



## AMERICAN ENVIRONMENTAL ASSOCIATES, INC.

### UNDERGROUND STORAGE TANK FACILITY SITE CHARACTERIZATION / REVISED REMEDIAL ACTION PLAN

LEO'S 3 CAR WASH  
2938 WEST 26TH STREET  
ERIE, PENNSYLVANIA 16506

FACILITY ID# 25-90615

CITY OF ERIE  
ERIE COUNTY, PENNSYLVANIA

PREPARED: May 2014

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LEO'S CAR WASH  
2938 WEST 26<sup>TH</sup> STREET  
ERIE, PENNSYLVANIA

FACILITY ID# 25-90615

SITE CHARACTERIZATION REPORT

MILLCREEK TOWNSHIP  
ERIE COUNTY, PENNSYLVANIA

PREPARED FOR:

LEO'S CAR WASH  
2938 WEST 26<sup>TH</sup> STREET  
ERIE, PENNSYLVANIA

PREPARED BY:

AMERICAN ENVIRONMENTAL ASSOCIATES, INC.  
1135 BUTLER AVENUE  
NEW CASTLE, PA 16101



May 2014

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## A. INTRODUCTION

American Environmental Associates, Inc. (AEA) has been contracted by Leo's Car Wash to provide environmental services pursuant to Underground Storage Tank (UST) corrective action and Environmental Remediation Standards Act (ACT 2) regulations at the subject site.

### A.1 Site History

Corrective actions were initiated in response to a release that was discovered during construction of a new canopy on January 23, 2002. The release was eventually found to be associated with a loose swing joint in the regular unleaded line for the middle dispenser. A minor amount of contaminated soil was removed; approximately five tons, and then the new canopy footers were poured. The swing joint lead was repaired at this time. Clean soil conditions were never obtained and over excavation was not performed at this time due to site restraints. A Notification of Reportable Release was confirmed on January 22, 2002 and submitted to the PADEP's Meadville Office on January 23, 2002.

An Initial Site Characterization report was prepared and dated November 27, 2002 documenting the installation of monitoring wells MW#1 through MW#6. These wells were installed to delineate subsurface impacts.

In October of 2002 monitoring wells MW#1 through MW#6 were installed to delineate subsurface impacts. Soils samples were collected on October 29, 2002 and October 30, 2002. Soil sample results showed exceedances of Benzene and of MTBE. Groundwater exhibited levels of benzene, toluene, ethylbenzene, naphthalene and MTBE that exceeded Statewide Health Standards.

An Interim Site Characterization Report was prepared and dated February 13, 2003 documenting the installation of Monitoring Wells MW #7, MW# 8, and MW #9.

These wells were installed to further delineate sub-surface contamination. Monitoring well soil samples were collected on January 17, 2003 for MW #7, MW# 8, and MW #9. The analytical results for soil were within the PADEP's Statewide Health Standards for Used Aquifers in Soil. Groundwater impacts were still present.

During April of 2003, AEA installed monitoring wells MW#10, MW# 11, and MW #12. Monitoring wells soil samples were collected on April 8, 2003 from MW#10, MW#11 and MW#12. The analytical results were within the PADEP's Statewide Health Standards for Used Aquifers in Soil. Groundwater analytical results indicated that monitoring wells MW#1, MW#2, MW#5, MW#6, MW#8, MW#9, MW#10 and MW#12 exceed Statewide Health Standard of Used Aquifers for one or more of the required parameters for unleaded gasoline.

In May of 2003, AEA submitted an overall Site Characterization Report for the facility. The report summarized site characterization activities including the drilling and installation of twelve groundwater monitoring wells and the collection of twelve soil samples and twelve groundwater samples.

In July of 2012, AEA submitted a revised RAP to PADEP for the installation of five additional groundwater recovery wells. In November of 2012, PADEP requested the installation of additional P.O.C. wells before they would approve the revised RAP. In November of 2012, AEA submitted a proposal to the PADEP for the additional P.O.C. wells they had requested. In May of 2013, PADEP approved the installation of additional P.O.C. wells. In July of 2013, P.O.C. wells MW#18, MW#19, and MW#20 were installed.

In November of 2013, the DEP directed the installation of one additional off-site monitoring well to be located downgradient of monitoring well MW#19. On March 27, 2014 monitoring well MW#21 was installed. Two vapor points were also installed on March 27, 2014 next to the homes located on two off-site properties; VP-1 was installed at the Dzikowski property and VP-2 was installed at the Parker property.

## A.2 Site Setting

The site is located at 2938 West 26<sup>th</sup> Street in Erie, Pennsylvania, Millcreek Township, Erie County (see Figure 2: Satellite Image of Site). Reconnaissance of the surrounding area indicates that residential and commercial properties are connected to a municipal water supply.

## A.3 Properties of Substance Released

The substance released is unleaded gasoline. The substance is a liquid. The amount released is unknown. There are several known toxins in gasoline, some of which are confirmed human carcinogens. Physical and toxicological properties of organic regulated substances (gasoline analytes) are included in Table 5 of the Pennsylvania Code Title 25, Chapter 250. Depending on the site, gasoline contamination may remain on site for years depending on the nature of the soil present, groundwater flow characteristics and the rate of natural attenuation of site contaminants.

## A.4 Additional Interim Remedial actions

A Remedial Action Plan was submitted to the PADEP on July 18, 2003. This plan recommended that American Environmental Associates, Inc. install a system to remediate the dissolved gasoline contaminants in the groundwater at the site. In a letter dated July 28, 2003, the DEP approved the Plan. The system is a dual phase high vacuum extraction (DPE). Monitoring wells MW#1, MW#3, MW#4, MW#5 and MW#6 will be utilized as recovery wells.

Site preparation included the installation of below grade recovery piping (2-inch diameter, schedule 40 PVC) and modification of the recovery well heads. Trenching was done for electric, vapor extraction, groundwater recovery piping and a discharge line to the groundwater discharge location.

The remediation system consists of a 7.5 Hp oil sealed liquid ring pump (LRP) to recover liquid and vapor phase fluids. The pump consists of a shrouded rotor which rotates freely within an eccentric casing. There is no metal to metal contact between the rotor and casing. Centrifugal force acting on liquids within the pump causes the liquids to form a ring inside the casing. A fixed port cylinder, concentric with the rotor, directs the gas into the suction ports. Gas is trapped between the blades by the liquid pistons formed by centrifugal force as the liquid recedes from the port cylinder. It is trapped at the point of maximum eccentricity and is then compressed by the liquid ring as it is forced radially inward toward the central port cylinder. After each revolution, the compressed gas and accompanying liquid are discharged. During the pumping cycle, the gas is in intimate contact with the sealing liquid and compression is nearly isothermal. When handling saturated vapor-gas mixtures, the liquid ring acts as a condenser, greatly increasing the effective capacity of the pump. Seal liquid will be oil supplied via a reservoir mounted on the LRP skid.

The recovered fluids are pumped through a vapor/liquid knockout tank. Liquids are then directed, via transfer pump, through liquid phase granular activated carbon absorbers (GACA) to municipal sewage. Vapors are drawn from the knockout tank through the LRP and vapor phase GACA's and discharged to the atmosphere. Treatment of the vapors will be conducted through two carbon units.

The subject site was put into operation in the first quarter of 2005 in order to obtain results to prepare a pay for performance proposal for the Underground Storage Tank Insurance Fund. The contract has since been executed and the system was put into operation permanently in January 4, 2006.

The system operates under the City of Erie Wastewater Groundwater Remediation Permit No. GRP 09-01. Quarterly reports are submitted to the City of Erie documenting analytical results and approximate volume of discharge. The system was operational

throughout the first quarter of 2014. The treatment system pumped approximately 22,097 gallons of water in the first quarter of 2014 and approximately 4,242,057 gallons of water since the system was put into operation (January 4, 2006).

Static water levels were obtained for MW#2, MW#7, MW#8, MW#9, MW#10, MW#11, and MW#12 on March 24, 2014. Groundwater samples were taken from monitoring wells monitoring wells MW#2, MW#7, MW#8, MW#9, MW#10, MW#11 and MW#12 on March 24, 2014. All samples were analyzed for unleaded gasoline parameters including; Benzene, Toluene, Ethylbenzene, Xylene, Cumene, Naphthalene, and MTBE (EPA 5030B/8260B). No free product was encountered during the sampling event.

## A.5 Conceptual Site Model

### A.5.1 Source Identification

Corrective actions were initiated in response to a release that was discovered during construction of a new canopy on January 23, 2002. The release was eventually found to be associated with a loose swing joint in the regular unleaded line for the middle dispenser. A Notification of Reportable Release was confirmed on January 22, 2002 and submitted to the PADEP's Meadville Office on January 23, 2002. Site characterization activities were initiated.

### A.5.2 Migration Pathways

Potential pathways for the contamination to route through include sanitary sewer, storm water sewer lines, water, and natural gas lines.



### A.5.3 Exposure Pathways and Potential Receptors

Types of potential receptors include human and ecological receptors. Potential human receptors include current and future commercial workers, future construction workers, future adult/child on-site residents and current and future off-site residents.

There are no identified ecological receptors associated with this site. No further ecological action is required, because the only constituents detected on site were Light Petroleum Products [Section 250.311(b)(1)] and the site is less than two acres in size (Section 250.311(b)(2)).

### A.5.4 Possible Pathways

Current and future commercial workers: Groundwater ingestion and skin contact are unlikely because the buildings are supplied by public water.

Future construction worker: Skin contact and volatilization to outside air may be considered complete exposure pathway

### A.5.5 Potential Migration Pathways

Several underground utilities exist at or near the subject site.

### A.5.6 Water Well Inventory

The subject site is supplied by public water. All adjacent properties are also serviced by public water supplies.

### A.5.7 Conclusions

Based on the presented pathway information, it is possible for a construction worker's skin to come in contact with contaminated media and complete an exposure pathway. Currently, no plans exist to further develop this site.

## **B. FIELD INVESTIGATIONS**

An Initial Site Characterization report was prepared and dated November 27, 2002 documenting the installation of monitoring wells MW#1 through MW#6. These wells were installed to delineate subsurface impacts.

In October of 2002 monitoring wells MW#1 through MW#6 were installed to delineate subsurface impacts. Soils samples were collected on October 29, 2002 and October 30, 2002. Soil sample results showed exceedances of Benzene and of MTBE. Groundwater exhibited levels of benzene, toluene, ethylbenzene, naphthalene and MTBE that exceeded Statewide Health Standards.

An Interim Site Characterization Report was prepared and dated February 13, 2003 documenting the installation of Monitoring Wells MW #7, MW# 8, and MW #9. These wells were installed to further delineate sub-surface contamination. Monitoring well soil samples were collected on January 17, 2003 for MW #7, MW# 8, and MW #9. The analytical results for soil were within the PADEP's Statewide Health Standards for Used Aquifers in Soil. Groundwater impacts were still present.

During April of 2003, AEA installed monitoring wells MW#10, MW# 11, and MW #12. Monitoring wells soil samples were collected on April 8, 2003 from MW#10, MW#11 and MW#12. The analytical results were within the PADEP's Statewide Health Standards for Used Aquifers in Soil. Groundwater analytical results indicated that

monitoring wells MW#1, MW#2, MW#5, MW#6, MW#8, MW#9, MW#10 and MW#12 exceed Statewide Health Standard of Used Aquifers for one or more of the required parameters for unleaded gasoline.

In May of 2003, AEA submitted an overall Site Characterization Report for the facility. The report summarized site characterization activities including the drilling and installation of twelve groundwater monitoring wells and the collection of twelve soil samples and twelve groundwater samples.

In July of 2012, AEA submitted a revised RAP to PADEP for the installation of five additional groundwater recovery wells. In November of 2012, PADEP requested the installation of additional P.O.C. wells before they would approve the revised RAP. In November of 2012, AEA submitted a proposal to the PADEP for the additional P.O.C. wells they had requested. In May of 2013, PADEP approved the installation of additional P.O.C. wells. In July of 2013, P.O.C. wells MW#18, MW#19, and MW#20 were installed.

In November of 2013, the DEP directed the installation of one additional off-site monitoring well to be located downgradient of monitoring well MW#19. On March 27, 2014 monitoring well MW#21 was installed. Two vapor points were also installed on March 27, 2014 next to the homes located on two off-site properties; VP-1 was installed at the Dzikowski property and VP-2 was installed at the Parker property

### **C. LABORATORY ANALYSIS**

Specifications for sample containers and sample preservation, which were employed, conformed to those outlined in EPA 5035 and EPA 5030B methodologies. Samples were packed in insulated shipping containers, which included appropriate samples bottles and preservatives for each set of analysis, as well as ice packs to maintain sample refrigeration during transport to the laboratory.

The soil samples obtained from the test borings were submitted to the laboratory for analysis of Benzene, Ethyl Benzene, Toluene, Xylenes, Cumene, Naphthalene, and MTBE. **Table 1: Summary of Analytical Results:** summarizes the soil sampling results.

Groundwater samples were submitted to the laboratory for analysis of Benzene, Ethyl Benzene, Toluene, Xylenes, Cumene, Naphthalene, and MTBE. **Table 2: Summary of Analytical Results:** summarizes the groundwater sampling results.

## **D. REMEDIAL ACTION OPTIONS**

Several recovery/treatment processes are typically used throughout the petroleum remediation industry to remove dissolved and absorbed phase volatile hydrocarbons from the subsurface. The choices usually chosen are air sparging, excavation, pump and treat and soil vapor extraction (SVE).

### **D.1 Air Sparging**

One remedial action alternative considered was air sparging in conjunction with SVE. The effectiveness of air sparging is sensitive to the type of lithology present in the saturated and unsaturated zones. The formation of gas pockets can cause significant lateral displacement of water, which can cause lateral migration of dissolved phase hydrocarbons. Due to the location of the hydrocarbon impacted area in relation to the subject site property boundary, this method was not considered the best remedial alternative.

### **D.2 Excavation**

Excavation of impacted soils containing concentrations of hydrocarbons is primarily used as an interim remedial action. Excavation is usually restricted to shallow areas in the unsaturated zone. Excavation will not directly address dissolved phase hydrocarbons. Due to the presence of dissolved hydrocarbons and the site disturbance created by excavation, this method was not considered a practical remedial alternative.

### **D.3 Pump and Treat**

Another remedial alternative is pump and treat. Pump and treat is useful when removing liquid and dissolved phases of hydrocarbons or to maintain hydraulic control, but when used as a stand-alone technology, will not remove the residual material contributing to the dissolved phase impacts.

### **D.4 Soil Vapor Extraction**

Soil vapor extraction involves the volatilization of hydrocarbons present in the unsaturated zone. SVE, by the introduction of oxygen, would also promote biodegradation in both the saturated and unsaturated zones. SVE is a viable remedial option for the removal of hydrocarbons from the unsaturated and dewatered saturated zones.

### **D.5 High Vacuum Soil Vapor Extraction**

High vacuum soil vapor extraction (SVE) involves the volatilizations of hydrocarbons present in groundwater. The HVE system typically volatilizes Volatile Organic Compounds (VOC) with less air than conventional systems, allowing a more concentrated stream of contaminants.

### **D.6 Natural Attenuation**

Depending on amount and concentration of contaminants, this could also be an alternative if closely monitored and seeing a downward trend of contaminants.

Based upon evaluation of the data included with this report, a remedial action plan (RAP) involving installation of a dual phase high vacuum extraction (DPE) system was recommended. Monitoring wells MW#1, MW#3, MW#4, MW#5 and MW#6 will be

utilized as recovery wells. At this time it is proposed to implement 5 additional recovery wells, RW #13, RW #14, RW #15, RW #16 and RW #17.

Site preparation included the installation of below grade recovery piping (2-inch diameter, schedule 40 PVC) and modification of the recovery well heads. Trenching was required for electric, vapor extraction, groundwater recovery piping and a discharge line to the groundwater discharge location.

The remediation system consists of a 7.5 Hp oil sealed liquid ring pump (LRP) to recover liquid and vapor phase fluids. The pump consists of a shrouded rotor which rotates freely within an eccentric casing. There is no metal to metal contact between the rotor and casing. Centrifugal force acting on liquids within the pump causes the liquids to form a ring inside the casing. A fixed port cylinder, concentric with the rotor, directs the gas into the suction ports. Gas is trapped between the blades by the liquid pistons formed by centrifugal force as the liquid recedes from the port cylinder. It is trapped at the point of maximum eccentricity and is then compressed by the liquid ring as it is forced radially inward toward the central port cylinder. After each revolution, the compressed gas and accompanying liquid are discharged. During the pumping cycle, the gas is in intimate contact with the sealing liquid and compression is nearly isothermal. When handling saturated vapor-gas mixtures, the liquid ring acts as a condenser, greatly increasing the effective capacity of the pump. Seal liquid will be oil supplied via a reservoir mounted on the LRP skid.

The recovered fluids are pumped through a vapor/liquid knockout tank. Liquids would then be directed, via transfer pump, through liquid phase granular activated carbon absorbers (GACA) to municipal sewage. The manufacturer's carbon adsorbers specifications are attached. A Process and Instrumentation Flow Diagram is also attached as Figure 3.

Vapors are drawn from the knockout tank through the LRP and vapor phase GACA's and discharged to the atmosphere. Treatment of the vapors will be conducted through two

carbon units. The manufacturer's carbon adsorbers specifications are attached. A Request for Determination of Requirement for Plan Approval/Operating Permit (RFD) will be submitted to the PADEP Bureau of Air Quality.

#### **E. CONCLUSION**

In July of 2012, AEA submitted a revised RAP to PADEP for the installation of five additional groundwater recovery wells. In November of 2012, PADEP requested the installation of additional P.O.C. wells before they would approve the revised RAP. In November of 2012, AEA submitted a proposal to the PADEP for the additional P.O.C. wells they had requested. In May of 2013, PADEP approved the installation of additional P.O.C. wells. In July of 2013, P.O.C. wells MW#18, MW#19, and MW#20 were installed.

In November of 2013, the DEP directed the installation of one additional off-site monitoring well to be located downgradient of monitoring well MW#19. On March 27, 2014 monitoring well MW#21 was installed. Two vapor points were also installed on March 27, 2014 next to the homes located on two off-site properties; VP-1 was installed at the Dzikowski property and VP-2 was installed at the Parker property. (Analytical analyses are attached in this report).

Groundwater delineation has been completed at the subject site.

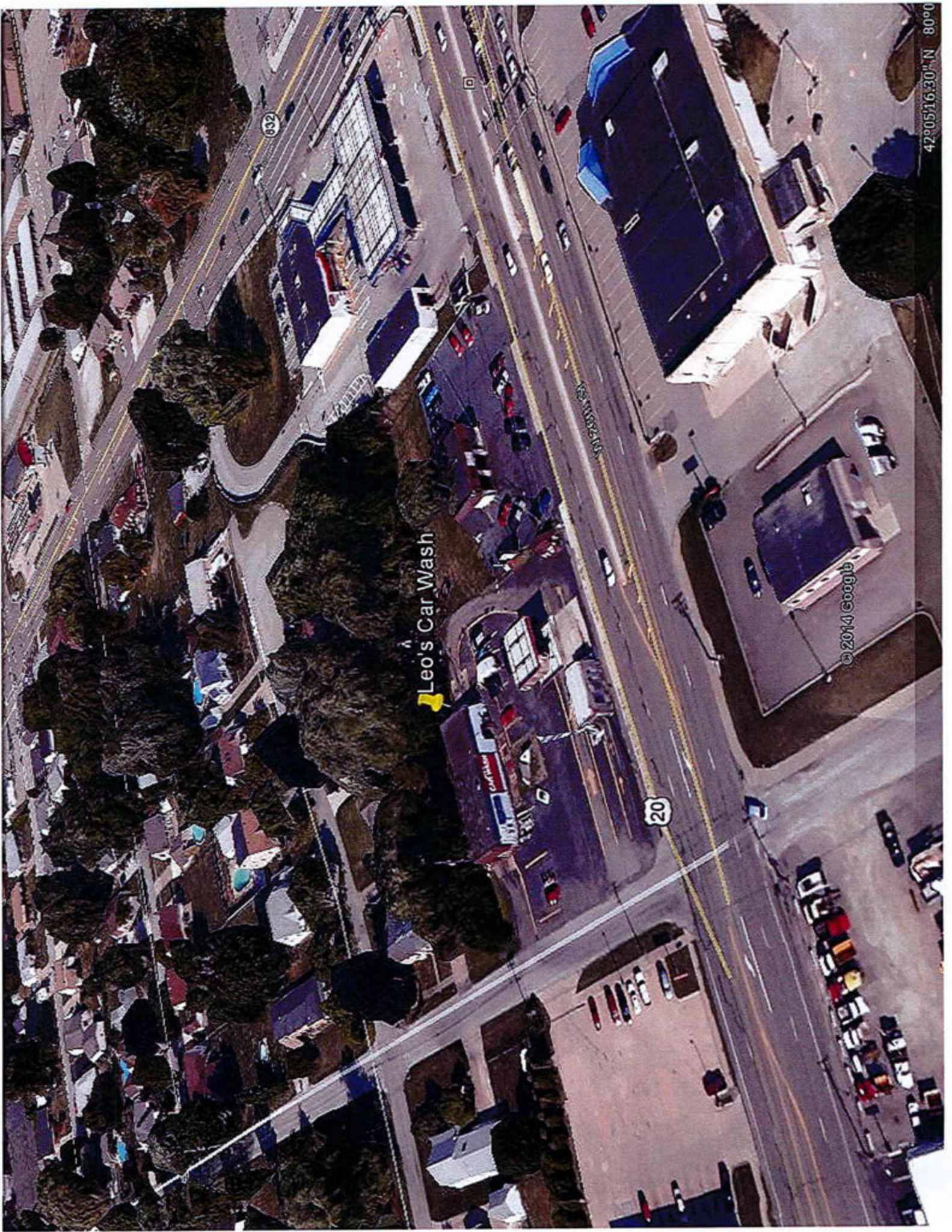
AEA is now proposing the installation of five additional recovery wells. RW #13, RW #14, RW #15, RW #16 and RW #17 as illustrated on the attached Field Investigation Map. This is in order to help expedite achievement of the proposed Statewide Health Standard.

FIGURE 1: TOPOGRAPHIC LOCATION MAP





FIGURE 2: SATELLITE IMAGE OF SITE



Leo's Car Wash

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42°05'16.30" N 80°0'

TABLE 1: SUMMARY OF ANALYTICAL RESULTS  
SOIL SAMPLES

**Table 1. Summary of Analytical Results – Soil Samples**

Leo's Car Wash  
Erie, PA

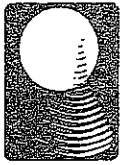
Parameter	MW#1	MW#2	MW#3	MW#4	MW#5	MW#6	MW#7	MW#8	MW#9	**SHS
Benzene	<0.1	0.26	0.10	7.26	0.59	1.33	<0.1	<0.1	<0.1	0.5
Toluene	<0.2	<0.2	1.23	61.8	0.31	0.58	<0.2	<0.2	<0.2	100
Ethyl Benzene	0.90	3.39	3.45	17.6	0.38	14.9	<0.2	<0.2	<0.2	70
Xylenes	1.56	2.03	11.5	98.8	1.33	65.5	<0.2	<0.2	<0.2	1000
Cumene	<0.2	0.50	1.07	4.81	<0.2	0.55	<0.2	<0.2	<0.2	18
Naphthalene	0.29	0.82	1.71	3.42	<0.2	0.57	<0.2	<0.2	<0.2	10
MTBE	<0.2	<0.2	0.25	<b>8.14</b>	<0.2	<0.2	<0.2	<0.2	<0.2	2

Parameter	MW#10	MW#11	MW#12	**SHS
Benzene	<0.1	<0.1	<0.1	0.5
Toluene	<0.2	<0.2	<0.2	100
Ethyl Benzene	<0.2	<0.2	<0.2	70
Xylenes	<0.2	<0.2	<0.2	1000
Cumene	<0.2	<0.2	<0.2	18
Naphthalene	<0.2	<0.2	<0.2	10
MTBE	<0.2	<0.2	<0.2	2

**Note:** All results are in mg/l or ppm.

**Bolded** numbers exceed allowable limits.

**\*\*SHS** = Statewide Health Standard for Soil



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Laboratory  
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REPORT DATE: 11/05/02

Customer: American Environmental  
Generator: Leo's Car Wash  
Sample Name: Test Boring MW#1 (8-10') Soil Sample  
Sample Date: 10/29/02  
Lab Sample #: HW37583

**EPA METHOD 5035/8260B  
LABORATORY RESULTS**

<u>Parameter</u>	<u>Result as Received, (mg/kg)</u>	<u>Detection Limit, (mg/kg)</u>
Benzene, mg/kg	<0.1	0.1
Toluene, mg/kg	<0.2	0.2
Ethyl Benzene, mg/kg	0.90	0.2
Xylenes, (Total, mg/kg)	1.56	0.2
Cumene, mg/kg	<0.2	0.2
Naphthalene, mg/kg	0.29	0.2
MTBE, mg/kg	<0.2	0.2

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Lab Director



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**REPORT DATE: 11/05/02**

**Customer:** American Environmental  
**Generator:** Leo's #3 Car Wash  
**Sample Name:** Test Boring MW#2 (3-5') Soil Sample  
**Sample Date:** 10/30/02  
**Lab Sample #:** HW37584

**EPA METHOD 5035/8260B  
LABORATORY RESULTS**

<u>Parameter</u>	<u>Result as Received, (mg/kg)</u>	<u>Detection Limit, (mg/kg)</u>
Benzene, mg/kg	0.26	0.1
Toluene, mg/kg	<0.2	0.2
Ethyl Benzene, mg/kg	3.39	0.2
Xylenes, (Total, mg/kg)	2.03	0.2
Cumene, mg/kg	0.50	0.2
Naphthalene, mg/kg	0.82	0.2
MTBE, mg/kg	<0.2	0.2

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**REPORT DATE:** 11/05/02

**Customer:** American Environmental  
**Generator:** Leo's #3 Car Wash  
**Sample Name:** Test Boring MW#3 (3-5') Soil Sample  
**Sample Date:** 10/30/02  
**Lab Sample #:** HW37585

**EPA METHOD 5035/8260B  
LABORATORY RESULTS**

<u>Parameter</u>	<u>Result as Received, (mg/kg)</u>	<u>Detection Limit, (mg/kg)</u>
Benzene, mg/kg	0.10	0.1
Toluene, mg/kg	1.23	0.2
Ethyl Benzene, mg/kg	3.45	0.2
Xylenes, (Total, mg/kg)	11.5	0.2
Cumene, mg/kg	1.07	0.2
Naphthalene, mg/kg	1.71	0.2
MTBE, mg/kg	0.25	0.2

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REPORT DATE: 11/05/02

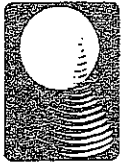
Customer: American Environmental  
Generator: Leo's #3 Car Wash  
Sample Name: Test Boring MW#5 (3-5') Soil Sample  
Sample Date: 10/30/02  
Lab Sample #: HW37587

EPA METHOD 5035/8260B  
LABORATORY RESULTS

<u>Parameter</u>	<u>Result as Received, (mg/kg)</u>	<u>Detection Limit, (mg/kg)</u>
Benzene, mg/kg	0.59	0.1
Toluene, mg/kg	0.31	0.2
Ethyl Benzene, mg/kg	0.38	0.2
Xylenes, (Total, mg/kg)	1.33	0.2
Cumene, mg/kg	<0.2	0.2
Naphthalene, mg/kg	<0.2	0.2
MTBE, mg/kg	<0.2	0.2

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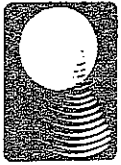
**REPORT DATE:** 11/05/02

**Customer:** American Environmental  
**Generator:** Leo's #3 Car Wash  
**Sample Name:** Test Boring MW#6 (8-10') Soil Sample  
**Sample Date:** 10/30/02  
**Lab Sample #:** HW37588

**EPA METHOD 5035/8260B  
LABORATORY RESULTS**

<u>Parameter</u>	<u>Result as Received, (mg/kg)</u>	<u>Detection Limit, (mg/kg)</u>
Benzene, mg/kg	1.33	0.1
Toluene, mg/kg	0.58	0.2
Ethyl Benzene, mg/kg	14.9	0.8
Xylenes, (Total, mg/kg)	65.5	0.8
Cumene, mg/kg	0.55	0.2
Naphthalene, mg/kg	0.57	0.2
MTBE, mg/kg	<0.2	0.2

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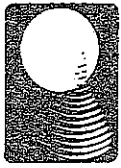
**REPORT DATE: 04/15/03**

**Customer:** American Environmental  
**Generator:** Leo's #3 Wash  
**Sample Name:** MW#10 (8'-10')  
**Sample Date:** 04/08/03  
**Lab Sample #:** HW39736

**EPA METHOD 5035/8260B  
LABORATORY RESULTS**

<u>Parameter</u>	<u>Result as Received, (mg/kg)</u>	<u>Detection Limit, (mg/kg)</u>
Benzene, mg/kg	<0.1	0.1
Toluene, mg/kg	<0.2	0.2
Ethyl Benzene, mg/kg	<0.2	0.2
Xylenes, (Total, mg/kg)	<0.2	0.2
Cumene, mg/kg	<0.2	0.2
Naphthalene, mg/kg	<0.2	0.2
MTBE, mg/kg	<0.2	0.2

Mark Swansiger  
Lab Director



**REPORT DATE:** 04/15/03

**Customer:** American Environmental  
**Generator:** Leo's #3 Wash  
**Sample Name:** MW#11 (3'-5')  
**Sample Date:** 04/08/03  
**Lab Sample #:** HW39737

**EPA METHOD 5035/8260B  
LABORATORY RESULTS**

<u>Parameter</u>	<u>Result as Received, (mg/kg)</u>	<u>Detection Limit, (mg/kg)</u>
Benzene, mg/kg	<0.1	0.1
Toluene, mg/kg	<0.2	0.2
Ethyl Benzene, mg/kg	<0.2	0.2
Xylenes, (Total, mg/kg)	<0.2	0.2
Cumene, mg/kg	<0.2	0.2
Naphthalene, mg/kg	<0.2	0.2
MTBE, mg/kg	<0.2	0.2

Mark Swansiger  
Lab Director



**Environmental  
Laboratory  
Services, Inc.**

(724) 652-5770

1135 Butler Avenue • New Castle, PA 16101

FAX (724) 652-3814

REPORT DATE: 04/15/03

Customer: American Environmental  
Generator: Leo's #3 Wash  
Sample Name: MW#12 (8'-10')  
Sample Date: 04/08/03  
Lab Sample #: HW39738

EPA METHOD 5035/8260B  
LABORATORY RESULTS

<u>Parameter</u>	<u>Result as Received, (mg/kg)</u>	<u>Detection Limit, (mg/kg)</u>
Benzene, mg/kg	<0.1	0.1
Toluene, mg/kg	<0.2	0.2
Ethyl Benzene, mg/kg	<0.2	0.2
Xylenes, (Total, mg/kg)	<0.2	0.2
Cumene, mg/kg	<0.2	0.2
Naphthalene, mg/kg	<0.2	0.2
MTBE, mg/kg	<0.2	0.2

Mark Swansiger  
Lab Director

TABLE 2: SUMMARY OF ANALYTICAL RESULTS  
GROUNDWATER SAMPLES

**Leo's Car Wash  
Static Water Level Data**

Monitoring Well	1st Qtr 2005	2nd Qtr 2006	3rd Qtr 2006	4th Qtr 2006	1st Qtr 2007	2nd Qtr 2007	3rd Qtr 2007	4th Qtr 2007	1st Qtr 2008	2nd Qtr 2008	3rd Qtr 2008	4th Qtr 2008	1st Qtr 2009	2nd Qtr 2009	3rd Qtr 2009	4th Qtr 2009
MW#1	11.37	12.19	11.80	7.61	10.80	11.60	14.20	11.40	21.80	11.85	SW	SW	SW	SW	SW	SW
MW#2	10.29	13.99	12.90	11.40	1.90	11.82	13.00	11.35	11.60	11.82	12.25	11.60	12.25	12.22	12.38	13.20
MW#3	9.81	9.41	10.40	9.10	7.85	8.90	19.68	8.98	23.60	8.20	*	SW	SW	SW	SW	SW
MW#4	11.5	9.30	9.25	8.75	7.85	8.85	10.85	8.40	21.60	8.98	*	SW	SW	SW	SW	SW
MW#5	8.71	8.73	8.90	8.52	8.33	8.70	9.00	8.75	11.69	8.70	*	SW	SW	SW	SW	SW
MW#6	10.69	14.81	12.60	10.90	10.76	11.30	14.90	10.75	21.00	11.55	*	SW	SW	SW	SW	SW
MW#7	7.91	7.99	8.44	7.85	7.55	8.05	8.50	8.15	7.60	8.15	8.42	8.05	7.88	8.08	8.40	8.00
MW#8	12.97	13.70	12.59	12.30	11.72	12.63	14.36	12.50	12.27	12.85	12.82	12.38	12.90	12.69	13.50	14.00
MW#9	12.37	12.95	12.59	12.40	11.75	12.60	13.02	12.38	12.20	12.60	12.68	12.52	12.55	12.55	13.25	12.90
MW#10	*	9.69	9.65	9.41	9.10	9.58	9.82	9.45	9.38	9.60	9.70	6.50	9.60	9.63	9.71	9.80
MW#11	*	6.27	6.70	6.12	5.81	6.35	16.80	6.45	5.86	6.45	6.70	9.50	6.03	6.40	6.80	6.55
MW#12	*	9.93	10.00	9.18	8.80	9.36	10.00	9.25	9.04	9.40	9.95	9.26	9.30	9.40	9.68	9.70
K-1	---	---	---	---	---	10.08	9.42	8.93	8.80	9.03	9.37	9.17	9.80	---	9.75	---
K-2	---	---	---	---	---	9.42	10.40	9.00	8.57	9.05	9.34	9.10	9.10	---	9.40	---
K-3	---	---	---	---	---	10.64	10.45	9.00	8.67	9.50	9.81	11.50	9.45	---	9.90	---

Monitoring Well	1st Qtr 2010	2nd Qtr 2010	3rd Qtr 2010	4th Qtr 2010	1st Qtr 2011	2nd Qtr 2011	3rd Qtr 2011	4th Qtr 2011	1st Qtr 2012	2nd Qtr 2012	3rd Qtr 2012	4th Qtr 2012	1st Qtr 2013	2nd Qtr 2013	3rd Qtr 2013	4th Qtr 2013
MW#1	SW	11.91	SW	SW	SW	11.13	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
MW#2	13.27	11.84	12.24	12.80	10.16	11.43	12.10	12.10	12.20	12.13	11.72	11.56	11.59	11.02	11.85	11.50
MW#3	SW	8.82	SW	SW	SW	8.35	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
MW#4	SW	8.80	SW	SW	SW	8.24	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
MW#5	SW	8.68	SW	SW	SW	8.33	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
MW#6	SW	10.71	SW	SW	SW	11.23	SW	SW	SW	SW	SW	SW	SW	SW	SW	SW
MW#7	8.20	8.09	8.35	8.23	7.34	7.50	8.35	8.31	8.05	8.34	8.40	7.99	7.90	7.55	8.26	7.82
MW#8	13.78	12.71	14.60	13.57	11.80	12.40	13.07	12.99	13.02	13.15	12.87	12.61	12.80	12.65	12.87	12.51
MW#9	12.90	12.55	12.86	12.70	11.64	12.32	12.68	12.60	12.63	12.67	12.52	12.37	12.45	12.50	12.64	12.35
MW#10	7.94	9.60	9.85	9.80	8.90	9.36	9.70	9.70	9.65	9.67	9.52	9.40	9.51	9.45	9.62	9.42
MW#11	6.55	6.40	6.65	6.54	5.66	5.76	6.63	6.60	6.35	6.64	6.70	6.29	6.20	6.10	6.55	6.20
MW#12	9.55	8.96	9.50	9.52	8.60	9.02	10.01	10.34	10.42	10.54	9.67	9.31	9.20	9.21	9.55	9.22
MW#18	---	---	---	---	---	---	---	---	---	---	---	---	---	---	9.80	9.65
MW#19	---	---	---	---	---	---	---	---	---	---	---	---	---	---	13.80	13.20
MW#20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	9.45	9.50
K-1	---	8.87	9.20	9.20	---	8.80	9.18	9.20	9.40	9.26	9.17	8.23	9.00	8.32	9.37	9.20
K-2	---	8.85	9.20	9.37	---	8.74	9.35	9.39	9.44	9.52	9.17	8.32	9.40	9.87	9.90	10.00
K-3	---	9.58	9.62	9.74	---	9.30	9.73	9.76	9.63	10.19	9.50	8.60	8.55	9.21	9.05	8.32

SW - System Well

**Leo's Car Wash  
Groundwater Data**

Monitoring Well	1st Qtr 2014
MW#1	SW
MW#2	11.62
MW#3	SW
MW#4	SW
MW#5	SW
MW#6	SW
MW#7	7.89
MW#8	12.85
MW#9	12.46
MW#10	9.52
MW#11	6.15
MW#12	9.22
K-1	---
K-2	---
K-3	---

SW - System Well



**Leo's Car Wash  
Monitoring Well MW#1/RW#1**

Parameter (mg/L)	1st Qtr 2006	3rd Qtr 2007	3rd Qtr 2008	2nd Qtr 2010	2nd Qtr 2011
Benzene	<b>0.127</b>	<b>0.029</b>	<b>0.060</b>	0.002	<0.001
Toluene	0.22	<0.002	0.010	<0.002	<0.002
Ethylbenzene	0.003	0.013	0.63	<0.002	0.032
Xylene	1.78	0.057	1.66	<0.002	0.040
Cumene	<0.002	<0.002	0.043	<0.002	0.004
Naphthalene	<b>0.162</b>	0.004	<b>0.30</b>	<0.002	0.009
MTBE	<b>0.48</b>	<b>0.078</b>	<0.002	0.011	<0.002

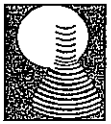
**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.

**Leo's Car Wash  
Monitoring Well MW#2**

Parameter (mg/L)	1st Qtr 2005	2nd Qtr 2006	3rd Qtr 2006	4th Qtr 2006	1st Qtr 2007	2nd Qtr 2007	3rd Qtr 2007	4th Qtr 2007	1st Qtr 2008	2nd Qtr 2008	3rd Qtr 2008	4th Qtr 2008
Benzene	<0.001	4.19	0.70	1.13	0.28	0.28	0.19	0.23	0.35	0.11	0.32	0.820
Toluene	<0.002	2.92	1.44	2.14	<0.1	<0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ethylbenzene	<0.002	1.19	1.35	1.63	0.84	0.67	0.64	0.21	0.12	0.10	0.14	0.263
Xylene	<0.002	5.89	6.21	7.57	3.35	2.46	1.58	0.23	0.21	0.18	0.18	0.354
Cumene	<0.002	0.08	0.16	0.18	0.18	0.20	0.23	0.09	0.08	0.07	0.12	0.132
Naphthalene	<0.002	0.35	0.48	0.39	0.25	0.27	0.35	0.10	0.06	0.05	0.03	0.084
MTBE	<0.002	0.58	0.37	0.26	0.23	0.18	0.05	0.10	0.07	<0.01	0.01	0.029

Parameter (mg/L)	1st Qtr 2009	2nd Qtr 2009	4th Qtr 2009	1st Qtr 2010	2nd Qtr 2010	3rd Qtr 2010	4th Qtr 2010	1st Qtr 2011	2nd Qtr 2011	3rd Qtr 2011	4th Qtr 2011
Benzene	0.335	0.698	0.139	0.121	0.212	0.104	0.076	0.500	0.316	0.089	0.13
Toluene	<0.010	<0.01	<0.010	<0.002	<0.002	<0.002	<0.002	0.005	<0.002	<0.002	<0.0020
Ethylbenzene	0.040	0.090	0.049	0.014	0.068	0.007	0.007	0.095	0.044	0.006	0.0090
Xylene	0.054	0.150	0.072	0.015	0.101	0.006	0.004	0.035	0.018	0.002	0.0070
Cumene	0.043	0.070	0.067	0.035	0.038	0.020	0.013	0.005	0.012	0.015	0.013
Naphthalene	0.035	0.030	0.021	<0.002	0.021	<0.002	0.002	0.020	0.003	0.002	0.0050
MTBE	0.012	<0.01	<0.010	0.013	0.015	0.006	0.005	0.014	0.011	0.005	0.0050

Parameter (mg/L)	1st Qtr 2012	2nd Qtr 2012	3rd Qtr 2012	4th Qtr 2012	1st Qtr 2013	2nd Qtr 2013	3rd Qtr 2013	4th Qtr 2013	1st Qtr 2014
Benzene	0.25	0.17	0.16	0.152	0.345	0.034	0.120	<0.001	0.901
Toluene	<0.0020	<0.0020	0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	0.015
Ethylbenzene	0.022	0.007	0.0040	0.004	0.036	0.023	0.004	<0.002	0.290
Xylene	0.0030	0.0040	0.0030	0.002	0.015	0.042	0.005	<0.002	0.157
Cumene	0.0090	0.0080	0.0070	0.004	0.014	<0.002	0.006	<0.002	0.017
Naphthalene	<0.0020	<0.0020	0.017	0.002	0.007	0.017	0.010	<0.002	0.020
MTBE	0.011	0.0070	0.0050	0.007	0.009	<0.002	0.005	<0.002	0.009



# Environmental Laboratory Services Inc.

1135 Butler Ave New Castle, PA 16101 ph 724.652.5770 fax 724.652.3814

PA Certification Lab ID #37-00237  
WV Certification Lab ID #379

Report Date: 04/03/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9402-001  
Sample Name: Monitoring Well MW#2 Groundwater Sample  
Sample Date: 3/24/2014 1:00:00 PM  
Date Received: 3/24/2014

Parameter	Result	Reporting Limit	Qual.	Method	Analysis Date	Analyst
Benzene, mg/L	0.901	0.001	D2	EPA 8260B	04/01/14 21:23	MGW
Toluene, mg/L	0.015	0.002		EPA 8260B	04/01/14 20:43	MGW
Ethylbenzene, mg/L	0.290	0.002	D2	EPA 8260B	04/01/14 21:23	MGW
Xylenes(Total), mg/L	0.157	0.002		EPA 8260B	04/01/14 20:43	MGW
Cumene, mg/L	0.017	0.002		EPA 8260B	04/01/14 20:43	MGW
Naphthalene, mg/L	0.020	0.002		EPA 8260B	04/01/14 20:43	MGW
MTBE, mg/L	0.009	0.002		EPA 8260B	04/01/14 20:43	MGW
Aqueous-phase purge-and-trap	---			EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director

**Leo's Car Wash  
Monitoring Well MW#3/RW#3**

Parameter (mg/L)	1st Qtr 2006	3rd Qtr 2007	3rd Qtr 2008	2nd Qtr 2010	2nd Qtr 2011
Benzene	3.32	0.114	3.59	1.41	0.756
Toluene	7.88	<0.002	0.198	0.020	0.009
Ethylbenzene	0.80	0.009	0.30	0.132	0.114
Xylene	6.16	0.059	2.33	0.342	0.250
Cumene	<0.2	<0.002	0.047	0.019	0.015
Naphthalene	0.37	0.004	0.14	0.029	0.020
MTBE	4.39	0.032	0.040	0.021	0.007

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.

**Leo's Car Wash  
Monitoring Well MW#4/RW#4**

Parameter (mg/L)	1st Qtr 2006	3rd Qtr 2007	3rd Qtr 2008	2nd Qtr 2010	2nd Qtr 2011
Benzene	<b>3.10</b>	<b>0.41</b>	<b>6.50</b>	<b>0.583</b>	<b>0.010</b>
Toluene	<b>2.98</b>	0.86	<b>11.07</b>	0.633	0.012
Ethylbenzene	0.66	0.15	<b>1.55</b>	0.132	0.003
Xylene	2.48	2.02	<b>12.79</b>	1.15	0.025
Cumene	<0.2	0.01	0.132	0.014	<0.002
Naphthalene	<b>0.23</b>	0.09	<b>0.23</b>	0.048	<0.002
MTBE	<b>7.44</b>	<b>0.14</b>	<b>0.39</b>	0.010	<0.002

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.

**Leo's Car Wash  
Monitoring Well MW#5/RW#5**

Parameter (mg/L)	1st Qtr 2006	3rd Qtr 2007	3rd Qtr 2008	2nd Qtr 2010	2nd Qtr 2011
Benzene	<b>0.48</b>	<b>0.12</b>	<b>0.402</b>	<b>2.48</b>	<b>0.028</b>
Toluene	0.94	0.26	0.701	<b>3.72</b>	0.087
Ethylbenzene	0.03	0.07	0.019	0.219	0.003
Xylene	1.61	0.31	0.450	2.48	0.082
Cumene	0.02	<0.01	<0.002	0.014	<0.002
Naphthalene	0.03	<b>0.13</b>	0.004	0.049	<0.002
MTBE	<b>0.14</b>	<b>0.13</b>	0.004	<b>0.030</b>	<0.002

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.

**Leo's Car Wash  
Monitoring Well MW#6/RW#6**

Parameter (mg/L)	1st Qtr 2006	3rd Qtr 2007	3rd Qtr 2008	2nd Qtr 2010	2nd Qtr 2011
Benzene	0.34	0.22	1.30	0.341	0.544
Toluene	0.12	0.003	0.045	<0.010	0.145
Ethylbenzene	0.27	0.114	0.44	0.144	0.218
Xylene	0.65	0.050	1.09	0.204	1.330
Cumene	0.02	0.022	0.011	<0.010	0.018
Naphthalene	<b>0.11</b>	0.030	0.046	0.013	0.067
MTBE	<b>0.95</b>	<b>0.32</b>	<b>0.26</b>	<b>0.043</b>	<b>0.037</b>

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.

**Leo's Car Wash  
Monitoring Well MW#7**

Parameter (mg/L)	1st Qtr 2005	2nd Qtr 2006	3rd Qtr 2006	4th Qtr 2006	1st Qtr 2007	2nd Qtr 2007	3rd Qtr 2007	4th Qtr 2007	1st Qtr 2008	2nd Qtr 2008	3rd Qtr 2008	4th Qtr 2008
Benzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Ethylbenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Xylene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cumene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Naphthalene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
MTBE	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

Parameter (mg/L)	1st Qtr 2009	2nd Qtr 2009	4th Qtr 2009	1st Qtr 2010	2nd Qtr 2010	3rd Qtr 2010	4th Qtr 2010	1st Qtr 2011	2nd Qtr 2011	3rd Qtr 2011	4th Qtr 2011
Benzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Toluene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Ethylbenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Xylene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Cumene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Naphthalene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
MTBE	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020

Parameter (mg/L)	1st Qtr 2012	2nd Qtr 2012	3rd Qtr 2012	4th Qtr 2012	1st Qtr 2013	2nd Qtr 2013	3rd Qtr 2013	4th Qtr 2013	1st Qtr 2014
Benzene	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Ethylbenzene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Xylene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cumene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Naphthalene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
MTBE	<0.0020	0.012	<0.0020	<0.002	<0.002	<0.002	<0.002	0.005	<0.002

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.





Report Date: 04/03/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9402-002  
Sample Name: Monitoring Well MW#7 Groundwater Sample  
Sample Date: 3/24/2014 11:45:00 AM  
Date Received: 3/24/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/01/14 21:52	MGW
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 21:52	MGW
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 21:52	MGW
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/01/14 21:52	MGW
Cumene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 21:52	MGW
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 21:52	MGW
MTBE, mg/L	<0.002	0.002	EPA 8260B	04/01/14 21:52	MGW
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director

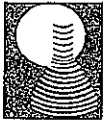
Leo's Car Wash  
Monitoring Well MW#8

Parameter (mg/L)	1st Qtr 2005	2nd Qtr 2006	3rd Qtr 2006	4th Qtr 2006	1st Qtr 2007	2nd Qtr 2007	3rd Qtr 2007	4th Qtr 2007	1st Qtr 2008	2nd Qtr 2008	3rd Qtr 2008	4th Qtr 2008
Benzene	<0.001	<b>0.021</b>	<b>0.007</b>	<0.001	<0.001	<0.001	<b>0.015</b>	<0.001	<0.001	<0.001	<0.001	0.002
Toluene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Ethylbenzene	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Xylene	<0.002	0.012	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cumene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Naphthalene	<0.002	0.006	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
MTBE	<b>1.48</b>	<b>0.158</b>	<b>0.074</b>	<b>0.049</b>	0.013	0.014	<b>0.052</b>	<0.002	<b>0.032</b>	<b>0.040</b>	<b>0.027</b>	<0.002

Parameter (mg/L)	1st Qtr 2009	2nd Qtr 2009	3rd Qtr 2009	4th Qtr 2009	1st Qtr 2010	2nd Qtr 2010	3rd Qtr 2010	4th Qtr 2010	1st Qtr 2011	2nd Qtr 2011	3rd Qtr 2011	4th Qtr 2011
Benzene	<0.001	<0.001	<0.001	<0.001	<b>0.007</b>	<0.001	<b>0.165</b>	<0.001	<0.001	0.002	<0.001	<0.0010
Toluene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.0020
Ethylbenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.014	<0.002	<0.002	<0.002	<0.002	<0.0020
Xylene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.0020
Cumene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.015	<0.002	<0.002	<0.002	<0.002	<0.0020
Naphthalene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.0020
MTBE	0.007	0.014	<b>0.025</b>	<b>0.027</b>	<b>0.038</b>	<b>0.040</b>	<b>0.138</b>	<b>0.025</b>	0.005	<b>0.023</b>	<b>0.035</b>	<b>0.033</b>

Parameter (mg/L)	1st Qtr 2012	2nd Qtr 2012	3rd Qtr 2012	4th Qtr 2012	1st Qtr 2013	2nd Qtr 2013	3rd Qtr 2013	4th Qtr 2013	1st Qtr 2014
Benzene	<0.0010	<0.0010	<b>0.20</b>	<b>0.226</b>	<b>0.573</b>	<0.001	<0.001	<0.001	<0.001
Toluene	<0.0020	<0.0020	<0.0020	<0.002	0.009	<0.002	<0.002	<0.002	<0.002
Ethylbenzene	<0.0020	<0.0020	0.0040	0.008	0.093	<0.002	<0.002	<0.002	<0.002
Xylene	<0.0020	<0.0020	0.0080	0.002	0.053	<0.002	<0.002	<0.002	<0.002
Cumene	<0.0020	<0.0020	0.0060	0.008	0.078	<0.002	0.011	<0.002	<0.002
Naphthalene	<0.0020	<0.0020	0.0040	0.01	0.046	<0.002	0.019	<0.002	<0.002
MTBE	0.013	<0.0020	0.018	<b>0.023</b>	0.010	<0.002	<0.002	0.003	0.017

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.



Report Date: 04/03/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9402-003  
Sample Name: Monitoring Well MW#8 Groundwater Sample  
Sample Date: 3/24/2014 12:00:00 PM  
Date Received: 3/24/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/01/14 22:21	MGW
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 22:21	MGW
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 22:21	MGW
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/01/14 22:21	MGW
Cumene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 22:21	MGW
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 22:21	MGW
MTBE, mg/L	0.017	0.002	EPA 8260B	04/01/14 22:21	MGW
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director

**Leo's Car Wash  
Monitoring Well MW#9**

Parameter (mg/L)	1st Qtr 2005	2nd Qtr 2006	3rd Qtr 2006	4th Qtr 2006	1st Qtr 2007	2nd Qtr 2007	3rd Qtr 2007	4th Qtr 2007	1st Qtr 2008	2nd Qtr 2008	3rd Qtr 2008	4th Qtr 2008
Benzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Ethylbenzene	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Xylene	<0.002	<0.002	0.007	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cumene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Naphthalene	<0.002	<0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
MTBE	<b>0.213</b>	<b>0.030</b>	<b>0.021</b>	<b>0.030</b>	0.003	0.006	0.004	<0.002	0.002	<0.002	0.007	<b>0.028</b>

Parameter (mg/L)	1st Qtr 2009	2nd Qtr 2009	3rd Qtr 2009	4th Qtr 2009	1st Qtr 2010	2nd Qtr 2010	3rd Qtr 2010	4th Qtr 2010	1st Qtr 2011	2nd Qtr 2011	3rd Qtr 2011	4th Qtr 2011
Benzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Toluene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Ethylbenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Xylene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Cumene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Naphthalene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
MTBE	<0.002	<0.002	0.004	<0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	0.0040

Parameter (mg/L)	1st Qtr 2012	2nd Qtr 2012	3rd Qtr 2012	4th Qtr 2012	1st Qtr 2013	2nd Qtr 2013	3rd Qtr 2013	4th Qtr 2013	1st Qtr 2014
Benzene	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Ethylbenzene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Xylene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cumene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Naphthalene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
MTBE	<0.0020	<0.0020	0.0040	0.003	<0.002	<0.002	0.003	<0.002	<0.002

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.



Report Date: 04/03/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9402-004  
Sample Name: Monitoring Well MW#9 Groundwater Sample  
Sample Date: 3/24/2014 12:30:00 PM  
Date Received: 3/24/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/02/14 12:11	ALH
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:11	ALH
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:11	ALH
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:11	ALH
Cumene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:11	ALH
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:11	ALH
MTBE, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:11	ALH
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director

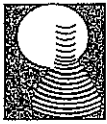
Leo's Car Wash  
Monitoring Well MW#10

Parameter (mg/L)	1st Qtr 2006	2nd Qtr 2006	3rd Qtr 2006	4th Qtr 2006	1st Qtr 2007	2nd Qtr 2007	3rd Qtr 2007	4th Qtr 2007	1st Qtr 2008	2nd Qtr 2008	3rd Qtr 2008	4th Qtr 2008
Benzene	<0.001	---	0.002	0.002	<b>0.021</b>	---	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	<0.002	---	<0.002	<0.002	<0.002	---	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Ethylbenzene	<0.002	---	<0.002	<0.002	<0.002	---	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Xylene	<0.002	---	<0.002	<0.002	<0.002	---	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cumene	<0.002	---	<0.002	<0.002	<0.002	---	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Naphthalene	<0.002	---	<0.002	<0.002	<0.002	---	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
MTBE	<b>0.026</b>	---	0.005	0.017	<b>0.072</b>	---	<0.002	0.004	<0.002	<0.002	<0.002	<0.002

Parameter (mg/L)	1st Qtr 2009	2nd Qtr 2009	3rd Qtr 2009	4th Qtr 2009	1st Qtr 2010	2nd Qtr 2010	3rd Qtr 2010	4th Qtr 2010	1st Qtr 2011	2nd Qtr 2011	3rd Qtr 2011	4th Qtr 2011
Benzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<b>0.125</b>	<b>0.060</b>	<0.001	<0.0010
Toluene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Ethylbenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.0020
Xylene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.0020
Cumene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.004	0.006	<0.002	<0.0020
Naphthalene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
MTBE	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<b>0.031</b>	0.018	<0.002	<0.0020

Parameter (mg/L)	1st Qtr 2012	2nd Qtr 2012	3rd Qtr 2012	4th Qtr 2012	1st Qtr 2013	2nd Qtr 2013	3rd Qtr 2013	4th Qtr 2013	1st Qtr 2014
Benzene	<0.0010	<0.0010	<0.0010	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Ethylbenzene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Xylene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cumene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Naphthalene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
MTBE	<0.0020	<0.0020	<0.0020	0.003	<0.002	<0.002	<0.002	<0.002	<0.002

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.



Report Date: 04/03/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9402-005  
Sample Name: Monitoring Well MW#10 Groundwater Sample  
Sample Date: 3/24/2014 12:45:00 PM  
Date Received: 3/24/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/02/14 12:43	ALH
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:43	ALH
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:43	ALH
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:43	ALH
Cumene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:43	ALH
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:43	ALH
MTBE, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:43	ALH
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director

**Leo's Car Wash  
Monitoring Well MW#11**

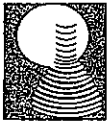
Parameter (mg/L)	1st Qtr 2006	2nd Qtr 2006	3rd Qtr 2006	4th Qtr 2006	1st Qtr 2007	2nd Qtr 2007	3rd Qtr 2007	4th Qtr 2007	1st Qtr 2008	2nd Qtr 2008	3rd Qtr 2008	4th Qtr 2008
Benzene	<0.001	---	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	<0.002	---	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Ethylbenzene	<0.002	---	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Xylene	<0.002	---	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cumene	<0.002	---	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Naphthalene	<0.002	---	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
MTBE	<0.002	---	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

Parameter (mg/L)	1st Qtr 2009	2nd Qtr 2009	3rd Qtr 2009	4th Qtr 2009	1st Qtr 2010	2nd Qtr 2010	3rd Qtr 2010	4th Qtr 2010	1st Qtr 2011	2nd Qtr 2011	3rd Qtr 2011	4th Qtr 2011
Benzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Toluene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Ethylbenzene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Xylene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Cumene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Naphthalene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
MTBE	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020

Parameter (mg/L)	1st Qtr 2012	2nd Qtr 2012	3rd Qtr 2012	4th Qtr 2012	1st Qtr 2013	2nd Qtr 2013	3rd Qtr 2013	4th Qtr 2013	1st Qtr 2014
Benzene	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Ethylbenzene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Xylene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cumene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Naphthalene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
MTBE	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.





Report Date: 04/03/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9402-006  
Sample Name: Monitoring Well MW#11 Groundwater Sample  
Sample Date: 3/24/2014 1:15:00 PM  
Date Received: 3/24/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/02/14 14:23	ALH
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:23	ALH
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:23	ALH
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:23	ALH
Cumene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:23	ALH
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:23	ALH
MTBE, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:23	ALH
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director

Leo's Car Wash  
Monitoring Well MW#12

Parameter (mg/L)	1st Qtr 2005	2nd Qtr 2006	3rd Qtr 2006	4th Qtr 2006	1st Qtr 2007	2nd Qtr 2007	3rd Qtr 2007	4th Qtr 2007	1st Qtr 2008	2nd Qtr 2008	3rd Qtr 2008	4th Qtr 2008
Benzene	<0.001	<0.001	0.003	---	<0.001	0.002	0.002	0.001	<0.001	<0.001	0.001	<0.001
Toluene	<0.002	<0.002	0.016	---	0.002	0.037	0.037	0.005	0.005	0.004	0.005	<0.002
Ethylbenzene	<0.002	<0.002	0.057	---	0.028	0.100	0.100	0.029	0.055	0.048	0.105	0.003
Xylene	<0.002	<0.002	0.386	---	0.156	0.402	0.402	0.159	0.248	0.212	0.330	0.008
Cumene	<0.002	<0.002	0.017	---	0.010	0.035	0.035	0.014	0.031	0.018	0.045	0.003
Naphthalene	<0.002	<0.002	0.055	---	0.011	0.038	0.038	0.009	0.018	0.018	0.029	0.002
MTBE	<b>0.86</b>	<0.002	<0.002	---	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

Parameter (mg/L)	1st Qtr 2009	2nd Qtr 2009	3rd Qtr 2009	4th Qtr 2009	1st Qtr 2010	2nd Qtr 2010	3rd Qtr 2010	4th Qtr 2010	1st Qtr 2011	2nd Qtr 2011	3rd Qtr 2011	4th Qtr 2011
Benzene	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Toluene	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
Ethylbenzene	0.005	0.022	0.042	0.021	0.011	<0.002	<0.002	0.006	<0.002	<0.002	<0.002	<0.0020
Xylene	<0.002	0.027	0.053	0.027	0.009	<0.002	<0.002	0.014	<0.002	<0.002	<0.002	0.0070
Cumene	0.005	0.018	0.037	0.022	0.014	<0.002	0.004	0.018	<0.002	0.003	<0.002	0.0030
Naphthalene	<0.002	0.004	0.006	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020
MTBE	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0020

Parameter (mg/L)	1st Qtr 2012	2nd Qtr 2012	3rd Qtr 2012	4th Qtr 2012	1st Qtr 2013	2nd Qtr 2013	3rd Qtr 2013	4th Qtr 2013	1st Qtr 2014
Benzene	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<b>0.213</b>	<0.001
Toluene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	0.002	<0.002
Ethylbenzene	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	0.013	<0.002
Xylene	0.0070	<0.0020	<0.0020	<0.002	0.002	<0.002	<0.002	0.006	<0.002
Cumene	0.0030	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	0.007	<0.002
Naphthalene	<0.0020	<0.0020	0.0020	<0.002	<0.002	<0.002	<0.002	0.014	<0.002
MTBE	<0.0020	<0.0020	<0.0020	<0.002	<0.002	<0.002	<0.002	0.006	<0.002

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.



Report Date: 04/03/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9402-007  
Sample Name: Monitoring Well MW#12 Groundwater Sample  
Sample Date: 3/24/2014 1:30:00 PM  
Date Received: 3/24/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/02/14 14:46	ALH
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:46	ALH
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:46	ALH
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:46	ALH
Cumene, mg/L	0.005	0.002	EPA 8260B	04/02/14 14:46	ALH
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:46	ALH
MTBE, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:46	
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director

**Leo's Car Wash  
Monitoring Well MW#18**

Parameter (mg/L)	3rd Qtr 2013		4th Qtr
	7/15/13	9/19/13	11/8/2013
Benzene	<0.001	<0.001	<0.001
Toluene	<0.002	<0.002	<0.002
Ethylbenzene	<0.002	<0.002	<0.002
Xylene	<0.002	<0.002	<0.002
Cumene	<0.002	<0.002	<0.002
Naphthalene	<0.002	<0.002	<0.002
MTBE	<0.002	<0.002	<0.002

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.



Report Date: 07/24/2013

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 7523-007  
Sample Name: Monitoring Well MW#18 Groundwater Sample  
Sample Date: 7/15/2013 11:30:00 AM  
Date Received: 7/15/2013

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	07/22/13 17:49	ALH
Toluene, mg/L	<0.002	0.002	EPA 8260B	07/22/13 17:49	ALH
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	07/22/13 17:49	ALH
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	07/22/13 17:49	ALH
Cumene, mg/L	<0.002	0.002	EPA 8260B	07/22/13 17:49	ALH
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	07/22/13 17:49	ALH
MTBE, mg/L	<0.002	0.002	EPA 8260B	07/22/13 17:49	ALH
Aqueous-phase purge-and-trap	---		EPA 5030B	07/22/13 17:49	ALH

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director



Report Date: 09/30/2013

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 8113-001  
Sample Name: Monitoring Well MW#18 Groundwater Sample  
Sample Date: 9/19/2013 1:15:00 PM  
Date Received: 9/19/2013

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	09/23/13 19:25	MGW
Toluene, mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:25	MGW
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:25	MGW
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:25	MGW
Cumene, mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:25	MGW
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:25	MGW
MTBE, mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:25	MGW
Aqueous-phase purge-and-trap	---		EPA 5030B	09/23/13 19:25	MGW

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director



# Environmental Laboratory Services Inc.

1135 Butler Ave New Castle, PA 16101 ph 724.652.5770 fax 724.652.3814

PA Certification Lab ID #37-00237

WV Certification Lab ID #379

Report Date: 11/18/2013

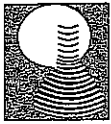
American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 8491-001  
Sample Name: Monitoring Well MW#18 Groundwater Sample  
Sample Date: 11/8/2013 1:00:00 PM  
Date Received: 11/8/2013

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	11/15/13 20:47	MGW
Toluene, mg/L	<0.002	0.002	EPA 8260B	11/15/13 20:47	MGW
Ethylbenzene, mg/L	<0.002	0.002	EPA-8260B	11/15/13 20:47	MGW
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	11/15/13 20:47	MGW
Cumene, mg/L	<0.002	0.002	EPA 8260B	11/15/13 20:47	MGW
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	11/15/13 20:47	MGW
MTBE, mg/L	<0.002	0.002	EPA 8260B	11/15/13 20:47	MGW
Aqueous-phase purge-and-trap	---		EPA 5030B	11/15/13 20:47	MGW

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director



Report Date: 04/25/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9667-001  
Sample Name: Monitoring Well MW#18 Groundwater Sample  
Sample Date: 4/23/2014 11:45:00 AM  
Date Received: 4/23/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/24/14 18:35	MGW
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/24/14 18:35	MGW
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/24/14 18:35	MGW
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/24/14 18:35	MGW
Cumene, mg/L	<0.002	0.002	EPA 8260B	04/24/14 18:35	MGW
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/24/14 18:35	MGW
MTBE, mg/L	<0.002	0.002	EPA 8260B	04/24/14 18:35	MGW
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

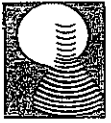
Approved By: Marianne Whipkey  
Laboratory Director



**Leo's Car Wash  
Monitoring Well MW#19**

Parameter (mg/L)	3rd Qtr 2013		4th Qtr	
	7/15/13	9/19/13	11/8/2013	4/23/2014
Benzene	<b>0.103</b>	<b>0.094</b>	<b>0.124</b>	<b>0.33</b>
Toluene	<0.002	<0.002	<0.002	<0.002
Ethylbenzene	<0.002	0.004	0.003	0.006
Xylene	<0.002	0.002	0.002	<0.002
Cumene	0.071	0.007	0.009	0.046
Naphthalene	<0.002	0.002	0.003	0.002
MTBE	<0.002	<0.002	0.002	0.002

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.



Report Date: 07/24/2013

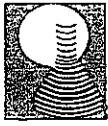
American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 7523-008  
Sample Name: Monitoring Well MW#19 Groundwater Sample  
Sample Date: 7/15/2013 11:45:00 AM  
Date Received: 7/15/2013

Parameter	Result	Reporting Limit	Qual.	Method	Analysis Date	Analyst
Benzene, mg/L	0.103	0.001	D2	EPA 8260B	07/22/13 18:36	ALH
Toluene, mg/L	<0.002	0.002		EPA 8260B	07/22/13 18:13	ALH
Ethylbenzene, mg/L	<0.002	0.002		EPA 8260B	07/22/13 18:13	ALH
Xylenes(Total), mg/L	<0.002	0.002		EPA 8260B	07/22/13 18:13	ALH
Cumene, mg/L	0.071	0.002		EPA 8260B	07/22/13 18:13	ALH
Naphthalene, mg/L	<0.002	0.002		EPA 8260B	07/22/13 18:13	ALH
MTBE, mg/L	<0.002	0.002		EPA 8260B	07/22/13 18:13	ALH
Aqueous-phase purge-and-trap	---			EPA 5030B	07/22/13 18:13	ALH

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director



Report Date: 09/30/2013

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 8113-002  
Sample Name: Monitoring Well MW#19 Groundwater Sample  
Sample Date: 9/19/2013 1:30:00 PM  
Date Received: 9/19/2013

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	0.094	0.001	EPA 8260B	09/23/13 19:50	MGW
Toluene, mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:50	MGW
Ethylbenzene, mg/L	0.004	0.002	EPA 8260B	09/23/13 19:50	MGW
Xylenes(Total), mg/L	0.002	0.002	EPA 8260B	09/23/13 19:50	MGW
Cumene, mg/L	0.007	0.002	EPA 8260B	09/23/13 19:50	MGW
Naphthalene, mg/L	0.002	0.002	EPA 8260B	09/23/13 19:50	MGW
MTBE, mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:50	MGW
Aqueous-phase purge-and-trap	---		EPA 5030B	09/23/13 19:50	MGW

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director



Report Date: 11/18/2013

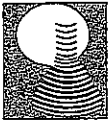
American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 8491-002  
Sample Name: Monitoring Well MW#19 Groundwater Sample  
Sample Date: 11/8/2013 1:15:00 PM  
Date Received: 11/8/2013

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	0.124	0.001	EPA 8260B	11/15/13 21:43	MGW
Toluene, mg/L	<0.002	0.002	EPA 8260B	11/15/13 21:43	MGW
Ethylbenzene, mg/L	0.003	0.002	EPA 8260B	11/15/13 21:43	MGW
Xylenes(Total), mg/L	0.002	0.002	EPA 8260B	11/15/13 21:43	MGW
Cumene, mg/L	0.009	0.002	EPA 8260B	11/15/13 21:43	MGW
Naphthalene, mg/L	0.003	0.002	EPA 8260B	11/15/13 21:43	MGW
MTBE, mg/L	0.002	0.002	EPA 8260B	11/15/13 21:43	MGW
Aqueous-phase purge-and-trap	---		EPA 5030B	11/15/13 21:43	MGW

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director



Report Date: 04/25/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9667-002  
Sample Name: Monitoring Well MW#19 Groundwater Sample  
Sample Date: 4/23/2014 11:50:00 AM  
Date Received: 4/23/2014

Parameter	Result	Reporting Limit	Qual.	Method	Analysis Date	Analyst
Benzene, mg/L	0.33	0.001	D2	EPA 8260B	04/24/14 19:47	MGW
Toluene, mg/L	<0.002	0.002		EPA 8260B	04/24/14 19:09	MGW
Ethylbenzene, mg/L	0.006	0.002		EPA 8260B	04/24/14 19:09	MGW
Xylenes(Total), mg/L	<0.002	0.002		EPA 8260B	04/24/14 19:09	MGW
Cumene, mg/L	0.046	0.002		EPA 8260B	04/24/14 19:09	MGW
Naphthalene, mg/L	0.002	0.002		EPA 8260B	04/24/14 19:09	MGW
MTBE, mg/L	0.002	0.002		EPA 8260B	04/24/14 19:09	MGW
Aqueous-phase purge-and-trap	---			EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director

**Leo's Car Wash  
Monitoring Well MW#20**

Parameter (mg/L)	3rd Qtr 2013		4th Qtr	
	7/15/13	9/19/13	11/8/13	4/23/14
Benzene	0.097	<b>0.056</b>	<b>0.048</b>	<b>0.085</b>
Toluene	0.042	0.018	0.011	0.035
Ethylbenzene	0.329	0.345	0.183	0.27
Xylene	0.524	0.468	0.353	0.22
Cumene	0.051	0.055	0.033	0.049
Naphthalene	0.024	0.035	0.026	0.015
MTBE	0.009	0.011	0.009	0.011

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.



Report Date: 07/24/2013

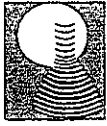
American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 7523-009  
Sample Name: Monitoring Well MW#20 Groundwater Sample  
Sample Date: 7/15/2013 12:00:00 PM  
Date Received: 7/15/2013

Parameter	Result	Reporting Limit	Qual.	Method	Analysis Date	Analyst
Benzene, mg/L	0.097	0.001	D2	EPA 8260B	07/22/13 19:24	ALH
Toluene, mg/L	0.042	0.002		EPA 8260B	07/22/13 19:00	ALH
Ethylbenzene, mg/L	0.329	0.002	D2	EPA 8260B	07/22/13 19:24	ALH
Xylenes(Total), mg/L	0.524	0.002	D2	EPA 8260B	07/22/13 19:24	ALH
Cumene, mg/L	0.051	0.002		EPA 8260B	07/22/13 19:00	ALH
Naphthalene, mg/L	0.024	0.002		EPA 8260B	07/22/13 19:00	ALH
MTBE, mg/L	0.009	0.002		EPA 8260B	07/22/13 19:00	ALH
Aqueous-phase purge-and-trap	---			EPA 5030B	07/22/13 19:00	ALH

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director



Report Date: 09/30/2013

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

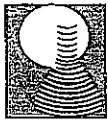
Project: Leo's #3 Car Wash  
Lab Sample #: 8113-003  
Sample Name: Monitoring Well MW#20. Groundwater Sample  
Sample Date: 9/19/2013 1:45:00 PM  
Date Received: 9/19/2013

Parameter	Result	Reporting Limit	Qual.	Method	Analysis Date	Analyst
Benzene, mg/L	0.056	0.001		EPA 8260B	09/23/13 20:17	MGW
Toluene, mg/L	0.018	0.002		EPA 8260B	09/23/13 20:17	MGW
Ethylbenzene, mg/L	0.345	0.002	D2	EPA 8260B	09/23/13 20:51	MGW
Xylenes(Total), mg/L	0.468	0.002	D2	EPA 8260B	09/23/13 20:51	MGW
Cumene, mg/L	0.055	0.002		EPA 8260B	09/23/13 20:17	MGW
Naphthalene, mg/L	0.035	0.002		EPA 8260B	09/23/13 20:17	MGW
MTBE, mg/L	0.011	0.002		EPA 8260B	09/23/13 20:17	MGW
Aqueous-phase purge-and-trap	---			EPA 5030B	09/23/13 20:17	MGW

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director





Report Date: 11/18/2013

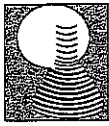
American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 8491-003  
Sample Name: Monitoring Well MW#20 Groundwater Sample  
Sample Date: 11/8/2013 1:30:00 PM  
Date Received: 11/8/2013

Parameter	Result	Reporting Limit	Qual.	Method	Analysis Date	Analyst
Benzene, mg/L	0.048	0.001		EPA 8260B	11/15/13 22:07	MGW
Toluene, mg/L	0.011	0.002		EPA 8260B	11/15/13 22:07	MGW
Ethylbenzene, mg/L	0.183	0.002	D2	EPA 8260B	11/15/13 22:40	MGW
Xylenes(Total), mg/L	0.353	0.002		EPA 8260B	11/15/13 22:07	MGW
Cumene, mg/L	0.033	0.002		EPA 8260B	11/15/13 22:07	MGW
Naphthalene, mg/L	0.026	0.002		EPA 8260B	11/15/13 22:07	MGW
MTBE, mg/L	0.009	0.002		EPA 8260B	11/15/13 22:07	MGW
Aqueous-phase purge-and-trap	---			EPA 5030B	11/15/13 22:07	MGW

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director



Report Date: 04/25/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9667-003  
Sample Name: Monitoring Well MW#20 Groundwater Sample  
Sample Date: 4/23/2014 11:55:00 AM  
Date Received: 4/23/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	0.085	0.001	EPA 8260B	04/24/14 20:22	MGW
Toluene, mg/L	0.035	0.002	EPA 8260B	04/24/14 20:22	MGW
Ethylbenzene, mg/L	0.27	0.002 D2	EPA 8260B	04/24/14 20:58	MGW
Xylenes(Total), mg/L	0.22	0.002	EPA 8260B	04/24/14 20:22	MGW
Cumene, mg/L	0.049	0.002	EPA 8260B	04/24/14 20:22	MGW
Naphthalene, mg/L	0.015	0.002	EPA 8260B	04/24/14 20:22	MGW
MTBE, mg/L	0.011	0.002	EPA 8260B	04/24/14 20:22	MGW
Aqueous-phase purge-and-trap	---		EPA 5030B		

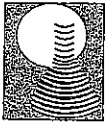
If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director

**Leo's Car Wash  
Monitoring Well MW#21**

Parameter (mg/L)	4/1/14	4/23/14
	Benzene	<0.001
Toluene	<0.002	<0.002
Ethylbenzene	<0.002	<0.002
Xylene	<0.002	<0.002
Cumene	<0.002	<0.002
Naphthalene	<0.002	<0.002
MTBE	<0.002	<0.002

**Bolded Results** exceed MCS's for Organic Regulated Substances in Groundwater for Residential Used Aquifers.



Report Date: 04/03/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9489-001  
Sample Name: Monitoring Well MW#21 Groundwater Sample  
Sample Date: 4/1/2014 2:00:00 PM  
Date Received: 4/2/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/02/14 15:10	ALH
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 15:10	ALH
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 15:10	ALH
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/02/14 15:10	ALH
Cumene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 15:10	ALH
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 15:10	ALH
MTBE, mg/L	<0.002	0.002	EPA 8260B	04/02/14 15:10	ALH
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director



Report Date: 04/25/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9667-004  
Sample Name: Monitoring Well MW#21 Groundwater Sample  
Sample Date: 4/23/2014 12:00:00 PM  
Date Received: 4/23/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/24/14 21:34	MGW
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/24/14 21:34	MGW
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/24/14 21:34	MGW
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/24/14 21:34	MGW
Cumene, mg/L	<0.002	0.002	EPA 8260B	04/24/14 21:34	MGW
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/24/14 21:34	MGW
MTBE, mg/L	<0.002	0.002	EPA 8260B	04/24/14 21:34	
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director

## APPENDIX A: GEOLOGIC LOGS

MONITORING WELL LOG

MW#1

Surface Elevation (MSL): 99.87 (ARBITRARY DATUM)  
 Casing Stickup: N/A  
 Borehole Diameter: 8 inches, From 0 To 25'  
 \_\_\_\_\_ inches, From \_\_\_\_\_ To \_\_\_\_\_  
 Total Depth: 25'  
 Depth of Ground Water: 11.35'/88.52'  
 Date Measured: 4/23/03

Drilling Method: HOLLOW-STEM AUGER  
 Date Drilled: 10/29/02  
 Drilled By: CHATFIELD DRILLING  
 Logged By: CHET ELEWSKI  
 County: ERIE  
 Township or Municipality: MILLCREEK TWP  
 Project Name: LEO'S CARWASH

Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	6" ASPHALT 6"-3' SAND & BROWN SILTY SOIL	[Symbol]				MANHOLE COVER W/ LOCKING CAP CONCRETE COLLAR BENTONITE CLAY SEAL 1' ABOVE SCREEN 5' OF SOLID WALL 2" PVC PIPE	0
5	BROWN SILTY SAND & GRAVEL	[Symbol]		18"	36.2		5
	BROWN GRAY SANDY SILT	[Symbol]				SAND PACK 20' OF 0.010 SLOT 2" PVC SCREEN	
10	BROWN GRAY SANDY SILT	[Symbol]		16"	2379		10
	BROWN GRAY SANDY SILT	[Symbol]				PVC END CAP	
15	GRAY SILTY SAND	[Symbol]		16"	65		15
20	GRAY SILT & SHALE	[Symbol]					20
25							25
30							30
35							35
40							40

MONITORING WELL LOG

MW#2

Surface Elevation (MSL): 100.85 (ARBITRARY DATUM) Drilling Method: HOLLOW-STEM AUGER

Casing Stickup: N/A Date Drilled: 10/29/02

Borehole Diameter: 8 inches, From 0 To 25' Drilled By: CHATFIELD DRILLING

       inches, From        To        Logged By: CHET ELEWSKI

Total Depth: 25' County: ERIE

Depth of Ground Water: 10.40'/90.45' Township or Municipality: MILLCREEK TWP

Date Measured: 4/23/03 Project Name: LEO'S CARWASH

Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	6" ASPHALT 6"-3' SAND & DARK BROWN SILTY SOIL, HEAVY PRODUCT ODOR	[Symbol]			1158	<p>MANHOLE COVER W/ LOCKING CAP CONCRETE COLLAR</p> <p>BENTONITE CLAY SEAL 1' ABOVE SCREEN</p> <p>5' OF SOLID WALL 2" PVC PIPE</p> <p>SAND PACK</p> <p>20' OF 0.010 SLOT 2" PVC SCREEN</p> <p>PVC END CAP</p>	0
5	DARK BROWN SANDY SILT, HEAVY PRODUCT ODOR	[Symbol]		14"	2871		5
	DARK BROWN SANDY SILT	[Symbol]					
10	BROWN DENSE SILTY CLAY	[Symbol]		16"	427		10
	BROWN DENSE SILTY CLAY	[Symbol]					
15	BROWN GRAY SILTY SAND, WET	[Symbol]		10"	10		15
20	GRAY SILT & CLAY W/SHALE LAYERS	[Symbol]					20
25							25
30							30
35							35
40						40	



MONITORING WELL LOG

MW#3

Surface Elevation (MSL): 101.48 (ARBITRARY DATUM) Drilling Method: HOLLOW-STEM AUGER  
 Casing Stickup: N/A. Date Drilled: 10/30/02  
 Borehole Diameter: 9 inches, From 0 To 24'9" Drilled By: CHATFIELD DRILLING  
 \_\_\_\_\_ inches, From \_\_\_\_\_ To \_\_\_\_\_ Logged By: JEREMY HOUK  
 Total Depth: 24'9" County: ERIE  
 Depth of Ground Water: 10.20'/91.28' Township or Municipality: MILLCREEK TWP  
 Date Measured: 4/23/03 Project Name: N/A

Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	2" ASPHALT DARK GRAY FINE SAND & ROCK FRAGMENTS				142		0
5	GRAY SAND & ROCK FRAGMENTS		8"	166	5		
	GRAY SILT & SAND W/ROCK FRAGMENTS						
10	DENSE GRAY SILT		14"	22	10		
	DENSE GRAY SILT						
15	0-7" DENSE GRAY SILT 7-14" BROWN SAND & ROCK FRAGMENTS, WET		14"	8	15		
20	GRAY SHALE						20
25							25
30							30
35							35
40						40	

MONITORING WELL LOG

MW#4

Surface Elevation (MSL): 102.0 (ARBITRARY DATUM)  
 Casing Stickup: N/A  
 Borehole Diameter: 9 inches, From 0 To 24'8"  
 \_\_\_\_\_ inches, From \_\_\_\_\_ To \_\_\_\_\_  
 Total Depth: 24'8"  
 Depth of Ground Water: 9.40' / 92.60'  
 Date Measured: 4/23/03

Drilling Method: HOLLOW-STEM AUGER  
 Date Drilled: 10/30/02  
 Drilled By: CHATFIELD DRILLING  
 Logged By: JEREMY HOUK  
 County: ERIE  
 Township or Municipality: MILLCREEK TWP  
 Project Name: LEO'S CARWASH

Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	4" ASPHALT FINE DARK GRAY SAND & ROCK FRAGMENTS				136		0
5	BROWN & GRAY SAND, STRONG ODOR			15"	192		5
	GREENISH GRAY SILT						
10	BROWN & GRAY SILT W/ ROCK FRAGMENTS			10"	210		10
	GRAY SILT & SAND, WET @12'						
15	0-8" DENSE GRAY SILT 8-15" BROWN SAND 15-17" DENSE GRAY SILT			17"	120		15
20	GRAY SILT & SHALE					20	
25						25	
30						30	
35						35	
40						40	

MONITORING WELL LOG

MW#5

Surface Elevation (MSL): 102.19 (ARBITRARY DATUM) Drilling Method: HOLLOW-STEM AUGER  
 Casing Stickup: N/A Date Drilled: 10/30/02  
 Borehole Diameter: 9 inches, From 0 To 19.5' Drilled By: CHATFIELD DRILLING  
 \_\_\_\_\_ inches, From \_\_\_\_\_ To \_\_\_\_\_ Logged By: JEREMY HOUK  
 Total Depth: 19.5' County: ERIE  
 Depth of Ground Water: 8.55'/93.64' Township or Municipality: MILLCREEK TWP  
 Date Measured: 4/23/03 Project Name: LEO'S CARWASH

Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	6" CONCRETE BROWN SAND & ROCK FRAGMENTS						0
5	BROWN SAND & ROCK FRAGMENTS		12"	42			5
	BROWN & GRAY SAND AND ROCK FRAGMENTS						
10	DENSE GRAY SILT & ROCK FRAGMENTS		12"	24			10
	DENSE GRAY SILT						
15	0-14" DENSE GRAY SILT, WET @ 15'; 14-20" BROWN SAND & ROCK FRAGMENTS		20"	5.4			15
	GRAY SHALE						
20	AUGER REFUSAL @ 19.5'						20
25							25
30							30
35						35	
40						40	

MONITORING WELL LOG

MW#6

Surface Elevation (MSL): 101.66' (ARBITRARY DATUM) Drilling Method: HOLLOW-STEM AUGER

Casing Stickup: N/A Date Drilled: 10/30/02

Borehole Diameter: 9 inches, From 0 To 24'9"  
inches, From \_\_\_\_\_ To \_\_\_\_\_ Drilled By: CHATFIELD DRILLING

Total Depth: 24'9" Logged By: JEREMY HOUK

Depth of Ground Water: 11.15'/90.51' County: ERIE

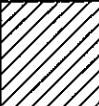
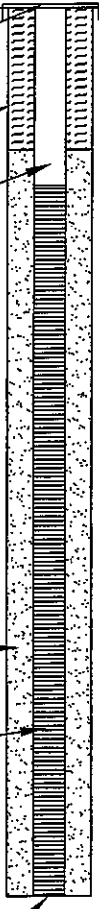






Date Measured: 4/23/03 Township or Municipality: MILLCREEK TWP  
 Project Name: LEO'S CARWASH

Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	3" ASPHALT BROWN SAND & ROCK FRAGMENTS						0
5	GRAY SAND & ROCK FRAGMENTS			24"	114		5
	GRAY-GREEN SILT						
10	DENSE GRAY SILT				114		10
	GRAY SILT & SAND						
15	0-4" WET GRAY SAND 4-18" DENSE BROWN SILT			18"	10.4		15
20	GRAY SHALE & SILT						20
25							25
30							30
35							35
40							40

MONITORING WELL LOG

MW#7

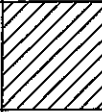
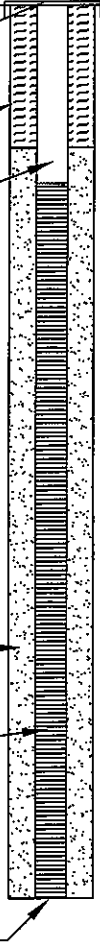
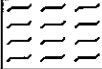
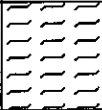
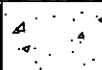

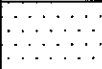
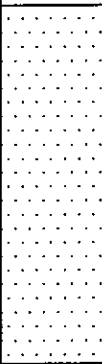
Surface Elevation (MSL): 100.94 (ARBITRARY DATUM) Drilling Method: HOLLOW-STEM AUGER  
 Casing Stickup: N/A Date Drilled: 1/17/03  
 Borehole Diameter: 8 inches, From 0 To 25' Drilled By: CHATFIELD DRILLING  
 \_\_\_\_\_ inches, From \_\_\_\_\_ To \_\_\_\_\_ Logged By: CHET ELEWSKI  
 Total Depth: 25' County: ERIE  
 Depth of Ground Water: 7.90'/93.04 Township or Municipality: MILLCREEK TWP  
 Date Measured: 4/23/03 Project Name: LEO'S CARWASH

Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	ASPHALT, CONCRETE, SAND & GRAVEL			-	-	 <p>MANHOLE COVER W/ LOCKING CAP CONCRETE COLLAR</p> <p>BENTONITE CLAY SEAL 1' ABOVE SCREEN</p> <p>5' OF SOLID WALL 4" PVC PIPE</p> <p>SAND PACK</p> <p>20' OF 0.020 SLOT 4" PVC SCREEN</p> <p>PVC END CAP</p>	0
5	BROWN GRAY SANDY SILTY CLAY			16"	20		5
	BROWN GRAY SANDY SILTY CLAY						
10	BROWN SILTY SAND & GRAVEL			16"	NMR		10
	BROWN SILTY SAND & GRAVEL						
15	GRAY SILT & SHALE CHIPS			-	-		15
20	GRAY SILT & SHALE CHIPS						20
25							25
30							30
35							35
40							40

MONITORING WELL LOG

MW#8

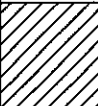
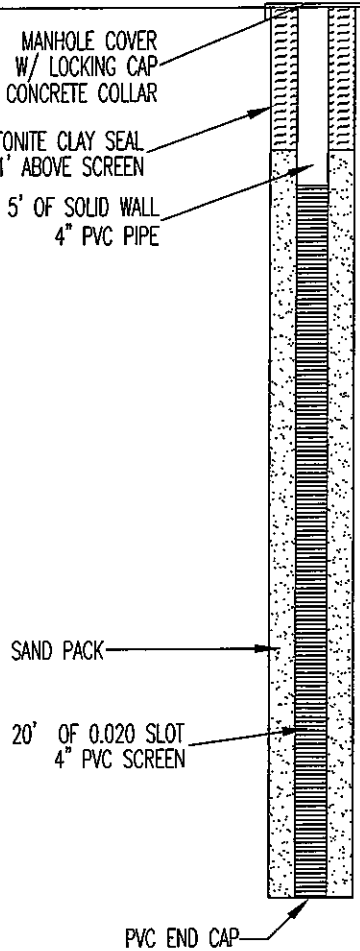






Surface Elevation (MSL): 100.33 (ARBITRARY DATUM) Drilling Method: HOLLOW-STEM AUGER  
 Casing Stickup: N/A Date Drilled: 1/17/03  
 Borehole Diameter: 8 inches, From 0 To 25' Drilled By: CHATFIELD DRILLING  
 \_\_\_\_\_ inches, From \_\_\_\_\_ To \_\_\_\_\_ Logged By: CHET ELEWSKI  
 Total Depth: 25' County: ERIE  
 Depth of Ground Water: 13.05/87.28 Township or Municipality: MILLCREEK TWP  
 Date Measured: 1/22/03 Project Name: LEO'S CARWASH

Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	ASPHALT, CONCRETE, SAND & GRAVEL			-	-	 <p>MANHOLE COVER W/ LOCKING CAP CONCRETE COLLAR</p> <p>BENTONITE CLAY SEAL 1' ABOVE SCREEN</p> <p>5' OF SOLID WALL 4" PVC PIPE</p> <p>SAND PACK</p> <p>20' OF 0.020 SLOT 4" PVC SCREEN</p> <p>PVC END CAP</p>	0
5	BROWN GRAY SANDY SILTY CLAY			4"	15		5
	BROWN GRAY SANDY SILTY CLAY			-	-		
10	BROWN SILTY SAND & GRAVEL			16"	20		10
	BROWN SILTY SAND & GRAVEL			-	-		
15	GRAY SILT & SHALE CHIPS			-	-		15
20	GRAY SILT & SHALE CHIPS			-	-		20
25							25
30							30
35							35
40							40

MONITORING WELL LOG

MW#9

Surface Elevation (MSL): 100.48 (ARBITRARY DATUM) Drilling Method: HOLLOW-STEM AUGER  
 Casing Stickup: N/A Date Drilled: 1/17/03  
 Borehole Diameter: 8 inches, From 0 To 25' Drilled By: CHATFIELD DRILLING  
       inches, From        To        Logged By: CHET ELEWSKI  
 Total Depth: 25' County: ERIE  
 Depth of Ground Water: 12.45'/88.03' Township or Municipality: MILLCREEK TWP  
 Date Measured: 4/23/03 Project Name: LEO'S CARWASH

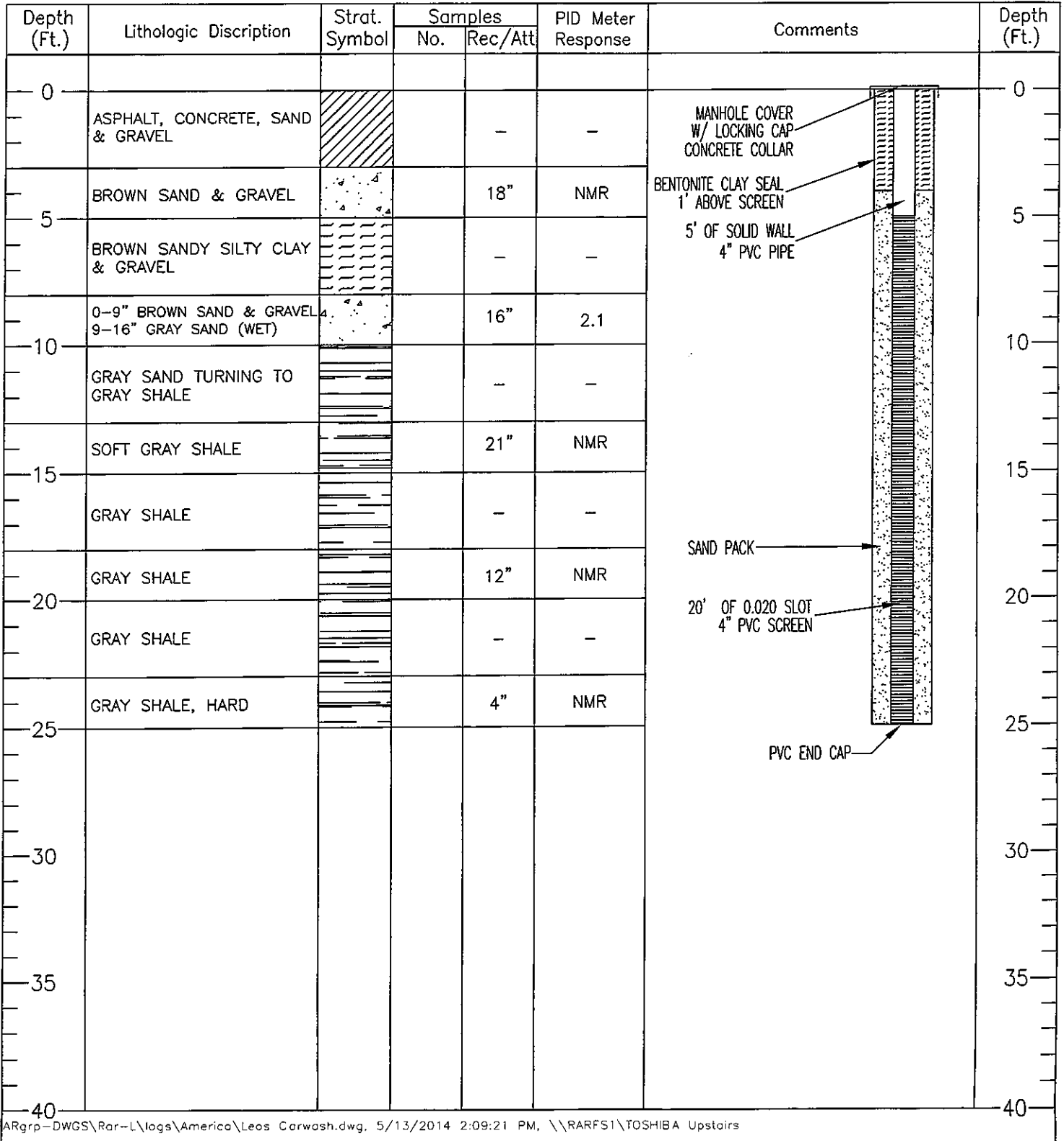
Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	ASPHALT, CONCRETE, SAND & GRAVEL			-	-	 <p>MANHOLE COVER W/ LOCKING CAP CONCRETE COLLAR</p> <p>BENTONITE CLAY SEAL 1' ABOVE SCREEN</p> <p>5' OF SOLID WALL 4" PVC PIPE</p> <p>SAND PACK</p> <p>20' OF 0.020 SLOT 4" PVC SCREEN</p> <p>PVC END CAP</p>	0
5	BROWN SANDY SILTY CLAY & GRAVEL			14"	3		5
	BROWN SANDY SILTY CLAY & GRAVEL			-	-		
10	BROWN SANDY SILTY CLAY & GRAVEL			12"	3		10
	BROWN SANDY SILTY CLAY & GRAVEL			-	-		
15	GRAY SILT & SHALE			-	-		15
20	GRAY SILT & SHALE			-	-		20
25							25
30							30
35							35
40						40	

MONITORING WELL LOG

MW#10

Surface Elevation (MSL): 97.47'(arbitrary datum)  
 Casing Stickup: N/A  
 Borehole Diameter: 8 inches, From 0 To 25'  
       inches, From        To         
 Total Depth: 25'  
 Depth of Ground Water: 6.10'/91.37'  
 Date Measured: 4/23/03

Drilling Method: HOLLOW-STEM AUGER  
 Date Drilled: 4/8/03  
 Drilled By: CHATFIELD DRILLING  
 Logged By: PATRICK E. PRUENT  
 County: ERIE  
 Township or Municipality: MILLCREEK TWP  
 Project Name: LEO'S CARWASH



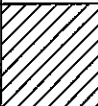
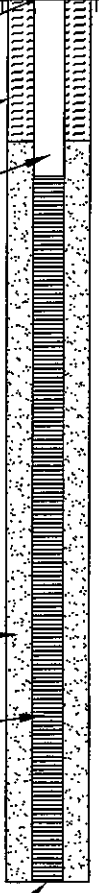













MONITORING WELL LOG

MW#12

Surface Elevation (MSL): 102.47 (ARBITRARY DATUM) Drilling Method: HOLLOW-STEM AUGER  
 Casing Stickup: N/A Date Drilled: 4/9/03  
 Borehole Diameter: 8 inches, From 0 To 25' Drilled By: CHATFIELD DRILLING  
       inches, From        To        Logged By: PATRICK E. PRUENT  
 Total Depth: 25' County: ERIE  
 Depth of Ground Water: 9.45'/93.02' Township or Municipality: MILLCREEK TWP  
 Date Measured: 4/23/03 Project Name: LEO'S CARWASH

Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	ASPHALT, CONCRETE, SAND & GRAVEL		-	-	-	 <p>MANHOLE COVER W/ LOCKING CAP CONCRETE COLLAR</p> <p>BENTONITE CLAY SEAL 1' ABOVE SCREEN</p> <p>5' OF SOLID WALL 4" PVC PIPE</p> <p>SAND PACK</p> <p>20' OF 0.020 SLOT 4" PVC SCREEN</p> <p>PVC END CAP</p>	0
5	REDDISH BROWN SAND & GRAVEL		-	15"	NMR		5
	REDDISH BROWN SAND & GRAVEL		-	-	-		
10	REDDISH BROWN SILTY SAND & GRAVEL, WET		-	10"	15.4		10
	REDDISH BROWN SAND & GRAVEL TURNING TO GRAY SHALE		-	-	-		
15	GRAY SILT WITH SHALE FRAGMENTS		-	16"	0.4		15
	GRAY SHALE		-	-	-		
20	GRAY SHALE, HARD		-	16"	0.2		20
	GRAY SHALE		-	-	-		
25	GRAY SHALE		-	3"	NMR		25
30						30	
35						35	
40						40	

MONITORING WELL LOG

MW#18

Surface Elevation (MSL): \_\_\_\_\_

Drilling Method: PROBE

Casing Stickup: N/A

Date Drilled: 7/10/13

Borehole Diameter: 2" inches, From 0 To 12'  
 \_\_\_\_\_ inches, From \_\_\_\_\_ To \_\_\_\_\_

Drilled By: CHATFIELD DRILLING

Logged By: JEREMY HOUK

Total Depth: 12'

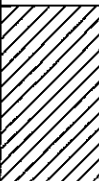
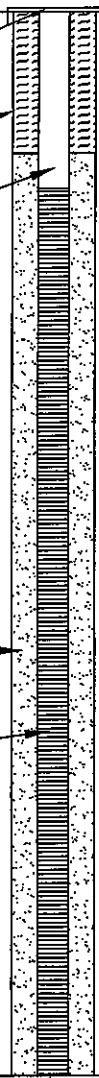



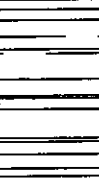
County: ERIE

Depth of Ground Water: \_\_\_\_\_

Township or Municipality: MILLCREEK TWP

Date Measured: \_\_\_\_\_

Project Name: LEO'S CARWASH

Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	6" TOPSOIL W/ SS COBBLES 6" BROWN SAND			12"	-	 <p>MANHOLE COVER W/ LOCKING CAP CONCRETE COLLAR</p> <p>BENTONITE CLAY SEAL 1' ABOVE SCREEN</p> <p>2' OF SOLID WALL 3/4" PVC PIPE</p> <p>SAND PACK</p> <p>10' OF 0.020 SLOT 3/4" PVC SCREEN</p> <p>PVC END CAP</p>	0
2	BROWN & GRAY SAND W/ SOME PEBBLES			18"	-		2
4	BROWN SAND			12"	-		4
6	BROWN SAND			12"	-		6
8	BROWN SHALE FRAGMENTS			10"	-		8
10	NO SAMPLE			-	-		10
12							12
14							14
16							16

MONITORING WELL LOG

MW#19

Surface Elevation (MSL): \_\_\_\_\_

Casing Stickup: \_\_\_\_\_ N/A

Borehole Diameter: 2" inches, From 0 To 18'  
 \_\_\_\_\_ inches, From \_\_\_\_\_ To \_\_\_\_\_

Total Depth: \_\_\_\_\_ 18'

Depth of Ground Water: \_\_\_\_\_

Date Measured: \_\_\_\_\_

Drilling Method: PROBE

Date Drilled: 7/11/13

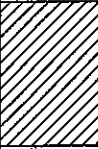
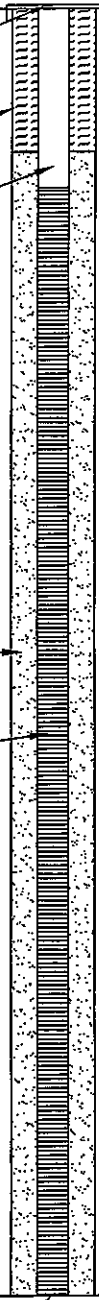





Drilled By: CHATFIELD DRILLING

Logged By: JEREMY HOUK

County: ERIE

Township or Municipality: MILLCREEK TWP

Project Name: LEO'S CARWASH

Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	HAND CLEARED SOFT TOPSOIL			-	-	 <p>MANHOLE COVER W/ LOCKING CAP CONCRETE COLLAR</p> <p>BENTONITE CLAY SEAL 1' ABOVE SCREEN</p> <p>2' OF SOLID WALL 3/4" PVC PIPE</p> <p>SAND PACK</p> <p>15' OF 0.020 SLOT 3/4" PVC SCREEN</p> <p>PVC END CAP</p>	0
	BROWN SAND W/ SANDSTONE COBBLES			-	-		5
5	BROWN SAND			-	-		10
10	BROWN SAND, WET @ 10', DRY @ 11-12'			-	-		15
15	BROWN TO GRAY SAND, WET @ 15'-6"			-	-		20
	DENSE GRAY SILT W/ SHALE FRAGS, DRY			-	-		
20							

MONITORING WELL LOG

MW#20

Surface Elevation (MSL): \_\_\_\_\_

Casing Stickup: \_\_\_\_\_ N/A

Borehole Diameter: 2" inches, From 0 To 17.5'  
 \_\_\_\_\_ inches, From \_\_\_\_\_ To \_\_\_\_\_

Total Depth: 17.5'

Depth of Ground Water: \_\_\_\_\_

Date Measured: \_\_\_\_\_

Drilling Method: PROBE

Date Drilled: 7/11/13

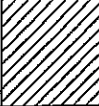


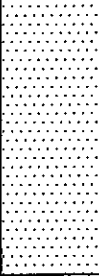


Drilled By: CHATFIELD DRILLING

Logged By: JEREMY HOUK

County: ERIE

Township or Municipality: MILLCREEK TWP

Project Name: LEO'S CARWASH

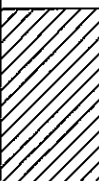
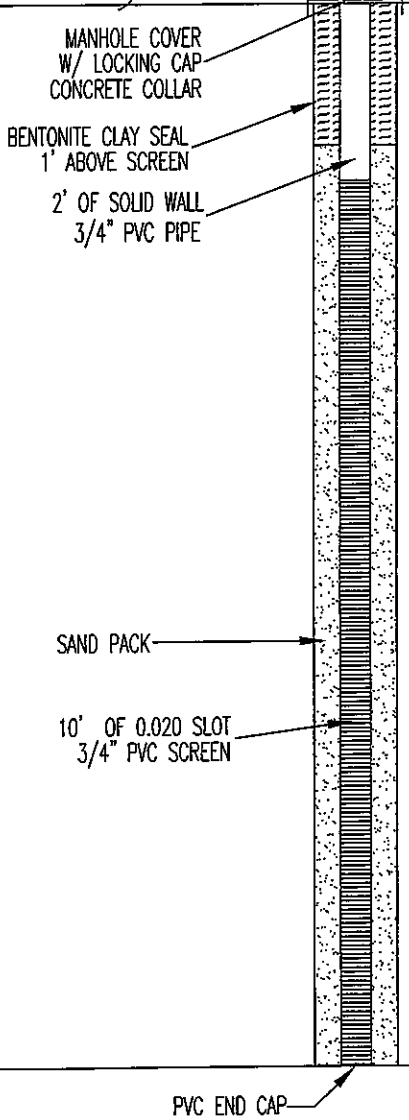
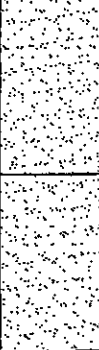
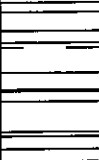




Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	2" ASPHALT BROWN FILL			-	-	MANHOLE COVER W/ LOCKING CAP CONCRETE COLLAR	0
	BROWN FILL TO BROWN SAND			-	-	BENTONITE CLAY SEAL 1' ABOVE SCREEN 2' OF SOLID WALL 3/4" PVC PIPE	
5	FINE BROWN SAND			36"	317		5
10	0-12" FINE SILT W/ SS COBBLES 12-15" FINE BROWN SAND			48"	516	SAND PACK 15' OF 0.020 SLOT 3/4" PVC SCREEN	10
15	WET GRAY SAND W/ GRAY SILT/SHALE			-	-		15
	GRAY WET SILTY SHALE			-	-		
20						PVC END CAP	20

MONITORING WELL LOG

MW#21

Surface Elevation (MSL): \_\_\_\_\_  
 Casing Stickup: \_\_\_\_\_ N/A  
 Borehole Diameter: 2" inches, From 0 To 12'  
 \_\_\_\_\_ inches, From \_\_\_\_\_ To \_\_\_\_\_  
 Total Depth: 12'  
 Depth of Ground Water: \_\_\_\_\_  
 Date Measured: \_\_\_\_\_

Drilling Method: PROBE  
 Date Drilled: 3/27/14  
 Drilled By: ALL PROBE  
 Logged By: JEREMY HOUK  
 County: ERIE  
 Township or Municipality: MILLCREEK TWP  
 Project Name: LEO'S CARWASH


Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	TOPSOIL & BROWN SAND			-	-		0
2	BROWN SAND			-	-		2
4	BROWN SAND			-	-		4
6	BROWN SANDY SHALE & SILT LAYERS			-	-		6
8	BROWN & GRAY SILT W/ SAND SHALE FRAGS			-	-		8
10	BROWN SILT & GRAY SHALE FRAGS, MOIST @ 10'			-	-		10
12	BROWN COARSE SAND, WET @ 10'			-	-		12
14							14
16							16

VAPOR POINT LOG

VP-A (1)

Surface Elevation (MSL):           -            
 Casing Stickup:                   N/A            
 Borehole Diameter: 2" inches, From 0 To 8'  
                                      inches, From            To             
 Total Depth:                   8'  
 Depth of Ground Water:                             
 Date Measured:                           

Drilling Method: HAND AUGER  
 Date Drilled: 3/27/14  
 Drilled By: ALL PROBE  
 Logged By: JEREMY HOUK  
 County: ERIE  
 Township or Municipality: MILLCREEK TWP  
 Project Name: LEO'S CARWASH

Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	BROWN SAND & SMALL GRAVEL WHOLE LENGTH						0
2							2
4							4
6							6
8							8
10							10
12							12
14							14
16						16	

VAPOR POINT LOG

VP-B (2)

Surface Elevation (MSL): \_\_\_\_\_ - \_\_\_\_\_

Casing Stickup: \_\_\_\_\_ N/A \_\_\_\_\_

Borehole Diameter: 2" inches, From 0 To 8'  
 \_\_\_\_\_ inches, From \_\_\_\_\_ To \_\_\_\_\_

Total Depth: \_\_\_\_\_ 8' \_\_\_\_\_

Depth of Ground Water: \_\_\_\_\_

Date Measured: \_\_\_\_\_

Drilling Method: HAND AUGER

Date Drilled: 3/27/14


Drilled By: ALL PROBE

Logged By: JEREMY HOUK

County: ERIE

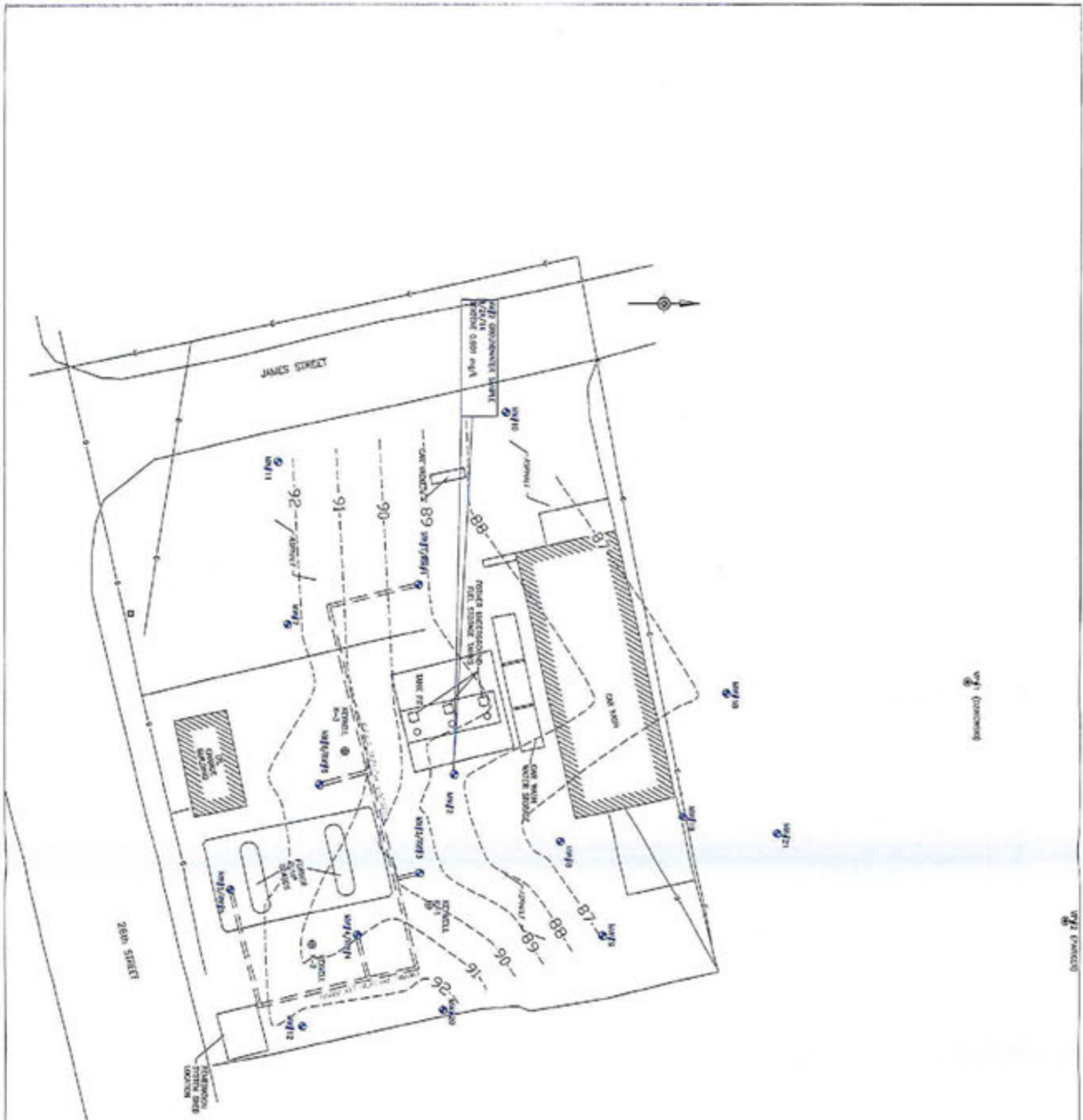
Township or Municipality: MILLCREEK TWP

Project Name: LEO'S CARWASH

Depth (Ft.)	Lithologic Discription	Strat. Symbol	Samples		PID Meter Response	Comments	Depth (Ft.)
			No.	Rec/Att			
0	BROWN SAND & SMALL GRAVEL WHOLE LENGTH			-	-		0
2							2
4							4
6							6
8							8
10							10
12							12
14							14
16						16	



APPENDIX B: GROUNDWATER ELEVATION CONTOUR  
& SITE MAP



Monitoring Well #	Surface Elevation	Depth to Water	Static Water Elev. 3/24/14
MW#1/R/W#1	99.58	recovery well	recovery well
MW#2	99.80	11.62	88.18
MW#3/R/W#3	101.21	recovery well	recovery well
MW#4/R/W#4	101.73	recovery well	recovery well
MW#5/R/W#5	101.84	recovery well	recovery well
MW#6/R/W#6	101.45	recovery well	recovery well
MW#7	100.22	7.89	92.33
MW#8	99.21	12.85	86.36
MW#9	99.38	12.46	86.92
MW#10	96.60	9.52	87.08
MW#11	98.49	6.15	92.34
MW#12	101.57	9.22	92.35
K-1	100.23	Inaccessible	Inaccessible
K-2	100.72	Inaccessible	Inaccessible
K-3	99.95	Inaccessible	Inaccessible



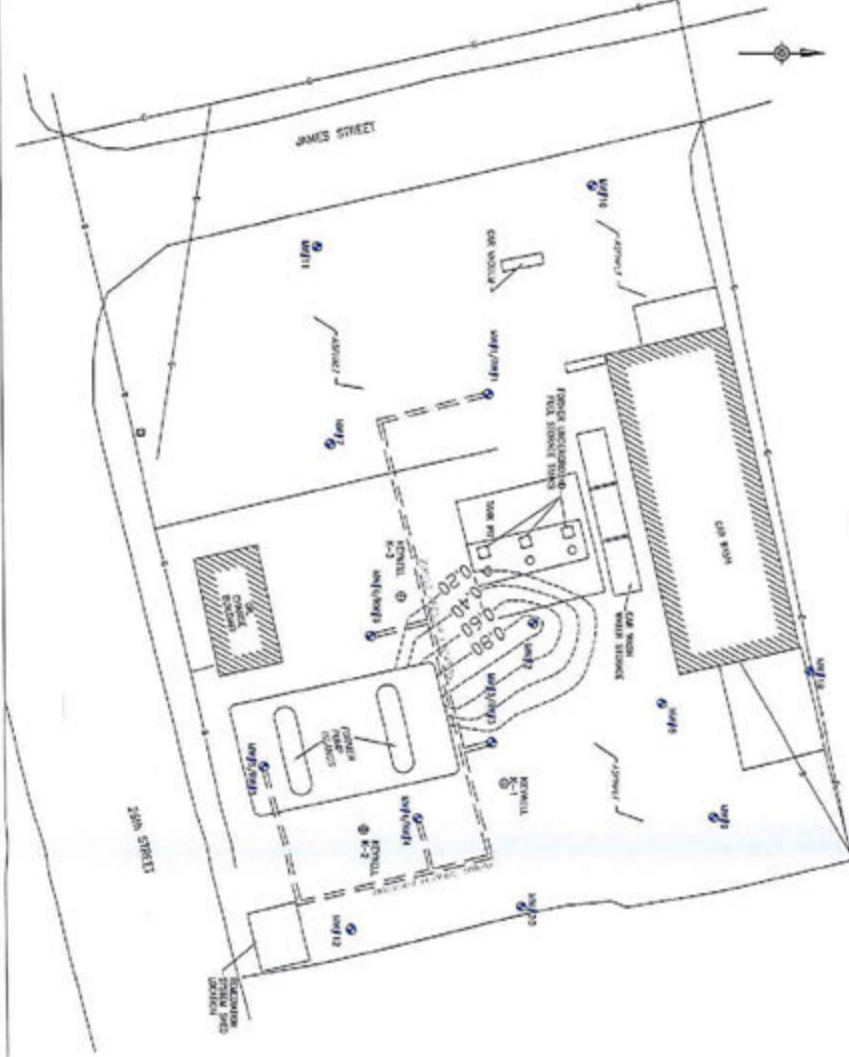
1 of 1  
SHEET NUMBER

**RAR engineering group, inc.**  
 3333 Cedar Avenue, New Castle, Pennsylvania 16135  
 telephone 724.222.2826 fax 724.222.2821 and www.rarengineering.com

CLIENT: BILD LEO'S #3 CAR WASH ERIE, PA  
 FIELD INVESTIGATION MAP

DESIGNED BY	DATE
DRAWN BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE
APPROVED BY	DATE
APPROVED BY	DATE
SCALE	1"=50'
DRAWING NO.	

REVISIONS	
NO.	DESCRIPTION



- MONITORING WELL LOCATIONS
- BENZENE CONTAMINANT CONCENTRATION CONTOURS
- ELECTRIC
- GAS LINE
- FIRE HYDRANT

Monitoring Well #	Benzene
MW#2	0.901
MW#7	non-detectable
MW#8	non-detectable
MW#9	non-detectable
MW#10	non-detectable
MW#11	non-detectable
MW#12	non-detectable

1  
of  
4  
SHEET NUMBER

**RAR engineering group, inc.**  
 322 Butler Avenue, New Castle, Pennsylvania 16135  
 telephone: 412.221.1111 fax: 412.221.1112 email: rar@rar-engineering.com

DRAWING TITLE:  
**LEO'S #3 CAR WASH  
 ERIE, PA**  
 CONTAMINANT  
 CONCENTRATION MAP

DESIGNED BY: [ ] DATE: [ ]  
 CHECKED BY: [ ] DATE: [ ]  
 APPROVED BY: [ ] DATE: [ ]  
 SCALE: 1"=30'  
 DRAWING NO.:

REVISIONS	
NO.	DATE DESCRIPTION

APPENDIX C: VAPOR INTRUSION DATA

**LEO'S CAR WASH**  
**Vapor Intrusion Results**  
**4/1/2014 & 4/25/14**

Sample	Benzene	Cumene	Ethyl Benzene	MTBE	Naphthalene	Toluene	m/p-Xylene	o-Xylene
VP #1 (A)								
4/1/2014	2.40	N.D.	14	N.D.	48	36	38	17
4/25/2014	3.3	3.9	12	N.D.	3.4	35	42	12
VP #2 (B)								
4/1/2014	2.0	N.D.	8.6	N.D.	8.4	24	23	11
4/25/2014	6.0	3.5	17	N.D.	6.0	47	61	18
Analytical Limits 100 X Indoor Air	270	<b>54,000</b>	1,900	<b>8,100</b>	420	<b>56,000</b>	14,000	14,000

All Units are in ug/m3  
**Bolded Results Exceed Limits**  
N.D. - Non Detect



Lancaster Laboratories  
Environmental

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# Analysis Report

## ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

R.A.R. Engineering Group, Inc  
1135 Butler Avenue  
New Castle PA 16101

April 14, 2014

Project: Leo's

Submittal Date: 04/03/2014  
Group Number: 1464286  
PO Number: RAR09-082  
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
VP-A Air (1)	7418137
VP-B Air (2)	7418138
Field Blank Air	7418139

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO R.A.R. Engineering Group, Inc Attn: Kyle Griffith

Respectfully Submitted,

Angela M. Miller  
Specialist

(717) 556-7260

Sample Description: VP-A Air (1)

SC# 930  
Leo's

UL Sample # AQ 7413137  
UL Group # 1464286  
Account # 12840

Project Name: Leo's

Collected: 04/01/2014 10:50 by BK  
Through 04/01/2014 14:50  
Submitted: 04/03/2014 08:15  
Reported: 04/14/2014 17:44

R.A.R. Engineering Group, Inc  
1135 Butler Avenue  
New Castle PA 16101

CAV No.	Analysis Name	CAS Number	As Received Final Result	MDL	As Received Final Result	MDL	DF
<b>Volatiles in Air ASTM D1946</b>							
10341	Helium as Tracer Gas	7440-39-7	N.D.	30,000	N.D.	4,900	6
<b>Volatiles in Air EPA TO-15</b>							
05298	Benzene	71-43-2	0.76 J	0.20	2.4 J	0.64	1
05298	Cumene	95-82-8	N.D.	0.20	N.D.	0.58	1
05298	Ethylbenzene	100-41-4	3.3	0.20	14	0.87	1
05298	Methyl t-Butyl Ether	1534-01-4	N.D.	0.20	N.D.	0.72	1
05298	Naphthalene	91-20-3	5.2	0.40	48	2.1	1
05298	Toluene	108-88-3	9.4	0.20	36	0.75	1
05298	m/p-Xylene	179601-21-1	8.8	0.20	38	0.87	1
05298	o-Xylene	95-47-5	1.9	0.20	17	0.87	1

MDL = Method Detection Limit

General Sample Comments

PA DMP Lab Certification ID 36-00037, Expiration Date: 1/31/15  
All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAV No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10341	Helium as Tracer Gas	ASTM D1946	1	D14100801	04/20/2014 16:17	Florida R Cimino	6
05298	TO 15 VOC Ext. List	EPA TO-15	1	D1809830A	04/09/2014 14:41	Delaney B Smith	1



Lancaster Laboratories  
Environmental

# Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-656-2300 • Fax: 717-656-9881 • www.LancasterLabs.com

Sample Description: VP-B Air (2)

SC# 922  
Leo's

LL Sample # AQ 7418138  
IL Group # 1464286  
Account # 12840

Project Name: Leo's

Collected: 04/01/2014 11:20 by EK

Through 04/01/2014 15:20

Submitted: 04/03/2014 08:15

Reported: 04/14/2014 17:44

R.A.R. Engineering Group, Inc  
1135 Butler Avenue  
New Castle PA 16101

CAI No.	Analysis Name	Gas Number	As Received Final Result	MDL	As Received Final Result	MDL	DF
<b>Volatiles in Air</b>							
10341	Helium as Tracer Gas	744C-59-7	N.D.	30,000	N.D.	4,900	6
<b>Volatiles in Air EPA TO-15</b>							
05298	Benzene	71-43-2	0.64 J	0.20	2.0 J	0.64	1
05298	Cumene	98-82-8	N.D.	0.20	N.D.	0.58	1
05298	Ethylbenzene	100-41-4	2.0	0.20	8.6	0.87	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.	0.20	N.D.	0.72	1
05298	Naphthalene	91-20-3	1.6	0.40	8.4	2.1	1
05298	Toluene	108-88-3	6.3	0.20	24	0.75	1
05298	m/p Xylene	179601-23-1	5.3	0.20	23	0.87	1
05298	o-Xylene	95-47-6	2.5	0.20	11	0.87	1

MDL = Method Detection Limit

### General Sample Comments

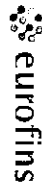
PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/15

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAI No.	Analysis Name	Method	Trials	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10341	Helium as Tracer Gas	ASPM D1946	1	14100803	04/10/2014 16:26	Flordia A Cimino	6
05298	TO 15 VON EXC. LISC	EPA TO-15	1	D14098302A	04/09/2014 15:29	Deirdre B Smith	1





Lancaster Laboratories  
Environmental

# Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-696-2300 • Fax: 717-696-2881 • www.LancasterLabs.com

Sample Description: Field Blank Air  
SC# 1031  
Leo's

LT Sample # AQ 7418139  
LT Group # 1464286  
Account # 12840

Project Name: Leo's  
Collected: 04/01/2014 10:55 by PK  
Through 04/01/2014 14:55  
Submitted: 04/03/2014 08:15  
Reported: 04/14/2014 17:44

R.A.R. Engineering Group, Inc  
1135 Butler Avenue  
New Castle PA 16101

CAT No.	Analysis Name	ASTM D1946	CAS Number	As Received Final Result	MDL	As Received Final Result	MDL	DP
10341	Helium as Tracer Gas		7440-59-7	N.D.	10,000	N.D.	1,600	2
<b>Volatiles in Air EPA TO-15</b>								
05298	Benzene		71-43-2	0.41 J	0.20	1.3 J	0.64	1
05298	Cumene		98-92-8	N.D.	0.20	N.D.	0.98	1
05298	Ethylbenzene		100-41-4	0.84 J	0.20	3.6 J	0.87	1
05298	Methyl t-Butyl Ether		1634-04-4	N.D.	0.20	N.D.	0.72	1
05298	Naphthalene		91-20-3	1.8 J	0.40	9.4 J	2.1	1
05298	Toluene		108-88-3	0.70 J	0.20	2.6 J	0.75	1
05298	m/p Xylene		179601-23-1	2.6 J	0.20	11 J	0.87	1
05298	o-Xylene		95-47-6	1.6 J	0.20	7.0 J	0.87	1

MDL = Method Detection Limit

### General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/15  
All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trials#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10341	Helium as Tracer Gas	ASTM D1946	1	14100R01	04/10/2014 16:33	Florida A Gilino	2
05298	TO 15 VOC Ext. Lab.	EPA TO-15	1	D409800A	04/09/2014 16:17	Jeffrey D Smith	1

**Quality Control Summary**

Client Name: R.A.R. Engineering Group, Inc  
Reported: 04/14/14 at 05:44 PM

Group Number: 1464286

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LGS/LCSDU was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

**Laboratory Compliance Quality Control**

Analysis Name	Blank Result	Blank MDL	Report Units	LC9 %REC	LC9P %RMC	LC9/LC9D Limits	RPD	RPD Max
Batch number: 14100HE01 Helium as Tracer Gas	N.D.	5,000.	ppm (V)					
Batch number: D1409830AA	Sample number(s): 7418137-7418139							
Benzene	N.D.	0.20	ppb (V)	98	89	70-130	10	25
Cumene	N.D.	0.20	ppb (V)	101	89	70-130	13	25
Methylbenzene	N.D.	0.20	ppb (V)	102	90	52-129	13	25
Methyl t-butyl Ether	N.D.	0.20	ppb (V)	88	70	26-181	23	25
Naphthalene	N.D.	0.20	ppb (V)	104	92	70-130	12	25
Toluene	N.D.	0.20	ppb (V)	102	90	70-130	13	25
m/p-xylene	N.D.	0.20	ppb (V)	106	94	70-130	12	25
o-xylene	N.D.	0.20	ppb (V)					

\* - Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

# Summa Canister Field Test Data/Chain of Custody



Lancaster Laboratories Environmental

Acct. # 12840

Group # 1464286 Sample # 7418137-39

For Eurofins Lancaster Laboratories Environmental use only  
Instructions on reverse side correspond with circled numbers.

Bottle Order (SCR) # 153645

<b>1 Client Information</b>					<b>3 Turnaround Time Requested (TAT) (circle one)</b>					<b>6 Analyses Requested</b>				
Client: <u>RAR Engineering Group Inc</u> Account #: _____					<u>Standard</u> Rush (specify) _____					EPA TO-15 Tracer Gas - Helelo, 24 <input checked="" type="checkbox"/> MTBE <input checked="" type="checkbox"/> BTEX <input checked="" type="checkbox"/> EPA 25 (select range below) Helium as tracer O2/CO2 Library Search				
Project Name/ID: <u>Leo's</u>					<b>4 Data Package Required?</b> <b>5 EDD Required?</b>									
Project Manager: <u>Kyle Griffith</u> P.O. #: _____					Yes    No    Yes    No Temperature (F)    Pressure ("Hg) Start    Stop    Start    Stop									
Sampler: <u>Paul Kepuchuk</u> Quote #: _____					Ambient    _____ Maximum    _____ Minimum    _____									
Name of state where samples were collected: <u>Pa.</u>														
<b>2</b>														
Sample Identification	Start Date/Time (24-hour clock)	Stop Date/Time (24-hour clock)	Canister Pressure in Field ("Hg) (Start)	Canister Pressure in Field ("Hg) (Stop)	Interior Temp. (F) (Start)	Interior Temp. (F) (Stop)	Flow Rec. ID	Can ID	Can Size (L)	Controller Flowrate (mL/min)				
<u>VP-A</u>	<u>4/1/14 10:50</u>	<u>4/1/14 14:50</u>	<u>27.</u>	<u>9.5</u>	<u>45</u>	<u>35</u>	<u>337183</u>	<u>930</u>	<u>1</u>	<u>3.66</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>VP-B</u>	<u>4/1/14 11:20</u>	<u>4/1/14 15:20</u>	<u>27.</u>	<u>8</u>			<u>336825</u>	<u>922</u>	<u>1</u>	<u>3.68</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
<u>Field Blank</u>	<u>4/1/14 10:55</u>	<u>4/1/14 14:45</u>	<u>30</u>	<u>.5</u>			<u>336708</u>	<u>1031</u>	<u>6</u>	<u>21.0</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>7 Instructions/QC Requirements &amp; Comments</b>								EPA 25 (check one) <input type="checkbox"/> C1 - C4 <input type="checkbox"/> C2 - C10 <input type="checkbox"/> C1 - C10 <input type="checkbox"/> C4 - C10 (GRO) <input type="checkbox"/> C2 - C4						
Canisters Shipped by: <u>[Signature]</u>	Date/Time: <u>3-26-14</u>	Canisters Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:	<b>8</b>						
Relinquished by: <u>[Signature]</u>	Date/Time: <u>4/2/14 9:00</u>	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by:	Date/Time:							
Relinquished by:	Date/Time:	Received by:	Date/Time:	Relinquished by:	Date/Time:	Received by: <u>[Signature]</u>	Date/Time: <u>4/3/14 8815</u>							

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

RL	Reporting Limit	BMQL	Below Minimum Quantitation Level
N.D.	none detected	MPN	Most Probable Number
TNTC	Too Numerous To Count	CP Units	cobalt-chloroplatinate units
IU	International Units	NTU	nephelometric turbidity units
umhos/cm	micromhos/cm	ng	nanogram(s)
C	degrees Celsius	F	degrees Fahrenheit
meq	milliequivalents	lb.	pound(s)
g	gram(s)	kg	kilogram(s)
µg	microgram(s)	mg	milligram(s)
mL	milliliter(s)	L	liter(s)
m3	cubic meter(s)	µL	microliter(s)
		pg/L	picrogram/liter

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

**Dry weight basis** Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

**Data Qualifiers:**

C – result confirmed by reanalysis.

J – estimated value – The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

U.S. EPA CLP Data Qualifiers:

<b>Organic Qualifiers</b>		<b>Inorganic Qualifiers</b>	
A	TIC is a possible aldiol-condensation product	B	Value is <CRDL, but ≥IDL
B	Analyte was also detected in the blank	E	Estimated due to interference
C	Pesticide result confirmed by GC/MS	M	Duplicate injection precision not met
D	Compound quantitated on a diluted sample	N	Spike sample not within control limits
E	Concentration exceeds the calibration range of the instrument	S	Method of standard additions (MSA) used for calculation
N	Presumptive evidence of a compound (TICs only)	U	Compound was not detected
P	Concentration difference between primary and confirmation columns >25%	W	Post digestion spike out of control limits
U	Compound was not detected	+	Duplicate analysis not within control limits
X, Y, Z	Defined in case narrative	*	Correlation coefficient for MSA <0.995

**Analytical test results meet all requirements of NELAP unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

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Lancaster Laboratories  
Environmental

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# Analysis Report

## ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

American Env. Assoc., Inc.  
1135 Butler Avenue  
New Castle PA 16101

May 06, 2014

Project: Leo's Car Wash

Submittal Date: 04/29/2014  
Group Number: 1470330  
State of Sample Origin: PA

Client Sample Description  
VP-B Air (2)  
VP-A Air (1)

Lancaster Labs (LL) #  
7445692  
7445693

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO RAR Engineering Group

Attn: Kyle Griffith

Respectfully Submitted,

Angela M. Miller  
Specialist

(717) 556-7260



Lancaster Laboratories  
Environmental

# Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-655-2300 • Fax: 717-655-2981 • www.LancasterLabs.com

Sample Description: VP-3 Air (2)

SC# 851  
Leo's Car Wash

LT Sample # AQ 7445592  
LT Group # 1470330  
Account # 12835

Project Name: Leo's Car Wash

Collected: 04/25/2014 10:30 by PK

Through 04/25/2014 14:30

American Env. Assoc., Inc.  
1135 Butler Avenue  
New Castle PA 16101

Submitted: 04/29/2014 07:55

Reported: 05/06/2014 15:59

CAT No.	Analysis Name	CAS Number	As Received Final Result	MDL	As Received Final Result	MDL	DF
<b>Volatiles in Air</b>							
10341	Heilum as Tracer Gas	7440-59-7	N.D.	10,000	N.D.	1,000	2
<b>Volatiles in Air</b>							
<b>EPA TO-15</b>							
05298	Benzene	71-43-2	1.9	0.20	6.0	0.64	1
05298	Cumene	98-82-3	0.72	0.20	3.5	0.98	1
05298	Rthylbenzene	100-41-4	3.9	0.20	17	0.87	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.	0.20	N.D.	0.72	1
05298	Naphthalene	91-20-3	1.1	0.20	5.0	2.1	1
05298	Toluene	106-88-3	12	0.20	47	0.75	1
05298	m/p-Xylene	179601-23-1	14	0.20	61	0.87	1
05298	o-Xylene	95-47-6	4.3	0.20	18	0.87	1

MDL = Method Detection Limit

### General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/15.  
All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trials	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10341	Heilum as Tracer Gas	ASTM D1946	1	14125HRC1	05/05/2014 15:20	Plorida R Cindro	2
05298	TO 15 VOA Ext. List	EPA TO-15	1	D141203OAA	04/30/2014 22:58	Michael A Ziegler	1



Lancaster Laboratories  
Environmental

# Analysis Report

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Sample Description: VP-A Air (1)  
GC# 823  
Leo's Car Wash

LL Sample # AQ 7445693  
LL Group # 1470330  
Account # 12835

Project Name: Leo's Car Wash  
Collected: 04/25/2014 10:15 by PK  
Through 04/25/2014 14:15  
Submitted: 04/29/2014 07:55  
Reported: 05/06/2014 15:59

American Env. Assoc., Inc.  
1135 Butler Avenue  
New Castle PA 16101

CAT No.	Analysis Name	Method	CSG Number	As Received Final Result	MDL	As Received Final Result	MDL	DF
<b>Volatiles in Air</b>								
10341	Helium as Tracer Gas	ASTM D1946	7440-59-7	N.D.	10,000	N.D.	1,600	2
<b>Volatiles in Air</b>								
<b>EPA TO-15</b>								
05298	Benzene		71-43-2	1.0	0.20	3.3	0.64	1
05298	Chetene		98-82-8	0.79	0.20	3.9	0.93	1
05298	Ethylbenzene		100-41-4	2.7	0.20	12	0.87	1
05298	Methyl t-Butyl ether		1634-04-4	N.D.	0.20	N.D.	0.72	1
05298	Naphthalene		91-20-3	0.64	0.40	3.4	2.1	1
05298	Toluene		108-88-3	3.3	0.20	35	0.75	1
05298	m/p-Xylene		179601-23-1	9.6	0.20	42	0.87	1
05298	o-Xylene		95-47-6	2.9	0.20	12	0.87	1

MDL = Method Detection Limit

### General Sample Comments

PA DEP Lab Certification ID 36-000317, Expiration Date: 1/31/15.  
All GC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10341	Helium as Tracer Gas	ASTM D1946	1	1425HR01	05/06/2014 15:34	Florinda A Cimino	2
05298	TO 15 VOA EXT. List	EPA TO-15	1	D142303CNA	04/30/2014 23:46	Michael A Ziegler	1

## Quality Control Summary

Client Name: American Biv. Assoc., Inc.      Group Number: 1470330  
 Reported: 05/06/14 at 03:59 PM

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Laboratory Compliance Quality Control

Analyte Name	Blank	Blank	Report	LCS	LCSD	LCS/LCSD	RPD	RPD Max
	Result	MDL	Units	\$REC	\$REC	Ratio		
Batch number: 14125HR01								
Helium as Tracer Gas								
Sample number(s): 7445692-7445693								
N.D.      5,000      ppm(v)								
Batch number: D14120302A								
Benzene								
Sample number(s): 7445692-7445693								
N.D.      0.20      ppb(v)      86      90      70-130      5      25								
Cumene								
N.D.      0.20      ppb(v)      87      85      70-130      2      25								
Ethylbenzene								
N.D.      0.20      ppb(v)      108      104      52-129      3      25								
Methyl t-butyl Ether								
N.D.      0.40      ppb(v)      80      75      26-191      6      25								
Naphthalene								
N.D.      0.20      ppb(v)      85      85      70-130      1      25								
Toluene								
N.D.      0.20      ppb(v)      88      86      70-130      2      25								
m/p-Xylene								
N.D.      0.20      ppb(v)      93      93      70-130      2      25								
o-Xylene								
N.D.      0.20      ppb(v)      95      93      70-130      2      25								

\* Outside of specification  
 (1) The result for one or both determinations was less than five times the LOQ.  
 (2) The unspiked result was more than four times the spike added.





# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>RL</b>	Reporting Limit	<b>BMQL</b>	Below Minimum Quantitation Level
<b>N.D.</b>	none detected	<b>MPN</b>	Most Probable Number
<b>TNTC</b>	Too Numerous To Count	<b>CP Units</b>	cobalt-chlorophthalate units
<b>IU</b>	International Units	<b>NTU</b>	nephelometric turbidity units
<b>umhos/cm</b>	microhm/cm	<b>mg</b>	nanogram(s)
<b>C</b>	degrees Celsius	<b>F</b>	degrees Fahrenheit
<b>meq</b>	milliequivalents	<b>lb.</b>	pound(s)
<b>g</b>	gram(s)	<b>kg</b>	kilogram(s)
<b>µg</b>	microgram(s)	<b>mg</b>	milligram(s)
<b>mL</b>	milliliter(s)	<b>L</b>	liter(s)
<b>m3</b>	cubic meter(s)	<b>µL</b>	microliter(s)
		<b>pg/L</b>	picogram/liter

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

**ppm** parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

**ppb** parts per billion

**Dry weight basis** Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

**Data Qualifiers:**

**C** – result confirmed by reanalysis.

**J** - estimated value – The result is  $\geq$  the Method Detection Limit (MDL) and  $<$  the Limit of Quantitation (LOQ).

**U.S. EPA CLP Data Qualifiers:**

<b>A</b>	TIC is a possible aldoi-condensation product	<b>B</b>	Value is $<$ CRDL, but $\geq$ IDL
<b>B</b>	Analyte was also detected in the blank	<b>E</b>	Estimated due to interference
<b>C</b>	Pesticide result confirmed by GC/MS	<b>M</b>	Duplicate injection precision not met
<b>D</b>	Compound quantitated on a diluted sample	<b>N</b>	Spike sample not within control limits
<b>E</b>	Concentration exceeds the calibration range of the instrument	<b>S</b>	Method of standard additions (MSA) used for calculation
<b>N</b>	Presumptive evidence of a compound (TICs only)	<b>U</b>	Compound was not detected
<b>P</b>	Concentration difference between primary and confirmation columns $>25\%$	<b>W</b>	Post digestion spike out of control limits
<b>U</b>	Compound was not detected	<b>*</b>	Duplicate analysis not within control limits
<b>X,Y,Z</b>	Defined in case narrative	<b>+</b>	Correlation coefficient for MSA $<0.995$

## Organic Qualifiers

## Inorganic Qualifiers

**Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

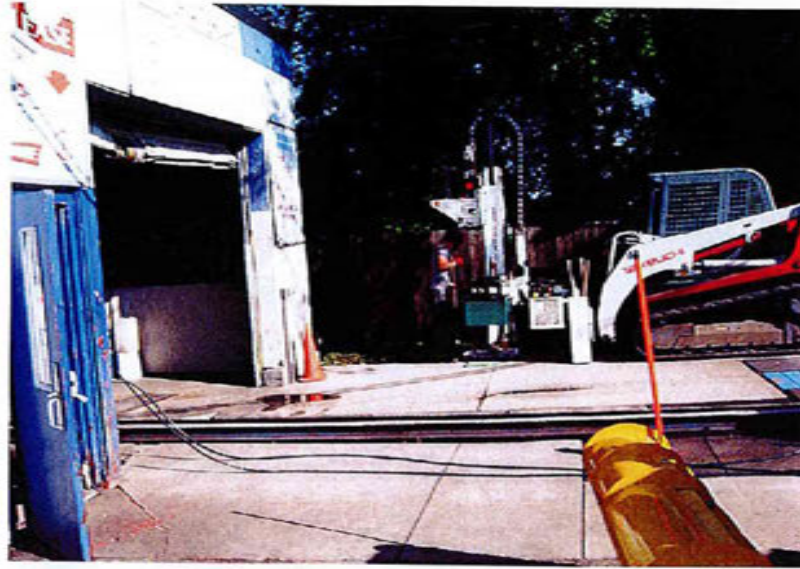
APPENDIX D: SITE PHOTOGRAPHS



Advancing Off-Site Monitoring Well #18 on Dzikowski



Completed Monitoring Well #18 on Dzikowski



Location of Monitoring Well #19 on Leo's Site



Finishing Cement Around MW #19 on Leo's Site



Location of Monitoring Well #20



Completed Monitoring Well #20 on Leo's Site



Setting-Up to Advance Off-Site MW #21 on Parker Property



Vapor Point on Parker Property



Vapor Point on Dzikowski Property



Photo Depicting Off-Site Properties Down-Gradient of Leo's Car Wash



APPENDIX E: UST CLOSURE REPORT

### UNDERGROUND STORAGE TANK SYSTEM CLOSURE REPORT FORM

25 - 90615  
Facility I.D.

Miller Creek Township Erie County  
Municipality County

11/30/06  
Date Prepared

Doug Dolecki  
Name of Person Submitting Report  
(Please Print)

Leo's Car Wash  
Company Name  
(if Applicable)

Owner  
Title

Closure Method (Check all that apply):

- Removal
- Closure-In-Place
- Change-In-Service

Site Assessment Results (Check all that apply):

- No Obvious Contamination - Sample Results Meet Standards/Levels
- No Obvious Contamination - Sample Results Do Not Meet Standards/Levels
- Obvious, Localized Contamination - Sample Results Meet Standards/Levels
- Obvious, Localized Contamination - Sample Results Do Not Meet Standards/Levels
- Obvious, Extensive Contamination

### UNDERGROUND STORAGE TANK SYSTEM CLOSURE REPORT FORM

Owners who are permanently closing underground storage tanks may use this form to demonstrate that an underground storage tank closure was performed in accordance with the "Closure Requirements for Underground Storage Tank Systems" document. PLEASE PRINT OR TYPE. COMPLETE ALL QUESTIONS.

#### SECTION I. Owner/Facility/Tank/Waste Management and Disposal Information

1. Facility ID Number 25 - 90615
2. Facility Name Leo's Car Wash
3. Facility County Erie
4. Facility Municipality Millcreek Township
5. Facility Address 2938 West 26<sup>th</sup> Street, Erie, PA 16506
6. Facility Contact Person Doug Dolaski
7. Facility Telephone Number (814) 833 - 7813
8. Owner Name Doug Dolaski
9. Owner Mailing Address 2938 West 26<sup>th</sup> Street, Erie, PA 16506
10. Description of Underground Storage Tanks (Complete for each tank closed)

DATE OF TANK CLOSURE (Month/Day/Year)	1	2	3	4
Tank Registration Number	1	2	3	4
Estimated Total Capacity (Gallons)	8000	8000	8000	8000
Substance(s) Stored Throughout Operating Life of Tank (Check All That Apply)	<b>a. Petroleum</b>			
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>b. Hazardous Substance</b>			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>c. Unknown</b>				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>a. Removal</b>				
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>b. Closure-in-Place</b>				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>c. Change-In-Service</b>				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Partial System Closure (Yes or No)</b>				
NO	NO	NO	NO	

NOTE: If Hazardous Substance Block is Checked, Attach Material Safety Data Sheets (MSDS) AND Chemical Abstract Service (CAS) No.

DATE OF TANK CLOSURE (Month/Day/Year)		-	-	-	-	-
Tank Registration Number						
Estimated Total Capacity (Gallons)						
Substance(s) Stored Throughout Operating Life of Tank (Check All That Apply)	a. Petroleum	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Unleaded Gasoline Leaded Gasoline Aviation Gasoline Kerosene Jet Fuel Diesel Fuel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fuel Oil No. 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fuel Oil No. 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fuel Oil No. 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fuel Oil No. 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Fuel Oil No. 6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	New Motor Oil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Used Motor Oil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Other, Please Specify					
	b. Hazardous Substance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Name of Principal					
	CERCLA Substance					
	AND					
	Chemical Abstract					
	Service (CAS) No.					
	c. Unknown	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	a. Removal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	b. Closure-in-Place	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	c. Change-In-Service	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Closure Method (Check Only One)						
Partial System Closure (Yes or No)						

Yes N/A

11. Briefly describe the storage tank facility and the nature of the operations which were conducted at the facility (both historical and present) including use of tanks:  
The site is a car wash and oil change facility and the tanks were used as a retail service station.

- 12. A site location and sampling map of the site, drawn to scale, is attached. See page 11 of 11.
- 13. Original, color photographs of the closure process are attached (i.e., inside of excavation/piping runs, pit water, tanks showing condition).
- 14. An amended "Registration of Storage Tanks" form was submitted to the DEP, Bureau of Watershed Conservation, Division of Storage Tanks, P.O. Box 8762, Harrisburg, PA 17105-8762.  
 Date: \_\_\_\_\_
- 15. If a reportable release was confirmed, the appropriate regional office of DEP was notified by the owner or operator.  
 Date: 01 - 23 - 2002 Office: PADEP's Meadville Office

Yes N/A

16. If tanks were cleaned on-site:

a. Briefly describe the disposition of usable product. The tanks contained no usable product at the time of removal.

b. Briefly describe the disposal of unusable product, sludges, sediments, and wastewater generated during cleaning. Provide the name and permit number of the processing, treatment, storage or disposal facility. (Attach documentation of proper disposal):  
Unusable material from tanks were placed in metal 55 gallon drums on site and disposed of properly.

c. If tank contents were determined/deemed to be hazardous waste, provide:

- (1) Generator ID Number: N/A
- (2) Licensed Hazardous Waste Transporter Name and ID Number:

17. If tanks were removed from the site for cleaning:

a. Provide the name and permit number of the processing, treatment, storage or disposal facility performing the tank cleaning:

b. If tank contents were determined/deemed to be hazardous waste, provide:

- (1) Generator ID Number:
- (2) Licensed Hazardous Waste Transporter Name and ID Number:

18. Briefly describe the disposition of tanks/piping (Attach documentation of proper disposal):  
UST's and related piping were cut for scrap.

19. If contaminated soil is excavated:

a. Briefly describe the disposition and amount (tons) of contaminated soil. Provide the name and permit number of the processing, treatment, storage or disposal facility. (Attach documentation of proper disposal):

b. If contaminated soil is determined/deemed to be hazardous waste, provide:

- (1) Generator ID Number:
- (2) Licensed Hazardous Waste Transporter Name and ID Number:

Yes N/A

20. Briefly describe the disposition of and amount: N/A (tons) of uncontaminated soil (attach analyses):

\_\_\_\_\_  
\_\_\_\_\_

I, Doug Dolecki (Print Name) hereby certify, under penalty of law as provided in 18 Pa. C.S. §4904 (relating to unsworn falsification to authorities) that I am the owner of the above referenced storage tank(s) and that the information provided by me in this closure report (Section 1) is true, accurate and complete to the best of my knowledge and belief.

  
\_\_\_\_\_  
Signature of Tank Owner

11/12/06  
\_\_\_\_\_  
Date

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

**UNDERGROUND STORAGE TANK SYSTEM  
CLOSURE REPORT FORM**

**SECTION II. Tank Handling Information**

Facility ID Number 25 - 90615

Yes N/A

1. Brieﬂy describe the excavation and initial on-site staging of uncontaminated/contaminated soil.  
The site has had a site characterization performed and a remedial action plan developed. There is presently a remediation system in place and working at the subject site. Soils from the excavation were placed back into the pit.
2. Brieﬂy describe the method of piping system closure and the closure of the piping systems including the quantity and condition of the piping.  
The piping was removed and disposed of as scrap.
3. Brieﬂy describe the condition of the tanks and any problems encountered during tank removal.  
The tanks were in relatively good shape at the time of removal.
4. Brieﬂy describe the method used to purge the tanks of and monitor for explosive vapors:  
An inductive diffuser was utilized to purge explosive vapors from the storage tanks. During the activities a LEL meter was used to monitor tanks for explosive vapors.
5. If tanks were cleaned on-site:
  - a. Brieﬂy describe the tank cleaning process: The tanks were entered and physically cleaned with hand tools and absorbent pads.
  - b. If subcontracted, name and address of company that performed the tank cleaning: \_\_\_\_\_
6. If tanks were closed-in-place, brieﬂy describe the tank fill material: \_\_\_\_\_
7. If contamination was suspected or observed, the "Notification of Contamination" form was submitted.

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

**UNDERGROUND STORAGE TANK  
CLOSURE REPORT FORM**

**SECTION III. Site Assessment Information**  
**Tank Registration # 001 (complete one sheet for EACH tank system and attach ALL  
laboratory sheets pertaining to that system)**

**Facility ID Number 25 - 90615**

**A. Provide depth of BEDROCK and WATER if encountered during excavation or soil boring (write "N/A: if NOT encountered).**

Bedrock N/A feet below land surface      Water 8 feet below land surface

**B. Provide Length of PIPING if piping was closed-in-place (write "N/A" if NOT closed-in-place).  
Length of piping N/A feet**

**C. TANK SYSTEM REMOVED FROM THE GROUND**

- 1). Was obvious contamination observed while excavating?
  - NO -----> Conduct confirmatory sampling -----> See end of this section for options on submission and maintenance of closure records -----> Do not complete item C.2. below.
  - YES-----> Report release to DEP within 2 hours -----> Describe contamination observed and likely source(s) tank, piping, dispenser, spills, overfills);  
Contamination was from previous leaking system in this tank pit prior to removal of tanks during this excavation.
- 2). Was contamination localized (within three feet of the tank system in every direction with no obvious water contamination)?
  - YES -----> Remove or remediate contaminated soil -----> Conduct confirmatory sampling-----> See end of this section for options on submission and maintenance of closure records -----> Call Indemnification Fund (717-787-0763).
  - NO-----> Continue interim remedial actions -----> See end of this section for options on submission and maintenance of closure records -----> Call Indemnification Fund (717-787-0763).

**D. TANK SYSTEM CLOSED-IN-PLACE OR CHANGED-IN-SERVICE**

- Was obvious contamination observed during sampling, boring or assessing water depths?
    - NO -----> Conduct confirmatory sampling -----> See end of this section for options on submission and maintenance of closure records.
    - YES-----> Report release to DEP within 2 hours -----> Describe contamination observed and likely source(s) tank, piping, dispenser, spills, overfills);
- Continue with corrective action -----> See end of this section for options on submission and maintenance of closure records -----> Call Indemnification Fund (717-787-0763).



E. If the answer to C.1. is "no", the answer to C.2. if "yes" or the answer to D. is "no", confirmatory samples are required. Use the sample/analysis information sheet on page 10 of 11 to provide the information on confirmatory sampling and complete the diagram on Page 11 of 11.

**Options for Submission and Maintenance of Closure Site Assessment Records**

Records of the site assessment must be maintained for at least three years after completion of permanent closure or change-in-service in one of the following ways:

- (a) By the owners and operators who took the UST system out of service;
- (b) By the current owners and operators of the UST system site; or
- (c) By mailing these records to the implementing agency if they cannot be maintained at the closed facility.

At least one option must be chosen. If option (c) is chosen, the closure report form should be sent to the DEP regional office responsible for the county in which the tank is located.

Where the results of the site assessment indicate that obvious, localized soil contamination was encountered and the analytical results of the confirmatory sampling show levels below the statewide standard/radiation levels, this closure report form (Sections I, II, and III) or some other acceptable site characterization report must be received by the Department within 180 days of verbally reporting the release.

Where the results of the site assessment indicate that no obvious contamination or obvious, localized contamination was encountered, but the analytical results of the confirmatory sampling show levels above the statewide standard/radiation levels, or where there is obvious, extensive contamination, Section 245.310(a)(8) of the CAP regulation requires that details of removal from service be included in the site characterization report. A copy of the completed closure report form should be submitted as part of the site characterization report to satisfy the requirements of Section 245.310(a)(8) of the CAP regulations.

I, Patrick E. Pruent (Print Name), hereby certify, under penalty of law as provided in 18 Pa. C.S. §4904 (relating to unsworn falsification to authorities) that I am the person who performed the site assessment activities associated with the closure of the above referenced storage tank(s) and that the information provided by me in this closure report (Section III) is true, accurate and complete to the best of my knowledge and belief.

  
Signature of Person Performing Site Assessment \_\_\_\_\_ Date 11/30/06

Professional Geologist \_\_\_\_\_ American Environmental Associates, Inc.  
Title of Person Performing Site Assessment \_\_\_\_\_ Name of Company Performing Site Assessment \_\_\_\_\_

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
BUREAU OF WASTE MANAGEMENT

**UNDERGROUND STORAGE TANK SYSTEM  
CLOSURE REPORT FORM**

Sample/Analysis Information  
(Attachment for Section III.)

Facility ID Number 25 - 90615

Sample ID. (See diagram)	Parameter	Analytical Method <sup>1</sup>	Media	Result (units)	Detection Limit (units)	Date Sample Taken	Date Sample Analyzed
HW60544	Benzene	5035/8260B	E Soil	<0.1 mg/kg	0.1 mg/kg	10 / 10 / 06	10 / 11 / 06
	Toluene	5035/8260B	E Soil	<0.2 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Ethyl Benzene	5035/8260B	E Soil	<0.2 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Xylenes	5035/8260B	E Soil	<0.2 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Cumene	5035/8260B	E Soil	<0.2 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Naphth- alene	5035/8260B	E Soil	<0.2 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	MTBE	5035/8260B	E Soil	0.23 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
						/ /	/ /
HW60546	Benzene	5035/8260B	E Soil	<0.1 mg/kg	0.1 mg/kg	10 / 10 / 06	10 / 11 / 06
	Toluene	5035/8260B	E Soil	<0.2 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Ethyl Benzene	5035/8260B	E Soil	<0.2 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Xylenes	5035/8260B	E Soil	<0.2 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Cumene	5035/8260B	E Soil	<0.2 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Naphth- alene	5035/8260B	E Soil	0.25 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	MTBE	5035/8260B	E Soil	<0.2 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
						/ /	/ /
						/ /	/ /

Facility ID Number 25 - 90615

Sample I.D. (See diagram)	Parameter	Analytical Method <sup>1</sup>	Media	Result (units)	Detection Limit (units)	Date Sample Taken	Date Sample Analyzed
HW60546	Benzene	5035/8260B	E Soil	3.57 mg/kg	0.1 mg/kg	10 / 10 / 06	10 / 11 / 06
	Toluene	5035/8260B	E Soil	7.32 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Ethyl Benzene	5035/8260B	E Soil	0.84 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Xylenes	5035/8260B	E Soil	3.35 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Cumene	5035/8260B	E Soil	<0.2 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Naphtha- lene	5035/8260B	E Soil	0.43 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	MTBE	5035/8260B	E Soil	<0.2 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
						/ /	/ /
HW60547	Benzene	5035/8260B	E Soil	0.10 mg/kg	0.1 mg/kg	10 / 10 / 06	10 / 11 / 06
	Toluene	5035/8260B	E Soil	1.13 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Ethyl Benzene	5035/8260B	E Soil	1.18 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Xylenes	5035/8260B	E Soil	8.60 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Cumene	5035/8260B	E Soil	0.35 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	Naphtha- lene	5035/8260B	E Soil	1.41 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
	MTBE	5035/8260B	E Soil	<0.2 mg/kg	0.2 mg/kg	10 / 10 / 06	10 / 11 / 06
						/ /	/ /
						/ /	/ /
						/ /	/ /

<sup>1</sup> Where EPA Method 5035 is required, indicate sample collection option in the right hand box of this column using the following codes:

P - Samples placed in a soil sample vial with a preservative present.

E - Samples collected and stored in a soil collection device which is airtight and affords little to no headspace.

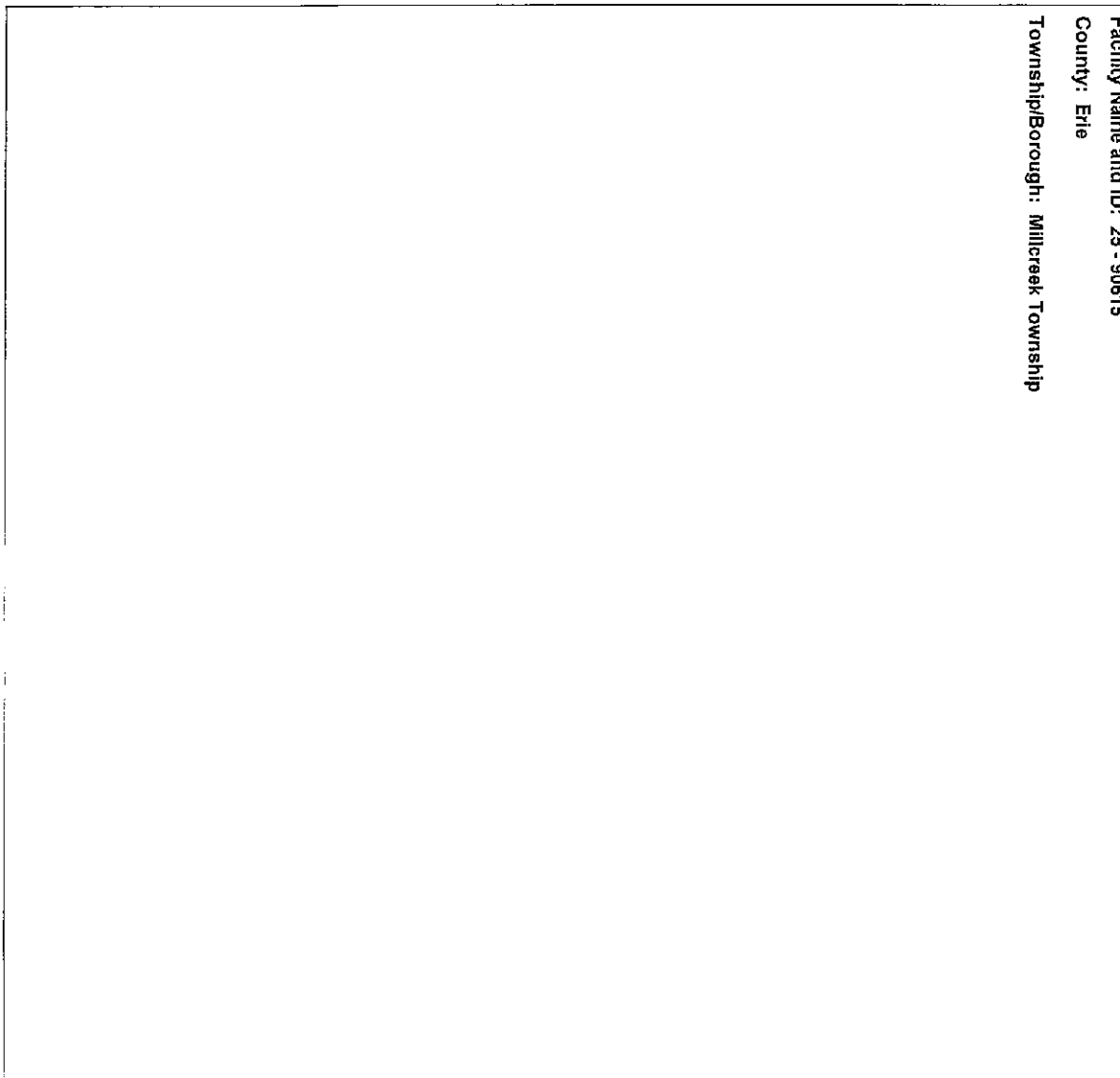
N - Samples placed in soil sample vial without a preservative present.

**Site Location and Sampling Map** - Use this page or suitable facsimile to provide a large scale map of the site where tanks were closed. Scales between 1" = 10 and 1" = 100 feet frequently work out well. Include the following information as each applies to the site: facility name and I.D., county, township or borough, property boundaries or area of interest, buildings, roads and streets with names or route numbers, utilities, location and ID number of storage tanks removed including piping and dispensers, soil stockpile locations, excavations or other locations of product recovery, north arrow, approximate map scale and legend. Also show depth and location of samples with sample ID numbers cross-referenced to the same ID numbers shown on Page 10 of 11.

**Facility Name and ID: 25 - 90615**

**County: Erie**

**Township/Borough: Millcreek Township**



APPENDIX F: REMEDIAL ACTION PLAN



**AMERICAN ENVIRONMENTAL ASSOCIATES, INC.**

**UNDERGROUND STORAGE TANK FACILITY  
REVISED REMEDIAL ACTION PLAN**

**LEO'S 3 CAR WASH  
2938 WEST 26TH STREET  
ERIE, PENNSYLVANIA 16506**

**FACILITY ID# 25-90615**

**CITY OF ERIE  
ERIE COUNTY, PENNSYLVANIA**

**PREPARED: May 2014**

**1135 Butler Avenue • New Castle, PA 16101  
Phone: (724) 652-1004 • Fax: (724) 652-3814**

LEO'S 3 CAR WASH  
2938 WEST 26<sup>TH</sup> STREET  
ERIE, PENNSYLVANIA 16506

FACILITY ID# 25-90615

REVISED REMEDIAL ACTION PLAN

CITY OF ERIE  
ERIE COUNTY, PENNSYLVANIA

PREPARED FOR:

LEO'S CAR WASH  
2938 WEST 26<sup>TH</sup> STREET  
ERIE, PENNSYLVANIA

PREPARED BY:

AMERICAN ENVIRONMENTAL ASSOCIATES, INC.  
1135 BUTLER AVENUE  
NEW CASTLE, PENNSYLVANIA 16101



MAY 2014

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## APPENDICES

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**REVISED REMEDIAL ACTION PLAN  
LEO'S CAR WASH  
FACILITY I.D. #25-90615**

**(1) Summary of Site Characterization Report Conclusions**

American Environmental Associates, Inc. (AEA) has been contracted by Lco's 3 Car Wash to provide environmental services pursuant to Underground Storage Tank (UST) corrective action and Land Recycling and Environmental Remediation Standards Act (Act 2) regulations at the subject site. The site is an oil change service and automated car wash located at 2938 West 26<sup>th</sup> Street, Millcreek Township, Erie County, Pennsylvania.

Corrective actions were initiated in response to a release that was discovered during construction of a new canopy on January 23, 2002. The release was eventually found to be associated with a loose swing joint in the regular unleaded line for the middle dispenser. A minor amount of contaminated soil was removed; approximately five tons, and then the new canopy footers were poured. The swing joint lead was repaired at this time. Clean soil conditions were never obtained and over excavation was not performed at this time due to site restraints. A Notification of Contamination was submitted to the PADEP's Meadville Office on January 23, 2002.

An Initial Site Characterization report was prepared and dated November 27, 2002 documenting the installation of monitoring wells MW#1 through MW#6. These wells were installed to delineate subsurface impacts.

In October of 2002 monitoring wells MW#1 through MW#6 were installed to delineate subsurface impacts. Soils samples were collected on October 29, 2002 and October 30, 2002. Soil sample results showed exceedances of Benzene and of MTBE. Groundwater exhibited levels of benzene, toluene, ethylbenzene, naphthalene and MTBE that exceeded Statewide Health Standards.

An Interim Site Characterization Report was prepared and dated February 13, 2003 documenting the installation of Monitoring Wells MW #7, MW# 8, and MW #9. These wells were installed to further delineate sub-surface contamination. Monitoring well soil samples were collected on January 17, 2003 for MW #7, MW# 8, and MW #9. The analytical results for soil were within the PADEP's Statewide Health Standards for Used Aquifers in Soil. Groundwater impacts were still present.

During April of 2003, AEA installed monitoring wells MW#10, MW# 11, and MW #12. Monitoring wells soil samples were collected on April 8, 2003 from MW#10, MW#11 and MW#12. The analytical results were within the PADEP's Statewide Health Standards for Used Aquifers in Soil. Groundwater analytical results indicated that monitoring wells MW#1, MW#2, MW#5, MW#6, MW#8, MW#9, MW#10 and MW#12 exceed Statewide Health Standard of Used Aquifers for one or more of the required parameters for unleaded gasoline.

In May of 2003, AEA submitted an overall Site Characterization Report for the facility. The report summarized site characterization activities including the drilling and installation of twelve groundwater monitoring wells and the collection of twelve soil samples and twelve groundwater samples.

A Remedial Action Plan was submitted to the PADEP on July 18, 2003. This plan recommended that American Environmental Associates, Inc. install a system to remediate the dissolved gasoline contaminants in the groundwater at the site. In a letter dated July 28, 2003, the DEP approved the Plan. The system is a dual phase high vacuum extraction (DPE). Monitoring wells MW#1, MW#3, MW#4, MW#5 and MW#6 were utilized as recovery wells.

Site preparation included the installation of below grade recovery piping (2-inch diameter, schedule 40 PVC) and modification of the recovery well heads. Trenching was done for electric, vapor extraction, groundwater recovery piping and a discharge line to the groundwater discharge location.

The remediation system consists of a 7.5 Hp oil sealed liquid ring pump (LRP) to recover liquid and vapor phase fluids. The pump consists of a shrouded rotor which rotates freely within an eccentric casing. There is no metal to metal contact between the rotor and casing. Centrifugal force acting on liquids within the pump causes the liquids to form a ring inside the casing. A fixed port cylinder, concentric with the rotor, directs the gas into the suction ports. Gas is trapped between the blades by the liquid pistons formed by centrifugal force as the liquid recedes from the port cylinder. It is trapped at the point of maximum eccentricity and is then compressed by the liquid ring as it is forced radially inward toward the central port cylinder. After each revolution, the compressed gas and accompanying liquid are discharged. During the pumping cycle, the gas is in intimate contact with the sealing liquid and compression is nearly isothermal. When handling saturated vapor-gas mixtures, the liquid ring acts as a condenser, greatly increasing the effective capacity of the pump. Seal liquid will be oil supplied via a reservoir mounted on the LRP skid.

The recovered fluids are pumped through a vapor/liquid knockout tank. Liquids are then directed, via transfer pump, through liquid phase granular activated carbon absorbers (GACA) to municipal sewage. Vapors are drawn from the knockout tank through the LRP and vapor phase GACA's and discharged to the atmosphere. Treatment of the vapors are conducted through two carbon units.

The system was put into operation in the first quarter of 2005 in order to obtain results to prepare a pay for performance proposal for the Underground Storage Tank Insurance Fund. The contract was executed and the system was put into operation permanently in January 4, 2006.

In July of 2012, AEA submitted a revised RAP to PADEP for the installation of five additional groundwater recovery wells. In November of 2012, PADEP requested the installation of additional P.O.C. wells before they would approve the revised RAP. In November of 2012, AEA submitted a proposal to the PADEP for the additional P.O.C.

wells they had requested. In May of 2013, PADEP approved the installation of additional P.O.C. wells. In July of 2013, P.O.C. wells MW#18, MW#19, and MW#20 were installed.

In November of 2013, the DEP directed the installation of one additional off-site monitoring well to be located downgradient of monitoring well MW#19. On March 27, 2014 monitoring well MW#21 was installed. Two vapor points were also installed on March 27, 2014 next to the homes located on two off-site properties; VP-A was installed at the Dzikowski property and VP-B was installed at the Parker property (Analytical analyses are attached in this report).

Groundwater delineation has been completed at the subject site.

AEA is now proposing the installation of five additional recovery wells. RW #13, RW #14, RW #15, RW #16 and RW #17 as illustrated on the attached Field Investigation Map. This is in order to help expedite achievement of the proposed Statewide Health Standard.

**(2) Plans Relating to Worker Health and Safety**

Attached in Appendix A

**(3) Federal, State & Local Permits and Approvals Needed to Conduct Remedial Actions**

Permit No. GRP #09-01 for groundwater discharge to City of Erie Wastewater Treatment Facility.

A Request for Determination of Requirement for Plan Approval/Operating Permit (RFD) was submitted to the PADEP Bureau of Air Quality.

#### **(4) Discussion of How the Remedial Action Will Attain the Selected Remediation Standard for the Site**

A Remedial Action Plan was submitted to the PADEP in July of 2003. The plan recommended that American Environmental Associates, Inc. install a system to remediate the dissolved gasoline contaminants in the groundwater at the site. The system is a dual phase high vacuum extraction (DPE). Monitoring wells MW#1, MW#3, MW#4, MW#5 and MW#6 are utilized as recovery wells.

Site preparation included the installation of below grade recovery piping (2-inch diameter, schedule 40 PVC) and modification of the recovery well heads. Trenching was done for electric, vapor extraction, groundwater recovery piping and a discharge line to the groundwater discharge location.

The remediation system consists of a 7.5 Hp oil sealed liquid ring pump (LRP) to recover liquid and vapor phase fluids. The pump consists of a shrouded rotor which rotates freely within an eccentric casing. There is no metal to metal contact between the rotor and casing. Centrifugal force acting on liquids within the pump causes the liquids to form a ring inside the casing. A fixed port cylinder, concentric with the rotor, directs the gas into the suction ports. Gas is trapped between the blades by the liquid pistons formed by centrifugal force as the liquid recedes from the port cylinder. It is trapped at the point of maximum eccentricity and is then compressed by the liquid ring as it is forced radially inward toward the central port cylinder. After each revolution, the compressed gas and accompanying liquid are discharged. During the pumping cycle, the gas is in intimate contact with the sealing liquid and compression is nearly isothermal. When handling saturated vapor-gas mixtures, the liquid ring acts as a condenser, greatly increasing the effective capacity of the pump. Seal liquid will be oil supplied via a reservoir mounted on the LRP skid.

The recovered fluids are pumped through a vapor/liquid knockout tank. Liquids are then directed, via transfer pump, through liquid phase granular activated carbon absorbers (GACA) to municipal sewage. Vapors are drawn from the knockout tank

through the LRP and vapor phase GACA's and discharged to the atmosphere. Treatment of the vapors is conducted through two carbon units.

The system was put into operation in the first quarter of 2005 in order to obtain results to prepare a pay for performance proposal for the Underground Storage Tank Insurance Fund. The contract was executed and the system was put into operation permanently in January 4, 2006. The system operates under the City of Erie Wastewater Groundwater Remediation Permit No. GRP 09-01. Quarterly reports are submitted to the City of Erie documenting analytical results and approximate volume of discharge.

The system was operational throughout the first quarter of 2014. The treatment system pumped approximately 22,097 gallons of water in the first quarter of 2014 and approximately 4,242,057 gallons of water since the system was put into operation.

AEA is now proposing the installation of five additional recovery wells. RW #13, RW #14, RW #15, RW #16 and RW #17 as illustrated on the attached Field Investigation Map. This is in order to help expedite achievement of the proposed Statewide Health Standard.

A Residential Used Aquifer Statewide Health Standard was chosen for this site.

#### **(5) Results of Pilot Study – Remedial Feasibility Testing**

On June 24, 2003, a dual phase vacuum enhanced extraction test was performed on monitoring well MW-3. The purpose of the test was to characterize the hydraulic and pneumatic properties of the shallow aquifer and vadose zone and to evaluate high vacuum soil vapor extraction (SVE) as a remedial alternative.

During the test vapor and water were extracted, separated and monitored. An Atlantic Fluidics A-20 (3 Hp) Liquid Ring Pump (LRP) was employed to extract vapors. In order to facilitate fluid extraction, the recovery well (MW#2) was fitted with an

airtight seal. A one-inch diameter drop tube was inserted through the seal, approximately 7.5 feet into the water table. Vapors and groundwater were extracted through the drop tube. After separation, groundwater was discharged through a 200-pound carbon vessel.

#### **Remedial Feasibility Testing**

The following data was recorded from the extraction well during the test: applied vacuum, water flow rates, vapor flow rate, lower explosive limit (% LEL), photo ionization detector (PID) readings and oxygen (% O<sub>2</sub>). Depth to water was recorded in all monitoring wells prior to and after aquifer testing. Vapor and groundwater recovery was performed simultaneously. Magnahelic gauges were mounted on select monitoring wells and monitored for vacuum response during the test.

#### **Vapor Recovery Data**

Testing was initiated by applying a wellhead vacuum of 25 inches of mercury. Airflow was measured through a rotometer mounted on the exhaust port of the LRP. An airflow of 4.0 to 6.0 standard feet per cubic minute (SCFM) was obtained.

Vapor effluent samples were collected and field screened periodically throughout the test. PID readings ranged from 30 to 266 parts per million (ppm). Per cent LEL and O<sub>2</sub> readings were taken in conjunction with the PID. LEL readings ranged from 5 to 28%. O<sub>2</sub> readings ranged from 20.0 to 20.9 %. Table 1 contains a summary of the field screening data.

Hydrocarbon removal rates were calculated using %LEL and airflow obtained from the field measurements. Hydrocarbon removal rates are summarized in Table 1. Vapor recovery rates ranged from 0.05 to 0.27 lbs./hr. Removal rates were calculated using equations developed by the American Petroleum Institute (API). A sample equation is provided below Table 1.

A time-series plot (%LEL, %O<sub>2</sub> and hydrocarbon recovery vs. time) is presented as Chart 1.

A vapor sample was collected at the end of testing. The sample was submitted to Environmental Laboratory Services, Inc. and analyzed for Benzene, Toluene, Ethylbenzene, Xylenes, Methyl-t-butyl ether (MTBE) and Gasoline Range Organics (GRO). The results are summarized below and indicate that appreciable hydrocarbon recovery was still occurring at the end of remedial testing.

Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	GRO
25.8	2.83	3.74	3.78	<0.1	300

Results are reported in ppm.

### Hydraulic / Pneumatic Influence

Groundwater was recovered at an average of 1.22 gallons per minute (gpm) following stabilization. Monitoring wells MW#1, MW#2, MW#3, MW#4, MW#5, MW#6, MW#7, and MW#8 were gauged prior to and after testing. Drawdown at recovery well MW#2 corresponds to the bottom of the drop tube. Drawdown ranged from -0.04 (MW#4) to -2.91' (MW#3) feet. Groundwater drawdown data is summarized in Table 2.

Magnahelic gauges were mounted on adjacent monitoring wells (MW#1, MW#3, MW#4, MW#6, MW#7 and MW#8) to measure resultant formation vacuums. A maximum vacuum response of 1.5 inches of water was obtained in MW#1. An induced vacuum of 0.1 inches of water was observed in monitoring well MW#8. Vacuum response data is summarized on Table 3. Vacuum response data from select wells is graphed on Chart 2.

Groundwater drawdown data generated during remedial testing indicates that a cone of depression of approximately 57 feet was created while pumping MW#2 at a relatively low flow rate of 1.2 gpm. Trends in the data suggest the cone of depression will be further expanded with long term pumping. Vacuum response data indicates a zone of influence of approximately 57 feet was achieved during testing. This data suggests that an applied vacuum of at least 23 inches of mercury is more than adequate to



create an SVE radius of influence. Charts, graphs and tables of the field tests are attached in Appendix B.

**(6) Design and Construction Details**

Attached in Appendix C.

**(7) Operation and Maintenance Details**

The remediation system will be checked twice per month to assure proper working conditions. It is anticipated that effluent water will be sampled once a month as per local sewage authority permit requirements. Flow meter measurements from the effluent water will also be taken monthly. Both water and air activated carbon units will be sampled monthly before and between activated carbon units to determine the effectiveness of the units. Groundwater samples will be obtained quarterly from monitoring wells MW #2, MW #7, MW #8, MW #9, MW #10, MW #11, MW #12, MW #17 and MW #18 to determine the effectiveness of the remediation system. Static water levels will be obtained quarterly from all non-pumping monitoring wells. Results of the above referenced sampling will be summarized in a quarterly remedial action status report.

**(8) Site Map Depicting Buildings, Roads, Property Boundaries  
And Other Pertinent Information**

The Site Map is attached in Appendix D.

**(9) Description of the Media and Parameters to be Monitored & Sampled**

The remediation system will be inspected at least once a month to assure proper working condition. Static water levels will be taken from all monitoring wells. Quarterly groundwater samples will be taken for monitoring wells MW#2, MW#7, MW#8, MW#9, MW#10, MW#11, MW#12, MW #17, MW #18 & MW #21 and analyzed for unleaded gasoline parameters (EPA 5030B/8260B).

Before, between and after activated carbon treatment water samples will be obtained monthly and analyzed for Benzene, Toluene, Ethylbenzene, Xylene, Cumene, Naphthalene, and MTBE. Air samples will be taken monthly before, between, and after activated carbon treatment and analyzed for Benzene, Toluene, Ethylbenzene, Xylene, MTBE, and Gasoline Range Organics.

The result of analytical testing during each quarter will be summarized in a Quarterly Remedial Action Progress Report and submitted to the Pennsylvania Department of Environmental Protection.

**(10) Description of Analytical Methods to be Utilized**

Analyzed for unleaded gasoline parameters (EPA 5030B/8260B).

**(11) Description of the Methodology That Will be Utilized to Demonstrate Attainment of the Selected Standard**

AEA installed two (3) downgradient monitoring wells (MW #18, MW #19 and MW #21) as depicted on the attached field investigation map. These wells are located downgradient on the Leo's Car Wash northern property boundary. The wells are constructed of ¾ inch PVC installed to a depth of approximately 12 feet. The wells will have 10 feet of slotted screen with a 2 foot riser. The depth of the wells was determined by the seasonal low water table prior to the installation of the remediation system. The reason for the ¾ inch wells are site constrictions and are being advanced utilizing a geo-probe rig per site and off-site constraints. AEA believes this will address the RAP that was approved by the Department in 2003 that stated further downgradient groundwater characterization was needed. Monitoring wells MW #18 & MW #21 confirms that no off-property contamination has occurred (Analytical results are attached in this report).

AEA proposed in the RRAP of July 25, 2012 to expand the remediation system to include recovery wells #13, #14, #15, and #16. AEA is now proposing an additional recovery well #17 (depicted on attached field investigation map) to include the area of

soil impact noted in the UST Closure Report that was submitted to the Department in December of 2006.

It was noted in the disapproval letter that vapor intrusion has not been addressed at the site. AEA proposes to install two (2) vapor points at the locations illustrated on the attached field investigation map. The vapor points will be constructed using a manufactured vapor point consisting of a 1" PVC pipe that has a 1 foot sand packed screen interval and risers that are sealed with bentonite to the surface. Samples will be collected using SUMMA canisters in accordance with standard operating procedures described in PADEP's guidance and sent to Lancaster Laboratories, in Lancaster, PA for analysis.

Additionally, random sampling will be conducted during field activities in order to address soil attainment at the site. Random sample locations are shown on the attached map. The depths of the samples are also included. The Department's Systematic Random Sampling Workbook Program was used in order to choose the locations and depths for the samples.

The current remediation system consists of a 7.5 Hp oil sealed liquid ring pump (LRP) to recover liquid and vapor phase fluids. The pump consists of a shrouded rotor which rotates freely within an eccentric casing. There is no metal to metal contact between the rotor and casing. Centrifugal force acting on liquids within the pump causes the liquids to form a ring inside the casing. A fixed port cylinder, concentric with the rotor, directs the gas into the suction ports. Gas is trapped between the blades by the liquid pistons formed by centrifugal force as the liquid recedes from the port cylinder. It is trapped at the point of maximum eccentricity and is then compressed by the liquid ring as it is forced radially inward toward the central port cylinder. After each revolution, the compressed gas and accompanying liquid are discharged. During the pumping cycle, the gas is in intimate contact with the sealing liquid and compression is nearly isothermal. When handling saturated vapor-gas mixtures, the liquid ring acts as a condenser, greatly

increasing the effective capacity of the pump. Seal liquid will be oil supplied via a reservoir mounted on the LRP skid.

The recovered fluids are pumped through a vapor/liquid knockout tank. Liquids are then directed, via transfer pump, through liquid phase granular activated carbon absorbers (GACA) to municipal sewage. Vapors are drawn from the knockout tank through the LRP and vapor phase GACA's and discharged to the atmosphere. Treatment of the vapors is conducted through two carbon units.

The remediation system will be checked twice per month to assure proper working conditions. It is anticipated that effluent water will be sampled once a month as per local sewage authority permit requirements. Flow meter measurements from the effluent water will also be taken monthly. Both water and air activated carbon units will be sampled monthly before and between activated carbon units to determine the effectiveness of the units. Groundwater samples will be obtained quarterly from monitoring wells MW#2, MW#7, MW#8, MW#9, MW#12, MW #18 and MW #19 to determine the effectiveness of the remediation system. Static water levels will be obtained quarterly from all non-pumping monitoring wells. Results of the above referenced sampling will be summarized in a quarterly remedial action status report.

The current remediation system will continue to run until such a time that groundwater is within limits. Then the system will be shut down and attainment sampling will commence for eight quarters.

As previously mentioned, soil and vapor studies will be conducted in order to achieve attainment for those media.

(12) **Description of Proposed Postremediation Care Requirements**  
N/A

(13) **Description of Additional Items Necessary to Develop the Remedial Action Plan**  
N/A

APPENDIX A: PLANS RELATING TO WORKER  
HEALTH & SAFETY

**R.A.R. Engineering Group, Inc.**

# **Safety Program**

## **Employee Handbook**

Prepared by:  
R.A.R. Engineering Group, Inc.  
in association with:  
U.S. Compliance Systems, Inc.

Disclaimer: This Employee Handbook is not all inclusive. It does reflect selected portions of the safety program belonging to:

R.A.R. Engineering Group, Inc.  
1135 Butler Avenue  
New Castle, PA 16101

To the best of our knowledge, the information contained herein is accurate. U.S. Compliance Systems, Inc. accepts no responsibility for errors or omissions.

# R.A.R. Engineering Group, Inc.

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# R.A.R. Engineering Group, Inc.

## SAFETY COMMITMENT

We are committed to ensuring that you do not work in an environment that is unsanitary, hazardous, or dangerous to your health or safety. You will be instructed on the recognition and avoidance of unsafe conditions and the regulations applicable to your work environment to control or eliminate any hazards or other exposure to illness or injury.

Using the safety and health training programs provided by the Occupational Safety and Health Administration (OSHA), as well as other reference materials, company safety training, policies, and procedures will be developed and implemented as needed.

Frequent and regular inspections of our facilities, materials, and equipment will be made by the Safety Program Administrator or designated persons.

You may operate equipment or machinery only if you are qualified by training or experience. Machinery, tools, material, or equipment that you find either not in compliance with a particular OSHA standard or that you determine is unsafe will be identified as such by tagging; locking the controls; or physically removing it from its place of operation.

Safety takes a commitment from all persons from senior management to the newest hire. It is expected that you will actively participate in safety training and perform your work in a safe manner.

The primary beneficiary of maintaining a safe work environment is you. You are the person who will not sustain an occupational injury or illness. A safe work site, additionally, protects fellow employees and those with whom we work. Performing tasks in a safe manner allows us to work more efficiently, reduces the possibility of equipment damage, eliminates costly citations, and enhances our opportunities to procure more work. Working safely has nothing but positive benefits to you and the company.

If confronted with a new task for which you do not know the proper safety procedures, ask for instruction from your supervisor before proceeding.

Do not hesitate to point out observed safety deficiencies to your supervisor -- you may prevent an injury to yourself or a fellow employee.

OSHA standards that are applicable to the work you do are readily accessible.

## SAFETY CONSIDERATIONS

You should have a working understanding of the below safety principles/ topics as they apply in all workplace situations. Safety procedures for specific tasks will be addressed through formal or on-the-job training depending on the task.

On every project, there will be a competent person with the knowledge and authority to stop work should a hazardous condition develop that cannot be immediately resolved.

Regular and frequent inspections will be made to ensure that established safety procedures are being followed.

## HOUSEKEEPING

You are to maintain a neat and orderly work area *as far as practical*. Housekeeping and general cleanliness have a direct effect on safety and health. Proper housekeeping can prevent slips and falls, allow unhampered egress in the event of an emergency, prevent falling object injuries, enhance fire safety, and prevent the infestation of vermin. Listed below are general housekeeping rules:

- a. All walking/working surfaces shall be kept clean and dry.
- b. Do not allow debris to accumulate.
- c. All stored materials will be neatly stacked.
- d. All containers, when not in use, will be sealed.
- e. No objects will be left unattended on stairways.
- f. Entrances and exits will be properly marked and not blocked.

## EMERGENCY MEDICAL RESPONSE

**DO NOT PROVIDE ANY MEDICAL ASSISTANCE  
FOR WHICH YOU ARE NOT QUALIFIED BY  
CERTIFIED TRAINING**

Should an injury occur that requires an emergency medical responder, the below listed actions will be taken in the order given:

1. Call the posted emergency response number.
2. Provide any medical assistance you are trained and certified to do.  
DO NOT provide any medical assistance you are not trained to do.

3. Designate an individual to direct the emergency responders to the injured party and provide Material Safety Data Sheets if applicable.
4. Notify your supervisor who, in turn, will notify the office.

#### FIRE PREVENTION

Fire prevention deals not with handling a fire emergency, but rather preventing a fire in the first place. To reduce the likelihood of a fire, you must adhere to the following rules:

1. There shall be no smoking except in designated smoking areas. Smoking materials will be totally extinguished and placed in appropriate receptacles. Under no circumstances will there be smoking during refueling of vehicles or within 50 feet of flammable materials.
2. All chemical products will be handled and stored in accordance with the procedures noted on their individual MSDS.
3. Heat producing equipment will be properly maintained and operated per the manufacturer's instructions to prevent accidental ignition of combustible materials.
4. Precautions will be taken when working with an open flame and those areas will be made fire safe by removing or protecting combustibles from ignition.
5. Combustible liquids must be stored in approved containers.
6. Chemical spills -- particularly combustible and reactive liquids -- must be cleaned up immediately. Damaged chemical containers and cleanup materials must be properly disposed.  

[Note: Exercise care! Information on appropriate personal protective equipment; proper disposal; proper cleanup procedures; required ventilation; etc. is found on the product's MSDS.]
7. Combustible liquids and trash must be segregated and kept from ignition sources.
8. Keep clear access to fire hydrants as well as portable fire extinguishers.
9. Practice good housekeeping!

## PORTABLE FIRE EXTINGUISHERS

Know the location of fire extinguishers, what class of fire extinguisher is appropriate for what type of fire, and how to safely use a fire extinguisher.

Portable fire extinguishers will be located allowing for ease of accessibility.

Portable fire extinguishers will be distributed as indicated below:

<u>CLASS</u>	<u>DISTRIBUTION</u>	<u>NOTES</u>
A "A" on a green triangle	75 feet or less travel distance between yourself and the extinguisher	Use on wood, paper, trash.
B "B" on a red square	50 feet or less travel distance between the hazard area and yourself	Use on flammable liquid, gas.
C "C" on a blue circle	Based on the appropriate pattern for the existing Class A or Class B hazards	Use on electrical fires.
D "D" on a yellow star	75 feet or less travel distance between the combustible metal working area and the extinguisher or other containers of Class D extinguishing agent.	Use on combustible metals.

Using the wrong fire extinguisher on some fires can actually spread the fire. Portable fire extinguishers suitable for ABC class fires will be available on all job sites – at least one extinguisher will be on each floor of a project, near the stairway.

## FIRE PROTECTION

The phone number of the local fire department as well as our facility address will be posted or readily accessible.

If a fire should occur, all personnel and the local fire department will be notified. In all emergency situations, you should:

- a. Remain calm.
- b. Speak clearly and slowly.
- c. Give the exact location.
- d. Describe the situation.
- e. Give the phone number from where you are calling.
- f. Do not hang up until told to do so.

## FIRST AID & FIRST AID KITS

Should a medical emergency occur, call 911 or, if 911 service is not available, call the emergency medical response phone number posted at the job site. Explain the situation clearly and follow the emergency response team's instructions.

If an emergency vehicle is being sent to the job site, establish easy access and keep on-lookers away.

Unless trained and licensed in CPR/first aid and a designated first aid provider as an additional job as part of the company bloodborne pathogen program, employees will not expose themselves to blood or other bodily fluids of other employees at any time.

Per OSHA, first aid is limited to:

- a. Using a non-prescription medication, such as aspirin, at non-prescription strength.
- b. Cleaning, flushing or soaking wounds on the surface of the skin;
- c. Using wound coverings such as bandages, Band-Aids™, gauze pads, etc.; or using butterfly bandages or Steri-Strips™.
- d. Using hot or cold therapy.
- e. Using any **non-rigid** means of support, such as elastic bandages, wraps, non-rigid back belts, etc..
- f. Using temporary immobilization devices while transporting an accident victim (e.g., splints, slings, neck collars, back boards, etc.).
- g. Drilling of a fingernail or toenail to relieve pressure, or draining fluid from a blister.
- h. Using eye patches.
- i. Removing foreign bodies from the eye using only irrigation or a cotton swab.
- j. Removing splinters or foreign material from areas other than the eye by irrigation, tweezers, cotton swabs or other simple means.
- k. Using finger guards.
- l. Using massages.
- m. Drinking fluids for relief of heat stress.

You must know the location and contents of first aid kits. These kits are worthless if not readily accessible. First aid kits will **not** be locked up.

First aid supplies generally include: adhesive bandages, bandage compresses, scissors, tweezers, triangular bandages, antiseptic soap or pads, eye dressing, and other items that are appropriate for the work we do.

First aid kits will be replenished as items are used. Sterile items will be wrapped and sealed and used only once. Other items such as tape or scissors can be reused and should be kept clean. In the absence of plentiful amounts of clean water, eye flush will be available.

## FLUIDS

From a safety standpoint, you must not neglect your need for potable (drinkable) fluids.

On job sites, exertion and heat dictate the need for plenty of water.

From a life process standpoint, what fluid intake is doing is keeping you healthy by allowing your body to maintain its core body temperature at its appropriate level as well as transporting, within your body, nourishment, gases, and waste.

Imagine your body as a water based chemical factory that functions only within a narrow temperature range. Sweating (water loss) cools your body and this fluid must be replaced.

Drink plenty of water!

## PERSONAL PROTECTIVE EQUIPMENT

A hazard assessment will be to determine what types of personal protective equipment (PPE) are appropriate. A major part of this hazard assessment will be determining what PPE needs can be eliminated through feasible engineering controls or work procedures.

Types of hazard categories that are considered are: impact; penetration; compression; chemical; heat; harmful dust; and light radiation.

The focus of PPE is to eliminate eye, hand, foot, limb, and head injury. Visitors exposed to the identified hazards will be loaned appropriate PPE (and given instruction in its use) prior to hazard exposure.

You must understand the limitations of your PPE; the correct procedure for putting on, adjusting, and removing the PPE; and the proper care, maintenance, and useful life of the PPE.

Cleanliness of PPE is of importance particularly when dealing with eye protection where fogging, scratches, or dirt can render the PPE a hazard rather than protection from a hazard.

An inexpensive pair of safety glasses could save your priceless eyesight.

Unique PPE required for job performance such as respirators, ear plugs, safety goggles, etc. will be supplied to you. You are responsible for maintenance of the equipment issued to you. Items of PPE that are damaged or non-functioning should be turned in to the supervisor for repair or replacement.

Normal PPE generally protects you from an *instant* injury such as a projectile in the eye. Respiratory and hearing protection, while PPE, fall under more stringent standards than hard hats, for example. Respiratory and hearing hazards can take years to present themselves. Hearing protection and respirator selection are more complicated, procedurally, than ordinary PPE (i.e., hard hats, safety glasses, gloves, steel toed boots, etc.). Their uses are governed by specific standards that require in depth training based on objective scientific data.

For personal comfort and to eliminate nuisance noises and nuisance respiratory conditions that are not at or above the threshold level for required protection, dust masks and ear plugs may be used at any time.

#### LIFTING, PUSHING & PULLING

Back injuries are often caused by the obvious -- putting excessive strain on the lower back by lifting an object that is too heavy or awkward, or by bending and/or twisting while lifting.

However, lifting injuries are also caused by less obvious reasons:

- a. poor physical condition
- b. poor posture
- c. poor judgment (lifting, pulling, pushing an object that is obviously too heavy or awkward without seeking assistance or a mechanical lifting device.)
- d. lack of exercise
- e. excessive body weight

Proper lifting techniques are important for employee safety. Below are lifting techniques that will reduce the likelihood of injury:

- a. lift objects comfortably, not necessarily the quickest or easiest way.
- b. lift, push, and pull with your legs, not your arms or back.

- c. when changing direction while moving an object, turn with your feet, not by twisting at the waist.
- d. avoid lifting higher than your shoulder height.
- e. when standing while working, stand straight.
- f. when walking, maintain an erect posture; wear slip-resistant, supportive shoes.
- g. when carrying heavy objects, carry them close to the body and avoid carrying them in one hand.
- h. when heavy or bulky objects need to be moved, obtain help or use a mechanical aid such as a dolly, hand truck, forklift, etc..
- i. when stepping down from a height of more than eight inches, step down backwards, not forward.
- j. handle heavy objects close to the body -- avoid reaching out.
- k. lift gradually and smoothly. Avoid jerky motions.
- l. maintain a clear line of vision.

#### SLIPS, TRIPS & FALLS

Slips, trips, and falls are among the most common job site accidents and they are easily preventable. Below are some of the causes of slips, trips, and falls:

- a. running on the job site.
- b. engaging in horseplay.
- c. working off a ladder that is not firmly positioned.
- d. carrying an object that blocks line of vision.
- e. work boots not laced or buckled.
- f. working off a scaffold without safety rails.
- g. using ladders that have oil and grease on the rungs.
- h. not using a handrail on steps.
- i. messy work areas with debris strewn about.
- j. not paying attention to what one is doing.

This list can go on and on, but all the above are easily preventable by adherence to common safety procedures, common sense, and awareness of potential hazards on the job site.



## BASIC TOOLS

Much is written about powered tools and the importance of guards and other safety related topics. Seldom addressed are the hazards associated with simple, non-powered tools. Every tool is potentially dangerous if not properly used. Basic tools would include, but not be limited to: hammers, screwdrivers, shovels, shears, utility knives, and wrenches.

Below are five guidelines for basic tool use.

1. Never use a tool for a purpose other than that for which it was designed!

Improper use of a tool will certainly damage it and may result in injury if the tool slips or breaks.

2. Never exceed a tool's design limits.

If a tool cannot do the job being properly used, you've got the wrong tool. Exceeding a tool's design limits will certainly damage the tool and, of course, expose yourself to injury if it slips or breaks.

3. Inspect tools before use.

Cracked or splintered handles, loose heads, "mushroomed" striking surfaces, dull chisels/blades, bent shafts, worn or deformed ends -- all are potentially dangerous conditions for tool use. Either repair or replace damaged tools -- do not use them!

4. Clean tools after use.

It is much easier to clean and/or lubricate tools immediately after use than waiting until the tools becomes rusty or encrusted with gunk.

5. Store tools properly.

If tools are properly stored automatically, you, over time, save hours not having to look for tools. From a safety standpoint, you will have the right tool at the right time. Additionally, by having tools properly stored, you'll prevent the possibility of rummaging around in a tool box and cutting yourself on an exposed sharp object.

## POWERED TOOLS

You may operate powered tools only if authorized. This authorization will be granted after it has been demonstrated that you have the ability to safely operate these items through training or experience.

Seemingly simple powered tools, misused, can cause serious injury. Understand the operator's manual and never bypass any guards.

## GROUND FAULT CIRCUIT INTERRUPTERS (GFCI)

When you are using temporary wiring -- extension cords are a form of temporary wiring -- ground fault circuit interrupters must be used. A GFCI is designed to prevent you from receiving a dangerous electrical shock.

Because 115V at 15A is so common, its safety is often taken for granted. The danger is not the voltage, it is the Amps (current). 0.015 Amps is enough current to cause a painful shock. The table below was prepared by the National Safety Council and the Pacific Telegraph Company:

### Safe Current Values

Amps		
0.001A	(1mA)	Cannot be felt
0.001 - 0.008A	(1 - 8 mA)	Felt, but not painful: muscle control is not lost.

### Unsafe Current Values

Amps		
0.015 - 0.02A	(15 - 20mA)	Painful shock: muscular control lost; cannot let go; not harmful to body organs
0.02 - 0.09A	(20 - 90mA)	Burns; breathing extremely difficult; sore muscles
0.1 - 0.2A	(100mA - 200mA)	*Ventricular Fibrillation (a fatal heart condition)
0.2 - 2A	(200mA - 2A)	Burns; paralysis of the lungs; nerve damaged if above 600V
2A and up frying currents; severe burns of two types:		1. External - caused by arcing on contact 2. Internal - cooking of the organs and flesh. Results in: amputation or destruction of vital organs

\*Ventricular Fibrillation is essentially a fluttering of the heart which is useless in circulating blood.

If you do receive a severe shock, you should seek medical evaluation even if there is no apparent damage.

GFCI's are required by all 120-volt, 15-, 20-, and 30-ampere receptacle outlets that are not a part of the permanent wiring of a building. GFCI's provide employee safety by detecting lost current resulting from a short, overheating, and/or ground fault and "tripping" or cutting off the current within as little as 1/40th of a second.

A GFCI **will not** protect one who comes in contact with two hot wires or a hot wire and a neutral wire. A GFCI **will** provide protection against fires, overheating, damage to insulation, and, the most common form of electrical shock hazard -- the ground fault. Always **test** a GFCI before use.

### SIGNS & TAGS

You must pay heed to the various signs and tags found throughout our facility. Color coding assists in determining the level of danger:

- red = danger
- yellow = caution
- orange = warning
- white = safety instruction
- fluorescent orange = biological hazard

### ADEQUATE LIGHTING

You must see what you are doing. A simple guideline for adequate lighting is this: if you are not sure if you have enough light for your work, you don't!

### APPROPRIATE CLOTHING

Wear clothing that is appropriate for your work. You may be exposed to heat, cold, rain, or snow. Wear clothing that provides comfort, yet be sure that it cannot snag on equipment.

### PERSONAL HYGIENE

You will have access to restroom facilities as needed. Do not take job site chemicals home with you on your skin or clothing.

### DRUGS AND ALCOHOL

With the exception of over the counter drugs such as aspirin or drugs prescribed by a physician, you may have no drugs or alcohol within our facility. Alcohol and drug abuse cause an unacceptable level of safety hazard. If you are found to be under the influence of drugs and/or alcohol, you will be immediately removed from your work assignment by your supervisor and further disciplinary action will be taken by the Safety Director.

If you are taking prescription medication that reduces motor skills, you should report this to your supervisor for appropriate work assignment.

### ACCIDENT INVESTIGATION

The purpose of Accident Investigation is to prevent the same type of accident from reoccurring. An accident investigation will begin immediately after the medical crisis is resolved.

Near-miss mishaps, events which result in no injury or damage, will be investigated because, even though the outcomes are different, the causes are the same.

Your responsibility, should you be involved as a witness in an accident investigation, is to fully answer questions that may be asked of you so that future accidents may be prevented.

### POSTINGS

There will be a prominently displayed bulletin board or area for postings. You must be aware of the location of the following posted items:

- a. OSHA Form 3165, *It's the law!*
- b. Emergency phone numbers & facility address for emergency response.

- c. During the period from 1 February through to April 30, OSHA Form 300A, *Summary of Work-Related Injuries and Illnesses*, must be posted for work-related injuries and illnesses which have occurred during the previous year.

If appropriate, the following will be posted:

- a. OSHA citations.
- b. Notice of informal hearing conference.
- c. Names and location of assigned first aid providers.
- d. Air or wipe sampling results.
- e. Emergency action plan.

#### SAFETY MEETINGS

Depending on the work at hand, safety meetings may be held during the work shift. Successful safety meetings demand interactive participation by the presenter as well as those attending. Pay attention, feel free to ask questions, and ensure that, at the completion of a safety meeting, you have no unanswered safety questions.

#### ENFORCEMENT

It is expected that all employees will abide by our safety rules and guidelines not only to protect themselves, but also to protect their fellow workers from harm. Should a safety violation occur, the following steps will be taken by the employee's immediate supervisor:

- a. **Minor Safety Violations:** Violations which would **not** reasonably be expected to result in serious injury.
  - 1. The hazardous situation will be corrected.
  - 2. The employee will be informed of the correct procedures to follow and the supervisor will ensure that these procedures are understood.
  - 3. The supervisor will make a written report of the occurrence using our Enforcement Documentation Form and inform the employee that this documentation will be forwarded to the Safety Director for a retention period of one year.
  - 4. A repeat occurrence of the same minor safety violation is considered substantially more serious than the first.

b. **Major Safety Violations:** Violations which would reasonably be expected to result in serious injury or death.

1. The hazardous situation will be corrected.
2. The employee will be informed of the correct procedures to follow and will impress upon the individual the severity of the violation and the likely consequences should this type of violation be repeated. The supervisor will ensure that the individual understands the correct procedures and will be cautioned that a reoccurrence could result in disciplinary action up to and including discharge.
3. The supervisor will make a written report of the occurrence using our Enforcement Documentation Form and inform the employee that this documentation will be forwarded to the Safety Director for a retention period of one year.

c. **Willful Major Safety Violations:** Intentional violation of a safety rule which would reasonably be expected to result in serious injury to the employee or a fellow worker.

1. The hazardous situation will be corrected.
2. The employee will be removed from the job site, the event will be documented and forwarded to the Safety Director, and the employee will be discharged.

Employees are to understand that the primary purpose of documenting safety violations is to ensure that the important business of employee safety is taken seriously and that the potential for injury is reduced to the lowest possible level.

Schedule of Enforcement Actions for Violations within a 1 Year Period  
Minor Violation

Offense	Action	Repeat of Same Offense	Action
1st	Written Notice	1st	1 Day Off
2nd	Written Notice	2nd	3 Days Off
3rd	1 Day Off	3rd	Dismissal
4th	2 Days Off		
5th	3 Days Off		
6th	Dismissal		

### Major Violation

Offense	Action	Repeat of Same Offense	Action
1st	Written Notice	1st	4 Days Off
2nd	2 Days Off	2nd	Dismissal
3rd	4 Days Off		
4th	Dismissal		

### HAZARDOUS JOB SITE MATERIALS

When working in or around older structures, potential asbestos and lead hazards **may** exist. On many job sites, the potential for crystalline silica exposure **may** exist. The presence of these hazards, and the appropriate PPE and respiratory protection requirements, will be disclosed before any work begins.

Should these materials be "discovered" as work progresses, we will protect our employees from these hazards by:

- a. identification of these items by the competent person.
- b. informing the owner, project designer, or engineer of the hazards.
- c. securing the areas in question until testing proves samples to be negative.

**Asbestos** can be found in pipe, wall, and boiler insulation; exterior sheeting; and flooring. Friable or crumbling asbestos presents the most hazard as it can float in the air and be inhaled into the respiratory system. Without respiratory protection, the microscopic asbestos fibers can enter the deepest portion of the lung, causing scar tissue to develop and stiffen the lung. The net result is a reduction of gas exchange -- a condition called asbestosis.

**Lead** can be found in water pipes, soldering, and paint. Lead is a heavy, toxic metal which can be absorbed into your body by ingestion and/or inhalation. It is a cumulative poison which can stay in your body for decades.

While massive doses of lead can kill in a matter of days, the more likely scenario on a job site is moderate exposure to asbestos or lead which probably would not create any health problems for years -- if at all.

**Crystalline Silica** can be readily found on many job sites in rocks as well as many concrete and masonry products. Crystalline Silica can be released in the air when employees are performing such tasks as:

- a. chipping, hammering, drilling, crushing, or hauling rock.
- b. abrasive blasting.
- c. sawing, hammering, drilling, or sweeping concrete or masonry.

Unprotected respiratory exposure to crystalline silica may cause a lung disease called silicosis.

Because of the chronic (long term) nature of these hazards, detrimental health effects due to exposure would not be immediately noticed.

The competent person on site will prevent exposures to these materials. Areas that contain the above materials will be cordoned off and protected with appropriate warning signs. Do not enter any restricted area unless dictated by job assignment and only after specific training for dealing with these hazards. The training would include PPE, respiratory protection, work procedures, medical surveillance, containment, hygiene, handling, testing, and labeling.

## SPECIFIC OSHA COMPLIANCE PROGRAMS

When you are confronted by situations listed below, you must perform your tasks in accordance with our written programs which comply with specific OSHA standards. Below is an overview of each program.

### Control of Hazardous Energy - Lockout/Tagout

**Applicable:** to servicing and maintenance of machines and equipment where the unexpected energization, start up or release of stored energy could occur and cause injury.

**Not**

**Applicable:** to routine, repetitive, integral procedures such as minor adjustments & tool changes. Work on cord and plug connected equipment where unplugging negates the hazard and the plug is in the control of the person doing the work.

**Hazard:** possibility of being crushed, dismembered, mangled, paralyzed, electrocuted, sliced, or punctured by the sudden release of energy such as the following sources: capacitor, chemical, counter weight, electrical, engine, flywheel, hydraulic, pneumatic, spring, thermal, or gravity.

#### Procedures

**Preparation for Shutdown:** Using the Energy Source Evaluation, all isolating devices must be located.

**Equipment Shutdown:** Inform the affected person and use normal shut down procedures.

**Equipment Isolation:** Physically isolate the equipment from its energy source(s) -- there may be more than one.

**Device application:** Apply color coded locks and/or tags to hold the isolating devices in a "Neutral" or "Off" position.

**Release of Stored Energy:** Dissipate stored energy.

**Verification of Isolation:** Prior to work, operate machine controls and ensure the machine will not operate.

**Release from Lockout/Tagout:** The person who applied the devices is the one who removes them after ensuring the area is clear and affected employees are informed.



## **Exposure Control Plan**

(for bloodborne pathogens or other infectious materials)

An exposure control plan is required when emergency medical response is not available within a reasonable time frame and personnel are assigned as first aid providers as an additional duty.

The primary hazard relates to the possibility of infection resulting from exposure to blood-borne pathogens or other infectious materials while providing first aid to a trauma victim or cleaning up bodily fluids after an incident.

As a statement of policy, should an exposure control plan be required, Universal Precautions will be used. Essentially, this means that each trauma victim's blood, bodily fluids, and other potentially infectious materials will be treated as if they are known to be infectious.

First aid providers must understand:

- a. the hazards of bloodborne pathogens and other infectious materials.
- b. engineering & work practice controls designed to minimize possible exposure such as:
  1. handwashing equipment & procedures.
  2. eating; drinking & smoking prohibitions.
  3. the containment of contaminated sharps.
  4. the containment of other regulated waste.
  5. the disposal of contaminated sharps & regulated waste
  6. controlling splashing/spraying of potentially infectious materials.
  7. the prohibition of mouth pipetting (the mouth suction of blood through a tube).
- c. the need to place an impermeable barrier between potential infectious materials and the provider's work clothes, street clothes, undergarments, skin, eyes, mouth, or other mucous membranes using:
  1. disposable gloves
  2. utility gloves
  3. eye & respiratory protection
  4. protective body clothing
- d. hepatitis B epidemiology and how bloodborne pathogens are transmitted.

- e. the importance of hepatitis B vaccination within 24 hours of possible exposure.
- f. the procedure for incident report preparation and the importance of completing them, in writing, before the end of the work shift.

### **Fall Protection**

Fall protection is required for employees working six feet or more above walking/working surface, when there is a potential for objects to fall on them, or when they are working around covers.

The obvious hazard is falling or being hit by a falling object.

A fall protection plan is required when conventional fall protection systems are infeasible.

Through training, employees must know where conventional fall protection systems are required such as when working on or around:

1. unprotected sides and edges
2. leading edges
3. hoist areas
4. holes
5. formwork & reinforcing steel
6. ramps, runways & other walkways.
7. excavations
8. dangerous equipment
9. overhand bricklaying & related work
10. roofing work on low-sloped roofs
11. steep roofs
12. precast concrete erection
13. residential construction
14. wall openings

Additionally, employees must understand:

- a. the selection, use, and maintenance of fall protection system(s).
- b. the types of fall protection systems:
  1. guardrail system
  2. personal fall arrest system
  3. safety net system

4. warning line system
5. safety monitoring system
6. positioning device system
7. controlled access zone (CAZ)
8. covers
9. protection from falling objects.

### **Forklifts**

Forklifts include: fork trucks; tractors; platform lift trucks; motorized hand trucks; and other specialized industrial trucks powered by electric motors or internal combustion engines.

The primary hazards involved in truck operation are:

1. physically hitting a person/object with the truck or load.
2. having a load fall and hit the operator or other person.
3. having the truck tip and crush the operator or other person.
4. fire or explosion during refueling/recharging.

Supervisors should ensure that truck operators are authorized by the Program Administrator. Authority to operate a truck will be revoked if unsafe acts are observed or it is apparent that the operator has not retained the knowledge and job skills necessary to safely perform truck operations.

Supervisors should caution employees not involved with truck operations to stay clear of them due to limited visibility of the operator and the size and weight of the vehicle and load.

### **Hazard Communication**

Practically all chemical products have physical or health hazards if they are inadvertently spilled or improperly used. Our Hazard Communication Plan details the methods used to keep our employees informed of these potential hazards.

The Program Administrator will ensure that all personnel understand:

- a. the importance and use of labels; material safety data sheets (MSDS); and the ready accessibility of MSDS.
- b. the physical & health hazards of chemicals used in the workplace.
- c. the methods used to detect the release of a hazardous chemical.

- d. the methods to protect oneself from chemical hazards including PPE; work practices; & emergency procedures.
- e. the need to share product information with other contractors.

### **Hearing Conservation**

Supervisors are to ensure that employees are not exposed to occupational noises that exceed the levels listed below. Excessive noise may cause permanent hearing loss. Supervisors should be aware that hearing loss is often painless and unnoticeable.

#### Permissible Noise Exposures

<u>Sound level</u> <u>Duration per day, hours</u>	<u>dBA slow response</u>
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

The Program Administrator will ensure that applicable standards are posted, medical surveillance and noise monitoring are instituted, and that all affected personnel understand the process of hearing and the importance of preventing hearing loss.

### **Permit-Required Confined Space**

Permit-required confined spaces may present a very hazardous environment if specific procedures, testing, and training are not implemented prior to entry. As a reminder:

A confined space is a space that:

- is large enough and so configured that an employee can bodily enter and perform assigned work; and
- has limited or restricted means for entry or exit. These spaces may include: ventilation or exhaust ducts, bins and tanks, boilers, sewers, tunnels and open top spaces more than 4 feet in depth such as pits, tubs, and vessels; and
- is not designed for continuous employee occupancy.

A permit-required confined space is:

a confined space that contains any recognized serious safety or health hazards. These hazards may be: engulfment by materials; entrapment by space shape; inhalation of hazardous (possibly fatal) atmospheres.

Supervisors should ensure that employees understand:

1. the need to identify and evaluate permit space hazards before entry.
2. the need to test conditions before entry and monitor conditions during entry.
3. how to prevent unauthorized entry.
4. how to eliminated or control hazards for safe permit-space entry operations.
5. the need to ensure that at least one attendant is stationed outside the permit-required space for the duration of the entry operations.
6. how to coordinate and monitor entry operations when we are working with employees of another contractor or client within a permit-required confined space.
7. our procedures for emergency rescue.
8. the establishment of a written procedure for preparation, issuance, use, and cancellation of entry permits.

### **Personal Protective Equipment**

A hazard assessment will be made on all job sites to determine what types of personal protective equipment (PPE) are appropriate. A major part of this hazard assessment will be determining what PPE needs can be eliminated through feasible engineering controls or work procedures.

Types of hazard categories that are considered are: impact; penetration; compression; chemical; heat; harmful dust; and light radiation.

The focus of PPE is to eliminate eye, hand, foot, limb, and head injury. Visitors exposed to the identified hazards will be loaned appropriate PPE (and given instruction in its use) prior to hazard exposure.

You must understand the limitations of your PPE; the correct procedure for putting on, adjusting, and removing the PPE; and the proper care, maintenance, and useful life of the PPE.

Cleanliness of PPE is of importance particularly when dealing with eye protection where fogging, scratches, or dirt can render the PPE a hazard rather than protection from a hazard.

Unique PPE required for job performance such as hard hats, respirators, ear plugs, safety goggles, etc. will be supplied to the employees. They are responsible for maintenance of the equipment issued to them. Items of PPE that are damaged or non-functioning should be turned in for repair or replacement.

For personal comfort and to eliminate nuisance noises and nuisance respiratory conditions that are not at or above the threshold level for required protection, dust masks and ear plugs may be used at any time.

### **Respiratory Protection**

As a supervisor, it is extremely important that you do not allow employees to be exposed to atmospheres that do not contain clean, breathable air free from contaminants that exceed permissible exposure limits.

Respiratory hazards can range from mildly irritating to fatal.

Because of the serious consequences of improperly using respiratory protection, those for whom it applies, must understand:

1. the importance of medical approval for respiratory use.
2. the respirator selection process.
3. how to determine the service life of particulate filters.
4. fit testing.
5. user seal tests.
6. the importance of work area surveillance.
7. cleaning, inspection & maintenance of respirators.

Of course, job sites often contain nuisance dusts that do not exceed permissible exposure limits. In these cases, employees may wear dust masks for personal comfort. Supervisors should caution those wearing dust masks that they do not offer true respiratory protection.

Of course, job sites often contain nuisance dusts that do not exceed permissible exposure limits. In these cases, employees may wear dust masks for personal comfort.

OSHA standards require that if an employer provides respirators for employee voluntary use or if you provide your own respirator, you must be

provided Appendix D of 29 CFR 1910.134. This appendix is printed below and all employees must read it.

**Standard Number: 1910.134 App D**

**Standard Title: (Mandatory) Information for Employees Using Respirators When not Required Under Standard.**

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard. You should do the following: 1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations. 2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you. 3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke. 4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

[63 FR 1152, Jan. 8, 1998; 63 FR 20098, April 23, 1998]

**Scaffolds & Ladders**

**Applicable:** when you are required to install, use, or dismantle a scaffold or ladder.

**Not**

**Applicable:** to fall protection required on a walking/working surface six feet above a lower level -- this is addressed in a Fall Protection Program.

**Hazards:** fall, electrical, and falling objects.

The Program Administrator will ensure that employees understand:

1. the procedures for dealing with the above hazards.
2. the proper use of scaffolds & ladders
3. the load and the load-carrying capacities of the scaffold.

During routine job site inspections, supervisors should be constantly vigilant for violations of the below ladder safety rules and take immediate corrective action to ensure the safety of our employees:

- a. a stairway or a ladder will be provided at all personnel points of access where there is a break in elevation of 19 inches or more.
- b. ladders will never be overloaded.
- c. ladder rungs, cleats, and steps must be parallel, level, and uniformly spaced when a ladder is in position for use.
- d. ladders will not be tied or fastened together unless they are so designed.
- e. portable ladders used for gaining access to an upper level will extend at least 3 feet above the upper landing surface or the ladder will be secured at its top.
- f. ladders must be free of oil, grease, or other slipping hazards.
- g. ladders must be used for the purpose for which they were designed.
- h. non-self supporting ladders will be used at an angle that the horizontal distance from the top support to the foot of the ladder is approximately  $\frac{1}{4}$  of the working length of the ladder.
- i. ladders will only be used on stable and level surfaces unless secured to prevent displacement.
- j. ladders shall not be used on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental displacement.
- k. ladders placed in any location where they can be displaced by workplace activities or traffic will be secured to prevent accidental displacement, or a barricade will be used to keep the activities or traffic away from the ladder.
- l. the area around the top and bottom of the ladder shall be kept clear.
- m. ladders shall not be moved, shifted, or extended while occupied.
- n. the top step of a stepladder shall not be used as a step.
- o. portable ladders with structural defects will be immediately marked in a manner that readily identifies them as defective and removed from service.
- p. when ascending or descending a ladder, one must face the ladder.



- q. employees must use at least one hand to grasp the ladder when progressing up and/or down the ladder.
- r. employees are not to carry any object or load that could cause loss of balance and a resultant fall.

# R.A.R. Engineering Group, Inc.

## EMPLOYEE ACKNOWLEDGMENT

**PLEASE READ, SIGN, & RETURN THIS FORM TO THE JOB SITE SUPERVISOR OR THE SAFETY PROGRAM ADMINISTRATOR.**

I have read and understand the contents of this Employee Handbook.

I will, to the best of my ability, work in a safe manner and follow established work rules and procedures.

I will ask for clarification of safety procedures of which I am not sure **prior** to performing a task.

I will report to the job site supervisor or competent person any unsafe acts or procedures and will ensure they are addressed and resolved before continuing work.

I understand that the complete safety program is located at:

1135 Butler Avenue  
New Castle, PA 16101

and is available for my review.

\_\_\_\_\_  
(Employee Name)

\_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Date)

APPENDIX B: FIELD TESTS - CHARTS, GRAPHS & TABLES

TABLE 1: HYDROCARBON RECOVERY DATA

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TABLE 1  
 MW-2 HYDROCARBON RECOVERY DATA

LEO'S #3 CAR WASH  
 ERIE, PENNSYLVANIA

Data Collected: June 23, 2003

Date Collection Time (Hrs.)	Applied Vacuum (in. of Hg)	PID (ppm)	%O <sub>2</sub>	%LEL	SCFM	Recovery data	
						Lbs/Hr	Gallons per minute
0:00	25	30	20.4	5	6.00	0.06	1.10
0:50	22	52	20.2	5	5.00	0.05	0.90
1:50	22	212	20.9	18	4.00	0.14	1.30
2:00	23	208	20.1	26	5.00	0.25	1.50
2:50	23	254	20.1	26	5.00	0.25	1.50
3:00	22	266	20.4	22	5.00	0.21	1.30
3:50	23	214	20.2	25	5.00	0.24	1.00
4:00	23	247	20.2	22	5.00	0.21	1.60
4:50	23	198	20	28	5.00	0.27	1.00
5:00	23	205	20.2	22	5.00	0.21	1.00

Sample Calculation:

$\text{lbs/hr} = (\%LEL)140(\text{SCFM})(1.36E-5)$   
 Adapted from Subsurface Venting from an Underground  
 Aquifer, API Publication #4410, September 1985.

TABLE 2: GROUNDWATER DRAWDOWN DATA

TABLE 2  
GROUNDWATER DRAWDOWN DATA

LEO'S #3 CAR WASH

ERIE, PENNSYLVANIA

Data Collected: June 23, 2003

Monitoring Well	10 Hrs.		525 Hrs.		Δh
	DTP	DTW	DTP	DTW	
MW-1	ND	11.46'	ND	12.82'	0.36'
MW-2	ND	10.55	ND	18.02'	7.47'
MW-3	9.54	10.24'	9.68'	13.15'	2.91'
MW-4	9.04'	10.24'	9.03'	10.28'	0.04'
MW-6	ND	11.39'	ND	11.39'	0.00'
MW-7	ND	8.13'	ND	8.13'	0.00'
MW-8	ND	12.92'	ND	13.62'	0.70'

ND - No LPH detected

Δ h - Groundwater Drawdown

DTP - Depth to product (feet)

DTW - Depth to water (feet)

TABLE 3: VACUUM RESPONSE DATA



TABLE 3  
 VACUUM RESPONSE DATA  
 LEO'S #3 CAR WASH  
 ERIE, PENNSYLVANIA

Data Collected: June 24, 2003

Monitoring Well	Distance from MW-2 (ft)	0.5 Hrs.	1.0 Hrs.	1.5 Hrs.	2.0 Hrs.	2.5 Hrs.	3.0 Hrs.	3.5 Hrs.	4.0 Hrs.	4.5 Hrs.	5.0 Hrs.
MW-1	67	0.0	0.3	0.8	1.5	1.5	1.5	0.9	0.6	0.6	0.6
MW-3	31	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MW-4	56	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MW-6	39	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MW-7	76	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MW-8	37	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1

Vacuum response data expressed in inches of water

CHART 1: RECOVERY DATA (MW#2)

CHART 1  
 RECOVERY DATA  
 Lower Explosive Limit, Hydrocarbon Recovery and Oxygen  
 Led's #3 Gas Wash  
 Erie, Pennsylvania

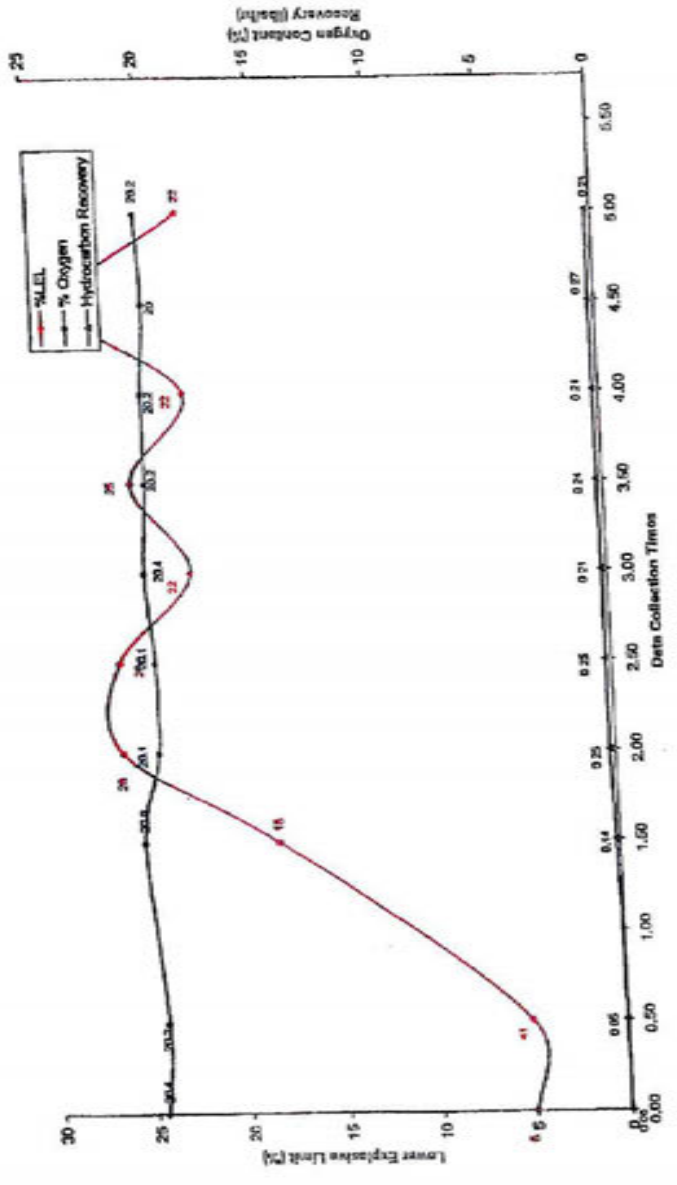
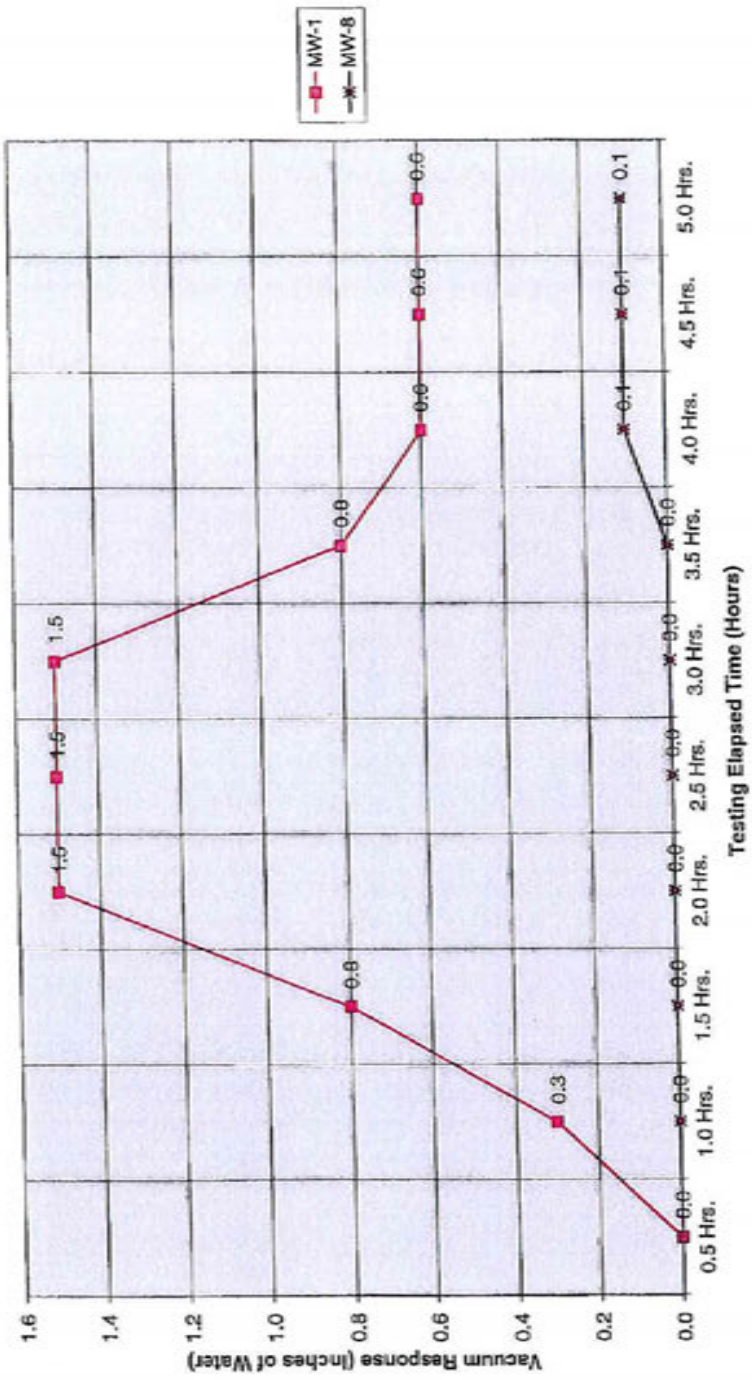
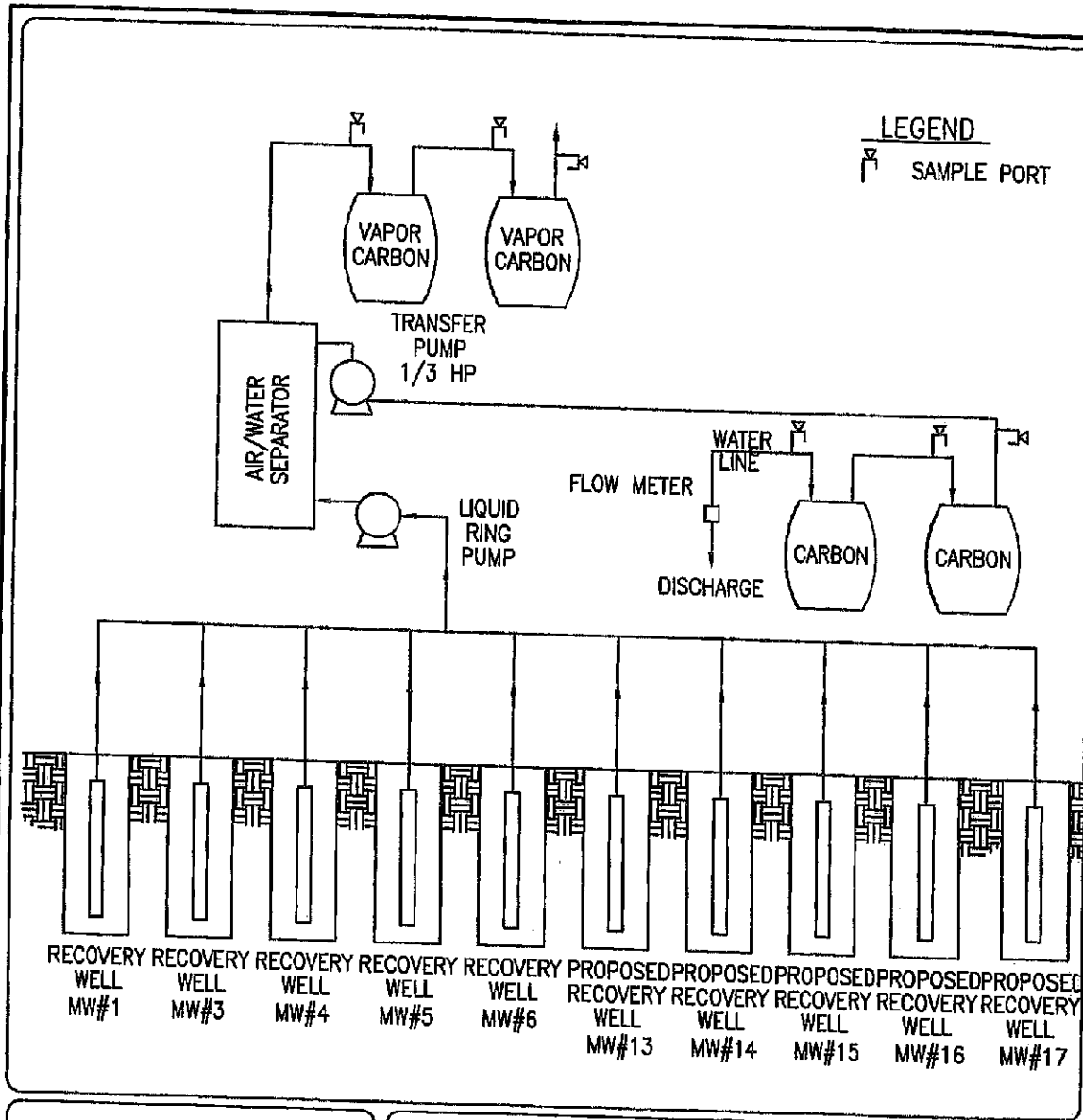


CHART 2: VACUUM RESPONSE DATA (MW#2)

Chart 2  
 Vacuum Response Data  
 LEO'S #3 CAR WASH ERIE, PA



APPENDIX C: DESIGN & CONSTRUCTION DETAIL



**RAR engineering group, inc.**  
 1135 Butler Avenue, New Castle, Pennsylvania 16101  
 telephone 724.652.1004 facsimile 724.652.3314  
 email rareengineering@rarengineering.com

**LEO'S #3 CAR WASH**  
**2938 WEST 26TH STREET**

**PROCESS AND INSTRUMENTATION DIAGRAM**

**ERIE COUNTY      PENNSYLVANIA**

SEAL

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

DESIGNED BY	DATE
DRAWN BY CMS	DATE 7/2012
CHECKED BY PEP	DATE 17/2012
SCALE NOT TO SCALE	
FILE NAME	
REVISION	DATE

**SPEC. 1: CARBON ADSORBERS SPECIFICATIONS**





### GENERAL DESCRIPTION

VentSorb canisters – each containing 180 pounds of activated carbon – are ideal for low-flow air purification applications at industrial and municipal facilities. These economical adsorption systems control small volume organic contaminant and/or odorous gas emissions from:

- Storage tank vents
- Reactor vents
- API separator vents
- Sludge thickener tanks at waste treatment plants
- Sewer gas vents, wet stations and weir boxes at chemical and municipal waste treatment plants
- Chemical plant wastewater holding tanks
- Laboratory hood exhausts
- Landfills
- Airstripper off-gases

The 55-gallon VentSorb canisters contain all the elements found in a full-scale adsorption system vessel; activated carbon, inlet connection and distributor, and an outlet connection for the purified air stream. Air is distributed across the carbon bed with a corrosion-resistant stainless steel septum.

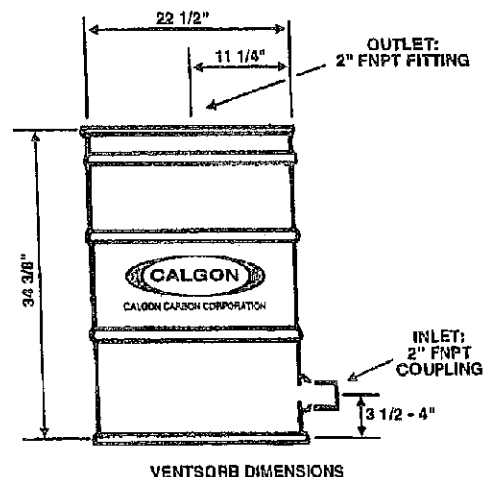
### FEATURES AND BENEFITS

VentSorb canisters offer industrial and municipal users several important features and benefits, including:

- Effective treatment to remove a variety of vapor phase organic contaminants and odor-causing compounds.
- Continuous treatment at varying flow rates and concentrations.
- Simple installation and operation.
- Flexibility to be installed in series or multiple units in parallel.
- Supplied with the type of activated carbon selected specifically for the application.
- Practical disposal option, as pre-approved spent carbon canisters may be returned to Calgon Carbon Corporation for safe carbon reactivation.
- Low cost per unit makes carbon treatment economical.

### VENTSORB SPECIFICATIONS

Vessel: ..... Open head 16 gauge steel canister  
Max Operating Pressure: ..... 4 psig  
Cover: ..... Removable steel cover,  
12 gauge bolt ring with polycord gasket  
Internal Coating: ..... Heat cured 100% phenolic  
External Coating: ..... High solids enamel  
Temperature: ..... 350°F (intermittent) (176.7°C)  
Inlet: ..... 2" FNPT; 304 stainless steel screen distributor  
Outlet: ..... 2" FNPT  
Max Flow: ..... 100 cfm (2.83 m<sup>3</sup>/min)  
Carbon: ..... 180 pounds Pellet BG or BPL 4x10 or VPR  
Ship Weight: ..... 247 pounds (112.3kg)  
Identification: ..... VentSorbs sequentially  
numbered for reference



## TYPICAL VENTSORB APPLICATIONS

Chemical, petrochemical, food, pulp and paper, and many other industrial plants – along with municipal sewage treatment facilities – are frequent users of VentSorb for continuous control of vented emissions. Here are a few examples of user applications:

**Storage Tank Vents** – VentSorb are widely used to control evaporative losses vented from storage tanks. Typically, these vapors are emitted during tank filling and emptying. In one application, a glycerin manufacturer is using the canisters to purify ambient air drawn into storage tanks during product transfer. The adsorption process helps prevent contamination of the company's glycerin product. The VentSorb units provide over six months of service for this application.

**Reactor Vents** – A pesticide manufacturer is using multiple VentSorb on five reactor vessels to control trace amounts of odorous methylamine and diethylamine (which are by-products of a caustic scrubbing process). Each VentSorb unit handles a 30 cfm air stream containing 15 ppm of amine vapors. The units provide over three months of service for this application.

**API Separator Vents** – A major refinery is using VentSorb units to control odorous emissions from settling basins where oil is separated from wastewater that is discharged in condensate, blowdown or drain systems. For this application, API separators are covered and vented to comply with local air pollution control regulations. The air stream is pulled through two VentSorb units, operating in parallel configuration, at 100 cfm.

## VENTSORB INSTALLATION

VentSorb canisters are shipped ready for installation. Each canister is self-supporting and should be placed on a level, accessible area as near as possible to the emission source. Installation is simple, requiring just a flexible hose or pipe to connect the vent to the 2-inch FNPT bottom inlet of the canister.

If the VentSorb will be vented directly to outside air, a U-shaped outlet pipe or rain hat – such as a pipe tee – is recommended to prevent precipitation from entering the unit.

VentSorb canisters operate from a continuous suction across the vent. The suction can be produced by a blower or by using the positive pressure inside the tank or process vessel. In many cases, the pressure or surge of pressure within the tank or vessel is sufficient to overcome the pressure drop across the canister – thus eliminating the need for a blower. Please consult pressure drop data in this bulletin for more information.

Maximum recommended air flow through a VentSorb is 100 cfm. If higher flows are encountered, plant operators should install two or more canisters in parallel configuration.

When VentSorb canisters are used to control vapors from organic solvent storage tanks, the following precautions are recommended:

- A safety relief valve must be provided. This protects the storage tank should the VentSorb become plugged or blocked in any fashion. Such a vent would open in this emergency situation, thereby relieving pressure.
- Under appropriate conditions, a flame arrestor and/or

backflow preventer must be installed as shown in this bulletin's storage tank installation drawing. This prevents backflow of air through the VentSorb when the storage tank is empty.

- Pre-wetting the carbon helps dissipate excessive heat that may be caused by high organic compound concentration (>0.5 to 1.0 Vol. %).

Also, if VentSorb canisters are used to control organic emissions from airstrippers or other high moisture content air streams, Calgon Carbon Corporation recommends that humidity in the air stream be reduced to under 50 percent. Lower humidity optimizes adsorptive capacity of the carbon. In addition, for similar applications that generate a condensate, Calgon Carbon Corporation recommends installation of a drain on the inlet piping.



*Four VentSorb units at a chemical plant are installed to operate in series end in parallel. More than 25 odorous and/or toxic vapors are controlled by 20 VentSorb units at this plant.*

## RETURN OF VENTSORBS

Arrangements should be made at the time of purchase regarding the future return of canisters containing spent carbon. Calgon Carbon Corporation will provide instructions on how to sample the spent carbon and arrange for carbon acceptance testing. The spent carbon is reactivated by Calgon Carbon Corporation and all of the contaminants are thermally destroyed. Calgon Carbon Corporation will not accept VentSorb for landfill, incineration or other means of disposal.

No VentSorb can be returned to the company unless the carbon acceptance procedure has been completed, an acceptance number provided, and the return labels (included with the units at the time of purchase) are attached.

VentSorb must be drained – and inlet/outlet connections must be plugged – prior to return to Calgon Carbon Corporation.

**THEORETICAL VENTSORB CAPACITIES**  
Theoretical Ventsorb Capacity Lb Adsorbed/VentSorb\*

	<u>BOILING POINT/°C</u>	<u>MOLECULAR WEIGHT</u>	<u>10 PPM</u>	<u>100 PPM</u>	<u>1,000 PPM</u>
Acrylonitrile	77.3	53.1	6	12	24
Benzene	80.1	78.1	14	23	36
n-Butane	-0.5	58.1	4	8	13
Carbon Tetrachloride	76.8	153.8	40	56	76
Dichloroethylene	37.0	97.0	12	21	35
Methylene	40.2	84.9	3	7	18
Freon 114	3.8	170.9	11	19	33
n-Hexane	68.7	86.2	18	25	34
Styrene	145.2	104.1	45	57	71
Toluene	110.6	92.1	34	44	58
Trichloroethylene	87.2	131.4	33	50	73

\* Theoretical capacity based on 70 degrees F., atmospheric pressure, less than 50 percent humidity and 180 pounds of carbon using Isotherm data for Pellet BG carbon.

**VENTSORB CARBON LIFE ESTIMATE**

This table lists the theoretical adsorption capacities for several compounds. The adsorption capacity for nonpolar organics increases with the boiling point, molecular weight and concentration of the air contaminant. Estimate the life of a VentSorb canister for other organic compounds by matching them with compounds of similar boiling point and molecular weight in this table. Low molecular weight (less than 50) and/or highly polar compounds such as formaldehyde, methane, ethanol, etc., will not be readily adsorbed at low concentrations.

Note: The standard VentSorb canister contains 180 pounds of Pellet BG carbon. When removing hydrogen sulfide and mercaptans from moist air vented from sewage operations, greater efficiency will be achieved by using a VentSorb canister which contains specially impregnated IVP carbon. A VentSorb containing IVP carbon can remove up to 40 pounds of hydrogen sulfide and 15 pounds of methyl mercaptan.

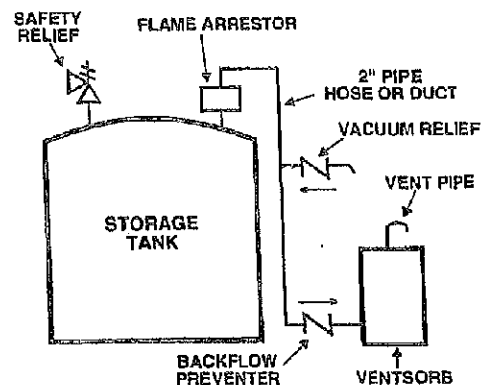
**VENTSORB SAFETY CONSIDERATIONS**

While complying with recommended installation instructions, plant operators should also be aware of these additional heat-related safety considerations:

1. When contacting with activated carbon, some types of chemical compounds – such as those from the ketone and aldehyde families and some organic acids or organic sulfur compounds – may react on the carbon surface causing severe exotherms or temperature excursions. If you are unaware or unsure of the reaction of an organic compound on activated carbon, appropriate tests should be performed before putting a VentSorb in service.
2. Heat of adsorption can lead to severe temperature excursions at high concentrations of organic compounds. Heating may be controlled by diluting the inlet air, time weighting the inlet concentration to allow heat to dissipate, or pre-wetting the carbon.
3. Do not use VentSorbs with IVP carbon in petrochemical or chemical industry applications.

4. IVP carbon can liberate heat by reacting chemically with oxygen. To prevent heat within a vessel, the carbon must not be confined without adequate air flow to dissipate the heat. In situations where there is insufficient or disrupted air flow through the vessel, the chemical reaction can be prevented by sealing the inlet and outlet connections to the vessel.

NOTE: CONTACT YOUR LOCAL CALGON CARBON CORPORATION TECHNICAL SALES REPRESENTATIVE FOR CLARIFICATION OR TO ANSWER ANY QUESTIONS.



Typical VentSorb Installation at Storage Tank

**CALGON CARBON CORPORATION AIR PURIFICATION SYSTEMS**

VentSorb is a unit specifically designed for a variety of small applications. Calgon Carbon Corporation offers a wide range of carbon adsorption systems and services for a greater range of flow rates and carbon usages to meet specific applications.

## WARRANTY

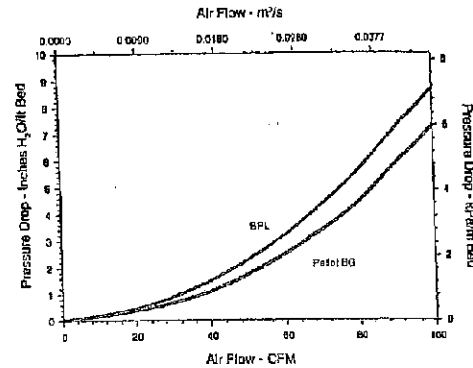
There are no expressed or implied warranties – or any warranty of merchantability or fitness – for a particular purpose associated with the sale of this product.

## LIMITATION OF LIABILITY

The Purchaser's exclusive remedy for any cause of action arising out of purchase and use of the VentSorb, including but not limited to breach of warranty, negligence and/or indemnification, is expressly limited to a maximum of the purchase price of the VentSorb unit as sold. All claims of whatsoever nature shall be deemed waived unless made in writing within forty-five (45) days of the occurrence giving rise to the claim. In no event shall Calgon Carbon Corporation for any reason be liable for incidental or consequential damages, damages in excess of the purchase price of the VentSorb unit, loss of profits or fines imposed by governmental agencies.

Application information provided in this bulletin is based upon theoretical data. Calgon Carbon Corporation assumes no responsibility for the use of the information in this product bulletin.

## VENTSORB PRESSURE DROP



Pressure drop through a VentSorb unit is a function of the process air flow as shown in the graph. A VentSorb canister can handle up to 100 cfm at a pressure drop of less than 15 inches water column. If higher flows or lower pressure drop is needed, multiple canisters may be installed in parallel operation. The maximum canister pressure should not exceed 4 psig.

If at any time our products or services do not meet your requirements or expectations, or if you would like to suggest any ideas for improvement, please call us at 1-800-548-1999.

For detailed information on the products described in this bulletin, please contact one of our Regional Sales Offices located nearest to you:

## 1-800-4-CARBON

### Domestic Sales Offices

#### Region I

Bridgewater, NJ  
Tel (908) 526-4646  
Fax (908) 526-2467

#### Region II

Pittsburgh, PA  
Tel (412) 787-6700  
1-800-4-CARBON  
Fax (412) 787-6876

#### Region III

Richmond, CA  
Tel (510) 412-1010  
Fax (510) 412-6660

#### Region IV

Houston, TX  
Tel (713) 680-2000  
Fax (713) 680-7909

### International Sales Offices

#### Australasia/Philippines/ Southeast Asia

Calgon Carbon Asia  
Singapore Office  
Tel (65) 221-3500  
Fax (65) 221-3554

#### Canada

Calgon Carbon Canada  
Bolton, Ontario  
Tel (905) 857-9915  
Fax (905) 857-9984

#### China/Korea/Taiwan

Calgon Carbon Asia  
Tokyo Office  
Tel 81 3 3560 7505  
Fax 81 3 3584 7202

#### Europe

Chemviron Carbon  
B-1200 Brussels, Belgium  
Tel 32 2 773 02 11  
Fax 32 2 770 93 84

#### Japan

Calgon Far East  
Tokyo Office  
Tel 81 3 3582 1861  
Fax 81 3 3586 9266

#### Latin America

Pittsburgh, PA  
Tel (412) 787-4519  
Fax (412) 787-4523

Calgon Carbon Corporation's activated carbon products are continuously being improved and changes may have taken place since this publication went to press.





## THEORETICAL FLOWSORB TREATMENT CAPACITY FOR TYPICAL CASES

	Case 1		Case 2		Case 3	
	Conc.	Gallons	Conc.	Gallons	Conc.	Gallons
Benzene	20 ppb	} 1,600,000	200 ppb	} 400,000	2 ppm	} 85,000
Toluene	40 ppb		400 ppb		4 ppm	
Xylene	40 ppb		400 ppb		4 ppm	
	Case 4		Case 5		Case 6	
	Conc.	Gallons	Conc.	Gallons	Conc.	Gallons
TCE	50 ppb	} 1,900,000	500 ppb	} 550,000	5 ppm	} 125,000
PCE	50 ppb		500 ppb		4 ppm	
	Case 7		Case 8		Case 9	
	Conc.	Gallons	Conc.	Gallons	Conc.	Gallons
Phenol	1 ppm	} 230,000	10 ppm	} 50,000	100 ppm	} 10,000
Total SOC	10 ppm		100 ppm		1,000 ppm	

Each case represents a groundwater or wastewater stream that contains the combination of contaminants listed. The treatment capacity indicates the total gallons of that particular water that may be treated before any of the specific contaminants are present in the treated water as noted. Theoretical capacity based on 5 gpm, water at 70°F or less and 165 pounds of Filtrasorb 300. Background TOC is less than 1 ppm except phenol cases as noted. Contaminants reduced to < 5 ppb, except phenol case which is for 95% phenol reduction.

### HOW TO ESTIMATE FLOWSORB LIFE

The treatment table on this page lists the volume of water that can be purified by the Flowsorb for typical contamination situations. However, most applications involve a unique mixture of organic chemical contaminants including some chemicals that adsorb at different capacities or strengths. Please consult with your Calgon Carbon Technical Sales Representative for more information about carbon usage rates.

### RETURN OF FLOWSORBS

Arrangements should be made at the time of purchase regarding the future return of canisters containing spent carbon. Calgon Carbon will provide instructions on how to sample the spent carbon and arrange for carbon acceptance testing. The spent carbon is reactivated by Calgon Carbon and all of the contaminants are thermally destroyed. The company will not accept Flowsorbs for landfill, incineration or other means of disposal.

Flowsorbs cannot be returned to Calgon Carbon unless the carbon acceptance procedure has been completed, an acceptance number provided, and the return labels (included with the units at the time of purchase) are attached.

Flowsorbs must be drained — and inlet/outlet connections must be plugged — prior to return to Calgon Carbon.

### SAFETY CONSIDERATIONS

It is unlikely that a worker would be able to physically enter a Flowsorb canister. However, the following information and precautions apply to a partially closed canister or situations where carbon is to be removed from the canister and stored elsewhere.

Wet or dry activated carbon preferentially removes oxygen from air. In closed or partially closed containers, oxygen depletion may reach hazardous levels. If workers must enter a vessel containing carbon, appropriate sampling and work procedures should be followed for potentially low-oxygen spaces — including all applicable federal and state requirements.

### CALGON CARBON CORPORATION LIQUID PURIFICATION SYSTEMS

Flowsorb is a unit specifically designed for a variety of small flow applications. Calgon Carbon Corporation offers a wide range of carbon adsorption systems and services for a greater range of flow rates and carbon usages to meet specific applications.

## WARRANTY

There are no expressed or implied warranties - or any warranty of merchantability or fitness - for a particular purpose associated with the sale of this product.

## LIMITATION OF LIABILITY

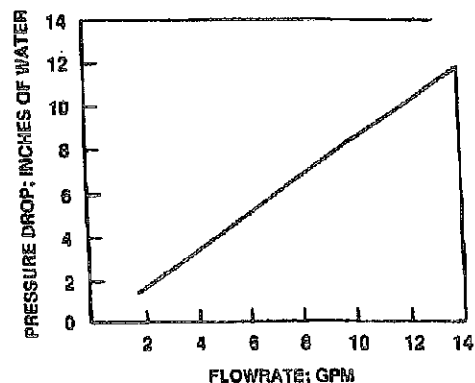
The Purchaser's exclusive remedy for any cause of action arising out of purchase and use of the Flowsorb, including but not limited to breach of warranty, negligence and/or indemnifications, is expressly limited to a maximum of the purchase price of the Flowsorb unit as sold. All claims of whatsoever nature shall be deemed waived unless made in writing within forty-five (45) days of the occurrence giving rise to the claim. In no event shall Calgon Carbon Corporation for any reason be liable for incidental or consequential damages, in excess of the purchase price of the Flowsorb unit, loss of profits or fines imposed by governmental agencies.

For information regarding incidents involving human and environmental exposure, please call (412) 787-6700 and ask for the Regulatory and Trade Affairs Department.

Application information provided in this bulletin is based upon theoretical data. Calgon Carbon Corporation assumes no responsibility for the use of the information in this product bulletin.

If at any time our products or services do not meet your requirements or expectations, or if you would like to suggest any ideas for improvement, please call us at 1-800-548-1999. From outside the U.S. please call +1-412-787-6700.

### FLOWSORB PRESSURE DROP



## 1-800-4-CARBON

[www.calgoncarbon.com](http://www.calgoncarbon.com)

### Domestic Sales Offices

#### East Coast Region

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Fax (908) 526-2467

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1-800-4-CARBON  
Fax (412) 787-6676

#### West Coast and

**Rockies Region**  
Richmond, CA  
Tel (510) 412-1010  
Fax (510) 412-5860

#### Gulf Coast Region

Houston, TX  
Tel (713) 690-2000  
Fax (713) 690-7909

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Fax 81 3 3584 7202

#### Europe

Chemviron Carbon  
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Tel 32 2 773 02 11  
Fax 32 2 770 93 94

#### Japan

Calgon Far East  
Tokyo Office  
Tel 81 3 3592 1861  
Fax 81 3 3586 9288

#### Latin America

Pittsburgh, PA  
Tel (412) 787-4519  
Fax (412) 787-4523

Calgon Carbon Corporation's activated carbon products are continuously being improved and changes may have taken place since this publication went to press.



## TYPICAL FLOWSORB OPERATING PARAMETERS

Flow Rate: ..... 10 gpm (37.8 l/m)  
 Contact Time: ..... 4.5 minutes  
 Pressure Drop: ..... < 1 psi (clean water and carbon)  
 Operating Pressure: ..... Recommend operation at  
 less than 5 psig, but higher pressures,  
 up to 12 psig, possible with tight cover closure

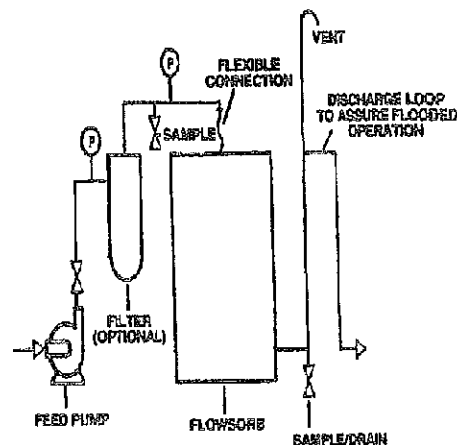
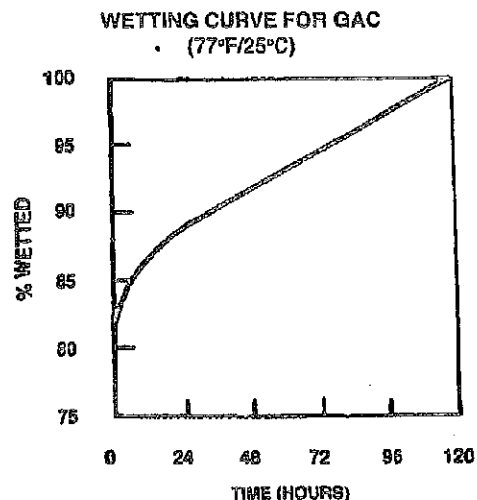
## FLOWSORB INSTALLATION

Flowsorb canisters are shipped with dry activated carbon; the carbon must be wetted and deaerated prior to use. This procedure displaces air from the internal structure of the carbon granules, thus assuring that the liquid to be treated is in contact with the carbon surface.

Prior to operation, each canister must be filled with clean water; the water should be introduced into the bottom outlet connection. The unit should set for approximately 48 hours—this allows most of the carbon's internal surface to become wetted, as shown on the wetting curve below.

After wetting, the carbon bed can be deaerated by draining the canister and again filling the canister upflow with clean water. This procedure will eliminate any air pockets which may have formed between the carbon granules. The Flowsorb is now ready for operation.

Canisters should be set on a flat, level surface and piped as recommended in the installation illustration. The influent pipe connection should be attached to the unit by using a flexible connection, as some minor deflection of the lid may occur if pressure builds due to filtration or other flow blockage downstream.



TYPICAL FLOWSORB INSTALLATION

Flowsorb discharge piping should include an elevated piping loop to assure that the canister remains flooded with water at all times. In addition to the piping loop, a drain connection is recommended on the discharge piping; this allows drainage of the unit prior to disconnection or temporary shutdown.

A filter should be installed if the liquid to be treated contains substantial amounts of suspended solids. A simple cartridge or screen filter helps prevent pressure buildup in the carbon bed.

## FLOWSORB OPERATION

Flowsorb canisters should be full of clean water before treatment begins. Flow rate to the canister should be determined based on required contact time between the liquid and the carbon media. In groundwater treatment applications, the recommended contact time is typically 8-10 minutes with a resultant flow of approximately 5 gpm. Consult your Galgon Carbon Corporation Technical Sales Representative for advice about proper contact time for your application.

Flowsorbs can be manifolded in parallel operation for higher flow rates. For series operation, two Flowsorbs can be piped together sequentially, as normal pressure drop will not exceed the recommended operating pressure.

These canisters have space for bed expansion and can be backflushed by introducing clean water or liquid at approximately 20-25 gpm to the outlet and taking backflush water from the inlet.

If the operating pressure is expected to exceed 5 psig, an application of adhesive caulk at the lid gasket is recommended to prevent leakage. With all surfaces dry, apply the adhesive caulk to the lid recess and lip of the drum per the manufacturer's procedure and set the Flowsorb gasket into the lid recess. After allowing the caulk to set, install the drum lid and tighten the bolt ring.



APPENDIX D: SITE MAP DEPICTING BUILDINGS, ROADS  
PROPERTY BOUNDARIES & OTHER PERTINENT INFORMATION





Report Date: 04/25/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

CCV The Continuing Calibration Verification (CCV) recovery for this compound did not meet method acceptance criteria. The average of all compounds did meet method acceptance criteria as specified in EPA Method 8000 B.

D1 Sample required dilution due to matrix interference.

D2 Sample required dilution due to high concentration of compound.

D3 Sample required dilution due to lack of proper sample weight or volume.

HT3 Sample was received and analyzed past holding time.

MB Compound detected in method blank at or above the method reporting limit.

MS1 The laboratory fortified matrix (LFM) result for this sample is above established acceptance criteria. But since the sample result is below the regulatory level, the result is valid for regulatory use.

MS2 The lab fortified matrix (LFM) result for this sample is not within established acceptance criteria. The sample result is above the regulatory limit and is considered to be "estimated" because matrix interferences may be preventing accurate determination.

MS3 The laboratory fortified matrix (LFM) result for this sample is not within established acceptance criteria due to high concentration of sample.

MS4 The laboratory fortified matrix (LFM) result for this sample is not within established acceptance criteria. The laboratory fortified blank (LFB) was within the accepted criteria, therefore matrix interference is assumed.

P1 Sample was not preserved properly.

RPD Relative Percent Difference (RPD) exceeded the method acceptance limits. The sample result is to be considered "estimated".



Report Date: 07/24/2013

American Environmental Associates  
 5946 Southland Drive  
 Erie, PA 16509

Project: Leo's #3 Car Wash  
 Lab Sample #: 7523-007  
 Sample Name: Monitoring Well MW#18 Groundwater Sample  
 Sample Date: 7/15/2013 11:30:00 AM  
 Date Received: 7/15/2013

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	07/22/13 17:49	ALH
Toluene, mg/L	<0.002	0.002	EPA 8260B	07/22/13 17:49	ALH
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	07/22/13 17:49	ALH
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	07/22/13 17:49	ALH
Cumene, mg/L	<0.002	0.002	EPA 8260B	07/22/13 17:49	ALH
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	07/22/13 17:49	ALH
MTBE, mg/L	<0.002	0.002	EPA 8260B	07/22/13 17:49	ALH
Aqueous-phase purge-and-trap	---		EPA 5030B	07/22/13 17:49	ALH

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
 Laboratory Director



Report Date: 09/30/2013

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 8113-001  
Sample Name: Monitoring Well MW#18 Groundwater Sample  
Sample Date: 9/19/2013 1:15:00 PM  
Date Received: 9/19/2013

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	09/23/13 19:25	MGW
Toluene, mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:25	MGW
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:25	MGW
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:25	MGW
Cumene, mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:25	MGW
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:25	MGW
MTBE, mg/L	<0.002	0.002	EPA 8260B	09/23/13 19:25	MGW
Aqueous-phase purge-and-trap	---		EPA 5030B	09/23/13 19:25	MGW

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director



Report Date: 11/18/2013

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 8491-001  
Sample Name: Monitoring Well MW#18 Groundwater Sample  
Sample Date: 11/8/2013 1:00:00 PM  
Date Received: 11/8/2013

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	11/15/13 20:47	MGW
Toluene, mg/L	<0.002	0.002	EPA 8260B	11/15/13 20:47	MGW
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	11/15/13 20:47	MGW
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	11/15/13 20:47	MGW
Cumene, mg/L	<0.002	0.002	EPA 8260B	11/15/13 20:47	MGW
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	11/15/13 20:47	MGW
MTBE, mg/L	<0.002	0.002	EPA 8260B	11/15/13 20:47	MGW
Aqueous-phase purge-and-trap	- - -		EPA 5030B	11/15/13 20:47	MGW

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director

## ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

R.A.R. Engineering Group, Inc  
1135 Butler Avenue  
New Castle PA 16101

April 14, 2014

Project: Leo's

Submittal Date: 04/03/2014

Group Number: 1464286

PO Number: RAR09-082

State of Sample Origin: PA

Client Sample Description

VP-A Air (VP-1 - DZ:KOWSKI)  
VP-B Air (VP-2 - PARKER)  
Field Blank Air

Lancaster Labs (LJ) #

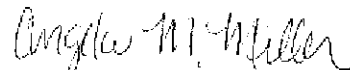
7418137  
7418138  
7418139

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC COPY TO R.A.R. Engineering Group, Inc

Attn: Kyle Griffith

Respectfully Submitted,



Angela M. Miller  
Specialist

(717) 556-7260

Sample Description: VP-A Air  
SC# 930  
Leo's

LL Sample # AQ 7418137  
LL Group # 1464286  
Account # 12840

Project Name: Leo's

Collected: 04/01/2014 10:50 by PK  
through 04/01/2014 14:50  
Submitted: 04/03/2014 08:15  
Reported: 04/14/2014 17:44

R.A.R. Engineering Group, Inc  
1135 Butler Avenue  
New Castle PA 16101

CAT No.	Analysis Name	CAS Number	As Received Final Result	MDL	As Received Final Result	MDL	DF
<b>Volatiles in Air ASTM D1946</b>							
10341	Helium as Tracer Gas	7440-59-7	N.D.	30,000	N.D.	4,900	6
<b>Volatiles in Air EPA TO-15</b>							
05298	Benzene	71-43-2	0.76	0.20	2.4	0.64	1
05298	Cumene	98-82-8	N.D.	0.20	N.D.	0.98	1
05298	Ethylbenzene	100-41-4	3.3	0.20	14	0.87	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.	0.20	N.D.	0.72	1
05298	Naphthalene	91-20-3	9.2	0.40	48	2.1	1
05298	Toluene	108-88-3	9.4	0.20	36	0.75	1
05298	m/p-Xylene	179601-23-1	8.8	0.20	38	0.87	1
05298	o-Xylene	95-47-6	3.9	0.20	17	0.87	1

MDL = Method Detection Limit

### General Sample Comments

PA DEP Lab Certification ID 35-00037, Expiration Date: 1/31/15

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10341	Helium as Tracer Gas	ASTM D1946	1	14100NF01	04/10/2014 16:17	Florida A Cimino	6
05298	TO 15 VGA Ext. List	EPA TO-15	1	D1409830AA	04/09/2014 14:41	Jeffrey B Smith	1



Sample Description: VP-B Air  
SC# 922  
Leo's

LL Sample # AQ 7418138  
LL Group # 1464286  
Account # 12840

Project Name: Leo's

Collected: 04/01/2014 11:20 by PK  
through 04/01/2014 15:20  
Submitted: 04/03/2014 08:15  
Reported: 04/14/2014 17:44

R.A.R. Engineering Group, Inc  
1135 Butler Avenue  
New Castle PA 16101

CAT No.	Analysis Name	CAS Number	As Received Final Result	MDL	As Received Final Result	MDL	DF
<b>Volatiles in Air ASTM D1946</b>							
10341	Helium as Tracer Gas	7440-59-7	N.D.	30,000	N.D.	4,900	6
<b>Volatiles in Air EPA TO-15</b>							
05298	Benzene	71-43-2	0.64 J	0.20	2.0 J	0.64	1
05298	Cumene	98-82-8	N.D.	0.20	N.D.	0.98	1
05298	Ethylbenzene	100-41-4	2.0	0.20	6.6	0.87	1
05298	Methyl t-Butyl Ether	1624-04-4	N.D.	0.20	N.D.	0.72	1
05298	Naphthalene	91-20-3	1.6	0.40	8.4	2.1	1
05298	Toluene	108 88-3	6.3	0.20	24	0.75	1
05298	m/p-Xylene	179601-23-1	5.3	0.20	23	0.87	1
05298	o-Xylene	95-47-6	2.5	0.20	11	0.87	1

MDL = Method Detection Limit

### General Sample Comments

PA DEP Lab Certification ID 36 00037, Expiration Date: 1/31/15

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10341	Helium as Tracer Gas	ASTM D1946	1	14100HE01	04/10/2014 16:26	Florida A Cimino	6
05298	TO 15 VOA Ext. List	EPA TO-15	1	D140903CAA	04/09/2014 15:29	Jeffrey B Smith	1

Sample Description: Field Blank Air  
SC# 1031  
Leo's

LL Sample # AQ 7418139  
LL Group # 1464286  
Account # 12840

Project Name: Leo's

Collected: 04/01/2014 10:55 by PK  
through 04/01/2014 14:55  
Submitted: 04/03/2014 08:15  
Reported: 04/14/2014 17:44

R.A.R. Engineering Group, Inc  
1135 Butler Avenue  
New Castle PA 16101

CAT No.	Analysis Name	CAS Number	As Received Final Result	MDL	As Received Final Result	MDL	DF
<b>Volatiles in Air ASTM D1946</b>							
10341	Helium as Tracer Gas	7440-59-7	N.D.	10,000	N.D.	1,600	2
<b>Volatiles in Air EPA TO-15</b>							
05298	Benzene	71-43-2	0.41 J	0.20	1.3 J	0.64	1
05298	Cumene	98-82-8	N.D.	0.20	N.D.	0.98	1
05298	Ethylbenzene	100-41-4	0.84 J	0.20	3.6 J	0.87	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.	0.20	N.D.	0.72	1
05298	Naphthalene	91-20-3	1.8	0.40	9.4	2.1	1
05298	Toluene	108 88-3	0.70 J	0.20	2.6 J	0.75	1
05298	m/p-Xylene	179601-23-1	2.6	0.20	11	0.87	1
05298	o-Xylene	95-47-6	1.6	0.20	7.0	0.87	1

MDL = Method Detection Limit

### General Sample Comments

PA DEP Lab Certification ID 36 00037, Expiration Date: 1/31/15

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10341	Helium as Tracer Gas	ASTM D1946	1	14100EE01	04/10/2014 16:33	Florida A Cimino	2
05298	TO 15 VOA Ext. List	EPA TO-15	1	D1409630AA	04/09/2014 16:17	Jeffrey B Smith	1

## Quality Control Summary

Client Name: R.A.R. Engineering Group, Inc  
Reported: 04/14/14 at 05:44 PM

Group Number: 1464286

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Laboratory Compliance Quality Control

Analysis Name	Blank Result	Blank MDL	Report Units	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD_Max
Batch number: 14100HE01 Helium as Tracer Gas	N.D.	5,000.	ppm(v)					
Batch number: D1409830AA								
Benzene	N.D.	0.20	ppb(v)	98	89	70-130	10	25
Cumene	N.D.	0.20	ppb(v)					
Ethylbenzene	N.D.	0.20	ppb(v)	101	89	70-130	13	25
Methyl t-Butyl Ether	N.D.	0.20	ppb(v)	102	90	52-129	13	25
Naphthalene	N.D.	0.40	ppb(v)	89	70	26-191	23	25
Toluene	N.D.	0.20	ppb(v)	104	92	70-130	12	25
m/p-Xylene	N.D.	0.20	ppb(v)	102	90	70-130	13	25
o-Xylene	N.D.	0.20	ppb(v)	106	94	70-130	12	25

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.

# Summa Canister Field Test Data/Chain of Custody



Lancaster Laboratories  
Environmental

Acct. # 12840

Group # 1464286

For Eurofins Lancaster Laboratories Environmental use only

Sample # 7418137-39

Bottle Order (SOR) # 153045

Instructions on reverse side correspond with order number.

<b>1 Client Information</b> Client: <u>RAR Engineering Group Inc</u> Project Name: <u>Leo's</u> Project Manager: <u>Kyle Griffith</u> Sampler: <u>Paul Kopschuck</u> Name of single where samples were collected: <u>Pa.</u>		Account # _____ P.O. # _____ Quote # _____	
<b>2 Sample Identification</b> Sample ID: <u>VP-A</u> <u>VP-B</u> <u>Field Blank</u>		Start Date/Time (24-hour clock): <u>4/1/14 10:50</u> <u>4/1/14 11:20</u> <u>4/1/14 10:55</u>	Stop Date/Time (24-hour clock): <u>4/1/14 14:50</u> <u>4/1/14 15:00</u> <u>4/1/14 14:55</u>
Canister Pressure in Field (Start) (Psi): <u>27</u> <u>27</u> <u>30</u>	Canister Pressure in Field (Stop) (Psi): <u>4.5</u> <u>8</u> <u>5</u>	Interior Temp. (Start) (F): <u>45</u> <u>55</u> <u>55</u>	Interior Temp. (Stop) (F): <u>55</u> <u>55</u> <u>55</u>
Flow Reg. ID: <u>337183</u> <u>336825</u> <u>336708</u>	Can ID: <u>930</u> <u>922</u> <u>1031</u>	Can Size (L): <u>1</u> <u>1</u> <u>6</u>	Controller Flowrate (mL/min): <u>3.06</u> <u>3.08</u> <u>21.0</u>
<b>3 Turnaround Time Requested (TAT) (circle one)</b> Rush (specify) <u>Standard</u>		<b>4 Data Package Required? (circle one)</b> Yes <input type="checkbox"/> No <input type="checkbox"/> EDD Required? Yes <input type="checkbox"/> No <input type="checkbox"/>	
Temperature (F): Start _____ Stop _____ Ambient _____ Maximum _____ Minimum _____		Pressure (Psi): Start _____ Stop _____	
<b>5 EPA TO-15 Traceability - Helium</b> Helium as tracer: <input checked="" type="checkbox"/> Helium <input checked="" type="checkbox"/> BTEX <input checked="" type="checkbox"/> MTBE		<b>6 Analyses Requested</b> EPA 25 (select range below) <input type="checkbox"/> C1 - C4 <input type="checkbox"/> C2 - C10 <input type="checkbox"/> C1 - C10 <input type="checkbox"/> C4 - C10 (GRO) <input type="checkbox"/> C2 - C4	
<b>7 Instructions/QC Requirements &amp; Comments</b> EPA 25 (check one)			
Canisters Shipped by: <u>CISA</u> Relinquished by: <u>Paul Kopschuck</u> Relinquished by: _____	Date/Time: <u>3-26-14</u> <u>4/2/14</u> <u>4/9/14</u>	Canisters Received by: _____ Received by: _____ Received by: _____	Date/Time: _____ Date/Time: _____ Date/Time: _____
Relinquished by: _____ Relinquished by: _____		Date/Time: _____ Date/Time: _____ Date/Time: _____	
Relinquished by: _____		Date/Time: _____	
Relinquished by: <u>Deborah Nesh</u>		Date/Time: <u>4/3/14</u>	

Eurofins Lancaster Laboratories Environmental, LLC • 2425 New Holland Pike, Lancaster, PA 17601 • 717-856-2900

The white copy should accompany samples to Eurofins Lancaster Laboratories Environmental. The yellow copy should be retained by the client.

# Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>RL</b>	Reporting Limit	<b>BMQL</b>	Below Minimum Quantitation Level
<b>N.D.</b>	none detected	<b>MPN</b>	Most Probable Number
<b>TNTC</b>	Too Numerous To Count	<b>CP Units</b>	cobalt-chloroplatinate units
<b>IU</b>	International Units	<b>NTU</b>	nephelometric turbidity units
<b>umhos/cm</b>	micromhos/cm	<b>ng</b>	nanogram(s)
<b>C</b>	degrees Celsius	<b>F</b>	degrees Fahrenheit
<b>meq</b>	milliequivalents	<b>lb.</b>	pound(s)
<b>g</b>	gram(s)	<b>kg</b>	kilogram(s)
<b>µg</b>	microgram(s)	<b>mg</b>	milligram(s)
<b>mL</b>	milliliter(s)	<b>L</b>	liter(s)
<b>m<sup>3</sup></b>	cubic meter(s)	<b>µL</b>	microliter(s)
		<b>pg/L</b>	picogram/liter

< less than - The number following the sign is the limit of quantitation, the smallest amount of analyte which can be reliably determined using this specific test.

> greater than

**ppm** parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

**ppb** parts per billion

**Dry weight basis** Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

**Data Qualifiers:**

**C** - result confirmed by reanalysis.

**J** - estimated value - The result is  $\geq$  the Method Detection Limit (MDL) and  $<$  the Limit of Quantitation (LOQ).

**U.S. EPA CLP Data Qualifiers:**

**Organic Qualifiers**

<b>A</b>	TIC is a possible aldol-condensation product
<b>B</b>	Analyte was also detected in the blank
<b>C</b>	Pesticide result confirmed by GC/MS
<b>D</b>	Compound quantitated on a diluted sample
<b>E</b>	Concentration exceeds the calibration range of the instrument
<b>N</b>	Presumptive evidence of a compound (TICs only)
<b>P</b>	Concentration difference between primary and confirmation columns $>25\%$
<b>U</b>	Compound was not detected
<b>X,Y,Z</b>	Defined in case narrative

**Inorganic Qualifiers**

<b>B</b>	Value is $<$ CRDL, but $\geq$ IDL
<b>E</b>	Estimated due to interference
<b>M</b>	Duplicate injection precision not met
<b>N</b>	Spike sample not within control limits
<b>S</b>	Method of standard additions (MSA) used for calculation
<b>U</b>	Compound was not detected
<b>W</b>	Post digestion spike out of control limits
<b>*</b>	Duplicate analysis not within control limits
<b>+</b>	Correlation coefficient for MSA $<0.995$

**Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



Lancaster Laboratories  
Environmental

# Analysis Report

2425 New Holland Pike, Lancaster, PA 17601 • 717-650-2900 • Fax: 717-650-2081 • www.LancasterLabs.com

## ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental  
2425 New Holland Pike  
Lancaster, PA 17601

Prepared for:

American Env. Assoc., Inc.  
1135 Butler Avenue  
New Castle PA 16101

May 06, 2014

Project: Leo's Car Wash

Submission Date: 04/29/2014

Group Number: 1470330

State of Sample Origin: PA

Client Sample Description \_\_\_\_\_

VP-B Air

VP-A Air

Lancaster Labs (LL) #

7445692

7445693

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

ELECTRONIC RAR Engineering Group  
COPY TO

Attn: Kyle Griffith

Respectfully Submitted,

Angela M. Miller  
Specialist

(717) 556-7260

Sample Description: VP-A Air  
SC# 823  
Leo's Car Wash

LL Sample # AQ 7445693  
LL Group # 1470330  
Account # 12835

Project Name: Leo's Car Wash

Collected: 04/25/2014 10:15 by PK American Env. Assoc., Inc.  
through 04/25/2014 14:15 1135 Butler Avenue  
Submitted: 04/29/2014 07:55 New Castle PA 16101  
Reported: 05/06/2014 15:59

CAT No.	Analysis Name	CAS Number	As Received Final Result	MDL	As Received Final Result	MDL	DF
<b>Volatiles in Air ASTM D1946</b>							
10341	Helium as Tracer Gas	7440 59 7	N.D.	10,000	N.D.	1,600	2
<b>Volatiles in Air EPA TO-15</b>							
05298	Benzene	71-43-2	1.0	0.20	3.3	0.64	1
05298	Cumene	98-82-8	0.79 J	0.20	3.9 J	0.98	1
05298	Ethylbenzene	100-41-4	2.7	0.20	12	0.87	1
05298	Methyl t-Butyl Ether	1634-04-4	N.D.	0.20	N.D.	0.72	1
05298	Naphthalene	91-20-3	0.64 J	0.40	3.4 J	2.1	1
05298	Toluene	108-88-3	9.3	0.20	35	0.75	1
05298	m/p-Xylene	178601-23-1	9.6	0.20	42	0.87	1
05298	o-Xylene	95-47-6	2.9	0.20	12	3.67	1

MDL = Method Detection Limit

### General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/15.

All QC in compliance unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10341	Helium as Tracer Gas	ASTM D1946	1	14125H501	05/05/2014 15:34	Florida A Cimino	2
05298	TO 15 VOA Ext. List	EPA TO 15	1	07412030AA	04/30/2014 23:46	Michael A Ziegler	1

Sample Description: VP-B Air  
SC# 851  
Leo's Car Wash

LL Sample # AQ 7445692  
LL Group # 1470330  
Account # 12835

Project Name: Leo's Car Wash

Collected: 04/25/2014 10:30 by PK American Env. Assoc., Inc.  
Through 04/25/2014 14:30 1135 Butler Avenue  
Submitted: 04/29/2014 07:55 New Castle PA 16101  
Reported: 05/06/2014 15:59

CAT No.	Analysis Name	CAS Number	As Received Final Result	MDL	As Received Final Result	MDL	DP
<b>Volatiles in Air ASTM D1946</b>							
10341	Helium as Tracer Gas	7440-59-7	N.D.	10,000	N.D.	1,600	2
<b>Volatiles in Air EPA TO-15</b>							
05298	Benzene	71-43-2	1.9	0.20	6.0	0.64	1
05298	Cumene	98-82-8	0.72 J	0.20	3.5 J	0.98	1
05298	Ethylbenzene	100-41-4	3.9	0.20	17	0.87	1
05298	Methyl t-Butyl Ether	1634-04-1	N.D.	0.20	N.D.	0.73	1
05298	Naphthalene	91-20-3	1.1	0.40	5.0	2.1	1
05298	Toluene	108-88-3	12	0.20	47	0.75	1
05298	m/p-Xylene	179601-23-1	14	0.20	61	0.87	1
05298	o-Xylene	95-47-6	4.3	0.20	16	0.87	1

MDL = Method Detection Limit

### General Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/15.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

### Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10341	Helium as Tracer Gas	ASTM D1946	1	14125EE01	05/05/2014 15:20	Florida A Cimino	2
05298	TO 15 VOA Ext. List	EPA TO-15	1	D1412C307A	04/30/2014 22:58	Michael A Ziegler	1



## Quality Control Summary

Client Name: American Env. Assoc., Inc.  
Reported: 05/05/14 at 03:59 PM

Group Number: 1470330

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

### Laboratory Compliance Quality Control

<u>Analysis Name</u>	<u>Blank Result</u>	<u>Blank MDL</u>	<u>Report Units</u>	<u>LCS %RRC</u>	<u>LCSD %RRC</u>	<u>LCS/LCSD Limits</u>	<u>RPD</u>	<u>RPD_Max</u>
Batch number: 14125FF01	Sample number(s): 7445692-7445693							
Helium as Tracer Gas	N.D.	5,000.	ppm(v)					
Batch number: D1412030AA	Sample number(s): 7445692-7445693							
Benzene	N.D.	0.20	ppb(v)	86	90	70-130	5	25
Cumene	N.D.	0.20	ppb(v)					
Ethylbenzene	N.D.	0.20	ppb(v)	97	85	70-130	2	25
Methyl t-Butyl Ether	N.D.	0.20	ppb(v)	108	104	52-129	3	25
Naphthalene	N.D.	0.40	ppb(v)	80	75	26-191	6	25
Toluene	N.D.	0.20	ppb(v)	85	85	70-130	1	25
m/p-Xylene	N.D.	0.20	ppb(v)	88	86	70-130	2	25
o-Xylene	N.D.	0.20	ppb(v)	95	93	70-130	2	25

\*- Outside of specification

- (1) The result for one or both determinations was less than five times the LOQ.
- (2) The unspiked result was more than four times the spike added.



## Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

<b>RL</b>	Reporting Limit	<b>BMQL</b>	Below Minimum Quantitation Level
<b>N.D.</b>	none detected	<b>MPN</b>	Most Probable Number
<b>TNTC</b>	Too Numerous To Count	<b>CP Units</b>	cobalt-chloroplatinate units
<b>IU</b>	International Units	<b>NTU</b>	nephelometric turbidity units
<b>umhos/cm</b>	micromhos/cm	<b>ng</b>	nanogram(s)
<b>C</b>	degrees Celsius	<b>F</b>	degrees Fahrenheit
<b>meq</b>	milliequivalents	<b>lb.</b>	pound(s)
<b>g</b>	gram(s)	<b>kg</b>	kilogram(s)
<b>µg</b>	microgram(s)	<b>mg</b>	milligram(s)
<b>mL</b>	milliliter(s)	<b>L</b>	liter(s)
<b>m3</b>	cubic meter(s)	<b>µL</b>	microliter(s)
		<b>pg/L</b>	picogram/liter
<b>&lt;</b>	less than - The number following the sign is the <u>limit of quantitation</u> , the smallest amount of analyte which can be reliably determined using this specific test.		
<b>&gt;</b>	greater than		
<b>ppm</b>	parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg), or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.		
<b>ppb</b>	parts per billion		
<b>Dry weight basis</b>	Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.		

### Data Qualifiers:

**C** – result confirmed by reanalysis.

**J** - estimated value – The result is ≥ the Method Detection Limit (MDL) and < the Limit of Quantitation (LOQ).

### U.S. EPA CLP Data Qualifiers:

Organic Qualifiers		Inorganic Qualifiers	
<b>A</b>	TIC is a possible aldol-condensation product	<b>B</b>	Value is <CRDL, but ≥IDL
<b>B</b>	Analyte was also detected in the blank	<b>E</b>	Estimated due to interference
<b>C</b>	Pesticide result confirmed by GC/MS	<b>M</b>	Duplicate injection precision not met
<b>D</b>	Compound quantitated on a diluted sample	<b>N</b>	Spike sample not within control limits
<b>E</b>	Concentration exceeds the calibration range of the instrument	<b>S</b>	Method of standard additions (MSA) used for calculation
<b>N</b>	Presumptive evidence of a compound (TICs only)	<b>U</b>	Compound was not detected
<b>P</b>	Concentration difference between primary and confirmation columns >25%	<b>W</b>	Post digestion spike out of control limits
<b>U</b>	Compound was not detected	<b>*</b>	Duplicate analysis not within control limits
<b>X,Y,Z</b>	Defined in case narrative	<b>+</b>	Correlation coefficient for MSA <0.995

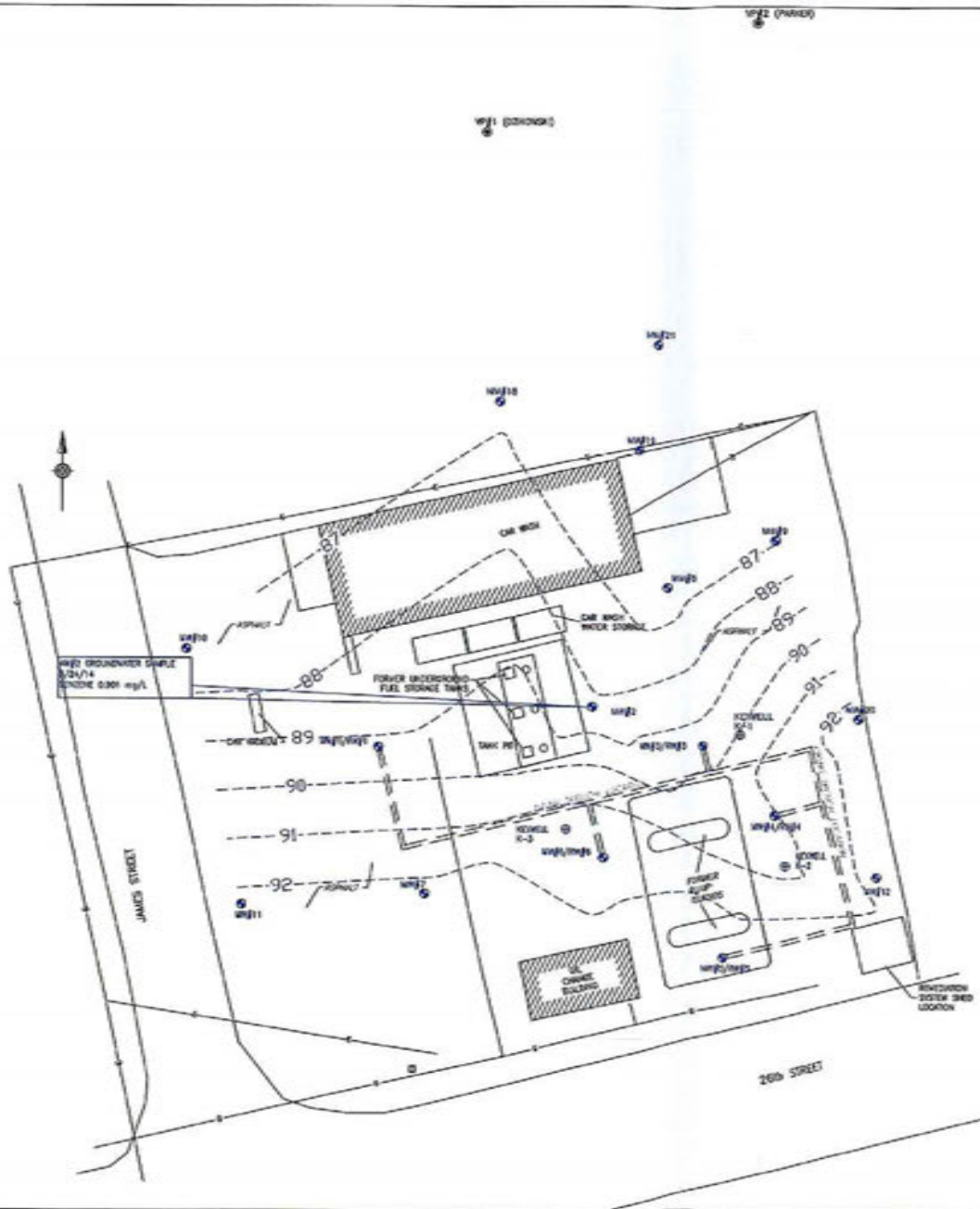
**Analytical test results meet all requirements of NELAC unless otherwise noted under the individual analysis.**

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. This report shall not be reproduced except in full, without the written approval of the laboratory.

Times are local to the area of activity. Parameters listed in the 40 CFR part 136 Table II as "analyze immediately" are not performed within 15 minutes.

**WARRANTY AND LIMITS OF LIABILITY** - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. THE FOREGOING EXPRESS WARRANTY IS EXCLUSIVE AND IS GIVEN IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED. WE DISCLAIM ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING A WARRANTY OF FITNESS FOR PARTICULAR PURPOSE AND WARRANTY OF MERCHANTABILITY. IN NO EVENT SHALL EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL, LLC BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES INCLUDING, BUT NOT LIMITED TO, DAMAGES FOR LOSS OF PROFIT OR GOODWILL REGARDLESS OF (A) THE NEGLIGENCE (EITHER SOLE OR CONCURRENT) OF EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL AND (B) WHETHER EUROFINS LANCASTER LABORATORIES ENVIRONMENTAL HAS BEEN INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. We accept no legal responsibility for the purposes for which the client uses the test results. No purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



Monitoring Well #	Surface Elevation	Depth to Water	Static Water Elev. 3/24/14
MW#1/RW#1	99.58	recovery well	recovery well
MW#2	99.80	11.52	88.18
MW#3/RW#3	101.21	recovery well	recovery well
MW#4/RW#4	101.73	recovery well	recovery well
MW#5/RW#5	101.84	recovery well	recovery well
MW#6/RW#6	101.45	recovery well	recovery well
MW#7	100.22	7.89	92.33
MW#8	99.21	12.85	86.36
MW#9	99.38	12.46	86.92
MW#10	96.60	9.52	87.08
MW#11	98.49	6.15	92.34
MW#12	101.57	9.22	92.35
K-1	100.23	inaccessible	inaccessible
K-2	100.72	inaccessible	inaccessible
K-3	99.95	inaccessible	inaccessible

- MONITORING WELL LOCATIONS
- GROUNDWATER CONTOURS
- ELECTRIC
- FIRE HYDRANT
- GAS

PREPARED BY: **RAR**  
 CHECKED BY: **LEO'S #3 CAR WASH**  
 DATE: **ERIC, PA**  
 SCALE: **1"=30'**

**RAR engineering group, Inc.**  
 133 North Avenue, New Canaan, Pennsylvania 19380  
 Phone: 610.288.4444, 610.288.4444 and 610.288.4444

**FIELD INVESTIGATION MAP**

SHEET NUMBER: **1 of 1**



Report Date: 04/03/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9402-001  
Sample Name: Monitoring Well MW#2 Groundwater Sample  
Sample Date: 3/24/2014 1:00:00 PM  
Date Received: 3/24/2014

Parameter	Result	Reporting Limit	Qual.	Method	Analysis Date	Analyst
Benzene, mg/L	0.901	0.001	D2	EPA 8260B	04/01/14 21:23	MGW
Toluene, mg/L	0.015	0.002		EPA 8260B	04/01/14 20:43	MGW
Ethylbenzene, mg/L	0.290	0.002	D2	EPA 8260B	04/01/14 21:23	MGW
Xylenes(Total), mg/L	0.157	0.002		EPA 8260B	04/01/14 20:43	MGW
Cumene, mg/L	0.017	0.002		EPA 8260B	04/01/14 20:43	MGW
Naphthalene, mg/L	0.020	0.002		EPA 8260B	04/01/14 20:43	MGW
MTBE, mg/L	0.009	0.002		EPA 8260B	04/01/14 20:43	MGW
Aqueous-phase purge-and-trap	---			EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director



Report Date: 04/03/2014

American Environmental Associates  
 5946 Southland Drive  
 Erie, PA 16509

Project: Leo's #3 Car Wash  
 Lab Sample #: 9402-002  
 Sample Name: Monitoring Well MW#7 Groundwater Sample  
 Sample Date: 3/24/2014 11:45:00 AM  
 Date Received: 3/24/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/01/14 21:52	MGW
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 21:52	MGW
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 21:52	MGW
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/01/14 21:52	MGW
Cumene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 21:52	MGW
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 21:52	MGW
MTBE, mg/L	<0.002	0.002	EPA 8260B	04/01/14 21:52	MGW
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
 Laboratory Director



Report Date: 04/03/2014

American Environmental Associates  
 5946 Southland Drive  
 Erie, PA 16509

Project: Leo's #3 Car Wash  
 Lab Sample #: 9402-003  
 Sample Name: Monitoring Well MW#8 Groundwater Sample  
 Sample Date: 3/24/2014 12:00:00 PM  
 Date Received: 3/24/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/01/14 22:21	MGW
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 22:21	MGW
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 22:21	MGW
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/01/14 22:21	MGW
Cumene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 22:21	MGW
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/01/14 22:21	MGW
MTBE, mg/L	0.017	0.002	EPA 8260B	04/01/14 22:21	MGW
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
 Laboratory Director



Report Date: 04/03/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9402-004  
Sample Name: Monitoring Well MW#9 Groundwater Sample  
Sample Date: 3/24/2014 12:30:00 PM  
Date Received: 3/24/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/02/14 12:11	ALH
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:11	ALH
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:11	ALH
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:11	ALH
Cumene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:11	ALH
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:11	ALH
MTBE, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:11	ALH
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director





Report Date: 04/03/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9402-005  
Sample Name: Monitoring Well MW#10 Groundwater Sample  
Sample Date: 3/24/2014 12:45:00 PM  
Date Received: 3/24/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/02/14 12:43	ALH
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:43	ALH
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:43	ALH
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:43	ALH
Cumene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:43	ALH
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:43	ALH
MTBE, mg/L	<0.002	0.002	EPA 8260B	04/02/14 12:43	ALH
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director



Report Date: 04/03/2014

American Environmental Associates  
 5946 Southland Drive  
 Erie, PA 16509

Project: Leo's #3 Car Wash  
 Lab Sample #: 9402-006  
 Sample Name: Monitoring Well MW#11 Groundwater Sample  
 Sample Date: 3/24/2014 1:15:00 PM  
 Date Received: 3/24/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/02/14 14:23	ALH
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:23	ALH
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:23	ALH
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:23	ALH
Cumene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:23	ALH
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:23	ALH
MTBE, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:23	ALH
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
 Laboratory Director



Report Date: 04/03/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

Project: Leo's #3 Car Wash  
Lab Sample #: 9402-007  
Sample Name: Monitoring Well MW#12 Groundwater Sample  
Sample Date: 3/24/2014 1:30:00 PM  
Date Received: 3/24/2014

Parameter	Result	Reporting Qual. Limit	Method	Analysis Date	Analyst
Benzene, mg/L	<0.001	0.001	EPA 8260B	04/02/14 14:46	ALH
Toluene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:46	ALH
Ethylbenzene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:46	ALH
Xylenes(Total), mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:46	ALH
Cumene, mg/L	0.005	0.002	EPA 8260B	04/02/14 14:46	ALH
Naphthalene, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:46	ALH
MTBE, mg/L	<0.002	0.002	EPA 8260B	04/02/14 14:46	
Aqueous-phase purge-and-trap	---		EPA 5030B		

If there are any questions regarding this data, please call.

Approved By: Marianne Whipkey  
Laboratory Director



Report Date: 04/03/2014

American Environmental Associates  
5946 Southland Drive  
Erie, PA 16509

- CCV The Continuing Calibration Verification (CCV) recovery for this compound did not meet method acceptance criteria. The average of all compounds did meet method acceptance criteria as specified in EPA Method 8000 B.
- D1 Sample required dilution due to matrix interference.
- D2 Sample required dilution due to high concentration of compound.
- D3 Sample required dilution due to lack of proper sample weight or volume.
- HT3 Sample was received and analyzed past holding time.
- MB Compound detected in method blank at or above the method reporting limit.
- MS1 The laboratory fortified matrix (LFM) result for this sample is above established acceptance criteria. But since the sample result is below the regulatory level, the result is valid for regulatory use.
- MS2 The lab fortified matrix (LFM) result for this sample is not within established acceptance criteria. The sample result is above the regulatory limit and is considered to be "estimated" because matrix interferences may be preventing accurate determination.
- MS3 The laboratory fortified matrix (LFM) result for this sample is not within established acceptance criteria due to high concentration of sample.
- MS4 The laboratory fortified matrix (LFM) result for this sample is not within established acceptance criteria. The laboratory fortified blank (LFB) was within the accepted criteria, therefore matrix interference is assumed.
- P1 Sample was not preserved properly.
- RPD Relative Percent Difference (RPD) exceeded the method acceptance limits. The sample result is to be considered "estimated".

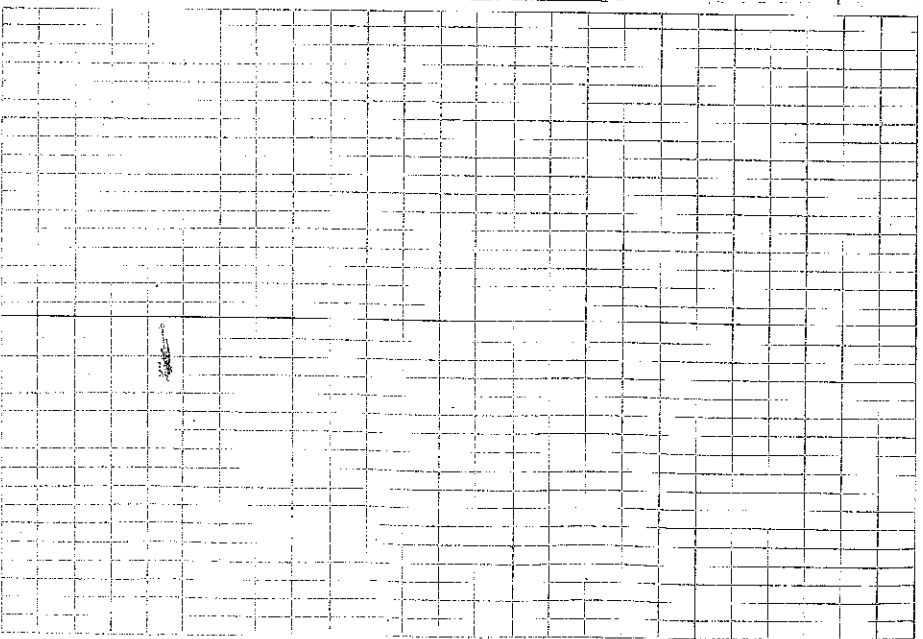
(45)

LEOIS CREEK WASH STATISTICS

	S.W.L. @ P.V.C.	S.W.L. @ Gauging Sta.
MW # 18	9.54	9.84
MW # 19	12.98'	13.53'
MW # 20	9.70'	10.35'
MW # 21	10.20'	10.63'

23 APR 14  
JR, AE

(47)



**Pat Pruent**

---

**From:** Scott Whipkey <swhipkey@rareengineering.com>  
**Sent:** Tuesday, March 18, 2014 9:36 AM  
**To:** 'Ferro, James'  
**Cc:** 'Pat Pruent'  
**Subject:** RE: Leo's Car Wash / Erie, PA / USTIF Claim# 2002-0013(M) (RESPONSE TO WELL/VAPOR SAMPLING REQUEST]

Jim,

We just received the signed site access agreements from the adjacent property owners and have the drilling scheduled for late next week. We have not performed the 1<sup>st</sup> quarter 2014 groundwater sampling yet. It is scheduled for the last week of March due to the piles of snow that were present at the site until the recent melt.

J. Scott Whipkey  
American Environmental Associates, Inc.  
1135 Butler Avenue  
New Castle, PA 16101  
Phone # 724-652-1004  
Fax # 724-652-3814

**From:** Ferro, James [<mailto:James.Ferro@icfi.com>]  
**Sent:** Monday, March 17, 2014 6:43 PM  
**To:** 'Scott Whipkey'  
**Cc:** 'Scott Morgan'; 'Pat Pruent'  
**Subject:** RE: Leo's Car Wash / Erie, PA / USTIF Claim# 2002-0013(M) (RESPONSE TO WELL/VAPOR SAMPLING REQUEST]

Hello Scott,

Can you confirm advise on the status of the well/soil-gas point installation and sampling work? Pat already exchanged an email regarding the benzene levels at well MW-12. If you have the Q1 2014 data can you let us know if the benzene results repeated or returned to historic concentrations? Thanks.

Jim Ferro | 703.218.2546 (w) | [James.Ferro@icfi.com](mailto:James.Ferro@icfi.com) | [icfi.com](http://icfi.com)  
ICF INTERNATIONAL | 9300 Lee Highway, Fairfax, VA 22031 | 703.231.0501 (m)  
Connect with us on [social media](#).

**From:** Ferro, James  
**Sent:** Thursday, February 13, 2014 3:08 PM  
**To:** 'Scott Whipkey'  
**Cc:** 'Scott Morgan'  
**Subject:** Leo's Car Wash / Erie, PA / USTIF Claim# 2002-0013(M) (RESPONSE TO WELL/VAPOR SAMPLING REQUEST]

Hi Scott,

I apologize for the delay in getting back to you on this request. I have reviewed the details of the proposed well and vapor point installations/sampling with Scott Morgan at GSC and it is agreed that an additional off-site monitoring well

beyond MW-19 is warranted as is the proposed soil gas sampling at the off-site locations. The costs also appear reasonable. Implementation of these activities based on the proposed costs will be reimbursed as out-of-scope T&M.

Also, Scott M was recently reviewing the Q4 2013 RAPR and noted that benzene levels in well MW-12 were reported at 213 ug/l whereas benzene had not been detected in that upgradient POC well since the 4<sup>th</sup> Quarter of 2007. Scott would like the chance to discuss that issue when you are available.

**Jim Ferro | 703.218.2546 (w) | [James.Ferro@icfi.com](mailto:James.Ferro@icfi.com) | [icfi.com](http://icfi.com)  
ICF INTERNATIONAL | 9300 Lee Highway, Fairfax, VA 22031 | 703.231.0501 (m)  
Connect with us on [social media](#).**

**From:** Scott Whipkey [<mailto:swhipkey@rareengineering.com>]  
**Sent:** Monday, November 25, 2013 2:27 PM  
**To:** Ferro, James  
**Subject:** Leo's Car Wash / Erie, PA / USTIF Claim# 2002-0013(M)

Jim,

As you recall we submitted a revised RAP in July of 2012 for the installation of 4 additional hi-vacuum extraction wells at the site. PADEP denied the revised RAP in September of 2012 and requested additional site characterization activities. After several meetings and much discussion, two additional POC wells and one off-site well were installed in July of 2013 as per the PADEP request.

Jack Ashton of the PADEP has now requested additional site characterization activities be performed at the above referenced site prior to his approval of our revised RAP. He has requested that one additional off-site groundwater monitoring well and two additional off-site vapor points be installed. Attached please find a copy of an e-mail that summarizes our additional site meeting with Jack Ashton and discusses the requested locations of the additional off-site monitoring well and vapor points requested by the PADEP. Also attached is a cost estimate for the additional site characterization work requested by the PADEP. As we discussed previously, the USTIF may consider payment of additional SCR costs because they are outside the scope of the PFP Contract for this site. Please let me know if the USTIF would consider payment of these additional SCR costs. Thank you.

J. Scott Whipkey  
American Environmental Associates, Inc.  
1135 Butler Avenue  
New Castle, PA 16101  
Phone # 724-652-1004  
Fax # 724-652-3814