ENVIRONMENTAL ALLIANCE, INC.

December 5, 2013

• *Engineering*

• *Remediation*

• *Consulting*

Mr. James Richmond
Maryland Department of the Environment
Oil Control Program
1800 Washington Boulevard
Baltimore, Maryland 21230

Re: **Post Remediation Monitoring Work Plan**
Sheetz Store #177
3281 Main Street
Manchester, Maryland
MDE Case # 06-0056CL
MDE Facility ID No. 6297

Dear Mr. Richmond:

Environmental Alliance, Inc. (Alliance) on behalf of Sheetz, Inc. (Sheetz) is submitting this work plan for post-remedial monitoring activities. Alliance requested system shut down in the October 2013 Quarterly Monitoring Report and the Maryland Department of the Environment (MDE) verbally requested a work plan to outline a post remedial monitoring plan.

Site Remediation History

A Corrective Action Plan (CAP) was submitted in September 2006 and the system was installed; however, the system was shut down due to limited mass recovery. Additional delineation, geophysical testing and packer testing activities were completed between June 2009 and November 2009.

A CAP Addendum (March 2010) and CAP Modifications (July 2010 and October 2011) were approved and system upgrade activities were completed in December 2010. The system was started on December 20, 2010 and continues to operate, discharging treated water to the Infiltration Gallery A. Subsequently, based on minimal mass removal, the tank field SVE system was shut down in June 2011. The 3017 Walnut Street agricultural well was permanently added to the groundwater extraction system in November 2011.

On-going remediation system operation and periodic sampling activities are conducted as directed by the MDE. CAP activities are conducted in accordance with the following documents:

- September 13, 2006 – Corrective Action Plan (CAP) submitted
- November 27, 2006 – MDE CAP approval
- March 8, 2010 – CAP Addendum (CAPA) submitted
- June 23, 2010 – MDE request for CAPA clarifications
- July 2, 2010 – CAPA Modification submitted
- August 20, 2010 – MDE March 2010 CAPA and July 2010 CAPA Modification approval

- May 25, 2011 – Corrective Action Activity Update – SVE Shutdown Request submitted
- June 24, 2011 – MDE request for CAPA
- June 29, 2011 – CAPA – Pilot Test Work Plan submitted
- August 9, 2011 – MDE Pilot Test Work Plan approval
- October 13, 2011 – CAPA Modification submitted
- November 30, 2011 – MDE CAPA Modification approval

The following is a brief summary of the remediation system data collected through September 30, 2013.

- Groundwater Extracted, Treated, & Discharged: 16,163,517 gallons
- Equivalent Liquid Phase Hydrocarbons Removed: 98.14 pounds
- Vapor Phase Hydrocarbons Removed: 231.75 pounds

The groundwater remediation system was started on December 20, 2010. Monitoring wells were gradually added to the remediation system through October 2011, to include pumping deep monitoring well MW-17D, six shallow monitoring wells MW-2, MW-5, MW-8, MW-9, MW-10, MW-11, and the agricultural well located at 3017 Walnut Street to further address MTBE concentrations. The agricultural well at 3017 Walnut Street was set to activate the pump saver under a dry well condition, and then shut off the pump for 24 hours before restarting (pulsed pumping). Pulsed pumping on monitoring well MW-17D by pumping for two weeks and then allowing two weeks with no pumping was initiated in March 2012.

Treated water is discharged to an on-site infiltration gallery. The system has been 92.69% operational since start-up. Since initial system start-up, system down time has occurred for short periods for liquid-phase granular activated carbon change-outs, critical safety device testing, and for minor maintenance (i.e. bag filter changes, etc.). The average groundwater quality reductions in target monitoring wells MW-1, MW-2, MW-3, MW-5, MW-8, MW-9, MW-10, MW-15A, MW-15B, MW-17D, MW-18, MW-19A, MW-20B, MW-21D, MW-24A, MW-24B, MW-27A, MW-27B, and MW-28 since system operation indicate a 96.69% decline in monitoring well MTBE concentrations since system start-up. The SVE system on the tank field has been shut down since June 2011, due to minimal to zero mass removal.

Post Remedial Monitoring Plan

The remediation system will be shut down following MDE approval and post-remedial monitoring of the groundwater liquid levels in the monitoring wells on-site will continue to be monitored on a monthly basis. In addition, the current groundwater sampling and analysis monitoring program will continue. The current monitoring program includes groundwater sampling from monitoring wells VMW-4, MW-6, MW-7, MW-12, MW-13, MW-14, MW-16, MW-20A, MW-20B, MW-21D, MW-22D, MW-23D, MW-24A, MW-24B, MW-25D, MW-26D, MW-29D, MW-30, MW-31 and MW-32 on a semi-annual basis (March and September). The remaining monitoring wells including monitoring wells MW-1, MW-2, MW-3, MW-5, MW-8, MW-9, MW-10, MW-11, MW-15A, MW-15B, MW-17D, MW-18, MW-19A, MW-19B, MW-28, MW-27A, and MW-27B are sampled on a quarterly basis. The Town of Manchester municipal supply wells, Walnut Street well, Walnut Street spring, Holland Drive well, and Bachman Road well, are sampled quarterly. The private drinking wells at 3032 Walnut Street and 2931 Bachman Road are no longer sampled, however the agricultural well at 3017 Walnut Street is sampled on a quarterly basis.

Should groundwater concentrations exceed the threshold levels determined below for MTBE, the remediation system will be re-started per the operating conditions prior to shut down, namely pulse

pumping. The proposed threshold level for MTBE is based on data from target monitoring wells MW-17D and MW-8. Groundwater data from the last eight quarters for monitoring wells MW-17D and MW-8 was evaluated using the EPA ProUCL software. A 95% UCL was calculated for MW-17D and MW-8 using the last eight quarters of data to determine the threshold level. For monitoring well MW-8 the data was found to correlate to a 95% UCL of 6,081 ug/L using the approximate gamma method. Thus for onsite monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, and MW-19A a threshold level of 6,000 ug/L for MtBE will be used. For monitoring well MW-17D the data was found to correlate to a 95% UCL of 163 ug/L using the approximate gamma method. Thus for all other site monitoring wells a threshold level of 160 ug/L for MtBE will be used.

If the system is re-started due to rebound concentrations above the proposed threshold presented above, the system will remain in operation for a minimum of one quarter and will be shut back off once decreasing trends of MtBE in site monitoring wells is observed to below threshold concentrations. This schedule may be modified based on data review and cycling may continue for multiple years. However, once concentrations remain below pre-shut down conditions for a period of four quarters, a request to terminate the, post-remedial monitoring will be submitted.

During periods of system operation, full operations and maintenance site visits will be implemented as outlined in the approved CAP.

The remediation system will be shut down upon receiving MDE approval of this work plan, as current groundwater concentrations meet the recommended threshold limits.

If you have any questions or further information is required, please contact Cari Finch at (410) 729-9000 ext. 5014 or William Smith at (302) 234-4400 ext. 1019. Thank you for your time.

Sincerely,
ENVIRONMENTAL ALLIANCE, INC.

Carianne A. Finch
Professional Engineer

William Smith
Principal Hydrogeologist

c: Mr. David Dodson, Sheetz, Inc. (electronic submittal and hard copy)
Ms. Susan Bull, MDE – Oil Control (one copy plus CD)
Mr. Chris Ralston, MDE – Oil Control (one copy)
Mr. Edwin Singer, Carroll County Health Department (CD only)
Mr. Steve Miller, Town of Manchester (CD only)
Mr. Warren Fox, XL Insurance (email only)
Mr. Tom Devilbiss, Carroll County (CD only)
Mr. John Grace, MDE Water Supply (CD only)
Mr. Peter Garey, Garey Business Center (CD only)

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