

EnviroTrac

Environmental Services

September 30, 2004

Ms. Yolande Norman
MDE, Oil Control Program
1800 Washington Boulevard
Baltimore, MD 21230

RE: Former Shell Service Station
15541 New Hampshire Avenue
Silver Spring, Maryland 20905

MDE OCP Case # 03-0695-MO1

Dear Ms. Norman;

EnviroTrac, on behalf of Shell Oil Products US, is submitting this report titled "Final Site Assessment Update" for the above referenced location. This report submittal is in response to the MDE directive dated November 13, 2003.

EnviroTrac has initiated quarterly sampling of the monitoring wells and private wells. The next sampling round is scheduled for October 4, 2004. An update will be provided when the data is available in order to provide the information before the next steps are decided upon. The October sample event will represent the first sample results since the July start up of the onsite pump and treat system.

Please contact Rich Tambascio of Shell Oil Products US or our office if you have any questions related to this project.

Sincerely,
EnviroTrac



Roy Backman

Vice President
Sr. Hydrogeologist

Attached – Final Site Assessment Report

cc: Shell Oil Products, US RM Tambascio
Draper Property, George Rudy



Environmental Services

FINAL SITE ASSESSMENT UPDATE

Former Shell Service Station
15541 New Hampshire Avenue
Silver Spring, Maryland 20905
CC # 137675

September 30, 2004

MDE OCP Case # 03-0695-MO1

Prepared for:

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A handwritten signature in black ink, appearing to read "Roy J. Backman". The signature is written over a horizontal line that extends to the right.

Roy J. Backman, PG
Vice President
Senior Hydrogeologist

Reviewed by:

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Senior Consultant
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EXECUTIVE SUMMARY

As follow up to the March 2003 Interim Status and August 2004 2nd Quarter reports, additional work has been completed in compliance with the MDE directive dated November 13, 2003. Specifically, shallow and deep overburden and shallow bedrock wells have been installed and sampled. Geophysical logging has also been performed on select wells, along with packer testing and vertical profile sampling. In addition, WSSC has completed a water main along Bryants Nursery Road, and Shell has reimbursed or directly paid the WSSC fees (Water Connection fee, System Development Charge, and Plumbers fee) in order to provide public water. As of this date, 710, 720, 721 and 750 Bryants Nursery Road are receiving public water. The remaining residents with water connections are planning to contract with their plumber and/or waiting on final schedules.

As previously outlined, Shell decided not to renew the lease at the Shell station located at 15541 New Hampshire Ave; Silver Spring, Maryland in 2002. In December 2002, the UST and appurtenances were removed. A UST removal report was prepared and submitted to the MDE in February 2003, with a work plan to install on-site monitoring wells. Both off-site and on-site access agreements were approved and in December 2003, four on-site wells and two offsite wells were subsequently installed and sampled. No free phase hydrocarbons were detected during the groundwater sampling event. Dissolved MTBE concentrations detected in the monitoring wells ranged from 8.9 ppb to 67,600 ppb on-site. As part of the assessment, a FOIA search and review of other sources was conducted, including an examination of the rebuilt Citgo station and storm drainage ponds. Additionally, slug tests were performed in order to evaluate subsurface conditions.

In October 2003, Shell sampled potable wells in the area at the request of the MDE. MTBE was detected in several wells ranging from 1 ppb to up to 77 ppb. An aggressive sampling plan (every two weeks) was required by the MDE (directive November 13, 2003). In potable wells with less than 20 ppb MTBE (MDE Advisory level), bottled water was supplied to residents who requested it (refer to Table 4). Five potable wells contained greater than 20 ppb MTBE, and carbon filtration units were offered to these residents. Only 3 residents accepted water treatment (#720, # 730 and # 731). 750 Bryants Nursery Road, with an MTBE concentration of 77 ppb, declined due to space

740 Bryants Nursery Road did not respond to communication efforts of both Shell and MDE.

In June 2004, a groundwater pump and treatment system was installed on three on-site wells at the former Shell station. The piping included soil vapor extraction accessories for future implementations. In July, the pump and treat system became operational. Water table influence has been observed across New Hampshire Avenue at wells MW-5 and MW-11. The system is currently in compliance with the discharge permit. Pumped water is being treated with granular activated carbon prior to discharge to the storm drain.

Several Monitoring wells were subjected to various tests from March to September 2004. The information indicated the probable pathway of MTBE migration is along the bedrock/overburden interface with minor pathways through subsurface bedrock features. Based on rock core analysis, geophysical testing and packer / slug testing, the potential migration of MTBE via potable well casing leakage is unlikely. This is evident from the slug tests performed on the inactive potable well at 750 Bryants Nursery Road which is the residence with the highest level of impact. The MTBE migration path is along top of overburden/bedrock interface which is connected with minor fractures. In particular well 750 Bryants Nursery Road out of service well appears to be cased within the overburden enhancing migration of MTBE to the bedrock fractures.

1.0 INTRODUCTION

The purpose of this report is to provide a summary of the historical data and results of the recent soil, bedrock and ground-water investigation conducted in the vicinity of the former Shell station located at 15541 New Hampshire Avenue, Silver Spring, Maryland. A Site location map showing the investigation area is provided in Figure 1. The work was conducted by EnviroTrac Ltd. for Motiva Enterprises, LLC, and under the oversight of the Maryland Department of the Environment Oil Control Program (MDE OCP).

The objectives of the investigation were to determine the likely source(s) of methyl tertiary butyl ether (MTBE) detected in private wells located within the study area and to monitor the extent of the impact to the overburden and bedrock aquifer system. The findings of this investigation indicate that the former Shell Station is a likely source of MTBE impacting the overburden and bedrock aquifer system. However other potential contributing sources were identified from freedom of information act (FOIA) data. Other sources include road runoff and MDE OCP spill cases.

The investigation included:

- A review of historical investigative work and data;
- Soil boring and overburden/shallow bedrock monitoring well installation;
- Rock coring and bedrock monitoring well installation;
- Dual packer testing of bedrock wells;
- Ground-water and soil sampling;
- Evaluation of potable well sampling data ;
- Geophysical logging on bedrock wells ;
- Vertical Profile sampling ;
- Slug testing and Aquifer pump Testing;
- Monitoring of on-site groundwater pump and treat system.

This study was previously approved by the MDE in a Work Plan submitted January 23, 2004 along with subsequent work plans and views this phase as meeting the requirements set forth in the MDE directive dated November 13, 2003.

2.0 PROJECT LOCATION, SETTING, REGIONAL AND LOCAL GEOLOGY

2.1 *Project Location and Topography*

The Site is at 500 feet above mean sea level (msl) and gently slopes towards the west (and to the east a topographic high). The study area is bounded by residential properties to the north, east and west. Commercial establishments, retail and gas stations are to the south. Currently, the former Shell station is leased as a Citgo Station. Residential properties to the north and east are on public water, except for # 715 Snider Lane and # 15605 New Hampshire Avenue. The resident of # 715 Snider has on their own accord, contracted with WCCS to connect public water. The residences on Bryants Nursery Road are on well water. Nine Bryants Nursery Road residents have public water available and are pending public water by WSSC. Refer to Figure 1 and Appendix A.

Based on topography, the predominant surface run-off within the Site flows from east to the west. (Appendix A). Road runoff is collected in Maryland Department of Transportation (DOT) drainage ponds. Roadside storm drains along New Hampshire Avenue direct stormwater to ponds # 7 and # 8 (Figure 1 and Appendix A). Runoff from pond # 8 drains to a low lying area located behind the church and residential homes on the north side of Bryants Nursery Road as far reaching as house #650 located along Bryants Lane (Appendix A). Runoff from the Citgo and Lowest Price stations area collected in storm drains and directed to ponds #7, located immediately west of New Hampshire Avenue. The retention pond ultimately discharges into the westward flowing stream (Nursery Run) located approximately 0.5 miles to the west through an outfall pipe located on the western side of the # 7 basin.

Photo documentation is provided in Appendix B.

2.2 Regional and Local Geology

Regional Geology:

Based on a review of the Bedrock Map of Montgomery County (Froelich 1975), the overburden and bedrock geology of the Site area in Montgomery County is primarily comprised of schist containing mica, chlorite, and quartz pelitic; with metagraywacke, gneiss and quartz veins. The schist is foliated with interlocking plates of mica and phyllite.

It is commonly interbedded with schistose-gneiss (quartz and feldspar) banding. Foliation dips steeply east and west. Fractures are parallel to the foliation and are often filled with clay. The overburden which is formed as rolling upland and steep sided strike valleys is rarely more than 100 feet thick. The overburden consists of weathered schist and a micaceous saprolite.

Local Geology:

Field observations during the additional soil borings indicate that the overburden subsurface ranges from approximately 0 to approximately 70 feet below grade. The overburden consists of a minor surface clay layer followed by saprolite overburden which grades at depth to a structured decomposed schist. Secondary mineralization was evidenced by garnet crystallization within the quartzite as garnets crystals were observed at MW-7. See Appendix C for well logs.

Ground water in the overburden occurs within the saprolite, and may exist above the schist interface portion of the Site at a depth of 5 to 20 feet below grade.

3.0 SITE BACKGROUND

A number of activities have been conducted in the vicinity of the Site since the detection of MTBE in private water wells. The following provides a history of the work performed to date by various entities as documented with the MDE FOIA spill cases (a map of MDE FOIA spill cases is included):

1993

- 05/21/1993 - 1000 gallon steel kerosene UST removed from 15711 New Hampshire Avenue. No leaks found upon removal. MDE Case 93-1612-MO1.
- 1000 gallon steel gasoline UST removed from 15711 New Hampshire Avenue. No leaks found upon removal. Same MDE Case number as above listed kerosene tank.

- 10/29/1993 - 550 gallon steel UST removed from 1400 Harding Lane, Silver Spring, MD. No leaks found upon removal. MDE Case 93-1242-MO1.

1994

- 09/08/1994 - MD SHA construction plans for Storm water Ponds # 7 and 8 along New Hampshire Avenue.

1996

- 05/10/1996 - Four (4) Underground Storage Tanks removed from 16255 New Hampshire Avenue, a former Texaco Station. MDE Case: 96-1926-MO. The tanks removed were the following:
 - Three (3) 10,000 gallon steel gasoline USTs
 - One (1) 550 gallon steel waste oil UST

2002

- 11/25/2002 - Shell removed USTs from 15541 New Hampshire Avenue.
- 12/04/2002 - Land owner, Draper Properties completes Phase II Investigation of 15541 New Hampshire Avenue property. Phase II work consists of soil borings and analysis of soil recovered using a GeoProbe.

2003

- 01/15/2003 - Citgo installed new USTs in former Shell Tank Field at subject property (15541 New Hampshire Avenue).
- 02/06/2003 - Annual Line Test at subject property (15541 New Hampshire Avenue) returns no anomalous results. All systems pass inspection.
- 06/10/2003 - Site Inspection by MDE OCP Inspector James Chilcote reveals a gasoline UST at the residence at 15520 New Hampshire Ave. Closer

Inspection of the tank indicates approximately 26.5" liquid in the tank, the top 2.5" being gasoline. No cap is present on the fill port. Immediate requirements include removal of liquid within tank and subsequent abandonment of the tank by removal.

- 06/10/2003 - Follow up Site Inspection of 15541 New Hampshire Avenue by MDE Inspector James Chilcote notes slight leak in dispenser union, liquid and debris in spill buckets, and water and product in regular STP sump.

- 07/28/2003 - Reports of gasoline odor at 700 Cloverly Street are found to be sewer related gases upon inspection. Upon further investigation of site activities, it is discovered that a sewer line was hit during excavation of said site for creation of shopping center. Line was repaired and associated odors ceased.

- 10/03/2003 - 1st round of official potable well sampling along Bryants Nursery
- 10/20/2003 - Follow up inspection by MDE Inspector James Chilcote 15520 New Hampshire Ave. No compliance with aforementioned requirements had been achieved since initial inspection of the site 06/10/2003.

- 11/20/2003 - Sampled 23 potable wells in Cloverly neighborhood with MDE and Montgomery County DEP.

- 11/26/2003 - 720, 721 and 730 Bryants Nursery Road fitted with POET carbon treatment

- 12/22/2003 - On-site and offsite wells MW-1 through MW-6 installed, dispenser
- 12/29/2003 island corings completed.

2004

- 02/17/2004 - MW-6D, MW-7S, MW-8S, MW-8D, MW-9S installed.

- 02/25/2004

- 02/24/2004 - Interval Sampling MW-3, MW-5 completed.

- 02/25/2004 - Interval Sampling & Geophysical Testing on potable well at 15545 New Hampshire Avenue completed.

- 03/16/2004 - MW-5D, MW-7D, MW-9D, MW-10 installed.

- 03/25/2004

- 04/07/2004 - Pump Test performed on MW-10.

- 04/14/2004 - SVE Test performed on MW-10.

- 04/27/2004 - MW-11S, MW-11D installed.

- 04/28/2004

- 05/24/2004 - Community Public meeting to present information collected to date.

Final Site Assessment

Former Shell Service Station, 15541 New Hampshire Avenue Silver Spring, Maryland

- 06/01/2004- -Installed **Bedrock wells** MW-5R, MW-6R, and MW-11R, including
- 06/18/2004 rock coring, packer & geophysical testing
- 06/14/2004- -Installed trenching and P&T system
- 06/21/2004
- 07/22/2004- -Pump & Treat System at 15541 New Hampshire Avenue start-up.
- 08/10/2004- Geophysical and Packer Tests completed on 750 Bryants Nursery Potable well.
- 08/26/2004- -Second Quarter 2004 Update Report submitted to MDE
- 08/27/2004- -Pump Test performed on MW-5D.
- 08/30/2004- -Pump Test performed on MW-6D.
- 09/10/2004- -SVE Pilot test performed on MW-1, MW-3, MW-10.
- 09/27/2004- - Community Public meeting to present information collected to date.

4.0 SOIL BORING and OVERBURDEN / SHALLOW BEDROCK WELL INSTALLATION

SGS Environmental Drilling (SGS) of Baltimore, Maryland was retained by EnviroTrac to perform drilling services to install overburden/shallow bedrock monitoring wells from December 2003 through June 2004 under the supervision of an EnviroTrac geologist. A truck mounted hollow stem auger was used overburden well installation soil samples were collected during borehole advancement via split spoons. ODEX Air rotary was used to collect rock cores and set the shallow bedrock wells. Geologic logs describing the material encountered in soil borings are included in Appendix C.

4.1 Soil Borings

Soil boring samples were logged in the field and screened using a photoionization detector (PID). PID readings for all soil borings are also included in Appendix C. Soil samples obtained from just above the ground-water interface or the highest PID reading from the borings were submitted to a Maryland State Certified laboratory. The samples were transported under chain of custody protocol for analysis of Volatile Organic Compounds (VOCs) via EPA method 8260 and total petroleum hydrocarbons via EPA method 8015 detailing gasoline and diesel range organics.

The drill cuttings were properly disposed. Soil disposal receipts are presented in Appendix D.

4.2 Soil Sampling Results

Overburden soils generally consisted of silt, clay and saprolite. Overburden thickness ranged from approximately 50 to 85 feet below grade. No odors were noted in any of the soil samples collected and PID readings were below the instruments detection limits (<0.0 ppm). PID readings taken in the on site wells ranged from 0-2000 ppm.

Soil samples were sent under chain of custody to Accutest Laboratories of Dayton, New Jersey. Refer to Table 1 for soil parameters detected above method detection limits. No parameters were detected above MDE MEAT guidance levels. Refer to Appendix E for Soil Laboratory results.

4.3 Overburden Well Installation

A total of seventeen (17) overburden monitoring wells have been installed at on-site and off-site locations. Refer to Figure 2 for well locations. The wells are identified as MW-1, 2, 3, 4 and 10 on site and MW-5S, 5D, 6S, 6D, 7S, 7D, 8S, 8D, 9S, 9D, 11S and 11D. Shallow overburden wells were completed at approximately 20 to 30 feet below grade. Deep overburden wells were completed approximately 50 to 70 feet below grade, except for well MW-9D was completed at 30 feet below grade. Wells were completed using hollow stem auger drilling method. 4-inch diameter, schedule 40 PVC monitoring wells were installed within the augers.

All overburden wells were installed using 0.020 inch slotted, 4 inch PVC, and screen. A #2 gravel pack was installed in the annulus surrounding the well screens and a bentonite seal was installed above the sand pack. The overburden deep wells were grouted to surface. All wells were completed flush to grade with permanently affixed road boxes. Well screen zone varied depending on depth to water encountered in the formation. The deep overburden wells are screened at near the base of the overburden with a 5 foot screen, except for MW-9D which has a 2 foot screen due to the proximity to well MW-9S. The elevation of the ground water in several of the overburden/shallow ground-water monitoring wells rose above the elevation detected during soil boring installation indicating that the ground water may be under artesian conditions. Following installation, each well was developed to remove sediment to ensure a good hydraulic connection between the well and surrounding aquifer. The depth to water measured in the shallow overburden wells following well development ranged from approximately 3.52 feet to 14.93 feet below top of casing. The deep overburden well's depth to water ranged from 3.88 feet to 15.18 feet below top of casing. The top of each well casing was surveyed to the nearest 0.01 foot using an arbitrary benchmark. Well log diagrams are included in Appendix C.

4.4 Shallow Bedrock Well Installation

Three shallow bedrock wells were drilled and can be identified as MW-5R, MW-6R and MW-11R. Preliminary information showed competent mica schist at approximately 65 feet below grade. The wells were drilled to a total of approximately 100 feet (based on rock

quality determination) and packer/slug testing additional geophysical logging was completed.

Permanent steel casing was then installed through the overburden and upper layers of bedrock and grouted in place. The grout was allowed to set up for a minimum of 24 hours prior to advancement of the borehole. Continuous NX rock cores were then collected from bedrock wells. Following coring the borehole was reamed out to 6-inches in diameter and advanced to a specified depth. All of the bedrock wells were completed with 4-inch PVC casing and screen. Following installation, each well was developed to remove sediment to ensure a good hydraulic connection between the well and surrounding aquifer. The top of each well casing was surveyed to the nearest 0.01 foot using an arbitrary benchmark. Bedrock well locations are presented in Figure 2. Well Logs and Construction Details are included in Appendix C.

5.0 ROCK CORING, GEOPHYSICAL LOGGING, PACKER TESTING AND VERTICAL PROFILING

NX Rock cores were collected from bedrock wells MW-5R, MW-6R using an open bottom core barrel device. No cores were collected from MW-11R. Each core was removed from the barrel and placed directly in core boxes and logged in the field. MW-5R was cored continuously from 69 to 103 feet below grade and MW-6R was continuously cored from 85 to 105 feet below grade. Photo-documentation of cores is provided in Appendix B. Rock coring logs are included in Appendix C.

Geophysical Logging was conducted on 5R, 6R and 750 Bryants Nursery Road to further investigate and to determine its total depth, casing length and subsurface structure including fractures. The geophysical work was completed by Geophysical Applications Incorporated and also Mid Atlantic Geophysics on two separate occasions. The Borehole Geophysics logging reports are provided in Appendix F.

The survey included the following down hole geophysical measurements:

- Borehole Caliper – physical measurements of fracture sizing within the borehole
- Acoustical Televiwer – provides an acoustical measurement of the walls of the borehole to measure fracture dip angles and down dip azimuths
- Fluid Temperature and fluid resistivity-to determine if water is infiltrating or ex-filtrating the borehole
- Natural gamma, SP and SPR logs – to determine contact points and fluid conductive changes
- Heat-pulse flow-meters – provides measurements of ambient and pumping groundwater infiltration and ex-filtration rates.
- Additional tests were completed at MW-5R, MW-6R and 750 Bryants Nursery
This included: optical televiwer, fluid conductivity, normal resistivity, and single point resistance.

Packer tests were performed using a 4-inch diameter, straddle type, dual inflatable packer manufactured by Tam International and equipped with a 2-foot stainless steel screen zone. For slug testing a pressure transducer manufactured by In-Situ Inc. (miniTROLL) was used to record water level measurements during the testing period. The software enabled a real-time analysis of data gathered and was used for further analysis of the slug test data. A discrete ground-water sample was retrieved from select intervals using a REDI-FLO2 variable-speed submersible pump made by Grundfos Pumps Co.

The dual inflatable packer was lowered within each bedrock well using a portable hoist to the specified depth and then inflated to seal off an interval within the borehole. Depth intervals were selected base on the fracture zones observed in rock cores. Sections of PVC flush joint riser were attached as the packer was lowered into the borehole. The pressure transducer was lowered through the PVC riser to approximately 2 ft. below the static water level and the water level was monitored until a static level was achieved. Once a static water level was attained, a slug of water was removed using a Teflon bailer. The recovery rate was then monitored with the pressure transducer until recovery reached static levels. The packer was then re-positioned on the next interval and the procedure was repeated.

Following the slug testing of the entire borehole the packers were realigned on each interval for ground-water sample collection. Prior to sampling each interval a submersible pump was lowered down into the packer and ground water was purged from the casing. The sample was then collected directly from the discharge hose of the pump.

Vertical Profile interval sampling was conducted on several wells to determine the change in concentration verses depth. A series of depth specific water samples were collected at MW-3, MW-5S, 5D, 6D, 750 Bryant's Nursery Road well, and adjacent property 15545 New Hampshire Avenue's out of service well. The water sample intervals ranged from 5 to 10 feet. The water samples were submitted to the laboratory under chain of custody protocol for analysis of Volatile Organic Compounds (VOCs) via EPA method 8260. Refer to Table 2 and graphs in Appendix G.

5.1 Rock Coring Results

Bedrock cores in MW-5R consisted of gray schist, grading downward from moderate to least fractured. Some secondary crystallization and iron deposition was apparent along fracture faces. The cores from MW-6R consisted of gray schist, some fractures from 85 to 100 feet below grade. No cores were collected from MW-11R.

Fracture sets appeared oriented parallel to the surface grade (low flat angles) were observed in all cores. MW-6R has a highly fractured set from 85 feet to 100 feet below grade. The direction of dip could not be determined with the method of rock coring used.

The geophysical logging results should be referred to for the fracture details (Appendix F).

5.2 Geophysical Logging Results

15545 New Hampshire Avenue

A geophysical survey was completed at 15545 New Hampshire Avenue on the out of service bedrock well in February 2004. The survey was completed by Geophysical Applications, Inc. of Holliston, Massachusetts, under observation by EnviroTrac.

The geophysical survey indicates the following conclusions related to 15645 well:

- Fluid temperature and resistivity probes confirmed a cluster of open and closed fractures present at a depth of 80 to 89 feet below grade, vertically dipping at angles 40 to 60 degrees downward to the west /northwest.
- The well is approximately 90 feet deep. The water level is 10 feet below grade. The steel well casing is 55 feet deep and set in a vault.
- A significant enlargement to almost 9 inches in diameter is present from 55.5 to 69 feet, which is likely the result of drilling operations. Similar borehole enlargements were noted at the bottom of the other casing locations that were independent of stratigraphy.
- No inflow was observed under static conditions. Water bearing fractures were located at depths of 58.5, 60.5 and 62 feet below grade.

Approximately 50% of the fractures dip at angles 10-35 degrees downward and at a trend of west /northwest. A less transmissive water bearing zone was also detected at 80 to 89 feet below grade.

MW-5R

A geophysical survey was completed at MW-5R in June 2004. The survey was completed by Mid Atlantic Geosciences of Centerville, Maryland, under observation by EnviroTrac.

The geophysical survey indicates the following conclusions related to well MW-5R:

- A hairline fracture located at 71.1 feet corresponds to slight inflections in the fluid conductivity and temperature indicating a possible fluid entry/exit point
- Numerous hairline fractures and quartz veins are located throughout MW-5R. Specifically at 76.6 feet, 84.4 feet, 97.3 feet and 98.4 feet. No major fractures were identified in the borehole.
- The well is approximately 100 feet deep. The water level is 21.1 feet below grade. The borehole measure 8 -inch diameter and steel well casing is 67.4 feet deep. The overburden bedrock interface is 61 feet below grade.
- No inflow was observed under static conditions. Pumping inflow was observed at depths of 70 to 99 feet below grade at less than 0.26 gpm.

The geophysical survey indicates the following conclusions related to MW-5R:

- A water bearing hairline fracture is present at a depth of approximately 71-98 feet below grade, at approximately 9 to 24 degrees downward to the west /northwest.

MW-6R

A geophysical survey was completed at MW-6R in June 2004. The survey was completed by Mid Atlantic Geosciences of Centerville, Maryland, under observation by EnviroTrac.

The geophysical survey indicates the following conclusions related to well MW-6R:

- A hairline fracture located at 71.1 feet corresponds to slight inflections in the fluid conductivity and temperature indicating a possible fluid entry/exit point
- Additional hairline fractures located at 90-99 feet in MW-6R. Corresponding fluid conductivity inflections are at same depth and this is likely a fluid entry point, in particular 90-92 feet zone. No other major fractures were identified in the borehole, except sealed fractures at 102.2 and 102.9 which had no vertical flow.
- The well is approximately 105 feet deep. The water level is 58.9 feet below grade. The borehole measures 8-inch diameter and steel well casing is 85.2 feet deep. The overburden bedrock interface is 77 feet below grade.
- Upward flow was observed under static conditions at 89 feet at a rate of 0.42 gpm. Pumping inflow was observed at depths of 90 to 92 feet below grade at less than 0.26 gpm.

The geophysical survey indicates the following conclusions related to MW-6R:

- A water bearing hairline fracture is present at a depth of approximately 89-92 feet below grade, at approximately 43 to 47 degrees downward to the west /northwest.

750 Bryants Nursery Road

A geophysical survey was completed at out of service well 750 Bryants Nursery Road in August 2004. The survey was completed by Mid Atlantic Geosciences of Centerville, Maryland, under observation by EnviroTrac.

The geophysical survey indicates the following conclusions related to well 750 Bryants Nursery Road:

- Hairline fractures located at 71.1 feet and 101 feet. This corresponds to slight inflections in the fluid conductivity and temperature indicating a possible fluid entry/exit point

- A fracture zone is located at 47-49 feet and is likely a fluid exit/entry point. No major fractures were identified in the borehole.
- The well is approximately 400 feet deep. The water level is 20.5 feet below grade. The borehole measure 6 –inch diameter and steel well casing is 44.2 feet deep. The overburden bedrock interface is ranged from 70 to 78 feet below grade. Please note this well draws water from overburden and bedrock zones. Refer to Appendix A for a subsurface cross section depicting the lithology and well construction details.
- No inflow was observed under static conditions. No pumping inflow was observed at over length of the borehole, greater than 0.15 gpm.

The geophysical survey indicates the following conclusions related to 750 Bryants Nursery Road well:

- A water bearing hairline fracture is present at a depth of approximately 71 and 101 feet below grade, at approximately 40 degrees downward to the west /northwest.

5.3 Packer Tests Results

In June and August 2004, EnviroTrac conducted packer testing on MW-5R, MW-6R and 750 Bryants Nursery wells. Packer testing included performing hydraulic head measurements, slug testing (750 only) and ground-water sampling at select depth intervals in each bedrock monitoring well. The tests were performed in an effort to identify hydraulically significant fractures, quantify the hydraulic properties of the significant fractures and determine the presence and distribution of MTBE contamination in the borehole.

Based on the graphs provided in Appendix H, the hydraulic head in 750 Bryants Nursery well appears to decrease with depth indicating a downward potential for water flow. The 41 foot data plot shows a steady minor decline and is representative of the casing seal. This indicates the casing seal for the most part is intact and downward migration along the casing is not likely.

The hydraulic conductivity measured in 750 Bryants Nursery Road well was calculated to be 1.06×10^{-4} fee/minute at the 47.5 foot depth and 2.38×10^{-4} fee/minute at the 137.5 foot depth. The conductivity values indicated a general increase of hydraulic conductivity with

The downward flow potential at 750 Bryants Nursery Road well may account for the increasing concentration of MTBE detected. However the opposite is observed in MW-5R and 6R. Water flowing from deeper fractures may have diluted the concentration of MTBE in these wells or has prevented the migration of MTBE into the fracture system intersected by the boreholes. Surrounding drinking water wells are installed in bedrock at depths ranging from 200 to 400 ft. below grade. MTBE was detected in drinking water wells at similar concentrations as detected in 750 Bryants Nursery Road and MW-8. Refer to Appendix H for the slug testing data and graphs.

6.0 GROUND-WATER MONITORING

Ground-water monitoring (gauging purging and sampling) was performed on all monitoring wells between July 1 and July 8, 2004.

6.1 Horizontal Ground-Water Flow

Depth to water was measured relative to the surveyed top of casing and was used to determine apparent ground-water flow direction in both the shallow and deep overburden wells. Ground water was detected at depths ranging from 3.52 to 14.93 feet below grade in shallow overburden wells and 3.88 to 15.18 feet in the deep overburden wells. The shallow bedrock water levels ranged from 12 to 17 feet below grade. Water level data and elevations are provided in Table 3 and Figure 3 and Figure 3A.

Ground-water flow in the overburden sediments was determined to flow west with a hydraulic gradient of 0.030 feet/feet. On site wells and off site well MW-11 does indicate water table influence.

6.2 Vertical Ground-Water Flow

Groundwater elevation measurements conducted within the deep overburden wells and paired shallow overburden wells were reviewed to determine the vertical hydraulic gradient. The following are the calculated vertical gradients:

MW-5S / MW-5D: -.030 downward
MW-6S / MW-6D: -.040 downward
MW-7S / MW-7D: -.016 downward
MW-8S / MW-8D: -.013 downward
MW-9S / MW-9D: -.029 downward
MW-11S / MW-11D: -.017 downward

A downward vertical-gradient was observed during the July 2004 sample round and well gauging event. This information may suggest that the overburden aquifer drains downward into fractured bedrock and migrates laterally.

6.3 Well Purging and Sampling

Following well gauging, ground-water samples were collected from all overburden wells. Prior to sample collection, the wells were purged of 3 to 5 well volumes of water using dedicated bailers. Water levels in the wells appeared to recharge to near initial conditions within minutes of sample collection. Purge water was treated with portable carbon units. Sample handling followed industry-standard practices, including trip blanks and chain of custody protocol. New, dedicated, disposable bailers were used in each well therefore field blanks were not collected. Ground-water samples were submitted following chain of custody protocol to Accutest Laboratories and analyzed for VOCs via EPA Method 8260 and 8015.

6.4 Ground-Water Sampling Analytical Results

Based on the July 2004 sample round presented in Table 3, MTBE was detected in on-site well wells and ranged from 4.8 (MW-2) to 123,000 (MW-3) micrograms per liter (ug/l) BTEX was not detected in wells MW-2. Well MW-1, MW-3, MW-4 and MW-10 contained BTEX ranging from 0.73 (MW-4) to 2,091.9 (MW-10) ug/l.

The off-site wells were also sampled in July 2004. Reviewing Table 3, the offsite well clusters (shallow and deep overburden and shallow bedrock show trending hydraulically down-gradient detections of MTBE ranging from :

Shallow Overburden-off-site

MTBE 1.1 ug/l in MW-9S to 12,000 ug/l in MW-11S

BTEX BDL in 7S, 8S, 9S to 14.1 ug/l in 11S

Deep Overburden-off-site

MTBE 4.4 ug/l in MW-9D to 260 ug/l in MW-5D

BTEX BDL in 5D, 7D, 8D, 9D, 11D to 4.3 ug/l in 6D;

Shallow Bedrock-off-site

MTBE 23.5 ug/l in MW-11R to 74.9 ug/l in MW-6R

BTEX BDL in 11R to 4.3 ug/l in 6D.

It should be noted that other oxygenates were detected and summarized along with TPH DRO and GRO, as well as non gas station related parameters (Table 3). Laboratory analytical data is provided in Appendix I and Figure 3 and 3A is a MTBE distribution map. An additional MTBE iso-concentration map is provided in Appendix A.

The dispenser island coring # 3 (Figure 4 and Table 1) resulted in only a groundwater sample to be collected. The results show 20.2 ppb of MTBE detected in the water at approximately 4 feet below grade.

7.0 POTABLE WELL DATA

The private wells in the area are completed in the bedrock aquifer and range in depth from 200 to 400 feet. These well were originally installed in 1982 through 1986. Potable wells are constructed with PVC or steel casings installed at the overburden bedrock interface to 5-10 feet into bedrock (Montgomery County Driller's well logs) with the remainder of the well completed as an open borehole. Please note the 750 Bryants Nursery Road well is cased above the bedrock. A cross section depicting this scenario is included in Appendix A.

Private wells along Bryants Nursery, New Hampshire Ave and Snider Lane are sampled at regular intervals by EnviroTrac personnel. The MTBE concentration in potable wells during sampling events from October 2003 to August 2004 ranged from below detection limits (BDL) to 77.9 ug/l (# 750 Bryants Nursery Road). Table 4 summarizes the potable well sampling data. Table 5 is a potable well status which summarizes the identified wells in the area that were sampled, provided water, connected the WSSC water main or provided carbon treatment.

8.9 ON SITE REMEDIATION SYSTEM INSTALLATION AND START UP

In June 2004, ground-water recovery pumps were piped and installed to MW-1, MW-3 and MW-10. Treated water is discharged under the approved groundwater general discharge permit. The water is pumped out of the wells and treated prior to discharge through two granular activated carbon vessels to be located at the rear of the station. The treated groundwater will be discharged to the on-site yard drain. Figure 5, a trench and install plan diagram is attached. System influent and effluent along with operational data is provided in Table 6. Laboratory reports are provided in Appendix J.

The system became operational in July and to date, the treatment system is operating efficiently and a cone of depression has developed to capture on site MTBE migration. Based on the groundwater elevation map (Figure 3), the system is influencing water levels in offsite wells MW-5 and MW-11.

Please note, an onsite SVE Pilot Test was completed on September 9, 2004 and the results will be reported along with the off-site August 2004 aquifer pump test in the next report following sampling.

9.0 FINDINGS & RECOMMENDATIONS

EnviroTrac makes the following conclusions, based upon the soil and ground-water data collected to date:

- The former Shell station located at 15541 New Hampshire Avenue was constructed in 1961. In 1985 the original USTs were replaced with fiberglass tanks. In December 2002, the USTs and pump island were removed as part of a lease divestment. A tank closure report was submitted to the MDE in February 2003.
- Pending MDE complete response to the tank pull report, Shell was required to inventory and sample potable wells in the area. Beginning on October 3, 2003, samples were collected from private potable wells by a certified MDE sampler. MTBE has been detected in 13 potable wells. Five (5) wells had detection of more than 20 ppb MTBE. Of these five, three residents accepted Shell-provided water treatment systems. Of the eight residences where MTBE was detected below the 20 ppb limit, five accepted Shell-provided bottled water.
- Based on the potable well sample results from those wells sampled, it appears the MTBE concentrations have stabilized.
- Ground-water occurs in the overburden saprolite. Based on the hydraulic head measurements, ground-water flow is to the west in the overburden wells.
- Ground water in the overburden beneath the former Shell Station is currently impacted by MTBE above MDE MEAT Guidance Water Quality values.
- MTBE has been detected in monitoring wells west of the former Shell station.
- Other potential sources in the area that could contribute to the MTBE plume have been identified from FOIA research.

- **Local runoff water from area commercial operations drains into nearby retention ponds. This may provide a pathway for MTBE migration into the aquifer system.**
- **The west/ northwest downward dipping fracture have potential to create the vertical migration of MTBE**
- **The 750 Bryants casing set at 45 feet below grade (refer to cross section in Appendix A) shows a pathway from the overburden to the bedrock zones. Currently, this well is out of service, as the resident is connected to public water.**

The findings suggest a likely scenario is that a release or releases occurred sometime after 1980, when MTBE became commonly used as a gasoline additive to meet EPA air emission requirements. MTBE migrated along the overburden-bedrock interface aquifer and over time, due to the characteristics of the bedrock aquifer system and 750 Bryants Nursery Road well casing (set in overburden), select potable wells located hydraulically down-gradient now contain MTBE.

Based upon the above the EnviroTrac recommends performing the following:

- 1) A quarterly ground-water sampling plan should be implemented to confirm water quality at the Site and monitor seasonal fluctuations over the hydrologic cycle.
- 2) Maintain the on-site pump and treat groundwater system checking for operation, performance and water table influence.
- 3) Once the WSSC has completed all planned water main connections to Bryants Nursery Road to those houses who have access perform the following:

Cancel bottled water delivery to those that have requested and are connected to the water main and remove POET carbon systems;

Offer carbon treatment to those Bryants Nursery Road residents with detected MTBE, who are not able to be connected to public water.

On a quarterly basis collect water samples for the remaining 11 active wells.

- 4) **Review** out of service well at 750 Bryants Nursery Road and determine if well **sealing the entire length** of the well will minimize migration of MTBE from the overburden to the bedrock.

- 5) **Conceptual Corrective Action Plan:** Based on the current onsite groundwater pump and treat system, influence can be observed in offsite well MW-11 and the system as is may be recovering and cutting off the source. The off-site area beyond MW-11 may require additional drawdown to further enhance water table depression efforts. After additional quarterly sampling efforts evaluate the need for additional actions. Off-site aquifer pump testing has been completed to allow calculation of the drawdown and radius of influence without further testing.

TABLES

TABLE 1 - Soil Analysis Data Summary

Sample ID	Date	Depth (feet)	Organic Constituents										Total Petroleum Hydrocarbons	Total PCBs	Total Pesticides	Total Phthalates		
			PPH	PPB	PPG	PPH	PPB	PPG	PPH	PPB	PPG	PPH					PPB	PPG
MDE MEAT	Soils	Residential	11.6	1,564	782	15,643	-	653	-	-	-	-	-	-	-	-	-	230
MW-1	12/22/2003	10-12	BDL (0.32)	BDL (1.1)	5.9	139	144.9	BDL (0.36)	BDL (0.32)	BDL (0.45)	BDL (7.0)	BDL (0.21)	BDL (0.21)	BDL (0.21)	BDL (0.21)	BDL (0.21)	BDL (0.21)	23.8
MW-2	12/22/2003	10-12	BDL (0.30)	BDL (0.98)	BDL (0.20)	BDL (0.65)	0	BDL (0.33)	BDL (0.30)	BDL (0.41)	BDL (6.5)	BDL (0.20)	BDL (0.20)	BDL (0.20)	BDL (0.20)	BDL (0.20)	BDL (0.20)	BDL (2.3)
MW-3	12/22/2003	5-7	BDL (0.31)	BDL (1.0)	BDL (0.21)	BDL (0.68)	0	27.5	BDL (0.31)	BDL (0.43)	1,380	BDL (0.21)	BDL (0.21)	BDL (0.21)	BDL (0.21)	BDL (0.21)	BDL (0.21)	BDL (2.1)
MW-4	12/22/2003	8-10	BDL (0.28)	BDL (0.87)	BDL (0.17)	BDL (0.57)	0	1.9	BDL (0.26)	BDL (0.36)	BDL (5.7)	BDL (0.17)	BDL (0.17)	BDL (0.17)	BDL (0.17)	BDL (0.17)	BDL (0.17)	BDL (2.2)
MW-5S	12/29/2003	12-14	BDL (0.24)	BDL (0.81)	BDL (0.16)	BDL (0.53)	0	BDL (0.27)	BDL (0.24)	BDL (0.34)	BDL (5.3)	BDL (0.16)	BDL (0.16)	BDL (0.16)	BDL (0.16)	BDL (0.16)	BDL (0.16)	BDL (2.2)
MW-5D	3/15/2004	12	BDL (1.4)	BDL (1.4)	BDL (1.4)	BDL (2.7)	BDL	122	BDL (6.8)	1.6	109	BDL (6.8)	BDL (6.8)	BDL (6.8)	BDL (6.8)	BDL (6.8)	BDL (6.8)	BDL (4.6)
MW-6S	12/29/2003	12-14	BDL (0.24)	BDL (0.76)	BDL (0.16)	BDL (0.51)	0	BDL (0.26)	BDL (0.24)	BDL (0.33)	BDL (5.1)	BDL (0.16)	BDL (0.16)	BDL (0.16)	BDL (0.16)	BDL (0.16)	BDL (0.16)	BDL (2.1)
MW-6D	2/17/2004	22	BDL (1.1)	BDL (1.1)	BDL (1.1)	BDL (2.2)	BDL	BDL (1.1)	BDL (5.5)	BDL (5.5)	BDL (28)	BDL (5.5)	BDL (5.5)	BDL (5.5)	BDL (5.5)	BDL (5.5)	BDL (5.5)	BDL (3.7)
MW-7S	2/17/2004	58	BDL (1.4)	BDL (1.4)	BDL (1.4)	BDL (2.7)	BDL	7.7	BDL (6.8)	BDL (6.8)	102	BDL (6.8)	BDL (6.8)	BDL (6.8)	BDL (6.8)	BDL (6.8)	BDL (6.8)	BDL (4.3)
MW-7D	2/17/2004	28	BDL (1.2)	BDL (1.2)	BDL (1.2)	BDL (2.3)	BDL	0.78	BDL (5.8)	BDL (5.8)	BDL (29)	BDL (5.8)	BDL (5.8)	BDL (5.8)	BDL (5.8)	BDL (5.8)	BDL (5.8)	BDL (4.0)
MW-8S	3/17/2004	20	BDL (1.3)	BDL (1.3)	BDL (1.3)	BDL (2.6)	BDL	20.8	BDL (6.6)	BDL (6.6)	BDL (33)	BDL (6.6)	BDL (6.6)	BDL (6.6)	BDL (6.6)	BDL (6.6)	BDL (6.6)	BDL (4.3)
MW-8D	2/25/2004	18	BDL (1.3)	BDL (1.3)	BDL (1.3)	BDL (2.7)	BDL	BDL (1.3)	BDL (6.7)	BDL (6.7)	BDL (33)	BDL (6.7)	BDL (6.7)	BDL (6.7)	BDL (6.7)	BDL (6.7)	BDL (6.7)	BDL (4.1)
MW-9D	2/23/2004	17	BDL (1.2)	BDL (1.2)	BDL (1.2)	BDL (2.4)	BDL	BDL (1.2)	BDL (6.1)	BDL (6.1)	BDL (30)	BDL (6.1)	BDL (6.1)	BDL (6.1)	BDL (6.1)	BDL (6.1)	BDL (6.1)	BDL (4.0)
MW-9S	2/23/2004	50	BDL (1.2)	BDL (1.2)	BDL (1.2)	BDL (2.4)	BDL	BDL (1.2)	BDL (6.0)	BDL (6.0)	BDL (38)	BDL (6.0)	BDL (6.0)	BDL (6.0)	BDL (6.0)	BDL (6.0)	BDL (6.0)	BDL (3.8)
MW-9D	2/25/2004	10	BDL (1.2)	BDL (1.2)	BDL (1.2)	BDL (2.5)	BDL	BDL (1.2)	BDL (6.2)	BDL (6.2)	BDL (31)	BDL (6.2)	BDL (6.2)	BDL (6.2)	BDL (6.2)	BDL (6.2)	BDL (6.2)	BDL (4.3)
MW-9D	3/23/2004	8	BDL (1.4)	BDL (1.4)	BDL (1.4)	BDL (2.8)	BDL	BDL (1.4)	BDL (7.1)	BDL (7.1)	BDL (36)	BDL (7.1)	BDL (7.1)	BDL (7.1)	BDL (7.1)	BDL (7.1)	BDL (7.1)	BDL (4.4)
MW-10	3/16/2004	10	BDL (1.2)	BDL (1.2)	4.3	6.2	10.5	2,470	BDL (6.1)	40.5	2,630	BDL (6.1)	BDL (6.1)	BDL (6.1)	BDL (6.1)	BDL (6.1)	BDL (6.1)	87.0
MW-11S	4/27/2004	14	BDL (1.2)	BDL (1.2)	BDL (1.2)	BDL (2.4)	BDL	BDL (1.2)	BDL (5.9)	BDL (5.9)	BDL (29)	BDL (5.9)	BDL (5.9)	BDL (5.9)	BDL (5.9)	BDL (5.9)	BDL (5.9)	BDL (4.0)
MW-11D	4/28/2004	15	BDL (1.2)	BDL (1.2)	BDL (1.2)	BDL (2.5)	BDL	1.8	BDL (6.2)	BDL (6.2)	BDL (31)	BDL (6.2)	BDL (6.2)	BDL (6.2)	BDL (6.2)	BDL (6.2)	BDL (6.2)	BDL (4.1)

MONITORING WELLS

Notes:
 BDL - Below Detection Limit (as specified)
 (*) - Soil Boring SE-4 sample was groundwater, not soil
 NA - Not Analyzed
 Bold indicates MDE MEAT Exceedance

TABLE 1 - Soil Analysis Data Summary

Sample ID	Date	Sample Depth (feet)	DISPENSER AREA SOIL BORINGS										POM	POM	
			PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB	PPB			PPB
SB-1	12/22/2003	5	BDL (1.1)	BDL (3.8)	560	PPB	1,260	1,620	17.1	BDL (1.1)	BDL (1.5)	BDL (2.4)	BDL (0.71)	22.1	63.8
SB-2	12/22/2003	4	BDL (1.7)	BDL (5.7)	63.9	11.9	75.8	2,278	18.1	35.7	37	BDL (1.1)	11.2	BDL (2.3)	
SB-3	12/23/2003	5	30.3	2.5	BDL (0.17)	1.8	34.6	8,810	75.1	224	1,410	BDL (0.17)	11.8	438	
SB-4(*)	12/23/2003	5	BDL (0.21)	BDL (0.25)	BDL (0.23)	BDL (0.20)	0	20.2	0.54	1.4	18.8	BDL (0.23)	BDL (0.052)	NA	

Notes:
 BDL - Below Detection Limit (as specified)
 (*) - Soil Boring SB-4 sample was groundwater, not soil
 NA - Not Analyzed
 Bold indicates MDE Exceedance

TABLE 3 - Groundwater Data Summary

Sample ID	Depth	T/C (°C)	Dissolved Oxygen (mg/L)				pH				Electrical Conductivity (µS/cm)				Total Dissolved Solids (mg/L)				Total Suspended Solids (mg/L)				Total Solids (mg/L)	
			07/10	07/11	07/12	07/13	07/10	07/11	07/12	07/13	07/10	07/11	07/12	07/13	07/10	07/11	07/12	07/13	07/10	07/11	07/12	07/13		
MW-10	4/5/2004	07.81	4.15	53.06	38.4	153	208	183	969	43,600	520	561	23,200	BDL	64.1	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
	7/1/2004	99.88*	5.43	94.45	78.4	88.9	858	363	2,091.9	34,300	1,080	779	28,600	BDL (50)	85.6	BDL (50)	BDL (50)	BDL (50)	BDL (50)	BDL (50)	BDL (50)	BDL (50)	BDL (50)	2.28
	8/17/2004	99.88*	14.25	85.83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9/19/2004	99.88	13.60	86.28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-11S	7/8/2004	99.72	10.08	95.64	14.1	BDL (25)	BDL (25)	BDL (25)	14.1	12,000	55.9	149	3,020	BDL (0.50)	15.9	BDL (0.50)	BDL (0.50)	BDL (0.50)	BDL (0.50)	BDL (0.50)	BDL (0.50)	BDL (0.50)	BDL (0.11)	BDL (0.11)
	8/17/2004	99.72	10.44	89.28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9/10/2004	99.72	11.55	88.17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-11D	7/8/2004	99.41	9.65	99.76	BDL (1.0)	BDL (1.0)	BDL (1.0)	BDL (1.0)	BDL	62.2	BDL (5.0)	0.67	16.0	BDL (0.50)	BDL (0.20)	BDL (0.50)	BDL (0.50)	BDL (0.50)	BDL (0.50)	BDL (0.50)	BDL (0.50)	BDL (0.20)	1.02	1.02
	8/17/2004	99.41	10.19	89.22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9/10/2004	99.41	11.17	88.24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW-11R	7/1/2004	99.75	44.98	54.77	BDL (0.50)	BDL (0.50)	BDL (0.50)	BDL (0.50)	BDL	26.4	BDL (0.50)	BDL (0.50)	BDL (5.0)	BDL (0.60)	BDL (0.20)	BDL (0.60)	BDL (0.60)	BDL (0.60)	BDL (0.60)	BDL (0.60)	BDL (0.60)	BDL (0.20)	0.428	0.428
	8/17/2004	99.75	16.43	83.32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9/10/2004	99.75	13.07	86.88	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TF-1	1/6/2004	-	-	-	30.2	60.3	0.34	27.9	116.7	20,800	192	386.0	1,710	BDL (0.34)	30.5	BDL (0.34)	BDL (0.34)	BDL (0.34)	BDL (0.34)	BDL (0.34)	BDL (0.34)	BDL (0.34)	0.389	0.389
	4/5/2004	-	-	-	BDL	BDL	BDL	BDL	BDL	45,200	631	657	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL
TF-2	4/5/2004	-	-	-	BDL	BDL	BDL	BDL	BDL	62,800	BDL	667	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL

Head Space PID (ppm)
 TF-1 491
 TF-2 298

Notes:
 *Elevation has changed due system
 PT - Product Thickness
 DTP - Depth to Product
 DTW - Depth to Water
 BDL - Below Detection Limit (as specified)
 Bold = MDE Meas Exceedance
 Samples run by method 8260, 8015b

TABLE 4 - Potable Well Sample Results Summary

Date of Sample	Total Dissolved Solids (TDS)		Total Hardness		Calcium		Magnesium		Sulfate		Chloride		Nitrate		Nitrite		Ammonia		Total Phosphate		Total Phosphate
	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	
711 Bryants Nursery																					
10/03/03	BDL	BDL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-
10/18/03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	-
11/21/03	0.46	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-
12/23/03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	-
01/16/04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	-
02/13/04	BDL	BDL	0.45	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-
03/02/04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	-
03/25/04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	-
04/16/04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	-
05/26/04	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	-
06/22/04, 2004	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	-
720 Bryants Nursery																					
10/03/03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	-
10/18/03	21	BDL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-
11/20/03	27.7	BDL	0.81	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	20
11/26/03	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	-
12/23/03	23.6	BDL	0.48	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	32,500
12/23/03	0.80	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	66,300
01/16/04	22.6	BDL	0.52	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-
01/16/04	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-
02/13/04	26.70	BDL	0.67	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-
02/13/04	1.10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-
02/13/04	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-
03/02/04	28.80	BDL	0.69	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-
03/02/04	1.30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-
03/02/04	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-
03/25/04	25.2	BDL	0.49	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	129,040
03/25/04	BDL	BDL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-
03/25/04	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-
03/25/04	28.6	BDL	0.53	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	144,400
04/16/04	BDL	BDL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-
04/16/04	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-
05/26/04	27.1	BDL	0.61	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	171,080
05/26/04	0.94	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-
05/26/04	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-
06/22/04	24.8	BDL	0.71	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	189,400
06/22/04	2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-
06/22/04	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	BDL	-

Notes:
 NA - Not Analyzed
 NS - No Sample
 BDL - Below Detection Limits
 Bold indicates MDE MEAT Exceedance
 All samples run by method 524.2, 8015b

Table 5**Wells in Vicinity of former Shell 15541 New Hampshire Avenue, Silver Spring, MD**

Address	Comments	MTBE RANGE 2003-2004
15605 NH Avenue (residence)	permit for PUBLIC WATER, active potable well, provided bottled water	1.8-10.3 ppb * (resample Sept to verify EPA 8260/524.2)
15545 NH Avenue (residence)	Out of Service Well, ON PUBLIC WATER	BDL
715 Snider Lane (residence)	ON PUBLIC WATER as of July 2004	1.3-18.3 ppb
15526 NH Avenue (business-Notary)	ON PUBLIC WATER	BDL
15550 NH Avenue	ON PUBLIC WATER, connected through Church @ 15560 NH	N/A
15529 NH Avenue NAPA Auto Parts)	ON PUBLIC WATER	BDL
750 Bryants Nursery Rd (residence)	ON PUBLIC WATER as of June 2004, provided bottled water- cancelled reimbursed bottled water.	46.8-77.9 ppb
741 Bryants Nursery Rd (residence)	Pending Connection, offered bottled water	BDL-1.7 ppb
740 Bryants Nursery Rd (residence)	Pending Connection, resident refused carbon treatment/water delivery	30-42 ppb ppb
731 Bryants Nursery Rd (residence)	Pending Connection, carbon filtration installed	26-37.2 ppb
730 Bryants Nursery Rd (residence)	Pending Connection, carbon filtration installed reimbursed bottled water.	19.6 -33.5 ppb
721 Bryants Nursery Rd (residence)	ON PUBLIC WATER, provided bottled water-cancelled	2.5-3.6 ppb
720 Bryants Nursery Rd (residence)	ON PUBLIC WATER as of Sept 2004, carbon filtration removal scheduled reimbursed bottled water.	21-28.9 ppb
711 Bryants Nursery Rd (residence)	Pending Connection, provided bottled water	BDL-.046 ppb
710 Bryants Nursery Rd	ON PUBLIC WATER as of Sept 2004, provided bottled water-cancelled	1.8-3.2 ppb
700 Bryants Nursery Rd (residence)	provided bottled water, potential carbon install no water main available	BDL- 1.1 ppb
670 Bryants Nursery Rd (residence/business)	added per residents request no water main available	BDL
661 Bryants Nursery Rd (residence)	no water main available	BDL
660 Bryants Nursery Rd (residence)	no water main available	BDL
651 Bryants Nursery Rd (residence/business)	no water main available	BDL
650 Bryants Nursery Rd (residence)	potential carbon install no water main available	1.2-1.5 ppb
621 Bryants Nursery Rd (residence)	no water main available	BDL
611 Bryants Nursery Rd (residence)	no water main available	BDL

Table 6
 Ground Water Pump and Treatment System
 Former Shell Station
 15541 New Hampshire Avenue
 Silver Spring, Maryland

Date	Influent			Effluent			Days of Operation	Operational Percentage %	Total		Mass Removal		
	BTEX ug/l	MTBE ug/l	TBA ug/l	BTEX ug/l	MTBE ug/l	TBA ug/l			Gallons	Gal/Day	BTEX pounds	MTBE pounds	TBA pounds
7/22/04	NR	NR	NR	NR	NR	NR	0.0	100	0	0	NR	NR	NR
7/26/04	363	45,500	26,000	0.0	0	0	4.0	100	28,800	7,200	NR	NR	NR
08/10/04	NR	NR	NR	NR	NR	NR	17.0	100	133,600	6,165	NR	NR	NR
8/17/04	NR	NR	NR	NR	NR	NR	24.0	100	191,400	2,408	NR	NR	NR
8/26/04	187	12,900	6,490	0.0	0.0	0.0	33.0	100	260,600	2,097	0.5	56.4	88.2
9/8/2004	141	TBD	TBD	0.0	0.0	0.0	46.0	100	351,000	1,965	0.3	#VALUE!	31.4
												#VALUE!	#VALUE!

Mass Removal: (((Influent Concentration₁ - Effluent Concentration₁) + (Influent Concentration₂ - Effluent Concentration₂)) / 2) * (Flow₂ - Flow₁) * (3.785 liters/gallon) * (1gram/1,000,000 ug) * (0.0022 pounds/gram)
 TBD data not available at the time of report compilation