**United States Environmental Protection Agency**
**Region V**
**POLLUTION REPORT**

**Date:** Monday, March 8, 2010
**From:** Steven Renninger

**To:**

| | |
|---|---|
| Randy Watterworth, OEPA | Bev Kush, EPA |
| Dave Combs, Ohio EPA | Rafael Gonzalez, EPA-OPA |
| Mick Hans, EPA | Tracy Johnson, EPA |
| Kevin Clouse, Ohio EPA | Jim Crawford, OEPA |
| Mark Johnson, EPA | Dale Farmer, Ohio EPA |
| Distribution List, National Response Center | Jason El-Zein, EPA 5 |
| Mark Case, Montgomery County Health Department | Bob Frey, Ohio Department of Health |
| Donna Winchester, City of Dayton | Denny Bristow, Dayton Regional Hazmat |
| David Chung, EPA | Rich Bendula, OEPA SWDO |
| Jim Shoemaker, City of Dayton | Mark Durno, EPA 5 |

**Subject:** FINAL POLREP
Brandt Pike Terminal Site
621 Brandt Pike, Dayton, OH
Latitude: 39.7870900
Longitude: -84.1621500

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|---|---|---|---|
| **POLREP No.:** | 2 | **Site #:** | Z5Fy |
| **Reporting Period:** | February 2008 through March 2010 | **D.O. #:** | |
| **Start Date:** | 12/3/2007 | **Response Authority:** | OPA |
| **Mob Date:** | | **Response Type:** | Time-Critical |
| **Demob Date:** | | **NPL Status:** | Non NPL |
| **Completion Date:** | 3/8/2010 | **Incident Category:** | Removal Action |
| **CERCLIS ID #:** | | **Contract #** | |
| **RCRIS ID #:** | | **Reimbursable Account #** | |
| **FPN#** | E07508 | | |

**Site Description**

The Brandt Pike Terminal Site includes four active petroleum products distribution facilities at the Brandt Pike Oil Terminal located at 621 Brandt Pike, Dayton, OH. Each of the four Facilities receives its petroleum products via the Inland Pipeline then pipes the petroleum products to large above-ground storage tanks and dispenses petroleum products to tank trucks or other pipelines for further distribution. The Facilities have been operating since the 1930's-1940's. The storage capacity of each of the facilities is between 8 million to 12 million gallons of oil. The Site is located in a mixed residential, commercial and industrial area. An inspection of the facilities revealed:

1) Beneath the Facilities is a sole source aquifer that provides water for the City of Dayton. Areas of the Site are within Dayton's wellfield protection area and are considered to be within a one-year travel time to the wellfield. Approximately one-half mile north and downgradient of the Facilities is the City of Dayton's drinking water wellfield and the Miami River. The Miami Wellfield provides water to approximately 440,000 persons in the Dayton area.

2) In 1986, Ohio EPA (OEPA), Emergency Response, responded to a report of an oil spill at the Site. Monitoring wells were installed under the direction of OEPA. The monitoring wells indicated that there was widespread petroleum-related groundwater contamination by benzene, toluene, ethylbenzene and xylene (BTEX) beneath the Brandt Pike oil distribution facilities and pipeline. Free phase diesel fuel, jet fuel and gasoline were found floating on the water table in such quantities to indicate that significant releases of oil products have occurred to the groundwater at the Site.

3) In April 1998, sampling at the Site detected a four inch layer of light non-aqueous phase liquid

(LNAPL) in a soil vapor recovery well, in close proximity to the Inland Pipeline. Groundwater sampling conducted in 1998 at a Site well revealed a BTEX concentration of 63,300 ppb in a monitoring well. Methyl Tertiary-Butyl Ether (MTBE) was detected in the soil and groundwater at the Site in 1998.

4) The City of Dayton installed two monitoring wells immediately north of the Site as part of their wellfield protection plan on January 31, 2006. Sampling of these monitoring wells has detected levels of MTBE in excess of 85 ppb and benzene in excess of 164 ppb, indicating groundwater containing oil, MTBE and benzene is moving downgradient in the direction of the residential neighborhood to the north of the Site and in the direction of the Miami River and the Miami Wellfield. On April 30, 2007, Dayton reported that MTBE was detected for the first time in a groundwater monitoring well at a level of 0.280 ppb.

5) Historic spills at the Site have contributed to the presence of a plume of commingled oil, benzene and MTBE contamination in groundwater at and downgradient of the Site which may present an imminent and substantial endangerment to health or the environment because the groundwater contamination plume appears to be moving downgradient in the general direction of (1) a residential area where some residents may continue to use private wells, (2) the Miami River and (3) the City of Dayton's Miami Wellfield which pumps groundwater from the sole source aquifer.

In July 2007, the U.S. EPA and the following respondents entered into an Administrative Order by Consent (AOC):

BP Products North America Inc
BP Oil Company
Buckeye Terminals, LLC
Inland Corporation
CITGO Petroleum Corporation
Sunoco, Inc (R&N)

Pursuant to the AOC and working under an EPA approved work plan, the Respondents, in order to determine the extent of contamination, completed the following activities:

A) Perform a field investigation to determine the extent of oil, MTBE and benzene in the groundwater including the installation of monitoring wells screened to detect oil, MTBE and benzene and establish a groundwater gradient.

B) Analyze the fate and transport of oil, MTBE and benzene in groundwater in the area of the Site with respect to the following potential downgradient receptors: (1) any residences with private wells, (2) the Miami River, and (3) the Dayton Miami Wellfield.

C) Evaluate the ongoing petroleum recovery systems to determine their impact on the transport of the oil, MTBE and benzene in groundwater.

D) If Benzene was detected off-site above the MCL, perform a vapor intrusion study in the downgradient offsite areas.

October 18, 2007 Update: The AOC 30-day public comment period started on October 18, 2007. The AOC and related information can be accessed and reviewed via the EPA Website: http://www.epa.gov/region5/sites/brandtpike/index.htm

On October 29, 2007, a technical work plan meeting was conducted with Bill Barber (BP Oil) and the PRPs environmental consultant, Environmental Resources Management (ERM).

On November 13, 2007, a technical work plan meeting was conducted with Bill Barber (BP Oil) and ERM.

The effective date of the AOC is December 3, 2007.

On January 17, 2008, the DRAFT "Investigation and Fate and Transport Evaluation Work Plan" was submitted to U.S. EPA, Ohio EPA, ODH, and the City of Dayton for review.

**Current Activities**

On February 11, 2008, U.S. EPA, Ohio EPA, City of Dayton and the PRPs conducted a technical work plan meeting, relating to the DRAFT "Investigation and Fate and Transport Evaluation Work Plan" that

was submitted by the Respondents on January 17, 2008.

On April 2, 2008, U.S. EPA submitted comments on the DRAFT "Investigation and Fate and Transport Evaluation Work Plan".

On April 4, 2008, Dr. Bob Frey from the Health Assessment Section of the Ohio Department of Health issued a letter to U.S. EPA recommending that an MTBE groundwater action level of 20 ppb be used for the project. For a listing of the Site Action Levels, see Table 1 located in the Documents Section of this Website.

On May 9, 2008, U.S. EPA issued a letter conditionally approving the "Investigation and Fate and Transport Evaluation Work Plan" subject to EPA-provided modifications. In addition, U.S. EPA approves the appointment of Mr. William Lozier, Environmental Resources Management (ERM), as Project Coordinator.

On May 14, 2008, ERM submitted a letter clarifying U.S. EPA's modifications to the "Investigation and Fate and Transport Evaluation Work Plan".

In July 2008, per the U.S. EPA approved work plan (dated 5-9-08), ERM continued obtaining access agreements at properties where field activities may occur which were not owned or under the control of the Respondents.

VERTICAL PROFILE SAMPLING

From August 18 through November 2008, ERM completed 17 vertical profile sample borings to aid in evaluating the vertical extent of contamination. The Vertical Profile Well Location Map is provided as Figure 4 in the Documents Section of this website. Vertical Profile Sampling Location Target Depths are identified in Table 3 in the Documents Section of this Website. Initially, the Waterloo Advanced Profiling System in conjunction with direct push technology, was utilized to collect groundwater samples at five-foot intervals at most locations. However, due to local geologic conditions which resulted in refusal prior to target depth at four locations, the vertical profiling was completed using a hydro-punch sampler. The hydro-punch sampler was advanced by hollow stem auger drilling techniques. The sampling intervals and achieved final depths for all of the vertical profiling activities are summarized in Table 4 located in the Documents Section of this website.

In summary, a total of 117 groundwater samples were submitted to a commercial laboratory for BTEX and MTBE analysis during vertical profiling activities. Additionally, one soil and 25 QA/QC samples were submitted. Additionally, for every groundwater sample that was collected as part of the vertical profile task, a split sample was collected and provided to U.S. EPA.

U.S. EPA analyzed 19 split water samples and the City of Dayton analyzed 30 split water samples for BTEX and MTBE. A summary of all of the sampling results can be found in Table 11 located in the Documents Section of this website. Benzene was the only contaminant detected greater than the site action levels. Benzene was detected in VP-01(33-38') at 5.06 ppb and in VP-02(34-39') at 8.75 ppb, both locations on the facility property.

The vertical profiling groundwater sample results (including U.S. EPA's split samples) did not indicate the presence of a plume of BTEX or MTBE within the Study Area (downgradient of the terminal) above MCL or site action levels.

MONITORING WELL NETWORK

Following the vertical profile activities, a monitoring well network consisting of up to 30 monitoring wells was developed, which included an evaluation of existing monitoring well construction details. Based on the results of the vertical profile sampling activities and a review of the existing monitoring wells, a monitoring well network consisting of 22 monitoring wells within the Study Area and three upgradient monitoring wells was defined. Additionally, sampling data from five existing on-Site (terminal) monitoring wells was evaluated as part of this investigation report. The monitoring well network was developed to provide both a lateral and vertical sampling network to monitor the groundwater quality within the Study Area.

Based on ERM's evaluation, it was determined that the majority of the existing monitoring wells located within the Study Area were screened at the correct depth. In addition, where there were no existing wells near the vertical profile location or if the existing wells were not properly screened, five new monitoring wells were proposed.

The monitoring well network that was developed for this investigation consisted of 22 new and existing monitoring wells, three upgradient monitoring wells and data from five monitoring wells sampled under separate programs. A summary of the monitoring well network can be found in Table 6, located in the Documents Section of this website.

On February 13, 2009, ERM submitted the Monitoring Well Network Addendum to U.S. EPA. The addendum presented the monitoring well network that would be sampled to complete the investigation of the Study Area. The Addendum was prepared based on data collected during vertical profiling activities; previous data and information for the Site; data provided by the City of Dayton and the Ohio EPA; and discussions between U.S. EPA, Ohio EPA, the City of Dayton, and the Respondent representatives on January 21, 2009.

On February 27, 2009, U.S. EPA approved the Monitoring Well Network Addendum. A copy of the Monitoring Well Network Addendum is included in the Documents Section of this website.

From March 23 to April 1, 2009, ERM installed and developed five new groundwater monitoring wells. The wells were developed following the procedures detailed in its sampling and analysis plan. A decontaminated bailer or submersible pump was used to develop each well. A surge block was used, if needed. Well development activities continued until three consecutive readings of field parameters had stabilized.

MONITORING WELL NETWORK – APRIL 2009 MONITORING EVENT

From April 20 through 27, 2009, ERM conducted groundwater monitoring activities at the 30 monitoring wells that comprised the approved monitoring well network. With the exception of monitoring wells that are part of the City of Dayton Early Warning Network (MW-28S, MW-48S, MW-50S, MW-53S, MW-54S, MW-61M and MW-62S), groundwater samples were collected by ERM using low-flow methodologies. All water samples were shipped to a commercial laboratory for analysis of BTEX and MTBE. All 30 groundwater samples were split and provided to U.S. EPA.

U.S. EPA analyzed 10 of the split samples for analysis of BTEX and MTBE. The City of Dayton was provided 10 split samples for EPA Method 8260 analysis at a commercial laboratory. In addition, the City of Dayton analyzed 7 of the split groundwater samples at its own laboratory for Drinking Water analysis.

The analytical results from the April 2009 Monitoring Event did not show concentrations of BTEX of MTBE greater than the site action levels outside the Brandt Pike Terminal property boundary. Table 12, which is located in the Documents Section of this website, summarizes the April 2009 groundwater sample results.

MONITORING WELL NETWORK – OCTOBER 2009 MONITORING EVENT

Although not part of the AOC or approved Work Plan, ERM agreed to conduct a second groundwater sampling event to confirm the April 2009 results and to evaluate the impact of seasonal fluctuations on groundwater quality.

From October 5 through 12, 2009, ERM conducted groundwater monitoring activities at the 30 monitoring wells that comprised the approved monitoring well network. With the exception of monitoring wells that are part of the City of Dayton Early Warning Network (MW-28S, MW-48S, MW-50S, MW-53S, MW-54S, MW-61M and MW-62S), groundwater samples were collected by ERM using low-flow methodologies. All water samples were shipped to a commercial laboratory for analysis of BTEX and MTBE. All 30 groundwater samples were split and provided to U.S. EPA.

U.S. EPA analyzed 10 of the split samples for analysis of BTEX and MTBE. The City of Dayton was provided 1 split sample for EPA Method 8260 analysis at a commercial laboratory. In addition, the City of Dayton analyzed 7 of the split groundwater samples at its own laboratory for Drinking Water analysis.

The analytical results from the October 2009 Monitoring Event did not show concentrations of BTEX of MTBE greater than the site action levels outside the Brandt Pike Terminal property boundary. Table 13, which is located in the Documents Section of this website, summarizes the October 2009 groundwater sample results.

INVESTIGATION REPORT AND FATE AND TRANSPORT/RISK ANALYSIS

On March 3, 2010, respondents (thru ERM) submitted the Investigation Report including the Fate and Transport Analysis. Based on the data collected, ERM reported that exposure pathways are not complete. Detected concentrations of BTEX and MTBE in the Study Area were all below Action Levels. Furthermore, ERM reported that collected data shows there is minimal transport of BTEX or MTBE into the Study Area.

EXISTING SYSTEMS

In the March 2010 Investigation Report, ERM reported that based on the data from reports completed on the Site and the lack of BTEX and MTBE in the Study Area, the existing systems on the Site have been effective in reducing BTEX and MTBE concentrations and controlling migration into the Study Area. These systems are the subject of discussions and annual reporting to the Ohio EPA and City of Dayton.

VAPOR INTRUSION

The AOC contained a provision to conduct a vapor intrusion investigation assuming BTEX and/or MTBE concentrations detected in the groundwater were greater than the site action levels. Since BTEX and MTBE were not detected greater than the site action levels under a residential area and/or a commercial building or occupied buildings where the general public may be present, this provision did not apply.

On March 3, 2010, U.S. EPA received the Investigation Report from the Respondents. U.S. EPA reviewed the final report and this investigation satisfies the requirements of the AOC.

**Planned Removal Actions**
None.

Investigation completed.

**Next Steps**
None.

**Key Issues**
1) A total of 331 groundwater and soil samples were collected and analyzed including 50 QA/QC samples and 93 split samples.
2) The March 2010 Investigation Report concluded that concentrations of BTEX and MTBE from the Site are not impacting the groundwater in the Study Area above MCLs or site action levels. This conclusion is based on data from the vertical profiles and two rounds of groundwater monitoring, including the results from split samples analyzed by U.S. EPA and the City of Dayton.

**Estimated Costs ***

| | Budgeted | Total To Date | Remaining | % Remaining |
|---|---|---|---|---|
| **Extramural Costs** | | | | |
| RST/START | $45,000.00 | $32,258.00 | $12,742.00 | 28.32% |
| **Intramural Costs** | | | | |
| USEPA - Direct (Region, HQ) | $30,000.00 | $27,000.00 | $3,000.00 | 10.00% |
| | | | | |
| **Total Site Costs** | $75,000.00 | $59,258.00 | $15,742.00 | 20.99% |

* The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The OSC does not necessarily receive specific figures on final payments made to any contractor(s). Other financial data which the OSC must rely upon may not be entirely up-to-date. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

**Disposition of Wastes**
Removal action included a groundwater investigation.