# REMEDIAL ACTION PROGRESS REPORT 4<sup>th</sup> Quarter 2012

# PADEP Facility ID #17-14821 PAUSTIF Claim #2008-0034(M) Kwik Fill #M-90

1322 South 2<sup>nd</sup> Street Clearfield, Lawrence Township Clearfield County, Pennsylvania 16830

Prepared for:

## United Refining Company of Pennsylvania

15 Bradley Street P.O. Box 688 Warren, Pennsylvania 16365

Prepared by:

Letterle & Associates, LLC 629 East Rolling Ridge Drive Bellefonte, Pennsylvania 16823

Jed Hi<del>ll</del>

Project Manager

Steven James Treschow, P.G. Professional Geologist

EVEN JAMES TRESCH

**GEOLOGIST** 

January 2013

"By affixing my seal to this document, I am certifying that the information is true and correct to the best of my knowledge. I further certify I am licensed to practice in the Commonwealth of Pennsylvania and that it is within my professional expertise to verify the correctness of the information."

Steven James Treschow, P.G. (signed and sealed this day (January 24, 2013))



Environmental Consulting & Remediation Services

629 East Rolling Ridge Drive Bellefonte, PA 16823

814. 355. 2241 office 814. 355. 2410 fax

January 24, 2013

Mr. Scott Ferguson, P.G. PADEP Environmental Cleanup Program 208 W. Third St., Suite 101 Williamsport, PA 17701-6448

RE: 4<sup>th</sup> Quarter 2012 Remedial Action Progress Report PADEP Facility ID #17-14821 PAUSTIF Claim #2008-0034(M) United Refining Company of Pennsylvania Kwik Fill #M-90 1322 South 2<sup>nd</sup> Street, Clearfield, PA

Dear Mr. Ferguson:

Enclosed please find a copy of the 4<sup>th</sup> Quarter 2012 Remedial Action Progress Report prepared by Letterle & Associates, LLC, on behalf of United Refining Company of Pennsylvania, for the Kwik Fill #M-90, located at 1322 South 2<sup>nd</sup> Street, Clearfield, Pennsylvania.

If you have any questions please contact Jed Hill at (814) 355-2241 or jhill@letterleassocjates.com.

Sincerely

Jed Hill

Project Manager

Enclosure

cc: Mr. Scott C. Wonsettler, P.G., United Refining Company of Pennsylvania

Mr. Gerald Hawk, ICF International

Mr. Robert McDonald, Arch Street Management

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#### **GENERAL INFORMATION**

Client Contact: Scott Wonsettler, P.G.

Letterle Project Manager: Jed Hill

Regulatory Contact: Scott Ferguson, P.G.

PADEP Facility ID #: 17-14821

PAUSTIF Claim #: 2008-0034 (M)

Number of Wells: 14 monitoring wells (on-site wells MW-2A, MW-32, and

MW-33 and off-site monitoring wells MW-3, MW-4, MW-7, MW-9, MW-10, MW-14, MW-15, MW-17, MW-21, MW-29,

and MW-30).

Wells Containing LNAPL: 0

#### SITE HISTORY

Letterle & Associates, LLC (Letterle) of Bellefonte, Pennsylvania (PA) is pleased to present this Remedial Action Progress Report (RAPR) for United Refining Company (United) of PA Kwik-Fill #M-90 (site), located in Lawrence Township, Clearfield, PA, for the period of October 1, 2012 through December 31, 2012. **Figure 1** depicts the site location and surrounding area.

The site is currently an active retail fueling (gasoline and diesel) station, which has two, 10,000-gallon and one, 8,000-gallon steel underground storage tanks (USTs). The two 10,000-gallon USTs were in installed in 1969 and the 8,000-gallon UST was installed in 1974. One 10,000-gallon UST and one 8,000-gallon contain unleaded gasoline and the remaining 10,000-gallon UST (in the middle) contains diesel fuel.

On June 15, 1995, the 10,000-gallon unleaded gasoline UST (#002) failed a tightness test. The PA Department of Environmental Protection (PADEP) was notified of the failure and subsequently, Mountain Research, Inc. (MRI) was retained by United in May 1996 to perform site characterization activities.

From June 1996 through October 1997, four soil boring/monitoring wells, MW-1, MW-1A, MW-2, and MW-2A, were installed on the site and five monitoring wells, MW-3 through MW-7, were installed off-site, on the Beckwith Machinery Company (Beckwith) property. Quarterly groundwater sampling began in February 1996. Groundwater analytical results for the monitoring wells indicated unleaded gasoline constituents at concentrations above their respective Medium-Specific Concentration (MSC) values. In June 1997, soil/groundwater samples were collected on-site and in the right-of-way of South 2<sup>nd</sup> Street. The results of the investigation indicated several soil/groundwater samples contained unleaded gasoline constituents at concentrations above their respective MSC values.

MRI prepared a Remedial Action Plan (RAP) in July 1999 proposing a Matrix Trailer Mounted Oxygen Injection System. The PADEP approved the RAP in January 2000. In February 2000, system installation was initiated. The system consisted of eight oxygen injection points and a small trailer to house any ancillary equipment. On April 12, 2000, the system was activated. The system was operational from April 12, 2000 until the first quarter of 2005. From February 1996 through

first quarter of 2005, MRI performed quarterly groundwater sampling from the monitoring well network.

From early 2005 through mid-2006, additional site investigations were initiated at the site to reevaluate the remedial approach. In October 2006, a Supplemental Site Characterization Report (SCR) and RAP Addendum was submitted to the PADEP. The Supplemental SCR/RAP Addendum identified two separate source areas, one on-site and one off-site at the BMC property. The on-site source area (Source Area #1) was found to have impacted groundwater beneath the site and downgradient on the former BMC property. Impacted groundwater from Source Area #2 was found to be related to an off-site release and not associated with the Kwik Fill M-90 facility. The Supplemental SCR/RAP Addendum strategy included remediating groundwater via an air sparge/soil vapor extraction (AS/SVE) system. An additional RAP Addendum was submitted in December 2006. The PADEP approved the Supplemental SCR/RAP Addendum and additional RAP Addendum in January 2007, with modifications. An AS/SVE system was installed at the site and operated from November 2007 through the fourth quarter of 2008.

A second release of unleaded gasoline occurred at the site, and was reported in February 2008. Additional site characterization activities were initiated and an Additional SCR and RAP Addendum was submitted in June 2011. The June 2011 Additional SCR/RAP Addendum included the selection of a dual phase extraction (DPE)/SVE system to address on-site soil and groundwater and enhanced in-situ bioremediation (EB) to address off-site groundwater. The June RAP Addendum was approved by the PADEP in July 2011.

#### REMEDIAL ACTION PLAN IMPLEMENTATION

The PA Underground Storage Tank Indemnification Fund (PAUSTIF) and their administrator, ICF International (ICFI), put the site remedial work out for competitive bid. The proposed scope of work was based upon the July 2011 approved RAP. Letterle was awarded the bid in March of 2012 and began implementation of the approved RAP.

Remedial actions completed in previous quarters include off-site well abandonment, dual-phase extraction well installation, remedial system trenching and piping, remedial system installation, and the application of a chemical oxidant as part of an enhanced bioremediation feasibility study.

#### **Remedial System**

The remedial system trailer was constructed and mobbed to the site during the third quarter of 2012 and began operation during the fourth quarter of 2012. The principal DPE system components housed within the trailer include:

- One claw pump;
- One air compressor;
- One air/water separator (AWS) tank;
- One equalization tank;
- Two transfer pumps and level controls;
- Six pneumatic groundwater pumps;

- Four 300-pound liquid-phase granular activated carbon (GAC) vessels (high pressure units):
- Two 600-pound vapor-phase GAC vessels; and,
- Control panel for the claw pump, air compressor, and the transfer pumps (including all system interlocks).

The trailer is located along the southern property boundary. The dimensions of the trailer are approximately 8 feet in width, 20 feet in length, and 8 feet tall. The trailer includes wall and roof insulation and has adjustable wall louvers close to the floor, each complete with an exterior mounted mesh screen. Each louver contains an explosion-proof (XP) fan to circulate outside air into it. The fan is controlled both thermostatically and by a manual wall switch located near the side door. The trailer contains an XP radiant heater unit with adjustable thermostat to prevent freeze damage during the winter. The heater/thermostat is capable of maintaining a minimum ambient air temperature of 50 °F within the enclosure regardless of outside temperatures.

The trailer has a double door large enough to remove any piece of equipment housed within the trailer. The trailer includes a sump built into the floor equipped with a high level alarm switch that will terminate system operation if activated. The influent and effluent PVC pipes stubbed out of the ground by the installation contractor are inside 18-inch well vaults and are connected in the trailer with a pressure connection. The trailer includes an outside wall electrical receptacle, a lightning rod, and grounding. The trailer contains a mounted 20-pound fire extinguisher within three feet of the door.

A fenced area adjacent to the remediation trailer was constructed to accommodate the vapor phase treatment equipment and associated control panels. The fenced area is approximately 8 feet by 14 feet in size and consist of a 6-foot high privacy fence with one access gate.

The remediation system began operation during the fourth quarter of 2012. The recovered groundwater is treated and discharged to the sanitary sewer under an issued permit from the Clearfield Municipal Authority (CMA).

# QUARTERLY SITE ACTIVITIES COMPLETED – $4^{TH}$ QUARTER 2012

#### **Remedial System Operation**

The DPE remedial system was activated on October 30, 2012 and the system was in operation upon arrival at the site on November 26, 2012. The system was shutdown at the end of the day to allow for return of groundwater levels to static conditions prior to starting the engineering evaluation on November 27, 2012. All remediation system equipment was observed to be in good working condition prior to shutdown. All clear schedule 40 PVC sight-tubes on the influent manifold showed signs of only minor scaling to the system piping. Since remediation system startup, a total of 142,565 gallons of groundwater have been extracted at an average of 4.71 gallons per minute (gpm) over the time period. All equipment safety alarms have been tested and are in good working order. The recovered and treated groundwater is treated and discharged to the sanitary sewer under an issued permit from the CMA. Under the terms of the permit, analytical reports and totalizer readings are reported in Discharge Monitoring Reports (DMR) on a monthly basis to the CMA. Petroleum

impacted soil and groundwater remediation systems have been listed as exempt from the Plan Approval/Operating permit requirements by PADEP, Division of Air Quality. The remediation system is operated under the exemption requirements.

#### **Remedial System Alterations**

The over amping of the rotary claw SVE pumps has been eliminated by increasing the size of the exhaust piping. Heat tape and insulation have been installed on all hoses and piping that is exposed under the trailer to prevent freezing. Sediment filter changes will initially occur during every O&M event in order to minimize system downtime due to clogged sediment filters. The four 400-pound liquid-phase GAC pressure vessels will continue to be connected in a parallel/series arrangement to treat the groundwater. The existing vapor carbon treatment system will remain with two 600-pound vapor-phase GAC units connected in a series configuration.

#### **Remedial System Summary**

Based on the results of the system engineering evaluation, the remediation system at the Kwik Fill M-90 site is operating with influence results similar to the original design and currently, the influence of the DPE system is large enough to cover the majority of the down gradient contaminated plume area. The DPE system has been placed into operation and extraction from the recovery wells will continue. To allow for adequate vacuum levels with the addition of the VEGE system, DPE recovery wells MW-1 and MW-28, MW-31, and MW-34 will be continuously operated through 2013. Wells MW-1A, MW-2, MW-35 and MW-36 will remain shutdown to increase the vacuum of the DPE system and to prevent overwhelming the groundwater treatment system with excessive amounts of extracted groundwater. The system will be serviced twice a month for regularly scheduled preventative maintenance to ensure operational success. Future evaluations will include measurements of vacuum at the top of each recovery well, groundwater recovery rates from each DPE well, and water table drawdown after an extended period of system operation. For additional details concerning the operation and performance of the remedial system, please see the Remediation System Start-Up Engineering Evaluation included as **Appendix B**.

#### **Groundwater Monitoring**

#### **Groundwater Gauging**

Letterle completed a quarterly groundwater gauging and sampling event on December 14, 2012. A total of 12 monitoring wells were sampled: on-site wells MW-2A, MW-32, and MW-33 and off-site monitoring wells MW-3, MW-4, MW-7, MW-10, MW-14, MW-15, MW-21, MW-29, and MW-30 (MW-9 and MW-17 could not be located). Prior to well purging, the depth to groundwater in each well was measured using an electronic water level probe accurate to the nearest 0.01 foot. The groundwater gauging and elevation results are on **Table 1**.

### Shallow Water-Bearing Zone

The groundwater gauging data collected during the sampling event indicated the following for the shallow water-bearing zone:

- Groundwater elevations in the shallow water-bearing zone ranged from 1,134.25 feet in MW-7 to 1,145.66 feet in MW-2A;
- The apparent groundwater flow direction in the shallow water-bearing zone is towards the north (towards the West Branch Susquehanna River) (Figure 3);
- Based on the groundwater elevation data for on-site monitor wells MW-2A (1,145.66 feet) and MW-7 (1,134.25 feet), the horizontal hydraulic gradient was approximately 0.030 feet per foot (ft/ft); and,
- The groundwater elevations observed in MW-10 was considered anomalous and was not used in groundwater contouring.

#### **Groundwater Sampling**

### Sampling Methodology

Quarterly groundwater sampling at the site was completed on December 14, 2012. Monitoring wells MW-2A, MW-3, MW-4, MW-7, MW-10, MW-14, MW-15, MW-21, MW-29, MW-30, MW-32, and MW-33 (MW-9 and MW-17 could not be located) were purged and sampled using low flow techniques. The following field screening parameters were collected from the sampled monitor wells via an YSI Model 556 flow-through cell and water quality meter: pH, Temperature, Specific Conductance, total suspended solids (TSS), dissolved oxygen (DO), and oxidation-reduction potential (ORP).

The groundwater samples were submitted for analysis of PADEP pre-March 2008 short list of unleaded gasoline constituents via USEPA Method 8260B. The laboratory analyses included the following constituents: benzene, toluene, ethylbenzene, xylene(s) total, methyl tert-butyl ether (MTBE), cumene (isopropylbenzene), and naphthalene.

#### Sampling Results

Within the shallow water-bearing zone, analytical results from the groundwater sampling program conducted on December 14, 2012 indicated no exceedances of the applicable PADEP Used-Aquifer TDS  $\leq 2,500$  milligrams per liter (mg/L)) Residential Statewide Health Standard (UARSHS) MSCs.

**Table 1** summarizes the groundwater analytical results. The complete analytical laboratory reports are included in **Appendix A.** 

#### PLANNED ACTIVITY

The following activity is currently planned for the 1<sup>st</sup> Quarter of 2013:

- Remedial system operation and maintenance (including permit-required sampling);
- Quarterly groundwater gauging and sampling; and,
- Quarterly reporting.

The targeted goals of the remedial action are the elimination of the potential exposure pathways identified during site characterization activities (i.e., inhalation via indirect contact with groundwater

and ingestion and dermal contact via direct contact with surface water) and the attainment of the applicable PADEP UARSHS MSCs.

# **TABLE**

					Campound			- 1		
					Ethyl-	Xylenes		34.640		
Piezometer/Well PADEP UARSHS	Date	MTBE	Benzene	Toluene	benzene	(Total)	Cumene	Naplithalene		
MSCs		20	- 5	1,000	700	10,000	840	100	Depth-to- Groundwater	Groundwater Elevation
MW-1	3/17/2010	10.9	<1,00	<1.00	<1.00	<3.00	<1.00	<2.00	2.26	1147.28
	-6/8/2010	11.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.57	1146.97
	8/30/2010 11/17/2010	18.6 13.7	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	4.78 3.40	1144.76 1146.14
	3/1/2011	6.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.78	1147.76
	5/31/2011	13.5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.75	1145.79
	8/24/2011 3/28/2012	12.1 14.8	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	4.12 2.12	1145.42 1147.42
	6/25/2012	1410	*7.00	<del></del>	nitoring well co					L
MW-1A	3/17/2010	7.1	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.57	1147,20
	6/8/2010	6.9	<1.00	<1.00	<1.00	<3.00	<1,00	<2.00	2.86	1146.91
	8/30/2010 11/17/2010	16.3 10.6	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	5,32 3.88	1144.45 1145,89
	3/1/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.04	1147.73
	5/31/2011	4.2	<1.00	<1.00	<1.00	<3.00	<1,00	<2,00	4.29	1.145.48
	8/24/2011 3/28/2012	8.6 <1.00	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2,00 <2,00	4.65 2,55	1145,12 1147,22
,	6/25/2012	41.00	~1.00		nitoring well co				2,32	1177,22
MW-2	3/17/2010	20.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.07	1146.91
	6/8/2010	20,5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3,36	1146.62
	8/30/2010 11/17/2010	20,5 20,1	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	5.61 4.36	1144.37 1145.62
	3/1/2011	11.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.73	1147.25
	5/31/2011	10.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.68	1145,30
	8/24/2011 3/28/2012	14.3 11.5	<1.00 1.1	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	4,90 2.85	1145.08 1147.13
	6/25/2012	11.3	.E.p.3.		nitoring well co				2.03	1177,15
MW-2A	3/17/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1,21	1147.66
	.6/8/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.27	1147.60
	8/30/2010 11/17/2010	<1,00 <1.00	<1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	3.23 2.25	1145.64 1146.62
	3/1/2014	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.91	1147.96
	5/31/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.16	1146.71
	8/24/2011 3/28/2012	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	2,52 0,45	1146,35 1148.42
	6/25/2012	5,22	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.51	1144.36
	9/6/2012	<1.00	<1.00	<1,00	<1.00	<2.00	<1.00	<1.00	3.21	1145.66
Approximate to the second street and the second street second sec	12/14/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.12	1144.75 1143.80
MW-3	3/18/2010 6/7/2010	43.2 44.0	<1,00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1,00 <1,00	<2.00 <2.00	2.43 2.40	1143.83
	8/31/2010	41.4	<1,00	<1.00	<1.00	<3.00	<1.00	<2.00	3.92	1142.31
	11/17/2010 3/2/2011	40.3	<1.00 <1.00	<1,00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	3.48 1.81	1142.75 1144.42
	5/31/2011	33.2 NS	~1.00 NS	NS	NS	NS	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	\2.00 NS	NG	NA
	8/24/2014	32.3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3,38	1142,85
1	3/28/2012	NS 21.9	NS 51.00	NS <1.00	NS <1.00	NS <2.00	NS <1.00	NS <1.00	1,40 3.17	1144.83 1143.06
	6/25/2012 9/6/2012	27.5	<1.00 <1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.17	1142.06
	12/14/2012	18.4	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	5.63	1140.60
MW-4	3/18/2010	<1,00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.97	1144.15
######################################	6/7/2010 8/31/2010	<1,00 <1,00	<1.00 <1.00	<1,00 <1,00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	2.17 4.44	1142,95 1140.68
***	11717/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.26	1141.86
	3/2/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.92	1144.20
# # #	5/31/2011	NS -1.00	NS ~1.00	NS <1.00	NS = 1.00	NS	NS <1.00	NS <2.00	NG 3.24	NA
¥	8/24/2014 3/28/2012	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00	1.20	1141.88 1143.92
	6/25/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	2.74	1142.38
	9/6/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.11	1141.01
When the grant of grant of the same of the	12/14/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	3.40	1141.72

					Compound	VINZENEY				
Piezometer/Well	Date	MTBE	Benzene	Toluene	Ethyl- benzene	Xylenes (Total)	Cumene	Naphtholene		e Granda i i
PADEP UARSHS	Date		5	1,000	700	10,000	840	100	Depth-to-	Groundwater
MSCs		20		<b>在15年</b>	動物 华人		<b>含、换三次数量</b>	CERTAIN	Groundwater	
MW-5	3/17/2010	5,4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.16	1143.51
	6/7/2010 8/31/2010	4.8 3.8	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	1.53 3.18	1143.14 1141.49
	11/17/2010	2.6	<1.00	<00.1>	<1.00	<3.00	<1.00	<2.00	2.80	1141.87
	3/1/2011	1.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.43	1144.24
	5/31/2011	NS	NS	NS 11.00	NS -1.00	NS	NS	NS	NG	NA 11/2/22
	8/24/2011 3/28/2012	5.7 NS	<1.00 NS	<1.00 NS	<1.00 NS	<3.00 NS	<1.00 NS	<2.00 NS	2.64 1.04	1142.03 1143.63
	6/25/2012	1117	A		of quarterly san			110	2.25	1142,42
	9/6/2012			Well not part c	of quarterly san	pling program			NG	NA
MW-6	3/17/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	6/7/2010	NS	NS NS	NS	NS NS	NS	NS	NS NS	NG NG	NA NA
	8/31/2010 11/17/2010	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NG NG	NA NA
	3/1/2011	NS NS	NS NS	NS	NS	NS	NS	NS	NG	NA
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	NS	NS NG	NS	NS VC	NS	NS	NS NS	NG	NA NA
	3/28/2012 6/25/2012	NS	NS	NS Welf could t	NS not be located.	NS Well not part (	NS of quarterly sar	NS npling program	NG	NA NA
	9/6/2012							npling program		
MW-7	3/18/2010	3.6	59.5	11.5	44.4	54.7	25.6	44.5	2.60	1139.41
	6/7/2010	3.1	57.7	12.9	55.2	60.3	35.4	61.3	5,77	1136.24
	8/31/2010	6.8	104	14.4	47.9	49.2	29.3	38.7	7.92	1134,09
	11/17/2010 3/2/2011	7.2 4.1	97,9 51.9	12.5 8.8	46.5 39.3	47,4 27.7	27.3 22.4	57.7 20.9	6.85 3.93	1135.16 1138.08
	5/31/2011	NS NS	NS	NS NS	39.3 NS	NS NS	NS NS	NS NS	3.93 NG	NA
	8/24/2011	7.7	73.8	10.2	25.8	28.5	31.3	40.7	7.21	1134.80
	3/28/2012	NS NS	NS	NS	NS	NS	NS	NS	7.15	1134,86
	6/25/2012 9/6/2012	3,84	<1.00 NS	<1.00 <2.00	<1.00 <2.00	<2.00 <4.00	<1.00 <2.00	<1.00 <2.00	7.49 7.76	1134.52 1134.25
	12/14/2012	10.6 <2.00	84.4	14,8	89.5	43.6	29.0	65.4	5.80	1134.23
MW-9	3/17/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	6/8/2010	32.8	<1.00	<1.00	<1.00	<3.00	<1,00	<2.00	0.00	1141.97
	8/30/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	11/17/2010 3/1/2011	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NG NG	NA NA
	5/31/2011	NS NS	NS NS	NS NS	NS	NS NS	NS	NS	NG	NA NA
	8/24/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	3/28/2012	NS	NS	NS	NS	NS	NS	NS	NG	NA.
	6/25/2012 9/6/2012					l could not be l l could not be l				
MW-10	3/17/2010	8.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.64	1147.90
141 48-10	6/7/2010	8.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.78	1148.76
	8/31/2010	8.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.08	1147.46
	11/17/2010	7.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.50	1147.04
	3/2/2011 5/31/2011	7.1 NS	<1.00 NS	<1.00 NS	<1,00 NS	<3.00 NS	<1,00 NS	<2.00 NS	0.14 NG	1149.40 NA
	8/24/2011	7.5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1,42	1148.12
	3/28/2012	NS	NS	NS	NS	NS	NS	NS	1.42	1148.12
	6/25/2012	5.01	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	1.23	1148,31
	9/6/2012 12/14/2012	6.16 5.56	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<2.00 <2.00	<1.00 <1.00	<1.00 <1.00	2.10 2.08	1147.44 1147.46
MW-12	3/17/2010:	NS NS	NS	NS	NS	NS	NS	NS	NG	NA
:11 11-12	6/7/2010	NS	NS	NS NS	NS NS	NS NS	NS NS	NS	NG NG	NA NA
	8/31/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	11/17/2010	30,3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.28	1142.28
	3/2/2011 5/31/2011	NS NS	NS NS	NS NC	NS NC	NS	NS NG	NS	NG NG	NA NA
	5/31/2011 8/24/2011	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NG NG	NA NA
	3/28/2012	NS NS	NS	NS	NS	NS NS	NS	NS .	NG	NA
	6/25/2012			Well not part o	f quarterly sam	pling program.			2.83	1142.73
	9/6/2012		Well could no	t be located. V	Vell not part of	quarterly same	oling program.		NG	NA

Notes: All results reported in ug/l.

Bold values indicate levels above LRL.

Bold and shaded values indicate exceedance of UARSHS MSCs.
NG - Not Gauged. NA - Not Available. NS - Not Sampled.

· 1000000000000000000000000000000000000					Compound					
					Ethyl-	Xylenes				
Piezometer/Well	Date:	MTRE	Benzene	Toluene	benzene	(Total)	Cumene	Naphthalene		
PADEP UARSHS MSCs		20	5	1,000	700	10,000	840	100	Depth-to- Groundwater	Groundwater Elevation
MW-14	3/17/201 <b>0</b> ,	23,0	<1,00	<1.00	<1.00	<3.00	<1.00	<2.00	1.97	1146.75
	- 6/7/201 <b>0</b>	18.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2,00	2.22	1146.50
	8/31/2010 11/17/2010	35.4 21.3	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1,00	<2.00 <2.00	4.43 3.40	1144,29 1145,32
	$\approx 3/2/2011$	2.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.62	1147.10
ļ	5/31/2011	21.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.44	1145.28
	8/24/2011	17.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.80	1143.92
	3/28/2012	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2,71	1146.01
	6/25/2012	8.80	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	3.59	1145.13
	9/6/2012	19.8	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.63	1144.09
	12/14/2012	<1,00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	6.89	1141.83
MW-15	3/18/2010	6.2	<1.00	<1.00	<1,00	<3.00	<1.00	<2.00	1.73	1145.56
	6/7/2010 8/31/2010	6.8 7.0	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3,00 <3.00	<1.00 <1.00	<2.00 <2.00	2.08 3.88	1145.21 1143.41
	11/17/2010	6.3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.44	1143.85
1	3/2/2011	4.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1,51	1145.78
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	6.6	<1.00	<1.00	<1,00	<3.00	<1.00	<2.00	3.27	1144,02
	3/28/2012	NS	NS	NS	NS	NS	NS	NS	2.20	1145.09
	6/25/2012	6.98	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	3.11	1144,18
	9/6/2012 12/14/2012	5.64 2.23	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<2.00 <2.00	<1.00 <1.00	<1,00 <1.00	4,18 5,45	1143.11 1141.84
778000 KW 127802 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 12700 1	Xe2/LASINGUS XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	RESEXTING A SECURITY OF THE SE	IIIXXIIIIIXAXIIIK 200XIIK IIXIX	5000 C C C C C C C C C C C C C C C C C C	Chical State (Introduction Co.					
MW-17	3/18/2010 6/7/2010	9,0	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	0.73	1142.53 1143.17
	8/31/2010	13.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.78	1141,48
	11/17/2010	11.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.70	1141.56
	3/1/2011	7.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.11	1143.15
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	NS	NS NS	NS	NS	NS Ma	NS	NS	NG	NA
	3/28/2012 6/25/2012	NS	NS	NS	NS Wal	NS I could not be I	NS conted	NS	NG	NA
	9/6/2012		CPSTNIKSHARIST TANIHIN THE ST	□ ************************************		l could not be l				
MW-21	3/17/2010	41,3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.86	1144.60
	6/7/2010	42.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.12	1144.34
	8/30/2010	40.0	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	3.43 3.22	1143.03 1143.24
	11/17/2010 3/2/2011	35.9 33.9	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.50	1143.24
	5/31/2011	NS	NS	NS	NS	NS	NS	NS NS	NG	NA
	8/24/2011	37.5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.05	1143.41
	3728/2012	NS	NS	NS	NS	NS	NS	NS	2.10	1144.36
	6/25/2012	21.7	<1.00	<1.00	<1.00	<2.00	<1.00	<1,00	2.94	1143.52
	9/6/2012	42.1	<2.00 <1.00	<2.00 <1.00	<2.00 <1.00	<4.00 <2.00	<2.00 <1.00	<2,00 <1.00	3.79 5.09	1142.67 1141.37
	12/14/2012	10.8			постеджения положения и положен	converses sometimes, suggest	**************************************			THE PROPERTY OF THE PARTY OF TH
MW-22	-3/17/2010 6/7/2010	5.8 8.4	<1.00 <1.00	<1.00 <1.00	<1,00 <1.00	<3.00 <3.00	00.1> 00.1>	<2.00 <2.00	1.79 2.18	1143.08 1142.69
	8/30/2010	8,6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.60	1141.27
	11/17/2010	6.7	<1.00	<1,00	<1.00	<3.00	<1.00	<2.00	3.38	1141.49
	3/2/2011	6.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.42	1143.45
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	-8/24/2011	10.5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.04	1141.83
	-3/28/2012 6/25/2012	NS	NS	NS Wall not part o	NS   f quarterly sam	NS NS	NS	NS	2,11 2.81	1142.76 1142.06
	9/6/2012				of quarterly sam				3.43	1142.00
	12/14/2012				f quarterly sam				4.06	1140.81
			201 BOX 151 15 15 15 15 15 15 15 15 15 15 15 15		A SHOW WILLIAM STORY		N-0-MIN-LTHITTIIIMPTHIT	TINGS THE BEAUTINESS OF STREET	STEARY WEST STREET, ASSURED A STATES	EGLAXIBOAN BUT WELL STORY

		las,			Compound	District of the				
					Ethyl-	Xylenes				
Piczometer/Well	Date	MTBL	Benzene	Toluene	henzene	(Total)	Cumene	Naphthalene		
PADEP UARSHS MSCs		20	5 - 5	1,000	700	10,000	840	100	Depth-to-	Groundwater Elevation
MW-23	3/17/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.51	1144,65
	6/7/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1,00	<2.00	2.03	1145.13
	8/31/2010/	<1.00	<1.00	<1,00	<1.00	<3.00	<1.00	<2.00	4.63	1142.53
	11/17/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.90	1143.26
	3/2/2011 5/31/2011	<1.00 NS	<1,00 NS	<1.00 NS	<1.00 NS	<3.00 NS	<1.00 NS	<2.00 NS	2.02 NG	1145.14 NA
	8/24/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.93	1143,23
	3/28/2012	NS	NS	NS	NS	NS	NS	NS	2.80	1144.36
	6/25/2012				of quarterly san				4.57	1142.59
	9/6/2012				of quarterly san				5.37 5,99	1141.79
	12/14/2012			and the same party and	f quarterly san	4:1024m11m217.co.x2.100	EACH SHEET ONCOME SATURATED	-2.00	#20.5 X 20.44 Y 10.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54	THE RESERVE OF THE PARTY OF THE
MW-28	3/17/2010 6/8/2010	4,5 3.4	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	3.13 3.44	1146.94 1146.63
	8/30/2010	6.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	5.64	1144.43
	11/17/2010		<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4,46	1145,61
	(3/1/2011)	7.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.01	1147.06
	5/31/2011	3.4	NS	NS	NS	NS	NS	NS	4.82	NA NA
	8/24/2011	4.9 14.6	<1.00 NS	<1.00 NS	<1.00 NS	<3.00 NS	<1.00 NS	<2.00 NS	4.97 2.88	1145.10 1147.19
	6/25/2012 6/25/2012	14.0	IND		nitoring well co				2.00	1147.19
MW-29	3/17/2010	35.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2,00	2.61	1144,65
191 97-29	6/7/2010	39.7	<1.00	<00.1>	<1.00	<3.00	<1.00	<2.00	2.83	1144.43
	8/30/2010	39.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4,95	1142.31
	11/17/2010		<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.95	1143.31
	3/2/2011	9.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2,23	1145.03
	5/31/2011 8/24/2011	NS 37.1	NS <1.00	NS <1.00	NS <1.00	NS <3.00	NS <1.00	NS <2.00	NG 3.81	NA 1143.45
	3/28/2012	NS	NS	NS NS	NS	NS	NS	NS	2.71	1144,55
	6/25/2012	22.8	<1,00	<1.00	<1.00	<2.00	<1.00	<1.00	3.58	1143.68
	9/6/2012	25.0	<1.00	<1.00	<1.00	<2.00	<1.00	<1,00	4.58	1142.68
mentalista esta esta esta esta esta esta esta e	12/14/2012	3.13	<1.00	<1.00	<1,00	<2.00	<1.00	<1.00	5.77	1141.49
MW-30	3/18/2010	17.0	23.9	<1,00	14.5	12.2	1,9	2.5	2,23	1145.03
	6/7/2010 8/31/2010	20.1	17.9 <1.00	<1,00 <1,00	12,4 3.1	10,5 <3.00	1,9 <1.00	<2.00 <2.00	2.41 4.07	1144.85 1143.19
	11/17/2010	25.9	<1.00	<1.00 <1.00	1.8	<3.00	<1.00	<2.00	3.61	1143.65
	3/2/2011	22.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2,35	1144,91
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA NA
	3/28/2012 6/25/2012	NS 8.41	NS <1.00	NS <1.00	NS <1.00	NS <2.00	NS <1.00	NS <1.00	NG 3.31	NA. 1143.95
	9/6/2012	10.8	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.30	1142.96
	12/14/2012	4.08	<2.00	<2.00	<2.00	<4.00	<2,00	<2.00	5.91	1141.35
MW-31	3/17/2010	7.8	668	783	265	2,700	26.4	119	3,16	1147.07
	- 6/8/2010s	6.3	336	118	119	754	10.2	61.8	3.61	1146.62
	8/30/2010	8.0	18.8	1.1	10.5	34.1	1.3	3.3	5.73	1144.50
	11/17/2010 3/1/2011	6.7 4.8	60,5 9,2	<1.00 1.4	20.6 3.6	20.4 4,1	1.8 <1.00	4.3 <2.00	4.73 3.48	1145.50 1146.75
	5/31/2011	6,3	66.1	<1.00	20.0	22.1	2.3	2.1	4.74	1145.49
	8/24/2011	14.3	439	7.2	135	272	12	35.7	5.03	1145.20
	3/28/2012	16,2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.18	1147.05
services of organization	6/25/2012	and the State of the Late of t		Мо	nitoring well co	AllKi-min - William - Will	X -166, 0	Commence of the state of the st		
MW-32	5/28/2010	4,1	<1,00	<1.00	<1.00	<3.00	<1.00	<2.00	4.22	1145.58
	6/8/2010	2.8	<1.00	<1.00	<1.00	<3.00 <3.00	<1.00	<2.00 <2.00	3.21 5.16	1146,59 1144,64
	8/30/2010 11/17/2010	1.6 2.2	<1,00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00	<1.00 <1.00	<2.00 <2.00	3.16 4.64	1144.64
	3/1/2014	2.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.94	1146.86
	5/31/2011	2,6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.15	1145,65
	8/24/2011	2.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.58	1145,22
	3/28/2012	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.49	1147.31
	6/25/2012 9/6/2012	4.51 4.07	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<2.00 <2.00	<1.00 <1.00	<1.00 <1.00	4.51 5.51	1145,29 1144,29
	9/0/2012 12/14/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	5,65	1144.15
44-11-442-14	And the second second second	manuscript of the second of th				Zin 2 Marcina arasını				

Notes:

All results reported in ug/l.

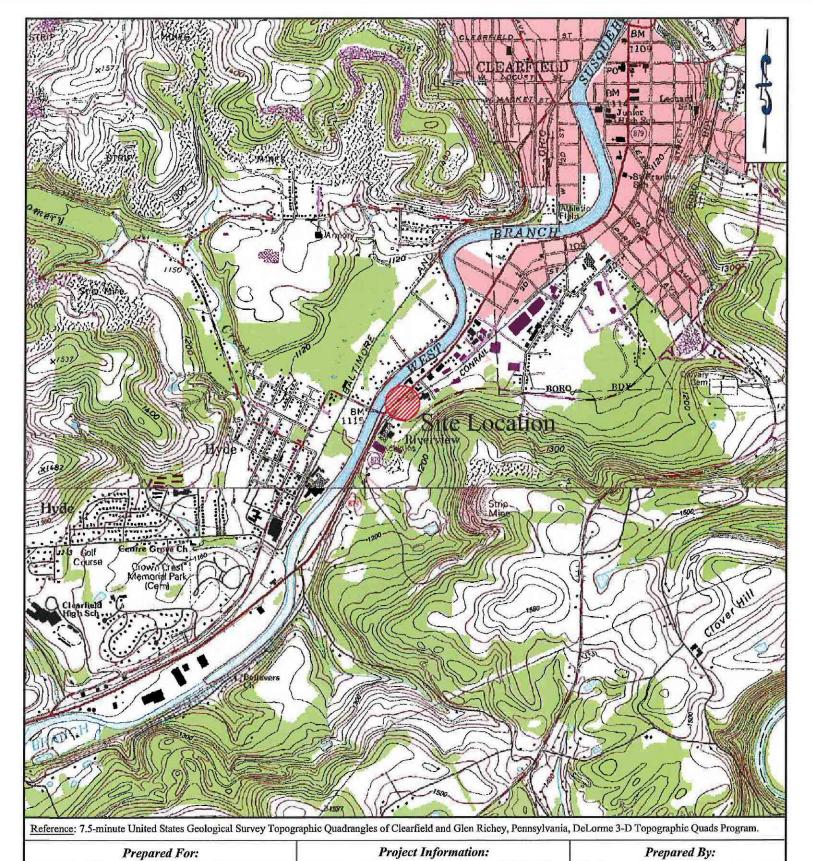
Bold values indicate levels above LRL.

Bold and shaded values indicate exceedance of UARSHS MSCs.

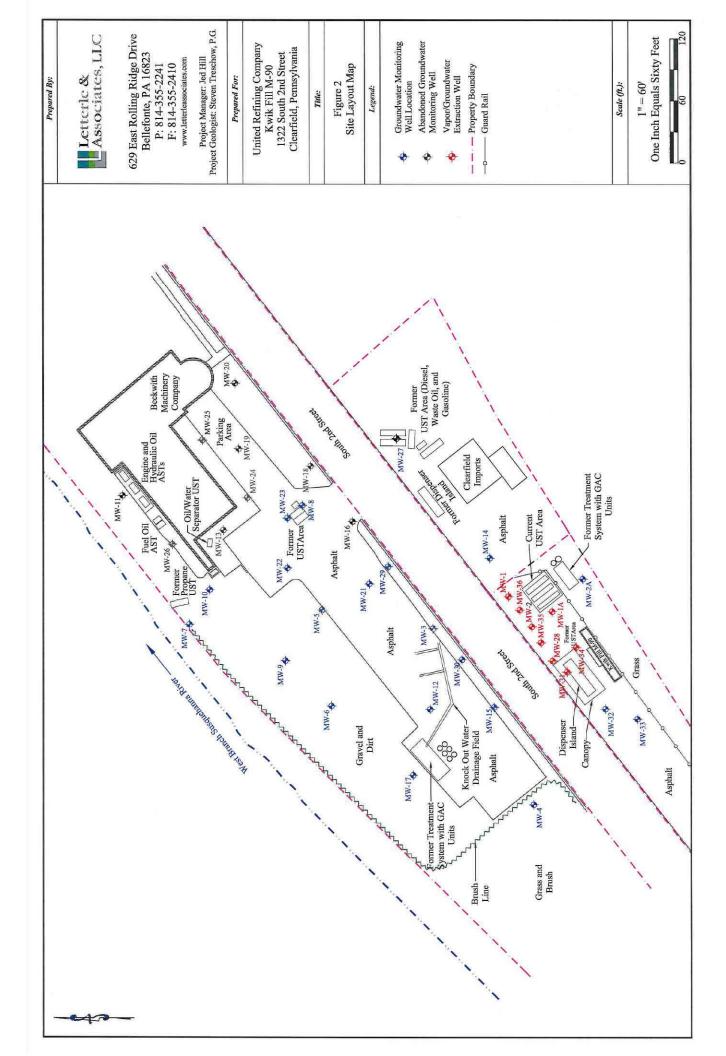
NG - Not Gauged. NA - Not Available. NS - Not Sampled.

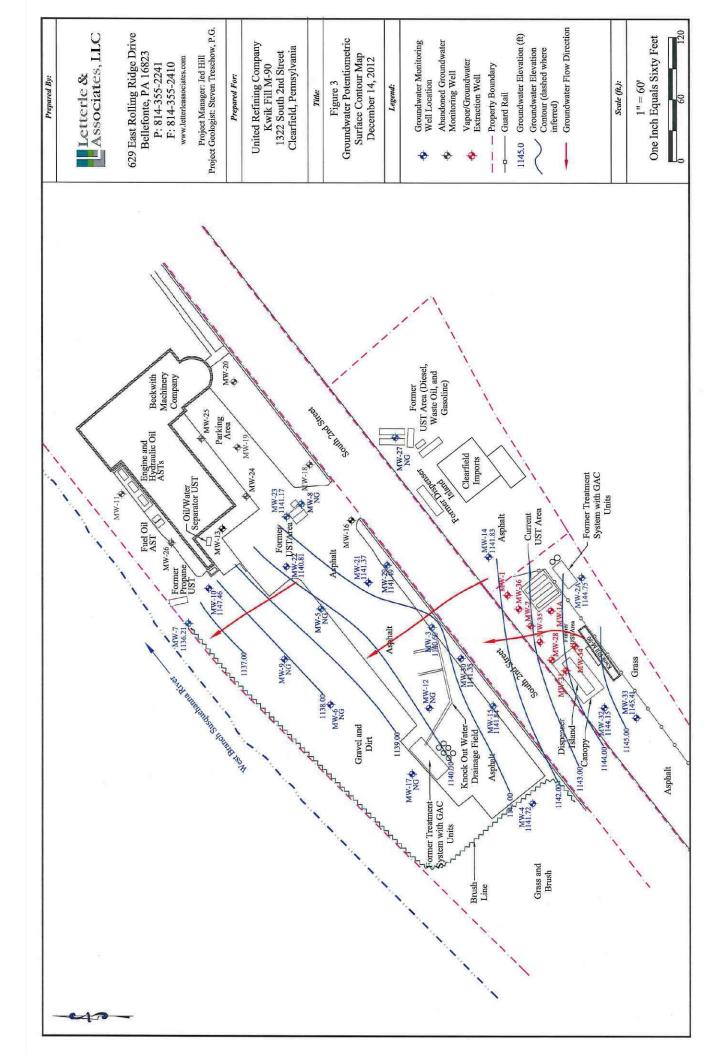
	7 - 2 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4	100			Compound					
Piezometer/Well	Date	мтвы	Benzene	Toluene	Ethyl- benzene	Xylenes (Total)	Cumene	Naphthalene		
PADEP UARSHS MSCs		20	5	1,000	700	10,000	840	100	Depth-to- Groundwater	Groundwater Elevation
MW-33	5/28/2010	<1,00	<1.00	<1.00	<1.00	<3.00	<1.00	< 2.00	4.41	1145.72
	6/8/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.36	1146.77
	8/30/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00_	<2.00	5,25	1144.88
	11/17/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	< 2.00	4.96	1145.17
	3/1/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.42	1146.71
	5/31/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.38	1145.75
	8/24/2011	<1.00	<1,00	<1.00	<1.00	<3.00	<1.00	<2.00	4.72	1145.41
	3/28/2012	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.70	1147.43
	6/25/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.66	1145.47
	9/6/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	5.70	1144.43
THE WORLD WINDOWS TO SERVE STATE OF THE SERVE STATE OF THE SERVE STATE STATE OF THE SERVE STATE STATE OF THE SERVE STATE STATE STATE OF THE SERVE STATE STAT	12/14/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.72	1145.41

# **FIGURES**



United Refining Company, Kwik Fill M-90 1322 South 2nd Street, Lawrence Township, Clearfield County, Pennsylvania PADEP Facility ID #17-14821	Project Manager: Jed Hill Project Geologist: Steven Treschow, P.G.	Letterle & Associates, LLC
Title:	Scale (feet):	629 East Rolling Ridge Drive Bellefonte, PA 16823
Figure 1	Scale: 1" = 2000'	P: 814-355-2241
Site Location Map	0 2000 4000	F: 814-355-2410 www.letterleassociates.com





# **APPENDICES**

# APPENDIX A

**Groundwater Analytical Laboratory Reports** 



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



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Letterle & Associates

629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

UR CLEARFIELD

Project Number: Collector:

[none]

Reported: 12/28/12 09:59

CLIENT

Number of Containers:

24

#### ANALYTICAL REPORT FOR SAMPLES

State Certifications: MD 275, WV 364

Sample ID	Laboratory ID	Matrix	Sample Type	Date Sampled	Date Received
MW-14	2L17019-01	Water	Grab	12/14/12 10:53	12/17/12 13:35
MW-2A	2L17019-02	Water	Grab	12/14/12 11:15	12/17/12 13:35
MW-33	2L17019-03	Water	Grab	12/14/12 11:29	12/17/12 13:35
MW-32	2L17019-04	Water	Grab	12/14/12 11:44	12/17/12 13:35
MW-4	2L17019-05	Water	Grab	12/14/12 12:02	12/17/12 13:35
MW-15	2L17019-06	Water	Grab	12/14/12 12:22	12/17/12 13:35
MW-10	2L17019-07	Water	Grab	12/14/12 12:34	12/17/12 13:35
MW-30	2L17019-08	Water	Grab	12/14/12 12:49	12/17/12 13:35
MW-3	2L17019-09	Water	Grab	12/14/12 13:02	12/17/12 13:35
MW-21	2L17019-10	Water	Grab	12/14/12 13:14	12/17/12 13:35
MW-29	2L17019-11	Water	Grab	12/14/12 13:25	12/17/12 13:35
MW-7	2L17019-12	Water	Grab	12/14/12 13:38	12/17/12 13:35

Fairway Laboratories, Inc.

Reviewed and Submitted by:

Michael P. Tyler Laboratory Director

Fairway Labs in Altoona, PA is a NELAP (National Environmental Laboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless otherwise stated on the analytical

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

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Letterle & Associates

Project:

UR CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector: CLIENT

[none]

24

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-14

**Date/Time Sampled:** 12/14/12 10:53

**Laboratory Sample ID:** 

2L17019-01 (Water/Grab)

							,	
					Date / Time		*	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
olatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 11:44	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 11:44	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/I	12/21/12 11:44	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 11:44	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 11:44	EPA 8260B	wlm	
Methyl tert-butyl ether	<1.00		1.00	ug/l	12/21/12 11:44	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 11:44	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene	A CONTRACTOR OF THE CONTRACTOR	91.7%	70-	130	12/21/12 11:44	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		92.2 %	70-	130	12/21/12 11:44	EPA 8260B	wlm	
Surrogate: Fluorobenzene		93.3 %	70-	130	12/21/12 11:44	EPA 8260B	wlm	



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State Certifications: MD 275, WV 364

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Project:

UR CLEARFIELD

629 East Rolling Ridge Drive

Project Number: none Reported:

Bellefonte PA, 16823

Collector:

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-2A

**Date/Time Sampled:** 12/14/12 11:15

CLIENT

24

Laboratory Sample ID:

2L17019-02 (Water/Grab)

					Date / Time		2 c	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EP.	A Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 12:22	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 12:22	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 12:22	EPA 8260B	wlm	
Xylenes (total)	< 2.00		2.00	ug/l	12/21/12 12:22	EPA 8260B	wini	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 12:22	EPA 8260B	wlm	
Methyl tert-butyl ether	<1,00		1.00	ug/l	12/21/12 12:22	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 12:22	EPA 8260B	wim	
Surrogate: 4-Bromofluorobenzene		97.9 %	70	130	12/21/12 12:22	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		87.9 %	70-	130	12/21/12 12:22	EPA 8260B	wlm	
Surrogate: Fluorobenzene		89.6%	70-	130	12/21/12 12:22	EPA 8260B	wlm	



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Project:

Collector:

UR CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

[none] CLIENT Reported:

Bellefonte PA, 16823

Project Manager:

Jed Hill

12/28/12 09:59

Number of Containers:

24

Client Sample ID: MW-33

**Date/Time Sampled:** 12/14/12 11:29

Laboratory Sample ID:

2L17019-03 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	*Analyst	Note
Volatile Organic Compounds by EP	A Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Xylenes (total)	< 2.00		2.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Methyl tert-butyl ether	<1.00		1.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		88.3 %	70-	130	12/21/12 13:00	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		86.5 %	70-	130	12/21/12 13:00	EPA 8260B	wlm	
Surrogate: Fluorobenzene		93.0 %	70-	130	12/21/12 13:00	EPA 8260B	włm	



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Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

UR CLEARFIELD

Project Number: [none]

Reported: 12/28/12 09:59

Collector: **CLIENT** 

Number of Containers:

Client Sample ID: MW-32

**Date/Time Sampled:** 12/14/12 11:44

Laboratory Sample ID:

2L17019-04 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/I	12/21/12 13:38	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 13:38	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 13:38	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 13:38	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 13:38	EPA 8260B	wlm	
Methyl tert-butyl ether	<1.00		1.00	ug/l	12/21/12 13:38	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 13:38	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		92.4%	70	130	12/21/12 13:38	EPA 8260B	wlm	11.1111
Surrogate: 1,2-Dichloroethane-d4		91.0%	70	130	12/21/12 13:38	EPA 8260B	wlm	
Surrogate: Fluorobenzene		93.6%	70	130	12/21/12 13:38	EPA 8260B	wlm	



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Project:

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Project Number:

[none]

Reported:

Bellefonte PA, 16823

Collector: CLIENT

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-4

**Date/Time Sampled:** 12/14/12 12:02

Laboratory Sample ID:

2L17019-05 (Water/Grab)

					Date / Time		*	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	A Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 14:16	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 14:16	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 14:16	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 14:16	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 14:16	EPA 8260B	wlm	
Methyl tert-butyl ether	<1.00		1.00	ug/l	12/21/12 14:16	EPA 8260B	wim	
Naphthalene	<1.00		1.00	ug/l	12/21/12 14:16	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene	AAAA AA	91.1%	70	130	12/21/12 14:16	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		93.6 %	70-	130	12/21/12 14:16	EPA 8260B	wlm	
Surrogate: Fluorobenzene		93.9 %	70-	130	12/21/12 14:16	EPA 8260B	wlm	



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Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

UR CLEARFIELD

Project Number:

none

Reported:

Collector: **CLIENT**  12/28/12 09:59

Number of Containers:

24

Client Sample ID: MW-15

**Date/Time Sampled:** 12/14/12 12:22

**Laboratory Sample ID:** 

2L17019-06 (Water/Grab)

					Date / Time		*	
Analyte	Result	MDL,	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Mathad 9260D							
Benzene	<1.00		1.00	ug/1	12/21/12 14:54	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 14:54	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 14:54	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 14:54	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 14:54	EPA 8260B	wlnı	
Methyl tert-butyl ether	2.23		1.00	ug/l	12/21/12 14:54	EPA 8260B	whn	
Naphthalene	<1.00		1.00	ug/l	12/21/12 14:54	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		89.8 %	70-	130	12/21/12 14:54	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		97.0 %	70-	130	12/21/12 14:54	EPA 8260B	wlm	
Surrogate: Fluorobenzene		96.2 %	70-	130	12/21/12 14:54	EPA 8260B	wlm	



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Project:

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629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

[none] CLIENT

24

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-10

**Date/Time Sampled:** 12/14/12 12:34

**Laboratory Sample ID:** 

2L17019-07 (Water/Grab)

Analyta	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Analyte	Kesun	WHAL	IXL	Omis	Allatyzou	Menod	Anatyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 15:33	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 15:33	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 15;33	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 15:33	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 15:33	EPA 8260B	wlm	
Methyl tert-butyl ether	5.56		1.00	ug/I	12/21/12 15:33	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 15:33	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		93.0 %	70-1	130	12/21/12 15:33	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		92.0 %	70	30	12/21/12 15:33	EPA 8260B	wlm	
Surrogate: Fluorobenzene		95.1 %	70-	30	12/21/12 15:33	EPA 8260B	wlm	



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629 East Rolling Ridge Drive

Client Sample ID: MW-30

Bellefonte PA, 16823

Project Manager:

Jed Hill

UR CLEARFIELD Project:

Project Number: [none]

> Collector: **CLIENT**

Reported: 12/28/12 09:59

Number of Containers: 24

**Date/Time Sampled:** 12/14/12 12:49

Laboratory Sample ID:

2L17019-08 (Water/Grab)

			V		Date / Time		**	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EP.	A Method 8260B							
Benzene	<2.00		2.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	
Toluene	<2.00		2.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	VC
Ethylbenzene	<2.00		2.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	
Xylenes (total)	<4.00		4.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	
Isopropylbenzene	<2.00		2.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	
Methyl tert-butyl ether	4.08		2.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	
Naphthalene	<2.00		2.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		87.3 %	70-	130	12/21/12 17:03	EPA 8260B	wim	
Surrogate: 1,2-Dichloroethane-d4		104 %	70-	130	12/21/12 17:03	EPA 8260B	wlm	
Surrogate: Fluorobenzene		105 %	70-	130	12/21/12 17:03	EPA 8260B	wlm	



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Project:

UR CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

CLIENT

[none]

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

24

Client Sample ID: MW-3

.....

**Date/Time Sampled:** 12/14/12 13:02

Laboratory Sample ID:

2L17019-09 (Water/Grab)

					Date / Time		*	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 16:11	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 16:11	EPA 8260B	wlm	
Ethylbenzene	<1.00		1,00	ug/I	12/21/12 16:11	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 16:11	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 16:11	EPA 8260B	wlm	
Methyl tert-butyl ether	18.4		1.00	ug/l	12/21/12 16:11	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 16:11	EPA 8260B	wlm	
Surrogate: 4-Bromoffuorobenzene		92.0 %	70	130	12/21/12 16:11	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		90.5 %	70-	130	12/21/12 16:11	EPA 8260B	wlm.	
Surrogate: Fluorobenzene		95.5 %	70-	130	12/21/12 16:11	EPA 8260B	wlm	



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629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager: Jed Hill Project: UR CLEARFIELD

Project Number: [none] Collector:

Reported:

**CLIENT** 

12/28/12 09:59

Number of Containers: 24

Client Sample ID: MW-21

**Date/Time Sampled:** 12/14/12 13:14

Laboratory Sample ID:

2L17019-10 (Water/Grab)

•					D ( (77)			
Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	*Analyst	Note
Volatile Organic Compounds by EPA	Method 8260R							
Benzene	<1.00		1.00	ug/l	12/21/12 16:49	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 16:49	EPA 8260B	włm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 16:49	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 16:49	EPA 8260B	wlm	
Isopropylbenzene	<1,00		1.00	ug/l	12/21/12 16:49	EPA 8260B	wlm	
Methyl tert-butyl ether	10.8		1.00	ug/l	12/21/12 16:49	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/Ī	12/21/12 16:49	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		86.1 %	70-	130	12/21/12 16:49	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		96.6%	70-	130	12/21/12 16:49	EPA 8260B	wlm	
Surrogate: Fluorobenzene		98.1 %	70-	130	12/21/12 16:49	EPA 8260B	wlm	



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State Certifications: MD 275, WV 364

Letterle & Associates

Project:

UR CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

[none] **CLIENT** 

24

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-29

**Date/Time Sampled:** 12/14/12 13:25

**Laboratory Sample ID:** 

2L17019-11 (Water/Grab)

					Date / Time		*	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Methyl tert-butyl ether	3,13		1.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		86,8 %	70	130	12/21/12 17:27	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		94.7%	70-	130	12/21/12 17:27	EPA 8260B	wlm	
Surrogate: Fluorobenzene		97.7%	70-	130	12/21/12 17:27	EPA 8260B	wlm	



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State Certifications: MD 275, WV 364

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Project:

Collector:

UR CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

[none]

Reported:

Bellefonte PA, 16823

**CLIENT** 

24

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-7

**Date/Time Sampled:** 12/14/12 13:38

Laboratory Sample ID:

2L17019-12 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	*Analyst	Note
Volatile Organic Compounds by EPA	A Method 8260B							
Benzene	84.4		2.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	
Toluene	14.8		2.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	VC
Ethylbenzene	89.5		2.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	
Xylenes (total)	43.6		4.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	
Isopropylbenzene	29.0		2.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	
Methyl tert-butyl ether	<2.00		2.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	
Naphthalene	65.4		2.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		96.2 %	70	130	12/21/12 17:43	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		94.5 %	70	130	12/21/12 17:43	EPA 8260B	wlm	
Surrogate: Fluorobenzene		101%	70	130	12/21/12 17:43	EPA 8260B	wlm	



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629 East Rolling Ridge Drive Project Number: [none]

Bellefonte PA, 16823 Collector: CLIENT 12/28/12 09:59

Project Manager: Jed Hill Number of Containers: 24

#### Notes

VC Check standard was outside the QC range. Data accepted based on acceptable LCS.

#### **Definitions**

Surrogate values must be within the indicated range, otherwise the results are considered to be estimated.

Reporting limits are adjusted accordingly when samples are analyzed at a dilution due to the matrix.

The following analyses are to be performed immediately upon sampling: pH, sulfite, chlorine residual, dissolved oxygen and ferrous iron. The date and time reported reflect the time the samples were analyzed at the laboratory.

If the solid sample weight for VOC analysis does not fall within the 3.5-6.5 gram range, the results are considered estimated values.

- P indicates analysis performed by Fairway Laboratories, Inc. at the Pennsdale location. This location is PaDEP Chapter 252 certified.
- Represents "less than" indicates that the result was less than reporting limit.
- MDL Method Detection Limit is the lowest or minimum level that provides 99% confidence level that the analyte is detected. Any reported result values that are less than the MDL are considered estimated values.
- RL Reporting Limit is the lowest or minimum level at which the analyte can be quantified.

Fairway Laboratories, Inc.

Fairway Labs in Altoona, PA is a NELAP (National Environmental Laboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless otherwise stated on the analytical report.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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### APPENDIX B

Remediation System Start-Up Engineering Evaluation

### REMEDIATION SYSTEM START-UP ENGINEERING EVALUATION

PADEP Facility ID #17-14821
PAUSTIF Claim #2008-0034(M)
Kwik Fill #M-90
1322 South 2<sup>nd</sup> Street
Clearfield, Lawrence Township,
Clearfield County, PA 16830

Prepared for:

United Refining Company of Pennsylvania
15 Bradley Street
P.O. Box 688
Warren, PA 16365

Prepared by:

Letterle & Associates, LLC 2859 Oxford Boulevard, Suite 110 Allison Park, Pennsylvania 15101

> Kenneth W. Dudash, P.E. Senior Project Engineer

> > December 2012

"By affixing my seal to this document, I am certifying that the information is true and correct to the best of my knowledge. I further certify I am licensed to practice in the Commonwealth of Pennsylvania and that it is within my professional expertise to verify the correctness of the information."

Kenneth W. Dudash, P.E. (signed and sealed this day (December 21, 2012))



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DPE System Groundwater Results DPE System Vapor Recovery Results

### 1.0 INTRODUCTION

As per the approved Pennsylvania Department of Environmental Protection (PADEP) Remedial Action Plan (RAP), a remedial system was installed at the United Refining Kwik Fill #M-90 Clearfield site (Kwik Fill M-90) during September 2012. The remedial system utilizes Dual Phase Extraction (DPE) technology to extract subsurface vapor and groundwater. The system was started on October 30, 2012 with a remediation system engineering evaluation performed at the Kwik Fill M-90 on November 27, 2012. This engineering evaluation was performed to document site conditions during the operation of the remedial system and to evaluate the performance and effectiveness of the remediation system, and to determine if any changes or modifications are necessary. The remediation system was checked for overall operating condition, hydraulic influence zone, pneumatic radius of influence (ROI), and groundwater/soil vapor extraction rates. This evaluation also compares the current remediation system operation to the original system design and recommends future system enhancements, if required.

### 2.0 SITE HISTORY

Kleinfelder East, Inc. (Kleinfelder) performed dual-phase extraction (DPE) pilot testing at the Kwik Fill M-90 in September 2010. Pilot test activities were conducted in order to assess the applicability of groundwater extraction in conjunction with soil vapor extraction (SVE) to remediate hydrocarbon-impacted soil and groundwater at the site. The pilot test involved the simultaneous recovery of soil vapor and groundwater from a designated extraction well (MW-31), while monitoring water table drawdown and induced vacuum in surrounding monitor wells.

During the testing, an average of 150 inches of water (in H2O) (11 inches of mercury (in.Hg)) was applied to the test well, resulting in an extracted flow rate of 25 standard cubic feet per minute (scfm). The average aquifer yield was approximately 2 gallons per minute (gpm) with a groundwater capture zone of 134 to 190 feet. A pneumatic ROI could not be calculated due to a lack of vacuum response in the surrounding wells but the closest well was 17 feet from MW-31. VOC concentrations were detected at low levels in the vapor stream during the tests.

The pilot test results indicated that a DPE system would be an effective and aggressive remediation strategy to reduce adsorbed and dissolved phase petroleum hydrocarbons in subsurface soil and groundwater. However, additional shallow wells in the source area were needed to shorten the time for active remediation.

The results from the pilot test depict an accurate representation of the site's hydraulic and pneumatic properties. Based on previous investigations by others, the geology of the site generally consists of unconsolidated materials (primarily silty clay) to depths of 10 to 17 feet. Unconsolidated materials are underlain by bedrock consisting of primarily sandstone and shale (Pottsville Group). Groundwater is located within the unconsolidated materials at depths ranging from one to seven feet below ground surface (bgs) across the site and adjoining properties. Groundwater typically flows to the northwest towards the West Branch of the Susquehanna River.

The geology of the site with the confining silty clay overburden provides for a small pneumatic ROI and hydraulic influence zone in the shallow areas to be treated with the DPE. The fractured bedrock of the deep aquifer provides for a very large hydraulic influence zone for the pneumatic pumps to be effective.

A DPE system was installed at the site and was activated on October 30, 2012. The purpose of the remediation system is to achieve attainment of the PADEP SHS for a residential used aquifer at the on-site point of compliance (POC), and off-site monitoring wells identified in the Site Characterization Report.

### 3.0 REMEDIATION SYSTEM AS-BUILT

The remediation system installation was completed at the site in September 2012. The system was activated on October 30, 2012. The following section details the system construction.

### 3.1 Remediation System Construction

The remediation system utilizes DPE technology with two high vacuum rotary claw pumps and six pneumatic pumps to remove vapors and groundwater from the subsurface. Groundwater can be extracted by the pneumatic pumps from six recovery wells (MW-1, MW-1A, MW-2, MW-28, MW-31 and MW-34) and by the rotary claw pumps from MW-35 and MW-36. The claw pumps apply vacuum and provide vapor recovery in all the recovery wells. Following extraction, groundwater and soil vapor are routed through an air/water separator (AWS). Groundwater from the pneumatic pumps is combined in an equalization tank. After equalization or separation, the groundwater is pumped through six sediment filters (connected in parallel/series) and then treated with four liquid phase granular activated carbon (GAC) units connected in a parallel/series configuration. The treated groundwater is discharged to a sanitary sewer drain southwest of the existing building site for treatment by the local sanitary authority.

The extracted vapor is passed through a heat exchanger to cool the temperature to below 100 degrees Fahrenheit and then treated with two 600-pound vapor phase GAC units connected in series to remove hydrocarbons from the vapor stream.

### 3.2 Remediation System Piping and Equipment

The following subsurface piping is used to extract soil vapor and groundwater from the site:

- MW-1, MW-1A, MW-2, MW-28, MW-31, and MW-34 through MW-36 are 4-inch diameter poly vinyl chloride (PVC) recovery wells. MW-1 is constructed with 11 feet of slotted screen from 5 to 16 feet bgs. MW-1A is constructed with 10 feet of screen from 5 to 15 feet bgs. MW-2 is constructed with 4-inch screen from 5 to 18.5 feet bgs. MW-28 has a screen from 5 to 21.5 feet bgs. MW-31 has 14 feet of screen from 5 to 19 feet bgs and MW-34 through MW-36 was constructed with screen from 5 to 22 feet bgs.
- Each recovery well is protected by 3' x 3' concrete pads with 18-inch diameter manholes.
- Vapor and groundwater are extracted through 1-inch diameter drop tubes extended to depths of 10 feet bgs in MW-35, and 10 feet bgs in MW-36. Extracted vapor and groundwater are conveyed through 2-inch diameter schedule 40 PVC subsurface piping installed from the system trailer to each recovery well.
- Each recovery well with drop tubes is connected to the subsurface extraction piping with pitless adapters installed on the recovery well riser piping at approximately 3 feet bgs. The pneumatic

groundwater pumps in MW-1, MW-1A, MW-2, MW-28, MW-31, and MW-34 are installed with the pump inlets at 1 foot from the bottom of the well.

• Treated groundwater is discharged via a 2 inch PVC pipe under a local sanitary permit.

The following remediation equipment is currently used to extract and treat vapor and groundwater from the site:

- Two 10-hp Busch Rotary Claw Pumps 230-volt three-phase (Model MM-1252-AV)
- One 80-gallon Air/Water Separator (MS80)
- One 250-gallon Equalization Tank
- One 2-hp transfer pump (Goulds Pumps Model NPE)
- One 3-hp transfer pump (Goulds Pumps Model NPE)
- Six 20" Big Blue® cartridge filter canisters
- Six pneumatic pumps (QED AP-4 Short)
- One 5.0 hp air compressor
- One 1.0 hp heat exchanger
- Four 300-pound liquid phase GAC units
- Two 600-pound vapor phase GAC units
- One explosion-proof heater and exhaust fan
- Electrical supply is 120/240 three phase, 200-amp service.

A Trenching Diagram and an as-built Piping and Instrumentation Diagram (P&ID) are included as Figures 1 and 2, respectively.

### 4.0 CURRENT REMEDIATION SYSTEM OPERATIONS

The DPE remedial system was activated on October 30, 2012 and the system was in operation upon arrival at the site on November 26, 2012. The system was shutdown at the end of the day to allow for return of groundwater levels to static conditions prior to starting the evaluation on November 27, 2012. All remediation system equipment was observed to be in good working condition prior to shutdown.

All clear schedule 40 PVC sight-tubes on the influent manifold showed signs of only minor scaling to the system piping. Since remediation system startup, a total of 142,565 gallons of groundwater have been extracted at an average of 4.71 gpm over the time period. All equipment safety alarms have been tested and are in good working order.

### 5.0 REMEDIATION SYSTEM DESIGN EVALUATION

### 5.1 DPE Engineering Evaluation – November 27, 2012

Upon arrival at the site on November 27, 2012, a pneumatic ROI and hydraulic influence zone test was initiated upon restart of the system. The remedial system had been in continuous operation for more than 7 days prior to the test. During initial system startup during the week of October 30, 2012, the system was adjusted to extract from wells MW-1, MW-28, MW-31 and MW-34 only. The number of recovery wells used for system operation was limited due to the volume of groundwater that exists at the

site and the high flow rate that can be obtained. If all the recovery wells are utilized together, the groundwater extraction flow rate would exceed treatment equipment flow rate specifications.

The system was adjusted to provide a vacuum of 12 inches of mercury (inHg) (99 scfm) during the test. Photo ionization detection (PID) reading of the vapor was measured at 124.9 parts per million volume (ppmv). Data obtained from monitoring the vacuum influence at the observation wells was used to obtain an approximate ROI. The pneumatic ROI is the transient pressure distribution created by the vacuum that results in an area in which the air flow rate through the soil decreases to the point in which the contaminants will not volatize. The ROI is measured in resulting inches of water (in H<sub>2</sub>O) vacuum. Generally, a level of 0.1 in H<sub>2</sub>O is the industry accepted standard extent that volatilization is limited due to a lack of subsurface vapor flow, and the extent of the ROI can be calculated.

Since MW-35 and MW-36 were not utilized for extraction, these wells were included in the monitoring during the evaluation. Vacuum levels of greater than 0.1 inches of water were found in adjacent wells MW-32, MW-35, and MW-36. All other monitor wells exhibited no vacuum response. The groundwater levels in all the monitor wells were below the well screen which allowed for a vacuum response if produced in these wells. The observed influence vacuum resulted in an average calculated pneumatic ROI of approximately 47 feet to the southwest but does not extend to MW-14 (40 feet to the northeast). The areas southeast of the existing tank field and north across South 2<sup>nd</sup> Street do not appear to be influenced by the vacuum of the DPE remediation system. Hydrocarbon content was recorded in the field with the PID during the evaluation.

Groundwater levels were recorded at all monitoring wells and were compared to static levels. From the difference in the observed groundwater levels, it was apparent that drawdown was occurring at a distance of approximately 140 feet to the northeast across South 2<sup>nd</sup> Street to MW-21. Drawdown was also recorded to the southwest to MW-33 at 0.1 feet. MW-27, which is located 180 feet east of the nearest recovery well MW-1, did not exhibit any drawdown. A hydraulic zone of influence map is included as Figure 3. Table 1 shows the groundwater and vacuum influence readings collected during the DPE evaluation. Chart 1 shows the calculated pneumatic ROI from the operating recovery wells during the DPE system evaluation. Chart 2 shows the calculated hydraulic zone of influence.

Hydrocarbon recovery was measured in the field with a PID at 116.8 ppm-v. This resulted in a calculated removal rate of 1.04 lbs per day. A summary of vapor recovery system hydrocarbon removal calculations is included as **Table 2**.

Since system startup, the remediation system has operated at an average of 81% runtime for the groundwater pumps and 56% for the vacuum pumps. The lower runtime for the vacuum pumps is due to an over amping problem which causes the claw pumps to shut down. The problems were diagnosed by a close examination of the effluent piping which contains multiple valves and piping diameters that caused excessive exhaust pressure which resulted in the over amping of the units. All exhaust piping and valves were replaced with larger diameter sizes from the rotary claw units to the heat exchanger.

The telemetry unit was connected during the initial operation of the system and has responded during alarm conditions. With only MW-1, MW-28, MW-31, and MW-34 DPE recovery wells in operation; the petroleum-impacted shallow area near the tank field is being affected by the system operation (based on groundwater drawdown and vacuum response produced by the wells during the evaluation). Vacuum short circuiting is apparent into the tank field with the LRP operating at <5 in. Hg with MW-1 in full operation. This results in a low availability of vacuum pump capacity to apply to the other DPE recovery

wells in operation. The applied vacuum was valved off to MW-1 to increase the vacuum of the system. Areas beyond MW-21 to the north/northeast due not appear to be influenced by the DPE system.

The DPE remediation system recovery wells are producing a hydraulic influence zone similar to the size calculated from the site pilot test data and predicted in the RAP. The pneumatic ROI appears to be larger than predicated in the pilot test study. The remediation system was designed to be able to establish a hydraulic influence zone and pneumatic ROI to encompass the entire onsite shallow impacted plume and extend down gradient to influence the plume. When the pneumatic ROI is overlaid over the contaminant plume map, results show that the majority of the shallow contaminated area on-site is affected by the current DPE remediation system.

### 5.2 Key Criteria of System Feasibility

Key criteria and quantified ranges of values that were expected during the system testing in order to ensure a technology is a technically feasible application and for the system to operate as planned and meet the clean-up schedule included the following:

• If the maximum attainable groundwater extraction rate realized during system operation is below 2 gpm DPE technology would be deemed infeasible;

The remedial system has averaged greater than 4 gpm since the system startup and averaged 3.6 gpm during the evaluation.

• The groundwater capture zone will be defined as a decrease in the elevation of groundwater of at least 0.1 feet at a distance from the extraction point of a least 134 feet for two of the observation points at varied directions from the test well;

The calculated hydraulic zone of influence from the evaluation results is 145 feet and includes the majority of the plume area north of the site across South 2<sup>nd</sup> Street.

• If the maximum attainable vacuum realized during the extraction is below 11 in. Hg, the specified vacuum equipment would be deemed infeasible and other vacuum equipment such as a regenerative blower will be the utilized equipment;

Although several of the recovery wells exhibited low vacuum yields during the evaluation, the majority of the site geology requires the applied vacuum to be above 11 in. Hg which requires the use of the existing vacuum equipment.

• The pneumatic ROI as defined by an observed vacuum of 0.1 inches of water after stabilization of the readings will be observed at a minimum distance of 15 feet from the extraction point for two observation points located at varied directions from the test well;

The calculated pneumatic ROI was 25 feet in a measured response at the site in a northeast and southwest direction from the operating recovery wells.

• The VOC recovery rate in the extracted vapor will be greater than 0.5 pounds per day, as calculated from the analytical results of the extracted vapor or field measured levels, and the attainable flow rate measured during the interval of the test.

The VOC recovery rate as calculated from the initial analytical results of the extracted vapor is 0.25 lbs/day which is below the 0.5 lbs/day criteria however, when calculated by the field measured levels, the system has been extracting 7.49 lbs/day (Table 2).

Due to the location of the site next to the West Branch of the Susquehanna River and the high water table, the available extracted groundwater rate is greater than 10 gpm for the initial 24 hours of system operation. Once the site has been dewatered, the recovery rate slows to less than 1.0 gpm per recovery well. It appears from the evaluation data that the remedial extraction equipment may have been

overdesigned and can provide the hydraulic influence with fewer recovery wells in operation. If the remedial system has been down for longer than 24 hours, the groundwater extraction rate during restart is greater than the design flow. This flow rate provides a groundwater pump air usage that exceeds the capacity of the air compressor. The actual groundwater flow rate is higher than the anticipated design flow rate which has overwhelmed the treatment units and transfer pump shutting down the system. Utilizing a lower number of recovery wells has allowed the system to remain in operation.

The extracted groundwater flow rate decreases with the dewatering of the site and allows the air compressor to operate at an optimum 30% duty cycle after approximately 24 hours of operation. The high groundwater levels at the site also inhibit vapor recovery due to the lack of available open soil pore space. Once the site is dewatered, the groundwater table falls and opens areas of the soil that was not available for vapor extraction without the dewatering of the site.

### 6.0 REMEDIATION SYSTEM UPGRADES

The over amping of the rotary claw SVE pumps has been eliminated by increasing the size of the exhaust piping. Heat tape and insulation have been installed on all hoses and piping that is exposed under the trailer to prevent freezing. Sediment filter changes will initially occur during every O&M event in order to minimize system downtime due to clogged sediment filters. The four 400-pound liquid-phase GAC pressure vessels will continue to be connected in a parallel/series arrangement to treat the groundwater. The existing vapor carbon treatment system will remain with two 600-pound vapor-phase GAC units connected in a series configuration.

### 7.0 REMEDIATION SYSTEM PERMITTING

The recovered groundwater is treated and discharged directly to the sanitary pipe under a permit issued by the Clearfield Municipal Authority (CMA). Under the terms of the permit, analytical reports and totalizer readings are reported in Discharge Monitoring Reports (DMR) on a monthly basis to the CMA.

Petroleum impacted soil and groundwater remediation systems have been listed as exempt from the Plan Approval/Operating permit requirements by PADEP, Division of Air Quality. The remediation system is operated under the exemption requirements.

### 8.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this system engineering evaluation, the remediation system at the Kwik Fill M-90 site is operating with influence results similar to the original design and currently, the influence of the DPE system is large enough to cover the majority of the down gradient contaminated plume area. The DPE system has been placed into operation and extraction from the recovery wells will continue. To allow for adequate vacuum levels with the addition of the VEGE system, DPE recovery wells MW-1 and MW-28, MW-31, and MW-34 will be continuously operated through 2013. MW-1A, MW-2, MW-35 and MW-36 will remain shutdown to increase the vacuum of the DPE system and to prevent overwhelming the groundwater treatment system with excessive amounts of extracted groundwater. The system will be serviced twice a month for regularly scheduled preventative maintenance to ensure operational success. Future evaluations will include measurements of vacuum at the top of each

Kwik Fill M-90 United Refining—Engineering Evaluation—December 2012

recovery well, groundwater recovery rates from each DPE well, and water table drawdown after an extended period of system operation.

### **TABLES**

### TABLE 1: DPE SYSTEM EVALUATION EVENT SUMMARY

SITE: M-90 Clearfield Kwik Fill

**DATE:** 11/20/2012

**VEGE EXTRACTION WELLS:** MW-1, MW-28, MW-31, MW-34

### GROUNDWATER GAUGING DATA ELAPSED TIME (IN HRS.)

	Initial						Total
Well	DTW	10;10	11:10	12:10	13:10	14:10	Drawdown
MW-2	5,15	5,34	5.63	5.78	5.86	6.2	1.05
MW-3	6.47	6,6	6.71	6.79	6.82	6.95	0.48
MW-4	5.04	5.05	5.05	5.06	5.06	5.06	0.02
MW-7	7.73	7.75	7.75	7.73	7.73	7.74	0.01
MW-8	6.4	6.4	6.41	6.48	6.51	6.46	0.06
MW-10	3.00	3.00	3.00	3.00	3.00	3.00	0.00
MW-14	8.12	8.51	8.81	8.98	9.1	9.31	1.19
MW-15	6.37	6.47	6.54	6.60	6.63	6.79	0.42
MW-21	5.72	5.74	5.81	5.81	5.86	5.9	0.18
MW-22	4.84	4.86	4.88	4.87	4.88	4.85	0.01
MW-23	6.31	6.35	6.25	6.25	6.25	6,24	-0.07
MW-27	6.7	6.67	6.69	6.67	6.66	6.67	-0.03
MW-29	6.47	6.51	6.55	6.57	6.58	6.64	0.17
MW-30	6.71	6.81	6.93	7.02	7.03	7.22	0.51
MW-32	7.51	7.65	7,93	8.16	8.3	8.5	0.99
MW-33	7.11	7.12	7.12	7.12	7.17	7.21	0.10
MW-35	9.45	11.88	12.46	12.66	12.81	14.55	5.10
MW-36	7.85	10.06	10,51	10.66	10.80	11.17	3.32
Totalizer	141695.4	142109.4	142283		142565.3		3.62 gpm

### SOIL VAPOR GAUGING DATA ELAPSED TIME (IN HRS.)

Well	1:00	2:00	3:00	4:00	5:00	
MW-2A				0	0	
MW-14				0	0	
MW-32				0.11	0.12	
MW-35				>10	>10	
MW-36				0.62	0.64	
PID				124.9	116.8	
Blower VAC						
(i.e., applied)				15	12	
Well VAC						

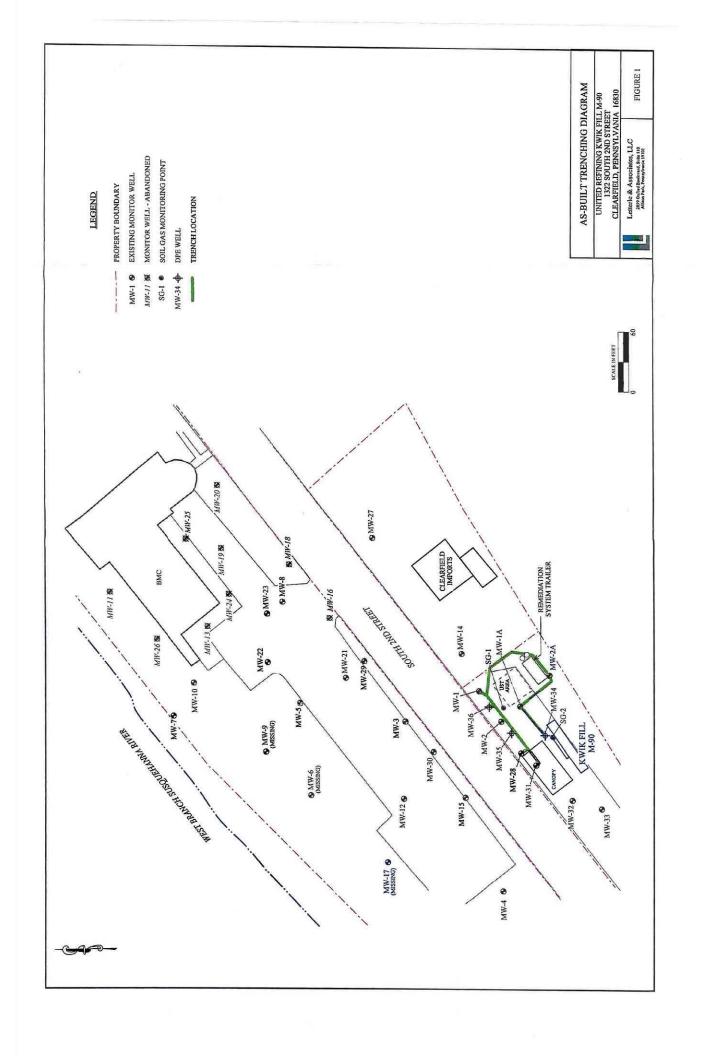
# TABLE 2 VAPOR RECOVERY SYSTEM HYDROCARBON REMOVAL CALCULATIONS (Field Quantification)

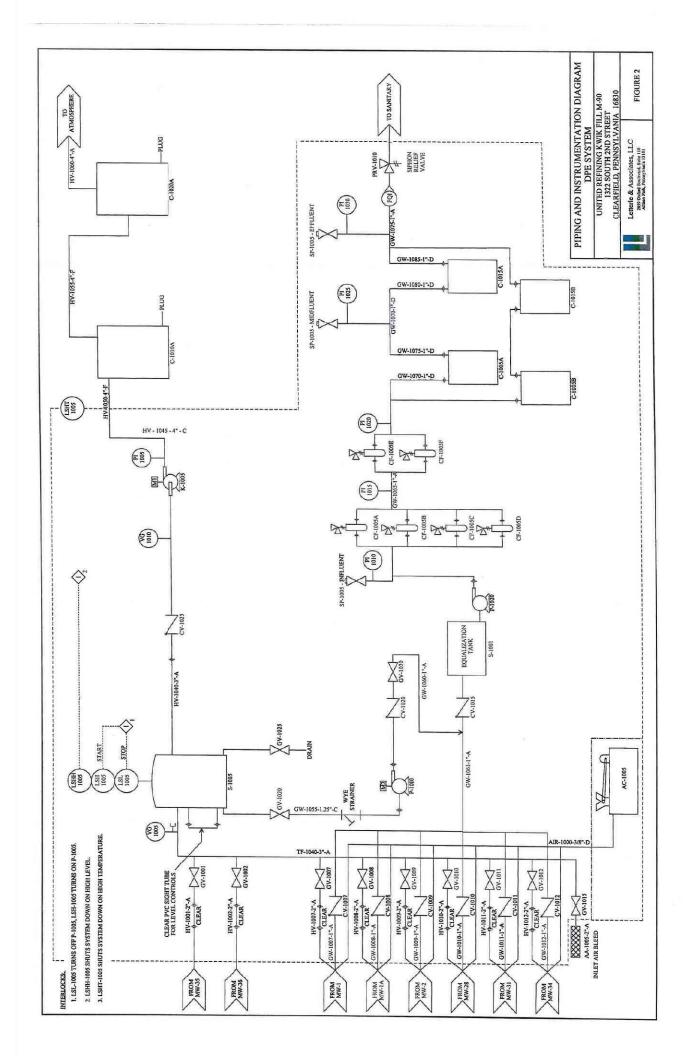
United Refining--Kwik Fill M-90 1322 South 2nd Street Clearfield, Pennsylvania 16830

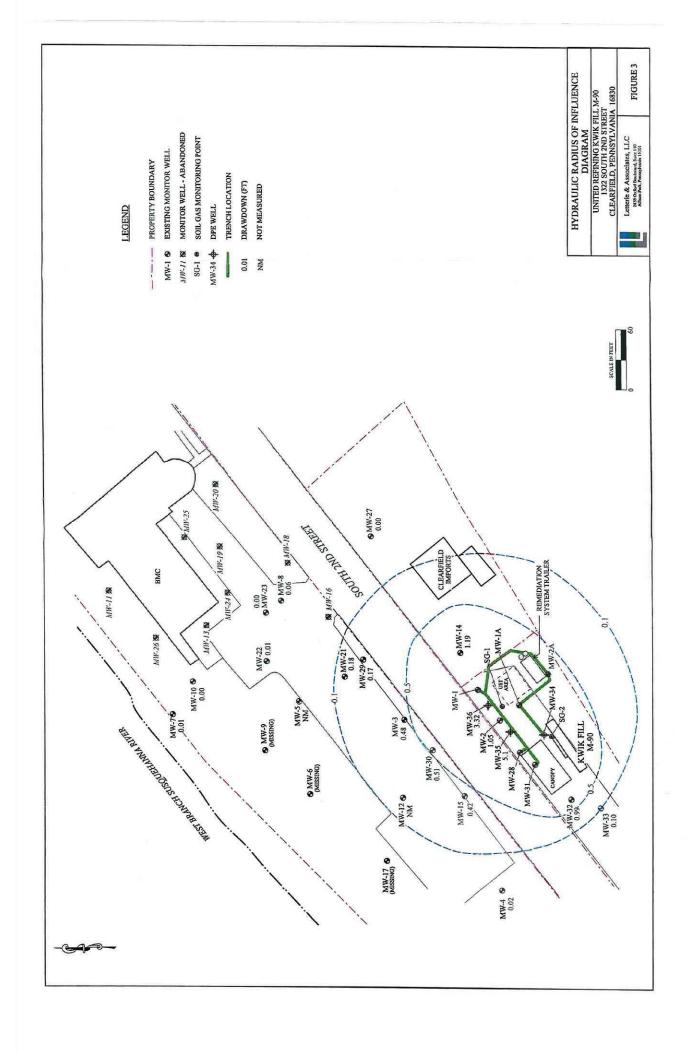
Sample Location	Date	Extracted Vapor rate (scfm)	PID Hydrocarbon concentration (ppm)	Hydrocarbon Mass Removed (lb/day)	Hydrocarbon Mass Removed To Date (lb)
Influent	10/04/12	158	126	1.79	1.79
	10/17/2012	158	227	3.22	43.69
	11/7/2012	158	75.3	1.07	37.07
	11/20/2012	66	116.8	1.04	77.97

Notes:

### **FIGURES**







### **CHARTS**

04 Pneumatic ROI = 47 feet CHART 1: DPE System Pneumatic ROI ٥\$ Clearfield, Pennsylvania November 20, 2012 United Refining M-90 0Þ 30 50 01 15.00 14.00 13.00 12.00 9.00 8.00 7.00 6.00 5.00 4.00 3.00 2.00 1.00 0.00 11.00 10.00

Response Vacuum( inches of water)

Distance from Nearest Recovery Well (feet)

-a-Applied Vacuum (12 inches of Hg)

CHART 2: DPE System Hydraulic Zone of Influence December 20, 2012

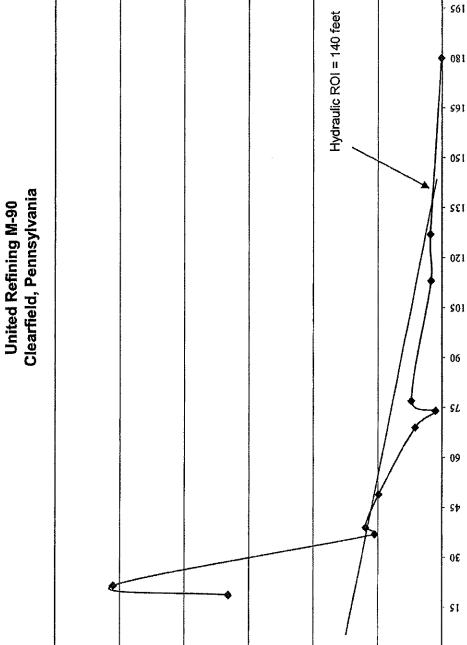
6.00

5.00

4.00

3.00

Groudwater Drawdown (ft)



Distance From Nearest Recovery Well (ft)

0.00 → 0

1.00

2.00

225

917





10/17/2012

Mr. Jed Hill Letterle and Associates, LLC 2859 Oxford Blvd, Suite 110 Allison Park, PA 15101

Dear Jed:

Enclosed are the sample data report, chain of custody record and quality control data for the sample(s) received on October 8, 2012 for your project; 277 - United Clearfield.

Please give me a call if you have questions or I can be of further assistance. Thank you for using Vaportech Services.

Sincerely,

David J. Masdea

Enclosure:

### Vaportech Service, Inc

LET38-2655

Letterle and Associates, LLC Project: 277 - United Clearfield

### **CONCENTRATIONS IN PPMV**

COMPOUND	EFFLUENT	BETWEEN	INFLUENT	PQL
MTBE	ND	ND	ND	0.07
BENZENE	ND	ND	1.84	0.07
TOLUENE	ND	ND	0.66	0.07
ETHYL BENZENE	ND	ND	0.27	0.07
M&P XYLENE	ND	ND	1.29	0.07
O-XYLENE	ND	ND	0.13	0.07
CUMENE	ND	ND	ND	0.07
NAPHTHALENE	ND	ND	ND	0.07
FILE NAME	V73A,581.BND	V73A,582,BND	V73Á.583,BNÖ	
DATE SAMPLED	10/04/12	10/04/12	10/04/12	
DATE RECEIVED	10/08/12	10/08/12	10/08/12	
DATE ANALYZED	10/11/12	10/11/12	10/11/12	

PQL - denotes lower 'Practical Quantitation Limit'

ND - 'Not Detected' at or above the lower practical quantitation limit

Reviewed by:

### Vaportech Service, Inc

### Letterle and Associates, LLC **Quality Control** Laboratory Project(s): 2655, 2663, 2664, 2665

### **CONCENTRATIONS IN PPMV**

### **CONTINUING CALIBRATION CHECK**

LABORATORY BLANK RESULTS

STANDARDS: STD 21V R4 PA-BTEX-H

FILE NAME: V73A.571.BND V73A.575.BND DATE ANALYZED: 10/10/12 10/10/12

BLANK:

N2 IN VIAL

**PRACTICAL** 

FILE NAME: V73A.570.BND

DATE ANALYZED: 10/10/12

						QUANTITATION
	KNOWN	RESULT	PERCENT		BLANK	LIMIT
COMPOUND	(PPMV)	(PPMV)	DIFFERENCE	COMPOUND	(PPMV):	(PPMV)
MTBE	50.33	48.00	4.63	MTBE	ND	0.07
BENZENE	1.25	1.26	0.64	BENZENE	ND	0.07
TOLUENE	1.06	1.10	3.30	TOLUENE	ND	0.07
ETHYL BENZENE	0.92	0.96	4.24	ETHYL BENZENE	ND	0.07
M&P XYLENE	1.84	1.94	5.65	M&P XYLENE	ND	0.07
O-XYLENE	0.92	0.96	4.24	O-XYLENE	ND	0.07
CUMENE	36.91	34.62	6.21	CUMENE	ND	0.07
NAPHTHALENE	34.61	32.68	5.58	NAPHTHALENE	ND	0.07

ND - 'Not Detected' at or above the lower practical quantitation limit

### LET 38-2655

## CHAIN-OF-CUSTODY RECORD

Services, Inc.

1158 Pittsburgh Road • Suite 201 • Valencia, PA 16059 Tel: 724-898-2622 • Fax: 724-898-2633 Enter letters in Requested Analysis columns below.

BTEX

Light Hydrocarbons

lysis Options:

Permanent Gases

Methane

1.1-DCE, 1,1-DCA, Methylene Chloride, trans-1,2-DCE, cis-1,2-DCE, Chloroform 1,1,1-TCA, Carbon Tetrachloride, Trichloroethylene (TCB), Tetrachloroethylene (PCB)

Chlorinated Hydrocarbons

624 Compound List

Light Hydrocarbons: Methane, Ethane, Ethylene, Propane, Propylene, iso-Butane, n-Butane

Methane, Ethane, Ethylene

Hydrogen

Carbon Dioxide, Oxygen, Nitrogen, Methane, Carbon Monoxide

Permanent Gases:
BTEX:
C5-C10:
Chlorinated HC:

Sampler's signature:

Benzene, Toluene, Ethyl Benzene, m & p.Xylene, o.Xylene Pentane, Hexane, Heptane, Octane, Nonane, Decane

TPH (C4 - C12 range)

口

G BTEX & C5 - C10

Company Name: Lettertof Associates, LLC	
iddress: @ 625 E. Paling Ridsk Drive	Ana
City: Buly hante State: PA Zip: (1823	₹
K11	A
roj. Location: United Charfeld	υ
roj. Number: #277	А
hone #: 814-355-2410	国

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PINK COPY: Submitter

YELLOW COPY : Laboratory

WHITE COPY : Laboratory to return.



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

www.falrwaylaboratories.com

Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

CLIENT

[none]

10/25/12 12:32

Project Manager:

Jed Hill

Number of Containers:

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Sample Type	Date Sampled	Date Received
INFLUENT	2311059-01	Water	Grab	10/04/12 11:00	10/11/12 13:45
BETWEEN	2J11059-02	Water	Grab	10/04/12 11:05	10/11/12 13:45
EFFLUENT	2J11059-03	Water	Grab	10/04/12 11:10	10/11/12 13:45

Fairway Laboratories, Inc.

Reviewed and Submitted by:

my ret

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Michael P. Tyler Laboratory Director

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Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number: [none]

Reported:

Bellefonte PA, 16823

Collector: CLIENT

10/25/12 12:32

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: INFLUENT

Date: I line ou

Date/Time Sampled: 10/04/12 11:00

Laboratory Sample ID:

2J11059-01 (Water/Grab)

Analyte	Result	MDL.	RL	Units	Date / Time Analyzed	Method	Analyst	Note
olatile Organic Compounds by EP	A Method 8260B							
Benzene	<2.00		2.00	ug/l	10/15/12 22:29	EPA 8260B	mlf	
Toluene	<2.00		2.00	ug/l	10/15/12 22:29	EPA 8260B	mlf	
Ethylbenzene	<2.00		2.00	ug/l	10/15/12 22:29	EPA 8260B	mlf	
Xylenes (total)	<4.00		4.00	ug/l	10/15/12 22:29	EPA 8260B	mlf	
Isopropylbenzene	<2.00		2.00	ug/l	10/15/12 22:29	EPA 8260B	mlf	
Methyl tert-butyl ether	20.1		2.00	ug/l	10/15/12 22:29	EPA 8260B	mlf	
Naphthalene	<2,00		2,00	ug/l	10/15/12 22:29	EPA 8260B	mlf	VC
Surrogate: 4-Bromofluorobenzene		110%	70	130	10/15/12 22:29	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		114%	70	130	10/15/12 22:29	EPA 8260B	mlf	
Surrogate: Fluorobenzene		77.7%	70-	130	10/15/12 22:29	EPA 8260B	mlf	



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Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

[none]

Reported:

Bellefonte PA, 16823

Collector:

CLIENT

10/25/12 12:32

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: BETWEEN

Date/Time Sampled: 10/04/12 11:05

Laboratory Sample ID:

2J11059-02 (Water/Grab)

	• • •							
Analyte	Result	MDĹ	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EPA	A Method 8260B						,	
Benzene	₹1.00		1,00	ug/l	10/17/12 17:38	EPA 8260B	mlf	
Toluene	<1,00		1.00	ug/l	10/17/12 17:38	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	10/17/12 17:38	EPA 8260B	ınlf	
Xylenes (total)	-2,00		2.00	ug/I	10/17/12 17:38	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	10/17/12 17:38	EPA 8260B	mlf	
Methyl tert-butyl ether	<1.00		00.1	ug/l	10/17/12 17:38	EPA 8260B	mlf	VH
Naphthalene	00.1>		1.00	ug/l	10/17/12 17:38	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		109%	70-	130	10/17/12 17:38	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		107%	70-	130	10/17/12 17:38	EPA 8260B	mlf	
Surrogate: Fluorobenzene		77.7%	70-	130	10/17/12 17:38	EPA 8260B	mif	

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Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number: [none] Reported:

Bellefonte PA, 16823

Collector: **CLIENT** 

7

10/25/12 12:32

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: EFFLUENT

Date/Time Sampled:

10/04/12 11:10

Laboratory Sample ID:

2J11059-03 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B						····	
Benzene	<1.00		1.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	
Xylenes (total)	<2,00		2.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	
Isopropylbenzene	-:1,00		1.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	
Methyl tert-butyl ether	<1.00		1.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	VH
Naphthalene	<1.00		1.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		107 %	70-,	130	10/17/12 18:16	EPA 8260B	mlf`	
Surrogate: 1,2-Dichloroethane-d4		105 %	70-	30	10/17/12 18:16	EPA 8260B	mlf	
Surrogate: Fluorobenzene		76.9 %	70-	130	10/17/12 18:16	EPA 8260B	mlf	
Conventional Chemistry Parameters I	y SM/EPA Me	thods			VII.		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Oil & Grease	<6.30		6.30	mg/l	10/23/12 10:39	EPA 1664A	edb	



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Letterle & Associates

Project:

Collector:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

CLIENT

none

10/25/12 12:32

Project Manager:

Jed Hill

Number of Containers: 7

Notes

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Check standard was outside the QC range. Data accepted based on acceptable LCS.

٧H

LCS value was outside the QC range. Data accepted based on acceptable check standard.

### **Definitions**

Surrogate values must be within the indicated range, otherwise the results are considered to be estimated.

Reporting limits are adjusted accordingly when samples are analyzed at a dilution due to the matrix.

The following analyses are to be performed immediately upon sampling: pH, sulfite, chlorine residual, dissolved oxygen and ferrous iron. The date and time reported reflect the time the samples were analyzed at the laboratory.

If the solid sample weight for VOC analysis does not fall within the 3.5-6.5 gram range, the results are considered estimated values.

- P indicates analysis performed by Fairway Laboratories, Inc. at the Pennsdale location. This location is PaDEP Chapter 252 certified.
- Represents "less than" indicates that the result was less than reporting limit.

MDL

Method Detection Limit - is the lowest or minimum level that provides 99% confidence level that the analyte is detected. Any reported result values that are less than the MDL are considered estimated values.

RL

Reporting Limit - is the lowest or minimum level at which the analyte can be quantified.

Fairway Laboratories, Inc.

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The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Pol. Box 1925	Relinquished by:	Relinquished by:	Relinquiented by:	Sampled by		Efflycat	Between	HARWINE	Sample Description/Location	TAT: Normal Rush Cl  Rush TAT subject to pre-approval and surcharge  Date Required: / /	Umi to	# 814-355-2241 # 814-355-2241	न्युद्धर १२०१३	CHAIN OF CLSTODY/ REQUEST FOR ANALYSIS Please print, See back of COC for instructions/terms and conditions.
P.O. Box 1925 Introora, P.A 16602  Reportable to Beniromental Laboratory  (814) 946-4305  Reportable to Beniromental Laboratory  (814) 946-8791  Reportable to Beniromental Laboratory  Yes Composite  Start Start End End End Pline  Bate Time Date Time  Received by:  Date Time  Received by:  Date Time  Received by:  PAIRWAY LABORATORIES  Phone: (570) 494-6380  Analyses Requested  Analys						<b>X</b>	_	×		GRAB	cld	\$23	S'NC	
FAIRWAY LABORATORIES  Phone: (570) 494-6380  Reportable to  PALDEP?  Yes O  One  One  One  One  One  One  One  O									Start Time			Sample Temp:		P.O. Box 1925 Altoona, PA 16607 Phone: (814) 946-43 Fax: (814) 946-87
Pennsdale, PA 17756 Phone: (570) 494-6380 ai Laboratory  Analyses Requested  Remarks	S		& Helse	CNV			•	වි	End Time So	d		Yes PWSID#		2 8
Pennsdale, PA 17756 Phone: (570) 494-6380 ai Laboratory  Analyses Requested  Remarks									Oth	ier		O	Die to	LABORA O O
mnsdale, PA 17756 one: (570) 494-6380  quested  Remarks	3. E	me	me DS			· ·	<b>X</b>	<b>×</b>						TORIES Environmental
	The state of the s	And the state of t							Junga and Andrea				alyses Requested	Pennsdale, PA 17 Phone: (570) 494 Laboratory
				Remarks					Bottle Type/Comments			FedEx UPS	LAB USE ONLY	4 17756 C-11 494-6380 Page

COC/Labels on bottles agree? ✓ □* Correct containers for all the analysis requested? ✓ □* Matrix:	gree?	10*0	orrect c	ontainers	for all ti	ne analy	sis reque	sted?	* Matrix: 1	100 to 10	\	
COC#				NII	nber and	Туре о	Number and Type of BOTTLES	ES			Comments	
	Poly Poly	Poly HZSO4	Poly HNO3	Amber HZSO4	Amber Non-	Poly	(Head	Other	Properly Preserved	Bacti		
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	peratur			By Whom:	тош:		l		Will Resample Provided Infor	ample Information	nation ()	
o missing information:	4.						   246  -	алагийн аменен амен	Client Contact:	ontact:	Client Contact:Date:	
* Comments:												

Chain of Custody Receiving Document

This is a date sensitive document and may not be current after October 5, 2012.



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

www.fairwaylaboratories.com

Letterle & Associates

Project:

UNITED CLEARFIELD

[none]

TW

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

11/26/12 11:41

Project Manager:

Jed Hill

Number of Containers:

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Sániple Type	Date Sampled	Date Received
INFLUENT	2K08082-01	Water	Grab	11/07/12 09:40	11/08/12 13:30
BETWEEN	2K08082-02	Water	Grab	11/07/12 09:45	11/08/12 13:30
EFFLUENT	2K08082-03	Water	Grab	11/07/12 09:50	11/08/12 13:30

Fairway Laboratories, Inc.

Reviewed and Submitted by:

MAT

Michael P. Tyler Laboratory Director Fairway Lobs in Altoonu, PA is a NELAP (National Environmental Loboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless otherwise stated on the analytical report.

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Page 1 of 7



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Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

Project Manager:

Jed Hill

Number of Containers:

11/26/12 11:41

Client Sample ID: INFLUENT

[none]

TW

Date/Time Sampled: 11/07/12 09:40

Laboratory Sample ID:

2K08082-01 (Water/Grab)

Analyte	Result	MIDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
					·······			
Volatile Organic Compounds by El	PA Method 8260B							
Benzene	<2.00		2.00	ug/l	11/09/12 07:08	EPA 8260B	mlf	
Toluene	<2.00		2.00	ug/l	11/09/12 07:08	EPA 8260B	mlf	
Ethylbenzene	<2.00		2.00	ug/l	11/09/12 07:08	EPA 8260B	mlf	
Xylenes (total)	<4.00		4.00	ug/l	11/09/12 07:08	EPA 8260B	mlf	
Isopropylbenzene	<2.00		2.00	ug/l	11/09/12 07:08	EPA 8260B	mlf	
Mothyl tert-butyl ether	17.6		2,00	ug/l	11/09/12 07:08	EPA 8260B	ınlf	
Naphthalene	~2.00		2.00	ng/l	11/09/12 07:08	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		98.9 %	70	130	11/09/12 07:08	EPA 8260B	mlf	***************************************
Surrogate: 1,2-Dichloroethane-d4		107%	70	130	11/09/12 07:08	EPA 8260B	mlf	
Surrogate: Fluorobenzene		96.1 %	70-	130	11/09/12 07:08	EPA 8260B	mif	



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State Certifications: MD 275, WV 364

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Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

Project Manager:

11/26/12 11:41

Jed Hill

7 Number of Containers:

Client Sample ID: BETWEEN

Date/Time Sampled: 11/07/12 09:45

[none]

TW

Laboratory Sample ID:

2K08082-02 (Water/Grab)

					Date / Time		*	
Analyte	Result	MDL	RI.	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EP/	Method 8260B							
Bonzene	<1.00		1.00	ug/l	11/09/12 08:57	EPA 8260B	mlf	
Toluene	~1,00		1.00	ug/l	11/09/12 08:57	EPA 8260B	mlf	
Ethylbenzene	~:1.00		1,00	ug/l	11/09/12 08:57	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	11/09/12 08:57	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1,00	ug/I	11/09/12 08:57	EPA 8260B	mlf	
Methyl tert-butyl ether	<1.00		1.00	ug/l	11/09/12 08:57	EPA 8260B	mlf	
Naphthalene	≪1,00		1.00	ug/l	11/09/12 08:57	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene	9	1.1 %	70-1	30	11/09/12 08:57	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4	4	108 %	70-1	30	11/09/12 08:57	EPA 8260B	mlf	
Surrogate: Fluorobenzene		106 %	70-1	30	11/09/12 08:57	EPA 8260B	mlf	



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Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

Project Manager:

Jed Hill

Number of Containers:

11/26/12 11:41

Client Sample ID: EFFLUENT

Date/Time Sampled: 11/07/12 09:50

[none]

TW

Laboratory Sample ID:

2K08082-03 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EPA	Method 82601	3					.,	
Benzene	<1.00		1.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Methyl tert-butyl ether	≪1.00		1.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Naphthalene	<1.00		1.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		90.3 %	70-	30	11/09/12 09:35	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		106%	70-	130	11/09/12 09:35	EPA 8260B	mlf	
Surrogate: Fluorobenzene		102%	70	130	11/09/12 09:35	EPA 8260B	mlf	
Conventional Chemistry Parameters	by SM/EPA M	ethods						
Oil & Grease	<b>∹6.30</b>		6.30	mg/l	11/19/12 16:00	EPA 1664A	rhb	

Fairway Laboratories, Inc.

Fairway Labs in Altaona, PA is a NELAP (National Environmental Laboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless otherwise stated on the analytical report.

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State Certifications: MD 275, WV 364

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Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Number of Containers:

[none]

Reported:

Bellefonte PA, 16823

Project Manager:

Jed Hill

Collector: TV

TW

11/26/12 11:41

Definitions

Surrogate values must be within the indicated range, otherwise the results are considered to be estimated.

Reporting limits are adjusted accordingly when samples are analyzed at a dilution due to the matrix.

The following analyses are to be performed immediately upon sampling: pH, sulfite, chlorine residual, dissolved oxygen and ferrous iron. The date and time reported reflect the time the samples were analyzed at the laboratory.

If the solid sample weight for VOC analysis does not fall within the 3.5-6.5 gram range, the results are considered estimated values.

- P indicates analysis performed by Fairway Laboratories, Inc. at the Pennsdale location. This location is PaDEP Chapter 252 certified.
- Represents "less than" indicates that the result was less than reporting limit.

MDL Method Detection Limit - is the lowest or minimum level that provides 99% confidence level that the analyte is detected. Any reported result values that are less than the MDL are considered estimated values.

RL Reporting Limit - is the lowest or minimum level at which the analyte can be quantified.

Fairway Laboratories, Inc.

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Relinquished by:    Received by:	Relinquished by:	Relinquished by	Sampled by		7.4+14625	153	Influent	Sample Description/Location	_ E	Phone #: 8 14-355-2241  Fax #: 8 14-355-2410  Project Name: United (Luc	Contact: Jed Hill	thertup liss	CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS Please print. See back of COC for instructions/terms and conditions.
Constraint Inc	11.11. 1330 Date Time	7.2	1.00		7	<	\ \ 		GRAB Composite	10 24 24 24 24 24 24 24 24 24 24 24 24 24	W 85.12	ks	
Received by:	Received by:	Received by:	10 Reserved by					Start Start Date Time	Composite Start		Received on ice? Sample Temp:		2019 9th Ave. P.O. Box 1925 Altoona, PA 16602 Phone: (814) 946-4306 Fax: (814) 946-8791
	7.**	+1	ate		V 950	2,840	11-7-12 0940	End End Date Time	-or- Composite End	GRAB	# PWSID#		91 06
	Date	11-8-11 21-8-11	11-8-12		 	<u>۷</u> ×	⁄	Oth	er	Matrix	PADEP? Yes Cl D#	Reportable to	FAIRWAY LABORATORIES
3:	Time	-					<u> </u>	<b>†</b>	1998 Unl	liadia	d bas		RATORIE
With Octains TITE Course Florer Day	#		Remarks						Oil P L			Analyses Requested	89 Kristi Rd Pennsdale, PA 17756 Phone: (570) 494-6380 Environmental Laboratory
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	* Matrix: WATCH	+	* Correct containers for all the analysis requested?	the anal	rs for all	ontaine	orrect o			COC/Labels on bottles agree?	ည
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] * or In cool down process? [] *	Acceptable? ↓ □ * or In		* Sample Temperature when arrived at Lab:	when arr	rature v	Тетре	Sample	`\ *	-!3   <u>-</u>	Received at Lab on ICE?	Re
Lab # 2408082 - CL		Client Centeur	-	Sample Temperature:	ple Tem	Sam	14.12	Ī.		Date/Time of this check:     4	Da
	of	Chain of Custody Receiving Document Page	tody Red	of Cus	Chain			<b>!</b>	B,	Receiver:	7
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Chain of Custody Receiving Document

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89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

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Letterle & Associates

629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

UNITED CLEARFIELD

Project Number:

[none]

Reported:

Collector: TW

12/14/12 10:12

Number of Containers:

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix _	Sample Type	Date Sampled	Date Received
INFLUENT	2L04066-01	Water	Grab	12/03/12 15:25	12/04/12 14:30
BETWEEN	2L04066-02	Water	Grab	12/03/12 15:27	12/04/12 14:30
EFFLUENT	2L04066-03	Water	Grab	12/03/12 15:30	12/04/12 14:30

Fairway Laboratories, Inc.

Reviewed and Submitted by:

THAT

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State Certifications: MD 275, WV 364

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Letterle & Associates

629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

Collector:

UNITED CLEARFIELD

Project Number: [none]

CLIENT

Reported:

12/14/12 10:12

7 Number of Containers:

Client Sample ID: INFLUENT

Date/Time Sampled:

12/03/12 15:25

Laboratory Sample ID:

2L04066-01 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<2.00		2,00	ug/l	12/11/12 02:49	EPA 8260B	wlm	
Toluene	<2.00		2.00	ug/l	12/11/12 02:49	EPA 8260B	whn	
Ethylbenzene	<2.00		2.00	ug/l	12/11/12 02:49	EPA 8260B	wlm	
Xylenes (total)	<4.00		4.00	ug/l	12/11/12 02:49	EPA 8260B	whn	
Isopropylbenzene	<2.00		2.00	ug/l	12/11/12 02;49	EPA 8260B	wlm	
Methyl tert-butyl ether	12.5		2.00	ug/l	12/11/12 02:49	EPA 8260B	wlm	
Naphthalene	<2.00		2.00	ug/l	12/11/12 02:49	EPA 8260B	wlm	VC
Surrogate: 4-Bromofluorobenzene	24.0	92.4 %	70-	130	12/11/12 02:49	EPA 8260B	yylm	
Surrogate: 1,2-Dichloroethane-d4		113%	70-	130	12/11/12 02:49	EPA 8260B	wlm	
Surrogate: Fluorobenzene		106 %	70-	130	12/11/12 02:49	EPA 8260B	wlm	



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State Certifications: MD 275, WV 364

Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

12/14/12 10:12

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: BETWEEN

Date/Time Sampled: 12/03/12 15:27

[none]

CLIENT

Laboratory Sample ID:

2L04066-02 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
							***************************************	
Volatile Organic Compounds by EPA						777 £ 07 647	10	OD VO
Benzene	<1,00		1,00	ug/l	12/06/12 11:55	EPA 8260B	mlf	QB, VC
Toluene	<1.00		1.00	ug/l	12/06/12 11:55	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	12/06/12 11:55	EPA 8260B	mlf	
Xylenes (total)	<2.00		2,00	ug/l	12/06/12 11:55	EPA 8260B	mlf	
Isopropylbenzene	<00,0		1,00	ug/l	12/06/12 11:55	EPA 8260B	mlf	
Methyl tert-butyl other	1,85		1,00	ug/l	12/06/12 11:55	EPA 8260B	mlf	
Naphthalene	<1.00		1,00	ug/l	12/06/12 11:55	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		86.8 %	70-	130	12/06/12 11:55	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		173%	70	130	12/06/12 11:55	EPA 8260B	mlf	QF
Surrogate: Fluorobenzene		140 %	70-	130	12/06/12 11:55	EPA 8260B	mlf	QF

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State Certifications: MD 275, WV 364

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Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

[none]

Reported:

Bellefonte PA, 16823

Collector: CLIENT 12/14/12 10:12

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: EFFLUENT

Date/Time Sampled: 12/03/12 15:30

Laboratory Sample ID:

2L04066-03 (Water/Grab)

					Date / Time		*	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	√:1.00		1.00	ug/l	12/06/12 14:46	EPA 8260B	mlf	
Toluene	<b>∹1.00</b>		1.00	ug/l	12/06/12 14:46	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	12/06/12 14:46	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	12/06/12 14:46	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	12/06/12 14:46	EPA 8260B	mlf	
Methyl tert-butyl ether	<1.00		1.00	ug/l	12/06/12 14:46	EPA 8260B	mlf	
Naphthalene	<1.00		1.00	ug/l	12/06/12 14:46	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		88,8 %	70-1	30	12/06/12 14:46	EPA 8260B	mlf	**************************************
Surrogate: 1,2-Dichloroethane-d4		169%	70-1	30	12/06/12 14:46	EPA 8260B	mlf	QF
Surrogate: Fluorobenzene		144%	70-1	30	12/06/12 14:46	EPA 8260B	mlf	QF
Conventional Chemistry Parameters	by SM/EPA Met	hods						
Oil & Grease	<6.30		6,30	mg/l	12/13/12 14:15	EPA 1664A	edb	

Pairway Laboratories, Inc.

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89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684

Number of Containers:



State Certifications: MD 275, WV 364

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Letterle & Associates

629 East Rolling Ridge Drive

Bellesonte PA, 16823

Project Manager;

QB

Jed Hill

Project:

UNITED CLEARFIELD

Project Number: [none]

CLIENT

Reported:

Collector: 7 12/14/12 10:12

Notes

The spike recovery was outside acceptance limits for the MS and/or MSD due to sample matrix interferences. The batch

was accepted based on acceptable CCV recovery.

QF Surrogate recovery out of range due to possible matrix interference.

VC Check standard was outside the QC range. Data accepted based on acceptable LCS,

#### **Definitions**

Surrogate values must be within the indicated range, otherwise the results are considered to be estimated.

Reporting limits are adjusted accordingly when samples are analyzed at a dilution due to the matrix.

The following analyses are to be performed immediately upon sampling; pH, sulfite, chlorine residual, dissolved oxygen and ferrous iron. The date and time reported reflect the time the samples were analyzed at the laboratory.

If the solid sample weight for VOC analysis does not fall within the 3.5-6.5 gram range, the results are considered estimated values.

P indicates analysis performed by Fairway Laboratories, Inc. at the Pennsdale location. This location is PaDEP Chapter 252 certified.

Represents "less than" - indicates that the result was less than reporting limit.

MDL Method Detection Limit - is the lowest or minimum level that provides 99% confidence level that the analyte is detected. Any

reported result values that are less than the MDL are considered estimated values.

RL Reporting Limit - is the lowest or minimum level at which the analyte can be quantified.

Fairway Laboratories, Inc.

Fairway Lahs in Altoona, PA is a NELAP (National Environmental Laboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless atherwise stated on the analytical report.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety,

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REMEDIAL ACTION PROGRESS REPORT

3rd Quarter 2012

PADEP Facility ID #17-14821 PAUSTIF Claim #2008-0034(M) Kwik Fill #M-90

1322 South 2<sup>nd</sup> Street Clearfield, Lawrence Township, Clearfield County, PA 16830

Prepared for:

United Refining Company of Pennsylvania

15 Bradley Street P.O. Box 688 Warren, PA 16365

Prepared by:

Letterle & Associates, LLC 629 East Rolling Ridge Drive

Bellefonte, Pennsylvania 16823

Steven James Treschow, P.G. Professional Geologist

STEVEN JAMES TRESCHO

**GEOLOGIST** 

Froject Manager

October 2012

"By affixing my seal to this document, I am certifying that the information is true and correct to the best of my knowledge. I further certify I am licensed to practice in the Commonwealth of Pennsylvania and that it is within my professional expertise to verify the correctness of the information."

Steven James Treschow, P.G. (signed and sealed this day (October 15, 2012))

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- Appendix A Site Photographs and Well Abandonment Forms
- Appendix B Well Logs
- Appendix C Groundwater Analytical Laboratory Reports

#### GENERAL INFORMATION

Client Contact:

Scott Wonsettler, P.G.

Letterle Project Manager:

Jed Hill

Regulatory Contact:

Scott Ferguson, P.G.

PADEP Facility ID #:

17-14821

PAUSTIF Claim #:

2008-0034 (M)

Number of Wells:

14 monitoring wells (on-site wells MW-2A, MW-32, and MW-33 and off-site monitoring wells MW-3, MW-4, MW-7, MW-9, MW-10,

MW-14, MW-15, MW-17, MW-21, MW-29, and MW-30).

Wells Containing LNAPL:

0

#### SITE HISTORY

Letterle & Associates, LLC (Letterle) of Bellefonte, Pennsylvania (PA) is pleased to present this Remedial Action Progress Report (RAPR) for United Refining Company (United) of PA Kwik-Fill #M-90 (site), located in Lawrence Township, Clearfield, PA, for the period of July 1, 2012 through September 30, 2012. **Figure 1** depicts the site location and surrounding area.

The site is currently an active retail fueling (gasoline and diesel) station, which has two, 10,000-gallon and one, 8,000-gallon steel underground storage tanks (USTs). The two 10,000-gallon USTs were in installed in 1969 and the 8,000-gallon UST was installed in 1974. One 10,000-gallon UST and one 8,000-gallon contain unleaded gasoline and the remaining 10,000-gallon UST (in the middle) contains diesel fuel.

On June 15, 1995, the 10,000-gallon unleaded gasoline UST (#002) failed a tightness test. The PA Department of Environmental Protection (PADEP) was notified of the failure and subsequently, Mountain Research, Inc. (MRI) was retained by United in May 1996 to perform site characterization activities.

From June 1996 through October 1997, four soil boring/monitoring wells, MW-1, MW-1A, MW-2, and MW-2A, were installed on the site and five monitoring wells, MW-3 through MW-7, were installed off-site, on the Beckwith Machinery Company (Beckwith) property. Quarterly groundwater sampling began in February 1996. Groundwater analytical results for the monitoring wells indicated unleaded gasoline constituents at concentrations above their respective Medium-Specific Concentration (MSC) values. In June 1997, soil/groundwater samples were collected on-site and in the right-of-way of South 2<sup>nd</sup> Street. The results of the investigation indicated several soil/groundwater samples contained unleaded gasoline constituents at concentrations above their respective MSC values.

MRI prepared a Remedial Action Plan (RAP) in July 1999 proposing a Matrix Trailer Mounted Oxygen Injection System. The PADEP approved the RAP in January 2000. In February 2000, system installation was initiated. The system consisted of eight oxygen injection points and a small trailer to house any ancillary equipment. On April 12, 2000, the system was activated. The system was operational from April 12, 2000 until the first quarter of 2005. From February 1996 through first quarter of 2005, MRI performed quarterly groundwater sampling from the monitoring well network.

From early 2005 through mid-2006, additional site investigations were initiated at the site to re-evaluate the remedial approach. In October 2006, a Supplemental Site Characterization Report (SCR) and RAP

Addendum was submitted to the PADEP. The Supplemental SCR/RAP Addendum identified two separate source areas, one on-site and one off-site at the BMC property. The on-site source area (Source Area #1) was found to have impacted groundwater beneath the site and downgradient on the former BMC property. Impacted groundwater from Source Area #2 was found to be related to an off-site release and not associated with the Kwik Fill M-90 facility. The Supplemental SCR/RAP Addendum strategy included remediating groundwater via an air sparge/soil vapor extraction (AS/SVE) system. An additional RAP Addendum was submitted in December 2006. The PADEP approved the Supplemental SCR/RAP Addendum and additional RAP Addendum in January 2007, with modifications. An AS/SVE system was installed at the site and operated from November 2007 through the fourth quarter of 2008.

A second release of unleaded gasoline occurred at the site, and was reported in February 2008. Additional site characterization activities were initiated and an Additional SCR and RAP Addendum was submitted in June 2011. The June 2011 Additional SCR/RAP Addendum included the selection of a dual phase extraction (DPE)/SVE system to address on-site soil and groundwater and enhanced in-situ bioremediation (EB) to address off-site groundwater. The June RAP Addendum was approved by the PADEP in July 2011.

#### REMEDIAL ACTION PLAN IMPLEMENTATION

The PA Underground Storage Tank Indemnification Fund (PAUSTIF) and their administrator, ICF International (ICFI), put the site remedial work out for competitive bid. The proposed scope of work was based upon the July 2011 approved RAP. Letterle was awarded the bid in March of 2012 and began implementation of the approved RAP.

#### **Off-Site Well Abandonment**

Nine off-site monitoring wells (MW-11, MW-13, MW-16, MW-18, MW-19, MW-20, MW-24, MW-25, and MW-26) were abandoned in accordance with PA well abandonment requirements and the PADEP Groundwater Monitoring Guidance Manual (December 2001). The wells were located to the north of the site and South 2<sup>nd</sup> Street on the former BMC property. Well abandonment and site restoration activities were coordinated with both United and Arch Street Management (the management firm for the BMC property) to ensure minimal disruption to routine business activities. Well abandonment activities took place on May 7<sup>th</sup> and 8<sup>th</sup>, 2012.

Prior to abandonment, the wells were evaluated to determine their condition; the details of construction and whether or not any obstructions existed that would interfere with the filling and sealing (in accordance with ACT 610, the Water Well Drillers License Act). No obstructions were identified in any of the wells. The wells were decommissioned by removing the manhole/concrete pad, inserting a steel tremie pipe into the well casing until touching the bottom of the well, and then pumping a portland cement-bentonite grout mixture into the well until the grout was within approximately one foot below ground surface.

Following the well abandonment activities, the ground surface at each location was restored to its original condition. Site restoration included concrete/asphalt patching, soil patching, and planting new grass, where appropriate. The site restoration work was completed on June 25<sup>th</sup> through 27<sup>th</sup>, 2012.

Site photographs of the completed wells and well abandonment forms are included in Appendix A.

#### **Dual-Phase Extraction Well Installation**

On May 21, 2012, three new DPE wells were installed at the site (MW-34, MW-35, and MW-36). Approximately one week prior to the drilling event, a PA One Call was placed to notify area utility companies that subsurface work will be taking place at the site. Additionally, Letterle subcontracted Enviroprobe Services, Inc. (Enviroprobe) to utilize ground penetrating radar, electromagnetics, and a line locator to verify the utility locations marked out by local utility companies and to locate potentially unknown structures in the subsurface.

Borings for the wells were advanced to intercept the first encountered water-bearing zone and to auger refusal (18 feet below ground surface (ft-bgs)). Each well was constructed with 13 feet of 4-inch diameter poly vinyl chloride (PVC) with 0.020-inch slot screen. Each well was constructed with 5 feet of solid 4-inch PVC riser. The monitoring well screen and riser were installed through the augers to ensure he screen does not contact the overburden material. The augers were raised incrementally as the filter pack sand was placed in the well annulus. A minimum of one foot of sand was maintained in the augers so the screen did not contact the formation and to prevent borehole bridging and/or collapse and assure an even distribution of filter sand media. The evenly distributed sand pack was extended approximately two feet above the top of the well screen. A hydrated bentonite seal was placed on top of the sand pack in each monitoring well with a minimum thickness of two feet, with the remainder of the well grouted with a bentonite grout.

The monitoring wells were completed with locking expansion caps and protected with flush-mount steel manhole covers set in two-foot square concrete pads. Each monitoring well was secured with a keyed alike padlock. On June 27<sup>th</sup>, 2012, the remediation wells were developed to remove fine-grained material that may have entered the wells during construction and to ensure proper hydraulic communication with the aquifer(s). The monitoring wells were developed using a surge block to clean the well screen, and purged of fine-grain materials with a submersible pump and low-density polyethylene tubing.

Prior to development, static depth to water and total depth measurements were collected in order to calculate the well volume of water. During purging, the color and clarity of purge water were observed and noted, and groundwater field parameters were measured using an YSI Model 556 water quality meter. Groundwater field parameters measured during well development included pH, Temperature, Specific Conductance, Total Dissolved Solids (TDS), Dissolved Oxygen (DO), and Oxidation/Reduction Potential (ORP).

Each well was developed by purging groundwater until field parameters stabilized to within 10%. The volume of groundwater removed from each well during the development activities was noted, and a total depth to bottom measurement was collected after development to verify and determine sediment thickness removed from the bottom of the wells. The development water was disposed of in a manner consistent with PADEP protocols. The locations of the DPE wells are shown on the site plan (Figure 2).

All drill cuttings and decontamination waste were placed into 55-gallon DOT-approved and appropriately-labeled steel drums pending transportation and off-site disposal. The drummed waste was disposed of in conjunction with the soil generated during remedial system trenching activities. The soil was transported to Clean Earth of Hagerstown, Maryland (MD).

Well logs for MW-34, MW-35, and MW-36 are included in Appendix B.

# Remedial System Trenching/Piping

A subsurface piping network was installed which connects existing extraction wells MW-1, MW-1A, MW-2, MW-28, MW-31 and newly installed DPE wells MW-34 through MW-36 to the remedial system. Prior to trenching for the remedial lines, the asphalt/concrete was sawcut. The surface covering was then removed to facilitate excavation of the trenches.

Trench dimensions were 36-inches deep and 16-inches to 24-inches wide. The wider trench was necessary near the remedial system as numerous lines converged in one location. The subsurface piping was installed such that each extraction well will have a dedicated 2-inch PVC airline conduit, a 2-inch PVC groundwater extraction conduit, and 2-inch PVC SVE piping. The lines were installed in a bed of pea gravel and placed such that lines were a minimum of four inches from the trench bottom or sidewalls and lines were placed a minimum of two inches apart. At the time of trenching, existing wells MW-1, MW-1A, MW-2, MW-28, and MW-31 were retrofitted as recovery wells. After piping installation, the trenches were filled to the ground surface with gravel overlain by a minimum of 4 inches of pea gravel followed by compacted crushed stone, and asphalt/concrete restored to existing conditions. The remedial system trenching/piping activities were completed on May 29<sup>th</sup> through June 6<sup>th</sup>, 2012.

All materials removed during trenching activities were temporarily staged on site pending transportation and off-site disposal. Letterle obtained pre-approval from the disposal facility so that on-site staging time was minimal. The soil was transported to Clean Earth of Hagerstown, MD.

#### Remedial System

The remedial system trailer was constructed and mobbed to the site during the third quarter of 2012. The principal DPE system components housed within the trailer include:

- One claw pump;
- One air compressor;
- One air/water separator (AWS) tank;
- One equalization tank;
- Two transfer pumps and level controls;
- Six pneumatic groundwater pumps;
- Four 300-pound liquid-phase granular activated carbon (GAC) vessels (high pressure units);
- Two 600-pound vapor-phase GAC vessels; and,
- Control panel for the claw pump, air compressor, and the transfer pumps (including all system interlocks).

The trailer is located along the southern property boundary. The dimensions of the trailer are approximately 8 feet in width, 20 feet in length, and 8 feet tall. The trailer includes wall and roof insulation and has adjustable wall louvers close to the floor, each complete with an exterior mounted mesh screen. Each louver contains an explosion-proof (XP) fan to circulate outside air into it. The fan is controlled both thermostatically and by a manual wall switch located near the side door. The trailer contains an XP radiant heater unit with adjustable thermostat to prevent freeze damage during the winter. The heater/thermostat is capable of maintaining a minimum ambient air temperature of 50 °F within the enclosure regardless of outside temperatures.

The trailer has a double door large enough to remove any piece of equipment housed within the trailer. The trailer includes a sump built into the floor equipped with a high level alarm switch that will terminate system operation if activated. The influent and effluent PVC pipes stubbed out of the ground by the installation contractor are inside 18-inch well vaults and are connected in the trailer with a pressure connection. The trailer includes an outside wall electrical receptacle, a lightning rod, and grounding. The trailer contains a mounted 20-pound fire extinguisher within three feet of the door.

A fenced area adjacent to the remediation trailer will be constructed to accommodate the vapor phase treatment equipment and associated control panels. The fenced area will be approximately 8 feet by 14 feet in size and consist of a 6-foot high privacy fence with one access gate.

The remediation system will commence operation during the fourth quarter of 2012. The recovered groundwater will be treated and discharged to the sanitary sewer under an issued permit from the Clearfield Municipal Authority (CMA).

# Enhanced Bioremediation (EB) Feasibility/Treatability Study

On August 9, 2012, an enhanced EB feasibility/treatability study was conducted at the site using off-site wells MW-21 and MW-29, and included injecting Oxygen Release Compound (ORC) Advanced into the subsurface. An aqueous solution (6 gallons of water per pound of ORC) containing 25-pounds of ORC was introduced into the subsurface through well MW-29 via tremie pipe. To evaluate the injection response and influenced subsurface oxygen levels, the injection was performed on MW-29 while monitoring MW-21. Groundwater quality parameters (pH, Temperature, Specific Conductance, TDS, DO, and ORP) were collected continuously during the injection pilot test at MW-21 utilizing an YSI Model 556 flow-through cell and water quality meter (low-flow sampling techniques). Insignificant response was observed in MW-21 during the pilot test; however, elevated DO levels in MW-29 were observed during the September 6, 2012 (third quarter of 2012) groundwater monitoring/sampling event.

In order to comply with the United States Environmental Protection Agency (USEPA) Underground Injection Control (UIC) Program, Letterle requested "rule authorization" from the USEPA to inject ORC into the subsurface via injection wells. The USEPA issued a "rule authorization" (approval) dated February 28, 2012.

# QUARTERLY SITE ACTIVITIES COMPLETED – $3^{RD}$ QUARTER 2012

# Groundwater Monitoring

# **Groundwater Gauging**

Letterle completed a quarterly groundwater gauging and sampling event on September 6, 2012. A total of 12 monitoring wells were sampled: on-site wells MW-2A, MW-32, and MW-33 and off-site monitoring wells MW-3, MW-4, MW-7, MW-10, MW-14, MW-15, MW-21, MW-29, and MW-30 (MW-9 and MW-17 could not be located). Prior to well purging, the depth to groundwater in each well was measured using an electronic water level probe accurate to the nearest 0.01 foot. The groundwater gauging and elevation results are on **Table 1**.

#### Shallow Water-Bearing Zone

The groundwater gauging data collected during the sampling event indicated the following for the shallow water-bearing zone:

- Groundwater elevations in the shallow water-bearing zone ranged from 1,134.25 feet in MW-7 to 1,145.66 feet in MW-2A;
- The apparent groundwater flow direction in the shallow water-bearing zone is towards the north (towards the West Branch Susquehanna River) (Figure 3);
- Based on the groundwater elevation data for on-site monitor wells MW-7 (1,134.25 feet) and MW-2A (1,145.66 feet), the horizontal hydraulic gradient was approximately 0.030 feet per foot (ft/ft); and,
- The groundwater elevation observed in MW-10 is considered anomalous and was not used in groundwater contouring.

# **Groundwater Sampling**

# Sampling Methodology

Quarterly groundwater sampling at the site was completed on September 6, 2012. Monitoring wells MW-2A, MW-3, MW-4, MW-7, MW-10, MW-14, MW-15, MW-21, MW-29, MW-30, MW-32, and MW-33 (MW-9 and MW-17 could not be located) were purged and sampled using low flow techniques. The following field screening parameters were collected from the sampled monitor wells via an YSI Model 556 flow-through cell and water quality meter: pH, Temperature, Specific Conductance, TDS, DO, and ORP.

The groundwater samples were submitted for analysis of PADEP pre-March 2008 short list of unleaded gasoline constituents via USEPA Method 8260B. The laboratory analyses included the following constituents: benzene, toluene, ethylbenzene, xylene(s) total, methyl tert-butyl ether (MTBE), cumene (isopropylbenzene), and naphthalene.

# Sampling Results

Within the shallow water-bearing zone, analytical results from the groundwater sampling program conducted on September 6, 2012 indicated the following exceedances of the PADEP Used-Aquifer TDS  $\leq$  2,500 milligrams per liter (mg/L)) Residential Statewide Health Standard (UARSHS) MSCs.:

MTBE in wells MW-3, MW-21, and MW-29

Table 1 summarizes the groundwater analytical results. The complete analytical laboratory reports are included in Appendix C.

An isoconcentration contour map (Figure 4) was prepared for MTBE which graphically depicts exceedances of the PADEP UARSHS MSC in shallow groundwater.

#### PLANNED ACTIVITY

The following activity is currently planned for the 4<sup>th</sup> Quarter of 2012:

- DPE system start-up, shakedown, and evaluation;
- Remedial system operation and maintenance (including permit-required sampling);
- · Quarterly groundwater gauging and sampling; and,
- Quarterly reporting.

The targeted goals of the remedial action are the elimination of the potential exposure pathways identified during site characterization activities (i.e., inhalation via indirect contact with groundwater and ingestion and dermal contact via direct contact with surface water) and the attainment of the PADEP Statewide Health Standards (SHS) for used aquifers at a residential property with a TDS concentration of less than or equal to 2,500 mg/l as detailed in Act 2, The Land Recycling and Environmental Remediation Standards Act.

TABLE

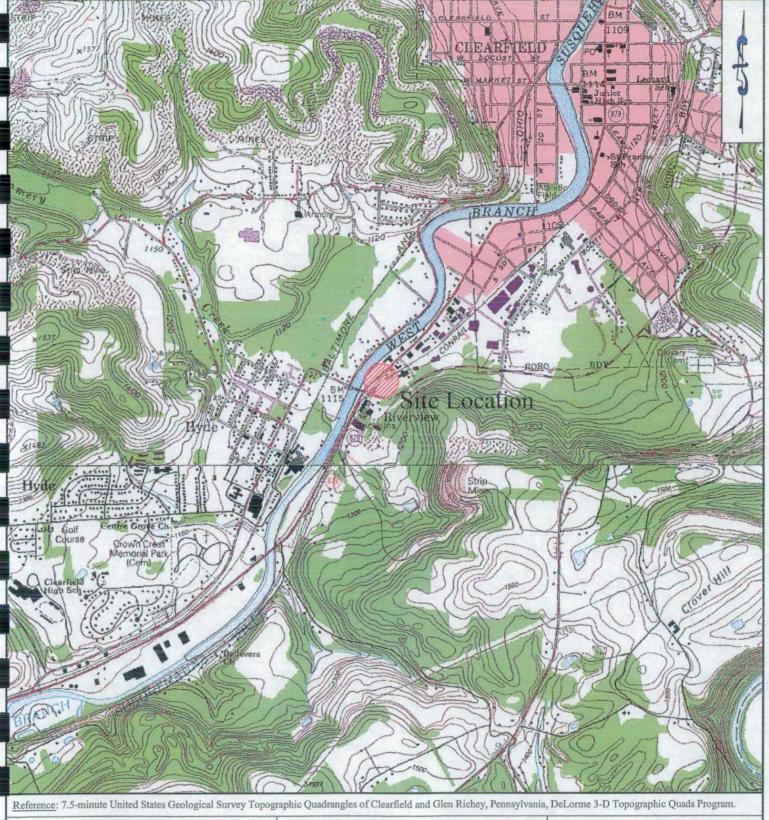
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	6/8/2010	11.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.57	1146.97
	8/30/2010	18.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.78	1144.76
	3/1/2011	6.6	<1.00	<1.00	<1.00 <1.00	<3.00	<1.00 <1.00	<2.00	3.40	1146.14
	5/31/2011	13.5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.78 3.75	1147.76 1145.79
	8/24/2011	12.1	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.12	1145.42
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	6/8/2010	6.9	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.86	1146.91
The State of	8/30/2010	16.3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	5.32	1144.45
The second	11/17/2010	10.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.88	1145.89
	3/1/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.04	1147.73
	5/31/2011	4.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.29	1145.48
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MANU A		20.4	-1.00							
MW-2	3/17/2010 6/8/2010	20.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.07	1146.91
	8/30/2010	20.5	<1.00 <1.00	<1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00	3.36	1146.62
	11/17/2010	20.1	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	5.61 4.36	1144.37 1145.62
rale in entre	3/1/2011	11.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.73	1147.25
	5/31/2011	10.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.68	1145.30
	8/24/2011	14.3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.90	1145.08
	3/28/2012 6/25/2012	11.5	1.1	<1.00	<1.00	<3.00 onverted to rem	<1.00	<2.00	2.85	1147.13
MW-2A	3/17/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.21	1147.66
	6/8/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.27	1147.60
	8/30/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.23	1145.64
	11/17/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.25	1146.62
	3/1/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.91	1147.96
	5/31/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.16	1146.71
E CONTRACTOR	8/24/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.52	1146.35
1	3/28/2012 6/25/2012	<1.00 5.22	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00	<1.00	<2.00	0.45	1148.42
and the second	9/6/2012	<1.00	<1.00	<1.00	<1.00	<2.00 <2.00	<1.00 <1.00	<1.00 <1.00	4.51 3.21	1144.36 1145.66
MW-3	3/18/2010	43.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.43	1143.80
11111-5	6/7/2010	44.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.43	1143.83
	8/31/2010	41.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.92	1142.31
	11/17/2010	40.3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.48	1142.75
	3/2/2011	33.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.81	1144.42
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	32.3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.38	1142.85
The Day of	3/28/2012	NS	NS	NS	NS	NS	NS	NS	1.40	1144.83
	9/6/2012	21.9	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<2.00	<1.00 <1.00	<1.00 <1.00	3.17 4.17	1143.06 1142.06
MW 4	Constitution of			The second second	The same of the same of			THE RESERVE OF THE PERSON NAMED IN	The second secon	
MW-4	3/18/2010 6/7/2010	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00	<1.00	<2.00	0.97	1144.15
	8/31/2010	<1.00	<1.00	<1.00	<1.00	<3.00 <3.00	<1.00 <1.00	<2.00	2.17 4.44	1142.95
	11/17/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.26	1141.86
	3/2/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.92	1144.20
10000	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.24	1141.88
	3/28/2012	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.20	1143.92
Committee of the Commit	6/25/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	2.74	1142.38
	9/6/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.11	1141.01

	Total State of			TO BE THE REAL PROPERTY.	Compound	LELENS I	This seek had		STEED STEEDS	250 5051
Piezometer/Well	Date	МТВЕ	Benzene	Toluene	Ethyl- benzene	Xylenes (Total)	Cumene	Naphthalene	Depth-to-	Groundwat
PADEP UARSHS MSCs		20	5	1,000	700	10,000	840	100	Groundwater	Elevation
MW-5	3/17/2010	5.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.16	1143.51
	6/7/2010	4.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.53	1143.14
	8/31/2010	3.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.18	1141.49
	11/17/2010	2.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.80	1141.87
	3/1/2011 5/31/2011	1.2 NS	<1.00 NS	<1.00 NS	<1.00 NS	<3.00	<1.00	<2.00	0.43	1144.24
	8/24/2011	5.7	<1.00	<1.00	<1.00	NS <3.00	NS <1.00	NS <2.00	NG 2.64	NA 1142.03
	3/28/2012	NS NS	NS NS	NS NS	NS	NS	NS	NS NS	1.04	1142.03
	6/25/2012			Well not part of				110	2.25	1142.42
	9/6/2012			Well not part of					NG	NA
MW-6	3/17/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	6/7/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/31/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	11/17/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	3/1/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
451	8/24/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	3/28/2012 6/25/2012	NS	NS	NS Well sould a	NS ot he leasted	NS Well not nort	NS	NS mpling program	NG	NA
	9/6/2012		1		ot be located.	Well not part	of quarterly sa	mpling program		
NAME OF		2.6	50.5							1100.41
MW-7	3/18/2010 6/7/2010	3.6	59.5 57.7	11.5	44.4	54.7	25.6	44.5	2.60	1139.41
700	8/31/2010	6.8	104	12.9 14.4	55.2 47.9	60.3 49.2	35.4 29.3	61.3	5.77 7.92	1136.24 1134.09
- 11 - 415	11/17/2010	7.2	97.9	12.5	46.5	47.4	27.3	57.7	6.85	1134.09
	3/2/2011	4.1	51.9	8.8	39.3	27.7	22.4	20.9	3.93	1138.08
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	7.7	73.8	10.2	25.8	28.5	31.3	40.7	7.21	1134.80
21.71	3/28/2012	NS	NS	NS	NS	NS	NS	NS	7.15	1134.86
	6/25/2012	3.84	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	7.49	1134.52
	9/6/2012	10.6	NS	<2.00	<2.00	<4.00	<2.00	<2.00	7.76	1134.25
MW-9	3/17/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	6/8/2010	32.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.00	1141.97
FURNITURE .	8/30/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	3/1/2011	NS NS	NS NS	NS NS	NS	NS	NS	NS	NG	NA
	5/31/2011	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NG NG	NA NA
	8/24/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
2000	3/28/2012	NS	NS	NS	NS	NS	NS	NS	NG	NA
	6/25/2012					could not be l			110	
60-	9/6/2012				Wel	could not be l	ocated.			
MW-10	3/17/2010	8.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.64	1147.90
A STATE OF THE PARTY OF	6/7/2010	8.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.78	1148.76
1 1 Am	8/31/2010	8.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.08	1147.46
445	11/17/2010	7.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.50	1147.04
	3/2/2011	7.1	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.14	1149.40
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
15577 53	8/24/2011	7.5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.42	1148.12
Section 1	3/28/2012 6/25/2012	NS 5.01	NS <1.00	NS <1.00	NS -1.00	NS <2.00	NS	NS -1.00	1.42	1148.12
	9/6/2012	6.16	<1.00	<1.00	<1.00 <1.00	<2.00	<1.00 <1.00	<1.00 <1.00	1.23 2.10	1148.31 1147.44
3433/ 12										
MW-12	3/17/2010 6/7/2010	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NG NG	NA
	8/31/2010	NS	NS	NS NS	NS NS	NS NS	NS NS	NS NS	NG	NA NA
	11/17/2010	30.3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.28	1142.28
	3/2/2011	NS	NS .	NS	NS	NS	NS	NS	NG	NA
-	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	3/28/2012	NS	NS	NS	NS	NS	NS	NS	NG	NA
	6/25/2012			Well not part of					2.83	1142.73
The state of	9/6/2012		Well could not	t be located. W	ell not part of	quarterly samp	ling program.	- 18 m 677	NG	NA

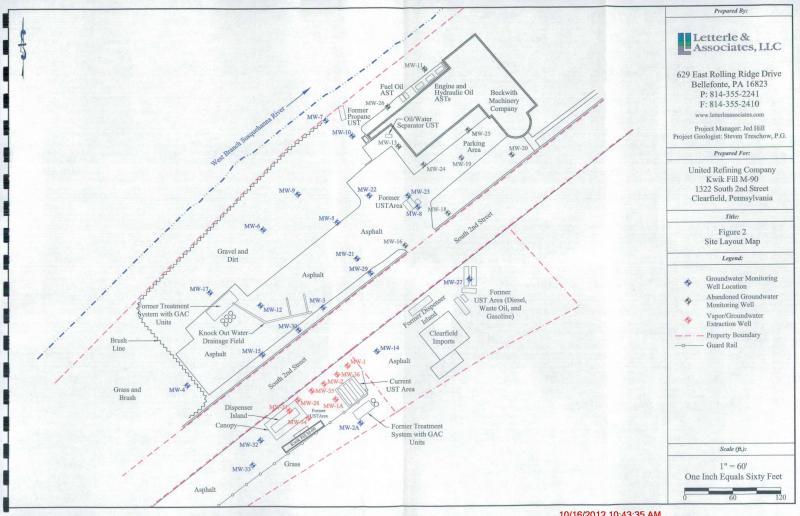
	Date	Compound							CHEST SERVICE	SERVICE SERVICE
Piezometer/Well		MTBE	Benzene	Toluene	Ethyl-	Xylenes	Cumene	Naphthalene		
		MIDE	Denzene	Toruenc	benzene	(Total)	Cumene	tvapituatene	Depth-to-	Groundwate
PADEP UARSHS MSCs		20	5	1,000	700	10,000	840	100	Groundwater	Elevation
MW-14	3/17/2010	23.9	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.97	1146.75
	6/7/2010	18.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.22	1146.50
	8/31/2010	35.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.43	1144.29
	11/17/2010	21.3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.40	1145.32
	3/2/2011	2.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.62	1147.10
	5/31/2011 8/24/2011	21.4	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00	3.44 4.80	1145.28 1143.92
	3/28/2012	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.71	1145.92
	6/25/2012	8.80	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	3.59	1145.13
	9/6/2012	19.8	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.63	1144.09
MW-15	3/18/2010	6.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.73	1145.56
	6/7/2010	6.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.08	1145.21
	8/31/2010	7.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.88	1143.41
	11/17/2010	6.3	<1:00	<1.00	<1.00	<3.00	<1.00	<2.00	3.44	1143.85
	3/2/2011 5/31/2011	4.8 NS	<1.00 NS	<1.00 NS	<1.00 NS	<3.00 NS	<1.00 NS	<2.00 NS	1.51 NG	1145.78 NA
THE STREET	8/24/2011	6.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.27	NA 1144.02
	3/28/2011	NS NS	NS NS	NS NS	NS NS	NS	NS	NS	2.20	1144.02
	6/25/2012	6.98	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	3.11	1144.18
	9/6/2012	5.64	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.18	1143.11
MW-17	3/18/2010	9.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.73	1142.53
	6/7/2010	1.3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.09	1143.17
	8/31/2010	13.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.78	1141.48
	11/17/2010	11.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.70	1141.56
	3/1/2011	7.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.11	1143.15
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	3/28/2012	NS NS NS NS NS NS NS NG NA  Well could not be located.								NA
	9/6/2012	Maria Dia		Thraines.		could not be l				The state of the
MW-21	3/17/2010	41.3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.86	1144.60
	6/7/2010	42.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.12	1144.34
	8/30/2010	40.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.43	1143.03
A. H. COM	11/17/2010	35.9	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.22	1143.24
	3/2/2011	33.9	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.50	1144.96
	5/31/2011	NS	NS =1.00	NS	NS	NS -2.00	NS	NS	NG 2.05	NA 1142.41
	8/24/2011 3/28/2012	37.5 NS	<1.00 NS	<1.00 NS	<1.00 NS	<3.00 NS	<1.00 NS	<2.00 NS	3.05 2.10	1143.41
	6/25/2012	21.7	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	2.94	1143.52
The same	9/6/2012	42.1	<2.00	<2.00	<2.00	<4.00	<2.00	<2.00	3.79	1142.67
MW-22	3/17/2010	5.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.79	1143.08
	6/7/2010	8.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.18	1142.69
	8/30/2010	8.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.60	1141.27
	11/17/2010	6.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.38	1141.49
	3/2/2011	6.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.42	1143.45
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	· NA
	8/24/2011	10.5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.04	1141.83
	3/28/2012	NS	NS	NS Wall not part o	NS S	NS	NS	NS	2.11	1142.76
	9/6/2012	Well not part of quarterly sampling program.  Well not part of quarterly sampling program.						2.81 3.43	1142.06 1141.44	
MW-23		<1.00				<3.00	<1.00	~2.00		
M W-23	3/17/2010 6/7/2010	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00	<1.00 <1.00	<2.00 <2.00	2.51	1144.65 1145.13
	8/31/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.63	1143.13
	11/17/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.90	1143.26
	3/2/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.02	1145.14
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.93	1143.23
	3/28/2012	NS	NS	NS	NS	NS	NS	NS	2.80	1144.36
Total Table	6/25/2012				f quarterly sam		4 1919	14 15 12 19	4.57	1142.59
THE RESERVE OF THE PARTY OF	9/6/2012			well not part o	f quarterly sam	pung program.		THE RESTAURANT OF	5.37	1141.79

	Date	Compound								THE RESERVE
Piezometer/Well		MTBE	Benzene	Toluene	Ethyl-	Xylenes	Cumene	Naphthalene		
PADEP UARSHS MSCs		20	5	1,000	benzene 700	(Total) 10,000	840	100	Depth-to- Groundwater	Groundwater Elevation
MW-28	3/17/2010	4.5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.13	1146.94
MW-20	6/8/2010	3.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.44	1146.63
	8/30/2010	6.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	5.64	1144.43
	11/17/2010	4.1	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.46	1145.61
	3/1/2011	7.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.01	1147.06
	5/31/2011	3.4	NS	NS	NS	NS	NS	NS	4.82	NA
	8/24/2011	4.9	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.97	1145.10
	3/28/2012 6/25/2012	14.6	NS	NS Mo	NS onitoring well c	NS onverted to ren	NS pedial extraction	NS n well	2.88	1147.19
MW-29	And the second	25.0	<1.00						2.71	1144.65
	3/17/2010 6/7/2010	35.0 39.7	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00	2.61	1144.65 1144.43
	8/30/2010	39.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.95	1142.31
	11/17/2010	37.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.95	1143.31
	3/2/2011	9.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.23	1145.03
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	37.1	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.81	1143.45
	3/28/2012	NS	NS	NS	NS	NS	NS	NS	2.71	1144.55
	6/25/2012	22.8	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	3.58	1143.68
	9/6/2012	25.0	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.58	1142.68
MW-30	3/18/2010	17.0	23.9	<1.00	14.5	12.2	1.9	2.5	2.23	1145.03
	6/7/2010	20.1	17.9	<1.00	12.4	10.5	1.9	<2.00	2.41	1144.85
	8/31/2010 11/17/2010	22.7	<1.00 <1.00	<1.00 <1.00	3.1	<3.00 <3.00	<1.00	<2.00	4.07	1143.19 1143.65
	3/2/2011	22.7	<1.00	<1.00	1.8 <1.00	<3.00	<1.00 <1.00	<2.00	3.61 2.35	1144.91
	5/31/2011	NS	NS	NS NS	NS NS	NS	NS	NS	NG	NA
	8/24/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	3/28/2012	NS	NS	NS	NS	NS	NS	NS	NG	NA
	6/25/2012	8.41	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	3.31	1143.95
	9/6/2012	10.8	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.30	1142,96
MW-31	3/17/2010	7.8	668	783	265	2,700	26.4	119	3.16	1147.07
	6/8/2010	6.3	336	118	119	754	10.2	61.8	3.61	1146.62
	8/30/2010	8.0	18.8	1.1	10.5	34.1	1.3	3,3	5.73	1144.50
	11/17/2010	6.7	60.5 9.2	<1.00	20.6	20.4	1.8	4.3	4.73	1145.50
10.40	3/1/2011 5/31/2011	6.3	66.1	1.4 <1.00	3.6	4.1	<1.00	<2.00	3.48 4.74	1146.75 1145.49
	8/24/2011	14.3	439	7.2	135	272	12	35.7	5.03	1145.49
	3/28/2012	16.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.18	1147.05
	6/25/2012	N. W.		Mo	nitoring well co				400	1711
MW-32	5/28/2010	4.1	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.22	1145.58
	6/8/2010	2.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.21	1146.59
	8/30/2010	1.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	5.16	1144.64
	11/17/2010	2.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.64	1145.16
	3/1/2011	2.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.94	1146.86
	5/31/2011	2.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.15	1145.65
	8/24/2011 3/28/2012	2.8 <1.00	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00	4.58 2.49	1145.22 1147.31
100	6/25/2012	4.51	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.51	1147.31
and had	9/6/2012	4.07	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	5.51	1144.29
MW-33	5/28/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.41	1145.72
	6/8/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.36	1145.72
	8/30/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	5.25	1144.88
	11/17/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.96	1145.17
	3/1/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.42	1146.71
	5/31/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.38	1145.75
	8/24/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.72	1145.41
	3/28/2012	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.70	1147.43
	6/25/2012 9/6/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.66	1145.47
	9/0/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	5.70	1144.43

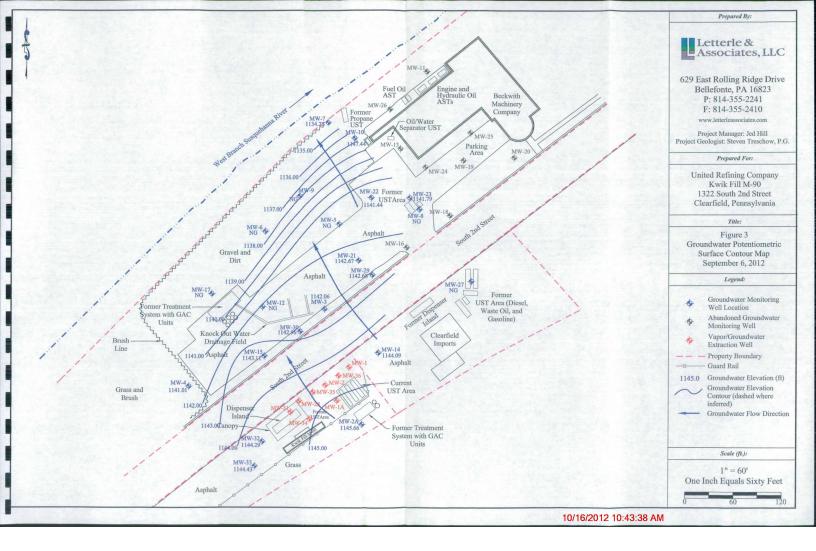
# **FIGURES**

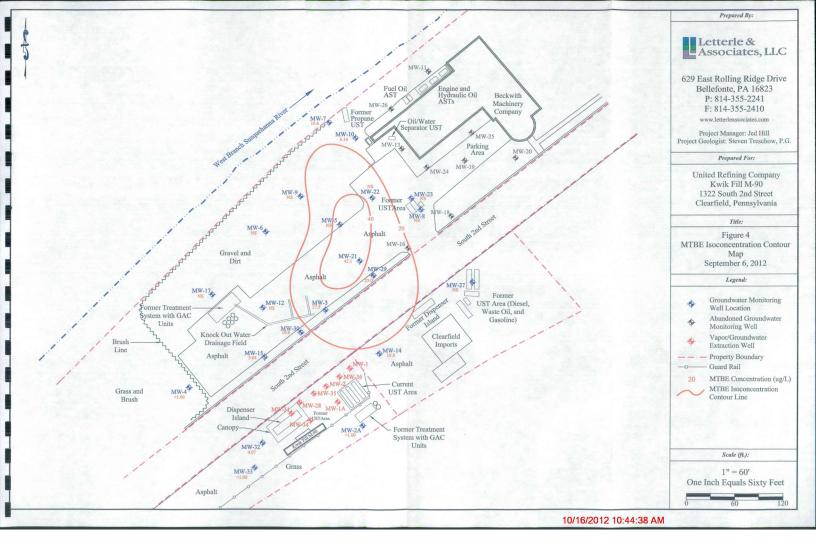


Prepared For:	Project Information:	Prepared By:		
United Refining Company, Kwik Fill M-90 1322 South 2nd Street, Lawrence Township, Clearfield County, Pennsylvania PADEP Facility ID #17-14821	Project Manager: Jed Hill Project Geologist: Steven Treschow, P.G.	Letterle & Associates, LLC  629 East Rolling Ridge Drive Bellefonte, PA 16823 P: 814-355-2241		
Title:	Scale (feet):			
Figure 1	Scale: 1" = 2000'			
Site Location Map	0 2000 4000	F: 814-355-2410 www.letterleassociates.com		



10/16/2012 10:43:35 AM





# APPENDICES

# APPENDIX A

Site Photographs and Well Abandonment Forms



MW-11



MW-13



MW-16



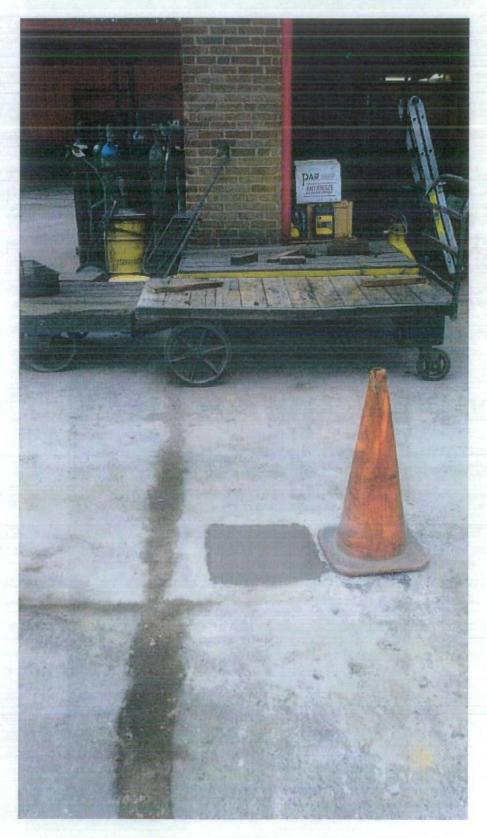
MW-18



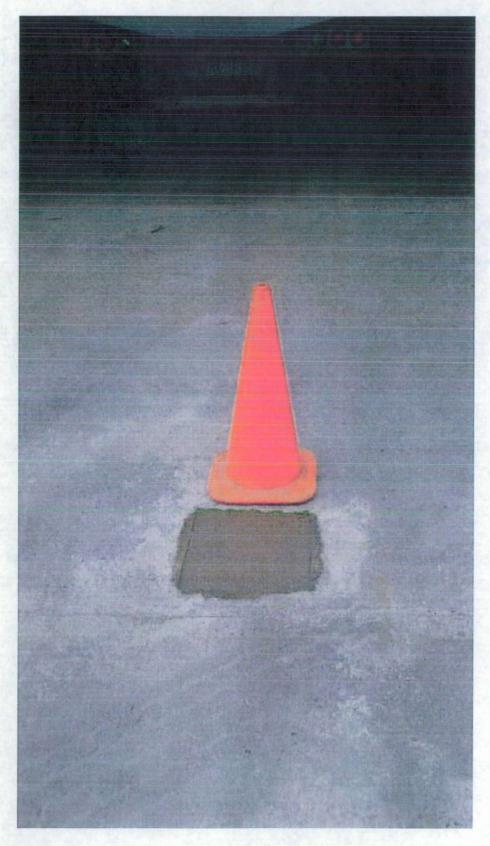
MW-19



MW-20



MW-24



MW-25



MW-26

CONTRACTOR/AGENT:	Earthsystems, LI	.c R	EGISTRATION	NO. <u>4494</u>	
DATE: 05/07-08/2012 TY	PE OF SITE O	OR PROGRA	AM: <u>Chapter 245</u>	Storage Tank Act	
1. WELL LOCATION: (S	show sketch of	location on l	back of this form	) See attached site laye	out map.
Municipality Lawrence To	wnship		County	Clearfield County	
Quadrangle Clearfield and G	len Richey, PA				<del></del> :
Latitude 41°00'21.64" N Lor	ngitude <u>78°27')</u>	•	d, community, su	ıbdivision, lot no.)	
2. OWNER AND ADDRI	ESS: United Ref	ining Co., 15 B	Bradlev St. P.O. Box	688. Warren, PA 1636	5
3. TOPOGRAPHY: (Circl depression, flat					
4. USE OF WELL: Groun	ndwater Monitori	ng		WELL DIAGRA	
5. DEPTH OF WELL: N	JA	DIAMET OF WEL	ER L: <u>4-inch ID</u>	diagram showing casing (if present) materials, perfora	), grouting
6. AMOUNT OF CASING REMOVED:	_NA_	DIAMET	ER: <u>4-inch</u> ID		
	_				MW-11
		neat	sand		
7. SEALING	bags	cement	cement		
MATERIAL:	(94 lb): gals of	4 bags	<u>NA</u>		
	water:	30 gallons	_NA_		
	yds of	<del></del>	<del></del>		
	sand:	<u>NA</u>	<u>NA</u>		
OTHER MATERIAL:_	NA	amount:	NA		
8. EXPLAIN METHOD C	F EMPLACE	MENT OF M	IATERIAL:		
Neat cement grout pressure grous is pumped to ensure no void spa		h ID tremie pir	oe placed from botto	m to top of boring. Rem	oved slowly as grout
9. CERTIFICATION: We	hereby certify	that this wel	I abandonment re	ecord is true and ex	act, and was
accomplished on 7th & 8th da	ay of the month	of <u>May</u>	, 2012	, with our acti	ve participation
and that we are qualified to	participate in s	such abandor	ment actions.		
1. Signature of Participant	Vyhor	2	2. Signature of	Participant:	
Date: 07/30/2012	Address:	_	Date:	Address:	
629 East Rolling Ridge Drive, I		323			

CO	NTRACTOR/AGENT	: Earthsystems, )	LLCR	EGISTRATION	NO. <u>4494</u>	
DA	TE: <u>05/07-08/2012</u> T	YPE OF SITE	OR PROGRA	AM: <u>Chapter 245</u>	Storage Tank Act	
1.	WELL LOCATION: (S	Show sketch o	of location on l	back of this form	.) See attached site layout	map.
Mu	nicipality <u>Lawrence To</u>	wnship		County _	Clearfield County	<del> </del>
Qu	adrangle <u>Clearfield and C</u>	<u> 3len Ri</u> chey, P <u>A</u>		1322 South 2nd	Street Clearfield, PA	
Lat	itude <u>41°00'21.64"</u> N Lo	ngitude <u>78°27'</u>		d, community, s	ubdivision, lot no.)	
2.	OWNER AND ADDR	ESS: <u>United R</u>	efining Co., 15 B	Bradley St, P.O. Box	x 688, Warren, PA 16365	
3. '	TOPOGRAPHY: (Circ ression, flat		•			w, local
	USE OF WELL: Grou	·	-		WELL DIAGRAM: diagram showing dep	pths of well,
5. ]	DEPTH OF WELL: <u>1</u>	<u>√A</u>	DIAMET OF WELL	ER L: <u>4-inch ID</u>	casing (if present), g materials, perforation	
	AMOUNT OF CASING REMOVED:	NA_	DIAMET	ER: 4-inch_ID		
					1	VIW-13
			neat	sand		
	SEALING	bags	cement	cement		
J	MATERIAL:	(94 lb): gals of	2 bags	_NA_		
		water:	15 gallons	NA		
		yds of sand:	<u>NA</u>	_NA_		
(	OTHER MATERIAL:_	NA NA	amount: _	NA		
8. I	EXPLAIN METHOD (	OF EMPLACE	EMENT OF M	IATERIAL:		
	t cement grout pressure groum		nch ID tremie pip	<u>e placed fro</u> m botto	m to top of boring. Remove	d slowly as grou
•	CERTIFICATION: We	•	v that this wel	l abandonment re	ecord is true and exact.	and was
	omplished on <u>7th &amp; 8th</u> d					
	that we are qualified to				, with our active p	Jactionpation
			<b>~</b> } .			
	ignature of Participant	1	Tal	72. Signature of	Participant:	
	East Rolling Ridge Drive, I	Address:	6823	Date:	Address:	·
<u> </u>		111 I		-	<del></del>	<del></del>

CONTRACTOR/AGENT:	Earthsystems, LI	LC RI	EGISTRATION :	NO. <u>4494</u>	
DATE: <u>05/07-08/2012</u> TY	PE OF SITE O	OR PROGRA	M: Chapter 245	Storage Tank Act	<del></del>
1. WELL LOCATION: (S	show sketch of	location on b	ack of this form.	) See attached site lay	out map.
Municipality <u>Lawrence To</u>	wnship		County	Clearfield County	
Quadrangle Clearfield and G	ilen Richey, P <u>A</u>				
Latitude 41°00'21.64" N Loi	ngitude <u>78°27'1</u>	•	d, community, su	bdivision, lot no.)	
2. OWNER AND ADDRI	ESS: United Ref	ining Co. 15 B	radlev St. P.O. Box	688 Warren PA 1630	65
2. O WILDRING TROPIC	Joon <u>Qintea Rei</u>	ming Co., 1.7 D	radicy Di, 1.O. Dox	000, Walten, 171 105	<u> </u>
3. TOPOGRAPHY: (Circle depression, flat	le) hilltop, sl	ope, stream	terrace, valley,	stream channel,	draw, local
4. USE OF WELL: Grou	ndwater Monitori	ng	•	WELL DIAGRA	
5. DEPTH OF WELL: N	T.4	DIAMET	FP	casing (if present	g depths of well,
5. DEFITTOR WELLr	iA		L: 4-inch ID	materials, perfor	
					, ,
6. AMOUNT OF					
CASING REMOVED:	<u>NA</u>	DIAMET	ER: 4-inch ID		
					MW-16
		neat	sand		
7. SEALING	bags	cement	cement		
MATERIAL:	(94 lb):	3 bags	NA.		
	gals of				
•	water:	23 gallons	<u>NA</u>		
	yds of sand:	27.1			
	sano:	<u>NA</u>	_NA_	•	
OTHER MATERIAL:_	NA	amount:	NA		
8. EXPLAIN METHOD O	OF EMPLACE	MENT OF M	IATERIAL:		
Neat cement grout pressure grout is pumped to ensure no void spa		h ID tremie pip	e placed from bottor	m to top of boring. Rer	noved slowly as grou
9. CERTIFICATION: We	hereby certify	that this wel	l abandonment re	ecord is true and ex	cact, and was
accomplished on 7th & 8th d	ay of the month	n of <u>May</u>		, with our act	ive participation
and that we are qualified to	participate in	uch abandon	ment actions.	,	
1. Signature of Participant	Tylin	Tabo	2. Signature of l	Participant:	
31/20/4012	Address:		Date:	Address:	<del></del>
629 East Rolling Ridge Drive, I	Belletonte, PA 168	823	<del></del>	<del></del> :	

CC	ONTRÁCTO	R/AGENT:	Earthsystems,	LLC R	EGISTRATION	NO. <u>4494</u>	<u> </u>
DA	ATE: <u>05/07-0</u>	<sub>8/2012</sub> TY	PE OF SITE	E OR PROGRA	AM: <u>Chapter 245</u>	Storage Tank Act	
1.	WELL LOC	CATION: (S	how sketch	of location on	back of this form	See attached site 1	ayout map.
Μι	ınicipality _	Lawrence To	wnship		County _	Clearfield County	<del></del> -
Qu	adrangle <u>Çl</u>	earfield and G	<u>len Ri</u> chey, P <u>A</u>			Street Clearfield, PA	
Lat	titude <u>41°00°</u>	21.64" N Lon	gitude <u>78°2</u>	•	ıd, community, sı	ubdivision, lot no.	)
2.	OWNER AI	ND ADDRE	ESS: <u>United F</u>	Refining Co., 15 I	Bradley St, P.O. Box	688, Warren, PA 16	365
	TOPOGRAI	•	e) hilltop,	slope, stream	terrace, valley,	stream channel,	draw, local
4.	USE OF WI	ELL: Groun	ndwater Monito	oring		WELL DIAGR	AM: sketch a
5.	DEPTH OF	WELL: <u>N</u>	Α	DIAMET OF WEL	TER L: <u>4-inch ID</u>	casing (if prese materials, perfo	nt), grouting
6.	AMOUNT ( CASING R		_NA_	DIAMET	TER: 4-inch ID		
							MW-18
				neat	sand		
	SEALING		bags	cement	cement		
	MATERIAI	<i>;</i> :	(94 lb):	3 bags	_NA_		
			gals of water:	2211	NIA		
			yds of	23 gallons	<u>NA</u>		
			sand:	NA_	_NA_		
	OTHER MA	TERIAL:_	NA	amount:	NA		
8.	EXPLAIN N	METHOD O	F EMPLAC	EMENT OF N	ATERIAL:		
	it cement grout			inch ID tremie pi	ge placed from botto	om to top of boring. R	emoved slowly as grou
9. (	CERTIFICA	TION: We	hereby certi	fy that this we	ll abandonment re	ecord is true and	exact, and was
acc	omplished o	n <u>7th &amp; 8th</u> da	y of the mo	nth of May	, 2012	, with our a	ctive participation
and	that we are	qualified to	participate i	n such abandor	nment actions.		•
1. S	Signature of	Participant:	Tolen	ab	2. Signature of	Participant:	
	e: <u>07/30/2012</u>						
629	East Rolling I	Ridge Drive <u>, E</u>	Bellefonte, PA	16823			<del></del>

CONTRACTOR/AGENT	Earthsystems,	LLC R	EGISTRATION	NO. <u>4494</u>
DATE: <u>05/07-08/2012</u> TY	PE OF SITE	OR PROGRA	AM: <u>Chapter 245</u>	Storage Tank Act
1. WELL LOCATION: (S	Show sketch o	of location on l	back of this form	See attached site layout map.
Municipality Lawrence To	wnship		County _	Clearfield County
Quadrangle Clearfield and C	ilen Richey, P <u>A</u>		1322 South 2nd	Street Clearfield, PA
Latitude 41°00'21.64" N Los	ngitude <u>78°27</u>	•	d, community, su	ıbdivision, lot no.)
2. OWNER AND ADDR	ESS: United R	Refining Co., 15 B	Bradley St. P.O. Box	688, Warren, PA 16365
				stream channel, draw, local
4. USE OF WELL: Grou	ındwater Monito	oring		WELL DIAGRAM: sketch a
5. DEPTH OF WELL: _1	ΛA	DIAMET OF WEL	ER L: <u>4-inch ID</u>	diagram showing depths of well, casing (if present), grouting materials, perforations, etc.
6. AMOUNT OF CASING REMOVED:	<u>NA</u>	DIAMET	ER: <u>4-inch</u> ID	,
				MW-19
7. SEALING MATERIAL:	bags (94 lb): gals of water: yds of	neat cement 3 bags 23 gallons	sand cement ·NA NA	
	sand:	_NA	<u>NA</u>	
OTHER MATERIAL:_	NA	amount: _	NA	
8. EXPLAIN METHOD O	OF EMPLAC	EMENT OF M	IATERIAL:	
Neat cement grout pressure grous pumped to ensure no void spa		nch ID tremie pip	e placed from botton	m to top of boring. Removed slowly as grout
9. CERTIFICATION: We	e hereby certi	fy that this wel	l abandonment re	ecord is true and exact, and was
accomplished on 7th & 8th d	ay of the mor	nth of <u>May</u>	, 2012	, with our active participation
and that we are qualified to			ment actions.	
1. Signature of Participant	Tylai	)ab	2. Signature of	Participant:
_	Address:		Date:	Address:

CONTRACTOR/AG	ENT: <u>Earthsystems.</u>	LLC R	EGISTRATION	NO. <u>4494</u>	
DATE: 05/07-08/2012	TYPE OF SITE	E OR PŖOGRA	M: <u>Chapter 245</u>	Storage Tank Act	
1. WELL LOCATIO	N: (Show sketch	of location on b	oack of this form	1.) See attached site lay	out map.
Municipality <u>Lawren</u>	ice Township		County	Clearfield County	
					•
Quadrangle Clearfield	and Glen Richey, PA	(Roa	<u>1322 South 2nd</u> d. community, s	Street Clearfield, PA ubdivision, lot no.)	<del></del> .
Latitude 41°00'21.64"]	N Longitude 78°2'	•	,	, ,	
2. OWNER AND AI	ODRESS: United I	Refining Co., 15 B	radley St, P.O. Box	k 688, Warren, PA 1636	5
3. TOPOGRAPHY: (depression, flat	(Circle) hilltop,	slope, stream	terrace, valley	, stream channel,	draw, local
4. USE OF WELL:	Groundwater Monit	oring		WELL DIAGRA	
5. DEPTH OF WELI	L: <u>NA</u>	DIAMET OF WELI	ER L: <u>4-inch ID</u>	diagram showing casing (if present materials, perfora	), grouting
6. AMOUNT OF CASING REMOV	VED: <u>NA</u>	DIAMET	ER: <u>4-inch</u> ID		
					MW-20
7 OD47 D10		neat	sand		
7. SEALING MATERIAL:	bags (94 lb):	cement  10 bags	cement <u>NA</u>		
	gals of				
	water: yds of	75 gallons	<u>NA</u>		
	sand:	NA_	_NA_		
OTHER MATERI	AL: <u>na</u>	amount: _	NA		
8. EXPLAIN METH	OD OF EMPLAC	EMENT OF M	IATERIAL:		
				to too of houise Doo	, d_alad
Neat cement grout pressur is pumped to ensure no vo		men 112 trenne pip	e piaced nom oom	oni to top of boring. Ken	loved slowly as grou
9. CERTIFICATION	: We hereby certi	ify that this wel	l abandonment r	ecord is true and ex	act, and was
accomplished on 7th &	8th day of the mo	nth of <u>May</u>	, _2012	2, with our acti	ve participation
and that we are qualifi	ed to participate i	n şuch abandon	ment actions.		
1. Signature of Partic	ipant: The	at )	2. Signature of	Participant:	
Date: <u>07/30/2012</u>	Address:		Date:		
629 East Rolling Ridge D	<i>1</i> /				

CONTRACTOR/AGENT	: Earthsystems, L	LC R	EGISTRATION	NO. <u>4494</u>	_
DATE: <u>05/07-08/2012</u> T	YPE OF SITE	OR PROGRA	M: <u>Chapter 245</u>	Storage Tank Act	
1. WELL LOCATION: (	Show sketch of	flocation on b	oack of this form	1.) See attached site layout map.	
Municipality <u>Lawrence To</u>	ownship		County _	Clearfield County	
Quadrangle Clearfield and C	Glen Richey, P <u>A</u>				
Latitude _41°00'21,64" N Lo	ngitude <u>78°27'</u>	•	d, community, s	ubdivision, lot no.)	
2. OWNER AND ADDR	ESS: United Re	fining Co. 15 B	radiev St. P.O. Box	x 688 Warren PA 16365	
				, stream channel, draw, local	
4. USE OF WELL: Grou	undwater Monitor	ing		WELL DIAGRAM: sketch a	
5. DEPTH OF WELL: _]	<u> </u>	DIAMET OF WELL	ER L: 4-inch ID	diagram showing depths of well, casing (if present), grouting materials, perforations, etc.	1
6. AMOUNT OF CASING REMOVED	: <u>NA</u>	DIAMET	ER: 4-inch ID		
				<u>MW-24</u>	
		neat	sand		
7. SEALING	bags	cement	cement		
MATERIAL:	(94 lb):	2 bags	_NA		
	gals of water:	15 gallons	_NA_		
•	yds of	15 gaitons			
	sand:	<u>NA</u>	_NA_		
OTHER MATERIAL:	NA	_ amount: _	NA	•	
8. EXPLAIN METHOD	OF EMPLACE	MENT OF M	IATERIAL:		
Neat cement grout pressure gro is pumped to ensure no void sp	_	ch ID tremie pip	e placed from botto	om to top of boring. Removed slowly as gro	out
9. CERTIFICATION: W	e hereby certify	that this wel	l abandonment r	ecord is true and exact, and was	
accomplished on 7th & 8th	lay of the mont	h of <u>May</u>		with our active participation	
and that we are qualified to	participate in	such abandon	ment actions.		
1. Signature of Participant	Tylan	ds_	2. Signature of	Participant:	
	Address:	922	Date:	Address:	
629 East Rolling Ridge Drive,	Denegonie, PA 10	043	<del></del>	<del> =</del>	

CONTRAC	TOR/AGENT	: Earthsystems, L	LC R	EGISTRATION 1	NO. <u>4494</u>	
DATE: <u>05/</u>	07-08/2012 TY	YPE OF SITE	OR PROGRA	M: Chapter 245 S	Storage Tank Act	
1. WELL I	OCATION: (S	Show sketch of	f location on l	pack of this form.	) See attached site la	yout map.
Municipalit	y <u>Lawrence To</u>	ownship		County	Clearfield County	<u>-</u>
Quadrangle	Clearfield and C	Glen Richey, PA		1322 South 2nd S	Street Clearfield, PA	
Latitude 41	<u>°00'21.64" N</u> Lo	ngitude <u>78°27'</u>	•	d, community, su	bdivision, lot no.)	
2. OWNER	AND ADDR	ESS: <u>United Re</u>	fining Co., 15 B	radley St, P.O. Box 6	688, Warren, PA 163	65
3. TOPOGI depression,		le) hilltop, s	lope, stream	terrace, valley,	stream channel,	draw, local
4. USE OF	WELL: Grou	ındwater Monitor	ing	-	WELL DIAGRA	
5. DEPTH	OF WELL: 1	ЛА	DIAMET OF WEL	ER L: <u>4-inch ID</u>	casing (if preser	,, ,
6. AMOUN CASING	IT OF G REMOVED:	NA_	DIAMET	ER: 4-inch ID		
						MW-25
		<del></del>	neat	sand		
7. SEALIN		bags	cement	cement		
MATER	IAL:	(94 lb):	<u> 2 bags</u>	<u>NA</u>		
		gals of water:	15 gallons	_NA_		
		yds of	ZJ ganons	<u>INA</u>		
		sand:	_NA	_NA_		
OTHER	MATERIAL:_	NA	_ amount: _	<u>NA</u>		
8. EXPLAI	N METHOD (	OF EMPLACE	MENT OF M	IATERIAL:		
	rout pressure gro	-	ch ID tremie pip	e placed from botton	n to top of boring. Re	moved slowly as grou
9. CERTIF	CATION: W	hereby certify	that this wel	l abandonment re	cord is true and e	xact, and was
accomplishe	ed on <u>7th &amp; 8th</u> d	ay of the mont	h of <u>May</u>		, with our ac	tive participation
		participate in	/			
1. Signature	of Participant	Typhol	ØD	2. Signature of F	Participant:	
Date: <u>07/30/</u>		Address: Bellefonte, PA 16		Date:		<del></del>
UZ7 East KOII	nig Wage DHVe,	penerome, PA 10	104J_	<del></del>	<del></del>	

CONTRACTOR/AGENT:	Earthsystems, LI	L <u>c</u> RI	EGISTRATION :	NO. 4494	
DATE: <u>05/07-08/2012</u> TY	PE OF SITE O	OR PROGRA	M: <u>Chapter 245</u>	Storage Tank Act	<del></del>
1. WELL LOCATION: (S	how sketch of	location on b	ack of this form.	) See attached site layout map.	
Municipality Lawrence To	wnship		County	Clearfield County	<del></del>
Quadrangle Clearfield and G	ilen Richey, P <u>A</u>				
Latitude 41°00'21.64" N Lor	ngitude <u>78°27'1</u>	•	d, community, su	bdivision, lot no.)	
2. OWNER AND ADDRI	ESS: <u>United Ref</u>	fining Co., 15 B	radley St, P.O. Box	688, Warren, PA 16365	_
3. TOPOGRAPHY: (Circle depression, flat	e) hilltop, sl	ope, stream	terrace, valley,	stream channel, draw, local	l
4. USE OF WELL: Grou	ndwater Monitori	ng		WELL DIAGRAM: sketch	
5. DEPTH OF WELL: _N	VA	DIAMET OF WELI	ER _: 4-inch ID_	diagram showing depths of casing (if present); grouting materials, perforations, etc.	wen,
6. AMOUNT OF CASING REMOVED:	NA	DIAMET	ER: <u>4-inch</u> ID		
				MW-26	
	<del>-</del>	neat	sand		
7. SEALING	bags	cement	cement		
MATERIAL:	(94 lb):	3 bags	_NA_		
	gals of water:	23 gallons	NA_		
	yds of				
	sand:	<u>NA</u>	_NA_		
OTHER MATERIAL:	NA	_ amount: _	NA		
8. EXPLAIN METHOD C	F EMPLACE	MENT OF M	ATERIAL:		
Neat cement grout pressure grous is pumped to ensure no void spa		h ID tremie pip	e <u>placed from</u> bottor	n to top of boring. Removed slowly	as grout
9. CERTIFICATION: We	hereby certify	that this wel	l abandonment re	cord is true and exact, and wa	is
accomplished on 7th & 8th d	ay of the montl	n of <u>May</u>		, with our active participa	ation
and that we are qualified to	participate in s	such abandon	ment actions.		
1. Signature of Participant	Tylu u	at	2. Signature of l	Participant:	
Date: <u>07/30/2012</u> 629 East Rolling Ridge Drive, I	Address:	222	Date:	Address:	
OZZ CASI KOHILIZ KIUZE DIIVE, I	Jenenome, PA 10	04.1			

APPENDIX B

Well Logs

#### Project No: 277

## Monitoring Well: MW-34

Project: United Refining - Clearfield

Client: United Refining

Location: Clearfield, PA

Logger: S. Treschow, P.G.



629 East Rolling Ridge Drive Bellefonte, PA 16823

	SUBSURFACE PROFILE		SAMP	LE	
Symbol	Description	Number	Туре	Dry, Moist, Saturated	Well Completion Details
	Ground Surface		1.50		
	Asphalt		gri q		
- W50	Gravel Sub-base; Grey; Dry.				Bentonite Bentonite Gravel Concrete
	Silt Loam Brown, clayey silt. Moist to wet. No odors.				
					4-Inch Riser
					Sand
	Limestone				Bedrock Place Screen
	Auger Refusal; Bedrock.	1	T. IN		4
	End of Borehole		377		

Drill Method: Auger Rig

Drill Date: May 21, 2012

Hole Size: 8.25 Inch

Datum: Local

Checked by: S. Treschow, P.G.

Sheet: 1 of 1

Project No: 277

## Monitoring Well: MW-35

Logger: S. Treschow, P.G.

Project: United Refining - Clearfield

Client: United Refining

Location: Clearfield, PA

Letterle & Associates, LLC

629 East Rolling Ridge Drive Bellefonte, PA 16823

		SUBSURFACE PROFILE	!	SAMP	LE	
	Symbol	Description	Number	Туре	Dry, Moist, Saturated	Well Completion Details
		Ground Surface	WE SE	1.7	-	
111		Asphalt	So a l			
111111	e visa	Gravel Sub-base; Grey; Dry.				Bentonite   Bentonite   Gravel   Concrete
THE PERSON	1. HE ENGL (1.95) SHEEL (1.16) (1.16) (1.16)	Silt Loam				Bentonite T
THE PERSON		Brown, clayey silt. Moist to wet. No odors.				
allered bear deep						4-Inch Riser
11111						4-
11111						
11111						
11111						
Hilli	100			deli		Sand
11111						
111111						
111111						u de la companya de l
mil						Bedrock Screen
1111		Limestone Auger Refusal; Bedrock.				Bedrock → CH 14
		End of Borehole	1 2 2			

Drill Method: Auger Rig

Drill Date: May 21, 2012

Hole Size: 8.25 Inch

Datum: Local

Checked by: S. Treschow, P.G.

Sheet: 1 of 1

#### Project No: 277

## Monitoring Well: MW-36

Project: United Refining - Clearfield

Client: United Refining

Location: Clearfield, PA

Logger: S. Treschow, P.G.



629 East Rolling Ridge Drive Bellefonte, PA 16823

		SUBSURFACE PROFILE		SAMP	LE	
	Symbol	Description	Number	Туре	Dry, Moist, Saturated	Well Completion Details
		Ground Surface		1	HALL F	
7		Asphalt	7	167	7,146	
		Gravel Sub-base; Grey; Dry.				Bentonite   Concrete   Concrete
		Silt Loam Brown, clayey silt. Moist to wet. No odors.				
						4-Inch Riser
						io io
						Sand
		Limestone				Bedrock Screen
1		Auger Refusal; Bedrock.	1			4
+		End of Borehole	3 1	100		

Drill Method: Auger Rig

Drill Date: May 21, 2012

Hole Size: 8.25 Inch

Datum: Local

Checked by: S. Treschow, P.G.

Sheet: 1 of 1

#### APPENDIX C

**Groundwater Analytical Laboratory Reports** 



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



www.fairwaylaboratories.com

State Certifications: MD 275, WV 364

Letterle & Associates

629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

KWIK FILL-CLEARFIELD

Project Number:

[none]

Reported:

Collector:

**CLIENT** 

09/17/12 08:42

Number of Containers:

24

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Sample Type	Date Sampled	Date Received
MW-2A	2107068-01	Water	Grab	09/06/12 11:05	09/07/12 13:52
MW-3	2107068-02	Water	Grab	09/06/12 13:40	09/07/12 13:52
MW-4	2107068-03	Water	Grab	09/06/12 12:09	09/07/12 13:52
MW-7	2107068-04	Water	Grab	09/06/12 14:32	09/07/12 13:52
MW-10	2107068-05	Water	Grab	09/06/12 12:46	09/07/12 13:52
MW-14	2107068-06	Water	Grab	09/06/12 10:47	09/07/12 13:52
MW-15	2107068-07	Water	Grab	09/06/12 12:30	09/07/12 13:52
MW-21	2107068-08	Water	Grab	09/06/12 13:57	09/07/12 13:52
MW-29	2107068-09	Water	Grab	09/06/12 14:15	09/07/12 13:52
MW-30	2107068-10	Water	Grab	09/06/12 13:10	09/07/12 13:52
MW-32	2I07068-11	Water	Grab	09/06/12 11:33	09/07/12 13:52
MW-33	2107068-12	Water	Grab	09/06/12 11:20	09/07/12 13:52

Fairway Laboratories, Inc.

Reviewed and Submitted by:

mat

Michael P. Tyler Laboratory Director

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10/16/2012 10:45:00 AM



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State Certifications: MD 275, WV 364

Letterle & Associates

629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

KWIK FILL-CLEARFIELD

Project Number:

[none]

Reported:

Collector:

CLIENT

09/17/12 08:42

Number of Containers:

Client Sample ID: MW-2A

Date/Time Sampled: 09/06/12 11:05

**Laboratory Sample ID:** 

2I07068-01 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B	<del>_</del>						
Benzene	<1.00		1.00	ug/l	09/11/12 11:35	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	09/11/12 11:35	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	09/11/12 11:35	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	09/11/12 11:35	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	09/11/12 11:35	EPA 8260B	mlf	
Methyl tert-butyl ether	<1.00		1.00	ug/l	09/11/12 11:35	EPA 8260B	mlf	
Naphthalene	<1.00		1.00	ug/l	09/11/12 11:35	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		98.9 %	70-1	30	09/11/12 11:35	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		120 %	70-1	30	09/11/12 11:35	EPA 8260B	mlf	
Surrogate: Fluorobenzene		113 %	70-1	30	09/11/12 11:35	EPA 8260B	mlf	

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State Certifications: MD 275, WV 364

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Project:

KWIK FILL-CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

CLIENT

[none]

24

09/17/12 08:42

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-3

**Date/Time Sampled:** 09/06/12 13:40

Laboratory Sample ID:

2107068-02 (Water/Grab)

					Date / Time		. *	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	09/11/12 12:14	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	09/11/12 12:14	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	u <b>g/l</b>	09/11/12 12:14	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	09/11/12 12:14	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	09/11/12 12:14	EPA 8260B	mlf	
Methyl tert-butyl ether	27.5		1.00	ug/l	09/11/12 12:14	EPA 8260B	mlf	
Naphthalene	<1.00		1.00	ug/l	09/11/12 12:14	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene	9	06.9 %	70-2	'30	09/11/12 12:14	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		113 %	70-	30	09/11/12 12:14	EPA 8260B	mlf	
Surrogate: Fluorobenzene		110%	70-	30	09/11/12 12:14	EPA 8260B	mlf	

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State Certifications: MD 275, WV 364

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Project:

KWIK FILL-CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

[none]

Reported:

Bellefonte PA, 16823

Collector:

**CLIENT** 

Project Manager:

Jed Hill

Number of Containers:

24

09/17/12 08:42

Client Sample ID: MW-4

Date/Time Sampled: 09/06/12 12:09

Laboratory Sample ID:

2107068-03 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	09/11/12 12:54	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	09/11/12 12:54	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/I	09/11/12 12:54	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	09/11/12 12:54	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	09/11/12 12:54	EPA 8260B	mlf	
Methyl tert-butyl ether	<1.00		1.00	ug/l	09/11/12 12:54	EPA 8260B	mlf	
Naphthalene	<1.00		1.00	ug/l	09/11/12 12:54	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		97.2 %	70-1	30	09/11/12 12:54	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		120 %	70-1	30	09/11/12 12:54	EPA 8260B	mlf	
Surrogate: Fluorobenzene		114%	70-1	30	09/11/12 12:54	EPA 8260B	mlf	

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Project:

Collector:

KWIK FILL-CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

[none] CLIENT

24

Project Manager:

Jed Hill

Number of Containers:

09/17/12 08:42

Client Sample ID: MW-7

**Date/Time Sampled:** 09/06/12 14:32

Laboratory Sample ID:

2107068-04 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Toluene	<2.00		2.00	ug/l	09/12/12 12:38	EPA 8260B	mlf	
Ethylbenzene	<2.00		2.00	ug/l	09/12/12 12:38	EPA 8260B	mlf	
Xylenes (total)	<4.00		4.00	ug/l	09/12/12 12:38	EPA 8260B	mlf	
Isopropylbenzene	<2.00		2.00	ug/l	09/12/12 12:38	EPA 8260B	mlf	
Methyl tert-butyl ether	10.6		2.00	ug/l	09/12/12 12:38	EPA 8260B	mlf	
Naphthalene	<2.00		2.00	ug/l	09/12/12 12:38	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene	5	8.4 %	70-	30	09/12/12 12:38	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		121%	70-	30	09/12/12 12:38	EPA 8260B	mlf	
Surrogate: Fluorobenzene		114%	70-1	30	09/12/12 12:38	EPA 8260B	mlf	

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629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

KWIK FILL-CLEARFIELD

Project Number:

[none]

Reported:

Collector:

CLIENT

09/17/12 08:42

Number of Containers:

Client Sample ID: MW-10

Date/Time Sampled: 09/06/12 12:46

**Laboratory Sample ID:** 

2107068-05 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B		_	_				
Benzene	<1.00		1.00	ug/l	09/11/12 14:13	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	09/11/12 14:13	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	09/11/12 14:13	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	09/11/12 14:13	EPA 8260B	mlf	
Isopropylbenzene	<i.00< td=""><td></td><td>1.00 .</td><td>ug/l</td><td>09/11/12 14:13</td><td>EPA 8260B</td><td>mlf</td><td></td></i.00<>		1.00 .	ug/l	09/11/12 14:13	EPA 8260B	mlf	
Methyl tert-butyl ether	6.16		1.00	ug/l	09/11/12 14:13	EPA 8260B	mlf	
Naphthalene	<1.00		1.00	ug/l	09/11/12 14:13	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		98.0 %	70-1	30	09/11/12 14:13	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		116 %	70-1	30	09/11/12 14:13	EPA 8260B	mlf	
Surrogate: Fluorobenzene		110 %	70-1	30	09/11/12 14:13	EPA 8260B	mlf	

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89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



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Project:

KWIK FILL-CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector: CLIENT

[none]

09/17/12 08:42

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-14

State Certifications: MD 275, WV 364

**Date/Time Sampled:** 09/06/12 10:47

Laboratory Sample ID:

2107068-06 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EPA	Mathad 9260D	·						
Benzene	<1.00		1.00	ug/l	09/11/12 05:54	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	09/11/12 05:54	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	09/11/12 05:54	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	09/11/12 05:54	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	09/11/12 05:54	EPA 8260B	mlf	
Methyl tert-butyl ether	19.8		1.00	ug/l	09/11/12 05:54	EPA 8260B	mlf	
Naphthalene	<1.00		1.00	ug/l	09/11/12 05:54	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		100 %	70-	130	09/11/12 05:54	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		125%	70-	130	09/11/12 05:54	EPA 8260B	mlf	
Surrogate: Fluorobenzene		112%	70-	130	09/11/12 05:54	EPA 8260B	mlf	

Fairway Laboratories, Inc.

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Letterle & Associates

629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

KWIK FILL-CLEARFIELD

Project Number:

[none]

Reported:

Collector:

CLIENT

09/17/12 08:42

State Certifications: MD 275, WV 364

Number of Containers:

24

Client Sample ID: MW-15

Date/Time Sampled: 09/06/12 12:30

**Laboratory Sample ID:** 

2107068-07 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EP	A Method 8260B							
Benzene	<1.00		1.00	ug/l	09/11/12 06:34	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	09/11/12 06:34	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	09/11/12 06:34	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	09/11/12 06:34	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	09/11/12 06:34	EPA 8260B	mlf	
Methyl tert-butyl ether	5.64		1.00	ug/l	09/11/12 06:34	EPA 8260B	mlf	
Naphthalene	<1.00		1.00	ug/l	09/11/12 06:34	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		101 %	70-1	130	09/11/12 06:34	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		132 %	70-1	130	09/11/12 06:34	EPA 8260B	mlf	QF
Surrogate: Fluorobenzene		120 %	70-1	130	09/11/12 06:34	EPA 8260B	mlf	

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89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

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Letterle & Associates

Project:

KWIK FILL-CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

[none] **CLIENT** 

09/17/12 08:42

Project Manager:

Jed Hill

Number of Containers:

24

Client Sample ID: MW-21

Date/Time Sampled: 09/06/12 13:57

Laboratory Sample ID:

2107068-08 (Water/Grab)

					Date / Time		*	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B	···			·-			
Benzene	<2.00		2.00	ug/l	09/12/12 13:18	EPA 8260B	mlf	
Toluene	<2.00		2.00	ug/l	09/12/12 13:18	EPA 8260B	mlf	
Ethylbenzene	<2.00		2.00	ug/l	09/12/12 13:18	EPA 8260B	mlf	
Xylenes (total)	<4.00		4.00	ug/l	09/12/12 13:18	EPA 8260B	mlf	
Isopropylbenzene	<2.00		2.00	ug/l	09/12/12 13:18	EPA 8260B	mlf	
Methyl tert-butyl ether	42.1		2.00	ug/l	09/12/12 13:18	EPA 8260B	mlf	
Naphthalcne	<2.00		2.00	ug/l	09/12/12 13:18	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		96.6 %	70	130	09/12/12 13:18	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		118%	70	130	09/12/12 13:18	EPA 8260B	mlf	
Surrogate: Fluorobenzene		112%	70-	130	09/12/12 13:18	EPA 8260B	mlf	

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89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

www.fairwaylaboratories.com

Letterle & Associates

Project:

KWIK FILL-CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Collector:

[none]

Reported:

Bellefonte PA, 16823

CLIENT

Project Manager:

Jed Hill

Number of Containers:

24

09/17/12 08:42

Client Sample ID: MW-29

Date/Time Sampled: 09/06/12 14:15

Laboratory Sample ID:

2107068-09 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
/olatile Organic Compounds by E	PA Method 8260B							
Benzene -	<1.00.		1.00	ug/l	09/11/12 07:14	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	09/11/12 07:14	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	09/11/12 07:14	EPA 8260B	mlf	
Xylenes (totał)	<2.00		2.00	ug/l	09/11/12 07:14	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	09/11/12 07:14	EPA 8260B	mlf	
Methyl tert-butyl ether	25.0		1.00	ug/l	09/11/12 07:14	EPA 8260B	mlf	
Naphthalene	<1.00		1.00	ug/l	09/11/12 07:14	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene	<del></del>	96.7 %	70-1	130	09/11/12 07:14	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		122%	70-1	130	09/11/12 07:14	EPA 8260B	mlf	
Surrogate: Fluorobenzene		111 %	70-1	30	09/11/12 07:14	EPA 8260B	mlf	

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Letterle & Associates

Project:

KWIK FILL-CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

**CLIENT** 

[none]

09/17/12 08:42

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-30

**Date/Time Sampled:** 09/06/12 13:10

Laboratory Sample ID:

2107068-10 (Water/Grab)

					Date / Time		*	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	09/11/12 07:55	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	09/11/12 07:55	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	09/11/12 07:55	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	09/11/12 07:55	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	09/11/12 07:55	EPA 8260B	mlf	
Methyl tert-butyl ether	10.8		1.00	ug/l	09/11/12 07:55	EPA 8260B	mlf	
Naphthalene	<1.00		1.00	ug/l	09/11/12 07:55	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene	1	01%	70-	130	09/11/12 07:55	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4	i	25 %	70-	130	09/11/12 07:55	EPA 8260B	mlf	
Surrogate: Fluorobenzene	1	113%	70-	30	09/11/12 07:55	EPA 8260B	mlf	

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629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

KWIK FILL-CLEARFIELD

Project Number:

[none]

Reported:

Collector:

CLIENT

09/17/12 08:42

Number of Containers:

24

Client Sample ID: MW-32

**Date/Time Sampled:** 09/06/12 11:33

**Laboratory Sample ID:** 

2107068-11 (Water/Grab)

· · · · · · · · · · · · · · · · · · ·								
Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	09/11/12 08:35	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	09/11/12 08:35	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	09/11/12 08:35	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	09/11/12 08:35	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	09/11/12 08:35	EPA 8260B	mlf	
Methyl tert-butyl ether	4.07		00.1	ug/l	09/11/12 08:35	EPA 8260B	mlf	
Naphthalene	<1.00		1.00	ug/l	09/11/12 08:35	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		100 %	70-	130	09/11/12 08:35	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		125 %	70-	130	09/11/12 08:35	EPA 8260B	mlf	
Surrogate: Fluorobenzene	•	115%	70-1	130	09/11/12 08:35	EPA 8260B	mlf	

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Letterle & Associates

Project:

KWIK FILL-CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector: CLIENT

[none]

24

09/17/12 08:42

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-33

Date/Time Sampled: 09/06/12 11:20

**Laboratory Sample ID:** 

2107068-12 (Water/Grab)

	•				Date / Time		*	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	09/11/12 09:14	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	09/11/12 09:14	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	09/11/12 09:14	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	09/11/12 09:14	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	09/11/12 09:14	EPA 8260B	mlf	
Methyl tert-butyl ether	<1.00		1.00	ug/l	09/11/12 09:14	EPA 8260B	mlf	
Naphthalene	<1.00		1.00	ug/l	09/11/12 09:14	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene	9	7.7%	70-	130	09/11/12 09:14	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		125%	70-	130	09/11/12 09:14	EPA 8260B	mlf	
Surrogate: Fluorobenzene	•	116%	70-	130	09/11/12 09:14	EPA 8260B	mlf	

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Letterle & Associates

629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

KWIK FILL-CLEARFIELD

Project Number:

[none]

Reported:

Collector:

CLIENT

09/17/12 08:42

Number of Containers: 24

#### Notes

QF

Surrogate recovery out of range due to possible matrix interference.

#### **Definitions**

Surrogate values must be within the indicated range, otherwise the results are considered to be estimated.

State Certifications: MD 275, WV 364

Reporting limits are adjusted accordingly when samples are analyzed at a dilution due to the matrix.

The following analyses are to be performed immediately upon sampling: pH, sulfite, chlorine residual, dissolved oxygen and ferrous iron. The date and time reported reflect the time the samples were analyzed at the laboratory.

If the solid sample weight for VOC analysis does not fall within the 3.5-6.5 gram range, the results are considered estimated values,

- P indicates analysis performed by Fairway Laboratories, Inc. at the Pennsdale location. This location is PaDEP Chapter 252 certified.
- Represents "less than" indicates that the result was less than reporting limit.

MDL Method Detection Limit - is the lowest or minimum level that provides 99% confidence level that the analyte is detected. Any reported result values that are less than the MDL are considered estimated values.

RLReporting Limit - is the lowest or minimum level at which the analyte can be quantified.

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Page 14 of 17

Reinquished by:  Reinquished by:  Date			Sampled by: Off CM 9-6-12	mw-32	Mw-30	9 mw-29			MW-14	WW-10	アゲーノ	mw-4	MW-3	MW-JA	Sample Description/Location	Rush TAT subject to pre-approval and surcharge Rush TAT subject to pre-approval and subject to pre	TAT: Normal D Rush D	Project Name: Krotk F. W. Charefield	#: 814	Contact: Sed How	-9 B Delling D	Client Name: Lothers & Association	CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS Please print. See back of COC for instructions/terms and conditions.
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2019 9th Ave.
P.O. Box 1925
Altoona, PA 16602
Phone: (814) 946-4306
Fax: (814) 946-8791 FAIRWAY LABORATORIES Environmental Laboratory

89 Kristi Rd
Pennsdale, PA 17756
Phone: (570) 494-6380

Page & of &

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Chain of Custody Receiving Document

This is a date sensitive document and may not be current after May 22, 2012.

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#### Cassel, Debra

From: Shirley Scheidell [delivery@yousendit.com]
Sent: Monday, February 11, 2013 3:45 PM

To: Cassel, Debra

**Subject:** 4th Qtr. 2012 RAPR - Claim #08-034(M), Kwik Fill M-90



## A file has been sent to you

from sscheidell@letterleassociates.com via YouSendlt.

Copy of the 4Q12 RAPR (supporting documentation) for completion of Milestone E1 of the 3/9/12 remediation agreement as requested.

United Refining Clearfield - 4th Qtr 2012 RAPR.pdf

Size: 9.36 MB Content will be available for download until February 28, 2013 12:45 PST.

# REMEDIAL ACTION PROGRESS REPORT 4<sup>th</sup> Quarter 2012

#### PADEP Facility ID #17-14821 PAUSTIF Claim #2008-0034(M) Kwik Fill #M-90

1322 South 2<sup>nd</sup> Street Clearfield, Lawrence Township Clearfield County, Pennsylvania 16830

Prepared for:

#### United Refining Company of Pennsylvania

15 Bradley Street P.O. Box 688 Warren, Pennsylvania 16365

Prepared by:

Letterle & Associates, LLC 629 East Rolling Ridge Drive Bellefonte, Pennsylvania 16823

Jed Hi<del>ll</del>

Project Manager

Steven James Treschow, P.G. Professional Geologist

EVEN JAMES TRESCH

**GEOLOGIST** 

January 2013

"By affixing my seal to this document, I am certifying that the information is true and correct to the best of my knowledge. I further certify I am licensed to practice in the Commonwealth of Pennsylvania and that it is within my professional expertise to verify the correctness of the information."

Steven James Treschow, P.G. (signed and sealed this day (January 24, 2013))



Environmental Consulting & Remediation Services

629 East Rolling Ridge Drive Bellefonte, PA 16823

814. 355. 2241 office 814. 355. 2410 fax

January 24, 2013

Mr. Scott Ferguson, P.G. PADEP Environmental Cleanup Program 208 W. Third St., Suite 101 Williamsport, PA 17701-6448

RE: 4<sup>th</sup> Quarter 2012 Remedial Action Progress Report PADEP Facility ID #17-14821 PAUSTIF Claim #2008-0034(M) United Refining Company of Pennsylvania Kwik Fill #M-90 1322 South 2<sup>nd</sup> Street, Clearfield, PA

Dear Mr. Ferguson:

Enclosed please find a copy of the 4<sup>th</sup> Quarter 2012 Remedial Action Progress Report prepared by Letterle & Associates, LLC, on behalf of United Refining Company of Pennsylvania, for the Kwik Fill #M-90, located at 1322 South 2<sup>nd</sup> Street, Clearfield, Pennsylvania.

If you have any questions please contact Jed Hill at (814) 355-2241 or jhill@letterleassocjates.com.

Sincerely

Jed Hill

Project Manager

Enclosure

cc: Mr. Scott C. Wonsettler, P.G., United Refining Company of Pennsylvania

Mr. Gerald Hawk, ICF International

Mr. Robert McDonald, Arch Street Management

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### **GENERAL INFORMATION**

Client Contact: Scott Wonsettler, P.G.

Letterle Project Manager: Jed Hill

Regulatory Contact: Scott Ferguson, P.G.

PADEP Facility ID #: 17-14821

PAUSTIF Claim #: 2008-0034 (M)

Number of Wells: 14 monitoring wells (on-site wells MW-2A, MW-32, and

MW-33 and off-site monitoring wells MW-3, MW-4, MW-7, MW-9, MW-10, MW-14, MW-15, MW-17, MW-21, MW-29,

and MW-30).

Wells Containing LNAPL: 0

### SITE HISTORY

Letterle & Associates, LLC (Letterle) of Bellefonte, Pennsylvania (PA) is pleased to present this Remedial Action Progress Report (RAPR) for United Refining Company (United) of PA Kwik-Fill #M-90 (site), located in Lawrence Township, Clearfield, PA, for the period of October 1, 2012 through December 31, 2012. **Figure 1** depicts the site location and surrounding area.

The site is currently an active retail fueling (gasoline and diesel) station, which has two, 10,000-gallon and one, 8,000-gallon steel underground storage tanks (USTs). The two 10,000-gallon USTs were in installed in 1969 and the 8,000-gallon UST was installed in 1974. One 10,000-gallon UST and one 8,000-gallon contain unleaded gasoline and the remaining 10,000-gallon UST (in the middle) contains diesel fuel.

On June 15, 1995, the 10,000-gallon unleaded gasoline UST (#002) failed a tightness test. The PA Department of Environmental Protection (PADEP) was notified of the failure and subsequently, Mountain Research, Inc. (MRI) was retained by United in May 1996 to perform site characterization activities.

From June 1996 through October 1997, four soil boring/monitoring wells, MW-1, MW-1A, MW-2, and MW-2A, were installed on the site and five monitoring wells, MW-3 through MW-7, were installed off-site, on the Beckwith Machinery Company (Beckwith) property. Quarterly groundwater sampling began in February 1996. Groundwater analytical results for the monitoring wells indicated unleaded gasoline constituents at concentrations above their respective Medium-Specific Concentration (MSC) values. In June 1997, soil/groundwater samples were collected on-site and in the right-of-way of South 2<sup>nd</sup> Street. The results of the investigation indicated several soil/groundwater samples contained unleaded gasoline constituents at concentrations above their respective MSC values.

MRI prepared a Remedial Action Plan (RAP) in July 1999 proposing a Matrix Trailer Mounted Oxygen Injection System. The PADEP approved the RAP in January 2000. In February 2000, system installation was initiated. The system consisted of eight oxygen injection points and a small trailer to house any ancillary equipment. On April 12, 2000, the system was activated. The system was operational from April 12, 2000 until the first quarter of 2005. From February 1996 through

first quarter of 2005, MRI performed quarterly groundwater sampling from the monitoring well network.

From early 2005 through mid-2006, additional site investigations were initiated at the site to reevaluate the remedial approach. In October 2006, a Supplemental Site Characterization Report (SCR) and RAP Addendum was submitted to the PADEP. The Supplemental SCR/RAP Addendum identified two separate source areas, one on-site and one off-site at the BMC property. The on-site source area (Source Area #1) was found to have impacted groundwater beneath the site and downgradient on the former BMC property. Impacted groundwater from Source Area #2 was found to be related to an off-site release and not associated with the Kwik Fill M-90 facility. The Supplemental SCR/RAP Addendum strategy included remediating groundwater via an air sparge/soil vapor extraction (AS/SVE) system. An additional RAP Addendum was submitted in December 2006. The PADEP approved the Supplemental SCR/RAP Addendum and additional RAP Addendum in January 2007, with modifications. An AS/SVE system was installed at the site and operated from November 2007 through the fourth quarter of 2008.

A second release of unleaded gasoline occurred at the site, and was reported in February 2008. Additional site characterization activities were initiated and an Additional SCR and RAP Addendum was submitted in June 2011. The June 2011 Additional SCR/RAP Addendum included the selection of a dual phase extraction (DPE)/SVE system to address on-site soil and groundwater and enhanced in-situ bioremediation (EB) to address off-site groundwater. The June RAP Addendum was approved by the PADEP in July 2011.

#### REMEDIAL ACTION PLAN IMPLEMENTATION

The PA Underground Storage Tank Indemnification Fund (PAUSTIF) and their administrator, ICF International (ICFI), put the site remedial work out for competitive bid. The proposed scope of work was based upon the July 2011 approved RAP. Letterle was awarded the bid in March of 2012 and began implementation of the approved RAP.

Remedial actions completed in previous quarters include off-site well abandonment, dual-phase extraction well installation, remedial system trenching and piping, remedial system installation, and the application of a chemical oxidant as part of an enhanced bioremediation feasibility study.

### **Remedial System**

The remedial system trailer was constructed and mobbed to the site during the third quarter of 2012 and began operation during the fourth quarter of 2012. The principal DPE system components housed within the trailer include:

- One claw pump;
- One air compressor;
- One air/water separator (AWS) tank;
- One equalization tank;
- Two transfer pumps and level controls;
- Six pneumatic groundwater pumps;

- Four 300-pound liquid-phase granular activated carbon (GAC) vessels (high pressure units):
- Two 600-pound vapor-phase GAC vessels; and,
- Control panel for the claw pump, air compressor, and the transfer pumps (including all system interlocks).

The trailer is located along the southern property boundary. The dimensions of the trailer are approximately 8 feet in width, 20 feet in length, and 8 feet tall. The trailer includes wall and roof insulation and has adjustable wall louvers close to the floor, each complete with an exterior mounted mesh screen. Each louver contains an explosion-proof (XP) fan to circulate outside air into it. The fan is controlled both thermostatically and by a manual wall switch located near the side door. The trailer contains an XP radiant heater unit with adjustable thermostat to prevent freeze damage during the winter. The heater/thermostat is capable of maintaining a minimum ambient air temperature of 50 °F within the enclosure regardless of outside temperatures.

The trailer has a double door large enough to remove any piece of equipment housed within the trailer. The trailer includes a sump built into the floor equipped with a high level alarm switch that will terminate system operation if activated. The influent and effluent PVC pipes stubbed out of the ground by the installation contractor are inside 18-inch well vaults and are connected in the trailer with a pressure connection. The trailer includes an outside wall electrical receptacle, a lightning rod, and grounding. The trailer contains a mounted 20-pound fire extinguisher within three feet of the door.

A fenced area adjacent to the remediation trailer was constructed to accommodate the vapor phase treatment equipment and associated control panels. The fenced area is approximately 8 feet by 14 feet in size and consist of a 6-foot high privacy fence with one access gate.

The remediation system began operation during the fourth quarter of 2012. The recovered groundwater is treated and discharged to the sanitary sewer under an issued permit from the Clearfield Municipal Authority (CMA).

### QUARTERLY SITE ACTIVITIES COMPLETED – $4^{TH}$ QUARTER 2012

### **Remedial System Operation**

The DPE remedial system was activated on October 30, 2012 and the system was in operation upon arrival at the site on November 26, 2012. The system was shutdown at the end of the day to allow for return of groundwater levels to static conditions prior to starting the engineering evaluation on November 27, 2012. All remediation system equipment was observed to be in good working condition prior to shutdown. All clear schedule 40 PVC sight-tubes on the influent manifold showed signs of only minor scaling to the system piping. Since remediation system startup, a total of 142,565 gallons of groundwater have been extracted at an average of 4.71 gallons per minute (gpm) over the time period. All equipment safety alarms have been tested and are in good working order. The recovered and treated groundwater is treated and discharged to the sanitary sewer under an issued permit from the CMA. Under the terms of the permit, analytical reports and totalizer readings are reported in Discharge Monitoring Reports (DMR) on a monthly basis to the CMA. Petroleum

impacted soil and groundwater remediation systems have been listed as exempt from the Plan Approval/Operating permit requirements by PADEP, Division of Air Quality. The remediation system is operated under the exemption requirements.

### **Remedial System Alterations**

The over amping of the rotary claw SVE pumps has been eliminated by increasing the size of the exhaust piping. Heat tape and insulation have been installed on all hoses and piping that is exposed under the trailer to prevent freezing. Sediment filter changes will initially occur during every O&M event in order to minimize system downtime due to clogged sediment filters. The four 400-pound liquid-phase GAC pressure vessels will continue to be connected in a parallel/series arrangement to treat the groundwater. The existing vapor carbon treatment system will remain with two 600-pound vapor-phase GAC units connected in a series configuration.

### **Remedial System Summary**

Based on the results of the system engineering evaluation, the remediation system at the Kwik Fill M-90 site is operating with influence results similar to the original design and currently, the influence of the DPE system is large enough to cover the majority of the down gradient contaminated plume area. The DPE system has been placed into operation and extraction from the recovery wells will continue. To allow for adequate vacuum levels with the addition of the VEGE system, DPE recovery wells MW-1 and MW-28, MW-31, and MW-34 will be continuously operated through 2013. Wells MW-1A, MW-2, MW-35 and MW-36 will remain shutdown to increase the vacuum of the DPE system and to prevent overwhelming the groundwater treatment system with excessive amounts of extracted groundwater. The system will be serviced twice a month for regularly scheduled preventative maintenance to ensure operational success. Future evaluations will include measurements of vacuum at the top of each recovery well, groundwater recovery rates from each DPE well, and water table drawdown after an extended period of system operation. For additional details concerning the operation and performance of the remedial system, please see the Remediation System Start-Up Engineering Evaluation included as **Appendix B**.

### **Groundwater Monitoring**

### **Groundwater Gauging**

Letterle completed a quarterly groundwater gauging and sampling event on December 14, 2012. A total of 12 monitoring wells were sampled: on-site wells MW-2A, MW-32, and MW-33 and off-site monitoring wells MW-3, MW-4, MW-7, MW-10, MW-14, MW-15, MW-21, MW-29, and MW-30 (MW-9 and MW-17 could not be located). Prior to well purging, the depth to groundwater in each well was measured using an electronic water level probe accurate to the nearest 0.01 foot. The groundwater gauging and elevation results are on **Table 1**.

### Shallow Water-Bearing Zone

The groundwater gauging data collected during the sampling event indicated the following for the shallow water-bearing zone:

- Groundwater elevations in the shallow water-bearing zone ranged from 1,134.25 feet in MW-7 to 1,145.66 feet in MW-2A;
- The apparent groundwater flow direction in the shallow water-bearing zone is towards the north (towards the West Branch Susquehanna River) (Figure 3);
- Based on the groundwater elevation data for on-site monitor wells MW-2A (1,145.66 feet) and MW-7 (1,134.25 feet), the horizontal hydraulic gradient was approximately 0.030 feet per foot (ft/ft); and,
- The groundwater elevations observed in MW-10 was considered anomalous and was not used in groundwater contouring.

### **Groundwater Sampling**

### Sampling Methodology

Quarterly groundwater sampling at the site was completed on December 14, 2012. Monitoring wells MW-2A, MW-3, MW-4, MW-7, MW-10, MW-14, MW-15, MW-21, MW-29, MW-30, MW-32, and MW-33 (MW-9 and MW-17 could not be located) were purged and sampled using low flow techniques. The following field screening parameters were collected from the sampled monitor wells via an YSI Model 556 flow-through cell and water quality meter: pH, Temperature, Specific Conductance, total suspended solids (TSS), dissolved oxygen (DO), and oxidation-reduction potential (ORP).

The groundwater samples were submitted for analysis of PADEP pre-March 2008 short list of unleaded gasoline constituents via USEPA Method 8260B. The laboratory analyses included the following constituents: benzene, toluene, ethylbenzene, xylene(s) total, methyl tert-butyl ether (MTBE), cumene (isopropylbenzene), and naphthalene.

### Sampling Results

Within the shallow water-bearing zone, analytical results from the groundwater sampling program conducted on December 14, 2012 indicated no exceedances of the applicable PADEP Used-Aquifer TDS  $\leq 2,500$  milligrams per liter (mg/L)) Residential Statewide Health Standard (UARSHS) MSCs.

**Table 1** summarizes the groundwater analytical results. The complete analytical laboratory reports are included in **Appendix A.** 

### PLANNED ACTIVITY

The following activity is currently planned for the 1<sup>st</sup> Quarter of 2013:

- Remedial system operation and maintenance (including permit-required sampling);
- Quarterly groundwater gauging and sampling; and,
- Quarterly reporting.

The targeted goals of the remedial action are the elimination of the potential exposure pathways identified during site characterization activities (i.e., inhalation via indirect contact with groundwater

and ingestion and dermal contact via direct contact with surface water) and the attainment of the applicable PADEP UARSHS MSCs.

### **TABLE**

					Campound			- 1		
					Ethyl-	Xylenes		34.640		
Piezometer/Well PADEP UARSHS	Date	MTBE	Benzene	Toluene	benzene	(Total)	Cumene	Naplithalene		
MSCs		20	- 5	1,000	700	10,000	840	100	Depth-to- Groundwater	Groundwater Elevation
MW-1	3/17/2010	10.9	<1,00	<1.00	<1.00	<3.00	<1.00	<2.00	2.26	1147.28
	-6/8/2010	11.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.57	1146.97
	8/30/2010 11/17/2010	18.6 13.7	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	4.78 3.40	1144.76 1146.14
	3/1/2011	6.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.78	1147.76
	5/31/2011	13.5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.75	1145.79
	8/24/2011 3/28/2012	12.1 14.8	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	4.12 2.12	1145.42 1147.42
	6/25/2012	1410	*7.00	<del></del>	nitoring well co					L
MW-1A	3/17/2010	7.1	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.57	1147,20
	6/8/2010	6.9	<1.00	<1.00	<1.00	<3.00	<1,00	<2.00	2.86	1146.91
	8/30/2010 11/17/2010	16.3 10.6	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	5,32 3.88	1144.45 1145,89
	3/1/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.04	1147.73
	5/31/2011	4.2	<1.00	<1.00	<1.00	<3.00	<1,00	<2,00	4.29	1.145.48
	8/24/2011 3/28/2012	8.6 <1.00	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2,00 <2,00	4.65 2,55	1145,12 1147,22
,	6/25/2012	41.00	~1.00		nitoring well co				2,32	1177,22
MW-2	3/17/2010	20.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.07	1146.91
	6/8/2010	20,5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3,36	1146.62
	8/30/2010 11/17/2010	20,5 20,1	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	5.61 4.36	1144.37 1145.62
	3/1/2011	11.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.73	1147.25
	5/31/2011	10.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.68	1145,30
	8/24/2011 3/28/2012	14.3 11.5	<1.00 1.1	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	4,90 2.85	1145.08 1147.13
	6/25/2012	11.3	.E.p.3.		nitoring well co				2.03	1177,15
MW-2A	3/17/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1,21	1147.66
	.6/8/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.27	1147.60
	8/30/2010 11/17/2010	<1,00 <1.00	<1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	3.23 2.25	1145.64 1146.62
	3/1/2014	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.91	1147.96
	5/31/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.16	1146.71
	8/24/2011 3/28/2012	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	2,52 0,45	1146,35 1148.42
	6/25/2012	5,22	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.51	1144.36
	9/6/2012	<1.00	<1.00	<1,00	<1.00	<2.00	<1.00	<1.00	3.21	1145.66
Approximate to the second street and the second sec	12/14/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.12	1144.75 1143.80
MW-3	3/18/2010 6/7/2010	43.2 44.0	<1,00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1,00 <1,00	<2.00 <2.00	2.43 2.40	1143.83
	8/31/2010	41.4	<1,00	<1.00	<1.00	<3.00	<1.00	<2.00	3.92	1142.31
	11/17/2010 3/2/2011	40.3	<1.00 <1.00	<1,00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	3.48 1.81	1142.75 1144.42
	5/31/2011	33.2 NS	~1.00 NS	NS	NS	NS	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	\2.00 NS	NG	NA
	8/24/2014	32.3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3,38	1142,85
1	3/28/2012	NS 21.9	NS 51.00	NS <1.00	NS <1.00	NS <2.00	NS <1.00	NS <1.00	1,40 3.17	1144.83 1143.06
	6/25/2012 9/6/2012	27.5	<1.00 <1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.17	1142.06
	12/14/2012	18.4	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	5.63	1140.60
MW-4	3/18/2010	<1,00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.97	1144.15
######################################	6/7/2010 8/31/2010	<1,00 <1,00	<1.00 <1.00	<1,00 <1,00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	2.17 4.44	1142,95 1140.68
***	11717/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.26	1141.86
	3/2/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.92	1144.20
# # #	5/31/2011	NS -1.00	NS ~1.00	NS <1.00	NS = 1.00	NS	NS <1.00	NS <2.00	NG 3.24	NA
¥	8/24/2014 3/28/2012	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00	1.20	1141.88 1143.92
	6/25/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	2.74	1142.38
	9/6/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.11	1141.01
When the grant of grant of the same of the	12/14/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	3.40	1141.72

					Compound	VINZENEY				
Piezometer/Well	Date	MTBE	Benzene	Toluene	Ethyl- benzene	Xylenes (Total)	Cumene	Naphtholene		e Granda i i
PADEP UARSHS	Date		5	1,000	700	10,000	840	100	Depth-to-	Groundwater
MSCs		20		2015年	動物 华元 5		<b>含、换三次数量</b>	CERTAIN	Groundwater	
MW-5	3/17/2010	5,4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.16	1143.51
	6/7/2010 8/31/2010	4.8 3.8	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	1.53 3.18	1143.14 1141.49
	11/17/2010	2.6	<1.00	<00.1>	<1.00	<3.00	<1.00	<2.00	2.80	1141.87
	3/1/2011	1.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.43	1144.24
	5/31/2011	NS	NS	NS 11.00	NS -1.00	NS 12.00	NS	NS	NG	NA 11/2/22
	8/24/2011 3/28/2012	5.7 NS	<1.00 NS	<1.00 NS	<1.00 NS	<3.00 NS	<1.00 NS	<2.00 NS	2.64 1.04	1142.03 1143.63
	6/25/2012	1117	A		of quarterly san			110	2.25	1142,42
	9/6/2012			Well not part c	of quarterly san	pling program			NG	NA
MW-6	3/17/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	6/7/2010	NS	NS NS	NS	NS NS	NS	NS	NS NS	NG NG	NA NA
	8/31/2010 11/17/2010	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NG NG	NA NA
	3/1/2011	NS NS	NS NS	NS	NS	NS	NS	NS	NG	NA
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	NS	NS NG	NS	NS VC	NS	NS	NS NS	NG	NA NA
	3/28/2012 6/25/2012	NS	NS	NS Welf could t	NS not be located.	NS Well not part (	NS of quarterly sar	NS npling program	NG	NA NA
	9/6/2012							npling program		
MW-7	3/18/2010	3.6	59.5	11.5	44.4	54.7	25.6	44.5	2.60	1139.41
	6/7/2010	3.1	57.7	12.9	55.2	60.3	35.4	61.3	5,77	1136.24
	8/31/2010	6.8	104	14.4	47.9	49.2	29.3	38.7	7.92	1134,09
	11/17/2010 3/2/2011	7.2 4.1	97,9 51.9	12.5 8.8	46.5 39.3	47,4 27.7	27.3 22.4	57.7 20.9	6.85 3.93	1135.16 1138.08
	5/31/2011	NS NS	NS	NS NS	39.3 NS	NS NS	NS NS	NS NS	3.93 NG	NA
	8/24/2011	7.7	73.8	10.2	25.8	28.5	31.3	40.7	7.21	1134.80
	3/28/2012	NS NS	NS	NS	NS	NS	NS	NS	7.15	1134,86
	6/25/2012 9/6/2012	3,84	<1.00 NS	<1.00 <2.00	<1.00 <2.00	<2.00 <4.00	<1.00 <2.00	<1.00 <2.00	7.49 7.76	1134.52 1134.25
	12/14/2012	10.6 <2.00	84.4	14,8	89.5	43.6	29.0	65.4	5.80	1134.23
MW-9	3/17/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	6/8/2010	32.8	<1.00	<1.00	<1.00	<3.00	<1,00	<2.00	0.00	1141.97
	8/30/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	11/17/2010 3/1/2011	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NG NG	NA NA
	5/31/2011	NS NS	NS NS	NS NS	NS	NS NS	NS	NS	NG	NA NA
	8/24/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	3/28/2012	NS	NS	NS	NS	NS	NS	NS	NG	NA.
	6/25/2012 9/6/2012					l could not be l l could not be l				
MW-10	3/17/2010	8.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.64	1147.90
141 48-10	6/7/2010	8.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.78	1148.76
	8/31/2010	8.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.08	1147.46
	11/17/2010	7.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.50	1147.04
	3/2/2011 5/31/2011	7.1 NS	<1.00 NS	<1.00 NS	<1,00 NS	<3.00 NS	<1,00 NS	<2.00 NS	0.14 NG	1149.40 NA
	8/24/2011	7.5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1,42	1148.12
	3/28/2012	NS	NS	NS	NS	NS	NS	NS	1.42	1148.12
	6/25/2012	5.01	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	1.23	1148,31
	9/6/2012 12/14/2012	6.16 5.56	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<2.00 <2.00	<1.00 <1.00	<1.00 <1.00	2.10 2.08	1147.44 1147.46
MW-12	3/17/2010:	NS NS	NS	NS	NS	NS	NS	NS	NG	NA
:11 11-12	6/7/2010	NS	NS	NS NS	NS NS	NS NS	NS NS	NS	NG NG	NA NA
	8/31/2010	NS	NS	NS	NS	NS	NS	NS	NG	NA
	11/17/2010	30,3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.28	1142.28
	3/2/2011 5/31/2011	NS NS	NS NS	NS NC	NS NC	NS	NS NG	NS	NG NG	NA NA
	5/31/2011 8/24/2011	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NS NS	NG NG	NA NA
	3/28/2012	NS NS	NS	NS	NS	NS NS	NS	NS .	NG	NA
	6/25/2012			Well not part o	f quarterly sam	pling program.			2.83	1142.73
	9/6/2012		Well could no	t be located. V	Vell not part of	quarterly same	oling program.		NG	NA

Notes: All results reported in ug/l.

Bold values indicate levels above LRL.

Bold and shaded values indicate exceedance of UARSHS MSCs.
NG - Not Gauged. NA - Not Available. NS - Not Sampled.

· 1000000000000000000000000000000000000					Compound					
					Ethyl-	Xylenes				
Piezometer/Well	Date:	MTRE	Benzene	Toluene	benzene	(Total)	Cumene	Naphthalene		
PADEP UARSHS MSCs		20	5	1,000	700	10,000	840	100	Depth-to- Groundwater	Groundwater Elevation
MW-14	3/17/201 <b>0</b> ,	23,0	<1,00	<1.00	<1.00	<3.00	<1.00	<2.00	1.97	1146.75
	- 6/7/201 <b>0</b>	18.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2,00	2.22	1146.50
	8/31/2010 11/17/2010	35.4 21.3	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1,00	<2.00 <2.00	4.43 3.40	1144,29 1145,32
	$\approx 3/2/2011$	2.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.62	1147.10
ļ	5/31/2011	21.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.44	1145.28
	8/24/2011	17.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.80	1143.92
	3/28/2012	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2,71	1146.01
	6/25/2012	8.80	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	3.59	1145.13
	9/6/2012	19.8	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.63	1144.09
	12/14/2012	<1,00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	6.89	1141.83
MW-15	3/18/2010	6.2	<1.00	<1.00	<1,00	<3.00	<1.00	<2.00	1.73	1145.56
	6/7/2010 8/31/2010	6.8 7.0	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3,00 <3.00	<1.00 <1.00	<2.00 <2.00	2.08 3.88	1145.21 1143.41
	11/17/2010	6.3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.44	1143.85
1	3/2/2011	4.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1,51	1145.78
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	6.6	<1.00	<1.00	<1,00	<3.00	<1.00	<2.00	3.27	1144,02
	3/28/2012	NS	NS	NS	NS	NS	NS	NS	2.20	1145.09
	6/25/2012	6.98	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	3.11	1144,18
	9/6/2012 12/14/2012	5.64 2.23	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<2.00 <2.00	<1.00 <1.00	<1,00 <1.00	4,18 5,45	1143.11 1141.84
7780000 TO 1000000 TO 10000000	Xe2 Mark Xerold Communication	RESEXTING A SECURITY OF THE SE	IIIXXIIIIIXAXIIIK 200XIIK IIXIX	5000 C C C C C C C C C C C C C C C C C C	Chical State (Introduction Co.					
MW-17	3/18/2010 6/7/2010	9,0	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	0.73	1142.53 1143.17
	8/31/2010	13.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.78	1141,48
	11/17/2010	11.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.70	1141.56
	3/1/2011	7.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	0.11	1143.15
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	NS	NS NS	NS	NS	NS Ma	NS	NS	NG	NA
	3/28/2012 6/25/2012	NS	NS	NS	NS Wal	NS I could not be I	NS conted	NS	NG	NA
	9/6/2012		CPSTNIKSHARIST TANIHIN THE ST	□ ************************************		l could not be l				
MW-21	3/17/2010	41,3	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.86	1144.60
	6/7/2010	42.2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.12	1144.34
	8/30/2010	40.0	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	3.43 3.22	1143.03 1143.24
	11/17/2010 3/2/2011	35.9 33.9	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.50	1143.24
	5/31/2011	NS	NS	NS	NS	NS	NS	NS NS	NG	NA
	8/24/2011	37.5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.05	1143.41
	3728/2012	NS	NS	NS	NS	NS	NS	NS	2.10	1144.36
	6/25/2012	21.7	<1.00	<1.00	<1.00	<2.00	<1.00	<1,00	2.94	1143.52
	9/6/2012	42.1	<2.00 <1.00	<2.00 <1.00	<2.00 <1.00	<4.00 <2.00	<2.00 <1.00	<2,00 <1.00	3.79 5.09	1142.67 1141.37
	12/14/2012	10.8			Protection of the second	converses sometimes, suggest	**************************************			THE PROPERTY OF THE PARTY OF TH
MW-22	-3/17/2010 6/7/2010	5.8 8.4	<1.00 <1.00	<1.00 <1.00	<1,00 <1.00	<3.00 <3.00	00.1> 00.1>	<2.00 <2.00	1.79 2.18	1143.08 1142.69
	8/30/2010	8,6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.60	1141.27
	11/17/2010	6.7	<1.00	<1,00	<1.00	<3.00	<1.00	<2.00	3.38	1141.49
	3/2/2011	6.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	1.42	1143.45
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	-8/24/2011	10.5	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.04	1141.83
	-3/28/2012 6/25/2012	NS	NS	NS Well not part o	NS   f quarterly sam	NS Indian program	NS	NS	2,11 2.81	1142.76 1142.06
	9/6/2012				of quarterly sam				3.43	1142.00
	12/14/2012				f quarterly sam				4.06	1140.81
			201 BOX 151 15 15 15 15 15 15 15 15 15 15 15 15		A SHOW AND THE REAL PROPERTY.		N-0-MIN-LTHITTIIIMPTHIT	TINGS THE BEAUTINESS OF STREET	STEADY WEST SANGER AND STREET	EGLAXIBOAN BUT WELL STORY

		las,			Compound	District of the				
					Ethyl-	Xylenes				
Piczometer/Well	Date	MTBL	Benzene	Toluene	henzene	(Total)	Cumene	Naphthalene		
PADEP UARSHS MSCs		20	5 - 5	1,000	700	10,000	840	100	Depth-to-	Groundwater Elevation
MW-23	3/17/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.51	1144,65
	6/7/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1,00	<2.00	2.03	1145.13
	8/31/2010/	<1.00	<1.00	<1,00	<1.00	<3.00	<1.00	<2.00	4.63	1142.53
	11/17/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.90	1143.26
	3/2/2011 5/31/2011	<1.00 NS	<1,00 NS	<1.00 NS	<1.00 NS	<3.00 NS	<1.00 NS	<2.00 NS	2.02 NG	1145.14 NA
	8/24/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.93	1143,23
	3/28/2012	NS	NS	NS	NS	NS	NS	NS	2.80	1144.36
	6/25/2012				of quarterly san				4.57	1142.59
	9/6/2012				of quarterly san				5.37 5,99	1141.79
	12/14/2012			and the same party and	f quarterly san	4:1024m11m217.co.x2.100	EACH SHEET ONCOME SATURATED	-2.00	#20.5 X 20.44 Y 10.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54 - 20.54	THE RESERVE OF THE PARTY OF THE
MW-28	3/17/2010 6/8/2010	4,5 3.4	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00 <3.00	<1.00 <1.00	<2.00 <2.00	3.13 3.44	1146.94 1146.63
	8/30/2010	6.4	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	5.64	1144.43
	11/17/2010		<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4,46	1145,61
	(3/1/2011⊯	7.6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.01	1147.06
	5/31/2011	3.4	NS	NS	NS	NS	NS	NS	4.82	NA NA
	8/24/2011	4.9 14.6	<1.00 NS	<1.00 NS	<1.00 NS	<3.00 NS	<1.00 NS	<2.00 NS	4.97 2.88	1145.10 1147.19
	6/25/2012 6/25/2012	14.0	IND		nitoring well co				2.00	1147.19
MW-29	3/17/2010	35.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2,00	2.61	1144,65
191 97-29	6/7/2010	39.7	<1.00	<00.1>	<1.00	<3.00	<1.00	<2.00	2.83	1144.43
	8/30/2010	39.0	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4,95	1142.31
	11/17/2010		<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.95	1143.31
	3/2/2011	9.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2,23	1145.03
	5/31/2011 8/24/2011	NS 37.1	NS <1.00	NS <1.00	NS <1.00	NS <3.00	NS <1.00	NS <2.00	NG 3.81	NA 1143.45
	3/28/2012	NS	NS	NS NS	NS	NS	NS	NS	2.71	1144,55
	6/25/2012	22.8	<1,00	<1.00	<1.00	<2.00	<1.00	<1.00	3.58	1143.68
	9/6/2012	25.0	<1.00	<1.00	<1.00	<2.00	<1.00	<1,00	4.58	1142.68
mentalista esta esta esta esta esta esta esta e	12/14/2012	3.13	<1.00	<1.00	<1,00	<2.00	<1.00	<1.00	5.77	1141.49
MW-30	3/18/2010	17.0	23.9	<1,00	14.5	12.2	1,9	2.5	2,23	1145.03
	6/7/2010 8/31/2010	20.1	17.9 <1.00	<1,00 <1,00	12,4 3.1	10,5 <3.00	1,9 <1.00	<2.00 <2.00	2.41 4.07	1144.85 1143.19
	11/17/2010	25.9 25.9	<1.00	<1.00 <1.00	1.8	<3.00	<1.00	<2.00	3.61	1143.65
	3/2/2011	22.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2,35	1144,91
	5/31/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA
	8/24/2011	NS	NS	NS	NS	NS	NS	NS	NG	NA NA
	3/28/2012 6/25/2012	NS 8.41	NS <1.00	NS <1.00	NS <1.00	NS <2.00	NS <1.00	NS <1.00	NG 3.31	NA. 1143.95
	9/6/2012	10.8	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.30	1142.96
	12/14/2012	4.08	<2.00	<2.00	<2.00	<4.00	<2,00	<2.00	5.91	1141.35
MW-31	3/17/2010	7.8	668	783	265	2,700	26.4	119	3,16	1147.07
	- 6/8/2010s	6.3	336	118	119	754	10.2	61.8	3.61	1146.62
	8/30/2010	8.0	18.8	1.1	10.5	34.1	1.3	3.3	5.73	1144.50
	11/17/2010 3/1/2011	6.7 4.8	60,5 9,2	<1.00 1.4	20.6 3.6	20.4 4,1	1.8 <1.00	4.3 <2.00	4.73 3.48	1145.50 1146.75
	5/31/2011	6,3	66.1	<1.00	20.0	22.1	2.3	2.1	4.74	1145.49
	8/24/2011	14.3	439	7.2	135	272	12	35.7	5.03	1145.20
	3/28/2012	16,2	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.18	1147.05
services of organization and company and	6/25/2012	and the state of t		Мо	nitoring well co	AllKi-Million Co. Co.	X -166, 0 - 27,	Commence of the state of the st		
MW-32	5/28/2010	4,1	<1,00	<1.00	<1.00	<3.00	<1.00	<2.00	4.22	1145.58
	6/8/2010	2.8	<1.00	<1.00	<1.00	<3.00 <3.00	<1.00	<2.00 <2.00	3.21 5.16	1146,59 1144,64
	8/30/2010 11/17/2010	1.6 2.2	<1,00 <1.00	<1.00 <1.00	<1.00 <1.00	<3.00	<1.00 <1.00	<2.00 <2.00	3.16 4.64	1144.64
	3/1/2014	2.7	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.94	1146.86
	5/31/2011	2,6	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.15	1145,65
	8/24/2011	2.8	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.58	1145,22
	3/28/2012	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.49	1147.31
	6/25/2012 9/6/2012	4.51 4.07	<1.00 <1.00	<1.00 <1.00	<1.00 <1.00	<2.00 <2.00	<1.00 <1.00	<1.00 <1.00	4.51 5.51	1145,29 1144,29
	9/0/2012 12/14/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	5,65	1144.15
44-11-442-14	And the second second second	manuscript of the second of th				Zin 2 Marcina and China				

Notes:

All results reported in ug/l.

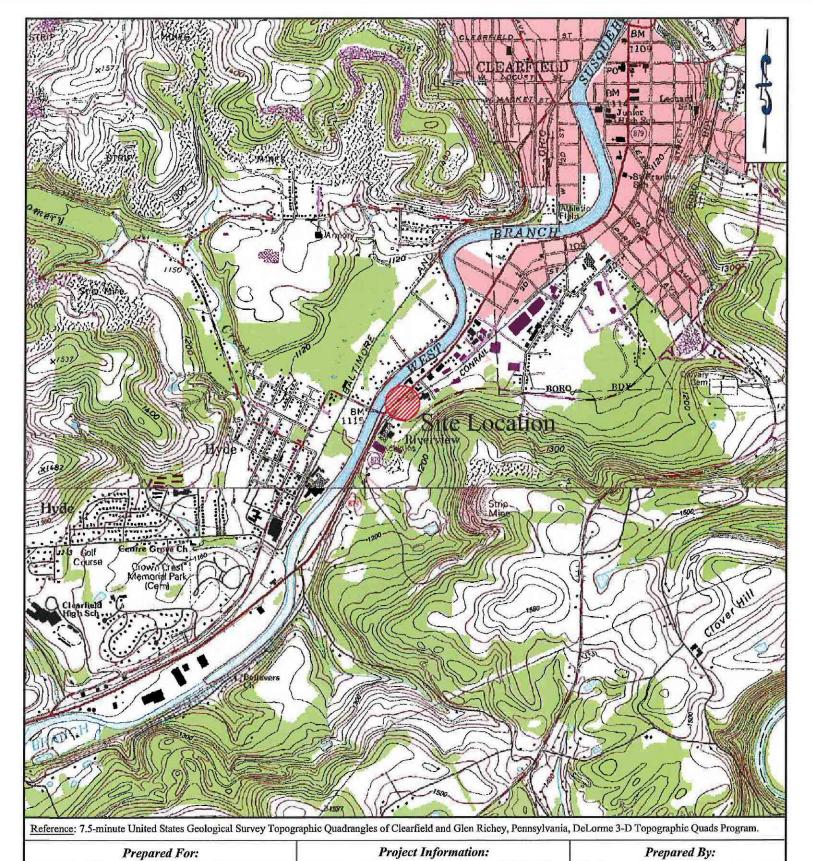
Bold values indicate levels above LRL.

Bold and shaded values indicate exceedance of UARSHS MSCs.

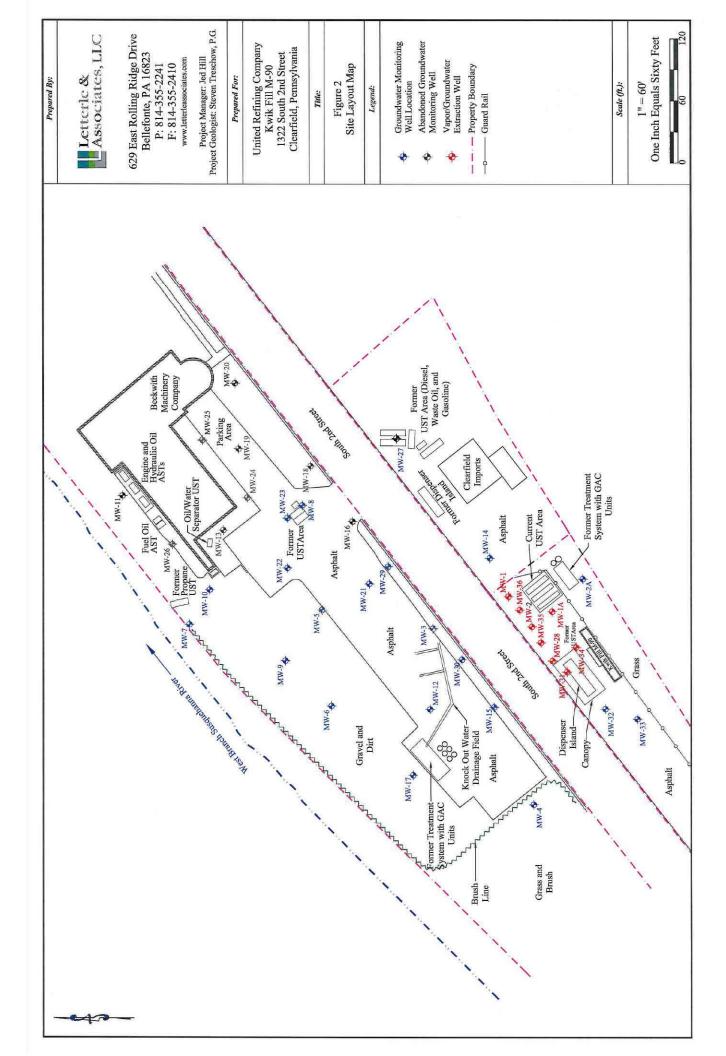
NG - Not Gauged. NA - Not Available. NS - Not Sampled.

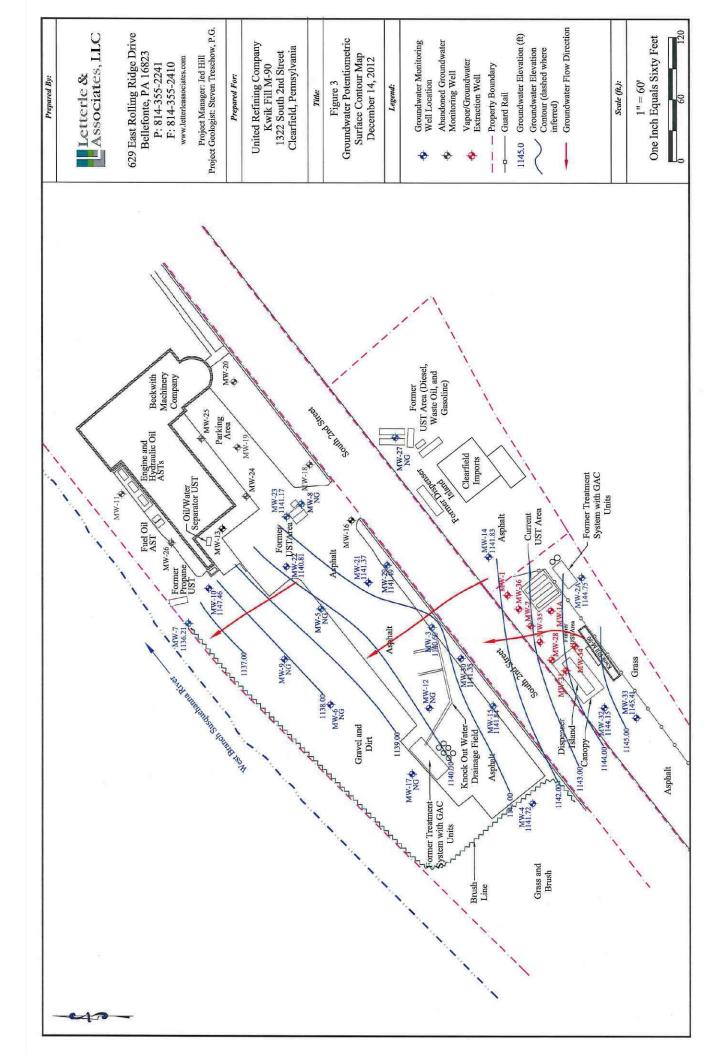
	7 - 2 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4 - 4	100			Compound					
Piezometer/Well	Date	мтвы	Benzene	Toluene	Ethyl- benzene	Xylenes (Total)	Cumene	Naphthalene		
PADEP UARSHS MSCs		20	5	1,000	700	10,000	840	100	Depth-to- Groundwater	Groundwater Elevation
MW-33	5/28/2010	<1,00	<1.00	<1.00	<1.00	<3.00	<1.00	< 2.00	4.41	1145.72
	6/8/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	< 2.00	3.36	1146.77
	8/30/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00_	<2.00	5,25	1144.88
	11/17/2010	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	< 2.00	4.96	1145.17
	3/1/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	3.42	1146.71
	5/31/2011	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	4.38	1145.75
	8/24/2011	<1.00	<1,00	<1.00	<1.00	<3.00	<1.00	<2.00	4.72	1145.41
	3/28/2012	<1.00	<1.00	<1.00	<1.00	<3.00	<1.00	<2.00	2.70	1147.43
	6/25/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.66	1145.47
	9/6/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	5.70	1144.43
THE WORLD WINDOWS TO SERVE STATE OF THE SERVE STATE OF THE SERVE STATE STATE OF THE SERVE STATE STATE OF THE SERVE STATE STATE STATE OF THE SERVE STATE STAT	12/14/2012	<1.00	<1.00	<1.00	<1.00	<2.00	<1.00	<1.00	4.72	1145.41

### **FIGURES**



United Refining Company, Kwik Fill M-90 1322 South 2nd Street, Lawrence Township, Clearfield County, Pennsylvania PADEP Facility ID #17-14821	Project Manager: Jed Hill Project Geologist: Steven Treschow, P.G.	Letterle & Associates, LLC
Title:	Scale (feet):	629 East Rolling Ridge Drive Bellefonte, PA 16823
Figure 1	Scale: 1" = 2000'	P: 814-355-2241
Site Location Map	0 2000 4000	F: 814-355-2410 www.letterleassociates.com





### **APPENDICES**

### APPENDIX A

**Groundwater Analytical Laboratory Reports** 



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



www.fairwaylaboratories.com

Letterle & Associates

629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

UR CLEARFIELD

Project Number: Collector:

[none]

Reported: 12/28/12 09:59

CLIENT

Number of Containers:

24

#### ANALYTICAL REPORT FOR SAMPLES

State Certifications: MD 275, WV 364

Sample ID	Laboratory ID	Matrix	Sample Type	Date Sampled	Date Received
MW-14	2L17019-01	Water	Grab	12/14/12 10:53	12/17/12 13:35
MW-2A	2L17019-02	Water	Grab	12/14/12 11:15	12/17/12 13:35
MW-33	2L17019-03	Water	Grab	12/14/12 11:29	12/17/12 13:35
MW-32	2L17019-04	Water	Grab	12/14/12 11:44	12/17/12 13:35
MW-4	2L17019-05	Water	Grab	12/14/12 12:02	12/17/12 13:35
MW-15	2L17019-06	Water	Grab	12/14/12 12:22	12/17/12 13:35
MW-10	2L17019-07	Water	Grab	12/14/12 12:34	12/17/12 13:35
MW-30	2L17019-08	Water	Grab	12/14/12 12:49	12/17/12 13:35
MW-3	2L17019-09	Water	Grab	12/14/12 13:02	12/17/12 13:35
MW-21	2L17019-10	Water	Grab	12/14/12 13:14	12/17/12 13:35
MW-29	2L17019-11	Water	Grab	12/14/12 13:25	12/17/12 13:35
MW-7	2L17019-12	Water	Grab	12/14/12 13:38	12/17/12 13:35

Fairway Laboratories, Inc.

Reviewed and Submitted by:

Michael P. Tyler Laboratory Director

Fairway Labs in Altoona, PA is a NELAP (National Environmental Laboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless otherwise stated on the analytical

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

www.fairwaylaboratories.com

Letterle & Associates

Project:

UR CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector: CLIENT

[none]

24

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-14

**Date/Time Sampled:** 12/14/12 10:53

**Laboratory Sample ID:** 

2L17019-01 (Water/Grab)

							,	
					Date / Time		*	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
olatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 11:44	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 11:44	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/I	12/21/12 11:44	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 11:44	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 11:44	EPA 8260B	wlm	
Methyl tert-butyl ether	<1.00		1.00	ug/l	12/21/12 11:44	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 11:44	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene	- A	91.7%	70-	130	12/21/12 11:44	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		92.2 %	70-	130	12/21/12 11:44	EPA 8260B	wlm	
Surrogate: Fluorobenzene		93.3 %	70-	130	12/21/12 11:44	EPA 8260B	wlm	



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

www.fairwaylaboratories.com

Letterle & Associates

Project:

UR CLEARFIELD

629 East Rolling Ridge Drive

Project Number: none Reported:

Bellefonte PA, 16823

Collector:

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-2A

**Date/Time Sampled:** 12/14/12 11:15

CLIENT

24

Laboratory Sample ID:

2L17019-02 (Water/Grab)

					Date / Time		2 c	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EP.	A Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 12:22	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 12:22	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 12:22	EPA 8260B	wlm	
Xylenes (total)	< 2.00		2.00	ug/l	12/21/12 12:22	EPA 8260B	wini	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 12:22	EPA 8260B	wlm	
Methyl tert-butyl ether	<1,00		1.00	ug/l	12/21/12 12:22	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 12:22	EPA 8260B	wim	
Surrogate: 4-Bromofluorobenzene		97.9 %	70	130	12/21/12 12:22	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		87.9 %	70-	130	12/21/12 12:22	EPA 8260B	wlm	
Surrogate: Fluorobenzene		89.6%	70-	130	12/21/12 12:22	EPA 8260B	wlm	



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Project:

Collector:

UR CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

[none] CLIENT Reported:

Bellefonte PA, 16823

Project Manager:

Jed Hill

12/28/12 09:59

Number of Containers:

24

Client Sample ID: MW-33

**Date/Time Sampled:** 12/14/12 11:29

Laboratory Sample ID:

2L17019-03 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	*Analyst	Note
Volatile Organic Compounds by EP	A Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Xylenes (total)	< 2.00		2.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Methyl tert-butyl ether	<1.00		1.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 13:00	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		88.3 %	70-	130	12/21/12 13:00	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		86.5 %	70-	130	12/21/12 13:00	EPA 8260B	wlm	
Surrogate: Fluorobenzene		93.0 %	70-	130	12/21/12 13:00	EPA 8260B	włm	



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629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

UR CLEARFIELD

Project Number: [none]

Reported: 12/28/12 09:59

Collector: **CLIENT** 

Number of Containers:

Client Sample ID: MW-32

**Date/Time Sampled:** 12/14/12 11:44

Laboratory Sample ID:

2L17019-04 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/I	12/21/12 13:38	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 13:38	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 13:38	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 13:38	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 13:38	EPA 8260B	wlm	
Methyl tert-butyl ether	<1.00		1.00	ug/l	12/21/12 13:38	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 13:38	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		92.4%	70	130	12/21/12 13:38	EPA 8260B	wlm	11.1111
Surrogate: 1,2-Dichloroethane-d4		91.0%	70	130	12/21/12 13:38	EPA 8260B	wlm	
Surrogate: Fluorobenzene		93.6%	70	130	12/21/12 13:38	EPA 8260B	wlm	



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Project:

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629 East Rolling Ridge Drive

Project Number:

[none]

Reported:

Bellefonte PA, 16823

Collector: CLIENT

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-4

**Date/Time Sampled:** 12/14/12 12:02

Laboratory Sample ID:

2L17019-05 (Water/Grab)

					Date / Time		*	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 14:16	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 14:16	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 14:16	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 14:16	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 14:16	EPA 8260B	wlm	
Methyl tert-butyl ether	<1.00		1.00	ug/l	12/21/12 14:16	EPA 8260B	wim	
Naphthalene	<1.00		1.00	ug/l	12/21/12 14:16	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene	AAAA-1142	91.1 %	70-	130	12/21/12 14:16	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		93.6 %	70-	130	12/21/12 14:16	EPA 8260B	wlm	
Surrogate: Fluorobenzene		93.9 %	70-	130	12/21/12 14:16	EPA 8260B	wlm	



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Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

UR CLEARFIELD

Project Number:

none

Reported:

Collector: **CLIENT**  12/28/12 09:59

Number of Containers:

24

Client Sample ID: MW-15

**Date/Time Sampled:** 12/14/12 12:22

**Laboratory Sample ID:** 

2L17019-06 (Water/Grab)

					Date / Time		*	
Analyte	Result	MDL,	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Mathad 9260D							
Benzene	<1.00		1.00	ug/1	12/21/12 14:54	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 14:54	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 14:54	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 14:54	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 14:54	EPA 8260B	wlnı	
Methyl tert-butyl ether	2.23		1.00	ug/l	12/21/12 14:54	EPA 8260B	whn	
Naphthalene	<1.00		1.00	ug/l	12/21/12 14:54	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		89.8 %	70-	130	12/21/12 14:54	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		97.0 %	70-	130	12/21/12 14:54	EPA 8260B	wlm	
Surrogate: Fluorobenzene		96.2 %	70-	130	12/21/12 14:54	EPA 8260B	wlm	



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629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

[none] CLIENT

24

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-10

**Date/Time Sampled:** 12/14/12 12:34

**Laboratory Sample ID:** 

2L17019-07 (Water/Grab)

Analyta	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Analyte	Kesun	WHAL	IXL	Omis	Allatyzou	Menod	Anatyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 15:33	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 15:33	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 15;33	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 15:33	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 15:33	EPA 8260B	wlm	
Methyl tert-butyl ether	5.56		1.00	ug/I	12/21/12 15:33	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 15:33	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		93.0 %	70-1	130	12/21/12 15:33	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		92.0 %	70	30	12/21/12 15:33	EPA 8260B	wlm	
Surrogate: Fluorobenzene		95.1 %	70-	30	12/21/12 15:33	EPA 8260B	wlm	



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Client Sample ID: MW-30

Bellefonte PA, 16823

Project Manager:

Jed Hill

UR CLEARFIELD Project:

Project Number: [none]

> Collector: **CLIENT**

Reported: 12/28/12 09:59

Number of Containers: 24

**Date/Time Sampled:** 12/14/12 12:49

Laboratory Sample ID:

2L17019-08 (Water/Grab)

					Date / Time		**	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EP.	A Method 8260B							
Benzene	<2.00		2.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	
Toluene	<2.00		2.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	VC
Ethylbenzene	<2.00		2.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	
Xylenes (total)	<4.00		4.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	
Isopropylbenzene	<2.00		2.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	
Methyl tert-butyl ether	4.08		2.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	
Naphthalene	<2.00		2.00	ug/l	12/21/12 17:03	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		87.3 %	70	130	12/21/12 17:03	EPA 8260B	wim	
Surrogate: 1,2-Dichloroethane-d4		104 %	70-	130	12/21/12 17:03	EPA 8260B	wlm	
Surrogate: Fluorobenzene		105 %	70	130	12/21/12 17:03	EPA 8260B	wlm	



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Project:

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629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

CLIENT

[none]

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

24

Client Sample ID: MW-3

.....

**Date/Time Sampled:** 12/14/12 13:02

Laboratory Sample ID:

2L17019-09 (Water/Grab)

					Date / Time		*	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 16:11	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 16:11	EPA 8260B	wlm	
Ethylbenzene	<1.00		1,00	ug/I	12/21/12 16:11	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 16:11	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 16:11	EPA 8260B	wlm	
Methyl tert-butyl ether	18.4		1.00	ug/l	12/21/12 16:11	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 16:11	EPA 8260B	wlm	•
Surrogate: 4-Bromofluorobenzene		92.0 %	70	130	12/21/12 16:11	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		90.5 %	70-	130	12/21/12 16:11	EPA 8260B	wlm	
Surrogate: Fluorobenzene		95.5 %	70-	130	12/21/12 16:11	EPA 8260B	wlm	



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629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager: Jed Hill Project: UR CLEARFIELD

Project Number: [none] Collector:

Reported:

**CLIENT** 

12/28/12 09:59

Number of Containers: 24

Client Sample ID: MW-21

**Date/Time Sampled:** 12/14/12 13:14

Laboratory Sample ID:

2L17019-10 (Water/Grab)

•					D ( (77)			
Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	*Analyst	Note
Volatile Organic Compounds by EPA	Method 8260R							
Benzene	<1.00		1.00	ug/l	12/21/12 16:49	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 16:49	EPA 8260B	włm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 16:49	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 16:49	EPA 8260B	wlm	
Isopropylbenzene	<1,00		1.00	ug/l	12/21/12 16:49	EPA 8260B	wlm	
Methyl tert-butyl ether	10.8		1.00	ug/l	12/21/12 16:49	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/Ī	12/21/12 16:49	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		86.1 %	70-	130	12/21/12 16:49	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		96.6%	70-	130	12/21/12 16:49	EPA 8260B	wlm	
Surrogate: Fluorobenzene		98.1 %	70-	130	12/21/12 16:49	EPA 8260B	wlm	



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Project:

UR CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

[none] **CLIENT** 

24

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-29

**Date/Time Sampled:** 12/14/12 13:25

**Laboratory Sample ID:** 

2L17019-11 (Water/Grab)

					Date / Time		*	
Analyte	Result	MDL	RL	Units	Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B							
Benzene	<1.00		1.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Toluene	<1.00		1.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Ethylbenzene	<1.00		1.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Xylenes (total)	<2.00		2.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Isopropylbenzene	<1.00		1.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Methyl tert-butyl ether	3,13		1.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Naphthalene	<1.00		1.00	ug/l	12/21/12 17:27	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		86,8 %	70	130	12/21/12 17:27	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		94.7%	70-	130	12/21/12 17:27	EPA 8260B	wlm	
Surrogate: Fluorobenzene		97.7%	70-	130	12/21/12 17:27	EPA 8260B	wlm	



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Project:

Collector:

UR CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

[none]

Reported:

Bellefonte PA, 16823

**CLIENT** 

24

12/28/12 09:59

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: MW-7

**Date/Time Sampled:** 12/14/12 13:38

Laboratory Sample ID:

2L17019-12 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	*Analyst	Note
olatile Organic Compounds by EPA	A Method 8260B							
Benzene	84.4		2.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	
Toluene	14.8		2.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	VC
Ethylbenzene	89.5		2.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	
Xylenes (total)	43.6		4.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	
Isopropylbenzene	29.0		2.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	
Methyl tert-butyl ether	<2.00		2.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	
Naphthalene	65.4		2.00	ug/l	12/21/12 17:43	EPA 8260B	wlm	
Surrogate: 4-Bromofluorobenzene		96.2 %	70	130	12/21/12 17:43	EPA 8260B	wlm	
Surrogate: 1,2-Dichloroethane-d4		94.5 %	70	130	12/21/12 17:43	EPA 8260B	wlm	
Surrogate: Fluorobenzene		101%	70-	130	12/21/12 17:43	EPA 8260B	wlm	



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629 East Rolling Ridge Drive Project Number: [none]

Bellefonte PA, 16823 Collector: CLIENT 12/28/12 09:59

Project Manager: Jed Hill Number of Containers: 24

#### Notes

VC Check standard was outside the QC range. Data accepted based on acceptable LCS.

#### **Definitions**

Surrogate values must be within the indicated range, otherwise the results are considered to be estimated.

Reporting limits are adjusted accordingly when samples are analyzed at a dilution due to the matrix.

The following analyses are to be performed immediately upon sampling: pH, sulfite, chlorine residual, dissolved oxygen and ferrous iron. The date and time reported reflect the time the samples were analyzed at the laboratory.

If the solid sample weight for VOC analysis does not fall within the 3.5-6.5 gram range, the results are considered estimated values.

- P indicates analysis performed by Fairway Laboratories, Inc. at the Pennsdale location. This location is PaDEP Chapter 252 certified.
- Represents "less than" indicates that the result was less than reporting limit.
- MDL Method Detection Limit is the lowest or minimum level that provides 99% confidence level that the analyte is detected. Any reported result values that are less than the MDL are considered estimated values.
- RL Reporting Limit is the lowest or minimum level at which the analyte can be quantified.

Fairway Laboratories, Inc.

Fairway Labs in Altoona, PA is a NELAP (National Environmental Laboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless otherwise stated on the analytical report.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Please print. See back of COC for instructions/terms	WEST DESTRUCTION OF THE SECOND	DECLIECT FOR ANALYSIS	CHAIN OF CUSTODY		
East (914) 046 9701	Phone: (814) 946-430K	Altoona, PA 16602	P.O. Box 1925	2019 9th Ave.	
	Emironmental L	FAIRWAY LABORATORIES	•	•••	
	ental Laboratory	Phone: (570	Pennsdale,	89 Kris	

Client Nan
Address: Hax: (814) 946-8/91 risti Rd 2, PA 17756 70) 494-6380 Page of a

	- FLI File Canary - FLI Copy Pink - Customer Receipt Copy	White Original - FLI	verse.	nted on the rev	conditions pri	e terms and o	agree to ti	, I hereby	ories, inc	o Fairway Labora	By relinquishing my sample to Fairway Laboratories, Inc., I hereby agree to the terms and conditions printed on the reverse.
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# APPENDIX B

Remediation System Start-Up Engineering Evaluation

# REMEDIATION SYSTEM START-UP ENGINEERING EVALUATION

PADEP Facility ID #17-14821
PAUSTIF Claim #2008-0034(M)
Kwik Fill #M-90
1322 South 2<sup>nd</sup> Street
Clearfield, Lawrence Township,
Clearfield County, PA 16830

Prepared for:

United Refining Company of Pennsylvania
15 Bradley Street
P.O. Box 688
Warren, PA 16365

Prepared by:

Letterle & Associates, LLC 2859 Oxford Boulevard, Suite 110 Allison Park, Pennsylvania 15101

> Kenneth W. Dudash, P.E. Senior Project Engineer

> > December 2012

"By affixing my seal to this document, I am certifying that the information is true and correct to the best of my knowledge. I further certify I am licensed to practice in the Commonwealth of Pennsylvania and that it is within my professional expertise to verify the correctness of the information."

Kenneth W. Dudash, P.E. (signed and sealed this day (December 21, 2012))



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DPE System Groundwater Results DPE System Vapor Recovery Results

## 1.0 INTRODUCTION

As per the approved Pennsylvania Department of Environmental Protection (PADEP) Remedial Action Plan (RAP), a remedial system was installed at the United Refining Kwik Fill #M-90 Clearfield site (Kwik Fill M-90) during September 2012. The remedial system utilizes Dual Phase Extraction (DPE) technology to extract subsurface vapor and groundwater. The system was started on October 30, 2012 with a remediation system engineering evaluation performed at the Kwik Fill M-90 on November 27, 2012. This engineering evaluation was performed to document site conditions during the operation of the remedial system and to evaluate the performance and effectiveness of the remediation system, and to determine if any changes or modifications are necessary. The remediation system was checked for overall operating condition, hydraulic influence zone, pneumatic radius of influence (ROI), and groundwater/soil vapor extraction rates. This evaluation also compares the current remediation system operation to the original system design and recommends future system enhancements, if required.

# 2.0 SITE HISTORY

Kleinfelder East, Inc. (Kleinfelder) performed dual-phase extraction (DPE) pilot testing at the Kwik Fill M-90 in September 2010. Pilot test activities were conducted in order to assess the applicability of groundwater extraction in conjunction with soil vapor extraction (SVE) to remediate hydrocarbon-impacted soil and groundwater at the site. The pilot test involved the simultaneous recovery of soil vapor and groundwater from a designated extraction well (MW-31), while monitoring water table drawdown and induced vacuum in surrounding monitor wells.

During the testing, an average of 150 inches of water (in H2O) (11 inches of mercury (in.Hg)) was applied to the test well, resulting in an extracted flow rate of 25 standard cubic feet per minute (scfm). The average aquifer yield was approximately 2 gallons per minute (gpm) with a groundwater capture zone of 134 to 190 feet. A pneumatic ROI could not be calculated due to a lack of vacuum response in the surrounding wells but the closest well was 17 feet from MW-31. VOC concentrations were detected at low levels in the vapor stream during the tests.

The pilot test results indicated that a DPE system would be an effective and aggressive remediation strategy to reduce adsorbed and dissolved phase petroleum hydrocarbons in subsurface soil and groundwater. However, additional shallow wells in the source area were needed to shorten the time for active remediation.

The results from the pilot test depict an accurate representation of the site's hydraulic and pneumatic properties. Based on previous investigations by others, the geology of the site generally consists of unconsolidated materials (primarily silty clay) to depths of 10 to 17 feet. Unconsolidated materials are underlain by bedrock consisting of primarily sandstone and shale (Pottsville Group). Groundwater is located within the unconsolidated materials at depths ranging from one to seven feet below ground surface (bgs) across the site and adjoining properties. Groundwater typically flows to the northwest towards the West Branch of the Susquehanna River.

The geology of the site with the confining silty clay overburden provides for a small pneumatic ROI and hydraulic influence zone in the shallow areas to be treated with the DPE. The fractured bedrock of the deep aquifer provides for a very large hydraulic influence zone for the pneumatic pumps to be effective.

A DPE system was installed at the site and was activated on October 30, 2012. The purpose of the remediation system is to achieve attainment of the PADEP SHS for a residential used aquifer at the on-site point of compliance (POC), and off-site monitoring wells identified in the Site Characterization Report.

# 3.0 REMEDIATION SYSTEM AS-BUILT

The remediation system installation was completed at the site in September 2012. The system was activated on October 30, 2012. The following section details the system construction.

# 3.1 Remediation System Construction

The remediation system utilizes DPE technology with two high vacuum rotary claw pumps and six pneumatic pumps to remove vapors and groundwater from the subsurface. Groundwater can be extracted by the pneumatic pumps from six recovery wells (MW-1, MW-1A, MW-2, MW-28, MW-31 and MW-34) and by the rotary claw pumps from MW-35 and MW-36. The claw pumps apply vacuum and provide vapor recovery in all the recovery wells. Following extraction, groundwater and soil vapor are routed through an air/water separator (AWS). Groundwater from the pneumatic pumps is combined in an equalization tank. After equalization or separation, the groundwater is pumped through six sediment filters (connected in parallel/series) and then treated with four liquid phase granular activated carbon (GAC) units connected in a parallel/series configuration. The treated groundwater is discharged to a sanitary sewer drain southwest of the existing building site for treatment by the local sanitary authority.

The extracted vapor is passed through a heat exchanger to cool the temperature to below 100 degrees Fahrenheit and then treated with two 600-pound vapor phase GAC units connected in series to remove hydrocarbons from the vapor stream.

# 3.2 Remediation System Piping and Equipment

The following subsurface piping is used to extract soil vapor and groundwater from the site:

- MW-1, MW-1A, MW-2, MW-28, MW-31, and MW-34 through MW-36 are 4-inch diameter poly vinyl chloride (PVC) recovery wells. MW-1 is constructed with 11 feet of slotted screen from 5 to 16 feet bgs. MW-1A is constructed with 10 feet of screen from 5 to 15 feet bgs. MW-2 is constructed with 4-inch screen from 5 to 18.5 feet bgs. MW-28 has a screen from 5 to 21.5 feet bgs. MW-31 has 14 feet of screen from 5 to 19 feet bgs and MW-34 through MW-36 was constructed with screen from 5 to 22 feet bgs.
- Each recovery well is protected by 3' x 3' concrete pads with 18-inch diameter manholes.
- Vapor and groundwater are extracted through 1-inch diameter drop tubes extended to depths of 10 feet bgs in MW-35, and 10 feet bgs in MW-36. Extracted vapor and groundwater are conveyed through 2-inch diameter schedule 40 PVC subsurface piping installed from the system trailer to each recovery well.
- Each recovery well with drop tubes is connected to the subsurface extraction piping with pitless adapters installed on the recovery well riser piping at approximately 3 feet bgs. The pneumatic

groundwater pumps in MW-1, MW-1A, MW-2, MW-28, MW-31, and MW-34 are installed with the pump inlets at 1 foot from the bottom of the well.

• Treated groundwater is discharged via a 2 inch PVC pipe under a local sanitary permit.

The following remediation equipment is currently used to extract and treat vapor and groundwater from the site:

- Two 10-hp Busch Rotary Claw Pumps 230-volt three-phase (Model MM-1252-AV)
- One 80-gallon Air/Water Separator (MS80)
- One 250-gallon Equalization Tank
- One 2-hp transfer pump (Goulds Pumps Model NPE)
- One 3-hp transfer pump (Goulds Pumps Model NPE)
- Six 20" Big Blue® cartridge filter canisters
- Six pneumatic pumps (QED AP-4 Short)
- One 5.0 hp air compressor
- One 1.0 hp heat exchanger
- Four 300-pound liquid phase GAC units
- Two 600-pound vapor phase GAC units
- One explosion-proof heater and exhaust fan
- Electrical supply is 120/240 three phase, 200-amp service.

A Trenching Diagram and an as-built Piping and Instrumentation Diagram (P&ID) are included as Figures 1 and 2, respectively.

# 4.0 CURRENT REMEDIATION SYSTEM OPERATIONS

The DPE remedial system was activated on October 30, 2012 and the system was in operation upon arrival at the site on November 26, 2012. The system was shutdown at the end of the day to allow for return of groundwater levels to static conditions prior to starting the evaluation on November 27, 2012. All remediation system equipment was observed to be in good working condition prior to shutdown.

All clear schedule 40 PVC sight-tubes on the influent manifold showed signs of only minor scaling to the system piping. Since remediation system startup, a total of 142,565 gallons of groundwater have been extracted at an average of 4.71 gpm over the time period. All equipment safety alarms have been tested and are in good working order.

## 5.0 REMEDIATION SYSTEM DESIGN EVALUATION

# 5.1 DPE Engineering Evaluation – November 27, 2012

Upon arrival at the site on November 27, 2012, a pneumatic ROI and hydraulic influence zone test was initiated upon restart of the system. The remedial system had been in continuous operation for more than 7 days prior to the test. During initial system startup during the week of October 30, 2012, the system was adjusted to extract from wells MW-1, MW-28, MW-31 and MW-34 only. The number of recovery wells used for system operation was limited due to the volume of groundwater that exists at the

site and the high flow rate that can be obtained. If all the recovery wells are utilized together, the groundwater extraction flow rate would exceed treatment equipment flow rate specifications.

The system was adjusted to provide a vacuum of 12 inches of mercury (inHg) (99 scfm) during the test. Photo ionization detection (PID) reading of the vapor was measured at 124.9 parts per million volume (ppmv). Data obtained from monitoring the vacuum influence at the observation wells was used to obtain an approximate ROI. The pneumatic ROI is the transient pressure distribution created by the vacuum that results in an area in which the air flow rate through the soil decreases to the point in which the contaminants will not volatize. The ROI is measured in resulting inches of water (in H<sub>2</sub>O) vacuum. Generally, a level of 0.1 in H<sub>2</sub>O is the industry accepted standard extent that volatilization is limited due to a lack of subsurface vapor flow, and the extent of the ROI can be calculated.

Since MW-35 and MW-36 were not utilized for extraction, these wells were included in the monitoring during the evaluation. Vacuum levels of greater than 0.1 inches of water were found in adjacent wells MW-32, MW-35, and MW-36. All other monitor wells exhibited no vacuum response. The groundwater levels in all the monitor wells were below the well screen which allowed for a vacuum response if produced in these wells. The observed influence vacuum resulted in an average calculated pneumatic ROI of approximately 47 feet to the southwest but does not extend to MW-14 (40 feet to the northeast). The areas southeast of the existing tank field and north across South 2<sup>nd</sup> Street do not appear to be influenced by the vacuum of the DPE remediation system. Hydrocarbon content was recorded in the field with the PID during the evaluation.

Groundwater levels were recorded at all monitoring wells and were compared to static levels. From the difference in the observed groundwater levels, it was apparent that drawdown was occurring at a distance of approximately 140 feet to the northeast across South 2<sup>nd</sup> Street to MW-21. Drawdown was also recorded to the southwest to MW-33 at 0.1 feet. MW-27, which is located 180 feet east of the nearest recovery well MW-1, did not exhibit any drawdown. A hydraulic zone of influence map is included as Figure 3. Table 1 shows the groundwater and vacuum influence readings collected during the DPE evaluation. Chart 1 shows the calculated pneumatic ROI from the operating recovery wells during the DPE system evaluation. Chart 2 shows the calculated hydraulic zone of influence.

Hydrocarbon recovery was measured in the field with a PID at 116.8 ppm-v. This resulted in a calculated removal rate of 1.04 lbs per day. A summary of vapor recovery system hydrocarbon removal calculations is included as **Table 2**.

Since system startup, the remediation system has operated at an average of 81% runtime for the groundwater pumps and 56% for the vacuum pumps. The lower runtime for the vacuum pumps is due to an over amping problem which causes the claw pumps to shut down. The problems were diagnosed by a close examination of the effluent piping which contains multiple valves and piping diameters that caused excessive exhaust pressure which resulted in the over amping of the units. All exhaust piping and valves were replaced with larger diameter sizes from the rotary claw units to the heat exchanger.

The telemetry unit was connected during the initial operation of the system and has responded during alarm conditions. With only MW-1, MW-28, MW-31, and MW-34 DPE recovery wells in operation; the petroleum-impacted shallow area near the tank field is being affected by the system operation (based on groundwater drawdown and vacuum response produced by the wells during the evaluation). Vacuum short circuiting is apparent into the tank field with the LRP operating at <5 in. Hg with MW-1 in full operation. This results in a low availability of vacuum pump capacity to apply to the other DPE recovery

wells in operation. The applied vacuum was valved off to MW-1 to increase the vacuum of the system. Areas beyond MW-21 to the north/northeast due not appear to be influenced by the DPE system.

The DPE remediation system recovery wells are producing a hydraulic influence zone similar to the size calculated from the site pilot test data and predicted in the RAP. The pneumatic ROI appears to be larger than predicated in the pilot test study. The remediation system was designed to be able to establish a hydraulic influence zone and pneumatic ROI to encompass the entire onsite shallow impacted plume and extend down gradient to influence the plume. When the pneumatic ROI is overlaid over the contaminant plume map, results show that the majority of the shallow contaminated area on-site is affected by the current DPE remediation system.

# 5.2 Key Criteria of System Feasibility

Key criteria and quantified ranges of values that were expected during the system testing in order to ensure a technology is a technically feasible application and for the system to operate as planned and meet the clean-up schedule included the following:

• If the maximum attainable groundwater extraction rate realized during system operation is below 2 gpm DPE technology would be deemed infeasible;

The remedial system has averaged greater than 4 gpm since the system startup and averaged 3.6 gpm during the evaluation.

• The groundwater capture zone will be defined as a decrease in the elevation of groundwater of at least 0.1 feet at a distance from the extraction point of a least 134 feet for two of the observation points at varied directions from the test well;

The calculated hydraulic zone of influence from the evaluation results is 145 feet and includes the majority of the plume area north of the site across South 2<sup>nd</sup> Street.

• If the maximum attainable vacuum realized during the extraction is below 11 in. Hg, the specified vacuum equipment would be deemed infeasible and other vacuum equipment such as a regenerative blower will be the utilized equipment;

Although several of the recovery wells exhibited low vacuum yields during the evaluation, the majority of the site geology requires the applied vacuum to be above 11 in. Hg which requires the use of the existing vacuum equipment.

• The pneumatic ROI as defined by an observed vacuum of 0.1 inches of water after stabilization of the readings will be observed at a minimum distance of 15 feet from the extraction point for two observation points located at varied directions from the test well;

The calculated pneumatic ROI was 25 feet in a measured response at the site in a northeast and southwest direction from the operating recovery wells.

• The VOC recovery rate in the extracted vapor will be greater than 0.5 pounds per day, as calculated from the analytical results of the extracted vapor or field measured levels, and the attainable flow rate measured during the interval of the test.

The VOC recovery rate as calculated from the initial analytical results of the extracted vapor is 0.25 lbs/day which is below the 0.5 lbs/day criteria however, when calculated by the field measured levels, the system has been extracting 7.49 lbs/day (Table 2).

Due to the location of the site next to the West Branch of the Susquehanna River and the high water table, the available extracted groundwater rate is greater than 10 gpm for the initial 24 hours of system operation. Once the site has been dewatered, the recovery rate slows to less than 1.0 gpm per recovery well. It appears from the evaluation data that the remedial extraction equipment may have been

overdesigned and can provide the hydraulic influence with fewer recovery wells in operation. If the remedial system has been down for longer than 24 hours, the groundwater extraction rate during restart is greater than the design flow. This flow rate provides a groundwater pump air usage that exceeds the capacity of the air compressor. The actual groundwater flow rate is higher than the anticipated design flow rate which has overwhelmed the treatment units and transfer pump shutting down the system. Utilizing a lower number of recovery wells has allowed the system to remain in operation.

The extracted groundwater flow rate decreases with the dewatering of the site and allows the air compressor to operate at an optimum 30% duty cycle after approximately 24 hours of operation. The high groundwater levels at the site also inhibit vapor recovery due to the lack of available open soil pore space. Once the site is dewatered, the groundwater table falls and opens areas of the soil that was not available for vapor extraction without the dewatering of the site.

# 6.0 REMEDIATION SYSTEM UPGRADES

The over amping of the rotary claw SVE pumps has been eliminated by increasing the size of the exhaust piping. Heat tape and insulation have been installed on all hoses and piping that is exposed under the trailer to prevent freezing. Sediment filter changes will initially occur during every O&M event in order to minimize system downtime due to clogged sediment filters. The four 400-pound liquid-phase GAC pressure vessels will continue to be connected in a parallel/series arrangement to treat the groundwater. The existing vapor carbon treatment system will remain with two 600-pound vapor-phase GAC units connected in a series configuration.

# 7.0 REMEDIATION SYSTEM PERMITTING

The recovered groundwater is treated and discharged directly to the sanitary pipe under a permit issued by the Clearfield Municipal Authority (CMA). Under the terms of the permit, analytical reports and totalizer readings are reported in Discharge Monitoring Reports (DMR) on a monthly basis to the CMA.

Petroleum impacted soil and groundwater remediation systems have been listed as exempt from the Plan Approval/Operating permit requirements by PADEP, Division of Air Quality. The remediation system is operated under the exemption requirements.

# 8.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this system engineering evaluation, the remediation system at the Kwik Fill M-90 site is operating with influence results similar to the original design and currently, the influence of the DPE system is large enough to cover the majority of the down gradient contaminated plume area. The DPE system has been placed into operation and extraction from the recovery wells will continue. To allow for adequate vacuum levels with the addition of the VEGE system, DPE recovery wells MW-1 and MW-28, MW-31, and MW-34 will be continuously operated through 2013. MW-1A, MW-2, MW-35 and MW-36 will remain shutdown to increase the vacuum of the DPE system and to prevent overwhelming the groundwater treatment system with excessive amounts of extracted groundwater. The system will be serviced twice a month for regularly scheduled preventative maintenance to ensure operational success. Future evaluations will include measurements of vacuum at the top of each

Kwik Fill M-90 United Refining—Engineering Evaluation—December 2012

recovery well, groundwater recovery rates from each DPE well, and water table drawdown after an extended period of system operation.

# **TABLES**

# TABLE 1: DPE SYSTEM EVALUATION EVENT SUMMARY

SITE: M-90 Clearfield Kwik Fill

**DATE:** 11/20/2012

**VEGE EXTRACTION WELLS:** MW-1, MW-28, MW-31, MW-34

# GROUNDWATER GAUGING DATA ELAPSED TIME (IN HRS.)

	Initial						Total
Well	DTW	10;10	11:10	12:10	13:10	14:10	Drawdown
MW-2	5,15	5,34	5.63	5.78	5.86	6.2	1.05
MW-3	6.47	6,6	6.71	6.79	6.82	6.95	0.48
MW-4	5.04	5.05	5.05	5.06	5.06	5.06	0.02
MW-7	7.73	7.75	7.75	7.73	7.73	7.74	0.01
MW-8	6.4	6.4	6.41	6.48	6.51	6.46	0.06
MW-10	3.00	3.00	3.00	3.00	3.00	3.00	0.00
MW-14	8.12	8.51	8.81	8.98	9.1	9.31	1.19
MW-15	6.37	6.47	6.54	6.60	6.63	6.79	0.42
MW-21	5.72	5.74	5.81	5.81	5.86	5.9	0.18
MW-22	4.84	4.86	4.88	4.87	4.88	4.85	0.01
MW-23	6.31	6.35	6.25	6.25	6.25	6,24	-0.07
MW-27	6.7	6.67	6.69	6.67	6.66	6.67	-0.03
MW-29	6.47	6.51	6.55	6.57	6.58	6.64	0.17
MW-30	6.71	6.81	6.93	7.02	7.03	7.22	0.51
MW-32	7.51	7.65	7,93	8.16	8.3	8.5	0.99
MW-33	7.11	7.12	7.12	7.12	7.17	7.21	0.10
MW-35	9.45	11.88	12.46	12.66	12.81	14.55	5.10
MW-36	7.85	10.06	10,51	10.66	10.80	11.17	3.32
Totalizer	141695.4	142109.4	142283		142565.3		3.62 gpm

# SOIL VAPOR GAUGING DATA ELAPSED TIME (IN HRS.)

Well	1:00	2:00	3:00	4:00	5:00	
MW-2A				0	0	
MW-14				0	0	
MW-32				0.11	0.12	
MW-35				>10	>10	
MW-36				0.62	0.64	
			***************************************			
PID				124.9	116.8	
Blower VAC						
(i.e., applied)				15	12	
Well VAC						

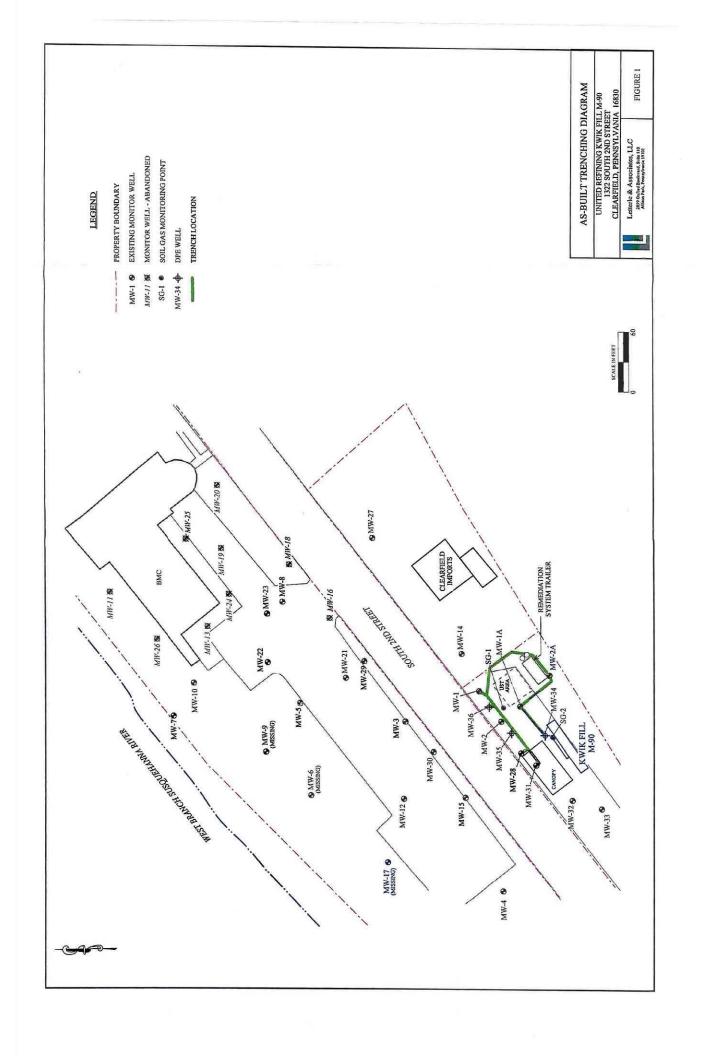
# TABLE 2 VAPOR RECOVERY SYSTEM HYDROCARBON REMOVAL CALCULATIONS (Field Quantification)

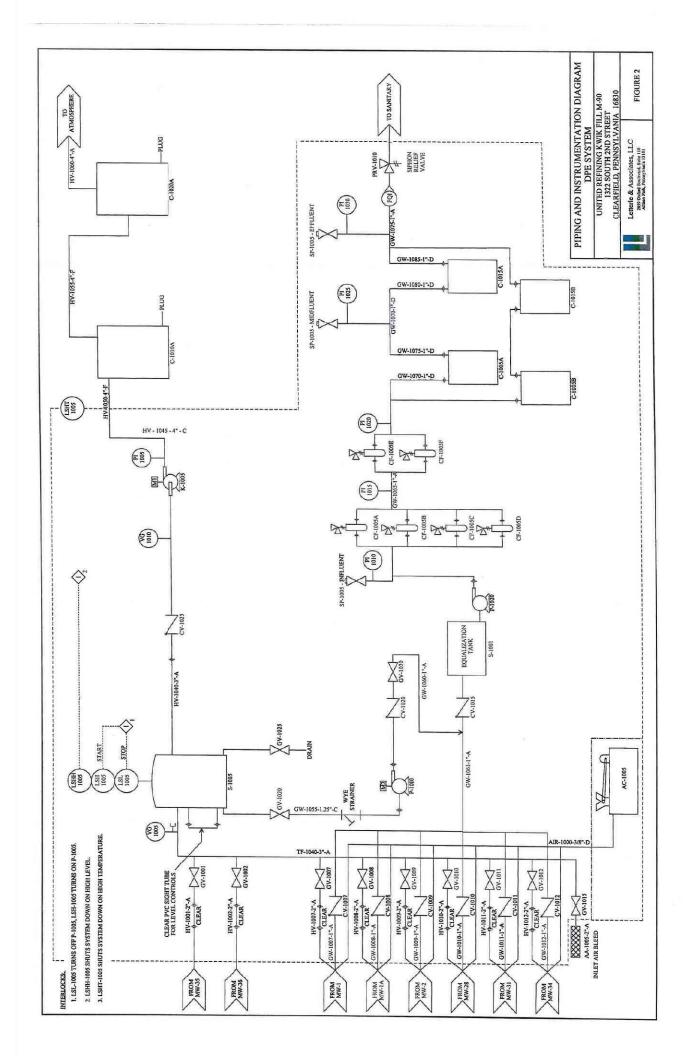
United Refining--Kwik Fill M-90 1322 South 2nd Street Clearfield, Pennsylvania 16830

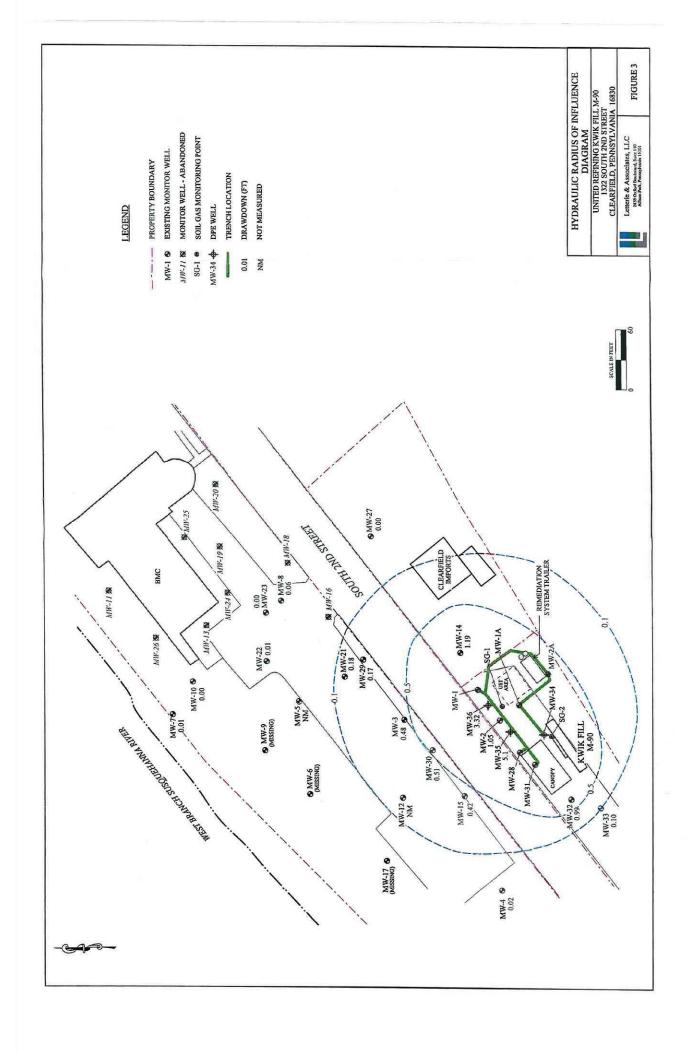
Sample Location	Date	Extracted Vapor rate (scfm)	PID Hydrocarbon concentration (ppm)	Hydrocarbon Mass Removed (lb/day)	Hydrocarbon Mass Removed To Date (lb)
Influent	10/04/12	158	126	1.79	1.79
	10/17/2012	158	227	3.22	43.69
	11/7/2012	158	75.3	1.07	37.07
	11/20/2012	66	116.8	1.04	77.97

Notes:

# **FIGURES**







# **CHARTS**

04 Pneumatic ROI = 47 feet CHART 1: DPE System Pneumatic ROI ٥\$ Clearfield, Pennsylvania November 20, 2012 United Refining M-90 0Þ 30 50 01 15.00 14.00 13.00 12.00 9.00 8.00 7.00 6.00 5.00 4.00 3.00 2.00 1.00 0.00 11.00 10.00

Response Vacuum( inches of water)

Distance from Nearest Recovery Well (feet)

-a-Applied Vacuum (12 inches of Hg)

CHART 2: DPE System Hydraulic Zone of Influence December 20, 2012

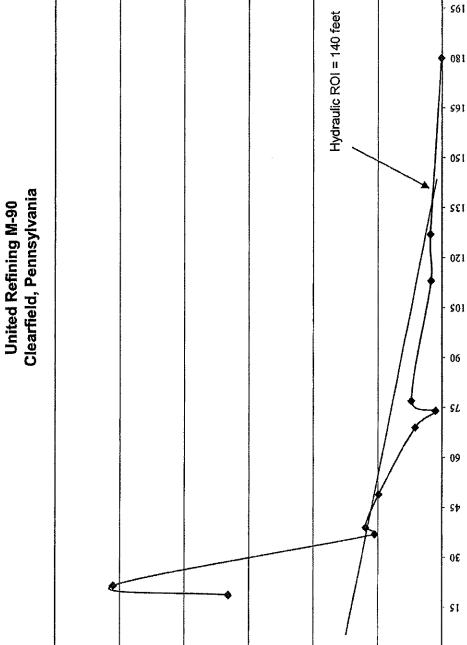
6.00

5.00

4.00

3.00

Groudwater Drawdown (ft)



Distance From Nearest Recovery Well (ft)

0.00 → 0

1.00

2.00

225

917





10/17/2012

Mr. Jed Hill Letterle and Associates, LLC 2859 Oxford Blvd, Suite 110 Allison Park, PA 15101

Dear Jed:

Enclosed are the sample data report, chain of custody record and quality control data for the sample(s) received on October 8, 2012 for your project; 277 - United Clearfield.

Please give me a call if you have questions or I can be of further assistance. Thank you for using Vaportech Services.

Sincerely,

David J. Masdea

Enclosure:

# Vaportech Service, Inc

LET38-2655

Letterle and Associates, LLC Project: 277 - United Clearfield

# **CONCENTRATIONS IN PPMV**

COMPOUND	EFFLUENT	BETWEEN	INFLUENT	PQL
MTBE	ND	ND	ND	0.07
BENZENE	ND	ND	1.84	0.07
TOLUENE	ND	ND	0.66	0.07
ETHYL BENZENE	ND	ND	0.27	0.07
M&P XYLENE	ND	ND	1.29	0.07
O-XYLENE	ND	ND	0.13	0.07
CUMENE	ND	ND	ND	0.07
NAPHTHALENE	ND	ND	ND	0.07
FILE NAME	V73A,581.BND	V73A,582,BND	V73Á.583,BNÖ	
DATE SAMPLED	10/04/12	10/04/12	10/04/12	
DATE RECEIVED	10/08/12	10/08/12	10/08/12	
DATE ANALYZED	10/11/12	10/11/12	10/11/12	

PQL - denotes lower 'Practical Quantitation Limit'

ND - 'Not Detected' at or above the lower practical quantitation limit

Reviewed by:

# Vaportech Service, Inc

# Letterle and Associates, LLC **Quality Control** Laboratory Project(s): 2655, 2663, 2664, 2665

# **CONCENTRATIONS IN PPMV**

## **CONTINUING CALIBRATION CHECK**

LABORATORY BLANK RESULTS

STANDARDS: STD 21V R4 PA-BTEX-H

FILE NAME: V73A.571.BND V73A.575.BND DATE ANALYZED: 10/10/12 10/10/12

BLANK:

N2 IN VIAL

**PRACTICAL** 

FILE NAME: V73A.570.BND

DATE ANALYZED: 10/10/12

						QUANTITATION
	KNOWN	RESULT	PERCENT		BLANK	LIMIT
COMPOUND	(PPMV)	(PPMV)	DIFFERENCE	COMPOUND	(PPMV):	(PPMV)
MTBE	50.33	48.00	4.63	MTBE	ND	0.07
BENZENE	1.25	1.26	0.64	BENZENE	ND	0.07
TOLUENE	1.06	1.10	3.30	TOLUENE	ND	0.07
ETHYL BENZENE	0.92	0.96	4.24	ETHYL BENZENE	ND	0.07
M&P XYLENE	1.84	1.94	5.65	M&P XYLENE	ND	0.07
O-XYLENE	0.92	0.96	4.24	O-XYLENE	ND	0.07
CUMENE	36.91	34.62	6.21	CUMENE	ND	0.07
NAPHTHALENE	34.61	32.68	5.58	NAPHTHALENE	ND	0.07

ND - 'Not Detected' at or above the lower practical quantitation limit

# LET 38-2655

# CHAIN-OF-CUSTODY RECORD

Services, Inc.

1158 Pittsburgh Road • Suite 201 • Valencia, PA 16059 Tel: 724-898-2622 • Fax: 724-898-2633 Enter letters in Requested Analysis columns below.

BTEX

Light Hydrocarbons

lysis Options:

Permanent Gases

Methane

1.1-DCE, 1,1-DCA, Methylene Chloride, trans-1,2-DCE, cis-1,2-DCE, Chloroform 1,1,1-TCA, Carbon Tetrachloride, Trichloroethylene (TCB), Tetrachloroethylene (PCB)

Chlorinated Hydrocarbons

624 Compound List

Light Hydrocarbons: Methane, Ethane, Ethylene, Propane, Propylene, iso-Butane, n-Butane

Methane, Ethane, Ethylene

Hydrogen

Carbon Dioxide, Oxygen, Nitrogen, Methane, Carbon Monoxide

Permanent Gases:
BTEX:
C5-C10:
Chlorinated HC:

Sampler's signature:

Benzene, Toluene, Ethyl Benzene, m & p.Xylene, o.Xylene Pentane, Hexane, Heptane, Octane, Nonane, Decane

TPH (C4 - C12 range)

口

G BTEX & C5 - C10

Company Name: Lettertof Associates, LLC	
iddress: @ 625 E. Paling Ridsk Drive	Ana
City: Buly hante State: PA Zip: (12823	₹
K11	A
roj. Location: United Charfeld	υ
roj. Number: #277	А
hone #: 814-355-2410	国

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(Other)	Cumm. MTSE. 624 Noohteeler	i	r F							Company		Company	Company:
Requested Analysis		4	1						Invoice to :	Recorded by:		Received by :	Received by :
										Time:	202	Time:	Time :
Sample	אע	£~\	ע 1				And the second s				10-7-12	Date:	Date:
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Number of Sample	2		<b>→</b>						<b>300</b>	A	not I		
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Colle	2/1/01		>						Result	Reling		Relie	Reling

PINK COPY: Submitter

YELLOW COPY : Laboratory

WHITE COPY : Laboratory to return.



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

www.falrwaylaboratories.com

Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

CLIENT

[none]

10/25/12 12:32

Project Manager:

Jed Hill

Number of Containers:

## ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Sample Type	Date Sampled	Date Received
INFLUENT	2311059-01	Water	Grab	10/04/12 11:00	10/11/12 13:45
BETWEEN	2J11059-02	Water	Grab	10/04/12 11:05	10/11/12 13:45
EFFLUENT	2J11059-03	Water	Grab	10/04/12 11:10	10/11/12 13:45

Fairway Laboratories, Inc.

Reviewed and Submitted by:

my ret

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Fairway Labs in Altoonu, PA is a NELAP (Nutional Environmental Laboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless otherwise stated on the analytical

Michael P. Tyler Laboratory Director

Page 1 of 7



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State Certifications: MD 275, WV 364

www.fairwaylaboratories.com

Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number: [none]

Reported:

Bellefonte PA, 16823

Collector: CLIENT

10/25/12 12:32

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: INFLUENT

Date: I line ou

Date/Time Sampled: 10/04/12 11:00

Laboratory Sample ID:

2J11059-01 (Water/Grab)

Analyte	Result	MDL.	RL	Units	Date / Time Analyzed	Method	Analyst	Note
olatile Organic Compounds by EP	A Method 8260B							
Benzene	<2.00		2.00	ug/l	10/15/12 22:29	EPA 8260B	mlf	
Toluene	<2.00		2.00	ug/l	10/15/12 22:29	EPA 8260B	mlf	
Ethylbenzene	<2.00		2.00	ug/l	10/15/12 22:29	EPA 8260B	mlf	
Xylenes (total)	<4.00		4.00	ug/l	10/15/12 22:29	EPA 8260B	mlf	
Isopropylbenzene	<2.00		2.00	ug/l	10/15/12 22:29	EPA 8260B	mlf	
Methyl tert-butyl ether	20.1		2.00	ug/l	10/15/12 22:29	EPA 8260B	mlf	
Naphthalene	<2,00		2,00	ug/l	10/15/12 22:29	EPA 8260B	mlf	VC
Surrogate: 4-Bromofluorobenzene		110%	70	130	10/15/12 22:29	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		114%	70	130	10/15/12 22:29	EPA 8260B	mlf	
Surrogate: Fluorobenzene		77.7%	70-	130	10/15/12 22:29	EPA 8260B	mlf	



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

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Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

[none]

Reported:

Bellefonte PA, 16823

Collector:

CLIENT

10/25/12 12:32

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: BETWEEN

Date/Time Sampled: 10/04/12 11:05

Laboratory Sample ID:

2J11059-02 (Water/Grab)

	• •							
Analyte	Result	MDĹ	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EPA	A Method 8260B						,	
Benzene	₹1.00		1.00	ug/l	10/17/12 17:38	EPA 8260B	mlf	
Toluene	<1,00		1.00	ug/l	10/17/12 17:38	EPA 8260B	mlf	
Ethylbenzene	<1.00		1,00	ug/l	10/17/12 17:38	EPA 8260B	mlf	
Xylenes (total)	-2,00		2.00	ug/l	10/17/12 17:38	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	10/17/12 17:38	EPA 8260B	mlf	
Methyl tert-butyl ether	<1.00		00.1	ug/l	10/17/12 17:38	EPA 8260B	mlf	VH
Naphthalene	00.1>		1.00	ug/l	10/17/12 17:38	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		109%	70-	130	10/17/12 17:38	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		107%	70-	130	10/17/12 17:38	EPA 8260B	mlf	
Surrogate: Fluorobenzene		77.7%	70-	130	10/17/12 17:38	EPA 8260B	mlf	

Fairway Laboratories, Inc.

Followay Lahs in Altoona, PA is a NELAP (National Environmental Luboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless otherwise stated on the analytical

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

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Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number: [none] Reported:

Bellefonte PA, 16823

Collector: **CLIENT** 

7

10/25/12 12:32

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: EFFLUENT

Date/Time Sampled:

10/04/12 11:10

Laboratory Sample ID:

2J11059-03 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	Analyst	Note
Volatile Organic Compounds by EPA	Method 8260B						····	
Benzene	<1.00		1.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	
Isopropylbenzene	-:1,00		1.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	
Methyl tert-butyl ether	<1.00		1.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	VH
Naphthalene	<1.00		1.00	ug/l	10/17/12 18:16	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		107 %	70-,	130	10/17/12 18:16	EPA 8260B	mlf`	
Surrogate: 1,2-Dichloroethane-d4		105 %	70-	30	10/17/12 18:16	EPA 8260B	mlf	
Surrogate: Fluorobenzene		76.9 %	70-	130	10/17/12 18:16	EPA 8260B	mlf	
Conventional Chemistry Parameters I	y SM/EPA Me	thods			VII.		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Oil & Grease	<6.30		6.30	mg/l	10/23/12 10:39	EPA 1664A	edb	



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

www.fairwaylaboratories.com

Letterle & Associates

Project:

Collector:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

CLIENT

none

10/25/12 12:32

Project Manager:

Jed Hill

Number of Containers: 7

Notes

۷Ċ

Check standard was outside the QC range. Data accepted based on acceptable LCS.

٧H

LCS value was outside the QC range. Data accepted based on acceptable check standard.

### **Definitions**

Surrogate values must be within the indicated range, otherwise the results are considered to be estimated.

Reporting limits are adjusted accordingly when samples are analyzed at a dilution due to the matrix.

The following analyses are to be performed immediately upon sampling: pH, sulfite, chlorine residual, dissolved oxygen and ferrous iron. The date and time reported reflect the time the samples were analyzed at the laboratory.

If the solid sample weight for VOC analysis does not fall within the 3.5-6.5 gram range, the results are considered estimated values.

- P indicates analysis performed by Fairway Laboratories, Inc. at the Pennsdale location. This location is PaDEP Chapter 252 certified.
- Represents "less than" indicates that the result was less than reporting limit.

MDL

Method Detection Limit - is the lowest or minimum level that provides 99% confidence level that the analyte is detected. Any reported result values that are less than the MDL are considered estimated values.

RL

Reporting Limit - is the lowest or minimum level at which the analyte can be quantified.

Fairway Laboratories, Inc.

Fairway Labs in Altoona, PA is a NELAP (National Environmental Laboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless otherwise stated on the analytical report.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Pol. Box 1925	Relinquished by:	Relinquished by:	Relinquiented by:	Sampled by		Stflycot	Between	HARWIN	Sample Description/Location	TAT: Normal Rush Cl  Rush TXT subject to pre-approval and surcharge  Date Required: / /	Umi to	8:14.55-2241 # 814-355-2241	प्रकृत इ	CHAIN OF CLSTODY/ REQUEST FOR ANALYSIS Please print, See back of COC for instructions/terms and conditions.
P.O. Box 1925 Introora, P.A 16602  Reportable to Beniromental Laboratory  (814) 946-4305  Reportable to Beniromental Laboratory  (814) 946-8791  Reportable to Beniromental Laboratory  Yes Composite  Start Start End End End Pline  Bate Time Date Time  Received by:  Date Time  Received by:  Date Time  Received by:  PAIRWAY LABORATORIES  Phone: (570) 494-6380  Analyses Requested  Analys						メ	X	×		GRAB	cld	823	SWC CS	
FAIRWAY LABORATORIES  Phone: (570) 494-6380  Reportable to  PALDEP?  Yes O  One  One  One  One  One  One  One  O									Start Time			Sample Temp:		P.O. Box 1925 Altoona, PA 16607 Phone: (814) 946-43 Fax: (814) 946-87
Pennsdale, PA 17756 Phone: (570) 494-6380 ai Laboratory  Analyses Requested  Remarks	S		& Helse	CM				ම්	End Time So	d		Yes PWSID#		2 8
Pennsdale, PA 17756 Phone: (570) 494-6380 ai Laboratory  Analyses Requested  Remarks				-					Oth	ier		O	Die to	LABORA O O
mnsdale, PA 17756 one: (570) 494-6380  quested  Remarks	3. E	me	me DS	<b>ま</b> 				<b>×</b>						TORIES Environmental
	The state of the s												alyses Requested	Pennsdale, PA 17 Phone: (570) 494 Laboratory
				Remarks					Bottle Type/Comments			FedEx UPS	LAB USE ONLY	4 17756 C-11 494-6380 Page

COC/Labels on bottles agree? ✓ □* Correct containers for all the analysis requested? ✓ □* Matrix:	lgree?		orrect c	ontainers	for all ti	ne analy	sis reque	sted? \	* Matrix: 1	100 to 10	\	
COC#				NII	nber and	Туре о	Number and Type of BOTTLES	SEC			Comments	
	Non- Poly	Poly HZSO4	Poly HNO3	Amber HZSO4	Amber Non-	Poly	(Head	Other	Properly Preserved	Bacti		
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* DEVIATION PRESENT:	T.	$\left( \cdot \right)$		CLUE	CLIENT CALLED: YES ()	CALLED:		a de de la constitución de la co	CLIENT RESPONSE: Proceed with analysis;	with an	CLIENT RESPONSE: Proceed with analysis; qualify data ( )	
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o missing information:	11:						   24   7	ALAMAKA MENENTENAN MAKAMANI	Client Contact:	ontact:	Client Contact:Date:	
* Comments:												

Chain of Custody Receiving Document

This is a date sensitive document and may not be current after October 5, 2012.



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

www.fairwaylaboratories.com

Letterle & Associates

Project:

UNITED CLEARFIELD

[none]

TW

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

11/26/12 11:41

Project Manager:

Jed Hill

Number of Containers:

### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Sániple Type	Date Sampled	Date Received
INFLUENT	2K08082-01	Water	Grab	11/07/12 09:40	11/08/12 13:30
BETWEEN	2K08082-02	Water	Grab	11/07/12 09:45	11/08/12 13:30
EFFLUENT	2K08082-03	Water	Grab	11/07/12 09:50	11/08/12 13:30

Fairway Laboratories, Inc.

Reviewed and Submitted by:

MAT

Michael P. Tyler Laboratory Director Fairway Lobs in Altoonu, PA is a NELAP (National Environmental Loboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless otherwise stated on the analytical report.

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Page 1 of 7



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State Certifications: MD 275, WV 364

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Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

Project Manager:

Jed Hill

Number of Containers:

11/26/12 11:41

Client Sample ID: INFLUENT

[none]

TW

Date/Time Sampled: 11/07/12 09:40

Laboratory Sample ID:

2K08082-01 (Water/Grab)

Analyte	Result	MIDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
					<u> </u>			
Volatile Organic Compounds by El	PA Method 8260B							
Benzene	<2.00		2.00	ug/l	11/09/12 07:08	EPA 8260B	mlf	
Toluene	<2.00		2.00	ug/l	11/09/12 07:08	EPA 8260B	mlf	
Ethylbenzene	<2.00		2.00	ug/l	11/09/12 07:08	EPA 8260B	mlf	
Xylenes (total)	<4.00		4.00	ug/i	11/09/12 07:08	EPA 8260B	mlf	
Isopropylbenzene	<2.00		2.00	ug/l	11/09/12 07:08	EPA 8260B	mlf	
Methyl tert-butyl ether	17.6		2,00	ug/l	11/09/12 07:08	EPA 8260B	mlf	
Naphthalene	~2.00		2.00	ng/l	11/09/12 07:08	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		98.9 %	70	130	11/09/12 07:08	EPA 8260B	mlf	•
Surrogate: 1,2-Dichloroethane-d4		107%	70	130	11/09/12 07:08	EPA 8260B	mlf	
Surrogate: Fluorobenzene		96.1 %	70-	130	11/09/12 07:08	EPA 8260B	mif	



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

www.fairwaylaboratories.com

Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number: [none] Reported:

Bellefonte PA, 16823

Collector:

TW

7

11/26/12 11:41

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: BETWEEN

Date/Time Sampled: 11/07/12 09:45

Laboratory Sample ID:

2K08082-02 (Water/Grab)

Analyte	Result	MDL	RI.	Units	Date / Time Analyzed	Method	* Analyst	Note
olatile Organic Compounds by EPA	Method 8260B							
Bonzene	<1.00		1.00	ug/l	11/09/12 08:57	EPA 8260B	mlf	
Toluene	<1,00		1.00	ug/l	11/09/12 08:57	EPA 8260B	mlf	
Ethylbenzene	~:1,00		1,00	ug/l	11/09/12 08:57	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	11/09/12 08:57	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1,00	ug/l	11/09/12 08:57	EPA 8260B	mlf	
Methyl tert-butyl ether	<1.00		1.00	ug/l	11/09/12 08:57	EPA 8260B	mlf	
Naphthalene	∘⊴1,00		1.00	ug/l	11/09/12 08:57	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene	9	1.1 %	70-1	30	11/09/12 08:57	EPA 8260B	mlf	
Surrogate: 1,2-Dichloraethane-d4	1	08 %	70-1	30	11/09/12 08:57	EPA 8260B	mif	
Surrogate: Fluorobenzene		06 %	70-1	30	11/09/12 08:57	EPA 8260B	mlf	



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP; PA 41-04684



State Certifications: MD 275, WV 364

www.fairwaylaboratories.com

Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

Project Manager:

Jed Hill

Number of Containers:

11/26/12 11:41

Client Sample ID: EFFLUENT

Date/Time Sampled: 11/07/12 09:50

[none]

TW

Laboratory Sample ID:

2K08082-03 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EPA	Method 82601	3					.,	
Benzene	<1.00		1.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Toluene	<1.00		1.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Xylenes (total)	<2.00		2.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Isopropylbenzene	<1.00		1.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Methyl tert-butyl ether	≪ <b>1.00</b>		1.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Naphthalene	<1.00		1.00	ug/l	11/09/12 09:35	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		90.3 %	70-	30	11/09/12 09:35	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		106%	70-	130	11/09/12 09:35	EPA 8260B	mlf	
Surrogate: Fluorobenzene		102%	70	130	11/09/12 09:35	EPA 8260B	mlf	
Conventional Chemistry Parameters	by SM/EPA M	ethods						
Oil & Grease	<b>∹6.30</b>		6.30	mg/l	11/19/12 16:00	EPA 1664A	rhb	

Fairway Laboratories, Inc.

Fairway Labs in Altaona, PA is a NELAP (National Environmental Laboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless otherwise stated on the analytical report.

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89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

www.fairwaylaboratories.com

Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Number of Containers:

[none]

Reported:

Bellefonte PA, 16823

Project Manager:

Jed Hill

Collector: TV

TW

11/26/12 11:41

Definitions

Surrogate values must be within the indicated range, otherwise the results are considered to be estimated.

Reporting limits are adjusted accordingly when samples are analyzed at a dilution due to the matrix.

The following analyses are to be performed immediately upon sampling: pH, sulfite, chlorine residual, dissolved oxygen and ferrous iron. The date and time reported reflect the time the samples were analyzed at the laboratory.

If the solid sample weight for VOC analysis does not fall within the 3.5-6.5 gram range, the results are considered estimated values.

- P indicates analysis performed by Fairway Laboratories, Inc. at the Pennsdale location. This location is PaDEP Chapter 252 certified.
- Represents "less than" indicates that the result was less than reporting limit.

MDL Method Detection Limit - is the lowest or minimum level that provides 99% confidence level that the analyte is detected. Any reported result values that are less than the MDL are considered estimated values.

RL Reporting Limit - is the lowest or minimum level at which the analyte can be quantified.

Fairway Laboratories, Inc.

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The results in this report apply to the samples unalyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

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Received by:	Received by:	Received by:	10 Reserved by					Start Start Date Time	Composite Start		Received on ice? Sample Temp:		2019 9th Ave. P.O. Box 1925 Altoona, PA 16602 Phone: (814) 946-4306 Fax: (814) 946-8791
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Chain of Custody Receiving Document

This is a date sensitive document and may not be current after November 5, 2012.



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



State Certifications: MD 275, WV 364

www.fairwaylaboratories.com

Letterle & Associates

629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager:

Jed Hill

Project:

UNITED CLEARFIELD

Project Number:

[none]

Reported:

Collector: TW

12/14/12 10:12

Number of Containers:

# ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix _	Sample Type	Date Sampled	Date Received
INFLUENT	2L04066-01	Water	Grab	12/03/12 15:25	12/04/12 14:30
BETWEEN	2L04066-02	Water	Grab	12/03/12 15:27	12/04/12 14:30
EFFLUENT	2L04066-03	Water	Grab	12/03/12 15:30	12/04/12 14:30

Fairway Laboratories, Inc.

Reviewed and Submitted by:

THAT

Michael P. Tyler Laboratory Director Fairway Labs in Altooná, PA is a NELAP (National Environmental Laboratory Accreditation Program) accredited lab, and as such, certifies that all applicable test results meet the requirements of NELAP, unless otherwise stated on the analytical report.

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Page 1 of 7



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State Certifications: MD 275, WV 364

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Letterle & Associates

629 East Rolling Ridge Drive

Bellefonte PA, 16823

Project Manager:

Project:

UNITED CLEARFIELD

Project Number: [none]

CLIENT

Reported:

Collector:

7

12/14/12 10:12

Jed Hill Number of Containers:

Client Sample ID: INFLUENT

Date/Time Sampled:

12/03/12 15:25

**Laboratory Sample ID:** 

2L04066-01 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
Volatile Organic Compounds by EP.	A Method 8260B							
Benzene	<2.00		2,00	ug/l	12/11/12 02:49	EPA 8260B	wlm	
Toluene	<2.00		2.00	ug/l	12/11/12 02:49	EPA 8260B	whn	
Ethylbenzene	<2.00		2.00	ug/l	12/11/12 02:49	EPA 8260B	wlm	
Xylenes (total)	<4.00		4.00	ug/l	12/11/12 02:49	EPA 8260B	whn	
Isopropylbenzene	<2.00		2.00	ug/l	12/11/12 02;49	EPA 8260B	wlm	
Methyl tert-butyl ether	12.5		2.00	ug/l	12/11/12 02:49	EPA 8260B	wlm	
Naphthalene	<2.00		2.00	ug/l	12/11/12 02:49	EPA 8260B	wlm	VC
Surrogate: 4-Bromofluorobenzene	24.0-0.0-0	92.4 %	70-	130	12/11/12 02:49	EPA 8260B	yılm	
Surrogate: 1,2-Dichloroethane-d4		113 %	70-1	130	12/11/12 02:49	EPA 8260B	wlm	
Surrogate: Fluorobenzene		106 %	70-1	130	12/11/12 02:49	EPA 8260B	wlm	



89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684



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Letterle & Associates

Project:

UNITED CLEARFIELD

629 East Rolling Ridge Drive

Project Number:

Reported:

Bellefonte PA, 16823

Collector:

12/14/12 10:12

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: BETWEEN

Date/Time Sampled: 12/03/12 15:27

[none]

CLIENT

Laboratory Sample ID:

2L04066-02 (Water/Grab)

Analyte	Result	MDL	RL	Units	Date / Time Analyzed	Method	* Analyst	Note
							***************************************	
Volatile Organic Compounds by EPA						777 £ 07 647	10	OD VO
Benzene	<1,00		1,00	ug/l	12/06/12 11:55	EPA 8260B	mlf	QB, VC
Toluene	<1.00		1.00	ug/l	12/06/12 11:55	EPA 8260B	mlf	
Ethylbenzene	<1.00		1.00	ug/l	12/06/12 11:55	EPA 8260B	mlf	
Xylenes (total)	<2.00		2,00	ug/l	12/06/12 11:55	EPA 8260B	mlf	
Isopropylbenzene	<00,0		1,00	ug/l	12/06/12 11:55	EPA 8260B	mlf	
Methyl tert-butyl other	1,85		1,00	ug/l	12/06/12 11:55	EPA 8260B	mlf	
Naphthalene	<1.00		1,00	ug/l	12/06/12 11:55	EPA 8260B	mlf	
Surrogate: 4-Bromofluorobenzene		86.8 %	70-	130	12/06/12 11:55	EPA 8260B	mlf	
Surrogate: 1,2-Dichloroethane-d4		173%	70	130	12/06/12 11:55	EPA 8260B	mlf	QF
Surrogate: Fluorobenzene		140 %	70-	130	12/06/12 11:55	EPA 8260B	mlf	QF

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Laboratory Sample ID:

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State Certifications: MD 275, WV 364

Letterle & Associates

Project:

UNITED CLEARFIELD

Date/Time Sampled: 12/03/12 15:30

629 East Rolling Ridge Drive

Project Number:

[none]

Reported:

Bellefonte PA, 16823

Collector: CLJENT

12/14/12 10:12

Project Manager:

Jed Hill

Number of Containers:

Client Sample ID: EFFLUENT

2L04066-03 (Water/Grab)

Date / Time Analyst Note MDL RL Analyzed Method Units Analyte Result Volatile Organic Compounds by EPA Method 8260B 12/06/12 14:46 Benzene <1.00 1.00 **EPA 8260B** mlf ug/l Toluene <1.00 1.00 ug/l 12/06/12 14:46 **EPA 8260B** mlf Ethylbenzene <1.00 1,00 ug/l 12/06/12 14:46 **EPA 8260B** mlf 12/06/12 14:46 <2.00 ug/l EPA 8260B Xylenes (total) 2.00 mlf Isopropylbenzene <1.00 1.00 ug/I 12/06/12 14:46 **EPA 8260B** mlf <1.00 12/06/12 14:46 EPA 8260B mlf Methyl tert-butyl ether 1.00 ug/l <1.00 12/06/12 14:46 **EPA 8260B** Naphthalene 1.00 ug/l mlf 12/06/12 14:46 EPA 8260B mlf Surrogate: 4-Bromofluorobenzene 88.8 % 70-130 12/06/12 14:46 EPA 8260B mlf ÒF Surrogate: 1,2-Dichloroethane-d4 169% 70-130 Surrogate: Fluorobenzene 144% 70-130 12/06/12 14:46 EPA 8260B mlf QF Conventional Chemistry Parameters by SM/EPA Methods EPA 1664A Oil & Grease <6,30 6,30 mg/l 12/13/12 14:15 edb

Pairway Laboratories, Inc.

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89 Kristi Road Pennsdale, PA 17756 (570) 494-6380 PaDEP: PA 41-04684

Number of Containers:



State Certifications: MD 275, WV 364

www.fairwaylaboratorles.com

Letterle & Associates

629 East Rolling Ridge Drive

Bellesonte PA, 16823

Project Manager;

QB

Jed Hill

Project:

UNITED CLEARFIELD

Project Number: [none]

CLIENT

Reported:

Collector: 7 12/14/12 10:12

Notes

The spike recovery was outside acceptance limits for the MS and/or MSD due to sample matrix interferences. The batch

was accepted based on acceptable CCV recovery.

QF Surrogate recovery out of range due to possible matrix interference.

VC Check standard was outside the QC range. Data accepted based on acceptable LCS,

### **Definitions**

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P indicates analysis performed by Fairway Laboratories, Inc. at the Pennsdale location. This location is PaDEP Chapter 252 certified.

Represents "less than" - indicates that the result was less than reporting limit.

MDL Method Detection Limit - is the lowest or minimum level that provides 99% confidence level that the analyte is detected. Any

reported result values that are less than the MDL are considered estimated values.

RL Reporting Limit - is the lowest or minimum level at which the analyte can be quantified.

Fairway Laboratories, Inc.

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