07	1.23E+07	4.21E+07	7.26E+03	4.62E+06
Weight, lb	1.733	28.87	27.0	92.9	0.02	10.18
Total lbs.	160.7					

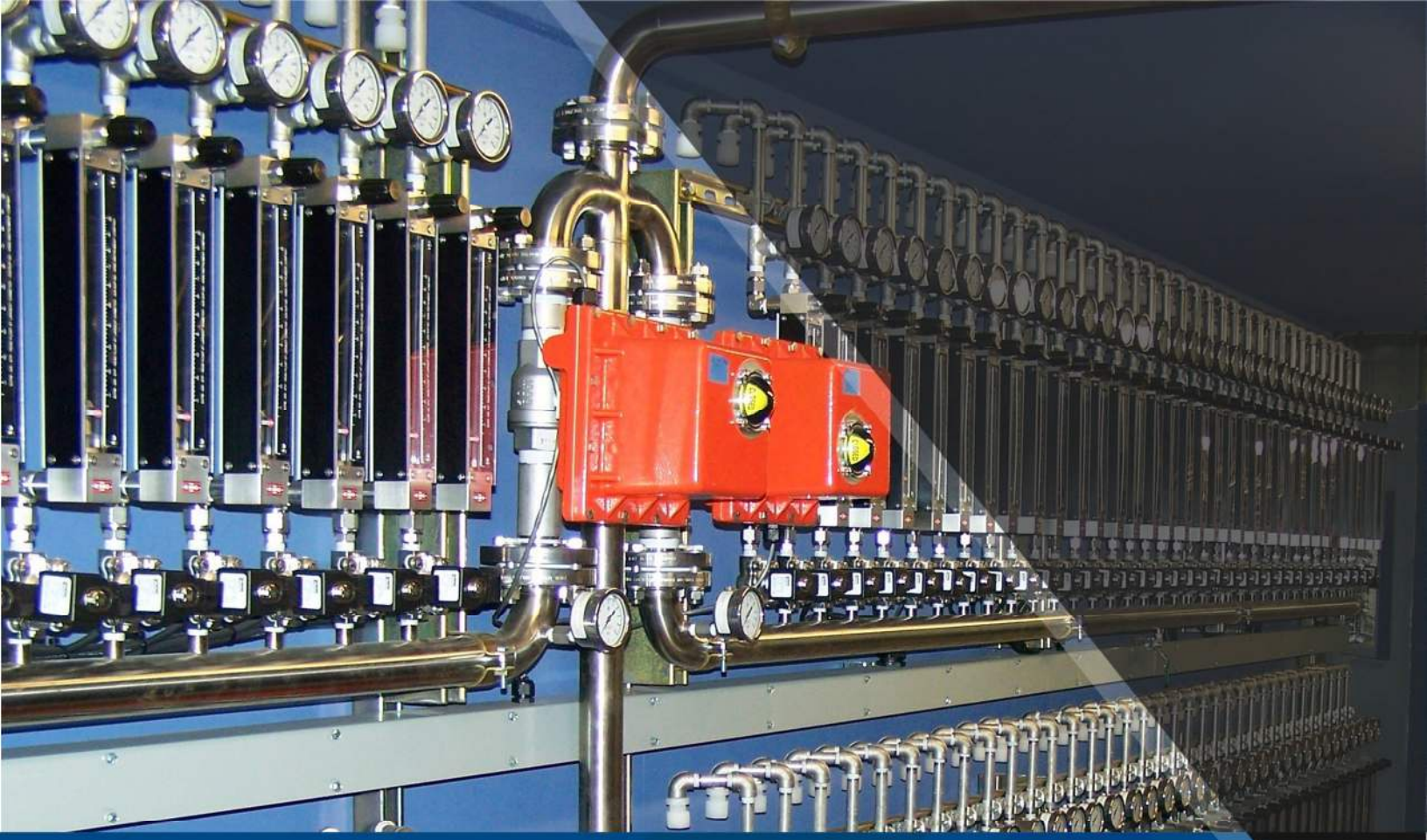
Total Mass of COCs to be Removed = 533 lbs

7) Ozone Required for Treatment

Number of COCs	6	
Gram Equivalent to Oxidize COC (13.6 g/g for BTEX, 3.0 g/g for MTBE, 3.0 g/g for nap.)	19.6	g/g
Total Mass of Ozone Required for COCs	1,741	lbs
Assume COCs Comprise 30% of Hydrocarbons Released	30%	
Total Mass of Ozone Required for all Hydrocarbons	5,804	lbs
Pounds of Ozone Per Day System Can Generate	10	lbs/day
No. of Days Required for all Hydrocarbons	580	days
Safety Factor for Naturally Occurring Oxidant Demand	20%	
No. Days Required for Hydrocarbons and Nat. Occurring Oxidant Demand	696	days
General Safety Factor	25%	
No. Days Required for Hydrocarbons, Nat. Oxidant Demand, and Safety Factor	871	
No. of Years Required for Hydrocarbons, Nat. Oxidant Demand, and Safety Factor	2.4	years
No. of Years Required assuming 75% Runtime	3.2	years

It is noted that the estimated cleanup time does not take into account the affects of natural attenuation.

APPENDIX C – EQUIPMENT SPECIFICATIONS AND QUOTATIONS



PPM - Childersburg, AL - Ozone Remediation & SVE System

Ozone & SVE

Firm Proposal QU-2405228.R1

Submitted To: PPM Consultants

Attention To: Jeff Schexnayder, [205]-836-5650, jeff.schexnayder@ppmco.com

Submitted By: Newterra Corporation, Inc.
1555 Coraopolis Heights Rd. Suite 4100
Coraopolis, PA 15108

Presented By: Daryl Ferro, 514-588-0480, dferro@newterra.com

newterra

Submitted 2025-05-02
Valid Until 2025-06-16

Contents

1 Introduction & Overview 3

About Newterra 3
Locations 4

2 Commercial Section 5

Pricing 5
Freight Pricing 5
Commercial Notes 5
Payments 6
Terms & Conditions 6
Lifecycle Services 7

3 Technical Section 8

Design Basis – Ozone 8
Design Basis - SVE 9
System Scope of Supply - Ozone 10
Sparge Well Material Specifications 12
Service & Maintenance Kit Specifications 13
System Scope of Supply - SVE 14
Services Scope 19
Customer's Scope of Supply 20
Welcome to Newterra Digital Service! 22
Engineering Submittals 24
Advantages of a Newterra Remediation System 25

4 Terms, Conditions, Warranties, and Guarantees 26

Terms and Conditions 26
Warranty 31

5 Newterra Lifecycle Solutions 32

6 Appendices 33

Preliminary General Arrangement Drawing – Ozone Trailer 34
Preliminary Layout Drawing – SVE Container 35
Preliminary Piping & Instrumentation Diagram – Ozone Trailer 36

1 Introduction & Overview

About Newterra

Newterra's approach is simple: we are a single point contractor combining process design, engineering, fabrication, and long-term life cycle support services to all our customers. We are a leading provider of modular, prefabricated water treatment technologies with a core focus of treating water for three primary purposes:

- **To drink**
- **To safely return to the environment or be reused**
- **For industries to use to produce goods and services**

Operating as Newterra since 1992, and headquartered in Coraopolis, PA, USA, Newterra is an industry leader in modular treatment solutions. Servicing a variety of customers in diverse end-markets including municipalities, land developers, military, commercial & institutional and a variety of light and heavy industries. Providing treatment solutions from 100 gallons per day up to several million gallons per day is within our wheelhouse and driven by the type of treatment solution targeted. Our cross functional team brings outstanding expertise in engineering, treatment applications, manufacturing, and service, leveraging a broad portfolio of technologies. We have dependable (largely modular) designs for ease of installation and operation. We employ a flexible business model to address your needs from capital equipment to rental units (water as a service) and full lifecycle support. Newterra provides real solutions to the world's most demanding industrial end-users, including Mining, Oil & Gas and food and beverage, as well as potable and wastewater solutions for Private and Commercial Developments, and Municipalities.

With over 200+ employees worldwide, delivering 100's of systems annually Newterra is more than just an equipment and solutions provider. Newterra forms a long-term partnership with all our customers, providing long-term Life Cycle support and site services. We understand operating a water or wastewater treatment system can be challenging. Oftentimes, the purchaser of the system, and even the operator of the system, cannot maintain the same level of expertise as the original system designer. Newterra is dedicated to the ongoing success of all its clients, and so we offer our engineering and technical capabilities as an ongoing service.

What differentiates Newterra from our competition is:

1) Client Relationships – Our fundamental belief is that knowing our clients and understanding their needs, desires and challenges is the only way to foster and maintain long-lasting relationships where both parties reap the benefits.
2) Flexibility – Newterra understands that not all clients or projects are the same and therefore offer the ability to design the level of systems that is appropriate for your specific project needs.
3) Stature – Newterra is a right sized company to provide a hands-on approach to every project. One of Newterra's greatest strengths is the ability to make decisions quickly and effectively. Our clients appreciate the speed of service and our level of attentiveness, especially in moments of crisis or emergency.
4) Streamlined In-House Services and Capabilities – Being an integrated mid-sized equipment and service provider allows Newterra the flexibility to offer a full spectrum of in-house capabilities to best serve and create value for our clients.

Locations

Newterra is headquartered in Coraopolis, PA, with engineering, fabrication, and field service offices strategically located thought North America to better service our growing client base.

Newterra Corporate Headquarters
1555 Coraopolis Heights Rd. Suite 4100
Coraopolis, PA 15108
USA

Systems Manufacturing
1291 California Ave.
Brockville, ON K6V 5Y6
Canada

Pressure Vessel Manufacturing
250 Bolton Sullivan Dr.
Heber Springs, AR 72543
USA

Surface Aerators & Mixer Manufacturing
1215 Chaska Creek Blvd., Suite 400
Chaska, MN 55318
USA

Systems Manufacturing
1220 Kendall Road
San Luis Obispo, CA 93401
USA

2 Commercial Section

Pricing

Item	Price
Firm Ozone Trailer System Purchase Price	$ 204,093.00
Firm Ozone Ancillary Equipment Purchase Price	$ 43,935.00
Firm SVE Containerized System Purchase Price	$ 133,677.00
Sales Tax on Equipment	Not Included
Total System Price	$ 381,705.00

Freight Pricing

Item	Price
Estimated Equipment Freight to Site • System will be shipped DAP to Childersburg, AL (Incoterms 2020) • Freight costs will be prepaid and added to invoice • All freight costs are subject to a 20% administration charge (included)	$ 19,651.00

Commercial Notes

- All prices are quoted in US Dollars (USD).
- Pricing is valid for 45 days (2025-06-16).
- Unless otherwise specified, any sales or value added taxes are not included.
- This proposal supersedes all previous proposals and correspondence.
- The pricing provided is contingent upon acceptance of Newterra's payment milestones, Terms & Conditions outlined in this proposal and may be adjusted if other payment terms or T&C's are applied at time of order.
- Unless specified within this proposal, the equipment delivery date, start date, and date of commencement of operations are to be negotiated.
- This proposal and the rates provided herein are subject to Newterra compliance check and financial due diligence by Newterra.
- Newterra's pricing is based on reasonable market variability in our supply chain. In the event of extreme volatility, defined as an increase of greater than 10% of the Producer Price Index (PPI) in value from the month of the proposal date to the month of submission of engineering documentation for approval, Newterra reserves the right to adjust the project price. PPI is obtained from the US Bureau of Labor Statistics: PPI for final demand, 12-month percent change, not seasonally adjusted.

Payments

Payment Terms

All payments are **Net 30** from date of invoice. Late payments may impact delivery schedule or be subject to interest or penalties as per the Contract.

Payment Milestones

- 50% on Order Acceptance
- 25% on Engineering Submittal
- 15% on Two Weeks Prior to Shipment
- 10% on Notification of Readiness to Ship (partial shipments allowed)

Terms & Conditions

- Newterra's attached Terms and Conditions apply.
- Newterra's attached Standard Warranty applies.

Lifecycle Services

The Newterra technical support teams are here to support, maintain and optimize your water, wastewater, and remediation systems to maximize your ROI, whether we're needed on an ad-hoc basis, or you enjoy the benefits of one of our service contract offerings.

Ad-Hoc Service and Support

If we cannot solve your technology challenges remotely, our experts can be at your site to support your solution, wherever you are. We can perform emergency maintenance required to keep your system operational in a pinch.

Service Contracts

Operating a water or wastewater treatment system can be challenging. Oftentimes, the purchaser of the system, and even the operator of the system, cannot maintain the same level of expertise as the original system designer. Newterra is dedicated to the ongoing success of all of its clients, and so we offer our engineering and technical capabilities as an ongoing service.

For a more detailed listing of Newterra's life cycle services please see the detailed listing found in the appendix of this proposal.

3 Technical Section

Design Basis – Ozone

Design Parameters

Site power	Three-phase, 208-230V, 60Hz Maximum Available Fault Current: 10,000 Symmetrical RMS Amps
System Area Classification	Non-hazardous location for control panel
Ambient temperatures	max: 100 °F min: 32 °F
Elevation	420 ft
Process Flow Rate (Design)	10 SCFM (Air + Ozone)

- Ozone will be produced by four Plasma Technics generators. The ozone generators are rated to produce 208 g/h (11 lb/day). Ozone outlet flow is 120 SCFH at 10 PSI. Ozone pressure will be boosted through a double-head diaphragm pump to a maximum 50 psi.
- Oxygen will be created by a PSA (pressure swing adsorption) oxygen concentrator, Air Sep model # AS-E, providing 90-95% pure oxygen at 135 SCFH at 10 psi
- Air will be supplied from a rotary screw compressor, Kaeser model # SM-15T, providing 55 SCFM at 125 PSI
- Generated ozone will be routed through two nested 24-point manifolds and two non-nested single sparge points.
    - Manifold will connect to up to 50 sparge points ½-inch OD PFA tubes
    - Sparge flow rate for each sparge point is up to 10 SCFM individually
- 230 VAC, 3-phase, 4-wire electrical service required, 100A estimated
- Delivery flow and pressure displayed and logged via PLC, viewable from HMI
- Maximum ozone sparge pressure of 50 PSI
- Maximum air / breakthrough sparge pressure of 90 PSI
- Automatic regression from ozone to air / breakthrough mode upon high pressure detection
- User selectable delivery gas for each sequence step (ozone or oxygen, either with or without air flow boost, or air flow boost only)
- Independent time duration control for each sequence step (programmable from 1 to 120 minutes)
- User configurable valve sparge sequence ordering, allows user to repeat valves within the sequence or change sparge sequence order without plumbing changes
- Variable ozone output can be individually configured for each valve (10-100%)
- Programmable cycle lag time between sparge cycles (1 to 480 minutes).
- Independent time accumulators for tracking ozone vs. oxygen vs. air/breakthrough time per valve
- Suspend mode for planned nonoperational periods
- Timed oxygen purge solenoid valve for remote startup and maintenance of oxygen purity system
- Automated maintenance notifications
- Email Alarm Notifications
- VNC Server capability for remote control and monitoring
- Distinctive built-in safety features:
    - Emergency Stop pushbutton on control panel

- Safety Switch on external wall of trailer
- Ambient ozone alarm/shutdown sensor
- High pressure alarm/shutdown
- Built-in thermal protection, high / low temperature alarm set points 131Ḟ / 35Ḟ
- Sensor failure alarm
- Remote shutdown interface signal (interlock to SVE, etc.) can be user selected to stop sequence or switch to air only sparge
- Remote ozone sensor connections

Design Basis - SVE

Design Parameters

Site power	Three-phase, 208-230V, 60Hz Maximum Available Fault Current: 10,000 Symmetrical RMS Amps
System Area Classification	Hazardous CL 1 DIV 2 location for equipment Non-hazardous location for control panel
Site Noise Constraints	n/a
Ambient temperatures	max: 100 °F min: 32 °F
Elevation	410 ft
Process Flow Rate (Design)	242 ACFM

Notes:

1) *(DISSIMILAR METALS) - All water handling piping and equipment will be constructed such that no dissimilar metals are in direct contact with each other. Transition fittings or PVC instrumentation will be used where required. The note regarding materials of construction at the end of this proposal will only apply to portions of the system that will not be handling water.*
2) ***CL 1 DIV 2 JOBS** The cost for third-party certification of the Class 1 Division 2 rated system has been included in this proposal. The system will be inspected at Newterra manufacturing facility and will be NRTL Approved Agency (US) / Provincially Recognized Agency (Canada) certified upon completion of the inspection. It should be noted that a field inspection of the system may be required depending on system complexity, to ensure components are properly connected on-site. If field inspection is required, the cost to do so is has been included. Please contact Newterra should you wish to discuss this certification process.*
3) *Additional cost may apply if the available fault current is greater than 10kA, or if the site voltage is not of the "Y" configuration.*
4) *(Substitutions) Unless specifically mentioned in this proposal, Newterra reserves the right to substitute any of the suggested models of equipment, instrumentation, valves and any other appurtenances suggested in the RFQ for equivalent models. Please contact Newterra to discuss further, as required.*
5) *(TEFC motors) where applicable, Newterra has included TEFC motors which are rated for a class 1, division 2 environment in lieu of the suggested EXP motors.*
6) *Previously used equipment has been proposed (subject to availability at time of order) within this proposal as a cost-effective approach that will still provide the required functionality and equipment meeting the intent of the specification:*

a) *List of used equipment - container*

System Scope of Supply - Ozone

Mobile Ozone Sparge System

All ozone wetted parts to be of ozone compatible materials (i.e., stainless steel, glass, PVDF, PTFE, and Viton)

Ozone output verification will be performed upon completion of fabricating the ozone sparge system. This system is an air-cooled piece of equipment. Adequate ventilation is required to ensure reliable operation.

Feed Gas Air Compressor

- Belt drive compressor
- 230V, 3 phase TEFC motor
- Integrated refrigerated dryer
- Kaeser model # SM-15T
- 55 SCFM @ 125 PSI

Feed Gas Air Filtration

- Particulate filter downstream of compressor
- Oil removal filter downstream of compressor

Feed Gas Condensate Filtration

- Zero-loss drain valve from refrigerated dryer and all filter bowl drains plumbed to single oil/water separator
- Kaeser model # KCF25

Air Receiver Tank

- 60-gallon air receiver tank upstream of oxygen generator
- Isolation valves, pressure relief valve, and pressure gauge included
- Zero-loss condensate drain included

Oxygen Generator Air Filtration

- Particulate filter downstream of receiver tank, included with AirSep AS-E
- Oil removal filter downstream of receiver tank, included with AirSep AS-E
- Oil vapor / fine particulate filter downstream of oxygen generator

Oxygen Generator

- Calibrated to deliver 135 SCFH of 90 to 95% purity oxygen at a maximum delivery pressure of 10 PSIG
- Pressure swing adsorption style oxygen generator
- AirSep Corporation model #AS-E135

Oxygen Receiver Tank

- 60-gallon oxygen receiver tank upstream of ozone generator
- Isolation valves, pressure relief valve, and pressure gauge included
- Maximum oxygen storage pressure of 65 PSIG

Oxygen Purity Monitor

- Oxygen purity monitor located upstream of ozone generator to alarm if purity falls below 85%
- GMI brand

Ozone Generators

- 208 g/h (11 lb/day) at up to 5% by weight ozone from oxygen at 10 PSIG
- Four (4) Plasma Technics generators, air cooled
- Integrated alarms with dry contact to PLC
- Backpressure regulators downstream of generators to control feed gas pressure

Ozone Boost Pump

- One (1) double-head standard Dia-Vac pump
- Inlet pressure at 10 PSIG
- Outlet pressure at up to 50 PSIG

Valve Manifold

- 50 point sparge manifold – may be broken into multiple nested manifolds
- 50 solenoid valves - 3/8" NPT, Stainless Steel Body, Normally Closed, 120VAC, Teflon, DIN
- 1/2” OD Kynar compression fittings

Mobile Ozone Sparge System Enclosure

Dimensions

- Overall dimensions (detailed layout drawings to be finalized upon award of contract): 14’L x 7”W
- Layout shall be designed to allow sufficient access for equipment maintenance and subsequent removal, as necessary

Type

- Mobile, pre-constructed Flat Top trailer
- Tube mainframe construction
- Tandem Axle, spare tire, stabilizer jacks, 2-5/16” ball hitch, hitch lock, 7-pin trailer plug
- One set of rear double doors, lockable (latch, hasp, etc.)
- Access ports in walls/floors, as appropriate, for ventilation, air supply lines and ozone discharge lines
- Exterior painted white

Electric and Lighting

- Interior GFCI receptacle
- (2) 100 watt compact fluorescent lights inside enclosure, ceiling fixtures with clear glass and cast guard
- Interior ozone monitor: ATI A14 GasSens, connected to system PLC, Alarm set point: 1 ppmv
- Interior emergency stop button tied to PLC
- Exterior service disconnect/emergency switch located on side wall of container
- HMI panel for safety, ease of use, and maintenance

Climate Control (heat and cooling)

- Interior foam-board and plywood insulation of walls and roof
- PLC controlled fan ventilation and heat
- One (1) 1,500 W wall mount space heater
- One (1) 10,000 BTU/Hr Wall Mounted AC Unit

Control System Requirements

- Main disconnect panel (NEMA 3R) to be located on exterior of enclosure. Final electric service connection (230V/3ph) by others.
- All electrical components to be U.L. approved
- PLC based system located on interior wall of trailer
- Allen-Bradley MicroLogix base controller
- PC-input connection to be provided, via ethernet
- Allen Bradley PanelView Plus 400 4" Human Machine Interface (HMI) with touch pad to allow modification to programming while operating
- Emergency Stop Button (mushroom-style) located on enclosure (will shut down entire ozone sparge system)
- Further alarm detail and actions lists to be provided upon award of contract, if desired
- Cell-phone based telemetry system included (Service contract required)
- Onboard VNC Server to allow control and monitoring of system from multiple computers, tablets, smartphones (free software clients and apps available)

Listing of Major Equipment Provided

- One (1) 7' x 14' Tandem Axle Trailer
- Four (4) Plasma Technics ozone generators
- One (1) 60-gallon air receiver tank
- One (1) AirSep model # AS-E oxygen generator
- One (1) 60-gallon oxygen receiver tank
- One (1) GMI oxygen purity sensor
- One (1) Air Dimensions Inc ozone discharge pump
- One (1) ATI B124 GasSens, ozone monitor/transmitters
- One (1) Allen Bradley MicroLogix base PLC controller
- One (1) Allen Bradley PanelView Plus 400 HMI display unit with key pad
- Fifty (50) Solenoid Valves
- One (1) Kaeser model # SM-15T belt-drive air compressor
- One (1) Kaeser model # KPF-100 particulate air filter
- One (1) Kaeser model # KOR-100 oil removal air filter
- One (1) Kaeser model # KCF25 condensate filter

Sparge Well Material Specifications

Fifty (50) In-situ Oxidation Point: IOP100-12-P

- Stainless Steel Body
- 3/8" x 1-1/2" Outlets (16)
- 50 mesh internal stainless screen
- 1" x 8 T.P.I. F-480 Male Flush Thread w/ Viton® O-ring

Riser Pipe: RP100 – Total 1550 ft

- 1"ID x 10'L pieces with Viton® O-ring

- Sch. 80
- 1” x 8 T.P.I. F-480 Male Flush Thread

Fifty (50) Well Head Connection: WHC10

- ¼” Stainless Steel Tee
- ¼” Stainless Steel Plug
- ¼” Stainless Steel Nipple
- 1/2” Compression fitting for ozone delivery tubing
- 1” Slip Sch. 80 Union with insert

Ozone Delivery Tubing: TUB-PFA-8 – Total 4900 ft

- PFA
- 1/2” OD x 3/8” ID

Service & Maintenance Kit Specifications

MOSUXX-104 Six Month Service Kit, Series D.5, includes

(Provided on request - Parts are subject to change based on final design specifications.)

- (4) V-C-104 - 1/4" MPT 316SS Check Valve
- S-IF-11-8.75 - Intake Filter
- S-OF-SX - Oil Filter
- S-AFC-4.7-2.0 - Air Filter
- S-FB-OR-F9KE-F - Oil Filter Element
- S-FB-PF-F9KB-F - Particulate Filter Element
- S-OWS-25-F - Oil/Water Separator Element
- F-OR-100 - Filter, Oil Removal, Inline, 1/4"

MOSUXX-104 Twelve Month Service Kit, Series D.5, includes

(Provided on request - Parts are subject to change based on final design specifications.)

- (4) V-C-104 - 1/4" MPT 316SS Check Valve
- S-ECH-O3-200-A - O3 Sensor, 0-2ppm Replacement Ozone Sensor
- V-PR-101 - Manifold Pressure Relief Valve, 100psi
- V-PR-207 - Oxygen Pressure Relief Valve, 45psi
- S-V-S-102-SK Solenoid Valve Rebuild Kit for Viton Valves Only
- S-CMP-O3-100-SK ODP Compressor Rebuild Kit
- F-OR-100 Inline Oil/Particulate Filter
- S-IF-11-8.75 - Intake Filter
- S-OF-SX - Oil Filter
- S-AFC-4.7-2.0 - Air Filter
- S-OSC-SX - Oil Separator Cartridge
- S-OIL-SYN-QT - Synthetic Oil, quart
- S-DB-4307 - Drive Belt
- S-FB-OR-F9KE-F - Oil Filter Element
- S-FB-PF-F9KB-F - Particulate Filter Element
- S-OWS-25-F - Oil/Water Separator Element Disclosures

System Scope of Supply - SVE

Vacuum Extraction Manifold:

2” Vacuum extraction manifold constructed with four 2” legs

Each Leg:

- Ball valve
- Gate valve
- Rotameter flow indicator
- Sample port
- Vacuum gauge
- Sch80 PVC piping with termination outside of enclosure

Please note:

a) A Fernco will be added to the end of the manifold for future expansion with ball valve.

Vapor Liquid Separator:

Newterra model VLW-90, 90 G vapor liquid separator with:

- Exterior to be painted with urethane gloss enamel (Newterra Blue)
- Interior to be carbon steel
- 6” clean out
- Sight tube assembly
- High level alarm switch
- High level pump control switch
- Low level pump control switch
- Manual drain plumbed to exterior of enclosure

Vapor inlet piping to vapor liquid separator to contain:

- Vacuum gauge
- Temperature gauge
- Sample port
- 2” PVC piping with the inlet terminated outside of enclosure

Moyno model 3301 progressive cavity transfer pump with a 1 HP 208-230/460V/3P motor:

- Performance: 5 GPM at 25’ TDH
- Motor: TEFC (Suitable for CL 1 DIV 2)

Water inlet piping to pump to contain the following components:

- Ball valve

Water discharge piping to contain the following components:

- Pressure gauge
- Sample port
- Check valve
- Water recirculation line with pressure relief valve
- PVC piping to be terminated outside of enclosure

Please note:

a) The recirculation line will include a pressure relief valve in lieu of a gate valve. This way, no manual manipulation of the valve is required on the recirculation line for pressure relief.

b) Often, a demisting element is included just before the discharge of the vapour stream from the VLS to increase the liquid removal efficiency of this unit from 96% to 99.9%. Pricing for this feature can be provide upon request. Please contact Newterra to discuss further, if necessary.

Soil Vapor Extraction Blower:

Busch Mink MM 1402 2L rotary claw blower with a 15 HP 208-230/460V/3P motor:

- Motor: TEFC (Suitable for CL 1 DIV 2) (VFD controlled) (inverter duty)
- Max performance at inlet of system: 277 CFM at 24" Hg vacuum
- Blower RPM: 3600
- Discharge temperature: 154F at an inlet of 100F

Inlet piping to blower to contain the following components:

- Vacuum gauge
- Solberg inlet filter/silencer
- Vacuum gauge
- Temperature gauge
- Newterra PFLOW pitot tube flow indicator and transmitter
- Sample port
- Low vacuum alarm switch
- Dilution line to contain:
    - Solberg filter/silencer
    - Ball valve
    - Vacuum gauge
    - Temperature gauge
    - Vacuum relief valve
    - 2" PVC piping

Discharge piping from blower to contain:

- Discharge silencer
- Sample port
- Pressure gauge
- Temperature gauge
- Newterra PFLOW pitot tube flow indicator
- 2" Steel piping

Heat Exchanger:

Xchanger model AA-250 with a 1 HP 208-230/460V3P motor:

- Motor: TEFC
- Air flow: 160 SCFM
- Air pressure: 1 PSI
- Pressure drop: 0.1 PSI
- Mounted on the wall and vented to outside through a weather hood for additional ventilation

Air discharge piping from heat exchanger to contain the following components:

- Three valve bypass
- Condensate trap with solenoid valve for auto drain
- Pressure gauge
- High pressure switch
- Temperature gauge
- High temperature switch

- Sample port
- Tee with valve for oxidizer or VPC use
- 2” Steel piping

Vapor Phase Carbon Filtration:

Two (2) TIGG N250 contactor vessels with:

- Dimensions – 32” (D) x 43” (H)
- 250 lbs of vapor phase carbon per vessel
- Pressure gauges on the inlet to each vessel
- Sample ports on the discharge from each vessel
- Temperature gauge between the vessels
- Three (3) flex hoses (each 10’ in length) with cam lock fittings

Water Storage Tank:

55 G single wall drum with:

- Ventilation stack
- High level alarm switch
- Manual drain with valve

System Enclosure:

MET US certified, built to NEC Class 1 Div 2 standards, all wiring intrinsically safe and all equipment pre-piped factory tested and mounted in enclosure

8’ x 20’ **used** modified shipping container with the following standard features:

- Exterior white paint
- Lifting eyes on upper corners
- Plywood floor coated with gator guard epoxy coating
- Insulated walls and ceiling
- Barn-style rear double doors
- Single entry side door
- Control panel mounted to exterior
- Hold down tabs on container exterior
- Lightning protection system as per NFPA lightning protection code 780

Interior to contain the following:

- Vacuum extraction system
- Lighting
- Fan with Class 1 Division 2 rating
- Passive vent louvers with weather hood
- Emergency stop switch
- Temperature transmitter

Please note:

a) Sump with level switch, LEL monitoring, temperature monitoring, fire extinguisher and many other options available upon request. Please contact Newterra to discuss, as required.

b) Typically, Newterra only insulates the floor in very northern climates, and therefore has not included provisions to insulate the floor in this base bid. However, Newterra can provide pricing for this option upon request. Please contact Newterra to discuss, as necessary.
c) Newterra reserves the right to modify the enclosure size as required to minimize footprint or to allow for unanticipated maintenance space.
d) 20' containers come with one set of fork pockets on the long side of the container only. Additional pockets would not be added. Customer could lift the container via crane if not wanting to lift from fork pockets.

Control System:

PLC based control panel with the following standard features:

- MET certified to the UL 698A standard
- NEMA 3R panel enclosure
- Panel box ventilation fan
- Panel box ventilation louver
- NEMA 3R Fused main disconnect
- Surge and lightning arrestor for control system
- Main power block
- Combination motor starters with overload and short circuit protection
- 120V/1P power transformer
- Branch circuit protection with circuit breakers for powered devices and control system power
- Allen Bradley MicroLogix PLC control system with 20% spares on cards
- 24 VDC IS power supply
- Intrinsically safe barricades
- Variable frequency drives with line and load reactors for:
    - SVE blower motor
- Ethernet switch
- Duplex 15 Amp GFI receptacle (located beneath panel)
- Wired and installed
- Factory tested prior to shipping

Outside cover of inner swing panel to contain the following:

- HOA switches with green run lights (contained within touchscreen)
- Red alarm indicator light
- Programmable 7" user display/touch screen with:
    - Color P&ID display
    - Display of measurements recorded from any transmitters present in system
    - System on/off control
    - Safety control over all valves and motors with timed delay when in Hand position
    - Door HOA's do not contain the safety delay when in Hand position
    - Timers for automated valves present in system (if applicable)
    - Programmable 24 hour on/off cycling timer programming
    - Alarm indicators with reset function
    - Run indicators for system components
    - Run time display of motors
    - Adjustment of system setpoints
    - USB port for datalogging download (USB key included)
- Emergency stop button

Please note:

a) An Arc-Flash study is an analysis done between the source of supply for the enclosure and the enclosure itself and therefore not typically included with an equipment vendor's scope of supply. Newterra will provide electrical documentation about the system in order to assist with the completion of the Arc Flash study, however the Arc Flash study is the responsibility of others.
b) Customer to provide accounts and network connection for VPN.

Operation and Maintenance Manual

- Operating instructions for all treatment system components
- Copy of operating manual for each piece of equipment (Digital copy only)
- Summary of system components
- Summary of system operation principles
- Summary of operation controls and fail safes
- Summary of maintenance requirements for each piece of equipment
- Digital only provided
- All documentation provided in English

Services Scope

System Startup/Commissioning

Typical System Startup/Commissioning includes the following:

- Equipment check
- Electrical, mechanical, and controls
- Functional test
- Equipment and control system
- Hydraulic test

Training

On-site operator training including the following topics:

- General system theory & process
- Specific system instruction
    - Components
    - Controls and operating philosophy
    - Alarms and alarm troubleshooting
    - Maintenance
    - Troubleshooting

Customer's Scope of Supply

Newterra does not include the following unless expressly detailed in this proposal:

- Installation of loose shipped tanks and equipment supplied by Newterra
- Placement and anchoring (if required) of equipment
- Stairs, access platforms, etc. as required
- Interconnecting piping supply and installation
- Interconnecting electrical and controls supply and installation including connection inside Newterra's panels
- Junction boxes for shipped loose equipment in external tanks
- Conduit penetrations into Newterra enclosure for field devices into Newterra panels
- Electrical power supply to our electrical panel, lightning, grounding, etc.
- Permitting
- Potable water supply to the plant site
- Wastewater testing
- Chemicals supply and storage
    - NOTE: Based on local regulations, additional safety equipment may be required to store and handle chemicals on the site which have not been included as part of this proposal. This may include but be limited to: eye wash stations, safety showers, spill containment, secondary containment, isolation curtains, isolated ventilated bulk storage buildings, personal protective equipment, constant ventilation systems, vapor suppression equipment, and spill containment equipment. Newterra can provide pricing for these options upon request.
- Treated effluent and waste sludge disposal
- All civil work including design
- Tank sizing as per Newterra supplied PFD, to be confirmed during detailed design
- Anything not mentioned in "Scope of Supply" above

Customer Responsibilities

Scope
Installation of all media (filtration media, ion exchange media…etc.), if applicable
Heavy equipment such as cranes, forklifts, man-lifts, trucks
Equipment off-loading at site
Equipment/System placement, levelling, erection and installation
Electrical utility connection to system/equipment
All piping/wiring to interconnect Newterra equipment with existing onsite equipment, field piping, factory piping, and utility connections
If skid mounted/loose equipment - all interconnecting piping materials & labor between Newterra skids/equipment.
If skid mounted/loose equipment - all interconnecting wiring materials & labor between Newterra junction box/equipment and control panel.
Installation of Newterra provided accessories
Supply and installation of all walkways, stairs, pipe supports or hangers, ladders, etc. which is not described in proposal
Utilities required to operate system including power, water and instrument air as required.
All civil work including foundations, footings, anchor bolts, additional pipe stack supports and any other civil work required for system placement and functionality.
Consumables such as chemicals for initial startup
Additional safety equipment may be required to store and handle chemicals on the site which have not been included as part of this proposal. This may include but be limited to: eye wash stations, safety showers, spill containment, secondary containment, isolation curtains, isolated ventilated bulk storage buildings, personal protective equipment, constant ventilation systems, vapor suppression equipment, and spill containment equipment.
Treated effluent and waste disposal
Obtaining all local, state/provincial or federal permits and approvals as required for system/equipment installation and operation
On/Off-site and/or special analytical testing including laboratory testing of samples from the system if required
Anything not specifically mentioned in scope of supply detailed above

Newterra Digital Service

Remote Data Collection and Analysis Technology

Welcome to Newterra Digital Service!

Newterra Digital Service™ is an advanced cloud-based data acquisition and customer portal for monitoring the operation of Newterra Systems and equipment in real-time. Accessible from any device with internet access, you can monitor all aspects of your systems, keep your team connected, and optimize performance with ease.

Services Offered	Access	Access & Control
Remote Software Updates	✔	✔
Unlimited Users	✔	✔
Historical Data Logging	✔	✔
Email Alarm Notifications – First Tier	✔	✔
Email Daily Reporting	✔	✔
System Documentation Access *(Manual, P&ID, Electrical)*	✔	✔
Newterra Experts Upon Request	✔	✔
Control System Remotely – Full Control of HMI		✔

Key Features and Benefits

- Real-time visibility to system performance
- Real-time system control
- Alarm notifications
- Mobile app
- Current operational data and historical trends for data analysis
- Security with multi-level user access
- Maintenance logs
- Direct connection to Newterra's Technical Service team

Why Choose Newterra Digital Service™?

Investing in Newterra Digital Service™ offers numerous benefits that enhance the efficiency and longevity of your water treatment systems. Here's why you should consider incorporating this advanced service into your operations:

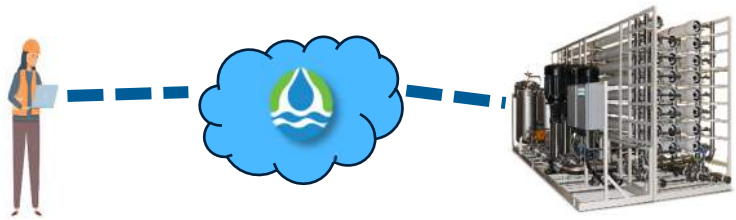
1. **Reduced System Downtime**: With real-time monitoring and alerts, potential issues can be identified and addressed promptly, minimizing system downtime and ensuring continuous operation.
2. **Reduced Operator Visits**: Remote access to system performance data means fewer on-site visits are necessary, saving time and reducing operational costs.
3. **Better System Performance**: Access to current and historical operational data allows for detailed analysis and optimization, resulting in improved system performance and efficiency.
4. **Increased Equipment Lifespan**: Proactive maintenance and timely interventions help extend the life of your equipment, protecting your investment and reducing long-term costs.
5. **Enhanced Security**: Multi-level user access ensures that only authorized personnel can access critical system data, maintaining the integrity and security of your operations.
6. **Comprehensive Support**: Direct connection to Newterra's Technical Service team provides expert support and guidance, ensuring your systems operate at their best.
7. **Convenient Access**: The cloud-based portal is accessible from any device with internet connectivity, giving you the flexibility to monitor your systems from anywhere, at any time.

By choosing Newterra Digital Service™, you are not just opting for a monitoring solution; you are empowering your team, optimizing your operations, and securing the future of your water treatment systems.

Elevate Your Operations with Newterra Digital Service™

Good news! Your system will be built with the hardware for Newterra Digital Service™ included giving you the opportunity to elevate your operations, empower your team, and ensure the longevity of your systems with our state-of-the-art digital solution. It's easy, during startup Newterra will set up your free 1-year subscription of Control and Access services.

For added peace of mind, you have the flexibility to use the built-in VPN security switch on the device to disable outside-in connections, ensuring that the Newterra Digital Service™ can be tailored to meet your site's specific security requirements.



Engineering Submittals

Initial Documents for Approval:

Mechanical Process and Instrumentation Diagram

- Schematic diagram describing Newterra's mechanical equipment scope of work including:
  - Equipment modules
  - Piping types and sizes
  - Manual valves
  - Automated valves
  - Gauges
  - Switches
  - Transmitters
  - Battery limits
  - motors
- Symbol legend

General Arrangement Drawing(s) (3D)

- Overall system footprint size
- Skid(s) / Container(s) arrangement
- Depiction of equipment placement on skid(s) / in container(s)
  - Equipment modules
  - Piping routes

Control Narrative

- List of inputs and outputs
- Functional description of system control
- Description of system alarms

Electrical Single Line Diagram

- Schematic diagram describing Newterra's electrical equipment scope of work including:
  - Motors
  - Control valves
  - Main disconnect with fuse voltage and amperage rating
  - Heaters, vent fans for containers

System Electrical Load List

- Full load amperage for the system
- Total kVA for the system
- List of electrical loads for each voltage and phase

Bill of Materials

- List of components to be included in the project
- Data sheets for components
- Performance curves

Appendices

- Equipment sizing information

Final Documents Included (other than final copies of the above submittals):

O&M Manual

- Submittals documents
- Operation instructions
- Maintenance guidance
- Startup and shutdown procedures
- Factory acceptance testing reports
- System component data
- As built level system drawings

Electrical Schematic Drawings

- Circuit schematics
- Panel layouts
- Network diagram

Advantages of a Newterra Remediation System

PRICE: We understand that the capital cost of the system is important; therefore, we have provided you with a system at the lowest cost possible while maintaining the engineering/manufacturing standards that built our reputation in the industry.

SERVICE AND SUPPORT AFTER SHIPMENT: The infrastructure we have to support you include: a field service team located throughout North America; an internal technical support staff ready to answer your calls; an inventory of replacement parts and consumables available for next day delivery; a sophisticated web-based telemetry and controls system that facilitates troubleshooting remotely; and we have a team that will provide various levels of training depending on your needs.

COMMITMENT: We understand that our performance will have a direct impact on your success with your client. We are extremely committed to ensuring that you are successful, this means that if we make a mistake we will do whatever it takes to resolve the problem immediately.

4 Terms, Conditions, Warranties, and Guarantees

Terms and Conditions

1. PURCHASE ORDER:
   Newterra ("Seller") will initiate work upon written acceptance of a complete order from a purchasing party ("Buyer"). A complete order includes a signed purchase order which includes the overall price of system and scope of supply, purchase order number, payment terms, billing and shipping addresses, Tax Identification Number.

2. APPLICABILITY / SCOPE:
   All goods and services provided shall be governed by the terms and conditions set forth herein. Any modifications to these terms or to the scope of any purchase order or project hereunder, shall be mutually agreed upon and set forth in writing executed by both parties. Such writing shall clearly set forth the nature and extent of the change, and, if applicable, any adjustment in price associated with such change.

3. SCHEDULE:
   The Seller's estimated delivery schedule is included in the proposal and may be affected by manufacturing loading at the time of order unless the proposal is based on a firm schedule as noted. If the approval to proceed with ordering material is not given within twenty-one (21) days of execution of this order, Seller reserves the right to adjust the sell price of this Purchase Order based on actual increases incurred from its Suppliers due to the delay in the project schedule.

   Upon receipt of Purchase Order, unless the proposal is based on a firm schedule as noted, Seller and Buyer shall agree to a schedule and timeline for provision of engineering documentation, unless otherwise agreed to in writing.
   In the event of Buyer caused delay, Seller shall be entitled to readjustment of schedule based on the impacts due to the delay. Seller shall advise Buyer, in writing, of the revised schedule. Seller shall be entitled to compensation from all costs associated with Buyer caused delay.

4. CREDIT APPROVAL:
   All new purchase orders are subject to mandatory credit approval for first time Buyer and discretionary credit approval for repeat Buyer (credit approval form available from Seller upon request). Should Seller learn of any information that causes Seller concern about Buyer's ability to perform any of its obligations owing to Seller under a Purchase Order, Seller has the right to request Buyer to provide Seller adequate assurance of due performance on such terms as are deemed reasonable by Seller when acting in good faith, including the right to demand full or partial payment from Buyer as demanded by Seller, or the right to adequate surety.

5. TELEMETRY SERVICES AGREEMENT:
   A Telemetry Services Agreement must be completed for all system orders that include a Seller Remote Telemetry and Communication Package. The Telemetry Services Agreement is required to activate the services listed in the proposal (Telemetry Service Agreement available from Seller upon request).

6. PRICING/TAXES:
   The price to be paid by Buyer shall be mutually agreed upon by the parties and set forth in writing. Unless otherwise agreed to, prices quoted do not include any State, Provincial or local sales or use tax, special fees, duties, tariffs or custom fees, freight and handling charges, or export crating costs that may be added to the price at invoicing. The Buyer agrees to make payments as described herein. If Seller is subjected to any such fees in connection with this sale or the delivery; the same shall be added to the purchase price and Buyer shall be responsible for paying that tax or reimbursing Seller therefore within 30 days. If Buyer is Tax Exempt, valid documentation in the form of an applicable tax-exempt certificate or direct pay permit must be provided at time of Purchase Order to be considered.

7. PAYMENT CONDITIONS:
   All orders require payment in advance unless credit has been established. Payment shall be made in the currency quoted without discount. Minimum billing amount is $100. Shipments outside of the U.S.A. and Canada shall be prepaid or drawn from an irrevocable Letter of Credit.

   Processing fees may be assessed for additional costs incurred for credit card charges, returned checks, Letters of Credit, or other bank charges. Wire transfers should be initiated with all bank charges paid from the account of the Buyer. Seller reserves the right to specify the method and/or timing of payment (including prior to shipment).

The Seller will be entitled to a late penalty calculated at a rate of 1.5% per month (18% per annum) or if lower, at the maximum rate permitted by law, for any payment not made by the date due. If legal proceedings are instituted for collection of overdue accounts unpaid after 30 days, the Buyer will be liable for all costs adjudged by the court, including court costs and reasonable attorney fees.

If the Buyer disputes any portion of an invoice, they shall notify Seller in writing with specific details and pay the undisputed portion as per the executed purchase order. Buyer shall reimburse all costs incurred in collection of past due amounts including but not limited to attorney's fees, court costs and collection fees incurred by Seller.

At Seller's option, Letters of Credit will be accepted by Seller when compliant with the following: The Letter of Credit must (a) Be IRREVOCABLE and CONFIRMED by a U.S.A. or Canadian bank; (b) Be in favor of Seller; (c) State payment is by site draft payable; (d) State that ALL bank charges, including those outside the country of origin, are to be applied to BUYER'S account; (e) Must state Ex-Works, point as factory unless terms of Pro Forma Invoice specify otherwise, (f) Be advised through a class A bank and show Buyer as applicant for the Letter of Credit.

8. SHIPPING & DELIVERY TERMS:
Unless otherwise specified in the Seller Proposal, Incoterms® 2020 are:

(a) EXW Seller Facility.

(b) DAP <delivery location> (if freight is included as specified in Seller Proposal)

9. ACCEPTANCE:

(a) Buyer shall inspect all shipments of equipment or other goods within 10 days of receipt and shall promptly notify Seller of any specific defects or non-conforming goods. The parties acknowledge that acceptance of any goods supplied hereunder shall be deemed to have occurred if Buyer fails to notify Seller of any such defects or non-conforming goods within 10 days of the date of receipt. The parties acknowledge that acceptance of any services provided hereunder shall be deemed to have occurred if Buyer fails to notify Seller of any defects or non-conformance in such services within 10 days of the date the services were completed;

(b) For any order hereunder which requires Seller's involvement in the installation, start-up, check-out and/or commissioning of any Seller equipment or system, the parties acknowledge that system acceptance shall be deemed to have occurred upon completion of the startup and checkout of the system, or upon beneficial use of the system by Buyer, whichever occurs first.

10. OPERATIONAL AND MAINTENANCE PROCEDURES:
Buyer acknowledges that any improper use, maintenance, or modification of the equipment provided hereunder, or use of unqualified maintenance or service technicians will severely impair the operational effectiveness of the entire system. Buyer hereby agrees to indemnify, defend and hold harmless Seller from and against any and all third-party claims arising, in any manner, out of: (a) Buyer's neglect of the equipment; (b) Buyer's use of technicians not authorized by Seller to service the equipment; or (c) Buyer's improper use or modification of the equipment or failure to follow the operational and maintenance procedures provided with the equipment.

11. SYSTEM STORAGE AFTER COMPLETION:
If Buyer is unable to accept equipment at the time of readiness, or at the Buyer's request, storage of completed systems may be provided. If Seller has space at its facility, storage will be charged at a rate of 0.5% per month accruing after the initial 30 days. If off-site storage is required, the per month rate will be the greater of 0.5% or actual warehouse and transportation costs, +20% administration fee.

The warranty period will start upon the original date of notice of readiness to ship. Any invoices due for payment that are subject to the shipment of the system will be initiated and subject to payment based on the date of notice of readiness to ship.

If the system is stored, transfer of title will occur immediately to Buyer upon entry into storage. Risk of Loss will transfer as per Incoterms® of the original contract.

12. CHANGE OF LAW OR REGULATIONS
Any change of laws, regulations, or another governmental requirement that causes an increase in the cost of producing or delivering the Products or which occurs after Seller accepts an order is not in the price. Any new or additional tariffs, duties, or surcharges are not included in the price of the goods and/or services and are the responsibility of the Buyer. Seller reserves the right to require that the Buyer pays for any new or increased tariff, duty, or surcharge prior to the delivery of the goods and/or services. Buyer assumes the risk of changes in the law, regulation, or other governmental requirements; Seller does not assume the risk of new or higher tariffs, duties, or surcharges.

13. TECHNICAL ASSUMPTIONS:

This proposal and pricing are based on Seller's interpretation of the sections of any RFP or specification that have been made available to Seller. Exceptions have been noted wherever possible. In the event of a conflict between the language in the specification or the proposal, Buyer agrees that the language in the proposal takes precedence and is the basis of the proposed pricing and scope.

14. HEALTH & SAFETY:
Any health and safety requirements, training or certification needs for entering a project site must be communicated at the time of Order. It is the Buyer/Owner's responsibility to ensure that field technicians operating on live panels are informed and equipped with the appropriate PPE.

15. APROVALS, PERMITS & INSPECTIONS:
Obtaining any required site permits (i.e. building) is the responsibility of the Buyer/Owner; the Seller is not responsible for any such items unless otherwise specified in the proposal.

All required site inspections including, but not limited to electrical, building and fire are the responsibility of the Buyer/Owner; the Seller is not responsible for any such items.

16. WARRANTY:
Refer to separate warranty document(s) attached hereto and incorporated herein as if set forth in full.

17. CONFIDENTIAL & PROPRIETARY INFORMATION:
Buyer acknowledges that the information and processes utilized by Seller in the design, manufacture, and supply of its products and systems are confidential and proprietary to Seller. Buyer agrees to treat as confidential and proprietary any such information or processes, including, but not limited to, design information or data, proposals, software, schematics, drawings, operational and maintenance manuals, testing procedures or other similar technical information ("Confidential Information") provided by Seller in connection with the supply or installation of products or systems hereunder, and will, at a minimum, protect any such confidential Information in a manner commensurate with the measures taken to protect Buyer's own confidential or proprietary information. Seller retains all rights, titles and interests in all such Confidential Information and Buyer shall not use or otherwise disclose to any third party any such Confidential Information except to the extent authorized by Seller in writing.

18. INTELLECTUAL PROPERTY RIGHTS:
Excepting for the benefit of air and/or water treatment as contemplated by the design of the equipment, all rights, benefits from any value received as a result of the use of intellectual property, equipment, information or advice provided by Seller remain the sole property of Seller, specifically, including, but not limited to, as it may relate to carbon or water credits, etc.

The Seller retains any and all intellectual property rights in and to the equipment, services, and/or information supplied hereunder (including, but not limited to, patents, copyrights, trademarks and trade secrets) ("Intellectual Property").

Buyer is not granted any interest, right, or license with respect to any such Intellectual Property, except to use the equipment, services and/or information for the purposes for which it is specifically provided to Buyer in accordance with the terms and conditions hereof.

Seller shall indemnify and hold Buyer harmless from and against all third-party claims of infringement or alleged infringement arising out of Buyer's use of any equipment, services, or information supplied by Seller hereunder. Provided, however, that Seller's indemnity obligation hereunder shall not apply to, and Seller shall not be responsible for, any claims to the extent arising out of Buyer's modification of Seller's equipment, services or information, or use of such equipment, services or information: (a) in combination with equipment, services or information not supplied by Seller, or (b) in the operation of any process or in any other manner inconsistent with the purpose for which Seller's equipment, services or information were intended.

Unless specified, programming for Seller's custom equipment and systems is proprietary and will remain the property of Seller and is not available for distribution to Buyer or others at any time.

19. INSURANCE:
Each party shall provide and maintain at its own expense, such policies of insurance in such amounts as are appropriate and commercially reasonable for parties engaging in the type of activities contemplated by the projects entered into hereunder. Upon request, each party shall furnish the other with certificates evidencing the required insurance coverage.

20. BUYER INDEMNIFICATION:
To the fullest extent permitted by law, Buyer hereby agrees to protect, defend, indemnify and hold harmless Seller and its affiliates, managers, shareholders, directors, officers and employees from and against all losses and damages incurred and all liability to others and all claims, causes of action and suits, for personal injury, including death or property damage arising out of the acts or omissions of Buyer

or Buyer Parties. Buyer agrees to pay all costs and expenses paid or incurred by Seller in enforcing its rights hereunder, including without limitation, attorney's fees, and court costs.

21. SELLER INDEMNIFICATION:
To the fullest extent permitted by law, Seller hereby agrees to protect, defend, indemnify and hold harmless Buyer and its affiliates, managers, shareholders, directors, officers and employees from and against all losses and damages incurred and all liability to others and all claims, causes of action and suits, for personal injury, including death or property damage to the extent such is caused by the negligent acts or omissions of Seller or Seller Parties. Seller agrees to pay all costs and expenses paid or incurred by Buyer in enforcing its rights hereunder, including without limitation, attorney's fees, and court costs.

22. LIENS:
Seller shall promptly pay for all materials, supplies and labor employed by it in providing the goods and/or services hereunder, such that any equipment or system supplied to Buyer remains free of materialmen's, warehousemen's, mechanics', and any other similar liens. Seller reserves all rights hereunder to file notice and execute liens in the event Buyer breaches it obligations in the proposal, Purchase Order, or as set forth herein. Any executed lien waiver, release claim, or payment application executed and submitted by Seller shall not serve to waive Seller's right to pursue a lien claim for previously noticed, reserved, or filed claims.

Seller reserves all rights hereunder to file notice and execute liens in the event Buyer breaches it obligations in the proposal, purchase order, or as set forth herein. Any executed lien waiver, release claim, or payment application executed and submitted by Seller shall not serve to waive Seller's right to pursue a lien claim for previously noticed, reserved, or filed claims.

23. NON-WAIVER:
The parties' failure to demand strict performance or to otherwise enforce any rights hereunder shall not constitute a waiver of any rights hereunder. No claim arising out of a breach hereof may be discharged in whole or in part by a waiver of the claim unless supported by consideration and set forth in a writing signed by the waiving party. Any such waiver shall apply to the specifically identified claim only and shall in no way constitute a waiver or discharge of any other prior or subsequent claim.

24. BREACH/DEFAULT:
In addition to any failure to comply with any other term or condition as set forth herein, the occurrence of any of the following events shall constitute a breach/default on the part of Buyer: (a) If Buyer shall become insolvent or make a general assignment for the benefit of creditors; (b) If a petition for Bankruptcy is filed by or against Buyer; (c) If, at any time Buyer fails to fulfill its obligations under the terms and conditions hereof, or acts in such a manner as to endanger performance of such obligations; (d) If Seller shall reasonably believe that Buyer will not timely fulfill its obligations, including payment or otherwise perform hereunder, and Buyer is unable to provide reasonable assurances that such timely performance will occur.

Upon breach/default by Buyer, Seller may terminate the contract or agreement by giving notice to the Buyer. Such termination may be effective immediately at the sole choice and discretion of Seller. In the event of a breach and contract termination, Buyer is still responsible for all costs incurred by Seller.

25. SUSPENSION:
If any project or order, for which Seller is to supply goods and/or services hereunder, is requested to be suspended by Buyer for any reason other than a breach by Seller, Seller shall cooperate with Buyer in rescheduling any planned or ongoing work, and in otherwise complying with the suspension instructions. However, Buyer must provide reasonable written notice to Seller for any requested suspension. Seller shall reserve the right to adjust the scheduling, pricing, and/or billing due to any impact of the approved suspension. Provided, however, that in the event of any such suspension which continues for a period of 90 days, Seller shall be entitled to terminate that order, without any further liability or obligation of Seller thereunder. Seller, may by written notice to Buyer, suspend this order due to any of the following: (i) Buyer fails to perform in accordance with the delivery schedule; (ii) Buyer fails to properly pay Seller for any properly submitted invoices; (iii) Buyer has breached or otherwise failed to comply with any provision of this order that is capable of being cured and Buyer does not cure the same within a period of five (5) calendar days after receipt of written notice from Seller.

26. TERMINATION FOR CAUSE:
Should Buyer be in breach under this project or order, Seller shall have the right, as well as all other rights per the applicable law to request to terminate all or part of any undelivered or unperformed portion of this Purchase Order by reasonable written notice to Seller. Upon receipt of such notice, Seller shall immediately stop delivery or work on the portion of the order terminated or canceled. In the event of such termination, Buyer shall be liable for the value of the work performed, materials received, and any materials not received that cannot be cancelled, prior to the time that notice of termination is given.

27. TERMINATION FOR CONVIENENCE:

If any project or order, for which Seller is to supply goods and/or services hereunder, is terminated in agreement with the provisions of these terms and conditions, Seller shall be entitled to charge 25% of selling price if canceled prior to incurring related engineering, drafting, and production time. If engineering and/or drafting time has been incurred, 40% of the selling price will be charged to the Buyer. If materials have been received, or materials not received cannot be cancelled, and/or production time has been incurred, 100% of the selling price plus additional costs incurred will be charged to the Buyer who placed the order. Additional costs incurred as a direct result of termination may include, but are not limited to, freight and storage charges, costs of labor, transportation, travel and living expenses for support, overhead and profit, and reasonable attorney fees.

28. FORCE MAJEURE:
Neither party shall be liable for any cost increase, failure or delay in its performance resulting from any cause beyond its reasonable control including, but not limited to, acts of God; acts or omissions of civil or military authority; fires; floods; unusually severe weather; strikes or other labor disputes; embargoes; wars; political strife; riots; epidemic; pandemic; changes in laws, delays in transportation; sabotage; or fuel, power, material or labor shortages.

29. LIMITATION OF LIAIBLITY:
Under no circumstances whatsoever will Seller be responsible for liquidated, indirect, special, incidental or consequential damages including, but not limited to, lost business, overhead, loss of use of property, delay, damages, lost profits or third party claims, whether foreseeable or not, even if Seller has been advised of the possibility of such damages in connection with the delivery, installation, use or performance of the equipment or the provision of maintenance services by Seller regardless of whether such claims are alleged to have arisen out of breach of warranty, breach of contract, stricter absolute liability in tort, or other act, error or omission or any other cause whatsoever, or any combination of the foregoing.

Under no circumstances whatsoever will Seller be responsible for direct damages in excess of 50% of the contract value.

30. ASSIGNMENT:
The rights and responsibilities of the Buyer as set forth herein are personal to the Buyer and may not be assigned or delegated without the prior written consent of Seller.

31. APPLICABLE LAW / DISPUTES:
Buyer acknowledges that the “Terms” from the Contract are deemed to be made in Pennsylvania for transactions in the U.S.A. and in Ontario for transactions in Canada, and that Buyer, in relation to this project, is deemed to be transacting business in Pennsylvania (U.S.A. transactions) and Ontario (Canadian transactions). It is the expectation of the parties that any disputes arising hereunder, whether in contract, tort or otherwise, will be amicably resolved by mutual agreement of the parties.

Any dispute, involving the supply of goods or services within the U.S.A. or Canada, which cannot be amicably resolved by the parties, shall be submitted to binding arbitration in accordance with the applicable rules and regulations of the Canadian Arbitration Association for Canadian contracts or the American Arbitration Association for U.S.A. and all other contracts. The substantive law of Pennsylvania for U.S.A. contracts or Ontario for Canadian contracts shall apply to any such arbitration, which shall be conducted in Pittsburgh, Pennsylvania (U.S.A. contracts) or Ottawa, Ontario (Canadian contracts).

Nothing herein shall be construed as preventing Seller from enforcing any claim or right to a mechanic’s lien or any claim or right against a bond regardless of where such a claim must be filed or enforced.

Warranty

This Warranty Agreement is between Newterra Corporation, Inc., or Newterra Ltd. (known as Newterra) and the customer (known as the Buyer).

General Warranty Statement

1. Newterra warranties those products of its manufacture against defective workmanship or material for a period of 12 months from startup or 18 months from the date of notice of readiness to ship, whichever comes first.
2. Newterra warranties “Aire-O2 Triton”, “Aire-O2 Standard Aspirator”, “Aire-O2 Halo Splasher” products of its manufacture against defective workmanship or material for a period of 36 months from the date of notice of readiness to ship.
3. This warranty is expressly and strictly limited to replacing, without charge (see Warranty Exclusions), any part or parts which proven to Newterra’s satisfaction upon examination, to have been defective in design, material or workmanship, and which have not been neglected, abused or misapplied, provided the Buyer gives Newterra immediate written notice upon discovery of any claimed defect.
4. During the warranty period, parts will be shipped as necessary with instructions to replace, which can be further elaborated over phone or email; visit(s) of our technician to site can be covered if there is a service agreement in place; otherwise, actual charges will be quoted to the owner at that time, if required.
5. Newterra will also warranty those component parts manufactured by others to the extent of the original manufacturer’s warranty. In any case, specific components warranties will be extended a minimum of one year from date of notice of readiness to ship.
6. Membranes, if used, will be covered under separate warranty statement.
7. This warranty shall not be construed as a fitness of purpose warranty nor a performance warranty.

Warranty Exclusions

8. Warranty coverage does not include:
    a. Freight, labor, travel, and living expenses associated with parts replacement
    b. Normal maintenance items such as lubrication, fan belts, and cleaning of the equipment
    c. Consumable items such as filters and reagents.
    d. Replacement of items due to normal wear and tear
    e. System parts damaged because of Buyer changes to the system and/or PLC program without the written consent of Newterra.
    f. System electrical components or motors damaged by inconsistent power, voltage fluctuations and/or frequent power failures.
9. If the Buyer, or any contractor employed by the Buyer, contracts an outside company, other than Newterra for modification of system equipment, without knowledge of Newterra, the warranty coverage will be denied.
10. If the Buyer, or any installation contractor employed by the Buyer, contracts outside Newterra for installation work or erection of quoted equipment, the Buyer shall assume full responsibility for said contract.
11. The warranty shall not cover normally scheduled preventative maintenance or maintenance services listed in O&M Manual unless specifically contracted with Newterra.
12. If Newterra’s Supplier assesses a part evaluation fee as part of their warranty claim assessment process, then the Buyer will be required to pay this fee. All parts must be returned to Newterra, transportation prepaid, unless other arrangements have been pre-approved by Newterra.

Warranty Validation

1. Newterra requires that the system be commissioned by a Newterra factory trained technician unless specifically authorized by Newterra. Newterra authorization will be dependent on the qualifications of the Buyer’s / contractor technicians.
2. Warranty validation is conditional upon timely receipt of:
    a. Signed Installation Checklist – by authorized Buyer representative, if not Newterra.
    b. As built Site drawings – by authorized Buyer representative, if not Newterra.
    c. Signed Pre-Commissioning Checklist – by authorized Buyer’s representative, if not Newterra.
    d. Signed Commissioning Checklist – by authorized Buyer’s representative, if not Newterra.
3. If the warranty validation requirements are not followed, Newterra reserves the right to deny warranty coverage.

Warranty Conditions

1. The system must be maintained and serviced in accordance with the schedule and procedures listed in the system O&M Manual. Failure to follow Newterra’s recommendations may result in a denial of warranty coverage. Newterra reserves the right to review maintenance records as part of the warranty claim assessment process.

5 Newterra Lifecycle Solutions

Robust Support and Complete Lifecycle Solutions: Call us at 1-800-420-4056

Newterra Lifecycle offerings are here to assist with maintaining your water treatment equipment every step of the way by offering OEM Spare Parts & Consumables customized to suit your needs, alongside a team of support staff dedicated to providing top level services for the life of your system. Not Just Technologies. Lifecycle Solutions.

Newterra Parts and Consumables Support

Our Newterra Parts Team ensures seamless replacement and maintenance parts support, with a detailed list of OEM critical spares, maintenance, and consumable parts provided in your Operations & Maintenance Manual. We're dedicated to meeting your parts requirements to ensure long-lasting equipment solutions. Whether your system needs regular maintenance or requires consumable parts for optimal performance, we have you covered. Our Customer Experience Team is here to assist you in identifying the right components based on your specific challenges. Let us connect you with one of our specialists to find the perfect solution tailored to your needs.

Technical Service Support

Our dedicated OEM Trained Service Team is here to help support you and your equipment needs. We offer a range of water treatment services including: 1) Operations Consultations, 2) Equipment Audits, 3) On-site Training, 4) 24/7 Digital Monitoring Services, 5) Equipment Maintenance/Repair, 6) Real-time Technical Support and 7) System Upgrades. Our Technical Services Teams are here to ensure your water treatment equipment is operating optimally, maximum uptime is achieved, and costly repairs are avoided. Reach out for expert guidance and a customized solution to your specific technical service needs today.

Newterra Digital Service

Newterra Digital Services offers the integration of 24/7 web-based remote monitoring to help you increase system runtime and track performance. It provides real-time data and notifications to you and our technical support team on how your system is running or if there are any issues. The technology also provides the ability to quickly analyze the root cause and assist in determining a proper solution. Newterra Digital Services web-based remote monitoring can consist of two levels of access; read-only and system control. With control, you can have the ability to restart components from remote locations saving you time and money. The advanced digital services support will help you get the most out of your water treatment equipment and stay ahead of potential problems.

Media & Media Services

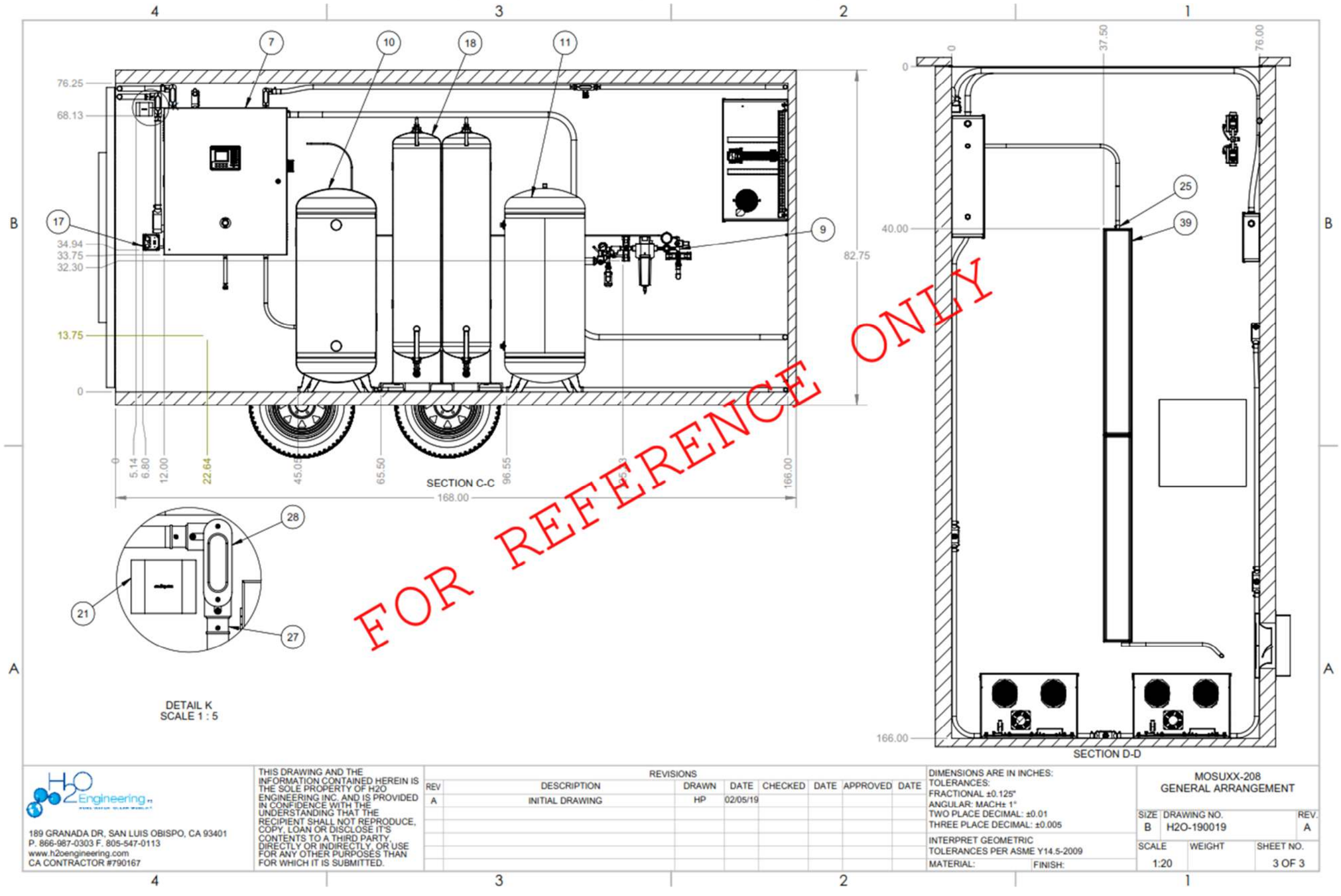
Proper media selection is crucial for efficiency, sustainability, and cost-effectiveness. Newterra leads this sector, providing a range of media solutions from bulk supplies to specialized drums, including Granular Activated Carbon (GAC) and Resin media. When your media has lost its ability to reduce contaminants, our trained professionals, backed by Newterra's experience in the design and implementation of liquid and vapor phase treatment systems, provide complete on-site services. Our trained technicians will arrive on-site and safely clean and remove vapor phase and liquid phase media or even the vessels themselves. We embrace the entire lifecycle of your system.

Rentals Solutions

For just about any water problem, Newterra has you covered. If you're looking for medium or short-term water or wastewater treatment solutions, Newterra has a large, in-stock inventory of solutions that are available to rent. From supplemental aeration to remediation systems, pressure vessels, and complete wastewater treatment systems, our temporary ownership and rental solutions can save precious capital while solving a critical need. Newterra offers flexible terms and conditions to suit any customer.

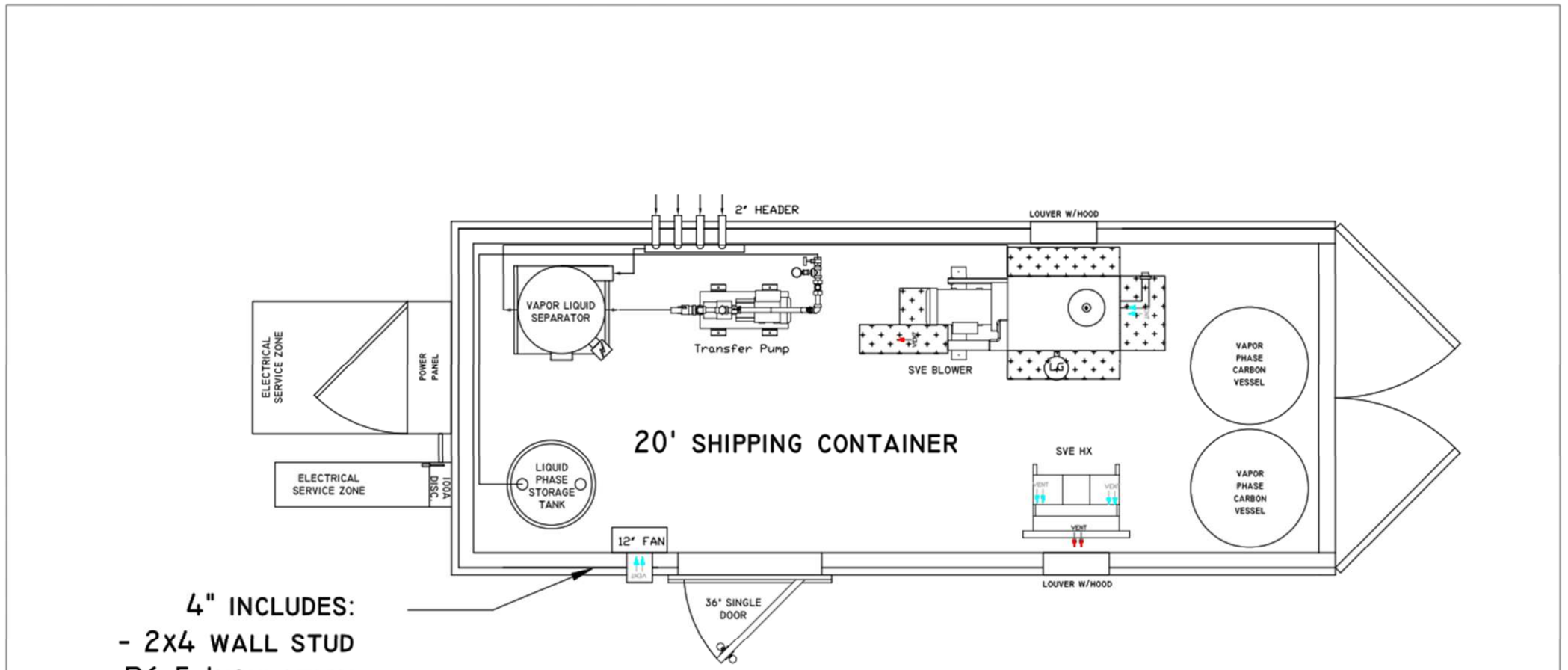
6 Appendices

Preliminary General Arrangement Drawing – Ozone Trailer



H2O Engineering	THIS DRAWING AND THE INFORMATION CONTAINED HEREIN IS THE SOLE PROPERTY OF H2O ENGINEERING INC. AND IS PROVIDED IN CONFIDENCE WITH THE UNDERSTANDING THAT THE RECIPIENT SHALL NOT REPRODUCE, COPY, LOAN OR DISCLOSE IT'S CONTENTS TO A THIRD PARTY, DIRECTLY OR INDIRECTLY, OR USE FOR ANY OTHER PURPOSES THAN FOR WHICH IT IS SUBMITTED.	REVISIONS							DIMENSIONS ARE IN INCHES: TOLERANCES: FRACTIONAL ±0.125" ANGULAR: MACH± 1° TWO PLACE DECIMAL: ±0.01 THREE PLACE DECIMAL: ±0.005 INTERPRET GEOMETRIC TOLERANCES PER ASME Y14.5-2009 MATERIAL: FINISH:	MOSUXX-208 GENERAL ARRANGEMENT	
		REV	DESCRIPTION	DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
		A	INITIAL DRAWING	HP	02/05/19				
189 GRANADA DR, SAN LUIS OBISPO, CA 93401 P. 866-987-0303 F. 805-547-0113 www.h2oengineering.com CA CONTRACTOR #790167									SIZE: B; DRAWING NO.: H2O-190019; REV.: A SCALE: 1:20; WEIGHT: ; SHEET NO.: 3 OF 3

Preliminary Layout Drawing – SVE Container



NOTES

LAYOUT DRAWING IS PRELIMINARY AND FOR CONCEPTUAL PURPOSES ONLY. FINAL GENERAL ARRANGEMENT DRAWING TO BE SUBMITTED FOR APPROVAL DURING ENGINEERING PHASE OF PROJECT.

newterra

PHONE: (800) 420-4056

www.newterra.com

LEVEL	REVISION	DATE (mm/dd/yy)	BY

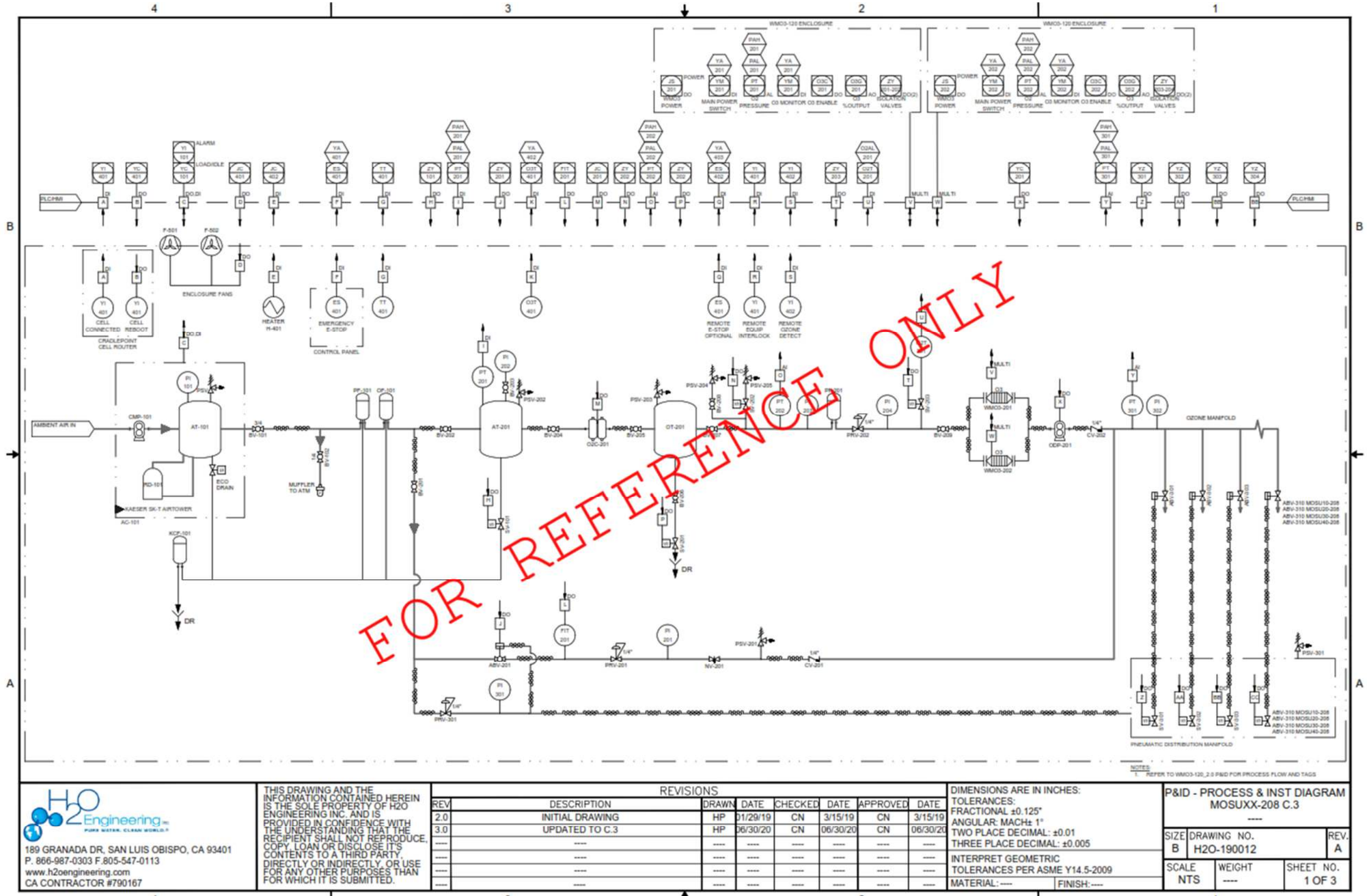
PROJECT NUMBER: 2405228

TITLE AND LOCATION: PRELIMINARY LAYOUT CHILDERSBURG SVE

CUSTOMER: PPM

DRAWN BY: TW | DATE: 5/2/25 | SHEET | SHEETS

Preliminary Piping & Instrumentation Diagram – Ozone Trailer



H2O Engineering, Inc. — PURE WATER. CLEAN WORLD.
189 GRANADA DR, SAN LUIS OBISPO, CA 93401
P. 866-987-0303 F.805-547-0113
www.h2oengineering.com
CA CONTRACTOR #790167

REVISIONS

REV	DESCRIPTION	DRAWN	DATE	CHECKED	DATE	APPROVED	DATE
2.0	INITIAL DRAWING	HP	01/29/19	CN	3/15/19	CN	3/15/19
3.0	UPDATED TO C.3	HP	06/30/20	CN	06/30/20	CN	06/30/20
----	----	----	----	----	----	----	----
----	----	----	----	----	----	----	----
----	----	----	----	----	----	----	----
----	----	----	----	----	----	----	----

DIMENSIONS ARE IN INCHES:
TOLERANCES:
FRACTIONAL ±0.125"
ANGULAR: MACH± 1°
TWO PLACE DECIMAL: ±0.01
THREE PLACE DECIMAL: ±0.005
INTERPRET GEOMETRIC TOLERANCES PER ASME Y14.5-2009
MATERIAL: ---- FINISH: ----

P&ID - PROCESS & INST DIAGRAM
MOSUXX-208 C.3

SIZE	DRAWING NO.	REV.
B	H2O-190012	A

SCALE	WEIGHT	SHEET NO.
NTS	----	1 OF 3

MK ENVIRONMENTAL INC.

765 Springer Dr
Lombard, IL 60148
615-392-7737 (office)

jgiltz@mkenv.com

QUOTATION

Date	5/1/2025
Quote No.	224050C
Reference	Kwik Shop 110
Page No.	1 of 2
Freight	Included
Terms	PWP Net 180
Ship Via	FLATBED
F.O.B.	Factory

Quotation valid for 30 days

SOLD TO:	SHIP TO:
Jeff Schexnayder PPM Consultants, Inc 5555 Bankhead Highway Birmingham, AL. 35210 205-836-5650 (office)	PPM Project No. 422603-CAPD Former Kwik Shop No. 110 33066 U.S. Hwy 280 Childersburg, AL.35044

QUANTITY		UNIT PRICE	AMOUNT
	150 amp 230 volt 3 phase 4 wire plus ground electrical service		
1	10 pound per day Ozone and Air Sparge injection system		
1	Ozone equipment refurbished enclosure or equal. Approximately 8.5'W x 12'L x 9.5'H or 8.5'W x 16'L x 9.5'H aluminum/steel enclosure secure and lockable man door on side Powered ventilation fan as needed Ambient ozone leak alarm sensor integrated with PLC		
1	Compressed air system Compressor package comes standard with: TEFC electric motor or equal Air-cooled aftercooler to reduce discharge air temperatures Full voltage motor starter (mounted and wired) Auto start/stop control Prefilter Oil filter and separator element Receiver tank		
1	Air Dryer with integrated controls and auto drain Coalescing filter		
1	Remote compressor restart option		
1	Oxygen concentrator 93% purity -100°F Dew Point The Pressure Swing Adsorption (PSA) Oxygen Generating Process		
1	Oxygen receiver tank		
1	oxygen pressure regulator		
1	inline oxygen concentration transducer integrated with PLC		
1	oxygen pressure transducer with Low and high oxygen pressure switch		
1	oxygen Rotameter for flow readings		
1	Ozone generator, 15 PSIG output pressure		
1	Compressed air sparge system pressure switch pressure regulator Motorized valve 50 PSIG output pressure, can be used for initial breakthrough, then switched over to ozone as needed		

MK ENVIRONMENTAL INC.

Jeff Schexnayder
PPM Consultants, Inc.

Date 5/1/2025
Quote No. 224050C
Reference Kwik Shop 110

QUANTITY		UNIT PRICE	AMOUNT
1	50 point distribution manifold for air, oxygen or ozone sparging stainless steel piping motorized stainless steel ball valves with PTFE seals. valve seals do not require periodic replacement Pressure gauge Pressure relief valve		
1	Master PLC control panel with HMI ◦ System controller with HMI panel for easy system operation ◦ All ozone and oxygen system operation will be controlled by HMI panel ◦ All well timing will be controlled by HMI panel with automated well switching ◦ Alarms and data can be logged ▪ HMI is connected to cellular modem for complete off-site system operation and viewing ◦ Simple one-touch start-up and shut-down of system ◦ Easy to view operation and control of system Independent time duration control for each sparge port. · Programmable cycle lag time between sparge cycles. · Individual and total sparge time cycle accumulator. Accumulator shall be protected or reset by a programmed password Cellular modem included. Data service to be billed separately, not included in system costs	-	
1	Freight to site, off loading and placement by others, add $2,500		
1	Startup and Training, 1-day, add $2,000		
1	Purchase of 10#/day system as described above. Does not include freight and start up services.	199,200.00	$199,200.00

Other Services Required (ADD TO THE NET TOTAL)

Consumables parts and labor for yearly service, performed mid year by MK. 10# sytem for the first year only
ADD $ 8,103.00 (subject to change)

SOS remote connection and monitoring service
ADD $ 165.00 plus tax per month (subject to change)

Notes:

1. Ozone tubing and down well ozone injection point materials are not included in this rental offer.
   A separate puchase quote for these items would apply.

2. MK ozone sparge rental equipment in this same configuration available at a cost savings and warranty
   for the entire term on the paid rental.

EQUIP. SUB TOTAL	$199,200.00
NET TOTAL	$199,200.00

Does not include permits, fees, etc.…
Offloading & placement by others.

Jerry Giltz
MK Environmetnal Inc.

MK ENVIRONMENTAL INC.

QUOTATION

765 Springer Dr
Lombard, IL 60148
630-920-1104 (office)
630-920-8013 (fax)
jgiltz@mkenv.com

Date	5/1/2025
Quote No.	225031
Reference	Kwik Shop 110
Page No.	1 of 1
Freight	Included
Terms	Net 30 Days
Ship Via	BEST
F.O.B.	Factory

Quotation valid for 30 days

SOLD TO:	SHIP TO:
Jeff Schexnayder PPM Consultants, Inc 5555 Bankhead Highway Birmingham, AL. 35210 205-836-5650	PPM Project No. 422603-CAPE Former Kwik Shop No. 110 33066 U.S. Hwy 280 Childersburg, AL.35044

QUANTITY		UNIT PRICE	AMOUNT
	Reference: Former Kwik Shop No. 110 Ozone Sparge Materials		
50	Set of down well ozone injection points, consisting of:	913.50	$45,675.00
50	Sparge Points, stainless steel		
50	Well Head assemblies, PVC with stainless elbow and Kynar compression fittings		
155	Riser Pipe 10-ft 1" sch 80 PVC 1550 feet riser pipe total		
4,900	feet Tubing, teflon, 1/2"OD x 3/8"ID, ozone well point connection tubing Packaged in continuous lengths of 1000 feet	5.50	$26,950.00
	QUOTATION IS VALID FOR 30 DAYS, AND IS FOR PRODUCT COSTS ONLY. UNLESS OTHERWISE INDICATED, FREIGHT AND SALES TAX WILL BE ADDED TO THE INVOICE FOR THE ORDER. >>> FREIGHT TERMS: Prepaid & Added <<<		
	EQUIP. SUB TOTAL		$72,625.00
	NET TOTAL		$72,625.00

Does not include permits, fees, etc.…
Offloading & placement by others.

Jerry Giltz
MK Environmental, Inc.

MK ENVIRONMENTAL INC.

765 Springer Drive
Lombard, IL. 60148-6412
615-392-7737

jgiltz@mkenv.com

QUOTATION

Date	5/1/2025
Quote No.	225032
Reference	Kwik Shop 110
Page No.	1 of 2
Freight	Included
Terms	Net 90 Days
Ship Via	Best
F.O.B.	Factory

SOLD TO:	**SHIP TO:**
Jeff Schexnayder	PPM Project No. 422603-CAPD
PPM Consulting, Inc.	Former Kwik Shop No. 110
5555 Bankhead Highway	33066 U.S. Hwy 280
Birmingham, AL. 35210	Childersburg, AL.35044
205-836-5650	

Quotation valid for 30 days

QUANTITY		UNIT PRICE	AMOUNT
	100 amp 3/60/230 volt 4 wire plus ground electrical service Brought to NEMA 3R control Panel Interior electrical will comply with NEC requirements for Class 1, Division 2, Group D Hazardous locations Motors will be Totally Enclosed Fan-Cooled (TEFC) construction		
1	Soil Vapor Extraction (SVE) Samos regenerative blower model SB200 D or equal 3.0 HP, 230/460 volt, TEFC motor ~ 60 SCFM @ 89" wc vacuum (6.5"Hg) Maximum open flow: 147 SCFM Maximum vacuum: 89" wc (6.5"Hg) Inlet particulate filter with vacuum gauge 85 gallon knockout condensate drum with tangential inlet design or equal High level k/o drum float switch Clean out port Manual drain valve Vacuum relief valve Dilution valve with filter/silencer Exhaust temperature gauge Exhaust sample port High temperature switch Blower silencer Condensation collection water in the knockout drum to be disposed of by others	29,488.00	$29,488.00
1	Master Control Panel System, Including: NEMA 3R weather proof enclosure Operator control knob Off/Run/Start Motor starter with MSP breaker and thermal overload protection Control transformer Intrinsically safe relays, alarm indicator LED's, output channels Hard wired relay logic SVE Hour meter (1) exterior GFCI utility outlet MCP to be mounted and wired outside the system enclosure <u>SVE automatic shut down upon:</u> SVE condenstate k/o drum high liquid level SVE exhaust high temperature switch		
1	MK Custom Mini Enclosure Sized to accommodate the equipment specified Removable front and side panels Fully insulated panels Control panel mounted outside the enclosure Mechanical & electrical installation. Piping, mounting and wiring of the SVE package Enclosure large enough to fit the SVE package inside Sound adsorption blankets installed in the interior of the enclosure to reduce noise levels outside the system enclosure during normal operation.		

MK ENVIRONMENTAL INC.

Jeff Schexnayder
PPM Consulting, Inc.

Date 5/1/2025
Quote No. 225032
Reference Kwik Shop 11

QUANTITY		UNIT PRICE	AMOUNT
1	Vapor Phase Carbon Vessels - SVE offgas VR-400 lbs drums 400 lb initial load each 4" plain pipe fitting Off loading, placement & piping pı` Installed outside the system trailer by others		
1	AWS3 knock out tank prior to oxidizer to minimize condensed liquids from entering burner or vapor phase carbon bed.		
1	Startup & Training Services 1-day remediation system startup & training services. Based on 2 weeks prior notice.	2,000.00	$2,000.00
1	Freight Services Off loading and placement by others	2,500.00	$2,500.00
	Notes: 1. Telemetry system is not included. Contact MKE for adding this option 2. SVE inlet manifold provided by other outside the SVE enclosure		

EQUIP. SUB TOTAL	$33,988.00
EQUIP. SALES TAX	
START UP/TRAINING	
FREIGHT	
NET TOTAL	$33,988.00

Does not include permits, fees, etc…
Offloading & placement by others.

Jerry Giltz,
MK Environmental, Inc.

APPENDIX D – SUBCONTRACTOR SPECIFICATIONS AND QUOTATIONS

FORMER KWIK SHOP NO. 110
SYSTEM INSTALLATION - QUOTE FORM
33066 U.S. HIGHWAY 280, CHILDERSBURG, ALABAMA

CATEGORY		COMPLETE ENVIRONMENTAL & REMEDIATION CO., LLC			
1	Mobilization (including rental equip and per diem)	1	L.S.	$16,175.00	$16,175.00
2	Trench in soil (includes backfill/compact native soil)	400	feet	$60.68	$24,272.00
3	Directional drill beneath 5th Street	100	feet	$102.00	$10,200.00
4	Install 2-inch Piping	1,800	feet	$3.00	$5,400.00
5	Install 4-inch Piping	200	feet	$4.00	$800.00
6	Install 50 separate links of tubing through 2-inch piping	1	L.S.	$15,000.00	$15,000.00
7	Install 18-inch manholes and 2' by 2' by 6" concrete pads	26	each	$550.00	$14,300.00
8	Install 8-foot wooden fence	110	feet	$72.00	$7,920.00
9	Install and compact 6-inch crushed limestone base for asphalt	1	L.S.	$3,000.00	$3,000.00
10	Top with Hot-mix asphalt 8-inch thick 5,000 lb compressive strength	550	square feet	$8.50	$4,675.00
11	Install gravel pad and level in compound (6-inch min. thickness)	1	L.S.	$2,400.00	$2,400.00
12	Install concrete pad (10' by 6' by 6-inches thick)	1	L.S.	$800.00	$800.00
13	Site Cleanup	1	L.S.	$2,400.00	$2,400.00
Total					**$107,342.00**

Field Days Anticipated to Complete Work 15

Kevin Ivy / Operation Manager — **7/31/2024**

Name/Title — Date

Signature

Cost Proposal

Date	Proposal #
5/5/2025	20559

PO Box 1147
Foxworth, MS 39483

Name / Address	Re:
PPM CONSULTANTS, INC. 5555 BANKHEAD HIGHWAY BIRMINGHAM, AL 35210	Environmental Services Former Kwik Shop No. 110 33066 US Hwy 280 Childersburg, AL

Description	Unit	Qty	Rate	Total
Mobilize (including rental equip and perdiem)	lump sum	1	18,300.00	18,300.00T
Trench & Backfill - Soil	per ft.	400	28.00	11,200.00T
Directional drill beneath 5th St. (PPM will obtain DOT permit if required)	per ft.	100	75.00	7,500.00T
2" PVC Sch 40 Piping	per ft.	1,800	2.50	4,500.00T
4" PVC Sch 40 Piping	per ft.	200	6.00	1,200.00T
Install 50 seperate links of tubing thru 2" piping	lump sum	1	6,500.00	6,500.00T
18" manholes & 2'x2'x6" concrete pads	per each	26	775.00	20,150.00T
8' Wooden Fence	per ft.	110	55.00	6,050.00T
Install & compact 6" crushed limestone base for asphalt	lump sum	1	4,500.00	4,500.00T
Top with Hot-mix asphalt 8" thick 5k strength	square ft.	550	38.00	20,900.00T
Install gravel pad & level in compound (6" min. thickness)	lump sum	1	3,000.00	3,000.00T
Install Concrete Pad (10'x6'x.5" thick)	lump sum	1	2,500.00	2,500.00T
Site Clean-up	lump sum	1	2,500.00	2,500.00T

Customer Acceptance of Cost Proposal

_____
Authorized Signature Date

*Payment Terms NTE 30 days upon project completion.
*1.5% Interest will be charged monthly to all overdue invoices.

Subtotal	$108,800.00
Tax (0.0%)	$0.00
Total	$108,800.00

Walker-Hill Environmental, Inc
Foxworth, MS Office
Phone: (601) 736-3500
Email: eric@whenv.com

CHALLENGE TESTING, INC.
QUOTE FORM
For
PPM CONSULTANTS, INC.
KWIK SHOP NO. 110
CHILDERSBURG, ALABAMA

December 17, 2024

Description	Units	Estimated Quantity	Unit Cost	Total Cost
Mobilization/demobilization	LS	1	300.00	300.00
Mobilization/demobilization	Mile	210	4.20	882.00
Mobilization/demobilization	Mile	0	2.10	0.00
Per diem (3 man crew)	Day	12	300.00	3600.00
GeoProbe or ATV rig if site conditions warrant	Day	0	250.00	0.00
Drill, sample & abandon a soil boring	Foot	0	30.00	0.00
Shelby Tube sample	Each	0	58.00	0.00
Additional splitspoon sample for frequency > 5' intervals	Each	0	20.00	0.00
Drill & install 1 sparge point inside 4 1/4" ID HSA* (note)	Foot	40	65.00	2600.00
Drill & install 2 sparge points inside 4 1/4" ID HSA* (note)	Foot	920	62.00	57040.00
Construct a concrete pad & install an 8" flush cover	Each	0	205.00	0.00
Fill upper 1' of 8 1/2" borehole with sand	Each	25	20.00	500.00
20' x 100' 6-mil plastic sheeting	Roll	2	155.00	310.00
Concrete block	Each	10	3.00	30.00
Standby rate	Hour	0	300.00	0.00
			Total Job Estimate:	**$65,262.00**

*Soil sampling not included in unit rate.
Note: Sparge points & pipe provided by the manufacturer.

APPENDIX E – WASTE DISPOSAL QUOTE

Schexnayder, Jeff

From: Amy Peoples <office@peoplesservices.co>
Sent: Friday, May 9, 2025 11:36 AM
To: Schexnayder, Jeff
Subject: RE: Roll off container quote

Happy to speak with you this morning. Below are the pricing details.

$750 per load and containers will be lined.
Tonnage is $50 per ton.

Please let me know if you need anything else. Thanks!

From: Schexnayder, Jeff
Sent: Friday, May 9, 2025 10:54 AM
To: Amy Peoples <office@peoplesservices.co>
Subject: Roll off container quote

Hello,

As we discussed, please send me a quote to provide a 20-yd RO container to transport soil and debris to the Shelby County Landfill for disposal. PPM will obtain a waste profile from ADEM prior to scheduling the container for delivery and will provide a copy of the ADEM waste profile letter. The address of the site is listed below.

Former Kwik Shop No. 110
33066 Highway 280
Childersburg, AL

Let me know if you need additional information or have any questions.

Thank you for your time.

PPM CONSULTANTS

Jeff Schexnayder, PG (*AL,GA,KY,TN)
Project Manager, PPM Consultants Inc.

t: 205-909-1452 | m: 205-317-9980
www.ppmco.com
5555 Bankhead Highway, Birmingham, Al, 35210

APPENDIX F – TECHNICAL SAMPLING AND QA/QC PLAN

1.0 TECHNICAL SAMPLING AND ANALYSIS PLAN FOR GROUNDWATER MONITORING

1.1 PURPOSE

This Technical Sampling and Analysis (TS&A) Plan describes the methods and procedures to be followed during groundwater monitoring activities at leaking underground storage tank sites. Any modification to the sampling process will be addressed and described within in the monitoring reports.

1.2 LIQUID GAUGING PROCEDURES

Prior to groundwater sampling, liquid levels are measured in each well to determine the groundwater elevation and flow direction. Liquid levels inside the wells are measured with an ORS or Keck interface probe from the top of the well casing using the same reference point from which the survey elevations determined during the assessment were recorded. Groundwater elevations at the site are calculated to a common datum. Calculations for determining the water table elevations are as follows:

$$WTE = ETC - DTW$$

Where:
WTE = water table elevation
ETC = elevation to the top of the casing
DTW = depth to water

Where free product is present, the groundwater elevation is adjusted using the following formula:

$$Z_{aw} = (1-\Gamma_{ro})(Z_{ow}) + (\Gamma_{ro})(Z_{ao})$$

Γ_{ro} = 0.755 (specific gravity)
Z_{ow} = oil/water elevation
Z_{ao} = air/oil elevation
Z_{aw} = air/water elevation

Groundwater flow direction at the site is determined through groundwater contouring based on water table elevations calculated from the monitoring wells installed at the site.

1.3 GROUNDWATER SAMPLING PROCEDURES

After the depth to water is measured, each well is purged of at least five well volumes of liquid prior to sampling using a submersible pump or bailer. Purged water is contained in sealed 55 gallon drums and disposed of at an approved disposal facility. Groundwater samples are collected using disposable bailers and immediately transferred into 40 ml glass VOA vials. The vials are immediately sealed and placed on ice inside coolers. The samples are shipped with chain-of-custody forms via common courier to an independent testing laboratory for analysis. One trip blank and one duplicate sample are submitted per event for QA/QC purposes. QA/QC procedures are described in detail in the QA/QC Plan.

1.4 LABORATORY ANALYSES

Laboratory analyses are performed by an independent testing laboratory. The laboratory used will maintain a QA/QC program which utilizes spike and duplicate analysis. Groundwater samples will be analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX), per EPA SW-846, Test Method 5030/8020, and other parameters that may be applicable to the constituents of concern. Results of the internal QA/QC program used by the laboratory are included in each report.

2.0 QUALITY ASSURANCE/QUALITY CONTROL PLAN

2.1 PURPOSE

This Quality Assurance/Quality Control (QA/QC) Plan describes the procedures followed by personnel during the project to ensure that all data generated is accurate and representative of conditions encountered. Any modification of these procedures will be documented in the respective quarterly update.

2.2 GROUNDWATER SAMPLING

2.2.1 Well Purging

Groundwater is purged from monitoring wells prior to sampling to ensure each sample is representative of existing subsurface conditions. At a minimum, five well volumes of standing water are purged using a submersible pump or bailer. Only water inside the upper column of the well is purged. Each well is purged at a minimal rate to avoid aeration through cascading action of groundwater in the screened interval. When the bailing method is employed, the bailer is slowly lowered and retrieved from the groundwater to minimize aeration inside the well. Groundwater in wells is allowed to recover to near static water level before sampling.

2.2.2 Sample Collection

Groundwater samples are collected using disposable bailers. Procedures for sampling groundwater are described below:

1) The bailer is lowered into the well slowly to avoid aeration of the sample;

2) The bailer is filled from the top of the water column and retrieved; and

3) The first bailer of water is transferred from the bottom of the bailer into 40 ML, prepared, VOA vials or applicable containers specific to the analyte. The sample container is filled completely to the top and tightly sealed. Samples are placed on ice immediately following collection.

2.2.3 Decontamination

Disposable vinyl gloves are worn during well purging and sample collection. During well purging, the gloves are changed between each well. Gloves are also changed between each sample acquisition during the sampling process. When a pump is used, all downhole equipment is decontaminated between each use by circulating clean water and phosphate-free detergent. Disposable bailers are used for collecting samples; therefore, no additional decontamination procedures are employed.

2.2.4 Sample Dispatch

Groundwater samples are packed in individual plastic protective envelopes (bubble pack) inside a cooler to avoid breakage during shipment. The coolers used are insulated to maintain sample temperature near 4° C. Each cooler is sealed with tape to discourage tampering. The samples are shipped to the laboratory via common courier.

2.3 SAMPLE CUSTODY

A traceable link is established from the time samples are obtained until submission of analytical results. The following section describes chain-of-custody (COC) procedures which are adhered to during the project to establish that traceable link.

2.3.1 Documentation

Protocols for documentation are used to ensure appropriate sample identification and transfer. This documentation includes sample labels, seals, and COC forms. Labels and seals will be filled out using water-proof ink. Information to be supplied on COC forms consists of the following:

- Project number and location of the site.

- Sample identification/location.
- Sample point (depth).
- Signature of collector.
- Date and time of sample collection.
- Sample matrix (water).
- Method of preservation (HCl).
- Number of containers per sample location.
- Analytical method requested.
- Name of person(s) in possession of the COC and samples.
- Applicable remarks.

Custody seals are placed on coolers in such a manner that the container cannot be opened without breaking the seal. At least two seals are used, (one on either side of the cooler).

2.3.2 Custody Procedures

COC procedures implemented during the project are as follows:

- Each sample collected for the project is entered on the COC record.
- The original COC record accompanies the sample containers during transport to document their custody.
- The shipping package is sealed with strapping tape and a custody seal affixed. The seal is placed on the package in such a manner that the package cannot be opened without breaking the seal. The seal documents that the samples remained unaltered during shipment through the common parcel carrier.
- The laboratory assumes custody of the sample upon receipt and a designated sample custodian is charged with sample care and receipt.

- The laboratory retains custody of the samples in a secure area for a minimum of one month following the date of receipt. At that time, the samples are disposed of in accordance with appropriate disposal procedures.

- The sampler maintains the final copy of the COC to verify that the samples were collected and sent to the laboratory.

2.4 QUALITY CONTROL CHECKS

The following quality control checks are implemented during the project to verify the adherence to the QA/QC plan, and to provide measurement for method and samplers performance.

2.4.1 Trip Blanks

Trip blanks are used to determine the QA/QC of sample handling procedures. The trip blanks are filled with distilled water in the laboratory and will accompany the cooler to and from the project site. One trip blank is sent per cooler.

2.4.2 Duplicate Samples

Duplicate groundwater samples are collected to provide a check on sampling techniques as well as laboratory equipment. Duplicate samples are collected simultaneously from the same well and labeled with a different well designation number. Duplicate samples are collected at a frequency of one per 10 samples submitted for laboratory analysis.

3.0 TS&A AND QA/QC PLAN APPROVAL/SIGN-OFF FORMAT

I have read, understood, and agreed with the information set forth in the TS&A and QA/QC Plan.

Name	Signature	Affiliation	Date
Name	Signature	Affiliation	Date
Name	Signature	Affiliation	Date
Name	Signature	Affiliation	Date
Name	Signature	Affiliation	Date
Name	Signature	Affiliation	Date
Name	Signature	Affiliation	Date
Name	Signature	Affiliation	Date
Name	Signature	Affiliation	Date

APPENDIX G – REMEDIATION MONITORING FORMS

OZONE/SVE SYSTEM FIELD MONITORING FORM

Site ID:	***Former Kwik Shop No. 110***	**Client: Russell Petroleum Corporation**	**Project Number:** ***422603-OM***
Site Location:	***33066 Highway 280 Childersburg, Alabama***		**System Configuration:**
Date:			**Time of Arrival / Departure:** /
Personnel:			**Status of System:**

SPARGE POINT DATA

Valve No.	Sparge Point	Online (Y/N)	Online? (O2 or O3)	Cycle Time	Pressure @ Manifold (psi)	Airflow @ Manifold (cfm)	Operational Time			
							Total	O_3	O_2	Air
1	SP-1									
2	SP-2S									
3	SP-2D									
4	SP-3									
5	SP-4S									
6	SP-4D									
7	SP-5S									
8	SP-5D									
9	SP-6S									
10	SP-6D									
11	SP-7S									
12	SP-7D									
13	SP-8S									
14	SP-8D									
15	SP-9S									
16	SP-9D									
17	SP-10S									
18	SP-10D									
19	SP-11S									
20	SP-11D									
21	SP-12S									
22	SP-12D									
23	SP-13S									
24	SP-13D									

OZONE/SVE SYSTEM FIELD MONITORING FORM

Site ID: *Former Kwik Shop No. 110*	**Client: Russell Petroleum Corporation**	**Project Number:** *422603-OM*	
Site Location: *33066 Highway 280 Childersburg, Alabama*		**System Configuration:**	
Date:		**Time of Arrival / Departure:** /	
Personnel:		**Status of System:**	

25	SP-14S									
26	SP-14D									
27	SP-15S									
28	SP-15D									
29	SP-16S									
30	SP-16D									
31	SP-17S									
32	SP-17D									
33	SP-18S									
34	SP-18D									
35	SP-19S									
36	SP-19D									
37	SP-20S									
38	SP-20D									
39	SP-21S									
40	SP-21D									
41	SP-22S									
42	SP-22D									
43	SP-23S									
44	SP-23D									
45	SP-24S									
46	SP-24D									
47	SP-25S									
48	SP-25D									
49	SP-26S									
50	SP-26D									

OZONE/SVE SYSTEM FIELD MONITORING FORM

Site ID:	***Former Kwik Shop No. 110***	**Client: Russell Petroleum Corporation**	**Project Number:** ***422603-OM***
Site Location:	***33066 Highway 280 Childersburg, Alabama***		**System Configuration:**
Date:			**Time of Arrival / Departure:** /
Personnel:			**Status of System:**

SVE BLOWER DATA

Blower Operating		**SVE Blower Vac (in-H20)**	
Blower Effluent Temp		**SVE-1 Vac (in-H20)**	
Airflow @ Blower (in-H20)		**SVE-2 Vac (in-H20)**	
Blower Effluent Pressure (in-H20)		**SVE-3 Vac (in-H20)**	
Bearings Greased (Y/N)		**SVE-4 Vac (in-H20)**	
Effluent Reading - Pre-Carbon (ppmv)		**Effluent Reading - Post Carbon (ppmv)**	

SVE Moisture Separator Level	**SVE Blower Vacuum**	**SVE Blower Temp.**

MISCELLANEOUS ***Date*** ***Initials***

Ambient Temp. (°F)	**Ozone Reading in Enclosure (ppm)**	**Cabinet Temp. (ºF)**	**Building Temp. (ºF)**	**O2 Moisture Indicator BLUE (Y/N)**	**A-Side**			**B-Side**		
					ATF Inlet Pressure (psi)	**O2 Airflow (scfm)**	**O3 Reactor Pressure (psi)**	**ATF Inlet Pressure (psi)**	**O2 Airflow (scfm)**	**O3 Reactor Pressure (psi)**

O&M Readings Time	**System Runtime (hrs)**	**Cycle Lag Time (minutes)**	**Air Tower Runtime (hrs)**	**A-Side ATF O2 Percent**	**B-Side ATF O2 Percent**	**Comp. Pres. (psi)**	**Comp. Temp. (ºF)**	**Air to Manifold Reg. Pressure (psi)**	**System Comps. Checked for Leaks (Y / N)**	**System Comps. Checked for Leaks (Y / N)**

Ozone Reading at OMP1 (ppmv)	**Ozone Reading at OMP2 (ppmv)**

OZONE/SVE SYSTEM FIELD MONITORING FORM

Site ID: *Former Kwik Shop No. 110*	**Client: Russell Petroleum Corporation**	**Project Number:**	***422603-OM***
Site Location:	***33066 Highway 280 Childersburg, Alabama***	**System Configuration:**	
Date:		**Time of Arrival / Departure:**	/
Personnel:		**Status of System:**	

MONITORING WELL DATA

Well ID	Depth to Water (ft BTOC)	Induced Pressure	Sparge Point(s) Online?	Other Info
MW-1				
MW-2				
MW-3				
MW-4				
MW-5				
MW-6				
MW-7				
MW-8				
MW-9				
MW-10R				
MW-11				
MW-12				
MW-13				
MW-14				
MW-15				
MW-16				
MW-17				
MW-18				
MW-19				
MW-20				
MW-21				
MW-22				

OZONE/SVE SYSTEM FIELD MONITORING FORM

Site ID: *Former Kwik Shop No. 110*	**Client: Russell Petroleum Corporation**	**Project Number:**	***422603-OM***
Site Location:	***33066 Highway 280 Childersburg, Alabama***	**System Configuration:**	
Date:		**Time of Arrival / Departure:**	/
Personnel:		**Status of System:**	

MW-23				
MW-24				
MW-25				
MW-26				
RW-1				
RW-2				
RW-3				

Work to be Performed This Visit

COMMENTS:

APPENDIX H – SITE HEALTH AND SAFETY PLAN

HEALTH, SAFETY, SECURITY AND ENVIRONMENTAL PROGRAM

HEALTH AND SAFETY PLAN

RUSSELL PETROLEUM CORPORATION
FORMER KWIK SHOP No. 110
33066 U.S. HIGHWAY 280
CHILDERSBURG, ALABAMA
TALLADEGA COUNTY

PPM PROJECT NO. **422603-CAPD**

May 15, 2025

PPM CONSULTANTS

PREPARED UNDER THE DIRECTION OF:
JERI F. THRASHER, CSP|MBA / HEALTH AND SAFETY DIRECTOR
1600 LAMY LANE, MONROE, LOUISIANA 71201
(P) 318.812.3454 / (C) 318.884.8188

HEALTH, SAFETY, SECURITY AND ENVIRONMENTAL PROGRAM

TABLE OF CONTENTS

PROJECT CHECKLIST – HASP AND JSA iv

EMERGENCY SUMMARY INFORMATION v

1.0 INTRODUCTION 1
1.1 COMPANY COMMITMENT 1
1.2 HASP PURPOSE 1
1.3 APPLICABILITY AND EXCEPTIONS 1
1.4 PROJECT AMENDMENTS 2

2.0 ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES 2
2.1 CHAIN-OF-COMMAND 2
2.2 PERSONNEL ROLES AND RESPONSIBILITIES 2
2.3 SHORT-SERVICE EMPLOYEES 4
2.4 TRAINING AND MEDICAL MONITORING 4

3.0 HAZARD ASSESSMENT AND CONTROL MEASURES 4
3.1 CHEMICAL HAZARDS AND CONTROLS 4
3.1.1 Gases and Fumes 4
3.1.1.1 Acids 4
3.1.1.2 Bases/Alkali 5
3.1.1.3 Calibration and Fuel Gases 5
3.1.1.4 Carbon Dioxide (Dry Ice) 5
3.1.1.5 Hydrogen Sulfide 6
3.1.2 Oxidizers 6
3.1.2.1 Hydrogen Peroxide (30-50%) 6
3.1.2.2 Oxygen Release Compound® (ORC) and ORC Advanced® 6
3.1.2.3 Ozone 7
3.1.2.4 RegenOx A and B™ 7
3.1.3 Particulates and Fibers 8
3.1.3.1 Aluminum Oxide 8
3.1.3.2 Asbestos 8
3.1.3.3 Heavy Metals 9
3.1.3.4 Nuisance and Concrete Dust 11
3.1.4 Volatile and Semi-Volatile Organic Compounds 12
3.1.4.1 Chlorinated Compounds 12
3.1.4.2 Isopropyl Alcohol 13
3.1.4.3 Methyl-Tertiary Butyl Ether (MTBE) 13
3.1.4.4 Organic Hydrocarbons 14
3.1.4.5 Pesticides 16
3.1.4.6 Polychlorinated Biphenyls (PCB) 18
3.1.5 Other/Unknown Chemicals 18
3.1.5.1 Activated Carbon 18
3.1.5.2 Alconox®/Liquinox® 18
3.1.5.3 Descaling Agents (Analytix AN-754GH) 19
3.1.5.4 GoJo® Natural Orange™ Pumice Hand Cleaner 19
3.1.5.5 Magnaflux Soundclear® Gr. 60 19
3.1.5.6 Unknown Chemicals and/or Concentrations 19
3.1.6 Chemical/Physical Properties 20

3.2 PHYSICAL HAZARDS AND CONTROLS 20
3.2.1 Combustion/Flammability 20
3.2.2 Compressed Gas 20
3.2.3 Concrete Coring and Cutting 21
3.2.4 Contaminated Water/Splash Hazards 21
3.2.5 Cuts and Lacerations 21
3.2.6 Driving Safety 22
3.2.7 Drowning 22
3.2.8 Electrical 22
3.2.8.1 Subsurface and Overhead Utilities 22
3.2.8.2 Electrical Tools and Power Cords 23
3.2.8.3 Lockout/Tagout 24
3.2.9 Hand and Power Tools 24
3.2.10 Illumination 25
3.2.11 Ladder Safety 25
3.2.11.1 Portable Ladder Safety 25
3.2.11.2 Fixed Ladder Safety 26
3.2.12 Material Handling and Back Safety 26
3.2.13 Mobile Equipment 26
3.2.13.1 Heavy Equipment and Machinery 26
3.2.13.2 Aerial and Scissor Lifts 27
3.2.14 Noise 27
3.2.15 Repetitive Motion 28
3.2.16 Scaffolding 28
3.2.17 Slips, Trips, and Falls 29
3.2.18 Traffic and Secluded Areas 29
3.2.19 Walking/Working Surfaces 30
3.2.19.1 Elevated Walking/Working Surfaces 30
3.2.19.2 Uneven Walking/Working Surfaces 31
3.2.19.3 Unstable Soils and Cave-Ins 31
3.2.20 Weather 32
3.2.20.1 Heat Stress 32
3.2.20.2 Cold Stress 32
3.2.20.3 Adverse Weather Conditions 33
3.3 BIOLOGICAL HAZARDS AND CONTROLS 33
3.3.1 Insects and Mosquitoes 33
3.3.2 Ticks and Spiders 33
3.3.3 Rodents, Reptiles and Roaming Animals 34
3.3.4 Poison Plants 35
3.3.5 Bloodborne Pathogens 35
3.3.6 Infectious Illnesses 35
4.0 EXPOSURE MONITORING 36
4.1 TERMINOLOGY/DEFINITIONS 36
4.2 ESTABLISHING EXPOSURE AND FLAMMABILITY LIMITS 37
4.2.1 Exposure Limits 37
4.2.2 Flammability Limits 37
4.3 REGULATORY EXPOSURE LIMITS 37

4.4 MONITORING EQUIPMENT AND CALIBRATION 40
4.5 SAMPLE COLLECTION 41
4.6 MONITORING FREQUENCY AND DOCUMENTATION 41

5.0 PERSONAL PROTECTIVE EQUIPMENT 41
5.1 PROJECT-SPECIFIC PPE REQUIREMENTS 41
5.2 REDUCTION OF PROTECTIVE CLOTHING AND EQUIPMENT 42
5.3 OTHER PROTECTIVE AIDS 43

6.0 SITE ACCESS, CONTROL, AND DECONTAMINATION 43
6.1 SITE ACCESS 43
6.2 DESIGNATED WORK ZONES 43
6.2.1 Non-Emergency Response Sites 43
6.2.2 Emergency Response Sites 43
6.3 AUTHORIZED PERSONNEL 44
6.4 STOP-WORK AUTHORITY 44
6.5 GENERAL SITE CONTROL AND SAFETY PRECAUTIONS 44
6.6 DECONTAMINATION PROCEDURES 45

7.0 EMERGENCY RESPONSE 45
7.1 ALARMS AND ONSITE NOTIFICATIONS 45
7.2 PERSONNEL ASSESSMENT AND EVACUATION 45
7.3 INCIDENT, NEAR-MISS, AND HAZARD RECOGNITION REPORTING 46
7.4 INJURY REPORTING AND CASE MANAGEMENT 46
7.5 GENERAL MEDICAL CARE AND FIRST AID 47
7.6 HAZARDOUS SUBSTANCE RELEASE 48
7.7 REGULATORY, CLIENT, OR OTHER AGENCY NOTIFICATIONS 48

8.0 WASTE MANAGEMENT 48
8.1 CONTAINER LABELING 48
8.1.1 Hazardous Material/Waste Labeling 48
8.1.2 Nonhazardous Material Waste Labeling 49
8.2 CONTAINER STORAGE AND DISPOSAL 49
8.3 CONTAINER INSPECTIONS 50

9.0 PERSONNEL/CONTRACTOR SAFETY REVIEW 50

10.0 CONTRACTOR RESPONSIBILITY AND SUPERVISION 50

11.0 CONFINED SPACE 51

12.0 LIST OF ABBREVIATIONS 51

HEALTH, SAFETY, SECURITY AND ENVIRONMENTAL PROGRAM

PROJECT CHECKLIST – HASP AND JSA

Project/Task and Corresponding Job Safety Analysis:

- ☐ Chemical Injection
- ☐ DPVE/SVE/AS System Install/Decommission
- ☒ Drilling/Probing [Hand Auger/Heavy Equipment – specify]
- ☐ Mobile Vacuum Event [Emergency Response]
- ☒ Ozone System Install/Decommission
- ☐ Remediation System Modification
- ☐ Spill Bucket Replacement/Closure
- ☐ Trenching/Excavation
- ☐ UST Closure [PPM as General Contractor]
- ☐ UST Closure/Raze & Rebuilds [Client Contractor, PPM Sample Only]
- ☐ Well Plugging and Abandonment [GIP/Overdrill – specify]
- ☐ Other [specify below and contact HSD with details]

Notes: [Specify type of system and whether install/decommission; identify chemical being injected and notify HSD in advance for new chemical(s); if trenching or excavating; specify whether P&A is GIP or overdrill; specify what system modification is to be conducted.]

Hazard Assessment:

Chemical Hazards

- ☐ Acids
- ☐ Activated Carbon
- ☒ Alconox®/Liquinox®/Isopropanol
- ☐ Asbestos
- ☐ Bases/Alkali
- ☐ Calibration Gas [Meth/Hex/Hydro/Iso]
- ☐ Carbon Dioxide [Dry Ice]
- ☐ Chlorinated Solvents [Dry Cleaners]
- ☐ Descaling Agents [Analytix AN-754GH]
- ☒ Diesel/PAHs
- ☒ Dust [Nuisance/Concrete]
- ☐ Dust [Granular Carbon/Aluminum Oxide]
- ☐ Fuel Gases [Meth/Hex/Butane/Prop]
- ☒ Gasoline [BTEX]
- ☐ Hydrogen Sulfide [H_2S]
- ☐ Kerosene
- ☐ Metals [specify metal(s) above]
- ☒ Methyl-Tertiary Butyl Ether [MTBE]
- ☒ Oil [hydraulic/lubricating]
- ☐ Oxidizer [specify chemical above]
- ☒ Ozone
- ☐ Pesticides [Industrial/Agricultural]
- ☐ Polychlorinated Biphenyls [PCB]
- ☐ Other* [contact HSD]
- ☐ Unknown(s)* [contact HSD]

Physical/Biological Hazards

- ☐ Biological [specify above]
- ☐ Combustion/Flammability
- ☒ Compressed Gas [cylinders]
- ☒ Concrete [coring/cutting]
- ☐ Crane [subcontractor]
- ☒ Cuts/Lacerations
- ☒ Driving
- ☐ Drowning
- ☐ Electrical
- ☐ Falls [elevated heights]
- ☐ Forklift
- ☒ Hand/Power Tools
- ☒ Heat/Cold Stress
- ☐ Illumination
- ☐ Ladder Safety
- ☒ Material Handling [back safety]
- ☒ Mobile Equipment
- ☒ Noise
- ☐ Repetitive Motion
- ☒ Slips/Trips/Falls
- ☒ Traffic or Secluded Sites
- ☐ Uneven Working Surfaces
- ☐ Unstable Soils/Cave-Ins
- ☐ Other* [contact HSD]
- ☐ Unknown(s)* [contact HSD]

Protective Equipment:

- ☐ Apron and Goggles
- ☐ Booties/Foot Covers
- ☒ Ear Plugs/Canal Caps
- ☐ Face Shield
- ☐ Flame-Retardant Clothing
- ☐ Hand – Cotton Gloves
- ☐ Hand – Kevlar Gloves
- ☒ Hand – Leather Gloves
- ☒ Hand – Nitrile Gloves
- ☐ Hand – Other*
- ☒ Hard Hat [Class E]
- ☐ Harness and Lanyard
- ☒ High Visibility Shirt/Vest
- ☐ Personal Flotation Device
- ☐ Protective Suits [tyvek]*
- ☐ Reflective Shirt/Vest
- ☐ Respirator [air-purifying]*
- ☐ Respirator [supplied air]*
- ☐ Rubber boots
- ☒ Safety Glasses
- ☒ Steel-Toed Boots
- ☐ Other* [contact HSD]

Documentation Required:

- ☒ Ambient Air Monitoring
- ☐ Forklift Safety Inspection
- ☒ HASP Acknowledgement Form
- ☒ Incident Report/Log [as applicable]
- ☒ Occupational Noise Monitoring
- ☒ Subsurface Clearance Checklist
- ☒ Tailgate Safety Meeting Log
- ☒ Trench/Excavation Inspection

Subcontractor-Required (must obtain copy):

- ☐ Crane Inspection
- ☐ Forklift Inspection
- ☐ Heavy Equipment Inspection [specify above]
- ☐ One Call
- ☐ Other* [specify above]

Return Pages in the Following Order:

- HASP Cover Page
- Project Checklist
- Emergency Summary Information and Maps
- Personnel Roles and Responsibilities, p.3
- Site Map with boring, well, trench/excavation locations
- One Call (if electronic copy)
- Subsurface Clearance Checklist
- Ambient Air Monitoring Report
- Occupational Noise Monitoring Report
- Crane Inspection (if applicable)
- Forklift Inspection (if applicable)
- Trench/Excavation Checklist
- Incident Report and Log (if applicable)
- HASP Acknowledgement
- Tailgate Safety Meeting Log

HASP Generated By [Print Name]: Andrew Paradis Date Generated: 5/15/2025

HEALTH, SAFETY, SECURITY AND ENVIRONMENTAL PROGRAM

EMERGENCY SUMMARY INFORMATION

Medical Facility:

In cases of incidents or near-misses, the Health and Safety Director (HSD) must be verbally contacted immediately once any spills/releases have been contained and appropriately isolated. Incidents resulting in injury or illness must be reported immediately to the HSD for further instruction and injury case management. 911 should be called for life-threatening cases or cases requiring immediate attention. Be prepared to administer CPR and first aid care only if you have been trained to do so, acquire consent from injured worker (unless unconscious in which consent is implied), and training is up-to-date.

Name of Hospital: Coosa Valley Medical Center Phone: 256-401-4000

Address: 315 West Hickory Street City, State: Sylacauga, Alabama Zip: 35150

Directions and Map: See attached (next page) Distance: 10.4 Miles Time: 16 Min

Company and Emergency Contact Information:

Agency/Emergency Responder	Telephone	Website
Fire Department / Police Department / Ambulance	911	--
Center for Disease Control and Prevention	800-232-4636	www.cdc.gov
CDC – Public Health Preparedness and Response	404-639-7405	cdcinfo@cdc.gov
CDC – Bioterrorism Preparedness and Response	404-639-0385	cdcinfo@cdc.gov
CDC – Toxic Substances and Disease Registry	770-488-7100	cdcinfo@cdc.gov
Chemtrec [24-Hour Emergency Chemical Spill]	800-262-8200	chemtrec@chemtrec.com
EPA RCRA Superfund Hotline	800-424-9346	--
Poison Control Center	800-222-1222	www.aapcc.org

PPM Contact Information	Representative	Office	Cell
Principal [Primary Regional Safety PIC]	Shawn Ivey	318-812-3463	318-237-0677
Principal [Alternate Regional Safety PIC]	Zane Hood	205-836-5650	205-240-9883
Health and Safety Director	Jeri Thrasher	318-812-3454	318-884-8188
Safety Supervisor [Baton Rouge]	Jason Beauvais	225-293-7270	337-247-6994
Safety Supervisor [Birmingham]	Andrew Paradis	205-836-5650	251-622-8607
Safety Supervisor [Jackson]	Lori Lea	601-956-8233	601-955-5920
Safety Supervisor [Mobile/Pensacola]	Kay Williams	251-990-9000	251-753-4455
Safety Supervisor [Monroe]	Sarah Scott	318-323-7270	225-241-6751
Safety Supervisor [Orlando]	Brian Richards	407-240-1127	352-409-1606

Note: District and Project Managers can be contacted by using the office phone numbers provided for each location. During periods of transition or in the absence of a designated Safety Supervisor, the Health and Safety Director will assume responsibilities.

Designated Break and Evacuation Locations:

Personal protective equipment is required at all times within the work zone and can only be removed when in the site's designated break area. Smoking will be permitted within the break area pending the site's ambient contaminant concentrations. In the event of an emergency, workers must report to the designated evacuation area for a headcount. This site's designated break and evacuations areas are outlined as follows:

Break Area: _____ Evacuation Area: _____

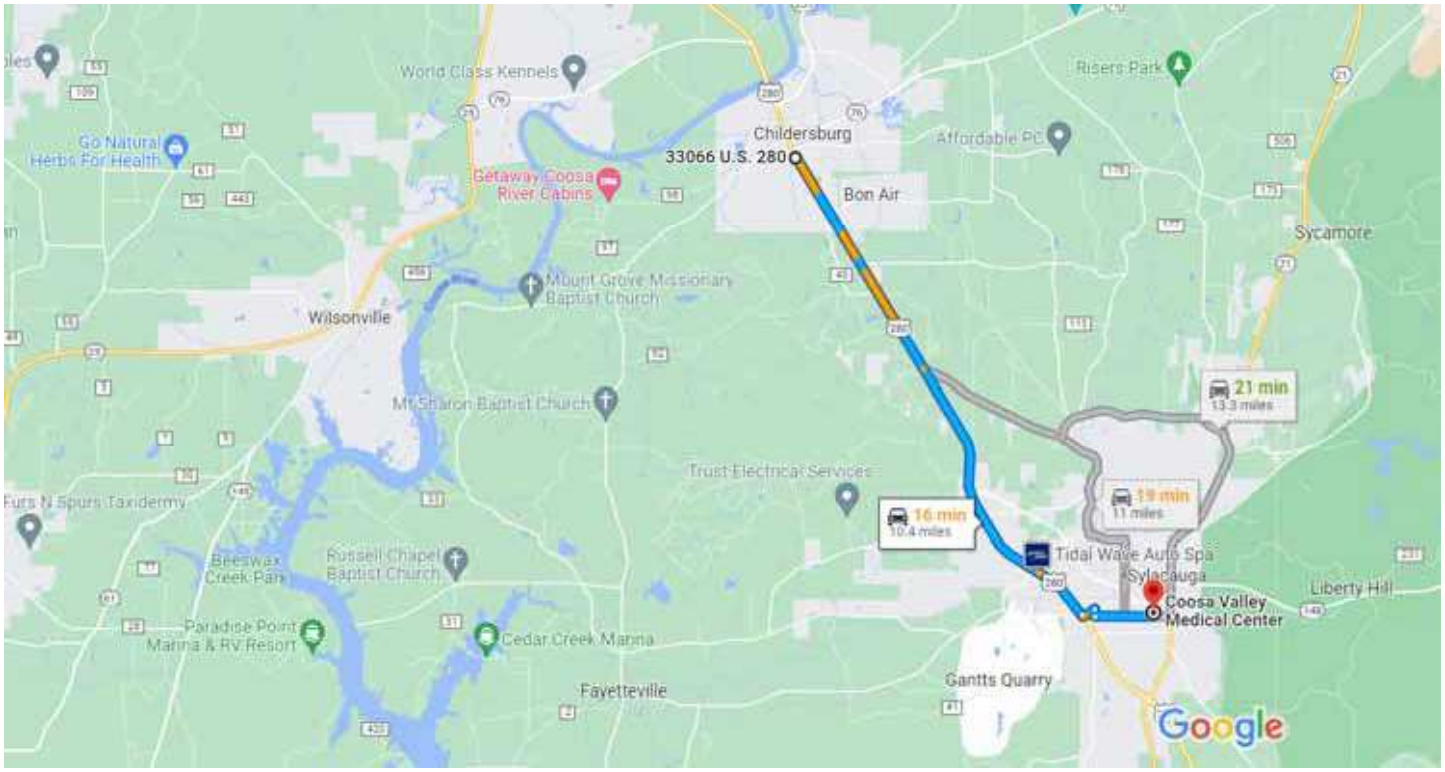
Break Area: _____ Evacuation Area: _____

Break Area: _____ Evacuation Area: _____

Google Maps

33066 US-280, Childersburg, AL 35044 to Coosa Valley Medical Ctr, 315 W Hickory St, Sylacauga, AL 35150

Drive 10.4 miles, 16 min



Map data ©2023 2 mi

33066 US-280
Childersburg, AL 35044

1. Head southeast on US-231 S/US-280 E/12th Ave SW toward 5th St SW
   Continue to follow US-231 S/US-280 E
   9.1 mi
2. Turn left onto W Fort Williams St
   0.3 mi
3. Turn right onto Coaling Rd
   0.1 mi
4. Turn left onto W Walnut St
   1.0 mi

Coosa Valley Medical Ctr
315 W Hickory St, Sylacauga, AL 35150

1.0 INTRODUCTION

1.1 COMPANY COMMITMENT

PPM is committed to the safety and wellbeing of its employees and subcontractors. Our mission to simplify the complex is done under the provision that worker health, safety and security is not compromised in the process. In addition, the company strives to ensure that the environment and its natural resources are preserved and not otherwise negatively impacted as the result of company-related processes. This commitment to our workers and our environment is outlined within our written health, safety, security and environmental (HSSE) program, which establishes the company's expectations through its policies and procedures.

1.2 HASP PURPOSE

The purpose of this health and safety plan (HASP) is to mitigate those hazards associated with routine company-related tasks that could not otherwise be substituted or eliminated. This document outlines the control measures, protective equipment and emergency response procedures necessary to ensure worker safety and wellbeing are maintained. This HASP has been prepared in accordance with the Occupational Safety and Health Administration (OSHA) 29 CFR 1910.120 standard for typical conditions encountered during routine business practices.

1.3 APPLICABILITY AND EXCEPTIONS

All field-related projects and/or tasks require a HASP, unless otherwise exempted by the safety department. The provisions outlined within this plan are applicable to all personnel assigned to the project and subcontracted workers hired by the company to complete the project. PPM will not be responsible for the safety of contracted workers hired directly by the client or partnering companies unless otherwise specified by these entities to do so and expressly agreed to, in writing, by all applicable parties. Accountability for the health, safety and security of contractors under these circumstances must be pre-established and explicitly outlined within the proposed scope of work and must additionally be approved by a Principal of the company.

This plan has been prepared specifically for common chemicals and tasks associated with routine business practices. Review and completion of this plan is separated into two categories:

1) *Routine and repetitive tasks that do not require field monitoring*. Some examples include: groundwater monitoring, mobile ozone or vacuum events (non-emergency release), system operation and maintenance, environmental assessments/audits, compliance audits, lead/asbestos inspections, and/or other similar non-intrusive tasks. These projects require review of applicable sections of the HASP and requires no field documentation other than HASP acknowledgement.
2) *Routine and repetitive tasks that require field monitoring*. Some examples include: drilling, geoprobing, excavating, trenching, chemical injection, remediation system installations or demobilizations, emergency mobile vacuum events (due to chemical releases), and/or other forms of similar sampling and analysis or subsurface disturbances. These projects require a HASP request form be submitted to the Safety Supervisor for preparation and document tracking. They also require review of applicable sections of the HASP and requires field documentation that must be returned to the safety department for recordkeeping.

Any project involving chemical(s), field-related task(s), and/or protective clothing and equipment not otherwise specified within this plan is considered non-routine and requires a site-specific plan be developed by the Health and Safety Director (HSD). When possible, please allow five days for preparation.

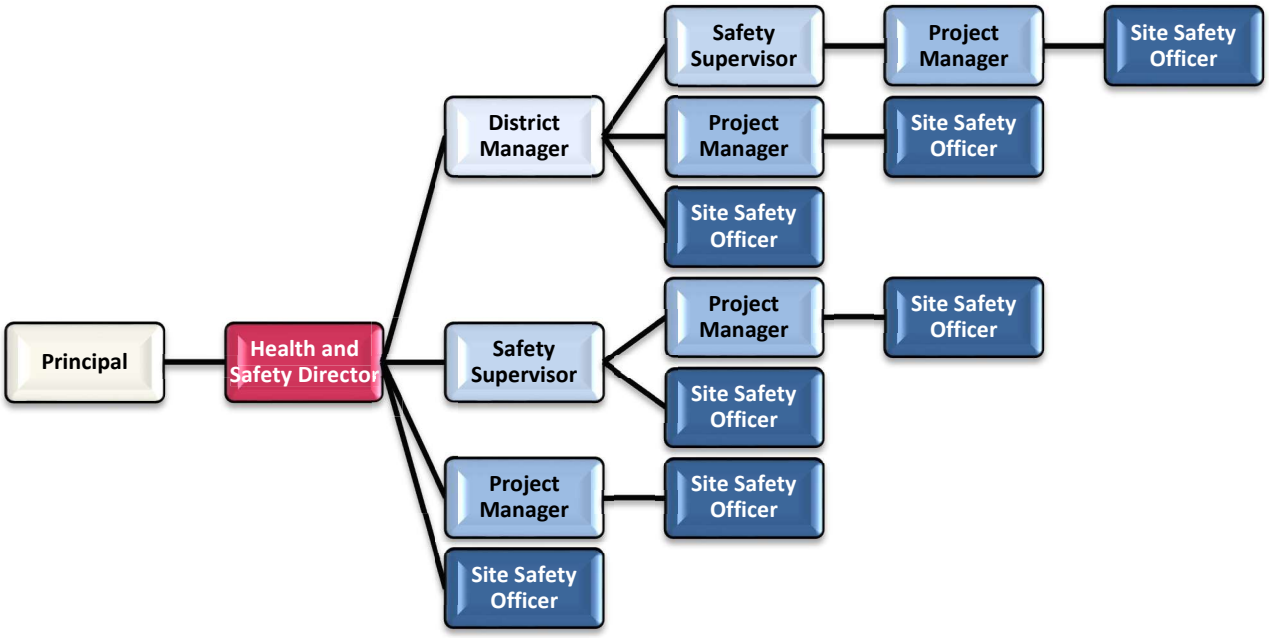
1.4 PROJECT AMENDMENTS

Should any unexpected conditions arise that introduces new hazards or eliminates existing hazards, work will cease immediately and this HASP will be amended to accommodate changes in site conditions. Additions or changes to this HASP will be communicated to all affected personnel and subcontractors.

2.0 ORGANIZATIONAL STRUCTURE AND RESPONSIBILITIES

2.1 CHAIN-OF-COMMAND

The hierarchy of command creates a system for accountability and is extremely beneficial to the reporting process. As indicated by the graphic below, PPM has built-in redundancies within its command chain to ensure that all affected parties are notified and accountable as well as to compensate for designated personnel when they are inaccessible. There are various ways in which to notify management; however, when it involves worker safety and health, the HSD and Principal must be notified and cannot be by-passed.



2.2 PERSONNEL ROLES AND RESPONSIBILITIES

Safety is the responsibility of every worker within the company, regardless of position. Workers are accountable for their own personal safety as well as the safety of the co-workers around them. Also, key personnel within the company have additional safety obligations due to their designated leadership roles within the organization. PPM expects its managers to set the tone for safety through their exemplary leadership thereby creating the foundation for a strong safety culture. Positions requiring additional safety responsibilities include the following:

- **Principal**. Principals are assigned responsibility for different departments within the company. Authorizing Principals in charge of review, implementation and enforcement of corporate HSSE policies and procedures are Shawn Ivey [BTR/JAC/MON] and Zane Hood [BHM/MOB/ORL].

- **Health and Safety Director**. The HSD is responsible for proposing and generating HSSE policies/procedures under the advisement of the Authorizing Principals and in accordance with evolving local, state and federal regulations; communicating HSSE requirements to all affected personnel within the organization; and ensuring uniform implementation of these provisions throughout the PPM organization. The HSD also ensures contractual HSSE obligations are fulfilled and sustained.
- **District Manager**. Each branch office has a designated District Manager (DM) who is responsible for ensuring that HSSE policies and procedures are implemented by the workers assigned to his/her office. The DM is directly accountable to the Principals for the safety performance of his/her office.
- **Safety Supervisor**. Each branch office has a designated Safety Supervisor (SS) assigned by the DM. The SS is responsible for ensuring HSSE compliance by all within his/her office through consistent toolbox training, unscheduled site safety inspections and any other tasks delegated by the HSD. The SS is directly accountable to the HSD for his/her supervisory role and is also accountable to his/her DM regarding the office's safety performance.
- **Project Manager**. Each project has a designated Project Manager (PM) who is responsible for the safety and wellbeing of the workers assigned to his/her jobsite(s). The PM establishes the overall scope-of-work for the project and must consider the appropriate safety provisions (i.e., engineering design, protective equipment, etc.) during the planning phase. The PM is directly accountable to their DM for job-related HSSE issues that arise throughout any phase of the project.
- **Site Safety Officer**. A site safety officer (SSO) is assigned to each field project. An alternate SSO is also assigned to any field project with more than one PPM employee onsite. The SSO is responsible for jobsite safety, which includes, but is not limited to, the following:

  → Designate break and evacuation areas based on current site conditions;
  → Review the provisions outlined within the HASP and JSA (as applicable) with all affected personnel, subcontractors, client, and regulatory officials;
  → Ensure site security and prevent unauthorized entry to the work zone;
  → Ensure subsurface utilities have been marked and appropriate Principal approval has been obtained for critical zone disturbances;
  → Locate emergency shut-off devices to pumps and heavy equipment;
  → Establish communication system with equipment operators;
  → Ensure all workers and contractors wear required protective equipment;
  → Prohibit onsite smoking, except when permitted within designated areas;
  → Complete required field documentation outlined within the HASP for worker exposure monitoring and other site safety inspections; and
  → Report to management any incident or near-miss event.

  The alternate SSO is responsible for jobsite safety in the absence of the SSO or when under the direction of the SSO.

The following personnel are assigned to this project:

Name	Title/Position
	District Manager
	Project Manager
Jeri F. Thrasher, CSP	Health and Safety Director
	Safety Supervisor (SS)
	Site Safety Officer (SSO)
	Alternate SSO
	Subcontractor

2.3 SHORT-SERVICE EMPLOYEES

Short-service employees are defined as any worker employed by PPM for less than six months or workers who have not yet completed required training and certification. Short-service employees are assigned a mentor and supervised at all times when in the field - (exception: establishing offices that do not have a mentor may require that short-service employees perform field duties unsupervised; however, exemption is required by an Authorizing Principal).

2.4 TRAINING AND MEDICAL MONITORING

PPM field personnel associated with this project have received company HSSE policy and procedural training as part of their safety orientation. Personnel have additionally received initial 40-Hour HAZWOPER certification, which is updated annually through an 8-Hour refresher. This training course meets the requirements of OSHA 29 CFR 1910.120(e). Short-service employees not otherwise HAZWOPER-certified will be provided training after 90-day probationary period.

In accordance with the medical monitoring requirements outlined within 29 CFR 1910.120(f), workers who are or may potentially be exposed to hazardous materials are provided a medical evaluation paid for by the company. Only those employees who have been medically cleared for duty by a physician are permitted to perform field duties.

3.0 HAZARD ASSESSMENT AND CONTROL MEASURES

3.1 CHEMICAL HAZARDS AND CONTROLS

PPM is an environmental consulting firm that specializes in environmental spill response, remediation and general regulatory compliance providing services to the energy, commercial, industrial, and private sectors. As part of these functions, workers will likely be exposed to chemical hazards through the following routes: site contamination, chemicals used as part of the remediation process, chemicals used for equipment maintenance and calibrations, and chemicals used/stored at client facilities.

3.1.1 Gases and Fumes

3.1.1.1 Acids

Acids have a pH <7, change litmus paper to red, taste sour (most citrus fruits are acidic), are corrosive to metals, and are commonly found in car/forklift batteries, used as sample preservatives and used to prevent algae, calcium and other similar buildups in piping systems. Common acids encountered through company-related processes include but are not limited to: hydrochloric (muriatic), nitric, phosphoric and sulfuric acid. Acids can cause moderate to severe skin and eye burns, and breathing the fumes created by these materials can cause extreme

burning of the respiratory system. Materials with a pH <2 must be disposed as a hazardous waste; however, acids can be neutralized with a base/alkali.

Control Measures: Never pour water into acid! Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Thoroughly wash exposed skin and hands upon completion of handling to avoid skin/eye irritations, itching and burning and prevent accidental ingestion. Prevent contact with metals.

3.1.1.2 Bases/Alkali

Commonly referred to as caustics, bases have a pH >7, change litmus paper to blue, have a bitter taste, feel slippery and are commonly used to make soap and textiles, found in common household detergents, cleaners (i.e., Drano, oven cleaners and ammonia products), milk of magnesia and antacids. Common bases encountered through company-related processes include but are not limited to: sodium hydroxide, potassium hydroxide, calcium hydroxide, ammonia, and sodium carbonate. Bases can cause moderate to severe skin and eye burns, and breathing the fumes created by these materials can cause extreme burning of the respiratory system and pulmonary edema. Materials with a pH >12.5 must be disposed as a hazardous waste. While bases react violently with acids, they can also be neutralized by acids.

Control Measures: Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Thoroughly wash exposed skin and hands upon completion of handling to avoid skin/eye irritations, itching and burning and prevent accidental ingestion.

3.1.1.3 Calibration and Fuel Gases

Calibration gases are used to calibrate air monitoring equipment. Common calibration gases used for equipment calibration include: hexane, hydrogen, isobutylene and methane. Calibration gases are used in small quantities, are highly flammable, and must be stored and handled safely. Gases such as hexane, methane, butane, and propane are used as fuel sources and may be encountered in larger quantities at oil and gas facilities. Workers may also come across methane gas through work in landfills, swamps, and agricultural land associated with raising livestock.

Control Measures: Keep containers upright, lids secured and store in climate-controlled environment away from heat sources. Calibration gases are asphyxiants (displace oxygen) so calibrate equipment in well-ventilated areas. When these gases are anticipated in larger quantities, workers must air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment.

3.1.1.4 Carbon Dioxide (Dry Ice)

Dry ice is carbon dioxide in a solid form. It may be used as a refrigerant and/or to displace vapors and has been used on some PPM jobsites for such purposes. Some hazards associated with the use of dry ice include, but are not limited to: frostbite through direct skin contact, asphyxiation due to displacement of oxygen in the atmosphere, and explosion from release of pressure exerted by the conversion of carbon dioxide solid to gas which could produce projectiles of the dry ice.

Control Measures: Avoid direct contact with solid dry ice to prevent frostbite. Avoid storing in areas with limited air flow (ventilation) such as buildings, vehicles, or other confined areas where gases can accumulate and be inhaled. Store inside a paper bag within a refrigerator, freezer, or cooler with a tight seal.

3.1.1.5 Hydrogen Sulfide

Hydrogen sulfide (H_2S) is a colorless gas known for its pungent odor (often referred to as a "rotten egg" odor) at low concentrations. It is a highly flammable and toxic substance associated with oil and gas refining, mining, tanning, pulp and paper processing, and rayon manufacturing. It can also occur naturally in sewers, well water, oil and gas wells, manure pits, and volcanoes. Hydrogen sulfide is heavier than air so it settles in low-lying enclosed areas such as manholes, sewers, and underground telephone vaults. Another characteristic of hydrogen sulfide is that it fatigues a worker's sense of smell so it cannot be relied upon in determining the continuous presence of H_2S gas. Health effects depend upon the exposure concentration and include, but are not limited to: irritation of eyes, respiratory system; apnea, coma, convulsions; conjunctivitis, eye pain, lacrimation (tears), photophobia (intolerance to light), corneal vesiculation; dizziness, headache, weakness, exhaustion, irritability, insomnia; gastrointestinal disturbance; as a liquid: frostbite.

Control Measures: Air monitor site conditions to ensure assigned action limits are not triggered. Wear personal monitoring badges for H_2S within the breathing zone. Where applicable, rely upon stationary monitoring devices and when alarms are triggered, evacuate the area upwind immediately. Use escape only respiratory protection when issued by PPM and/or the client facility.

3.1.2 Oxidizers

3.1.2.1 Hydrogen Peroxide (30-50%)

Hydrogen peroxide is a colorless liquid with a slightly sharp odor. It is a powerful oxidizer injected into subsurface soils, in conjunction with ozone, for the treatment of contaminants such as MTBE, BTEX, hydrocarbons – aliphatic and polyaromatic, diesel fuel, chlorinated solvents, VOCs, and pesticides. It is generally noncombustible, but upon contact with a combustible material, may result in spontaneous combustion. Direct contact may result in severe skin and eye damage. Symptoms of exposure include: irritation of eyes, nose, and throat; corneal ulcer; burning and redness of skin; and bleaching of hair.

Control Measures: Because hydrogen peroxide is injected into subsurface soils, worker exposures will likely result from a release at the monitoring wellhead, sparge point or other similar avenues that will lead the substance to ground surface. Therefore, workers must routinely air monitor around sparge points and monitoring wells for evidence of leakage. Collections must occur at the wellhead (source) as well as within the breathing zone of the worker. Hydrogen peroxide is injected into the subsurface via tubing from storage containers of liquid hydrogen peroxide so workers may have direct contact with these storage containers during initial setup and when replacing empty containers with new containers. Wear face shields, elbow-length gloves, and aprons as necessary to prevent direct contact with substance, and workers must keep face away from the source while collecting ambient air samples to avoid potential inhalation exposures and splash hazards.

3.1.2.2 Oxygen Release Compound® (ORC) and ORC Advanced®

ORC® and ORC Advanced® are forms of enhanced aerobic bioremediation which supplies oxygen to accelerate the biodegradation of soil and groundwater contaminants. Both materials are a white powder that gets mixed with water and injected in subsurface soils. Once mixed, these

materials have a pH of 10 [ORC] and 11-13 [ORC Advanced], making them a significant skin and eye irritant. Symptoms of exposure include: cough, sore throat, nose bleeds (extended exposures), eye watering and redness, eye lesions (extended exposures), nausea and vomiting if ingested and skin irritation.

Control Measures: When in powder form, this material is to be treated as a nuisance dust. Avoid creating dusty environments during the mixing process. When dealing with unknown dust concentrations, wear air-purifying respirator with P-100 HEPA filter until product becomes slurry mixture. Wear nitrile, neoprene or rubber gloves for hand protection and safety glasses or goggles for eye protection. Avoid storing oxidizers near combustible materials, other strong oxidizers, strong acids or other strong chemical agents. etc. (see safety data sheet for complete list of incompatibles).

3.1.2.3 Ozone

Ozone is a pale, blue gas with a distinctive odor similar to that of chlorine bleach and can be smelled at relatively low concentrations. It is a powerful oxidizer injected into subsurface soils for the treatment of contaminants such as MTBE, BTEX, hydrocarbons – aliphatic and polyaromatic, diesel fuel, chlorinated solvents, VOCs, and pesticides. Symptoms of exposure include: dryness of mouth, coughing, irritation to nose, throat and chest; difficult breathing, headache, and fatigue; eye irritation causing pain, lacrimation (tears) and inflammation.

Control Measures: Because ozone is injected into subsurface soils, worker exposures will likely result from a release at the monitoring wellhead, sparge point or other similar avenues that will lead the substance to ground surface. Workers must consistently air monitor sparge points and monitoring wells for evidence of ozone leakage. Collections must occur at the wellhead (source) as well as within the breathing zone of the worker. Ozone rapidly coverts into O_2, CO_2 and other less toxic molecules but exposure limits can be triggered at the wellhead so workers must keep face away from the source while collecting the sample until it can be confirmed that the sample is acceptable for worker exposure.

Although this system has built-in safety features which shut down the system if a leak is detected, sometimes ozone concentrations can build up inside the mobile ozone trailer. Workers should use caution when opening door and should keep door open while in use to allow for ventilation.

3.1.2.4 RegenOx A and B™

RegenOx™ is an oxidizing compound comprised of two parts (A and B) that is injected into subsurface soils as part of in-situ remediation. Part A is a white, odorless powder with a pH of 10.5 and is the oxidizer/catalyst component of this mixture. Part B is a blue/green, odorless liquid with a pH of 11 and is the activator complex. Both parts are mixed together prior to subsurface injection. The mixing of these materials is a relatively safe process but exposures can result in skin, eye, respiratory and gastrointestinal irritations. Symptoms include: coughing, shortness of breath, irritation to mucous membranes, nose and throat; skin and eye itching/redness; vomiting and diarrhea associated with ingestion [Part A] and irritation to mouth, esophagus and stomach [Part B].

Control Measures: When mixing materials, wear protective clothing such as neoprene, rubber or PVC gloves for hand protection and goggles or face-shield for eye protection. Avoid storing oxidizers near combustible materials, other strong oxidizers, acids, bases, salts of heavy metals, reducing agents, etc. (see safety data sheet for complete list of incompatibles).

3.1.3 Particulates and Fibers

Particulates are commonly referred as particulate matter and consist of pieces of solid matter suspended in a gas or liquid. Particulate matter can occur naturally or be man-made. Fibers consist of continuous filaments or elongated pieces like those similar to thread. Fibers are used to produce various materials such as paper, rope, and clothing. The common types of particulates and fibers encountered by personnel are outlined in the following sections.

3.1.3.1 Aluminum Oxide

Aluminum oxide is a byproduct generated by ozone remediation systems. Condensation forms on aluminum metal parts which when combined with oxygen creates a white, odorless, crystalline powder scale which can build up on metal parts of the system and presents a potential contact, inhalation, and/or ingestion exposure to workers. Aluminum oxide is a noncombustible solid, is not considered carcinogenic, and may include symptoms such as irritation of eyes, skin, and respiratory system.

Control Measures: To eliminate contact exposures, workers must wear chemical-resistant gloves and aprons to remove powder scale buildup from aluminum piping during routine system maintenance. Workers should avoid creating dust buildup of this substance, and when this cannot otherwise be avoided, workers must upgrade to respiratory equipment with P-100 filter to prevent inhalation of this material.

3.1.3.2 Asbestos

Asbestos is a naturally-occurring fibrous material used in many products due to its attractive features. Asbestos has tensile strength, can easily be woven, and is heat and chemical resistant. It is most commonly found in roofing shingles, floor and ceiling tiles, textiles, coatings, paper and cement products, piping insulation and friction products such as automobile clutch, brake and transmission parts. The three most common forms of asbestos include:

- **Amosite (brown asbestos)**. Amphibole fiber formation (straight, needle-like fibers). Originated in Africa and used industrially as a fire retardant in thermal insulation, used in cement sheeting and is also found in ceiling tiles.
- **Chrysotile (white asbestos)**. Serpentine fiber formation (curled fibers). Is less friable (less-likely to be inhaled) than other types of asbestos and therefore viewed by many to be the safest type of the asbestos, which is why it is the most common form of asbestos used in the U.S. mostly in the form of building materials.
- **Crocidolite (blue asbestos)**. Amphibole fiber formation (straight, needle-like fibers). Originated in South Africa and Australia and used for thermal and chemical insulation as well as construction piping and water casings. Is considered to be the most dangerous type of asbestos.

When asbestos is disturbed through repairs, remodeling or demolition, airborne fibers can be inhaled by workers causing respiratory diseases such as lung cancer, asbestosis and mesothelioma – all of which have a latency period between exposure and onset of symptoms. These respiratory diseases are chronic in nature and generally irreversible. Smokers are more susceptible to the damaging health effects of asbestos exposures. Symptoms of asbestos exposure include: shortness of breath, difficult breathing or swallowing, persistent coughing that progressively worsens, wheezing and hoarseness, coughing up blood, pain or tightening in the chest, swelling of face or neck, loss of appetite, weight loss, fatigue or anemia.

Control Measures: Asbestos-containing areas must be identified by signs, which will likely be found when working at larger industrial and commercial facilities. In these cases, workers must avoid these areas and take all necessary precautions to prevent disturbing any materials within these areas. In most cases, potential asbestos exposures will be in the form of sample collection as part of environmental site assessments performed on commercial properties. Personnel must be certified asbestos inspectors to perform these collections. In some cases, demolition of structures potentially containing asbestos materials may be supervised. At a minimum, the designated PPM-representative must be asbestos certified; however, the demolition and air monitoring requirements will be subcontracted to an appropriately state-certified contractor.

Because the sample collection process disturbs asbestos-containing materials (ACM) or potential asbestos-containing materials (PACM), workers must wear air-purifying respiratory protection in the form of half-mask respirator with P-100 high efficiency particulate air (HEPA) filters and must also wet the sample area with a soap-water mixture to reduce the dispersion of fibers. *Note: asbestos-containing materials will be presumed until otherwise verified through laboratory analysis. Buildings constructed prior to the 1980s have a greater likelihood of containing asbestos. PACMs must be treated as if they contain asbestos, and the greatest level of control should be used when collecting samples*.

3.1.3.3 Heavy Metals

Numerous heavy metals bind naturally to soils; therefore, dusty environments can introduce these hazards to workers. Heavy metals are poisonous to humans and can cause severe health effects due to their proven or suspected carcinogenic characteristics. Common heavy metals encountered through company-related processes include:

- **Aluminum**. A silvery-white, malleable, ductile, and odorless solid (metal); combustible as a solid (although takes effort), but easily ignitable when in fine dust form which can cause explosions; can cause damage to the eyes, skin and respiratory system; symptoms include: skin, eye and respiratory irritation.
- **Arsenic**. A silver-gray or tin-white metal commonly associated with under-ground storage tanks; noncombustible in solid form but presents slight explosion hazard in dust form when exposed to flame; is considered potential lung and lymphatic system carcinogen and can also affect liver, kidneys and skin through inhalation, skin absorption, skin/eye contact and ingestion exposures; symptoms include: respiratory irritations such as ulceration of nasal septum, dermatitis, gastrointestinal disturbances, hyperpigmentation (darkening) of the skin, and peripheral neuropathy (problem with nerves that carry information to and from the brain and spinal cord which can result in pain, loss of sensation and inability to control muscles).
- **Barium**. A silvery-white metal that exists naturally in the environment; because it is very reactive in its natural state, it is often combined with other elements such as oxygen, carbon and sulfur; it has many uses, but one likely exposure source is that it is used by the oil and gas industry to make drilling mud, which lubricates the drill and simplifies the process when drilling through rock; barium in its natural state is highly flammable and reacts violently with water; may cause irritation of skin, eye, nose, throat and upper respiratory tract, allergic reactions, and central nervous system damage; symptoms include: corneal damage including blindness, poisoning, dermatitis, and skin, eye and throat burns.
- **Cadmium**. A soft, bluish-white metal commonly associated with underground storage tanks; noncombustible in solid form but will burn in powder form; is considered potential prostate and lung carcinogen and can also affect respiratory system, kidneys and blood through inhalation and ingestion exposures; symptoms include: pulmonary

edema (fluid in air sacs of lungs) which causes difficult breathing, cough, chest tightness, substernal pain, headache, chills, muscle aches, nausea, vomiting, diarrhea, loss of smell, emphysema, proteinuria (protein in urine), and mild anemia.

- **Chromium**. A hard, steel-gray metal commonly associated with underground storage tanks; noncombustible in solid form but finely dispersed dust particles will rapidly burn when exposed to a flame; chromium is not considered a likely carcinogen, but does affect skin, eyes and respiratory system through inhalation, ingestion and contact exposures; symptoms include: skin and eye irritation and lung fibrosis (scarring of the lungs).
- **Copper**. A soft, malleable reddish-orange metal commonly associated with underground storage tanks; noncombustible in solid form but may ignite when in powder form; copper is not considered a likely carcinogen, but does affect skin, eyes, respiratory system, liver and kidneys through inhalation, ingestion and contact exposures; symptoms include: skin, eye and pharynx irritation, nasal septum perforation, metallic taste, and dermatitis.
- **Iron**. A lustrous metal with a grayish tinge commonly used in industry in the construction of machinery, tools, automobiles, ships and building components; it is the most commonly used of all metals and can also be found in numerous dietary sources; elevated iron in the blood can react with peroxides to produce free radicals that can damage DNA, proteins, lipids and other cellular components; upon exposure, iron can cause skin, eye, mucous and respiratory irritations; it is also flammable as a fine dust.
- **Lead**. A soft, gray metal commonly associated with underground storage tanks, paints and coatings; noncombustible in solid form; lead is not considered a likely carcinogen, but does affect eyes, gastrointestinal tract, central nervous system, kidneys, blood and gingival tissue (soft tissue of the mouth surrounding the teeth) through inhalation, ingestion and contact exposures; symptoms include: eye irritation, weakness, exhaustion, insomnia, facial pallor (paleness), weight loss/anorexia, malnutrition, constipation, abdominal pain, colic, anemia, gingival lead line, tremor, paralysis of wrist and ankles, encephalopathy (various brain disorders), kidney disease, and hypertension.
- **Magnesium**. A strong, silvery-white, light-weight metal that exists naturally in the environment; because it is very reactive in its natural state, it is often combined with other elements to form magnesium oxide, various salts, and other industrially-important compounds; magnesium is the third most commonly used metal; because it is light-weight, it is widely used in manufacturing numerous electronics; upon exposure, magnesium can cause skin and eye irritations; it is also flammable as a fine dust.
- **Mercury**. A silver-white, liquid metal associated with underground storage tanks, batteries, fluorescent bulbs, thermometers and thermostats; noncombustible liquid; mercury is not considered a likely carcinogen but does affect skin, eyes, respiratory system, central nervous system and kidneys through inhalation, skin absorption, ingestion and contact exposures; symptoms include: skin and eye irritation, cough, chest pain, difficult breathing, bronchitis, pnuemonitis (lung inflammation), tremor, insomnia, irritability, indecision, headache, weakness, exhaustion, stomatitis (inflammation of lining within the mouth), salivation, gastrointestinal disturbance, weight loss/anorexia, and proteinuria (protein in urine).
- **Selenium**. Crystalline, red to gray solid that is considered to be combustible when in fine dust form; elemental selenium is rare – it is most commonly produced as a byproduct of refining copper or producing sulfuric acid; selenium can cause damage to the skin, eyes, respiratory system, liver, kidneys, blood and spleen; symptoms include:

skin, eye, nose, and throat irritations, visual disturbance, headache, chills, fever, difficulty breathing, bronchitis, metallic taste, garlic breath, gastrointestinal disturbance, dermatitis, and skin and eye burns.

- **Silver**. A white, lustrous metal that is noncombustible in solid form but can become flammable when in dust form. Silver can cause damage to the nasal septum, skin and eyes. Symptoms include: blue-gray eyes, nasal septum, throat and skin, ulceration of skin, and gastrointestinal disturbance.
- **Zinc**. A bluish-white metal commonly associated with underground storage tanks and used as an anti-corrosion agent; zinc is commonly found in common cold lozenges and over-the-counter cold remedies, as a dietary supplement and also within common foods such as beans, nuts, whole grains and pumpkin/sunflower seeds; zinc is commonly considered non-toxic but in abundance can result in gastrointestinal irritation through ingestion exposures; symptoms include: loss of appetite, nausea, vomiting, stomach cramps, diarrhea and headaches.

Control Measures: Soils should be wet and kept damp to reduce the amount of airborne dust concentrations generated. Providing sufficient ventilation, wearing safety glasses with side-shield protection and wearing dust masks or respiratory equipment with P100 filter are other alternatives for working in dusty environments. Most PPM jobsites can be mitigated using wet methods only. Workers should use additional precautions when using both wet methods and power tools or corded equipment to avoid electrical shock. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion.

3.1.3.4 Nuisance and Concrete Dust

Dust generation is a common occurrence when working with contaminated soils and when mixing or dismantling concrete. In most cases, activities that result in dust accumulation are subcontracted making them more susceptible to these respiratory hazards than PPM personnel. Generally, dust accumulation is minimal, but the SSO must ensure that subcontractors are using effective controls to minimize dust accumulation, and that they are also equipped and wearing the appropriate protective equipment when performing these tasks. Contaminants associated with common job-related dusty environments include:

- **Total and respirable dust**. Dust found in the air that can cause breathing difficulties if inhaled. OSHA has established permissible exposure limits (PELs) for both total and respirable dusts to regulate worker exposures. Respirable dust is defined as dust particles less than 10 micrometers in diameter, which is too small to be visible. Symptoms of exposure can include coughing, wheezing and breathing difficulties.
- **Concrete dust**. Commonly generated through core drilling and jack-hammering through concrete. Also, small areas of concrete can be replaced by workers who may generate dusts from bags of cement as part of the mixing process. Trace amounts of crystalline silica, alkaline compounds and hexavalent chromium are found within cement. OSHA has established PELs for Portland cement to regulate worker exposures. Symptoms of exposure can include coughing, wheezing, eye irritations and in severe cases silicosis.

Control Measures: Soils should be wet and kept damp to reduce the amount of airborne dust concentrations generated. Providing sufficient ventilation, wearing safety glasses with side-shield protection and wearing dust masks or respiratory equipment with P100 filter are other alternatives for working in dusty environments. Most PPM jobsites can be mitigated using wet methods only. Workers should use additional precautions when using both wet methods and

power tools or corded equipment to avoid electrical shock. Wet cement can also cause skin burns so workers should wear goggles, aprons or long-sleeved clothing, and hand protection when mixing cement. Wash skin immediately and thoroughly if exposed to wet cement.

3.1.4 Volatile and Semi-Volatile Organic Compounds

Volatile organic compounds (VOCs) are a broad group of materials that have the ability to vaporize (change from a solid or liquid into a gas) with an increase in ambient temperature. Some example VOCs include: paints and lacquers, paint thinners, pesticides, solvents and degreasers, glues/adhesives and petroleum fuels. Semi-volatile organic compounds (SVOCs) include phenols and polycyclic aromatic hydrocarbons (PAHs), which have a higher boiling point than water and may vaporize with an increase in ambient temperature. VOC/SVOCs are not known for acute toxicity but have significant chronic health effects because concentrations are often low and symptoms are slow to develop, which is why several VOC/SVOCs are suspected or known carcinogens. Common VOC/SVOCs are outlined in the following sections.

3.1.4.1 Chlorinated Compounds

A chlorinated solvent is a type of organochlorine, which is an organic compound (contains carbon) that also contains chlorine. They are found in a variety of products and used as part of the dry cleaning process due to its ability to dissolve materials such as fats and greases. Workers are most likely to be exposed to these chemicals as part of soil and groundwater assessment and remediation associated with dry cleaning contaminants. Chlorinated solvents can be environmentally persistent and tend to evaporate easily making inhalation the primary route of worker exposure. However, workers may additionally be exposed to chlorinated solvents through ingestion, absorption and skin/eye contact. Common chlorinated solvents encountered through company-related processes include:

- **Carbon tetrachloride**. A noncombustible, colorless liquid with ether-like odor; considered a potential carcinogen with damaging effects to the central nervous system, eyes, lungs, liver, kidneys, and skin; symptoms include: skin and eye irritation, central nervous system depression, nausea, vomiting, drowsiness, dizziness, and incoordination.
- **Chloroform**. A noncombustible, colorless liquid with pleasant odor; considered a potential carcinogen with damaging effects to the liver, kidneys, heart, eyes, skin, and central nervous system; symptoms include: skin and eye irritation, dizziness, mental dullness, nausea, confusion, headache, weakness, exhaustion, anesthesia, and enlarged liver.
- **Methylene chloride**. A combustible, colorless liquid with chloroform-like odor; considered a potential carcinogen with damaging effects to the eyes, skin, cardiovascular system, and central nervous system; symptoms include: skin and eye irritation, weakness, exhaustion, drowsiness, dizziness, numb and tingling limbs, and nausea.
- **Perchloroethylene (Tetrachloroethylene)**. A noncombustible, colorless liquid with mild chloroform-like odor; when in a fire, it decomposes to hydrogen chloride and phosgene; considered a potential carcinogen with damaging effects to the eyes, skin, respiratory system, liver, kidneys and central nervous system; symptoms include: skin, eye, nose, throat and respiratory irritation, nausea, flushed face and neck, dizziness, incoordination, headache, drowsiness, skin redness, and liver damage.

- **Trichloroethylene**. A combustible, colorless liquid with chloroform-like odor; will burn when exposed to flame, but is difficult to burn; considered a potential carcinogen with damaging effects to the eyes, skin, respiratory system, heart, liver, kidneys, and central nervous system; symptoms include: skin and eye irritation, headache, visual disturbance, weakness, exhaustion, dizziness, tremor, drowsiness, nausea, vomiting, dermatitis, cardiac arrhythmias, parasthesia (tingling or numbness of the skin), and liver injury.
- **Vinyl chloride**. A combustible, colorless gas or liquid (below 7º F) with pleasant odor at high concentrations; considered a potential carcinogen with damaging effects to the liver, central nervous system, blood, respiratory system, and lymphatic system; symptoms include: weakness, exhaustion, abdominal pain, gastrointestinal bleeding, enlarged liver, pallor or cyanosis of extremities, and frostbite (as a liquid).

Control Measures: Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

3.1.4.2 Isopropyl Alcohol

After bailers and reusable sampling equipment is decontaminated with alconox® solution, it is then sprayed with isopropyl alcohol. Also referred to as isopropanol, isopropyl alcohol is a colorless, flammable liquid commonly known as rubbing alcohol. It is considered a skin, eye and respiratory system irritant that causes damage through inhalation, ingestion and skin/eye contact exposures. Symptoms of overexposure include: irritation of eyes, nose and throat, drowsiness, dizziness, headache and dry, cracking skin.

Control Measures: Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Increase frequency of air monitoring if action limits are triggered and remove or isolate all ignition sources if flammability limits are triggered. Thoroughly wash exposed skin and hands upon completion of handling to avoid skin/eye irritations.

3.1.4.3 Methyl-Tertiary Butyl Ether (MTBE)

MTBE is a colorless, flammable liquid with an ether-like odor used as a fuel additive to reduce emission gases such as ozone and carbon monoxide. At one point gasoline could consist of as much as 10-15% MTBE but has since been replaced with ethanol and other additions less harmful to humans and the environment. MTBE poses a concern because it is considered a potential human carcinogen, can easily travel through soils, and is very soluble in water creating larger contaminant plumes than other gasoline constituents. It is also more resistant to biodegradation making it more environmentally persistent. MTBE is considered a skin, eye, respiratory and central nervous system irritant with symptoms that include: skin, eye and mucous membrane irritation, dizziness, nausea, headache, intoxication, loss of balance and coordination, unconsciousness, coma, respiratory failure and death.

Control Measures: Avoid prolonged exposures to oil mist, liquid or vapor. Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective

equipment. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

3.1.4.4 Organic Hydrocarbons

Total petroleum hydrocarbon (TPH) is a broadly used term referring to a large family of compounds that originate from crude oil. Crude oil is a naturally-occurring, flammable liquid comprised of a complex mixture of various hydrocarbons. It is recovered through oil drilling, but can be refined and separated into other substances such as gasoline, kerosene, diesel and lubricating oils. TPH is generally comprised of hydrogen and carbon; hence the term "hydrocarbon". Because there are so many different mixtures, TPH is divided into groups or fractions, and each fraction consists of hydrocarbons that exhibit similar soil and groundwater traits. Fractioning TPH is beneficial in the risk assessment process because certain fractions may be eliminated as contaminants of concern. Common petroleum-based chemicals encountered through company-related processes include:

- **Gasoline**. Gasoline is extracted from crude oil through a distillation process. It is comprised primarily of aliphatic hydrocarbons, but also includes some aromatic hydrocarbons such as benzene and toluene to increase octane ratings. Additional additives such as tetraethyl lead and methyl-tertiary butyl ether (MTBE) were added to gasoline to enhance performance and reduce harmful carbon monoxide exhaust emissions and reduce smog. Due its harmful effects to human health and the environment, neither additive is currently used and has been replaced instead with alcohols such as ethanol or methanol.

  Gasoline is used primarily as a fuel source but can also be used as a solvent. Components of gasoline are considered to be carcinogenic, and because gasoline is highly volatile, inhalation of vapors is always a concern for workers. Gasoline is also a skin and eye irritant, its vapors are highly flammable, and it is a major source of pollution gas (i.e., 1 U.S. gallon of gasoline produces 19.4 pounds of carbon dioxide, a greenhouse gas). Gasoline is comprised of the following four constituents:

  → Benzene – a colorless, flammable liquid with a sweet odor; makes up on average 0.62% to 1% of gasoline; is considered a known carcinogen with damaging effects to skin, eyes, respiratory system, blood, central nervous system and bone marrow, which can result in anemia (decreased red blood cell count making one weak and tired), decreased white blood cell count (difficult to fight off infections), and low blood platelet count (excessive bleeding); benzene causes damage through inhalation, skin absorption, ingestion and contact exposures; symptoms include: drowsiness, dizziness, headaches, confusion, tremors, skin/eye irritations, redness and blistering of the skin, vomiting, stomach irritation, convulsions, rapid heart rate, unconsciousness, leukemia (long-term) and death (large doses).

  → Toluene – a colorless, flammable liquid with benzene-like odor (smells like paint thinner); can produce damaging effects to skin, eyes, respiratory and central nervous systems, liver and kidneys; toluene causes damage through inhalation, skin absorption, ingestion, and contact exposures; symptoms include: eye and nose irritation, weakness, exhaustion, confusion, euphoria, dizziness, headaches, dilated pupils, lacrimation (tears), anxiety, muscle fatigue, insomnia, parathesia (tingling or numbness of the skin), dermatitis, and liver/kidney damage.

→ Ethylbenzene – a colorless, flammable liquid with aromatic odor (smells like gasoline); is considered a potential human carcinogen that can produce damaging effects to skin, eyes, respiratory and central nervous systems; ethylbenzene causes damage through inhalation, skin/eye contact and ingestion exposures; symptoms include: irritation of the eyes, skin and mucuous membranes, headaches, dizziness, dermatitis, narcosis (unconsciousness) and coma.

→ Xylene – colorless, flammable liquid with sweet, balsam-like odor; is a mixture of ortho-, meta- and para-xylene isomers that releases carbon monoxide gas when burned; can produce damaging effects to skin, eyes, respiratory and central nervous systems, gastrointestinal tract, blood, liver and kidneys; xylene causes damage through inhalation, skin absorption, ingestion and skin/eye contact exposures; symptoms include: irritation of skin, eyes, nose and throat, dizziness, excitement, drowsiness, incoord-ination, staggering gait, corneal vacuolization, anorexia, nausea, vomiting, abdominal pain and dermatitis.

Control Measures: Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Increase frequency of air monitoring once action limits are triggered to ensure that all ignition sources are removed or isolated when flammability limits are triggered. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

- **Kerosene**. Kerosene is a source of fuel refined from crude oil that is heavier than gasoline but lighter than diesel. It is a colorless to yellowish oily liquid used in households as a lamp oil and used industrially as jet fuel for aircraft and rocket engines. Kerosene has a strong odor, is highly flammable, and causes damage to the eyes, skin, respiratory system, and central nervous system. Workers may be exposed to liquid kerosene and its vapors through inhalation, ingestion, skin and/or eye contact. Symptoms include: irritation of eyes, skin, nose and throat; burning sensation in chest; headache, nausea, lassitude (weakness, exhaustion), restlessness, incoordination, confusion, drowsiness; vomiting, diarrhea; dermatitis; and chemical pneumonitis (aspiration liquid). Kerosene is commonly referred to as paraffin in other countries.

  Control Measures: Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Increase frequency of air monitoring once action limits are triggered to ensure that all ignition sources are removed or isolated when flammability limits are triggered. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

- **Diesel/polycyclic aromatic hydrocarbons (PAHs)**. Diesel is a source of fuel refined from crude oil and used in diesel trucks, boats, school and city buses, trains, cranes, farming equipment, emergency response vehicles and power generators. Diesel is an attractive fuel source because it is less volatile and emits smaller amounts of greenhouse gases (CO and CO_2); however, during combustion it does release large amounts of soot which can lead to acid rain, smog and poor health conditions. PAHs are found in crude oil and

soot and are also a by-product of petroleum processing or combustion, specifically the incomplete burning of oil and gas. Common PAH constituents include: acenaphthene, acenaphthylene, anthracene, benz(a)anthracene, benzo(a)pyrene, benzo(b)-fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h) anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, and pyrene. The regulated PAH constituents are outlined below:

→ Coal tar pitch volatiles - PAH components anthracene, benzo(a)pyrene, chrysene, phenanthrene, and pyrene, all of which have the same chemical description, target organs, and regulatory threshold limits are not addressed by NIOSH as individual components. Instead, they are classified and regulated as coal tar pitch volatiles. Coal tar pitch volatiles may vary slightly but are described as combustible, black or brown amorphous residues and are considered a potential human carcinogen with damaging effects to respiratory system, skin, bladder, and kidneys. Symptoms include: dermatitis and bronchitis.

→ Naphthalene – Naphthalene is a combustible, colorless to brown solid with an odor or mothballs that causes damaging effects to eyes, skin, blood, liver, kidneys, and central nervous system. Symptoms include: eye irritation, headache, confusion, excitement, discomfort, nausea, vomiting, abdominal pain, bladder irritation, profuse sweating, jaundice, blood in urine, renal failure, dermatitis, optic and cornea damage.

Control Measures: Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Increase frequency of air monitoring once action limits are triggered to ensure that all ignition sources are removed or isolated when flammability limits are triggered. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

- **Hydraulic and lubrication oils**. Oils used for internal combustion engines to lubricate moving parts, prevent corrosion and to cool the engine. Lubricating oils are made from crude oil but also include additives to improve certain properties. Lubricating oils can be highly flammable and can cause irritation of nose, throat and lungs, headaches, dizziness, nausea, vomiting and diarrhea.

  Control Measures: Avoid prolonged exposures to oil mist, liquid or vapor. Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

3.1.4.5 Pesticides

A pesticide is another type of organochlorine commonly used for crop dusting agricultural farmland not only to kill insects, rodents and germs, but is also used for weed and mildew control. The term “pesticide” includes a broad category of chemicals that can be further broken down into insecticides, rodenticides and fungicides. Some older and more recently banned pesticides (such as DDT) tend to be environmentally persistent. Workers are potentially exposed to

pesticides as part of the assessment or remediation of impacted farmland as well as commercial pesticide manufacturing and/or storage facilities. Similarly to chlorinated solvents, pesticides can be volatile making inhalation the primary route of worker exposures. However, workers may additionally be exposed to pesticides through ingestion, absorption and skin/eye contact. There are numerous pesticides tested as part of assessment and remediation of impacted sites; however, the following pesticides are OSHA-regulated materials that pose a potential health risk to workers:

- **Aldrin**. A noncombustible, colorless to dark-brown crystalline solid with mild chemical odor; may dissolve in flammable liquids; formerly used as an insecticide and is considered a potential carcinogen with damaging effects to the central nervous system, kidneys, liver, and skin; symptoms include: headache, dizziness, nausea, vomiting, vague feeling of discomfort, jerking of limbs, convulsions, coma, hematuria (blood in urine), and azotemia (blood containing high levels of urea, creatinine and other nitrogen-rich compounds).
- **Dichlorodiphenyltrichloroethane (DDT)**. A combustible, colorless crystals or off-white powder with a slight aromatic odor; considered a potential carcinogen with damaging effects to the eyes, skin, central nervous system, liver, kidneys, and peripheral nervous system; symptoms include: skin and eye irritation, tingling and numbness of tongue, lips and face, tremor, anxiety, dizziness, confusion, vague feeling of discomfort, headache, weakness, exhaustion, convulsions, partial loss or impaired movement of hands, and vomiting.
- **Dieldrin**. A noncombustible, colorless to light-tan crystals with a mild chemical odor; used as an insecticide and is considered a potential carcinogen with damaging effects to the central nervous system, liver, kidneys, and skin; symptoms include: headache, dizziness, nausea, vomiting, vague feeling of discomfort, sweating, jerking of limbs, convulsions, and coma.
- **Endrin**. A noncombustible, colorless to tan, crystalline solid with a mild chemical odor; may dissolve in flammable liquids; used as an insecticide with damaging effects to the central nervous system and liver; symptoms include: epileptic-like convulsions, stupor, headache, dizziness, abdominal discomfort, nausea, vomiting, anorexia, insomnia, aggressiveness, confusion, drowsiness, weakness, and exhaustion.
- **Heptachlor**. A noncombustible, white to light-tan crystals with a camphor-like odor; may dissolve in flammable liquids; used as an insecticide and is considered a potential carcinogen with damaging effects to the central nervous system and liver; symptoms provided for animals only and include: tremor, convulsions, and liver damage.
- **Lindane**. A noncombustible, white to yellow crystalline powder with slight, musty odor; may dissolve in flammable liquids; causes damaging effects to skin, eyes, respiratory system, central nervous system, blood, liver, and kidneys; symptoms include: skin, eye, nose and throat irritation, headache, nausea, convulsions, respiratory difficulty, cyanosis, aplastic anemia, and muscle spasm.

Control Measures: Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

3.1.4.6 Polychlorinated Biphenyls (PCB)

Polychlorinated biphenyls (PCBs) are a mixture of numerous chlorinated compounds and are commercially sold under the trade name Aroclor® 1242 (contains 42% Cl^-) and Aroclor® 1254 (contains 54% Cl^-). It is a colorless to light-yellow, oily solid or liquid with no known taste or smell and can volatilize to a vapor with a slight increase in temperature. PCBs were used as coolants and lubricants in transformers, capacitors and electrical equipment because they do not burn easily and are good insulators. Production in the U.S. was discontinued in 1977 due to its environmental persistence and damaging health effects. PCBs do not easily break down, bind strongly to soil, accumulate in fish and marine life, and can travel far distances in air.

Workers are likely to be exposed to PCBs through damaged or burning transformers, known/suspected site contamination, or ingestion of contaminated fish. PCBs can also be found in pre-1977 fluorescent light fixtures, electrical devices (TVs and appliances), and hydraulic oils. Worker exposures are likely to occur through inhalation, absorption, ingestion and contact causing damaging effects to the skin, eyes, liver and reproductive system. Symptoms include: eye irritation, chloracne (acne-like skin condition in adults), liver damage, and reproductive effects.

Control Measures: Air monitor site conditions to ensure assigned action limits are not triggered. Immediately report any triggered action limit to the safety department and be prepared to temporarily shut down jobsite to incorporate control measures (i.e., stand upwind of concentrations) or upgrade protective equipment. Wear hand protection when handling contaminated soils/groundwater and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

3.1.5 Other/Unknown Chemicals

3.1.5.1 Activated Carbon

Also referred to as activated charcoal, this material comes in various forms but is most often purchased by PPM in granular form (occasionally purchased in pellet form). Activated carbon is a porous material that is effective in the adsorption of gases/vapors and is commonly used as part of the groundwater treatment process. This material is non-toxic but can be irritating to the skin and eyes. Loose granules can also present a slip hazard and dusts can accumulate when replacing spent carbon with unspent carbon.

Control Measures: Keep granules inside storage bag or carbon vessel and immediately remove spilled granules from the work area to prevent slipping. Wear appropriate protective clothing such as gloves and safety glasses when working with/near this material to prevent skin and eye contact. Keep dust generation to a minimum using a porta vac and be prepared to wear a dust mask or half mask with P-100 HEPA cartridge when dusts cannot otherwise be mitigated.

3.1.5.2 Alconox®/Liquinox®

Alconox® (powder) and Liquinox® (liquid) are detergents used to decontaminate bailers and equipment to prevent cross-contamination of samples. Detergents generally can be skin or eye irritants that can cause itching, pain, redness or burning.

Control Measures: Keep face away from solution when mixing and wear safety glasses with side-shield protection or goggles depending upon the degree of splashing. Wear hand protection when handling this product and wash hands prior to eating, drinking or other forms of hand-to-mouth contact to prevent accidental ingestion and contact irritations of skin/eye.

3.1.5.3 Descaling Agents (Analytix AN-754GH)

Various chemicals may be used to prevent the accumulations of scaling along monitoring well walls. These descalers may vary by office location; however, most of these chemicals exhibit similar characteristics. They are typically acidic in nature and may be extremely corrosive to skin, eyes, and respiratory system.

Control Measures: Keep face away from solution when handling and wear safety glasses with side-shield protection or goggles depending upon the degree of splashing. Use safe precautions when handling material and make every effort to avoid direct contact with this material through the use of protective clothing and equipment such as chemical-resistant gloves, goggles and aprons. Avoid inhaling any fumes that may arise from these chemicals.

3.1.5.4 GoJo® Natural Orange™ Pumice Hand Cleaner

GoJo® Natural Orange™ is a nonhazardous sanitizer used to clean hands, face, and exposed skin from dust, sludge, or other residues that may be encountered through the inspection process. This cleaning agent is not likely to produce adverse effects for most workers; however, some may be sensitive to this substance and reactions can consist of skin and eye irritations that can cause itching, pain, redness or burning.

Control Measures: Keep cleaning agents away from eyes and avoid continued use if you experience adverse skin reactions. If reactions persist after the substance is discontinued and cleaned from the affected area, seek prompt medical attention.

3.1.5.5 Magnaflux Soundclear® Gr. 60

Magnaflux Soundclear® Gr. 60 is an ultrasonic couplant (a bonding gel) that is applied to the transducer of the ultrasonic thickness meter, which when applied to the exterior wall of storage tanks, can establish the thickness of the tank wall.

Control Measures: Keep gel away from eyes and skin, and avoid continued use if you experience adverse eye/skin reactions. If reactions persist after the substance is discontinued and cleaned from the affected area, seek prompt medical attention. Use appropriate sanitation precautions to avoid accidental ingestion. Inhalation is not anticipated; however, respiratory irritations may occur if not handled properly.

3.1.5.6 Unknown Chemicals and/or Concentrations

Workers do not often come into contact with unknown chemicals and/or chemical concentrations. Although rare, workers may potentially encounter unknowns during drum characterizations as requested by a particular client. When the client cannot identify the material(s) inside a drum or other container, this material(s) is to be treated as an extremely hazardous substance using the highest level of safety precautions including, but not limited to, personal protective clothing/equipment. When working with known chemicals at unknown concentrations, the same level of safety precautions must be implemented to preserve worker safety and wellbeing. These situations are considered an immediately dangerous to life and/or health (IDLH) environment.

Control Measures: When this type of work is proposed by a client, it must be presented and approved by Authorizing Principals, Shawn Ivey or Zane Hood. Due to the increase in safety precautions, a site-specific HASP must be generated by the HSD, which may require additional time to prepare. Never open a drum/container that does not belong to PPM if the contents or concentrations are unknown.

3.1.6 Chemical/Physical Properties

The following table outlines the chemical and physical properties associated with the most common volatile or semi-volatile constituents encountered by PPM.

Chemical Name	VP[1]	VD[2]	SG[3]	Sol[4]	FP[5]	LEL[6]	UEL[7]
Diesel	0.009 psia	>1	0.83-0.88	Negligible	125	0.6	7.5
Gasoline	38-300	3-4	0.72-0.76	Insoluble	45	1.4	7.6
Benzene	75	2.8	0.88	<1	12	1.2	7.8
Toluene	21	4	0.87	<1	40	1.1	7.1
Ethylbenzene	7	4	0.87	<1	55	0.8	6.7
Xylene	9	4	0.86	<1	81	1.1	7.0
MTBE	245-256	3.1	0.74	4.8	-17	1.6	8.4
Ozone	>1 atm	1.7	2.14	<1	N/A	N/A	N/A

1 – Vapor Pressure (mmHg) – the higher the VP, the more likely it is to change from a liquid to a vapor with an increase in temperature.
2 – Vapor Density – how heavy the material is in air; anything >1 will sink into worker breathing zone; anything <1 will rise.
3 – Specific Gravity – how heavy the material is in water; anything >1 will sink in water; anything <1 will float on water.
4 – Solubility (%) – how likely the material is to be dissolved in water.
5 – Flash Point (°F) – lowest temp that material vapors will ignite/burn.
6 – Lower Explosive Limit (%) – lowest concentration in which vapors will ignite.
7 – Upper Explosive Limit (%) – highest concentration in which vapors will ignite.

3.2 PHYSICAL HAZARDS AND CONTROLS

3.2.1 Combustion/Flammability

The three elements needed to produce a fire are: combustible material, oxygen, and ignition source (heat). As part of most projects, the presence of gasoline (flammable contaminant) within an outdoor environment (sufficient oxygen content) when combined with the use of heavy equipment (electrical source) provides all three elements necessary to produce a flammable setting. Fires can also be the result of overloading circuitry and improper chemical storage.

Control Measures: Monitor ambient site concentrations to ensure flammable action limits are not triggered. Oxidizers are capable of releasing oxygen and generating heat so store them away from combustible materials. Do not overload power outlets. Remove foot heaters or other electrical devices if they trip ground fault circuit interrupters (GFCI) or produce burnt smell and/or smoke. Use ABC-rated fire extinguisher to extinguish fire or follow company evacuation procedures when warranted.

3.2.2 Compressed Gas

Compressed gases such as acetylene and oxygen may be used to operate cutting torches. Cylinders can become projectiles if they are not secured and/or stored properly. Improper handling of cylinders can also result in muscular sprains/strains, falls, bruising, or broken bones. Other hazards may include chemical burns, explosion fire, poisoning, and cold burns due to container mishandling. In addition, utility gas lines are often buried onsite nearby areas where drilling, trenching or other similar surface disturbances are likely to occur. Contact with a subsurface gas line could result in an explosion, fire, and other significant physical bodily injury.

Control Measures: Only qualified workers appropriately trained in compressed gas safety are permitted to work with compressed gases. Keep compressed gas cylinders upright and secured when in storage, transit or use. The valve protection cap must remain in place when not in use and during storage and should only be removed when the cylinder is secured and/or ready for use. Never drag or slide a compressed gas cylinder, drop a cylinder, or subject cylinders to strikes from other objects as this may cause damage to the valves. Store in a climate-controlled environment away from heat sources, heavily traveled paths, and emergency exits and store

other combustible materials in a separate location away from compressed gas cylinders. Smoking is prohibited near compressed gases. Keep empty and full cylinders segregated and replace empty cylinders promptly. Restrict unauthorized access to compressed gases and visually inspect containers weekly.

3.2.3 Concrete Coring and Cutting

The use of jackhammers and coring equipment is necessary to cut through concrete when conducting subsurface work. The use of this equipment is extremely loud, creates dusty environments and can create projectiles out of broken pieces of concrete.

Control Measures: Wet affected areas of concrete to reduce amount of dust generated; however, avoid creating large puddles of water as some equipment being used is corded and can create electrical hazards. If dust continues to be a problem, workers must wear air-purifying respirator with P-100 HEPA filter. Use vacuum-based core drills or secure the base of the core drill to concrete when working on uneven surfaces. Know where the manual shut-off switch is located and if not within reaching distance of worker, someone must be present at electrical outlet to unplug equipment should it be necessary. Operator and any worker required to be within 10 feet of coring/cutting process must wear face shield over safety glasses with side-shield protection to protect against flying particles.

3.2.4 Contaminated Water/Splash Hazards

Beware of splash hazards posed by purging and/or development of groundwater monitoring wells. Chemical splash hazards may also be encountered during drum sampling of known contaminants. Contaminants are likely to vary; therefore, the chemical hazards section of this plan should be referenced to address the hazards posed by the contaminant.

Control Measures: Workers must wear safety glasses with side-shield protection. Goggles may be necessary depending upon the degree of splashing. Goggles are required when moving containers of or working with severe eye irritants, acids or caustics.

3.2.5 Cuts and Lacerations

Acetate liners used for soil collections must be cut to collect the sample. Also, tubing materials used when groundwater sampling or used for air monitoring must be cut in various lengths. Shears or tube cutters are alternatives to using knives or other blades; however, there may be instances in which the use of knives or blades cannot be avoided.

Control Measures: Always use sharpened blades as dull blades can require more applied force. Wear leather or Kevlar® gloves to protect hands. Secure the object being cut keeping free hand out of the way and always cut away from the body. If cut must be made towards the body, cut the object at an angle away from the body. Utility knives must have a self-retracting blade and should not be stored in pockets of clothing.

When collecting soil samples, workers should rely upon the subcontractor to cut the sample liners whenever possible. When workers must cut the liners, the following specific instructions are required:

- Secure the liner to a stable structure (i.e., the truck tailgate or portable table).

- Use the proper cutting tool for the job (see photo); subcontractors often have this tool.
- Cut the liner perpendicular to the body – avoid cutting towards the body.

3.2.6 Driving Safety

Most company-related field activities occur offsite and require personnel to drive from the office to the jobsite. Collision with another vehicle or into a structure can result in property damage, worker injury or even a fatality.

Control Measures: Drivers must have valid state license to drive and must be classified appropriate to the type of vehicle he/she will be required to operate (i.e., vehicles with gross vehicle weight rating [GVWR] >10,000 lbs or any vehicle/trailer combination GVWR >10,000 lbs requires a commercial driver's license). Additional safety precautions for driver safety include, but are not limited to, the following:

- Obey all federal and state traffic laws (i.e., speed limits, yielding, etc.)
- Plan route to site in advance to avoid traffic congestion, construction, road closures, inclement weather or other similar forms of delay
- Perform pre-use inspection to ensure vehicle is fueled and in good working order
- Ensure all materials are secured
- Avoid distractions such as changing radio stations, reading texts or emails, eating, drinking, or other similar functions
- Pull over to take or make a phone call even when using hands-free devices
- Texting while driving is strictly prohibited by PPM and is a law in several states
- Drive defensively - yield to aggressive drivers, slow down when driving through adverse weather conditions or when driving through school zones

3.2.7 Drowning

Water bodies where the potential for drowning exists includes: oceans, rivers, lakes, seas, gulfs, bays, ponds, wetlands, bayous, streams or other similar water sources. Work over or near these types of water bodies is rarely encountered, and routine company job tasks do not usually result in the use of a boat. However, when they arise, jobs of this nature do pose a risk of drowning. When sample collections are anticipated to occur from within a boat, this will likely take place in various locations of the water body with varying or unknown depths, currents, floating and subsurface debris, and/or other similar hazards.

Control Measures: Tasks requiring work over or near water where the potential for drowning could occur requires a minimum of two workers. Use a boat with a flat, stable surface to reduce the potential for rollover. In addition, workers must wear a U.S. Coast Guard-approved life preserver at all times when inside the boat or when otherwise performing a task where the potential for drowning still exists. Once over water, movement within the boat should be minimized, and workers must use caution when collecting the sample. Workers must be equipped with buoys or other similar means to extract any individual that should fall into the water.

3.2.8 Electrical

3.2.8.1 Subsurface and Overhead Utilities

Typical jobsites will pose both subsurface and overhead utility hazards. Also, remediation systems are electrically operated and pose similar electrical hazards. Contact with power lines or exposed electrical wires can result in electric shock, severe skin burns and electrocution. Electrical wires are generally insulated as a first line of defense; however, tears or damage to the insulated material can directly expose workers to the wire. Other utility lines may be present at common jobsites and include water, sewer, natural gas, telephone and fiber optic. A punctured

natural gas line can spontaneously combust and cause a massive explosion. In addition, active retail gas stations contain subsurface product lines running from the tank pit to the dispenser islands and the layout of these lines can often be difficult to determine. Damage to some utilities may not necessarily pose a safety risk but damage to these structures can disrupt normal business functions and be very costly.

Control Measures: Treat all electrical lines and wires as active and avoid contact. Keep all equipment at least 10 feet away from all overhead power lines unless they have been isolated or shielded by the local energy company. Add an additional 0.4 inches to this distance for every 1 kV in excess of 50 kV. Follow all clearance procedures outlined within the company's written Subsurface Clearance program, which includes but is not limited to the following measures:

Pre-Work Clearance (Offsite and Onsite Preparations)

- Request as-built drawings and/or obtain specialized knowledge of subsurface utility/structural locations from the client or property owner.
- Pre-plan borehole locations and visually review with client or property owner.
- Contact state one-call 48-72 hours (state-specific time requirements vary) to mark utility locations prior to field work; make secondary notices if site not marked.
- Contact additional local utility providers that do not subscribe to one-call to mark utility locations prior to field work; make secondary notices if site not marked.
- Hire private utility locators to identify presence of subsurface structures in addition to or in the absence of other clearance methods.
- Perform visual site observations for indicators of subsurface utilities/structures.
- Locate all emergency shut-off devices and isolate the work area.
- Identify and avoid critical zones (*any area within 10 feet of UST system)* or obtain principal approval when there are no other alternatives to avoidance.
- Follow clearance procedures for critical and non-critical zones.

Subsurface Clearance Procedures

- Clear all boreholes horizontally to 110% of the diameter of the widest digging instrument intended for use starting in all four cardinal directions (NSEW) then fully covering the entire circumference of the area.
- Clear all boreholes vertically to minimum 4-foot depth BGS unless greater depths are specified by the Office Manager/Principal.
- Use company-approved clearance methods (for drilling/probing) in order of preference outlined as follows:
  1) Blunt-tip push probe
  2) Tiered approach – use push probe for vertical clearance, then use digging tools (i.e., hand auger or post-hole diggers) to clear horizontally to same depth previously cleared vertically; then use push probe to further advance vertically; continue until depth-requirement is achieved
  3) Hand auger and/or post-hole digger – used only when push probe cannot otherwise be advanced vertically due to soil type(s)
- Use flat-edge shovel to clear for trenches/excavations when in areas of marked or suspected subsurface utilities/structures; clear area until utility/structure is located; if not located within depth-requirement, proceed with trenching/excavating.

3.2.8.2 Electrical Tools and Power Cords

Assorted power tools may be required for certain tasks. Power tools can be battery operated or otherwise have an electrical power cord, which can be plugged into an electrical outlet. Due to this factor, energy can be controlled by plugging or unplugging the cord and does not require energy isolation. The electrical wires are typically insulated; however, kinks or cuts made to the

power cord jacket can expose workers to these electrical wires resulting in electric shock or electrocution.

Control Measures: Perform an initial inspection to ensure tools and cords are in good working order and immediately discard or label damaged tools/cords to prevent use until repairs or replacements can be made. Additional safety precautions for electrical protection include, but are not limited to, the following:

- Only use electrical outlets and matching cords with grounding wire (3-prong).
- Never remove grounding prong to accommodate a 2-prong electrical outlet.
- Electrical cords should be rated for hard or extra hard use.
- Insulated jackets should show no evidence of kinks, cuts or tears; any sign of wear (frayed insulation or exposed wires) requires immediate labeling of the cord as "damaged" and must be immediately removed from the work area.
- Avoid placing electrical cords or tools in pools of water or other wet areas.
- All portable or temporary wiring must be protected by GFCI.
- Avoid using tools or cords that trip the GFCI.
- Do not run over cords or place them through doors, windows or other pinch points.

3.2.8.3 Lockout/Tagout

Remediation systems are electrically-operated systems that may require energy isolation as part of operation, maintenance or repairs. According to 29 CFR 1910.147(a)(2)(ii), energy must be isolated when 1) a worker must remove or by-pass safety guards or devices; or 2) a worker must place a body part at the point of operation or where a danger zone exists in the operating cycle. These requirements do not apply to corded equipment as this power source can be isolated by unplugging the equipment. It also does not apply to other pressurized systems for gas or steam if it can be proven that continuity of service is essential or that shut down of the system is impractical.

Routine operations and maintenance procedures typically do not trigger the requirements for energy isolation. However, it should be noted that during certain system or component repairs, these criteria may be triggered and the locking and tagging of the system and/or its components is necessary to prevent the unintentional startup of the system.

Control Measures: Locking and tagging of the system must be conducted in accordance with company requirements outlined within its written Lockout/Tagout program. An itemized procedure list for system deactivation and reactivation are posted at all remediation systems.

3.2.9 Hand and Power Tools

The electrical hazards posed by the use of power tools have previously been addressed. However, other hazards are posed by the use of hand or power tools. Removing or by-passing safety guards can expose a worker to the piercing, cutting, crushing or rotating hazards of mechanical equipment. Improper posture or repetition of hand tools can lead to musculoskeletal disorders as outlined within the previous section.

Control Measures: Use equipment in accordance with manufacturer guidelines and according to its intended purpose. Always select the appropriate tool for the job and refrain from making adjustments. Never remove or bypass safety guards. Perform an initial inspection to ensure tools are in good working order and immediately discard or label damaged tools to prevent use until repairs or replacements can be made. Keep tools stored appropriately to prevent rust or other signs of weathering. Wear appropriate head, eye, hand, and foot protection at all times. Avoid wearing jewelry or loose-fitting protective gloves/clothing that could become entangled in moving parts of the tool.

3.2.10 Illumination

Most company-related tasks will be conducted during normal, daylight hours; however, some tasks may be required to be conducted at night. When these instances occur, visibility will be decreased making the jobsite and the task more dangerous. In addition, the overall visibility of workers to drivers, equipment operators, etc. may be decreased.

Control Measures: The National Cooperative Highway Research Program (NCHRP) Report 498: Illumination Guidelines for Nighttime Highway Work outlines a set of guidelines for adequate lighting when working at night. Workers should adhere to these requirements to ensure appropriate visibility during all phases of the project. The three categories outlined by the NCHRP include the following:

- Level I illuminance is necessary in areas where the work crew is in motion, moving from spot to spot. Required for low accuracy tasks that may involve the use of slow-moving equipment, and where large objects must be visible.
- Level II illuminance is necessary in areas on or around construction equipment. A higher degree of lighting in this area will provide a safer environment for equipment operators allowing them to perform tasks that require a moderate level of accuracy.
- Level III illuminance is necessary for tasks that require a higher level of visual acuity or difficulty.

Sample tasks and the illumination requirements for those tasks are outlined below:

Sample Tasks (Not All-Inclusive)	Illumination Levels	Average Minimum Maintained Illuminance
All work operation areas; setup of lane or road closures, lane closure tapes, and flagging stations	Level I	54 lux (5 foot-candles)
Areas on or around construction equipment; asphalt paving, milling and concrete placement and/or removal	Level II	108 lux (10 foot-candles)
Pavement or structural crack/ pothole filling; joint repair, pavement patching/repairs; installation of signal/electrical/ mechanical equipment	Level III	215 lux (20 foot-candles)

Note: A foot-candle (fc) is defined as a unit of illumination that is equal to one lumen per square foot, or 10.764 lux.

Increased lighting can be provided using portable light plant towers, balloon lighting, roadway luminaires mounted on temporary poles, and factory-installed lights on equipment. Workers should select a light source and position it in a manner that reduces the amount of glare. When conducting night tasks on or near road system right-of-ways, workers must additionally adhere to appropriate state DOT roadway and traffic control requirements. Reflective clothing/vests are required when working at night or decreased illumination.

3.2.11 Ladder Safety

3.2.11.1 Portable Ladder Safety

Portable ladders are commonly used when replacing spent carbon with inactivated granular carbon or to access stationary aboveground storage tanks for inspections and/or maintenance. Carbon vessels consist of 55-gallon drums or other vessels that commonly range from 8-30 feet in height. It should be noted that carbon vessels can exceed 30 feet but these vessels are not common to current company processes. As part of this change-out process, workers must climb

portable ladders at heights greater than 4 feet and they must do so carrying 50-lb sacks of granular carbon or other materials.

Control Measures: Falls from ladder use are exempted from the fall protection standards (29 CFR 1926.500-503). Instead falls from ladders are outlined within 29 CFR 1910.23, which does not require the use of personal fall arrest system when working at elevations in excess of 4 feet (general industry). Use buddy system when able or check in periodically with the office to relay status. Use a portable A-frame ladder and ensure that it is locked in place. Place ladder on level, compact ground surfaces and avoid wet areas. Never place ladder near entrance/exit or other pathway that could interfere with ladder usage. Use ladder for its intended purpose and in accordance with manufacturer's guidelines. Use two hands when ascending or descending.

3.2.11.2 Fixed Ladder Safety

Fixed ladders may be used at client facilities to access rooftops or other similar elevated walking/working surface. This is often necessary with asbestos and/or lead sample collections, vacuum events, aboveground tank inspections and industrial compliance.

Control Measures: Falls from ladder use are exempted from the fall protection standards (29 CFR 1926.500-503). Instead falls from ladders are outlined within 29 CFR 1910.23, which does not require the use of personal fall arrest system when working at elevations in excess of 4 feet (general industry). According to OSHA requirements, fixed ladders must have cages, wells, ladder safety devices, or self-retracting lifelines when the climb is less than 24 feet but the top of the ladder is greater than 24 feet above lower levels. When a fixed ladder is greater than 24 feet, it must be equipped with one of the following: ladder safety devices or self-retracting lifelines with rest platforms at intervals not to exceed 150 feet. When able and it does not otherwise introduce additional safety hazards, personnel may be required to use personal fall arrest system. This will be determined on a case-by-case basis.

3.2.12 Material Handling and Back Safety

It is common for workers to transport materials such as hand or power tools, bailers, sampling containers and monitoring equipment from the office to various site locations. Workers are also likely to relocate drums or other chemical storage containers. Materials may be heavy putting strain on the back, or they may be large or bulky and obstruct vision during transport.

Control Measures: When lifting or relocating heavy or large items, mechanical devices should be used as a first line of defense. When mechanical means are not available, workers should use the buddy system to lift and transport loads in excess of 50 lbs or load that obstruct view of travel. When lifting an object, workers should bend at the knees and lift with the legs – avoid applied pressure to the back as muscle strain will likely occur. Keep loads close to the body and avoid twisting while carrying loads. Ensure travel paths are free of obstructions prior to lift and relocating materials.

3.2.13 Mobile Equipment

3.2.13.1 Heavy Equipment and Machinery

Various types of heavy equipment are necessary to perform routine tasks such as drilling, geoprobing (direct push), mobile vacuum, trenching, excavating, remediation system installations and removals, underground storage tank removals, and other similar tasks. The use of this type of equipment is mostly subcontracted, and PPM requires its subcontractors be adequately trained to safely operate these types of heavy machinery. Other forms of heavy equipment such as forklifts, skid steers, and core drills can be operated by company personnel. PPM requires that operators of these types of equipment be deemed competent by the company through safety, instructional and observational training and/or operator experience. Also,

equipment must be inspected by a competent prior to use, documented and returned to the safety department for recordkeeping. Hazards associated with the use of heavy equipment include, but are not limited to, the following:

- Pinching, rolling, crushing, rotating hazards from equipment, hoses and connections
- Contact with overhead or underground utilities gas lines, power lines, etc.)
- Falling loads
- Hydraulic or pressurized equipment parts
- Swing radius of equipment
- Operator blind spots
- Hot equipment parts

Control Measures: Use equipment in accordance with its intended purpose. Machinery must be grounded prior to use and equipped with emergency stop devices. Workers must locate and test these devices prior to using the equipment. When the equipment is in use, one worker must be readily available to engage emergency stop devices unless other workers remain away from the equipment while in operation. Equipment must remain at least 10 feet away from any overhead utility line unless the line has been otherwise isolated or shielded from accidental contact. Derricks/masts of mobile equipment must be lowered prior to relocating equipment from one location to another while onsite. Personnel who work with or near rotating or other moving parts are prohibited from wearing jewelry, loose clothing or other similar means that could become entangled within the equipment. Long hair should be tied back and protective clothing should fit securely. Workers should not collect samples or otherwise place hands in or near augers when it is rotating, and workers must also avoid climbing mast of equipment when it is in operation. Wheels should be chocked and hand brakes set to secure equipment when at rest.

Contact with hot parts must be avoided and it should be noted that metal parts become extremely hot with sun exposure, which can cause significant skin burns. Workers are prohibited from working beneath elevated loads and must avoid any area impacted by the swing radius of operating equipment unless a spotter is used. Additionally, workers must be aware of operator blind spots which may also require the use of a spotter.

3.2.13.2 Aerial and Scissor Lifts

Use of aerial and/or scissor lifts is a rare occurrence. Workers anticipated to use such equipment will require additional training beyond what is provided through policy/procedural safety orientation(s) and annual refresher. Aerial and scissor lifts are not synonymous and are covered under two separate OSHA regulations. Regulatory requirements for aerial lifts can be found in §1926.453, while requirements for scissor lifts (defined by OSHA as a mobile scaffolding system) can be found in §1926.452(w). This equipment can reach elevations in excess of 4 feet triggering fall protection. It should be noted that per OSHA guidelines, aerial lifts require the use of personal fall arrest systems in conjunction with the use of a guardrail system, while scissor lifts require the use of personal fall arrest systems only in the absence of a guardrail system.

Control Measures: Use of aerial and scissor lifts is strictly prohibited unless approved in advance by the safety department. Additional regulatory training and competency assessment(s) will be required in making this determination.

3.2.14 Noise

OSHA regulates worker exposures to noise. The established action limit for an 8-hour workday is 85 decibels (dB), a time-weighted average (TWA). Levels at or in excess of this limit can cause hearing loss, which depending upon exposure can be a temporary or permanent loss. Noisy

environments can also interfere with worker communication and comprehension, which poses additional safety risks.

Noise exposures can be measured using sound level meters or noise dosimeters. Certain work-related processes considered to be noisy include but are not limited to the following:

- Remediation systems – systems vary, but noise levels have been measured ≥90 dB
- Heavy equipment operation (including vac trucks) – have been measured ≥120 dB
- Use of power tools – sound levels vary (electric drill – 95 dB, power saw 110 dB, power drill – 130 dB, pneumatic drill – 120 dB)
- Work conducted nearby high traffic roadways – typical freeway traffic is 70 dB; however, large 18-wheelers have been measured ≥90 dB
- Coring and cutting of concrete – use of jackhammers or coring equipment have been measured ≥130 dB

Control Measures: Download NIOSH Sound Level Meter or similar app on any smart phone to assess noise levels. Sound level meters may also be used to assess noise levels. Document noise levels using PPM's Occupational Noise Monitoring Report and return to the HSD upon completion of the project. In the absence of monitoring equipment, workers who must shout at a co-worker 5 feet away are likely triggering regulatory threshold limits for noise exposures. Those environments ≥85 dB require the use of administrative controls or protective equipment. Administrative measures such as limiting work hours within noisy environments should be the first line of defense used to control worker exposures to noise levels in excess of 85 dB. When this cannot be achieved use hearing protectors such as earplugs, canal caps or ear muffs to protect worker hearing.

3.2.15 Repetitive Motion

Some tasks require a degree of repetition that may put strain on muscles and joints of the body. Poor posture can also put a similar degree of strain on the body. Typical symptoms of repetitive motion strain do not necessarily occur immediately (i.e., they can appear at rest during sleep) and include but are not limited to the following:

- Tingling, swelling or numbness of wrists, knees, elbow or other joints
- Sharp, piercing pain
- Loss of flexibility or muscle strength

Control Measures: Avoid performing repetitive tasks that target specific parts of the body for extended periods of time. Recognize symptoms promptly and vary job task for a while. Stretching and flexibility exercises can strengthen muscles over time. Report any signs or symptoms of repetitive motion strain to the HSD immediately. These injuries progressively worsen so prevention is imperative.

3.2.16 Scaffolding

Use of scaffolding systems, which includes walking, working, assembling, disassembling, and/or other similar uses, is a rare occurrence. Workers anticipated to work on or near scaffolding systems will require additional training beyond what is provided through policy/procedural safety orientation(s) and annual refresher. Scaffolding systems will most commonly be encountered at a client facility and should be avoided.

Control Measures: Use of scaffolding systems is strictly prohibited. Work requiring the use of a scaffolding system will be subcontracted to appropriately qualified contractors.

3.2.17 Slips, Trips, and Falls

Open boreholes generated through drilling or direct push as well as improper materials storage can pose tripping hazards. In addition, typical groundwater monitoring activities can result in open monitoring wells producing the same results. Trenching and excavating jobs can result in large, open earth depressions of varied depths and widths in which workers, tools or equipment could potentially fall. Activated carbon replacements, asbestos/lead sampling, aboveground storage tank inspections and/or maintenance, and use of catwalks may require work at elevations ≥4 feet, which may require additional safety measures such as the use of fall protective equipment (i.e. full-body harness and lanyard). *Note: Only personnel who have received additional fall protection training are considered competent for performing these tasks – all other workers are prohibited from working at elevations ≥4 feet without additional training and certification.*

Areas surrounding tank systems are likely to contain aboveground piping, pumps, loading platforms, retaining walls/berms, and other similar features which may require the worker to walk on and/or over in order to gain access to certain areas of the tank for inspection. Walking on or around surfaces associated with drainage structures (i.e., sumps, canal ditches, etc.) may also create slip, trip and fall hazards.

Control Measures: Store all materials away from work areas until ready for use and keep all travel paths unobstructed. Walk around materials – never walk over them. Use secured, steel sheet plates or wood to cover open boreholes. Use company truck and cones to isolate traffic from open monitoring wells. Heavy equipment, barricades and caution tape must be used to isolate open excavations from vehicular traffic and unauthorized personnel. Use full-body harness and lanyard to tie-off to stable structure when working on walking/working surfaces at elevations ≥4 feet (refer to Section 3.2.19). Refer to Section 3.2.11 for fall hazards associated with the use of ladders.

3.2.18 Traffic and Secluded Areas

Most petroleum remediation activities occur at active retail gasoline facilities, which expose workers to vehicular traffic. In some cases, work may be required within roadway right-of-ways or workers may be required to cross highways to perform work on an adjoining property or within a median. Secluded areas are not typical of most field-related projects; however, they do exist on occasion. Workers required to perform tasks at remote locations should be aware that these locations may be unlawfully inhabited and/or have the potential for illegal activities.

Control Measures: Use buddy system when working in high traffic areas as first line of defense, especially on spill bucket closures, groundwater sampling, or other similar tasks that require workers to bend, kneel or sit at or slightly above ground level which greatly decreases worker visibility. When these conditions are triggered, the buddy system will require one worker to stand nearby the other worker to create a unit whereby the observer has the primary responsibility of ensuring the safety of the worker with decreased visibility. When working upright, the buddy system will permit workers to separate only to distances that are clearly visible to both workers in a manner that ensures both can continuously monitor the other during all phases of the task. For example, during the sample collection, workers must fill vials or other containers at the vehicle so that they remain in an upright position during collection. Collections at the well are prohibited unless workers are together as a unit because when workers are separated, this process generally requires the worker to bend or kneel, which decreases the visibility of that individual. In addition, the worker is no longer in a position to observe his/her co-worker voiding the effectiveness of the buddy system. If operating as a unit, one worker may observe while the other collects the sample at the well.

When the buddy system cannot be implemented, use the company vehicle and cones to clearly define and block traffic from your work area. Relocate vehicle and cones when work area changes. Workers must wear high visibility safety shirts or ANSI Class II vests to increase visibility even when using additional safety precautions. Reflective clothing/vests are required when working at night or decreased illumination. Additional illumination requirements for night work can be found in Section 3.2.10. When conducting night tasks on or near road system right-of-ways, workers must additionally adhere to appropriate state DOT roadway and traffic control requirements. When working in secluded or unsafe areas, the following measures are required:

- Schedule work during daylight hours.
- Contact local police department and inquire about security.
- Never go to site alone; use buddy system.
- Notify manager or co-worker regarding your location, estimated time to perform duties and anticipated time of return; make intermittent calls throughout the day.
- Have cell phone readily available and pre-set to 911.
- Carry whistle and pepper spray as alternate methods of defense.
- Wear work clothes and protective equipment to identify you are there in a professional capacity.
- Park vehicle nearby and never exit the vehicle if anyone or anything appears suspicious.

Note: The use of the buddy system as outlined above applies to traffic hazards only and should not be incorporated universally without additional discussion and management approval. For instance, the use of the buddy system as required when conducting emergency response is clearly specified by OSHA §1910.120 in a manner that opposes the previously outlined requirements. In the absence of regulatory direction, PPM will adhere to this definition of the buddy system.

3.2.19 Walking/Working Surfaces

3.2.19.1 Elevated Walking/Working Surfaces

Activated carbon replacements, asbestos/lead sampling, and aboveground storage tank inspections and/or maintenance may require work at elevations ≥4 feet. In addition, use of catwalks may exist at heights ≥4 feet. According to §1910.21, a catwalk is considered a runway which is defined as a passageway for persons, elevated above the surrounding floor or ground level, such as a footwalk along shafting or a walkway between buildings. When working on multilevel surfaces, any floor deteriorations or openings must be obstructed to prevent inadvertent falls from an elevated surface. Also, when working on multilevel structures, such as the roof of a tank, openings within the walking/working surface can cause collapse and/or extreme falls. Working at elevated heights can create fall hazards that can result in a fatality or serious physical impairment. Due to these risks, tasks such as these may require additional safety measures such as the use of fall protective equipment (i.e. full-body harness and lanyard). Falling objects from a catwalk to a lower level is another hazard commonly associated with elevated walking/working surfaces. *Note: Only personnel who have received additional fall protection training are considered competent for performing these tasks - all other workers are prohibited from working at elevations ≥4 feet without additional training and certification.*

Control Measures: Walking/working surfaces located greater than 4 feet (general industry) above ground surface requires fall protection in the form of a guardrail system to protect against inadvertent falls from elevated heights. Use barriers to isolate floor openings to prevent inadvertent trips and/or falls through such openings. Holes and openings must always be covered when not otherwise needed to perform a task. To protect workers from falling objects, runways must include toeboards, screens, guardrail system, debris nets, catch platforms, canopy structures, or barricades. Workers on lower levels must also wear hard hats at all times. Runways should consist of a nonskid surface material or grating, handrail supports for 200 pounds of force,

and means of egress that is permanent and stationary (ex. fixed ladders or stairs). Workers should wear laced footwear with rubber soles to give better foot and ankle support and to reduce the likelihood of slips.

3.2.19.2 Uneven Walking/Working Surfaces

Uneven walking and/or working surfaces are not uncommon. Sites with minimal grounds-keeping can disguise potholes, which could result in trips/falls or foot injuries. Dense vegetation can also disguise dips and potholes. Using limbs, branches, or other similar debris to cross over streams creates an unstable ground surface that can become structurally unsafe after repeated use. Aboveground storage tank lids may be domed and unlevel posing additional hazards in the inspection process.

Control Measures: When work is to be performed at an inactive facility, bring weed eaters and sprayer to address overgrown vegetation. When grounds keeping is the responsibility of the client, the Project Manager should call in advance and request site maintenance be performed prior to PPM's arrival onsite. Workers should also wear laced, steel-toed boots which gives better ankle support than slip-on safety footwear. When working in highly vegetative areas that must be accessed, workers should use mechanical equipment to clear cut access paths or use other hand tools. Avoid walking over vegetation or other debris that may become unstable after repeated use.

3.2.19.3 Unstable Soils and Cave-Ins

Soil is an extremely heavy material, and may weigh more than 100 pounds per cubic foot. A cubic yard of soil may weigh more than 2,700 pounds. That is nearly one and a half tons, the equivalent weight of a car. Furthermore, wet soil or rocky soil is usually heavier. The human body cannot support such heavy loads without being injured. The primary hazard associated with a trench or excavation is a cave-in. Common excavations consist of an average depth of 10-15 feet, and when soils cave-in on or around a worker, it will generally result in death.

Control Measures: Any trench or excavation ≥4 feet in depth must have the following protective measures implemented:

- Perform visual inspections prior to start of work daily and conduct additional inspections warranted by changes in site conditions.
- Provide onsite competent person with the knowledge and authority to correct any noted hazards derived from daily visual inspections.
- Keep all tools, materials, equipment and workers at least 2 feet away from edge of trench/excavation.
- Ladder or other means of egress in accordance with 29 CFR 1926.651(c)(2) must be provided by the subcontractor and be present onsite at all times – PPM requires a ladder be present onsite under these conditions regardless of whether a worker enters the trench/excavation.
- When controls are used and workers are required to enter a trench/excavation, ladders must be placed so that workers are not required to travel lateral distances greater than 25 feet.

OSHA requires that any trench/excavation with a depth ≥4 feet use engineering controls to prevent cave-ins. In addition, OSHA also requires that any trench/excavation with a depth ≥20 feet use a qualified engineer to determine the appropriate engineering control. *Note: Under no circumstances must any individual enter a trench/excavation with a depth of 4 feet or greater without the use of engineering controls. In addition, no equipment requiring an individual to be placed on or inside the equipment during its operation is permitted inside the trenched/excavated area. Soil packing and obtaining samples must be conducted through alternative methods*.

3.2.20 Weather

3.2.20.1 Heat Stress

Heat is a common concern for states in the southern U.S. and the use of personal protective clothing only adds to this stress. Heat stress can occur in as little as 15 minutes. Symptoms are generally progressive but some exceptions do apply. Some symptoms of heat stress may not arise, may go unnoticed or may occur simultaneously depending on the degree of progression and the awareness level of the worker. The following symptoms are associated with heat stress:

- Heat rash – skin rash caused by plugged sweat ducts due to perspiration
- Fainting – blood is not circulated properly to the brain and typically results from extended periods of standing in conjunction with immobility
- Dehydration – extreme water loss; workers will experience thirst
- Heat cramps – leg or stomach muscle cramps due to loss of sodium and potassium through perspiration
- Heat exhaustion – profuse sweating and clammy skin
- Heat stroke – core body temperature rises to life-threatening condition (104°F)

Control Measures: Heat stress can occur very rapidly; therefore, workers must be alert to the signs and symptoms and should be additionally aware of sluggishness or behavioral changes in their co-workers. Workers should be acclimated to their environment and breaks should be taken as necessary to replenish fluids and cool down core body temperature. Alternate workers as necessary to keep work going. Remove excess protective clothing and break in a shaded, cool area. Any worker exhibiting symptoms of heat stress will be prohibited from performing additional duties for the remainder of the day.

3.2.20.2 Cold Stress

The degree of coldness depends upon temperature, wind and wetness. When exposed to colder climates, the body loses heat faster than it can be generated. Prolonged exposures can rapidly use up the body's stored energy resulting in the following:

- Trench foot – injury to feet when immersed in water for prolonged periods resulting in reddening of skin, numbness, leg cramps, swelling, tingling pain, blisters or ulcers, bleeding under skin, and gangrene
- Chilblain – damage to capillary blood vessels in skin resulting in redness and itching mostly on cheeks, ears, fingers and toes; possible blistering, inflammation and ulceration in extreme cases
- Frostbite – injury caused by freezing of the skin, reduced blood flow to hands/feet, numbness, tingling or stinging, aching, bluish or pale, waxy skin which may lead to amputation
- Hypothermia – body loses heat faster than it can generate it resulting in (early symptoms) shivering, fatigue, loss of coordination, confusion and disorientation; (late symptoms) no shivering, blue skin, dilated pupils, slowed pulse and breathing and loss of consciousness

Control Measures: Workers should be acclimated to their environment, wear multiple layers of clothing, remove wet or damp clothing promptly and breaks should be taken as necessary to drink warm fluids and warm core body temperature. Alternate workers as necessary to keep work going. Any worker exhibiting symptoms of cold stress will be prohibited from performing additional duties for the remainder of the day.

3.2.20.3 Adverse Weather Conditions

Adverse weather conditions can include heavy rainfall, thunderstorm, lightning, hail, snow, tornado watch/warning, tropical storm or hurricane advisory to name a few. These types of weather conditions interfere with travel and field work. Workers who attempt to drive under these conditions put themselves at risk.

Control Measures: Follow local weather advisories and postpone work as necessary. Weather conditions can change rapidly while onsite. Carry NOAA weather radios when in the field to monitor changes in weather. Be prepared to use stop-work authority as necessary to address changes in weather. Plan your escape route in advance and be prepared to move to higher ground and/or evacuate. Never drive through flooded roads.

3.3 BIOLOGICAL HAZARDS AND CONTROLS

3.3.1 Insects and Mosquitoes

Insects and mosquitoes are prominent in just about any work location. Large ant beds as well as other insect nests such as hornets, wasps, yellow jackets and bees can be found as early as spring. They can reside in trees, high vegetative areas, holes within the ground or within piles of trash and debris.

Mosquitoes can carry infectious diseases such as West Nile virus and Zika virus, which can cause long-term debilitating illnesses, birth defects, or fatality. They are most active at dusk or dawn. Symptoms vary and can appear between 3-14 days after a bite.

- West Nile: (mild symptoms) – fever, headache, body aches, nausea, vomiting, and swollen lymph glands or skin rash on chest, stomach and back; symptoms may last for several days to a few weeks; occurs in up to 20% of people infected; (severe symptoms) – high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness and paralysis; symptoms may last for several weeks and neurological symptoms may be permanent; occurs in 1 out of 250 people infected.
- Zika: mild fever, skin rashes, muscle and joint pain, and conjunctivitis (pink eye) that usually last between 2-7 days; can cause severe birth defects in offspring of pregnant women.

Control Measures: PPM contracts a professional spraying company to spray for insect nests; however, workers should carry pest-control materials as necessary and keep extra cans of wasp, hornet, bee and ant spray as a secondary precaution. Workers required to carry allergy treatments such as an epinephrine injection (epipen) must keep this nearby at all times, and co-workers must know the location of this treatment should it be needed. To prevent mosquito bites, use insect repellant containing DEET, wear long-sleeved shirts and long pants and remove any standing water from buckets or barrels where mosquitoes can lay their eggs.

3.3.2 Ticks and Spiders

Spiders can be found in highly vegetative areas, in and around remediation systems and in other similar areas. Black widow spiders are commonly found inside well vaults, beneath a system in dark crevices and other similar dark spaces.


Black Widow


Brown Widow


Brown Recluse

Ticks can be encountered in highly vegetative areas with limited grounds keeping. Ticks are external parasites and there are more than 800 different species. Deer ticks carry Lyme disease, but <5% of all tick bites result in Lyme infection. Symptoms of Lyme infection include: flu-like illness with red skin rash that occurs within 3 weeks of bite. Rash should be circular and can increase daily. Symptoms of exposure should be reported immediately to the safety department and medical attention should be sought as necessary.

Control Measures: PPM contracts a professional spraying company to spray for spiders when also spraying for insects. Avoid placing hands and arms in dark spaces that cannot be seen. Use caution when opening well vaults or when working in other dark places. Do post-job body inspection and remove ticks immediately.

3.3.3 Rodents, Reptiles and Roaming Animals

The southeast U.S. is home to various species of venomous snakes. Venomous snakes will likely be found beneath piles of debris, near bodies of water or in high or heavily vegetative areas. They generally have a triangular-shaped head, elliptical pupils, and some have rattlers. A few common species of venomous snakes are identified below.


Southern Copperhead


Water Moccasin


E. Diamondback Rattler

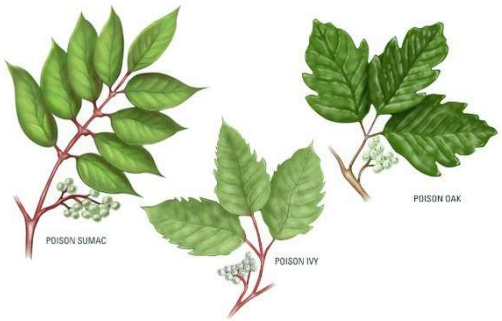

Coral Snake

Facilities located near lakes, rivers, bayous, streams or that otherwise have ponds may have alligators present. Alligators will come out of the water and onto land surface to build nests for their eggs or to sunbathe. They are also known to lie beneath the water's surface in wait when they are preparing to attack and they may not be visible to workers. Highly vegetative areas and areas with trash or debris can be home to rodents such as rats or mice. Remediation systems provide warmth in colder climates and it is not uncommon to find rodents and other animals within or around the unit. Sites located in populated areas may have wandering animals. Pets may be trained to attack when approached, may have mange (parasitic skin diseases) or may carry other diseases.

Control Measures: When working in or around bodies of water, be aware of any indicators of alligator presence, which require immediate evacuation of the area. General awareness and caution must be used when working in highly vegetative areas. Never place hands or other parts of body in an area that is not clearly visible. Snake guards/chaps should be worn when working in suspected snake-infested areas. Workers must avoid wandering animals – they may appear to be a pet; however, they can carry diseases and they may bite or scratch.

3.3.4 Poison Plants

Heavily vegetative areas may have poisonous plants such as poison ivy, oak or sumac, which produce a poisonous sap called urushiol. Typically the first exposure to these plants may not result in any symptoms as this is classified as a "sensitization period". Future exposures to these plants will then produce bumps often mistaken for mosquito bites until they begin to ooze. This is spread by scratching affected areas and touching other unaffected areas.



Control Measures: First line of defense is to be able to identify and avoid these plants. Weed killers should be used to minimize mowing and to eliminate exposure to poison ivy, oak or sumac. It should be noted that poisonous plants still thrive throughout the winter and they are more difficult to locate without their leaves. Workers should wear long-sleeved shirts and long pants tucked into boots when working in highly vegetative areas. Pre-medicated towelettes or lotions form a barrier on the skin and prevent adverse reactions. Rubbing alcohol can remove the oil resin up to 30 minutes after exposure, and antihistamines (non-drowsy) can also be taken post-exposure to minimize the reaction.

3.3.5 Bloodborne Pathogens

Sharps hazards come in various forms and may include hypodermic needles, cutting tools or equipment/machinery with sharp edges like box cutters, scissors, machinery blades, etc. Hypodermic needles are occasionally encountered at some jobsites. Needles may be used for insulin injections or drug use. Other sharps may become contaminated upon contact with infected sources. Life-threatening illnesses such as hepatitis or human immunodeficiency virus [HIV] (also referred to as bloodborne pathogens) may be transmitted via contaminated sharps so workers should be extremely cautious at all field locations. Also, bloodborne pathogens can be transmitted from an infected individual to another when providing first aid. All individuals and sharps must be treated as other potentially infectious materials (OPIM).

Control Measures: Never reach beneath the remediation system or stick hands in areas not clearly visible. Do a visual inspection before reaching for any component or item. Never recap a needle! Remove needles carefully using puncture-resistant gloves. Place them in plastic containers with a closed lid. Duct tape the lid before discarding. Drop off at community drop sites (where available). This type of waste is considered biohazardous waste; however, only healthcare facilities and medical waste industries are regulated. Be aware that the state of Florida requires disposal of this waste at established drop off locations, but all other states in which PPM has an office only recommend using these locations where available. Avoid contact with sharp edges of equipment/machinery, use cutting tools in accordance with manufacturer's guidelines, and always cut away from or perpendicular to the body. Use the concept of universal precautions for infection control. This concept is to treat all human blood and certain human body fluids as if known to be infectious for HIV, hepatitis B, and other bloodborne pathogens.

3.3.6 Infectious Illnesses

Infectious illnesses caused by viral, bacterial, fungal and parasitic agents are often transmitted by infected biological sources such as mosquitoes, humans, birds, pigs, ticks, etc. Such illnesses as influenza, swine and avian flu, coronavirus (COVID-19), HIV, Zika and West Nile virus, tuberculosis, and hepatitis, to name a few, can be acquired through occupational exposures.

Control Measures: Workers will be immunized, where appropriate and available, and personal protective equipment will be provided to eliminate or reduce potential contact with contaminated sources. Illnesses transmitted person-to-person that may result as an epidemic or pandemic event will be addressed through social distancing, telecommuting, and other recommendations or requirements outlined by state and federal agencies. The preventive measures warranted will be dictated by the illness type and mode of transmission; therefore, each situation will be evaluated on a case-by-case basis.

The current illness prevention measures in place to prevent or minimize the spread of COVID-19 include, but are not limited to, the following:

- Get vaccinated;
- Ensure worker temperature is ≤100.4°F;
- Maintain social distances of 6 feet or greater;
- Wear facemask in public settings and when social distancing cannot be maintained;
- Clean and disinfect hands frequently and after contact with commonly–touched sources;
- Clean and disinfect common areas such as restrooms, kitchen, and break areas;
- Clean and disinfect commonly shared vehicles, instruments, tools, or other similar materials; and
- Immediate isolation from others once potential COVID-19 symptoms develop, and management reporting to prevent contact with and spread of infection to others.

Note: Additional safety precautions for SARS-CoV-2 are outlined within PPM's Exposure Control and Response Plan for Coronavirus Disease 2019 (COVID-19) and must be implemented in accordance with the plan.

4.0 EXPOSURE MONITORING

As part of company-related processes, employees will or have the potential to be exposed to various chemical hazards. Chemicals that pose an inhalation hazard may not be considered a threat to worker health until a regulatory limit or more stringent company-imposed action limit is triggered. In addition, some chemicals can become flammable at certain limits. To ensure workers are not working within hazardous or flammable atmospheres, ambient air monitoring will be performed for any work-related process in which chemicals pose an inhalation hazard and have assigned regulatory limits for permissible worker exposures or are otherwise considered a potential fire hazard. Air monitoring will not be required when working with or near materials considered to be non-hazardous in nature or do not otherwise pose an inhalation or fire hazard to workers.

4.1 TERMINOLOGY/DEFINITIONS

In order to determine existing or potential worker overexposures to hazardous or flammable substances, workers must first understand common exposure terminology. Some commonly used exposure terms are defined in the following table:

Term	Definition
Action Limit	Company-assigned exposure limit assigned to a chemical that is more stringent than the regulatory or recommended exposure limit.
Ceiling Limit	Maximum concentration of a chemical a worker can be exposed to at any point during a work shift. This is an instantaneous reading.
Flammability/Explosive Range	The concentration range (LEL-UEL) of a combustible or flammable material (gas/vapor) that will burn or explode when introduced to an ignition source.

Term	Definition
Immediately Dangerous to Life and/or Health (IDLH)	Concentration of a chemical beyond which a worker will be capable of escaping death or permanent injury without help in less than 30 minutes.
Lower Flammability/ Explosive Limit (LFL/LEL)	The lowest concentration of a gas/vapor needed to produce a fire or explosion when exposed to an ignition source.
Permissible Exposure Limit (PEL)/Threshold Limit Value (TLV)	OSHA's regulatory exposure limit is the PEL, whereas the TLV is used to represent other published recommended exposure limits (NIOSH or ACGIH).
Short-Term Exposure Limit (STEL)	Maximum concentration of a chemical a worker can be exposed to without adverse effects over a 15-minute period (unless otherwise noted) not to exceed 4 times per work shift with 1-hr rest intervals between exposures.
Time-Weighted Average (TWA)	Maximum concentration of a chemical a worker can be exposed to without any adverse effect. Based on an 8-hr day/40-hr week.
Upper Flammability/ Explosive Limit (UFL/UEL)	The highest concentration of a gas/vapor needed to produce a fire or explosion when exposed to an ignition source.

4.2 ESTABLISHING EXPOSURE AND FLAMMABILITY LIMITS

4.2.1 Exposure Limits

For any material that has an established regulatory or recommended exposure limit, PPM has established a more conservative action limit. It is the company's intention to take some form of action before a worker is exposed at regulatory or recommended levels. The exception to this concept applies only to contaminants with very low exposure limits and also to the detection capabilities of air monitoring equipment.

Action limits are established on a case-by-case basis and in accordance with general industry practice. When ambient air concentrations trigger action limits, engineering, administrative or work practice controls should be incorporated to eliminate the exposure or reduce worker exposures to an acceptable limit. When this cannot be achieved, workers will be required to upgrade personal protective equipment.

4.2.2 Flammability Limits

PPM has adopted general industry practice by setting its flammability action limits to be 10% of the regulatory limit. Since lower and upper explosive limits are provided as a percentage, PPM has additionally converted the flammability ranges of commonly encountered combustible and flammable materials into parts per million (ppm). Regardless of the volatile monitoring equipment used, workers will be able to determine when a given work environment is or becomes a flammable environment. Workers must also recognize that when working in environments in which chemical concentrations >UEL, as effective control measures are introduced the chemical concentration will again fall back into the flammability range and ignition sources must be eliminated until concentrations once again fall below the material's assigned LEL.

4.3 REGULATORY EXPOSURE LIMITS

Whenever an action, regulatory or recommended exposure limit is triggered, workers must be prepared to immediately report site conditions to management, to develop and implement alternative control measures, to evacuate the site when warranted and/or be prepared to upgrade personal protective equipment (i.e., wear respiratory protection). In order to wear respiratory protection, workers must first be medically cleared by a physician, be fit-tested to a

specific respirator and have received training in accordance with the procedures outlined within the company's Respiratory Protection program. To ascertain eligibility, workers must receive authorization from the safety department prior to using a respirator.

Action, regulatory, and/or recommended exposure limits assigned to routine chemicals commonly encountered by workers are outlined within the following table:

Constituent	Toxicity					Fire
	Action	PEL/TLV	STEL	Ceiling	IDLH	LEL-UEL
Activated carbon	--	--	--	--	--	--
Alconox® [nuisance dust]	5	5	--	--	--	--
Aldrin[pesticide]	0.25	0.25	--	--	25	--
Aluminum[metal]	5	5	--	--	--	--
Aluminum oxide[nuisance dust]	5	5	--	--	--	--
Ammonia[base]	50	50	35†	--	300	15,000-28,000
Arsenic[metal]	0.01	0.01	--	--	5	--
Analytix AN-754GH	--	--	--	--	--	--
Asbestos	0.1	0.1	1	--	--	--
Barium[metal]	0.5	0.5	--	--	--	--
Benzene	1	1	5	--	500	1,200-7,800
n-Butane	400	800	--	--	--	1,600-8,400
Cadmium[metal]	0.005	0.005	--	--	9	--
Calcium hydroxide[base]	5	5	--	--	--	--
Carbon dioxide[dry ice]	2,500	5,000†	30,000	--	40,000	--
Carbon tetrachloride	2	2†	--	25	200	--
Chloroform	2	2†	2 [60-min]	50	500	--
Chromium[metal]	0.5	0.5	--	--	250	--
Coal tar pitch volatiles[PAH]	0.2	0.2	--	--	80	--
Copper[metal]	1	1	--	--	100	--
DDT[pesticide]	1	1	--	--	500	--
Dieldrin[pesticide]	0.25	0.25	--	--	50	--
Diesel	100[skin]	100[skin]	--	--	--	600-7,500
Dust [Total]	15	15	--	--	--	--
Dust [Respirable]	5	5	--	--	--	--
Dust [Portland Cement]	50	50	--	--	--	--
Endrin[pesticide]	0.1	0.1	--	--	2	--
Ethylbenzene	100	100†	125†	--	800	800-6,700
Gasoline	100	300†	500†	--	--	1,400-7,600
Heptachlor[pesticide]	0.5	0.5	--	--	35	--
Hexane	50	50†	--	--	1,100	1,100-7,500
Hydrochloric acid[HCl]	--	--	--	5	50	--
Hydrogen peroxide[30-50%]	1	1	--	--	75	--
Hydrogen Sulfide[H_2S]	1	1	--	10	100	4,000-44,000
Iron[metal]	--	--	--	--	--	--
Isobutylene	--	--	--	--	--	1,800-9,600
Isopropyl alcohol	200	400†	500†	--	2,000	2,000-12,700
Kerosene	50	100	--	--	--	700-5,000
Klozur[sodium persulfate]	5	5	--	--	--	--
Lead[metal]	0.05	0.05	--	--	100	--
Lindane[pesticide]	0.5	0.5	--	--	50	--
Liquinox®	--	--	--	--	--	--

Constituent	Toxicity					Fire
	Action	PEL/TLV	STEL	Ceiling	IDLH	LEL-UEL
Lubricating oils[motor oil]	--	--	--	--	--	--
Magnesium[metal]	--	--	--	--	--	--
Mercury[metal/vapor]	0.1[skin]	0.1†[skin]	--	0.1†[skin]	10[skin]	--
Methane	--	--	--	--	--	5,000-15,000
Methylene chloride	25	25	125	--	2,300	13,000-23,000
MTBE	50	50	--	--	--	1,000-8,000
Muriatic acid[HCl]	--	--	--	5	50	--
Naphthalene[PAH]	10	10†	15†	--	250	900-5,900
Nitric acid	2	2†	4†	--	25	--
NXT[Klozur – sodium persulfate]	5	5	--	--	--	--
Oil[crude]	0.2[mg/m³]	0.2[mg/m³]	--	--	--	1,000-8,000
ORC®/ORC Advanced®	5	5	--	--	--	--
Ozone	0.05	0.1†	0.3†	0.1	5	--
PCB	0.5[skin]	0.5[skin]	--	--	5	--
Perchloroethylene[PERC]	25	25†	--	150[cap]	150	--
Phosphoric acid[H_3PO_4]	1	1†	3†	--	1,000	--
Potassium hydroxide[base]	2	2†	--	2	--	--
Propane	500	1,000	--	--	2,100	2,100-9,500
RegenOx A or B™	--	--	--	--	--	--
Selenium[metal]	0.2	0.2	--	--	1	--
Silver[metal]	0.01	0.01	--	--	10	--
Sodium carbonate[base]	--	--	--	--	--	--
Sodium hydroxide[base]	2	2	--	2†	10	--
Sulfuric acid[H_2SO_4]	1	1	15†	--	15	--
Tetrachloroethylene[PERC]	25	25†	100	150[cap]	150	--
Toluene	100	100†	150†	300	500	1,100-7,100
Trichloroethylene	50	50†	200†	200	1,000	8,000-10,500*
Vinyl chloride	1	1	--	5[15-min]	--	3,600-33,000
Xylene	100	100†	150†	--	900	1,100-7,000
Zinc[metal]	--	--	--	--	--	--

NOTES:
† - More protective OSHA PELs vacated by the 11th Circuit Court of Appeals in July 1992; however, OSHA can enforce under the General Duty Clause. PPM will adhere to these exposure limits to ensure worker health and wellbeing is maintained.
Diesel, dusts, heavy metals, bases/alkalis, Trap & Treat BOS-200, and PCBs are all measured as mg/m³ – not ppm!
Asbestos is measured as number of fibers per unit air (f/cc); Portland cement is measured as million parts per cubic feet (mppcf).
Action limit and PEL are time-weighted averages over 8-hour work period. STEL is TWA over 4 15-min periods, with the exception of asbestos, which has a 30-minute excursion limit. Others are instantaneous readings.
PAHs - coal tar pitch volatile components of TPH-D include anthracene, benzo(a)pyrene, chrysene, phenanthrene and pyrene, all of which have the same permissible exposure and IDLH limits; therefore, all components lumped into one group. The only other regulated component of PAH is naphthalene which is a component of crude or refined oil and is listed separately from other PAHs.
Only the regulated pesticide components of EPA SWA-846 Methods 8080/8081 are included above.
Perchloroethylene (PCE) has a ceiling limit of 200 ppm for 5 minutes within any 3-hr period not to exceed 300 ppm but this has been capped at 150 ppm to match IDLH concentrations for this material. Trichloroethylene's flammability range is effective ≥77ºF.
Flammability ranges (LEL-UEL) are set at 10%.

Any constituent not otherwise specified above that is anticipated as part of company-related processes in which workers have the potential to be exposed must be immediately reported to the safety department and will require a site-specific HASP. This HASP will be generated and issued by the safety department and requires a 1-week advanced notice.

4.4 MONITORING EQUIPMENT AND CALIBRATION

Because PPM works with a variety of chemicals, not all constituents can be detected with one universal monitoring device. Some monitoring equipment can provide instantaneous readings, while others require laboratory analysis (wet method analysis). In addition, each monitoring device has its advantages and disadvantages. Some commonly used monitoring devices used by PPM include the following:

- **Organic vapor analyzers (OVA)**. This monitoring device is used to detect volatile and semi-volatile substances. Some OVAs used by the company include MiniRAE 2000 PGM 7600, GasTech®, RKI Eagle® photoionization detector (PID), and Micro FID® flame ionization detector (FID). The advantage of this monitoring device is that it is a direct-read instrument and provides instantaneous readings. Some disadvantages of this equipment are that it generally does not provide readings less than 1 ppm, it does not give percent LEL or provide oxygen content. OVAs generally detect a group of chemicals and do not indicate which compound is being detected.
- **Ozone meters**. This monitoring device is used to detect ozone gas and is also a direct-read instrument. The ozone meter used by some offices within the company is the EcoSensor Ozone Sensor A-21ZX. It is chemical-specific but has some interference from other oxidizing gases.
- **PortaSens II gas detector**. The monitoring device is a portable, direct-read gas leak detector that has the ability to measure a variety of different gases by simply inserting a gas-specific sensor. This instrument is lightweight and can measure gases such as acetylene, ammonia, carbon monoxide, fluorine, formaldehyde, hydrogen, hydrogen chloride, hydrogen cyanide, hydrogen peroxide, hydrogen sulfide, oxygen, ozone, phosgene, and sulfur dioxide. For a composite list of gases, refer to the manufacturer's website.
- **Portable air monitoring pumps**. These monitoring devices are used to assess continuous personnel and background exposures and are commonly used for sampling heavy metals, asbestos, silica or nuisance/respirable dusts. A common portable air monitoring pump used by the company is the SKC AirChek52®. Pumps are set to a specific flow rate of air (can be low volume or high volume) and contaminants are captured using a filter, which is later sent for laboratory analysis. Some advantages of this monitoring equipment are that these pumps are small, light-weight and portable. Some disadvantages of this monitoring equipment are that they do not provide instantaneous readings; exposures are unknown until laboratory results are received.
- **Personal monitoring badges**. These monitoring devices are used to assess continuous personnel exposures. They are light-weight, easy to use and can target specific constituents as opposed to a group of compounds. Badges must be sent to lab for analysis so they do not provide instantaneous readings. In addition, other constituents with similar chemical make-up can cause interference giving inaccurate exposures so samplers must be able to identify potential cross-interference prior to sampling.
- **Colorimetric indicator tubes**. These monitoring devices are used to assess continuous personnel exposures. Passive diffusion tubes are used when determining longer term exposures and workers need only break off the tip of the tube to initiate sampling. Pumps can also be used to draw in air and generally give a short-term exposure assessment during the period of time the air is extracted. Tubes are contaminant-specific and change color when in contact with the constituent giving an instantaneous reading.

Colorimetric tubes have a $^{+/-}$25% degree of error and chemicals with similar make-up can cause interference giving inaccurate exposures so samplers must be able to identify potential cross-interference prior to sampling.

To ensure it is in good working order, air monitoring equipment must be calibrated in accordance with manufacturer recommendations for each monitoring device. Workers must be aware that each office utilizes different monitoring equipment; therefore, readings from instruments calibrated with methane may not be the same as readings from instruments calibrated with hexane. Be sure to use the instrument's conversion tables as provided by the manufacturer when warranted. In addition, some metals can produce toxic gases when burned or exposed to open flames; therefore, the safety data sheet should be referenced when working with metal-contaminated soils.

4.5 SAMPLE COLLECTION

To appropriately determine exposures, samples must be collected within the breathing zone (shoulder level) of the worker, subcontractor or other affected pedestrian when relevant to site concentrations and location of these concentrations in relation to the general public. It should be noted that there may be times in which samples must be collected at the source (i.e., inside manhole) for technical purposes. These concentrations must be identified and reported as separate readings not indicative of worker exposures. Additional precautions must be taken to prevent impact to worker breathing zone during the sample collection when at or near the contaminant source. Depending on the concentrations in this given area or when impact to worker breathing zone cannot otherwise be avoided, respiratory protection may be required.

4.6 MONITORING FREQUENCY AND DOCUMENTATION

Ambient air monitoring is required prior to field work to establish a baseline and intermittently throughout the course of a project to compensate for changes in site conditions. Samples must be collected every two hours so long as concentrations are well below established action limits. Areas selected for monitoring must compensate for worker/subcontractor exposures, general public exposures, residential areas, potential nearby business exposures, etc. and may warrant numerous collection locations.

When there is a noted increase in ambient site concentrations, the sampling frequency must be increased to every 30 minutes until site conditions indicate a decreasing trend. If site concentrations are elevating at a rapid pace, continuous air monitoring must be conducted to ensure no threshold limits are triggered. This may require temporary postponement of site activities until concentrations can be reduced to an acceptable limit. Whenever any threshold limit is triggered, site activities must be halted and the safety department notified.

All monitoring areas, concentrations, sample collection times and/or notations (i.e., change in site conditions, contaminant source readings, etc.) must be documented using the company's Ambient Air Monitoring Report form. Forms must be completed fully and returned to the safety department for review upon completion of the project.

5.0 PERSONAL PROTECTIVE EQUIPMENT

5.1 PROJECT-SPECIFIC PPE REQUIREMENTS

Depending on the degree of the hazard(s) posed by field tasks, various levels of protective clothing and equipment may be required. Protective clothing and/or equipment required by routine tasks covered by this HASP are outlined further in the table below. Protective clothing and/or equipment not otherwise covered by this plan will require a site-specific HASP. Contact the HSD for further instructions.

Field Task	Protective Clothing/Equipment										
	Steel-Toed Shoes[1]	Safety Glasses[2]	High Visibility Shirt/ Vest[3]	Gloves[4]	Hearing Protector[5]	Hard Hat (Class E)[6]	Goggles/Face Shield[7]	Respirator (APR)[8]	Harness/Lanyard	Flotation Devices/ Buoys[9]	Fire Retardant Clothing[10]
Activated carbon replacement	X		X	X	X	X	X	X	X		
Asbestos inspections or sampling	X	X	X	X				X			
Chemical injection	X	X	X	X	X	X					
▪ Working with dry powder	X		X	X	X	X	X	X			
▪ Working with liquid/mixing w/H_20	X		X	X	X	X	X				
Compliance audits/visual inspections[Phase 1]	X	X	X								
DPT - drilling, geoprobing[Hand Auger]	X	X	X	X							
DPT - drilling, geoprobing[Heavy Equipment]	X	X	X	X	X	X					
Groundwater sampling	X	X	X	X							
Mobile vacuum event	X	X	X	X	X						
Mobile ozone	X	X	X	X	X						
Monitoring well plugging and abandonment	X	X	X	X	X	X					
Operation and maintenance of system	X	X	X	X	X						
Remediation system install/demobilization	X	X	X	X	X	X					
Spill bucket replacement/closure	X	X	X	X	X	X					
Trenching and excavating	X	X	X	X	X	X					
UST pull/closure	X	X	X	X	X	X					
Any work over or near water body		X		X			X			X	
Any work performed at oil and gas facility, terminals, or other similar property	X	X		X	X	X					X

1 – Steel-toed boots/shoes or equivalent ANSI-approved composite-toe footwear; rubber boots may be used when working within a boat or near a water body
2 – Safety glasses must be ANSI-approved and equipped with side-shield protection; prescription lenses are permitted if equipped with side-shield protection
3 – DOT Class II or III high visibility clothing or safety vests with exposure to traffic and/or mobile equipment
4 – Nitrile gloves for petroleum contamination; Kevlar®/leather gloves for cutting hazards; other chemical-resistant gloves needed for more stringent chemical hazards
5 – Ear plugs, canal caps or ear muffs when noise levels ≥85 dB
6 – Class E hard hats required for protection against electrical hazards
7 – Safety glasses must be upgraded to goggles or face shield when working with/mixing powders or when working with liquids that present splash hazard
8 – Air-purifying respirator (half-mask or full-face) required for all asbestos sample collections and when chemical threshold limits are triggered and control measures are ineffective
9 – Personal flotation devices (life jacket) must be U.S. Coast Guard-approved.
10 – Fire-retardant clothing is a client-specific requirement; clients within the oil/gas industry generally require fire-retardant clothing

5.2 REDUCTION OF PROTECTIVE CLOTHING AND EQUIPMENT

The use of protective clothing and equipment is mandatory at all times during the course of a project except when inside a designated break area. A break area will be assigned by the Site Safety Officer during the pre-entry safety briefing. The break area must be:

- Located a minimum of 50 feet away from the work zone
- Located where ambient concentrations are not > chemical detection limit
- Located out of the way of vehicular traffic and must not hinder any functions of other businesses

The break area must be clearly designated by posting cones, barricades, or caution tape. Affected personnel and subcontractors must be informed of the break area during the pre-work safety briefing. Only when inside the break area may protective clothing and/or equipment be

removed. If the conditions noted above cannot be met, the safety department must be contacted. Variances may be granted based on certain site conditions.

5.3 OTHER PROTECTIVE AIDS

Protective equipment can be used in a number of ways to draw attention to the worker or work area, to isolate the work area from unauthorized persons and/or traffic, or to identify the hazard(s) posed by the activity. Common examples of protective equipment used by PPM include, but are not limited to the following:

- Signs, posters, labels
- Cones, barricades, caution tape
- Heavy equipment/machinery or company vehicles
- Steel plate covers or wood for monitoring wells and/or holes
- First aid kit
- Flashing lights
- Flag extensions on cones for greater visibility
- Portable 10 or 20-lb ABC fire extinguishers
- Lockout/tagout devices
- Handheld eyewash bottles

6.0 SITE ACCESS, CONTROL, AND DECONTAMINATION

6.1 SITE ACCESS

Typical PPM jobsites occur in areas open and accessible to the general public. However, when working at unguarded gated facilities, workers must secure appropriate means of site access from the client. This can include a coordinated effort to meet the client at a designated date and time, or acquiring keys to the facility from the client. *Note: Personnel and/or subcontractors are prohibited from climbing over or crawling beneath site fencing to secure site access.*

6.2 DESIGNATED WORK ZONES

6.2.1 Non-Emergency Response Sites

Most offsite activities occur at jobsites either open to the public (i.e., retail gasoline stations) or controlled access to private facilities. In either case, routine business practices, especially those involved in the remediation process, occur after releases have been controlled. Under these conditions, the immediate work area will be defined using caution tape, cones, barricades, vehicles, equipment, or other similar means in order to prevent unauthorized entry of others into the work zone; create a barrier between hazards associated with the task(s) and the public, and eliminate the migration of potentially hazardous substances into clean areas of the property.

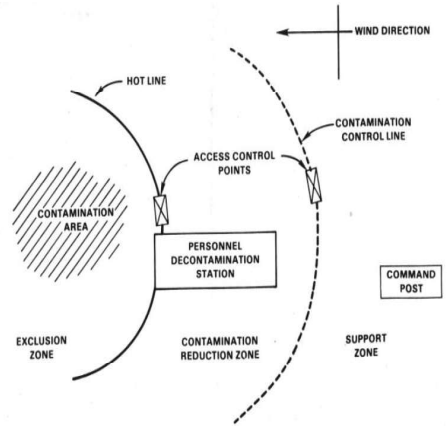
6.2.2 Emergency Response Sites

On occasion, PPM may be required to respond to an active chemical release. Jobsites with the following conditions meet OSHA's definition for a hazardous waste site:

- Uncontrolled releases of hazardous substances;
- Cleanup of RCRA sites;
- Hazardous waste operations at treatment, storage and disposal (TSD) facilities; and
- Emergency response operations for release, or potential threat of release, of hazardous substances.

Work performed at any jobsite that meets the definition of a hazardous waste site requires designated work areas to isolate hazardous work areas from unprotected persons, to prevent the migration of contamination, and to prevent the transfer of contamination through impacted protective clothing as well as monitoring and sampling equipment. Designated work areas include the following:

- Exclusion zone – the area denoting site contamination where heavy equipment operation and sample collection is likely to occur
- Contamination reduction zone – the area surrounding the exclusion zone where clothing and equipment is decontaminated to prevent the transfer of contaminants
- Support zone – any area not otherwise considered the exclusion or contamination reduction zone



6.3 AUTHORIZED PERSONNEL

Only authorized personnel are permitted within the work zone (non-emergency response) and/or exclusion or decontamination reduction zones (emergency response). An authorized person is considered to be any individual who has a relevant role or function in relation to the project, participates in onsite safety briefings, and signs the HASP acknowledgement form. Facility managers, client, agency representatives, and law enforcement or regulatory officials may refuse to participate in planned safety meetings or HASP review. As this situation arises, all equipment and job tasks should be temporarily halted to allow for onsite inspection and monitoring by these individuals. When unauthorized persons exit the defined work zone(s), all site activities may resume.

6.4 STOP-WORK AUTHORITY

The SSO has full stop-work authority and should use this authority under the following conditions:

- When a hazardous condition, unsafe behavior or other safety concern is noted
- When a near-miss or incident is reported
- When an unauthorized individual enters the designated work zone
- When lightning or other signs of inclement weather is noted within the area
- When a contaminant action limit is triggered
- When unexpected conditions arise that could warrant changes to safety procedures and/or scope of work

6.5 GENERAL SITE CONTROL AND SAFETY PRECAUTIONS

The following denotes simple procedures for maintaining site control and worker safety:

- Designated parking and pedestrian walkways in areas a reasonable distance away from active investigation
- Use buddy system whenever feasible
- Perform pre-job inspection to establish appropriate baselines and to visually inspect for obstacles, clearances, etc.
- Avoid smoking on the jobsite unless within authorized areas (i.e., break areas when deemed appropriate by the SSO for smoking)
- Use appropriate safety devices (i.e., cones, barricades, etc.) to clearly identify work zones and break areas
- Prevent unauthorized entry and use stop-work authority as necessary

- Perform post-job inspection to ensure all materials have been removed from the site; pay close attention to the vehicles to ensure animals or person(s) are not located beneath the vehicle and that all cab and toolbox doors have been secured

6.6 DECONTAMINATION PROCEDURES

In order to prevent the spread of contamination from impacted work zones, monitoring equipment, sampling equipment, and/or workers, decontamination must take place. Decontamination is defined as the removal or reduction of contaminants. Decontamination procedures vary based on the degree of site contamination as well as the contaminant(s) involved, and this process must take place within the contamination reduction zone. As impacted workers and equipment exit the exclusion zone, they must be decontaminated using appropriate detergent solutions. Disposal protective clothing must be discarded in garbage bags or lined containers for proper disposal.

Typical company functions require a low level of decontamination which involves the cleaning of bailers, purge materials and/or other similar equipment as samples are collected in various areas of a jobsite. Most chemicals in which workers are exposed are classified as skin and eye irritants; therefore, it is important for workers to remove contaminated clothing as soon as possible, flush eyes for a minimum of 20 minutes and use alconox®/liquinox® solution to wash impacted skin.

7.0 EMERGENCY RESPONSE

7.1 ALARMS AND ONSITE NOTIFICATIONS

To compensate for unexpected conditions and/or changes in existing site conditions, each jobsite must have an effective communication system in place. Workers are notified of emergencies through various forms of effective communication consisting of the following:

- Verbal communication – is generally the most effective form of communication for the majority of all job-related tasks associated with a project
- Hand communication – hand signals are used in place of verbal communication under the following conditions:
  - → When noise levels become elevated due to heavy equipment operation or other similar measures that prevent workers from hearing verbal communications
  - → When equipment operator's line of vision is obstructed
  - → Under any situation deemed necessary by the SSO
- Continuous horn blast of vehicle or air horn – used in lieu of verbal and hand communications due to:
  - → Large, dispersed work zones or multiple work areas that prevent overall effectiveness of other forms of communication
  - → Multiple site distractions that inhibit immediate worker attention
  - → Elevated noise levels that inhibit immediate worker attention

  One continuous blast is to be used so as not to confuse workers with other equipment sounds.

7.2 PERSONNEL ASSESSMENT AND EVACUATION

Once an alarm has been triggered, workers must be evacuate the work zone and meet in the designated area assigned during the pre-entry safety briefing. This location is determined by the SSO based on distance from existing hazards and verification that it is upwind of any chemical hazard source. Site evacuation is warranted under the following conditions:

- When ambient air concentrations meet or exceed an established action limit assigned for a constituent
- When new hazards not otherwise addressed within this safety plan are encountered
- When subcontractor, field personnel, clients, or regulatory officials violate the safety provisions outlined within this plan
- Upon client or regulatory agency request
- Under any condition the SSO deems unsafe

When evacuation is warranted, all field personnel and subcontractors will meet at the designated area for a preliminary head count, which is conducted by the SSO. Further provisions will be discussed at that time.

7.3 INCIDENT, NEAR-MISS, AND HAZARD RECOGNITION REPORTING

Incidents, near-misses or other noted hazards must be reported promptly to the safety department so that each case can be further investigated to determine the root-cause of the event in order to prevent future recurrences. An incident is defined as an occurrence that results in worker injury or property damage. Examples of an incident include, but are not limited to, the following:

- Underground storage tank (UST) puncture
- Auto-related accident regardless of fault
- Contact with overhead or subsurface utilities (i.e., water, sewer, telephone, fiber optic, power, transfer product lines, etc.)
- Chemical spill or release
- Slips, trips, or falls

A near miss is defined as an unplanned event that did not result in injury, illness or damage but had the potential to do so. Unexpected hazards may arise from unsafe acts or conditions or changes in site conditions. Incidents, near-misses and hazards must be reported to the safety department immediately once the site has been secured. The site is considered secured once all leaks have been properly contained, and the area has been evacuated and further isolated to prevent unauthorized entry. All reports must be made to the District Manager or can be made to the safety department directly. In addition, all reports must be documented using the Incident, Near-Miss and Hazard Recognition Report.

7.4 INJURY REPORTING AND CASE MANAGEMENT

Any incident that results in injury must be reported immediately to the HSD. Reported injuries or illnesses that warrant medical care must be managed by the safety department. In order to achieve this, all cases are evaluated for medical necessity. Whenever possible, workers are sent to the company's pre-established occupational medicine clinics that specialize in work-related injury care. Workers are permitted to seek medical attention (911) without prior company consent only when the injury appears to be life-threatening or when the injury requires immediate medical attention and contact with designated company officials cannot be achieved.

Workers who seek medical attention without company consent will be required to pay for their own medical care out-of-pocket. This provision also applies to follow up care when an injury/illness does not get better. Workers must additionally report changes in medical condition to the HSD, and additional medical evaluations must be coordinated by the company.

7.5 GENERAL MEDICAL CARE AND FIRST AID

It is company policy that all field workers be trained in adult CPR and first aid. Workers who have received this level of training should be prepared to administer care for minor injuries. Certified workers may additionally be called upon to provide care to more seriously injured persons while waiting for additional medical attention. If the victim is conscious, workers must indicate that they are certified and they must additionally obtain consent prior to administering care. Consent is implied when the victim is unconscious.

Some general emergency care provisions are outlined below (not all-inclusive):

Hazard Category	Hazard	Response
Chemical	Inhalation	Move worker to fresh air. If vomiting, dizzy or groggy, seek medical attention immediately. Administer CPR if certified.
	Dermal/Contact	Remove contaminated clothing and flush affected area with soap/water for ~20 minutes. Seek medical care if pain persists.
	Ingestion	Seek immediate medical attention. Do not give fluids to an unconscious person. Do not induce vomiting.
	Eye	Flush with copious amounts of water for ~20 minutes. Seek medical attention if pain persists.
Physical	Heat stress	Apply warm, damp heat and pressure to reduce pain in legs/ abdomen. Give electrolyte drinks by mouth, if conscious. Remove excess clothing and attempt to cool core body temperature promptly using cold water. Medical attention is warranted for extreme heat stress.
	Cold stress	Remove any wet clothing immediately and bundle in extra clothing and/or blankets. Drink warm fluids, if conscious. Attempt to warm core body temperature using heater or other methods. Medical attention is warranted for extreme cold stress.
	Sprain/strain	Use combination heat/cold therapies to reduce swelling and apply pain relief. Take an over-the-counter naproxen sodium (Aleve) or ibuprofen (Advil) for pain and inflammation. Seek medical attention if pain persists for more than a few days.
	Tingling/ numbness	Generally an indication of swelling but can lead to permanent nerve damage. Take an over-the-counter naproxen sodium (Aleve) or ibuprofen (Advil) for pain and inflammation. Seek medical attention if symptoms persist.
	Cuts/lacerations	Apply pressure to wound for blood to clot and use bandages to cover wound. Antibiotic creams can prevent infection. Seek medical attention for deep cuts that require stitches.
	Ringing in ears	Symptom of hearing loss, which will require medical testing to determine if this is a temporary or permanent hearing loss.
Biological	Needle stick	Immediately remove needle. Squeeze the area to extract blood from the wound. Seek immediate medical care and carry the needle with you to the medical clinic.
	Insect/spider/ tick/animal bite	Immediately remove insect or tick and pay close attention over the next few days for symptoms of delayed illness. Seek medical attention if noted. Seek medical attention for black/brown widow and brown recluse spider bites as well as animal bites.
	Poison plants	Pay attention for evidence of allergic reaction (itching, redness and irritation) and seek medical attention if over-the-counter remedies prove ineffective or if affected area spreads.

Hazard Category	Hazard	Response
Biological	Infectious Illness [COVID-19]	If potential COVID-related symptoms present while onsite, isolate yourself from other workers and maintain distances in much greater excess than 6 feet. Inform workers onsite (call them if necessary) to inform them of your current condition. Report your symptoms to management immediately. Minimize the amount of contact you have with commonly shared materials such as the vehicle, field paperwork, tools, etc. Self-quarantine until tested negative or upon management permission to return to work as based on CDC recommendations for symptoms approach.

***Caution**: Individuals with heart problems, on a "low sodium" diet, or who otherwise have blood pressure issues and work in hot environments should consult a physician for proper alternative care when working under these conditions.*

7.6 HAZARDOUS SUBSTANCE RELEASE

In the event that hazardous substances migrate from the work zone and potentially endanger unprotected personnel or the community, the area will be isolated and the spill contained and cleaned by authorized personnel. On-site activities will cease until the release is brought under control and the site is returned to its previous condition or otherwise poses no additional harm to site personnel. All hazardous materials must be containerized and labeled until it can be profiled and disposed in accordance with regulatory requirements at an approved landfill. Workers should reference the SDS for additional information.

7.7 REGULATORY, CLIENT, OR OTHER AGENCY NOTIFICATIONS

In the event of an emergency, all reporting must be made to your direct project or office manager and/or safety department. Other required client, regulatory or other agency notifications will be made by management within appropriate reporting deadlines.

8.0 WASTE MANAGEMENT

Under normal conditions associated with the remediation process, groundwater monitoring wells are purged of impacted groundwater and as part of the investigation process, impacted soils are stored within containers until these wastes can be profiled and disposed at an approved landfill. Other chemicals may be ordered for maintenance or to otherwise facilitate the remediation process. It is the company's objective to ensure all containers are in good condition and labeled appropriately so as to prevent any release of contaminated materials from these containers until it can be appropriately disposed.

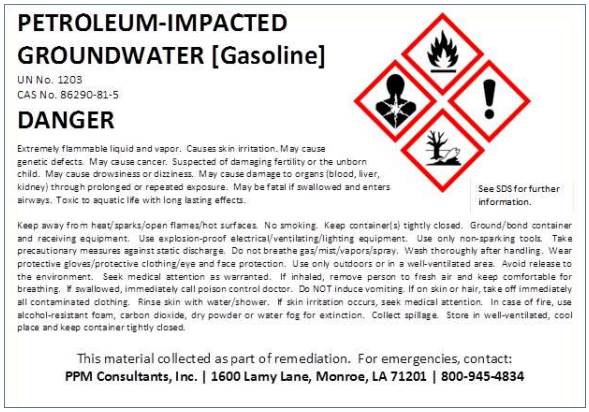
8.1 CONTAINER LABELING

All containers used by the company must be appropriately labeled – even when a waste is in accumulation or a material is still in use. Containers are defined by the company as any bucket, bottle, barrel, drum, jar, tote, can, box, crate, tank, or other similar means used to contain, store, and/or transport materials. Containers may be movable or stationary and can vary in weight and dimension; however, common containers used by the company include drums, totes, buckets, soil bags or super sacks.

8.1.1 Hazardous Material/Waste Labeling

Any hazardous material or waste container(s) must be labeled in accordance with 29 CFR 1910.1200 using a globally harmonized system (GHS) for chemical classification and labeling. Tags using the same GHS-format should be used for soil bags and super sacks. Each label must contain six required elements, which include the following:

- Product identifier – should match the product name on the safety data sheet
- Signal word – "danger" (severe) or "warning" (less severe)
- Hazard statements – phrase assigned to a hazard class used to describe the nature of the product's hazards
- Precautionary statements – a measure to minimize or prevent adverse effects that results from exposure
- Supplier identification – name, address, and telephone number of the supplier or manufacturer*
- Pictograms – graphical symbols used to convey specific hazard information visually



Note: Hazardous materials ordered by PPM must have the manufacturer or supplier information posted on the containers; however, materials generated as part of the remediation process must identify PPM as the emergency contact.

8.1.2 Nonhazardous Material/Waste Labeling

Containers of nonhazardous materials and/or wastes must also be labeled. They will be labeled using the same labeling system as addressed within the previous section; however, workers should expect these labels to be less detailed since these materials are not likely to pose hazards. Continued use of this labeling system will permit workers to identify the contents of any container used by the company.

Once materials have been deemed as a waste, then non-hazardous waste labels must additionally be affixed to the container(s) so long as the material is truly considered to be a nonhazardous substance. Verbiage for this label template has been modified to meet the needs of the company, and workers are required to complete the label in accordance with the following requirements:

- Generator – PPM must never be identified as the generator; wastes are generated on behalf of the client and therefore, must have the client's name.
- Contact – PPM will be considered the contact; this will enable clients with multiple subcontractors to identify which of their contractors is generating the waste.
- Phone – Provide PPM's phone number in case of emergency (800-945-4834).
- Contents – Identify the material being stored within the container.
- Start date – Indicate the date that the material is first placed inside the container; if the container will be accumulating, worker must still provide a date and must also indicate that it is in accumulation.

8.2 CONTAINER STORAGE AND DISPOSAL

In accordance with company policy, all wastes must be stored within fenced remediation systems, behind buildings or in other inconspicuous areas so as not to be disturbed by unauthorized individuals. Wastes must also be profiled and disposed within 90 days of task completion. Drums that are in accumulation may reside onsite for a period no greater than 365

days. Materials in accumulation must be profiled and disposed at least once per calendar year to ensure container integrity. Variances to this policy must be approved by the District Manager or safety department in advance.

8.3 CONTAINER INSPECTIONS

Containers stored at sites with a remediation system undergo routine visual inspections. Inspections occur on a quarterly basis to ensure that container integrity is maintained and that there is no evidence of leakage, excessive rusting, bulging or other forms of container damage that could result in a release. Inspections are documented and retained by the safety department. Evidence of container damage is promptly addressed.

9.0 PERSONNEL/CONTRACTOR SAFETY REVIEW

This HASP and any corresponding JSA(s) must be outlined during a safety briefing that is to be held by the SSO. This safety briefing shall occur prior to the start of the project and consists of an entire review of all relevant sections of this safety plan as it relates to all phases of the project. Affected company personnel, subcontractors, clients, and/or regulators assigned to the project must participate in the safety briefing to gain access to the work zone. Changes or additions in site personnel will require an additional safety briefing be conducted with all affected person(s) to permit site access. Participants of the safety briefing will be required to sign a form to acknowledge they have received safety instructions and agree to abide by the provisions outlined within the HASP and JSA.

Additional tailgate meetings shall occur on a daily basis prior to the initiation of work activities. All authorized persons must attend the tailgate meeting held by the SSO to discuss the safety provisions affected by the task(s) to be performed for that day. Each participant will be required to sign the tailgate meeting log to acknowledge they have received safety instructions and agree to abide by those provisions reviewed during the tailgate meeting. ***No one should be permitted to participate in the tailgate meetings until a complete review of the HASP and corresponding JSA(s) has been completed!***

10.0 CONTRACTOR RESPONSIBILITY AND SUPERVISION

Subcontractors must abide by all safety procedures outlined within this plan, or they will be required to leave the premises until these procedures are implemented. Subcontractors will be permitted to operate under a separate safety plan as long as it meets the minimum requirements established by this HASP, has been reviewed and approved by the HSD in advance of the project's start date, and does not other otherwise conflict with the provisions of this HASP.

Subcontractors may not initiate work without the authorization of PPM, and all subcontracted work must be performed under the supervision of a PPM representative. Managers and field workers must coordinate schedules with the subcontractor(s) in advance of the project. All field processes must be shut down when a PPM representative leaves the jobsite unless otherwise approved by the District Manager; however, notations must be made within the HASP when this exception is granted.

Subcontractors must provide advanced notification when bringing additional chemicals not otherwise covered by this safety plan onto the jobsite. A safety data sheet must be provided to the HSD for review/approval before any chemical will be permitted onsite. If approved, any additional hazards, preventive measures, and emergency response procedures associated with the introduction of these substances must be incorporated into this HASP prior to the start of the project.

11.0 CONFINED SPACE

Confined space is defined by OSHA as any space that is "large enough and so configured that an employee can bodily enter and perform assigned work, has limited or restricted means for entry or exit, and is not designed for continuous employee occupancy." In accordance with this definition, PPM will not be conducting any field-related task that can be defined as confined space entry. PPM personnel have not been adequately trained for confined space entry; therefore, in the event site conditions warrant this type of work, a qualified contractor will be hired for this task.

12.0 LIST OF ABBREVIATIONS

ACM	asbestos-containing material
ANSI	American National Standards Institute
BGS	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
CFR	Code of Federal Regulations
CHMM	Certified Hazardous Materials Manager
CO/CO_2	carbon monoxide/dioxide
CSP	Certified Safety Professional
dB	decibel
DEET	N,N-diethyl-meta-toluamide
DOT	Department of Transportation
fc	foot-candle
FID	flame ionization detector
GFCI	ground fault circuit interrupter
GHS	Globally Harmonized System of Chemical Classification and Labeling
GVWR	gross vehicle weight rating
HASP	health and safety plan
HEPA	high efficiency particulate air
HIV	human immunodeficiency virus
HMIS	hazardous materials information system
HSD	Health and Safety Director
HSSE	health, safety, security and environmental
IDLH	immediately dangerous to life and/or health
JSA	job safety analysis
kV	kilo volt
LEL	lower explosive limit
LFL	lower flammability limit
MTBE	methyl-tertiary butyl ether
NCHRP	National Cooperative Highway Research Program
NIOSH	National Institute for Occupational Safety and Health
NOAA	National Oceanic and Atmospheric Administration
O_2/O_3	oxygen/ozone
ORC	oxygen release compound
OSHA	Occupational Safety and Health Administration
OVA	organic vapor analyzer
PACM	presumed asbestos-containing material
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
P.E.	Professional Engineer
PEL	permissible exposure limit
P.G.	Professional Geologist
PIC	Principal-in-Charge
PID	photo-ionization detector
PPM	PPM Consultants, Inc.
ppm	parts per million
SDS	safety data sheet
SS	Safety Supervisor
SSO	Site Safety Officer
STEL	short-term exposure limit
SVOC	semi-volatile organic compound
TPH	total petroleum hydrocarbon
TLV	threshold limit value
TWA	time-weighted average
UEL	upper explosive limit
UFL	upper flammability limit
VOC	volatile organic compound
UST	underground storage tank

SAFETY DATA SHEETS
AND
FIELD FORMS

Note: ***Safety data sheets and field forms are separate documents that can also be found on the PPM Server via the ipad. Locate the appropriate forms as dictated by the task and/or the Safety Supervisor, complete and return to the Safety Department for recordkeeping.***