June 16, 2021

Mr. Tyler Sims, Hydrogeologist
Alabama Department of Environmental Management
1400 Coliseum Boulevard
Montgomery, Alabama 36110

Re: Modified Corrective Action Plan
(Cost Proposal No. 25)
Bulk Plant Montgomery
3378 Tank View Court
Montgomery, Alabama
Facility I.D. No. 14249-101-005185
Incident No. UST12-11-03
PPM Project No. 422601-MCAP

Dear Mr. Sims:

Enclosed please find the Modified Corrective Action Plan (Cost Proposal No. 25) prepared by PPM Consultants, Inc. for the referenced site.

If you have any questions or need additional information, please do not hesitate to contact me at (205) 836-5650.

Sincerely,
PPM Consultants, Inc.

Jeffrey M. Schexnayder, P.G.
Project Manager

c: Mr. J. Clark Ward, Russell Petroleum Corporation

MODIFIED CORRECTIVE ACTION PLAN (COST PROPOSAL NO. 25)

RUSSELL PETROLEUM CORP.
BULK PLANT
3378 TANKVIEW COURT
MONTGOMERY, MONTGOMERY COUNTY, ALABAMA

FACILITY I.D. NO. 14249-101-005185
INCIDENT NO. UST12-11-03

PPM PROJECT NO. 422604-MCAP

MAY 3, 2021

PPM CONSULTANTS

MODIFIED CORRECTIVE ACTION PLAN
(COST PROPOSAL NO. 25)

FOR

BULK PLANT
3378 TANKVIEW COURT
MONTGOMERY, ALABAMA

FACILITY I.D. NO. 14249-101-005185
INCIDENT NO. UST12-11-03

PREPARED FOR:

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

PPM PROJECT NO. 422601-MCAP

MAY 3, 2021

PREPARED BY:

JEFFREY M. SCHEXNAYDER, P.G.
PROJECT MANAGER

REVIEWED BY:

MATTHEW J. EBBERT, P.G.
SENIOR GEOLOGIST

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(205) 836-5650

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CERTIFICATION PAGE

I certify under penalty of law that this Modified Corrective Action Plan (MCAP) for the Bulk Plant facility located at 3378 Tankview Court in Montgomery, 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

05/04/21
Date

UST RELEASE FACT SHEET

GENERAL INFORMATION:

SITE NAME: Bulk Plant

ADDRESS: 3378 Tankview Court, Montgomery, Alabama

FACILITY I.D. NO.: 14249-101-005185

UST INCIDENT NO.: UST12-11-03

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?	5
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?	{X} Yes { X } No
Have surface waters been impacted by the release?	{X} Yes { } 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? {X} Yes { } No Maximum thickness measured: MW-4 – 1.21 feet 3/12/2021

Maximum COC concentrations measured in soil: 4.010 mg/kg (RW-2-25')

Current Maximum COC concentrations measured in groundwater: (March 12, 2021)
Benzene 0.708 mg/L (MW-4)
BTEX 30.728 mg/L (MW-4)
MTBE 0.054 mg/L (RW-3)
Naph 23.0 mg/L (MW-4)

Exposure assessment information obtained from CTE Environmental

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: Bulk Plant
SITE ADDRESS: 3378 Tankview Court, Montgomery, Alabama

FACILITY I.D. NO.: 14249-101-005185
UST INCIDENT NO.: UST12-11-03

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.	☐	☒
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.	☐	☒

ADEM GROUNDWATER BRANCH
UST SITE CLASSIFICATION SYSTEM CHECKLIST (CONTINUED)

CLASSIFICATION	*DESCRIPTION*	*YES*	*NO*
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

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:	**C.2**

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

1.0 INTRODUCTION

PPM Consultants, Inc. (PPM) was retained by Russell Petroleum Corp. (Russell) to prepare a Modified Corrective Action Plan (MCAP) to address persistent free product and dissolved benzene and naphthalene concentrations that exceed the Site-Specific Corrective Action Limits (SSCALs) observed in multiple monitoring and recovery wells at the Russell Petroleum Corporation Bulk Plant facility located in Montgomery, Alabama. The preparation of the MCAP was authorized by the Alabama Department of Environmental Management (ADEM) with their approval of Cost Proposal No. 25 via correspondence dated October 6, 2020. Corrective actions are in response to an accidental release of gasoline from the underground storage tank (UST) system at the site. Constituents of concern (COCs) for the site include benzene, toluene, ethylbenzene, and total xylenes (BTEX), methyl tertiary butyl ether (MTBE), and naphthalene.

Previous remedial activities to date consisted of monthly 8-hour mobile enhanced multiphase extraction (MEME) events. From December 2012 through September 2020, a total of 50 MEME events were conducted at the site and an estimated 1,712 equivalent gallons of hydrocarbons were recovered.

During the March 2021 triannual groundwater monitoring event, free product was observed in monitoring well MW-4 (1.21 feet). PPM recommends the installation of a fixed-based dual-phase vacuum extraction (DPVE) system designed to effectively and efficiently recover free product on the groundwater surface in a timely manner.

This MCAP provides a summary of pertinent environmental activities conducted to date at the facility as well as a detailed description of the selected approach for site remediation.

2.0 BACKGROUND

2.1 SITE LOCATION

The Bulk Plant facility is currently an active bulk plant located at 3378 Tankview Court, in Montgomery, Alabama. The site is situated in the northeast ¼ of the northeast ¼ of Section 28, Township 16 North, Range 17 East, *Cantelous, Alabama, Quadrangle*. More specifically, the site is located at approximately 32° 21’ 27” north latitude and 86° 22’ 41” west longitude. The site location is shown in **Figure 1**, **Site Location Map** in **Appendix A**, **Figures**.

2.2 ADJACENT PROPERTIES

The site is located on the northeast corner of the intersection of West Boulevard and Tankview Court in a commercial and residential area of Montgomery, Alabama. A power line easement and vacant wooded land are located north of the site. Vacant wooded land borders the site to the east and vacant cleared land borders the site to the south. A Citgo retail petroleum station is located across West Boulevard, approximately 275 feet southwest of the site. Vacant cleared land is located across West Boulevard to the west, followed by residential properties. A property owned by the City of Montgomery is located adjacent to the northwest corner of the site. Adjacent properties are shown on **Figure 2**, **Area Map**.

2.3 SITE DESCRIPTION

The Bulk Plant facility is located on an approximate 1.8-acre parcel of land. A two-story office building for Russell Petroleum is located on the western portion of the property. A parking lot for the facility is located on the south central portion of the property. The northeastern and northwestern portions of the property are utilized for storage of equipment, work trucks, and signs. The UST system and associated loading rack are located in the north central portion of the site. The loading rack is covered by a canopy. Excluding the parking lot, the majority of the site is surrounded by a security fence.

The UST system consists of two 20,000-gallon gasoline USTs and two 20,000-gallon diesel USTs located in a single tank pit south of the loading rack. Site features are shown in **Figure 3, Site Map**.

Underground utilities identified at the site include sanitary sewer, water, and telephone. A sanitary sewer main, water main, telephone lines, and power lines are located in the right-of-way (R.O.W.) of U.S. Highway 31. The property's electrical service and phone service lines are located overhead along the western property boundary and enter the west portion of the building. The fuel loading rack underground control wires traverse from the main building to the northeast toward the fuel loading rack. Approximate locations of utilities are shown on **Figure 3**.

2.4 SITE HISTORY

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

- January 1990 – UST Closure Assessment performed by Harmon Engineering
- February to April 2012 – Preliminary Investigation completed by CTE. Monitoring wells MW-1 though MW-4 were installed. Soil and groundwater samples were collected.
- December 2012 to February 2013 – Secondary Investigation completed by CTE. Monitoring wells MW-5 through MW-11 were installed. Soil and groundwater samples were collected.
- August to September 2013 – Groundwater monitoring performed by CTE.
- December 2013 – CTE completed an Alabama Risk-Based Corrective Action (ARBCA) evaluation.
- October 2014 – CTE prepared a Corrective Action Plan (CAP) for the site.
- June to September 2015 – CTE installed recovery wells RW-1 through RW-5 and performed groundwater monitoring activities and MEME events.
- February 2016 through December 2019 – CTE performed tri-annual groundwater monitoring and monthly MEME events.
- January 2020 – Russell Petroleum retained PPM as their environmental contractor.

Remediation by Natural Attenuation (RNA) Monitoring: PPM completed four 8-hour MEME events at the Bulk Plant facility from March through June 2020. An estimated 123 pounds (20 equivalent gallons) of petroleum hydrocarbons were removed from the site. A groundwater sampling event was conducted at the site on May 22, 2020. Free product was observed in monitoring wells MW-1 (0.23 feet), MW-4 (0.49 feet), and recovery well RW-4 (0.15 feet) on May 22, 2020. Dissolved COC concentrations were below the SSCALs in all sampled wells.

PPM completed three 8-hour MEME events at the Bulk Plant facility from July through September 2020. Approximately 7,990 gallons of liquids were removed from the subsurface during the three recovery events. An estimated 343 pounds (56 equivalent gallons) of petroleum hydrocarbons were removed from the site in the vapor phase this period. Free product was not observed in the monitoring wells during groundwater elevation measurements; however, while purging MW-4 free product was evident in the disposable bailer. Dissolved COC concentrations were below the SSCALs in all sampled wells.

PPM completed a comprehensive triannual groundwater monitoring event at the Bulk Plant facility on March 12, 2021. The groundwater surface was relatively flat with a slight downward gradient toward the UST pit. Measurable free product was observed in monitoring well MW-4 with an approximate thickness of 1.21 feet. Dissolved benzene concentrations exceeded their respective SSCALs in monitoring well MW-4 and recovery well RW-1. Additionally, the dissolved naphthalene concentration exceeded the SSCAL in MW-4.

2.4.1 Soil

PPM reviewed the subsurface lithology identified in soil boring logs submitted by the CTE Environmental advanced during the Preliminary and Secondary Investigations. Subsurface lithology was identified from visual inspection of soil encountered in borings advanced at the site. Based on this information and a review of literature sources, the site is located within Quaternary Alluvial and low terrace deposits within the Coastal Plain Physiographic Province. The general lithology of the site consists of clayey silt to silty sand with gravel. This is consistent with soils that comprise the Alluvial and low terrace deposits. Soil borings and monitoring well construction logs from previous site investigations are provided in **Appendix B, Soil Boring Logs/Monitoring Well Construction Logs**.

2.4.2 COCs in Soil

Based on information obtained during previous assessments conducted at the site, all reported COC concentrations in soil are below their respective SSCALs for on-site indoor inhalation. In addition, COC concentrations in on-site soil at the source do not exceed groundwater resource protection (GRP) values. A summary of this data is presented in **Table 1, Soil Analytical Summary, Appendix C, Tables**. In addition, **Figure 4, COC Concentrations in Soil** illustrates measured COC soil concentration at the site.

2.4.3 Groundwater

Groundwater depths were measured in monitoring wells MW-1 through MW-11 and recovery wells RW-1 through RW-5, on March 12, 2021. Groundwater depths in the wells measured ranged from 15.70 feet below top of casing (BTOC) in MW-2 to 18.82 feet BTOC in MW-9. Based on the calculated groundwater elevations, the groundwater surface appeared relatively flat with a gradual slope toward the UST pit. This is generally consistent with historical groundwater elevations at the site. The hydraulic gradient south of the UST pit, measured from MW-8 to RW-4, was 0.0012 feet per foot (ft/ft).

Groundwater elevation data are provided in **Table 2, Groundwater Elevation Survey Data**. **Figure 5**, **Groundwater Elevation Map (March 12, 2021)** depicts the groundwater elevation and flow direction observed during the most recent groundwater monitoring event.

2.4.4 Free Product

Free product has historically been observed in monitoring wells MW-1, MW-4, and MW-6 and recovery well RW-4. Free product was first observed in monitoring well MW-4 in December 2012 and in MW-1 in October 2013. Free product thicknesses have ranged from 0.09 feet to 3.29 feet in MW-1 and MW-4. More recently, during the March 2021 triannual groundwater sampling event, free product was observed in MW-4 at a thickness of 1.21 feet.

2.4.5 COCs in Groundwater

During the groundwater sampling event conducted on March 12, 2021, groundwater samples were collected from monitoring wells MW-1 through MW-11 and recovery wells RW-1 through RW-5. Dissolved COC concentrations exceeded their respective SSCALs in the following monitoring wells:

- Benzene: MW-4 [0.708 milligrams per liter (mg/L)] and RW-1 (0.700 mg/L)
- Naphthalene: MW-4 (23.0 mg/L).

Groundwater analytical results are summarized in **Table 3, Groundwater Analytical Summary**. The recent extent of COC impact is depicted on **Figure 6, Dissolved Benzene Isoconcentration Map (March 12, 2021)**, **Figure 7, Dissolved MTBE Isoconcentration Map (March 12, 2021)**, and **Figure 8, Dissolved Naphthalene Isoconcentration Map (March 12, 2021)**.

3.0 REMEDIAL APPROACH

This MCAP has been prepared to achieve the following objectives:

- Remove residual free product from the subsurface
- Reduce dissolved COC concentrations to below approved SSCALs
- Accomplish site objectives in a safe, timely, and cost-effective manner.

Based on the persistent presence of free product and apparent extent of COC impact following 50 MEME events, a sustained remedial effort will be necessary to achieve project objectives.

4.0 PROPOSED CORRECTIVE ACTION

The following provides a description of the proposed corrective action efforts for the site including associated effectiveness monitoring.

4.1 CORRECTIVE ACTION OVERVIEW

The first phase of corrective action will consist of DPVE system operation and associated effectiveness monitoring. Operation of the DPVE system will remove free product, soil vapors, and groundwater impact. In addition, these efforts should reduce the potential for further migration of dissolved COC impact by creating groundwater drawdown within the zone of influence for the recovery wells.

The second phase of corrective action may consist of RNA monitoring and would be intended to address dissolved COC concentrations that may be at or near the SSCALs but do not warrant further DPVE system efforts.

A baseline groundwater sampling event will be conducted prior to DPVE system startup. Subsequent groundwater monitoring events will be conducted 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.

A description of the additional corrective actions and associated effectiveness monitoring is provided in the following sections.

4.2 DUAL-PHASE VACUUM EXTRACTION

4.2.1 Overview of DPVE

DPVE is a method of extracting vapor and liquid from the subsurface by applying high vacuum to recovery wells in the region where the COCs are present. These high vacuums produce both vapor and liquid phase flow from the subsurface. The flow of air through the subsurface creates a concentration gradient that causes the volatilization of some contaminants that may be present in the vadose zone while delivering oxygen, which can increase microbial activity necessary to biodegrade other contaminants. Free product

floating on the groundwater can also be removed at a higher rate in comparison to traditional pump and treat techniques.

The vacuum applied by the DPVE system to a recovery well source creates a low pressure head in the well casing, resulting in a low point in the hydraulic system increasing water flow to the well more readily. The flow of water from the subsurface results in the removal of substances dissolved or suspended in the water and can help to control or reverse the migration of dissolved COC impact. Therefore, DPVE enhances the recovery of COC in the subsurface by removing free product at a higher rate, increasing the groundwater capture zone around the recovery well, and affecting more of the vadose zone by depressing the water table.

Hydrocarbons in the liquid and vapor phase are brought to the surface where they are separated in a vapor-liquid separation vessel. The extracted liquid phase may include both water and hydrocarbons. Multiple liquid phases can be separated in secondary treatment systems. The free phase hydrocarbons are collected for off-site disposal or recycling, and the water is routed for treatment prior to discharging to a permitted location. The vapor phase can be treated by means of a thermal or catalytic oxidizer, through a carbon filter, or in some cases, discharged directly to the atmosphere depending on discharge limits established by ADEM.

Additional details on the installation and utilization of the technology at this site are presented in the following sections.

4.2.2 Design Considerations

A pilot test was not performed for this MCAP as MEME events were previously conducted at the site. In general, combinations of monitoring wells MW-1 and MW-4 and recovery wells RW-1 through RW-4 were utilized as extraction wells during the MEME events. Groundwater elevations were measured prior to initiating the MEME events and prior to event termination. Induced pressures were also measured prior to each event termination.

4.2.2.1 Liquid Removal

During the 50 8-hour MEME events, an estimated 161,014 gallons of liquid were removed from the subsurface. Based on the events, this equates to an average recovery rate of 6.7 gallons per minute (gpm). Free product has been routinely observed in monitoring wells MW-1 and MW-4 and recovery wells RW-1, RW-3, and RW-4 prior to initiating the events.

4.2.2.2 Induced Pressure Radius of Influence

Induced vacuum (differential pressure) readings, collected during the September 2020 MEME event, above the Environmental Protection Agency (EPA) minimum response limit of 0.1 inches of water column (in. w.c.) were measured at monitoring wells MW-2, MW-3, MW-5, MW-6, MW-8 through MW-11 and RW-1, RW-3, and RW-5 ranging from 0.12 to 0.36 in. w.c. while MW-1, MW-4, and RW-4 were utilized as extraction wells. The MEME event data indicated that vacuum influence is possible at a radius of at least 35 feet.

4.2.2.3 Hydraulic Radius of Influence

Groundwater levels were measured and recorded at adjacent monitoring wells during the MEME events to evaluate the effect of the aquifer under the influence of applied vacuum. Drawdown greater than 0.1 feet was not observed during the September 2020 MEME event. Which potentially indicates high permeability rates in the subsurface.

4.2.2.4 Vapor/Hydrocarbon Removal

The rate of vapor removal measured during the September 2020 MEME event averaged approximately 142 actual cubic feet per minute (acfm). An estimated 10,859 pounds (1,712 equivalent gallons) of hydrocarbons were removed during the 50 8-hour extraction events. VOC concentrations typically spiked during the first hour of the events and steadily decreased toward the end of the events.

There are currently four recovery wells located on the site near the USTs and one near the office building. Two additional recovery wells are proposed based on the extent of COC impact in groundwater. Additional information relative to the overall number of proposed recovery wells required is provided in **Section 4.3**. Previous MEME event data reported by Fruits and Associates and recent groundwater data obtained by PPM were utilized for DPVE system selection and recovery well layout.

The proposed DPVE system and recovery well layout are anticipated to sufficiently recover free product, soil vapors, and impacted groundwater within the target area. The depths of the recovery wells/screened intervals should produce adequate influence across shallow and lower zones of impact.

4.2.3 DPVE System

PPM recommends that an oil-sealed liquid-ring vacuum pump (LRVP) with an operating capacity of at least 500 acfm at 20 inches of mercury (in Hg) be used at the site. The

LRVP will be driven by a 40-hp totally enclosed fan cooled (TEFC) motor. The DPVE system will be trailer mounted with steel corner posts, steel roof frame, and removable sliding wall panels for accessibility to system components. The system will have third party MET certification by a Nationally Recognized Testing Lab at the MK Environmental factory.

PPM submitted quotation requests to the following two equipment manufacturers: Product Recovery Management (PRM) and MK Environmental. Based on the pricing, in addition to knowledge of the quality of their systems, PPM recommends utilizing MK Environmental for the construction of the DPVE system.

The phase separation equipment will consist of a vacuum-rated knockout pot for separation of the extracted liquids (free product and groundwater) and vapor, two pressure rated separators on the discharge side of the LRVP, an oil/water separator (OWS), and an air stripper (AS) for groundwater treatment.

The aboveground transfer capacity of the unit is rated at 20 gpm on average in the liquid phase. Other components of the DPVE system are discussed in the following sections. Information regarding system components is provided in **Appendix D, Equipment Manufacturer's Specifications and Quotations**.

4.2.4 Air Treatment

Vapor emissions from the LRVP will be treated by means granular activated carbon (GAC). Two 400-pound GAC vessels will be acquired with the purchase of the DPVE system.

4.2.5 Water Treatment

Recovered fluids will be transferred from the primary air/water separator to the OWS by means of one 1.5-hp transfer pump. From the OWS, groundwater will gravity flow to the air stripper.

Once groundwater enters the air stripper, the dissolved COCs will be removed by means of a low profile air stripper equipped with an 800 standard cubic feet per minute (scfm) blower that will remove up to 99 percent of benzene, per MK Environmental. The design flow rate is 20 gpm. Once treated, the groundwater will gravity flow into a sump located within the air stripper. When the groundwater in the sump reaches a pre-set level, a 1.5-hp transfer pump will be activated and the groundwater will be pumped through the effluent

discharge line and subsequently to the permitted outfall located at a stormwater drainage ditch approximately 60 feet west of the system location. PPM will submit an application for a National Pollutant Discharge Elimination System (NPDES) permit for the DPVE system effluent upon approval of the MCAP.

4.2.6 Electrical Components

The internal DPVE electrical equipment will meet or exceed Class I, Division 2 National Electrical Code (NEC) standards for explosion-proof apparatus. The LRVP will utilize three-phase, 230-volt power. Power will be provided to the system by Alabama Power.

4.2.7 Fail-Safe and Telemetry Components

The DPVE unit will be equipped with a telemetry system to provide prompt notification of system shut down if the system cannot restart automatically. The telemetry system is programmed to automatically contact designated personnel in the event of an alarm condition. The telemetry system provides data on the cause of shutdowns and, under certain conditions, permits restart of the DPVE system from a remote location.

The telemetry system can also be accessed for remote monitoring of major system parameters. An hour meter wired to the electrical system of the LRVP will be installed which will provide the total runtime of the system over a given time period. A cellular based communication account will be established to facilitate communication with the telemetry system.

4.2.8 Monitoring Components

Monitoring ports will be installed at select locations for collection of vapor extraction and water discharge data. In addition, a flow totalizer meter will be installed to monitor total volume of water discharged from the system. Site glasses will be installed to visually assess the rate of liquid extraction from the subsurface and to make necessary adjustments to enhance liquid recovery rates.

4.3 RECOVERY WELL CONSTRUCTION

It is recommended that DPVE be applied to the subsurface by means of four existing and three proposed 4-inch inside diameter (I.D.) recovery wells (RW-1 through RW-4, PRW-6 and PRW-7, and MW-4R) positioned at strategic locations around the Bulk Plant UST location. Monitoring well MW-4 will be over drilled and reinstalled as a 4-inch Type II recovery well (MW-4R). Since free product is present at the site, the termination depth of

the proposed recovery wells will extend to approximately 25 feet BGS to capture residual free product and reduce dissolved COC impact.

Vacuum applied to these seven recovery points should induce air flow, capture groundwater, and remove residual free product throughout the target area. Air and groundwater flow from each recovery well will be controlled with gate valves in the manifold to be located adjacent to the DPVE unit. Existing monitoring wells will be used to monitor site response and to serve as locations for measuring induced vacuum and groundwater drawdown once the system is operational. Should the radius of influence from these extraction points be deemed insufficient to capture the majority of COC impact, additional extraction points may be added as needed. The placement of the proposed recovery wells is provided in **Figure 9, Proposed System Layout**.

4.4 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 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.

If dissolved COC concentrations appear to be stable and are at or just below SSCALs, an RNA monitoring program may be implemented at the site. It is anticipated that DPVE system operation will reduce free product thickness and decrease COC concentrations over time. Once this has been accomplished, an RNA monitoring program may be necessary once site conditions indicate active remediation is no longer warranted at the site.

There are multiple secondary approaches for monitoring RNA effectiveness including estimating a first order rate of attenuation and measuring select water quality parameters. PPM will use both methods to evaluate the overall effectiveness of RNA. However, the stable and/or decreasing trends of dissolved COC concentrations will be the primary gauge of RNA effectiveness.

Select water quality parameters [pH, temperature, specific conductance, oxidation reduction potential (ORP), and dissolved oxygen, etc.] will also be monitored during the potential RNA groundwater monitoring events. In addition, select wells may be sampled for nitrate, manganese, iron, and sulfate to further assess the aerobic condition of the aquifer.

4.5 ANTICIPATED SITE RESPONSE

4.5.1 Pneumatic Response

PPM proposes application of DPVE to RW-1 through RW-4, PRW-6, PRW-7, MW-4R. The intent of this configuration is to induce air movement throughout the area of free product and COC impact above SSCALs and to hydraulically contain dissolved COC impact. Pneumatic response will be evaluated after the DPVE is in operation and will vary depending on the overall configuration utilized.

4.5.2 Hydraulic Response

PPM conservatively assumes sustained liquid removal rates up to 2 gpm from a single recovery well and a combined extraction rate of up to 14 gpm with seven recovery wells in operation simultaneously. This rate may decrease over time as the site is gradually dewatered and due to seasonal fluctuations in groundwater elevations.

4.5.3 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 upon completion of the active remediation efforts. However, efforts will be made to obtain site remedial objectives within four years of implementing corrective action activities outlined in this CAP.

4.6 PERMITS

Upon MCAP approval by ADEM, PPM will submit system, building, and electrical plans to the City of Montgomery Permit and Inspection Department. The Permit and Inspection Department is expected to review the plans and provide approval or comments, revisions, or requests within approximately 10 business days from plan submittal. Following approval, a building permit will be issued to PPM. At that time, PPM can apply for an electrical permit and plumbing permit with the City of Montgomery.

A NPDES permit will be required to discharge treated groundwater from the DPVE system. The system effluent outfall will discharge to a stormwater drop inlet located approximately 60 feet west of the proposed DPVE system location. The drainage ditch discharges to the West End Ditch which ultimately discharges to the Alabama River. Upon MCAP approval by ADEM, PPM will submit a NPDES permit application and associated fees.

4.6.1 Effluent Water

Operation of the DPVE system produces both liquid and vapor phase discharge. It is expected that the extraction process will vacuum-strip up to 80 percent of the COC constituents from the liquid stream. The air stripper is capable of removing up to 99 percent of COC constituents. PPM will discharge the effluent water to the permitted outfall per the parameters established by the pending NPDES permit.

4.6.2 Effluent Air

Upon approval, the ADEM Air Division will be notified of the proposed remediation system and associated methods of emissions treatment. The influent vapor concentrations will be treated with GAC. After effluent vapor concentrations remain below site-specific emission thresholds (SSETs) established by ADEM and free product is no longer present, the GAC may be removed from the discharge stream (once approved by ADEM).

4.7 DPVE SYSTEM INSTALLATION

4.7.1 General

The DPVE system will be located within a fenced enclosure once the system has been installed. The proposed location of the unit is shown on **Figure 9**.

Installation dates will be based on the approval date of this MCAP by ADEM, equipment availability, and subcontractor scheduling. Initial installation activities will consist of the following:

- City of Montgomery permit applications
- ADEM NPDES permit application
- ADEM air discharge notice
- Completion of a Solid Waste Profile
- Installation of recovery wells

- Installation of piping from each recovery well to the DPVE system location
- Completion of a comprehensive baseline sampling event
- Construction of a manifold to connect the recovery wells to the LRVP
- Mobilization of the DPVE unit and GAC vessels to the site
- Installation of required electrical power supply equipment and lines
- Connection to the local power service provided by Alabama Power
- Site survey of new recovery wells and associated trenching
- Connection of telemetry through a wireless cellular based service
- Preliminary system testing and startup
- Reporting.

4.7.2 Recovery Well Construction

Seven recovery wells will be utilized for groundwater remediation. Five recovery wells are already present on site; however, RW-5 is outside of the treatment area. The proposed recovery wells are strategically located such that remedial objectives can be obtained. The 2-inch Type II monitoring well MW-4 will be over drilled and reinstalled as a 4-inch recovery well (MW-4R). Proposed recovery wells PRW-6 and PRW-7 are located proximal to monitoring wells that have periodically contained free product and elevated COC concentrations above SSCALs.

The borings for the proposed recovery wells will be advanced to approximately 25 feet BGS, with 4.25-inch I.D. hollow-stem augers. The borings will be reamed with 6.25-inch I.D. augers. Down-hole drilling equipment will be cleaned prior to use at each location with a high-pressure steam rinse. Rinse fluids will not be contained; however, they will be discharged to an impervious surface on-site. Soil cuttings generated during boring advancement will be placed in a roll-off container for disposal.

The wells will be constructed with 15-foot lengths of 4-inch I.D., 0.01-inch slotted polyvinyl chloride (PVC) screen and appropriate length of riser pipe. Sand will be placed in the boring annulus for each of the proposed wells from the bottom of the boring to approximately 2 feet above the screen. A bentonite seal approximately 2 feet thick will be constructed above the sand pack and the remaining annular space will be cemented to within approximately 1-foot BGS. The site will be subsequently surveyed for horizontal and vertical control. Locations will be referenced to existing monitoring wells at the site. Typical construction details of the recovery wells are presented in **Figure 10, Details and Sections for 4-inch Recovery Wells and Piping Trench**. Typical construction details for the system manifold are presented in **Figure 11, Profile/Plan View of Manifold**.

Environmental, Inc. and Walker-Hill Environmental provided quotes for the system installation. Walker-Hill Environmental was the lowest quote for the system installation. The quotes are provided in **Appendix E**, **Subcontractor Specifications and Quotations**.

4.7.3 Utility Connections

Electrical

The DPVE system will be equipped with a main control panel mounted on the system enclosure. The DPVE system will be properly wired by a local electrician for safe system operation. The certified electrical subcontractor will install a temporary power pole, weather head and meter base, a fused main disconnect, and the proper wiring to the system control panel. Electrical work will be performed in general accordance with applicable state and local codes.

Telemetry

Remote communication to the telemetry system will be provided by a wireless cellular service provided by MK Environmental. The connectivity will provide remote communication through a secure log in.

Water Effluent

A 2-inch water effluent discharge line will be installed from the DPVE system to a stormwater drop inlet approximately 50 feet west of the system enclosure.

4.7.4 Recovery Well Configuration

Seven recovery wells (RW-1 through RW-4, PRW-6, PRW-7, and MW-4R) will be utilized for groundwater remediation. Each recovery point will be strategically placed to remove free product and impacted groundwater.

Wellhead specifications will consist of the following:

- Installation of 24-inch by 24-inch by 24-inch deep, spring-loaded, well vaults at each of seven recovery wells that will be utilized by the DPVE system
- Installation of a 4-inch I.D. to 2-inch I.D. expandable well seal; 2-inch I.D., Schedule (SCH) 40, T-pipe connection; 1-foot piece of 2-inch I.D., SCH 40 pipe

with 2-inch fernco; 2-inch by 4-inch SCH 40 PVC fitting; and ¾-inch SCH 40 PVC piping

- Installation of a 2-inch I.D., SCH 40 PVC priming tube/drop tube into each recovery well.

Construction details of the recovery wells, and trenching are shown in **Figure 10**.

4.7.5 Recovery Piping and Trenches

Vacuum will be applied to seven independent recovery lines consisting of 4-inch I.D. SCH 40 PVC piping within trenches extending from the system manifold to each individual recovery well. A 2-inch PVC I.D. SCH 40 drop tube will be installed in each recovery well and extended through a 4-inch by 2-inch well seal installed at the top of each recovery well casing. A 2-inch PVC Tee will be connected to the top of each drop tube and connected to the recovery lines by a 4-inch by 2-inch PVC bushing. Vacuum at the wellhead will be measured with pressure gauges affixed to the ¾-inch piping extending from each recovery well to the system manifold within the system fencing. The piping will be installed to a depth of approximately 18 inches. Efforts will be made to ensure that the piping does not interfere with existing underground utilities.

Trenches will be backfilled with crusher-run gravel and completed at the surface with approximately 6 inches of concrete. Excavated soils generated during recovery well and trench installation will be placed in a roll-off container provided by GFL Environmental and transported to Stones Throw Landfill in Tallassee, Alabama, upon approval by ADEM.

4.7.6 System Manifold

The DPVE recovery line manifold will be installed on the east side of the DPVE system. A 4-inch brass gate valve will be installed on each recovery line to allow each recovery line to operate independently for liquid recovery optimization during system operation. A section of 4-inch I.D. clear PVC pipe will be installed on each recovery line at the manifold to verify liquid recovery at each location. The manifold configuration is shown on **Figure 11, Profile/Plan View of Manifold**.

4.7.7 System Placement and Security

Since the DPVE system is trailer mounted, it can be positioned in place without the use of a crane. The two 400-pound carbon vessels will be offloaded with an excavator and positioned at the locations designated on **Figure 9**. The system will be set-up and leveled

on concrete block footings (1/8-inch over 4 feet). The system will be enclosed in an 8-foot tall wooden privacy fence to prevent unauthorized access. Warning signs will be posted on each side of the privacy fence.

4.8 GROUNDWATER MONITORING

A baseline groundwater monitoring event will be conducted at the site prior to system start up. The following provides a detailed description of the fieldwork methodology for the baseline event and subsequent 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.

Select monitoring wells will then be sampled in general accordance with PPM's internal Quality Assurance/Quality Control (QA/QC) plan. Prior to sampling, each monitoring 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 monitoring wells will be transferred to the system air stripper for treatment and subsequent discharge to the permitted outfall. Grab samples will be collected from on-line recovery wells via single use, disposable bailers as groundwater is continuously removed from these locations during system operation.

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.

Upon completion of sampling activities, sample coolers will be transported or shipped under standard chain-of-custody protocol to an independent testing laboratory for analyses.

4.9 DPVE STARTUP/INITIAL OPTIMIZATION

During the initial startup of the system, vacuum will not be applied to the recovery wells in order to allow adequate time to check system operation. System components will be monitored to ensure that the system is operating properly prior to applying the vacuum to the subsurface. During the first day of operation, the vacuum will gradually be applied to the recovery wells by slowly decreasing the percentage of ambient air introduced at the LRVP intake. Data will be collected to evaluate the initial VOC concentrations in the discharge air, the average groundwater removal rate, and the average airflow rate through the subsurface. This information will provide a comparison of the system performance during the optimization period. The initial startup period is anticipated to be completed in approximately two days.

Measurement of water table drawdown in the recovery wells will be used to evaluate the hydraulic radius of influence and will assist in estimating the capture zone. The vapor discharge rate and ambient airflow rates will be measured to assess if the system is effective in creating sufficient airflow in the subsurface. Adjustments which may optimize the air flow could include adjusting the level of applied vacuum to the recovery well in various combinations, installing passive venting wells, and cleaning of well screens due to clogging or biological fouling.

The volume of groundwater removed from the subsurface will be monitored to observe the groundwater recovery rate and volume. Modifications will be performed in the field to enhance the rate of groundwater recovery such as adjusting the level of applied vacuum to the recovery points in various combinations.

4.10 DPVE OPERATIONS AND MAINTENANCE

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 DPVE O&M.

PPM anticipates visiting the site approximately two times per month. 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 continued 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. Pumps within the unit will be serviced on a routine basis. 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 shut down.

Typical O&M activities will include the following:

- Visual inspection of treatment system components and their condition (including pipe connections for potential leaks due to vibration)
- Inspection and testing of fluid level probes and cleaning as needed
- Monitoring of vacuum levels at designated points in the DPVE system
- Monitoring of pressure levels on the exhaust side of the LRVP
- Monitoring of service water volumes used
- Monitoring of vapor temperatures at designated points in the DPVE system
- Removal of silt and sludge buildup from the knockout pot and other system components
- Evaluation of free product separation effectiveness in the oil separator (if present)
- Removal of air stripper foulants.

4.11 MONITORING

The progress of corrective action activities will be monitored to evaluate if the remedial objectives are being met. Soil analytical results obtained during the previous investigations at the site will be used for comparison purposes. Results from the baseline groundwater sampling will be used to gauge the progress of groundwater remediation efforts.

4.11.1 DPVE System Monitoring

System monitoring will include routine measurement of operational parameters and will coincide with O&M activities. Parameters to be measured, recorded, or calculated during the monthly activities are as follows:

- Date of each site visit

- Measuring groundwater/free product elevation in select monitoring wells (minimum of once per quarter for the first year)
- Manual bailing of free product from monitoring and recovery wells (if observed)
- Hydraulic and pneumatic radius of influence and supporting calculations
- Mass of hydrocarbons removed in vapor and liquid phase and supporting calculations
- Volume of liquids removed and discharged
- Air flow readings at pump discharge
- Liquid flow totalizer readings at system effluent
- Vapor concentrations at the LRVP discharge and carbon vessels
- Effluent sampling results and permit compliance status
- Total system runtime and explanations of unscheduled shutdowns
- O&M activities and system condition.

The information will be compiled into an on-going project database designed to automatically calculate information such as mass of hydrocarbons and volume of groundwater removed. This information is automatically calculated for both the monitoring period and life of the project. An example of a monitoring form to be used by PPM personnel is included in **Appendix F**, **DPVE Monitoring Forms**.

4.11.2 Monthly System Sampling

Effluent water samples will be collected on a monthly basis in accordance with the pending NPDES permit for the site. PPM will provide water effluent analytical results per the NPDES requirements in the Discharge Monitoring Reports (DMRs) submitted to ADEM semi-annually. Water effluent samples will be analyzed for pH, oil and grease (EPA Method 1664A), BTEX, MTBE, and naphthalene (EPA Method 8260). Samples will be collected from a port installed on the discharge side of the air stripper and prior to entering the effluent discharge line that extends to the outfall. A field measurement of pH will be performed at the time samples are collected. The volume of water discharged, as indicated by the in-line flow meter, will also be recorded at this time.

PPM anticipates collecting effluent vapor samples from the LRVP emissions on a quarterly basis. Each sample will be analyzed for total VOCs per EPA Method 8260, modified for air.

4.11.3 Quarterly Groundwater Sampling

PPM will collect groundwater samples from each of the recovery wells and monitoring wells, at least once annually. A comprehensive groundwater sampling event of 18 wells is recommended during subsequent quarterly periods to monitor the effectiveness of the system at reducing dissolved COC concentrations. Sampling activities will be conducted in general accordance with PPM's **Technical Sampling and Analysis QA/QC Plan**, **Appendix G**. Groundwater samples will be analyzed for BTEX, MTBE, and naphthalene per EPA Method 8260.

5.0 REPORTING

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

1. NPDES permit submittal
   Notification will be submitted to ADEM once the NPDES permit application has been submitted.

2. System Purchase and Delivery
   A system delivery letter will be submitted to ADEM within 10 days of system delivery to the site.

3. Report of Corrective Action Implementation
   This report will include drawings of the system/layout and locations of recovery wells following installation.

4. Reporting of Corrective Action Effectiveness
   PPM proposes to submit 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 effectiveness, and recommendations concerning any additional modifications or change in remedial approaches that may be necessary. ADEM Corrective Action System Effectiveness Monitoring Report (CASEMR) forms will be included with each report.

5. Site Closure Report/Monitoring Well Abandonment
   This report will describe in detail the closure of the site and removal of all remediation equipment. A separate cost proposal will be submitted for this work.

6.0 CLOSURE EVALUATION

The data collected during site monitoring will be evaluated on a regular basis. Criteria for considering termination of remedial activities will include reduction in COC concentrations to established cleanup levels, or determination that asymptotic levels have been reached. Analysis of the hydrocarbon mass removal data, and the latest results of quarterly groundwater sampling will be used to evaluate if site objectives have been met.

The DPVE system will be shutdown following approval from ADEM. The site will be monitored for potential increases in COC concentrations (rebound) following shutdown of the system prior to demobilization of the system and ancillary components. Recommendations will be provided to ADEM concerning further action should rebound occur.

7.0 SITE HEALTH AND SAFETY

A site-specific Health and Safety Plan (HASP) was developed for corrective action efforts at the facility is included in **Appendix H, Site-Specific Health and Safety Plan**. The HASP was specifically designed to address the corrective actions and monitoring activities at the site. PPM project personnel are 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.

8.0 PROJECT SCHEDULE

PPM will notify ADEM five days in advance of any planned trenching, system installation, or startup 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 telephone or electronic mail of the new date and reason for rescheduling.

8.1 CITY OF MONTGOMERY AND NPDES PERMIT SUBMITTAL

Upon approval from ADEM, PPM will submit the City of Montgomery building permit, ALDOT ROW, and ADEM NPDES permit applications. PPM anticipates the permits will take approximately 90 days for review and approval by the City of Montgomery and ADEM.

8.2 ESTIMATED SCHEDULE FOR SYSTEM INSTALLATION

The equipment manufacturer (MK Environmental) estimates a lead time for building the system at 10 to 12 weeks. PPM estimates that site preparation/system installation activities will require approximately two weeks to complete, pending site and weather conditions encountered. System placement and connection activities will likely require two to three days to complete.

System start-up activities will require approximately two days for adequate system monitoring prior to departing from the site. Based on this anticipated schedule, PPM estimates that system installation, start up, and initial optimization efforts can be completed within 120 days of MCAP approval. A report can be submitted within 150 days of authorization.

8.3 ESTIMATED CLEAN UP TIME

Although the length of time required to reach the cleanup objectives cannot be predicted precisely, PPM anticipates that the DPVE unit will be operated for approximately two years. A more accurate prediction of cleanup time will be provided once the system has been in operation long enough to establish trends in VOC mass removal rates, groundwater extraction rates, and hydraulic and pneumatic capture zones.

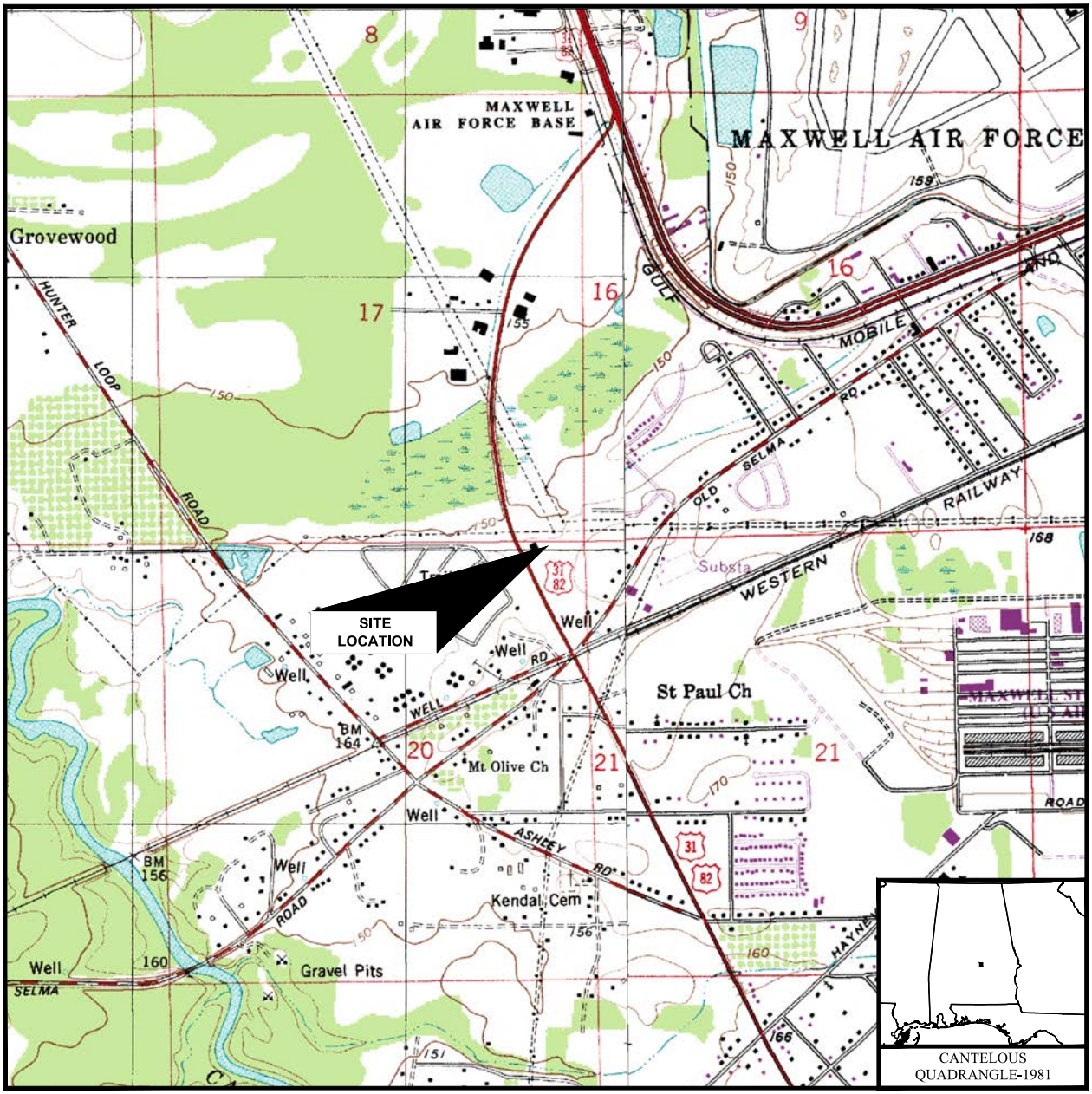
9.0 COST ESTIMATED

Cost proposals for completion of activities associated with implementation of the CAP and the first two quarters of O&M activities are included in the following:

- **Appendix I Cost Proposal No. 26 - Equipment Purchase**
- **Appendix J Cost Proposal No. 27 - DPVE System Installation and Startup**
- **Appendix K Cost Proposal No. 28 - First Quarter O&M and Groundwater Sampling**
- **Appendix L Cost Proposal No. 29 - Second Quarter O&M and Groundwater Sampling**.

APPENDICES

APPENDIX A – FIGURES



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1 .5 0 1 MILES

1000 0 1000 5000 10,000 FEET

1 0 KILOMETER 1 2

1000 0 METER 1000 2000

N

PPM CONSULTANTS, INC. www.ppmco.com	
DRAWN BY: BWH	DRAWN DATE: 04/08/21
PROJECT NUMBER: 422601	PHASE: MCAP

RUSSELL PETROLEUM CORPORATION
BULK PLANT
3378 TANKVIEW COURT
MONTGOMERY, ALABAMA

SITE LOCATION MAP

FIGURE NUMBER 1

SOURCE: MONTGOMERY COUNTY (2016)

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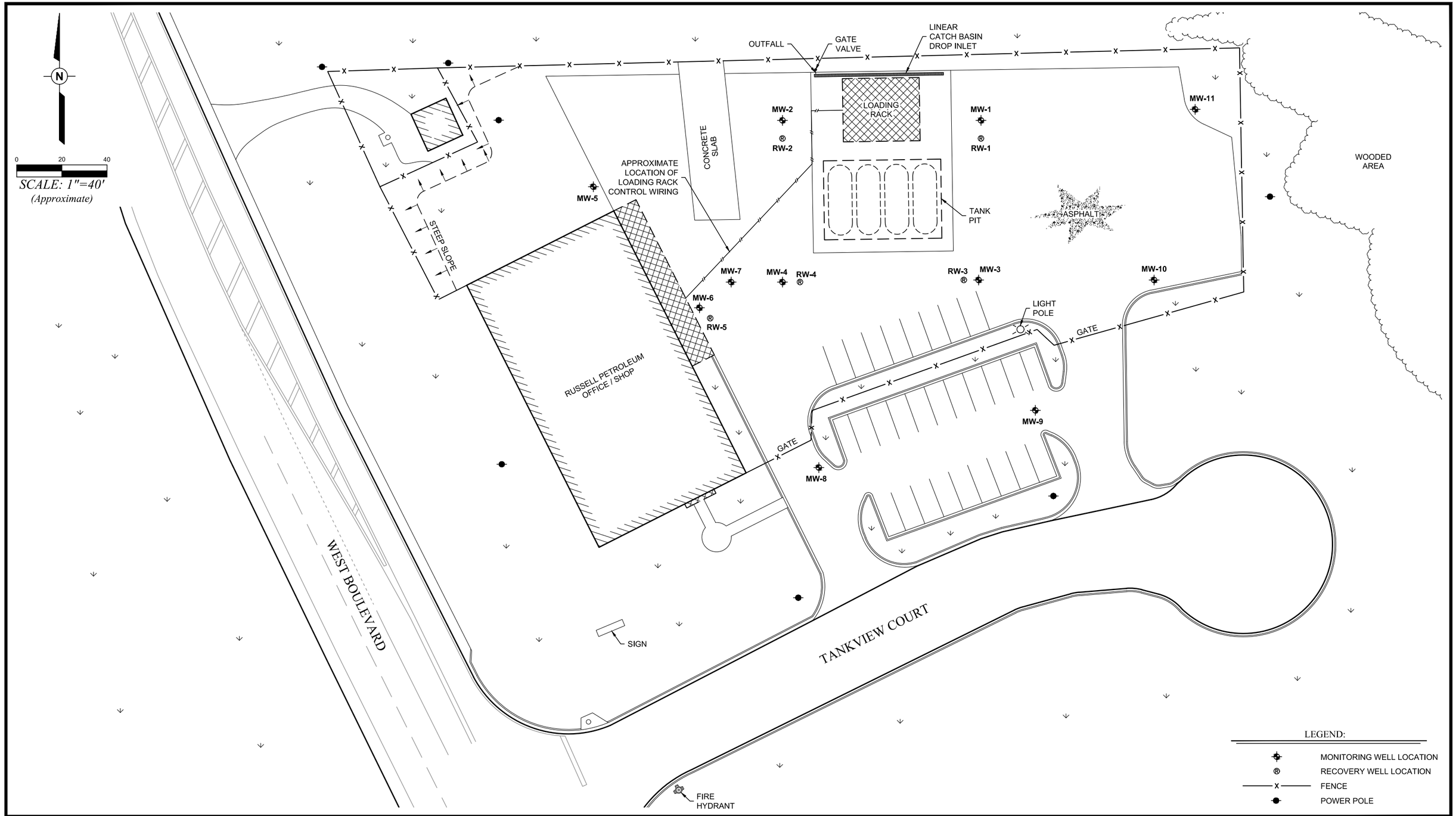
DRAWN BY:	DRAWN DATE:
BWH	04/08/21
PROJECT NUMBER:	PHASE:
422601	MCAP

RUSSELL PETROLEUM CORPORATION
BULK PLANT
3378 TANKVIEW COURT
MONTGOMERY, ALABAMA

AREA MAP

FIGURE NUMBER
2



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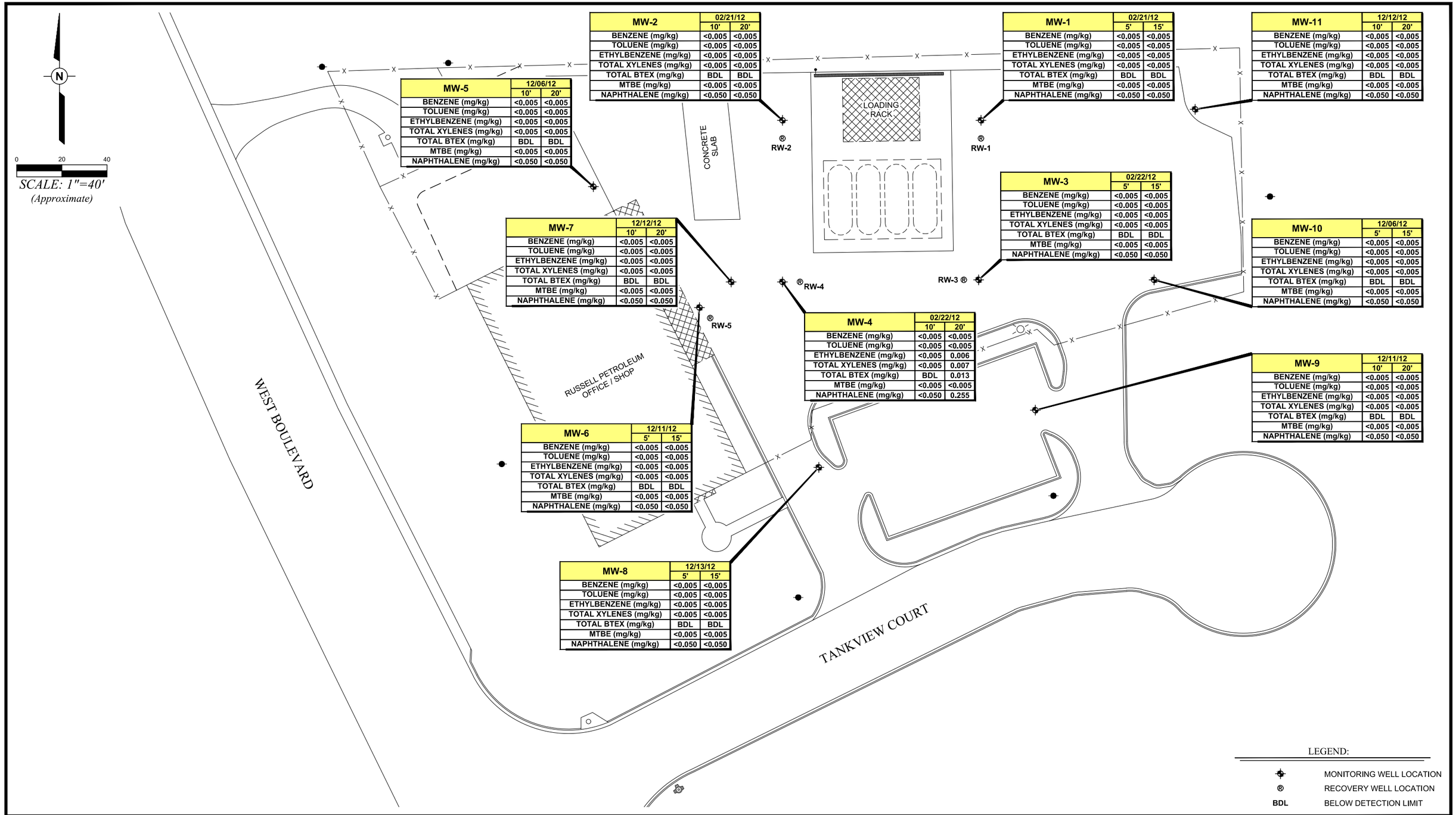
PROJECT NUMBER:	PHASE:
422601	MCAP

RUSSELL PETROLEUM CORPORATION
BULK PLANT
3378 TANKVIEW COURT
MONTGOMERY, ALABAMA

SITE MAP

FIGURE NUMBER
3



MW-2	02/21/12	
	10'	20'
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.005	<0.005
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.050	<0.050

MW-1	02/21/12	
	5'	15'
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.005	<0.005
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.050	<0.050

MW-11	12/12/12	
	10'	20'
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.005	<0.005
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.050	<0.050

MW-5	12/06/12	
	10'	20'
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.005	<0.005
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.050	<0.050

MW-3	02/22/12	
	5'	15'
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.005	<0.005
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.050	<0.050

MW-10	12/06/12	
	5'	15'
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.005	<0.005
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.050	<0.050

MW-7	12/12/12	
	10'	20'
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.005	<0.005
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.050	<0.050

MW-4	02/22/12	
	10'	20'
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	0.006
TOTAL XYLENES (mg/kg)	<0.005	0.007
TOTAL BTEX (mg/kg)	BDL	0.013
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.050	0.255

MW-9	12/11/12	
	10'	20'
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.005	<0.005
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.050	<0.050

MW-6	12/11/12	
	5'	15'
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.005	<0.005
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.050	<0.050

MW-8	12/13/12	
	5'	15'
BENZENE (mg/kg)	<0.005	<0.005
TOLUENE (mg/kg)	<0.005	<0.005
ETHYLBENZENE (mg/kg)	<0.005	<0.005
TOTAL XYLENES (mg/kg)	<0.005	<0.005
TOTAL BTEX (mg/kg)	BDL	BDL
MTBE (mg/kg)	<0.005	<0.005
NAPHTHALENE (mg/kg)	<0.050	<0.050

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BWH	04/08/21
PROJECT NUMBER:	PHASE:
422601	MCAP

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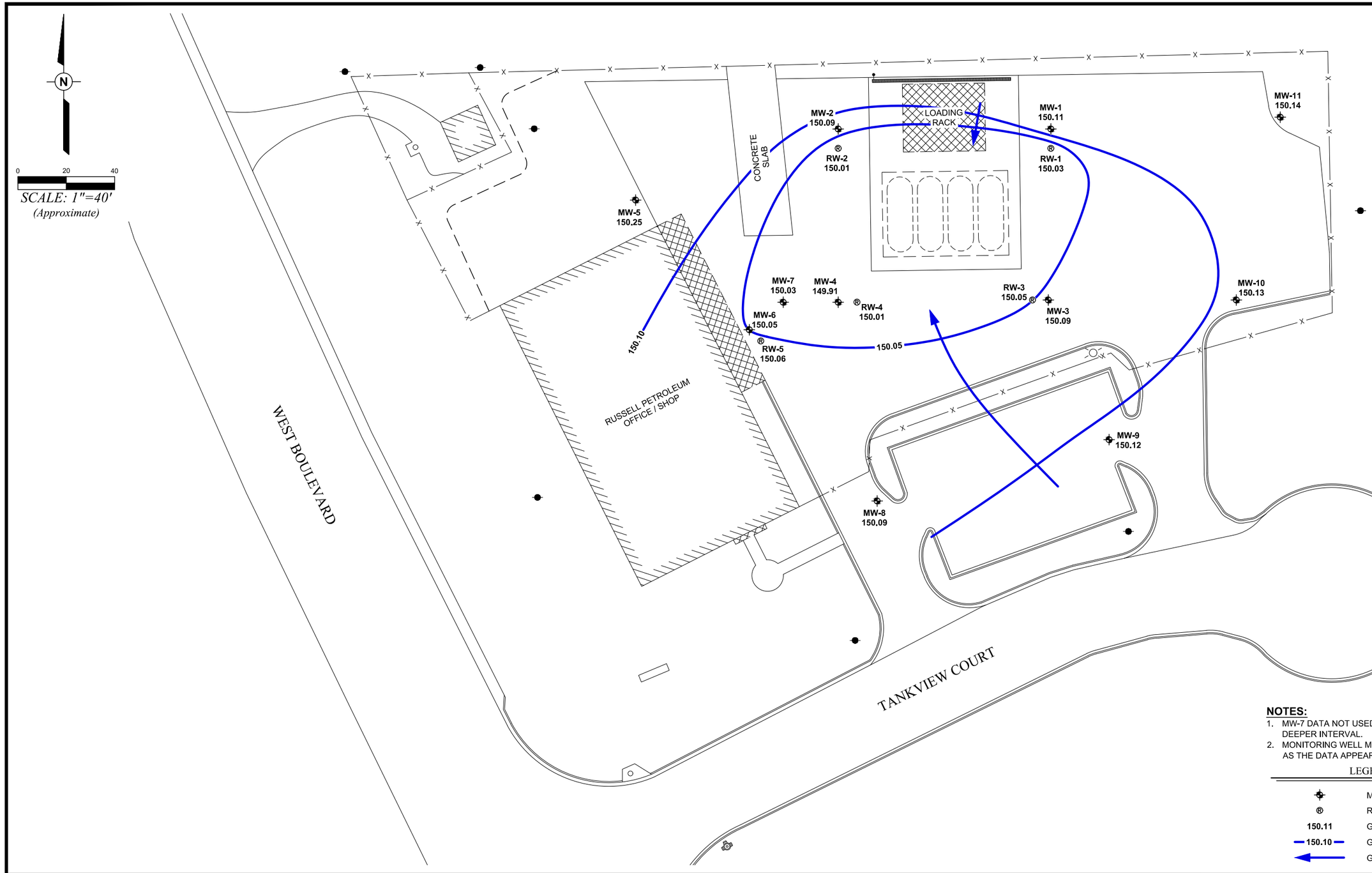
MONTGOMERY, ALABAMA

COC CONCENTRATIONS IN SOIL

FIGURE NUMBER
4



NOTES:

1. MW-7 DATA NOT USED TO CONTOUR AS IT IS SCREENED AT A DEEPER INTERVAL.
2. MONITORING WELL MW-4 DATA WAS NOT USED TO CONTOUR AS THE DATA APPEARS ANOMALOUS.

LEGEND:

⊕	MONITORING WELL LOCATION
®	RECOVERY WELL LOCATION
150.11	GROUNDWATER ELEVATION (ft.)
150.10	GROUNDWATER ELEVATION CONTOUR (ft.)
←	GROUNDWATER FLOW DIRECTION

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BWH	04/08/21
PROJECT NUMBER:	PHASE:
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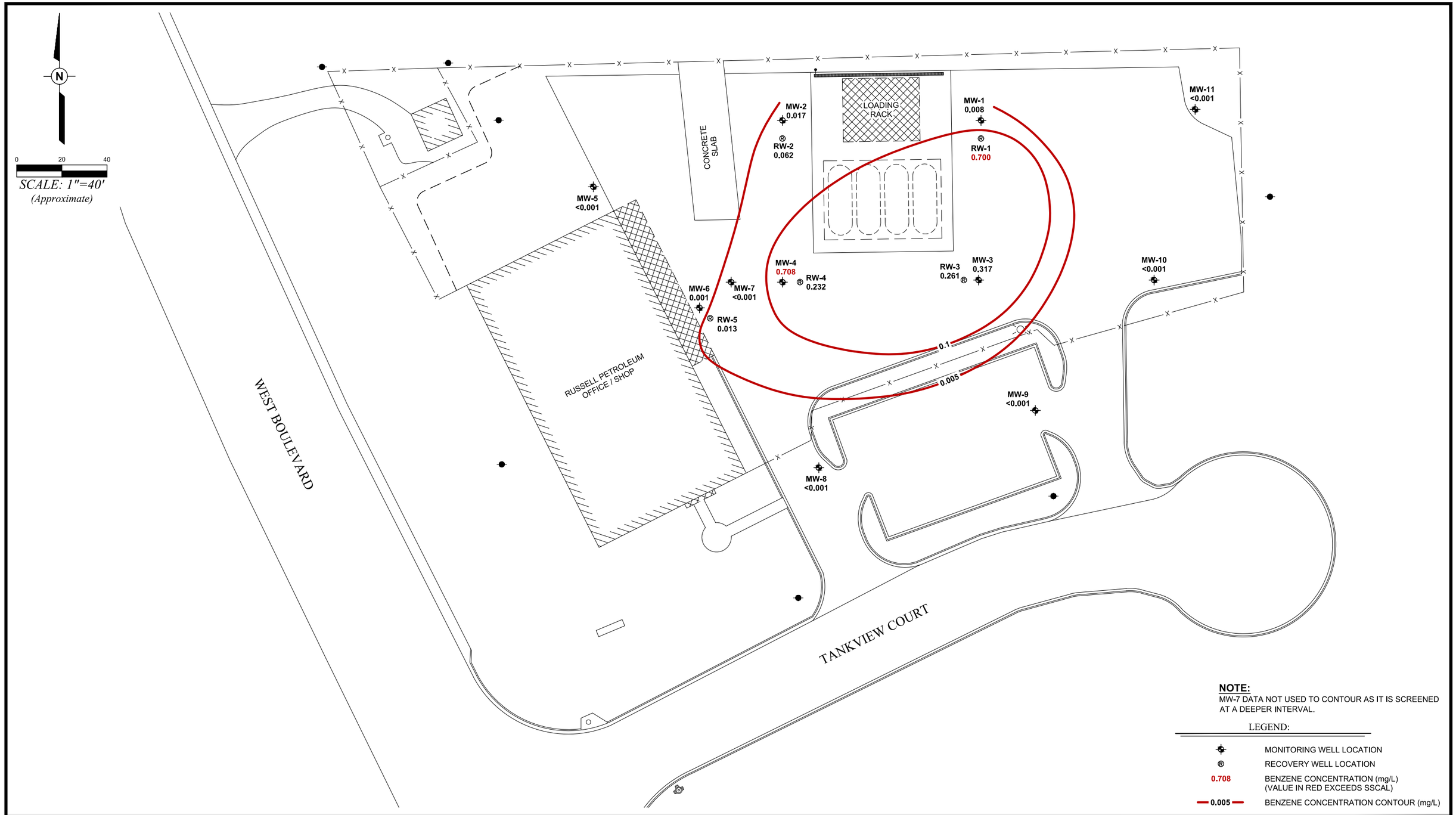
MONTGOMERY, ALABAMA

GROUNDWATER ELEVATION MAP
(MARCH 12, 2021)

FIGURE NUMBER
5



NOTE:
MW-7 DATA NOT USED TO CONTOUR AS IT IS SCREENED AT A DEEPER INTERVAL.

LEGEND:

- MONITORING WELL LOCATION
- ® RECOVERY WELL LOCATION
- 0.708 BENZENE CONCENTRATION (mg/L) (VALUE IN RED EXCEEDS SSCAL)
- 0.005 BENZENE CONCENTRATION CONTOUR (mg/L)

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BWH	04/08/21
PROJECT NUMBER:	PHASE:
422601	MCAP

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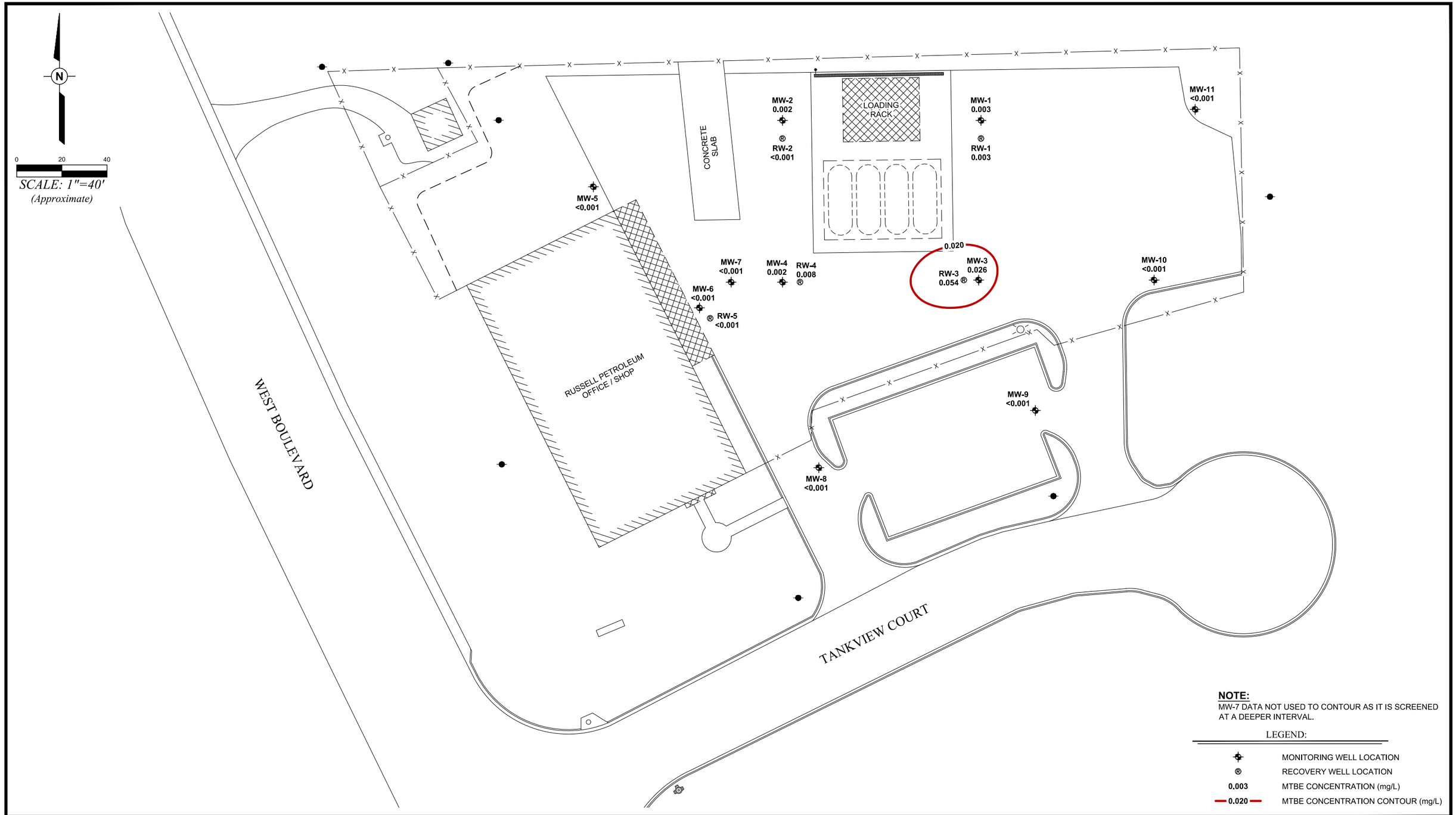
MONTGOMERY, ALABAMA

DISSOLVED BENZENE ISOCONCENTRATION MAP
(MARCH 12, 2021)

FIGURE NUMBER
6



NOTE:
MW-7 DATA NOT USED TO CONTOUR AS IT IS SCREENED AT A DEEPER INTERVAL.

LEGEND:

- MONITORING WELL LOCATION
- ® RECOVERY WELL LOCATION
- 0.003 MTBE CONCENTRATION (mg/L)
- 0.020 MTBE CONCENTRATION CONTOUR (mg/L)

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BWH	04/08/21
PROJECT NUMBER:	PHASE:
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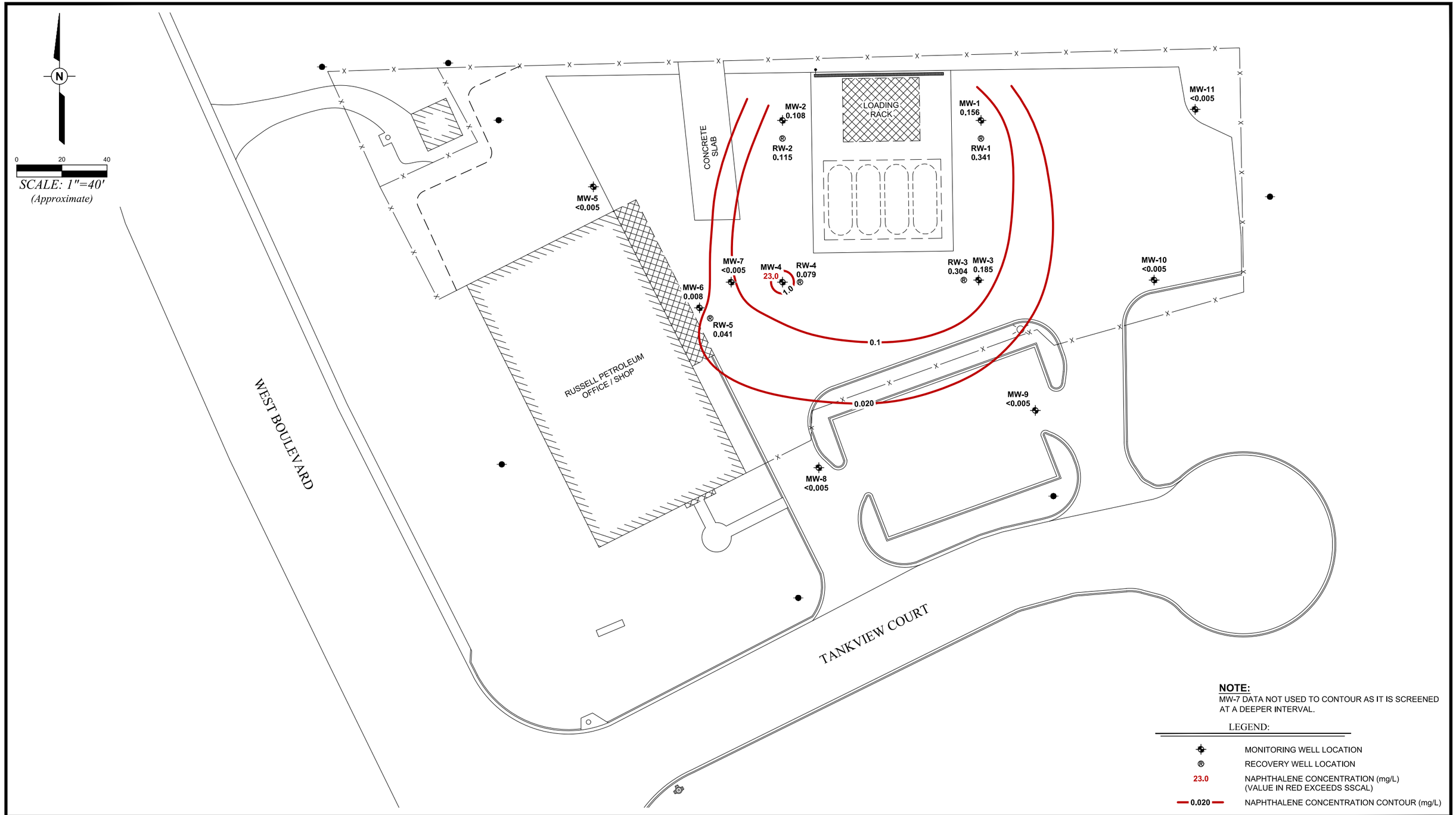
BULK PLANT
3378 TANKVIEW COURT
MONTGOMERY, ALABAMA

DISSOLVED MTBE ISOCONCENTRATION MAP
(MARCH 12, 2021)

FIGURE NUMBER
7



NOTE:
MW-7 DATA NOT USED TO CONTOUR AS IT IS SCREENED AT A DEEPER INTERVAL.

LEGEND:

⌖	MONITORING WELL LOCATION
®	RECOVERY WELL LOCATION
23.0	NAPHTHALENE CONCENTRATION (mg/L) (VALUE IN RED EXCEEDS SSCAL)
0.020	NAPHTHALENE CONCENTRATION CONTOUR (mg/L)

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BWH	04/08/21
PROJECT NUMBER:	PHASE:
422601	MCAP

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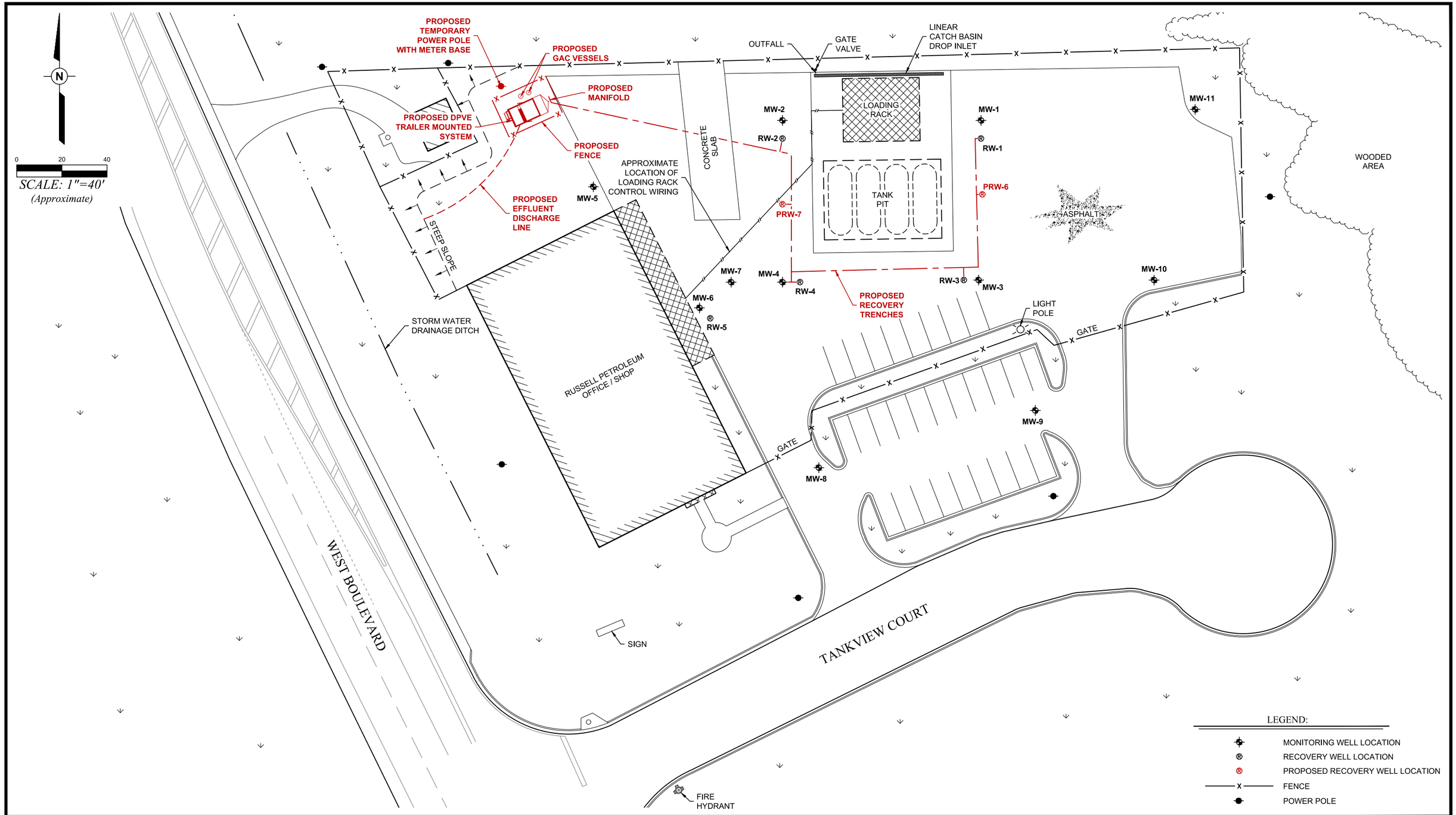
DISSOLVED NAPHTHALENE ISOCONCENTRATION MAP (MARCH 12, 2021)

FIGURE NUMBER
8



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PROJECT NUMBER: 422601	PHASE: MCAP

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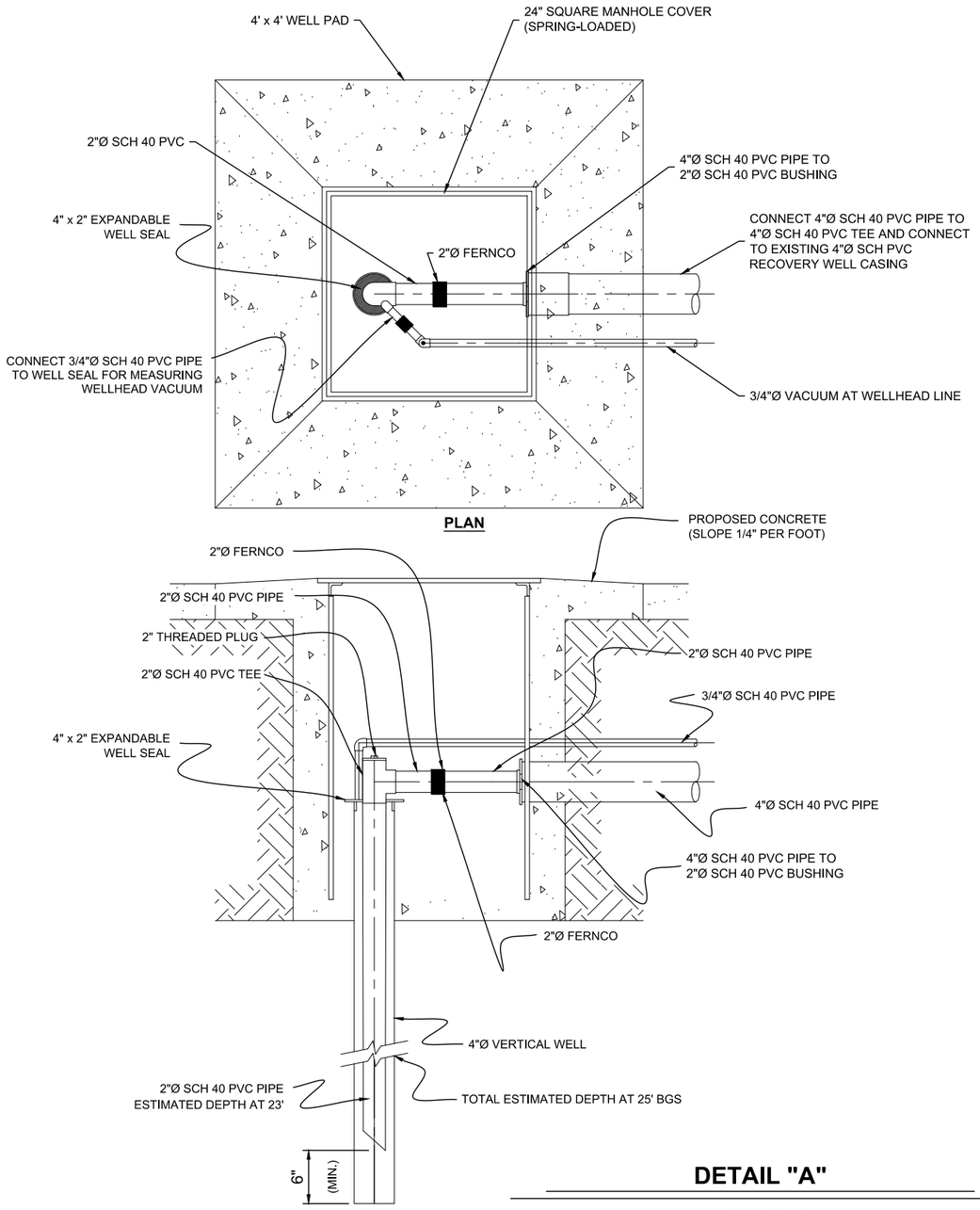
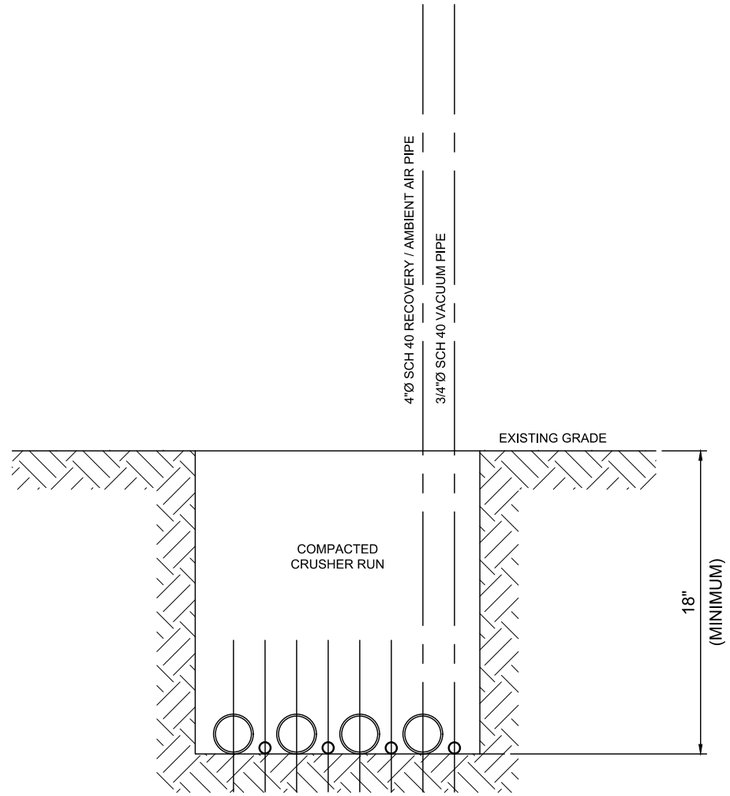
PROPOSED SYSTEM LAYOUT

FIGURE NUMBER
9



DETAIL "A"

NOT TO SCALE



RECOVERY WELL TRENCH

NOT TO SCALE

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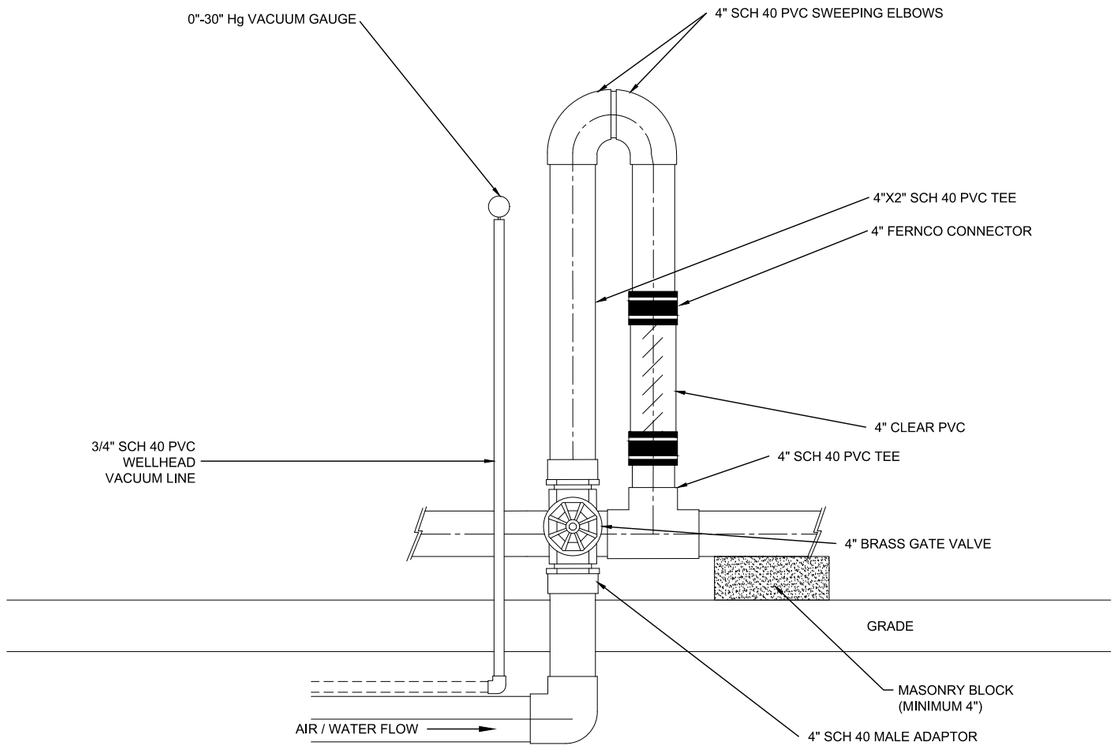
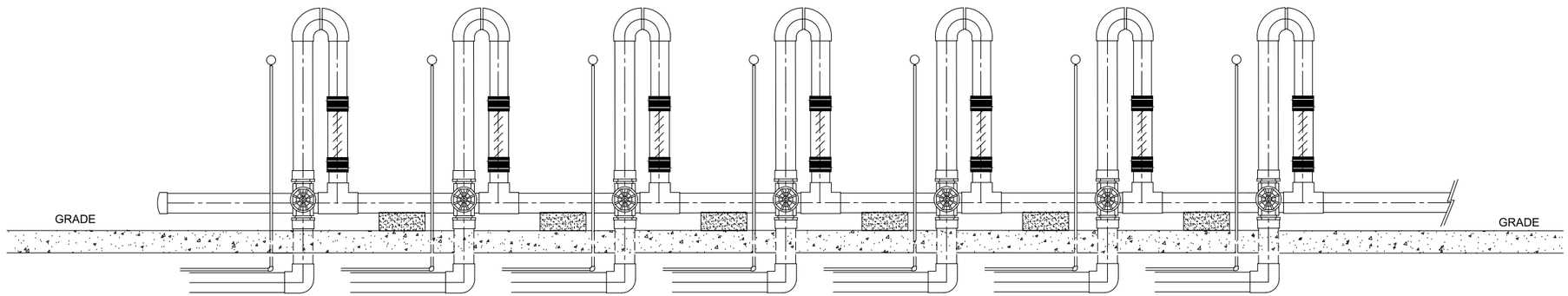
DETAILS AND SECTIONS FOR 4" RECOVERY WELLS AND PIPING TRENCH

FIGURE NUMBER 10



NOT TO SCALE



NOT TO SCALE

PPM CONSULTANTS, INC. www.ppmco.com	
DRAWN BY: BWH	DRAWN DATE: 04/08/21
PROJECT NUMBER: 422601	PHASE: MCAP

RUSSELL PETROLEUM CORPORATION
BULK PLANT
3378 TANKVIEW COURT
MONTGOMERY, ALABAMA

PROFILE / PLAN VIEW OF MANIFOLD

FIGURE NUMBER
11

APPENDIX B – SOIL BORING LOGS/MONITORING WELL CONSTRUCTION LOGS

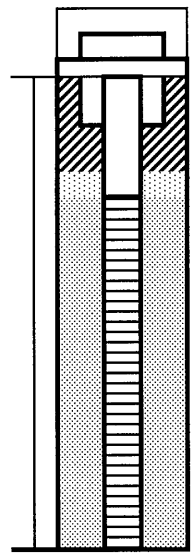
CTE

MW-1

Project	Bulk Plant MTG	Measuring Point Elev:	166.46'	Date Started:	2/21/2012
Location	Montgomery, Alabama	Logged by:	Phillip Gilbert	Date Finished:	2/21/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	12-1373

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
0	Asphalt					
2	Red/Tan Clayey SILT					
4	Grey SILT	<0.005	<0.005	<0.050		
6						
8	Red/Tan Clayey SILT					
10						
12						
14	Tan Silty SAND w/ gravel	<0.005	<0.005	<0.050		
16						
18						
20						
22					21.79'	
24					22.05'	
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



Boring terminated at 30.0 feet

Weather: Sunny

Start of Boring: 8:16:00 AM

End Of Boring: 9:11:00 AM

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 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.

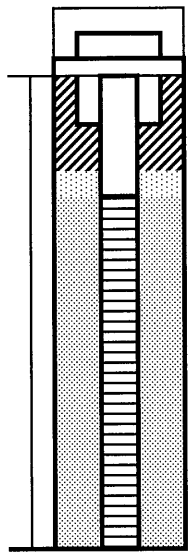
CTE

MW-2

Project	Bulk Plant MTG	Measuring Point Elev:	165.79	Date Started:	2/21/2012
Location	Montgomery, Alabama	Logged by:	Phillip Gilbert	Date Finished:	2/21/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	12-1373

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	Asphalt					
2	Red/Tan Clayey SILT					
4	Grey SILT					
6						
8						
10	Red/Tan Clayey SILT	<0.005	<0.005	<0.050		
12						
14						
16						
18						
20	Tan Silty SAND w/ gravel	<0.005	<0.005	<0.050		
22					22.39'	
24					22.91'	
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



Boring terminated at 30.0 feet

Weather: Sunny

Start of Boring: 9:32:00 AM

End Of Boring: 10:56:00 AM

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 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.

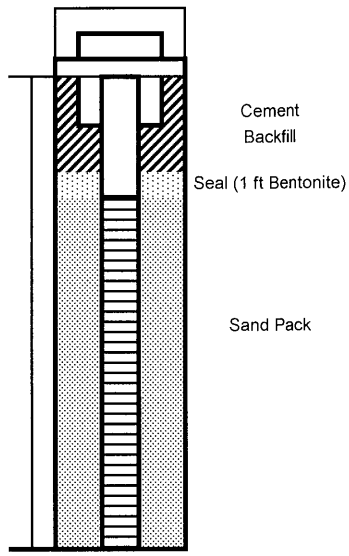
CTE

MW-3

Project	Bulk Plant MTG	Measuring Point Elev:	166.89'	Date Started:	2/22/2012
Location	Montgomery, Alabama	Logged by:	Phillip Gilbert	Date Finished:	2/22/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	12-1373

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
0	Asphalt					
2						
4		<0.005	<0.005	<0.050		
6						
8						
10	Red/Tan Clayey SILT					
12						
14						
16		<0.005	<0.005	<0.050		
18						
20	Tan Silty SAND w/ gravel					
22					22.39'	
24					23.05'	
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



Boring terminated at 30.0 feet

Weather: Sunny

Start of Boring: 8:24:00 AM

End Of Boring: 9:02:00 AM

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 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.

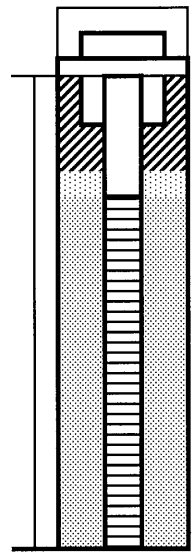
CTE

MW-4

Project	Bulk Plant MTG	Measuring Point Elev:	166.02'	Date Started:	2/22/2012
Location	Montgomery, Alabama	Logged by:	Phillip Gilbert	Date Finished:	2/22/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	12-1373

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
2	Asphalt					
4						
6						
8						
10	Red/Tan Clayey SILT	<0.005	<0.005	<0.050		
12						
14						
16						
18						
20	Tan Silty SAND w/ gravel	<0.005	<0.005	<0.050		
22					21.59'	
24					22.45'	
26						
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



Boring terminated at 30.0 feet

Weather: Sunny

Start of Boring: 9:21:00 AM

End Of Boring: 11:04:00 AM

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 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-5

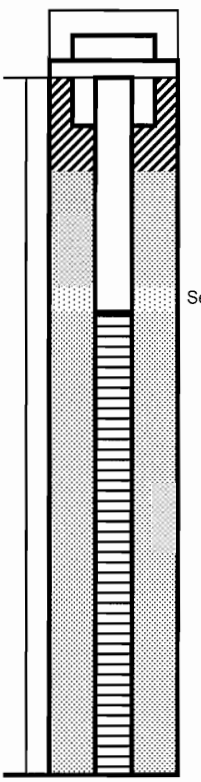
Project	Bulk Plant MTG	Measuring Point Elev:	166.41	Date Started:	12/6/2012
Location	Montgomery, Alabama	Logged by:	Phillip Gilbert	Date Finished:	12/6/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	12-1373

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	Gravel					
2						
4						
6	Red/Tan Clayey SILT					
8						
10		<0.005	<0.005	<0.050		
12						
14						
16						
18						
20	Tan Silty SAND w/ gravel	<0.005	<0.005	<0.050		
22						
24					23.55	
26					23.69	
28						
30						
32						
34						
36						
38						
40						
42						

Riser
10 ft 0 in PVC
0 to 10 ft

Screen
20 ft 0 in PVC
10 to 30 ft

Monitoring Well Installation



Boring terminated at 30.0 feet

Weather:	P. Cloudy
Start of Boring:	10:00 AM
End Of Boring:	12:20 AM

Static Water Level

Initial Water Level

The boring was advanced to a depth of 30 ft using a 6 5/8 in hollow stem auger. Twenty feet of PVC screen and ten feet of PVC riser were then installed. A sand pack was installed from 10 to 30 feet and the remainder of the annular space was back-filled with neat portland cement.

CTE

MW-6

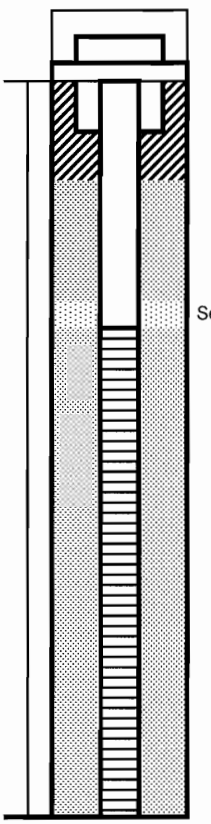
Project	Bulk Plant MTG	Measuring Point Elev:	166.51	Date Started:	12/11/2012
Location	Montgomery, Alabama	Logged by:	Phillip Gilbert	Date Finished:	12/11/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	12-1373

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
0	Asphalt					
2	Red/Tan Clayey SILT					
4	Grey SILT	<0.005	<0.005	<0.050		
6						
8	Red/Tan Clayey SILT					
10						
12						
14						
16	Tan Silty SAND w/ gravel	<0.005	<0.005	<0.050		
18						
20						
22						
24					23.57'	
26					23.63'	
28						
30						
32						
34						
36						
38						
40						
42						

Riser
10 ft 0 in PVC
0 to 10 ft

Screen
20 ft 0 in PVC
10 to 30 ft

Monitoring Well Installation



Boring terminated at 30.0 feet

Weather:	Sunny
Start of Boring:	8:30 AM
End Of Boring:	9:45 AM

Static Water Level

Initial Water Level

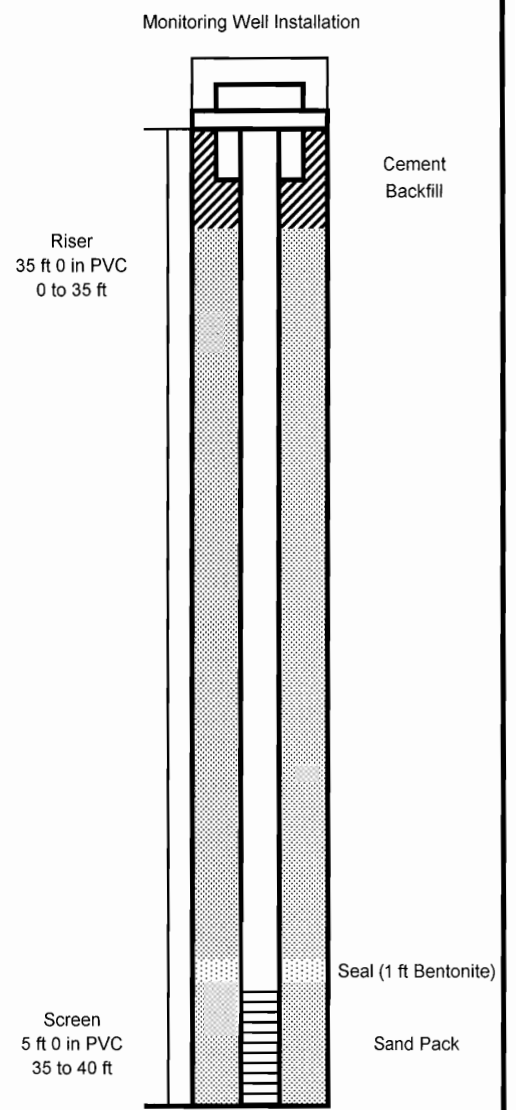
The boring was advanced to a depth of 30 ft using a 6 5/8 in hollow stem auger. Twenty feet of PVC screen and ten feet of PVC riser were then installed. A sand pack was installed from 10 to 30 feet and the remainder of the annular space was back-filled with neat portland cement.

CTE

MW-7

Project	Bulk Plant MTG	Measuring Point Elev:	166.19	Date Started:	12/6/2012
Location	Montgomery, Alabama	Logged by:	Phillip Gilbert	Date Finished:	12/6/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	12-1373

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
0	Asphalt					
2	Red/Tan Clayey SILT					
4	Grey SILT					
6						
8						
10	Red/Tan Clayey SILT	<0.005	<0.005	<0.050		
12						
14						
16						
18						
20	Tan Silty SAND w/ gravel	<0.005	<0.005	<0.050		
22						
24					23.23'	
26					23.29'	
28						
30						
32						
34						
36						
38						
40						
42						



Boring terminated at 30.0 feet

Weather:	Sunny
Start of Boring:	8:20 AM
End Of Boring:	10:10 AM

Static Water Level

Initial Water Level

The boring was advanced to a depth of 40 ft using a 6 5/8 in hollow stem auger. Five feet of PVC screen and thirty-five feet of PVC riser 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.

CTE

MW-8

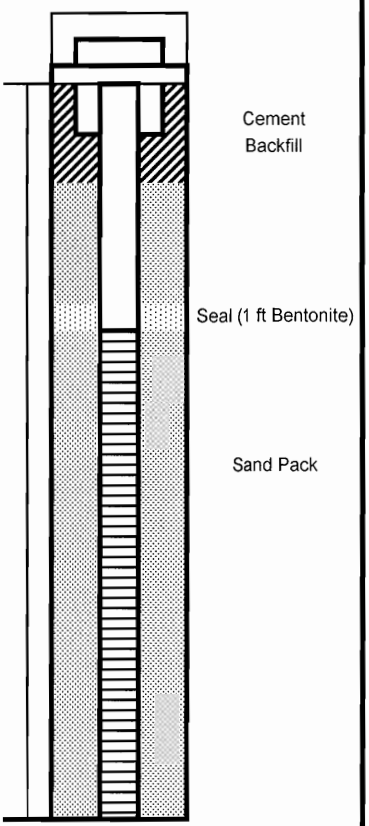
Project	Bulk Plant MTG	Measuring Point Elev:	167.35	Date Started:	12/13/2012
Location	Montgomery, Alabama	Logged by:	Phillip Gilbert	Date Finished:	12/13/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	12-1373

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
0	Asphalt					
2	Red/Tan Clayey SILT					
4	Grey SILT	<0.005	<0.005	<0.050		
6						
8	Red/Tan Clayey SILT					
10						
12						
14						
16	Tan Silty SAND w/ gravel	<0.005	<0.005	<0.050		
18						
20						
22						
24					24.60'	
26					24.63'	
28						
30						
32						
34						
36						
38						
40						
42						

Riser
10 ft 0 in PVC
0 to 10 ft

Screen
20 ft 0 in PVC
10 to 30 ft

Monitoring Well Installation



Boring terminated at 30.0 feet

Weather:	Sunny
Start of Boring:	8:00 AM
End Of Boring:	9:20 AM

Static Water Level

Initial Water Level

The boring was advanced to a depth of 30 ft using a 6 5/8 in hollow stem auger. Twenty feet of PVC screen and ten feet of PVC riser were then installed. A sand pack was installed from 10 to 30 feet and the remainder of the annular space was back-filled with neat portland cement.

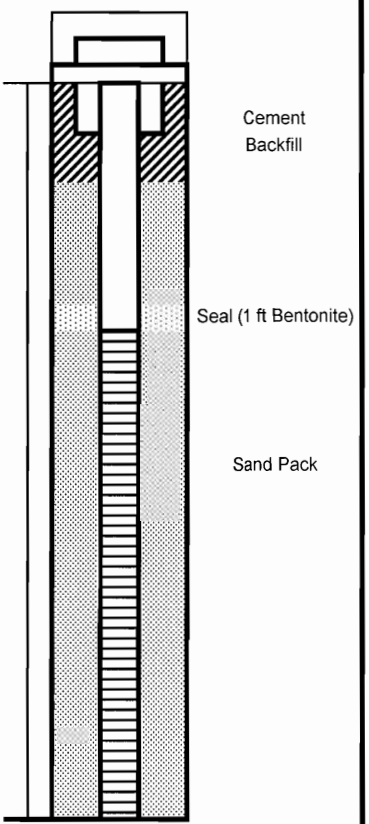
CTE

MW-9

Project	Bulk Plant MTG	Measuring Point Elev:	168.84	Date Started:	12/11/2012
Location	Montgomery, Alabama	Logged by:	Phillip Gilbert	Date Finished:	12/11/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	12-1373

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	Asphalt					
2						
4						
6	Red/Tan Clayey SILT					
8						
10		<0.005	<0.005	<0.050		
12						
14						
16						
18						
20	Tan Silty SAND w/ gravel	<0.005	<0.005	<0.050		
22						
24					25.95'	
26					25.98'	
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



Boring terminated at 30.0 feet

Weather:	Sunny
Start of Boring:	8:10 AM
End Of Boring:	9:20 AM

Static Water Level

Initial Water Level

The boring was advanced to a depth of 30 ft using a 6 5/8 in hollow stem auger. Twenty feet of PVC screen and ten feet of PVC riser were then installed. A sand pack was installed from 10 to 30 feet and the remainder of the annular space was back-filled with neat portland cement.

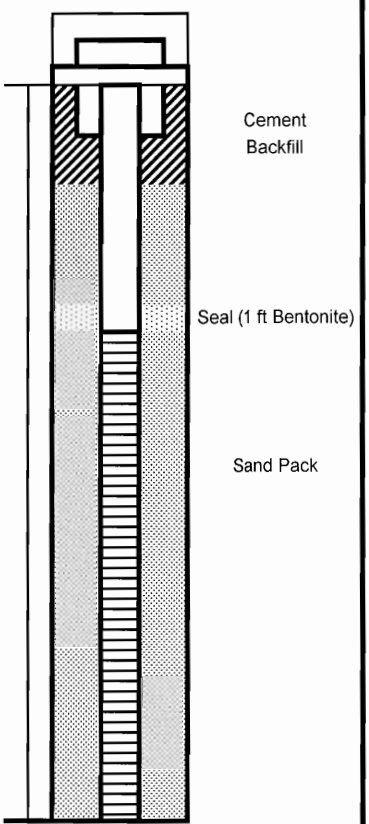
CTE

MW-10

Project	Bulk Plant MTG	Measuring Point Elev:	168.10	Date Started:	12/6/2012
Location	Montgomery, Alabama	Logged by:	Phillip Gilbert	Date Finished:	12/6/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	12-1373

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	Asphalt					
2	Red/Tan Clayey SILT					
4		<0.005	<0.005	<0.050		
6						
8	Red/Tan Clayey SILT					
10						
12						
14						
16		<0.005	<0.005	<0.050		
18						
20	Tan Silty SAND w/ gravel					
22						
24					24.90'	
26					24.96'	
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



Boring terminated at 30.0 feet

Weather:	P. Cloudy
Start of Boring:	8:00 AM
End Of Boring:	9:45 AM

Static Water Level

Initial Water Level

The boring was advanced to a depth of 30 ft using a 6 5/8 in hollow stem auger. Twenty feet of PVC screen and ten feet of PVC riser were then installed. A sand pack was installed from 10 to 30 feet and the remainder of the annular space was back-filled with neat portland cement.

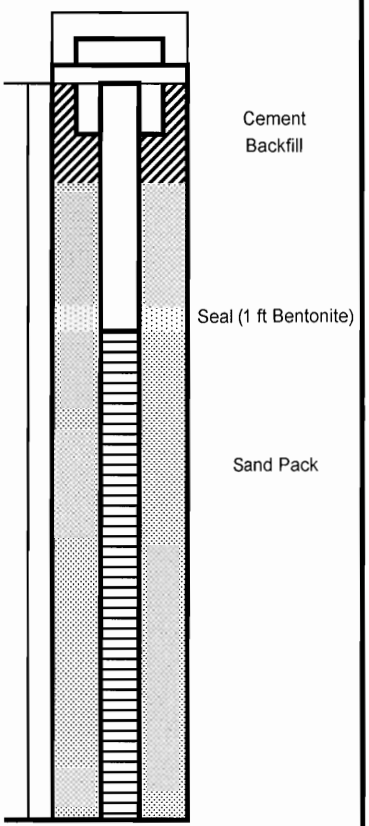
CTE

MW-11

Project	Bulk Plant MTG	Measuring Point Elev:	166.02	Date Started:	12/6/2012
Location	Montgomery, Alabama	Logged by:	Phillip Gilbert	Date Finished:	12/6/2012
		Drilling Method:	Hollow Stem Auger	Job Number:	12-1373

Depth (Feet)	Description	BTEX ppm	MTBE ppm	Naphthalene ppm	Water Level	Graphic Log
	Asphalt					
2	Red/Tan Clayey SILT					
4	Grey SILT					
6						
8	Red/Tan Clayey SILT					
10		<0.005	<0.005	<0.050		
12						
14						
16						
18						
20	Tan Silty SAND w/ gravel	<0.005	<0.005	<0.050		
22						
24					23.85'	
26					23.92'	
28						
30						
32						
34						
36						
38						
40						
42						

Monitoring Well Installation



Boring terminated at 30.0 feet

Weather:	Sunny
Start of Boring:	10:30 AM
End Of Boring:	11:30 AM

Static Water Level

Initial Water Level

The boring was advanced to a depth of 30 ft using a 6 5/8 in hollow stem auger. Twenty feet of PVC screen and ten feet of PVC riser were then installed. A sand pack was installed from 10 to 30 feet and the remainder of the annular space was back-filled with neat portland cement.

APPENDIX C – TABLES

TABLE 1
SOIL ANALYTICAL SUMMARY
BULK PLANT MONTGOMERY
MONTGOMERY, ALABAMA

BORING I.D.	SAMPLE DEPTH (ft. BGS)	SAMPLING DATE	BENZENE (mg/kg)	TOLUENE (mg/kg)	ETHYL-BENZENE (mg/kg)	TOTAL XYLENES (mg/kg)	TOTAL BTEX (mg/kg)	MTBE (mg/kg)	NAPH-THALENE (mg/kg)
MW-1	5	02/21/12	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
	15		<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
MW-2	10	02/21/12	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
	20		<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
MW-3	5	02/22/12	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
	15		<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
MW-4	10	02/22/12	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
	20		<0.005	<0.005	0.006	0.007	0.013	<0.005	0.255
SSCAL - GRP Source and On-Site Inh.			*0.422*	*73.6*	*173*	*105*	--	*0.668*	*27.5*
MW-5	10	12/06/12	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
	20		<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
MW-6	5	12/11/12	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
	15		<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
MW-7	10	12/12/12	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
	20		<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
MW-8	5	12/13/12	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
	15		<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
MW-9	10	12/11/12	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
	20		<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
MW-10	5	12/06/12	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
	15		<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
MW-11	10	12/12/12	<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
	20		<0.005	<0.005	<0.005	<0.005	BDL	<0.005	<0.050
SSCAL On-Site Indoor Inh.			*0.422*	*73.6*	*265*	*105*	--	*1,050*	*89.5*

Notes: *BGS - Below ground surface (approximate)*
mg/kg - milligrams per kilogram
BDL - Below Detection Limits
SSCALs - Site-specific Corrective Action Levels
GRP - Groundwater Resource Protection
BTEX and MTBE analyses conducted per EPA Method 8260
Naphthalene analyses conducted per EPA Method 8270

Sources: *CTE Environmental, Inc.*
PPM Consultants, Inc.
PPM Project No. 422601-MCAP

TABLE 2
GROUNDWATER ELEVATION SURVEY DATA
BULK PLANT MONTGOMERY
MONTGOMERY, 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	03/05/12	166.46	30	10 - 30	21.79	--	--	144.67
	12/14/12		NM		23.30	--	--	143.16
	10/11/13		NM		22.21	21.02	1.19	145.15
	06/03/15		NM		19.75	19.70	0.05	146.75
	12/29/15		NM		20.80	20.60	0.20	145.81
	11/09/16		NM		22.25	19.71	2.54	146.13
	03/30/17		NM		18.94	18.83	0.11	147.60
	07/25/17		NM		18.20	14.91	3.29	150.74
	11/01/17		NM		16.71	16.22	0.49	150.12
	02/27/18		NM		16.30	15.62	0.68	150.67
	07/25/18		NM		17.25	--	--	149.21
	11/09/18		NM		18.65	--	--	147.81
	02/14/19		NM		16.65	16.38	0.27	150.01
	07/17/19		NM		16.72	16.45	0.27	149.94
	11/05/19		NM		19.22	--	--	147.24
	05/22/20	166.21	27.6		15.72	15.49	0.23	150.66
	10/26/20		27.2		16.57	--	--	149.64
	03/12/21		27.1		16.10	--	--	150.11
MW-2	03/05/12	165.79	30	10 - 30	21.31	--	--	144.48
	12/14/12		NM		22.85	--	--	142.94
	10/11/13		NM		20.74	--	--	145.05
	06/03/15		NM		19.30	--	--	146.49
	12/29/15		NM		20.50	--	--	145.29
	11/09/16		NM		19.71	--	--	146.08
	03/30/17		NM		18.51	--	--	147.28
	07/25/17		NM		14.55	--	--	151.24
	11/01/17		NM		15.75	--	--	150.04
	02/27/18		NM		15.86	--	--	149.93
	07/25/18		NM		16.60	--	--	149.19
	11/09/18		NM		18.18	--	--	147.61
	02/14/19		NM		15.92	--	--	149.87
	07/17/19		NM		16.32	--	--	149.47
	11/05/19		NM		18.62	--	--	147.17
	05/22/20		29.4		15.15	--	--	150.64
	10/26/20		28.8		16.31	--	--	149.48
	03/12/21		29.0		15.70	--	--	150.09
MW-3	03/05/12	166.89	30	10 - 30	22.39	--	--	144.50
	12/14/12		NM		23.82	--	--	143.07
	10/11/13		NM		21.62	--	--	145.27
	06/03/15		NM		20.25	--	--	146.64
	12/29/15		NM		21.45	--	--	145.44
	11/9/2016		NM		20.50	--	--	146.39
	3/30/2017		NM		19.15	--	--	147.74
	07/25/17		NM		15.42	--	--	151.47
	11/01/17		NM		16.80	--	--	150.09
	02/27/18		NM		16.92	--	--	149.97
	07/25/18		NM		17.59	--	--	149.30
	11/09/18		NM		19.21	--	--	147.68
	02/14/19		NM		16.95	--	--	149.94
	07/17/19		NM		17.24	--	--	149.65
	11/05/19		NM		19.55	--	--	147.34
	05/22/20	166.74	34.2		16.03	--	--	150.71
	10/26/20		33.5		17.15	--	--	149.59
	03/12/21		33.6		16.65	--	--	150.09

TABLE 2
GROUNDWATER ELEVATION SURVEY DATA
BULK PLANT MONTGOMERY
MONTGOMERY, 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	03/05/12	166.02	30	10 - 30	21.59	--	--	144.43
	12/14/12		NM		24.42	22.86	1.56	142.78
	10/11/13		NM		21.25	20.81	0.44	145.10
	06/03/15		NM		19.55	19.46	0.09	146.54
	12/29/15		NM		20.60	--	--	145.42
	11/09/16		NM		20.23	19.68	0.55	146.21
	03/30/17		NM		18.70	18.55	0.15	147.43
	07/25/17		NM		16.90	14.39	2.51	151.02
	11/01/17		NM		18.55	15.65	2.90	149.66
	02/27/18		NM		16.00	14.95	1.05	150.81
	07/25/18		NM		18.90	16.53	2.37	148.91
	11/09/18		NM		19.02	18.32	0.70	147.53
	02/14/19		NM		16.95	16.07	0.88	149.73
	07/17/19		NM		18.60	16.23	2.37	149.21
	11/05/19		NM		19.31	18.77	0.54	147.12
	05/22/20	165.95	34.3		15.49	15.00	0.49	150.83
	10/26/20		33.2		16.09	--	--	149.86
	03/12/21		33.1		16.95	15.74	1.21	149.91
MW-5	12/14/12	166.41	30	10 - 30	23.55	--	--	142.86
	10/11/13		NM		21.35	--	--	145.06
	06/03/15		NM		20.23	--	--	146.18
	12/29/15		NM		21.07	--	--	145.34
	11/09/16		NM		20.68	--	--	145.73
	03/30/17		NM		19.15	--	--	147.26
	07/25/17		NM		15.18	--	--	151.23
	11/01/17		NM		16.34	--	--	150.07
	02/27/18		NM		16.27	--	--	150.14
	07/25/18		NM		17.10	--	--	149.31
	11/09/18		NM		18.80	--	--	147.61
	02/14/19		NM		16.43	--	--	149.98
	7/17/2019		NM		16.72	--	--	149.69
	11/5/2019		NM		19.02	--	--	147.39
	05/22/20	166.40	29.1		15.70	--	--	150.70
	10/26/20		29.0		16.45	--	--	149.95
	03/12/21		30.1		16.15	--	--	150.25
MW-6	12/14/12	166.51	30	10 - 30	23.57	--	--	142.94
	10/11/13		NM		21.39	21.38	0.01	145.13
	06/03/15		NM		19.97	--	--	146.54
	12/29/15		NM		21.12	--	--	145.39
	11/09/16		NM		20.26	--	--	146.25
	03/30/17		NM		19.19	--	--	147.32
	07/25/17		NM		15.12	--	--	151.39
	11/01/17		NM		16.45	--	--	150.06
	02/27/18		NM		16.65	--	--	149.86
	07/25/18		NM		17.25	--	--	149.26
	11/09/18		NM		18.90	--	--	147.61
	02/14/19		NM		16.68	--	--	149.83
	07/17/19		NM		16.98	--	--	149.53
	11/05/19		NM		19.31	--	--	147.20
	05/22/20	166.45	30.8		15.74	--	--	150.71
	10/26/20		30.2		16.83	--	--	149.62
	03/12/21		30.2		16.40	--	--	150.05

TABLE 2
GROUNDWATER ELEVATION SURVEY DATA
BULK PLANT MONTGOMERY
MONTGOMERY, 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	12/14/12	166.19	40	35 - 40	23.23	--	--	142.96
	10/11/13		NM		21.05	--	--	145.14
	06/03/15		NM		19.65	--	--	146.54
	12/29/15		NM		20.80	--	--	145.39
	11/09/16		NM		20.72	--	--	145.47
	03/30/17		NM		18.91	--	--	147.28
	07/25/17		NM		14.80	--	--	151.39
	11/01/17		NM		16.20	--	--	149.99
	02/27/18		NM		16.35	--	--	149.84
	07/25/18		NM		16.98	--	--	149.21
	11/09/18		NM		18.57	--	--	147.62
	02/14/19		NM		16.38	--	--	149.81
	07/17/19		NM		16.65	--	--	149.54
	11/05/19		NM		19.01	--	--	147.18
	05/22/20	166.13	38.8		15.44	--	--	150.69
	10/26/20		38.7		16.56	--	--	149.57
	03/12/21		39.9		16.10	--	--	150.03
MW-8	12/14/12	167.35	30	10 - 30	24.60	--	--	142.75
	10/11/13		NM		22.36	--	--	144.99
	06/03/15		NM		20.02	--	--	147.33
	12/29/15		NM		22.22	--	--	145.13
	11/09/16		NM		21.93	--	--	145.42
	03/30/17		NM		20.30	--	--	147.05
	7/25/2017		NM		16.12	--	--	151.23
	11/1/2017		NM		17.51	--	--	149.84
	02/27/18		NM		17.73	--	--	149.62
	07/25/18		NM		18.26	--	--	149.09
	11/09/18		NM		19.90	--	--	147.45
	02/14/19		NM		17.94	--	--	149.41
	07/17/19		NM		17.95	--	--	149.40
	11/05/19		NM		20.32	--	--	147.03
	05/22/20	167.54	30.0		16.72	--	--	150.82
	10/26/20		29.3		17.83	--	--	149.71
	03/12/21		29.7		17.45	--	--	150.09
MW-9	12/14/12	168.84	30	10 - 30	25.95	--	--	142.89
	10/11/13		NM		23.75	--	--	145.09
	06/03/15		NM		19.84	--	--	149.00
	12/29/15		NM		23.60	--	--	145.24
	11/09/16		NM		22.46	--	--	146.38
	03/30/17		NM		21.65	--	--	147.19
	07/25/17		NM		17.50	--	--	151.34
	11/01/17		NM		18.87	--	--	149.97
	02/27/18		NM		19.08	--	--	149.76
	07/25/18		NM		19.62	--	--	149.22
	11/09/18		NM		21.28	--	--	147.56
	02/14/19		NM		19.13	--	--	149.71
	07/17/19		NM		19.32	--	--	149.52
	11/05/19		NM		21.68	--	--	147.16
	05/22/20	168.94	29.9		18.10	--	--	150.84
	10/26/20		29.3		19.21	--	--	149.73
	03/12/21		29.4		18.82	--	--	150.12

TABLE 2
GROUNDWATER ELEVATION SURVEY DATA
BULK PLANT MONTGOMERY
MONTGOMERY, 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	12/14/12	168.10	30	10 - 30	24.90	--	--	143.20
	10/11/13		NM		22.67	--	--	145.43
	06/03/15		NM		19.17	--	--	148.93
	12/29/15		NM		22.47	--	--	145.63
	11/09/16		NM		21.84	--	--	146.26
	03/30/17		NM		20.54	--	--	147.56
	11/01/17		NM		17.78	--	--	150.32
	02/27/18		NM		17.95	--	--	150.15
	07/25/18		NM		18.53	--	--	149.57
	11/09/18		NM		20.19	--	--	147.91
	02/14/19		NM		18.00	--	--	150.10
	07/17/19		NM		18.25	--	--	149.85
	11/05/19		NM		20.59	--	--	147.51
	05/22/20	167.83	29.3		17.03	--	--	150.80
	10/26/20		28.7		18.16	--	--	149.67
	03/12/21		28.9		17.70	--	--	150.13
MW-11	12/14/2012	166.02	30	10 - 30	23.85	--	--	142.17
	10/11/2013		NM		21.67	--	--	144.35
	06/03/15		NM		19.98	--	--	146.04
	12/29/15		NM		21.38	--	--	144.64
	11/09/16		NM		20.81	--	--	145.21
	03/30/17		NM		19.51	--	--	146.51
	07/25/17		NM		15.48	--	--	150.54
	11/01/17		NM		16.80	--	--	149.22
	02/27/18		NM		16.88	--	--	149.14
	07/25/18		NM		17.55	--	--	148.47
	11/09/18		NM		19.18	--	--	146.84
	02/14/19		NM		16.98	--	--	149.04
	07/17/19		NM		17.28	--	--	148.74
	11/05/19		NM		19.57	--	--	146.45
	05/22/20	166.84	29.9		16.08	--	--	150.76
	10/26/20		29.3		17.15	--	--	149.69
	03/12/21		29.3		16.70	--	--	150.14
RW-1	07/25/17	NM	30	15 - 30	23.85	--	--	--
	11/01/17		NM		16.17	--	--	--
	02/27/18		NM		16.45	--	--	--
	07/25/18		NM		17.09	--	--	--
	11/09/18		NM		18.70	--	--	--
	02/14/19		NM		16.50	--	--	--
	07/17/19		NM		16.81	--	--	--
	11/05/19		NM		19.11	--	--	--
	05/22/20	166.26	30.6		15.65	--	--	150.61
	10/26/20		30.0		16.68	--	--	149.58
	03/12/21		29.8		16.23	--	--	150.03
RW-2	07/25/17	NM	30	15 - 30	14.50	--	--	--
	11/01/17		NM		15.81	--	--	--
	02/27/18		NM		15.94	--	--	--
	07/25/18		NM		16.60	--	--	--
	02/14/19		NM		16.00	--	--	--
	07/17/19		NM		16.31	--	--	--
	11/05/19		NM		18.62	--	--	--
	05/22/20	165.72	30.4		15.10	--	--	150.62
	10/26/20		29.4		16.20	--	--	149.52
	03/12/21		29.4		15.71	--	--	150.01

TABLE 2
GROUNDWATER ELEVATION SURVEY DATA
BULK PLANT MONTGOMERY
MONTGOMERY, 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)
RW-3	07/25/17	NM	30	15 - 30	15.33	--	--	--
	11/01/17		NM		16.70	--	--	--
	02/27/18		NM		16.85	--	--	--
	07/25/18		NM		17.45	--	--	--
	11/09/18		NM		19.05	--	--	--
	02/14/19		NM		16.88	--	--	--
	7/17/2019		NM		17.16	--	--	--
	11/5/2019		NM		19.49	--	--	--
	05/22/20	166.67	30.7		15.92	--	--	150.75
	10/26/20		29.1		17.00	--	--	149.67
	03/12/21		29.4		16.62	--	--	150.05
RW-4	07/25/17	NM	30	15 - 30	14.68	--	--	--
	11/01/17		NM		17.60	--	--	--
	02/27/18		NM		16.25	--	--	--
	07/25/18		NM		18.15	--	--	--
	11/09/18		NM		18.33	--	--	--
	02/14/19		NM		16.20	--	--	--
	07/17/19		NM		16.85	--	--	--
	11/05/19		NM		19.05	--	--	--
	05/22/20	165.93	30.5		15.38	15.23	0.15	150.66
	10/26/20		29.3		16.33	--	--	149.60
	03/12/21		29.2		15.92	--	--	150.01
RW-5	07/25/17	NM	30	15 - 30	15.04	--	--	--
	11/01/17		NM		16.40	--	--	--
	02/27/18		NM		16.58	--	--	--
	07/25/18		NM		17.15	--	--	--
	11/09/18		NM		18.81	--	--	--
	02/14/19		NM		16.61	--	--	--
	07/17/19		NM		16.88	--	--	--
	11/05/19		NM		19.22	--	--	--
	05/22/20	166.36	30.2		15.64	--	--	150.72
	10/26/20		28.8		16.71	--	--	149.65
	03/12/21		29.4		16.30	--	--	150.06

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

Sources: *CTE Environmental*
PPM Consultants, Inc.
PPM Project No. 422601-RNA3

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
BULK PLANT MONTGOMERY
MONTGOMERY, 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	03/05/12	0.514	<0.005	0.193	0.490	1.197	<0.005	0.201
	12/14/12	0.540	0.005	0.113	0.299	0.957	<0.005	0.139
	10/11/13	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	06/03/15	0.117	0.002	0.159	0.273	0.551	<0.001	0.315
	12/29/15	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	11/09/16	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	03/30/17	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	07/25/17	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	11/01/17	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	02/27/18	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	07/25/18	0.030	<0.001	0.036	0.041	0.107	0 003	0.206
	11/09/18	0.038	<0.001	0.176	0.016	0.230	0.002	1.000
	02/14/19	0.021	<0.001	0.052	0.026	0.099	0.001	0.214
	07/17/19	0.030	<0.001	0.044	0.018	0.092	0.001	0.333
	11/05/19	0.008	<0.001	0.008	0.003	0.019	0.001	0.165
	05/22/20	0.012	<0.001	0.025	0.009	0.046	0.002	0.130
	10/26/20	0.024	*0.002*	0.037	*0.012*	0.075	0.005	0.550
	03/12/21	0.008	<0.001	0.010	<0.003	0.018	0.003	0.156
SSCALs - GRP POC		***0.580***	***116.0***	***81.23***	***175***	**--**	***2.321***	***2.321***
MW-2	03/05/12	0.162	0.042	0.091	0.207	0.502	0.007	0.134
	12/14/12	0.128	0.076	0.153	0.538	0.895	<0.005	0.459
	10/11/13	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	06/03/15	0.034	0.007	0.119	0.310	0.470	<0.001	0.309
	12/29/15	0.033	0.002	0.098	0.242	0.375	<0.001	0.378
	11/09/16	0.023	0.005	0.090	0.204	0.322	<0.001	0.792
	03/30/17	0.030	0.003	0.099	0.187	0.319	<0.001	0.479
	07/25/17	0.006	<0.001	0.028	0.048	0.082	<0.001	0.103
	11/01/17	0.009	<0.001	0.013	0.020	0.042	<0.001	0.184
	02/27/18	0.002	<0.001	0.015	0.019	0.036	<0.001	0.075
	07/25/18	0.005	<0.001	0.023	0.035	0.063	<0.001	0.089
	11/09/18	0.014	<0.001	0.055	0.062	0.131	<0.001	0.360
	02/14/19	0.008	<0. 001	0.025	0.036	0.069	<0.001	0.255
	07/17/19	0.004	<0.001	0.017	0.017	0.038	<0.001	0.181
	11/05/19	0.009	<0.001	0.013	0.004	0.026	<0.001	0.053
	05/22/20	0.107	<0.001	0.047	0.004	0.158	0.003	0.156
	10/26/20	0.048	<0.005	0.080	*0.006*	0.134	*0.003*	0.452
	03/12/21	0.017	<0.002	0.042	*0.004*	0.063	*0.002*	0.108
SSCALs - GRP POC		***0.603***	***120.6***	***84.43***	***175***	**--**	***2.412***	***2.412***
MW-3	03/05/12	0.030	<0.001	0.010	0.039	0.079	<0.005	<0.001
	12/14/11	0.198	0.10	0.081	0.167	0.546	<0.005	0.101
	10/11/13	0.474	0.001	0.103	0.274	0.852	0.012	0.017
	06/03/15	0.406	0.004	0.229	0.463	1.102	0.017	0.480
	12/29/15	0.050	<0.001	0.021	0.036	0.107	0.002	0.087
	11/09/16	0.408	0.008	0.176	0.283	0.875	0.013	0.279
	03/30/17	0.384	0.003	0.169	0.219	0.775	0.013	0.525
	07/25/17	0.280	0.002	0.100	0.057	0.439	0.017	0.222
	11/01/17	0.385	0.007	0.230	0.149	0.771	0.019	2.760
	02/27/18	0.273	0.004	0.119	0.055	0.451	0.010	0.311
	07/25/18	0.370	0.002	0.076	0.029	0.477	0.007	0.375
	11/09/18	0.365	0.003	0.309	0.164	0.841	0.008	1.670
	02/14/19	0.278	0.001	0.089	0.031	0.399	0.007	0.300
	07/17/19	0.306	0.001	0.090	0.025	0.422	0.004	0.755
	11/05/19	0.237	<0.001	0.073	0.033	0.343	0.007	0.395
	05/22/20	0.101	<0.001	0.053	0.015	0.169	0.005	0.208
	10/26/20	0.123	*0.002*	0.042	*0.010*	0.177	0.025	0.493
	03/12/21	0.317	*0.008*	0.057	*0.017*	0.399	0.026	0.185
SSCALs - GRP POC		***0.630***	***125.9***	***88.15***	***175***	**--**	***2.518***	***2.518***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
BULK PLANT MONTGOMERY
MONTGOMERY, 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	03/05/12	0.447	0.044	0.624	1.790	2.905	0.033	0.202
	12/14/12	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	10/11/13	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	06/03/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/29/15	0.163	0.011	0.257	0.700	1.131	0.006	0.417
	11/09/16	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	03/30/17	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	07/25/17	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	11/01/17	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	02/27/18	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	07/25/18	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	11/09/18	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	02/14/19	0.343	0.003	0.13	0.329	0.805	0.012	0.255
	07/17/19	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	11/05/19	0.254	0.004	0.148	0.385	0.791	0.019	0.361
	05/22/20	0.050	0.004	0.104	0.249	0.407	<0.001	0.240
	10/26/20	0.117	0.012	0.271	0.704	1.104	*0.002*	0.645
	03/12/21	**0.708**	*0.160*	8.56	21.3	30.728	*0.002*	**23.0**
SSCALs - GRP SOURCE		***0.635***	***127.0***	***88.88***	***175***	**--**	***2.539***	***2.539***
MW-5	12/14/12	0.009	<0.001	0.004	0.008	0.021	<0.005	0.008
	10/11/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/03/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/29/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/09/16	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	0.009
	03/30/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	07/25/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/01/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/27/18	<0.001	<0.001	0.002	0.006	0.008	<0.001	<0.005
	07/25/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/09/18	NS	NS	NS	NS	NS	NS	NS
	02/14/19	NS	NS	NS	NS	NS	NS	NS
	07/17/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/05/19	NS	NS	NS	NS	NS	NS	NS
	05/22/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/26/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/12/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
SSCALs - GRP POC		***0.154***	***30.75***	***21.53***	***175***	**--**	***0.615***	***0.615***
MW-6	12/14/12	0.016	0.005	0.072	0.142	0.235	<0.005	0.085
	10/11/13	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	06/03/15	0.013	0.001	0.047	0.037	0.098	0.001	0.106
	12/29/15	0.002	<0.001	0.022	0.023	0.047	<0.001	0.134
	11/09/16	0.013	0.002	0.042	0.044	0.101	<0.001	0.192
	03/30/17	<0.001	<0.001	0.018	0.019	0.037	<0.001	0.146
	07/25/17	<0.001	<0.001	<0.001	<0.003	BDL	0.002	0.009
	11/01/17	<0.001	<0.001	<0.001	<0.003	BDL	0.002	0.016
	02/27/18	<0.001	<0.001	<0.001	<0.003	BDL	0.002	<0.005
	07/25/18	<0.001	<0.001	<0.001	<0.003	BDL	0.002	<0.005
	11/09/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/14/19	<0.001	<0.001	<0.001	<0.003	BDL	0.001	<0.005
	07/17/19	<0.001	0.041	0.06	1.79	1.891	0.001	0.032
	11/05/19	0.004	0.002	0.008	0.289	0.303	<0.001	0.039
	05/22/20	0.002	<0.001	0.003	0.005	0.010	<0.001	0.015
	10/26/20	<0.001	<0.001	0.002	<0.003	0.002	<0.001	0.014
	03/12/21	0.001	<0.001	0.003	<0.003	0.004	<0.001	0.008
SSCALs - GRP POC		***0.300***	***59.97***	***41.98***	***175***	**--**	***1.199***	***1.199***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
BULK PLANT MONTGOMERY
MONTGOMERY, 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	12/14/12	0.005	<0.001	0.009	0. 019	0.014	<0.005	0.006
	10/11/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/03/15	0.216	0.010	0.160	0.515	0.901	0.044	0.426
	12/29/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/09/16	<0.001	<0. 001	<0.001	<0.003	BDL	<0001	<0.005
	03/30/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	07/25/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/01/17	<0.001	<0. 001	<0.001	<0.003	BDL	<0.001	<0.005
	02/27/18	<0.001	<0.001	0.001	0.004	0.005	<0.002	0.007
	07/25/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0005
	11/09/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	02/14/19	NS	NS	NS	NS	NS	NS	NS
	07/17/19	<0.001	<0.001	<0.001	0.008	0.008	<0.001	<0.005
	11/05/19	NS	NS	NS	NS	NS	NS	NS
	05/22/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/26/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/12/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
SSCALs - GRP POC		***0.385***	***76.99***	***53.90***	***175***	**--**	***1.540***	***1.540***
MW-8	12/14/12	<0.001	<0.001	<0.001	<0.005	BDL	<0.005	<0.001
	10/11/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/03/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	12/29/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/09/16	NS	NS	NS	NS	NS	NS	NS
	03/30/17	NS	NS	NS	NS	NS	NS	NS
	07/25/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/01/17	NS	NS	NS	NS	NS	NS	NS
	02/27/18	NS	NS	NS	NS	NS	NS	NS
	07/25/18	<0.001	<0.001	<0.00	<0.003	BDL	<0001	<0.005
	11/09/18	NS	NS	NS	NS	NS	NS	NS
	02/14/19	NS	NS	NS	NS	NS	NS	NS
	07/17/19	<0.001	<0. 001	<0.001	<0.003	BDL	<0.001	<0.005
	11/05/19	NS	NS	NS	NS	NS	NS	NS
	05/22/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/26/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/12/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
SSCALs - GRP POC		***0.189***	***37.78***	***26.45***	***175***	**--**	***0.756***	***0.756***
MW-9	12/14/12	<0.001	<0.001	<0.001	<0.005	BDL	<0.005	<0.001
	10/11/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/03/15	NS	NS	NS	NS	NS	NS	NS
	12/29/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/09/16	NS	NS	NS	NS	NS	NS	NS
	03/30/17	NS	NS	NS	NS	NS	NS	NS
	07/25/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/01/17	NS	NS	NS	NS	NS	NS	NS
	02/27/18	NS	NS	NS	NS	NS	NS	NS
	07/25/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/09/18	NS	NS	NS	NS	NS	NS	NS
	02/14/19	NS	NS	NS	NS	NS	NS	NS
	07/17/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/05/19	NS	NS	NS	NS	NS	NS	NS
	05/22/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/26/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/12/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
SSCALs - GRP POC		***0.158***	***31.64***	***22.15***	***175***	**--**	***0.633***	***0.633***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
BULK PLANT MONTGOMERY
MONTGOMERY, 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	12/14/12	<0.001	<0.001	<0.001	<0.005	BDL	<0.005	<0.001
	10/11/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/03/15	NS	NS	NS	NS	NS	NS	NS
	12/29/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/09/16	NS	NS	NS	NS	NS	NS	NS
	03/30/17	NS	NS	NS	NS	NS	NS	NS
	07/25/17	NS	NS	NS	NS	NS	NS	NS
	11/01/17	NS	NS	NS	NS	NS	NS	NS
	02/27/18	NS	NS	NS	NS	NS	NS	NS
	07/25/18	<0.001	<0.00 1	<0.001	<0.003	BDL	<0.001	<0.005
	11/09/18	NS	NS	NS	NS	NS	NS	NS
	02/14/19	NS	NS	NS	NS	NS	NS	NS
	07/17/19	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/05/19	NS	NS	NS	NS	NS	NS	NS
	05/22/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/26/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/12/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
SSCALs - GRP POC		***0.163***	***32.56***	***22.79***	***175***	*--*	***0.651***	***0.651***
MW-11	12/14/12	<0.001	<0.001	<0.001	<0.005	BDL	<0.005	<0.001
	10/11/13	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	06/03/15	NS	NS	NS	NS	NS	NS	NS
	12/29/15	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/09/16	NS	NS	NS	NS	NS	NS	NS
	03/30/17	NS	NS	NS	NS	NS	NS	NS
	07/25/17	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/01/17	NS	NS	NS	NS	NS	NS	NS
	02/27/18	NS	NS	NS	NS	NS	NS	NS
	07/25/18	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	11/09/18	NS	NS	NS	NS	NS	NS	NS
	02/14/19	NS	NS	NS	NS	NS	NS	NS
	07/17/19	<0.001	<0.001	<0001	<0.003	BDL	<0.001	<0.005
	11/05/19	NS	NS	NS	NS	NS	NS	NS
	05/22/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	10/26/20	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
	03/12/21	<0.001	<0.001	<0.001	<0.003	BDL	<0.001	<0.005
SSCALs - GRP POC		***0.150***	***29.90***	***20.93***	***175***	*--*	***0.598***	***0.598***
RW-1	07/25/17	**0.767**	0.001	0.012	0.185	0.965	0.005	0.240
	11/01/17	**0.625**	0.002	0.031	0.177	0.835	0.004	0.590
	02/27/18	**0.840**	0.002	0.128	0.126	1.096	0.006	0.182
	07/25/18	**0.895**	0.001	0.024	0.097	1.017	0.006	0.186
	11/09/18	**1.240**	0.001	0.086	0.059	1.386	0.007	0.412
	02/14/19	**0.840**	<0.001	0.043	0.034	0.917	0.004	0.254
	07/17/19	**1.040**	<0.001	0.037	0.027	1.104	0.004	0.347
	11/05/19	**0.805**	<0.001	0.045	0.021	0.871	0.004	0.262
	05/22/20	0.555	*0.001*	0.051	0.030	0.637	*0.004*	0.312
	10/26/20	0.571	*0.001*	0.015	*0.010*	0.597	*0.004*	0.177
	03/12/21	**0.700**	*0.002*	0.109	*0.022*	0.833	*0.003*	0.341
SSCALs (MW-1)		***0.580***	***116.0***	***81.23***	***175***	*--*	***2.321***	***2.321***
RW-2	07/25/17	0.002	<0.001	<0.001	<0.003	0.002	<0.001	<0.005
	11/01/17	0.006	<0.001	0.003	0.004	0.013	<0.001	0.060
	02/27/18	0.101	<0.001	0.029	0.046	0.176	0.002	0.082
	07/25/18	0.004	<0.001	0.003	0.005	0.012	0.001	0.048
	11/09/18	0.006	<0.001	0.007	0.005	0.018	<0.001	0.104
	02/14/19	0.133	<0.001	0.039	0.066	0.238	0.003	0.202
	07/17/19	0.002	<0001	0.001	<0.003	0.003	<0.001	0.057
	11/05/19	0.004	<0.001	0.005	<0.003	0.009	<0.001	0.840
	05/22/20	0.006	<0.001	0.003	<0.003	0.009	<0.001	0.040
	10/26/20	0.039	<0.001	0.014	0.007	0.060	0.001	0.114
	03/12/21	0.062	<0.001	0.061	0.039	0.162	<0.001	0.115
SSCALs (MW-2)		***0.603***	***120.6***	***84.43***	***175***	*--*	***2.412***	***2.412***

TABLE 3
GROUNDWATER ANALYTICAL SUMMARY
BULK PLANT MONTGOMERY
MONTGOMERY, 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	07/25/17	0.415	0.004	0.042	0.052	0.513	0.008	0.176
	11/01/17	0.422	0.002	0.011	0.025	0.460	0.013	0.462
	02/27/18	0.316	<0.001	0.020	0.034	0.370	0.005	0.129
	07/25/18	0.485	0.001	0.079	0.026	0.591	0.005	0.183
	11/09/18	0.396	<0.001	0.053	0.028	0.477	0.004	0.280
	02/14/19	0.382	<0.001	0.003	0.015	0.400	0.005	0.178
	07/17/19	0.191	<0.001	0.007	0.011	0.209	0.003	0.250
	11/05/19	0.292	<0.001	0.070	0.016	0.378	0.005	0.260
	05/22/20	0.145	<0.001	0.051	0.015	0.211	0.003	0.259
	10/26/20	0.077	<0.005	0.016	<0.015	0.093	0.085	0.462
	03/12/21	0.261	<0.005	0.015	<0.015	0.276	0.054	0.304
SSCALs (MW-3)		***0.630***	***125.9***	***88.15***	***175***	**--**	***2.518***	***2.518***
RW-4	07/25/17	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	11/01/17	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	02/27/18	0.057	0.002	0.021	0.092	0.172	0.012	0.184
	07/25/18	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	11/09/18	0.087	<0.001	0.012	0.064	0.163	0.008	0.296
	02/14/19	0.116	<0.001	0.026	0.065	0.207	0.009	0.106
	07/17/19	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**	**NS-FP**
	11/05/19	0.168	<0.001	0.037	0.093	0.298	0.005	0.104
	05/22/20	0.065	<0.001	0.033	0.065	0.163	0.009	0.119
	10/26/20	0.081	<0.005	0.031	0.070	0.182	*0.002*	0.182
	03/12/21	0.232	<0.002	0.068	0.070	0.370	0.008	0.079
SSCALs (MW-4)		***0.635***	***127.0***	***88.88***	***175***	**--**	***2.539***	***2.539***
RW-5	07/25/17	0.001	<0.001	<0.001	<0.003	0.001	0.002	<0005
	11/01/17	<0.001	<0.001	<0.001	<0.003	BDL	0.002	0.056
	02/27/18	0.014	0.001	0.019	0.012	0.046	0.002	0.027
	07/25/18	<0.001	<0.001	0.002	0.004	0.006	0.002	0.034
	11/09/18	0.001	<0.001	0.002	<0.003	0.003	<0.001	0.012
	02/14/19	0.008	<0.001	0.016	0.012	0.036	<0.001	0.030
	07/17/19	<0.001	<0.001	0.003	0.003	0.006	<0.001	0022
	11/05/19	0.006	<0.001	0.018	0.026	0.050	0.002	0.085
	05/22/20	0.002	<0.001	0.005	0.009	0.016	<0.001	0.019
	10/26/20	<0.001	<0.001	0.003	0.004	0.007	<0.001	0.023
	03/12/21	0.013	<0.001	0.020	0.025	0.058	<0.001	0.041
SSCALs (MW-6)		***0.300***	***59.97***	***41.98***	***175***	**--**	***1.199***	***1.199***
Duplicates								
DUP (MW-3)	05/22/20	0.104	<0.001	0.051	0.014	0.169	0.004	0.228
DUP (MW-3)	10/26/20	0.125	*0.003*	0.044	*0.010*	0.182	0.030	0.458
DUP (MW-3)	03/12/21	0.344	*0.008*	0.065	*0.018*	0.435	0.027	0.183

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
NS-FP - Not sampled due to free product
SSCAL - Site Specific Corrective Action Level
POC - Point of Compliance
GRP - Groundwater Resource Protection
Bold *type indicates concentration exceeds SSCAL*

Sources:
CTE Environmental
PPM Consultants, Inc.
PPM Project No. 422601-RNA3

APPENDIX D – EQUIPMENT MANUFACTURER'S SPECIFICATIONS AND QUOTATIONS

MK ENVIRONMENTAL INC.

QUOTATION

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

jgiltz@mkenv.com

Date	4/22/2021
Quote No.	220079C
Reference	Russell's
Page No.	1 of 3
Freight	Included
Terms	PWP - Net 180
Ship Via	FLATBED
F.O.B.	Factory

SOLD TO:	SHIP TO:
Jeff Schexnayder PPM Consulting, Inc. 5555 Bankhead Highway Birmingham, AL. 35210 205-836-5650	Russell Petroleum Bulk Plant 3378 Tankview Court Montgomery, AL.

Quotation valid for 60 days

QUANTITY		UNIT PRICE	AMOUNT
	200 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 TEFC construction		
1	40 HP single stage oil sealed liquid ring blower or equal ~500 ACFM @ 20"Hg. Capacity 3/60/230-460 volt, 40 HP TEFC motor Direct drive motor Oil Scavenge line Backpressure gauge Air/Oil Separator Temperature gauge Y strainer with clean out plug High temperature switch low and high oil level switches inlet filter inlet check valve (1) extra 5-gallon bucket of seal oil for top off ~200 gallon Air/water separator with conductivity probe level switches 10" diameter clean out ports with vacuum rated quick release lid Liquid filled vacuum gauge Vacuum assist hose tank drain valve Vacuum relief valve Dilution valve with filter/silencer Inlet screen	104,841.00	$104,841.00
1	1.5 hp transfer pump, 3450 rpm, TEFC motor Cast Iron housing with composite impeller, anti air lock design manual "Pump ON" button inside building for sampling		
1	MKE Model SA20HE 20 GPM capacity Oil/Water Separator and air stripper treatment system Coalescing separator with product skimming weir Polyethylene coalescing pack with reduced spacing for efficient oil removal Low profile air stripper with 3 hp AMCA Type B spark resistant aluminum blower Nylon tube aeration air stripper for high mass removal rates with low maintenance Low, high, and high-high sump conductivity probes 12" clean out hatch Low blower pressure alarm 304 stainless steel construction		
1	Free Product Drum 55-gallon drum with high level product drum switch with 30 feet of so cord to wire into the master contol panel by others. Includes 15' of 1" rubber red hose for product collection.		
1	1.5 hp transfer pump, 3450 rpm, TEFC motor Cast Iron housing with composite impeller, anti air lock design manual "Pump ON" button inside building for sampling		

MK ENVIRONMENTAL INC.

Jeff Schexnayder
PPM Consulting, Inc.

Date 4/22/2021
Quote No. 220079C
Reference Russell's

QUANTITY		UNIT PRICE	AMOUNT
1	Groundwater flow totalizer with pulse output for remote totalization Flow calibration button		
1	Master Control Panel System, Including: NEMA 3R control panel with blank front cover Swing out sub panel for gauges, control operators, and switches IEC Magnetic motor starters, safety switches, H-O-A controls Control transformer (8) intrinsically safe relays, (8) alarm indicator LED's, (16) output channels Hard wired relay logic (1) exterior GFCI utility outlet System run time totalizing hour meter Blower low pressure alarm Anti-falsing alarm circuit to prevent nuisance tripping Auto-release restart timer for remote restarts via telemetry Three phase voltage and phase monitor Emergency E-stop LED red indicator light located on swing out sub panel <u>Liquid ring automatic shut down upon:</u> AWS1 high liquid level High LRP temperature alarm Air stripper blower low pressure Air stripper sump High liquid level alarm Phase fault condition Interior Emergency Stop Mushroom button with twist to release detent Air/oil separator high and low oil level alarms		
1	200 Amp Fused Main Disconnect Weatherhead with extension pole and bracket support Electric meter socket base SHIPPED loose inside the trailer. Installed by others.		
1	MK Site Optimization Software (SOS) - Cellular Wireless Monitoring Unit. MK Cloud based monitoring capabilities with Email & SMS alarming notification Includes: Cellular antenna, wiring diagrams, setup forms. Digital Inputs, Analog inputs, and Digital Outputs for remote operation capabilities Flow and Vacuum graphing and data export capabilities Input status report and real time updates (RTU) One full year of service included starting at time of installation for this project only. Wireless service will be supported and billed through MKE @ $125/mo (subject to change) NO more need for telephone company analog landline installation and its long distance monthly fees.		
1	Vacuum transducer integrated into telemetry system for real time monitoring, 4-20mA		
1	System trailer mounted building 8.5'W x 12'L x 9.5'H aluminum/steel enclosure, fully insulated with Removable sliding wall panels for ease of maintenance Exterior grade plywood floor, structural steel frame Includes 100 watt XP interior light, and removable center grate for ease of maintenance The breaker panel and control panel will be mounted on a vertical steel bracket attached to platform end. The bracket, panels and all conduits will allow for the removal of the enclosure panels by one person. Steel corner posts and roof frame Continuous sheet aluminum roof for superior protection		
1	12,000 BTU XP heater with XP thermostat. All components fully piped, wired and factory tested		

MK ENVIRONMENTAL INC.

Jeff Schexnayder
PPM Consulting, Inc.

Date 4/22/2021
Quote No. 220079C
Reference Russell's

QUANTITY		UNIT PRICE	AMOUNT
1	Equipment Electrical Installation Includes XP wiring, XP seal off connectors, liquid tight flexible conduit UL listed equipment.		
1	Equipment Mechanical Installation Includes mounting, piping and connectors Brass fittings, sample ports, pressure gauges and sight glasses		
1	Third Party MET Certification The entire remediation building to be third party certified at MK Environmental factory. National Recognized Testing Lab (NRL)		
2	Vapor Phase Carbon Vessels - DPVE - each set piped in series VF-400 vessels 400 lb initial load each 4" plain pipe fitting Off loading, placement & piping provided by others Installed outside the system building by others		
1	AWS3 knock out tank prior to oxidizer to minimize condensed liquids from entering burner or vapor phase carbon bed.		

Notes

1. MK Site Optimization Software (SOS) - Cellular Wireless Monitoring Unit will be supported and billed through MKE at the rate of $125/month (subject to change) after the first year of service for this project only. Billed annually there-after Subject to change..

2. Lead time approximately 8-10 weeks.

3. Please allow up to 2-weeks notice for startup and training support.

4. Twelve month manufacture warranty starting the day of shipment.

EQUIP. SUB TOTAL		$104,841.00
EQUIP. SALES TAX		
START UP/TRAINING		$2,500.00
FREIGHT		$2,500.00
NET TOTAL		$109,841.00

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

Jerry Giltz,
MK ENVIRONMENTAL, INC.

Product Specifications

MK Environmental Inc.
765 Springer Drive
Lombard, IL. 60148
630-920-1104 Phone
630-920-8013 Fax

MK MOBILE TRAILER UNIT

SYSTEM DESCRIPTION

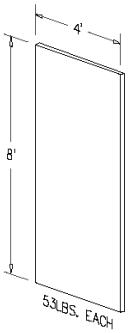
The mobile trailer integrates all the remedial technologies necessary to provide a total site-specific clean-up solution in one complete package. The trailer saves time, space and money. All the room needed for maintenance, without taking up a lot of room

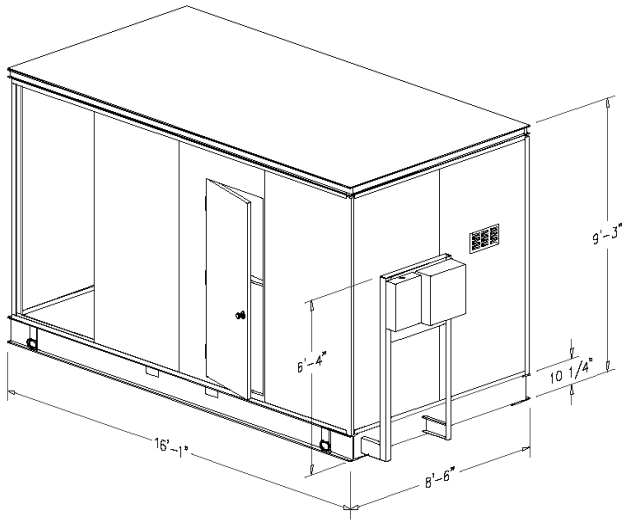
- All equipment fully piped, wired and tested
- Completely Integrated remediation system
- Factory built equipment trailer
- Flatbed trailer, structural steel construction with aluminum exterior for low maintenance
- Removable sliding wall panels; fully insulated and faced inside and out with aluminum sheeting
- All panels removable for full accessibility and maintenance to all equipment within
- MK Environmental manufactures all process components
- Dimensions: 12', 16', or 20' long x 8.5' wide x 9.5' high
- Flatbed trailer mounted

MK ENVIRONMENTAL ON-SITE PLATFORM

INSULATED, REMOVABLE WALL PANELS

TYPICAL OF AN 8' X 16' PLATFORM.
OTHER SIZES AVAILABLE.





Trailer Specifications:

- 10,000 # G.V.W.R. (Gross Vehicle Weight Rating)
- 7,750 # Payload Capacity
- (2) 5,200 # Axels with Electric Brakes
- 2-5/16" Adjustable Coupler with Safety Chains and Latch Hooks
- Complete Break-A-Way System with Charger
- Rubber Mounted, Sealed Lighting with D.O.T. Stop, Tail, Turn and Clearance
- 10" I-bean Frame and 3" x 3.5# Cross Members
- 7K Drop Leg Jack, Bolted On
- ST225/75-15 Load Rang D Tires and Wheels
- Wood Floor, Painted and Finished

Optional Features:

- Modular building only (as shown above)
- XP heater with thermostat
- XP ventilation fan
- Noise Issues: *Sound insulation package for < 70 dB operation*

- Factory installed fused main disconnect, meter base and weatherhead
- UL listed control panel

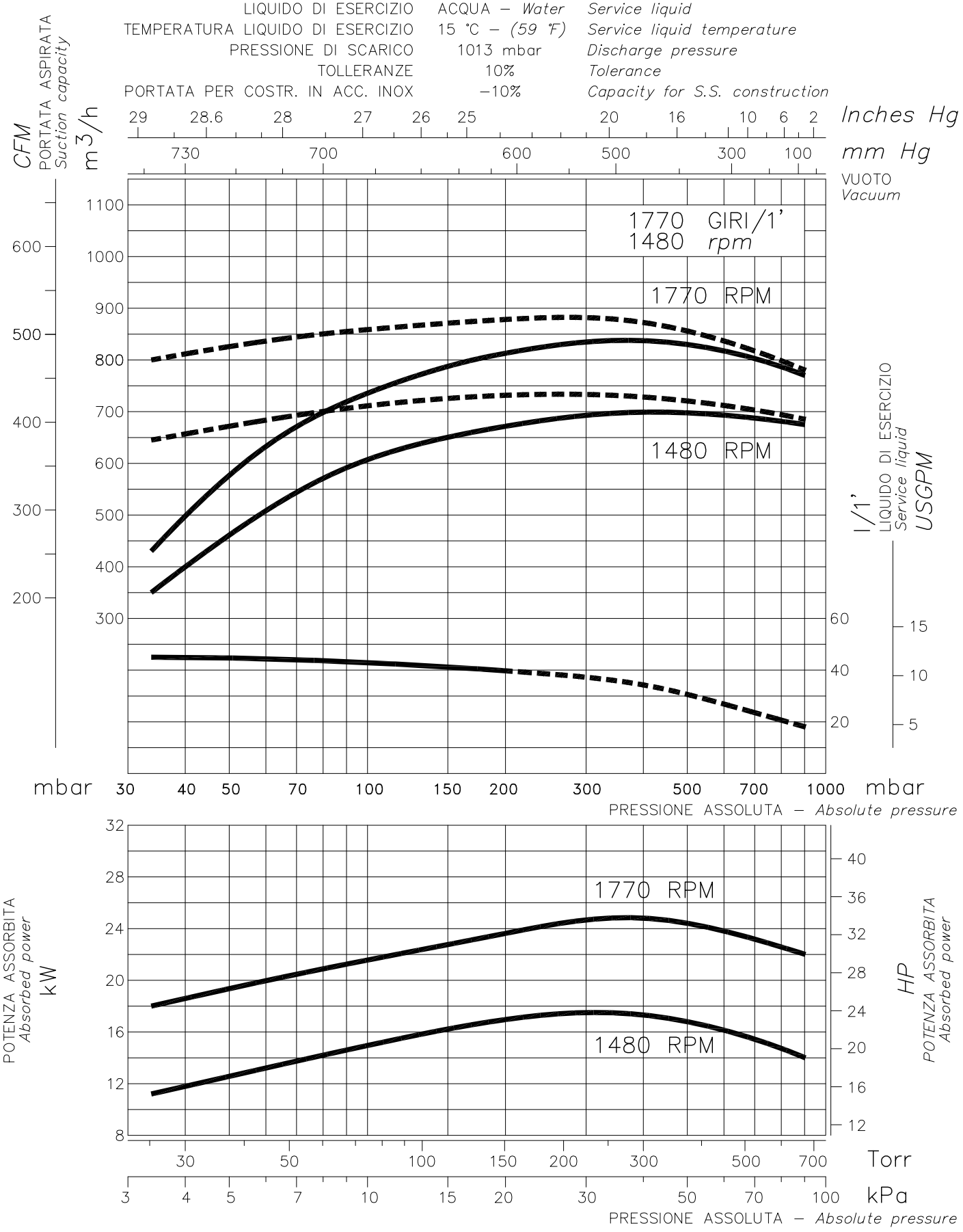
DIAGRAMMA DI FUNZIONAMENTO
Performance curves

POMPA PER VUOTO AD ANELLO DI LIQUIDO
Liquid ring vacuum pump

TIPO *Type* **TRVX 1005**

pompetravaini S.p.A.
CASTANO PRIMO (MILANO)

I DATI RIPORTATI SONO RIFERITI A		*Data refers to :*
ARIA SECCA A 20 °C	———	*Dry air at 20 °C (68 °F)*
ARIA SATURA A 20 °C	- - - -	*Saturated air at 20 °C (68 °F)*
LIQUIDO DI ESERCIZIO	ACQUA – *Water*	*Service liquid*
TEMPERATURA LIQUIDO DI ESERCIZIO	15 °C – *(59 °F)*	*Service liquid temperature*
PRESSIONE DI SCARICO	1013 mbar	*Discharge pressure*
TOLLERANZE	10%	*Tolerance*
PORTATA PER COSTR. IN ACC. INOX	–10%	*Capacity for S.S. construction*



RIF.–*Ref.:* F.P./C.T.	DATA–*Date:* 01–2012	SOST.–*Repl.:*	N°.: 7265.150.01.01–02

Product Specifications

MK Environmental Inc.
765 Springer Drive
Lombard, IL. 60148
630-920-1104 Phone
630-920-8013 Fax

Environmental Inc.

WATER SEALED DUAL EXTRACTION SYSTEM

See AWS-1 product specification

- MK dual extraction system is the most evolved package in the industry today.
- MK has designed a water sealed liquid ring pump package that is truly easy to operation and maintain.
- With our exclusive WaterSaver option, the seal water is recirculated from the liquid ring pump, to AWS2, through a Water/Water heat exchanger and then back to the liquid ring pump. In this design, the heat generated by the liquid ring pump is transferred to the air stripper, raising the temperature of the groundwater prior to stripping, greatly enhancing the stripping action. At the same time cooling the seal water stream by passing through 60-degree groundwater prior to the liquid ring blower.

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MK Environmental Inc.
765 Springer Drive
Lombard, IL. 60148
630-920-1104 Phone

Environmental Inc.

STRIPPERATOR SA15B

The Stripperator SA15B is a complete process treatment unit for hydrocarbon-contaminated water. It integrates both coalescing oil/water separator and the Cascade low profile Air Stripper into one component. The unit will separate free product, coalesce suspended hydrocarbons and settle solids.

- Integrates a coalescing oil/water separator and cascade low profile air stripper and effluent sump into a single component (3 tanks built into1)
- Gravity flow from oil/water separator to the air stripper (NO PUMP REQUIRED)
- Fully gasketed lids with quick release adjustable latches
- Small footprint 37”W X 71”L X 37” H
- 304 Stainless Steel construction
- Fits through a double door – minimal space required
- Easy access to separator and air stripper as well as simple to maintain
- Allows quick inspection and viewing of operation
- 15 GPM capacity

REMOVAL EFFICIENCY

Flow	Benzene	MTBE
10 GPM	99.85	94.77
15 GPM	99.0	87.0

Based on SA 15B Stripperator unit @ 60°F

- 304 stainless steel interior and exterior
- 75 gallon polyethylene effluent sump
- Approximate weight = 1,000 lbs.
- 60 micron droplet product removal in OWS
- Cast aluminum air stripper blower wheel
- 2.0 hp, 3 ph, TEFC motor is standard
- Influent 1" FNTP
- 1.25" FNTP effluent port
- Effluent sump included
- 1" Drain valves included
- 800 SCFM blower
- Hinged, gasketed lid for ease of access and maintenance
- Large sludge holding capacity with bottom drain
- Low maintenance conductivity probe level sensors

MK Environmental Inc.
765 Springer Drive, Lombard, IL 60148
630-920-1104 Phone - mkenv.com

CT Series

High Pressure Centrifugal Pumps
½ - 2½ HP
Heads to 140 Feet
Capacities to 95 GPM

MYERS CT SERIES LINE OF HIGH PRESSURE CENTRIFUGAL PUMPS PROVIDES QUALITY AT A COMPETITIVE PRICE. The complete line of ½ to 2½ HP units provide strong pressures up to 140 feet and flows up to 95 gpm.

The rugged cast iron body construction is available with either a corrosion resistant composite or brass impeller. The brass impeller unit is equipped with a high temperature, viton seal for more demanding applications. The heavy duty motor features a double ball bearing, 50° C ambient, dual voltage design for dependable service. The compact, back pullout design provides easy installation and serviceability.

The quality features of the CT series will provide dependable service for a wide variety of applications.

SPECIFICATIONS

HP	Catalog No. Composite Impeller	Catalog No. Brass Impeller	Pipe Tapping Sizes Suction (NPT)	Pipe Tapping Sizes Discharge (NPT)	Motor Voltage	Phase	Approx. Wt. Lbs.
½	CT05	CT05B	1¼"	1"	115/230	1	30
	CT053	CT05B3	1¼"	1"	208/230/460	3	30
¾	CT07	CT07B	1¼"	1"	115/230	1	32
	CT073	CT07B3	1¼"	1"	208/230/460	3	32
1	CT10	CT10B	1¼"	1"	115/230	1	35
	CT103	CT10B3	1¼"	1"	208/230/460	3	35
1½	CT15	CT15B	1¼"	1"	115/230	1	40
	CT153	CT15B3	1¼"	1"	208/230/460	3	40
2	CT20	CT20B	1½"	1¼"	115/230	1	57
	CT203	CT20B3	1½"	1¼"	208/230/460	3	57
2½	CT25	CT25B	2"	1½"	115/230	1	62
	CT253	CT25B3	2"	1½"	208/230/460	3	62

ADVANTAGES BY DESIGN

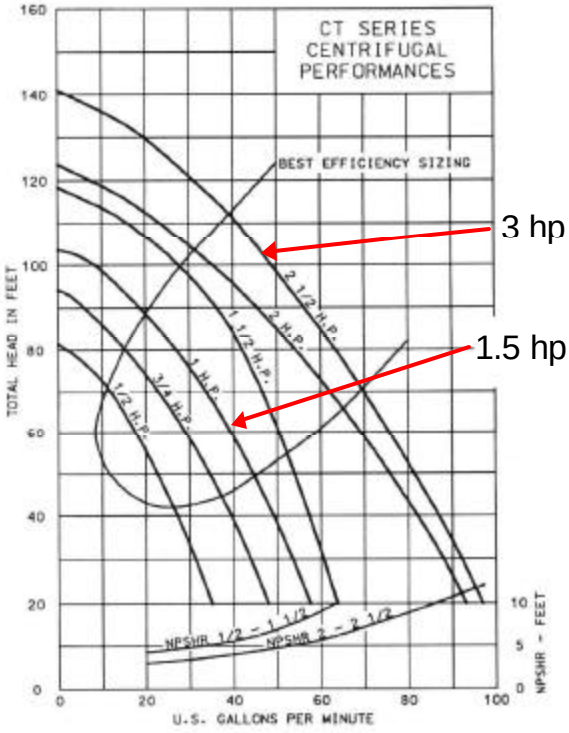
- Heavy duty cast iron construction.
- Back pull-out design.
- Dependable double ball bearing motor
- Continuous duty rating motor.
- Choice of brass or composite impeller.
- Brass impeller pumps rated 212° F.
- Composite impeller pumps rated 140° F.
- Maximum working pressure of 125 psi.
- CSA listed.

Applications

- Booster service
- Irrigation
- Circulating
- Cooling towers
- Air conditioning
- Liquid transfer
- Sprinkling systems
- General industrial service

Note: MK Environmental uses oversized pump motors. See below

PUMP PERFORMANCE



3 hp (MK)

1.5 hp (MK)

WHERE INNOVATION MEETS TRADITION

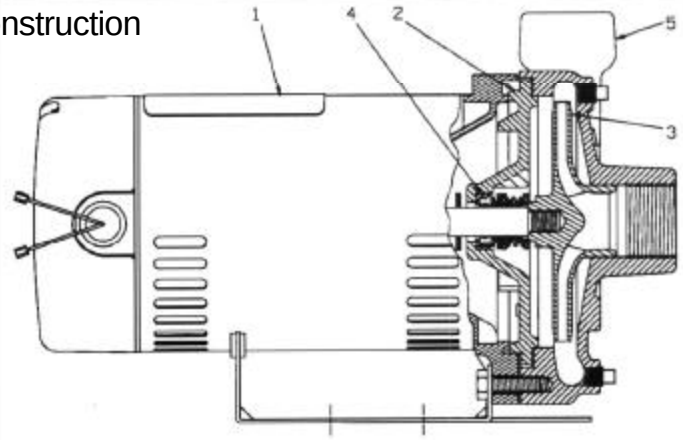
Myers

ISO 9001 Certified Company

CT Series

High Pressure Centrifugal Pumps
½ - 2½ HP
Heads to 140 Feet
Capacities to 95 GPM

1. **MOTOR** MK standard is TEFC construction
   - NEMA standard
   - Double ball bearing
   - Open drip proof
   - 60 Hz, 3450 rpm
   - Stainless steel shaft
   - Single phase with built-in overload protection
   - Three phase require overload protection in starter unit
   - Non-overloading
   - Continuous duty
   - Strong capacitor start design

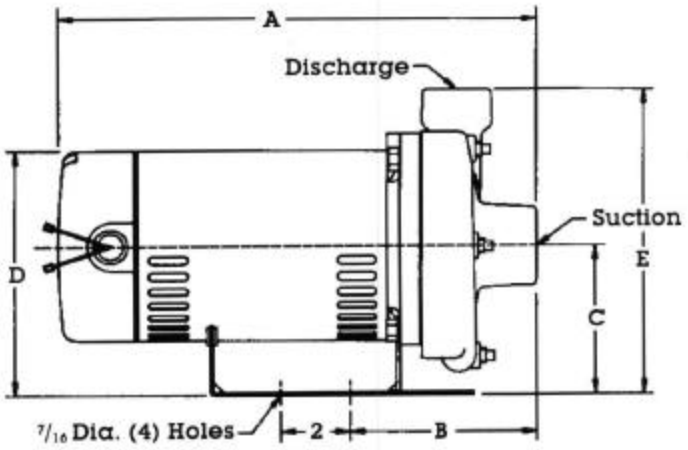


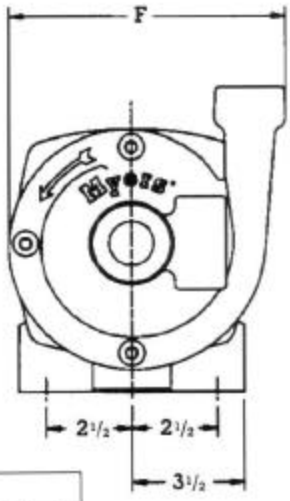
2. **SEAL PLATE**
   - Heavy duty cast iron for dependable service and long life

3. **IMPELLER**
   - Reinforced composite for applications to 140° F.
   - Threaded SST insert on composite impellers
   - Brass for applications to 212° F.
   - Enclosed design for high efficiencies
   - Balanced for smooth operation

4. **MECHANICAL SEAL**
   - Standard carbon/ceramic faces, Buna elastomers, 300 series SST components (standard for pumps with composite impellers)
   - High temperature carbon/ceramic faces, viton elastomers, 300 series SST components (standard for pumps with brass impellers)

5. **CASING**
   - Heavy duty cast iron construction
   - Back pull-out design
   - Discharge can be rotated in four positions
   - Tapped openings for priming, venting and draining.
   - Vertical discharge standard





HP	Dimensions, inches							
	A	B	C	D	E	F	Suct.	Disch.
½	13⅞	5½	4⅜	7¼	9	8	1¼	1
¾	14⅜	5½	4⅜	7¼	9	8	1¼	1
1	15⅛	5½	4⅜	7¼	9	8	1¼	1
1½	15⅛	5½	4⅜	7¼	9	8	1¼	1
2	16½	6¼	4½	7½	9½	8⅞	1½	1¼
2½	16½	6¼	4½	7½	9½	8⅞	2	1½

FleetZOOM™

FZ300

Cellular Monitoring System

Overview:

The FZ300 is a compact cellular transceiver for monitoring industrial equipment that sends live data to the monitoring web site, providing real-time status and alarms. It features 14 digital inputs, 4 digital outputs and 2 analog inputs. In addition to alarming on status changes, the system keeps track of on-time and cycles for the digital inputs; useful for monitoring pump, fan, or compressor run times and duty cycles. Analog inputs can alarm on high or low conditions and are useful for monitoring temperatures, pressures, tank levels or flow rates. The unit monitors input power voltage and provides an optional battery backup which enables the system to alarm on main power voltage level or failure and continue operating without main power.

The easy to use web site updates continuously, displaying location and operating status for all of your monitored equipment. Alarms are immediately displayed on the web site and trigger messages sent to interested personnel in your organization via SMS text messages and emails. Every event is permanently logged in the web site allowing powerful historical analysis using the built in reporting features to give equipment owners detailed insight into the operation and readiness of their equipment fleets.

Proactive service reminders are automatically generated and sent as equipment reaches service intervals based on run-time. Service logs and manuals available over the secure web site reduce paperwork and automate record keeping while providing up to the minute service records for all of your monitored equipment.

Features:

Easy to install cellular monitoring system. A variety of optional enclosures and mounting options provide for a clean and professional installation. Unit includes a quad magnet bracket for quick mounting and templates for mounting with included standoffs.

Advanced power management employing low power idle modes enable the unit to operate in solar powered applications with minimal power draw.

No software to buy, install or maintain; all mapping and data features are accessible over the secure web site from any computer with Internet access.

Technical Specifications:

Size	4.0” x 4.3” x 2.3” in.	**Power**	9 - 32 Volts DC
Radio	Quad Band GPRS GSM	**Battery Backup**	Internal
Transmit Power		**Current Consumption**	
850 / 900 MHz	Class 4, 2 Watts	Idle	65 mA
1800 / 1900 MHz	Class 2, 1 Watt	Transmit, Average	250 mA
Digital Inputs	14	Peak	2.1 A
Digital Outputs	4	**Temperature**	
Analog Inputs	2, 0-5 Volt or 0 to 20 mA	Operating	-30°C to +70°C
Connectors	5mm Terminal Blocks	Storage	-40°C to +85°C
GSM Connector	SMA	**Max. Humidity**	95% Non-Condensing

Radio Agency Approvals:

FCC	Part 15
	Part 22
	Part 24
GCF	Version 3.21.1
PTCRB	Version 3.7.1
Industry Canada	Yes
CE Mark	Yes
RoHS Compliant	Yes
Emark	Yes

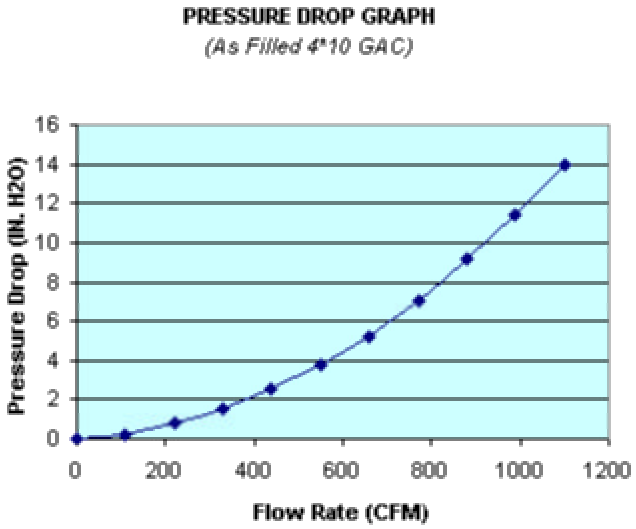
Each Complete Monitoring System Includes:

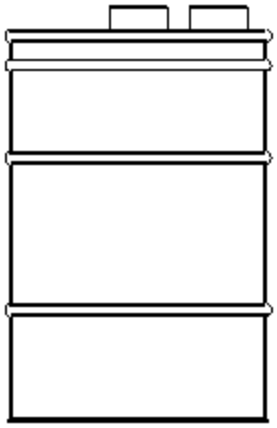
Digital Cellular Monitoring Unit:
- 14 Digital Inputs
- 4 Digital Outputs
- 2 Analog Inputs
- Connected 24x7x365

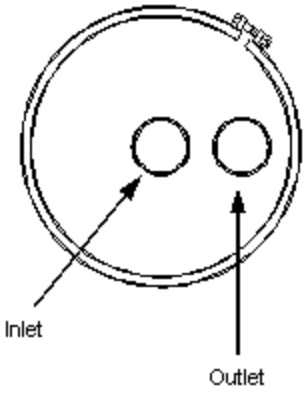
Low Profile or High Gain Cellular Antenna:
- 4” (Low Profile)
- 12.4” (High Gain)
- 12’ Cable Length
- Magnet Mount

Mapping & Reporting:
- Web Accessible
- Graphical Map Overview
- Simple User Interface
- Run Service Reports
- Monitor Equipment Use

Alarming & Notifications:
- Equipment Status Change
- Equipment Service Needed
- SMS Text Message
- BlackBerry, PDA Message
- Email







VR-400 SPECIFICATIONS			
Overall Height	3'11"	Vessel/Internal Piping Materials	CS/ SCH 40 PVC
Diameter	30"	Internal Coating	Polyamide Epoxy Resin
Inlet / Outlet (FNPT)	6"	External Coating	Urethane Enamel
Drain / Vent (FNPT)	OPT	Maximum Pressure / Temp	2 PSIG / 150º F
GAC Fill (lbs)	400	Cross Sectional Bed Area	8.8 FT^2
Shipping / Operational Weight (lbs)	500/575	Bed Depth/Volume	11.7 IN / 14.25 FT^3

Proposal For System Purchase

Prepared For: PPM Consultants - AL

PRMFiltration

Environmental Remediation & Landfill Equipment Solutions

Created by:

Scott Freeman
Product Recovery Management, Inc.

Prepared for:

Jeff Schexnayder
PPM Consultants - AL

Product Recovery Management, Inc.
200 20th Street
Butner, NC, 27509, United States

Quote 8697 Due Date: Apr 12, 2021	Sales Rep: Scott Freeman scott.freeman@prmfiltration.com | (919) 957-8890

Sold To	Ship To
JeffSchexnayder PPM Consultants - AL 5555 Bankhead Highway Birmingham, Alabama 35210	PPM Consultants Russell Petroleum Bulk Plant 3378 Tankview Court Montgomery, Alabama

Type of System:
Dual Phase Extraction System
Treatment Trailer
(8.5' x 24' Enclosed Trailer)

(example image, actual system may differ)

Product Recovery Management, Inc.
200 20th Street
Butner, NC, 27509, United States

PRM proposes to provide a fully packaged remediation system for your project in accordance with the design specifications. The equipment is itemized in the written proposal below.

Treatment Trailer

8.5' x 24' Enclosed trailer

- 3/4" PT plywood treated floor
- Single side door and double back doors
- Dual 7000 lb torsion axles w/ electric brakes
- Running and brake lights, and std 7 way plug for lights and brakes
- Radial tires
- Factory supplied door hold backs.
- Trailer will be insulated
- Trailer will have 7'6" side walls for extra height
- Wall vents throughout for proper ventilation.
- Trailer to be rated and wired for Class 1 Div II for SVE location
- (4) Heavy duty corner jacks installed
- Thermostatically controlled hazardous location exhaust fan with fan guard for SVE side, exterior louver, exterior finger guard, and sound hood.
- Hazardous location fluorescent lights w/ switch
- Thermostatically controlled hazardous location convection heater
- Emergency push stop button
- Includes full fabrication of treatment system, including plumbing, electrical, and thorough testing as well as labeling.

MPE System

- Travaini TRVX1007/C/F Single stage Oil sealed liquid ring pump system
- 40Hp 230V 3 phase TEFC motor
- Oil reservoir w/ high/low level and oil heat exchanger
- High Temperature switch
- Vacuum transmitter
- Temperature transmitters on either side of the Heat exchanger with VFD control on heat exchanger motor for maximized thermal efficiency.
- 4" Discharge piping to exterior to be connected to vapor phase carbons
- (2) VP-500 Carbon vessels filled with 500 lbs of carbon each
    - Units will ship loose and are mounted on skid based, each are designed to sit on the exterior of the system enclosure. Connecting hoses/fittings, sample ports, pressure gauges will be included
    - Carbon vessels will custom designed to adequately handle the airflow
- Dwyer DS300-4 and differential pressure gauge for flow readings
- Temperature gauge Pressure gauge, and Sample port
- On discharge of blower prior to exiting enclosure to the carbons, PRM will plumb a second moisture separator tank in line to help eliminate and oil/moisture blow back to the carbons

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Moisture Separator

- PRM model MS-200 moisture separator, aluminum construction. Designed for hi-vac application.
- Centrifugal design with bolt down lid and 6" clean out.
- Solberg 245P inlet filter, filter will be integral to MS tank design
- 1” manual drain valve
- 2” Gate valve for dilution air mounted on MS tank. Includes inlet filter/silencer
- 0-30” Hg Vacuum gauge
- Sight glass assembly mounted to side of tank with 3 float stem switch to control transfer pump, and high level shut off
- Dwyer DS300-4 and differential pressure gauge for flow readings

MS Transfer Pump

- Continental Pump Model CPML56 progressive cavity transfer pump
- Coupled to a 1.5 HP 230V 3 phase TEFC motor
- Ball valves and unions on the inlet and discharge
- Pres gauge, check valve, ball valve, valved sample port, and PRM Pulse water meter plumbed on discharge side
- Discharge piping will plumb to Oil Water Separator

Bag Filtration

- PRM Bag Filter housings, 8" Dia x 30" long
- 2" I/O, 100 psi rating, 100 gpm rating
- SS Strainer basket sized for #2 trade size bag
- (25) count of 25 micron bag filters included
- Ball valves on inlet and outlet
- Pressure gauges and sample ports

Oil Water Separator

- PRM model OWS-30 Oil Water Separator
- 2" inlet/outlet
- 2" adjustable oil skimmer, outlet on either side
- (2) 1" air vents
- 2" wide gasketed lid w/ easy turn retainers
- Three float stem mounted in the sight tube to control the transfer pump
- Gravity drain line to exterior to be connected to 55 Gallon product tank.

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Transfer Pump

- Ebara Model CDU70 centrifugal transfer pump
- Coupled to a 3/4 HP 230V 3 phase TEFC motor
- Ball valves and unions on the inlet and discharge
- Pres gauge, check valve, ball valve, valved sample port
- Discharge piping will plumb to Air Striper

Air Stripper

- PRM Model AST-234 Air Stripper, stainless steel construction, 24” wide x 36” long with 4 trays
- Pressure blower 230V, 3 Phase, TEFC blower
- Design Flow rate of 20-30 GPM
- Pressure transmitter
- Sump pressure gauge
- Manual sump drain valve
- Three float stem mounted in the sight tube to control the transfer pump
- Pressure Gauge and Sample port will be plumbed on outlet of discharge of AST blower

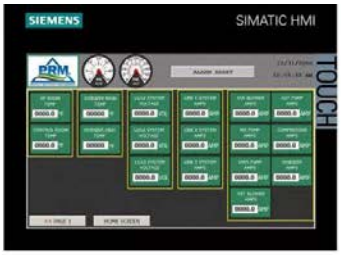
Transfer Pump

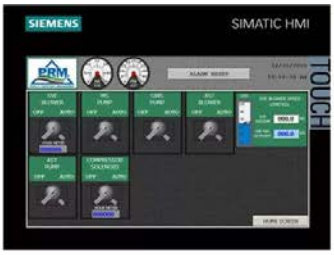
- Ebara Model CDU70 transfer pump
- Coupled to a 3/4 HP 230V 3 phase TEFC motor
- Ball valves and unions on the inlet and discharge
- Pres gauge, check valve, ball valve, valved sample port
- PRM Pulse water meter plumbed on discharge side
- Discharge piping will plumb to exterior of the enclosure

Main System Industrial Control Panel

- NEMA 4 enclosure will mount on exterior of the enclosure. Panel will be 3rd party certified.
- Hand-Off-Auto switches and green running lights and red alarm lights on HMI
- Intrinsically safe relays for all switches were applicable
- Contacts and relays
- Motor starters with thermal overload and circuit protection.
- Variable frequency drives for LRP and HE motors
- Siemens S7-1200PLC with color HMI touch screen
    - 7” color Comfort HMI with complete HMI system control
    - Remote I/O mounted in panel board, configured via Ethernet
    - Ethernet switch
- Includes all license fees, Smartservice for Internet based connectivity and control via secure log in.
- All reporting will be via email or text messaging through a messaging service.
- ***Please see options for PRM to provide wireless service that will be pre-programmed prior to system arrival

- GFCI all weather outlet located underneath control panel
- Standard lightning protection module
- CyberPower 825 UPS and surge protector
- System push stop button
- System will restart automatically if it is safe to do so.





System Load Center

- PRM has placed all circuit breakers in an adjacent 200A load center Main Breaker panel. The load center serves to minimize risk of Arc Flash or Shock hazards associated with operations and troubleshooting of the system.
- 200 Amp 230 V, 3 phase load center with main breaker mounted on trailer interior
- Individual circuit breakers for branch circuit protection of individual motors and loads
- Breaker locks will be provided for each breaker in the panel.
- Breaker panel is properly grounded and bonded and will comply with all provisions for grounding as specified in the 2011 NEC.
- Main power will enter load center and all distribution of power shall be made from here.

Miscellaneous

- Provide 3rd Party UL certification listing of the entire package. Include di-electric testing of the entire package and application of the UL listing. PRM recommends for ease of permitting. The certification process adds validity and compliance and mitigates liability for all parties involved.
- Delivery will be via truck, unloading provision must be onsite at time of delivery
- Includes 1 year warranty
- Includes (2) O&M manuals
- Two sets of as builts one-line electrical drawings
- Includes full submittal package for approval prior to construction
- See options for on-site startup and training

Power at the above referenced facility is: 120/230V three phase CLOSED DELTA ONLY

Please note that a system connected to an open delta electrical system can cause warranty issues. Please see Warranty disclaimer below. Warranty issues are at the discretion of PRM.

End of written proposal. Please see attached warranty disclaimer and security agreement. If your project payment schedule includes progress payments, then a security agreement may not be required. The written security agreement is intended to reserve PRM's right of ownership of the equipment in the event of a default of payment due to bankruptcy or some other unforeseen event. A security agreement is required in order for PRM to file for a UCC for the equipment.

We have quoted prices with terms that we feel best represent the client's needs based on review of the request. PRM can offer flexible alternative payment terms on the project based on customer request with terms up to 270 days. Note that if PRM has provided progress payment terms, these terms are structured to offer the client the best overall value as we have reduced pricing and not included any financing terms for the project. Extended payment terms do incur pricing increases due to the cost of PRM internally financing projects for customers due to the cost of carrying money for these durations. If we have quoted with terms that you prefer to change, please contact your sales agent to discuss. Note that extended terms are typically offered on State or Federally funded projects where the funding structure is such that extended terms may be required.

*********IMPORTANT*********

Upon taking receipt of equipment that has physical signs of damage, it is the responsibility of the client to document that damage on the Bill of Lading at the time of receipt of the equipment. In the event that the Bill of Lading is not properly marked and the damage is visible, PRM has no ability to make a claim against the carrier and thus the recipient would become responsible for all charges of damage repairs. The client must also notify PRM Corporate headquarters in writing within 24 hours with a written description of all damage as well as digital images of the damage. PRM selects the best carriers in the nation to do our transporting however there is always potential for damage, especially on longer journeys. Our carriers all carry freight damage insurance which we can make claims against, but only if we follow the rules and the most critical rule is that the damage must be documented on the Bill of Lading at receipt of the equipment.

Loose Items Integrations - PRM typically manufactures systems complete in our facility where components or subsystems may require detachment for shipping and reassembly onsite. Unless specifically quoted in our written proposal, PRM will package loose equipment separately for that shipment. It is the onsite systems contractor or other subcontractors to un-package and reinstall these components onsite. In the event the client needs or requires for PRM to install the components, there will be a required additional charge to do so. If a clients specification states that PRM is to reassemble those components, it is understood and agreed that PRM is not including pricing to do so in our base pricing unless specifically stated by PRM. PRM ships hundreds of modular systems each year and in >99% of the cases, all of our clients have the site contractors perform the components installations. It typically may not be price competitive for PRM to perform site installation work and in many cases PRM may be banned by state requirements due to contracting licenses.

Product Recovery Management, Inc.
200 20th Street
Butner, NC, 27509, United States

System Pricing

Ln #	Qty	Description	Unit Price	Subtotal
	1	REMEDIATION SYSTEM PRICING	$131,856.95	$131,856.95
	1	SYSTEM DELIVERY	$2,400.00	$2,400.00
	1	SYSTEM START UP - SEE OPTIONS	$0.00	$0.00
			Total	**$134,256.95**

Notes

Shipping is always estimated at the time of the quote. Due to volatile fuel costs during the past decade, PRM reserves the right to adjust shipping prices based on the national average fuel cost at the time of delivery vs. at the time of the quote.

Any purchase authorization must include PRM's signed/completed acceptance form (below) and a signed PRM Security Agreement as furnished by PRM.

Lead time is determined at time of order, but is typically 12-14 weeks from receipt of approved submittals.

Payment Terms and Conditions

NET 90 DAYS. PRM will invoice at the onset of the project and from time of readiness to ship, payment would be a maximum of N90 days or upon receipt of payment from the State, whichever occurs first.

Authorized & Accepted By (Signature) **By signing, you agree to the below Standard Terms and Conditions**	Date	PO # / Project Reference

Product Recovery Management, Inc.
200 20th Street
Butner, NC, 27509, United States

System Options (not required)

Please select any optional items below. Options are not necessarily upgrades, they are listed as alternatives. It is up to the engineer working for you to make the ultimate decision that the option chosen is in your best interest. Options chosen may be an invalidation of strictly following a Request for Proposal or a Specification. You accept this option as an approved alternative to the specification. PRM provides the options typically to enhance the system. The system options below will be in addition to the base system quoted above.

Option Name	Price	QTY	Subtotal
☐ Vapor Phase Carbon PRM has quoted reactivated carbon in the base bid. If Virgin carbon is required than this price adder must be chosen.	$1,155.00	1	$1,155.00
☐ Vacuum Relief Valve Blower will be controlled by the VFD which will eliminate the need for a VRV. If client still prefers, PRM can provide a 2" Kunkle valve to be installed	$425.00	1	$425.00
☐ Sound attenuation insulation PRM will provide and install sound attenuation insulation on the interior walls and ceiling to help reduce the overall decibel rating of the system	$2,175.00	1	$2,175.00
☐ Telemetry Service Includes 4G / 3G Hi Speed Wireless Internet connectivity. No requirements for customer supplied Static IP. PRM handles all networking interconnects and also handles portal services. The system is maintained and updated continuously using Cradlepoint online management system. Service will be charged on a yearly basis at the beginning of the calendar year. **Add $912.00** for 1 year of Telemetry service	$912.00	1	$912.00
☐ Start Up & Training PRM can provide one day of onsite start up and training once the system is installed and power has been connected to the system	$1,750.00	1	$1,750.00
	Total		**$0.00**

Authorized & Accepted By (Signature) **By signing, you agree to the below Standard Terms and Conditions**	Date	PO # / Project Reference

Warranty

WARRANTY DISCLAIMER

Product Recovery Management (PRM) will warrant all new equipment manufactured by PRM to be free of defects in materials and workmanship for a period of 1 year from the date of manufacture as established by PRM provided the following conditions are met:

1. Equipment must be operated and maintained in accordance with the guidelines established in the O&M manual(s) provided with the equipment or with the individual Equipment O&M manuals.. This includes the site specific manual as provided by PRM as well as the individual component manuals provided.
2. Warranty service shall not be applicable unless a complete logbook of routine maintenance is kept and provided to PRM upon request. For warranty coverage to be ensured,, PRM requires that O&M logs be sent to PRM staff quarterly so PRM can confirm previous maintenance, not after a warranty claim.
3. Warranty service shall not be applicable unless all outstanding invoices which are over terms are paid in full.
4. PRM will not warrant electrical equipment that is operated on an Open Delta electrical system. The only power to be used with PRM supplied equipment will be either a “Y” or a “Closed Delta”. Proper engineering design would accommodate the correct electrical provisions in the engineering specification. PRM will not be liable for any changes to the electrical supply and distribution system that are required to bring the electrical system(s) to these standards.
5. For skidded equipment, PRM is not responsible for warranty of equipment that is not provided protection from the elements such as direct sunlight, rain, hail or other weather conditions exerted by nature. It is a generally accepted practice that skids placed outdoors should be provided physical protection from the elements. An example of potential damage is direct sunlight during summer months. Motors may be designed for certain maximum operating temperatures but without physical protection, motor temperatures may exceed recommended temperatures which causes damage such as accelerated grease degradation in motor bearings. This is one of the major cause of motor failures in the elements.
6. PRM shall not be responsible for consequential damage that may occur due to direct or indirect damage caused by a failure of another piece of equipment.
7. Technicians should be duly trained and have a good understanding of electrical, and mechanical systems. Failure to have a properly trained technician work on PRM supplied equipment can result in invalidation of the warranty at the discretion of PRM.
8. PRM typically manufactures equipment/systems to client provided specifications. Failures due to a design problem by the client which can be identified as a design issue that led to the failure may be disclaimed by PRM under our standard warranty.
9. All equipment quoted as pre-wired and pre-plumbed has been done so by trained personnel. PRM has been instrumental in conformity to State and Federal Codes. If local codes vary from Federal and State Codes, it is the client's responsibility to notify PRM of particular requirements in the bid request that may necessitate changes to the proposed system.
10. Delivery must occur within 2 weeks of completion of testing by PRM or storage fees of $250.00 per week may be charged by PRM due to inconvenience of storage and location requirements. The fee may be larger for systems over $100,000.00.
11. Electrical work for this quotation is in accordance with the most current version of the National Electrical Code (NEC).
12. This bid may be for equipment only and proposed startup. This quotation does not include pricing for installation, wiring or plumbing unless explicitly stated herein.
13. This quotation is not subject to subcontractor contract. PRM shall act as an equipment vendor.
14. General warranty is for parts. In the event of a component failure that is covered under warranty, PRM will provide the repair components/parts at PRMs discretion under warranty. Shipping of replacement components is to be paid for by the client. It is understood that the client will provide the labor to replace warranted parts. It is understood that all shipping for all warrantable items are to be shipped most cost effective way unless client requests expedited shipping. If expedited shipping is requested, it is understood and agreed that PRM will invoice for all shipping charges which will be paid for by client in a timely manner.
15. PRM is typically engaged in system startups and for many clients O&M activities. PRMs general rate for service technicians is $95.00 per hour and $115.00 per hour for engineer level senior technicians. In the event a scheduled event has delays that are no fault of PRMs, PRM shall be able to invoice for overage time which may happen on startups or other service activities. Additional fees such as daily per diem and truck/mileage fees are applicable as well as parts purchased which require reimbursement plus markup. Also it is understood that PRM will be compensated in the event weather or other delaying occurrences occur that may require to procure special vehicles to perform a duty. An example would be to do a startup activity for a project in adverse weather condition where cold weather and snow may require PRM to secure a 4WD truck to do startup. It should be expected by the client that additional fees will be invoiced to cover additional expenses. It should also be considered acceptable for adverse weather to cause additional labor charges for site work as travel delays and slower sitework conditions would be expected to cause slower safe progress. It should also be understood that PRM always considers employee safety first. This means that PRM reserves the right to hold back and delays shipments.
16. For equipment being shipped into FL, NC, NY, VA, and WY, the appropriate sales and use tax has been included if shown on the quote and will be paid by PRM to the state taxing authority, For equipment going to all other states, it is the customer's responsibility to pay any required sales and use taxes to their appropriate taxing authority. For bid comparisons, it is important that taxes be added to any bids from out of state to provide funds for payment of the taxes due.

PAYMENT TERMS

Payment terms are established on the pricing page. Service Charges of 1.5% per month will be charged on all overdue invoices. If PRM is required to bring legal action to enforce this agreement, the prevailing party shall be entitled to its reasonable attorney fees.. This agreement shall be governed by and construed in accordance with the laws of the State of North Carolina and venue shall be proper and personal jurisdiction had in state court, Durham County, North Carolina. Above payment terms are contingent upon receipt by PRM of original signed quote as well as the original signed security agreement.

TECHNICAL SUPPORT

In the event of a problem or failure, immediately contact PRM's corporate office and request technical assistance. Please make sure that you have the PRM Project Number available. A technician will assist in determining if the equipment is operating properly and if not, then PRM will guide the onsite technician in proper settings and adjustment. PRM technical phone support is billable at a rate of $95.00 per hour at the discretion of PRM. Purchase of a system from PRM and initiation of phone support constitutes a legal agreement that PRM can invoice for phone support.

RETURN AUTHORIZATION

If a component failure has occurred, PRM will ship a replacement part to the site or client office for replacement of the failed part by the Client. PRM will not be responsible for labor to replace the failed part. PRM will issue an RMA upon determination that a replacement part is necessary. PRM will invoice for the part and credit will be issued for the part only once the defective part is returned to PRM and PRM makes a determination that the part is defective at no fault of the client and within the warranty period.

STARTUPS

PRM recommends that all systems be ordered and that the client pay PRM to provide a day or two of startup training. In order for PRM to warranty an oxidizer system, it is a requirement that the client receive training from PRM. Only technicians that are duly trained by PRM should operate an oxidizer due to the potential risk and liability of improper operation. In no event shall PRM be liable for any consequential accidents, property damage, personal injury or death occurrences that may happen due to improper operation of an oxidizer.

DELIVERY ACCEPTANCE & CLIENT RESPONSIBILITIES

Buildings and systems that arrive may arrive to the project site tarped or with provisions to protect roofing and such parts. It is the client's responsibility to remove these items upon arrival. All fasteners installed to retain the materials must also be removed . If the client has a contractor doing the site installation work, PRM recommends that they ensure that the contractor handle these items.

SECURITY AGREEMENT

See the security agreement document on the following pages. If this project is a State or Federally funded project where the client has asked PRM to extend payment terms for the project beyond Net 45 days, PRM will require an executed security agreement. This agreement is a simple document that gives PRM ownership/entitlement to the equipment until PRM is paid for the equipment. This document protects PRM in the event a client should default on payment.

SECURITY AGREEMENT

_____, a _____ corporation (the "Debtor"), hereby grants to PRODUCT RECOVERY MANAGEMENT, INC. (the "Secured Party") a security interest in all of Debtor's right, title and interest, now or hereafter acquired until entire debt secured by this agreement is paid in full, in the following Collateral (the "Collateral"):

1. Remediation Equipment. All remediation equipment, supplies, fittings, machinery, and other tangible personal property, in all of its forms and including fixtures, for PROJECT , located in _____ , sold to Debtor by the Secured Party together with all parts, instruments, substitutions, replacements, additions, accessories, fittings, operating manuals, plans, specifications, and tools (the "Remediation Equipment"); and
2. Proceeds and Products. All proceeds (including without limitation any rents, royalties, insurance proceeds, replacements, additions, and accessions thereto) and products of the Remediation Equipment.

THIS SECURITY AGREEMENT (the “Agreement”) SECURES: (i) the Debtor's payment to the Secured Party for the Remediation Equipment under the purchase order and/or other contracts or agreements providing for Debtor’s purchase of the Collateral (the “Contracts”); and (ii) all costs reasonably incurred by Secured Party to enforce this Agreement, and to maintain and preserve the Collateral, including without limitation all taxes, assessments, insurance, reasonable attorneys' fees, legal expenses, and expenses of sale, together with interest thereon, at a rate not greater than 18% per annum, pursuant to the following TERMS:

THE DEBTOR: bears the risk of loss; shall keep the Collateral insured for the full amount secured by this agreement at all times and at Debtor’s cost; shall repair and maintain the Collateral at Debtor’s cost and shall not use the Collateral or any part of it in a manner resulting or likely to result in waste or unreasonable deterioration of the Collateral; shall pay all taxes and assessments on the Collateral as they become due and shall keep the Collateral otherwise unencumbered; shall keep the Collateral separate and identifiable from other property owned by Debtor or located on the same premises as Collateral; shall not, without prior written consent from Secured Party, sell, lease, or otherwise dispose of any portion of the Collateral; waives the automatic stay under 11 U.S.C. Section 362; and shall promptly execute and deliver all further instruments and documents and take all action reasonably requested by Secured Party from time to time in order to perfect and protect the security interest granted in this Agreement or to enable Secured Party to exercise its rights hereunder.

THE SECURED PARTY may: file one or more financing statements, continuation statements, or amendments relative to the Collateral without the signature of the Debtor, where permitted by law; enter the premises where the Collateral is located and inspect the Collateral, either in person or by its agent, at any reasonable times and at reasonable intervals; and exercise any of the rights hereunder or pay any unpaid taxes or other obligations of the Debtor with regard to the Collateral without waiving or releasing the Debtor from any of its duties or obligations under the Contracts, provided that the Secured Party shall not be obligated to perform any of the Debtor’s obligations under the Contracts or to take any action to collect or enforce any claim for payment hereunder, and that

such failure to collect or enforce shall not be deemed a waiver of said rights, a waiver of Debtor's default, or a release of Debtor's obligations.

EVENTS OF DEFAULT. The following shall constitute events of default: Debtor's failure to pay when due any obligation secured by this Agreements under the terms of the Contracts; Debtor's breach of any affirmative covenant or other term hereunder; and/or Debtor's disposition of the Collateral in violation of this Agreement shall constitute an event of default hereunder.

REMEDIES. If an event of default shall occur, Secured Party shall have all the rights and remedies afforded a secured party by law, including all the rights and remedies of a secured party on default under the Uniform Commercial Code (the "Code") (whether or not the Code applies to the affected Collateral), and may also: (a) enter on Debtor's premises to take possession of the Collateral; (b) take immediate possession of the Collateral, wherever found, with or without legal process; (c) require Debtor to assemble the Collateral and make it available to Secured Party at a place designated by Secured Party that is reasonably convenient to both Debtor and Secured Party; and (d) apply the proceeds received from the sale or other disposition of the Collateral on default of Debtor to the payment of reasonable attorneys' fees and legal expenses incurred by Secured Party as a result of Debtor's default, in addition to those purposes provided for by law.

GENERAL PROVISIONS. Time is of the essence. Neither this Agreement nor the Debtor's obligations to the Secured Party are assignable without the prior written consent of Secured Party, although the Secured Party may assign this Agreement on written notice to the Debtor. This Agreement shall not be amended except by written instrument signed by the party to be bound, and the provisions herein are severable. Venue and jurisdiction over any disputes and parties hereto shall be proper in North Carolina. The validity, interpretation, and performance of this Agreement shall be governed by and construed under the laws of the State of North Carolina

DEBTOR: _____, a _____ Corporation By _____, its _____	DATED: _____

APPENDIX E – SUBCONTRACTOR SPECIFICATIONS AND QUOTATIONS

March 19, 2021

Mr. Eric Meitzler
Walker-Hill Environmental, Inc.
4 S. Poplar Street
Foxworth, Mississippi 39483

Re: Quotation Request for Remediation System Installation
Russell Petroleum Bulk Plant
3378 Tank View Court
Montgomery, Alabama
Facility I.D. No. 14249-101-005185
Incident No. UST12-11-03
PPM Project No. 422601-MCAP

Dear Mr. Meitzler:

PPM Consultants, Inc. (PPM) is proposing to install a soil and groundwater remediation system at the referenced site (**Figure 1, Proposed System Layout, Attachment A, Figures**) and requests a price quotation for the following work elements. Please note the work will be performed at the Russell Petroleum Bulk Plant located at 3378 Tank View Court, Montgomery, Alabama.

System Installation Portion

- Trench in asphalt and install approximately 65 feet of 2-inch inside diameter (I.D.) polyvinyl chloride (PVC) effluent line for discharge to a stormwater drop inlet. Technical specifications for installation of the effluent line are included in **Attachment B, Discharge Water Lines**.

- Trench approximately 290 feet in asphalt; 20 feet in concrete; and 20 feet in grass to install piping from the recovery wells to the manifold. Cost to include saw cutting asphalt and concrete. All trenching and piping will be performed in accordance with the dimension and details on the attached drawings. Each extraction well will have separate vacuum piping connected to the manifold (see below). Technical specifications for installation of the extraction lines are included in **Attachment C, Extraction Lines**.

- Install independent 4-inch I.D. PVC extraction lines and 0.75-inch I.D. PVC vacuum measurement lines from the manifold to each recovery well, as depicted in **Figure 2,**

Details and Sections for 4" Recovery Wells and Recovery Well Trench. The technical specifications for installation of extraction lines are included in **Attachment C**. A total of 1,260 feet of extraction piping will be required for connection from the manifold to each well location:

- 310 feet (manifold to RW-1)
- 110 feet (manifold to RW-2)
- 245 feet (manifold to RW-3)
- 170 feet (manifold to MW-4)
- 140 feet (manifold to PRW-5)
- 285 feet (manifold to PRW-6)

- The recovery trenches will be backfilled with **crusher run** gravel and compacted to prevent subsidence. The recovery trenches in asphalt and concrete will be completed at the surface with approximately 6 inches of concrete. Steel dowel pins will be drilled into the existing concrete at 3-foot linear spacing per side. Dowel pins will extend at least 3 inches into the existing concrete with at least 4 inches of reveal in the new concrete. Dowel pins are not required for asphalt pavement. The finished grade of concrete should match the existing grade on both sides of the trench and a light broom finish should be applied after the concrete has been allowed to slightly cure. **Note: If the concrete work does not look professional, look clean, match the existing surface, or significantly cracks within one year, the contractor may be required to remove and replace the concrete at his or her own costs**. The recovery trench portion located in grass will be completed with topsoil.

- Spring-loaded, 2-foot by 2-foot, locking recovery well vaults will be installed around each of the seven recovery wells and set within 4-foot by 4-foot concrete pads. The technical specifications for the installation of the well vaults are included in **Attachment D, Well Vault Installation**.

- Install a PVC manifold system in accordance with details shown on **Figure 3, Profile/Plan View of Manifold**.

- Trenching, construction of recovery well pads, and finishing of concrete will be performed in zones. Each zone shall be barricaded by the contractor to prevent vehicles from entering the work zone and work shall not proceed within a separate zone prior to completing the previous zone. Barricades shall be linked, plastic Jersey Barriers similar to that shown below.

- Position the remediation system and two 500-pound carbon vessels at the locations designated on **Figure 2** including set-up and leveling (1/8-inch over 4 feet). The trailer-mounted Dual-Phase Vacuum Extraction (DPVE) system should be placed on concrete block footings. Technical specifications for remediation unit placement are included in **Attachment E, Remediation Unit Placement**.

- Provide power hook-up to the DPVE system. Three phase, 208/230-volt power and associated power pole will be provided to the site by Alabama Power. The electrician will install a temporary power pole, weather head, meter base, and main disconnect for the system. All electrical work must be performed by a licensed electrician in accordance with state and local code. Technical specifications for electrical requirements are included in **Attachment F, Electrical**.

- Connect carbon vessel to exhaust side of the liquid-ring vacuum pump (LRVP) with 4-inch I.D. PVC piping.

- Install an 8-foot high wooden privacy fence (approximately 30 feet by 20 feet) around the perimeter of the DPVE system in accordance with **Figure 2**. The fence will have one double gate (minimum 8-foot total width) for equipment entry and one single gate (minimum 3-foot width) for personnel entry.

- Restoration of site to original conditions. Specifications for site cleanup are included in **Attachment G, Cleanup, Repair, Etc.**

The site shall be barricaded for safety reasons during all work. The contractor shall perform work in consecutive workdays until such time that the project is complete. A schedule of implementation should be submitted with your proposal.

Please use the attached quote form to submit pricing (Attachment H, Quote Form). Also, please provide your estimated number of days to complete the work. Alternate, more economical trenching methods are welcome, but must be included as a separate quote with accompanying documentation justifying the deviations. Payment will be made based on actual measurements following completion of the work. Should the estimated quantities be exceeded, a change order should be requested prior to initiation of work. If this is not practical, at a minimum, a verbal confirmation should be requested and followed up by written correspondence (email or fax). .

PPM recommends, but does not require, that you visit the site prior to your submittal. If you plan to visit the site, please provide 24-hour notice to PPM so that we may notify our client. If you have any questions or need additional information, please contact me at your convenience.

Sincerely,
PPM Consultants, Inc.

Jeffrey M. Schexnayder, P.G.
Project Manager

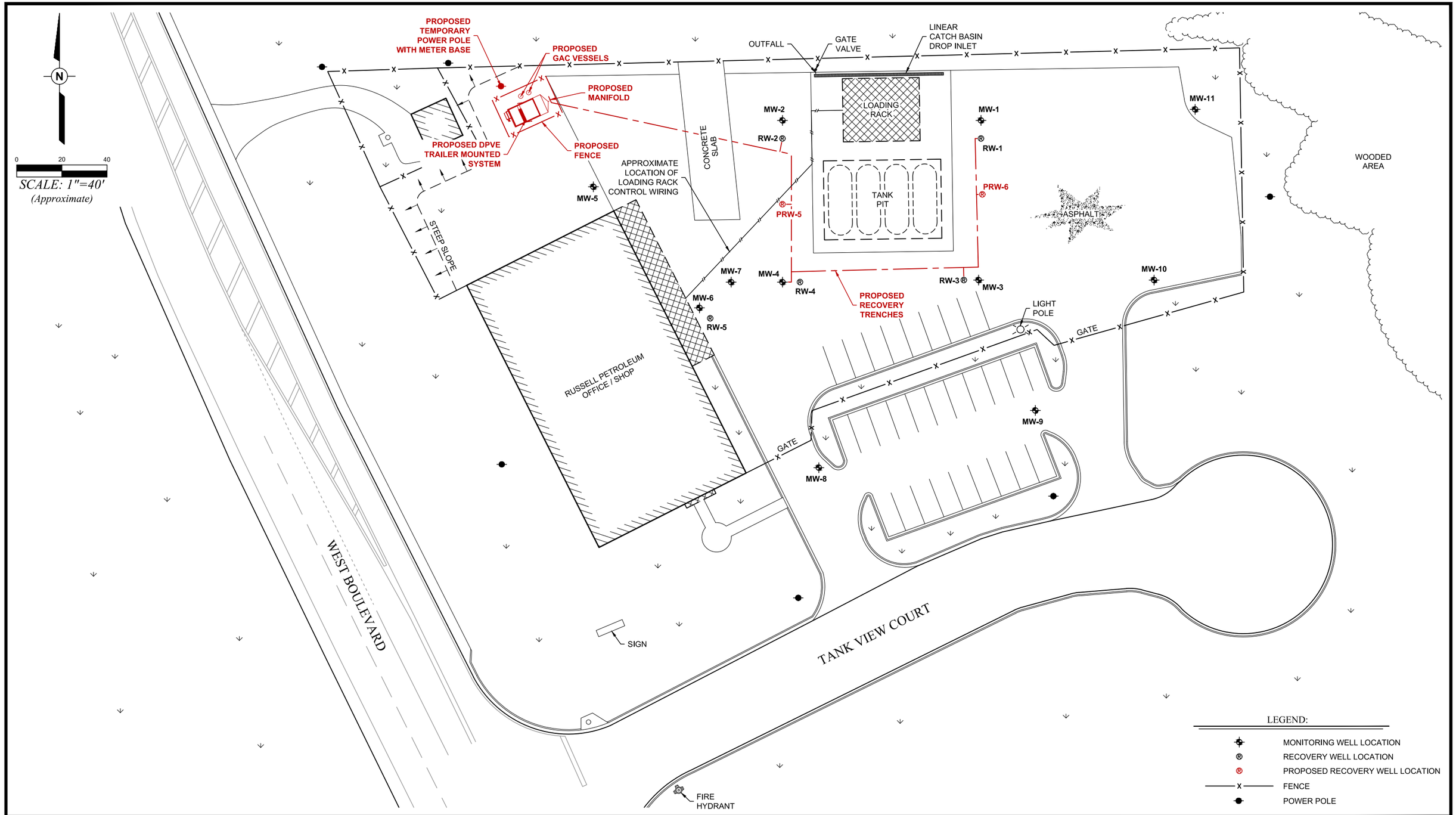
c: Mr. J. Clark Ward, Russell Petroleum Corporation

Attachments

ATTACHMENTS

ATTACHMENT A

FIGURES

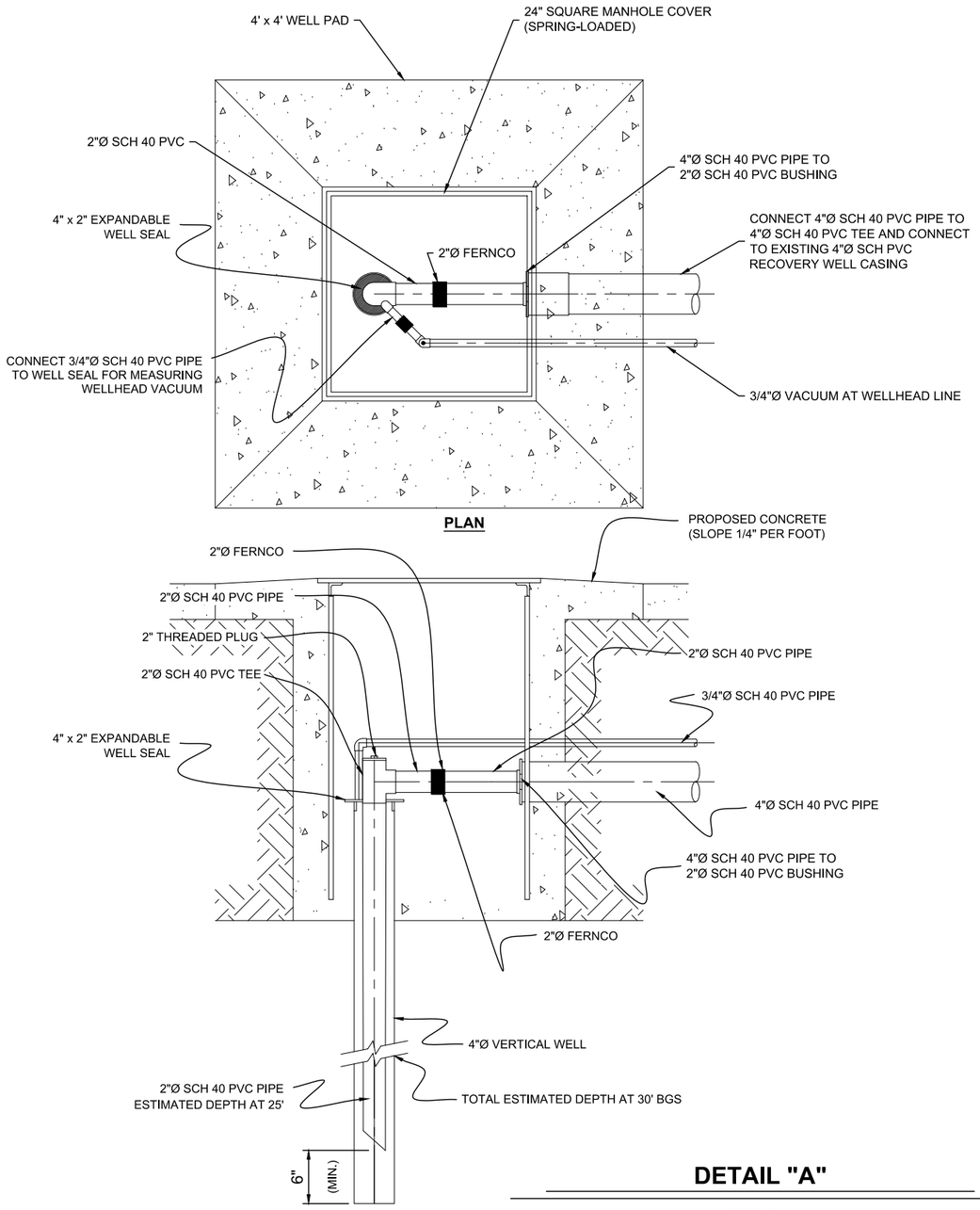


PPM CONSULTANTS, INC. www.ppmco.com	
DRAWN BY: BWH	DRAWN DATE: 01/04/21
PROJECT NUMBER: 422601	PHASE: MCAP

RUSSELL PETROLEUM CORPORATION
BULK PLANT
3378 TANK VIEW COURT
MONTGOMERY, ALABAMA

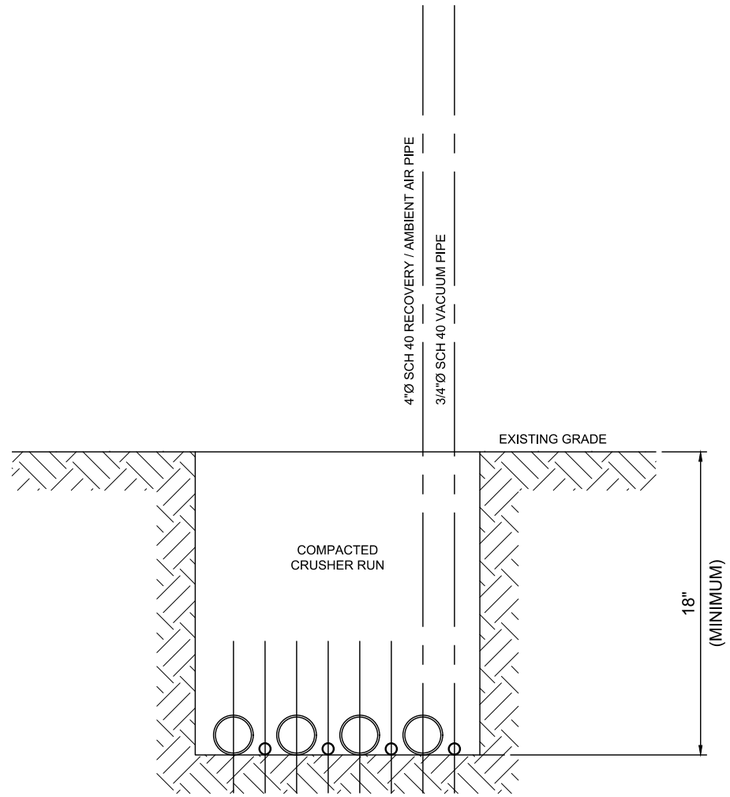
PROPOSED SYSTEM LAYOUT

FIGURE NUMBER
1



DETAIL "A"

NOT TO SCALE



RECOVERY WELL TRENCH

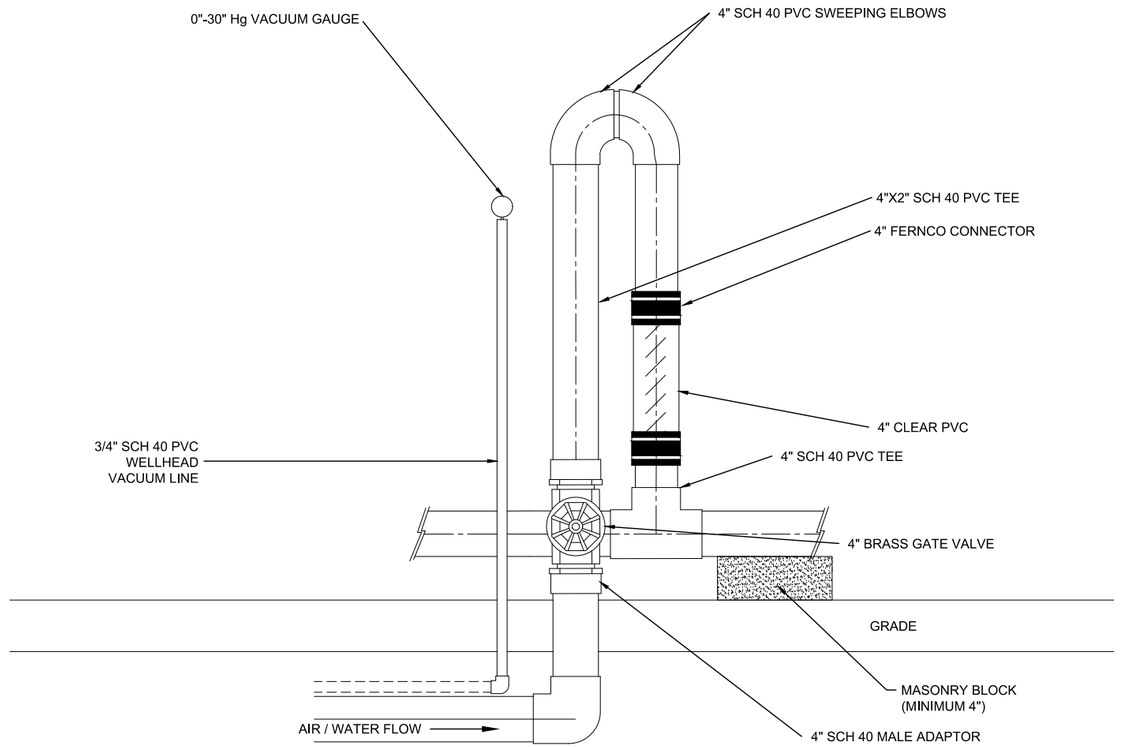
NOT TO SCALE

PPM CONSULTANTS, INC. www.ppmco.com	
DRAWN BY: BWH	DRAWN DATE: 01/04/21
PROJECT NUMBER: 422601	PHASE: MCAP

RUSSELL PETROLEUM CORPORATION
BULK PLANT
3378 TANK VIEW COURT
MONTGOMERY, ALABAMA

DETAILS AND SECTIONS FOR 4" RECOVERY WELLS
AND RECOVERY WELL TRENCH

FIGURE NUMBER
2



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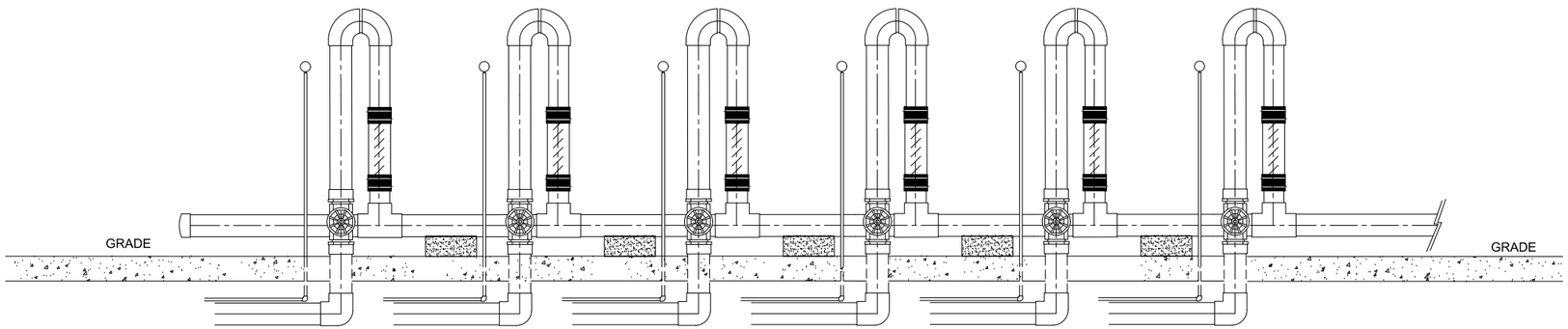

NOT TO SCALE

PPM CONSULTANTS, INC. www.ppmco.com	
DRAWN BY: BWH	DRAWN DATE: 01/04/21
PROJECT NUMBER: 422601	PHASE: MCAP

RUSSELL PETROLEUM CORPORATION
BULK PLANT
3378 TANK VIEW COURT
MONTGOMERY, ALABAMA

PROFILE / PLAN VIEW OF MANIFOLD

FIGURE NUMBER
3

ATTACHMENT B

DISCHARGE WATER LINES

PPM Consultants, Inc.
5555 Bankhead Highway
Birmingham, Alabama 35210

SECTION 4000 SERVICE AND DISCHARGE WATER LINES

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	4000.2.2	Conformance	4000-1
	4000.2.3	Testing	4000-1
4000.3	EXCAVATION, TRENCHING, AND BACKFILL		4000-1
4000.4	SURFACE OBSTRUCTIONS		4000-2
4000.5	SUBSURFACE OBSTRUCTIONS		4000-2
4000.6	LAYING AND JOINING PIPES		4000-3
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4000.0 SERVICE AND DISCHARGE WATER LINES

4000.1 GENERAL

The Work provided for herein consists of furnishing all plant, labor, materials, equipment and any and all other items and performing all operations pertinent to and incidental to the completion of the service water and effluent water lines, tie-ins, repairs and all Work specified and/or required to construct, install and make operational the system or Work as shown on the Drawings and specified herein.

4000.2 MATERIAL

4000.2.1 Scope

This specification covers the requirements for Polyvinyl Chloride (PVC) Pressure Rated Pipe for water supply and distribution systems.

4000.2.2 Conformance

PVC pipe shall meet the requirements of ASTM D 2241 Standard Specification for "Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)," and shall be furnished with integral bell or twin gasket coupling.

40002.3 Testing

Product shall be tested in accordance with ASTM D 2241 and ASTM D 3139.

4000.3 EXCAVATION, TRENCHING, AND BACKFILL

All excavation, trenching, and backfill required for the successful completion of this Work as shown on the Drawings. However, excavation for all water mains shall be with vertical sides and flat bottom, and the maximum trench width shall be the nominal diameter of the pipe plus two feet (2') maximum.

Select backfill will be placed around the pipe so as to prevent foreign objects from coming in contact with the pipe, but no special compaction will be required unless specifically designated. The remainder of the trench shall be randomly backfilled with the excavation material.

The above backfilling procedure is not applicable adjacent to structures of across roadways. Special laying, bedding, and backfilling (Type 1, 2, etc.) may be required as

designated on the Drawings, elsewhere in the specifications, or in the Bid Proposal. In such case, those special requirements will supersede the above.

When using backhoes or trackhoes, the trench bottom shall be smooth and flat. Hand labor may be required to catch the trench bottom prior to laying of pipe. No sudden or abrupt elevation changes or directional changes shall be made. Contractor must anticipate directional changes and start sufficiently in advance of such to insure a smooth directional change. Driveways, etc., will have to be cut deeper to prevent an abrupt change in elevation.

4000.4 SURFACE OBSTRUCTIONS

All buildings, fences, bridges, railroads, trees, telephone lines, power lines, or other property or improvements encountered shall be carefully protected from all injury by whatever means are necessary. In the event such damage occurs or such obstructions are removed during the progress of the Work, they shall be repaired or replaced in a satisfactory manner within a reasonable time; except that the Contractor is fully responsible for any ramifications of any nature resulting from any such damage or removal.

4000.5 SUBSURFACE OBSTRUCTIONS

The Contractor shall exercise extreme care during excavation, backfilling, laying, or other operations not to disturb or injure any other structure, pipes, conduct, cables, or other underground improvements without the written approval of the Engineer. The Contractor will be required to sling, brace, or otherwise maintain any of these facilities in operation at his expense. He shall repair any damage done in a manner satisfactory to the Engineer within a reasonable time, except that the Contractor is fully responsible for any ramification of nature resulting from any such damage.

The Contractor shall give sufficient notice to the affected utility should it be necessary to remove or disturb any of their facilities. He shall also abide fully by their regulations governing such Work. The Contractor shall immediately notify the proper authorities or utility company should any damage to such facility occur during the prosecution of this Work.

The Engineer reserves the right to make any necessary repairs to damaged or disturbed facilities at the Contractor's expense or to allow the utility to make repairs, for which the Contractor shall pay the Engineer or utility the proper changes for such repairs.

The Engineer will not be liable for any claim arising based on underground obstructions being different than indicated on the Drawings or in the Contract Documents.

The Contractor shall be responsible for locating and uncovering underground obstructions sufficiently far enough in advance so that the method of avoiding may be determined before the pipe laying reaches the obstruction.

The Contractor shall be governed by instructions of the Engineer regarding pipe to be laid along State highways and the Engineer, along with the applicable Highway Department, will determine whether pipe shall be laid over, under, or along the end of the various drainage structures or facilities encountered.

4000.6 LAYING AND JOINING PIPES

The Contractor shall employ, for the laying and joining of all pipe, only workmen who are skilled in laying and joining such pipe.

All pipe and accessories shall be transported and handled in such a manner as to insure that they are delivered and installed in a sound and undamaged condition. Couplings and rubber gaskets shall be adequately stored to prevent damage and shall be kept clean of oil, grease, and other deleterious substances and kept away from excessive heat.

Immediately before placing pipes in the trench, it shall be examined for any defects and cleaned and freed from any dirt or foreign material. Any defective pipe shall be promptly removed from the site.

When Work is suspended either for the night or for any other reasons, all open ends shall be securely and adequately plugged to prevent the entrance of foreign materials or trench water. While pipe laying is in progress, the Contractor shall keep the trench free of water.

Any deflections from a straight line shall not exceed that recommended by the pipe manufacturer for the particular type of pipe and joints.

Pipe shall be laid in trench with flat bottom. Bell holes shall not be required if sufficient loose soil is placed in the trench bottom to insure that the pipe is bedded for the entire

length of the barrel. The pipe shall not rest on the bells on a hard bottom. If not installed as above, bell holes shall be required.

Select backfill shall be placed around the pipe to insure that no foreign material comes in contact with the pipe. The remainder of the trench shall be backfilled with the excavated material.

Additional bedding and backfilling requirements (i.e., Type I, Class B, etc.) may be required; at which time such will specifically be designated on the Drawings or in the Bid Proposal.

Any pipe laid within State R.O.W., parallel and/or under road ditch shall be buried a minimum of 36" from top of pipe to natural ground of ditch bottom. There is no special payment for this Work.

4000.7 LOCATION OF APPURTENANCES

In no case, unless written approval is provided by the Engineer, shall any structure, valve, meter, flush valve, and other appurtenance be constructed in a ditch or drainage way (bottom, foreslope, or backslope). If such structure or appurtenance is so constructed without written approval, the Engineer shall order same to be removed and relocated as the Engineer so directs, with no compensation due to the Contractor. Such remedial work shall be performed before payment for such items can be made.

Should the Contractor encounter a situation where any such appurtenance would be so placed as described above, he shall immediately notify the Engineer or his representative prior to continuing, such that a suitable plan can be formed which will prevent such placement as is prohibited.

4000.8 CUTTING INTO AND CONNECTING TO EXISTING SEWERS AND MANHOLES

When during the course of construction, it is necessary to cut into and/or connect to existing sewers and manholes at points indicated on the Plans and in these Specifications, the following provisions shall apply.

The flow in existing sewers shall not be interrupted without permission of the Engineer. If, in the opinion of the Engineer, any interruption will be such as to prevent proper

service to the public, the Engineer may require the Contractor to maintain pumps or other reasonable means of continuing or by-passing flow.

4000.9 CONTRACTOR'S RESPONSIBILITY

It is the sole responsibility of the Contractor to oversee, control, schedule, and supervise his employees, Subcontractors, or others associated with the Work and to provide safety for all employees, persons, the public, or others as required by local, state, or federal laws, statues or requirements. Neither the Engineer nor his representative is responsible for the above.

The Contractor shall make every reasonable effort to construct the project in accordance with the Drawings, specifications, or field instructions.

The Contractor shall have sufficient labor, equipment and materials to undertake the Work and complete same within the specified contract time.

Prior to cutting a line, making a tie-in, or other similar Work, the Contractor shall make every effort to ensure he has all fittings, valves, tees, connections, repair collars, etc., such that the Work can be accomplished quickly and efficiently.

All Work, labor, materials, and appurtenances shall be guaranteed against defects in labor or materials for a period of one (1) year from the date of the Substantial Completion.

If notified by telephone or mail, the Contractor shall promptly return to make any repairs needed and/or to refill and dress line trenches, driveways or other Work as required. Should more than seven (7) days from date of notification pass without such Work being satisfactorily accomplished, the Owner may have such Work done by whatever means deemed expedient, and the cost of such Work shall be deducted from monies owed Contractor, or he or his bonding company shall be billed for such.

4000.10 MEASUREMENT AND PAYMENT

4000.10.1 Water Lines

4000.10.1.1 Measurement

Water lines will be measured by the linear foot along the centerline of the pipe without deduction for valves or fittings, except that pipe jacked and bored will be excluded and

measured separately. Pipe installation in casing will be included. Measurement shall be from center to center of crosses, reducers, etc.

4000.10.1.2 Payment

Water lines shall be paid for at the Contract Unit Price Bid per linear foot for pipe of the various sizes, types, and classes, which price and payment shall constitute full compensation for furnishing all plant, labor, equipment, and materials, hauling, trenching, bed preparation, laying, jointing, and backfilling, testing, sterilization, and other operations incidental to the satisfactory completion of the Work as shown on the Drawings.

4000.10.2 Replacement or Repair of Street and Sidewalk Surfacing

4000.10.2.1 Measurement

All surface areas authorized cut by the Engineer shall be measured for payment by the square yard (SY), and shall be equal to the actual length of trench cutting the payment times the allowable trench width as shown on the Drawings plus two feet (2').

4000.10.2.2 Payment

Payment will be made at the Contract Unit Price Bid per square yard for the various types of surfacing, which price and payment shall constitute full compensation for furnishing all plant, labor, equipment, and performing all Work, including all other operations incidental to the satisfactory completion of Work shown on the Drawings and specified herein. No additional compensation of any type will be paid for repairing damaged surfacing which was not authorized in writing by the Engineer and all repairs thereto will be promptly made by the Contractor to the satisfaction of the Engineer at no additional cost to the Engineer.

4000.10.3 Maintenance Gravel

4000.10.3.1 Measurement

Maintenance gravel used to maintain traffic on streets and drives will be measured by the cubic yard by measured truck.

4000.10.3.2 Payment

Maintenance gravel, ordered placed by the Engineer or Resident Inspector, will be paid for at the Contract Unit Price Bid per cubic yard for "Maintenance Gravel" which price

and payment shall constitute full compensation for all plant, labor, equipment, and materials necessary to produce, store, transport, place and spread the gravel as directed.

4000.10.4 Line Tie-In

Line tie-in shall be measured per each, complete, and paid for at the Unit Price Bid.

ATTACHMENT C

EXTRACTION LINES

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4200.0 EXTRACTION LINES

4200.1 GENERAL

This part of the Work includes installation of extraction lines and other appurtenances for extracting contaminated vapors and liquids from the subsurface, excavation and backfill of trenches, cutting and replacing walks and roadway surfaces, and other miscellaneous work necessary to complete and make ready for operation a complete extraction system.

4200.2 MATERIALS

4200.3 BEDDING, HAUNCHING, AND BACKFILL MATERIALS

Requirements for various bedding and backfill classes should be as detailed on the Drawings, and the materials used shall be in accordance with the following Specifications.

4200.3.1 Coarse Aggregate

Crushed aggregate or graded gravel shall be clean, free from clay, sticks, or other deleterious substances, meeting the following graduation:

SIEVE	PERCENT PASSING BY WEIGHT
3/8"	95-100
No. 100	0-7

4200.3.2 Granular Backfill

Granular backfill shall be sharp "flume sand," clean, free from clay, sticks, or other deleterious substances meeting the following graduation:

SIEVE	PERCENT PASSING BY WEIGHT
3/8"	95-100
No. 100	0-3

4200.3.3 Select Native Soil

Select native soil shall be fine sand and clayey gravels, including fine sands, sand-clay mixtures, and gravel-clay mixtures (Unified Soil Classification soil types GM, GC, SM, and SC), or inorganic silts, very fine sands, silty or clayey fine sands, or inorganic clays of low to medium plasticity, silty clays, lean clays, having a liquid limit of fifty percent

(50%) or less (United Soil Classification soil types ML, CL, or CLML), as described in ASTM D2487.

4200.4 CONSTRUCTION METHODS

4200.4.1 General

The Contractor shall be required to install the subsurface extraction lines upon the completion of the excavation for the well vaults (**PPM Technical Specification No. 200**). Sizes of extraction lines are specified on Drawings. At a minimum, the extraction lines should be installed to 30 inches below ground surface. These lines are to be stubbed up perpendicular to ground surface near the unit and in the excavated area for later completion as specified on the Drawings.

4200.4.2 Cooperation with Utility Officials

The Contractor's attention is directed to the fact that his Work will be performed in the close proximity of existing utilities, streets, drainage structures, etc. The Contractor shall at all times cooperate with the various utility and street officials and shall notify the appropriate personnel prior to excavation in areas where known utilities are located.

4200.4.3 Clearing of Right-of-Way

The Contractor shall clear the right-of-way provided for the extraction line of all objectionable debris and obstructions that will interfere with the installations of the mains. Wooded areas shall be cleared and grubbed and surface obstructions to remain shall be protected in accordance with **PPM Technical Specification No. 1000.**

4200.4.4 Excavation of Trench and Backfill

Excavation, preparation for trenches, and backfill shall be in accordance with the latest revisions of the applicable standards for Polyvinyl Chloride ASTM D2321, unless otherwise amended by these Specifications or the Drawings.

It is the intent of these Specifications that all pipes be properly supported, and then backfilled with granular or select material meeting the requirements of **PPM Technical Specification No. 2000.** If the native soil in the trench is satisfactory for backfill (in any horizon), the Contractor shall preserve that material for use as backfill in the pipe zone. If the entire trench is in a soil which does not conform to the backfill requirements, the Contractor shall refurnish a borrow material which conforms to **PPM Technical Specification No. 2000** for use in the pipe zone. Compensation shall be as noted in the payment section.

4200.5 SURFACE OBSTRUCTIONS

4200.5.1 Obstruction of Streets, Premises, etc.

All materials shall be placed as to interfere as little as possible with public travel. At street crossings and other points as directed by the Engineer, trenches shall be bridged in a manner so as to prevent any serious interruption of public travel. The closure of both sides of a double roadway to vehicular traffic will not be permitted except by written permission by the proper authorities. Special care shall be taken to give free access at all times to all fire hydrants, water valves, fire alarm boxes, and Police and Fire Department driveways.

In case the Contractor shall fail to keep open streets, sidewalks, approaches to premises, etc., and shall refuse or neglect to open them within twelve (12) hours after written notification by the Engineer; or shall the Contractor fail to afford proper and necessary access to fire hydrants, water valves, fire alarm boxes, or Police Department or Fire Department driveways, and shall neglect or refuse to afford such access within one (1) hour of receiving written or oral notice to do so, the Engineer shall be and is hereby authorized and empowered to put on such force as may be necessary and to do the Work, deducting the actual cost thereof from any money which may be due or may become due the Contractor.

4200.5.2 Conflict with Surface Obstruction

All shade trees, shrubbery, utility poles, etc., within the right-of-way provided shall be protected, and any building or structure, which may be endangered during the Work, shall be shored up and otherwise protected. The cost thereof from any amounts due or to become due the Contractor.

Any properties disturbed or damaged by the Contractor shall be restored to its original condition. No additional compensation will be made from this corrective Work.

4200.6 SUBSURFACE OBSTRUCTION

The Contractor shall anticipate all underground obstructions such as water lines, gas lines, sewer lines, utility lines, concrete and debris. Any such lines or obstructions indicated on the Drawings show only the approximate location and must be verified in the field by the Contractor. The Engineer does not imply or guaranty the exact location of any existing underground utility; however, the Engineer will endeavor to familiarize the Contractor with all known underground obstructions.

The Contractor shall take the necessary precautions not to injure any gas or water pipe, sewer, drain or service pipes connected therewith or conduits or other underground structures, and the Contractor must repair or have repaired at once, at his own cost, any public or private structure or pipe damage by or in the course of his Work. Should the Contractor fail to repair or have repaired such damage or injury within a reasonable time, the Engineer may after twenty-four (24) hours reasonable notice, have such repairs made and deduct the cost thereof from any amounts due or become due the Contractor.

The Contractor shall assume all risks and be responsible for all expense and damage attending the presence or proximity of any gas or water pipes, sewers, drains, conduits, or other underground structures where such pipes or other structures cross the trench or appear in the trench in such a manner as not to demand their rearrangement or realignment. The Contractor's risks and responsibilities shall also apply to such structures as are approximately parallel with or adjacent to but outside of said trench.

The Contractor shall uncover known subsurface obstructions in advance of construction so that the method of avoiding same may be determined before pipe laying reaches the obstruction.

Should any pipe or other obstruction (so located as to interfere with the Work) be encountered, the Contractor shall at once notify the Engineer of the locality and circumstances, and the place shall be passed over until satisfactory arrangements are made.

Should the obstruction parallel the trench, the Engineer may require the Contractor to offset or re-align his pipeline to miss the obstruction. This re-alignment may be made by the use of fittings, pipe deflection, and/or manholes as the case may dictate.

4200.7 MEASUREMENT AND PAYMENT

4200.7.1 Extraction Lines

4200.7.1.1 Measurement

Extraction lines shall be measured by the linear foot along the centerline of the pipe without deduction for valves or fittings. Pipe installation in casing will be included. Measurement will be from center to center of crosses, reducers, etc.

4200.7.1.2 Payment

Extraction lines shall be paid for at the Contract Unit Price Bid per linear foot for pipe of the various sizes, types, and classes, which price and payment shall constitute full compensation for furnishing all plant, labor, equipment, and materials, including hauling, trenching, bed preparation, laying, jointing, and backfilling, testing, sterilization, and other operations incidental to the satisfactory completion of the Work as shown on the Drawings.

4200.7.2 Replacement or Repair of Street and Sidewalk Surfacing

4200.7.2.1 Measurement

All surface areas authorized cut by the Engineer shall be measured for payment by the square yard (SY), and will be equal to the actual length of trench cutting the payment times the allowable trench width as shown on the Drawings plus two feet (2').

4200.7.2.2 Payment

Payment shall be made at the Contract Unit Price Bid per square yard for the various types of surfacing, which price and payment shall constitute full compensation for furnishing all plant, labor, equipment, and performing all Work, including all other operations incidental to the satisfactory completion of Work shown on the Drawings and specified herein. No additional compensation of any type shall be paid for repairing damaged surfacing which was not authorized in writing by the Engineer, and all repairs thereto shall be promptly made by the Contractor to the satisfaction of the Engineer at no additional cost to the Engineer.

4200.7.3 Maintenance Gravel

4200.7.3.1 Measurement

Maintenance gravel used to maintain traffic on streets and drives shall be measured by the cubic yard by measured truck.

4200.7.3.2 Payment

Maintenance gravel, ordered placed by the Engineer or Resident Inspector, shall be paid for at the Contract Unit Price Bid per cubic yard for "Maintenance Gravel" which price and payment shall constitute full compensation for all plant, labor, equipment, and materials necessary to produce, store, transport, place, and spread the gravel as directed.

4200.7.4 Line Tie-In

Line tie-in shall be measured per each, complete, and paid for at the Unit Price Bid.

ATTACHMENT D

WELL VAULT INSTALLATION

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200.0 WELL VAULT INSTALLATION

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200.0 WELL VAULT INSTALLATION

200.1 GENERAL

The Contractor shall be required to install locking, spring loaded well vault(s) as specified on Drawings. At a minimum, the Contractor shall saw cut and excavate an area 4 inches larger than the dimensions of the vault on all sides (i.e., for a 30" x 30" x 30" vault, the excavated area shall be 38" x 38" x 38" minimum). The Engineer shall determine the exact placement of the vaults.

The task of this section shall include, but not necessarily be limited to the following:

- Saw cut existing asphalt
- Excavation
- Install a locking well vault
- Concrete placement
- Site restoration
- Other as may be indicated, noted, or shown on drawings, specified herein, or as reasonably implied therein

200.2 MATERIALS

All materials shall be new, unless specifically stated otherwise and be manufactured and approved for the intended service. All materials covered by local codes shall meet the requirements of those codes.

The Contractor will be responsible for backfilling and placing concrete in the excavated area around the well vaults to the original grade. The Contractor should complete these tasks as specified in the drawings.

200.3 MEASUREMENT AND PAYMENT

Measurement and payment shall be made for the following only and the cost of all other work, materials, equipment, and operations necessary for the satisfactory completion of this project, as shown on the plans and specified herein.

Complete well vault installation will be measured by the job basis for the furnishings, installation, and finishing paving area as required by the Specifications and Drawings.

ATTACHMENT E

REMEDIATION UNIT PLACEMENT

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300.0 REMEDIATION UNIT PLACEMENT

300.1 GENERAL

The Contractor shall be required to place remediation units as specified on drawings. Remediation unit placement shall be scheduled to take place after the installation of the subsurface extraction lines, recovery well vaults, subsurface utilities, and the electricity. It shall be the responsibility of the Engineer to schedule the delivery of the unit to the site. After the unit is in place, all subsurface utility lines and extraction lines will be piped into the unit by the Contractor according to drawing specifications and the approval of the Engineer.

300.2 SKID-MOUNTED REMEDIAL UNIT

300.2.1 Unloading and Setup

The Remediation unit shall be brought to the site on a "low-boy" or a standard trailer. The unit may be placed by either a crane or large forklift(s). The Weight of the unit is shown on the Drawings.

300.2.1.1 Crane Method

If a crane is used to lift the Remediation unit, the unit shall be lifted and set in place by the four "D" rings located along the skid at each corner of the unit. The Contractor shall use four lifting chains with end hooks to allow for adjusting of the crane's hook over the unit's center-of-gravity. Also, a 9-foot spreader bar shall be used to prevent damage to the remedial unit's roof.

300.2.1.2 Forklift Method

If a forklift(s) is used to lift the Remediation unit, the fork spacing should be wide enough to fit the lift pockets that are built into the skid of the unit, as specified on the Drawings. Based on the size and weight of the Remediation unit two fork trucks may be required for placement of the unit, depending on their lifting capacity.

300.2.2 Placement

The unit shall be supported on 3-inch solid cinder blocks placed at points around the perimeter of the unit to a minimum height of 9 inches. The location of the unit and block placement is specified on Drawings. If field conditions warrant any changes to the remediation unit placement, these changes must be made by the Engineer.

300.2.3 Leveling

The Contractor shall be required to level the unit once the unit is properly placed. The unit must be leveled to 1/8-inch over a 4-foot interval in all directions, measured on the air stripper tank. Solid steel or hardwood shims, provided by the Contractor, may be used for the final leveling of the Remediation unit.

300.3 TRAILER-MOUNTED REMEDIAL UNIT

The unit shall be placed on 3-inch blocks adequately stacked to a height so that the weight of the unit is not resting on the Trailer Axle. The Contractor shall be required to level the trailer once the unit has been set in the proper place (1/8-inch on 4-foot).

The location of the unit and block placement is specified on the Drawings. Any changes due to field conditions shall be made by the Engineer.

300.4 DPVE ASSOCIATED FEATURES

The Contractor shall be required to install all features associated with the vacuum extraction lines, water lines, sewer lines, electrical power, and the inline filtration system. The Drawings will specify all associated features, which may include but not limited to:

- Inline filtration system
- Muratic acid injection system
- Gate valves
- Site tubes, Fernco® couplings, specified reducers, associated piping and connections
- Extraction line manifold
- Vacuum gauges and flow meters

300.5 FINAL UTILITY CONNECTIONS

The final utility connections should be made after the unit has been placed. Contractor will be responsible for making the final connections as specified in the Specifications and Drawings. All exposed service water and sewer lines shall be insulated using pipe insulation having an R-2 rating.

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SECTION 300 REMEDIATION UNIT PLACEMENT

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300.0 REMEDIATION UNIT PLACEMENT

300.1 GENERAL

The Contractor shall be required to place remediation units as specified on drawings. Remediation unit placement shall be scheduled to take place after the installation of the subsurface extraction lines, recovery well vaults, subsurface utilities, and the electricity. It shall be the responsibility of the Engineer to schedule the delivery of the unit to the site. After the unit is in place, all subsurface utility lines and extraction lines will be piped into the unit by the Contractor according to drawing specifications and the approval of the Engineer.

300.2 SKID-MOUNTED REMEDIAL UNIT

300.2.1 Unloading and Setup

The Remediation unit shall be brought to the site on a "low-boy" or a standard trailer. The unit may be placed by either a crane or large forklift(s). The Weight of the unit is shown on the Drawings.

300.2.1.1 Crane Method

If a crane is used to lift the Remediation unit, the unit shall be lifted and set in place by the four "D" rings located along the skid at each corner of the unit. The Contractor shall use four lifting chains with end hooks to allow for adjusting of the crane's hook over the unit's center-of-gravity. Also, a 9-foot spreader bar shall be used to prevent damage to the remedial unit's roof.

300.2.1.2 Forklift Method

If a forklift(s) is used to lift the Remediation unit, the fork spacing should be wide enough to fit the lift pockets that are built into the skid of the unit, as specified on the Drawings. Based on the size and weight of the Remediation unit two fork trucks may be required for placement of the unit, depending on their lifting capacity.

300.2.2 Placement

The unit shall be supported on 3-inch solid cinder blocks placed at points around the perimeter of the unit to a minimum height of 9 inches. The location of the unit and block placement is specified on Drawings. If field conditions warrant any changes to the remediation unit placement, these changes must be made by the Engineer.

300.2.3 Leveling

The Contractor shall be required to level the unit once the unit is properly placed. The unit must be leveled to 1/8-inch over a 4-foot interval in all directions, measured on the air stripper tank. Solid steel or hardwood shims, provided by the Contractor, may be used for the final leveling of the Remediation unit.

300.3 TRAILER-MOUNTED REMEDIAL UNIT

The unit shall be placed on 3-inch blocks adequately stacked to a height so that the weight of the unit is not resting on the Trailer Axle. The Contractor shall be required to level the trailer once the unit has been set in the proper place (1/8-inch on 4-foot).

The location of the unit and block placement is specified on the Drawings. Any changes due to field conditions shall be made by the Engineer.

300.4 DPVE ASSOCIATED FEATURES

The Contractor shall be required to install all features associated with the vacuum extraction lines, water lines, sewer lines, electrical power, and the inline filtration system. The Drawings will specify all associated features, which may include but not limited to:

- Inline filtration system
- Muratic acid injection system
- Gate valves
- Site tubes, Fernco® couplings, specified reducers, associated piping and connections
- Extraction line manifold
- Vacuum gauges and flow meters

300.5 FINAL UTILITY CONNECTIONS

The final utility connections should be made after the unit has been placed. Contractor will be responsible for making the final connections as specified in the Specifications and Drawings. All exposed service water and sewer lines shall be insulated using pipe insulation having an R-2 rating.

300.6 TELEPHONE

The local telephone company shall be responsible for making the appropriate telephone service connections. The Engineer shall be responsible for coordinating the installation of telephone service.

300.7 METHOD OF PAYMENT

Measurement and payment shall be made for the cost of all other work, materials, equipment, labor, and operations necessary for the satisfactory completion of this project, as shown on the plans and specified herein.

Complete Remediation unit installation will be measured by the job basis for furnishing, installing, connecting all piping (extraction lines, water lines, and sewer lines), electrical power, and making operational the remedial unit.

ATTACHMENT F

ELECTRICAL

SECTION 5000 ELECTRICAL

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5000.0 ELECTRICAL

5000.1 GENERAL

The Contractor shall provide all plant, labor, equipment, and materials to install and make operative all electrical systems and components as shown on the Drawings, as specified herein, or as required to make any portion of the job functional.

The latest published regulations of the National Electrical Code and the latest IEEE, IPCEA, NEMA, and ASA Standards shall be considered as included in these Specifications and shall be fully complied with except where they differ from the Drawings and Specifications, in which case the Drawings and Specifications shall take precedence.

5000.2 MATERIALS

5000.2.1 General

All materials used by the Contractor shall be fully approved by the Underwriters Laboratories for the class of service for which they are installed. All workmanship shall conform to the best practice and equipment, and accessories furnished and installed shall be complete, tested and ready to operate.

Contractor shall furnish starters, fixtures, wiring, conduits, and electrical appurtenances required. He shall also be responsible for installing all necessary reports that may be required for any electrical equipment or conduit.

5000.2.2 Conduit

All wiring shall be enclosed in conduit. All conduit, fittings, couplings, elbow, etc., shall be sheradized or galvanized rigid steel conduit.

Conduit shall be cast Feraloy with rubber gaskets.

For exposed conduit work, outlets and junction boxes with threaded compression type hubs shall be used.

Short lengths of flexible conduit shall be installed between terminals and the end of rigid conduits in full compliance with the National Electrical Code.

5000.2.3 Miscellaneous

All other items shall be in accordance with the National Electrical Code and shall be of a size and type as ordinarily employed for the purpose intended.

5000.3 WORKMANSHIP

The Contractor shall check all Drawings, which may affect the location of equipment, to avoid possible interference and permit the full coordination of all Work. Should any interference prevent the setting of fixtures, cabinets, or conductors, etc., at points shown on the Drawings, necessary minor deviations, as directed by the Engineer, shall be made without additional cost.

The Drawings showing the layout of the electrical work indicate the approximate location of the outlets, switches, receptacles, and control stations, etc.; however, they are generally only schematic and are not intended to show the exact routing of conduits, etc. The final determination of the routing shall be governed by structural, physical, etc., conditions.

Bends and offsets in the conduits shall be avoided wherever possible, but when they must be made, an approved conduit-bending machine shall be used. Conduit deformed in any way shall not be installed and shall be removed from the job.

Conduit shall cut true and square with threads cut and cleaned before reaming. Conduits shall be joined by approved conduit couplings and shall have ends butted in all cases where couplings are used. Where conduits cannot be joined by standard threaded couplings, approved unions shall be used. All couplings and unions shall be mechanically strong, and shall make perfect electric grounds between the conduits connected.

All conduit shall be installed such that no obstruction, irregularities, etc., will exist that may damage the conductors or insulation, and the Contractor shall be fully responsible for all wire placed in conduits and for any damage to other equipment or fixtures as a result of faulty electrical work.

Conduit installed outdoors or in damp locations or exposed to the weather, shall have moisture-tight fittings. Conduits below ground shall be either approved galvanized or PVC.

All equipment shall be grounded as required, and all grounding equipment and workmanship shall be as set forth in the National Electrical Code.

5000.4 TESTS

All electrical equipment shall be tested by the Contractor in accordance with the latest published regulations of the National Electric Code, the IEEE and IPCEA. The Contractor shall provide all necessary testing equipment for making these tests, and the cost of these tests shall be included in the Bid Price.

The Contractor shall notify the Engineer in advance of making all tests and shall be recorded and the results submitted to the Engineer and shall include circuit-continuity tests, insulation resistance tests, high potential tests, and operational tests.

If test results are not satisfactory, the Contractor shall make such adjustments, replacements, and changes as necessary and shall repeat the tests as necessary to demonstrate that the equipment is adequate.

5000.5 GUARANTEE

The Contractor shall guarantee to the owner that all electrical equipment and materials shall be free from defects in materials and workmanship for a period of one (1) year from the date of acceptance and that he will replace or repair any such faulty equipment at no additional cost to the owner.

5000.6 SCOPE OF THE WORK

The Work included in this section consists of furnishing all labor, equipment, supplies, and service (unless otherwise specified) and performing all operations necessary for the complete electrical systems as required by these Specifications and as shown on the Drawings, subject to these terms and conditions of the contract.

The Work shall also include the completion of electrical work not specifically mentioned, or shown, which is necessary for the successful operation of all electrical systems of the project.

All equipment shall be connected complete, whether furnished by the Electrical Contractor, or furnished by the owner through other contracts. Electrical systems shall be complete and left ready for operation, unless otherwise specifically noted.

The Work of this section shall include, but not limited to the following:

- Grounding
- Conduits & fittings
- Pull boxes & junction boxes

- Panelboards
- Wiring devices
- Wiring connections to mechanical equipment
- Electrical work incidental to the requirements of the mechanical systems
- Testing electrical equipment
- Other as may be indicated, noted or shown on Drawings, specified herein, or as reasonably implied therein

5000.7 QUALITY ASSURANCE

5000.7.1 Codes and Standards

The following Codes, Standards, Rules and Regulations, ordinances, and/or requirements shall be considered a part of these Specifications and are complied with:

National Electric Code (NFPA 70) 2005.
Life Safety Code® (NFPA 101) 2006.
OSHA Code of Federal Regulations (where applicable).
State and Local Codes, Standards, Rules and Regulations, Ordinances, and/or Requirements

The requirements of the listed codes, Standards, Rules and Regulations are minimum, and where the Drawings and Specifications indicate requirements that exceed these minimums, the more stringent requirement shall be provided. Should there be conflicts between the requirements of the Codes, Standards, Rules and Regulations, the most exacting stringent requirement shall be used.

5000.7.2 PERMITS

Contractor shall apply for and secure and pay for all permits and inspection and connection fees incidental to the electric work. Engineer will pay electric deposit for final connection.

No Work shall be concealed until approved by the local inspector and all local regulations adhered to.

Upon completion, a certificate of approval from the appropriate regulatory agency shall be furnished.

5000.8 DRAWINGS

The Drawings indicate the general arrangement of circuits and outlets, location of switches, panelboards, and other Work. Information shown on the Drawings is schematic, however, re-circuiting will not be permitted without specific approval.

Drawings and Specifications are complimentary to the other, and what is called for by one shall be as binding as if called for by both. Data presented on these Drawings is as accurate as planning can determine, but accuracy is not guaranteed and field verification of all dimensions, locations, levels, etc., to suit field conditions is directed.

The Electrical Contractor shall be responsible that his equipment, as submitted for approval, shall fit the space available. Review all architectural, structural, and mechanical Drawings and adjust all Work to conform to all conditions shown therein. The civil Drawings shall take presidency over all other Drawings. Discrepancies between different Drawings, or between Drawings and Specifications or Regulations or Codes governing the installation shall be brought to the attention of the Engineer, in writing, before the date of the bid opening. In the event such discrepancies exist, and the Engineer is not so notified, the Engineer reserves the right to exercise sole arbitration authority.

5000.9 MATERIAL REQUIREMENTS

All materials used on this job shall be new, unless specifically stated otherwise and shall be manufactured and approved for the intended service. All materials covered by local codes shall meet the requirements of those codes. All electrical materials shall have the UL stamp of approval. All electrical materials are to be UL listed.

5000.10 EXCAVATION AND BACKFILL

Electrical contractor shall perform excavation and backfill associated with his work unless otherwise noted.

Backfill shall be soil, sand, or other approved granular material, applied in layers, not exceeding eight inches in thickness as separately compacted.

Additionally, excavation and backfill shall be performed in accordance with related Specifications of the Contractor.

5000.11 CONDUIT INSTALLATION

All power and lighting wiring to be run in conduit as follows: RGS conduit to be used for exposed service riser at pole; RGS conduit to be used for all runs underground or under slab buried to depths specified in NEC; no horizontal conduit to be run in the slab, and no EMT in, under, or through the slab; the final three feet of any conduit run terminating at an adjustable or motor driven piece of equipment to be made with Flex if a dry location, or with liquid-tight flexible conduits if a wet location.

All conduits shall be of sufficient size and so installed that the required number of conductors can be installed without injury to the insulation or excessive strain put on the Contractors.

Supports for conduits shall be suited to the conditions under which they are used and shall be provided as required. Supports shall consist of approved type, one hole conduit clamps, galvanized iron straps secured by screws or bolts, or hangers of approved type. Approved expansion anchors shall be used for mounting conduit on concrete or masonry.

All conduits shall be swabbed until all moisture and grit are removed before any wires are pulled and cable installed. A suitable galvanized pull wire shall be left in each and every empty conduit continuous from outlet to outlet to facilitate the insertion of wires by others. It shall be incumbent to exercise the necessary precautions to prevent the accumulation of water, dirt, or concrete in the conduits during execution of the Work. Conduits in which water or other foreign material has accumulated shall be thoroughly cleaned. Where such accumulation cannot be removed by methods approved by the Engineer, the conduit shall be replaced.

5000.12 CONDUCTORS: INSTALLATION

Install any conductors in a single raceway simultaneously. Use specifically manufactured lubricant for wire pulling. Dress and lace wires and cables in all cabinets and panels for neat installation. Leave sufficient slack on all runs to permit secure connection of equipment.

5000.13 TESTING AND ACCEPTANCE

When the motor, equipment, and control wiring has been completed, all motors shall be subjected to a test in the presence of the owner's representative and the Contractor who furnished the equipment. The method of wiring, the connections, and the operation shall be approved by the equipment supplier. Any defect found at the time of testing shall be corrected to the satisfaction of the Contractor. Any defect developing on any portion of this equipment within the guarantee period, directly traceable to faulty material or

workmanship on the part of the Electrical Contractor, shall be made good at the Electrical Contractor's expense.

5000.14 CLEAN UP

Clean-up and remove from the premises all debris and materials not installed. Leave area in condition satisfactory to the Engineer.

5000.15 WARRANTY

The Electrical Contractor shall leave the entire electrical system in the proper working order and shall guarantee this Work for a period of one year.

5000.16 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for any of the items of Work covered in this section, and all cost thereof shall be included in the prices for the other items of Work.

ATTACHMENT G

CLEANUP, REPAIR, ETC.

SECTION 1300 CLEANUP, REPAIRS, ETC.

		PAGE
1300.1	**GENERAL**	1300-1
1300.2	**PROTECTION, REMOVAL, AND REPLACEMENT OF EXISTING FACILITIES**	1300-1
1300.3	**PROTECTION OF PROPERTY**	1300-1
1300.4	**CLEAN-UP**	1300-1
	1300.4.1 Repairs to Roads, Streets, etc.	1300-1
	1300.4.2 Repair and Maintenance or Replacement of Fences, Lawns, Driveways, etc.	1300-2
1300.5	**RESPONSIBILITY OF CONTRACTOR**	1300-2
1300.6	**MEASUREMENT AND PAYMENT**	1300-2

1300.0 CLEANUP, REPAIRS, ETC.

1300.1 GENERAL

The Scope of the Work required by this section includes cleaning up of all areas in which the contractor has worked; repairing all property (both public and private) which has been damaged, disturbed, altered, etc., by the Contractor's operations; and maintenance of necessary access to and across the work area.

1300.2 PROTECTION, REMOVAL, AND REPLACEMENT OF EXISTING FACILITIES

The Contractor shall be required to work around existing facilities, including, but not limited to, buildings, utilities, fences, roads, streets, sidewalks, etc., and will, in some cases, be required to remove and replace or reinstall such.

The Contractor shall exercise care not to damage any such property, and shall be fully responsible for any such damages, whether to the owner's property or any responsibility from such damages.

Any property removed shall be replaced such that, after replacement, it shall be similar and equal in all respects to that removed.

1300.3 PROTECTION OF PROPERTY

The Contractor shall be responsible for protecting all property, both private and public, and shall be responsible for any damages or blockage to streets, alley, adjacent property, etc., and shall be responsible for the stoppage or diversion of any surface waters, rainfall, etc., and does hereby indemnify the Engineer of any responsibilities from such damages.

1300.4 CLEAN-UP

The Contractor shall, after acceptance of the various items of work, neatly clean all his work area, including any access areas, such that after clean up, the areas will be in a neat condition and shall be in at least an equal condition as when the Contractor started his operations.

1300.4.1 Repairs to Roads, Streets, etc.

The Contractor shall repair any and all damages to roads, streets, etc., occurring as a result of his operations. All construction methods, materials, etc., shall be strictly in accordance with state, parish (county), or local specifications or codes as applicable and

the contractor shall replace or repair such to the satisfaction of the applicable governing body and the Engineer, or as specified elsewhere herein and/or as shown on the plans.

1300.4.2 Repair and Maintenance or Replacement of Fences, Lawns, Driveways, etc.

The Contractor shall repair or replace any and all damage or alterations to fences, lawns, or other property as a result of his operations. All such repair or replacement shall be performed such that the finished product shall be in a condition of at least equal to that prior to its damage or removal, all as determined by the Engineer.

The Contractor shall maintain such temporary fencing, gates, etc., as is required to protect livestock, etc., at all times during his operations and shall be fully responsible for any and all damages to such as a result of his negligence.

The Contractor shall exercise due care with respect to damage to lawns, sidewalks, driveways, entrances, etc., and shall maintain access to all property, both public and private, at all times. The Contractor shall promptly repair any such damages to the satisfaction of the Engineer.

1300.5 RESPONSIBILITY OF CONTRACTOR

Should the Contractor fail to repair or replace any damages as specified herein or should he fail to maintain access, or to protect any property, all as specified herein, within a reasonable time as determined by the Engineer, the Engineer hereby reserves the right to perform, or have performed for him, such work and deduct the cost thereof from any money due or which shall become due to the Contractor.

1300.6 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for any of the items covered in this section, and all cost thereof shall be included in the prices for the other items of work.

ATTACHMENT H

QUOTE FORM

RUSSELL PETROLEUM BULK PLANT
SYSTEM INSTALLATION - QUOTE FORM
MONTGOMERY, ALABAMA

	WALKER-HILL ENVIRONMENTAL, INC.			
Mobilization (including rental equip)	1	L.S.		$0.00
Trench in Soil (includes backfill with soil)	20	feet		$0.00
Trench in Asphalt for Effluent (includes saw cutting)	65	feet		$0.00
Trench in Asphalt (includes saw cutting)	290	feet		$0.00
Trench in Concrete (includes saw cutting)	20	feet		$0.00
Install 4-inch Piping	1,260	feet		$0.00
Install 2-inch Piping	65	feet		$0.00
Install 0.75-inch Piping (sweeping turns)	1,260	feet		$0.00
Backfill Trenches with Crusher Run	375	feet		$0.00
Install and Finish Concrete	375	feet		$0.00
Install Vaults (includes saw cutting)	7	well		$0.00
Construct Manifold and Connect Carbon Vessel	1	L.S.		$0.00
Position Remediation System and Level	1	L.S.		$0.00
Electrical Work	1	L.S.		$0.00
Install 8-Foot Wooden Fence w/ Gates	100	feet		$0.00
Barricade and Steel Plate Rental/Moving	1	L.S.		$0.00
Site Cleanup	1	L.S.		$0.00
Total				**$0.00**

Days Anticipated to Complete Work _____

Name/Title _____ **Date** _____

Signature _____

RUSSELL PETROLEUM BULK PLANT
SYSTEM INSTALLATION - QUOTE FORM
MONTGOMERY, ALABAMA

	WALKER-HILL ENVIRONMENTAL, INC.			
Mobilization (including rental equip)	1	L.S.	$6,500.00	$6,500.00
Trench in Soil (includes backfill with soil)	20	feet	$25.00	$500.00
Trench in Asphalt for Effluent (includes saw cutting)	65	feet	$40.00	$2,600.00
Trench in Asphalt (includes saw cutting)	290	feet	$40.00	$11,600.00
Trench in Concrete (includes saw cutting)	20	feet	$40.00	$800.00
Install 4-inch Piping	1,260	feet	$4.00	$5,040.00
Install 2-inch Piping	65	feet	$3.00	$195.00
Install 0.75-inch Piping (sweeping turns)	1,260	feet	$2.00	$2,520.00
Backfill Trenches with Crusher Run	375	feet	$3.00	$1,125.00
Install and Finish Concrete	375	feet	$5.00	$1,875.00
Install Vaults (includes saw cutting)	7	well	$875.00	$6,125.00
Construct Manifold and Connect Carbon Vessel	1	L.S.	$6,300.00	$6,300.00
Position Remediation System and Level	1	L.S.	$1,800.00	$1,800.00
Electrical Work	1	L.S.	$3,000.00	$3,000.00
Install 8-Foot Wooden Fence w/ Gates	100	feet	$38.00	$3,800.00
Barricade and Steel Plate Rental/Moving	1	L.S.	$2,500.00	$2,500.00
Site Cleanup	1	L.S.	$1,000.00	$1,000.00
Total				**$57,280.00**

Days Anticipated to Complete Work **10**

Eric Meitzler / Vice President — **3/26/2021**

Name/Title — **Date**

Signature

RUSSELL PETROLEUM BULK PLANT
SYSTEM INSTALLATION - QUOTE FORM
MONTGOMERY, ALABAMA

	ENVIRONMENTAL, INC.				
Mobilization (including rental equip)	1	L.S.	5200.00	5200	$0.00
Trench in Soil (includes backfill with soil)	20	feet	21.25	425	$0.00
Trench in Asphalt for Effluent (includes saw cutting)	65	feet	24.95	1621.75	$0.00
Trench in Asphalt (includes saw cutting)	290	feet	24.95	7235.5	$0.00
Trench in Concrete (includes saw cutting)	20	feet	47.50	950	$0.00
Install 4-inch Piping	1,260	feet	6.70	8442	$0.00
Install 2-inch Piping	65	feet	4.54	295.10	$0.00
Install 0.75-inch Piping (sweeping turns)	1,260	feet	1.00	1260	$0.00
Backfill Trenches with Crusher Run	375	feet	6.12	2295	$0.00
Install and Finish Concrete	375	feet	10.25	3843.75	$0.00
Install Vaults (includes saw cutting)	6	well	825.00	4950	$0.00
Construct Manifold and Connect Carbon Vessel	1	L.S.	4770	4770	$0.00
Position Remediation System and Level	1	L.S.	530	530	$0.00
Electrical Work	1	L.S.	8880	8880	$0.00
Install 8-Foot Wooden Fence w/ Gates	100	feet	46.30	4630	$0.00
Barricade and Steel Plate Rental/Moving	1	L.S.	1760	1760	$0.00
Site Cleanup	1	L.S.	1130	1130	$0.00
Total				$58,218.10	**$0.00**

Days Anticipated to Complete Work 9

TIM WALKER/SR. GEOLOGIST — 3-30-21

Name/Title — **Date**

Signature

TECHNICAL DRILLING SERVICES, INC.
QUOTE FORM
For
PPM CONSULTANTS, INC.
TANK VIEW COURT
MONGTOMERY, ALABAMA

April 8, 2021

Description	Units	Estimated Quantity	Unit Cost	Total Cost
Mobilization/demobilization	LS	1	200.00	200.00
Mobilization/demobilization	Mile	250	2.24	560.00
Mobilization/demobilization	Mile	0	1.12	0.00
Per diem (3 man crew)	Day	2	255.00	510.00
Drill, sample & abandon a soil boring*	Foot	0	22.00	0.00
Drill, sample & install a 2" PVC Type II well in soil*	Foot	0	43.00	0.00
Over-drill a 2" & reinstall as a 4" PVC Type II well in soil*	Foot	33	45.00	1485.00
Drill, sample & install a 4" PVC Type II well in soil*	Foot	60	45.00	2700.00
Drill, sample & install a type III 2" PVC well in soil*	Foot	0	95.00	0.00
Construct a concrete pad & install an 8" flush cover	Each	0	150.00	0.00
Construct a concrete pad & install a 12" flush cover	Each	0	200.00	0.00
Additional Soil Sample (frequency >5' intervals)	Each	0	20.00	0.00
Shelby tube sample	Each	0	50.00	0.00
55 Gallon Drum	Each	0	50.00	0.00
Standby rate	Hour	0	200.00	0.00
			TOTAL JOB ESTIMATE:	**$5,455.00**

*Price includes splitspoon samples taken at 5-foot intervals.

March 26, 2021

Client: PPM Consultants, Inc.

Attn: Jeff Schexnayder

Project: 3378 Tank View Court**,** Montgomery**,** AL 36108

Submitted By:
Jonathan Deputy
404.273.2864
Jonathan.deputy@gprsinc.com

GPRS appreciates the opportunity to provide this proposal. I encourage you to visit our website (www.gprsinc.com) and contact any of the numerous references listed. Our insurance certificate and W-9 can also be downloaded here. Please feel free to contact me if you have any questions, or if you need additional information.

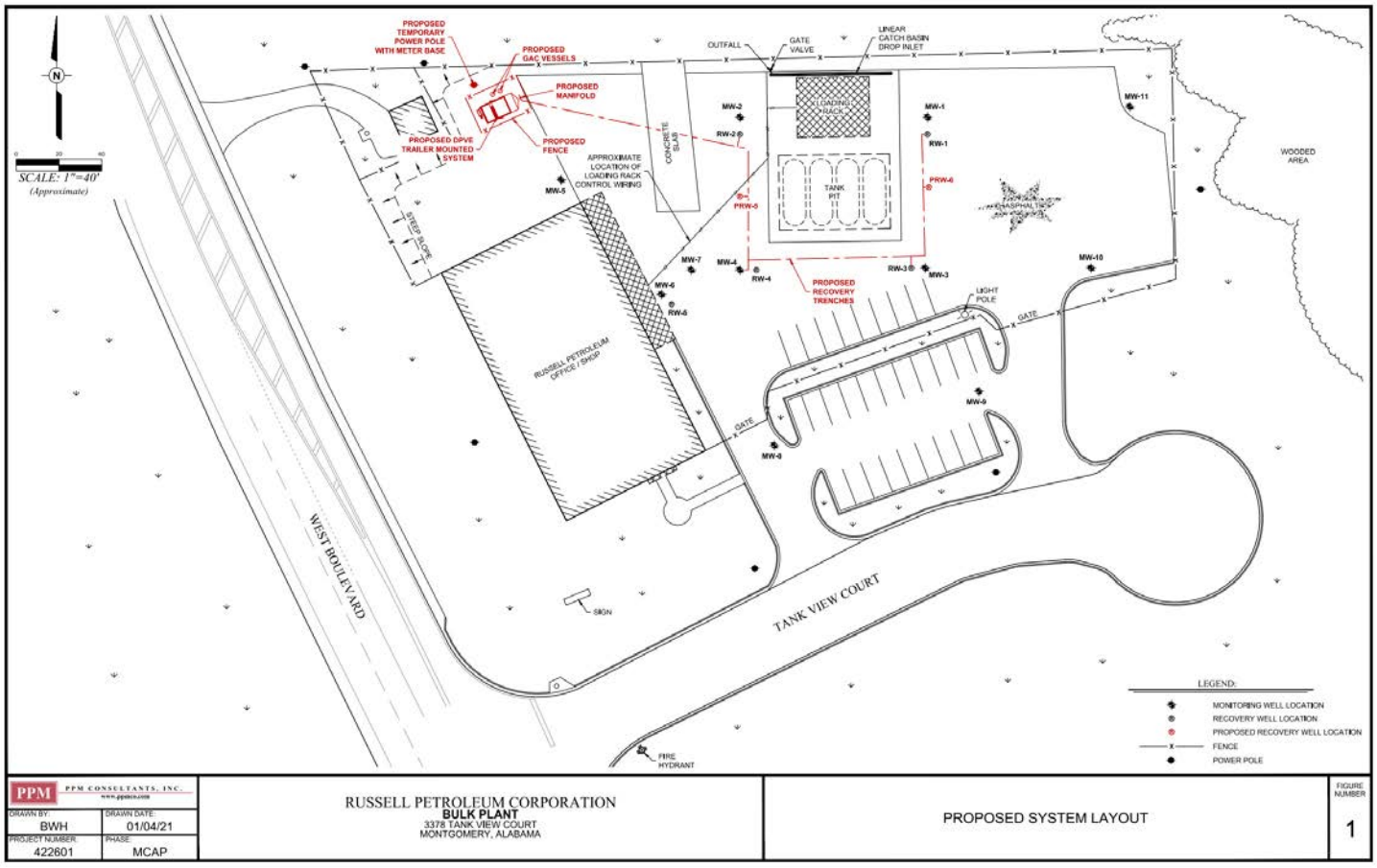
SCOPE OF WORK

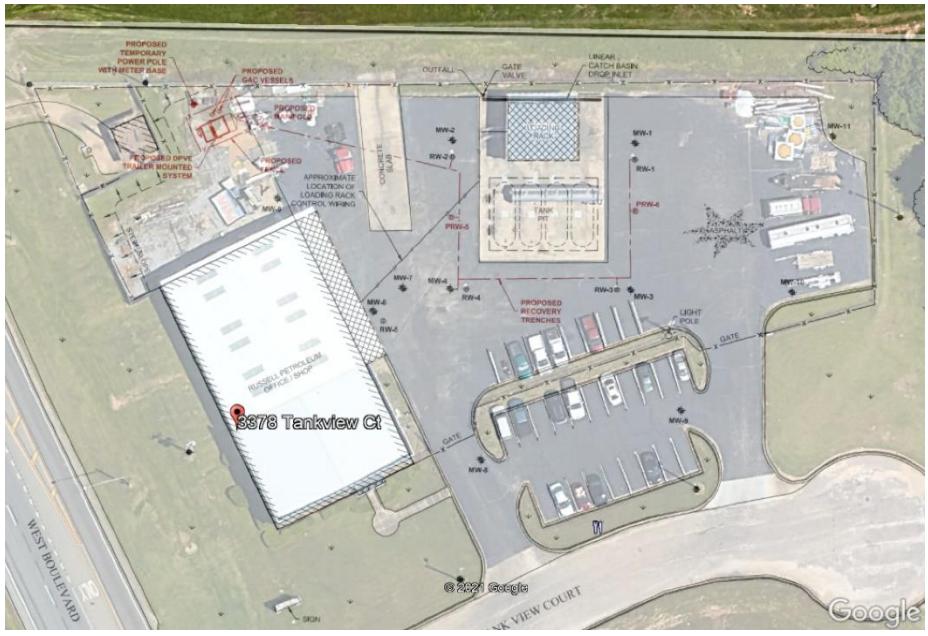
We understand the scope to be to search for underground utilities in the path of trenching for approximately 320 linear feet and also approximately 550 sq. feet at the end of the trench. We will locate within approximately 10' of each side of the proposed trenching path. We will attempt to trace any utilities for which there are structures visible from the work area. Utilities will be marked on the surface using paint, flags, or other appropriate means. The client will be responsible to provide drawings or notify GPRS of any utilities known to be entering the work area for which there are no apparent surface features or structures that are visible from the work area. The areas should be laid out, marked, and cleared of obstructions prior to our arrival in order to avoid additional charges. Please visit www.simspec.org for an overview of our industry-leading best practices that will be applied to this project.

EQUIPMENT

- **Underground Scanning GPR Antenna.** The antenna frequencies range from 250 MHz-450 MHz is mounted in a stroller frame which rolls over the surface. The surface needs to be reasonably smooth and unobstructed in order to obtain readable scans. Obstructions such as curbs, landscaping, and vegetation will limit the feasibility of GPR. The data is displayed on a screen and marked in the field in real time. The total depth achieved can be as much as 8' or more with this antenna but can vary widely depending on the types of materials being scanned through. Some soil types such as clay may limit maximum depths to 3' or less. As depth increases, targets must be larger in order to be detected and non-metallic targets can be especially difficult to locate. Depths provided should always be treated as estimates as their accuracy can be affected by multiple factors. For more information, please visit: Link
- **Electromagnetic Pipe Locator.** The EM locator can passively detect the signals from live AC power or radio signals travelling along some conductive utilities. It can also be used in conjunction with a transmitter to connect directly to accessible, metallic pipes, risers, or tracer wires. A current is sent through the pipe or tracer wire at a specific frequency and the resulting signal can then be detected by the receiver. A utility's ability to be located depends on a variety of factors including access to the utility, conductivity, grounding, interference from other utilities, and many others. Depths provided should always be treated as estimates as their accuracy can be affected by multiple factors. For more information, please visit: Link
- **Traceable Rodder.** The rodder has a copper wire encased in fiberglass. The line is pushed through accessible pipes before placing a current on the wire and the signal is then traced from the surface. The maximum traceable depth is 10' depending on the soil conditions and the maximum distance is 200'. The line can be pushed through a pipe with direct access such as a sewer line at a cleanout or a storm drain catch basin. It may not be able to be pushed through deeper pipes within manholes. Electrical conduits will not be accessed by GPRS. The signal cannot be located through metallic pipes. For more information, please visit: Link
- **GPS.** This handheld GPS unit offers accuracy down to 4 inches, however, the accuracy achieved will depend on the satellite environment at the time of collection and should not be considered to be survey-grade. Features can be collected as points, lines, or areas and then exported as a KML/KMZ or overlaid on a CAD drawing. For more information, please visit: Link

MAP OF SCAN AREA





PROJECT COSTS

SERVICE	DESCRIPTION	PRICE
SCANNING/FIELD MARKINGS	Described on Page 1	$900
MOBILIZATION	Outside of local market	Included
GPS MAP	Findings will be collected with GPS and displayed with an aerial image background. Results are not survey-grade accuracy. See example: Link	Included
TOTAL		***$900**
OPTIONAL SERVICES (INITIAL IF DESIRED)		
FORMAL REPORT	Detailed report of findings with photos, example data, and a site sketch (if applicable) in addition to the basic summary report that is included with every job. See example: Link	Initial___ $200
CAD DRAWING	Findings will be drafted in CAD with an aerial image background. A linework version will also be provided if the client provides an existing drawing. Results are not survey-grade accuracy. See example: Link	Initial___ $600

* This price assumes that we will be given access to perform the work during normal, weekday business hours (7am-5pm).
* As-builts and any other applicable drawings should be made available to GPRS prior to the project if possible.
* A thorough utility search can only be completed if GPRS is given access to all utility structures, interior and exterior. This service is never a replacement for the use of the state One Call system (811).
* All of our technicians have OSHA-10 safety training or greater. Site-specific safety training is not included in this quote. Please notify us if this project requires additional safety training.

This proposal is subject to the General Terms and Conditions for Services of Ground Penetrating Radar Systems, LLC posted at Link (the "Terms and Conditions") and is hereby incorporated by reference into and made a part of this proposal. Customer acknowledges it has read and agrees to be bound by such Terms and Conditions. In the event of any conflict between the terms of this proposal and the Terms and Conditions, the Terms and Conditions will prevail. Customer also acknowledges that Ground Penetrating Radar Systems, LLC may, from time to time and at its discretion, modify the Terms and Conditions and Customer agrees to be bound by such Terms and Conditions as modified.

PROPOSAL-SPECIFIC TERMS & CONDITIONS

1. Customer agrees to meet and perform all requirements described in this document and has fully read and understands all items listed within this document.
2. It is the customer's responsibility to prepare the site for scanning, including clearly identifying areas to be scanned, securing access to all areas required for scanning, and keeping these areas clear and free of obstructions. Delays caused by customer's failure to do so may result in an increased price.
3. GPRS does not conduct an investigation, analysis, or interpretation of soil composition, soil/concrete conditions, or geophysical, geological, engineering, or land surveying information. Customer acknowledges it understands that we are merely reporting retrieved data and that we do NOT provide geophysical, geological, engineering, or land surveying services. Customer should contact a professional in those fields if such services are needed.
4. If for some reason the technician arrives on site and the work is cancelled there will be a charge of $500.00 per requested technician.

ACCEPTED AND AGREED:

Billing Company Name: _____

Billing Address: _____

Company Phone/Email: _____ PO#: _____ Job#: _____

Print Name: _____ Signature _____ Date: _____

APPENDIX F – DPVE MONITORING FORMS

DPVE FIELD MONITORING FORM

Russell Bulk Plant	**Project Number: 422601-OM**
Montgomery, Alabama	**Well Configuration:**
Date:	**Time of Arrival:**
Personnel:	**Status of System:**

SITE RESPONSE DATA:

Observation Point	SYSTEM OPERATING			SYSTEM DOWN			PNEUMATIC
	DTW	DTP	PT	DTW	DTP	PT	Induced Vacuum
MW-1							
MW-2							
MW-3							
MW-4R							
MW-5							
MW-6							
MW-7							
MW-8							
MW-9							
MW-10							
MW-11							
RW-1							
RW-2							
RW-3							
RW-4							
RW-5							
RW-6							
RW-7							

RECOVERY WELL DATA:

VOC Readings ISOLATED (Y or N) :____

Recovery Well	Online (Y/N)	VOC's (ppmv)	Oxygen (%)
RW-1			
RW-2			
RW-3			
RW-4			
MW-4R			
RW-6			
RW-7			

DPVE FIELD MONITORING FORM

Russell Bulk Plant	**Project Number: 422601-OM**
Montgomery, Alabama	**Well Configuration:**
Date:	**Time of Arrival:**
Personnel:	**Status of System:**

Control Panel Data:

Time of Reading	System Runtime Meter Reading (Hrs)	Stirpperator Blower Pressure (in-wc)	Alarms Present? (Y/N)	Identify Alarms

Water Effluent

Effluent Sample Collected (Y/N)	pH (6.0 - 8.5)	pH Within Range (Y/N)	Temperature (°F)	Sample Time	Color / Odor	BTEX/MTBE OIL & GREASE, pH

Pump Data

Ambient Temp (°F)	LRVP Inlet Temp (°F)	LRVP Outlet Temp (°F)	LRVP Oil Level OK (Y/N)

AIR EFFLUENT DATA:

AWS-2 Stack

LRVP Run Time (hrs)	AWS-1 Vac (in-Hg)	Air Temperature (°F)	Differential Pressure (in-wc)	Total VOCs (ppmv) / LEL (%)	Oxygen (%)

Stripperator (Main Stack)

Time of Reading	Differential Pressure (in-wc)	Total VOCs (ppmv) / LEL (%)		Oxygen (%)	Air Temperature (°F)	Stipperator Discharge Meter Reading (gals)

Carbon Vessals

Pre-Carb/ Heat Exchanger:	Air Temperature (°F) (Pre-H.T. Unit)	Differential Pressure Pre-H.T. (in-wc)	Total VOC's/LEL Pre-H.T. (ppmv)	% Oxygen Pre-H.T.
Post Carb	Temperature (°F)	Differential Pressure Pre-H.T. (in-wc)	Total VOC's/LEL Post-Carbon (ppmv)	% Oxygen Post-Carbon

Miscellaneous Data:

RKI Calibration Gas	Recovery Well Configuration at Departure	Electric meter (KwH)

APPENDIX G – TECHNICAL SAMPLING AND ANALYSIS QA/QC PLAN

PPM
CONSULTANTS

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 PROCEEDURES

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 PROCEEDURES

After the depth to water is measured, each well is purged of at least three to 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), and MTBE 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, three to 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 Deconamination

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 collection
- 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
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Name	Signature	Affiliation	Date
Name	Signature	Affiliation	Date

APPENDIX H – SITE-SPECIFIC HEALTH AND SAFETY PLAN

HEALTH, SAFETY, SECURITY AND ENVIRONMENTAL PROGRAM

HEALTH AND SAFETY PLAN

RUSSELL PETROLEUM CORPORATION
BULK PLANT
3378 TANKVIEW COURT
MONTGOMERY, ALABAMA
MONTGOMERY COUNTY

PPM PROJECT NO. 422601-MCAP

APRIL 16, 2021

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

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HEALTH, SAFETY, SECURITY AND ENVIRONMENTAL PROGRAM

PROJECT CHECKLIST – HASP AND JSA

Project/Task and Corresponding Job Safety Analysis:

- ☐ Asbestos Inspection
- ☐ Carbon Change-Out
- ☐ Chemical Injection
- ☒ DPVE/SVE/Air Sparge Installation
- ☐ DPVE/SVE/Air Sparge Demobilization
- ☐ Drilling/Probing [Hand Auger]
- ☒ Drilling/Probing [Heavy Equipment]
- ☐ Mobile Vacuum Event [Emergency Response]
- ☐ Ozone System Installation
- ☐ Ozone System Demobilization
- ☐ Remediation System Modification* [specify below]
- ☐ Spill Bucket Replacement/Closure
- ☒ Trenching/Excavation
- ☐ UST Pull/Closure
- ☐ Well Plugging and Abandonment [Grout In Place]
- ☐ Well Plugging and Abandonment [Overdrilling]
- ☐ Other* [specify below and contact HSD with details]

Hazard Assessment:

Chemical Hazards

- ☐ Acids [HCl, HNO_3, H_3PO_4, H_2SO_4]
- ☐ Activated Carbon
- ☒ Alconox®/Liquinox®/Isopropanol
- ☐ Asbestos
- ☐ Bases [NaOH/KOH/$CaOH_2$/NH_3/Na_2CO_3]
- ☐ Calibration Gas [Meth/Hex/Isobutyl]
- ☐ 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 [As/Cd/Cr/Cu/Pb/Hg/Zn]
- ☒ Methyl-Tertiary Butyl Ether [MTBE]
- ☐ Oil/Lubricating Oils
- ☐ Oxidizer [NXT/ORC®/ORC Advanced®]
- ☐ Oxidizer [RegenOx A/B™]
- ☐ Ozone
- ☐ Ozone/Hydrogen Peroxide
- ☐ Pesticides [Industrial/Agricultural]
- ☐ Polychlorinated Biphenyls [PCB]

- ☐ Other C/P/B Hazard* [contact HSD]
- ☐ Unknown C/P/B Hazard* [contact HSD]

Physical/Biological Hazards

- ☐ Aerial Lifts
- ☒ Biological
- ☐ Combustion/Flammability
- ☐ Compressed Gas [cylinders]
- ☒ Concrete [coring/cutting]
- ☒ Cuts/Lacerations
- ☒ Driving
- ☐ Drowning
- ☐ Electrical
- ☐ Elevated Working Surfaces
- ☐ Forklift/Crane [truck-mount]
- ☒ Hand/Power Tools
- ☒ Heat/Cold Stress
- ☒ Heavy Equipment
- ☐ Illumination
- ☐ Ladder Safety
- ☒ Material Handling [back safety]
- ☒ Noise
- ☒ Repetitive Motion
- ☐ Scaffolding/Scissor Lifts
- ☒ Slips/Trips/Falls
- ☒ Traffic or Secluded Sites
- ☒ Uneven Working Surfaces
- ☐ Unstable Soils/Cave-Ins

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
- ☐ Protective Suits [tyvek]*
- ☐ Reflective Shirt/Vest
- ☐ Respirator [air-purifying]*
- ☐ Respirator [supplied air]*
- ☒ Safety Glasses
- ☒ Steel-Toed Boots
- ☐ Other PPE* [contact HSD]

Documentation Required:

- ☒ Ambient Air Monitoring
- ☐ Crane Operator Inspection
- ☐ Forklift Safety Inspection
- ☒ HASP Acknowledgement Form
- ☐ Incident Report/Log [as applicable]
- ☒ Subsurface Clearance Checklist
- ☒ Tailgate Safety Meeting Log
- ☒ Trench/Excavation Inspection

Return Pages in the Following Order:

- HASP Coverpage
- Project Checklist
- Emergency Summary Information and Maps
- Personnel Roles and Responsibilities, p.3
- One Call (if electronic copy)
- Subsurface Clearance Checklist
- Ambient Air
- Trench/Excavation Checklist
- HASP Acknowledgment
- Tailgate Logs

HASP Generated By [Print Name]: Brandy Hall Date Generated: 4/16/21

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: Jackson Hospital Phone: (334) 293-8000

Address: 1725 Pine Street City, State: Montgomery, AL Zip: 36106

Directions and Map: See attached (next page) Distance: 7.3 mi Time: 12 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	318-323-7270	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]	David Durbin	225-293-7270	225-603-8050
Safety Supervisor [Birmingham]	Brandy Hall	205-836-5650	205-913-5471
Safety Supervisor [Jackson]	Regan Byrd	601-956-8233	601-862-8693
Safety Supervisor [Mobile/Pensacola]	Kay Williams	251-990-9000	251-753-4455
Safety Supervisor [Monroe]	Matt Colvin	318-812-3467	318-355-6415
Safety Supervisor [Orlando]	Amy Guilfoyle	407-240-1127	941-730-5600

Note: District and Project Managers can be contacted by using the office phone numbers provided for each location.

Designated Break and Evacuation Locations:

Personal protective equipment is required at all times within the work zone and can only be doffed 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:

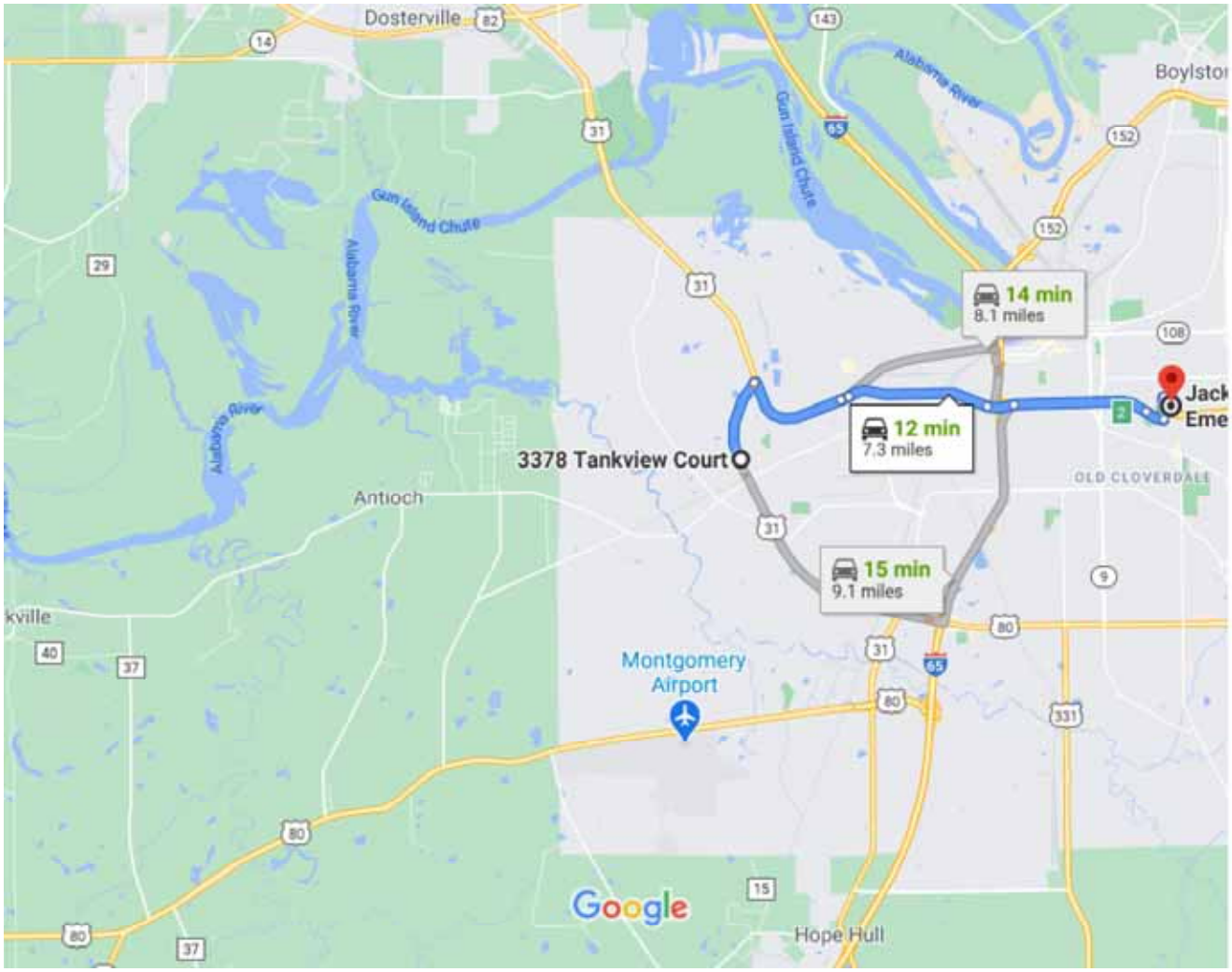
Break Area: _____ Evacuation Area: _____

Google Maps

3378 Tankview Court, Montgomery, AL to Jackson Hospital: Emergency Room

Drive 7.3 miles, 12 min

Cancel Print



Map data ©2021 2 mi

3378 Tankview Ct

Montgomery, AL 36108

4 s (108 ft)

10 min (6.7 mi)

at the 1st cross street onto West Blvd

1.1 mi

3. Turn right onto Birmingham Hwy

1.4 mi

4. Keep right to stay on Birmingham Hwy

492 ft

5. Continue onto Day St

Pass by Subway (on the left in 0.5 mi)

1.8 mi

6. Keep left at the fork, follow signs for

0.3 mi

1.7 mi

0.2 mi

3 min (0.5 mi)

0.3 mi

0.1 mi

0.1 mi

Destination will be on the right

59 ft

Jackson Hospital: Emergency Room

1725 Pine St, Montgomery, AL 36106

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

1.0 INTRODUCTION

1.1 COMPANY COMMITMENT

PPM is committed to the safety and wellbeing of its employees and subcontractors. Our mission to exceed client expectations 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 field activities.

1.3 APPLICABILITY

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. 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.

1.4 EXCEPTIONS

This general report template has been prepared specifically for common chemicals and tasks associated with routine company-related field processes as outlined within the Project Checklist – HASP and Job Safety Analysis (JSA) form. Any project involving a chemical or field-related task not otherwise specified within this form is considered non-routine and is not covered by the provisions of this written plan. HASP requests and proposed scope-of-work for non-routine chemicals and/or job-related tasks must be sent directly to the Health and Safety Director (HSD) so that a site-specific HASP can be prepared. When possible, please allow five days for preparation.

Common, repetitive field tasks such as groundwater monitoring, operation and maintenance of remediation systems, environmental site assessments, mobile vacuum events and other similar tasks that do not require exposure monitoring will be addressed within a separate HASP prepared specifically for these activities.

1.5 MANAGEMENT OF CHANGE

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. The primary Safety Principal-in-Charge (PIC) is Shawn Ivey [Monroe], and the alternate Safety PIC is Zane Hood [Birmingham]. Each is responsible for authorizing HSSE policies and procedures set forth by the safety department and establishing the final provisions when discrepancies are noted.
- **Health and Safety Director**. The HSD is responsible for proposing and generating HSSE policy/procedures under the advisement of the Safety PIC, communicating these provisions to all affected workers within the organization, and ensuring uniform implementation of these provisions throughout all branch offices.

- **District Manager**. Each branch office has a designated District Manager who is responsible for ensuring that HSSE policies and procedures are implemented by the workers assigned to his or her office. The District Manager 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 District Manager. 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 task delegated by the HSD. The SS is directly accountable to the HSD for his/her supervisory role and is also accountable to his/her District Manager regarding the office's safety performance.
- **Project Manager**. Project Managers are responsible for all aspects of their assigned projects, including the safety and wellbeing of the workers assigned to their jobsite. Project Managers establish 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. Project Managers are directly accountable to their District Managers for the job-related safety aspects.
- **Site Safety Officer**. A site safety officer (SSO) is assigned to each field project. An alternate SSO is 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 with all affected personnel, subcontractors, client, and regulatory officials
  - → Ensure site security and preventing unauthorized entry to the work zone
  - → Ensure subsurface utilities have been marked and appropriate Principal approval has been obtained for exclusion 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
  - → Report to management any incident or near-miss involving worker injury/illness, property damage, contact with overhead or subsurface utilities, chemical/product releases or auto accident

  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
Michael Ellison	District Manager
Jeff Schexnayder	Project Manager
Jeri F. Thrasher, CSP	Health and Safety Director
Brandy Hall	Safety Supervisor (SS)
Andrew Paradis/Connor Gaston	Site Safety Officer (SSO)
Jeb Burttram/Roman Delacruz	Alternate SSO
Technical Drilling/Walker Hill Environmental	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, Principal exemption is required).

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 the OSHA 29 CFR 1910.120 standard. 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, 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

A hazard is defined as a "situation that poses a level of threat to life, health, property or environment." For purposes of this written plan, hazards have been categorized in four ways – chemical, physical, biological and environmental. Hazards further outlined within the following sections are those that could not otherwise be eliminated or substituted as part of the risk assessment process. The control measures discussed throughout the following sections are required to mitigate the hazards posed to workers in order to ensure that worker safety and health is maintained.

3.1 CHEMICAL HAZARDS AND CONTROLS

PPM is an environmental consulting firm that specializes in environmental spill response, remediation and general regulatory compliance. 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 bases/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, 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 Nano Xothermal Technology (NXT)

NXT is process used to treat chemical contamination. It is a system comprised of two compounds: Klozur® (sodium persulfate) and dry caustic potash (potassium hydroxide). This material can either be injected into the subsurface or can be placed inside open excavations as part of in-situ remediation. This material is a white solid with a pH range that is undetermined but anticipated to be on the caustic side. Symptoms of exposure include: skin, eye and respiratory irritation, itching, redness and burning; can cause permanent eye damage.

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 (including ozone), acids, heavy metals, etc. (see safety data sheet for complete list of incompatibles).

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).

3.1.2.5 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.

3.1.3 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**. Also called 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**. Also called 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**. Also called 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 moist 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.

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. Wet cement can also cause skin burns so workers should wear goggles and aprons or long-sleeved clothing when mixing cement.

Control Measures: Soils should be wet and kept moist 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.

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.

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. Thoroughly wash exposed skin and hands upon completion of handling to avoid skin/eye irritations.

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.

- **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.

- **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.

- **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. Thoroughly wash exposed skin and hands upon completion of handling to avoid skin/eye irritations.

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.

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.

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.

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 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 Shawn Ivey or Zane Hood, Regional Principals. Due to the increase in safety precautions, a site-specific HASP must be generated by the Health and Safety Director, which may require additional time to prepare. Never open a site 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 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.

3.2.3 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.

3.2.4 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.

3.2.5 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 drivers 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 exclusion zones (*any area within 10-foot circumference of UST pit)* or obtain principal approval when there are no other alternatives to avoidance
- Follow clearance procedures for exclusion zones, critical zones (*any area within 10 feet of furthest edge of any fuel dispenser, product distribution lines, or aboveground electrical utility; entire area between UST pit and dispenser islands; and/or any area within 10 feet of suspected subsurface utilities/structures*), and non-exclusion zones (*any area not otherwise defined as exclusion or critical*).

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 Subpart M). Instead falls from ladders are outlined within Subpart X of 29 CFR 1926.1053, which does not require the use of personal fall arrest system when working at elevations in excess of 4 feet. 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. **Note: PPM purposely chooses to reference the most stringent safety measures under construction industry standards, while additionally enforcing the more stringent general industry height requirement of 4 feet. This is an overlap of standards but provides the greatest level of worker protection.*

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, and industrial compliance; specifically air compliance.

Control Measures: Falls from ladder use are exempted from the fall protection standards (29 CFR 1926 Subpart M). Instead falls from ladders are outlined within Subpart X of 29 CFR 1926.1053, 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. **Note: PPM purposely chooses to reference the most stringent safety measures under construction industry standards, while additionally enforcing the more stringent general industry height requirement of 4 feet. This is an overlap of standards but provides the greatest level of worker protection.*

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, knuckle-boom truck-mounted crane, 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
- 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 scissor lifts is strictly prohibited. Company personnel are not appropriately trained for working with aerial and scissor lifts and are therefore not authorized on these machines without additional safety training and approval from the safety department. Workers should be aware that 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.

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: When available, workers should carry sound level meters to assess noise levels. 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 strictly prohibited. Company personnel are not appropriately trained for working with scaffolding systems and are therefore not authorized on these systems without additional safety training and approval from the safety department. 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. Carbon change-outs, 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). 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: 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

Carbon change-outs, 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. 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). 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.

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:

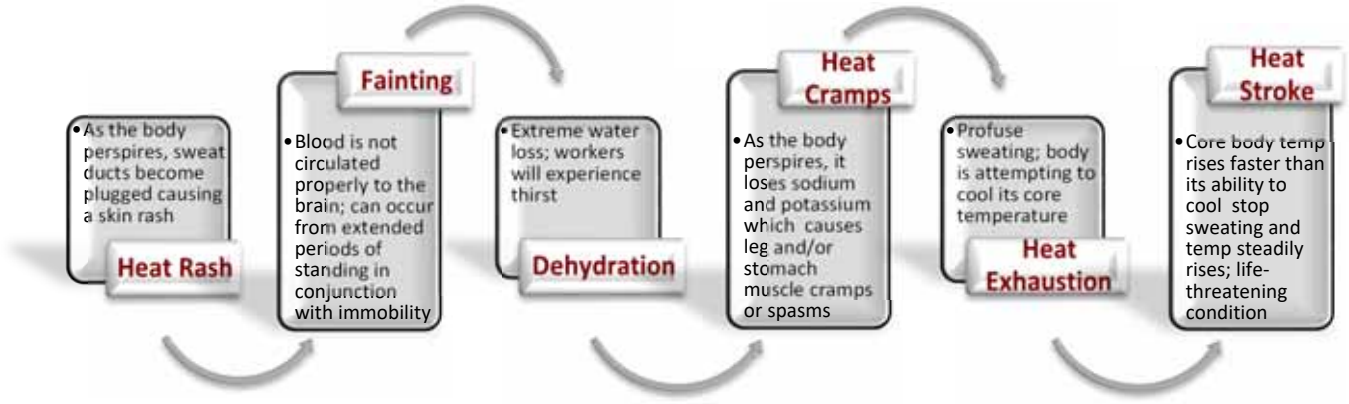
- Perform visual inspections prior to start of work daily and conduct additional inspections warranted by changes in site conditions.
- Provide onsite competent person with the knowledge and authority to correct any noted hazards derived from daily visual inspections.
- Keep all tools, materials, equipment 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. *When PPM does not incorporate these engineering controls, under no circumstances must any individual enter a trench/excavation with a depth of 4 feet or greater. 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:



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 frostbite, trench foot, chilblains and hypothermia.

COLD STRESS	DEFINITION	SYMPTOMS OF EXPOSURE
Trench foot	Injury to the feet when immersed in water for prolonged period of time; wet feet lose heat and blood vessels constrict causing cells to die due to lack of oxygen	Reddening of skin, numbness, leg cramps, swelling, tingling pain, blisters or ulcers, bleeding under skin, gangrene (foot turns dark purple, blue or gray)
Chilblain	Exposures to temperature slightly above freezing to 60°F causing damage to capillary blood vessels in skin; damage is permanent and returns with additional exposures	Redness and itching mostly on cheeks, ears, fingers and toes, possible blistering, inflammation, possible ulceration (severe cases)
Frostbite	Injury caused by freezing of the skin (nose, ears, cheeks, chin, fingers or toes); can lead to amputation	Reduced blood flow to hands/feet numbness, tingling or stinging, aching, bluish or pale, waxy skin
Hypothermia	Body is losing heat faster than it can be generated producing an abnormally low body temperature, which impairs the brain and makes a person unable to think clearly or move well; is extremely dangerous because a person may not realize it is happening	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.
- West Nile (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 nearby 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.

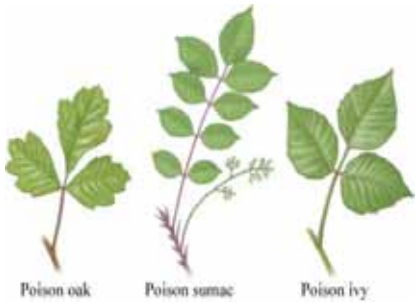
Sites located in populated areas may have wandering animals. Pets may be trained to attack when approached, may have mange (parasitic skin diseases) or may carry other diseases.

Control Measures: When working in or around bodies of water, workers must be aware of any indicators of alligator presence, which require that workers immediately evacuate the area. General awareness and caution must be used when working in highly vegetative areas and workers must 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.

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.
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). Workers must be aware that in order to wear respiratory protection, they 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	--

CONSTITUENT	TOXICITY					FIRE
	ACTION	PEL/TLV	STEL	CEILING	IDLH	LEL-UEL
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®	--	--	--	--	--	--
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	--

CONSTITUENT	TOXICITY					FIRE
	ACTION	PEL/TLV	STEL	CEILING	IDLH	LEL-UEL
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/m^3 – 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.

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

While the use of protective clothing/equipment provides protection against chemical and physical hazards, there are additional disadvantages associated with its usage. Personal protective equipment can be heavy, bulky and uncomfortable, slow down the work process and/or increase the degree of heat stress put on a worker. Therefore, the use of personal protective equipment is always a last resort. Only when other alternatives such as engineering, administrative or work practice controls fail to eliminate or reduce a hazard to an acceptable level will the use of protective clothing and/or equipment become a consideration.

5.1 PROTECTIVE CLOTHING AND EQUIPMENT

5.1.1 Head Protection

In accordance with 29 CFR 1910.135, the company provides head protection from impact and penetration hazards posed by falling objects, projectiles, and shock/burn hazards posed by contact with electricity. While OSHA requires that head protection be provided, it is the American National Standards Institute (ANSI) that sets criteria for head protection. ANSI Z89.1-2014 separates protective helmets into different types and categories as follows:

HARD HAT TYPES	
Type I – hard hat that provides protection from impact to the top of the head only	Type II – hard hat that provides protection from impact to the top and sides of the head

CLASSIFICATION	PROTECTION PROVIDED	
Class G [Formerly Class A]	G – General; intended to reduce the force of impact of falling objects and reduce the danger of contact with exposed low-voltage electrical conductors; proof-tested at 2,200 volts of electrical charge	
Class E [Formerly Class B]	E – Electrical; intended to reduce the force of impact of falling objects and reduce the danger of contact with exposed high-voltage electrical conductors; proof-tested at 20,000 volts	
Class C [Formerly Class C]	C – Conductive; intended to reduce the force of impact of falling objects, but offer no electrical protection	

PPM's preference for hard hat selection is ANSI Z89.1-2014 approved Type II, Class E hard hat with ratchet suspension; however, Type I and Class G hard hats are permitted for use. PPM prohibits the use of Class C hard hats because they provide no protection against electrical hazards.

5.1.2 Eye and Face Protection

In accordance with 29 CFR 1910.133, the company requires each affected employee to use appropriate eye and/or face protection when exposed to hazards from particulates, flying particles (projectiles), molten metal, liquid chemicals, chemical gases, vapors, or fumes, metal shavings, and/or potentially injurious light radiation. PPM requires the use of safety glasses with side-shield protection for all outdoors field activities. Workers are permitted to use prescriptive lenses so long as side-shield protectors are used. Safety glasses may be upgraded to goggles or face shields when mixing chemicals, when dealing with chemical splash hazards, or when working in extremely dusty environments that cannot otherwise be addressed through the use of controls. Face shields may also be required when working with projectiles. Eye and face protection must be ANSI Z87.1-2010 approved.

5.1.3 Hand Protection

In accordance with 29 CFR 1910.138, the company requires workers to use appropriate hand protection when their hands are exposed to hazards such as those from skin absorption of harmful substances, severe cuts or lacerations, severe abrasions, punctures, chemical burns, thermal burns, and harmful temperature extremes. PPM bases this selection on an evaluation of the performance characteristics of the hand protection relative to the task(s) to be performed, conditions present, duration of use, and the hazards/potential hazards identified. The following gloves are recommended for typical company tasks:

- Nitrile gloves – good for working with oil and grease and can also protect against some dry chemicals; they are disposable and easy to use; this is the most commonly used glove provided by the company

- Neoprene, vinyl [PVC] and rubber gloves – also good for working with chemicals such as janitorial or cleaning products, fuels, oils and grease; can be purchased as disposable or reusable; neoprene is preferred when working with acids or bases

- Butyl or laminate gloves – good for working with ketones
- Latex gloves – good for working with bloodborne pathogens such as viral and bacterial agents; nitrile gloves will work as well so latex is not commonly provided by the company

- Cotton or leather gloves – good for material handling of heavy and abrasive objects; leather is sturdy and can resist splinters from wood products and provides some protection against heat
- Cut-resistant gloves – good when working with sharp or cutting objects; there are various brands of cut-resistant gloves including Kevlar®, Magid® and Ansell®

Hand protection must be ANSI/ISEA 105-2011 approved. *Note: ISEA is the International Safety Equipment Association*.

5.1.4 Foot Protection

In accordance with 29 CFR 1910.136, the company requires workers to use protective footwear when working in areas where there is a danger of foot injuries due to falling or rolling objects, sharp edges, slippery surfaces, and unlevel walking/working surfaces. PPM requires ASTM F2412/F2413-approved steel-toed footwear for all field sites. *Exception: Rubber boots or other footwear may be used when workers collect samples within body of water or when workers are required to enter a boat*. Composite-toed shoes are permitted when they meet the ASTM testing requirements for compressive strength.

5.1.5 Skin Protection and Visibility

Typical PPM jobsites warrant level D protective clothing, which consists of long pants and short or long-sleeved shirt. Other clothing may be required based on the hazard exposure and is outlined below:

- Fire-retardant clothing – required by clients within the oil and gas industry to access their facility
- High visibility clothing – reflective, high visibility company-provided t-shirts or DOT Class II/III reflective high visibility safety vests are required when working in/nearby active traffic and when working on/nearby roadway right-of-way

Special considerations may require that full-body protective suits such as Tyvek®, Saranex™, or Tychem® be worn. The need for this type of equipment requires pre-planning by the safety department and management and must be discussed during the proposal phase of a project. Skin protection must be ANSI 103-2010 approved.

5.1.6 Hearing Protection

Preservation of hearing is of utmost importance. Most of the hearing lost cannot ever be recovered. Through the aging process, workers will be prone to natural hearing loss. Therefore, it is the company's responsibility to distinguish between natural and work-related hearing loss and to ensure that workers exposed to noise levels ≥85 dB are provided with hearing protection. The most common form of hearing protection provided to workers is the earplug. Earplugs come in various shapes and sizes and are relatively inexpensive so they can

be tailored to the comfort preferences of the individual. Workers who do not respond well to the use of earplugs will be provided canal caps or ear muffs upon verbal request to the safety department. Hearing protection must be ANSI S12.68-2007 approved.

5.1.7 Respiratory Protection

In accordance with 29 CFR 1910.134, the company provides respiratory protection when workers are exposed to hazardous materials at triggered regulatory threshold limits. Only those workers who have been medically cleared by a physician are permitted to wear respiratory equipment. Workers that have been medically cleared must also be fit-tested prior to respirator use. Documentation must be received by the safety department before a worker is approved for respiratory use.

Because workers are not required to work with extremely hazardous materials, with unknowns or within oxygen-deficient environments, supplied-air respiratory equipment is not applicable to current company processes. PPM purchases a variety of National Institute for Occupational Safety and Health (NIOSH)-approved air-purifying half-mask and full-face respirators to be worn when ambient chemical concentrations trigger company-assigned action limits. It should be noted that because most field work is conducted in outdoor, open environments, respiratory protection is generally not required.

5.1.8 Electrical Protective Equipment

Insulating equipment such as rubber insulating blankets, rubber insulating matting, rubber insulating covers, rubber insulating line hose, rubber insulating gloves, and rubber insulating sleeves is required when working on or near energized equipment and/or devices. Insulating equipment must be capable of withstanding, without failure, the voltages that may be imposed upon it. Insulating equipment must be proof-tested and inspected in accordance with the provisions outlined within 29 CFR 1910.137. Use of damage or defective insulating equipment is strictly prohibited!

5.1.9 Life Saving Equipment

In accordance with 29 CFR 1926.106, employees working over or near water, where the danger of drowning exists, must be provided a U.S. Coast-Guard-approved life jacket or buoyant work vest. Where applicable, ring buoys with at least 90 feet of line must be provided and readily available for emergency rescue operations. The distance between ring buoys cannot exceed 200 feet. In addition, at least one life-saving skiff must be immediately available at locations where employees are working over or adjacent to water.

5.2 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

5.3 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	FIRE RETARDANT CLOTHING[9]
Asbestos inspections or sampling	X	X	X	X				X			
Carbon change-out	X		X	X	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
2 – Safety glasses must be 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 – Fire-retardant clothing is a client-specific requirement; clients within the oil/gas industry generally require fire-retardant clothing

5.4 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.

6.0 SITE ACCESS, CONTROL, AND DECONTAMINATION

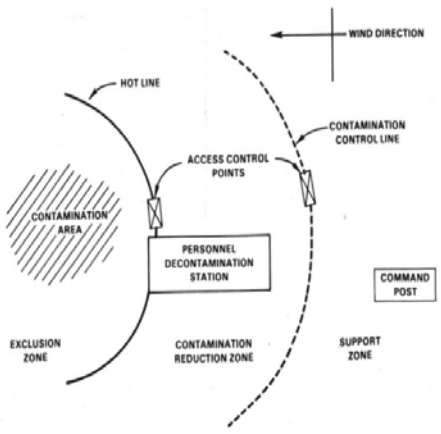
6.1 SITE ACCESS

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

Each jobsite must be assigned 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 exclusion zone. 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 exclusion zone, 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.

HAZARD CATEGORY	HAZARD	RESPONSE
Physical	Heat stress	Apply warm, moist 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.

***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.

The GHS labeling system will replace the HMIS labeling system previously used by the company. In general, HMIS labels may still be used in conjunction with, or as a component of, the GHS labeling system. The international requirements for HMIS labeling are similar to those developed by the American Coatings Association with the exception that the degree of

hazard severity as indicated by the numbering system is reversed (example: under the old system the higher the number, the higher the hazard severity; under international GHS requirements, the lower the number, the higher the hazard severity). Therefore, workers may continue to see HMIS labels as part of the GHS labeling system when used by other companies; however, PPM will discontinue the use of HMIS labels moving forward.

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

APPENDIX I – COST PROPOSAL NO. 26 – EQUIPMENT PURCHASE

Alabama Tank Trust Fund
Cost Proposal
Part I

I.1 Cost Proposal Information:

Cost Proposal Number:	Date of Cost Proposal (mm/dd/yy):
26 422601-EQP	5/3/2021
UST or AST Incident Number:	Facility I.D. Number:
UST12-11-03	14249-101-005185

I.2 Facility Information

Facility Name:	Bulk Plant Montgomery
Facility Address:	3378 Tank View Court Montgomery, Alabama

I.3 Owner Information:

Owner Name:	Russell Petroleum Corporation
Owner Address:	P.O. Box 250330 Montgomery, Alabama 36125
Employer Tax Number (IRS):	63-0644370

I.4 Response Action Contractor Information:

Approved Response Action Contractor Name:	PPM Consultants, Inc. 5555 Bankhead Highway Birmingham, Alabama 35210
Approved Response Action Contractor Address:	
Project Contact:	Jeffrey M. Schexnayder, P.G.
Project Contact Phone #:	205-836-5650
Project Contact E-mail:	jeff.schexnayder@ppmco.com
Employer Tax Number (IRS):	72-1256279

Cost Proposal Number: 26

Facility Name: Bulk Plant Montgomery

I.5 Activity Information:

Indicate below the activities for which the cost proposal is submitted:	
	Site Stabilization/Initial Abatement
	Preliminary Investigation
	Secondary Investigation / Additional Well Installation
	Alabama Risk Based Corrective Action (ARBCA)
	Groundwater Sampling
	Free Product Removal/Mobile Enhanced Multiphase Extraction (MEME)
	Corrective Action Plan Evaluation
	Develop Corrective Action Plan
X	Corrective Action
	Stockpile Sampling / Management / Disposal
	Provision of Alternate Water Supply
	Pilot Test
	Monitoring/Recovery/Injection Well Abandonment
	System Decommissioning/Removal

Activities/Other/Brief Summary of Activities:

DPVE System purchase

Provide proposed completion date for this phase of work activities:

6/30/2021

Provide projected date of cleanup completed:

12/31/2023

I.6 Subcontractor Information:

Indicate Subcontractors to be used during this phase of work:

Name & Address	Service Provided
MK Environmental	DPVE Equipment

Cost Proposal Number:	Facility Name:
26	Bulk Plant Montgomery

Signatures must be provided in Sections I.7 and I.8 below for this proposal to be processed.

I.7 Certification of Unintentional release of Motor Fuel & Cost Proposal- Owner Signature:

I certify that an unintentional release has occurred from a motor fuel underground or aboveground tank system at this site and I authorize this Cost Proposal amount for corrective action activities to be conducted at this site.

1.Owner or Operator Signature:	J Clark Ward
Typed or Printed Name and Title:	J. Clark Ward, CFO
Email address:	cward@russell-corporation.com
Date:	06/16/2021

I.8 Cost Proposal- Contractor Signature:

2.Response Action Contractor Signature:	Michael L. Ellison
Typed or Printed Name and Title:	Michael L. Ellison, P.E., Principal
Date:	06/16/21

I.9 Trust Fund Obligation Information:

Estimated Total Cost of all Anticipated Response Actions (To be updated overtime):	$1,250,000.00
Total of Previously Approved Cost Proposals:	$533,029.40
Total Proposed Costs to Date (Approved Costs Plus Costs Proposed in this Cost Proposal):	$647,653.20
Estimate Percent Completion of entire project to date:	52%

I.10 Cost Proposal Amount

Proposed Costs under this Cost Proposal:	**$114,623.80**	**Personnel**	**$1,311.00**
		Field Equipment	**$0.00**
Owners Required Contribution for UST Release($5,000): *Applicable for CP#1 Only*		**Mileage**	**$0.00**
		Per Diem	**$0.00**
		Drilling	**$0.00**
Owners Required Contribution for AST Release($10,000): *Applicable for CP#1 Only*		**Analytical**	**$0.00**
		Other	**$113,312.80**
Total of This Cost Proposal:	**$114,623.80**		

Cost Proposal Summary

CP Total	Facility I.D. #	CP #	Incident Number	Site Name
$114,623.80	14249-101-005185	26	UST12-11-03	Bulk Plant Montgomery

Part II- Alabama Tank Trust Fund Itemization Form "A" Cost Proposal

Scenarios	Unit $	Units	Quantity	Requested$
System Purchase Letter	$1,311	/ltr	1	$1,311.00
Total Report and Plan Costs				**$1,311.00**

Part II- Alabama Tank Trust Fund Itemization Form "B" Cost Proposal

Postage / Shipping and Copying (plans reports, ADEM and owner)	$85	/sow	1	$85.00
Total Field Costs				**$85.00**

Part II- Alabama Tank Trust Fund Itemization Form "C" Cost Proposal

Total Drilling Costs				**$0.00**

Part II- Alabama Tank Trust Fund Itemization Form "D" Cost Proposal

	Pass Through	Quoted Amoun	Requested$
Corrective Action System Purchase	5%	$107,836.00	$113,227.80
Total Subs / Vendors / Utilities			**$113,227.80**

APPENDIX J – COST PROPOSAL NO. 27 – DPVE SYSTEM INSTALL & STARTUP

Alabama Tank Trust Fund
Cost Proposal
Part I

I.1 Cost Proposal Information:

Cost Proposal Number:	Date of Cost Proposal (mm/dd/yy):
27 422601-INST	5/3/2021
UST or AST Incident Number:	Facility I.D. Number:
UST12-11-03	14249-101-005185

I.2 Facility Information

Facility Name:	Bulk Plant Montgomery
Facility Address:	3378 Tank View Court Montgomery, Alabama

I.3 Owner Information:

Owner Name:	Russell Petroleum Corporation
Owner Address:	P.O. Box 250330 Montgomery, Alabama 36125
Employer Tax Number (IRS):	63-0644370

I.4 Response Action Contractor Information:

Approved Response Action Contractor Name:	PPM Consultants, Inc. 5555 Bankhead Highway Birmingham, Alabama 35210
Approved Response Action Contractor Address:	
Project Contact:	Jeffrey M. Schexnayder, P.G.
Project Contact Phone #:	205-836-5650
Project Contact E-mail:	jeff.schexnayder@ppmco.com
Employer Tax Number (IRS):	72-1256279

Cost Proposal Number: 27

Facility Name: Bulk Plant Montgomery

I.5 Activity Information:

Indicate below the activities for which the cost proposal is submitted:	
	Site Stabilization/Initial Abatement
	Preliminary Investigation
	Secondary Investigation / Additional Well Installation
	Alabama Risk Based Corrective Action (ARBCA)
	Groundwater Sampling
	Free Product Removal/Mobile Enhanced Multiphase Extraction (MEME)
	Corrective Action Plan Evaluation
	Develop Corrective Action Plan
X	Corrective Action
	Stockpile Sampling / Management / Disposal
	Provision of Alternate Water Supply
	Pilot Test
	Monitoring/Recovery/Injection Well Abandonment
	System Decommissioning/Removal

Activities/Other/Brief Summary of Activities:

DPVE System installation, comprehensive baseline groundwater sampling event (11 2-inch monitoring wells and (7 4-inch recovery wells), IDW disposal, PCW disposal, NPDES permit application, ADEM Air Permit, and associated reporting.

Provide proposed completion date for this phase of work activities:

8/31/2021

Provide projected date of cleanup completed:

12/31/2023

I.6 Subcontractor Information:

Indicate Subcontractors to be used during this phase of work:

Name & Address	Service Provided
Walker-Hill Environmental	DPVE system installation
Technical Drilling Services	Recovery Well Installation
Sutherland Environmental Company	Sample Analysis

Cost Proposal Number:	Facility Name:
27	Bulk Plant Montgomery

Signatures must be provided in Sections I.7 and I.8 below for this proposal to be processed.

I.7 Certification of Unintentional release of Motor Fuel & Cost Proposal- Owner Signature:

I certify that an unintentional release has occurred from a motor fuel underground or aboveground tank system at this site and I authorize this Cost Proposal amount for corrective action activities to be conducted at this site.

1.Owner or Operator Signature:	J Clark Ward
Typed or Printed Name and Title:	J. Clark Ward, CFO
Email address:	cward@russell-corporation.com
Date:	06/16/2021

I.8 Cost Proposal- Contractor Signature:

2.Response Action Contractor Signature:	Michael L. Ellison
Typed or Printed Name and Title:	Michael L. Ellison, P.E., Principal
Date:	06/16/21

I.9 Trust Fund Obligation Information:

Estimated Total Cost of all Anticipated Response Actions (To be updated overtime):	$1,250,000.00
Total of Previously Approved Cost Proposals:	$647,653.20
Total Proposed Costs to Date (Approved Costs Plus Costs Proposed in this Cost Proposal):	$749,809.70
Estimate Percent Completion of entire project to date:	60%

I.10 Cost Proposal Amount

Proposed Costs under this Cost Proposal:	**$102,156.50**	**Personnel**	**$27,260.15**
		Field Equipment	**$731.00**
Owners Required Contribution for UST Release($5,000): *Applicable for CP#1 Only*		**Mileage**	**$336.00**
		Per Diem	**$1,225.50**
		Drilling	**$6,000.50**
Owners Required Contribution for AST Release($10,000): *Applicable for CP#1 Only*		**Analytical**	**$1,358.50**
		Other	**$65,244.85**
Total of This Cost Proposal:	**$102,156.50**		

Cost Proposal Summary

CP Total	Facility I.D. #	CP #	Incident Number	Site Name
$102,156.50	14249-101-005185	27	UST12-11-03	Bulk Plant Montgomery

Part II- Alabama Tank Trust Fund Itemization Form "A" Cost Proposal

Scenarios	Unit $	Units	Quantity	Requested$
Off-site access - ALDOT	$1,480	/property	1	$1,480.00
CA System Installation Report (all Classes same)	$7,552	/report	1	$7,552.00
General NPDES Application Preparation	$771	/permit	1	$771.00
ADEM Solid Waste Profile Preparation	$216.50	/profile	1	$216.50
Total Report and Plan Costs				**$10,019.50**

Part II- Alabama Tank Trust Fund Itemization Form "B" Cost Proposal

Porous material 0-30 feet	$324	/well	3	$972.00
Groundwater Sampling Set-up (2hrs tech time)	$126.00	/sow	1	$126.00
Purge/Development Water Handling (see Basis)	$94.50	/sow	1	$94.50
Groundwater Sampling and Gauging 2" Well	$63.00	/well	11	$693.00
Groundwater Sampling and Gauging 4" Well	$72.45	/well	7	$507.15
System Installation Oversight (up to 7 days in field)	$8,714	/system	1	$8,714.00
System Installation Oversight Adder (per day over 7 doc req.)	$974	/day	3	$2,922.00
System Startup	$1,664	/system	1	$1,664.00

Travel

Mileage Rate			$0.560	
Mileage (One way office to site)			75	
Number of round trips to site			4	$336.00
Technician(s)-travel time	$63	/hr	8	$504.00
Geologist/Engineer-travel time	$87	/hr	12	$1,044.00
Per diem (6-12hrs)	$12.75	/day	2	$25.50
Per diem >2 consecutive days (overnight)(invoice(s) required)	$100	/day	12	$1,200.00

Equipment and Equipment Kits

55-Gallon Drums	$50	/drum	4	$200.00
Sampling Expendables(gloves, ice, string, jars, foil, distilled water, paper towels	$50	/sow	1	$50.00
Monitoring Well Development	$75	/day	1	$75.00
Monitoring Well/Boring Installation	$60	/day	2	$120.00
Groundwater Monitoring	$160	/day	1	$160.00
Bailers	$7	/bailer	18	$126.00
Postage / Shipping and Copying (plans reports, ADEM and owner)	$85	/sow	1	$85.00

Analytical Samples

	Method			Pass Through	Sample #	
BTEX/MTBE/Naph (water)	8260	$65	/sample	10%	18	$1,287.00
Other	QA/QC 8260	$65.00	/sample	10%	1	$71.50
Total Field Costs						**$20,976.65**

Cost Proposal Summary

CP Total	Facility I.D. #	CP #	Incident Number	Site Name
$102,156.50	14249-101-005185	27	UST12-11-03	Bulk Plant Montgomery

Part II- Alabama Tank Trust Fund Itemization Form "C" Cost Proposal

Scenarios	Unit $	Unit	Quantity	Requested$
Mileage Rate (Current Federal Rate)			$0.560	
Mileage (drilling device driven or ATV) (**ONE WAY** mileage up to 450	$2.24	/mile	125	
Number of Mobilizations (includes $200 mob/demob amount)			1	$760.00
4" Monitoring Well (HSA) [3]	$45.00	/foot	93	$4,185.00
Per Diem (overnight) (man days)(hotel receipts required)	$85.00	/day	6	$510.00
Pass Through (if appropriate) Enter "5" or "10" as appropriate			10%	$545.50
Total Drilling Costs				**$6,000.50**

Part II- Alabama Tank Trust Fund Itemization Form "D" Cost Proposal

	Pass Through	Quoted Amoun	Requested$
ADEM Solid Waste Profile (ADEM review fee)	5%	$217.00	$227.85
Corrective Action System Install	5%	$57,280.00	$60,144.00
NPDES Permit Application (permit fee)	5%	$3,210.00	$3,370.50
Power Costs	5%	$250.00	$262.50
Water Treatment/Disposal	5%	$200.00	$210.00
Other/Misc. (receipts required) GPR Utility Survey	5%	$900.00	$945.00
Total Subs / Vendors / Utilities			**$65,159.85**

Part II- Alabama Tank Trust Fund Itemization Form "E" Cost Proposal

Per diem allowed for Alabama Tank Trust Fund Contractor Personnel Only
Maximum allowable rates are referenced on the "Maximum Rates" Tab in this document.
This page should be submitted whenever per diem is being claimed.

Points of Travel From	To	Projected Date mm/dd/yy	Personnel Classification	Hour of Departure am/pm	Hour of Return am/pm	Activity To Be Performed	Amount Per diem claimed
Use this section to enter claims for daily per diems							
Birmingham	Montgomery		Tech			GWS	$12.75
Birmingham	Montgomery		Tech			GWS	$12.75
				Total number of daily per diems			2
Use this section to enter claims for extended daily per diems							
				Total number of ext. daily per diems			0
Use this section to enter claims for overnight per diems							
Birmingham	Montgomery		Geo			MWI	$100.00
Birmingham	Montgomery		Geo			MWI	$100.00
Birmingham	Montgomery		Geo			INST	$100.00
Birmingham	Montgomery		Geo			INST	$100.00
Birmingham	Montgomery		Geo			INST	$100.00
Birmingham	Montgomery		Geo			INST	$100.00
Birmingham	Montgomery		Geo			INST	$100.00
Birmingham	Montgomery		Geo			INST	$100.00
Birmingham	Montgomery		Geo			INST	$100.00
Birmingham	Montgomery		Geo			INST	$100.00
Birmingham	Montgomery		Geo			INST	$100.00
Birmingham	Montgomery		Geo			INST	$100.00
				Total number of overnight per diems			12

APPENDIX K – COST PROPOSAL NO. 28 – FIRST QUARTER O&M AND GROUNDWATER SAMPLING

Alabama Tank Trust Fund
Cost Proposal
Part I

I.1 Cost Proposal Information:

Cost Proposal Number:	Date of Cost Proposal (mm/dd/yy):
28 422601-OM1	5/3/2021
UST or AST Incident Number:	Facility I.D. Number:
UST12-11-03	14249-101-005185

I.2 Facility Information

Facility Name:	Bulk Plant Montgomery
Facility Address:	3378 Tank View Court Montgomery, Alabama

I.3 Owner Information:

Owner Name:	Russell Petroleum Corporation
Owner Address:	P.O. Box 250330 Montgomery, Alabama 36125
Employer Tax Number (IRS):	63-0644370

I.4 Response Action Contractor Information:

Approved Response Action Contractor Name:	PPM Consultants, Inc. 5555 Bankhead Highway Birmingham, Alabama 35210
Approved Response Action Contractor Address:	
Project Contact:	Jeffrey M. Schexnayder, P.G.
Project Contact Phone #:	205-836-5650
Project Contact E-mail:	jeff.schexnayder@ppmco.com
Employer Tax Number (IRS):	72-1256279

Cost Proposal Number: 28

Facility Name: Bulk Plant Montgomery

I.5 Activity Information:

Indicate below the activities for which the cost proposal is submitted:	
	Site Stabilization/Initial Abatement
	Preliminary Investigation
	Secondary Investigation / Additional Well Installation
	Alabama Risk Based Corrective Action (ARBCA)
	Groundwater Sampling
	Free Product Removal/Mobile Enhanced Multiphase Extraction (MEME)
	Corrective Action Plan Evaluation
	Develop Corrective Action Plan
X	Corrective Action
	Stockpile Sampling / Management / Disposal
	Provision of Alternate Water Supply
	Pilot Test
	Monitoring/Recovery/Injection Well Abandonment
	System Decommissioning/Removal

Activities/Other/Brief Summary of Activities:

Quarterly Operations and Maintainance of DPVE system, comprehensive groundwater sampling event (11 monitoring wells and 7 recovery wells)

September 1, 2021 through November 30, 2021

Provide proposed completion date for this phase of work activities:

12/31/2021

Provide projected date of cleanup completed:

12/31/2023

I.6 Subcontractor Information:

Indicate Subcontractors to be used during this phase of work:

Name & Address	Service Provided
Sutherland Environmental Company	Sample Analysis

Cost Proposal Number:	Facility Name:
28	Bulk Plant Montgomery

Signatures must be provided in Sections I.7 and I.8 below for this proposal to be processed.

I.7 Certification of Unintentional release of Motor Fuel & Cost Proposal- Owner Signature:

I certify that an unintentional release has occurred from a motor fuel underground or aboveground tank system at this site and I authorize this Cost Proposal amount for corrective action activities to be conducted at this site.

1.Owner or Operator Signature:	J Clark Ward
Typed or Printed Name and Title:	J. Clark Ward, CFO
Email address:	cward@russell-corporation.com
Date:	06/16/2021

I.8 Cost Proposal- Contractor Signature:

2.Response Action Contractor Signature:	Michael L. Ellison
Typed or Printed Name and Title:	Michael L. Ellison, P.E., Principal
Date:	06/16/21

I.9 Trust Fund Obligation Information:

Estimated Total Cost of all Anticipated Response Actions (To be updated overtime):	$1,250,000.00
Total of Previously Approved Cost Proposals:	$749,809.70
Total Proposed Costs to Date (Approved Costs Plus Costs Proposed in this Cost Proposal):	$776,639.35
Estimate Percent Completion of entire project to date:	62%

I.10 Cost Proposal Amount

Proposed Costs under this Cost Proposal:	**$26,829.65**	**Personnel**	**$13,416.65**
		Field Equipment	**$1,356.00**
Owners Required Contribution for UST Release($5,000): *Applicable for CP#1 Only*		**Mileage**	**$672.00**
		Per Diem	**$102.00**
		Drilling	**$0.00**
Owners Required Contribution for AST Release($10,000): *Applicable for CP#1 Only*		**Analytical**	**$1,848.00**
		Other	**$9,435.00**
Total of This Cost Proposal:	**$26,829.65**		

Cost Proposal Summary

CP Total	Facility I.D. #	CP #	Incident Number	Site Name
$26,829.65	14249-101-005185	28	UST12-11-03	Bulk Plant Montgomery

Part II- Alabama Tank Trust Fund Itemization Form "A" Cost Proposal

Scenarios	Unit $	Units	Quantity	Requested$
SEMR - DPVE, P&T Reports				
1-12 wells, BTEX/MTBE/Naphthalene	$4,927	/report	1	$4,927.00
SEMR adder >12 wells, BTEX/MTBE/Naph	$37.50	/well	6	$225.00
Total Report and Plan Costs				**$5,152.00**

Part II- Alabama Tank Trust Fund Itemization Form "B" Cost Proposal

Porous material 0-30 feet	$324	/well	3	$972.00
Groundwater Sampling Set-up (2hrs tech time)	$126.00	/sow	1	$126.00
Purge/Development Water Handling (see Basis)	$94.50	/sow	1	$94.50
Groundwater Sampling and Gauging 2" Well	$63.00	/well	11	$693.00
Groundwater Sampling and Gauging 4" Well	$72.45	/well	7	$507.15
DPVE, Pump and Treat O&M 3 months	$3,856	/quarter	1	$3,856.00
Travel				
Mileage Rate			$0.560	
Mileage (One way office to site)			75	
Number of round trips to site			8	$672.00
Technician(s)-travel time	$63	/hr	32	$2,016.00
Per diem (6-12hrs)	$12.75	/day	8	$102.00
Equipment and Equipment Kits				
Sampling Expendables(gloves, ice, string, jars, foil, distilled water, paper towels	$50	/sow	1	$50.00
Expendables O&M	$25	/day	6	$150.00
Groundwater Monitoring	$160	/day	1	$160.00
Bailers	$7	/bailer	18	$126.00
DPVE, SVE, AS, P&T O&M	$145	/day	6	$870.00
Postage / Shipping and Copying (plans reports, ADEM and owner)	$85	/sow	1	$85.00

Analytical Samples

	Method			Pass Through	Sample #	
BTEX/MTBE/Naph (water)	8260	$65	/sample	10%	18	$1,287.00
Oil & Grease		$50	/sample	10%	3	$165.00
Air Samples (System Influent)		$100	/sample	10%	1	$110.00
Other	QA/QC 8260	$65.00	/sample	10%	1	$71.50
Other	Effluent 8260	$65.00	/sample	10%	3	$214.50
Total Field Costs						**$12,327.65**

Part II- Alabama Tank Trust Fund Itemization Form "C" Cost Proposal

Total Drilling Costs	**$0.00**

Part II- Alabama Tank Trust Fund Itemization Form "D" Cost Proposal

Cost Proposal Summary

CP Total	Facility I.D. #	CP #	Incident Number	Site Name
$26,829.65	14249-101-005185	28	UST12-11-03	Bulk Plant Montgomery

		Pass Through	Quoted Amoun	Requested$
Phone Costs (telemetry)		10%	$500.00	$550.00
Power Costs		10%	$7,500.00	$8,250.00
Other/Misc. (receipts required)	LRVP Seal Oil	10%	$500.00	$550.00
	Total Subs / Vendors / Utilities			**$9,350.00**

Part II- Alabama Tank Trust Fund Itemization Form "E" Cost Proposal

Per diem allowed for Alabama Tank Trust Fund Contractor Personnel Only
Maximum allowable rates are referenced on the "Maximum Rates" Tab in this document.
This page should be submitted whenever per diem is being claimed.

Points of Travel From	To	Projected Date mm/dd/yy	Personnel Classification	Hour of Departure am/pm	Hour of Return am/pm	Activity To Be Performed	Amount Per diem claimed
Use this section to enter claims for daily per diems							
Birmingham	Montgomery		Tech			GWS	$12.75
Birmingham	Montgomery		Tech			GWS	$12.75
Birmingham	Montgomery		Tech			OM	$12.75
Birmingham	Montgomery		Tech			OM	$12.75
Birmingham	Montgomery		Tech			OM	$12.75
Birmingham	Montgomery		Tech			OM	$12.75
Birmingham	Montgomery		Tech			OM	$12.75
Birmingham	Montgomery		Tech			OM	$12.75
				Total number of daily per diems			8
Use this section to enter claims for extended daily per diems							
				Total number of ext. daily per diems			0
Use this section to enter claims for overnight per diems							
				Total number of overnight per diems			0

APPENDIX L – COST PROPOSAL NO. 29 – SECOND QUARTER O&M AND GROUNDWATER SAMPLING

Alabama Tank Trust Fund
Cost Proposal
Part I

I.1 Cost Proposal Information:

Cost Proposal Number:	Date of Cost Proposal (mm/dd/yy):
29 422601-OM2	5/3/2021
UST or AST Incident Number:	Facility I.D. Number:
UST12-11-03	14249-101-005185

I.2 Facility Information

Facility Name:	Bulk Plant Montgomery
Facility Address:	3378 Tank View Court Montgomery, Alabama

I.3 Owner Information:

Owner Name:	Russell Petroleum Corporation
Owner Address:	P.O. Box 250330 Montgomery, Alabama 36125
Employer Tax Number (IRS):	63-0644370

I.4 Response Action Contractor Information:

Approved Response Action Contractor Name:	PPM Consultants, Inc. 5555 Bankhead Highway Birmingham, Alabama 35210
Approved Response Action Contractor Address:	
Project Contact:	Jeffrey M. Schexnayder, P.G.
Project Contact Phone #:	205-836-5650
Project Contact E-mail:	jeff.schexnayder@ppmco.com
Employer Tax Number (IRS):	72-1256279

Cost Proposal Number: 29

Facility Name: Bulk Plant Montgomery

I.5 Activity Information:

Indicate below the activities for which the cost proposal is submitted:	
	Site Stabilization/Initial Abatement
	Preliminary Investigation
	Secondary Investigation / Additional Well Installation
	Alabama Risk Based Corrective Action (ARBCA)
	Groundwater Sampling
	Free Product Removal/Mobile Enhanced Multiphase Extraction (MEME)
	Corrective Action Plan Evaluation
	Develop Corrective Action Plan
X	Corrective Action
	Stockpile Sampling / Management / Disposal
	Provision of Alternate Water Supply
	Pilot Test
	Monitoring/Recovery/Injection Well Abandonment
	System Decommissioning/Removal

Activities/Other/Brief Summary of Activities:

Quarterly Operations and Maintainance of DPVE system, comprehensive groundwater sampling event (11 monitoring wells and 7 recovery wells)

December 1, 2021 through February 28, 2022

Provide proposed completion date for this phase of work activities:

3/31/2022

Provide projected date of cleanup completed:

12/31/2023

I.6 Subcontractor Information:

Indicate Subcontractors to be used during this phase of work:

Name & Address	Service Provided
Sutherland Environmental Company	Sample Analysis

Cost Proposal Number:	Facility Name:
29	Bulk Plant Montgomery

Signatures must be provided in Sections I.7 and I.8 below for this proposal to be processed.

I.7 Certification of Unintentional release of Motor Fuel & Cost Proposal- Owner Signature:

I certify that an unintentional release has occurred from a motor fuel underground or aboveground tank system at this site and I authorize this Cost Proposal amount for corrective action activities to be conducted at this site.

1.Owner or Operator Signature:	J Clark Ward
Typed or Printed Name and Title:	J. Clark Ward, CFO
Email address:	cward@russell-corporation.com
Date:	06/16/2021

I.8 Cost Proposal- Contractor Signature:

2.Response Action Contractor Signature:	Michael L. Ellison
Typed or Printed Name and Title:	Michael L. Ellison, P.E., Principal
Date:	06/16/21

I.9 Trust Fund Obligation Information:

Estimated Total Cost of all Anticipated Response Actions (To be updated overtime):	$1,250,000.00
Total of Previously Approved Cost Proposals:	$776,639.35
Total Proposed Costs to Date (Approved Costs Plus Costs Proposed in this Cost Proposal):	$803,469.00
Estimate Percent Completion of entire project to date:	64%

I.10 Cost Proposal Amount

Proposed Costs under this Cost Proposal:	**$26,829.65**	**Personnel**	**$13,416.65**
		Field Equipment	**$1,356.00**
Owners Required Contribution for UST Release($5,000): *Applicable for CP#1 Only*		**Mileage**	**$672.00**
		Per Diem	**$102.00**
		Drilling	**$0.00**
Owners Required Contribution for AST Release($10,000): *Applicable for CP#1 Only*		**Analytical**	**$1,848.00**
		Other	**$9,435.00**
Total of This Cost Proposal:	**$26,829.65**		

Cost Proposal Summary

CP Total	Facility I.D. #	CP #	Incident Number	Site Name
$26,829.65	14249-101-005185	29	UST12-11-03	Bulk Plant Montgomery

Part II- Alabama Tank Trust Fund Itemization Form "A" Cost Proposal

Scenarios	Unit $	Units	Quantity	Requested$
SEMR - DPVE, P&T Reports				
1-12 wells, BTEX/MTBE/Naphthalene	$4,927	/report	1	$4,927.00
SEMR adder >12 wells, BTEX/MTBE/Naph	$37.50	/well	6	$225.00
Total Report and Plan Costs				**$5,152.00**

Part II- Alabama Tank Trust Fund Itemization Form "B" Cost Proposal

Porous material 0-30 feet	$324	/well	3	$972.00
Groundwater Sampling Set-up (2hrs tech time)	$126.00	/sow	1	$126.00
Purge/Development Water Handling (see Basis)	$94.50	/sow	1	$94.50
Groundwater Sampling and Gauging 2" Well	$63.00	/well	11	$693.00
Groundwater Sampling and Gauging 4" Well	$72.45	/well	7	$507.15
DPVE, Pump and Treat O&M 3 months	$3,856	/quarter	1	$3,856.00
Travel				
Mileage Rate			$0.560	
Mileage (One way office to site)			75	
Number of round trips to site			8	$672.00
Technician(s)-travel time	$63	/hr	32	$2,016.00
Per diem (6-12hrs)	$12.75	/day	8	$102.00
Equipment and Equipment Kits				
Sampling Expendables(gloves, ice, string, jars, foil, distilled water, paper towels	$50	/sow	1	$50.00
Expendables O&M	$25	/day	6	$150.00
Groundwater Monitoring	$160	/day	1	$160.00
Bailers	$7	/bailer	18	$126.00
DPVE, SVE, AS, P&T O&M	$145	/day	6	$870.00
Postage / Shipping and Copying (plans reports, ADEM and owner)	$85	/sow	1	$85.00

Analytical Samples

	Method			Pass Through	Sample #	
BTEX/MTBE/Naph (water)	8260	$65	/sample	10%	18	$1,287.00
Oil & Grease		$50	/sample	10%	3	$165.00
Air Samples (System Influent)		$100	/sample	10%	1	$110.00
Other	QA/QC 8260	$65.00	/sample	10%	1	$71.50
Other	Effluent 8260	$65.00	/sample	10%	3	$214.50
Total Field Costs						**$12,327.65**

Part II- Alabama Tank Trust Fund Itemization Form "C" Cost Proposal

Total Drilling Costs	**$0.00**

Part II- Alabama Tank Trust Fund Itemization Form "D" Cost Proposal

Cost Proposal Summary

CP Total	Facility I.D. #	CP #	Incident Number	Site Name
$26,829.65	14249-101-005185	29	UST12-11-03	Bulk Plant Montgomery

		Pass Through	Quoted Amoun	Requested$
Phone Costs (telemetry)		10%	$500.00	$550.00
Power Costs		10%	$7,500.00	$8,250.00
Other/Misc. (receipts required)	LRVP Seal Oil	10%	$500.00	$550.00
	Total Subs / Vendors / Utilities			**$9,350.00**

Part II- Alabama Tank Trust Fund Itemization Form "E" Cost Proposal

Per diem allowed for Alabama Tank Trust Fund Contractor Personnel Only
Maximum allowable rates are referenced on the "Maximum Rates" Tab in this document.
This page should be submitted whenever per diem is being claimed.

Points of Travel From	To	Projected Date mm/dd/yy	Personnel Classification	Hour of Departure am/pm	Hour of Return am/pm	Activity To Be Performed	Amount Per diem claimed
Use this section to enter claims for daily per diems							
Birmingham	Montgomery		Tech			GWS	$12.75
Birmingham	Montgomery		Tech			GWS	$12.75
Birmingham	Montgomery		Tech			OM	$12.75
Birmingham	Montgomery		Tech			OM	$12.75
Birmingham	Montgomery		Tech			OM	$12.75
Birmingham	Montgomery		Tech			OM	$12.75
Birmingham	Montgomery		Tech			OM	$12.75
Birmingham	Montgomery		Tech			OM	$12.75
				Total number of daily per diems			8
Use this section to enter claims for extended daily per diems							
				Total number of ext. daily per diems			0
Use this section to enter claims for overnight per diems							
				Total number of overnight per diems			0