

# MARYLAND DEPARTMENT OF THE ENVIRONMENT

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Land Management Administration • Oil Control Program

## DRINKING WATER SAMPLING AND ENVIRONMENTAL INVESTIGATION

**Exxon Service Station  
3031 Baltimore Boulevard  
Finksburg, Carroll County, Maryland  
Case No. 1993-0398CL**

The Maryland Department of the Environment (MDE), Oil Control Program (OCP), in coordination with the Carroll County Health Department (CCHD), is evaluating the impact of petroleum constituents, primarily methyl tertiary-butyl ether (MTBE) and benzene, at the Exxon service station/convenience store.

Benzene is a major component of gasoline with a Federal Drinking Water Standard of 5 ppb. MTBE is a fuel additive commonly used to reduce carbon monoxide and ozone levels caused by auto emissions. There is no national regulatory standard for MTBE in drinking water. In 1997, the U.S. Environmental Protection Agency (EPA) issued an advisory for MTBE of 20 to 40 parts per billion (ppb), based on taste and odor. Although the EPA has not established a regulated Maximum Contaminant Level (MCL) for MTBE, the MDE has adopted an action level of 20 ppb.

In September 2005, the MDE-OCP was made aware of environmental problems at the Exxon station upon receiving groundwater-sampling results from the three newly installed monitoring wells. MTBE contamination was detected in monitoring wells at up to 10,500 ppb and benzene at up to 99 ppb.

This Exxon service station is an active gasoline retail station and convenience store that has been operated by ExxonMobil since the early-1980s. In August 2007, Exxon commissioned the removal of four (4) underground storage tank systems (a 12,000-gallon and two 8,000-gallon gasoline tanks and a 10,000-gallon diesel tank). These tanks, including a 1,000-gallon waste oil tank (removed in 1992) were installed in May 1982. The active UST system includes two (2) 20,000-gallon tanks (20,000-gallon gasohol; 12,000/8,000-gallon gasohol/diesel). There are eight (8) monitoring wells, four (4) tank field observation pipes, and a transient non-community drinking water supply well on-site.

The majority of the surrounding area is supplied by public water, however, the Exxon station and several nearby properties are served by drinking water wells. Groundwater flow is east to southeasterly and depth to groundwater is 15 to 16 feet. On October 28, 2005 the CCHD issued notification letters to property owners within a one-half mile radius of the facility regarding the petroleum impacts to the on-site wells. To date, CCHD has sampled ten (10) off-site private drinking water well and there have been no petroleum constituents detected above the State's action levels or the Maximum Contaminant Level for safe drinking water. At this time, the MDE-OCP does not anticipate expanding the off-site residential sampling effort beyond sampling needed to ensure community safety.

### Chronology:

- August 26, 1992. MDE-OCP on-site to observe the removal of the 1000-gallon waste oil tank. No contamination issues noted.
- April 27, 1998. MDE-OCP conducted a compliance assistant inspection. A minor violation cited.
- February 4, 2002. MDE-OCP conducted a compliance assistant inspection. Several outstanding issues identified:
  - Provide last 3 months of inventory records and leak detection results;
  - Remove debris and product from spill catchment basins;

- Properly grout tank field monitoring pipes;
  - Hydrostatic test performed on spill buckets - failed.
- July 15, 2005. MDE-OCP received the updated schedule for the installation of groundwater monitoring wells.
  - August 19, 2005. MDE-OCP on-site to view locations of newly installed groundwater monitoring wells
  - September 2005. MDE-OCP received the *Subsurface Investigation Results –September 6, 2005*.
    - Sampling event for monitoring wells collected on 08/16/2005
      - MW1 MTBE – 3.84 ppb
      - MW2 MTBE – 10,500 ppb; benzene – 87.6 ppb
      - MW3 MTBE – 83.7 ppb; benzene – 99 ppb
      - Tank field monitoring pipes were not sampled.
  - October 18, 2005. MDE-OCP directive letter sent to Exxon.
    - Test the UST system for vapor leaks utilizing the Maryland Helium Testing Protocol;
    - Test all spill catchment basins and containment sumps;
    - Conduct a self-audit of the UST systems;
    - Sample all monitoring wells, tank field pipes and on-site drinking water supply well – semi-annually;
    - Include completion log for the drinking water supply well.
  - November 1, 2005. MDE-OCP received a copy of the CCHD notification letter 10/28/05 to residents living within one-half mile of the facility.
  - January 18, 2006. MDE-OCP received a response to the directive letter dated 10/18/05
    - UST system tested for vapor leaks, using the Helium Testing Protocol, 09/08/05 - passed
    - Testing of spill catchment basins and containment sumps completed on 09/08/05 – passed
    - Self-audit completed. Inventory records to be sent separately
  - January 26, 2006. MDE-OCP received copies of the CCHD letters mailed to property owners concerning drinking water sample results.
    - Sampling event on 11/23/05. (*see table for results*)
  - February 21, 2006. MDE-OCP received a copy groundwater sampling results collected by the CCHD from drinking water wells at 3106 Old Westminster Pike and 3031 Baltimore Blvd (Exxon station) (*see table for results*)
  - April 20, 2006. MDE-OCP received a copy groundwater sampling results collected by the CCHD from private wells on 3/09/06 and 3/10/06. CCHD letters mailed to property owners concerning drinking water sample results on 04/14-20/2006. (*see table for results*)
  - May 1, 2006. MDE-OCP received the *First Quarter 2006 Groundwater Monitoring Report*.
    - Groundwater flow to the east/southeast
    - On-site drinking water well sampled on 3/06/06
      - PW (untreated) MTBE - 1 ppb
    - Sampling event for monitoring wells collected on 03/15-17/06
      - MW1 MTBE – 15.8 ppb
      - MW2 MTBE - 2060 ppb; benzene – 38.6 ppb;  
Tertiary butyl alcohol (TBA is an unregulated compound) - 4030 ppb
      - MW3 MTBE - 429 ppb; TBA - 58.9 ppb;  
Tertiary amyl methyl ether (TAME is an unregulated compound) - 26.7 ppb;  
– Di-isopropyl ether – 13.6 ppb

(DIPE is an unregulated compound, commonly associated with old leaded gasoline)

- TF1 and TF2 (gasoline tank field area) Both tank field monitoring pipes were dry.

- May 12, 2006. MDE-OCP received Tank *Excavation Assessment Report - May 9, 2006*. The report provides details regarding the removal of the hydraulic lift reservoir tanks.
  - Hydraulic reservoir tanks removed 02/15/2006 were found to be in good condition.
  - Hydraulic tanks taken off-site for proper disposal.
  - No groundwater encountered in the excavation.
  - Limited soil samples collected from within the building where these hydraulic tanks were housed (TPH – DRO –1060 ppm).
- June 6, 2006. MDE-OCP received copy of the private drinking water sample results collected by CCHD on 5/11/06. (*see table for results*)
- July 28, 2006. MDE-OCP received *Second Quarter 2006 Groundwater Monitoring Report – July 27, 2006*.
  - On-site drinking water well sampled on 06/05/06 (*see table for results*)
  - PW (untreated) below regulatory levels; MTBE – non detect
  - Sampling event for monitoring wells collected on 05/26/06 (*see table for results*)
  - Tank field monitoring pipes TF1-TF4 were reportedly dry  
TF3 and TF4 - diesel tank field area
- August 17, 2006. MDE-OCP received the *Data Clarification Report-August 16, 2006*.
  - Tank field pipes in gasoline tank field TF1 and TF2 - Dry during sampling events on 3/15/06 and 5/26/06.
  - Tank field pipes in diesel tank field TF3 and TF4 - Dry on 5/26/06.
  - Updated site plan submitted
  - Groundwater samples collected on 5/26/06 (*see table for results*)
- September 12, 2006. MDE-OCP received *Work Plan for Additional Site Assessment – September 11, 2006* proposing the following activities:
  - Installation of five (5) additional groundwater monitoring wells
  - Development, surveying and sampling of all monitoring wells
  - Characterization of the aquifer using rising head slug tests
  - Conduct geophysical analysis and packer testing of on-site potable well.
- September 27, 2006. MDE-OCP received *Work Plan Addendum Correspondence-September 21, 2006*, detailing the geophysical procedures for the on-site drinking water supply well.
- October 5, 2006. MDE-OCP received the *Work Plan Addendum Clarification-October 3, 2006*, detailing the rationale for the location of the proposed additional monitoring wells.
- October 17, 2006. MDE-OCP letter requesting the submittal of disposal receipts relating to the removal of the hydraulic lift reservoir tanks.
- October 25, 2006. MDE letter approving the activities as proposed in the *Work Plan for Additional Site Assessment – September 11, 2006*, with the following modifications:
  - Reposition MW6 easterly nearer to the dispenser island
  - Reposition MW8 nearer to the diesel fuel UST
  - Maintain MW2 as a monitoring point
  - Dispose of purge water off-site
  - OCP disagreed with geophysical testing of the on-site supply well. Recommended drilling deep monitoring wells to obtain geophysical data

- October 30, 2006. MDE-OCP received *Third Quarter 2006 Groundwater Monitoring Report – October 27, 2006. (see table for results)*
  - Mobile remediation event completed on 07/06/06 at MW2 over a seven hour period resulting in the removal and off-site disposal of 1500 gallons of water
  - Mobile remediation event completed on 08/30/06 at MW2 over a six hour period resulting in the removal and off-site disposal of 1842 gallons of water
  - Gauging and sampling of the monitoring wells and tank field pipes completed on 09/06/06. Tank field monitoring pipes (TF1-TF4) were dry
  
- December 12, 2006. MDE-OCP received *Work Plan Modifications-December 7, 2006*. Modifications detailed in MDE correspondence dated 10/25/06 accepted.
  
- January 26, 2007. MDE-OCP received *Fourth Quarter 2007 Groundwater Monitoring Report – January 24, 2007. (see table for results)*
  
- May 16, 2007. MDE-OCP received the *Underground Storage System Removal Notification-May 14, 2007*.
  - ExxonMobil slated to decommission all existing UST systems at this facility.
  
- April 30, 2007. MDE-OCP received *First Quarter 2007 Groundwater Monitoring Report-April 26, 2007. (see table for results)*
  - Hydraulic gradient 0.016ft/ft between MW8 and MW6
  - Groundwater flow is easterly
  - Depth to groundwater 17.28 to 19.19 ft
  
- May 17, 2007. MDE-OCP received the *Underground Storage System Removal Notification-May 14, 2007*.
  
- June 7, 2007. MDE-OCP received the *Site Characterization Report-June 6, 2007*.
  - On-site potable well appears to influence groundwater flow in an easterly direction and there appears To be a direct hydraulic connection between the potable well and the monitoring wells
  - Three geotechnical soil borings completed on 03/21/07 with soil samples collected on 03/28/07.
  
- July 27, 2007. MDE-OCP received the *Second Quarter 2007 Groundwater Monitoring Report-July 26, 2007*.
  - Groundwater monitoring completed on May 25, 2007. *(see table for results)*
  
- August 13, 2007. MDE-OCP Tank Removal/Abandonment form regarding the removal of the underground storage tank (UST) system (a 12,000-gallon and two (2) 8,000-gallon gasoline; a 10,000-gallon diesel)
  - No perforations noted in UST system
  - Soils to be removed during installation of new UST system
  
- November 29, 2007. MDE-OCP received the *Tank Excavation Assessment Report-November 27, 2007*.
  - Four single-walled, fiberglass tanks and associated piping and dispensers removed in August 2007
  - No visible perforations noted in the four removed tanks
  - Soil samples collected from tank field excavations, piping runs and dispensers- samples not collected from underneath former diesel tank due to presence of concrete slab
  - Approximately 944 tons of soil removed for off-site disposal
  - Two 20,000-gallon double-walled USTs, associated piping and dispensers installed in August 2007
  - Approximately 74 drinking water wells located within 1000 feet of the facility
  
- January 29, 2008. MDE-OCP received the received the *Remedial Action Update-January 23, 2008*.

- February 5, 2008. MDE-OCP received the *Fourth Quarter 2007 Groundwater Monitoring Report-February 4, 2008*.
  - Groundwater monitoring completed on November 1, 2007. (*see table for results*)
- April 22, 2008. MDE-OCP received the *First Quarter 2008 Groundwater Monitoring Report-April 21, 2008*.
  - Groundwater monitoring completed on February 7, 2008. (*see table for results*)
- July 16, 2008. MDE-OCP received, via email, the passing results for post-installation UST system testing on a 20,000-gallon, 12,000-gallon and an 8,000-gallon UST - (20,000-gallon compartmentalized)
- July 29, 2008. MDE-OCP *Well Installation Approval Letter* to Exxon.
  - Approved the installation of MW4R
  - Continue semi-annual sampling of the monitoring well network (MW1 through MW8)
  - Continue semi-annual sampling of the station's drinking water well.
- July 31, 2008. MDE-OCP received the *Second Quarter 2008 Groundwater Monitoring Report-July 25, 2008*.
  - Groundwater monitoring completed on 05/19/08. (*see table for results*)
- October 31, 2008. MDE-OCP received the *Third Quarter 2008 Groundwater Monitoring Report- October 30, 2008*.
  - Groundwater monitoring completed on 09/16/08. (*see table for results*)
  - Replacement well MW-4R installed on-site 09/02/08
  - Groundwater flow direction east/northeast
  - Mobile EFR event proposed for 4<sup>th</sup> quarter 2008 at MW4R
- December 5, 2008. MDE-OCP letter to Exxon approving the completion of the EFR event using MW4R and gauging MW2, MW4R and MW8 before, during and after the EFR event and followed by a complete round of groundwater monitoring one month after the EFR event.

#### **Related Case**

- Case No. 92-1695CL (closed)
  - January 1, 1992. MDE-OCP opened *Case No. 92-1695CL* in response to a diesel pump dispenser dripping very slowly with product from the nozzle. The nozzle was required to be repaired.
  - February 7, 1992. MDE-OCP notified by Exxon via letter dated 02/04/92 that the diesel meter would be repaired and that an estimated amount of one pint had leaked.
  - February 20, 1992. MDE-OCP follow-up inspection determined that the necessary repairs had been made. *Case No. 92-1695CL* was closed.

#### **Future Updates:**

- Future updates on this case investigation will be posted at [www.mde.state.md.us](http://www.mde.state.md.us) [at the MDE home page, (select) Land, (select) Program, (select) Oil Control, (select) Remediation Sites].

#### **Contacts:**

- Maryland Department of the Environment (MDE) Oil Control Program: 410-537-3443
- Carroll County Health Department (CCHD) 410-876-1884

#### **Disclaimer**

The intent of this fact sheet is to provide the reader a summary of site events as they are contained within documents available to MDE. To fully understand the site and surrounding environmental conditions, MDE recommends that the reader review the case file that is available at MDE through the Public Information Act. The inclusion of a person or company's name within this fact sheet is for informational purposes only and should not be considered a conclusion by MDE on liability, involvement in a wrongful act or contribution to environmental damage.

**Monitoring Well Sample Results at the Exxon service station located at 3031 Baltimore Boulevard**

Sample Location	Sampling Date	Benzene MCL – 5 ppb	MTBE Action Level – 20 ppb	Tertiary butyl alcohol (TBA) is an unregulated comp.	Other Petroleum Constituents of Concern <i>Naphthalene's action level is 10 ppb</i> <i>TAME is an unregulated compound</i>
<b>On-site Monitoring Wells</b>					
<b>MW1</b> (Installed 08/2005) Total Depth - 40 ft	08/16/05	ND	3.84	----	----
	03/15/06	ND	15.8	ND	---
	05/26/06	ND	0.56j	ND	---
	09/06/06	ND	ND	ND	----
	11/18/06	ND	ND	ND	---
	02/26/07	1.8	39.2	69.9	---
	05/25/07	0.61J	1.2	ND	---
	11/01/07	ND	3.4	ND	---
	02/07/08	ND	ND	17.7j	ND
	05/19/08	ND	ND	ND	ND
	09/16/08	ND	ND	ND	ND
<b>MW2</b> (installed 08/2005) Total Depth 30 ft	08/16/05	87.6	10500	---	---
	03/15/06	38.6	2060	4030	Naphthalene - 28.8j, TAME - 65j
	05/26/06	26.4	1470	5640	Naphthalene - 45.4, TAME - 37.9
	09/06/06	70.3	9730	24900	Naphthalene - 128j, TAME -142
	11/18/06	25.9	705	3730	Naphthalene - 27.4, TAME - 16.3j
	02/26/07	11.6	332	1130	Naphthalene 42
	05/25/07	12.1	162	1650	Naphthalene 52.3
	11/01/07	30.6	472	882	Naphthalene - 111
	02/07/08	71.6	1230	6140	Naphthalene - 259
	05/19/08	7.8	342	131	Naphthalene – 67.2
	09/16/08	23.5	163	1010	Naphthalene – 200
<b>MW3</b> (installed 08/2005) Total Depth 40 ft	08/16/05	99	83.7	---	---
	03/15/06	0.93j	17.8	ND	---
	05/26/06	0.37j	4.7	ND	---
	09/06/06	16.4	66.8	ND	---
	11/18/06	1.2	14.7	ND	---
	02/26/07	0.46j	3.6	ND	---
	05/25/07	0.56j	4.3	ND	ND
	11/01/07	ND	0.29j	ND	ND
	02/07/08	ND	0.7j	ND	ND
	05/19/08	ND	1.6	ND	ND
	09/16/08	ND	1.9	ND	ND
<b>MW4</b> (installed 10/06) Total Depth 30 ft <b>Abandoned 9/12/07</b>	11/18/06	462	44300	104000	TAME - 763j
	02/26/07	378	23500	45700	Naphthalene - 423, TAME - 512
	05/25/07	207	16300	22400	Naphthalene - 297, TAME - 348
	11/01/07	NS	NS	NS	NS
<b>MW4R</b> (installed 09/02/08) Total Depth 30.5 ft	09/16/08	211	9030	12100	Naphthalene - 664, TAME - 244
<b>MW5</b> (installed 10/06) Total Depth 30 ft	11/18/06	ND	269	3760	---
	02/26/07	1.8	268	2170	---
	05/25/07	2.9	285	2420	---
	11/01/07	2.3	168	3950	---
	02/07/08	1.8	154	2960	---
	05/19/08	1.1	189	2300	---
	09/16/08	0.6j	139	980	---

Sample Location	Sampling Date	Benzene MCL – 5 ppb	MTBE Action Level – 20 ppb	Tertiary butyl alcohol (TBA) is an unregulated comp.	Other Petroleum Constituents of Concern <i>Naphthalene's action level is 10 ppb</i> <i>TAME is an unregulated compound</i>
<b>MW6</b> (installed 10/06) Total Depth 30 ft	11/18/06	ND	ND	ND	ND
	02/26/07	2.9	3.9	ND	---
	05/25/07	ND	ND	ND	---
	11/01/07	ND	ND	ND	---
	02/07/08	ND	ND	ND	---
	05/19/08	ND	ND	ND	---
	09/16/08	ND	ND	ND	ND
<b>MW7</b> (installed 10/06) Total Depth 30 ft	11/18/06	ND	4.6	ND	ND
	02/26/07	0.48j	1.1	ND	---
	05/25/07	ND	0.88j	ND	---
	11/01/07	ND	2.9	ND	ND
	02/07/08	ND	0.53j	ND	ND
	05/19/08	ND	0.24j	ND	ND
	09/16/08	ND	ND	ND	ND
<b>MW8</b> (installed 10/06) Total Depth 30 ft	11/18/06	99.7	78.2	333	---
	02/26/07	112	65.8	314	---
	05/25/07	71.8	68.7	448	---
	11/01/07	33.4	28.8	385	---
	02/07/08	35.0	25.5	256	---
	05/19/08	14.8	21.3	156	---
	09/16/08	5	10.8	101	---
<b>Tankfield Observation Pipes</b>					
<b>TF1</b> abandoned	03/15/06	DRY	DRY	DRY	
	05/26/06	DRY	DRY	DRY	
	09/06/06	DRY	DRY	DRY	
	11/18/06	DRY	DRY	DRY	
	02/26/07	DRY	DRY	DRY	
	05/25/07	DRY	DRY	DRY	
<b>TF1R</b>	11/01/07	DRY			
	02/07/08	DRY			
	05/19/08	DRY			
	09/16/08	DRY			
<b>TF2</b> abandoned	03/15/06	DRY	DRY	DRY	
	05/26/06	DRY	DRY	DRY	
	09/06/06	DRY	DRY	DRY	
	11/18/06	DRY	DRY	DRY	
	02/26/07	DRY	DRY	DRY	
	05/25/07	DRY	DRY	DRY	
<b>TF2R</b>	11/01/07	DRY			
	02/07/08	DRY			
	05/19/08	DRY			
	09/16/08	DRY			
<b>TF3</b> abandoned	05/26/06	DRY	DRY	DRY	
	09/06/06	DRY	DRY	DRY	
	11/18/06	DRY	DRY	DRY	
	02/26/07	DRY	DRY	DRY	
	05/25/07	DRY	DRY	DRY	
<b>TF3R</b>	11/01/07	DRY			
	02/07/08	DRY			
	05/19/08	DRY			
	09/16/08	DRY			
<b>TF4</b> abandoned	05/26/06	DRY	DRY	DRY	
	09/06/06	DRY	DRY	DRY	
	11/18/06	DRY	DRY	DRY	
	02/26/07	DRY	DRY	DRY	
	05/25/07	DRY	DRY	DRY	
<b>TF4R</b>	11/01/07	DRY			
	02/07/08	DRY			
	05/19/08	DRY			
	09/16/08	DRY			

**Drinking Water Sample Results in the vicinity of the Exxon Service Station  
located at 3031 Baltimore Boulevard**

Addresses	Sample Event	Petroleum constituents detected	
		MTBE (20 ppb – State's action level)	Other Petroleum constituents
<b>Exxon Service Station</b>			
3031 Baltimore Boulevard (total depth 88 ft) Casing depth to 25 ft – with open borehole to bottom	CCHD - 11/23/05	ND	ND
	Exxon – 03/06/06	1	ND
	Exxon – 06/05/06	ND	ND
	Exxon – 09/06/06	ND	ND
	Exxon – 12/13/06	ND	ND
	Exxon – 03/16/07	0.75	ND
	Exxon – 06/19/07	0.19j	--
	Exxon – 11/01/07	ND	ND
	Exxon – 02/29/08	ND	ND
	Exxon - 05/19/08	ND	ND
	Exxon - 05/19/08	0.12j	ND
<b>Private Wells Off-site</b>			
2950 Dede Road	CCHD - 11/23/05	ND	
3109 Murray Road	CCHD - 05/11/06	ND	
3006 Old Westminster Pike	CCHD - 11/23/05	ND	
3019 Old Westminster Pike	CCHD - 11/23/05	ND	
3051 Old Westminster Pike	CCHD – 03/10/06	ND	
3101 Old Westminster Pike	CCHD - 11/23/05	3.25	
	CCHD - 03/10/06	1.3	
3105 Old Westminster Pike	CCHD - 03/09-10/06	ND	
3106 Old Westminster Pike (Dan's Body Shop)	CCHD - 12/20/05	3.35	
3109 Old Westminster Pike	CCHD - 05/11/06	ND	
3110 Old Westminster Pike	CCHD - 03/09/06	0.55	