

**OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
DUNN FIELD**

Defense Depot Memphis, Tennessee



Department of the Army



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**Air Force Center for Engineering and the
Environment
Contract No. FA8903-08-D-8771
Task Order No. 0069**

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Prepared for:

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Contract No. FA8903-08-D-8771
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Prepared by:

HDR
184 Creekside Park
Suite 100
Spring Branch, Texas 78070

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LIST OF ACRONYMS AND ABBREVIATIONS

AFCEE	Air Force Center for Environmental Excellence
AS/SVE	air sparging with soil vapor extraction
bgs	below ground surface
cDCE	cis-1,2-Dichloroethene
CF	Chloroform
COV	Coefficient of Variation
CT	Carbon Tetrachloride
CVOC	Chlorinated Volatile Organic Compound
DCE	1,1-Dichloroethene
DDMT	Defense Depot Memphis, Tennessee
DQE	data quality evaluation
DQO	data quality objective
e ² M	engineering-environmental management
FSVE	Fluvial Soil Vapor Extraction
IAQ	Intermediate Aquifer
IRA	Interim Remedial Action
LCS	Laboratory Calibration Standard
LTM	Long-term Monitoring
MACTEC	MACTEC Engineering and Consulting, Inc.
MAQ	Memphis Aquifer
MAROS	Monitoring and Remediation Optimization System
MI	Main Installation
msl	mean seal level
MW	Monitoring Well
NPL	National Priorities List
PCE	Tetrachloroethene
PDB	passive diffusion bag
PRB	permeable reactive barrier
QC	Quality Control
RA	Remedial Action
RAO	Remedial Action Objective
RA SAP	Remedial Action Sampling and Analysis Plan

**LIST OF ACRONYMS AND ABBREVIATIONS
(Continued)**

RD	Remedial Design
RG	Remediation Goal
RL	Reporting Limit
ROD	Record of Decision
RW	Recovery Well
SVE	Soil Vapor Extraction
TA	Treatment Area
TC	Target Concentrations
TCA	1,1,2-Trichloroethane
TCE	Trichloroethene
tDCE	trans-1,2-Dichloroethene
TDEC	Tennessee Department of Environmental Conservation
TeCA	1,1,2,2-Tetrachloroethane
TSVE	Thermal Soil Vapor Extraction
U.S.	United States
USEPA	United States Environmental Protection Agency
µg/L	Micrograms per liter
VC	Vinyl Chloride
VOCs	Volatile organic compound

1.0 INTRODUCTION

HDR has prepared this 2010 Annual Long-term Monitoring (LTM) Report for Off Depot Groundwater at Dunn Field on Defense Depot Memphis, Tennessee (DDMT) under Contract FA8903-08-D-8771, Task Order 0069 to the Air Force Center for Engineering and the Environment (AFCEE). Off Depot LTM is performed to document changes in plume concentrations, detect potential plume migration to off-site areas or into deeper aquifers, and track progress toward remediation goals. The Off Depot LTM was performed in accordance with the *Long-Term Groundwater Monitoring Plan* (LTM Plan) in Appendix C of the *Off Depot Groundwater Final Remedial Design, Rev. 1* (Off Depot Groundwater RD) (CH2M HILL, 2008).

1.1 SITE LOCATION AND DESCRIPTION

DDMT is located in southeastern Memphis, Shelby County, Tennessee approximately 5 miles east of the Mississippi River and just northeast of Interstate 240 ([Figure 1](#)). DDMT originated as a military facility in the early 1940s; it received, warehoused, and distributed supplies common to all United States (U.S.) military services and some civil agencies located primarily in the southeastern U.S., Puerto Rico, and Panama. Stocked items included food; clothing; petroleum products; construction materials; and industrial, medical, and general supplies. In 1995, DDMT was placed on the list of the Department of Defense facilities to be closed under Base Realignment and Closure. Storage and distribution of material continued until the facility closed in September 1997.

DDMT covers approximately 642 acres and includes the Main Installation (MI) and Dunn Field. The MI contains approximately 578 acres with open storage areas, warehouses, former military family housing, and outdoor recreational areas. Dunn Field, which is located across Dunn Avenue from the north-northwest portion of the MI, contains approximately 64 acres and includes former mineral storage and waste disposal areas.

In 1992, DDMT was added to the National Priorities List (NPL) (57 Federal Register 47180 No. 199). Responsibility for environmental restoration activities at DDMT transferred from the Defense Logistics Agency to the Department of the Army in December 2010. The regulatory oversight agencies are U.S. Environmental Protection Agency (USEPA) Region 4 and the Tennessee Department of Environment and Conservation (TDEC). DDMT's USEPA Identification Number is TN4210020570.

1.2 GEOLOGY AND HYDROGEOLOGY

The geologic units of interest at Dunn Field are (from youngest to oldest): loess, including surface soil; fluvial deposits; Jackson formation/Upper Claiborne group; and Memphis Sand.

The loess consists of wind-blown and deposited brown to reddish-brown, low-plasticity clayey silt to silty clay. The loess deposits are about 20 to 30 feet thick and are continuous throughout the Dunn Field area.

The fluvial (terrace) deposits consist of two general layers. The upper layer is a silty, sandy clay that transitions to a clayey sand and ranges from about 10 to 36 feet thick. The lower layer is composed of interlayered sand, sandy gravel, and gravelly sand, and has an average thickness of approximately 40 feet. The uppermost aquifer is the unconfined fluvial aquifer, consisting of saturated sands and gravelly sands in the lower portion of the deposits. The saturated thickness of the fluvial aquifer ranges from 3 to 50 feet and is controlled by the configuration of the uppermost clay in the Jackson Formation/Upper Claiborne Group. The groundwater in the fluvial aquifer is not a drinking water source for area residents.

The Jackson Formation/Upper Claiborne Group consists of clays, silts, and sands. The uppermost clay unit appears to be continuous, except in the southwestern area of Dunn Field. Off site, to the west and northwest of Dunn Field, there are possible gaps in the clay. Where present, these gaps create connections to the underlying intermediate aquifer (IAQ) from the fluvial deposits. The IAQ is locally developed in deposits of the Jackson Formation/Upper Claiborne Group.

The Memphis Sand primarily consists of thick-bedded, white to brown or gray, very fine-grained to gravelly, partly argillaceous and micaceous sand. The Memphis Sand ranges from 500 to 890 feet in thickness and begins at a depth below ground surface (bgs) of approximately 120 to 300 feet. The top of the Memphis Sand was identified at 255 feet bgs (elevation of 21 feet above msl) in MW-67, the first monitoring well (MW) completed in the Memphis Sand at DDMT. The Memphis aquifer (MAQ) is confined by overlying clays and silts in the Cook Mountain formation (part of the Jackson/Upper Claiborne group) and contains groundwater under strong artesian (confined) conditions regionally. The City of Memphis obtains the majority of its drinking water from this unit. The Allen Well Field, which is operated by Memphis Light, Gas and Water, is located approximately two miles west of DDMT.

1.3 REMEDIAL ACTION

1.3.1 Interim Remedial Action

The *Record of Decision for Interim Remedial Action* was signed in April 1996, with the objective of hydraulic containment to prevent further contaminant plume migration and reduce contaminant mass in groundwater. The Interim Remedial Action (IRA) groundwater recovery system included 11 recovery wells (RWs) screened in the fluvial aquifer and located along the western boundary of Dunn Field. Based on reduction of chlorinated volatile organic compound (CVOC) concentrations in groundwater following implementation of the Dunn Field Source Areas remedial action (RA), five RWs were shutdown in June 2008 and the remaining RWs were shutdown in January 2009. The IRA system was removed and the RWs abandoned in July 2010.

1.3.2 Record of Decision and Amendment

The *Memphis Depot Dunn Field Record of Decision* (Dunn Field ROD) (CH2M HILL, 2004) was finalized in April 2004. The selected remedy addresses surface soil, material within disposal sites and associated soil, and CVOCs in subsurface soil and groundwater. The RA objectives (RAOs) established in the Dunn Field ROD for groundwater are:

- Prevent human exposure to contaminated groundwater (i.e., exceeding protective target concentrations)
- Prevent further off-site migration of volatile organic compounds (VOCs) in excess of protective target levels
- Remediate fluvial aquifer groundwater to drinking water quality to be protective of the deeper MAQ

The major components of the selected remedy from the Dunn Field ROD are:

- Excavation, transportation, and disposal of soil and material contained within disposal sites based upon results from a pre-design investigation
- Soil vapor extraction (SVE) to reduce VOC concentrations in subsurface soils to levels that are protective of the intended land use and groundwater
- Injection of zero valent iron within Dunn Field to treat CVOCs in the most contaminated part of the groundwater plume, and installation of a permeable reactive barrier (PRB) to remediate CVOCs within the off-site areas of the groundwater plume

- Monitored natural attenuation and LTM of groundwater to document changes in plume concentrations, detect potential plume migration to off-site areas or into deeper aquifers, and track progress toward remediation goals
- Implementation of land use controls, which consist of the following institutional controls: Deed and/or lease restrictions; Notice of Land Use Restrictions; City of Memphis/Shelby County zoning restrictions and the Memphis and Shelby County Health Department groundwater well restrictions.

The selected remedies were modified through the *Dunn Field Record of Decision Amendment* (ROD Amendment) (e²M, 2009) approved in January 2009. The major changes were the use of air sparging with soil vapor extraction (AS/SVE) instead of a PRB for the Off Depot groundwater plume and the addition of in situ thermal desorption to enhance SVE in the loess on Dunn Field. Construction of the selected remedies has been completed. The *Source Areas Interim Remedial Action Completion Report, Revision 1* (HDR|e²M, 2009) was approved by USEPA and TDEC in November 2009. The *Preliminary Close Out Report* (USEPA, 2010) was approved in May 2010 and the DDMT NPL site status was revised to Construction Complete.

1.3.3 Remedial Action Operations

Two RA systems are still operating at Dunn Field, the fluvial soil vapor extraction (FSVE) system in the Source Areas on Dunn Field and the AS/SVE system located in the Off Depot groundwater plume west of Dunn Field.

The FSVE system consists of two blowers connected to seven SVE wells with screened intervals at approximately 30 to 70 feet bgs. System operations began in July 2007 and approximately 4,030 pounds of VOCs were removed through July 2010. The VOC concentration in the extracted vapor has decreased asymptotically to less than 1 part per million. The FSVE system was shutdown October 2010 to January 2011 for a rebound test and confirmation soil sampling to evaluate progress toward remediation goals.

The AS/SVE system consists of a compressor connected to 90 air sparge points at the base of the Fluvial aquifer and two blowers connected to 12 SVE wells with screened intervals at approximately 40 to 75 feet bgs. System operations began in December 2009. Approximately 70 pounds of VOCs have been removed through September 2010 and CVOC concentrations within the plume passing through the treatment area are below the goal of 50 micrograms per liter (µg/L) for individual analytes. Further reduction to the remediation goals is to be achieved through natural attenuation.

1.4 PREVIOUS GROUNDWATER MONITORING

The Dunn Field ROD identified three CVOC plumes in the fluvial aquifer underlying Dunn Field. Mixing and intermingling of the plumes have occurred due to the active groundwater extraction system and natural groundwater flow. The nine CVOCs listed below have been detected most frequently in past groundwater sampling events:

- Tetrachloroethene (PCE)
- Trichloroethene (TCE)
- cis-1,2-Dichloroethene (cDCE)
- trans-1,2-Dichloroethene (tDCE)
- 1,1-Dichloroethene (DCE)
- 1,1,2,2-Tetrachloroethane (TeCA)
- 1,1,2-Trichloroethane (TCA)
- Carbon tetrachloride (CT)
- Chloroform (CF)

The highest groundwater contaminant concentrations were detected in the central plume. The individual CVOCs with the highest concentrations are TeCA and TCE, with maximum concentrations up to 40,800 µg/L for TeCA and 7,110 µg/L for TCE (MW-73; October 2003).

Regular groundwater monitoring in the Dunn Field area at DDMT was performed as part of the IRA from 1999 through 2009. Beginning in 2010, groundwater monitoring is being conducted in accordance with the Off Depot Groundwater RD and consists of performance monitoring in the AS/SVE treatment area and LTM in the remainder of the plume. There are 36 monitoring wells used for performance monitoring and 58 monitoring wells used for LTM. Another 20 monitoring wells are used for water level measurements during LTM events.

The LTM plan classified the monitoring wells in three categories:

- Background – wells screened in the fluvial aquifer located along or outside of the Dunn Field boundary; located upgradient to or at a distance from contaminant plumes on Dunn Field; no (or only low-level) previous detections of site contaminants in well samples.
- Sentinel – wells screened within either the fluvial or intermediate aquifers adjacent to or within the window to the IAQ.
- Performance – wells screened in the fluvial aquifer; located within the limits of known contaminant plumes; or repeatedly have contaminants in samples; located in areas targeted for treatment during the RA.

The LTM plan also established an initial sampling frequency (biennial, annual or semiannual) for the 58 existing wells: biennial, annual and semiannual. The performance wells will initially be sampled to monitor the effectiveness of the RAs and will then be added to the LTM program. Performance

monitoring and LTM sample events are conducted at the same time with a single water level sweep of the wells prior to sample collection.

2.0 LTM ACTIVITIES

LTM activities during 2010 consisted of water level measurements and groundwater sampling of designated wells in an annual event in March and a semiannual event in September. Field activities and laboratory analyses were performed in accordance with the *Remedial Action Sampling and Analysis Plan* (RA SAP) (MACTEC Engineering and Consulting, Inc [MACTEC], 2005).

The 58 LTM wells selected for periodic sampling are classified as background (9), performance (36) or sentinel (13) wells and assigned semiannual (1), annual (31) or biennial (26) sampling frequencies. The LTM wells are listed on [Table 1](#) and the locations are shown on [Figure 2](#). The current well classification, sample frequency and 2010 sampling events are shown on [Table 2](#).

2.1 GROUNDWATER MONITORING

Groundwater levels are measured in all LTM wells prior to sampling during each LTM sample event. Measurements are made using Solinst Model 101 water level meters with electronic sensors and tapes graduated in 0.01-foot increments. The water level measurements are shown on [Table 3](#).

Groundwater samples are collected using either passive diffusion bags or low-flow purging methods. Water levels are measured in the wells to be sampled approximately one month prior to sample collection. If saturated thickness of the well screen is greater than 5 feet, a passive diffusion bag (PDB) is installed, if not already present. If the saturated thickness is less than 5 feet, the well is selected for low-flow sampling.

When samples are collected using a PDB, a sample of water from the PDB removed from the well is transferred to 40-milliliter vials preserved with hydrochloric acid. Following sample collection, a new PDB is filled with de-ionized water and placed in the middle of the saturated section of well screen.

When samples are collected using bladder pumps and low-flow purging methods, dedicated Teflon[®] bladders and Teflon[®]-lined polyethylene tubing are used. The pumping rate at each well is monitored in order that the water levels not decline more than 1.2 inches (0.1 foot). Following sampling, the bladder and tubing for each well are placed in separate, sealed plastic bags and stored for future sampling events. Water quality parameters are measured at approximately 5 to 10 minute intervals during purging using a flow-through cell with a YSI 600XLM and a LaMotte 2020e turbidity meter. The units are calibrated each morning prior to sampling, and if abnormal readings were observed during the day, the instruments are recalibrated in the field. Purging continues at each well for up to two hours in order to meet the

stabilization criteria: three successive readings within 0.1 for pH, 10 millivolts for oxygen reduction potential, 3 percent for specific conductance, 10 percent for dissolved oxygen and less than 20 nephelometric turbidity units for turbidity. Temperatures are also measured and recorded, but not used as a stabilization parameter. All measurements are recorded on the field sampling forms. Samples are collected in 40-milliliter vials preserved with hydrochloric acid when stabilization criteria are met or the field team leader approves the variance from the criteria.

Samples were sent to Microbac Laboratories in Marietta, Ohio for VOC analysis by Method SW8260B. The activities during each sampling event are summarized in the following sections.

2.1.1 March 2010

Annual groundwater sampling was conducted with samples collected from 32 monitoring wells on 26 and 29 March. Samples were collected from 31 of 32 wells designated for annual sampling and one additional well. A planned sample was not collected from MW-175 because the well was damaged during thermal soil vapor extraction (TSVE) treatment. Although MW-78 is assigned biennial sampling, it was sampled in March because it was not accessible during the previous sample event in October 2009.

Water levels were measured in LTM wells on 22 March 2010. Three wells were omitted; MW-10 and MW-34 were not accessible, and MW-175 was damaged during TSVE treatment and was not useable.

Water levels were checked in the wells to be sampled on 15 March. Following review, 28 wells were selected for sampling with PDBs and 4 wells were selected for low-flow sampling. Well MW-78 was selected for low-flow sampling in order to purge the well prior to sampling; the surface completion was damaged and replaced since the previous sample was collected. Wells MW-172 and MW-228 each had saturated thickness near 8 feet and information for MW-132 was incomplete; low-flow sampling was selected for these wells as a conservative approach.

Samples were collected using PDBs in 28 monitoring wells on 26 March. The PDBs had been placed in these wells during the October 2009 sample event. PDB sample intervals for March are shown on [Table 4](#). Water quality parameters were not measured prior to sampling wells with PDBs.

Groundwater samples were collected using bladder pumps and low-flow purging methods in 4 monitoring wells on 29 March. Samples were collected when stabilization criteria were met. The final stabilization measurements in March are shown on [Table 5](#).

2.1.2 September 2010

Semiannual groundwater sampling was conducted with a sample collected from one designated monitoring well, MW-147, on 23 September. Water levels were measured in LTM wells on 20-21 September.

Water levels were checked in the well to be sampled on 12 August. Following review, MW-147 was selected for sampling with a PDB. A sample was collected using the PDB in MW-147 on 23 September. The PDB sample interval is shown on [Table 6](#). Water quality parameters were not measured prior to sampling.

2.2 WASTE DISPOSAL

The waste generated during groundwater sampling was classified as either non-investigative waste or investigative derived waste. Non-investigative waste, such as packaging materials, personal protective equipment, disposable sampling supplies, and other inert refuse, was collected and placed in a designated collection bin for disposal at a municipal landfill.

The groundwater from purging was collected in 5-gallon buckets with lids and added to the FSVE condensate water storage tank on Dunn Field. When the storage tank nears capacity, a waste water sample will be collected and a discharge request submitted to the City of Memphis.

3.0 SUMMARY OF MONITORING RESULTS

3.1 HYDROGEOLOGY

Water level measurements for the 2010 Off Depot LTM events are shown on [Table 3](#). Groundwater contour maps for each event are shown on [Figures 3](#) and [4](#). The groundwater elevation contour maps are similar. Groundwater flow is generally to the west on Dunn Field. The maps show a trough in groundwater elevations approximately 1,000 feet west of Dunn Field, with flow apparently diverging to the north and south. The AS/SVE system is located on the eastern edge of the trough

Groundwater elevations in the fluvial aquifer are highest northeast of Dunn Field (MW-65: 260.82 feet mean seal level [msl] in March and 250.88 msl in September) and generally decrease toward the trough west of Dunn Field (MW-165: 216.08 feet msl in March and 218.53 feet msl in September). The spatial variation in water levels in the fluvial aquifer monitoring wells is primarily due to the elevation of the underlying clay of the Jackson Formation/Upper Claiborne Group.

The groundwater elevations in IAQ wells, away from the ‘windows’ providing connection with the fluvial aquifer, were approximately 166-167 feet msl in March and 158-159 feet msl in September. Groundwater elevation in MW-67, which is screened in the Memphis Sand, was approximately 166.6 feet msl in March and 157.6 feet in September.

3.2 DATA QUALITY EVALUATION

Data collected during the two 2010 LTM sampling events in March and September were reviewed based on guidelines in the RA SAP. The review process was performed by an independent data validation contractor, Diane Short and Associates, Inc. Based on the review and the project data quality objectives (DQOs), the data are acceptable and usable. No data were rejected. The complete analytical results with data quality evaluation (DQE) flags are presented in [Appendix A](#).

There were qualifications of VOC data, with the primary causes of the qualified data described below.

- Rinsate blank contamination resulted in one qualification (1,4-dichlorobenzene in MW-78-ODLA-1) in the March event. Trip blank contamination resulted in one qualification (chloromethane in MW-147-ODLS-2) in the September event. The detections in the associated samples were less than 5x the blank; the results are qualified as B.

- One sample had an elevated associated laboratory calibration standard (LCS) recovery observed, and several samples had low LCS recoveries. When a high recovery is associated with a non-detect, no qualifier is added since the indicated bias is high. When a low recovery is associated with a non-detect, the result is qualified as estimated UJ. When the target is detected with either a high or low LCS recovery, the result is qualified as estimated J. The analytes that were recovered high or low were non-detect in all associated samples and were qualified accordingly.
- CF was qualified as estimated J in one sample (MW-057-ODLA-1) in March based on matrix spike/matrix spike duplicate recovery. The result could be biased low approximately proportional to the recovery.
- Any result reported below the reporting limit (RL) but above the method detection limit was flagged “J” and considered an estimated result (unless overridden by other quality control [QC] flags).

Overall, the VOC data from the two LTM events met project DQOs and were determined to be sufficient to support the evaluation of RA. The complete DQE for 2010 Off Depot LTM is provided in [Appendix B](#).

3.3 ANALYTICAL RESULTS

The results for each sampling event are discussed in the following sections based on concentrations detected above the RL for the nine primary CVOCs detected at Dunn Field: CT, CF, DCE, tDCE, cDCE, TeCA, PCE, TCA, and TCE. Vinyl chloride (VC), a significant CVOC degradation product, is also considered. The analytical results were compared to the maximum contaminant levels and groundwater target concentrations from Table 2-21G of the Dunn Field ROD.

3.3.1 March 2010

Groundwater samples were collected from 32 LTM wells for the annual event in March 2010. [Table 7](#) lists the analytical results for the primary CVOCs and for other VOCs detected above the RL in one or more samples. Seven VOCs were detected above RLs. A summary of the primary CVOC results is provided on [Table 8](#).

3.3.2 September 2010

Groundwater samples were collected from 1 LTM well for the semiannual event in September 2010. [Table 9](#) lists the analytical results for the primary CVOCs and for other VOCs detected above the RL in one or more samples. Only one VOC, acetone, was detected above RLs.

3.4 PLUME MAPS

Total CVOC concentrations for the March and September sample events are shown on [Figures 5 and 6](#). The results include wells sampled for both the LTM and performance monitoring events.

The total CVOC concentrations demonstrate continued reduction in the Off Depot plume due to the Source Areas RA on Dunn Field, including continuing operation of the FSVE system. CVOC concentrations have decreased or remained at low levels in all on-site wells. As shown on [Figure 5](#), all monitoring wells on Dunn Field have total CVOC concentrations below 50 µg/L except for MW-57 near loess treatment area 4 (TA-4). Concentrations for individual CVOCs in on-site wells are below 50 µg/L, except CF at 50.7 µg/L in MW-57. The highest total CVOC concentration in the LTM wells west of Dunn Field was 264 µg/L in MW-144.

CVOCs were not detected in MW-147, the only LTM well sampled in September.

Although total CVOC concentrations for the Off Depot performance monitoring wells are shown on [Figures 5 and 6](#), the performance monitoring results for 2010 will be discussed on the Off Depot Groundwater Interim Remedial Action Completion Report, in preparation.

3.5 WELL CLASSIFICATION REVIEW

Currently, 58 wells are included in Off Depot LTM. The current well classifications shown on [Table 2](#) are 9 background wells, 13 sentinel wells and 36 performance wells. The 58 LTM wells are sampled semiannually (1 well), annually (31 wells) and biennially (26 wells).

Analytical results for the individual well classifications in the 2010 LTM events are summarized in the following sections.

3.5.1 Background Wells

There are nine LTM background wells screened in the fluvial aquifer located along or outside of the Dunn Field boundary; wells upgradient to or at a distance from contaminant plumes on Dunn Field; and wells with no, or low, previous detections of primary CVOC. Three background wells were sampled in March 2010. Only one well, MW-178, contained VOCs above the RL; CF was detected at 1.03 µg/L.

3.5.2 Sentinel Wells

There are 13 LTM sentinel wells screened within either the fluvial or intermediate aquifers adjacent to or within a window. No sentinel wells were sampled in 2010.

3.5.3 Performance Wells

There are 36 LTM performance wells screened in the fluvial aquifer and within the limits of groundwater plumes. Twenty-nine performance wells were sampled in March and one performance well was sampled in September.

In March, primary CVOCs were not detected above RLs in 14 performance wells. The remaining performance wells had CVOCs detected above the RLs and 10 wells (MW-6, MW-15, MW-31, MW-32, MW-57, MW-71, MW-87, MW-144, MW-190 and MW-225) had CVOCs at concentrations above the target concentrations, primarily TeCA and TCE.

In September, no primary CVOCs were detected above the RL in the one well sampled.

3.6 TREND ANALYSIS

Historical analytical results for the primary CVOCs in all LTM wells are provided in [Appendix C](#). Time trend plots for primary CVOCs detected above target concentrations in LTM wells are provided in [Appendix D](#); where multiple sample results were available for a sampling event, the higher result was plotted.

Concentration trends were assessed for the available groundwater analytical results for the LTM sentinel and performance wells from January 2004 through September 2010 using the Mann-Kendall test. The Mann-Kendall test does not require any assumptions as to the statistical distribution of the data and can be used with data sets which include irregular sampling intervals and missing data. The analysis was performed using the Mann-Kendall module within the Monitoring and Remediation Optimization System (MAROS) software version 2.2 developed by AFCEE. The Mann-Kendall trend evaluation using MAROS relies on three statistical metrics: the Mann-Kendall statistic (S), the coefficient of variation (COV) and the confidence factor (CF).

The Mann-Kendall statistic (S) measures the trend in the data. Positive values indicate an increase in constituent concentrations over time, whereas negative values indicate a decrease in constituent concentrations over time. The strength of the trend is proportional to the magnitude of the Mann-Kendall

Statistic (i.e., large magnitudes indicate a strong trend). Typically, the Mann-Kendall test results in No Trend, Increasing or Decreasing designations for the dataset. MAROS uses the CF to provide a finer resolution of outcomes.

The COV is a statistical measure of how the individual data points vary about the mean value; it is defined as the standard deviation divided by the average. Values less than or near 1.00 indicate that the data form a relatively close group about the mean value. Values larger than 1.00 indicate that the data show a greater degree of scatter about the mean. The Confidence in Trend is the statistical probability that the constituent concentration is increasing ($S > 0$) or decreasing ($S < 0$).

The Concentration Trend for each well is determined according to the following rules:

Mann-Kendall Statistic	Confidence in Trend	Concentration Trend
$S > 0$	$> 95\%$	Increasing
$S > 0$	90 - 95%	Probably Increasing
$S > 0$	$< 90\%$	No Trend
$S \leq 0$	$< 90\%$ and $COV \geq 1$	No Trend
$S \leq 0$	$< 90\%$ and $COV < 1$	Stable
$S < 0$	90 - 95%	Probably Decreasing
$S < 0$	95%	Decreasing

The Mann-Kendall analysis was run for the six CVOCs detected above target concentrations in one or more of the 58 Off Depot LTM wells. The analysis was limited to samples collected since January 2004 to provide a more consistent comparison between wells. Over half of the LTM wells were installed in 2004 or later, and the start of the FSVE in 2007 had a significant impact on CVOC concentrations in groundwater at Dunn Field.

The results of the Mann-Kendall analysis are shown on [Tables 10](#) through [15](#). The tables present the statistical metrics for each well, the concentration trend, the number of sample rounds and the number of samples with detects. In addition, the maximum and minimum analytical results for the review period are shown.

The results are summarized below for background wells, performance wells and sentinel wells. There were few detections of most primary CVOCs in the background and sentinel wells and of DCE in the performance wells, thus the analysis indicates insufficient data for many wells. For the remaining CVOCs reported in the performance wells, Mann Kendall analysis indicates that almost all wells are stable/no trend or have decreasing trends; only a couple of the performance wells had increasing trends for CF (MW-57 and MW-75), PCE (MW-31) and TCE (MW-31).

Background Wells

	Total Locations	Insufficient Data	Increasing/ Probably Increasing	Stable/ No Trend	Decreasing/ Probably Decreasing
TeCA	9	5	0	4	0
DCE	9	7	0	1	1
CT	9	6	1	2	0
CF	9	3	2	2	2
PCE	9	1	0	6	2
TCE	9	2	0	4	3

Performance Wells

	Total Locations	Insufficient Data	Increasing/ Probably Increasing	Stable/ No Trend	Decreasing/ Probably Decreasing
TeCA	36	8	0	13	15
DCE	36	30	0	5	1
CT	36	14	0	12	10
CF	36	4	2	19	11
PCE	36	5	1	15	15
TCE	36	3	1	11	21

Sentinel Wells

	Total Locations	Insufficient Data	Increasing/ Probably Increasing	Stable/ No Trend	Decreasing/ Probably Decreasing
TeCA	13	9	0	3	1
DCE	13	9	0	3	1
CT	13	11	0	1	0
CF	13	9	0	1	3
PCE	13	10	0	2	1
TCE	13	8	0	5	0

4.0 CONCLUSIONS AND RECOMMENDATIONS

The RAs on Dunn Field have resulted in significant reduction of CVOC concentrations in groundwater, as seen in total CVOC plume maps for April 2007, April 2008, April 2009 and March 2010 shown in [Figure 7](#).

As described in the ROD Amendment, the active Off Depot remedy is to reduce individual CVOC concentrations to 50 µg/L or less. The AS/SVE system in combination with natural attenuation processes is expected to reduce groundwater concentrations to maximum contaminant levels (MCLs) within a reasonable period of time. Based on the Off Depot treatment goal, individual CVOC concentrations in wells on Dunn Field are not to exceed 50 µg/L after RA unless the groundwater will pass through the Off Depot treatment area. The AS/SVE system will continue to operate until the influent (upgradient) concentrations from the Dunn Field plume do not exceed 50 ppb for individual CVOCs. Only 3 of the 32 LTM wells sampled in 2010 contained individual CVOC concentrations above 50 µg/L. One on-site well, MW-57, contained CF at 50.7 µg/L. Off-site well MW-32 contained CF at 60 µg/L and off-site well MW-144 contained TeCA at 150 µg/L and TCE at 109 µg/L.

Due to the presence of multiple CVOCs in the plumes within and immediately downgradient of Dunn Field, the Dunn Field ROD established remediation goals (RGs) for groundwater based on a target cumulative risk level of 1 in 10,000 (1×10^{-4}) and a Hazard Index of 1.0. The final RGs may vary based on the individual concentration of each CVOC in a compliance well; however, they will not exceed MCL or nonzero MCL goal levels.

Of the 32 Off Depot LTM wells sampled in 2010, 10 wells had primary CVOC concentrations above an MCL or above the target concentration (TC) for TeCA. Five of the wells (MW-6, MW-15, MW-57, MW-87, and MW-225) are located on Dunn Field near the western property line in the central portion of the source areas; CVOC concentrations exceeded the MCL for TCE in three wells (7.57 µg/L to 13.8 µg/L) and exceeded the TC for TeCA in four wells (2.67 µg/L to 12 µg/L).

Four of the off-site wells (MW-32, MW-71, MW-144 and MW-190) are located west of the source areas in the central portion of the Off Depot plume; CVOC concentrations exceeded the MCLs for TCE in three wells (8.58 µg/L to 109 µg/L) and for CT in one well (6.71 µg/L) and exceeded the TC for TeCA in three wells (8.26 µg/L to 150 µg/L). The highest concentrations were in MW-144. The fifth off-site well (MW-31) is located northeast of Dunn Field and is within the plume originating from an off-site source

northeast of Dunn Field; CVOC concentrations exceeded the MCLs for PCE (22.7 µg/L), TCE (20.4 µg/L) and DCE (22.7 µg/L).

One change is recommended to the Off Depot LTM wells.

- Well MW-175, located at the western edge of TA-3, was damaged during T SVE treatment and is not usable; it is recommended for abandonment. No previous samples from the well exceeded MCLs or TCs. Wells MW-06 and MW-87 are located downgradient of MW-175 ([Figure 2](#)), and a replacement well is not considered necessary.

Changes to sample frequency are recommended in accordance with the LTM plan:

- Three background wells (MW-172, MW-178 and MW-187) are sampled annually. CVOC concentrations in the last four samples from each well have been below MCLs and TCs. The wells are recommended for biennial sampling.
- One performance well (MW-147) is sampled semiannually. CVOC concentrations in the last four samples have been below MCLs and TCs. The well is recommended for annual sampling.
- Three performance wells currently sampled biennially are recommended for annual sampling. MW-05 and MW-91 do not have a sufficient history of results below the MCL and MW-184 had a recent sample above the MCL for several CVOCs.

5.0 REFERENCES

- CH2M HILL, 2004. *Final Dunn Field Record of Decision, Revision 2*. Prepared for the U.S. Army Engineering and Support Center, Huntsville, Alabama. March 2004.
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TABLES

TABLE 1
LTM WELLS
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Well	Aquifer	Well Classification	Sample Frequency	Northing (ft)	Easting (ft)	Ground Elevation (ft, msl)	Stick Up (ft)	Riser Length (ft)	Screen Length (ft)	Total Well Depth (ft, btoc)
MW-03	Fluvial	Performance	Wtr Lvl	281596.25	802100.69	290.40	2.0	65.5	10	75.5
MW-04	Fluvial	Background	Biennial	281278.87	802369.19	300.00	1.6	60.0	20	80.0
MW-05	Fluvial	Performance	Biennial	281254.49	802084.68	301.30	3.3	60.0	20	80.0
MW-06	Fluvial	Performance	Annual	280604.17	802069.13	288.10	1.0	51.0	20	71.0
MW-07	Fluvial	Performance	Wtr Lvl	281839.88	802481.70	293.10	2.0	67.0	10	77.0
MW-08	Fluvial	Background	Wtr Lvl	282001.04	802727.91	292.74	-0.2	56.5	10	66.5
MW-10	Fluvial	Performance	Wtr Lvl	281662.55	802201.26	289.20	-0.4	58.6	10	68.6
MW-13	Fluvial	Background	Biennial	281033.56	802369.21	300.10	-0.1	66.0	15	81.0
MW-14	Fluvial	Background	Biennial	280003.37	802288.95	302.44	-0.2	65.0	15	80.0
MW-15	Fluvial	Performance	Annual	280348.88	801985.36	295.23	-0.1	63.4	15	78.4
MW-28	Fluvial	Background	Wtr Lvl	281568.58	803154.48	294.89	-0.1	54.3	15	69.3
MW-31	Fluvial	Performance	Annual	281651.53	801783.90	287.50	2.9	64.1	15	79.1
MW-32	Fluvial	Performance	Annual	280834.37	801615.51	285.60	-0.2	52.7	15	67.7
MW-33	Fluvial	Performance	Biennial	280398.10	801561.30	277.70	3.0	44.6	15	59.6
MW-37	Intermediate	Sentinel	Biennial	280831.22	801616.58	285.50	-0.6	165.7	15	180.7
MW-42	Fluvial	Background	Wtr Lvl	281883.92	800182.40	275.10	-0.3	49.0	10	59.0
MW-43	Intermediate	Sentinel	Wtr Lvl	280284.33	800111.73	284.99	0.0	161.5	10	171.5
MW-44	Fluvial	Performance	Annual	281073.71	800601.09	269.40	-0.3	64.0	10	74.0
MW-45	Fluvial	Background	Wtr Lvl	280728.08	804125.99	293.30	-0.1	58.0	10	68.0
MW-51	Fluvial	Background	Biennial	282345.86	802828.62	275.50	-0.3	55.0	10	65.0
MW-57	Fluvial	Performance	Annual	280184.05	802006.19	291.10	-0.3	60.0	10	70.0
MW-58	Fluvial	Performance	Biennial	279845.07	802066.44	290.70	-0.2	57.0	10	67.0
MW-65	Fluvial	Background	Biennial	283529.72	803887.68	264.00	-0.8	40.8	10	50.8
MW-67	Memphis	Sentinel	Wtr Lvl	280473.05	800933.94	275.53	2.7	260.0	15	275.0
MW-68	Fluvial	Performance	Wtr Lvl	281500.76	802040.04	291.60	0.1	72.5	10	82.5
MW-69	Fluvial	Performance	Annual	281202.55	802011.49	304.90	2.1	82.1	10	92.1
MW-71	Fluvial	Performance	Annual	280584.68	801804.71	291.90	2.5	65.5	10	75.5
MW-74	Fluvial	Performance	Annual	280991.20	802044.29	304.00	-0.3	70.0	20	90.0
MW-75	Fluvial	Performance	Annual	281080.10	802051.10	304.30	-0.7	71.0	20	91.0
MW-78	Fluvial	Performance	Biennial	282051.71	802065.28	275.40	-0.4	44.5	20	64.5
MW-80	Fluvial	Background	Wtr Lvl	281417.56	800199.07	274.00	-0.2	53.0	20	73.0
MW-87	Fluvial	Performance	Annual	280696.36	802038.55	292.80	2.1	63.0	15	78.0
MW-91	Fluvial	Performance	Biennial	280474.97	802014.43	289.30	2.7	55.0	15	70.0
MW-126	Fluvial	Background	Wtr Lvl	282390.01	800491.67	252.49	-0.3	16.0	10	26.0
MW-127	Fluvial	Background	Wtr Lvl	280738.40	799810.30	268.86	-0.2	60.0	10	70.0
MW-128	Fluvial	Background	Biennial	282712.19	803376.38	284.77	-0.6	54.8	20	74.8
MW-129	Fluvial	Background	Wtr Lvl	282271.08	803128.53	293.33	-0.3	65.0	15	80.0
MW-130	Fluvial	Background	Wtr Lvl	282116.23	803242.02	293.69	-0.5	59.5	20	79.5
MW-132	Fluvial	Performance	Annual	281006.28	802129.10	301.05	-0.3	73.5	15	88.5
MW-134	Fluvial	Performance	Wtr Lvl	281012.74	802102.58	301.05	-0.2	75.0	15	90.0
MW-144	Fluvial	Performance	Annual	281138.63	801528.84	291.89	-0.3	56.8	20	76.8
MW-145	Fluvial	Performance	Annual	280967.63	800823.18	284.86	-0.1	80.1	20	100.1
MW-147	Fluvial	Performance	Semiannual	281501.06	801674.04	289.97	-0.2	60.2	20	80.2
MW-153	Fluvial	Performance	Biennial	282119.38	800952.34	279.26	-0.1	76.1	20	96.1
MW-154	Fluvial	Background	Wtr Lvl	280501.53	800919.48	274.07	-0.3	53.3	10	63.3
MW-167	Fluvial	Background	Wtr Lvl	281394.03	800618.54	285.21	-0.4	70.5	15	85.5
MW-169	Transition	Sentinel	Biennial	282491.23	800956.58	262.17	-0.3	68.1	20	88.1

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Well	Aquifer	Well Classification	Sample Frequency	Northing (ft)	Easting (ft)	Ground Elevation (ft, msl)	Stick Up (ft)	Riser Length (ft)	Screen Length (ft)	Total Well Depth (ft, btoc)
MW-170	Fluvial	Sentinel	Biennial	282443.17	801260.46	273.98	-0.2	59.8	20	79.8
MW-171	Fluvial	Sentinel	Biennial	282315.35	801057.83	271.02	-0.3	53.3	15	68.3
MW-172	Fluvial	Background	Annual	280213.31	802221.98	300.94	-0.7	68.0	10	78.0
MW-174	Fluvial	Performance	Annual	280352.00	802092.07	296.83	-0.3	67.0	10	77.0
MW-175	Fluvial	Performance	Annual	280618.49	802175.36	291.93	-0.3	67.5	10	77.5
MW-176	Fluvial	Performance	Annual	280823.77	802032.08	299.92	-0.2	76.0	10	86.0
MW-178	Fluvial	Background	Annual	280982.81	802227.34	300.57	-0.3	76.0	10	86.0
MW-179	Fluvial	Performance	Annual	281075.70	802158.65	301.32	-0.2	77.0	10	87.0
MW-180	Fluvial	Performance	Annual	281476.43	802131.85	296.39	-0.3	72.0	10	82.0
MW-182	Fluvial	Sentinel	Biennial	280524.22	800623.13	272.98	2.4	62.0	10	72.0
MW-184	Fluvial	Performance	Biennial	280903.16	801442.29	283.34	-0.2	58.0	10	68.0
MW-185	Fluvial	Sentinel	Biennial	282673.47	800985.92	256.98	-0.3	85.0	10	95.0
MW-186	Fluvial	Sentinel	Biennial	282691.30	800988.07	256.69	-0.4	148.0	10	158.0
MW-187	Fluvial	Background	Annual	280563.18	802348.09	303.21	-0.5	76.0	10	86.0
MW-190	Fluvial	Performance	Annual	281138.88	801595.73	297.58	-0.3	78.0	10	88.0
MW-220	Fluvial	Performance	Wtr Lvl	281617.49	802166.87	290.31	3.0	64.9	15	79.9
MW-221	Fluvial	Performance	Annual	281399.71	802100.05	298.37	3.2	73.1	15	88.1
MW-222	Fluvial	Performance	Annual	280986.04	802145.54	301.06	2.8	74.2	15	89.2
MW-223	Fluvial	Performance	Annual	280913.53	802104.29	300.41	2.6	73.9	15	88.9
MW-224	Fluvial	Performance	Annual	281017.74	802181.62	301.18	3.0	73.7	15	88.7
MW-225	Fluvial	Performance	Annual	280947.12	802070.50	301.30	3.2	75.0	15	90.0
MW-226	Fluvial	Performance	Annual	280931.94	802147.21	300.56	2.6	74.2	15	89.2
MW-227	Fluvial	Performance	Annual	280257.91	802081.00	296.64	3.1	63.6	15	78.6
MW-228	Fluvial	Performance	Annual	280251.88	802157.40	298.59	3.1	64.1	15	79.1
MW-230	Fluvial	Background	Wtr Lvl	281842.54	802800.22	286.92	-0.4	59.3	15	74.3
MW-231	Intermediate	Sentinel	Biennial	280944.20	801628.65	289.43	-0.3	167.8	26	193.3
MW-234	Intermediate	Sentinel	Biennial	281005.44	801630.89	291.71	-0.2	166.6	10	176.8
MW-235	Fluvial	Sentinel	Biennial	280727.57	800447.83	264.21	-0.2	50.6	10	60.8
MW-237	Intermediate	Sentinel	Biennial	281356.02	800963.99	289.53	-0.4	166.5	10	176.7
MW-239	Intermediate	Sentinel	Biennial	281334.02	801009.58	288.77	-0.3	165.5	10	175.7
MW-240	Intermediate	Sentinel	Biennial	282897.03	800869.30	259.51	-0.2	86.6	10	96.8

Notes:

ft: feet

ft, btoc: feet below top of casing

ft, msl: feet mean seal level

TABLE 2
LTM SAMPLE SCHEDULE
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Well ID	Aquifer	Well Classification	Sample Frequency	Annual Mar 2010	Semiannual Sep 2010
MW-04	Fluvial	Background	Biennial	-	-
MW-05	Fluvial	Performance	Biennial	-	-
MW-06	Fluvial	Performance	Annual	X	-
MW-13	Fluvial	Background	Biennial	-	-
MW-14	Fluvial	Background	Biennial	-	-
MW-15	Fluvial	Performance	Annual	X	-
MW-31	Fluvial	Performance	Annual	X	-
MW-32	Fluvial	Performance	Annual	X	-
MW-33	Fluvial	Performance	Biennial	-	-
MW-37	Intermediate	Sentinel	Biennial	-	-
MW-44	Fluvial	Performance	Annual	X	-
MW-51	Fluvial	Background	Biennial	-	-
MW-57	Fluvial	Performance	Annual	X	-
MW-58	Fluvial	Performance	Biennial	-	-
MW-65	Fluvial	Background	Biennial	-	-
MW-69	Fluvial	Performance	Annual	X	-
MW-71	Fluvial	Performance	Annual	X	-
MW-74	Fluvial	Performance	Annual	X	-
MW-75	Fluvial	Performance	Annual	X	-
MW-78	Fluvial	Performance	Biennial	X	-
MW-87	Fluvial	Performance	Annual	X	-
MW-91	Fluvial	Performance	Biennial	-	-
MW-128	Fluvial	Background	Biennial	-	-
MW-132	Fluvial	Performance	Annual	X	-
MW-144	Fluvial	Performance	Annual	X	-
MW-145	Fluvial	Performance	Annual	X	-
MW-147	Fluvial	Performance	Semiannual	X	X
MW-153	Fluvial	Performance	Biennial	-	-
MW-169	Transition	Sentinel	Biennial	-	-
MW-170	Fluvial	Sentinel	Biennial	-	-
MW-171	Fluvial	Sentinel	Biennial	-	-
MW-172	Fluvial	Background	Annual	X	-
MW-174	Fluvial	Performance	Annual	X	-
MW-175	Fluvial	Performance	Annual	NS	-
MW-176	Fluvial	Performance	Annual	X	-
MW-178	Fluvial	Background	Annual	X	-
MW-179	Fluvial	Performance	Annual	X	-
MW-180	Fluvial	Performance	Annual	X	-
MW-182	Fluvial	Sentinel	Biennial	-	-
MW-184	Fluvial	Performance	Biennial	-	-
MW-185	Transition	Sentinel	Biennial	-	-
MW-186	Transition	Sentinel	Biennial	-	-
MW-187	Fluvial	Background	Annual	X	-
MW-190	Fluvial	Performance	Annual	X	-
MW-221	Fluvial	Performance	Annual	X	-
MW-222	Fluvial	Performance	Annual	X	-
MW-223	Fluvial	Performance	Annual	X	-
MW-224	Fluvial	Performance	Annual	X	-
MW-225	Fluvial	Performance	Annual	X	-
MW-226	Fluvial	Performance	Annual	X	-

TABLE 2
LTM SAMPLE SCHEDULE
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Well ID	Aquifer	Well Classification	Sample Frequency	Annual Mar 2010	Semiannual Sep 2010
MW-227	Fluvial	Performance	Annual	X	-
MW-228	Fluvial	Performance	Annual	X	-
MW-231	Intermediate	Sentinel	Biennial	-	-
MW-234	Intermediate	Sentinel	Biennial	-	-
MW-235	Fluvial	Sentinel	Biennial	-	-
MW-237	Intermediate	Sentinel	Biennial	-	-
MW-239	Intermediate	Sentinel	Biennial	-	-
MW-240	Transition	Sentinel	Biennial	-	-

Notes:

- X: Sample collected
- : Sample not planned or collected
- NS: Sample planned but not collected

TABLE 3
WATER LEVEL MEASUREMENTS
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Well ID	Aquifer	Top of Casing	Top of Screen	Groundwater		Groundwater	
		Elevation	Elevation	Depth to Water	Elevation	Depth to Water	Elevation
		(ft, msl)	(ft, msl)	22-Mar-2010	9/20-21/2010	22-Mar-2010	9/20-21/2010
				(ft, btoc)	(ft, msl)	(ft, btoc)	(ft, msl)
MW-03	Fluvial	292.35	226.85	64.05	228.30	62.77	229.58
MW-04	Fluvial	301.61	241.61	71.40	230.21	71.70	229.91
MW-05	Fluvial	304.64	244.64	75.96	228.68	74.71	229.93
MW-06	Fluvial	289.11	238.11	59.59	229.52	58.38	230.73
MW-07	Fluvial	295.10	228.10	63.45	231.65	62.56	232.54
MW-08	Fluvial	292.59	236.09	59.11	233.48	58.47	234.12
MW-10	Fluvial	288.79	230.19	-	-	57.74	231.05
MW-13	Fluvial	300.01	234.01	69.94	230.07	68.60	231.41
MW-14	Fluvial	302.22	237.22	72.42	229.80	71.50	230.72
MW-15	Fluvial	295.12	231.72	65.50	229.62	64.36	230.76
MW-19	Fluvial	290.57	207.47	85.79	204.78	-	-
MW-28	Fluvial	294.79	240.49	53.18	241.61	52.73	242.06
MW-31	Fluvial	290.37	226.27	66.60	223.77	64.86	225.51
MW-32	Fluvial	285.38	232.68	61.02	224.36	59.44	225.94
MW-33	Fluvial	280.71	236.11	53.10	227.61	51.79	228.92
MW-34	Intermediate	299.97	163.37	130.32	169.65	-	-
MW-37	Intermediate	284.91	119.21	119.00	165.91	129.25	155.66
MW-42	Fluvial	274.83	225.83	53.43	221.40	51.65	223.18
MW-43	Intermediate	284.99	123.49	118.51	166.48	124.45	160.54
MW-44	Fluvial	269.07	205.07	52.59	216.48	50.40	218.67
MW-45	Fluvial	293.22	235.22	52.87	240.35	52.96	240.26
MW-51	Fluvial	275.23	220.23	37.62	237.61	37.78	237.45
MW-53	Fluvial	306.38	233.88	72.34	234.04	-	-
MW-54	Fluvial	295.35	210.85	78.07	217.28	75.49	219.86
MW-55	Fluvial	292.08	228.08	69.50	222.58	-	-
MW-57	Fluvial	290.77	230.77	60.90	229.87	60.30	230.47
MW-58	Fluvial	290.51	233.51	61.59	228.92	60.92	229.59
MW-62	Fluvial	293.65	207.65	93.56	200.09	-	-
MW-65	Fluvial	263.22	222.42	2.40	260.82	12.34	250.88
MW-67	Memphis	278.21	18.21	111.65	166.56	120.65	157.56
MW-68	Fluvial	291.69	219.19	64.00	227.69	62.70	228.99
MW-69	Fluvial	307.02	224.94	79.20	227.82	77.74	229.28
MW-70	Fluvial	304.99	224.18	76.95	228.04	75.47	229.52
MW-71	Fluvial	294.40	228.90	66.56	227.84	65.08	229.32
MW-74	Fluvial	303.68	233.68	75.05	228.63	73.64	230.04
MW-75	Fluvial	303.61	232.61	75.13	228.48	73.79	229.82
MW-76	Fluvial	302.71	229.71	80.53	222.18	78.58	224.13
MW-77	Fluvial	304.42	236.42	78.45	225.97	76.96	227.46
MW-78	Fluvial	275.00	230.50	-	-	44.70	230.30
MW-79	Fluvial	285.03	202.53	68.71	216.32	66.97	218.06
MW-80	Fluvial	273.81	220.81	57.41	216.40	55.76	218.05
MW-87	Fluvial	294.93	231.93	65.90	229.03	64.58	230.35
MW-91	Fluvial	291.99	236.99	62.67	229.32	61.51	230.48
MW-126	Fluvial	252.22	236.22	14.03	238.19	20.00	232.22
MW-127	Fluvial	268.71	208.71	58.20	210.51	56.93	211.78
MW-128	Fluvial	284.14	229.39	35.69	248.45	39.30	244.84
MW-129	Fluvial	293.01	228.01	52.40	240.61	52.98	240.03
MW-130	Fluvial	293.20	233.70	51.88	241.32	52.00	241.20
MW-132	Fluvial	300.73	227.23	72.76	227.97	70.80	229.93
MW-134	Fluvial	300.81	225.81	-	-	70.57	230.24
MW-144	Fluvial	291.60	235.10	70.63	220.97	68.47	223.13
MW-145	Fluvial	284.72	204.72	67.69	217.03	65.70	219.02
MW-147	Fluvial	289.72	229.72	67.20	222.52	65.36	224.36
MW-148	Fluvial	294.71	224.71	75.44	219.27	72.97	221.74

TABLE 3
WATER LEVEL MEASUREMENTS
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Well ID	Aquifer	Top of Casing	Top of Screen	Groundwater		Groundwater	
		Elevation	Elevation	Depth to Water	Elevation	Depth to Water	Elevation
		(ft, msl)	(ft, msl)	22-Mar-2010	22-Mar-2010	9/20-21/2010	9/20-21/2010
				(ft, btoc)	(ft, msl)	(ft, btoc)	(ft, msl)
MW-149	Fluvial	287.18	205.78	70.27	216.91	67.97	219.21
MW-150	Fluvial	296.81	225.61	79.06	217.75	76.47	220.34
MW-151	Fluvial	284.27	207.27	67.68	216.59	65.30	218.97
MW-152	Fluvial	289.59	198.59	73.04	216.55	71.00	218.59
MW-153	Fluvial	279.17	203.17	63.00	216.17	61.53	217.64
MW-154	Fluvial	273.81	220.81	56.00	217.81	55.59	218.22
MW-155	Fluvial	291.65	214.65	74.58	217.07	71.78	219.87
MW-157	Fluvial	286.78	229.78	67.66	219.12	65.18	221.60
MW-158	Fluvial	294.07	203.06	77.60	216.47	75.25	218.82
MW-158A	Fluvial	293.95	216.03	77.48	216.47	75.16	218.79
MW-159	Fluvial	286.33	205.89	69.84	216.49	67.30	219.03
MW-160	Fluvial	293.69	228.04	75.43	218.26	73.39	220.30
MW-161	Fluvial	296.40	234.60	74.48	221.92	72.45	223.95
MW-162	Fluvial	299.70	233.39	77.95	221.75	75.86	223.84
MW-163	Fluvial	290.63	234.42	70.09	220.54	67.88	222.75
MW-164	Fluvial	287.48	231.86	66.21	221.27	64.03	223.45
MW-165	Fluvial	287.06	198.43	70.98	216.08	68.53	218.53
MW-165A	Fluvial	287.26	215.96	70.92	216.34	68.63	218.63
MW-166	Fluvial	282.72	199.59	66.19	216.53	63.90	218.82
MW-166A	Fluvial	282.90	215.15	66.30	216.60	64.01	218.89
MW-167	Fluvial	284.82	214.68	67.39	217.43	66.89	217.93
MW-169	Transition ¹	261.90	194.12	72.44	189.46	72.21	189.69
MW-170	Fluvial	273.75	214.14	55.36	218.39	53.85	219.90
MW-171	Fluvial	270.69	217.72	53.14	217.55	51.75	218.94
MW-172	Fluvial	300.28	232.28	70.24	230.04	69.17	231.11
MW-174	Fluvial	296.56	229.56	66.79	229.77	65.68	230.88
MW-175	Fluvial	291.63	224.13	71.95	219.68	60.48	231.15
MW-176	Fluvial	299.68	223.68	70.76	228.92	69.39	230.29
MW-178	Fluvial	300.26	224.26	70.72	229.54	69.53	230.73
MW-179	Fluvial	301.16	224.16	72.18	228.98	70.77	230.39
MW-180	Fluvial	296.14	224.14	67.55	228.59	66.25	229.89
MW-182	Fluvial	275.40	213.40	63.07	212.33	61.80	213.60
MW-184	Fluvial	283.12	225.12	62.71	220.41	60.11	223.01
MW-185	Transition ¹	256.71	171.71	71.15	185.56	70.30	186.41
MW-186	Transition ¹	256.31	108.31	77.16	179.15	80.71	175.60
MW-187	Fluvial	302.74	226.74	72.44	230.30	71.09	231.65
MW-190	Fluvial	297.32	219.32	76.03	221.29	73.84	223.48
MW-220	Fluvial	293.29	228.35	64.15	229.14	65.32	227.97
MW-221	Fluvial	301.52	228.40	73.15	228.37	71.88	229.64
MW-222	Fluvial	303.82	229.64	74.75	229.07	74.15	229.67
MW-223	Fluvial	303.00	229.13	73.92	229.08	72.48	230.52
MW-224	Fluvial	304.13	230.42	74.91	229.22	73.48	230.65
MW-225	Fluvial	304.52	229.54	75.45	229.07	74.23	230.29
MW-226	Fluvial	303.19	228.97	74.00	229.19	72.63	230.56
MW-227	Fluvial	299.70	236.06	69.69	230.01	70.55	229.15
MW-228	Fluvial	301.65	237.56	71.56	230.09	68.68	232.97
MW-229	Intermediate	311.77	123.34	144.73	167.04	-	-
MW-230	Fluvial	286.57	227.32	52.19	234.38	51.40	235.17
MW-231	Intermediate	289.18	121.43	123.12	166.06	131.31	157.87
MW-232	Intermediate	285.18	135.13	118.73	166.45	126.51	158.67
MW-234	Intermediate	291.50	124.91	125.32	166.18	133.60	157.90
MW-235	Fluvial	264.00	213.41	53.04	210.96	52.61	211.39
MW-237	Intermediate	289.18	122.73	122.86	166.32	130.37	158.81

TABLE 3
WATER LEVEL MEASUREMENTS
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Well ID	Aquifer	Top of Casing	Top of Screen	Groundwater		Groundwater	
		Elevation	Elevation	Depth to Water	Elevation	Depth to Water	Elevation
		(ft, msl)	(ft, msl)	22-Mar-2010	22-Mar-2010	9/20-21/2010	9/20-21/2010
				(ft, btoc)	(ft, msl)	(ft, btoc)	(ft, msl)
MW-239	Intermediate	288.44	122.97	122.43	166.01	129.44	159.00
MW-240	Transition ¹	259.28	172.71	72.07	187.21	71.13	188.15
MW-241	Fluvial	292.82	219.57	74.18	218.64	71.76	221.06
MW-242	Fluvial	295.40	222.20	76.09	219.31	74.50	220.90
MW-243	Fluvial	292.26	211.56	75.78	216.48	73.66	218.60
MW-244	Fluvial	288.72	212.39	72.09	216.63	69.47	219.25
MW-245	Fluvial	290.13	205.40	73.53	216.60	71.28	218.85
MW-246	Fluvial	288.17	202.97	71.88	216.29	69.33	218.84
MW-247	Fluvial	285.70	205.70	69.42	216.28	66.92	218.78
MW-248	Fluvial	275.45	207.94	58.81	216.64	56.72	218.73
MW-249	Fluvial	285.53	207.49	68.63	216.90	66.61	218.92
MW-250	Intermediate	289.66	120.96	123.93	165.73	131.81	157.85
MW-251	Intermediate	285.83	125.63	119.86	165.97	127.78	158.05
MW-1-TDEC	Fluvial	275.83	NA	24.05	251.78	-	-
MW-2-TDEC	Fluvial	272.13	NA	21.40	250.73	-	-
MW-3-TDEC	Fluvial	265.28	NA	6.12	259.16	-	-

Notes:

- 1) Transitional between Fluvial and Intermediate aquifers based on groundwater elevations
- Not measured
- ft, msl feet, mean sea level
- ft, btoc feet, below top of casing
- H Wtr lvl only
- L LTM
- NA Not available
- P PMW

TABLE 4
PDB SAMPLE INTERVALS, MARCH 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Monitoring Well	Date Collected	Measured Well Depth (ft, bgs)	Top of Screen Depth (ft, btoc)	Screen Length (ft)	Depth to Water (ft, btoc)	Sample Depth ¹ (ft, btoc)
MW-06	3/26/2010	70.0	51.0	20	59.9	65.5
MW-15	3/26/2010	78.5	63.4	15	65.7	72.5
MW-31	3/26/2010	76.2	64.1	15	67.0	73.2
MW-32	3/26/2010	67.7	52.7	15	61.3	64.6
MW-44	3/26/2010	74.3	64.0	10	53.3	69.0
MW-57	3/26/2010	70.3	60.0	10	61.1	66.1
MW-69	3/26/2010	90.0	82.1	10	79.3	87.1
MW-71	3/26/2010	73.0	65.5	10	66.8	71.4
MW-74	3/26/2010	90.3	70.0	20	75.2	82.9
MW-75	3/26/2010	91.7	71.0	20	75.2	83.5
MW-87	3/26/2010	75.9	63.0	15	66.2	73.1
MW-144	3/26/2010	76.8	56.8	20	70.7	74.3
MW-145	3/26/2010	100.1	80.1	20	68.7	90.1
MW-147	3/26/2010	80.3	60.3	20	67.3	74.3
MW-174	3/26/2010	77.3	67.0	10	67.1	72.8
MW-176	3/26/2010	86.2	76.0	10	71.0	81.0
MW-178	3/26/2010	86.3	76.0	10	71.0	81.0
MW-179	3/26/2010	87.2	77.0	10	72.3	82.0
MW-180	3/26/2010	82.3	72.0	10	67.6	77.0
MW-187	3/26/2010	86.5	76.0	10	75.5	81.0
MW-190	3/26/2010	88.3	78.0	10	76.3	83.2
MW-221	3/26/2010	85.0	73.1	15	73.3	81.2
MW-222	3/26/2010	86.4	74.2	15	74.8	82.5
MW-223	3/26/2010	86.3	73.9	15	74.0	82.0
MW-224	3/26/2010	85.8	73.7	15	75.0	82.5
MW-225	3/26/2010	86.7	75.0	15	75.6	83.5
MW-226	3/26/2010	86.6	74.2	15	74.2	82.2
MW-227	3/26/2010	75.6	63.6	15	69.9	75.0

Notes:

- 1) Sample depth is to PDB mid-point
- ft: feet
- ft, bgs feet below ground surface
- ft, btoc feet below top of casing
- PDB passive diffision bag

TABLE 5
 FINAL WELL STABILIZATION MEASUREMENTS, MARCH 2010
 OFF DEPOT GROUNDWATER
 ANNUAL LONG-TERM MONITORING REPORT - 2010
 Dunn Field - Defense Depot Memphis, Tennessee

Well ID	Sample Date	Method	Time	Well Depth (ft, btoc)	Sample Pump Depth (ft, btoc)	Water Depth (ft, btoc)	Purge Rate (ml/min)	Volume Purged (L)	pH	Temp (C)	Specific Conductivity (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTUs)
MW-78	3/29/2010	low flow	8:48	64.5	55.0	45.2	180	8.92	5.95	15.86	0.543	6.4	70.00	16.5
MW-132	3/29/2010	low flow	13:24	88.5	84.0	72.3	140	6.82	5.66	28.17	0.301	7.7	53.40	11.1
MW-172	3/29/2010	low flow	11:15	78.0	76.1	70.4	160	7.00	5.72	21.97	0.206	8.59	125.20	6.63
MW-228	3/29/2010	low flow	9:59	79.1	77.0	71.8	160	3.42	5.78	25.38	0.227	8.47	101.60	4.98

Notes:

°C :	degrees Celsius	mS/cm:	milliSiemens per centimeter
DO:	Dissolved Oxygen	mV:	millivolts
ft, btoc:	feet below top of casing	NA:	not available
L:	liters	NTU:	nephelometric turbidity unit
mg/L:	milligrams per liter	ORP:	Oxidation Reduction Potential
mL/min:	milliliters per minute		

TABLE 6
PDB SAMPLE INTERVALS, SEPTEMBER 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Monitoring Well	Date Collected	Top of Screen Depth (ft, btoc)	Screen Length (ft)	Depth to Water (ft, btoc)	Sample Depth ¹ (ft, btoc)
MW-147	9/23/2010	60.3	20	65.4	74.3

Notes:

- 1) Sample depth is to PDB mid-point
- ft: feet
- ft, btoc: Feet below top of casing
- PDB: passive diffision bag

TABLE 7
ANALYTICAL RESULTS SUMMARY, MARCH 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

	Well ID			MW-06	MW-15	MW-31	MW-32	MW-44	MW-57	MW-69
	Lab ID			L10030693-16	L10030693-17	L10030693-18	L10030693-19	L10030693-20	L10030693-21	L10030693-24
	Date			3/26/2010	3/26/2010	3/26/2010	3/26/2010	3/26/2010	3/26/2010	3/26/2010
Analyte	Units	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	2.67	11.8	<0.5	9.16	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	0.283 J	<1	0.434 J	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	30.9	<1	<1	<1	<1
Carbon tetrachloride	µg/L	5	3	<1	1.81	<1	6.71	<1	<1	<1
Chloroform	µg/L	80	12	5.4	14.7	0.16 J	60	<0.3	50.7 J	0.161 J
cis-1,2-Dichloroethene	µg/L	70	35	1.62	0.796 J	<1	6.27	<1	1.03	<1
Tetrachloroethene	µg/L	5	2.5	<1	0.85 J	22.7	2.43	<1	0.27 J	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	0.926 J	<1	<1	<1
Trichloroethene	µg/L	5	5	2.29	13.8	20.4	38.3	0.426 J	7.57	<1
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				12.0	44.5	74.2	124.6	0.4	59.6	0.2

Notes:

µg/L: micrograms per liter

-- : Not Listed

MCL: Maximum Contaminant Level

MDL: Method Detection Limit

RL: Reporting Limit

TC: Target Concentration

Results detected at or above RL shown in bold

DQE FLAGS:

J: Concentration estimated

<: Analyte not detected above RL

Method:

8260B: Volatile Organic Compounds

TABLE 7
ANALYTICAL RESULTS SUMMARY, MARCH 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

	Well ID			MW-71	MW-74	MW-75	MW-78	MW-87	MW-132	MW-144
	Lab ID			L10030693-25	L10030693-26	L10030693-27	L10030780-01	L10030693-28	L10030780-02	L10030693-29
	Date			3/26/2010	3/26/2010	3/26/2010	3/29/2010	3/26/2010	3/29/2010	3/26/2010
Analyte	Units	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	8.26	0.43 J	<0.5	<0.5	12	<0.5	150
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	0.653 J	<1	0.321 J
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	5	3	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	80	12	1.47	0.696	0.142 J	<0.3	1.04	0.366	0.316
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	<1	<1	1.38	<1	3.26
Tetrachloroethene	µg/L	5	2.5	<1	0.712 J	0.624 J	<1	<1	0.354 J	0.918 J
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	0.445 J
Trichloroethene	µg/L	5	5	0.612 J	2.4	<1	<1	2	<1	109
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				10.3	4.2	0.8	0	17.1	0.7	264.3

Notes:

µg/L: micrograms per liter

-- : Not Listed

MCL: Maximum Contaminant Level

MDL: Method Detection Limit

RL: Reporting Limit

TC: Target Concentration

Results detected at or above RL shown in bold

DQE FLAGS:

J: Concentration estimated

<: Analyte not detected above RL

Method:

8260B: Volatile Organic Compounds

TABLE 7
ANALYTICAL RESULTS SUMMARY, MARCH 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

	Well ID			MW-145	MW-147	MW-172	MW-174	MW-176	MW-178	MW-179
	Lab ID			L10030693-30	L10030693-31	L10030780-03	L10030693-32	L10030693-33	L10030693-34	L10030693-35
	Date			3/26/2010	3/26/2010	3/29/2010	3/26/2010	3/26/2010	3/26/2010	3/26/2010
Analyte	Units	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	0.274 J	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	5	3	<1	<1	0.922 J	1.2	<1	<1	<1
Chloroform	µg/L	80	12	<0.3	<0.3	<0.3	0.337	0.147 J	1.03	0.136 J
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	5	2.5	<1	<1	0.339 J	0.651 J	<1	<1	0.383 J
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				0.274	0	1.3	2.5	0.1	1.0	0.5

Notes:

µg/L: micrograms per liter

-- : Not Listed

MCL: Maximum Contaminant Level

MDL: Method Detection Limit

RL: Reporting Limit

TC: Target Concentration

Results detected at or above RL shown in bold

DQE FLAGS:

J: Concentration estimated

<: Analyte not detected above RL

Method:

8260B: Volatile Organic Compounds

TABLE 7
ANALYTICAL RESULTS SUMMARY, MARCH 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

	Well ID			MW-180	MW-187	MW-190	MW-221	MW-222	MW-223	MW-224
	Lab ID			L10030693-36	L10030693-37	L10030693-38	L10030693-39	L10030693-40	L10030693-41	L10030693-44
	Date			3/26/2010	3/26/2010	3/26/2010	3/26/2010	3/26/2010	3/26/2010	3/26/2010
Analyte	Units	MCL	TC							
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5	<0.5	23.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	5	3	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	80	12	<0.3	0.149 J	0.186 J	<0.3	0.396	0.75	0.186 J
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	0.747 J	<1	<1	<1	<1
Tetrachloroethene	µg/L	5	2.5	<1	<1	0.707 J	<1	0.313 J	0.447 J	<1
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	5	5	<1	<1	31.9	<1	2.54	1.49	<1
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1	<1	<1	<1
Total Primary CVOCs				0	0.1	57.0	0	3.2	2.7	0.2

Notes:

µg/L: micrograms per liter

-- : Not Listed

MCL: Maximum Contaminant Level

MDL: Method Detection Limit

RL: Reporting Limit

TC: Target Concentration

Results detected at or above RL shown in bold

DQE FLAGS:

J: Concentration estimated

<: Analyte not detected above RL

Method:

8260B: Volatile Organic Compounds

TABLE 7
ANALYTICAL RESULTS SUMMARY, MARCH 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Well ID	MW-225		MW-226		MW-227		MW-228	
	Lab ID Date	Units	MCL	TC	L10030693-45 3/26/2010	L10030693-46 3/26/2010	L10030693-47 3/26/2010	L10030780-04 3/29/2010	
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	0.926	<0.5	<0.5	<0.5	<0.5	
1,1,2-Trichloroethane	µg/L	5	1.9	<1	<1	<1	<1	<1	
1,1-Dichloroethene	µg/L	7	7	<1	<1	<1	<1	<1	
Carbon tetrachloride	µg/L	5	3	<1	<1	0.682 J	0.756 J		
Chloroform	µg/L	80	12	0.212 J	<0.3	<0.3	<0.3		
cis-1,2-Dichloroethene	µg/L	70	35	<1	<1	<1	<1		
Tetrachloroethene	µg/L	5	2.5	0.679 J	0.751 J	0.543 J	0.445 J		
trans-1,2-Dichloroethene	µg/L	100	50	<1	<1	<1	<1		
Trichloroethene	µg/L	5	5	8.58	<1	<1	<1		
Vinyl chloride	µg/L	2	--	<1	<1	<1	<1		
Total Primary CVOCs					10.4	0.8	1.2	1.2	

Notes:

µg/L: micrograms per liter

-- : Not Listed

MCL: Maximum Contaminant Level

MDL: Method Detection Limit

RL: Reporting Limit

TC: Target Concentration

Results detected at or above RL shown in bold

DQE FLAGS:

J: Concentration estimated

<: Analyte not detected above RL

Method:

8260B: Volatile Organic Compounds

TABLE 8
PRIMARY CVOC RESULTS, MARCH 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

VOC Analyte	MCL (µg/L)	TC (µg/L)	Number of Locations with Analyte Above RL	Maximum Concentrations (µg/L)	Location of Maximum Concentration	Number of Locations with Analyte Above MCL	Number of Locations with Analyte Above TC
1,1,2,2-Tetrachloroethane	--	2.2	8	150	MW-144	-	7
1,1,2-Trichloroethane	5	1.9	0	0.653 J	MW-87	0	0
1,1-Dichloroethene	7	7	1	30.9	MW-31	1	1
Carbon tetrachloride	5	3	3	6.71	MW-32	1	1
Chloroform	80	12	13	60	MW-32	0	3
cis-1,2-Dichloroethene	70	35	5	6.27	MW-32	0	0
Tetrachloroethene	5	2.5	2	22.7	MW-31	1	1
trans-1,2-Dichloroethene	100	50	0	0.926 J	MW-32	0	0
Trichloroethene	5	5	12	109	MW-144	7	7
Vinyl chloride	2	--	0	0		0	-

Notes:

µg/L micrograms per liter

--: Not Listed

MCL: Maximum Contaminant Level

RL: reporting limit

TC: Target Concentration

TABLE 9
ANALYTICAL RESULTS SUMMARY, SEPTEMBER 2010
OFF DEPOT GROUNDWATER
LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Well ID	MCL	TC	MW-147
	Lab ID Date units			L10090659-47 9/23/2010
1,1,2,2-Tetrachloroethane	µg/L	--	2.2	<0.5
1,1,2-Trichloroethane	µg/L	5	1.9	<1
1,1-Dichloroethene	µg/L	7	7	<1
Carbon tetrachloride	µg/L	80	12	<1
Chloroform	µg/L	70	35	<0.3
cis-1,2-Dichloroethene	µg/L	5	2.5	<1
Tetrachloroethene	µg/L	100	50	<1
trans-1,2-Dichloroethene	µg/L	5	5	<1
Trichloroethene	µg/L	2	--	<1
Vinyl chloride	µg/L			<1
Total Primary CVOCs	µg/L			0
Acetone	µg/L			23

Notes:

µg/L: micrograms per liter

-- : Not Listed

MCL: Maximum Contaminant Level

MDL: Method Detection Limit

RL: Reporting Limit

TC: Target Concentration

Results detected at or above RL shown in bold

Method:

8260B: Volatile Organic Compounds

TABLE 10
MANN-KENDALL TREND ANALYSIS - TeCA
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Well	Classification	COC	Coefficient of Variation	MK (S)	Confidence Factor (CF)	Concentration Trend	Number of Sample Rounds	Detects	Max	Min
MW-04	Background	TeCA	0.80	-3	72.90%	S	4	1	0.23	0.23
MW-13	Background	TeCA	1.87	-3	61.40%	NT	8	3	2.64	0.66
MW-14	Background	TeCA	0.49	-2	59.20%	S	6	1	0.15	0.15
MW-51	Background	TeCA	0.39	-6	88.30%	ND	7	0	--	--
MW-65	Background	TeCA	0.00	0	0.00%	N/A	2	0	--	--
MW-128	Background	TeCA	0.44	-7	86.40%	ND	13	0	--	--
MW-172	Background	TeCA	0.19	3	57.95%	ND	9	0	--	--
MW-178	Background	TeCA	0.19	3	57.95%	ND	9	0	--	--
MW-187	Background	TeCA	0.35	-1	50.00%	S	9	1	0.141	0.141
MW-05	Performance	TeCA	0.00	0	0.00%	N/A	1	0	--	--
MW-06	Performance	TeCA	2.08	-43	100.00%	D	10	10	613	2.67
MW-15	Performance	TeCA	1.65	-18	93.40%	PD	11	11	273	0.963
MW-31	Performance	TeCA	0.41	-19	83.50%	S	24	2	0.446	0.262
MW-32	Performance	TeCA	1.14	-27	89.90%	NT	16	12	46	1.59
MW-33	Performance	TeCA	0.48	-29	97.35%	ND	13	0	--	--
MW-44	Performance	TeCA	0.43	-32	95.50%	ND	17	0	--	--
MW-57	Performance	TeCA	0.46	-36	94.20%	ND	18	0	--	--
MW-58	Performance	TeCA	0.40	-3	72.90%	ND	4	0	--	--
MW-69	Performance	TeCA	2.52	-17	83.15%	NT	19	3	5.51	0.229
MW-71	Performance	TeCA	0.87	-17	80.60%	S	16	16	27.6	1.72
MW-74	Performance	TeCA	1.51	-46	100.00%	D	13	13	1330	0.364
MW-75	Performance	TeCA	1.36	-8	95.80%	D	5	3	10.8	0.356
MW-78	Performance	TeCA	1.93	-6	81.45%	NT	11	5	5.2	0.35
MW-87	Performance	TeCA	1.44	-1	50.00%	NT	7	7	180	0.939
MW-91	Performance	TeCA	0.97	5	82.05%	NT	6	3	0.92	0.26
MW-132	Performance	TeCA	1.62	-43	99.85%	D	13	10	2400	0.277
MW-144	Performance	TeCA	0.89	-101	100.00%	D	21	17	13000	79.4
MW-145	Performance	TeCA	0.54	-23	85.90%	S	21	1	0.274	0.274
MW-147	Performance	TeCA	1.24	-40	94.60%	PD	20	14	634	0.373
MW-153	Performance	TeCA	0.50	-25	97.00%	ND	16	0	--	--
MW-174	Performance	TeCA	1.17	14	87.30%	NT	11	6	2.08	0.315
MW-175	Performance	TeCA	0.09	-2	59.20%	ND	5	0	--	--
MW-176	Performance	TeCA	0.24	4	75.80%	ND	5	0	--	--
MW-179	Performance	TeCA	0.89	-1	50.00%	S	9	1	0.326	0.326
MW-180	Performance	TeCA	2.04	-16	94.00%	PD	9	4	44.2	0.763
MW-184	Performance	TeCA	1.36	1	50.00%	NT	4	2	5.06	1.74
MW-190	Performance	TeCA	1.62	-10	99.20%	D	5	5	4410	23.5
MW-221	Performance	TeCA	2.79	-13	92.85%	PD	8	4	110	0.147
MW-222	Performance	TeCA	2.07	-20	99.30%	D	8	6	1130	1.19
MW-223	Performance	TeCA	1.86	-16	96.90%	D	8	7	30.3	0.227
MW-224	Performance	TeCA	2.82	-1	50.00%	NT	10	2	190	140
MW-225	Performance	TeCA	0.85	-18	98.40%	D	9	8	75.9	0.926
MW-226	Performance	TeCA	2.69	-8	80.10%	NT	8	2	220	9.56
MW-227	Performance	TeCA	1.39	-20	99.30%	D	10	8	130	5.14
MW-228	Performance	TeCA	2.46	-19	98.85%	D	8	4	46	0.22
MW-37	Sentinel	TeCA	1.27	-21	91.30%	PD	16	1	0.788	0.788
MW-169	Sentinel	TeCA	0.72	-31	99.20%	ND	17	0	--	--
MW-170	Sentinel	TeCA	0.72	-31	99.20%	ND	21	0	--	--
MW-171	Sentinel	TeCA	0.72	-31	99.20%	ND	17	0	--	--
MW-182	Sentinel	TeCA	0.00	0	37.50%	ND	4	0	--	--
MW-185	Sentinel	TeCA	0.00	0	37.50%	ND	4	0	--	--
MW-186	Sentinel	TeCA	0.85	-1	50.00%	S	5	1	0.43	0.43
MW-231	Sentinel	TeCA	0.00	0	37.50%	ND	4	0	--	--
MW-234	Sentinel	TeCA	1.24	-3	72.90%	NT	4	1	0.469	0.469
MW-235	Sentinel	TeCA	0.00	0	37.50%	ND	4	0	--	--
MW-237	Sentinel	TeCA	0.00	0	37.50%	ND	4	0	--	--
MW-239	Sentinel	TeCA	1.37	3	72.90%	NT	4	1	0.605	0.605
MW-240	Sentinel	TeCA	0.00	0	40.80%	ND	5	0	--	--

Notes:

I: Increasing
D: Decreasing
N/A: Insufficient Data
ND: Not Detected

NT: No Trend
PD: Probably Decreasing
PI: Probably Increasing
S: Stable

TABLE 11
MANN-KENDALL TREND ANALYSIS - DCE
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Well	Classification	COC	Coefficient of Variation	MK (S)	Confidence Factor (CF)	Concentration Trend	Number of Sample Rounds	Detects	Max	Min
MW-04	Background	DCE	0.00	0	37.50%	ND	4	0	--	--
MW-13	Background	DCE	0.00	0	43.73%	ND	8	0	--	--
MW-14	Background	DCE	0.00	0	40.80%	ND	6	0	--	--
MW-51	Background	DCE	0.14	0	40.80%	S	7	7	21	14
MW-65	Background	DCE	0.00	0	0.00%	N/A	2	0	--	--
MW-128	Background	DCE	1.11	-9	93.20%	PD	13	12	310	0.74
MW-172	Background	DCE	0.31	6	69.40%	ND	9	0	--	--
MW-178	Background	DCE	0.31	6	69.40%	ND	9	0	--	--
MW-187	Background	DCE	0.31	6	69.40%	ND	9	0	--	--
MW-05	Performance	DCE	0.00	0	0.00%	N/A	1	0	--	--
MW-06	Performance	DCE	0.29	5	63.60%	ND	10	0	--	--
MW-15	Performance	DCE	0.29	5	63.60%	ND	11	0	--	--
MW-31	Performance	DCE	0.48	1	50.00%	NT	24	23	40	4.69
MW-32	Performance	DCE	0.15	12	70.40%	ND	16	0	--	--
MW-33	Performance	DCE	0.16	15	82.75%	ND	13	0	--	--
MW-44	Performance	DCE	0.15	15	77.50%	ND	17	0	--	--
MW-57	Performance	DCE	0.41	24	84.70%	NT	18	1	0.538	0.538
MW-58	Performance	DCE	0.00	0	37.50%	ND	4	0	--	--
MW-69	Performance	DCE	0.16	18	84.70%	ND	19	0	--	--
MW-71	Performance	DCE	0.15	15	77.50%	ND	16	0	--	--
MW-74	Performance	DCE	0.26	3	55.35%	ND	13	0	--	--
MW-75	Performance	DCE	0.00	0	40.80%	ND	5	0	--	--
MW-78	Performance	DCE	0.00	0	42.27%	ND	11	0	--	--
MW-87	Performance	DCE	0.00	0	42.27%	ND	7	0	--	--
MW-91	Performance	DCE	0.00	0	40.80%	ND	6	0	--	--
MW-132	Performance	DCE	1.18	-3	55.35%	NT	13	1	1.8	1.8
MW-144	Performance	DCE	1.31	2	51.80%	ND	21	1	0	0
MW-145	Performance	DCE	0.15	12	70.40%	ND	21	0	--	--
MW-147	Performance	DCE	1.04	-47	97.10%	D	20	11	5.65	0.657
MW-153	Performance	DCE	0.32	-1	50.00%	S	16	15	9.1	2.99
MW-174	Performance	DCE	0.29	5	63.60%	ND	11	0	--	--
MW-175	Performance	DCE	0.46	2	59.20%	ND	5	0	--	--
MW-176	Performance	DCE	0.00	0	40.80%	ND	5	0	--	--
MW-179	Performance	DCE	0.31	6	69.40%	ND	9	0	--	--
MW-180	Performance	DCE	1.18	10	82.10%	NT	9	3	2.04	0.558
MW-184	Performance	DCE	0.00	0	37.50%	ND	4	0	--	--
MW-190	Performance	DCE	0.00	0	40.80%	ND	5	0	--	--
MW-221	Performance	DCE	0.34	7	76.35%	ND	8	0	--	--
MW-222	Performance	DCE	0.10	7	76.35%	ND	8	0	--	--
MW-223	Performance	DCE	0.27	7	76.35%	ND	8	0	--	--
MW-224	Performance	DCE	0.34	7	76.35%	ND	10	0	--	--
MW-225	Performance	DCE	0.34	7	76.35%	ND	9	0	--	--
MW-226	Performance	DCE	0.27	7	76.35%	ND	8	0	--	--
MW-227	Performance	DCE	0.34	7	76.35%	ND	10	0	--	--
MW-228	Performance	DCE	0.34	7	76.35%	ND	8	0	--	--
MW-37	Sentinel	DCE	0.16	15	82.75%	ND	16	0	--	--
MW-169	Sentinel	DCE	0.25	11	77.70%	ND	17	0	--	--
MW-170	Sentinel	DCE	0.62	-30	98.95%	D	21	9	4.37	1.3
MW-171	Sentinel	DCE	0.30	7	67.60%	NT	17	1	0.544	0.544
MW-182	Sentinel	DCE	0.00	0	37.50%	ND	4	0	--	--
MW-185	Sentinel	DCE	0.00	0	37.50%	ND	4	0	--	--
MW-186	Sentinel	DCE	0.00	0	37.50%	ND	5	0	--	--
MW-231	Sentinel	DCE	0.00	0	37.50%	ND	4	0	--	--
MW-234	Sentinel	DCE	0.00	0	37.50%	ND	4	0	--	--
MW-235	Sentinel	DCE	0.00	0	37.50%	ND	4	0	--	--
MW-237	Sentinel	DCE	0.10	-4	83.30%	S	4	4	2.2	1.77
MW-239	Sentinel	DCE	0.46	2	62.50%	NT	4	3	0.899	0.536
MW-240	Sentinel	DCE	0.00	0	40.80%	ND	5	0	--	--

Notes:

I: Increasing
D: Decreasing
N/A: Insufficient Data
ND: Not Detected

NT: No Trend
PD: Probably Decreasing
PI: Probably Increasing
S: Stable

TABLE 12
MANN-KENDALL TREND ANALYSIS - CT
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Well	Classification	COC	Coefficient of Variation	MK (S)	Confidence Factor (CF)	Concentration Trend	Number of Sample Rounds	Detects	Max	Min
MW-04	Background	CT	0.00	0	37.50%	ND	4	0	--	--
MW-13	Background	CT	0.00	0	43.73%	ND	8	0	--	--
MW-14	Background	CT	0.97	7	92.05%	PI	6	2	0.939	0.743
MW-51	Background	CT	0.00	0	40.80%	ND	7	0	--	--
MW-65	Background	CT	0.00	0	0.00%	N/A	2	0	--	--
MW-128	Background	CT	0.13	-1	50.00%	ND	13	0	--	--
MW-172	Background	CT	1.08	2	54.00%	NT	9	4	1.5	0.35
MW-178	Background	CT	0.20	6	69.40%	ND	9	0	--	--
MW-187	Background	CT	1.13	-6	69.40%	NT	9	1	0.8	0.8
MW-05	Performance	CT	0.00	0	0.00%	N/A	1	0	--	--
MW-06	Performance	CT	1.25	-44	100.00%	D	10	8	31.2	0.463
MW-15	Performance	CT	1.15	-33	99.90%	D	11	11	58.2	0.513
MW-31	Performance	CT	0.43	-7	62.60%	S	24	6	0.539	0.18
MW-32	Performance	CT	0.93	-14	73.65%	S	16	12	20.2	2.3
MW-33	Performance	CT	1.12	9	70.40%	NT	13	5	1.5	0.278
MW-44	Performance	CT	0.52	-13	74.10%	S	17	14	1.3	0.5
MW-57	Performance	CT	0.66	-70	99.90%	D	18	17	33	0.9
MW-58	Performance	CT	1.16	3	72.90%	NT	4	1	0.81	0.81
MW-69	Performance	CT	0.14	-18	84.70%	ND	19	0	--	--
MW-71	Performance	CT	0.91	-29	93.70%	PD	16	15	37.8	0.301
MW-74	Performance	CT	0.17	3	55.35%	ND	13	0	--	--
MW-75	Performance	CT	0.00	0	40.80%	ND	5	0	--	--
MW-78	Performance	CT	0.00	0	42.27%	ND	11	0	--	--
MW-87	Performance	CT	1.28	-12	98.20%	D	7	4	18.7	7.16
MW-91	Performance	CT	1.00	-8	95.80%	D	6	6	9.35	0.449
MW-132	Performance	CT	0.20	-3	55.35%	ND	13	0	--	--
MW-144	Performance	CT	1.07	-7	60.50%	NT	21	5	1.59	0.9
MW-145	Performance	CT	0.13	-12	70.40%	ND	21	0	--	--
MW-147	Performance	CT	1.23	-73	99.90%	D	20	12	4.3	0.36
MW-153	Performance	CT	0.14	-18	90.45%	ND	16	0	--	--
MW-174	Performance	CT	1.11	-14	87.30%	NT	11	7	5.9	0.607
MW-175	Performance	CT	0.72	3	67.50%	NT	5	2	0.383	0.361
MW-176	Performance	CT	0.71	-2	59.20%	S	5	1	0.415	0.415
MW-179	Performance	CT	0.20	6	69.40%	ND	9	0	--	--
MW-180	Performance	CT	0.96	-15	92.50%	PD	9	2	0.72	0.26
MW-184	Performance	CT	0.57	2	62.50%	NT	4	4	13.4	4.19
MW-190	Performance	CT	1.07	-5	82.05%	NT	5	2	1.17	0.63
MW-221	Performance	CT	0.21	7	76.35%	ND	8	0	--	--
MW-222	Performance	CT	0.36	-7	76.35%	ND	8	0	--	--
MW-223	Performance	CT	0.57	-13	92.85%	PD	8	2	0.39	0.283
MW-224	Performance	CT	0.21	7	76.35%	ND	10	0	--	--
MW-225	Performance	CT	0.21	7	76.35%	ND	9	0	--	--
MW-226	Performance	CT	0.06	7	76.35%	ND	8	0	--	--
MW-227	Performance	CT	1.44	-20	99.30%	D	10	9	43	0.524
MW-228	Performance	CT	1.67	4	64.00%	NT	8	3	3.4	0.627
MW-37	Sentinel	CT	2.46	-9	70.40%	NT	16	1	4.12	4.12
MW-169	Sentinel	CT	0.37	-31	99.20%	ND	17	0	--	--
MW-170	Sentinel	CT	0.37	-31	99.20%	ND	21	0	--	--
MW-171	Sentinel	CT	0.37	-31	99.20%	ND	17	0	--	--
MW-182	Sentinel	CT	0.00	0	37.50%	ND	4	0	--	--
MW-185	Sentinel	CT	0.00	0	37.50%	ND	4	0	--	--
MW-186	Sentinel	CT	0.00	0	37.50%	ND	5	0	--	--
MW-231	Sentinel	CT	0.00	0	37.50%	ND	4	0	--	--
MW-234	Sentinel	CT	0.00	0	37.50%	ND	4	0	--	--
MW-235	Sentinel	CT	0.00	0	37.50%	ND	4	0	--	--
MW-237	Sentinel	CT	0.00	0	37.50%	ND	4	0	--	--
MW-239	Sentinel	CT	0.00	0	37.50%	ND	4	0	--	--
MW-240	Sentinel	CT	0.00	0	40.80%	ND	5	0	--	--

Notes:

I: Increasing
D: Decreasing
N/A: Insufficient Data
ND: Not Detected

NT: No Trend
PD: Probably Decreasing
PI: Probably Increasing
S: Stable

TABLE 13
MANN-KENDALL TREND ANALYSIS - CF
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Well	Classification	COC	Coefficient of Variation	MK (S)	Confidence Factor (CF)	Concentration Trend	Number of Sample Rounds	Detects	Max	Min
MW-04	Background	CF	0.37	-2	62.50%	S	4	4	0.43	0.16
MW-13	Background	CF	0.44	-15	98.50%	D	8	8	0.409	0.127
MW-14	Background	CF	0.00	0	40.80%	ND	6	0	--	--
MW-51	Background	CF	0.80	7	92.05%	PI	7	3	0.449	0.186
MW-65	Background	CF	0.00	0	0.00%	N/A	2	0	--	--
MW-128	Background	CF	0.53	-1	50.00%	ND	13	0	--	--
MW-172	Background	CF	2.04	-26	99.70%	D	9	5	13	0.139
MW-178	Background	CF	1.07	17	95.10%	I	9	7	1.03	0.125
MW-187	Background	CF	0.53	3	57.95%	NT	9	6	0.29	0.13
MW-05	Performance	CF	0.00	0	0.00%	N/A	1	1	0.227	0.227
MW-06	Performance	CF	1.26	-19	94.60%	PD	10	10	84.7	5.4
MW-15	Performance	CF	1.54	-37	100.00%	D	11	11	1530	0.524
MW-31	Performance	CF	0.75	11	70.50%	NT	24	14	1.19	0.131
MW-32	Performance	CF	1.08	-17	78.20%	NT	16	15	176	0.2
MW-33	Performance	CF	0.54	-3	55.35%	S	13	1	0.184	0.184
MW-44	Performance	CF	0.56	-22	87.15%	S	17	13	0.91	0.213
MW-57	Performance	CF	1.32	46	97.90%	I	18	18	73	3.25
MW-58	Performance	CF	1.31	0	37.50%	NT	4	4	8.89	0.149
MW-69	Performance	CF	0.37	2	52.40%	NT	19	8	0.261	0.136
MW-71	Performance	CF	1.35	-47	99.50%	D	16	16	303	1.47
MW-74	Performance	CF	1.21	2	52.70%	NT	13	7	1.37	0.163
MW-75	Performance	CF	0.85	7	92.05%	PI	5	3	0.383	0.129
MW-78	Performance	CF	0.00	0	42.27%	ND	11	0	--	--
MW-87	Performance	CF	0.94	-5	76.50%	S	7	7	6.25	0.148
MW-91	Performance	CF	1.13	-4	75.80%	NT	6	6	25.6	0.538
MW-132	Performance	CF	1.17	-5	60.55%	NT	13	5	0.732	0.13
MW-144	Performance	CF	0.73	-27	87.65%	S	21	12	4.3	0.316
MW-145	Performance	CF	0.52	-12	70.40%	ND	21	0	--	--
MW-147	Performance	CF	0.99	-92	100.00%	D	20	14	13.4	0.147
MW-153	Performance	CF	0.53	-18	90.45%	ND	16	0	--	--
MW-174	Performance	CF	1.47	-25	98.60%	D	11	10	68	0.154
MW-175	Performance	CF	0.83	0	40.80%	S	5	5	2.55	0.48
MW-176	Performance	CF	0.42	-6	88.30%	S	5	4	0.246	0.147
MW-179	Performance	CF	0.50	6	69.40%	NT	9	4	0.16	0.125
MW-180	Performance	CF	1.64	-8	76.20%	NT	9	4	2.04	0.136
MW-184	Performance	CF	1.32	0	37.50%	NT	4	4	117	2.94
MW-190	Performance	CF	1.10	-8	95.80%	D	5	5	2.73	0.135
MW-221	Performance	CF	1.65	-18	98.40%	D	8	3	1.4	0.167
MW-222	Performance	CF	0.73	3	59.40%	NT	8	4	0.396	0.156
MW-223	Performance	CF	0.56	-10	86.20%	S	8	8	0.95	0.177
MW-224	Performance	CF	0.56	-2	54.80%	S	10	4	0.186	0.15
MW-225	Performance	CF	0.83	-14	94.60%	PD	9	7	0.78	0.149
MW-226	Performance	CF	0.96	-13	92.85%	PD	8	7	0.72	0.133
MW-227	Performance	CF	1.58	-24	99.90%	D	10	9	1100	0.322
MW-228	Performance	CF	2.63	-23	99.85%	D	8	5	120	0.155
MW-37	Sentinel	CF	2.93	-9	70.40%	NT	16	1	6.01	6.01
MW-169	Sentinel	CF	1.38	-31	99.20%	D	17	2	0.8	0.8
MW-170	Sentinel	CF	0.89	-31	99.20%	D	21	2	0.42	0.42
MW-171	Sentinel	CF	0.67	-31	99.20%	ND	17	0	--	--
MW-182	Sentinel	CF	0.00	0	37.50%	ND	4	0	--	--
MW-185	Sentinel	CF	0.00	0	37.50%	ND	4	0	--	--
MW-186	Sentinel	CF	0.00	0	37.50%	ND	5	0	--	--
MW-231	Sentinel	CF	0.00	0	37.50%	ND	4	0	--	--
MW-234	Sentinel	CF	0.00	0	37.50%	ND	4	0	--	--
MW-235	Sentinel	CF	0.00	0	37.50%	ND	4	0	--	--
MW-237	Sentinel	CF	0.39	-6	95.80%	D	4	3	0.181	0.129
MW-239	Sentinel	CF	0.00	0	37.50%	ND	4	0	--	--
MW-240	Sentinel	CF	0.00	0	40.80%	ND	5	0	--	--

Notes:

I: Increasing
D: Decreasing
N/A: Insufficient Data
ND: Not Detected

NT: No Trend
PD: Probably Decreasing
PI: Probably Increasing
S: Stable

TABLE 14
MANN-KENDALL TREND ANALYSIS - PCE
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Well	Classification	COC	Coefficient of Variation	MK (S)	Confidence Factor (CF)	Concentration Trend	Number of Sample Rounds	Detects	Max	Min
MW-04	Background	PCE	1.18	-5	89.55%	NT	4	2	33.4	23.4
MW-13	Background	PCE	0.90	-20	99.95%	D	8	6	4.69	0.571
MW-14	Background	PCE	0.85	2	59.20%	NT	6	1	0.507	0.507
MW-51	Background	PCE	0.49	6	88.30%	NT	7	7	2.3	0.3
MW-65	Background	PCE	0.00	0	0.00%	N/A	2	0	--	--
MW-128	Background	PCE	0.13	-5	76.50%	S	13	2	0.18	0.15
MW-172	Background	PCE	0.74	7	72.80%	NT	9	3	0.59	0.296
MW-178	Background	PCE	0.98	-29	99.95%	D	9	7	2.8	0.263
MW-187	Background	PCE	0.51	-1	50.00%	S	9	2	0.36	0.253
MW-05	Performance	PCE	0.00	0	0.00%	N/A	1	0	--	--
MW-06	Performance	PCE	0.86	-40	100.00%	D	10	7	1.9	0.254
MW-15	Performance	PCE	1.02	-31	99.80%	D	11	11	14.4	0.612
MW-31	Performance	PCE	1.76	43	99.00%	I	24	22	43.5	0.31
MW-32	Performance	PCE	1.24	3	53.90%	NT	16	10	5.41	0.37
MW-33	Performance	PCE	0.14	-15	82.75%	ND	13	0	--	--
MW-44	Performance	PCE	0.13	-15	77.50%	ND	17	0	--	--
MW-57	Performance	PCE	0.49	-48	98.40%	D	18	18	5.06	0.27
MW-58	Performance	PCE	0.54	3	72.90%	NT	4	1	0.309	0.309
MW-69	Performance	PCE	0.86	-22	89.80%	S	19	13	4.72	0.271
MW-71	Performance	PCE	1.23	-18	82.05%	NT	16	14	7.34	0.265
MW-74	Performance	PCE	1.63	-18	87.50%	NT	13	13	8.93	0.473
MW-75	Performance	PCE	0.48	-2	59.20%	S	5	5	1.31	0.46
MW-78	Performance	PCE	0.00	0	42.27%	ND	11	0	--	--
MW-87	Performance	PCE	0.96	-12	98.20%	D	7	4	1.45	0.676
MW-91	Performance	PCE	0.36	-8	95.80%	D	6	6	1.18	0.494
MW-132	Performance	PCE	1.36	-20	90.20%	PD	13	13	8.3	0.303
MW-144	Performance	PCE	0.92	-17	76.10%	S	21	17	19.9	0
MW-145	Performance	PCE	0.13	-12	70.40%	ND	21	1	0	0
MW-147	Performance	PCE	0.77	-53	98.45%	D	20	14	12.2	2.95
MW-153	Performance	PCE	0.69	-5	61.90%	S	16	5	0.714	0.24
MW-174	Performance	PCE	0.85	-8	72.90%	S	11	8	1.9	0.297
MW-175	Performance	PCE	0.46	-4	75.80%	S	5	4	0.52	0.28
MW-176	Performance	PCE	0.64	-7	92.05%	PD	5	2	0.44	0.287
MW-179	Performance	PCE	0.68	-18	96.20%	D	9	8	1.77	0.281
MW-180	Performance	PCE	1.26	-14	91.00%	PD	9	5	5.02	0.766
MW-184	Performance	PCE	1.49	2	62.50%	NT	4	3	4.98	0.393
MW-190	Performance	PCE	1.21	-8	95.80%	D	5	5	12.5	0.588
MW-221	Performance	PCE	1.97	-18	98.40%	D	8	3	6.9	0.893
MW-222	Performance	PCE	1.70	-14	94.60%	PD	8	7	5.7	0.312
MW-223	Performance	PCE	1.27	-10	86.20%	NT	8	8	3.7	0.262
MW-224	Performance	PCE	0.75	-24	99.90%	D	10	9	2.23	0.436
MW-225	Performance	PCE	0.68	-4	64.00%	S	9	8	2.3	0.566
MW-226	Performance	PCE	1.68	4	64.00%	NT	8	7	7.1	0.417
MW-227	Performance	PCE	1.46	-20	99.30%	D	10	10	22	0.267
MW-228	Performance	PCE	1.41	4	64.00%	NT	8	3	1.8	0.399
MW-37	Sentinel	PCE	0.82	-9	70.40%	S	16	1	0.637	0.637
MW-169	Sentinel	PCE	0.37	-31	99.20%	ND	17	0	--	--
MW-170	Sentinel	PCE	0.42	-27	98.00%	D	21	1	0.485	0.485
MW-171	Sentinel	PCE	0.37	-31	99.20%	ND	17	0	--	--
MW-182	Sentinel	PCE	0.00	0	37.50%	ND	4	0	--	--
MW-185	Sentinel	PCE	0.00	0	37.50%	ND	4	0	--	--
MW-186	Sentinel	PCE	0.00	0	37.50%	ND	5	0	--	--
MW-231	Sentinel	PCE	0.00	0	37.50%	ND	4	0	--	--
MW-234	Sentinel	PCE	0.00	0	37.50%	ND	4	0	--	--
MW-235	Sentinel	PCE	0.00	0	37.50%	ND	4	0	--	--
MW-237	Sentinel	PCE	0.31	0	37.50%	S	4	3	0.286	0.256
MW-239	Sentinel	PCE	0.00	0	37.50%	ND	4	0	--	--
MW-240	Sentinel	PCE	0.00	0	40.80%	ND	5	0	--	--

Notes:

I: Increasing
D: Decreasing
N/A: Insufficient Data
ND: Not Detected

NT: No Trend
PD: Probably Decreasing
PI: Probably Increasing
S: Stable

TABLE 15
MANN-KENDALL TREND ANALYSIS - TCE
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Well	Classification	COC	Coefficient of Variation	MK (S)	Confidence Factor (CF)	Concentration Trend	Number of Sample Rounds	Detects	Max	Min
MW-04	Background	TCE	1.12	-5	89.55%	NT	4	2	2.23	1.11
MW-13	Background	TCE	0.96	-7	80.90%	S	8	3	0.91	0.262
MW-14	Background	TCE	0.00	0	40.80%	ND	6	0	--	--
MW-51	Background	TCE	0.34	6	88.30%	NT	7	7	10.4	3.8
MW-65	Background	TCE	0.00	0	0.00%	N/A	2	0	--	--
MW-128	Background	TCE	0.92	-9	93.20%	PD	13	11	38	0.42
MW-172	Background	TCE	2.05	-19	97.00%	D	9	3	7	0.383
MW-178	Background	TCE	2.20	-24	99.40%	D	9	5	130	0.373
MW-187	Background	TCE	2.21	-13	89.00%	NT	9	2	3.7	0.26
MW-05	Performance	TCE	0.00	0	0.00%	N/A	1	0	--	--
MW-06	Performance	TCE	1.25	-45	100.00%	D	10	10	236	2.29
MW-15	Performance	TCE	1.14	-35	100.00%	D	11	11	403	0.289
MW-31	Performance	TCE	0.73	43	99.00%	I	24	23	34.2	1.83
MW-32	Performance	TCE	1.19	-3	53.90%	NT	16	15	113	2.47
MW-33	Performance	TCE	0.14	-15	82.75%	ND	13	0	--	--
MW-44	Performance	TCE	0.57	0	47.80%	S	17	13	1.14	0.252
MW-57	Performance	TCE	0.32	-26	86.70%	S	18	18	48	7.57
MW-58	Performance	TCE	0.59	-4	83.30%	S	4	3	0.67	0.321
MW-69	Performance	TCE	1.32	-22	89.80%	NT	19	10	9.84	0.334
MW-71	Performance	TCE	1.39	-29	93.70%	PD	16	16	158	0.612
MW-74	Performance	TCE	2.02	-48	100.00%	D	13	13	1240	0.458
MW-75	Performance	TCE	2.07	-7	92.05%	PD	5	2	31.5	1.71
MW-78	Performance	TCE	0.53	-7	86.40%	S	11	5	0.59	0.26
MW-87	Performance	TCE	1.11	-7	86.40%	NT	7	6	105	0.778
MW-91	Performance	TCE	0.98	-4	75.80%	S	6	5	13.8	0.567
MW-132	Performance	TCE	1.91	-43	99.85%	D	13	10	1570	0.305
MW-144	Performance	TCE	0.76	-78	100.00%	D	21	18	4500	0
MW-145	Performance	TCE	0.13	-12	70.40%	ND	21	0	--	--
MW-147	Performance	TCE	0.87	-73	99.90%	D	20	15	278	0.313
MW-153	Performance	TCE	0.55	0	46.87%	S	16	3	0.469	0.251
MW-174	Performance	TCE	1.54	-23	97.70%	D	11	6	33	0.485
MW-175	Performance	TCE	0.73	-4	75.80%	S	5	5	2.2	0.39
MW-176	Performance	TCE	1.33	-7	92.05%	PD	5	3	3.07	0.579
MW-179	Performance	TCE	1.41	-20	97.80%	D	9	4	2.11	0.264
MW-180	Performance	TCE	2.20	-14	91.00%	PD	9	5	78	0.893
MW-184	Performance	TCE	1.41	0	37.50%	NT	4	4	84	2.27
MW-190	Performance	TCE	1.61	-8	95.80%	D	5	5	2720	27.6
MW-221	Performance	TCE	2.73	-18	98.40%	D	8	4	140	0.501
MW-222	Performance	TCE	2.12	-16	96.90%	D	8	8	1100	1.04
MW-223	Performance	TCE	2.10	-16	96.90%	D	8	8	500	1.49
MW-224	Performance	TCE	2.42	-13	92.85%	PD	10	3	92	13.4
MW-225	Performance	TCE	1.76	-22	99.80%	D	9	8	320	8.58
MW-226	Performance	TCE	2.72	-18	98.40%	D	8	3	740	0.855
MW-227	Performance	TCE	1.52	-23	99.85%	D	10	8	440	3.56
MW-228	Performance	TCE	2.65	-16	96.90%	D	8	3	42	0.911
MW-37	Sentinel	TCE	2.12	-9	70.40%	NT	16	1	2.71	2.71
MW-169	Sentinel	TCE	0.37	-31	99.20%	ND	17	0	--	--
MW-170	Sentinel	TCE	0.37	-31	99.20%	ND	21	0	--	--
MW-171	Sentinel	TCE	0.37	-31	99.20%	ND	17	0	--	--
MW-182	Sentinel	TCE	1.13	-3	72.90%	NT	4	1	0.77	0.77
MW-185	Sentinel	TCE	0.99	-4	83.30%	S	4	3	1.88	0.448
MW-186	Sentinel	TCE	0.87	2	62.50%	NT	5	5	4.92	0.422
MW-231	Sentinel	TCE	0.00	0	37.50%	ND	4	0	--	--
MW-234	Sentinel	TCE	0.00	0	37.50%	ND	4	0	--	--
MW-235	Sentinel	TCE	0.00	0	37.50%	ND	4	0	--	--
MW-237	Sentinel	TCE	0.00	0	37.50%	ND	4	0	--	--
MW-239	Sentinel	TCE	0.00	0	37.50%	ND	4	0	--	--
MW-240	Sentinel	TCE	0.19	-6	88.30%	S	5	5	2.42	1.56

Notes:

I: Increasing
D: Decreasing
N/A: Insufficient Data
ND: Not Detected

NT: No Trend
PD: Probably Decreasing
PI: Probably Increasing
S: Stable

FIGURES



Figure 1

SITE LOCATION MAP

OFF DEPOT GROUNDWATER
ANNUAL LONG TERM
MONITORING REPORT – 2010

DUNN FIELD
DEFENSE DEPOT
MEMPHIS, TENNESSEE

Projection: NAD 1927 StatePlane Tennessee
Units: Feet

0 0.6 1.2 1.8 2.4 3 Miles

**Installation Location
Memphis, Tennessee**



Date: January 2011
Edition: Rev 0

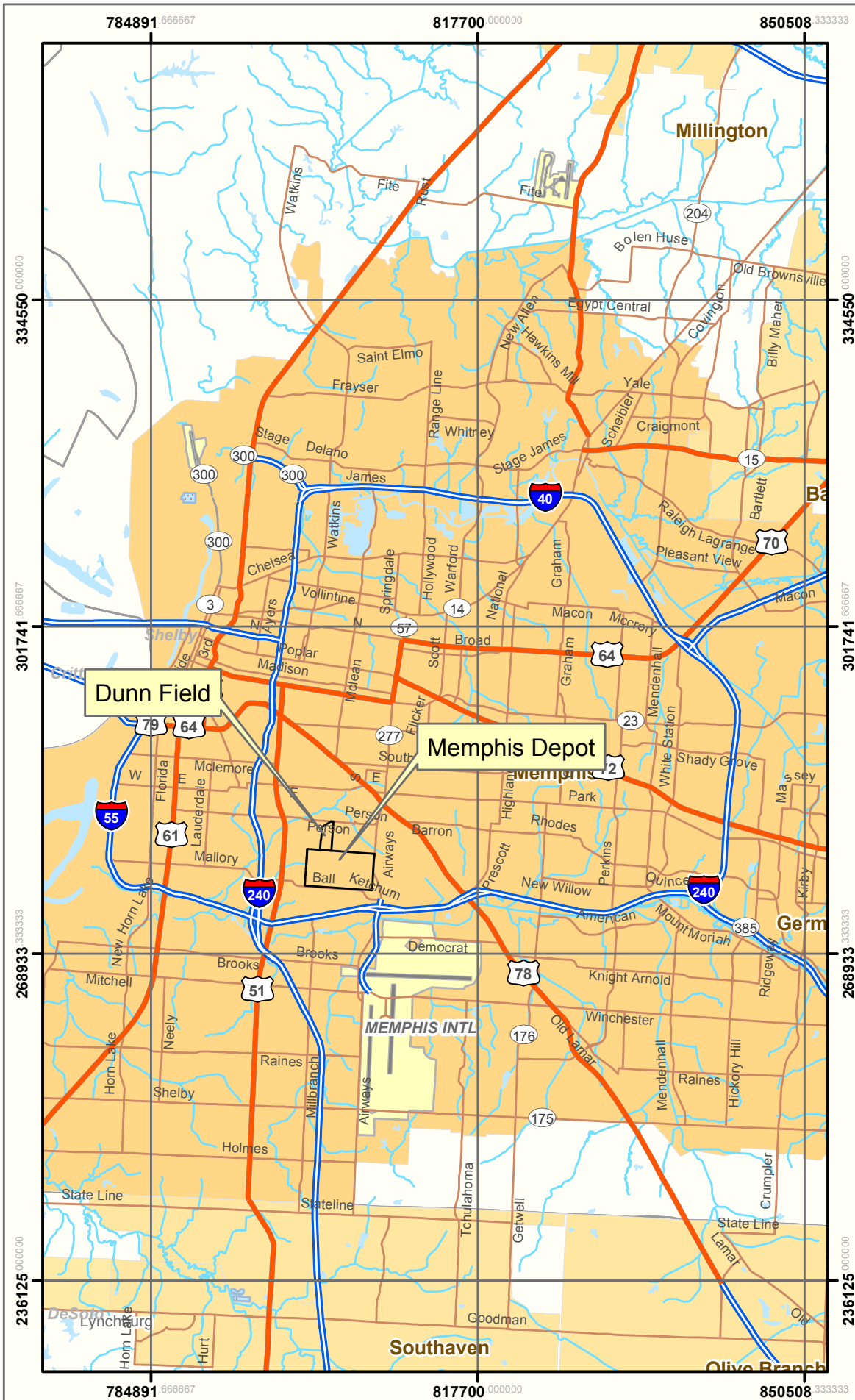




Figure 2

WELL LOCATION MAP

OFF DEPOT GROUNDWATER
ANNUAL LONG TERM
MONITORING REPORT - 2010

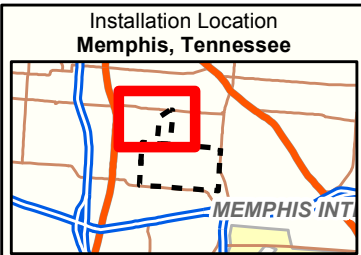
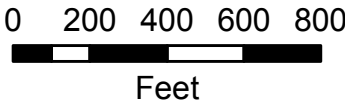
DUNN FIELD
DEFENSE DEPOT
MEMPHIS, TENNESSEE

Legend

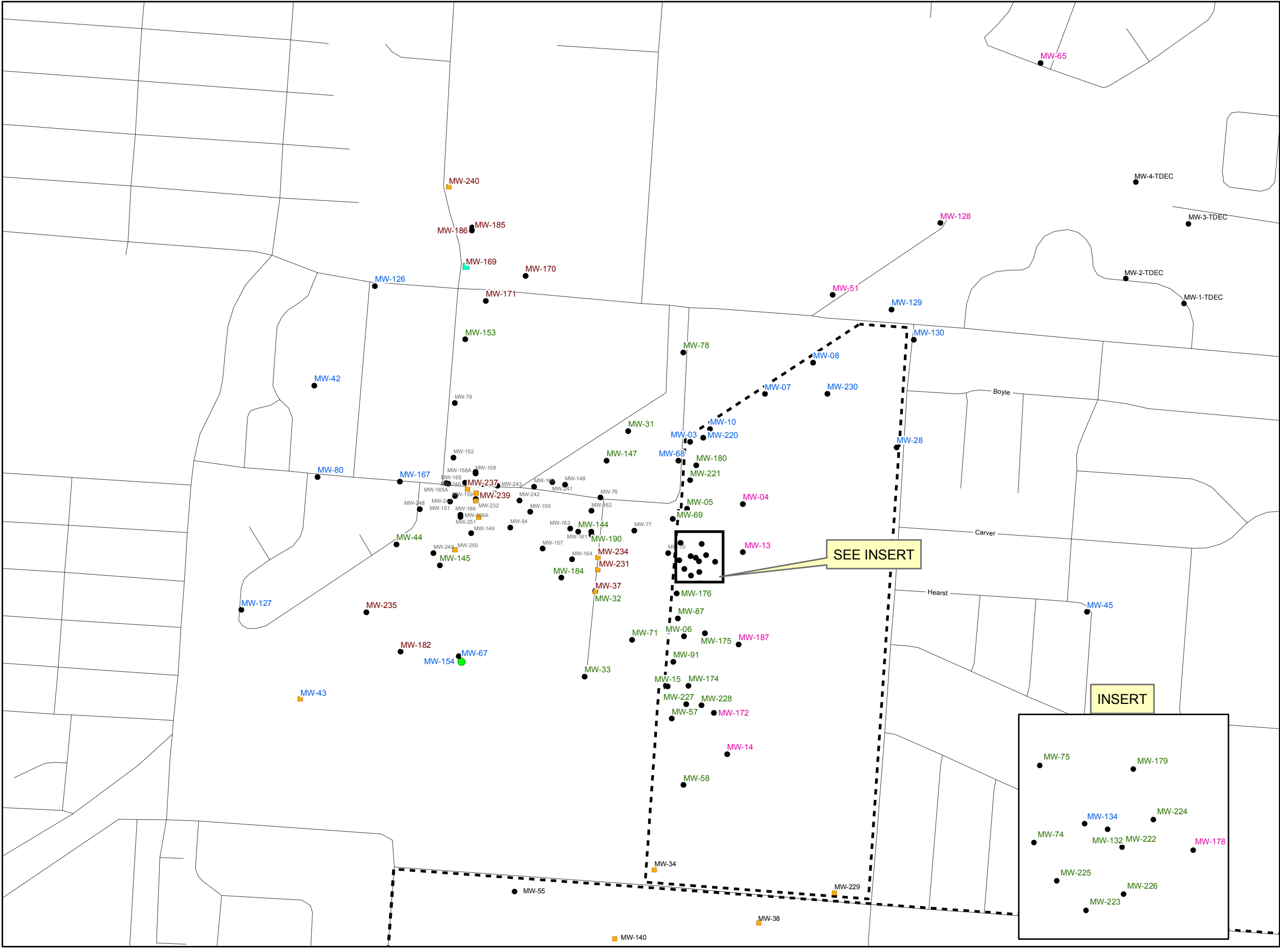
- Monitoring Well Screened in the Fluvial Aquifer
- Monitoring Well Screened in the Intermediate Aquifer
- Monitoring Well Screened in the Transition Zone
- Monitoring Well Screened in the Memphis Aquifer

Off Depot Well Classification

- MW-04 Background
- MW-05 Sentinel
- MW-06 Performance
- MW-03 Water Level Only
- Dunn Field Boundary



Date: January 2011
Edition: Rev 0



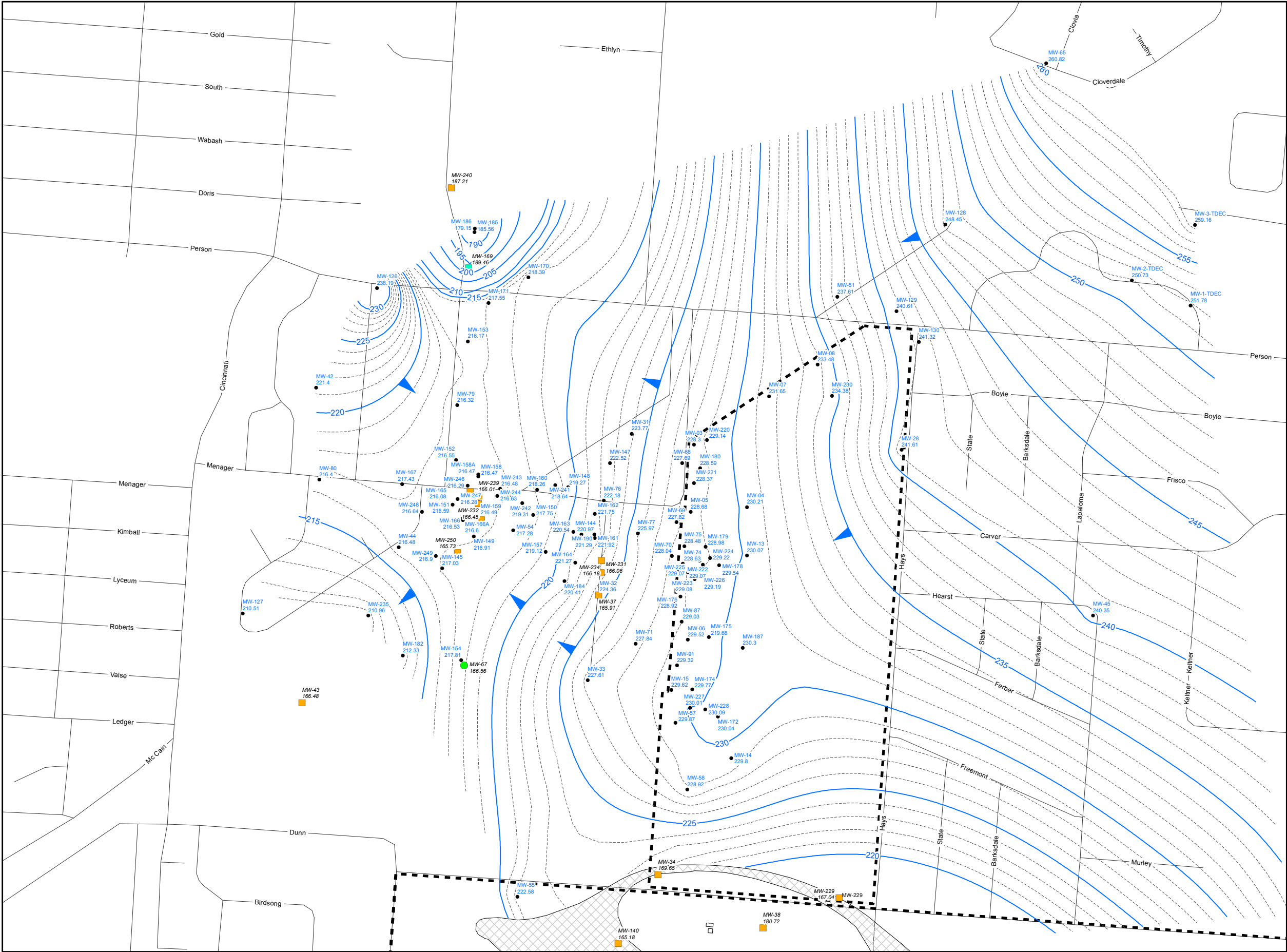
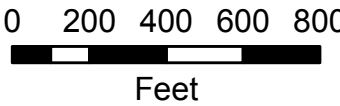


Figure 3
**GROUNDWATER
ELEVATION MAP,
FLUVIAL AQUIFER,
MARCH 2010**

OFF DEPOT GROUNDWATER
ANNUAL LONG TERM
MONITORING REPORT - 2010

DUNN FIELD
DEFENSE DEPOT
MEMPHIS, TENNESSEE

- Legend**
- Monitoring Well Screened in the Fluvial Aquifer
 - Monitoring Well Screened in the Intermediate Aquifer
 - Monitoring Well Screened in the Transition Zone
 - Monitoring Well Screened in the Memphis Aquifer
 - Dunn Field Boundary
 - Clay Elevation Exceeds Groundwater Elevation
- Groundwater Contours**
- 1-ft Contour
 - 5-ft Contour
 - Groundwater Flow Direction



Date: January 2011
Edition: Rev 0



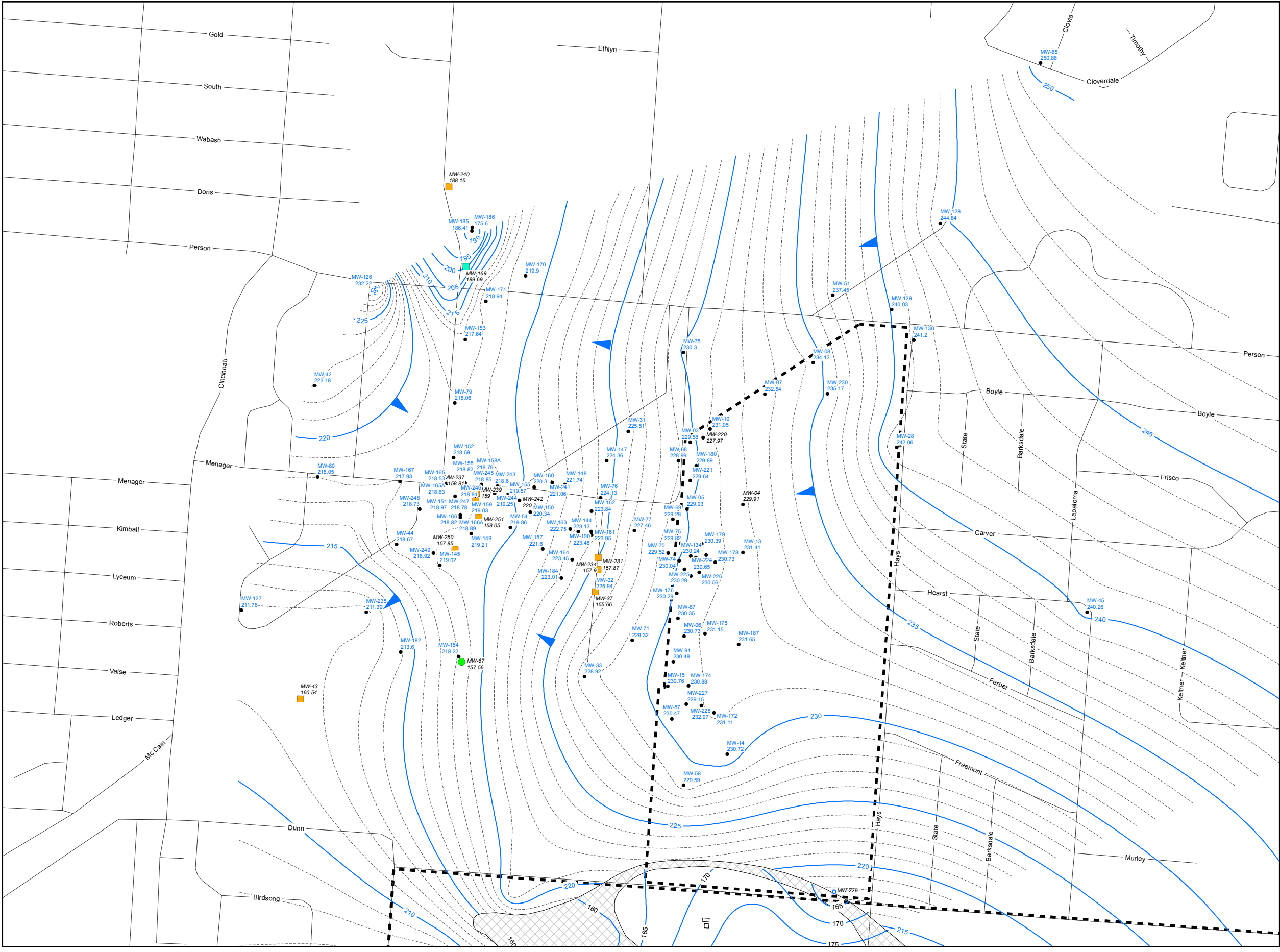


Figure 4

**GROUNDWATER
ELEVATION MAP,
FLUVIAL AQUIFER,
SEPTEMBER 2010**

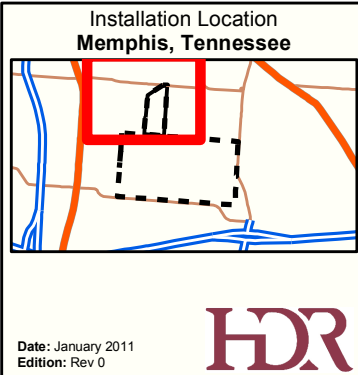
OFF DEPOT GROUNDWATER
ANNUAL LONG TERM
MONITORING REPORT - 2010

DUNN FIELD
DEFENSE DEPOT
MEMPHIS, TENNESSEE

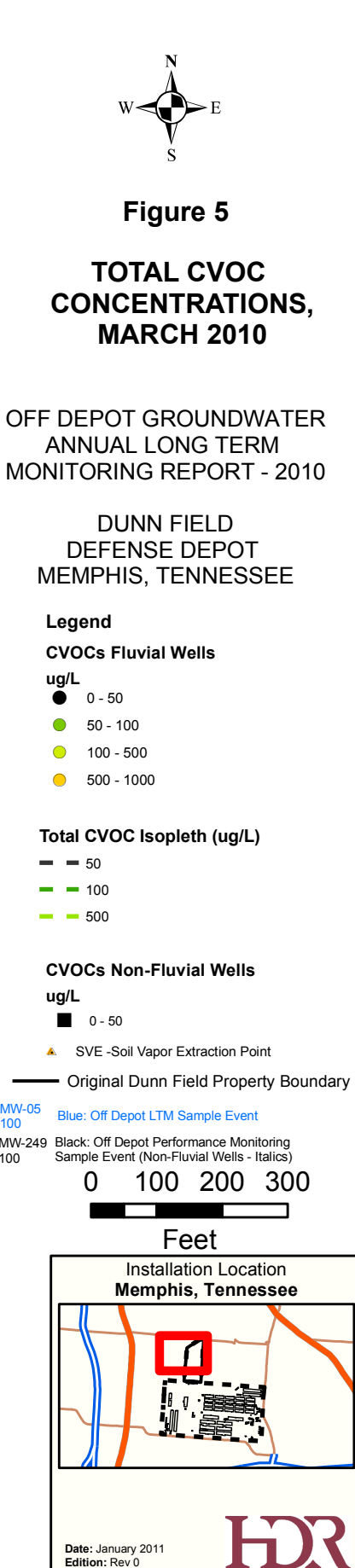
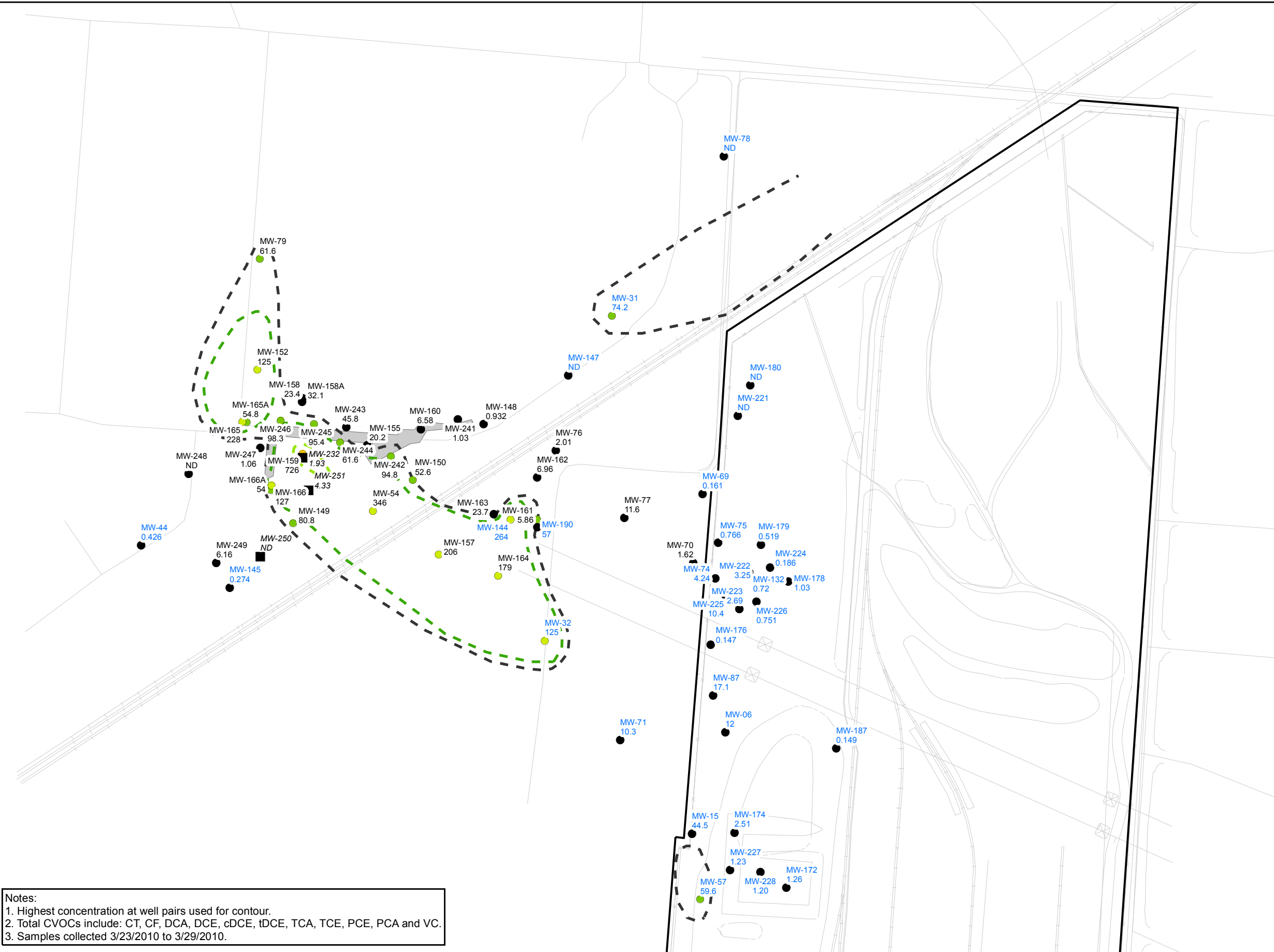
- Legend**
- Monitoring Well Screened in the Fluvial Aquifer
 - Monitoring Well Screened in the Intermediate Aquifer
 - Monitoring Well Screened in the Transition Zone
 - Monitoring Well Screened in the Memphis Aquifer
 - Dunn Field Boundary
 - Clay Elevation Exceeds Groundwater Elevation
- MW-03 Blue non-italics: value used for groundwater contours 100.12
- Groundwater Contours**
- 1-ft Contour
 - 5-ft Contour
 - Groundwater Flow Direction

0 200 400 600 800

Feet



G:\121842\003_ODPM\ODLTM 2010 Annual Report\GIS



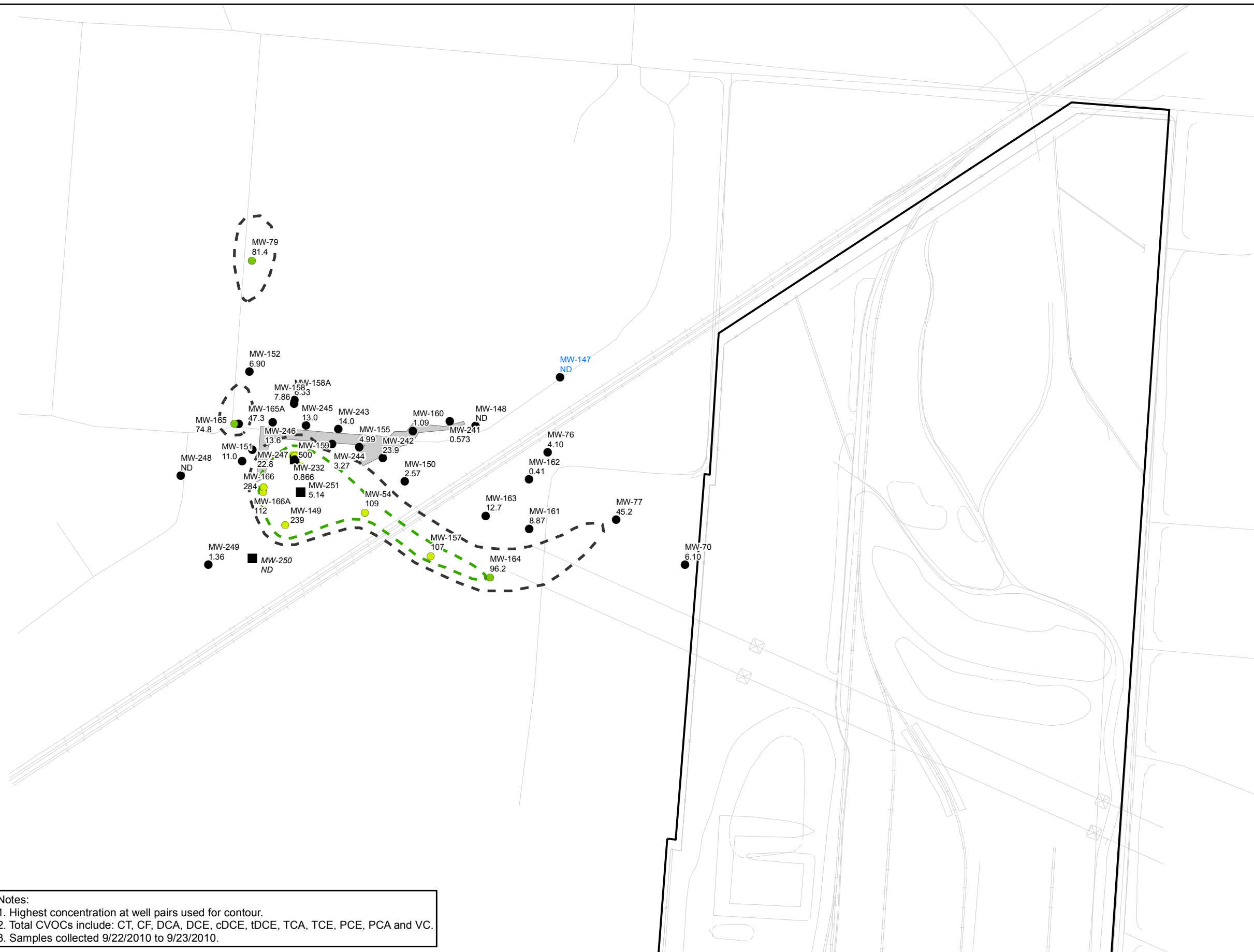


Figure 6

**TOTAL CVOC
CONCENTRATIONS,
SEPTEMBER 2010**

OFF DEPOT GROUNDWATER ANNUAL LONG TERM MONITORING REPORT - 2010

DUNN FIELD
DEFENSE DEPOT
MEMPHIS, TENNESSEE

Legend

CVOCs Fluvial Wells

ug/L

- 0 - 50
● 50 - 100
● 100 - 500

Total CVOC Isopleth (ug/L)

-   50
 100
  500

CVOCs Non-Fluvial Wells

ug/L

- 0 - 50

 SVE -Soil Vapor Extraction Point

— Original Dunn Field Property Boundary

MW-05
100 Blue: Off Depot LTM Sample Event

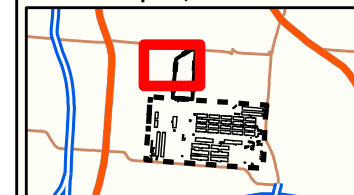
MW-249 Black: Off Depot Performance Monitoring
100 Sample Event (Non-Fluvial Wells - Italics)

0 100 200 300

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Feet

Installation Location
Memphis, Tennessee

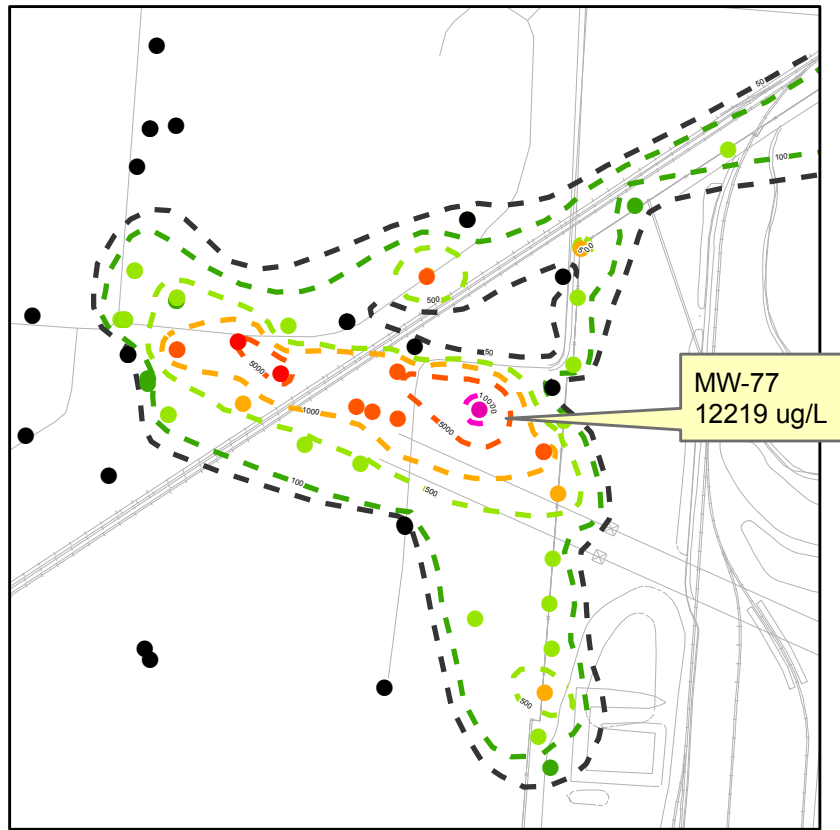


Date: January 2011
Edition: Rev 0

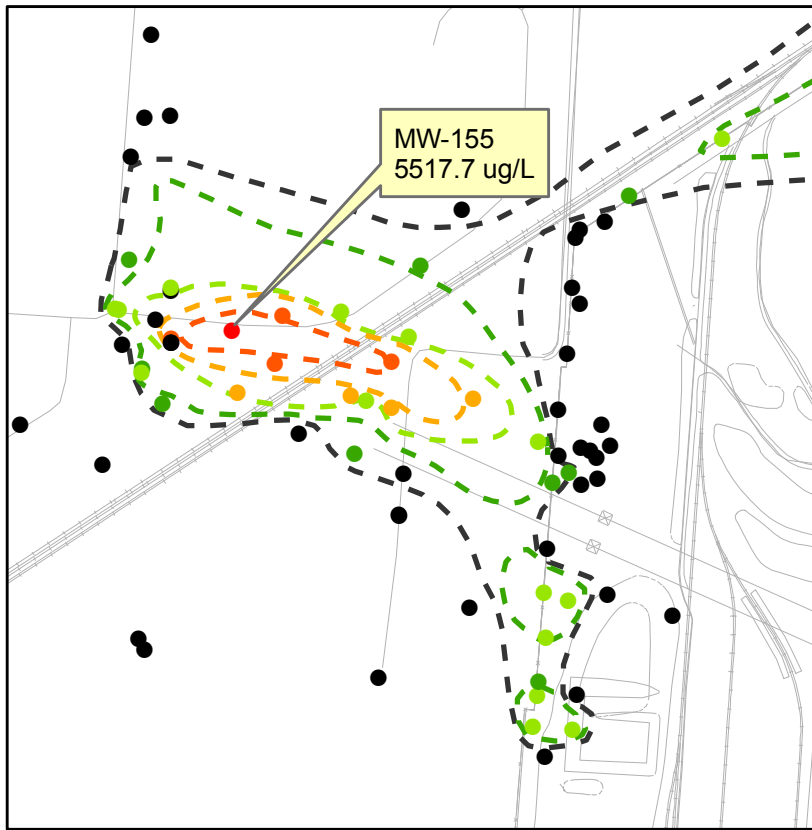
H&R

Notes:

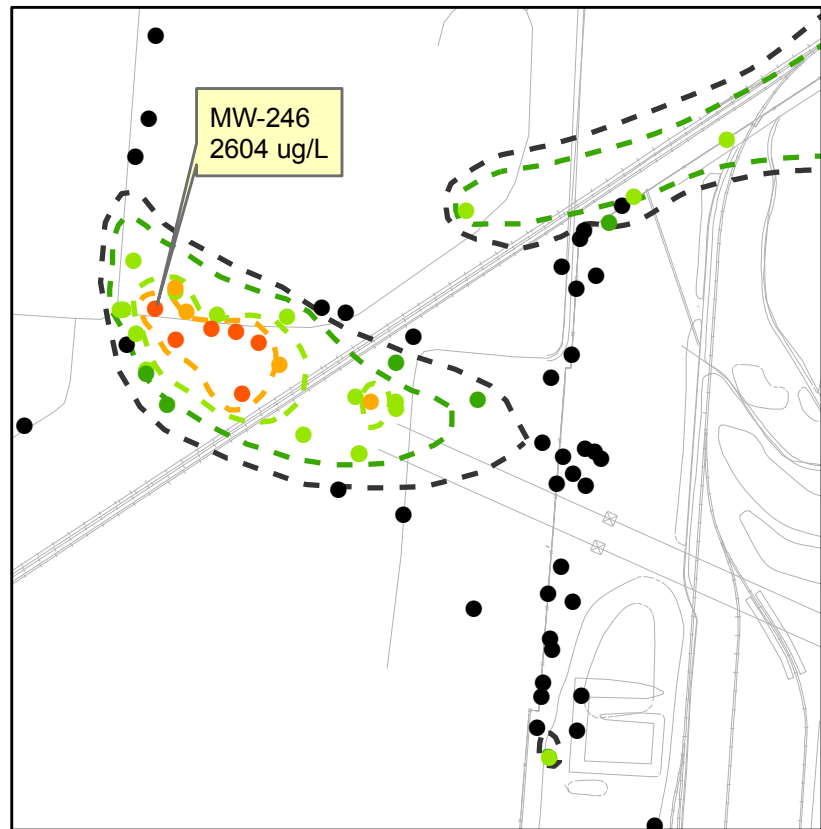
1. Highest concentration at well pairs used for contour.
2. Total CVOCs include: CT, CF, DCA, DCE, cDCE, tDCE, TCA, TCE, PCE, PCA and VC.
3. Samples collected 9/22/2010 to 9/23/2010.



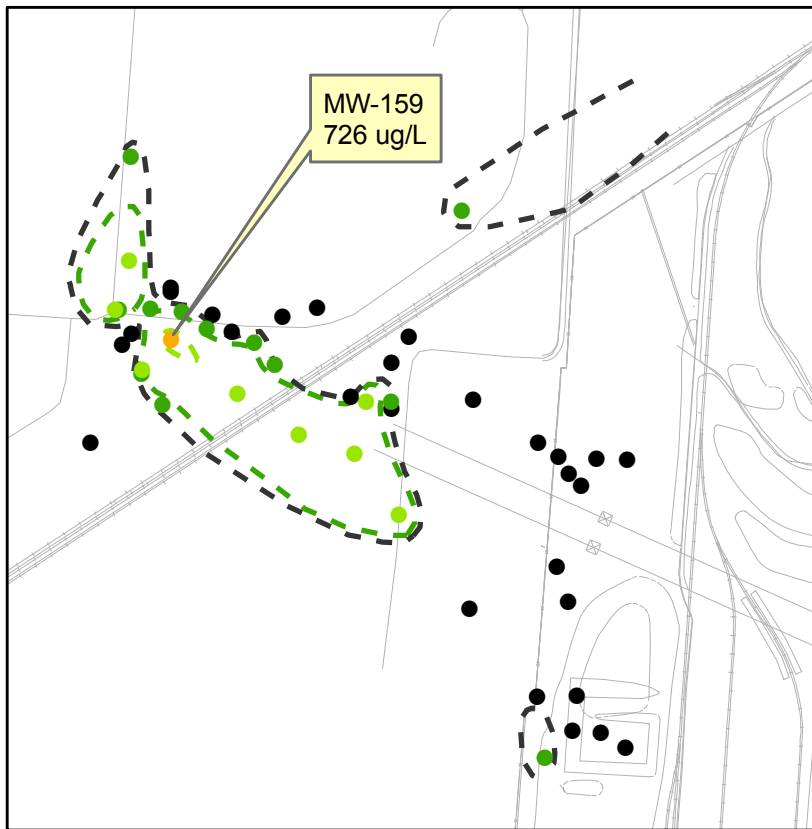
APRIL 2007



APRIL 2008



APRIL 2009



MARCH 2010



Figure 7
TOTAL CVOC
CONCENTRATIONS,
2007 - 2010

OFF DEPOT GROUNDWATER
ANNUAL LONG TERM
MONITORING REPORT - 2010

DUNN FIELD
DEFENSE DEPOT
MEMPHIS, TENNESSEE

Legend

Total CVOC Isopleth (ug/L)

- 50
- 100
- 500
- 1000
- 5000
- 10000

Total CVOC Ranges (ug/L)

- 0 - 50
- 50 - 100
- 100 - 500
- 500 - 1000
- 1000 - 5000
- 5000 - 10000
- 10000 - 50000

0 200 400 600 800
Feet



Date: January 2011
Edition: Rev 0

HDR

APPENDIX A
COMPLETE ANALYTICAL RESULTS

TABLE A-1
ANALYTICAL RESULTS, MARCH 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Well ID Lab ID Date Units	MW-06 L10030693-16 3/26/2010	MW-06 DUP-1 L10030693-48 3/26/2010	MW-15 L10030693-17 3/26/2010	MW-31 L10030693-18 3/26/2010	MW-32 L10030693-19 3/26/2010	MW-44 L10030693-20 3/26/2010
1,1,1,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	<1	<1	<1	0.364 J	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	2.67	2.46	11.8	<0.5	9.16	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	0.283 J	<1	0.434 J	<1
1,1-Dichloroethane	µg/L	<1	<1	<1	0.886 J	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	30.9	<1	<1
1,1-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	0.406 J	<1	<1	<1
1,2,4-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	<0.5	<0.5	0.423 J	<0.5	0.402 J	<0.5
1,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane	µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone	µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
Acetone	µg/L	<10	<10	<10	4.36 J	<10	<10
Benzene	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene	µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L	<1	<1	<1	<1	<1	<1
Bromomethane	µg/L	<1	<1	<1	<1	<1	<1
Carbon disulfide	µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ
Carbon tetrachloride	µg/L	<1	<1	1.81	<1	6.71	<1
Chlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	5.4	5.4	14.7	0.16 J	60	<0.3
Chloromethane	µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	1.62	1.65	0.796 J	<1	6.27	<1
cis-1,3-Dichloropropene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene	µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)	µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)	µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride	µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)	µg/L	<10	<10	<10	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene	µg/L	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Styrene	µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	0.85 J	22.7	2.43	<1
Toluene	µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	0.926 J	<1
trans-1,3-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	2.29	2.36	13.8	20.4	38.3	0.426 J
Trichlorofluoromethane	µg/L	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

Samples analyzed using method 8260B

µg/L: micrograms per liter

<: Not detected above reporting limit

DQE FLAGS:

J: Concentration estimated

UJ: Non-Detect, reporting limit estimated

TABLE A-1
ANALYTICAL RESULTS, MARCH 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Well ID Lab ID Date Units	MW-57 L10030693-21 3/26/2010	MW-69 L10030693-24 3/26/2010	MW-71 L10030693-25 3/26/2010	MW-74 L10030693-26 3/26/2010	MW-75 L10030693-27 3/26/2010	MW-78 L10030780-01 3/29/2010
1,1,1,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	8.26	0.43 J	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.198 B
1-Chlorohexane	µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone	µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
Acetone	µg/L	<10	<10	5.28 J	<10	<10	<10
Benzene	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene	µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L	<1	<1	<1	<1	<1	<1
Bromomethane	µg/L	<1	<1	<1	<1	<1	<1 UJ
Carbon disulfide	µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	50.7 J	0.161 J	1.47	0.696	0.142 J	<0.3
Chloromethane	µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	1.03	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene	µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)	µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)	µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride	µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)	µg/L	<10	<10	<10	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene	µg/L	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Styrene	µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	0.27 J	<1	<1	0.712 J	0.624 J	<1
Toluene	µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	7.57	<1	0.612 J	2.4	<1	<1
Trichlorofluoromethane	µg/L	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

Samples analyzed using method 8260B

µg/L: micrograms per liter

<: Not detected above reporting limit

DQE FLAGS:

J: Concentration estimated

UJ: Non-Detect, reporting limit estimated

TABLE A-1
ANALYTICAL RESULTS, MARCH 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Well ID Lab ID Date Units	MW-87 L10030693-28 3/26/2010	MW-132 L10030780-02 3/29/2010	MW-144 L10030693-29 3/26/2010	MW-144 DUP- L10030693-49 3/26/2010	MW-145 L10030693-30 3/26/2010	MW-147 L10030693-31 3/26/2010
1,1,1,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	12	<0.5	150	121	0.274 J	<0.5
1,1,2-Trichloroethane	µg/L	0.653 J	<1	0.321 J	<1	<1	<1
1,1-Dichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane	µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone	µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
Acetone	µg/L	2.89 J	<10	8.22 J	3.2 J	2.99 J	9.2 J
Benzene	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene	µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L	<1	<1	<1	<1	<1	<1
Bromomethane	µg/L	<1	<1 UJ	<1	<1	<1	<1
Carbon disulfide	µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	1.04	0.366	0.316	0.241 J	<0.3	<0.3
Chloromethane	µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	1.38	<1	3.26	2.76	<1	<1
cis-1,3-Dichloropropene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene	µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)	µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)	µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride	µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)	µg/L	<10	<10	<10	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene	µg/L	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Styrene	µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	0.354 J	0.918 J	0.825 J	<1	<1
Toluene	µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	0.445 J	0.411 J	<1	<1
trans-1,3-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	2	<1	109	92.6	<1	<1
Trichlorofluoromethane	µg/L	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

Samples analyzed using method 8260B

µg/L: micrograms per liter

<: Not detected above reporting limit

DQE FLAGS:

J: Concentration estimated

UJ: Non-Detect, reporting limit estimated

TABLE A-1
ANALYTICAL RESULTS, MARCH 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Well ID Lab ID Date Units	MW-172 L10030780-03 3/29/2010	MW-174 L10030693-32 3/26/2010	MW-176 L10030693-33 3/26/2010	MW-178 L10030693-34 3/26/2010	MW-179 L10030693-35 3/26/2010	MW-180 L10030693-36 3/26/2010
1,1,1,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	<0.5	0.319 J	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane	µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone	µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
Acetone	µg/L	<10	<10	<10	<10	<10	<10
Benzene	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene	µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L	<1	<1	<1	<1	<1	<1
Bromomethane	µg/L	<1 UJ	<1	<1	<1	<1	<1
Carbon disulfide	µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ
Carbon tetrachloride	µg/L	0.922 J	1.2	<1	<1	<1	<1
Chlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	<0.3	0.337	0.147 J	1.03	0.136 J	<0.3
Chloromethane	µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene	µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)	µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)	µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride	µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)	µg/L	<10	<10	<10	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene	µg/L	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Styrene	µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	0.339 J	0.651 J	<1	<1	0.383 J	<1
Toluene	µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Trichlorofluoromethane	µg/L	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

Samples analyzed using method 8260B

µg/L: micrograms per liter

<: Not detected above reporting limit

DQE FLAGS:

J: Concentration estimated

UJ: Non-Detect, reporting limit estimated

TABLE A-1
ANALYTICAL RESULTS, MARCH 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Well ID Lab ID Date Units	MW-187 L10030693-37 3/26/2010	MW-187 DUP- L10030693-50 3/26/2010	MW-190 L10030693-38 3/26/2010	MW-221 L10030693-39 3/26/2010	MW-222 L10030693-40 3/26/2010	MW-223 L10030693-41 3/26/2010
1,1,1,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	23.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	µg/L	<2	<2	<2	<2	<2	<2
1,2-Dibromoethane	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1
1,3-Dichloropropane	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane	µg/L	<1	<1	<1	<1	<1	<1
2,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1
2-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
2-Hexanone	µg/L	<10	<10	<10	<10	<10	<10
4-Chlorotoluene	µg/L	<1	<1	<1	<1	<1	<1
Acetone	µg/L	<10	<10	3.32 J	<10	<10	4.7 J
Benzene	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene	µg/L	<1	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L	<1	<1	<1	<1	<1	<1
Bromomethane	µg/L	<1	<1 UJ	<1	<1	<1	<1
Carbon disulfide	µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1
Chlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	0.149 J	<0.3	0.186 J	<0.3	0.396	0.75
Chloromethane	µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	<1	<1	0.747 J	<1	<1	<1
cis-1,3-Dichloropropene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	<1	<1	<1	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1	<1
m-,p-Xylene	µg/L	<2	<2	<2	<2	<2	<2
MEK (2-Butanone)	µg/L	<10	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)	µg/L	<5	<5	<5	<5	<5	<5
Methylene chloride	µg/L	<1	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)	µg/L	<10	<10	<10	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1	<1	<1	<1
n-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
n-Propylbenzene	µg/L	<1	<1	<1	<1	<1	<1
o-Xylene	µg/L	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	µg/L	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Styrene	µg/L	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	0.707 J	<1	0.313 J	0.447 J
Toluene	µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	31.9	<1	2.54	1.49
Trichlorofluoromethane	µg/L	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

Samples analyzed using method 8260B

µg/L: micrograms per liter

<: Not detected above reporting limit

DQE FLAGS:

J: Concentration estimated

UJ: Non-Detect, reporting limit estimated

TABLE A-1
ANALYTICAL RESULTS, MARCH 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Well ID Lab ID Date Units	MW-224 L10030693-44 3/26/2010	MW-225 L10030693-45 3/26/2010	MW-226 L10030693-46 3/26/2010	MW-227 L10030693-47 3/26/2010	MW-228 L10030780-04 3/29/2010
1,1,1,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	µg/L	<0.5	0.926	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-Dichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
1,1-Dichloropropene	µg/L	<1	<1	<1	<1	<1
1,2,3-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	µg/L	<1	<1	<1	<1	<1
1,2,4-Trichlorobenzene	µg/L	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1
1,2-Dibromo-3-chloropropane	µg/L	<2	<2	<2	<2	<2
1,2-Dibromoethane	µg/L	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1
1,2-Dichloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	µg/L	<1	<1	<1	<1	<1
1,3-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1
1,3-Dichloropropane	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4
1,4-Dichlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
1-Chlorohexane	µg/L	<1	<1	<1	<1	<1
2,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1
2-Chlorotoluene	µg/L	<1	<1	<1	<1	<1
2-Hexanone	µg/L	<10	<10	<10	<10	<10
4-Chlorotoluene	µg/L	<1	<1	<1	<1	<1
Acetone	µg/L	<10	<10	<10	<10	<10
Benzene	µg/L	<0.4	<0.4	<0.4	<0.4	<0.4
Bromobenzene	µg/L	<1	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1
Bromodichloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	µg/L	<1	<1	<1	<1	<1
Bromomethane	µg/L	<1	<1	<1	<1	<1
Carbon disulfide	µg/L	<1 UJ	<1 UJ	<1 UJ	<1 UJ	<1 UJ
Carbon tetrachloride	µg/L	<1	<1	<1	0.682 J	0.756 J
Chlorobenzene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	0.186 J	0.212 J	<0.3	<0.3	<0.3
Chloromethane	µg/L	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1
cis-1,3-Dichloropropene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromomethane	µg/L	<1	<1	<1	<1	<1
Dichlorodifluoromethane	µg/L	<1	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<0.6	<0.6	<0.6	<0.6	<0.6
Isopropylbenzene	µg/L	<1	<1	<1	<1	<1
m-,p-Xylene	µg/L	<2	<2	<2	<2	<2
MEK (2-Butanone)	µg/L	<10	<10	<10	<10	<10
Methyl t-butyl ether (MTBE)	µg/L	<5	<5	<5	<5	<5
Methylene chloride	µg/L	<1	<1	<1	<1	<1
MIBK (methyl isobutyl ketone)	µg/L	<10	<10	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1	<1	<1
n-Butylbenzene	µg/L	<1	<1	<1	<1	<1
n-Propylbenzene	µg/L	<1	<1	<1	<1	<1
o-Xylene	µg/L	<1	<1	<1	<1	<1
p-Isopropyltoluene	µg/L	<1	<1	<1	<1	<1
sec-Butylbenzene	µg/L	<1	<1	<1	<1	<1
Styrene	µg/L	<1	<1	<1	<1	<1
tert-Butylbenzene	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	0.679 J	0.751 J	0.543 J	0.445 J
Toluene	µg/L	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	8.58	<1	<1	<1
Trichlorofluoromethane	µg/L	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1

Notes:

Samples analyzed using method 8260B

µg/L: micrograms per liter

<: Not detected above reporting limit

DQE FLAGS:

J: Concentration estimated

UJ: Non-Detect, reporting limit estimated

TABLE A-2
ANALYTICAL RESULTS, SEPTEMBER 2010
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

Analyte	Well ID	MW-147
	Lab ID	L10090659-47
Units	Date	9/23/2010
	Units	
1,1,1,2-Tetrachloroethane	µg/L	<0.5
1,1,1-Trichloroethane	µg/L	<1
1,1,2,2-Tetrachloroethane	µg/L	<0.5
1,1,2-Trichloroethane	µg/L	<1
1,1-Dichloroethane	µg/L	<1
1,1-Dichloroethene	µg/L	<1
1,1-Dichloropropene	µg/L	<1
1,2,3-Trichlorobenzene	µg/L	<1
1,2,3-Trichloropropane	µg/L	<1
1,2,4-Trichlorobenzene	µg/L	<1
1,2,4-Trimethylbenzene	µg/L	<1
1,2-Dibromo-3-chloropropane	µg/L	<2
1,2-Dibromoethane	µg/L	<1
1,2-Dichlorobenzene	µg/L	<1
1,2-Dichloroethane	µg/L	<0.5
1,2-Dichloropropane	µg/L	<1
1,3,5-Trimethylbenzene	µg/L	<1
1,3-Dichlorobenzene	µg/L	<1
1,3-Dichloropropane	µg/L	<0.4
1,4-Dichlorobenzene	µg/L	<0.5
1-Chlorohexane	µg/L	<1
2,2-Dichloropropane	µg/L	<1
2-Chlorotoluene	µg/L	<1
2-Hexanone	µg/L	<10
4-Chlorotoluene	µg/L	<1
Acetone	µg/L	23
Benzene	µg/L	<0.4
Bromobenzene	µg/L	<1
Bromochloromethane	µg/L	<1
Bromodichloromethane	µg/L	<0.5
Bromoform	µg/L	<1
Bromomethane	µg/L	<1 J
Carbon disulfide	µg/L	<1
Carbon tetrachloride	µg/L	<1
Chlorobenzene	µg/L	<0.5
Chloroethane	µg/L	<1
Chloroform	µg/L	<0.3
Chloromethane	µg/L	0.81 U
cis-1,2-Dichloroethene	µg/L	<1
cis-1,3-Dichloropropene	µg/L	<0.5
Dibromochloromethane	µg/L	<0.5
Dibromomethane	µg/L	<1
Dichlorodifluoromethane	µg/L	<1
Ethylbenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<0.6
Isopropylbenzene	µg/L	<1
m-,p-Xylene	µg/L	<2
MEK (2-Butanone)	µg/L	2.64 J
Methyl t-butyl ether (MTBE)	µg/L	<5
Methylene chloride	µg/L	<1
MIBK (methyl isobutyl)	µg/L	<10
Naphthalene	µg/L	<1
n-Butylbenzene	µg/L	<1
n-Propylbenzene	µg/L	<1
o-Xylene	µg/L	<1
p-Isopropyltoluene	µg/L	<1
sec-Butylbenzene	µg/L	<1
Styrene	µg/L	<1
tert-Butylbenzene	µg/L	<1
Tetrachloroethene	µg/L	<1
Toluene	µg/L	<1
trans-1,2-Dichloroethene	µg/L	<1
trans-1,3-Dichloropropene	µg/L	<1
Trichloroethene	µg/L	<1
Trichlorofluoromethane	µg/L	<1
Vinyl chloride	µg/L	<1

Notes:

Samples analyzed using method 8260E

µg/L: micrograms per liter

<: Not detected above reporting limit

DQE FLAGS:

J: Concentration estimated

UJ: Non-Detect, reporting limit estimated

APPENDIX B
DATA QUALITY EVALUATION

DATA QUALITY EVALUATION

Off Depot Long-Term Monitoring (LTM) was conducted by HDR during two sample events in 2010. Wells were selected for sampling in accordance with the *Long-Term Groundwater Monitoring Plan* (LTM Plan) in Appendix C of the *Off Depot Groundwater Final Remedial Design, Rev. 1* (CH2M HILL, 2008) and the *Work Plan for Off Depot Groundwater Sampling* (HDR/e²M, March 2010). Groundwater samples were submitted to Microbac Laboratories in Marietta, Ohio for analysis. The field and laboratory procedures were performed in accordance with the *Remedial Action Sampling and Analysis Plan, Rev. 0* (RA SAP) (MACTEC, 2005).

The data quality evaluation (DQE) process involves assessment of all field and laboratory procedures, including data validation in accordance with the RA SAP completed by Diane Short and Associates, Inc (DSA). The data validation reports are included in this appendix. (The first DQE report includes SDG L10030650 that was not associated with Off Depot LTM, and some samples in SDGs L10030693 and L10030780 were not associated with this project. The second DQE report for SDG 10090659 also includes some samples that were not associated with Off Depot LTM. Due to large sampling efforts at DDMT, each SDG includes samples that were received in one cooler, which may have included samples from more than one area at DDMT.) This assessment is designed to evaluate problems with the quality assurance (QA)/quality control (QC) associated with the laboratory data and potential impact to the data quality objectives (DQOs). The DQE findings are summarized in the following sections.

FIELD ACTIVITIES AND FIELD QUALITY CONTROL

The field effort included the collection of groundwater samples from designated wells during the annual LTM event in March 2010 and the semiannual LTM event in September 2010. The LTM well locations are shown on Figure 2 of the report. Field QC samples were collected at selected wells to evaluate sampling technique and decontamination procedures. These samples included field duplicates, trip blanks, and field equipment (rinsate) blanks. Additional samples were collected at selected locations for matrix spike/matrix spike duplicate (MS/MSD) analyses in the laboratory. Sample bottles met U.S. Environmental Protection Agency (USEPA) requirements for environmentally clean containers. Sample labels were pre-printed to facilitate sample tracking from the field through the laboratory. Documentation of the sampling was performed in the field to ensure that the samples collected, sample labels, chain-of-custody (COC) records, which were generated electronically using a personal digital assistant (PDA) supplied by the laboratory, and request for analysis were consistent. Where necessary, COC forms were filled out manually. Custody seals were placed on each sample cooler prior to shipment by common carrier.

ANALYTICAL METHODS

The groundwater samples were analyzed for Target Compound List (TCL) volatile organic compounds (VOCs) by method SW 8260B.

LABORATORY QUALITY CONTROL

The laboratory QC program, including sample handling, laboratory control, and reporting, is documented in the RA SAP. Sample handling includes documentation of sample receipt, placement in storage, lab personnel using the sample, and disposal. The laboratory control consists of instrument calibration and maintenance, laboratory control samples (LCS), method blanks and matrix spikes. Reporting of the laboratory control data was planned prior to the collection of the data, allowing the laboratory to place the appropriate information into the data package so that the DQE could be performed in a timely manner.

DQE SUMMARY

The objective of the DQE was to provide a review of the chemical data reports submitted by the laboratory and to assess the data in relation to the data quality objectives stated in the RA SAP. The DQE consisted of review of laboratory QC data and field QC parameters, and flagging of the data as usable, usable with qualification, or unusable in accordance with the DQE standard operating procedures (SOPs) using the criteria stated in the RA SAP for each analytical method performed. The following information was reviewed:

- Sample Integrity (Deliverables)
- Sample Completeness
- Sample Holding Times
- Laboratory Methods for Extraction and Analysis (Calibration, Internal Standards)
- Method Accuracy (bias) and Precision (Surrogates, Matrix Spike/Matrix Spike Duplicates (MS/MSD), LCS Recoveries)
- Laboratory Performance Criteria (Blanks, Instrument Performance Check)

Field QC parameters were evaluated through field duplicates, rinsate blanks, field documentation, and shipping criteria.

The DQE was summarized by use of flags that indicate to the reviewer that the data being considered has been qualified using the established criteria. Sample delivery group (SDG) narratives detailing the

evaluation of the laboratory data by DSA are included as attachments in this Appendix. The SDGs and associated groundwater samples are listed on Table B-1.

The following sections provide summary discussions of the required data qualifications for each sampling event. A Level III DQE was performed and the data quality indicators (DQIs), expressed in terms of precision, accuracy, representativeness, comparability, completeness, and sensitivity, were assessed. This included the evaluation of sample integrity, holding times, trip blanks, rinsate blanks, method blanks, internal standards, surrogate recoveries, matrix spike/matrix spike duplicate (MS/MSD) recoveries, LCSs, and field duplicate precision. The results of the DQI assessment are provided below.

Precision

Field duplicates were collected to assess sampling precision. They consisted of replicate grab samples collected concurrently with the associated field samples. Precision is best expressed in terms of relative percent difference (RPD). Field precision goals were met for the duplicate sample pairs collected during the two LTM sampling events. Laboratory precision is discussed in more detail in the attached narratives.

Accuracy

Accuracy or bias was measured through the analyses of LCSs and MS/MSDs. Sample specific accuracy is measured through surrogate recovery. Accuracy is expressed as percent recovery (%R).

Although there were a number of low LCS recoveries observed in the March and September events, all associated data are qualified J and as such are valid. Accuracy goals based upon LCS were met. Further discussion of the LCS and MS/MSD recoveries is provided in the attached DQE narratives.

Representativeness

Representativeness refers to the degree sample data accurately and precisely describes the population of samples at a sampling point or under certain environmental conditions. Samples that are not properly preserved or are analyzed beyond holding times may not be considered representative. Review of sampling procedures, laboratory preparation, analysis holding times, trip blank and rinsate blank analysis help in providing this assessment.

Sampling procedures followed the RA SAP and were considered representative of the matrices collected. Laboratory preparation and analysis followed method guidelines.

Comparability

The selection of standardized methods and consistent laboratory practices facilitates the comparison of data between LTM events. Past LTM data are comparable to recent events. Consistent methodology has been maintained throughout the LTM sampling events.

Completeness

Completeness is determined for both field and analytical objectives. Field completeness is calculated from the number of samples proposed versus the actual number of samples collected. Analytical completeness is expressed in terms of usable data. The project completeness goal for DDMT is 90% as stated in the RA SAP.

Data from the two LTM events in March and September 2010 were greater than 98% complete and therefore met the completeness DQO.

Sensitivity

Analytical sensitivity is the concentration at which the measurement system can quantitate target analytes in the environmental matrices of concern. Analytical sensitivity is expressed in terms of the reporting limit (RL), which is provided by the respective laboratories as their reasonable and defensible quantitation limit for environmental samples above the method detection limit (MDL), which is established by each laboratory using pure water or clean matrix. The analytical method RLs and MDLs were compared to groundwater protection standards as listed in the RA QAPP and were determined to meet the overall project objectives. (The MDLs for six VOCs [1,1,2,2-tetrachloroethane, 1,1,2-trichloroethane, 1,2-dichloroethane, bromodichloromethane, carbon tetrachloride, and dibromochloromethane) were above the standards; however, as noted in the QAPP..."MDLs for these VOC ... compounds are higher than their corresponding screening levels because current VOC ... analytical method technology can not achieve MDLs lower than those listed."]

The following sections discuss only those deficiencies encountered during the evaluation that resulted in qualified and/or unusable data.

Annual Event – March 2010

A total of 42 water samples including 32 groundwater field samples and ten QA/QC samples (duplicates, MS/MSD, trip blanks, rinsate blanks) were collected from 32 LTM wells in March 2010. The data are usable with qualifications as described below:

- Chloroform was qualified as estimated J in one sample (MW-057-ODLA-1) based on MS/MSD recovery. The result could be biased low approximately proportional to the recovery.
- When a high LCS recovery is associated with a non-detect in samples, no qualifier is added since the indicated bias is high. When the analyte is detected, the result is qualified as J and data could be biased high proportional to the LCS %R. All results associated with low recoveries are qualified J. Thirty-one samples had a low LCS for carbon disulfide, which was non-detect and qualified J. Three samples had a low LCS for bromomethane, which was non-detect and qualified J. The analytes with low LCS recoveries were not contaminants of concern and will not impact the use of the data.
- There was one detection of 1,4-dichlorobenzene observed below the reporting limit in one rinsate blank. Whenever methylene chloride, acetone or 2-butanone is detected in associated samples at a level less than 10x the method blank (corrected for dilution), the result is qualified as U. The factor is 5x for other analytes. 1,4-Dichlorobenzene in MW-78-ODLA-1 was detected and qualified U. Such results are usable as non-detects.
- Any result reported below the reporting limit (RL) but above the method detection limit (MDL) was flagged “J” and considered an estimated result (unless overridden by other QC flags).

Semi-Annual Event – September 2010

A total of one water sample including one groundwater field sample and no QA/QC samples (duplicates, MS/MSD, trip blanks, rinsate blanks) was collected from one LTM well (MW-147) in September 2010. The sample was collected at the same time as Off Depot performance monitoring and QA/QC were included in that report. Samples were collected from two screened intervals in MW101 and MW107. The sample was analyzed for TCL VOCs. The data are usable with qualifications as described below:

- When a high LCS recovery is associated with a non-detect in samples, no qualifier is added since the indicated bias is high. When the analyte is detected, the result is qualified as J. Data could be biased high proportional to the LCS %R. All results associated with low recoveries are qualified. Bromomethane in one sample (MW-147-LS-2) was qualified J based on a low LCS recovery. Bromomethane is not a contaminant of concern and will not impact the use of the data.
- Contamination (methylene chloride and chloromethane) was observed in one trip blank and resulted in a U qualification for associated data (chloromethane in MW-147-ODLS-2). (Although there was no trip blank specifically associated with this project, the one sample for this project was shipped in the same cooler as the samples from other projects and the trip blanks.) Whenever methylene

chloride or acetone is detected in associated samples at a level less than 10x the method blank (corrected for dilution), the result is qualified as U. For other analytes, the factor used is 5x. Such results are usable as non-detects.

- Any result reported below the reporting limit (RL) but above the method detection limit (MDL) was flagged “J” and considered an estimated result (unless overridden by other QC flags).

SUMMARY

The sample data from the March and September 2010 Off Depot LTM events met the data quality objectives and are of sufficient quality to support the evaluation of remedial actions.

TABLE B-1
SDG SUMMARY TABLE
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

SDG	Groundwater Samples			Quality Control Samples
<u>Annual and Biennial Sampling Event - March 2010</u>				
L10030693	MW-06	MW-75	MW-180	TB-31510-ODLA-1
	MW-15	MW-87	MW-187	DUP-1-ODLA-1
	MW-31	MW-144	MW-190	DUP-2-ODLA-1
	MW-32	MW-145	MW-221	DUP-3-ODLA-1
	MW-44	MW-147	MW-222	MW-57-ODLA-1MS
	MW-57	MW-174	MW-223	MW-57-ODLA-1MSD
	MW-69	MW-176	MW-224	MW-223-ODLA-1MS
	MW-71	MW-178	MW-225	MW-223-ODLA-1MSD
	MW-74	MW-179	MW-226	
			MW-227	
L10030780	MW-78	MW-172	MW-228	RB-ODLA-1
	MW-132			TB-31610-ODLA-1
<u>Semi-Annual Sampling Event - September 2010</u>				
L10090659	MW-147-ODLS-2			

ORGANIC DATA QUALITY REVIEW REPORT
VOLATILE ORGANICS SW-846 METHOD 8260B
8260B/5030B

SDG: L10030650, 10030693, 10030780

PROJECT: Memphis Defense Depot, Off Depot groundwater and LTM for e2m, Texas

LABORATORY: Microbac Laboratories, Inc., Marietta, OH

SAMPLE MATRIX: Water

SAMPLING DATE (Month/Year): March 2010

NO. OF SAMPLES: 104 aqueous samples; including 5 trip blanks, 2 rinse blanks, 7 field duplicates

ANALYSES REQUESTED: SW-846 8260B

SAMPLE NO.: See attached result forms and associated EDD

DATA REVIEWER: Diane Short

QA REVIEWER: Diane Short and Associates Inc. INITIALS/DATE: _____

Telephone Logs included Yes____ No X

Contractual Violations Yes____ No X

The project QAPP (11/05), the EPA Contract Laboratory Program National Functional Guidelines for Organic Review, 1999 and 2001, and the SW-846 Method 8260B have been referenced by the reviewer to perform this data validation review. The EPA qualifiers have been expanded to include a descriptor code and value to define QC violations and their values, per the approval of the Project Manager. Per the Scope of Work, the review of these samples includes Level III validation of all chains of custody, calibrations and QC forms referencing the QC limits in the above documents.

I. DELIVERABLES

A. All deliverables were present as specified in the Statement of Work (SOW), SW-846, or in the project contract.

Yes ☒ No ☐

This report has been requested to include the following review: Holding times and sample integrity (chains of custody, sample log in), Calibrations, Summary QC.

Although the samples are collected and delivered together, the laboratory splits the samples into numerous analytical batches which are run on up to 3 different instruments. This compounds the validation work, the data tracking and paperwork. The reviewer iterates the request to minimize the environmental impact of the paperwork by analyzing client samples in the minimum number of analytical batches and on the same instrument. The variability in response of instruments to client compounds can add a precision variability to the data results.

B. Chain of Custody Documentation was complete and accurate.

Yes ☒ No ☐

No qualifiers have been added for chain of custody issues and the project manager will update chains per the following notes to complete the project record.

Only the first page of the chain of custody documents were signed and dated by the laboratory. These are electronically-generated chain of custody documents, and there may be electronic signatures for these which we are not able to review. However, the hardcopy documents should be properly signed and dated by the sampler and the laboratory on each page. There is also no tracking to identify the gap in time from relinquishment to laboratory receipt.

C. Samples were received at the required temperature, preservation and intact with no bubbles.

Yes ☒ No ☐

EPA regulations (See Federal Register, March 12, 2007, 40CFR Part 122) require only that the temperature of samples delivered to the laboratory be equal to or less than 6° C. The sample receipt conditions are fully compliant with applicable regulations.

There is no formal log-in verification for bubbles and sample integrity. The project manager, to date, has approved of the laboratory narrative to discuss any integrity outliers

II. ANALYTICAL REPORT FORMS

A. The Analytical Report or Data Sheets are present and complete for all requested analyses.

Yes ☒ No ☐

B. Holding Times

1. The contract holding times were met for all analyses (Time of sample receipt to time of analysis (VOA) or extraction and from extraction to analysis).

Yes ☒ No ☐

2. The Clean Water Act (40 CFR 136) or method holding times were met for all analyses (14 days from time of sample collection to analysis or extraction).

Yes ☒ No ☐

III. INSTRUMENT CALIBRATION – GC/MS

A. Initial Calibration

1. The Response (RF) and Relative Response Factors (RRF) and average RRF for all compounds for all analyses met the contract criteria of >0.01 for volatiles and 0.05 for semi-volatiles.

Yes ☒ No ☐ NA ☐

Method 8260: Per the project manager, the 2001 EPA CLP validation guidance has been applied to the common “poor responders”. Acetone, 2-butanone, and 4-methyl-2-pentanone are the compounds for which any

calibration response factors below 0.05 have been observed. The validation guidance used for this project allows for a response of 0.01 for these compounds if spectral integrity can be verified at low concentrations. These spectra are not commonly provided and are not part of the deliverable for these data sets. The laboratory has been tasked with providing to the client verification that the 0.01 RF is valid. Given the spectral verification is available, the data are not qualified for response $>0.01 < 0.05$. No data have been qualified.

Most of the low-responding compounds are highly water-soluble and capable of hydrogen bonding with water. This decreases their purge efficiency and results in the relatively low response. The implication of this low purge efficiency is that a relatively low absolute recovery of such compounds is achieved in the purge step of the analysis. If this recovery is consistent, reasonable accuracy and precision can be achieved in a given matrix, which is indicated for the lab matrix by acceptable recoveries in LCS and calibration checks. However, this causes these targets to be more sensitive to matrix variations that impact purge efficiency (such as ionic strength or the presence of varying levels of soluble non-target organic material) than are the more hydrophobic compounds typically analyzed by this method, and as a result they are more likely to exhibit matrix bias.

2a. The relative standard deviation (RSD) for the five point calibration was within the 30% limit for the CCCs.
Yes ☒ No ☐ NA ☐

This is a method requirement and indicates that the analytical system is in control.

2b. The relative standard deviation (RSD) for the five point calibration was within the 30% limit for all other compounds, the average %RSD was $<15\%$, or a linear curve was used.
Yes ☒ No ☐ NA ☐

3. The 12 hour system Performance Check was performed as required in SW-846.
Yes ☒ No ☐ NA ☐

An ICV is also reported with each batch and instrument. It has the same outliers as the LCS and in the same range, so data have been qualified per the results listed in the LCS section.

B. Continuing Calibrations

1. The midpoint standard was analyzed for each analysis at the required frequency and the QC criteria of > 0.05 (.01 for CLP 2001 VOA) were met.
Yes ☒ No ☐ NA ☐

2. The percent difference (%D) limits of $\pm 25\%$ were met. The 2001 NFG also allow for 40% D for the poor responders (pr). For other compounds the QAPP notes rejection of detected compounds with $\%D > 40\%$.
Yes ☒ No ☐ NA ☐

When there are no detections, unless the %D is biased low and so large as to indicate a significant probability of false negatives, no qualifiers are added for %D outliers when targets are not detected or for a high recovery for undetected compounds. Data are qualified JC#, where # is the %D. There could be variability to the data as there is variability to the response.

The QAPP indicates that compounds in a run should be rejected if the %D is $> 40\%$. We interpret this to mean that non-detects should be rejected and that detected targets should be J-qualified, which is the normal validation process for rejection. No data have been outside the noted criteria and no qualifiers are applied.

IV. GC/MS INSTRUMENT PERFORMANCE CHECK

The BFB (VOA) performance check was injected once at the beginning of each 12-hour period and relative abundance criteria for the ions were met.
Yes ☒ No ☐ NA ☐

V. INTERNAL STANDARDS

The Internal Standards met the 100% upper and -50% lower limits criteria and the Retention times were within the required windows.

Yes ☒ No ☐ NA ☐

VI. SURROGATE

Surrogate spikes were analyzed with every sample.

Yes ☒ No ☐

And met the recovery limits defined in the QAPP of 70 – 130% for VOA and 45-135% for SVOA base/neutral fraction or 35-140% for the acid fraction. For SVOA, one surrogate per fraction is allowed to be at 15 – 150%.

Yes ☒ No ☐

VII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A. Matrix spike (MS) and matrix spike duplicates (MSD) were analyzed for every analysis performed and for every 20 samples or for every matrix whichever is more frequent.

Yes ☒ No ☐

There are 5 MS/MSD pair designated or analyzed by the laboratory for 94 client samples. This is a sufficient frequency for the number of field samples.

B. The MS and MSD percent recoveries were within the limits defined in the QAPP of VOA at 70 – 130% with 5 compounds allowed to be within 60 – 140%; SVOA at 45- 135%, 5 compounds allowed to be at 15 – 150%. Reject non-detects at < 15% for SVOA.

Yes ☐ No ☒ NA ☐

The full target list has been spiked. Outliers observed per the QAPP limits for Method 8260 MS/MSD runs are shown in the table below. For analytes where the parent sample concentration is > 4x the spike level, no qualifier is added because the level of the spike is similar to the normal variability expected in the method; hence recoveries for such cases are not meaningful. Data are qualified JMS#, where # is the %R. Data could be biased slightly low in proportion to the recovery. As carbon disulfide is low in all the LCS's, the low recovery appears to be laboratory related, not matrix related.

Lab ID	Client ID	Compound	Conc. ug/l	flag	RL	Qualifier
L10030780-11	MW85-LS-11	Acetone	12.5	M	10	JMS69D31
L10030780-11	MW85-LS-11	Carbon disulfide		U	1	JL77MS64
L10030780-11	MW85-LS-11	Carbon tetrachloride	116	M	1	JMS63
L10030650-02	MW-148-ODPM-4	Carbon disulfide		U	1	JL74MS68
L10030650-18	MW-242-ODPM-4	Bromomethane		U	1	JMS63
L10030650-18	MW-242-ODPM-4	MEK (2-Butanone)		U	10	JL78MS66
L10030693-21	MW-057-ODLA-1	Chloroform	50.7	M	0.3	JMS43

C. The MSD relative percent differences (RPD) were within the defined contract limits for VOA of 30% water, 40 soil, with 5 compounds allowed to be < 40%.RPD; for SVOA of 50% for water and 60% for soil and 5 compounds allowed to be > 60% RPD.

Yes ☐ No ☒ NA ☐

Qualifiers are added only when the MS or MSD recovery is also out of limits. Data are qualified JD#, where # is the RPD. As the RPD increases, the matrix precision decreases. One qualifications was required for this set of samples.

D. The MS/MSD were client samples.

Yes ☒ No ☐ NA ☐

VIII. LABORATORY CONTROL SAMPLE

A. Laboratory Control Samples (LCS) was analyzed for every analysis performed and for every 20 samples.
Yes ☒ No ☐

B. The LCS percent recoveries were within the limits defined in the QAPP for VOA of 80-120% for water and 75 – 125% for soil. Five compounds are allowed to be 60 – 140%. No soil limits are defined in the QAPP and laboratory limits will be applied. If an LCS and LCSD are analyzed, both samples must have the same compounds out for data to be qualified.

Yes ☐ No ☒

The full target list has been spiked. When a high LCS recovery is associated with a non-detect in samples, no qualifier is added since the indicated bias is high. When the target is detected, the result is qualified as JL#, where # is the elevated recovery. Data could be biased high or low proportional to the LCS %R. All results associated with low recoveries are qualified. Dichlorodifluoromethane, and sometimes vinyl chloride, are consistently high in the ICV and the LCS standards. The compounds are not been detected and data are not qualified for high recovery with one exception for vinyl chloride.

The table below shows the outliers and the limits applied per the QAPP. The limits are specified per matrix. Only two recoveries are outside of the marginal exceedance limits (60-140). Qualifiers are added for all outliers as described here but the project manager may consider reversing some of these when the limits fall within the marginal exceedance limits. Please see the project EDD for a detailed list of qualifiers added.

Lab ID	Client ID	Compound	Conc ug/l	Flag	RL	MDL	Qualifier
L10030780-01	MW-78-ODLA-1	Bromomethane		U	1	0.5	JL76
L10030780-01	MW-78-ODLA-1	Carbon disulfide		U	1	0.5	JL74
L10030780-02	MW-132-ODLA-1	Bromomethane		U	1	0.5	JL76
L10030780-02	MW-132-ODLA-1	Carbon disulfide		U	1	0.5	JL74
L10030780-03	MW-172-ODLA-1	Bromomethane		U	1	0.5	JL76
L10030780-03	MW-172-ODLA-1	Carbon disulfide		U	1	0.5	JL74
L10030780-04	MW-228-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030780-05	RB-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030780-06	TB-031610-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030780-07	MW64-LS-11	Carbon disulfide		U	1	0.5	JL77
L10030780-08	MW94-LS-11	Carbon disulfide		U	1	0.5	JL77
L10030780-09	MW-200-LS-11	Carbon disulfide		U	1	0.5	JL77
L10030780-10	MW21-LS-11	Carbon disulfide		U	1	0.5	JL68
L10030780-11	MW85-LS-11	Carbon disulfide		U	1	0.5	JL77MS64
L10030780-14	MW88-LS-11	Carbon disulfide		U	1	0.5	JL68
L10030780-15	MW100B-LS-11	Carbon disulfide		U	1	0.5	JL68
L10030780-15	MW100B-LS-11	Vinyl chloride	131		5	1.25	JL134
L10030780-16	MW113-LS-11	Carbon disulfide		U	1	0.5	JL68
L10030780-17	DR1-5-LS-11	Carbon disulfide		U	1	0.5	JL68
L10030780-18	DR1-5A-LS-11	Carbon disulfide		U	1	0.5	JL68
L10030780-19	DR2-1-LS-11	Carbon disulfide		U	1	0.5	JL68
L10030780-20	PMW21-03-LS-11	Carbon disulfide		U	1	0.5	JL68
L10030780-21	TB-041210-LS-11	Carbon disulfide		U	1	0.5	JL68
L10030693-01	MW-248-ODPM-4	Carbon disulfide		U	1	0.5	JL76

L10030693-02	DUP-4-ODPM-4	Carbon disulfide		U	1	0.5	JL77
L10030693-03	MW-70-ODPM-4	Carbon disulfide		U	1	0.5	JL74
L10030693-04	MW-76-ODPM-4	Carbon disulfide		U	1	0.5	JL74
L10030693-05	MW-77-ODPM-4	Carbon disulfide		U	1	0.5	JL74
L10030693-06	MW-79-ODPM-4	Carbon disulfide		U	1	0.5	JL74
L10030693-07	MW-152-ODPM-4	Carbon disulfide		U	1	0.5	JL74
L10030693-08	MW-157-ODPM-4	Carbon disulfide		U	1	0.5	JL74
L10030693-09	MW-161-ODPM-4	Carbon disulfide		U	1	0.5	JL74
L10030693-10	MW-162-ODPM-4	Carbon disulfide		U	1	0.5	JL74
L10030693-11	MW-163-ODPM-4	Carbon disulfide		U	1	0.5	JL74
L10030693-12	MW-164-ODPM-4	Carbon disulfide		U	1	0.5	JL74
L10030693-13	ODPM-4-RB	Carbon disulfide		U	1	0.5	JL74
L10030693-14	DUP-2-ODPM-4	Carbon disulfide		U	1	0.5	JL74
L10030693-15	TB-31810-ODPM-3	Carbon disulfide		U	1	0.5	JL76
L10030693-16	MW-006-ODLA-1	Carbon disulfide		U	1	0.5	JL76
L10030693-17	MW-015-ODLA-1	Carbon disulfide		U	1	0.5	JL76
L10030693-18	MW-031-ODLA-1	Carbon disulfide		U	1	0.5	JL76
L10030693-19	MW-032-ODLA-1	Carbon disulfide		U	1	0.5	JL76
L10030693-20	MW-044-ODLA-1	Carbon disulfide		U	1	0.5	JL74
L10030693-21	MW-057-ODLA-1	Carbon disulfide		U	1	0.5	JL76
L10030693-24	MW-069-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030693-25	MW-071-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030693-26	MW-074-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030693-27	MW-075-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030693-28	MW-087-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030693-29	MW-144-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030693-30	MW-145-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030693-31	MW-147-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030693-32	MW-174-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030693-33	MW-176-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030693-34	MW-178-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030693-35	MW-179-ODLA-1	Carbon disulfide		U	1	0.5	JL77
L10030693-36	MW-180-ODLA-1	Carbon disulfide		U	1	0.5	JL78
L10030693-37	MW-187-ODLA-1	Carbon disulfide		U	1	0.5	JL78
L10030693-38	MW-190-ODLA-1	Carbon disulfide		U	1	0.5	JL78
L10030693-39	MW-221-ODLA-1	Carbon disulfide		U	1	0.5	JL78
L10030693-40	MW-222-ODLA-1	Carbon disulfide		U	1	0.5	JL78
L10030693-44	MW-224-ODLA-1	Carbon disulfide		U	1	0.5	JL78
L10030693-45	MW-225-ODLA-1	Carbon disulfide		U	1	0.5	JL78
L10030693-46	MW-226-ODLA-1	Carbon disulfide		U	1	0.5	JL78
L10030693-47	MW-227-ODLA-1	Carbon disulfide		U	1	0.5	JL78
L10030693-48	DUP-1-ODLA-1	Carbon disulfide		U	1	0.5	JL78

L10030693-49	DUP-2-ODLA-1	Carbon disulfide		U	1	0.5	JL78
L10030693-50	DUP-3-ODLA-1	Bromomethane		U	1	0.5	JL77
L10030693-50	DUP-3-ODLA-1	Carbon disulfide		U	1	0.5	JL70
L10030693-51	TB-31510-ODLA-1	Carbon disulfide		U	1	0.5	JL78
L10030650-02	MW-148-ODPM-4	Carbon disulfide		U	1	0.5	JL74MS68
L10030650-05	MW-149-ODPM-4	Acetone	3.8	F	10	2.5	JL78
L10030650-05	MW-149-ODPM-4	Carbon disulfide		U	1	0.5	JL73
L10030650-05	MW-149-ODPM-4	MEK (2-Butanone)		U	10	2.5	JL78
L10030650-05	MW-149-ODPM-4	MIBK (methyl isobutyl ketone)		Q	10	2.5	JL78
L10030650-07	MW-151-ODPM-4	Carbon disulfide		U	1	0.5	JL66
L10030650-09	MW-158-ODPM-4	Acetone	3.75	F	10	2.5	JL78
L10030650-09	MW-158-ODPM-4	Carbon disulfide	1.06		1	0.5	JL73
L10030650-09	MW-158-ODPM-4	MEK (2-Butanone)		U	10	2.5	JL78
L10030650-09	MW-158-ODPM-4	MIBK (methyl isobutyl ketone)		Q	10	2.5	JL78
L10030650-10	MW-158A-ODPM-4	Acetone	4.08	F	10	2.5	JL78
L10030650-10	MW-158A-ODPM-4	Carbon disulfide		U	1	0.5	JL73
L10030650-10	MW-158A-ODPM-4	MEK (2-Butanone)		U	10	2.5	JL78
L10030650-10	MW-158A-ODPM-4	MIBK (methyl isobutyl ketone)		Q	10	2.5	JL78
L10030650-11	MW-159-ODPM-4	Carbon disulfide	69		5	2.5	JL73
L10030650-12	MW-160-ODPM-4	Carbon disulfide		U	1	0.5	JL73
L10030650-13	MW-165-ODPM-4	Carbon disulfide		U	1	0.5	JL73
L10030650-14	MW-166-ODPM-4	Carbon disulfide		U	1	0.5	JL72
L10030650-15	MW-166A-ODPM-4	Carbon disulfide		U	1	0.5	JL72
L10030650-16	MW-232-ODPM-4	Carbon disulfide		U	1	0.5	JL73
L10030650-17	MW-241-ODPM-4	Carbon disulfide		U	1	0.5	JL73
L10030650-18	MW-242-ODPM-4	Acetone	4.85	F	10	2.5	JL78
L10030650-18	MW-242-ODPM-4	Carbon disulfide		U	1	0.5	JL73
L10030650-18	MW-242-ODPM-4	MEK (2-Butanone)		U	10	2.5	JL78MS66
L10030650-18	MW-242-ODPM-4	MIBK (methyl isobutyl ketone)		Q	10	2.5	JL78
L10030650-21	MW-243-ODPM-4	Acetone	5.07	F	10	2.5	JL78
L10030650-21	MW-243-ODPM-4	Carbon disulfide		U	1	0.5	JL73
L10030650-21	MW-243-ODPM-4	MEK (2-Butanone)		U	10	2.5	JL78
L10030650-21	MW-243-ODPM-4	MIBK (methyl isobutyl ketone)		Q	10	2.5	JL78
L10030650-25	MW-247-ODPM-4	Acetone	4.01	F	10	2.5	JL78
L10030650-25	MW-247-ODPM-4	Carbon disulfide		U	1	0.5	JL73
L10030650-25	MW-247-ODPM-4	MEK (2-Butanone)		U	10	2.5	JL78
L10030650-25	MW-247-ODPM-4	MIBK (methyl isobutyl ketone)		Q	10	2.5	JL78
L10030650-26	MW-249-ODPM-4	Acetone		F	10	2.5	JL78
L10030650-26	MW-249-ODPM-4	Carbon disulfide		U	1	0.5	JL73

L10030650-26	MW-249-ODPM-4	MEK (2-Butanone)		U	10	2.5	JL78
L10030650-26	MW-249-ODPM-4	MIBK (methyl isobutyl ketone)		Q	10	2.5	JL78
L10030650-27	MW-250-ODPM-4	Acetone	4.07	F	10	2.5	JL78
L10030650-27	MW-250-ODPM-4	Carbon disulfide		U	1	0.5	JL73
L10030650-27	MW-250-ODPM-4	MEK (2-Butanone)		U	10	2.5	JL78
L10030650-27	MW-250-ODPM-4	MIBK (methyl isobutyl ketone)		Q	10	2.5	JL78
L10030650-28	MW-251-ODPM-4	Acetone	4.49	F	10	2.5	JL78
L10030650-28	MW-251-ODPM-4	Carbon disulfide		U	1	0.5	JL73
L10030650-28	MW-251-ODPM-4	MEK (2-Butanone)		U	10	2.5	JL78
L10030650-28	MW-251-ODPM-4	MIBK (methyl isobutyl ketone)		Q	10	2.5	JL78
L10030650-31	TB-31910-ODPM-3	Carbon disulfide		U	1	0.5	JL74

In some cases, the laboratory analyzed both an LCS and an LCSD as there was no MS/MSD. In such cases, per the QAPP only results in which both recoveries are out of limits are qualified. An LCS/LCSD was performed for SDG L10030693, WG 327234; SDG L10030650 WG 326987, 326997 and 326996. In WG 327114, a compound (bromomethane, Methyl ethyl ketone, Methyl isobutyl ketone) was slightly low in the LCS or LCSD, but within range in the other QC pair. No qualifier has been applied.

IX. BLANKS

A. Method Blanks were analyzed at the required frequency and for each matrix and analysis.

Yes X No

B. No blank contamination was found in the Method Blank.

Yes X No

Method blanks are undetected for client compounds. Whenever methylene chloride, acetone, 2-butanone or phthalate esters are detected in associated samples at a level less than 10x the method blank (corrected for dilution), the result is qualified as UMB#, where # is the corrected method blank level. Such results are usable as nondetects. For other targets, the factor used is 5x.

C. If Field Blanks were identified, no blank contamination was found.

Yes No X

There are 5 trip blanks (TB in the client ID) and 2 rinse blanks (RB in the client ID) for 8260. There are detections observed below the reporting limit in the trip blanks. When analytes are present in both the field blank and the associated samples, the results in the samples are qualified in the same manner as for method blanks. For clarity, the qualifiers used in this case are UTB# for trip blanks and URB# for rinse blanks, where # is the associated blank value. Qualifiers added are shown in the table below. Results so qualified are usable as non-detects.

Laboratory ID	Client ID	Compound	Result ug/l	Flag	RL	MDL	Qualifier
L10030780-01	MW-78-ODLA-1	1,4-Dichlorobenzene	0.198	F	0.5	0.125	URB1.04
L10030650-06	MW-150-ODPM-4	Methylene chloride	0.277	F	1	0.25	UTB.395
L10030650-13	MW-165-ODPM-4	1,4-Dichlorobenzene	0.159	F	0.5	0.125	URB1
L10030650-14	MW-166-ODPM-4	1,4-Dichlorobenzene	0.141	F	0.5	0.125	URB1
L10030693-12	MW-164-ODPM-4	1,4-Dichlorobenzene	0.193	F	0.5	0.125	URB.99

X. FIELD QC

If Field duplicates were identified, they met guidance for VOA of RPD of < 35% for water or < 50% for soils. For SVOA < 50% RPD for water, no soils RPD is defined in the QAPP. For values reported at < 5 x the reporting limit (RL), a difference of 2 x RL is used as guidance (4 x RL for soils). Data are not qualified for field duplicates as these are evaluated for the total project by the client.

Yes ☐ No ☐ NA ☐

There are 7 identified field duplicates, in control. There are a few discrepancies between acetone and chloroform results, but they are well within the 2x RL limit and these are both common laboratory or field outliers.

SDG	Parent	Dup	Comment
L10030650	MW-54-ODPM-4	DUP-1-ODPM-4	OK
L10030650	MW-165A-ODPM-4	DUP-3-ODPM-4	OK
L10030693	MW248-ODPM-4	DUP-4-ODPM-4	OK
L10030693	MW-157-ODPM-4	DUP-2-ODPM-4	OK
L10030693	MW-006-ODLA-1	DUP-1-ODLA-1	OK
L10030693	MW-144-ODLA-1	DUP-2-ODLA-1	OK
L10030693	MW-187-ODLA-1	DUP-3-ODLA-1	OK

XI. SYSTEM PERFORMANCE

A. The RICs, chromatograms, tunes and general system performance were acceptable for all instruments and analytical systems.

Yes ☐ No ☐ NA ☒

Not part of this review level

B. The suggested EQLs for the sample matrices in this set were met.

Yes ☒ No ☐ NA ☐

XII. TCL COMPOUNDS

A. The identification is accurate and all retention times, library spectra and reconstructed ion chromatograms (RIC) were evaluated for all detected compounds.

Yes ☐ No ☐ NA ☒

Not part of this review level

B. Quantitation was checked to determine the accuracy of calculations for representative compounds in each internal standards quantitation set.

Yes ☐ No ☐ NA ☒

Not part of this review level

XIII. TENTATIVELY IDENTIFIED COMPOUNDS

TICs were properly identified and met the library identification criteria.

Yes ☐ No ☐ NA ☒

Not part of this review level

XIV. OVERALL ASSESSMENT OF THE CASE

The laboratory has complied with the requested method. Data are fully usable after consideration of qualifiers. The following is noted:

General Deliverables and Data Packages

This report has been requested to include the following review: Holding times and sample integrity (chains of custody, sample log in), Calibrations, Summary QC.

Although the samples are collected and delivered together, the laboratory splits the samples into numerous analytical batches which are run on up to 3 different instruments. This compounds the validation work, the data tracking and paperwork. The reviewer iterates the request to minimize the environmental impact of the paperwork by analyzing client samples in the minimum number of analytical batches and on the same instrument. The variability in response of instruments to client compounds can add a precision variability to the data results.

Chain of Custody:

No qualifiers have been added for chain of custody issues and the project manager will update chains per the following notes to complete the project record.

Only the first page of the chain of custody documents were signed and dated by the laboratory. These are electronically-generated chain of custody documents, and there may be electronic signatures for these which we are not able to review. However, the hardcopy documents should be properly signed and dated by the sampler and the laboratory on each page. There is also no tracking to identify the gap in time from relinquishment to laboratory receipt.

Sample Condition:

EPA regulations (See Federal Register, March 12, 2007, 40CFR Part 122) require only that the temperature of samples delivered to the laboratory be equal to or less than 6° C. The sample receipt conditions are fully compliant with applicable regulations.

There is no formal log-in verification for bubbles and sample integrity. The project manager, to date, has approved of the laboratory narrative to discuss any integrity outliers

Calibration:

Method 8260: Per the project manager, the 2001 EPA CLP validation guidance has been applied to the common “poor responders”. Acetone, 2-butanone, and 4-methyl-2-pentanone are the compounds for which any calibration response factors below 0.05 have been observed. The validation guidance used for this project allows for a response of 0.01 for these compounds if spectral integrity can be verified at low concentrations. These spectra are not commonly provided and are not part of the deliverable for these data sets. The laboratory has been tasked with providing to the client verification that the 0.01 RF is valid. Given the spectral verification is available, the data are not qualified for response $>0.01 < 0.05$. No data have been qualified.

An ICV is also reported with each batch and instrument. It has the same outliers as the LCS and in the same range, so data have been qualified per the results listed in the LCS section.

Matrix Spikes:

There are 5 MS/MSD pairs designated or analyzed by the laboratory for 94 samples. This is a sufficient frequency for the number of field samples.

The full target list has been spiked. Outliers observed per the QAPP limits for Method 8260 MS/MSD runs are shown in the table in the text. For analytes where the parent sample concentration is $> 4x$ the spike level, no qualifier is added because the level of the spike is similar to the normal variability expected in the method; hence recoveries for such cases are not meaningful. Data are qualified JMS#, where # is the %R. Data could be biased slightly low in proportion to the recovery. As carbon disulfide is low in all the LCS's, the low recovery appears to be laboratory related, not matrix related.

Qualifiers are added for the MS or MSD precision. Data are qualified JD#, where # is the RPD. As the RPD increases, the matrix precision decreases. One qualifications was required for this set of samples.

Field Blanks:

There are 5 trip blanks (TB in the client ID) and 2 rinse blanks (RB in the client ID) for 8260. There are detections observed below the reporting limit in the trip blanks and rinse blanks. When analytes are present in both the field blank and the associated samples, the results in the samples are qualified in the same manner as for method blanks. For clarity, the qualifiers used in this case are UTB# for trip blanks and URB# for rinse blanks, where # is the associated blank value. Qualifiers added are shown in the table in the text. Results so qualified are usable as non-detects.

LCS Recoveries:

The full target list has been spiked. When a high LCS recovery is associated with a non-detect in samples, no qualifier is added since the indicated bias is high. When the target is detected, the result is qualified as JL#, where # is the elevated recovery. Data could be biased high or low proportional to the LCS %R. All results associated with low recoveries are qualified and one detect for slightly high acetone.

Dichlorodifluoromethane, and sometimes vinyl chloride, are consistently high in the ICV and the LCS standards. The compounds are not been detected and data are not qualified for high recovery with one exception for vinyl chloride.

The table in the text shows the outliers and the limits applied per the QAPP. The limits are specified per matrix. Only two recoveries are outside of the marginal exceedance limits (60-140). Qualifiers are added for all outliers as described here but the project manager may consider reversing some of these when the limits fall within the marginal exceedance limits. Please see the project EDD for a detailed list of qualifiers added.

In some cases, the laboratory analyzed both an LCS and an LCSD as there was no MS/MSD. In such cases, per the QAPP only results in which both recoveries are out of limits are qualified. An LCS/LCSD was performed for SDG L10030693, WG 327234; SDG L10030650 WG 326987, 326997 and 326996. In WG 327114, a compound (bromomethane, Methyl ethyl ketone, Methyl isobutyl ketone) was slightly low in the LCS or LCSD, but within range in the other QC pair. No qualifier has been applied.

Field QC:

There are 7 identified field duplicates, in control. There are a few discrepancies between acetone and chloroform results, but they are well within the 2x RL limit and these are both common laboratory or field outliers.

ORGANIC DATA QUALITY REVIEW REPORT
VOLATILE ORGANICS SW-846 METHOD 8260B
8260B/5030B

SDG: L10090659

PROJECT: Memphis Defense Depot, Off Depot groundwater and LTM for e2m, Texas

LABORATORY: Microbac Laboratories, Inc., Marietta, OH

SAMPLE MATRIX: Water

SAMPLING DATE (Month/Year): September 2010

NO. OF SAMPLES: 47 aqueous samples; including 2 trip blanks, 2 field duplicates

ANALYSES REQUESTED: SW-846 8260B

SAMPLE NO.: See attached result forms and associated EDD

DATA REVIEWER: Diane Short

QA REVIEWER: Diane Short and Associates Inc. INITIALS/DATE: _____

Telephone Logs included Yes____ No X

Contractual Violations Yes____ No X

The project QAPP (11/05), the EPA Contract Laboratory Program National Functional Guidelines for Organic Review, 1999 and 2001, and the SW-846 Method 8260B have been referenced by the reviewer to perform this data validation review. The EPA qualifiers have been expanded to include a descriptor code and value to define QC violations and their values, per the approval of the Project Manager. Per the Scope of Work, the review of these samples includes Level III validation of all chains of custody, calibrations and QC forms referencing the QC limits in the above documents.

I. DELIVERABLES

A. All deliverables were present as specified in the Statement of Work (SOW), SW-846, or in the project contract.

Yes ___ No X

B. Chain of Custody Documentation was complete and accurate.

Yes ___ No X

No qualifiers have been added for chain of custody issues and the project manager will update chains per the following notes to complete the project record.

There is one standard chain with one sample and full receipt and relinquishment data. For all the other samples, there is a sampler signature on several pages, but not on all and no dates or times of relinquishment and receipt on any of the chains. There is no courier identified, but there is a tracking number on the laboratory log-in form.

C. Samples were received at the required temperature, preservation and intact with no bubbles.

Yes X No ___

EPA regulations (See Federal Register, March 12, 2007, 40CFR Part 122) require only that the temperature of samples delivered to the laboratory be equal to or less than 6° C. The sample receipt conditions are fully compliant with applicable regulations.

II. ANALYTICAL REPORT FORMS

A. The Analytical Report or Data Sheets are present and complete for all requested analyses.

Yes X No ___

B. Holding Times

1. The contract holding times were met for all analyses (Time of sample receipt to time of analysis (VOA) or extraction and from extraction to analysis).

Yes X No ___

2. The Clean Water Act (40 CFR 136) or method holding times were met for all analyses (14 days from time of sample collection to analysis or extraction).

Yes X No ___

III. INSTRUMENT CALIBRATION – GC/MS

A. Initial Calibration

1. The Response (RF) and Relative Response Factors (RRF) and average RRF for all compounds for all analyses met the contract criteria of >0.01 for volatiles and 0.05 for semi-volatiles.

Yes X No ___ NA ___

Method 8260: Per the project manager, the 2001 EPA CLP validation guidance has been applied to the common “poor responders”. Acetone, 2-butanone, and 4-methyl-2-pentanone are the compounds for which any calibration response factors below 0.05 have been observed. The validation guidance used for this project allows for a response of 0.01 for these compounds if spectral integrity can be verified at low concentrations. These spectra are not commonly provided and are not part of the deliverable for these data sets. The laboratory has been tasked with providing to the client verification that the 0.01 RF is valid. Given the spectral verification is available, the data are not qualified for response >0.01 < 0.05. No data have been qualified.

Most of the low-responding compounds are highly water-soluble and capable of hydrogen bonding with water. This decreases their purge efficiency and results in the relatively low response. The implication of this low purge efficiency is that a relatively low absolute recovery of such compounds is achieved in the purge step of the analysis. If this recovery is consistent, reasonable accuracy and precision can be achieved in a given matrix, which is indicated for the lab matrix by acceptable recoveries in LCS and calibration checks. However, this causes these targets to be more sensitive to matrix variations that impact purge efficiency (such as ionic

strength or the presence of varying levels of soluble non-target organic material) than are the more hydrophobic compounds typically analyzed by this method, and as a result they are more likely to exhibit matrix bias.

For Instrument HPMS 6, there was no Initial Calibration summary form to indicate the individual and average response factors and the % RSDs. The narrative states that all calibration criteria were met and no qualification is added. The missing page needs to be submitted to complete the project record. The response factors could be derived from the associated continuing calibration and were acceptable.

2a. The relative standard deviation (RSD) for the five point calibration was within the 30% limit for the CCCs.

Yes ☒ No ☐ NA ☐

This is a method requirement and indicates that the analytical system is in control.

2b. The relative standard deviation (RSD) for the five point calibration was within the 30% limit for all other compounds, the average %RSD was <15%, or a linear curve was used.

Yes ☐ No ☒ NA ☐

Review of the calibration data notes that naphthalene is 31.3% for instrument HPMS11, the 8/26/10 calibration. As no naphthalene data are reported as detected and the response factor is sufficient to verify the non-detect, no qualification is required.

3. The 12 hour system Performance Check was performed as required in SW-846.

Yes ☒ No ☐ NA ☐

An ICV is also reported with each batch and instrument. It has the same outliers as the LCS and in the same range, so data have been qualified per the results listed in the LCS section.

B. Continuing Calibrations

1. The midpoint standard was analyzed for each analysis at the required frequency and the QC criteria of > 0.05 (.01 for CLP 2001 VOA) were met.

Yes ☒ No ☐ NA ☐

2. The percent difference (%D) limits of $\pm 25\%$ were met. The 2001 NFG also allow for 40% D for the poor responders (pr). For other compounds the QAPP notes rejection of detected compounds with %D > 40%.

Yes ☐ No ☒ NA ☐

When there are no detections, unless the %D is biased low and so large as to indicate a significant probability of false negatives, no qualifiers are added for %D outliers when targets are not detected or for a high recovery for undetected compounds. Data are qualified JC#, where # is the %D. There could be variability to the data as there is variability to the response.

The QAPP indicates that compounds in a run should be rejected if the %D is > 40%. We interpret this to mean that non-detects should be rejected and that detected targets should be J-qualified, which is the normal validation process for rejection.

For HPMS11 chloromethane was out of limits for almost every calibration, but within the 40% allowance for poor responders. No qualification has been applied.

For HPMS6 bromomethane was out of limits for almost every calibration, but within the 40% allowance for poor responders. No qualification has been applied.

For HPMS8, 2-butanone was at 38.2%, 4-methyl-2-pentanone was at 27.1%. These and other outliers were within the CLP 25% limit or the 40% poor responder limit. No qualification has been applied.

The difference in the calibration outliers verified the distinct difference in response of the instruments used for the analysis of the client samples.

IV. GC/MS INSTRUMENT PERFORMANCE CHECK

The BFB (VOA) performance check was injected once at the beginning of each 12-hour period and relative abundance criteria for the ions were met.

Yes ☒ No ☐ NA ☐

V. INTERNAL STANDARDS

The Internal Standards met the 100% upper and -50% lower limits criteria and the Retention times were within the required windows.

Yes ☒ No ☐ NA ☐

VI. SURROGATE

Surrogate spikes were analyzed with every sample.

Yes ☒ No ☐

And met the recovery limits defined in the QAPP of 70 – 130% for VOA and 45-135% for SVOA base/neutral fraction or 35-140% for the acid fraction. For SVOA, one surrogate per fraction is allowed to be at 15 – 150%.

Yes ☒ No ☐

VII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A. Matrix spike (MS) and matrix spike duplicates (MSD) were analyzed for every analysis performed and for every 20 samples or for every matrix whichever is more frequent.

Yes ☐ No ☒

There are 2 MS/MSD pairs analyzed by the laboratory. This is a sufficient frequency for the number of field samples (when field duplicates and blanks are excluded), but not to meet the method criteria of 1 per work group (preparation and analysis set).

B. The MS and MSD percent recoveries were within the limits defined in the QAPP of VOA at 70 – 130% with 5 compounds allowed to be within 60 – 140%; SVOA at 45- 135%, 5 compounds allowed to be at 15 – 150%. Reject non-detects at < 15% for SVOA.

Yes ☒ No ☐ NA ☐

The full target list has been spiked. There were outliers observed per the QAPP limits for Method 8260. There were outliers per the laboratory limits, but not the QAPP and for which no qualification is applied. They have been noted for the record.

For analytes where the parent sample concentration is > 4x the spike level, no qualifier is added because the level of the spike is similar to the normal variability expected in the method; hence recoveries for such cases are not meaningful. Undetected data are not qualified for high results. Data are qualified JMS#, where # is the %R. Results could be biased proportional to the spike recovery. Only the client sample is qualified.

Work Group (instrument)	Client ID	Compound	%R	Qualifier
344011 (8)	MW-148-ODPM-6	Acetone	142/ 144	JMS144
		Bromodichloromethane	123/122	OK, per QAPP
		2-butanone	144/ 144	None, ND
		Carbon disulfide	147/ 130	None, ND
344094 (11)	MW-242- ODPM-6	Carbon disulfide	187/ 182	None, ND
		Chloromethane	59.1/ 59.7	JMS59.1

C. The MSD relative percent differences (RPD) were within the defined contract limits for VOA of 30% water, 40 soil, with 5 compounds allowed to be < 40% RPD; for SVOA of 50% for water and 60% for soil and 5 compounds allowed to be > 60% RPD.

Yes ☒ No ☐ NA ☐

Qualifiers are added only when the MS or MSD recovery is also out of limits. Data are qualified JD#, where # is the RPD. As the RPD increases, the matrix precision decreases. No qualifications was required for this set of samples.

D. The MS/MSD were client samples.

Yes X No NA

Sufficient MS/MSD samples were reported from client samples when the trip blank and duplicates were taken out of the count. Client samples are noted in the table above.

VIII. LABORATORY CONTROL SAMPLE

A. Laboratory Control Samples (LCS) was analyzed for every analysis performed and for every 20 samples.

Yes X No

B. The LCS percent recoveries were within the limits defined in the QAPP for VOA of 80-120% for water and 75 – 125% for soil. Five compounds are allowed to be 60 – 140%. No soil limits are defined in the QAPP and laboratory limits will be applied. If an LCS and LCSD are analyzed, both samples must have the same compounds out for data to be qualified.

Yes No X

The full target list has been spiked. When a high LCS recovery is associated with a non-detect in samples, no qualifier is added since the indicated bias is high. When the target is detected, the result is qualified as JL#, where # is the elevated recovery. Data could be biased high or low proportional to the LCS %R. All results associated with low recoveries are qualified.

The table below shows the outliers and the limits applied per the QAPP. Four applicable recoveries are outside of the marginal exceedence limits (60-140 %). No qualifiers are added when associated compounds are non-detect (ND) and the recoveries are high. The specific samples qualified are contained in the table at the end of the report. Data could be biased high or low proportional to the spike recovery due to laboratory accuracy for the noted compound.

Work Group (Instrument)	Compound	%R	Qualifier
344006 (11)	Chloromethane	69.8	JL69.8
	Acetone	121	JL121
344094(11)	Chloromethane	63.7	JL63.7
344443 (11)	Outliers, but this is for TCE only		TCE only
3344505 (11)	Chloromethane	34.9	None, cal for TCE only
344503 (6)	Carbon disulfide	66.1	JL66
	Chloromethane	59	JL59
	Dichlorodifluoromethane	34.4	JL34
	Vinyl chloride	71.3	JL71
334525 (6)	bromodichloromethane	122	None, ND
	Bromomethane	78.8	JL78.8
	Dichlorodifluoromethane	154	None, ND
	Vinyl chloride	123	None, ND
344011 (8)	1,1,2,2-tetrachloroethane	122	JL122
	1,2 dichloroethane	124	None ND
	2-hexanone	121	JL121
	Acetone	139	JL139
	Bromodichloromethane	123	None, ND
	Chloroethane	124	None ND
	Dichlorodifluoromethane,	121	None ND
	2-butanone	147	JL147
	MIBK	129	JL129
	Trichlorofluoromethane	132	None, ND
	Vinyl chloride	121	None, ND

No LCS and LCSD pair was reported when there was no MS/MSD.

IX. BLANKS

A. Method Blanks were analyzed at the required frequency and for each matrix and analysis.

Yes ☒ No ☐

B. No blank contamination was found in the Method Blank.

Yes ☒ No ☐

Method blanks are undetected for client compounds. Whenever methylene chloride, acetone, 2-butanone or phthalate esters are detected in associated samples at a level less than 10x the method blank (corrected for dilution), the result is qualified as UMB#, where # is the corrected method blank level. Such results are usable as nondetects. For other targets, the factor used is 5x.

C. If Field Blanks were identified, no blank contamination was found.

Yes ☐ No ☒

There are 2 trip blanks (TB in the client ID) and no rinse blanks (RB in the client ID). TB-31910 has no reported detections. There are detections observed below the reporting limit in trip blank TB-31810-ODPM-6 (chloromethane at 0.77 and methylene chloride at 0.309 ug/l). The qualifiers used in this case are UTB# for trip blanks, where # is the associated blank value. Qualifiers added are shown in the table at the end of the report. Results so qualified are usable as non-detects.

Acetone has been consistently reported in past rinse blanks. As there is no rinse blank, the presence of acetone cannot be confirmed, but data at low levels for acetone could be suspect.

X. FIELD QC

If Field duplicates were identified, they met guidance for VOA of RPD of < 35% for water or < 50% for soils. For SVOA < 50% RPD for water, no soils RPD is defined in the QAPP. For values reported at < 5 x the reporting limit (RL), a difference of 2 x RL is used as guidance (4 x RL for soils). Data are not qualified for field duplicates as these are evaluated for the total project by the client.

Yes ☐ No ☐ NA ☐

There are 2 identified field duplicates, all in control. These are consistent field duplicate pairs on this project to date.

Parent	Dup	Comment
MW-54-ODPM-6	DUP-1-ODPM-6	OK
MW-157-ODPM-6	DUP-2-ODPM-6	OK

XI. SYSTEM PERFORMANCE

A. The RICs, chromatograms, tunes and general system performance were acceptable for all instruments and analytical systems.

Yes ☐ No ☐ NA ☒

Not part of this review level

B. The suggested EQLs for the sample matrices in this set were met.

Yes ☒ No ☐ NA ☐

XII. TCL COMPOUNDS

A. The identification is accurate and all retention times, library spectra and reconstructed ion chromatograms (RIC) were evaluated for all detected compounds.

Yes ☐ No ☐ NA ☒

Not part of this review level

B. Quantitation was checked to determine the accuracy of calculations for representative compounds in each internal standards quantitation set.

Yes ____ No ____ NA X ____

Not part of this review level

XIII. TENTATIVELY IDENTIFIED COMPOUNDS

TICs were properly identified and met the library identification criteria.

Yes ____ No ____ NA X ____

Not part of this review level

XIV. OVERALL ASSESSMENT OF THE CASE

The laboratory has complied with the requested method. Data are fully usable after consideration of qualifiers. The following is noted:

General Deliverables and Data Packages

This report has been requested to include the following review: Holding times and sample integrity (chains of custody, sample log in), Calibrations, Summary QC.

Although the samples are collected and delivered together, the laboratory splits the samples into numerous analytical batches which are run on 3 different instruments and 8 distinct QC sets (days of analysis per instrument). Two of these are for diluted TCE only. This compounds the validation work, the data tracking and paperwork. The reviewer iterates the request to minimize the environmental impact of the paperwork by analyzing client samples in the minimum number of analytical batches and on the same instrument. The variability in response of instruments to client compounds adds a precision variability to the data results. For Instrument HPMS 6, there was no Initial Calibration summary form to indicate the individual and average response factors and the % RSDs. The narrative states that all calibration criteria were met and no qualification is added. The missing page needs to be submitted to complete the project record.

Chain of Custody:

No qualifiers have been added for chain of custody issues and the project manager will update chains per the following notes to complete the project record.

Sample Condition:

EPA regulations (See Federal Register, March 12, 2007, 40CFR Part 122) require only that the temperature of samples delivered to the laboratory be equal to or less than 6° C. The sample receipt conditions are fully compliant with applicable regulations.

Initial Calibration:

Method 8260: Per the project manager, the 2001 EPA CLP validation guidance has been applied to the common "poor responders". Acetone, 2-butanone, and 4-methyl-2-pentanone are the compounds for which any calibration response factors below 0.05 have been observed. The validation guidance used for this project allows for a response of 0.01 for these compounds if spectral integrity can be verified at low concentrations. These spectra are not commonly provided and are not part of the deliverable for these data sets. The laboratory has been tasked with providing to the client verification that the 0.01 RF is valid. Given the spectral verification is available, the data are not qualified for response $>0.01 < 0.05$. No data have been qualified.

An ICV is also reported with each batch and instrument. It has the same outliers as the LCS and in the same range, so data have been qualified per the results listed in the LCS section.

For Instrument HPMS 6, there was no Initial Calibration summary form to indicate the individual and average response factors and the % RSDs. The narrative states that all calibration criteria were met and no qualification is added. The missing page needs to be submitted to complete the project record. The response factors could be derived from the associated continuing calibration and were acceptable.

Review of the calibration data notes that naphthalene is 31.3% RSD for instrument HPMS11, the 8/26/10 initial calibration. As no naphthalene data are reported as detected and the response factor is sufficient to verify the non-detect, no qualification is required.

An ICV is also reported with each batch and instrument. It has the same outliers as the LCS and in the same range, so data have been qualified per the results listed in the LCS section.

Continuing Calibration:

When there are no detections, unless the %D is biased low and so large as to indicate a significant probability of false negatives, no qualifiers are added for %D outliers when targets are not detected or for a high recovery for undetected compounds. Data are qualified JC#, where # is the %D. There could be variability to the data as there is variability to the response.

The QAPP indicates that compounds in a run should be rejected if the %D is > 40%. We interpret this to mean that non-detects should be rejected and that detected targets should be J-qualified, which is the normal validation process for rejection.

For HPMS11 chloromethane was out of limits for almost every calibration, but within the 40% allowance for poor responders. No qualification has been applied.

For HPMS6 bromomethane was out of limits for almost every calibration, but within the 40% allowance for poor responders. No qualification has been applied.

For HPMS8, 2-butanone was at 38.2%, 4-methyl-2-pentanone was at 27.1%. These and other outliers were within the CLP 25% limit or the 40% poor responder limit. No qualification has been applied.

The difference in the calibration outliers verified the distinct difference in response of the instruments used for the analysis of the client samples.

Matrix Spikes:

There are 2 MS/MSD pairs analyzed by the laboratory. This is a sufficient frequency for the number of field samples (when field duplicates and blanks are excluded), but not to meet the method criteria of 1 per work group (preparation and analysis set).

The full target list has been spiked. There were outliers observed per the QAPP limits for Method 8260. There were outliers per the laboratory limits, but not the QAPP and for which no qualification is applied. They have been noted for the record.

For analytes where the parent sample concentration is > 4x the spike level, no qualifier is added because the level of the spike is similar to the normal variability expected in the method; hence recoveries for such cases are not meaningful. Undetected data are not qualified for high results. Data are qualified JMS#, where # is the %R. Results could be biased proportional to the spike recovery. Only the client sample is qualified.

Work Group (instrument)	Client ID	Compound	%R	Qualifier
344011 (8)	MW-148-ODPM-6	Acetone	142/ 144	JMS144
		Bromodichloromethane	123/122	OK, per QAPP
		2-butanone	144/ 144	None, ND
		Carbon disulfide	147/ 130	None, ND
344094 (11)	MW-242- ODPM-6	Carbon disulfide	187/ 182	None, ND
		Chloromethane	59.1/ 59.7	JMS59.1

Laboratory Control Samples:

The full target list has been spiked. When a high LCS recovery is associated with a non-detect in samples, no qualifier is added since the indicated bias is high. When the target is detected, the result is qualified as JL#, where # is the elevated recovery. Data could be biased high or low proportional to the LCS %R. All

results associated with low recoveries are qualified. The QAPP limits are not the same as the laboratory limits.

The table below shows the outliers and the limits applied per the QAPP. Four applicable recoveries are outside of the marginal exceedence limits (60-140 %). No qualifiers are added when associated compounds are non-detect (ND) and the recoveries are high. The specific samples qualified are contained in the table at the end of the report. Data could be biased high or low proportional to the spike recovery due to laboratory accuracy for the noted compound.

Work Group (Instrument)	Compound	%R	Qualifier
344006 (11)	Chloromethane	69.8	JL69.8
	Acetone	121	JL121
344094(11)	Chloromethane	63.7	JL63.7
344274 (11)	1,2,3-trichloropropane	121	None, ND
	Acetone	129	JL129
	Chloromethane	60.6	JL60.6
	Dichlorodifluoromethane	76.7	JL76.7
	2-butanone	122	None, ND
344443 (11)	Outliers, but this is for TCE only		TCE only
3344505 (11)	Chloromethane	34.9	None, cal for TCE only
344503 (6)	Carbon disulfide	66.1	JL66
	Chloromethane	59	JL59
	Dichlorodifluoromethane	34.4	JL34
	Vinyl chloride	71.3	JL71
334525 (6)	bromodichloromethane	122	None, ND
	Bromomethane	78.8	JL78.8
	Dichlorodifluoromethane	154	None, ND
	Vinyl chloride	123	None, ND
344011 (8)	1,1,2,2-tetrachloroethane	122	JL122
	1,2 dichloroethane	124	None ND
	2-hexanone	121	JL121
	Acetone	139	JL139
	Bromodichloromethane	123	None, ND
	Chloroethane	124	None ND
	Dichlorodifluoromethane,	121	None ND
	2-butanone	147	JL147
	MIBK	129	JL129
	Trichlorofluoromethane	132	None, ND
	Vinyl chloride	121	None, ND

No LCS and LCSD pair was reported when there was no MS/MSD.

Field Blanks:

There are 2 trip blanks (TB in the client ID) and no rinse blanks (RB in the client ID). TB-31910 has no reported detections. There are detections observed below the reporting limit in trip blank TB-31810-ODPM-6 (chloromethane at 0.77 and methylene chloride at 0.309 ug/l). The qualifiers used in this case are UTB# for trip blanks, where # is the associated blank value. Qualifiers added are shown in the table at the end of the report. Results so qualified are usable as non-detects.

Acetone has been consistently reported in past rinse blanks. As there is no rinse blank, the presence of acetone cannot be confirmed, but data at low levels for acetone could be suspect.

Field QC:

There are 2 identified field duplicates, all in control.

Parent	Dup	Comment
MW-54-ODPM-6	DUP-1-ODPM-6	OK
MW-157-ODPM-6	DUP-2-ODPM-6	OK

SUMMARY TABLE OF QUALIFIED DATA

			ug/l				
Lab ID	Client ID	Compound	Result	Flag	RL	MDL	DV Qual
L10090659-01	MW-54-ODPM-6	1,1,2,2-Tetrachloroethane	44.9		0.5	0.2	JL122
L10090659-01	MW-54-ODPM-6	Acetone	6.67	Q	10	2.5	JL139
L10090659-01	MW-54-ODPM-6	MEK (2-Butanone)		Q	10	2.5	JL129
L10090659-01	MW-54-ODPM-6	MIBK (methyl isobutyl ketone)		Q	10	2.5	JL129
L10090659-02	MW-70-ODPM-6	1,1,2,2-Tetrachloroethane	1.07		0.5	0.2	JL122
L10090659-02	MW-70-ODPM-6	2-Hexanone		Q	10	2.5	JL121
L10090659-02	MW-70-ODPM-6	Acetone	6.02	Q	10	2.5	JL139
L10090659-02	MW-70-ODPM-6	MEK (2-Butanone)		Q	10	2.5	JL147
L10090659-02	MW-70-ODPM-6	MIBK (methyl isobutyl ketone)		Q	10	2.5	JL129
L10090659-03	MW-76-ODPM-6	Chloromethane		Q	1	0.5	JL63.7
L10090659-04	MW-77-ODPM-6	Acetone	5.63	F	10	2.5	JL121
L10090659-04	MW-77-ODPM-6	Chloromethane		Q	1	0.5	JL69.8
L10090659-05	MW-148-ODPM-6	2-Hexanone		Q	10	2.5	JL121
L10090659-05	MW-148-ODPM-6	Acetone	4.23	M	10	2.5	JL139MS144
L10090659-05	MW-148-ODPM-6	MEK (2-Butanone)		M	10	2.5	JL147
L10090659-05	MW-148-ODPM-6	MIBK (methyl isobutyl ketone)		Q	10	2.5	JL129
L10090659-08	MW-150-ODPM-6	Acetone	4.83	F	10	2.5	JL121
L10090659-08	MW-150-ODPM-6	Chloromethane		Q	1	0.5	JL69.8
L10090659-09	MW-155-ODPM-6	Acetone	4.1	F	10	2.5	JL121
L10090659-09	MW-155-ODPM-6	Chloromethane		Q	1	0.5	JL69.8
L10090659-10	MW-157-ODPM-6	Acetone	6.33	F	10	2.5	JL121
L10090659-10	MW-157-ODPM-6	Chloromethane		Q	1	0.5	JL69.8
L10090659-11	MW-159-ODPM-6	Acetone	4.7	F	10	2.5	JL121
L10090659-11	MW-159-ODPM-6	Chloromethane		Q	1	0.5	JL69.8
L10090659-12	MW-161-ODPM-6	Acetone	7.18	F	10	2.5	JL121
L10090659-12	MW-161-ODPM-6	Chloromethane		Q	1	0.5	JL69.8
L10090659-13	MW-162-ODPM-6	Acetone	5.15	F	10	2.5	JL121
L10090659-13	MW-162-ODPM-6	Chloromethane		Q	1	0.5	JL69.8
L10090659-14	MW-163-ODPM-6	Chloromethane		Q	1	0.5	JL69.8
L10090659-15	MW-164-ODPM-6	Chloromethane		Q	1	0.5	JL63.7
L10090659-16	MW-232-ODPM-6	Chloromethane		Q	1	0.5	JL63.7

L10090659-17	MW-241-ODPM-6	Chloromethane		Q	1	0.5	JL63.7
L10090659-18	MW-242-ODPM-6	Chloromethane		Q	1	0.5	JL63.7MS59
L10090659-21	MW-243-ODPM-6	Chloromethane		Q	1	0.5	JL63.7
L10090659-22	MW-244-ODPM-6	Chloromethane		Q	1	0.5	JL63.7
L10090659-23	MW-245-ODPM-6	Chloromethane		Q	1	0.5	JL63.7
L10090659-24	MW-251-ODPM-6	Chloromethane		Q	1	0.5	JL63.7
L10090659-25	DUP-1-ODPM-6	Chloromethane		Q	1	0.5	JL63.7
L10090659-26	DUP-2-ODPM-6	Chloromethane		Q	1	0.5	JL63.7
L10090659-27	TB-31910-ODPM-6	Chloromethane		Q	1	0.5	JL63.7
L10090659-28	MW-79-ODPM-6	Chloromethane		Q	1	0.5	JL63.7
L10090659-29	MW-149-ODPM-6	Carbon disulfide		U	1	0.5	JL66.1
L10090659-29	MW-149-ODPM-6	Chloromethane		U	1	0.5	JL59
L10090659-29	MW-149-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL34.4
L10090659-29	MW-149-ODPM-6	Vinyl chloride		U	1	0.25	JL71.3
L10090659-30	MW-151-ODPM-6	Acetone	7.08	F	10	2.5	JL129
L10090659-30	MW-151-ODPM-6	Chloromethane		Q	1	0.5	JL60.6
L10090659-30	MW-151-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL76.7
L10090659-31	MW-152-ODPM-6	Acetone	5.09	F	10	2.5	JL129
L10090659-31	MW-152-ODPM-6	Chloromethane		Q	1	0.5	JL60.6
L10090659-31	MW-152-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL76.7
L10090659-32	MW-158-ODPM-6	Acetone	5.64	F	10	2.5	JL129
L10090659-32	MW-158-ODPM-6	Chloromethane		Q	1	0.5	JL60.6
L10090659-32	MW-158-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL76.7
L10090659-33	MW-158A-ODPM-6	Acetone	6.17	F	10	2.5	JL129
L10090659-33	MW-158A-ODPM-6	Chloromethane		Q	1	0.5	JL60.6
L10090659-33	MW-158A-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL76.7
L10090659-34	MW-160-ODPM-6	Chloromethane		Q	1	0.5	JL60.6
L10090659-34	MW-160-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL76.7
L10090659-35	MW-165-ODPM-6	Acetone	5.21	F	10	2.5	JL129
L10090659-35	MW-165-ODPM-6	Chloromethane		Q	1	0.5	JL60.6
L10090659-35	MW-165-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL76.7
L10090659-36	MW-165A-ODPM-6	Acetone	5.88	F	10	2.5	JL129
L10090659-36	MW-165A-ODPM-6	Chloromethane		Q	1	0.5	JL60.6
L10090659-36	MW-165A-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL76.7
L10090659-37	MW-166-ODPM-6	Acetone	6.69	F	10	2.5	JL129
L10090659-37	MW-166-ODPM-6	Chloromethane		Q	1	0.5	JL60.6
L10090659-37	MW-166-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL76.7
L10090659-38	MW-166A-ODPM-6	Acetone	6.3	F	10	2.5	JL129

L10090659-38	MW-166A-ODPM-6	Chloromethane		Q	1	0.5	JL60.6
L10090659-38	MW-166A-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL76.7
L10090659-39	MW-246-ODPM-6	Carbon disulfide		U	1	0.5	JL66.1
L10090659-39	MW-246-ODPM-6	Chloromethane		U	1	0.5	JL59
L10090659-39	MW-246-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL34.4
L10090659-39	MW-246-ODPM-6	Vinyl chloride		U	1	0.25	JL71.3
L10090659-40	MW-247-ODPM-6	Carbon disulfide		U	1	0.5	JL66.1
L10090659-40	MW-247-ODPM-6	Chloromethane		U	1	0.5	JL59
L10090659-40	MW-247-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL34.4
L10090659-40	MW-247-ODPM-6	Vinyl chloride		U	1	0.25	JL71.3
L10090659-41	MW-248-ODPM-6	Carbon disulfide		U	1	0.5	JL66.1
L10090659-41	MW-248-ODPM-6	Chloromethane		U	1	0.5	JL59
L10090659-41	MW-248-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL34.4
L10090659-41	MW-248-ODPM-6	Vinyl chloride		U	1	0.25	JL71.3
L10090659-42	MW-249-ODPM-6	Carbon disulfide		U	1	0.5	JL66.1
L10090659-42	MW-249-ODPM-6	Chloromethane		U	1	0.5	JL59
L10090659-42	MW-249-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL34.4
L10090659-42	MW-249-ODPM-6	Vinyl chloride		U	1	0.25	JL71.3
L10090659-43	MW-250-ODPM-6	Carbon disulfide		U	1	0.5	JL66.1
L10090659-43	MW-250-ODPM-6	Chloromethane		U	1	0.5	JL59
L10090659-43	MW-250-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL34.4
L10090659-43	MW-250-ODPM-6	Vinyl chloride		U	1	0.25	JL71.3
L10090659-44	DUP-3-ODPM-6	Carbon disulfide		U	1	0.5	JL66.1
L10090659-44	DUP-3-ODPM-6	Chloromethane		U	1	0.5	JL59
L10090659-44	DUP-3-ODPM-6	Dichlorodifluoromethane		U	1	0.25	JL34.4
L10090659-44	DUP-3-ODPM-6	Methylene chloride	0.259	F	1	0.25	UTB.309
L10090659-44	DUP-3-ODPM-6	Vinyl chloride		U	1	0.25	JL71.3
L10090659-45	DUP-4-ODPM-6	Bromomethane		Q	1	0.5	JL78.8
L10090659-46	TB-31810-ODPM-6	Bromomethane		Q	1	0.5	JL78.8
L10090659-47	MW-147-ODLS-2	Bromomethane		Q	1	0.5	JL78.8
L10090659-47	MW-147-ODLS-2	Chloromethane	0.81	F	1	0.5	UTB.77

APPENDIX C
HISTORICAL CVOC RESULTS

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-04

	Sample Name	MW4	MW042	MW043	MW044	MW045	MW04-76	MW4-78	MW-4-IS-6	MW-04-IS-7
	Sample Date	11/15/1993	6/20/1997	9/25/1997	3/28/1998	10/15/1998	11/21/2005	11/9/2007	4/21/2009	10/14/2009
Primary CVOCs	Units									
1,1,2,2-Tetrachloroethane	µg/L	ND	<10	<10	<10	<10	0.23 J	<1	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	ND	<10	<10	<10	<10	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	ND	<10	<10	<10	<10	<1	<1	<1	<1
Carbon tetrachloride	µg/L	ND	<10	<10	<10	<10	<1	<1	<1	<1
Chloroform	µg/L	ND	1 J	<10	<10	1 J	0.43 J	0.16	0.328	0.294 J
cis-1,2-Dichloroethene	µg/L	--	--	--	--	--	<1	<1	<1	<1
Tetrachloroethene	µg/L	32.6	74	78	72	120	33.4	23.4	<1	<1
Total 1,2-Dichloroethene	µg/L	--	<10	<10	<10	<10	--	--	--	--
trans-1,2-Dichloroethene	µg/L	ND	--	--	--	--	<1	<1	<1	<1
Trichloroethene	µg/L	ND	2 J	3 J	3 J	4 J	2.23	1.11	<1	<1
Vinyl chloride	µg/L	ND	<10	<10	<10	<10	<1 UJ	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-05

Sample Name		MW5	MW052	MW053	MW054	MW055	MW-05-IS-7
Sample Date		11/16/1993	6/21/1997	9/27/1997	3/28/1998	10/15/1998	10/13/2009
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	ND	<10	<10	<10	<10	<0.5
1,1,2-Trichloroethane	µg/L	ND	<10	<10	<10	<10	<1
1,1-Dichloroethene	µg/L	ND	<10	<10	<10	<10	<1
Carbon tetrachloride	µg/L	ND	<10	<10	<10	<10	<1
Chloroform	µg/L	1.85	5 J	5 J	3 J	3 J	0.227 J
cis-1,2-Dichloroethene	µg/L	--	--	--	--	--	<1
Tetrachloroethene	µg/L	16.9	48	89	65	70	<1
Total 1,2-Dichloroethene	µg/L	--	2 J	2 J	<10	1 J	--
trans-1,2-Dichloroethene	µg/L	ND	--	--	--	--	<1
Trichloroethene	µg/L	3.33	8 J	14	5 J	8 J	<1
Vinyl chloride	µg/L	ND	<10	<10	<10	<10	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-06

Sample Name		MW6	MW062	MW063	MW064	MW065	MW06RD67	MW06-67	MW-06-SARA-GW01
Sample Date		11/18/1993	6/21/1997	9/27/1997	3/30/1998	10/15/1998	10/27/2004	11/21/2005	5/16/2007
Primary CVOCs	Units								
1,1,2,2-Tetrachloroethane	µg/L	219	110	220	130	220	613	237	41
1,1,2-Trichloroethane	µg/L	9.1	7 J	9 J	5 J	8 J	20.9 J	10.1	3.9
1,1-Dichloroethene	µg/L	ND	<20	<20	<10	<20	<1	<1	<1
Carbon tetrachloride	µg/L	43.7	45	37	15	23	31.2 J	26.5	16
Chloroform	µg/L	14.3	16 J	14 J	6 J	10 J	15.4 J	10.2	6.2
cis-1,2-Dichloroethene	µg/L	--	--	--	--	--	436	295	200
Tetrachloroethene	µg/L	3.06	4 J	3 J	1 J	2 J	1.9 J	1.84	1.4
Total 1,2-Dichloroethene	µg/L	--	410	380	150	270	--	--	--
trans-1,2-Dichloroethene	µg/L	20.8	--	--	--	--	25.4 J	16.8	11
Trichloroethene	µg/L	198	260	240	94	160	236	171	120
Vinyl chloride	µg/L	ND	<20	<20	<10	<20	1.59 J	1.35 J	0.68

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-06

		Sample Name	MW6-69	MW-6-IS-4	MW-06-TSVE-GW	MW-6-IS-5	MW-6-IS-6	MW-06-IS-7	MW-006-ODLA-1
		Sample Date	11/7/2007	4/15/2008	8/19/2008	10/17/2008	4/22/2009	10/13/2009	3/26/2010
Primary CVOCs	Units								
1,1,2,2-Tetrachloroethane	µg/L		18.4	8.89	8.1	5.57	3.23	3.96	2.67
1,1,2-Trichloroethane	µg/L		2.32	1.02	0.972	0.674 J	<1	<1	<1
1,1-Dichloroethene	µg/L		<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L		13.8	3.78	1.35	0.793 J	0.463 J	<1	<1
Chloroform	µg/L		8.55	84.7	29.4	21.2	6.17	5.48	5.4
cis-1,2-Dichloroethene	µg/L		150	36.2	23.1	15	4.91	3.78	1.62
Tetrachloroethene	µg/L		1.14	1.07	0.365	<1	0.254 J	<1	<1
Total 1,2-Dichloroethene	µg/L		--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		6.33	1.45	0.926	0.458 J	<1	<1	<1
Trichloroethene	µg/L		78.1	32.5	14.2	8.6	2.53	2.44	2.29
Vinyl chloride	µg/L		0.484	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-13

		Sample Name	MW13	MW132	MW133	MW134	MW135	MW13-79.5FT	MW13-ZVI-TS1	MW13-ZVI-TS2
		Sample Date	11/15/1993	6/20/1997	9/26/1997	3/26/1998	10/15/1998	1/8/2001	10/22/2003	11/17/2003
Primary CVOCs		Units								
1,1,2,2-Tetrachloroethane	µg/L		ND	<10	<10	<10	<10	<1	0.517	<0.5
1,1,2-Trichloroethane	µg/L		ND	<10	<10	<10	<10	<1	<0.5	<0.5
1,1-Dichloroethene	µg/L		ND	<10	<10	<10	<10	<1	<1	<1
Carbon tetrachloride	µg/L		ND	<10	<10	<10	<10	<1	<1	<1
Chloroform	µg/L		ND	<10	<10	<10	<10	<1	0.391 J	0.402 J
cis-1,2-Dichloroethene	µg/L		--	--	--	--	--	<1	<1	<1
Tetrachloroethene	µg/L		2.01	7 J	8 J	2 J	3 J	<1	9.06	6.33
Total 1,2-Dichloroethene	µg/L		--	<10	<10	<10	<10	--	--	--
trans-1,2-Dichloroethene	µg/L		ND	--	--	--	--	<1	<1	<1
Trichloroethene	µg/L		ND	<10	<10	<10	<10	<1 UJ	1.23	0.325 J
Vinyl chloride	µg/L		ND	<10	<10	<10	<10	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-13

Sample Name		MW13-ZVI-TS3	MW13-ZVI-TS4	MW13-ZVI-TS5	MW13RD77	MW13-77	MW13-75	MW-13-IS-6
Sample Date		12/17/2003	2/2/2004	4/5/2004	10/28/2004	11/21/2005	11/7/2007	4/21/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	2.64 J	0.66 J	<1	<0.5
1,1,2-Trichloroethane	µg/L	<0.5	<0.5	<0.5	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	0.352 J	0.409 J	0.397 J	0.345 J	0.27 J	0.127	0.142 J
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	6.97	4.69	4.53	3.5	2.15	0.571	<1
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	0.308 J	0.262 J	0.638 J	<1	0.91 J	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1 UJ	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-13

	Sample Name	MW-13-IS-7
	Sample Date	10/14/2009
Primary CVOCs	Units	
1,1,2,2-Tetrachloroethane	µg/L	<0.5
1,1,2-Trichloroethane	µg/L	<1
1,1-Dichloroethene	µg/L	<1
Carbon tetrachloride	µg/L	<1
Chloroform	µg/L	0.187 J
cis-1,2-Dichloroethene	µg/L	<1
Tetrachloroethene	µg/L	<1
Total 1,2-Dichloroethene	µg/L	--
trans-1,2-Dichloroethene	µg/L	<1
Trichloroethene	µg/L	<1
Vinyl chloride	µg/L	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-14

		Sample Name	MW14	MW142	MW143	MW144	MW145	MW-14-Y2Q1	MW-14	MW-14-Y2Q3
		Sample Date	11/17/1993	6/18/1997	9/24/1997	3/25/1998	10/15/1998	2/16/2000	5/18/2000	8/24/2000
Primary CVOCs		Units								
1,1,2,2-Tetrachloroethane	µg/L	ND	<10	<10	<10	<10	<10	<1	<1	<1 UJ
1,1,2-Trichloroethane	µg/L	ND	<10	<10	<10	<10	<10	<1	<1	<1
1,1-Dichloroethene	µg/L	ND	<10	<10	<10	<10	<10	<1	<1	<1
Carbon tetrachloride	µg/L	ND	1 J	<10	<10	<10	<10	<1	<1	<1
Chloroform	µg/L	ND	<10	<10	<10	<10	<10	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	--	--	--	--	--	--	<1	<1	<1
Tetrachloroethene	µg/L	ND	<10	<10	<10	<10	<10	<1	<1	<1
Total 1,2-Dichloroethene	µg/L	<0.01	<10	<10	<10	<10	<10	--	--	--
trans-1,2-Dichloroethene	µg/L	ND	--	--	--	--	--	<1	<1	<1
Trichloroethene	µg/L	ND	<10	1 J	<10	<10	1 J	<1	<1	<1 UJ
Vinyl chloride	µg/L	ND	<10	<10	<10	<10	<10	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-14

		Sample Name	MW-14-Y2Q4	MW14RD77	MW14-75	MW14-77.5	MW-14-IS-6	MW-14-IS-7
		Sample Date	11/6/2000	10/28/2004	11/21/2005	11/7/2007	4/21/2009	10/13/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L		<1	<1	0.15 J	<1	<0.5	<0.5
1,1,2-Trichloroethane	µg/L		<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L		<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L		<1	<1	<1	<1	0.743 J	0.939 J
Chloroform	µg/L		<1	<1	<1	<1	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L		<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L		<1	<1	<1	<1	0.507 J	<1
Total 1,2-Dichloroethene	µg/L		--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L		<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L		<1	<1	<1 UJ	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-15

	Sample Name	MW15	MW152	MW153	MW154	MW155	MW-15-Y1Q1	MW-15-Y1Q2	MW-15-Y1Q3
	Sample Date	11/18/1993	6/20/1997	9/26/1997	3/28/1998	10/15/1998	2/3/1999	5/25/1999	8/27/1999
Primary CVOCs	Units								
1,1,2,2-Tetrachloroethane	µg/L	2.71	<20	<25	<10	<10	<1	28.2	165
1,1,2-Trichloroethane	µg/L	<1	<20	<25	<10	<10	<1	2.66	4.18
1,1-Dichloroethene	µg/L	<1	<20	<25	<10	<10	<1	<1	<1
Carbon tetrachloride	µg/L	38.9	31	46	3 J	5 J	27.9	79.6	39.2
Chloroform	µg/L	59.2	300	380	13	31	308	1610	1270
cis-1,2-Dichloroethene	µg/L	--	--	--	--	--	5.96	22.6	12.4
Tetrachloroethene	µg/L	4.29	7 J	12 J	<10	<10	4.75	18.8	10
Total 1,2-Dichloroethene	µg/L	--	8 J	12 J	<10	1 J	--	--	--
trans-1,2-Dichloroethene	µg/L	2.09	--	--	--	--	2.13	8.26	4.29
Trichloroethene	µg/L	46.4	99	140	6 J	13	115	518	331
Vinyl chloride	µg/L	ND	<20	<25	<10	<10	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-15

Sample Name		MW-15-Y1Q4	MW-15-Y2Q1	MW15NA	MW-15	MW-15-Y2Q3	MW-15-Y2Q4	MW15RD74	MW15-77
Sample Date		11/3/1999	2/15/2000	3/24/2000	5/17/2000	8/22/2000	11/7/2000	10/27/2004	11/21/2005
Primary CVOCs	Units								
1,1,2,2-Tetrachloroethane	µg/L	291	522	600	343	389	147	273 J	273
1,1,2-Trichloroethane	µg/L	5.72	10.2	11	4.69	5.7	2.6	10.5	6.09
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	35.2	29	27	16.3	24.7	12.8	58.2	13.4
Chloroform	µg/L	1020	1060	1400	704	848	224	1530	489
cis-1,2-Dichloroethene	µg/L	10.8	14.3	14	6.96	12	4.75	46.3	15
Tetrachloroethene	µg/L	8.46	6.91	12	3.96	7.18	2.84	14.4	2.98
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	4.08	4.54	5	2.29	4.17	1.73	10.1	3.1
Trichloroethene	µg/L	299	299	360	154	234	65.9	403	133
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1	2.81 J

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-15

		Sample Name	MW-15-SARA-GW01	MW15-75	MW-15-IS-4	MW-15-TSVE-GW	MW-15-IS-5	MW-15-IS-6	MW-15-IS-7
		Sample Date	5/15/2007	11/7/2007	4/15/2008	8/19/2008	10/16/2008	4/20/2009	10/13/2009
Primary CVOCs	Units								
1,1,2,2-Tetrachloroethane	µg/L		78	2.47	2.15	0.988	4.61	0.963	24.5 J
1,1,2-Trichloroethane	µg/L		3.7	<1	<1	<1	0.593 J	<1	0.905 J
1,1-Dichloroethene	µg/L		<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L		31	25	16	6.35	2.51	0.513 J	2.97
Chloroform	µg/L		810	186	106	33.4	29.9	0.524	31.1 J
cis-1,2-Dichloroethene	µg/L		27	10.6	5.99	3.07	2.54	<1	1.69
Tetrachloroethene	µg/L		14	6.32	7.19	2.99	1.16	0.612 J	1.13
Total 1,2-Dichloroethene	µg/L		--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		5.8	3.67	2.02	0.731	<1	<1	0.332 J
Trichloroethene	µg/L		330	145	104	44.2	22.9	0.289 J	27
Vinyl chloride	µg/L		<1	0.313	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-15

	Sample Name	MW-015-ODLA-1
	Sample Date	3/26/2010
Primary CVOCs	Units	
1,1,2,2-Tetrachloroethane	µg/L	11.8
1,1,2-Trichloroethane	µg/L	0.283 J
1,1-Dichloroethene	µg/L	<1
Carbon tetrachloride	µg/L	1.81
Chloroform	µg/L	14.7
cis-1,2-Dichloroethene	µg/L	0.796 J
Tetrachloroethene	µg/L	0.85 J
Total 1,2-Dichloroethene	µg/L	--
trans-1,2-Dichloroethene	µg/L	<1
Trichloroethene	µg/L	13.8
Vinyl chloride	µg/L	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-31

	Sample Name	MW31	MW312	MW313ADD	MW314	MW315	MW-31-Y1Q1	MW-31-Y1Q2	MW-31-Y1Q3
	Sample Date	11/19/1993	6/20/1997	9/24/1997	3/24/1998	10/15/1998	2/3/1999	5/25/1999	8/27/1999
Primary CVOCs	Units								
1,1,2,2-Tetrachloroethane	µg/L	96	<10	10 J	97	33	3.22	<1	<1
1,1,2-Trichloroethane	µg/L	6.48	<10	<20	4 J	<25	<1	<1	<1
1,1-Dichloroethene	µg/L	52.4	29	47	26	14 J	7.86	33.3	7.9
Carbon tetrachloride	µg/L	4.81	1 J	8 J	3 J	<25	1.51	<1	0.59 J
Chloroform	µg/L	21.1	10	49	21 J	16 J	7.22	<1	1.66
cis-1,2-Dichloroethene	µg/L	--	--	--	--	--	58.9	4.78	4.34
Tetrachloroethene	µg/L	95.4	67	110	66	42	4.25	7.55	1.31
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	164	--	--	--	--	22.2	2.14	4.66
Trichloroethene	µg/L	1110	78	220	400	380	140	23.9	33.7
Vinyl chloride	µg/L	<	<10	<20	<25	<25	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-31

Sample Name		MW-31-Y1Q4	MW-31-Y2Q1	MW31NA	MW-31	MW-31-Y2Q3	MW-31-Y2Q4	MW-31_010214
Sample Date		11/3/1999	2/15/2000	3/23/2000	5/17/2000	8/23/2000	11/7/2000	2/14/2001
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	<1	14.8
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	1.2
1,1-Dichloroethene	µg/L	5.98	9.89	8	22.3	<1	31.5	7.98
Carbon tetrachloride	µg/L	<1	<1	<1	<1	0.4 J	<1	2.76
Chloroform	µg/L	0.92 J	1.19	0.5 J	1.29	<1	<1	25.1
cis-1,2-Dichloroethene	µg/L	5.09	6.89	0.6 J	15.5	12.3	4.24	148
Tetrachloroethene	µg/L	0.9 J	0.64 J	1 J	1.16	2.08	0.92 J	5.02
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	2.52	3.37	0.3 J	7.78	<1	4.53	49.3
Trichloroethene	µg/L	18	25.6	4	49.5	68.1	18.5	241
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-31

		Sample Name	MW-31-Y3S2-B	MW-31-2_020410	MW-31-2_021002	MW-31-2	MW-31-2_031028	MW31 (77.5-79.5)
		Sample Date	10/3/2001	4/10/2002	10/2/2002	4/8/2003	10/28/2003	4/29/2004
Primary CVOCs		Units						
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	31.2	39.5	55.4	5.37	8.38	40	
Carbon tetrachloride	µg/L	1.25	<1	0.88 J	<1	<1	0.24 J	
Chloroform	µg/L	1.61	<1	1.08	<1	<1	0.32 J	
cis-1,2-Dichloroethene	µg/L	5.53	6.78	17	2.06	<1	0.56 J	
Tetrachloroethene	µg/L	4.19	1.24	1.32	0.92	<1	2.2	
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	
trans-1,2-Dichloroethene	µg/L	4.83	5.34	11.3	1.53	<1	0.47 J	
Trichloroethene	µg/L	38.1	33.1	87.5	13.5	2.32	16	
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-31

Sample Name		MW-31	MW31 77.5-79.5	0506625-008	0511645-025	0604364-031	MW-31T	MW-31-77.1-IS-2
Sample Date		8/12/2004	10/20/2004	6/17/2005	11/18/2005	4/12/2006	10/18/2006	4/9/2007
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1.7	<1	<1	<1	<1	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1.7	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	26 B	17	24.9	27.8	29.6	30.6	12.5
Carbon tetrachloride	µg/L	<1.7	<1 J	<1	<1	<1	<1	0.451 J
Chloroform	µg/L	<1.7	<1	<1	<1	<1	0.131 J	0.458
cis-1,2-Dichloroethene	µg/L	<1.7	0.58 J	0.814 J	<1	1.56	<1	7.32
Tetrachloroethene	µg/L	0.59 J	0.42 J	0.547 J	0.755 J	1.35	7.58	1.45
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<1.7	0.31 J	0.595 J	<1	1.4	<1	5.44
Trichloroethene	µg/L	5.5	4.7	8.48	8.86	4.99	3.85	30.2
Vinyl chloride	µg/L	<1.7 J	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-31

		Sample Name	MW-31-77.1-IS-3	MW-31-77.1-IS-4	MW-31-76.95-IS-5	MW-31-76.95-IS-6	MW-31-IS-7
		Sample Date	10/5/2007	4/11/2008	10/17/2008	4/14/2009	10/14/2009
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L		0.262 J	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L		<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L		7.73	7.17	7.36	35	28.8
Carbon tetrachloride	µg/L		0.48 J	0.368 J	<1	<1	<1
Chloroform	µg/L		0.398	0.802	0.219 J	0.186 J	0.161 J
cis-1,2-Dichloroethene	µg/L		8.45	2.87	<1	0.26 J	0.273 J
Tetrachloroethene	µg/L		0.887 J	0.916 J	3.17	43.5	41.2
Total 1,2-Dichloroethene	µg/L		--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		5.23	1.51	<1	<1	<1
Trichloroethene	µg/L		5.87	3.21	4.34	33.4	29
Vinyl chloride	µg/L		<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-31

Sample Name MW-031-ODLA-1		
Sample Date 3/26/2010		
Primary CVOCs	Units	
1,1,2,2-Tetrachloroethane	µg/L	<0.5
1,1,2-Trichloroethane	µg/L	<1
1,1-Dichloroethene	µg/L	30.9
Carbon tetrachloride	µg/L	<1
Chloroform	µg/L	0.16 J
cis-1,2-Dichloroethene	µg/L	<1
Tetrachloroethene	µg/L	22.7
Total 1,2-Dichloroethene	µg/L	--
trans-1,2-Dichloroethene	µg/L	<1
Trichloroethene	µg/L	20.4
Vinyl chloride	µg/L	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-32

		Sample Name	MW32	MW322	MW323	MW324	MW-32-Y1Q1	MW-32-Y1Q2	MW-32-Y1Q3	MW-32-Y1Q4
		Sample Date	11/18/1993	6/21/1997	9/29/1997	3/27/1998	2/3/1999	5/25/1999	8/26/1999	11/3/1999
Primary CVOCs		Units								
1,1,2,2-Tetrachloroethane	µg/L		162	91	110	140	5.67	4.42	0.92 J	<1
1,1,2-Trichloroethane	µg/L		7.69	5 J	5 J	6 J	1.54	<1	<1	<1
1,1-Dichloroethene	µg/L		<	<10	<10	<10	<1	<1	<1	<1
Carbon tetrachloride	µg/L		33	25	16	20	25.2	14.2	17.3	25.2
Chloroform	µg/L		11.3	8 J	6 J	7 J	7.89	32.2	76.9	73
cis-1,2-Dichloroethene	µg/L		--	--	--	--	30.5	16.7	4.64	4.59
Tetrachloroethene	µg/L		2	2 J	1 J	1 J	1.16	1.28	2.22	2.63
Total 1,2-Dichloroethene	µg/L		--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		10.4	--	--	--	3.82	1.76	0.99 J	1.01
Trichloroethene	µg/L		137	93	76	100	31.9	28.1	34.6	36.8
Vinyl chloride	µg/L		<	<10	<10	<10	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-32

		Sample Name	MW-32-Y2Q1	MW-32	MW-32-Y2Q3	MW-32-Y2Q4	MW-32_010220	MW-32-Y3S2	MW-32-1_020410
		Sample Date	2/15/2000	5/16/2000	8/24/2000	11/9/2000	2/20/2001	10/3/2001	4/10/2002
Primary CVOCs		Units							
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	2.12	21.5	68.2	216	24	
1,1,2-Trichloroethane	µg/L	<1	<1	<1	0.61 J	<1	<1	0.59 J	
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1	
Carbon tetrachloride	µg/L	25.5	37	47.2	61.3	19.7	42.7	12.1	
Chloroform	µg/L	77.2	117	171	372 J	434	828	102	
cis-1,2-Dichloroethene	µg/L	5.07	6.61	5.66	8.55	9.44	12.6 J	4.21	
Tetrachloroethene	µg/L	2.34	3.94	5.9	6.39 J	3.74	<1	0.82 J	
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	--	
trans-1,2-Dichloroethene	µg/L	1.12	2	2.68	4.53	2.42	5.82 J	1.26	
Trichloroethene	µg/L	41.8	58.2	89.2	94.8	71.9	238	37.9	
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1	

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-32

		Sample Name	MW-32-1_021001	MW-32-1	MW-32-1_031028	MW32 (64.5-66.5)	MW-32	MW32 65.9-66.9
		Sample Date	10/1/2002	4/8/2003	10/28/2003	4/29/2004	8/13/2004	10/20/2004
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L		14	11	7.82	8.1	21	3.6
1,1,2-Trichloroethane	µg/L		<1	0.52	<1	<1	<2.5	<1
1,1-Dichloroethene	µg/L		<1	<1	<1	<1	<2.5	<1
Carbon tetrachloride	µg/L		12.3	1.18	<1	8.2	7.6	2.3 J
Chloroform	µg/L		91.5	50.2	50.9	37	68	17
cis-1,2-Dichloroethene	µg/L		3.49	9.16	7.97	2	2.8	1.7
Tetrachloroethene	µg/L		1.41	<1	<1	0.37 J	0.97 J	<1
Total 1,2-Dichloroethene	µg/L		--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		0.72 J	<1	<1	0.36 J	<2.5	0.23 J
Trichloroethene	µg/L		34.8	13.5	13.4	14	24	7.3
Vinyl chloride	µg/L		<1	<1	<1	<1	<2.5	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-32

	Sample Name	MW32RD66	0506521-007	0511580-006	0604364-015	MW-32B	MW-32-65.6-IS-2	MW-32-65.6-IS-3
	Sample Date	10/28/2004	6/14/2005	11/16/2005	4/12/2006	10/19/2006	4/9/2007	10/8/2007
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	17.1 J	3.72	32.7	46	21.7	1.59	<0.5
1,1,2-Trichloroethane	µg/L	0.379 J	<1	1.06	1.28	0.594 J	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	9.56 J	2.83	12.3	17.4	12.3	3.95	<1
Chloroform	µg/L	64.7 J	11.5	131	154	86	8.63	<0.3
cis-1,2-Dichloroethene	µg/L	3.3 J	1.65	4.99	7.62	3.53	1.14	<1
Tetrachloroethene	µg/L	0.936 J	<1	1.55	2.58	1.63	0.82 J	<1
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	0.490 J	<1	<1	1.25	0.613 J	<1	<1
Trichloroethene	µg/L	22 J	4.1	55	70	38	6.47	<1
Vinyl chloride	µg/L	<1 B	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-32

		Sample Name	MW-32-65.6-IS-4	MW-32-66.84-IS-5	MW-32-66.84-IS-6	MW-32-IS-7	MW-032-ODLA-1
		Sample Date	4/11/2008	10/17/2008	4/15/2009	10/14/2009	3/26/2010
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L		<0.5	<0.5	<0.5	16.2	9.16
1,1,2-Trichloroethane	µg/L		<1	<1	<1	0.873 J	0.434 J
1,1-Dichloroethene	µg/L		<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L		<1	<1	<1	20.2	6.71
Chloroform	µg/L		4.07	0.2 J	0.593	176	60
cis-1,2-Dichloroethene	µg/L		0.263 J	2.09	3.03	10.3	6.27
Tetrachloroethene	µg/L		<1	<1	<1	5.41	2.43
Total 1,2-Dichloroethene	µg/L		--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		<1	<1	<1	1.97	0.926 J
Trichloroethene	µg/L		2.47	3.65	4.41	113	38.3
Vinyl chloride	µg/L		<1	<1	0.495 J	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-33

	Sample Name	MW33	MW332	MW333	MW334	MW335	MW-33-Y1Q1	MW-33-Y1Q2
	Sample Date	11/19/1993	6/18/1997	9/25/1997	3/25/1998	10/16/1998	2/2/1999	5/25/1999
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	2.28	<10	<10	<10	<10	<1	<1
1,1,2-Trichloroethane	µg/L	<	<10	<10	<10	<10	<1	<1
1,1-Dichloroethene	µg/L	<	<10	<10	<10	<10	<1	<1
Carbon tetrachloride	µg/L	<	<10	<10	<10	<10	<1	<1
Chloroform	µg/L	<	<10	<10	<10	<10	<1	<1
cis-1,2-Dichloroethene	µg/L	--	--	--	--	--	<1	<1
Tetrachloroethene	µg/L	<	<10	<10	<10	<10	<1	<1
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<	--	--	--	--	<1	<1
Trichloroethene	µg/L	<	<10	<10	<10	<10	<1	<1
Vinyl chloride	µg/L	<	<10	<10	<10	<10	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-33

	Sample Name	MW-33-Y1Q3	MW-33-Y1Q4	MW-33-Y2Q1	MW-33	MW-33-Y2Q3	MW-33-Y2Q4
	Sample Date	8/26/1999	11/2/1999	2/15/2000	5/16/2000	8/22/2000	11/8/2000
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1	<1
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-33

		Sample Name	MW-33-Y3S2	MW-33-1_020410	MW-33-1_021002	MW-33-1	MW-33-1_031028
		Sample Date	10/3/2001	4/10/2002	10/2/2002	4/8/2003	10/28/2003
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L		<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L		<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L		<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L		<1	<1	<1	<1	<1
Chloroform	µg/L		<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	µg/L		<1	<1	<1	<1	<1
Tetrachloroethene	µg/L		<1	<1	<1	<1	<1
Total 1,2-Dichloroethene	µg/L		--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		<1	<1	<1	<1	<1
Trichloroethene	µg/L		<1	<1	<1	<1	<1
Vinyl chloride	µg/L		<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-33

		MW33 59.5-61.5	MW33 59.33-61.33	0506521-005	0511580-003	0604364-012	MW-33
		4/29/2004	10/20/2004	6/14/2005	11/16/2005	4/12/2006	10/20/2006
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1 J	<1	<1	0.562 J	0.278 J
Chloroform	µg/L	<1	<1	<1	<1	<1	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1	<1
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-33

		Sample Name	MW-33-58-IS-2	MW-33-58-IS-3	MW-33-58-IS-4	MW-33-59.15-IS-5	MW-33-59.15-IS-6
		Sample Date	4/9/2007	10/8/2007	4/14/2008	10/17/2008	4/15/2009
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L		<0.5	<0.5	<0.5 J	<0.5	<0.5
1,1,2-Trichloroethane	µg/L		<1	<1	<1 J	<1	<1
1,1-Dichloroethene	µg/L		<1	<1	<1 J	<1	<1
Carbon tetrachloride	µg/L		0.457 J	1.5	<1 J	<1	0.474 J
Chloroform	µg/L		<0.3	<0.3	<0.3 J	<0.3	0.184 J
cis-1,2-Dichloroethene	µg/L		<1	<1	<1 J	<1	<1
Tetrachloroethene	µg/L		<1	<1	<1 J	<1	<1
Total 1,2-Dichloroethene	µg/L		--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		<1	<1	<1 J	<1	<1
Trichloroethene	µg/L		<1	<1	<1 J	<1	<1
Vinyl chloride	µg/L		<1	<1	<1 J	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-33

	Sample Name	MW-33-IS-7
	Sample Date	10/14/2009
Primary CVOCs	Units	
1,1,2,2-Tetrachloroethane	µg/L	<0.5
1,1,2-Trichloroethane	µg/L	<1
1,1-Dichloroethene	µg/L	<1
Carbon tetrachloride	µg/L	<1
Chloroform	µg/L	<0.3
cis-1,2-Dichloroethene	µg/L	<1
Tetrachloroethene	µg/L	<1
Total 1,2-Dichloroethene	µg/L	--
trans-1,2-Dichloroethene	µg/L	<1
Trichloroethene	µg/L	<1
Vinyl chloride	µg/L	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-37

	Sample Name	MW37SP	MW373	MW372	MW374	MW-37	MW-37-3_020410	MW-37-3_021001	MW-37-3
	Sample Date	11/18/1993	9/29/1996	6/18/1997	3/27/1998	2/20/2001	4/10/2002	10/1/2002	4/8/2003
Primary CVOCs	Units								
1,1,2,2-Tetrachloroethane	µg/L	ND	<10	<10	<10	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L	ND	<10	<10	<10	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	ND	<10	<10	<10	<1	<1	<1	<1
Carbon tetrachloride	µg/L	ND	<10	<10	<10	<1	<1	<1	<1
Chloroform	µg/L	ND	<10	<10	<10	<1	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	--	--	--	--	<1	<1	<1	<1
Tetrachloroethene	µg/L	ND	<10	<10	<10	<1	<1	<1	<1
Total 1,2-Dichloroethene	µg/L	--	<10	<10	<10	--	--	--	--
trans-1,2-Dichloroethene	µg/L	ND	--	--	--	<1	<1	<1	<1
Trichloroethene	µg/L	ND	<10	<10	<10	<1	<1	<1	<1
Vinyl chloride	µg/L	ND	<10	<10	<10	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-37

Sample Name		MW-37-3_031028	MW37 180-182.5	MW37 180.5-182.5	0506521-009	0511580-005	0604364-014
Sample Date		10/28/2003	4/29/2004	10/21/2004	6/14/2005	11/16/2005	4/12/2006
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1 J	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1	<1
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<1	<1 J	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-37

		MW-37	MW-37-173.2-IS-2	MW-37-173.2-IS-3	MW-37-173.2-IS-4	MW-37-173.25-1S-5
		10/19/2006	4/9/2007	10/8/2007	4/14/2008	10/17/2008
Primary CVOCs	Units					
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	0.788	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	4.12	<1	<1
Chloroform	µg/L	<0.3	<0.3	6.01	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	0.29 J	<1	<1
Tetrachloroethene	µg/L	<1	<1	0.637 J	<1	<1
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	2.71	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-37

Sample Name		MW-37-173.25-IS-6	MW-37-IS-7
Sample Date		4/15/2009	10/14/2009
Primary CVOCs	Units		
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1
1,1-Dichloroethene	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Chloroform	µg/L	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
Total 1,2-Dichloroethene	µg/L	--	--
trans-1,2-Dichloroethene	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Vinyl chloride	µg/L	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
ND Not Detected, RL unavailable
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-44

Sample Name		MW442	MW443	MW444	MW445	MW-44-Y1Q1	MW-44-Y1Q2	MW-44-Y1Q3	MW-44-Y1Q4
Sample Date		6/20/1997	9/25/1997	3/27/1998	10/17/1998	2/2/1999	5/25/1999	8/26/1999	11/2/1999
Primary CVOCs	Units								
1,1,2,2-Tetrachloroethane	µg/L	<10	<10	<10	<10	<1	<1	<10	<1
1,1,2-Trichloroethane	µg/L	<10	<10	<10	<10	<1	<1	<10	<1
1,1-Dichloroethene	µg/L	<10	<10	<10	<10	<1	<1	<10	<1
Carbon tetrachloride	µg/L	6 J	6 J	4 J	<10	<1	<1	<10	<1
Chloroform	µg/L	6 J	<10	4 J	<10	<1	<1	<10	<1
cis-1,2-Dichloroethene	µg/L	--	--	--	--	<1	<1	<10	<1
Tetrachloroethene	µg/L	<10	<10	<10	<10	<1	<1	<10	<1
Total 1,2-Dichloroethene	µg/L	2 J	2 J	1 J	<10	--	--	--	--
trans-1,2-Dichloroethene	µg/L	--	--	--	--	<1	<1	<10	<1
Trichloroethene	µg/L	4 J	5 J	3 J	<10	<1	<1	<10	<1
Vinyl chloride	µg/L	<10	<10	<10	<10	<1	<1	<10	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-44

		Sample Name	MW-44-Y2Q1	MW-44	MW-44-Y2Q3	MW-44-Y2Q4	MW-44-Y3S2-C	MW-44-3_020410	MW-44-3_021001
		Sample Date	2/15/2000	5/16/2000	8/24/2000	11/8/2000	10/3/2001	4/10/2002	10/1/2002
Primary CVOCs	Units								
1,1,2,2-Tetrachloroethane	µg/L		<1	<1	<1	<1	1.29	<1	<1
1,1,2-Trichloroethane	µg/L		<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L		<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L		<1	2.3	5.3	2.1	6.47	4.36	4.39
Chloroform	µg/L		<1	1.88	3.62	1.23	5.04	2.81	2.8
cis-1,2-Dichloroethene	µg/L		<1	0.65 J	1.35	0.622 J	<1	1.1	1.01
Tetrachloroethene	µg/L		<1	<1	<1	<1	<1	<1	<1
Total 1,2-Dichloroethene	µg/L		--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L		<1	1.36	4.92	0.79 J	2.77	2.05	1.67
Vinyl chloride	µg/L		<1	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-44

Sample Name		MW-44-1	MW-44-1_031028	MW44 (69-71)	MW-44	MW44 69-71	0506607-009	0511631-015	0604443-014
Sample Date		4/8/2003	10/28/2003	4/29/2004	8/14/2004	10/21/2004	6/16/2005	11/17/2005	4/13/2006
Primary CVOCs	Units								
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	3.65	1.96	1.3	0.8 J	0.71 J	<1	1.01	<1
Chloroform	µg/L	2.19	1.15	0.91 J	0.4 J	0.64 J	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	0.84	<1	0.35 J	<1	0.27 J	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<1	<1	<1 J	<1	<1	<1	<1	<1
Trichloroethene	µg/L	1.64	0.82 J	0.75 J	0.28 J	0.55 J	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-44

		Sample Name	MW-44	MW-44-69-IS-2	MW-44-69-IS-3	MW-44-69-IS-4	MW-44-69.75-IS-5	MW-44-69.75-IS-6
		Sample Date	10/19/2006	4/9/2007	10/5/2007	4/11/2008	10/20/2008	4/14/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L		<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L		<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L		1.2	1.24	1.2	0.823 J	0.708 J	0.5 J
Chloroform	µg/L		0.467	0.694	0.63	0.567	0.366	0.266 J
cis-1,2-Dichloroethene	µg/L		<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L		<1	<1	<1	<1	<1	<1
Total 1,2-Dichloroethene	µg/L		--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L		0.366 J	0.688 J	0.467 J	0.599 J	0.665 J	0.252 J
Vinyl chloride	µg/L		<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-44

		Sample Name	MW-44-IS-7	MW-044-ODLA-1
		Sample Date	10/15/2009	3/26/2010
Primary CVOCs	Units			
1,1,2,2-Tetrachloroethane	µg/L		<0.5	<0.5
1,1,2-Trichloroethane	µg/L		<1	<1
1,1-Dichloroethene	µg/L		<1	<1
Carbon tetrachloride	µg/L		0.822 J	<1
Chloroform	µg/L		0.213 J	<0.3
cis-1,2-Dichloroethene	µg/L		<1	<1
Tetrachloroethene	µg/L		<1	<1
Total 1,2-Dichloroethene	µg/L		--	--
trans-1,2-Dichloroethene	µg/L		<1	<1
Trichloroethene	µg/L		<1	0.426 J
Vinyl chloride	µg/L		<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-51

		Sample Name	MW512	MW513	MW514	MW515	MW-51-Y1Q1	MW-51-Y1Q2	MW-51-Y1Q3	MW-51-Y1Q4
		Sample Date	6/20/1997	9/27/1997	3/28/1998	10/19/1998	2/2/1999	5/24/1999	8/26/1999	11/3/1999
Primary CVOCs		Units								
1,1,2,2-Tetrachloroethane	µg/L	<10	<10	<10	<10	<10	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L	<10	<10	<10	<10	<10	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	6 J	23	30	10	23.4	16.9	15.2	8.19	
Carbon tetrachloride	µg/L	<10	<10	<10	<10	<1	<1	<1	<1	
Chloroform	µg/L	<10	<10	<10	<10	<1	<1	<1	<1	
cis-1,2-Dichloroethene	µg/L	--	--	--	--	<1	<1	<1	<1	
Tetrachloroethene	µg/L	1 J	4 J	4 J	2 J	1.5	<1	0.54 J	0.83 J	
Total 1,2-Dichloroethene	µg/L	<10	<10	<10	<10	--	--	--	--	
trans-1,2-Dichloroethene	µg/L	--	--	--	--	<1	<1	<1	<1	
Trichloroethene	µg/L	5 J	13	15	7 J	8.44	4.64	3.71	2.93	
Vinyl chloride	µg/L	<10	<10	<10	<10	<1	<1	<1	<1	

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-51

Sample Name		MW-51-Y2Q1	MW-51	MW-51-Y2Q3	MW-51-Y2Q4	MW-51_010219	MW-51-Y3S2-B	MW-51-2_020410
Sample Date		2/15/2000	5/16/2000	8/24/2000	11/8/2000	2/19/2001	10/3/2001	4/10/2002
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	1.08	8.23	12.9	57.9	15.8	31.4	26.4
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	1.49	3.51	1.86	2.13	<1
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	0.7 J	4.63	6.33	13.2	6.09	9.88	1.9
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-51

Sample Name		MW-51-2_021001	MW-51-100	MW-51-1_031028	MW51 (63-65)	MW51 63-65	MW51-61	MW-51-IS-6
Sample Date		10/1/2002	4/8/2003	10/28/2003	4/29/2004	10/21/2004	11/8/2007	4/20/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	<1	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	57	33.3	17.6	21	16	17.6	20.3
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1 J	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1	0.186	0.449
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	0.74 J	0.76	0.92 J	1.3	1.2	1.65	1.01
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	7.11	9.83	5.54	5.5	5.1	7.71	6.32
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-51

	Sample Name	MW-51-IS-7
	Sample Date	10/15/2009
Primary CVOCs	Units	
1,1,2,2-Tetrachloroethane	µg/L	<0.5
1,1,2-Trichloroethane	µg/L	<1
1,1-Dichloroethene	µg/L	15
Carbon tetrachloride	µg/L	<1
Chloroform	µg/L	0.231 J
cis-1,2-Dichloroethene	µg/L	<1
Tetrachloroethene	µg/L	2.3
Total 1,2-Dichloroethene	µg/L	--
trans-1,2-Dichloroethene	µg/L	<1
Trichloroethene	µg/L	10.4
Vinyl chloride	µg/L	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-57

Sample Name		DJA224	MW-57-Y2Q1	MW-57	MW-57-Y2Q3	MW-57-Y2Q4	MW-57-Y3S2-B	MW-57-2_020410
Sample Date		3/15/1999	2/16/2000	5/17/2000	8/22/2000	11/7/2000	10/3/2001	4/10/2002
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<10	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L	<10	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<10	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	14	39.9	50.6	45.7	48.3	37.5	42.8
Chloroform	µg/L	6 J	13.2	10.3	11.3	8.93	28	15.1
cis-1,2-Dichloroethene	µg/L	--	<1	<1	0.53 J	0.411 J	0.97 J	0.55 J
Tetrachloroethene	µg/L	2 J	5.38	5.1	5.86	5.07	5.24	6.08
Total 1,2-Dichloroethene	µg/L	<10	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	--	1.55	1.51	1.83	1.5	1.73	1.88
Trichloroethene	µg/L	22	50.8	46.5	49.2	30.9	77.4	66.4
Vinyl chloride	µg/L	<10	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-57

Sample Name		MW-57-2_021001	MW-57-2	MW-57-2_031028	MW57 (67-69)	MW57 66.8-68.8	MW57RD67	0506521-004
Sample Date		10/1/2002	4/8/2003	10/28/2003	4/29/2004	10/21/2004	10/28/2004	6/14/2005
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<3.3	<1	<1	<1
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<3.3	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<3.3	<1	<1	<1
Carbon tetrachloride	µg/L	43	42.4	33.3	33	19	23.7	20.6
Chloroform	µg/L	29.7	15.6	18.2	5.7	6.1	9.29	4.94 B
cis-1,2-Dichloroethene	µg/L	1.13	0.68	<1	<3.3	0.27 J	0.340 J	<1
Tetrachloroethene	µg/L	8.14	7.86	5.32	5	2.7	2.96	2.6
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	2.27	1.37	1.45	0.46 J	0.58 J	0.799 J	<1
Trichloroethene	µg/L	54.1	73.3	71.6	48	29	35.9	19
Vinyl chloride	µg/L	<1	<1	<1	<3.3	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-57

Sample Name		0511645-003	0604364-006	MW-57	MW-57-66.6-IS-2	MW-57-SARA-GW01	MW-57-66.6-IS-3
Sample Date		11/18/2005	4/12/2006	10/20/2006	4/10/2007	5/15/2007 9:35:00 AM	10/5/2007
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	17.1	23	31	29.6	28	22.9
Chloroform	µg/L	4.75 B	3.25 B	5.67	6.6	5.8	6.29
cis-1,2-Dichloroethene	µg/L	<1	<1	0.294 J	0.325 J	0.33	0.371 J
Tetrachloroethene	µg/L	2.3	2.81	4.02	5.06	4.3	4.48
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<1	0.419 J	0.659 J	0.684 J	0.58	0.719 J
Trichloroethene	µg/L	17.6	18	28.7	34.6	29	31.2
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-57

Sample Name		MW-57-66.6-IS-4	MW-57-TSVE-GW	MW-57-68.32-IS-5	MW-57-68.32-IS-6	MW-57-IS-7	MW-057-ODLA-1
Sample Date		4/14/2008	8/19/2008	10/17/2008	4/15/2009	10/13/2009	3/26/2010
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	0.538 J	<1	<1
Carbon tetrachloride	µg/L	11.1	6.04	4.23	1.82	0.9 J	<1
Chloroform	µg/L	3.32	12.6	15.9	73	67.4	50.7 J
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	1.44	1.48	1.03
Tetrachloroethene	µg/L	3.03	2.18	1.82	1.17	0.841 J	0.27 J
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<1	0.386	0.358 J	0.567 J	0.31 J	<1
Trichloroethene	µg/L	19.4	29.2	30.4	28.7	20.3	7.57
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-58

Sample Name		DJA225	MW-58-Y2Q1	MW-58	MW-58-Y2Q3	MW-58-Y2Q4	MW-58_010219	MW-58-Y3S2
Sample Date		3/15/1999	2/16/2000	5/17/2000	8/22/2000	11/7/2000	2/19/2001	10/3/2001
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<10	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L	<10	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<10	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<10	<1	<1	0.26 J	<1	0.43 J	<1
Chloroform	µg/L	<10	3.68	5.88	2.42	1.91	2.05	1.85
cis-1,2-Dichloroethene	µg/L	--	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<10	<1	<1	0.41 J	<1	0.4 J	<1
Total 1,2-Dichloroethene	µg/L	<10	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	--	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<10	4.36	4.22	1.44	2.72	2.47	1.78
Vinyl chloride	µg/L	<10	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-58

Sample Name		MW-58-1_020410	MW-58-1_021001	MW-58-1	MW-58-1_031028	MW58 (64.5-66.5)	MW58-66	MW58-66.5
Sample Date		4/10/2002	10/1/2002	4/8/2003	10/28/2003	4/28/2004	11/21/2005	11/8/2007
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	2.75	3.36	1.47	<1	1.1	1.99	8.89
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	0.57	<1	<1	<1	<1
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	2.46	1.82	1.06	<1	0.41 J	0.67 J	0.321
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1J	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-58

	Sample Name	MW-58-IS-7
	Sample Date	10/15/2009
Primary CVOCs	Units	
1,1,2,2-Tetrachloroethane	µg/L	<0.5
1,1,2-Trichloroethane	µg/L	<1
1,1-Dichloroethene	µg/L	<1
Carbon tetrachloride	µg/L	0.81 J
Chloroform	µg/L	0.149 J
cis-1,2-Dichloroethene	µg/L	<1
Tetrachloroethene	µg/L	0.309 J
Total 1,2-Dichloroethene	µg/L	--
trans-1,2-Dichloroethene	µg/L	<1
Trichloroethene	µg/L	<1
Vinyl chloride	µg/L	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-65

Sample Name		MW655	MW-65-2_020410	MW-65-2_021001	MW-65-IS-6	MW-65-IS-7
Sample Date		11/11/1998	4/10/2002	10/1/2002	4/20/2009	10/15/2009
Primary CVOCs	Units					
1,1,2,2-Tetrachloroethane	µg/L	<10	<1	<1	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<10	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<10	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<10	<1	<1	<1	<1
Chloroform	µg/L	<10	<1	<1	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	--	<1	<1	<1	<1
Tetrachloroethene	µg/L	<10	<1	<1	<1	<1
Total 1,2-Dichloroethene	µg/L	<10	--	--	--	--
trans-1,2-Dichloroethene	µg/L	--	<1	<1	<1	<1
Trichloroethene	µg/L	<10	<1	<1	<1	<1
Vinyl chloride	µg/L	<10	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-69

	Sample Name	MW-69-Y2Q1	MW-69	MW-69-Y2Q3	MW-69-Y2Q4	MW69-94.2FT	MW-69-Y3S2-B	MW-69-2_020410
	Sample Date	2/16/2000	5/18/2000	8/24/2000	11/9/2000	1/8/2001	10/3/2001	4/10/2002
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	4.36	<1	0.6 J	<1	<1
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	0.73 J	<1	<1	0.3 J	<1	<1
Chloroform	µg/L	<1	3.56	<1	2.12	1	<1	1.52
cis-1,2-Dichloroethene	µg/L	4.11	31.2	2.26	23.1	11	<1	7.92
Tetrachloroethene	µg/L	1.76	4.87	0.68 J	6.39 J	4	<1	1.84
trans-1,2-Dichloroethene	µg/L	2.26	19.1	0.86 J	12.3	5	<1	4.14
Trichloroethene	µg/L	99.2	642	50.4	464	350	1.01	128
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-69

Sample Name	MW-69-2_021002	MW-69-2	MW-69-2_031028	MW69 (91-93)	MW69 91.4-93.4	0506550-006	0511580-008
Sample Date	10/2/2002	4/8/2003	10/28/2003	4/29/2004	10/21/2004	6/15/2005	11/16/2005
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	0.17 J	<1
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	0.98 J	1.94	<1	0.55 J	1.5	0.951 J
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1 R	<1
Trichloroethene	µg/L	8.12	2.18	<1	0.47 J	3.7	2.47
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-69

Sample Name		0604364-020	MW-69T	MW-69-88.2-IS-2	MW-69-88.2-IS-3	MW-69-88.2-IS-4	MW-69-89.64-IS-5
Sample Date		4/12/2006	10/20/2006	4/11/2007	10/8/2007	4/14/2008	10/17/2008
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	5.51	<0.5	<0.5	<0.5	<0.5	0.229 J
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	0.261 J	0.144 J	0.136 J	<0.3	0.147 J
cis-1,2-Dichloroethene	µg/L	<1	0.348 J	<1	<1	<1	<1
Tetrachloroethene	µg/L	4.72	2.03	0.898 J	1.03	0.658 J	0.67 J
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	3.85	9.84	0.879 J	<1	<1	0.88 J
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-69

Sample Name		MW-69-89.64-IS-6	MW-69-IS-7	MW-069-ODLA-1
Sample Date		4/15/2009	10/14/2009	3/26/2010
Primary CVOCs	Units			
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Chloroform	µg/L	0.206 J	<0.3	0.161 J
cis-1,2-Dichloroethene	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	0.308 J	0.271 J	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1
Trichloroethene	µg/L	1.74	<1	<1
Vinyl chloride	µg/L	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-71

	Sample Name	MW-71-Y2Q1	MW71NA	MW-71	MW-71-Y2Q3	MW-71-Y2Q4	MW-71-Y3S2-B	MW-71-2_020410
	Sample Date	2/15/2000	3/24/2000	5/18/2000	8/23/2000	11/9/2000	10/3/2001	4/10/2002
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	97.7	180	181	168	78.4	268	68.1
1,1,2-Trichloroethane	µg/L	3.21	5 J	4.54	4.04	2.99	5.17 J	6
1,1-Dichloroethene	µg/L	<1	<10	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	53.9	47	34	32.9	26.5	22.6	20.3
Chloroform	µg/L	996	1600	1080	989	605 J	857	828
cis-1,2-Dichloroethene	µg/L	11.5	14	9.98	8.94	6.49	9.09 J	9.64
Tetrachloroethene	µg/L	10	15	7.35	7.02	4.09 J	<1	1.96
trans-1,2-Dichloroethene	µg/L	4.7	5 J	3.72	2.94	2.29	2.91 J	3.36
Trichloroethene	µg/L	330	390	239	247	95.6	186	70.9
Vinyl chloride	µg/L	<1	<10	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-71

Sample Name		MW-71-2_021002	MW-71-2	MW-71-2_031028	MW71 (74.4-76.4)	MW71 73.86-75.86	MW71RD73
Sample Date		10/2/2002	4/8/2003	10/28/2003	4/29/2004	10/21/2004	10/28/2004
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	9.49	7.62	27	3.8	6	4.27
1,1,2-Trichloroethane	µg/L	<1	0.66	<1	<2	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<2	<1	<1
Carbon tetrachloride	µg/L	11.2	17.6	6.87	8.2	5.6 J	9.9
Chloroform	µg/L	8.89	35.4	88.8	56	28	17.5
cis-1,2-Dichloroethene	µg/L	1.12	1.59	1.59	0.98 J	0.7 J	0.59 J
Tetrachloroethene	µg/L	<1	1.31	<1	0.54 J	0.4 J	0.61 J
trans-1,2-Dichloroethene	µg/L	<1	0.52	<1	<2	<1	<1
Trichloroethene	µg/L	27	44.5	17.4	6.9	12	6.95
Vinyl chloride	µg/L	<1	<1	<1	<2	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-71

Sample Name		0506521-006	0511580-004	0604364-013	MW-71	MW-71-72.3-IS-2	MW-71-72.3-IS-3	MW-71-72.3-IS-4
Sample Date		6/14/2005	11/16/2005	4/12/2006	10/20/2006	4/11/2007	10/8/2007	4/14/2008
Primary CVOCs		Units						
1,1,2,2-Tetrachloroethane	µg/L	25.8	27.6	26.3	22.9	4.66	2.21	1.72
1,1,2-Trichloroethane	µg/L	0.634 J	0.924 J	0.766 J	1.16	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	12.8	14	16.3	37.8	16.5	12.6	7.66
Chloroform	µg/L	103	94.2	73.5	303	59.2	32.6	17.3
cis-1,2-Dichloroethene	µg/L	1.86	10.6	10.6	11.7	1.89	1.65	0.523 J
Tetrachloroethene	µg/L	1.58	2.1	2.65	7.34	3.03	1.52	0.715 J
trans-1,2-Dichloroethene	µg/L	0.532 J	<1	0.977 J	3.07	0.59 J	0.36 J	<1
Trichloroethene	µg/L	34.9	47.9	54	158 J	36.2	21	9.37
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-71

Sample Name		MW-71-74.28-IS-5	MW-71-74.28-IS-6	MW-71-IS-7	MW-071-ODLA-1
Sample Date		10/17/2008	4/15/2009	10/14/2009	3/26/2010
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	5.32	4.42	7.97	8.26
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	5.94	0.683 J	0.301 J	<1
Chloroform	µg/L	27.2	8.79	3.79	1.47
cis-1,2-Dichloroethene	µg/L	0.717 J	0.262 J	<1	<1
Tetrachloroethene	µg/L	0.856 J	0.265 J	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	12.7	3.93	2.23	0.612 J
Vinyl chloride	µg/L	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-74

	Sample Name	MW74-90FT	MW74-ZVI-TS1	MW74-ZVI-TS2	MW74-ZVI-TS3	MW74-ZVI-TS4	MW74-ZVI-TS5	MW74RD84
	Sample Date	1/8/2001	10/22/2003	11/17/2003	12/19/2003	2/2/2004	4/6/2004	10/28/2004
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	180	1250	4770	1650	460	718	658
1,1,2-Trichloroethane	µg/L	2 J	1.05	4.95	1.75	0.402 J	2.83	2.89 J
1,1-Dichloroethene	µg/L	<1 UJ	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	0.5 J	0.502 J	<1	<1	<1	<1	<1
Chloroform	µg/L	2	0.716 J	1.63	0.422 J	<1	0.369 J	<1
cis-1,2-Dichloroethene	µg/L	20	17.1	47.1	9.88	2.99	14.6	4.2 J
Tetrachloroethene	µg/L	8	4.22	3.9	1.2	0.475 J	1.9	0.874 J
trans-1,2-Dichloroethene	µg/L	4 J	4.17	5.23	1.44	0.677 J	3.07	1.15 J
Trichloroethene	µg/L	750	552	918	241	147	551	95.8 J
Vinyl chloride	µg/L	0.2 J	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-74

Sample Name		MW74-85	MW74-SARA-GW01	MW74-85	MW-74-IS-4	MW-74-TSVE-GW	MW-74-IS-5	MW-74-IS-6
Sample Date		11/20/2005	5/17/2007 9:00:00 AM	11/9/2007	4/15/2008	8/19/2008	10/21/2008	4/22/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	1330	60	95.8	16.1	15.4	0.458 J	19.8
1,1,2-Trichloroethane	µg/L	4.06	<1	1.15	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	1.37	0.2	0.196	0.163 J	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	42.2	2.3	4.98	<1	<1	<1	<1
Tetrachloroethene	µg/L	8.93	1.1	0.81	0.473 J	0.474	0.842 J	0.521 J
trans-1,2-Dichloroethene	µg/L	6.89	0.3	0.456	<1	<1	<1	<1
Trichloroethene	µg/L	1240	69	61.8	7.19	3.64	0.458 J	4.05
Vinyl chloride	µg/L	<1 UJ	<1	<1	<1	<1	<1	<1 UJ

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-74

Sample Name		MW-74-IS-7	MW-074-ODLA-1
Sample Date		10/14/2009	3/26/2010
Primary CVOCs	Units		
1,1,2,2-Tetrachloroethane	µg/L	0.364 J	0.43 J
1,1,2-Trichloroethane	µg/L	<1	<1
1,1-Dichloroethene	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Chloroform	µg/L	0.628	0.696
cis-1,2-Dichloroethene	µg/L	<1	<1
Tetrachloroethene	µg/L	0.495 J	0.712 J
trans-1,2-Dichloroethene	µg/L	<1	<1
Trichloroethene	µg/L	2.34	2.4
Vinyl chloride	µg/L	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-75

Sample Name		MW75-91FT	MW75-87	MW75-87	MW-75-IS-6	MW-75-IS-7	MW-075-ODLA-1
Sample Date		1/8/2001	11/20/2005	11/9/2007	4/22/2009	10/14/2009	3/26/2010
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	4	10.8	7.01	0.356 J	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	2	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	0.1 J	<1	<1	<1	<1	<1
Chloroform	µg/L	1	<1	<1	0.129 J	0.383	0.142 J
cis-1,2-Dichloroethene	µg/L	34	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	2	1.31	0.623	0.46 J	0.526 J	0.624 J
trans-1,2-Dichloroethene	µg/L	5	<1	<1	<1	<1	<1
Trichloroethene	µg/L	8	31.5	1.71	<1	<1	<1
Vinyl chloride	µg/L	<0.001	<1 J	<1	<1 J	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-78

Sample Name	MW-78	MW-78-Y3S2-C	MW-78-3_020410	MW-78-3_021001	MW-78-1	MW-78-1_031028	MW78 (62-64)
Sample Date	2/14/2001	10/3/2001	4/10/2002	10/1/2002	4/8/2003	10/28/2003	4/29/2004
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	5.2
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	0.7 J
Trichloroethene	µg/L	<1	<1	<1	<1	<1	0.36 J
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-78

		Sample Name	MW78 61.8-63.8	MW78-58	MW78-59	MW-78-IS-6	MW-78-ODLA-1
		Sample Date	10/21/2004	11/17/2005	11/8/2007	4/21/2009	3/29/2010
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	0.74 J	<1	<1	<1	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1 J	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	0.59 J	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1 UJ	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-87

		Sample Name	MW87-80.3FT	MW87RD74	MW87-77	MW87-68	MW-87-IS-6	MW-87-IS-7	MW-087-ODLA-1
		Sample Date	1/8/2001	10/27/2004	11/21/2005	11/9/2007	4/23/2009	10/13/2009	3/26/2010
Primary CVOCs	Units								
1,1,2,2-Tetrachloroethane	µg/L		140	10.2 J	86.6	180	0.939	7.09	12
1,1,2-Trichloroethane	µg/L		6	0.799 J	3.59	6.67	<1	<1	0.653 J
1,1-Dichloroethene	µg/L		0.2 J	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L		32	18.7 J	8.18	7.16	<1	<1	<1
Chloroform	µg/L		6	6.03 J	3.88	6.25	0.148 J	0.471	1.04
cis-1,2-Dichloroethene	µg/L		210	49.5 J	65.4	91.2	<1	0.391 J	1.38
Tetrachloroethene	µg/L		2	1.45 J	0.95 J	0.676	<1	<1	<1
trans-1,2-Dichloroethene	µg/L		17	5.40 J	3.49	4.6	<1	<1	<1
Trichloroethene	µg/L		150	105 J	64.2	91.4	<1	0.778 J	2
Vinyl chloride	µg/L		0.9 J	<1	<1 UJ	0.272	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-91

Sample Name		MW91RD68	MW91-68	MW91-69	MW-91-IS-6	MW-91-IS-7
Sample Date		10/27/2004	11/21/2005	11/7/2007	4/22/2009	10/14/2009
Primary CVOCs	Units					
1,1,2,2-Tetrachloroethane	µg/L	<1	0.26 J	<1	0.92	0.678
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	9.35 J	4.8 J	3.29	0.449 J	0.479 J
Chloroform	µg/L	13.4 J	4.72	25.6	0.538	1.83
cis-1,2-Dichloroethene	µg/L	1.19 J	0.46 J	<1	<1	<1
Tetrachloroethene	µg/L	1.18 J	0.72 J	0.594	0.677 J	0.494 J
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	12.7 J	6.01	13.8	<1	0.567 J
Vinyl chloride	µg/L	<1	<1 UJ	<1	<1 UJ	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-128

Sample Name		MW-128-4_030728	MW-128-4_031028	MW128 (71-73)	MW128 71-73	0506550-004	MW128-69.5
Sample Date		7/28/2003	10/28/2003	4/29/2004	10/22/2004	6/15/2005	11/8/2007
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<11	<5	<1	<1
1,1,2-Trichloroethane	µg/L	<1	<1	<11	<5	<1	<1
1,1-Dichloroethene	µg/L	5.32	3.41	5.1	54	153	0.795
Carbon tetrachloride	µg/L	<1	<1	<11	<5	<1	<1
Chloroform	µg/L	<1	<1	<11	<5	<1	<1
cis-1,2-Dichloroethene	µg/L	<1	<1	<11	<5	<1	<1
Tetrachloroethene	µg/L	<1	<1	0.18 J	<5	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<11	<5	<1	<1
Trichloroethene	µg/L	2.17	1.14	38	16	24.2	0.883
Vinyl chloride	µg/L	<1	<1	<11	<5	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-128

Sample Name		MW-128-IS-6	MW-128-IS-7
Sample Date		4/20/2009	10/15/2009
Primary CVOCs	Units		
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1
1,1-Dichloroethene	µg/L	24.9	<1
Carbon tetrachloride	µg/L	<1	<1
Chloroform	µg/L	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1
Trichloroethene	µg/L	4.12	<1
Vinyl chloride	µg/L	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-132

	Sample Name	MW132-ZVI-TS1	MW132-ZVI-TS2	MW132-ZVI-TS3	MW132-ZVI-TS4	MW132-ZVI-TS5	MW132RD82
	Sample Date	10/23/2003	11/19/2003	12/18/2003	2/3/2004	4/6/2004	10/28/2004
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	896	11.2	78.5	523	180	1160 J
1,1,2-Trichloroethane	µg/L	<12.5	<0.25	<0.25	1.85	<0.25	4.81 J
1,1-Dichloroethene	µg/L	<25	<0.5	<0.5	<0.5	<0.5	<1
Carbon tetrachloride	µg/L	<12.5	<0.25	<0.25	<0.25	<0.25	<1
Chloroform	µg/L	<6.25	<0.125	<0.125	<0.125	<0.125	0.731 J
cis-1,2-Dichloroethene	µg/L	20.3 J	0.397 J	1	4.57	1.25	47.8 J
Tetrachloroethene	µg/L	<12.5	<0.25	<0.25	0.336 J	0.782	6.98 J
trans-1,2-Dichloroethene	µg/L	23 J	<0.25	0.417 J	1.67	0.554 J	14.3 J
Trichloroethene	µg/L	476	6.7	32.9	102	42.2	1570
Vinyl chloride	µg/L	<12.5	<0.25	<0.25	<0.25	<0.25	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-132

Sample Name		MW132-86	MW132-SARA-GW01	MW132-82	MW-132-IS-4	MW-132-TSVE-G	MW-132-IS-5	MW-132-IS-6
Sample Date		11/20/2005	5/17/2007	11/8/2007	4/15/2008	8/19/2008	10/20/2008	4/23/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	1190	2400	92.4	25.1	0.599	0.277 J	<0.5
1,1,2-Trichloroethane	µg/L	1.02	<4	1.67	0.469 J	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	1.8	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<4	<1	<1	<1	<1	<1
Chloroform	µg/L	0.42 J	<1.2	<1	<0.3	0.13	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	13.3	92	1.11	0.388 J	<1	<1	<1
Tetrachloroethene	µg/L	5.96	8.3	0.424	0.649 J	1.06	0.675 J	0.553 J
trans-1,2-Dichloroethene	µg/L	2.93	6.4	0.281	<1	<1	<1	<1
Trichloroethene	µg/L	481	870	8.87	16.7	0.305	<1	0.749 J
Vinyl chloride	µg/L	<1 UJ	10	1.93	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-132

Sample Name		MW-132-IS-7	MW-132-ODLA-1
Sample Date		10/14/2009	3/29/2010
Primary CVOCs	Units		
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1
1,1-Dichloroethene	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Chloroform	µg/L	<0.3	0.366
cis-1,2-Dichloroethene	µg/L	<1	<1
Tetrachloroethene	µg/L	0.303 J	0.354 J
trans-1,2-Dichloroethene	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Vinyl chloride	µg/L	<1	<1

Notes:

µg/L micrograms per liter

RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL

< Not detected at or above RL

UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-144

		Sample Name	MW-144	MW-144	MW144RD75	MW-144	MW-144	0506551-001	0511462-014	0604364-025
		Sample Date	6/9/2004	8/12/2004	10/27/2004	1/27/2005	3/23/2005	6/15/2005	11/14/2005	4/12/2006
Primary CVOCs		Units								
1,1,2,2-Tetrachloroethane	µg/L		13000	7700	6230 J	4600	7700	5810 J	4970	5040
1,1,2-Trichloroethane	µg/L		--	<250	7.05 J	10 J	14 J	9.64 J	14.1 J	9.04
1,1-Dichloroethene	µg/L		<420	<250	<1	<12	<25	<10	<20	<1
Carbon tetrachloride	µg/L		<420	<250	1.47 J	<12	<25	<10	<20	1.03
Chloroform	µg/L		<420	<250	2.76 J	3.2 J	4.3 J	<10	<20	2.72 B
cis-1,2-Dichloroethene	µg/L		<420	68 J	74.1 J	69	72	70.2	54.3	83.9
Tetrachloroethene	µg/L		<420	<250	7.69 J	10 J	13 J	8.78 J	10.2	19.9 J
Total 1,2-Dichloroethene	µg/L		<830	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		<420	<250	17.5 J	15	14 J	14.1	<20	7.28 J
Trichloroethene	µg/L		3200	2800	2060	2100	4500	2610	2280	2650
Vinyl chloride	µg/L		<420	<250 J	<1	<12	<25	<10	<20	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-144

		Sample Name	MW144-75_060427	MW-144	MW-144-74.9-IS-2	MW-144-74.9-IS-3	MW-144-74.9-IS-4
		Sample Date	4/27/2006	10/19/2006	4/10/2007	10/8/2007	4/11/2008
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L		4080	2520	1350	841	79.4
1,1,2-Trichloroethane	µg/L		8.94	60.4	20.4	8.75	0.461 J
1,1-Dichloroethene	µg/L		<1	<10	<10	<1	<1
Carbon tetrachloride	µg/L		0.9 J	<10	<10	1.59	<1
Chloroform	µg/L		3.13	1.45 J	<3	1.7	1.77
cis-1,2-Dichloroethene	µg/L		88.9	98.2	33.5	26.3	2.31
Tetrachloroethene	µg/L		16.9	11.4	4.11 J	3.49	<1
Total 1,2-Dichloroethene	µg/L		--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		7.04	19.2	3.39 J	2.24	<1
Trichloroethene	µg/L		2790	1890	694	464	37.6
Vinyl chloride	µg/L		<1 UJ	<10	<10	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-144

		Sample Name	MW-144-75.68-IS-6	MW-144-IS-7	MW-144-ODLA-1
		Sample Date	4/15/2009	10/14/2009	3/26/2010
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L		403	301	150
1,1,2-Trichloroethane	µg/L		1.06	0.661 J	0.321 J
1,1-Dichloroethene	µg/L		<1	<1	<1
Carbon tetrachloride	µg/L		<1	<1	<1
Chloroform	µg/L		1.19	0.501	0.316
cis-1,2-Dichloroethene	µg/L		12.9	6.81	3.26
Tetrachloroethene	µg/L		1.56	1.4	0.918 J
Total 1,2-Dichloroethene	µg/L		--	--	--
trans-1,2-Dichloroethene	µg/L		2.61	0.676 J	0.445 J
Trichloroethene	µg/L		179	173	109
Vinyl chloride	µg/L		<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-145

Sample Name		MW-145	MW-145	MW-145	MW-145	0506623-009	0511631-017	0604443-035	MW-145T
Sample Date		6/8/2004	8/16/2004	1/27/2005	3/23/2005	6/17/2005	11/17/2005	4/13/2006	10/19/2006
Primary CVOCs	Units								
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1	<0.5
1,1,2-Trichloroethane	µg/L	--	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<1	<1	<1	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
Total 1,2-Dichloroethene	µg/L	<2	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-145

		Sample Name	MW-145-86.6-IS-2	MW-145-86.6-IS-3	MW-145-86.6-IS-4	MW-145-90.75-IS-5	MW-145-90.75-IS-6
		Sample Date	4/9/2007	10/8/2007	4/14/2008	10/20/2008	4/14/2009
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L		<0.5	<0.5	<0.5 J	<0.5	<0.5
1,1,2-Trichloroethane	µg/L		<1	<1	<1 J	<1	<1
1,1-Dichloroethene	µg/L		<1	<1	<1 J	<1	<1
Carbon tetrachloride	µg/L		<1	<1	<1 J	<1	<1
Chloroform	µg/L		<0.3	<0.3	<0.3 J	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L		<1	<1	<1 J	<1	<1
Tetrachloroethene	µg/L		<1	<1	<1 J	<1	<1
Total 1,2-Dichloroethene	µg/L		--	--	--	--	--
trans-1,2-Dichloroethene	µg/L		<1	<1	<1 J	<1	<1
Trichloroethene	µg/L		<1	<1	<1 J	<1	<1
Vinyl chloride	µg/L		<1	<1	<1 J	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-145

Sample Name		MW-145-IS-7	MW-145-ODLA-1
Sample Date		10/15/2009	3/26/2010
Primary CVOCs	Units		
1,1,2,2-Tetrachloroethane	µg/L	<0.5	0.274 J
1,1,2-Trichloroethane	µg/L	<1	<1
1,1-Dichloroethene	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Chloroform	µg/L	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
Total 1,2-Dichloroethene	µg/L	--	--
trans-1,2-Dichloroethene	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Vinyl chloride	µg/L	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-147

Sample Name		MW-147	MW-147	MW147RD74	MW-147	MW-147	0506625-006	0511645-026	0604364-032	MW-147
Sample Date		6/10/2004	8/17/2004	10/26/2004	1/27/2005	3/22/2005	6/17/2005	11/18/2005	4/12/2006	10/18/2006
Primary CVOCs		Units								
1,1,2,2-Tetrachloroethane	µg/L	97	56	61.8 J	140	180	251 J	185	311	87.9
1,1,2-Trichloroethane	µg/L	--	<5.6	0.742 J	1.8	2.2	2.62	3.9	4.36	1.39
1,1-Dichloroethene	µg/L	<5.7	2.2 B	1.23	1.2	2.7	2.07	3.32	1.76	0.657 J
Carbon tetrachloride	µg/L	1.8 J	4.3 J	1.5	0.36 J	0.45 J	0.729 J	1.27	0.565 J	0.364 J
Chloroform	µg/L	7.5	12	13.4	3.4	3	5.94 B	5.1 B	5.53 B	2.66
cis-1,2-Dichloroethene	µg/L	70	57	60.6	48	39	65.1	95	74.8	41.2
Tetrachloroethene	µg/L	7.5	5.3 J	5.94	3.4	3.4	4.44	4.83	3.61	3.92
Total 1,2-Dichloroethene	µg/L	94	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	24	20	23.3	12	15	15.9	20.5	14.4	10.3
Trichloroethene	µg/L	160	120	130	77	73	124	121	106	81.3
Vinyl chloride	µg/L	<5.7	<5.6	<1	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-147

Sample Name		MW-147-73.7-IS-2	MW-147-73.7-IS-3	MW-147-73.7-IS-4	MW-147-77-IS-5	MW-147-78.81-IS-6	MW-147-IS-7
Sample Date		4/10/2007	10/5/2007	4/11/2008	10/17/2008	4/14/2009	10/14/2009
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	634	198	22	0.373 J	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	9.28	4.47	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	1.49	5.65	<1	<1	<1	<1
Carbon tetrachloride	µg/L	0.83 J	2.3	<1	<1	<1	<1
Chloroform	µg/L	7.24	4.6	0.509	0.147 J	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	155	120 J	6.15	0.401 J	<1	<1
Tetrachloroethene	µg/L	12.2	8.97	7.92	2.95	<1	<1
Total 1,2-Dichloroethene	µg/L	--	--	--	--	--	--
trans-1,2-Dichloroethene	µg/L	39.6	28.9	1	<1	<1	<1
Trichloroethene	µg/L	278	169	53.9	3.1	<1	0.313 J
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-147

Sample Name		MW-147-ODLA-1	MW-147-ODLS-2
Sample Date		3/26/2010	9/23/2010
Primary CVOCs	Units		
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1
1,1-Dichloroethene	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Chloroform	µg/L	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
Total 1,2-Dichloroethene	µg/L	--	--
trans-1,2-Dichloroethene	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Vinyl chloride	µg/L	<1	<1

Notes:

-- not analyzed
µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-153

Sample Name		MW-153	0506605-007	0511645-012	0604443-010	MW-153T	MW-153-87.1-IS-2	MW-153-87.1-IS-3
Sample Date		8/19/2004	6/16/2005	11/18/2005	4/13/2006	10/18/2006	4/10/2007	10/8/2007
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1 J	<1	<1	<1	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	9.1	3.73	4.56	5.4	4.87	5.91	5.61
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	0.368 J	0.334 J	0.302 J
Tetrachloroethene	µg/L	0.24 J	<1	<1	<1	<1	0.332 J	0.714 J
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1	0.251 B	0.272 J
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-153

Sample Name		MW-153-87.1-IS-4	MW-153-86.75-IS-5	MW-153-86.75-IS-6	MW-153-IS-7
Sample Date		4/14/2008	10/20/2008	4/14/2009	10/14/2009
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	6.37	5.31	5.16	2.99
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<0.3	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	0.341 J	<1	<1	<1
Tetrachloroethene	µg/L	0.445 J	0.272 J	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	0.469 J	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-169

Sample Name		MW-169	0506551-011	0511645-008	0604443-006	MW-169T	MW-169-81.8-IS-2	MW169-81-8-IS-3
Sample Date		12/12/2004	6/15/2005	11/18/2005	4/13/2006	10/19/2006	4/9/2007	10/8/2007
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	0.8 B	<1	<1	<1	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	0.26 J	<1	<1	<1	0.282 J	<1	<1
Tetrachloroethene	µg/L	<1	<1 J	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1 J	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-169

Sample Name		MW-169-81.8-IS-4	MW-169-86.06-IS-5	MW-169-87.06-B1	MW-169-IS-7
Sample Date		4/11/2008	10/20/2008	6/8/2009	10/14/2009
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<0.3	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	0.4	0.547 J
Tetrachloroethene	µg/L	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-170

Sample Name		MW-170	0506605-003	0511645-005	0604443-003	MW-170T	MW-170-77.7-IS-2	MW-170-77.7-IS-3
Sample Date		12/12/2004	6/16/2005	11/18/2005	4/13/2006	10/19/2006	4/9/2007	10/8/2007
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	1.3	4.06	4.37	2.84	3.52	3.67	3.06
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	0.42 B	<1	<1	<1	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1	<1	0.485 J
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1 J	<1 J	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-170

Sample Name		MW-170-77.7-IS-4	MW-170-70.91-IS-5	MW-170-70.91-IS-6	MW-170-IS-7
Sample Date		4/11/2008	10/20/2008	4/14/2009	10/14/2009
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	1.43	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<0.3	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
B Estimated, possibly biased high or false positive
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-171

Sample Name		MW-171	0506605-005	0511645-010	0604443-008	MW-171T	MW-171-62.4-IS-2	MW171-IS-3
Sample Date		12/13/2004	6/16/2005	11/18/2005	4/13/2006	10/19/2006	4/9/2007	10/8/2007
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	0.544 J	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Vinyl chloride	µg/L	<1 J	<1 J	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-171

Sample Name		MW-171-62.4-IS-4	MW-171-63.75-IS-5	MW-171-63.75-IS-6	MW-171-IS-7
Sample Date		4/11/2008	10/20/2008	4/14/2009	10/14/2009
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<0.3	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-172

Sample Name		MW172-76_060425	MW-172-SARA-GW01	MW172-77	MW-172-IS-4	MW-172-TSVE-G	MW-172-IS-5
Sample Date		4/25/2006	5/15/2007	11/9/2007	4/14/2008	8/18/2008	10/16/2008
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	<1	<0.5	<1	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	0.35 J	1.5	<1	<1	<1	<1
Chloroform	µg/L	5.88 J	13	0.375	0.143 J	<0.3	0.139 J
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	0.59	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	1.88	7	0.383	<1	<1	<1
Vinyl chloride	µg/L	<1 UJ	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-172

Sample Name		MW-172-IS-6	MW-172-IS-7	MW-172-ODLA-1
Sample Date		4/16/2009	10/14/2009	3/29/2010
Primary CVOCs	Units			
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	0.674 J	0.922 J
Chloroform	µg/L	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	0.296 J	0.339 J
trans-1,2-Dichloroethene	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-174

Sample Name		MW174-75	MW174-75B	MW174-SARA-GW01	MW174-76-SB	MW-174-IS-4	MW-174-TSVE-G	MW-174-IS-5
Sample Date		11/16/2005	11/19/2005	5/14/2007	11/9/2007	4/15/2008	8/18/2008	10/16/2008
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	0.37	<1	0.7	1.4	0.629
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	3.06 J	2.93	5.9	2.93	<1	<1	<1
Chloroform	µg/L	37.4	31.4	68	30.6	0.666	0.345	0.154 J
cis-1,2-Dichloroethene	µg/L	0.28 J	<1	0.63	<1	<1	<1	<1
Tetrachloroethene	µg/L	0.99 J	1.05	1.9	0.55	0.297 J	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	0.28	<1	<1	<1	<1
Trichloroethene	µg/L	16.9	14.2	33	11.8	<1	<1	<1
Vinyl chloride	µg/L	<1	<1 UJ	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-174

Sample Name		MW-174-IS-6	MW-174-IS-7	MW-174-ODLA-1
Sample Date		4/16/2009	10/13/2009	3/26/2010
Primary CVOCs	Units			
1,1,2,2-Tetrachloroethane	µg/L	2.08	0.315 J	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	0.607 J	0.988 J	1.2
Chloroform	µg/L	1.47	1.54	0.337
cis-1,2-Dichloroethene	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	0.347 J	0.591 J	0.651 J
trans-1,2-Dichloroethene	µg/L	<1	<1	<1
Trichloroethene	µg/L	0.658 J	0.485 J	<1
Vinyl chloride	µg/L	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-175

Sample Name		MW175-73	MW-175-SARA-GW01	MW175-77	MW-175-IS-4	MW-175-TSVE-G
Sample Date		11/19/2005	5/15/2007	11/9/2007	4/14/2008	8/18/2008
Primary CVOCs	Units					
1,1,2,2-Tetrachloroethane	µg/L	<1	<0.5	<1	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	0.361	0.383 J	<1
Chloroform	µg/L	1.78	0.48	2.55	0.489	0.496
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	0.52 J	0.3	<1	0.317 J	0.28
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	2.2	0.39	1.17	0.874 J	0.438
Vinyl chloride	µg/L	<1 UJ	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-176

Sample Name		MW176-81	MW176-85	MW-176-IS-6	MW-176-IS-7	MW-176-ODLA-1
Sample Date		11/18/2005	11/8/2007	4/23/2009	10/13/2009	3/26/2010
Primary CVOCs	Units					
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	0.415	<1	<1	<1
Chloroform	µg/L	0.21 J	0.246	0.166 J	<0.3	0.147 J
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	0.44 J	0.287	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	0.73 J	3.07	0.579 J	<1	<1
Vinyl chloride	µg/L	<1 UJ	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-178

Sample Name		MW178-81	MW178-SARA-GW01	MW178-84.85	MW-178-IS-4	MW-178-TSVE-G	MW-178-IS-5	MW-178-IS-6
Sample Date		11/19/2005	5/17/2007 8:25:00 AM	11/9/2007	4/15/2008	8/18/2008	10/20/2008	4/20/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1	<0.5	<1	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	0.18 J	0.21	<1	<0.3	0.135	0.125 J	0.291 J
cis-1,2-Dichloroethene	µg/L	0.44 J	1.7	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	2.52	2.8	2.31	0.726 J	0.824	0.419 J	<1
trans-1,2-Dichloroethene	µg/L	0.37 J	0.95	<1	<1	<1	<1	<1
Trichloroethene	µg/L	46.9	130	2.11	<1	0.488	0.373 J	<1
Vinyl chloride	µg/L	<1 UJ	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-178

Sample Name		MW-178-IS-7	MW-178-ODLA-1
Sample Date		10/14/2009	3/26/2010
Primary CVOCs	Units		
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1
1,1-Dichloroethene	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Chloroform	µg/L	0.602	1.03
cis-1,2-Dichloroethene	µg/L	<1	<1
Tetrachloroethene	µg/L	0.263 J	<1
trans-1,2-Dichloroethene	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Vinyl chloride	µg/L	<1	<1

Notes:

µg/L micrograms per liter

RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL

< Not detected at or above RL

UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-179

Sample Name		MW179-82	MW179-SARA-GW01	MW179-86	MW-179-IS-4	MW-179-TSVE-G	MW-179-IS-5	MW-179-IS-6
Sample Date		11/19/2005	5/17/2007	11/8/2007	4/15/2008	8/18/2008	10/20/2008	4/17/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	<1	<0.5	0.326	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	0.16 J	<0.3	<1	<0.3	0.125	0.131 J	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	0.8 J	1.1	0.905	1.77	0.597	0.627 J	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	0.28 J	1.8	2.11	0.264 J	<1	<1	<1
Vinyl chloride	µg/L	<1 UJ	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-179

Sample Name		MW-179-IS-7	MW-179-ODLA-1
Sample Date		10/14/2009	3/26/2010
Primary CVOCs	Units		
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1
1,1-Dichloroethene	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Chloroform	µg/L	<0.3	0.136 J
cis-1,2-Dichloroethene	µg/L	<1	<1
Tetrachloroethene	µg/L	0.281 J	0.383 J
trans-1,2-Dichloroethene	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Vinyl chloride	µg/L	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-180

Sample Name		MW180-77	MW180 SARA GW01	MW180-81	MW-180-IS-4	MW-180-TSVE-G	MW-180-IS-5	MW-180-IS-6
Sample Date		11/20/2005	5/21/2007	11/8/2007	4/16/2008	8/20/2008	10/21/2008	4/15/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	44.2 J	21	<1	0.763	1.35	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	0.558	2.04	0.766 J
Carbon tetrachloride	µg/L	0.72 J	0.26	<1	<1	<1	<1	<1
Chloroform	µg/L	2.04	1.6	<1	<0.3	<0.3	<0.3	0.136 J
cis-1,2-Dichloroethene	µg/L	2.51	23	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	5.02	2.8	<1	<1	0.766	1.88	0.948 J
trans-1,2-Dichloroethene	µg/L	1.7	9.6	<1	<1	<1	<1	<1
Trichloroethene	µg/L	24.4	78	<1	<1	0.978	1.8	0.893 J
Vinyl chloride	µg/L	<1 UJ	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-180

Sample Name		MW-180-IS-7	MW-180-ODLA-1
Sample Date		10/13/2009	3/26/2010
Primary CVOCs	Units		
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1
1,1-Dichloroethene	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Chloroform	µg/L	0.154 J	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1
Tetrachloroethene	µg/L	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Vinyl chloride	µg/L	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-182

Sample Name		MW182-69	MW182-70	MW-182-IS-6	MW-182-IS-7
Sample Date		11/19/2005	11/8/2007	4/20/2009	10/15/2009
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	0.77 J	<1	<1	<1
Vinyl chloride	µg/L	<1 UJ	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-184

Sample Name		MW184-67	MW184-68	MW-184-IS-6	MW-184-IS-7
Sample Date		11/18/2005	11/9/2007	4/23/2009	10/14/2009
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	1.74	<1	<0.5	5.06
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	8.08	4.19	4.52	13.4
Chloroform	µg/L	32.6	7.79	2.94	117
cis-1,2-Dichloroethene	µg/L	1.43	1.2	0.424 J	5.61
Tetrachloroethene	µg/L	0.69 J	<1	0.393 J	4.98
trans-1,2-Dichloroethene	µg/L	0.33 J	0.27	<1	1.63
Trichloroethene	µg/L	12.6	9.47	2.27	84
Vinyl chloride	µg/L	<1 UJ	<1	<1 UJ	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-185

Sample Name		MW185-90	MW185-90.5	MW-185-IS-6	MW-185-IS-7
Sample Date		11/18/2005	11/8/2007	4/21/2009	10/14/2009
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	0.74 J	<1	0.334 J	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	1.88	0.448	0.649 J	<1
Vinyl chloride	µg/L	<1 UJ	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-186

Sample Name		MW186-153	MW186-153-RD-EB	MW-186-IS-6	MW-186-IS-7
Sample Date		11/22/2005	11/9/2007	4/21/2009	10/14/2009
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	<1	0.43	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	1.37	0.819	4.92	1.83
Vinyl chloride	µg/L	<1 UJ	<1	<1	<1

Notes:

µg/L micrograms per liter

RL reporting limit

DQE Flags:

< Not detected at or above RL

UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-187

Sample Name		MW187-84_060425	MW-187-SARA-GW01	MW187-81	MW-187-IS-4	MW-187-TSVE-G	MW-187-IS-5
Sample Date		4/25/2006	5/16/2007	11/8/2007	4/16/2008	8/20/2008	10/16/2008
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	<1	<0.5	0.141	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	0.8	<1	<1	<1	<1
Chloroform	µg/L	0.13 J	0.29	<1	<0.3	0.139	0.183 J
cis-1,2-Dichloroethene	µg/L	<1	0.4	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	0.36	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	0.26 J	3.7	<1	<1	<1	<1
Vinyl chloride	µg/L	<1 UJ	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-187

Sample Name		MW-187-IS-6	MW-187-IS-7	MW-187-ODLA-1
Sample Date		4/21/2009	10/15/2009	3/26/2010
Primary CVOCs	Units			
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Chloroform	µg/L	<0.3	0.162 J	0.149 J
cis-1,2-Dichloroethene	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	0.253 J	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-190

Sample Name		MW190-86_060426	MW190-86	MW-190-IS-6	MW-190-IS-7	MW-190-ODLA-1
Sample Date		4/26/2006	11/9/2007	4/23/2009	10/14/2009	3/26/2010
Primary CVOCs	Units					
1,1,2,2-Tetrachloroethane	µg/L	4410	1040	276	28.1	23.5
1,1,2-Trichloroethane	µg/L	8.84	3.38	0.45 J	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	0.63 J	1.17	<1	<1	<1
Chloroform	µg/L	2.73	1.32	0.562	0.135 J	0.186 J
cis-1,2-Dichloroethene	µg/L	80.5 J	33.3	3.4	0.547 J	0.747 J
Tetrachloroethene	µg/L	12.5	6.01	1.37	0.588 J	0.707 J
trans-1,2-Dichloroethene	µg/L	6.48	1.56	0.416 J	<1	<1
Trichloroethene	µg/L	2720	705	109	27.6	31.9
Vinyl chloride	µg/L	<1 UJ	<1	<1 UJ	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-221

	Sample Name	MW221 SARA GW01	MW221-85	MW-221-IS-4	MW-221-TSVE-G	MW-221-IS-5	MW-221-IS-6	MW-221-IS-7
	Sample Date	5/21/2007	11/9/2007	4/16/2008	8/20/2008	10/21/2008	4/16/2009	10/13/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	110	0.692	<0.5	0.147	0.329 J	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	1.9	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	1.4	0.368	0.167 J	<0.3	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	52	0.268	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	6.9	1.09	0.893 J	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	10	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	140	2.33	<1	1.19	0.501 J	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-221

Sample Name MW-221-ODLA-1		
Sample Date 3/26/2010		
Primary CVOCs	Units	
1,1,2,2-Tetrachloroethane	µg/L	<0.5
1,1,2-Trichloroethane	µg/L	<1
1,1-Dichloroethene	µg/L	<1
Carbon tetrachloride	µg/L	<1
Chloroform	µg/L	<0.3
cis-1,2-Dichloroethene	µg/L	<1
Tetrachloroethene	µg/L	<1
trans-1,2-Dichloroethene	µg/L	<1
Trichloroethene	µg/L	<1
Vinyl chloride	µg/L	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-222

	Sample Name	MW-222-SARA-GW01	MW222-84	MW-222-IS-4	MW-222-TSVE-G	MW-222-IS-5	MW-222-IS-6	MW-222-IS-7
	Sample Date	5/16/2007	11/9/2007	4/15/2008	8/19/2008	10/20/2008	4/16/2009	10/14/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	340	1130	12.7	1.36	47.1	1.19	<0.5
1,1,2-Trichloroethane	µg/L	<5	8.97	7.57	0.492	0.648 J	<1	<1
1,1-Dichloroethene	µg/L	<5	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<5	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	<1.5	0.358	0.156 J	<0.3	<0.3	<0.3	0.269 J
cis-1,2-Dichloroethene	µg/L	150	25.4	10.4	4.12	4.51	<1	<1
Tetrachloroethene	µg/L	5.7	1.23	0.312 J	0.337	0.484 J	0.377 J	<1
trans-1,2-Dichloroethene	µg/L	66	5.2	0.301 J	<1	0.376 J	<1	<1
Trichloroethene	µg/L	1100	351	5.34	1.18	5.81	1.87	1.04
Vinyl chloride	µg/L	<5	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-222

	Sample Name	MW-222-ODLA-1
	Sample Date	3/26/2010
Primary CVOCs	Units	
1,1,2,2-Tetrachloroethane	µg/L	<0.5
1,1,2-Trichloroethane	µg/L	<1
1,1-Dichloroethene	µg/L	<1
Carbon tetrachloride	µg/L	<1
Chloroform	µg/L	0.396
cis-1,2-Dichloroethene	µg/L	<1
Tetrachloroethene	µg/L	0.313 J
trans-1,2-Dichloroethene	µg/L	<1
Trichloroethene	µg/L	2.54
Vinyl chloride	µg/L	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-223

Sample Name		MW-223-SARA-GW01	MW223-84	MW-223-IS-4	MW-223-TSVE-G	MW-223-IS-5	MW-223-IS-6	MW-223-IS-7
Sample Date		5/16/2007	11/9/2007	4/15/2008	8/18/2008	10/17/2008	4/17/2009	10/14/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	14	30.3	0.323 J	0.366	0.913	0.778	0.227 J
1,1,2-Trichloroethane	µg/L	3.1	2.81	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<2	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	0.39	0.283	<1	<1	<1	<1	<1
Chloroform	µg/L	0.95	0.838	0.439	0.252	0.249 J	0.177 J	0.551
cis-1,2-Dichloroethene	µg/L	15	5.56	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	3.7	0.944	0.343 J	0.262	0.457 J	0.813 J	0.319 J
trans-1,2-Dichloroethene	µg/L	3.7	1.21	<1	<1	<1	<1	<1
Trichloroethene	µg/L	500	144	4.55	2.32	3.56	7.38	4.01
Vinyl chloride	µg/L	<2	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-223

	Sample Name	MW-223-ODLA-1
	Sample Date	3/26/2010
Primary CVOCs	Units	
1,1,2,2-Tetrachloroethane	µg/L	<0.5
1,1,2-Trichloroethane	µg/L	<1
1,1-Dichloroethene	µg/L	<1
Carbon tetrachloride	µg/L	<1
Chloroform	µg/L	0.75
cis-1,2-Dichloroethene	µg/L	<1
Tetrachloroethene	µg/L	0.447 J
trans-1,2-Dichloroethene	µg/L	<1
Trichloroethene	µg/L	1.49
Vinyl chloride	µg/L	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-224

Sample Name		MW-224-SARA-GW01	MW224-84.5	MW-224-IS-4	MW-224-TSVE-G	MW-224-IS-5	MW-224-IS-6
Sample Date		5/16/2007	11/10/2007	4/16/2008	8/18/2008	10/20/2008	4/15/2009
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	140	<1	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	0.18	0.17	<0.3	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	4.8	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	1.7	2.23	1.33	0.771	0.628 J	0.436 J
trans-1,2-Dichloroethene	µg/L	1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	92	13.4	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-224

Sample Name		MW-224-IS-7	MW-224-ODLA-1
Sample Date		10/14/2009	3/26/2010
Primary CVOCs	Units		
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1
1,1-Dichloroethene	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Chloroform	µg/L	<0.3	0.186 J
cis-1,2-Dichloroethene	µg/L	<1	<1
Tetrachloroethene	µg/L	0.451 J	<1
trans-1,2-Dichloroethene	µg/L	<1	<1
Trichloroethene	µg/L	<1	<1
Vinyl chloride	µg/L	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-225

Sample Name		MW-225-SARA-GW01	MW225-88-SB	MW-225-IS-4	MW-225-TSVE-G	MW-225-IS-5	MW-225-IS-6
Sample Date		5/15/2007	11/9/2007	4/16/2008	8/20/2008	10/17/2008	4/20/2009
Primary CVOCs	Units						
1,1,2,2-Tetrachloroethane	µg/L	15	75.9	21.3	13.9	22.8	4.03
1,1,2-Trichloroethane	µg/L	0.62	2.34	0.544 J	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	0.78	0.517	0.275 J	0.155	0.149 J	<0.3
cis-1,2-Dichloroethene	µg/L	8.6	11.2	1.71	0.889	0.321 J	<1
Tetrachloroethene	µg/L	2.3	1.19	0.616 J	0.644	0.652 J	0.727 J
trans-1,2-Dichloroethene	µg/L	2.2	1.21	<1	<1	<1	<1
Trichloroethene	µg/L	320	140	39.6	19.6	8.66	9.46
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-225

Sample Name		MW-225-IS-7	MW-225-ODLA-1
Sample Date		10/13/2009	3/26/2010
Primary CVOCs	Units		
1,1,2,2-Tetrachloroethane	µg/L	2.47	0.926
1,1,2-Trichloroethane	µg/L	<1	<1
1,1-Dichloroethene	µg/L	<1	<1
Carbon tetrachloride	µg/L	<1	<1
Chloroform	µg/L	0.198 J	0.212 J
cis-1,2-Dichloroethene	µg/L	<1	<1
Tetrachloroethene	µg/L	0.566 J	0.679 J
trans-1,2-Dichloroethene	µg/L	<1	<1
Trichloroethene	µg/L	11	8.58
Vinyl chloride	µg/L	<1	<1

Notes:

µg/L micrograms per liter

RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL

< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-226

Sample Name		MW-226-SARA-GW01	MW226-83	MW-226-IS-4	MW-226-TSVE-G	MW-226-IS-5	MW-226-IS-6	MW-226-IS-7
Sample Date		5/15/2007	11/9/2007	4/15/2008	8/20/2008	10/20/2008	4/17/2009	10/14/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	220	9.56	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	1.4	1.09	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<2	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<2	<1	<1	<1	<1	<1	<1
Chloroform	µg/L	0.72	0.156	0.155 J	0.157	0.155 J	0.133 J	0.184 J
cis-1,2-Dichloroethene	µg/L	19	2.57	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	7.1	0.559	<1	0.417	0.533 J	0.794 J	0.75 J
trans-1,2-Dichloroethene	µg/L	4.5	0.486	<1	<1	<1	<1	<1
Trichloroethene	µg/L	740	24.7	0.855 J	<1	<1	<1	<1
Vinyl chloride	µg/L	<2	1.24	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-226

	Sample Name	MW-226-ODLA-1
	Sample Date	3/26/2010
Primary CVOCs	Units	
1,1,2,2-Tetrachloroethane	µg/L	<0.5
1,1,2-Trichloroethane	µg/L	<1
1,1-Dichloroethene	µg/L	<1
Carbon tetrachloride	µg/L	<1
Chloroform	µg/L	<0.3
cis-1,2-Dichloroethene	µg/L	<1
Tetrachloroethene	µg/L	0.751 J
trans-1,2-Dichloroethene	µg/L	<1
Trichloroethene	µg/L	<1
Vinyl chloride	µg/L	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-227

	Sample Name	MW227-SARA-GW01	MW227-78	MW-227-IS-4	MW-227-TSVE-G	MW-227-IS-5	MW-227-IS-6	MW-227-IS-7
	Sample Date	5/14/2007	11/10/2007	4/16/2008	8/18/2008	10/17/2008	4/21/2009	10/13/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	120	118	28.1	5.14	10.7	15.1	<0.5
1,1,2-Trichloroethane	µg/L	6.1	7.33	1.02	0.538	0.982 J	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	43	33.7	4.02	3.52	7.26	0.524 J	<1
Chloroform	µg/L	1100	1080	110	30.9	134	7.5	0.322
cis-1,2-Dichloroethene	µg/L	40	58.5	6.33	2.89	6.4	0.328 J	<1
Tetrachloroethene	µg/L	22	13.5	2.25	1.81	2.7	0.345 J	0.267 J
trans-1,2-Dichloroethene	µg/L	8.5	10.9	1	0.37	1.04	<1	<1
Trichloroethene	µg/L	420	387	40.8	28.4	61.8	3.56	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-227

	Sample Name	MW-227-ODLA-1
	Sample Date	3/26/2010
Primary CVOCs	Units	
1,1,2,2-Tetrachloroethane	µg/L	<0.5
1,1,2-Trichloroethane	µg/L	<1
1,1-Dichloroethene	µg/L	<1
Carbon tetrachloride	µg/L	0.682 J
Chloroform	µg/L	<0.3
cis-1,2-Dichloroethene	µg/L	<1
Tetrachloroethene	µg/L	0.543 J
trans-1,2-Dichloroethene	µg/L	<1
Trichloroethene	µg/L	<1
Vinyl chloride	µg/L	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-228

	Sample Name	MW228-SARA-GW01	MW228-78	MW-228-IS-4	MW-228-TSVE-G	MW-228-IS-5	MW-228-IS-6	MW-228-IS-7
	Sample Date	5/14/2007	11/10/2007	4/16/2008	8/18/2008	10/17/2008	4/16/2009	10/14/2009
Primary CVOCs	Units							
1,1,2,2-Tetrachloroethane	µg/L	46	5.07	0.509	0.22	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	0.99	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	3.4	<1	<1	<1	<1	<1	0.627 J
Chloroform	µg/L	120	4.51	0.387	2.81	0.155 J	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	1.6	<1	<1	<1	<1	<1	<1
Tetrachloroethene	µg/L	1.8	<1	<1	<1	<1	<1	0.399 J
trans-1,2-Dichloroethene	µg/L	0.38	<1	<1	<1	<1	<1	<1
Trichloroethene	µg/L	42	0.974	<1	0.911	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-228

		Sample Name	MW-228-ODLA-1
		Sample Date	3/29/2010
Primary CVOCs	Units		
1,1,2,2-Tetrachloroethane	µg/L	<0.5	
1,1,2-Trichloroethane	µg/L	<1	
1,1-Dichloroethene	µg/L	<1	
Carbon tetrachloride	µg/L	0.756 J	
Chloroform	µg/L	<0.3	
cis-1,2-Dichloroethene	µg/L	<1	
Tetrachloroethene	µg/L	0.445 J	
trans-1,2-Dichloroethene	µg/L	<1	
Trichloroethene	µg/L	<1	
Vinyl chloride	µg/L	<1	

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-231

Sample Name		MW-231-IS-4	MW-231-IS-5	MW-231-IS-6	MW-231-IS-7
Sample Date		4/14/2008	10/22/2008	4/17/2009	10/14/2009
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<0.3	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1

Notes:

µg/L micrograms per liter

RL reporting limit

DQE Flags:

< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-234

Sample Name		MW-234-IS-4	MW-234-IS-5	MW-234-IS-6	MW-234-IS-7
Sample Date		4/14/2008	10/22/2008	4/17/2009	10/14/2009
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	0.469 J	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<0.3	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-235

Sample Name		MW-235-IS-4	MW-235-IS-5	MW-235-IS-6	MW-235-IS-7
Sample Date		4/15/2008	10/22/2008	4/17/2009	10/15/2009
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<0.3	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1

Notes:

µg/L micrograms per liter

RL reporting limit

DQE Flags:

< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-237

Sample Name		MW-237-IS-4	MW-237-IS-5	MW-237-IS-6	MW-237-IS-7
Sample Date		4/11/2008	10/22/2008	4/16/2009	10/15/2009
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	2.2	2.02	2.17	1.77
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Chloroform	µg/L	0.181 J	0.162 J	0.129 J	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	0.256 J	0.261 J	0.286 J	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1	<1

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-239

Sample Name		MW-239-IS-4	MW-239-IS-5	MW-239-IS-6	MW-239-IS-7
Sample Date		4/11/2008	10/21/2008	4/16/2009	10/15/2009
Primary CVOCs	Units				
1,1,2,2-Tetrachloroethane	µg/L	<0.5	<0.5	<0.5	0.605
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	0.76 J	<1	0.536 J	0.899 J
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<0.3	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	<1	<1	<1	0.278 J
Tetrachloroethene	µg/L	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Vinyl chloride	µg/L	<1	<1	<1 UJ	<1 UJ

Notes:

µg/L micrograms per liter
RL reporting limit

DQE Flags:

J Estimated, based on QC data or below RL
< Not detected at or above RL
UJ Not detected, RL estimated

HISTORICAL ANALYTICAL RESULTS, PRIMARY CVOCs
OFF DEPOT GROUNDWATER
ANNUAL LONG-TERM MONITORING REPORT - 2010
Dunn Field - Defense Depot Memphis, Tennessee

MW-240

Sample Name		MW240-90	MW-240-IS-4	MW-240-IS-5	MW-240-IS-6	MW-240-IS-7
Sample Date		11/7/2007	4/11/2008	10/21/2008	4/17/2009	10/14/2009
Primary CVOCs	Units					
1,1,2,2-Tetrachloroethane	µg/L	<1	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1
Chloroform	µg/L	<1	<0.3	<0.3	<0.3	<0.3
cis-1,2-Dichloroethene	µg/L	1.85	1.43	1.01	0.922 J	0.86 J
Tetrachloroethene	µg/L	<1	<1	<1	<1	<1
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1
Trichloroethene	µg/L	2.42	2.13	1.63	1.56	1.73
Vinyl chloride	µg/L	<1	<1	<1	<1	<1

Notes:

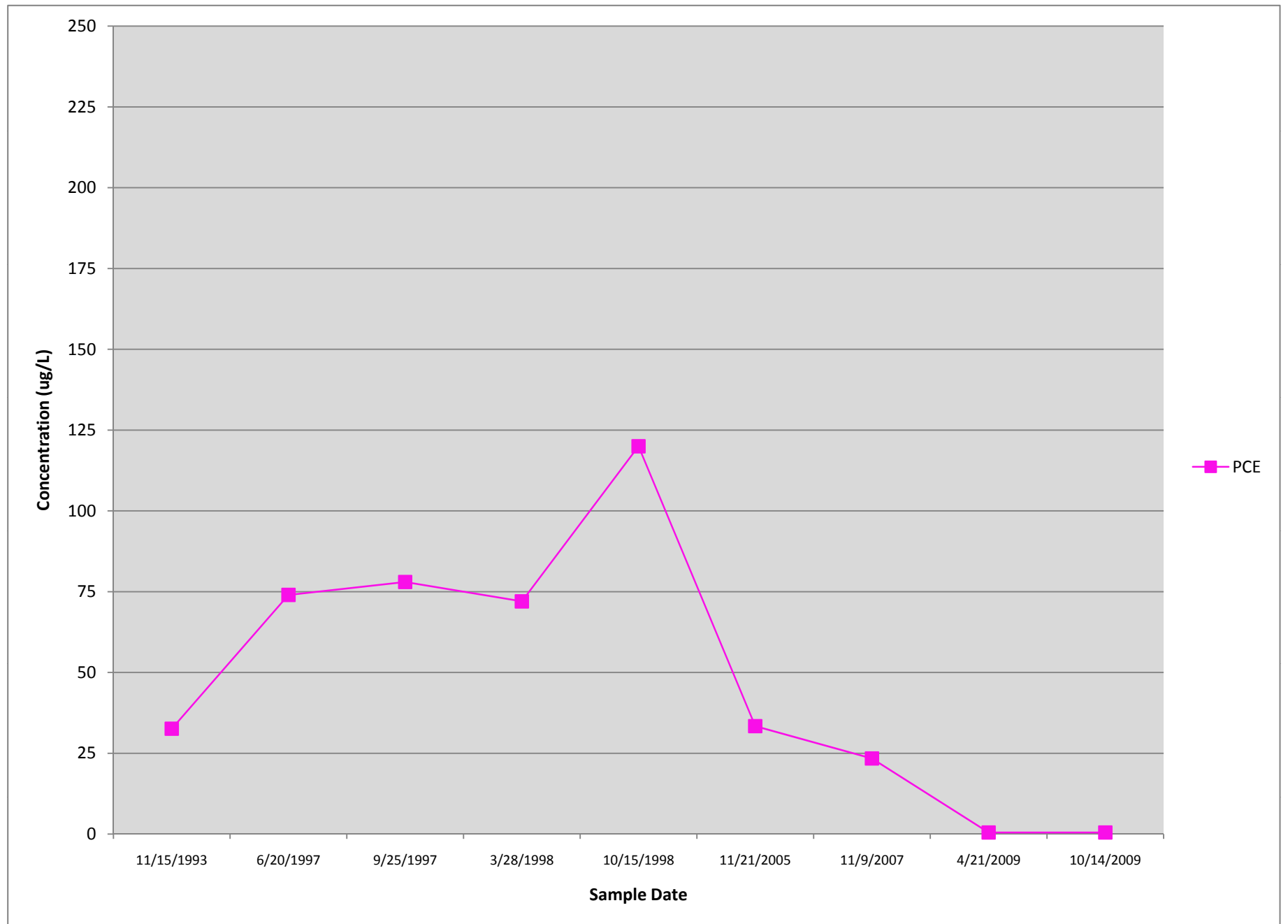
µg/L micrograms per liter
RL reporting limit

DQE Flags:

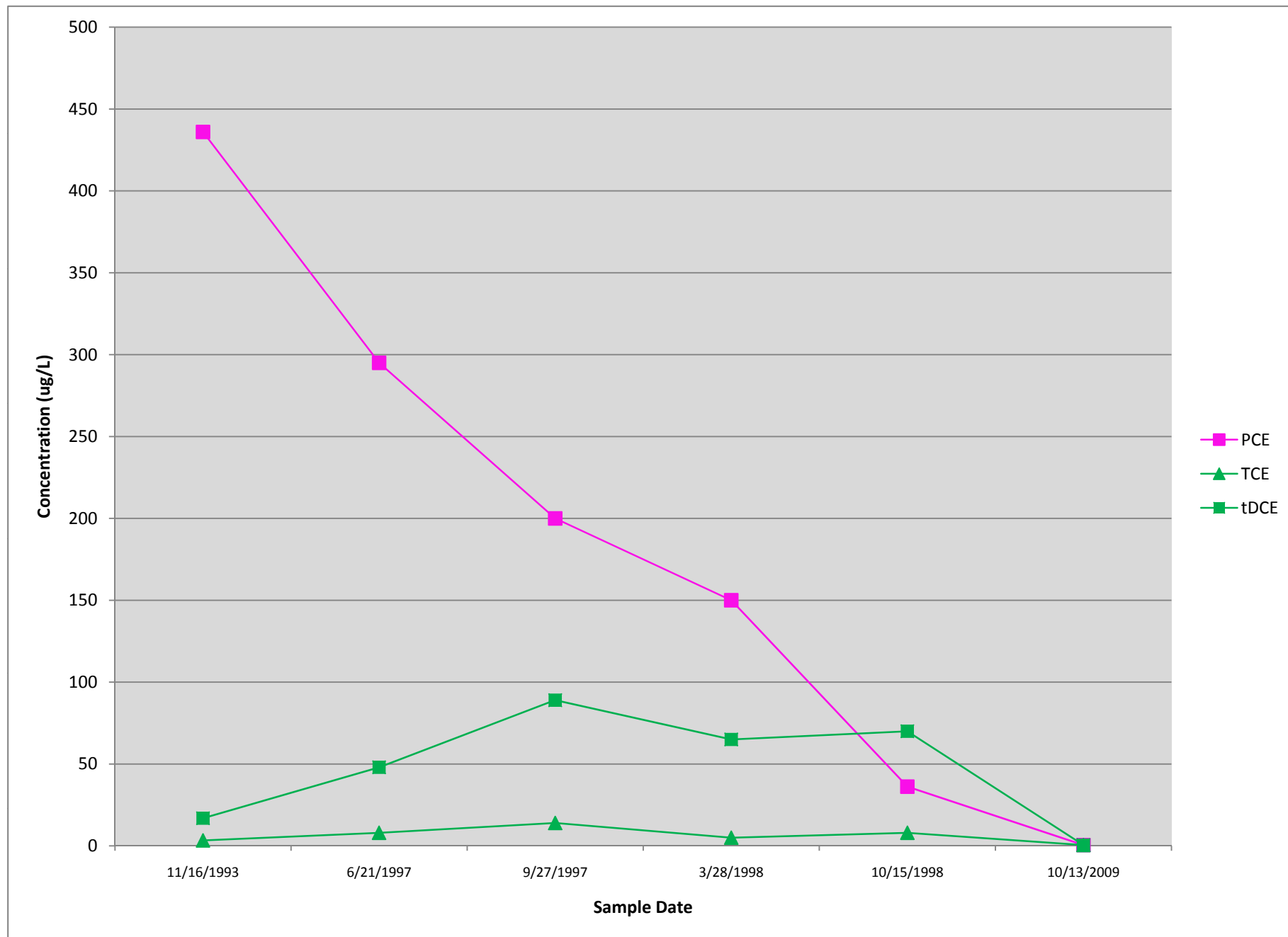
J Estimated, based on QC data or below RL
< Not detected at or above RL

APPENDIX D
CVOC TIME-TREND PLOTS

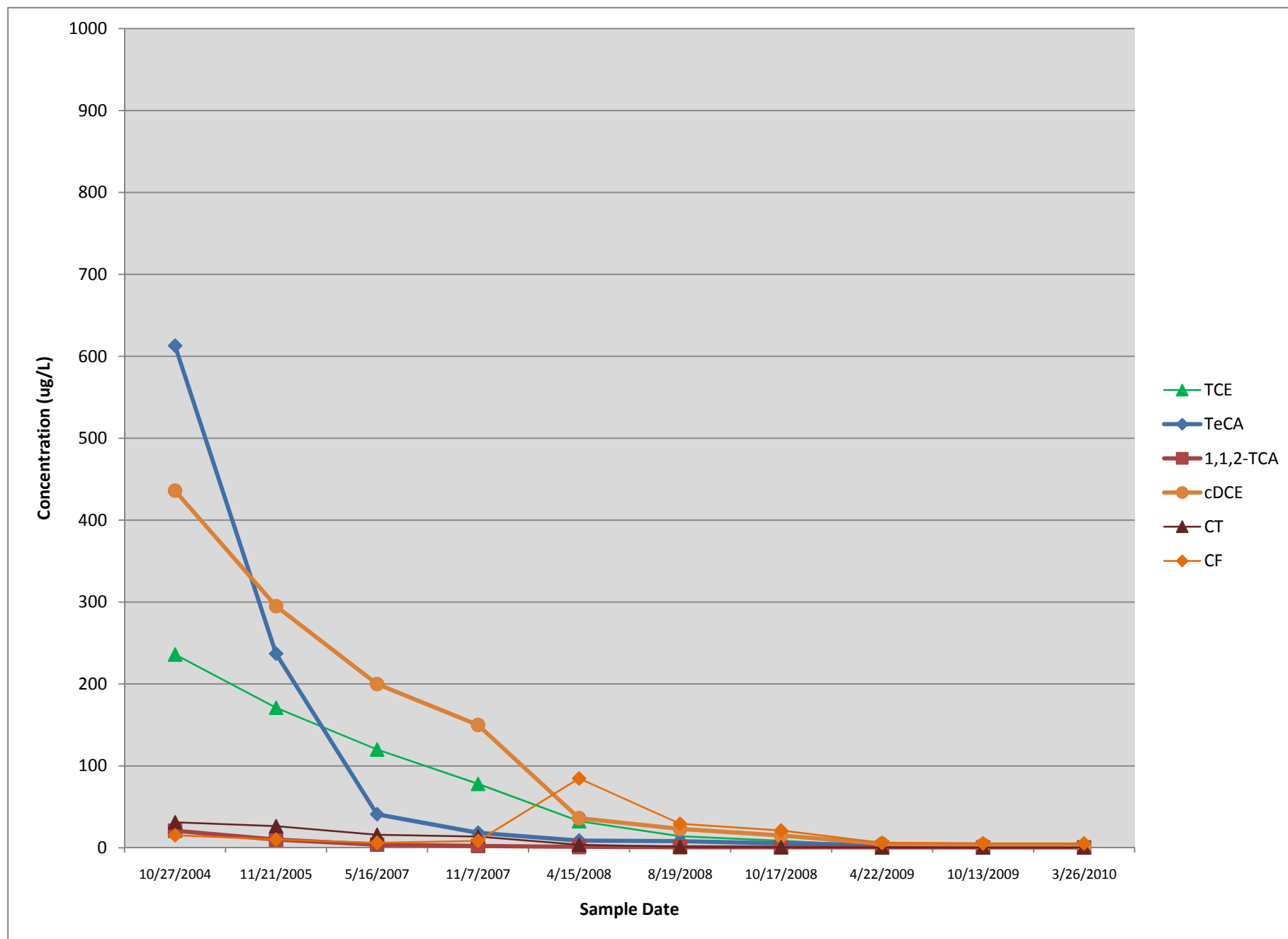
MW-04



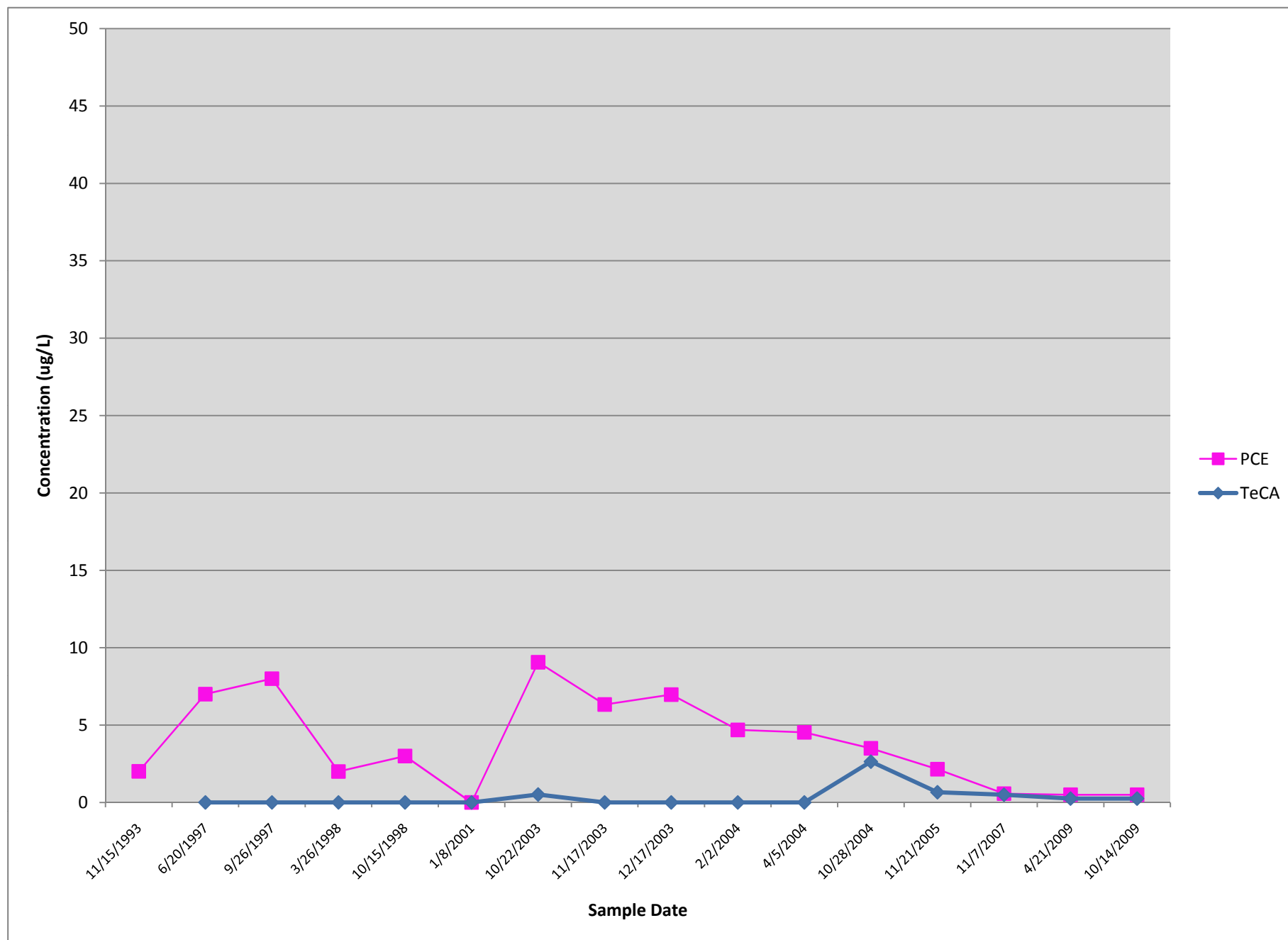
MW-05



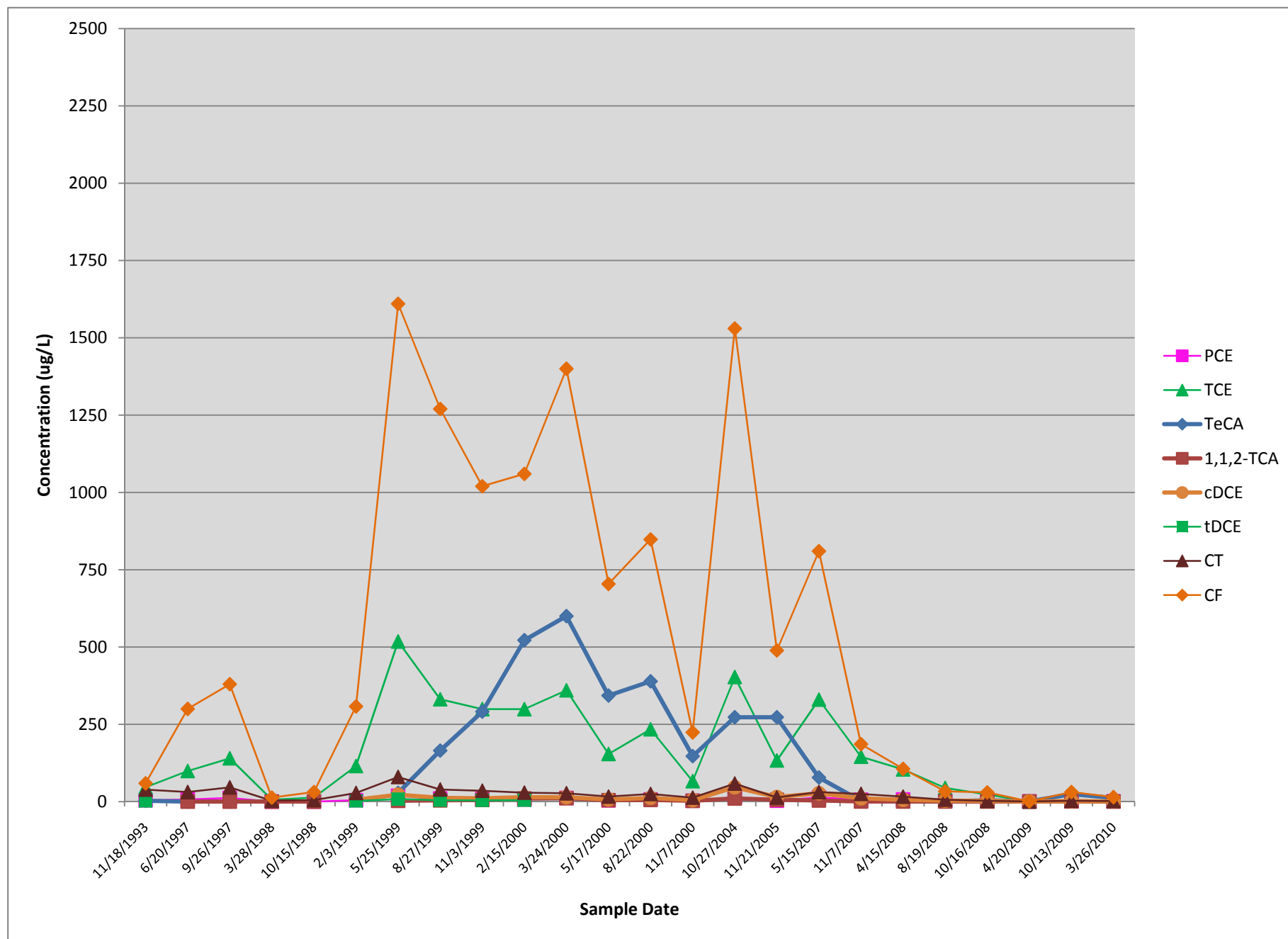
MW-06



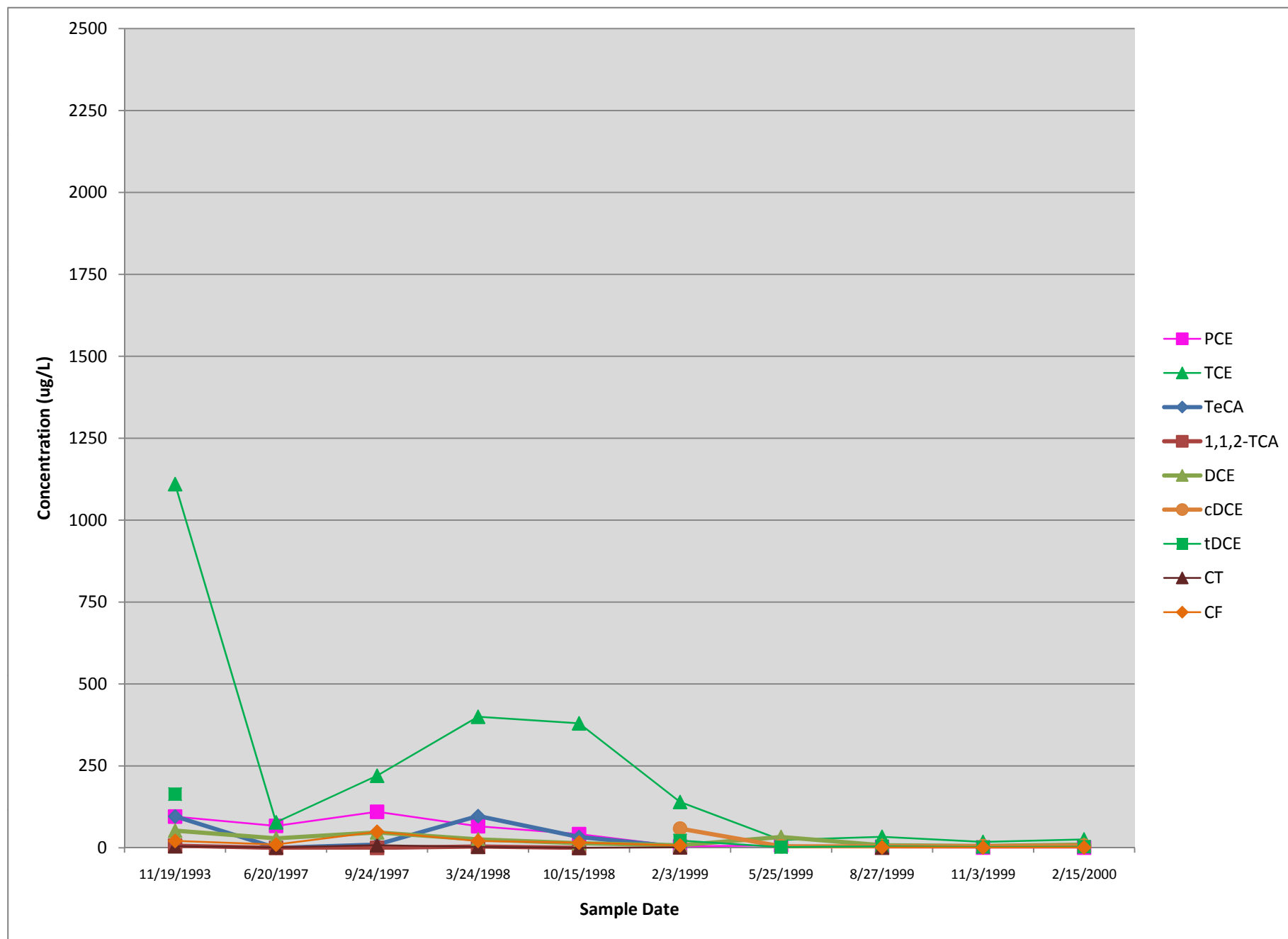
MW-13

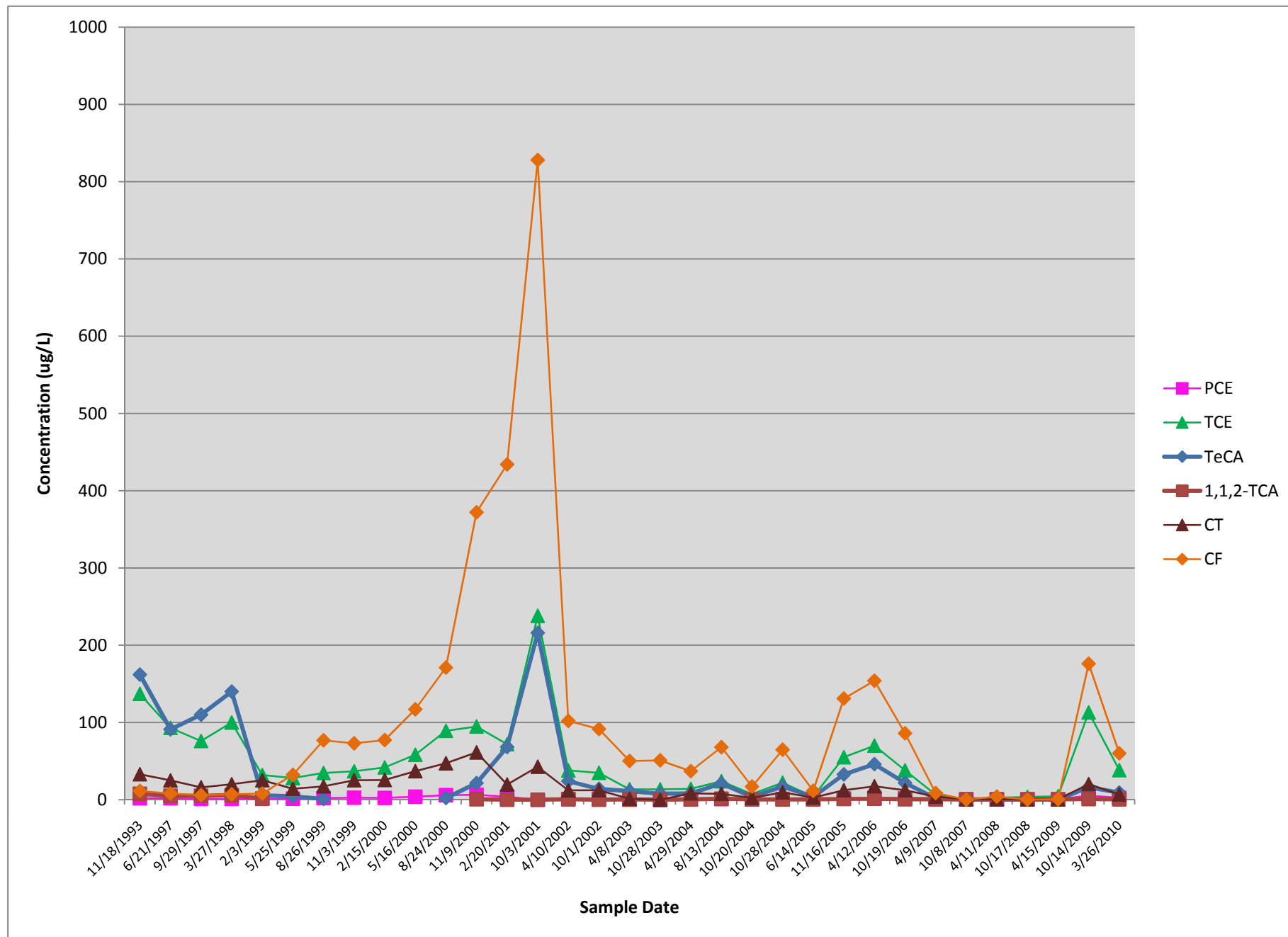


MW-15

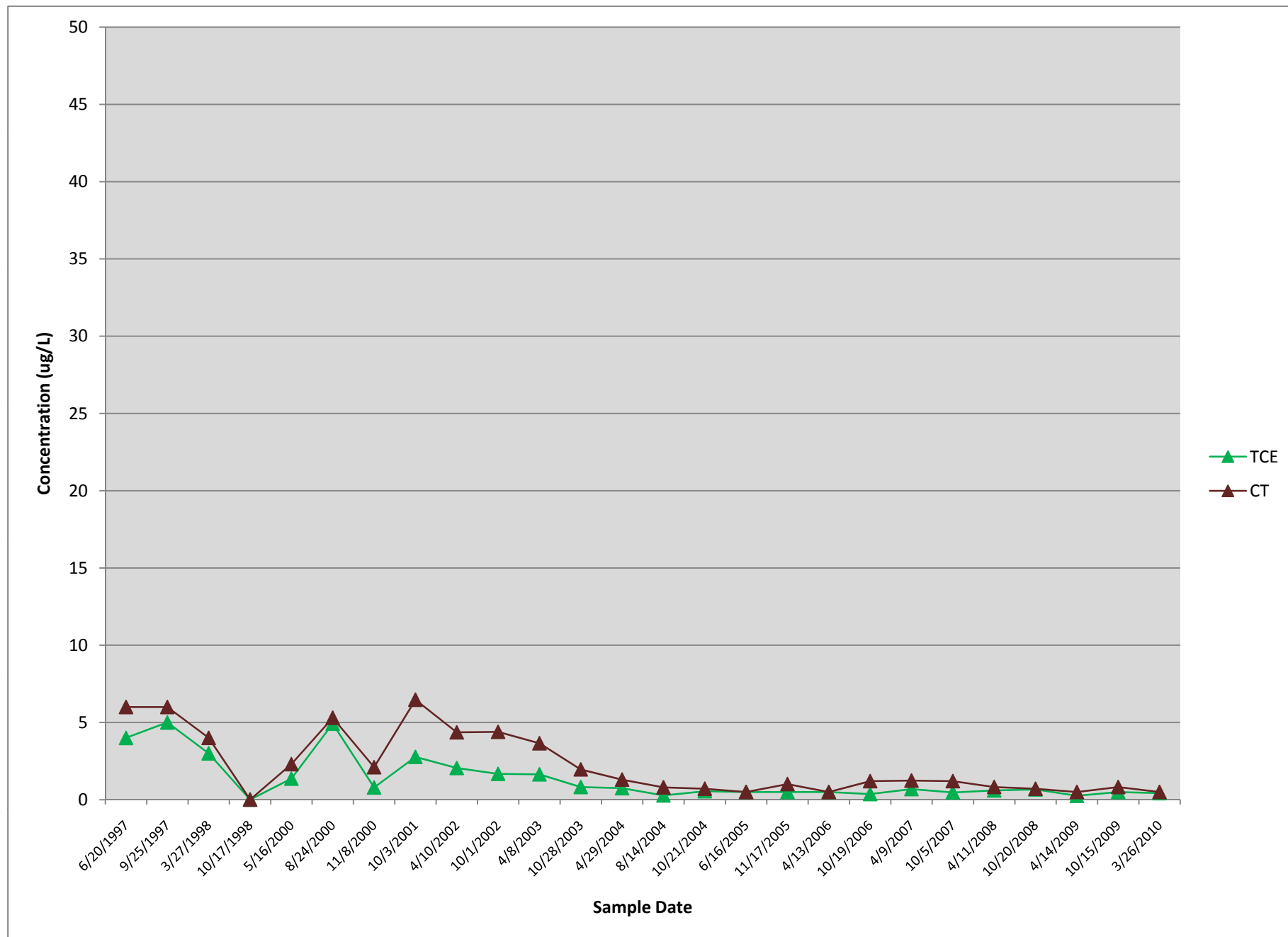


MW-31

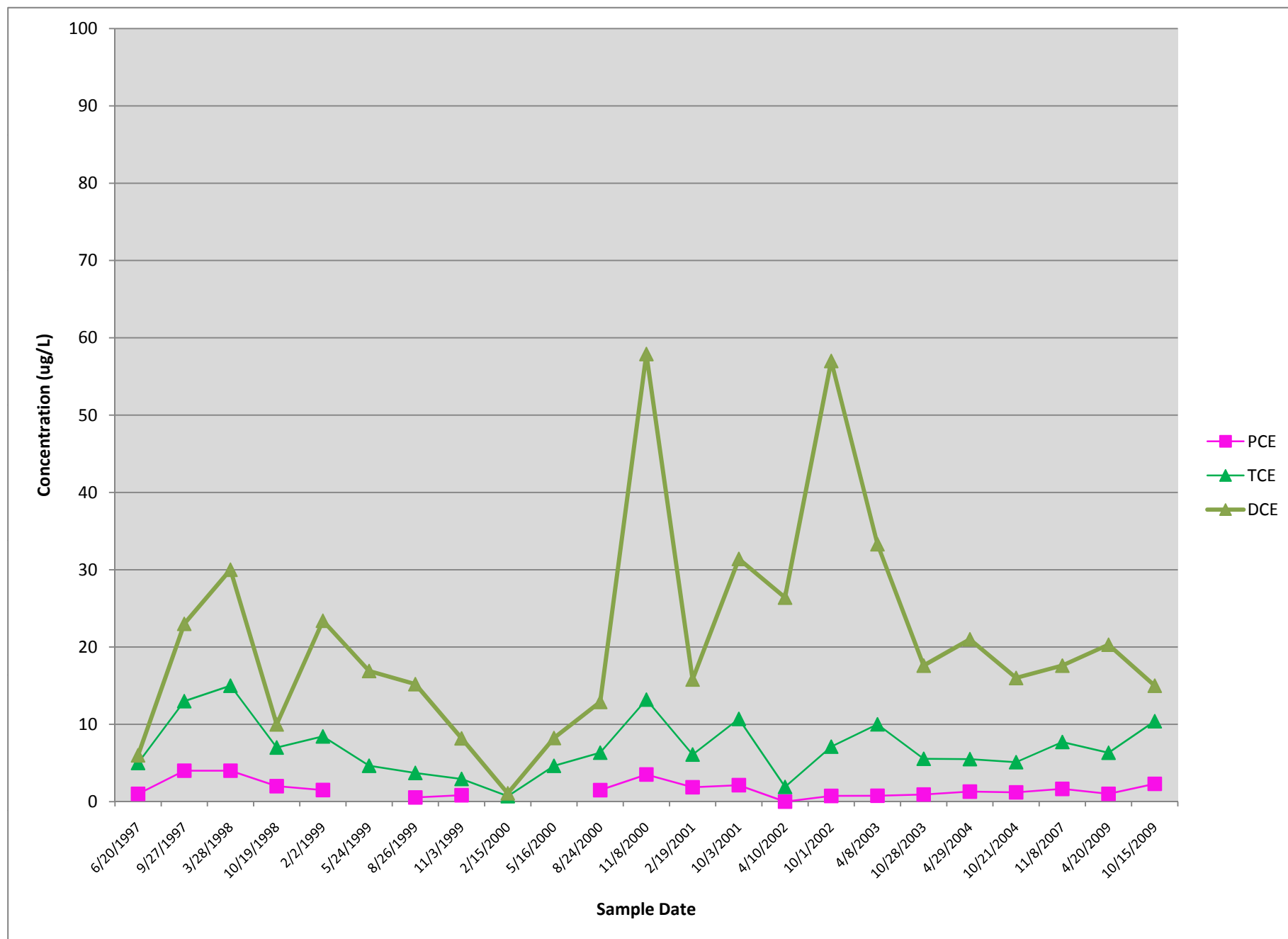




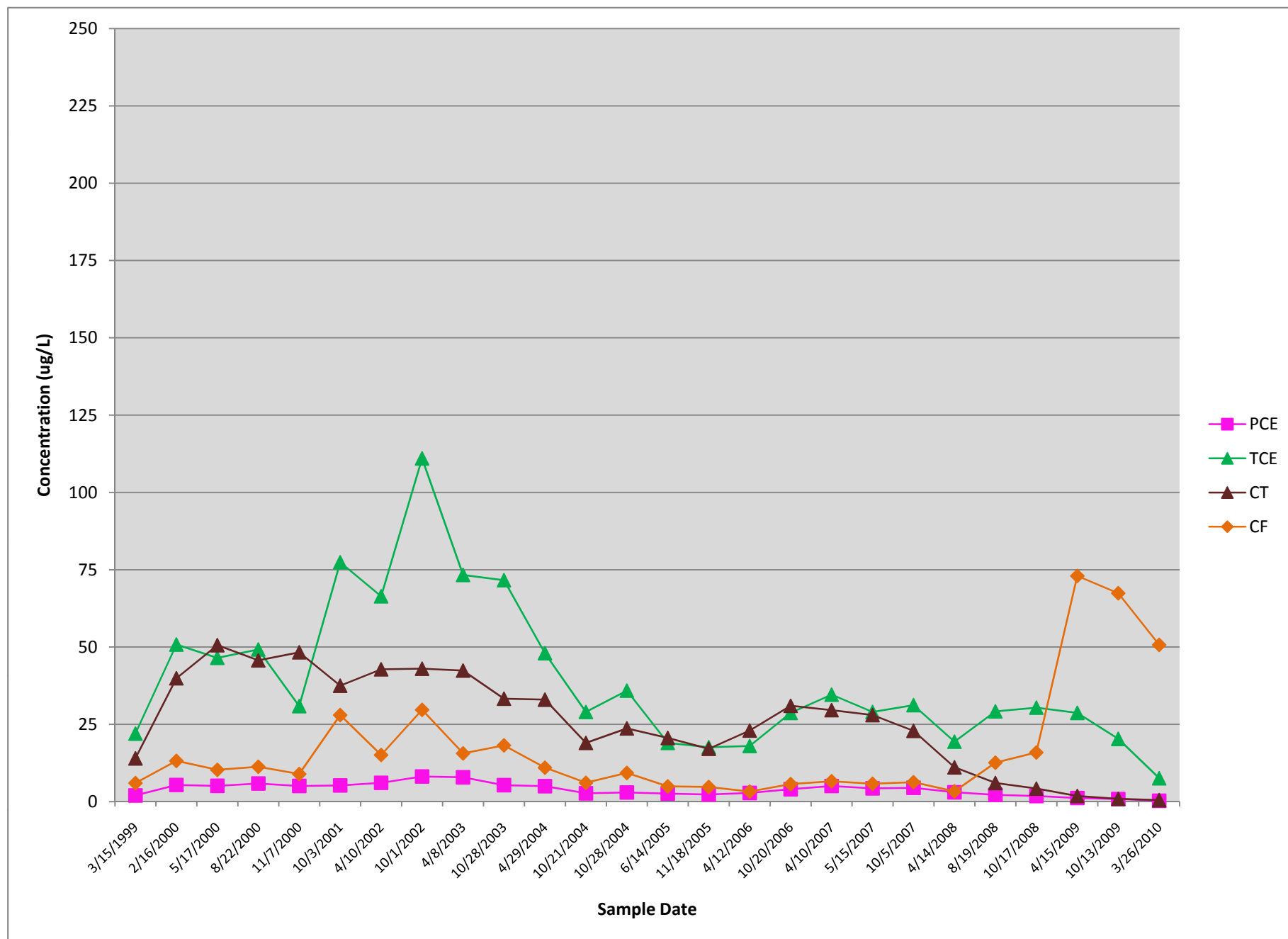
MW-44



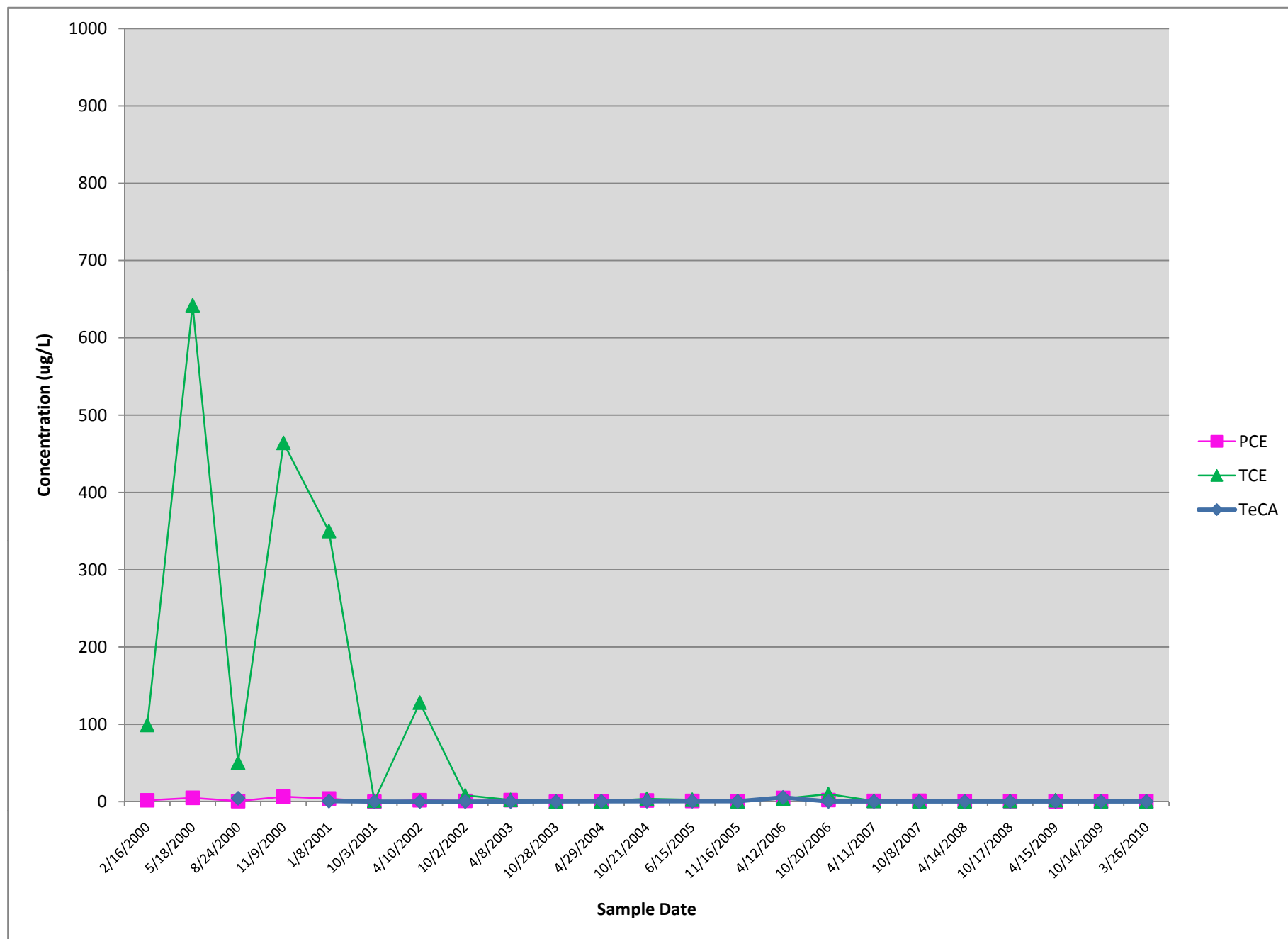
MW-51



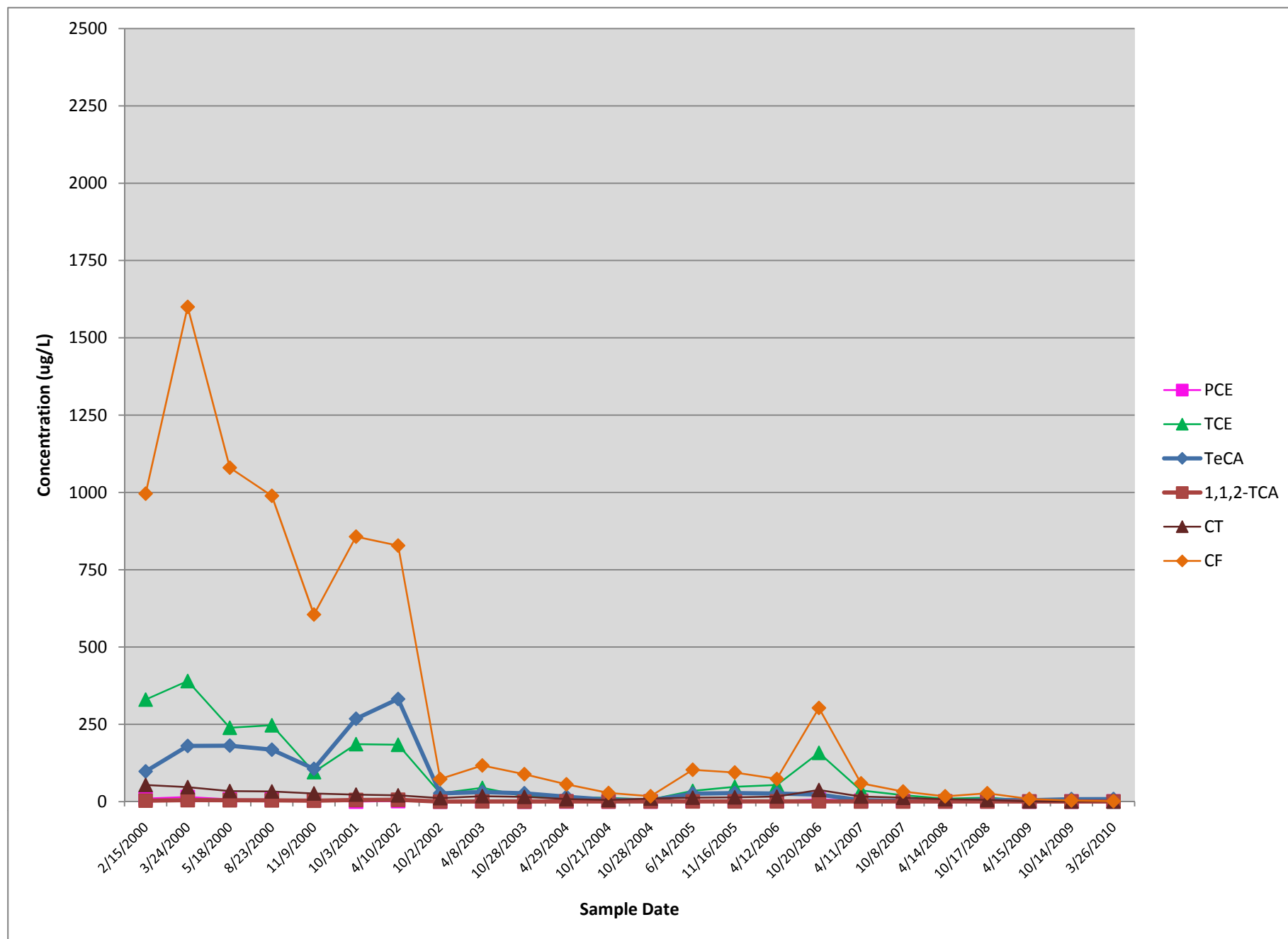
MW-57



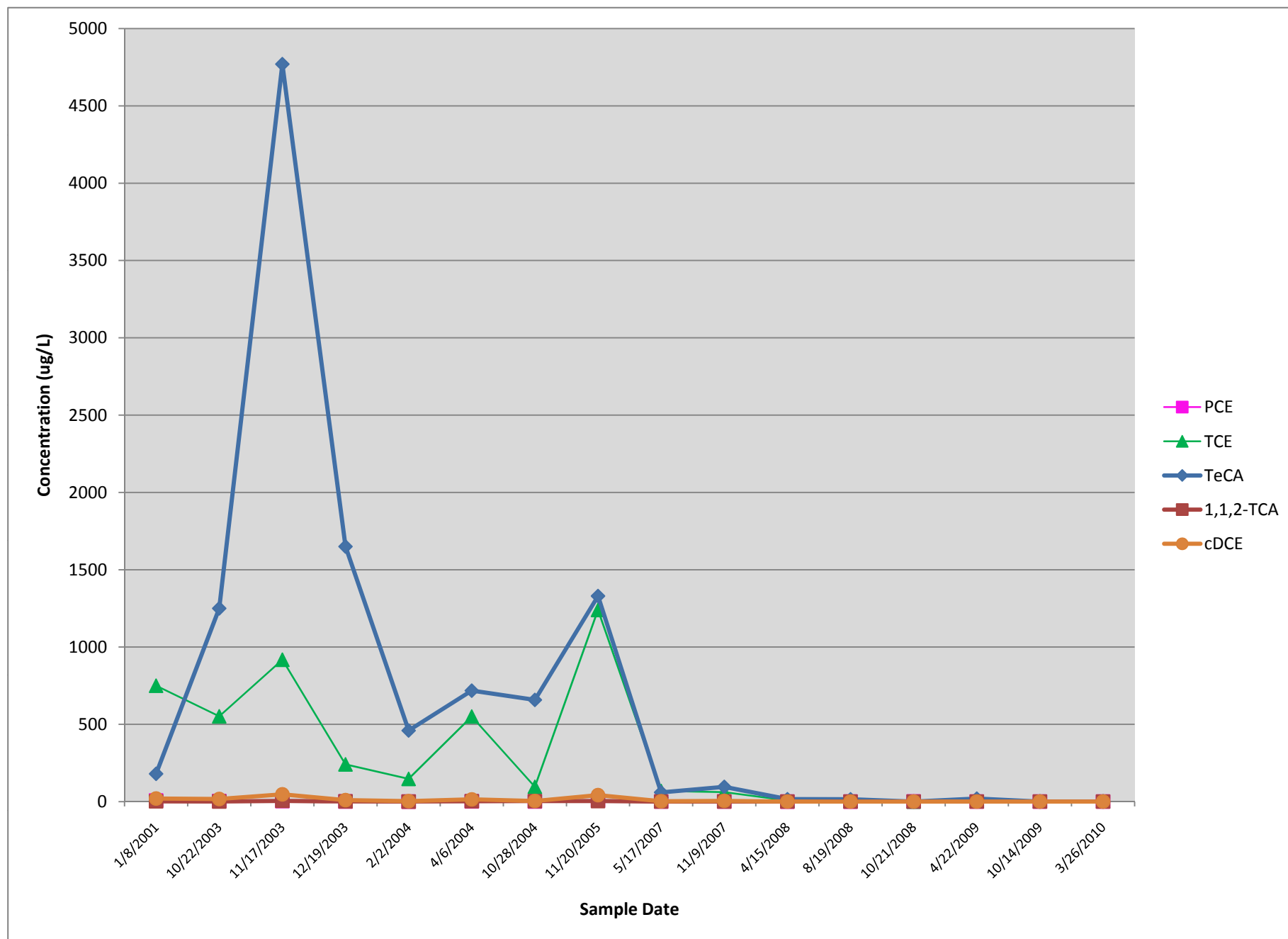
MW-69



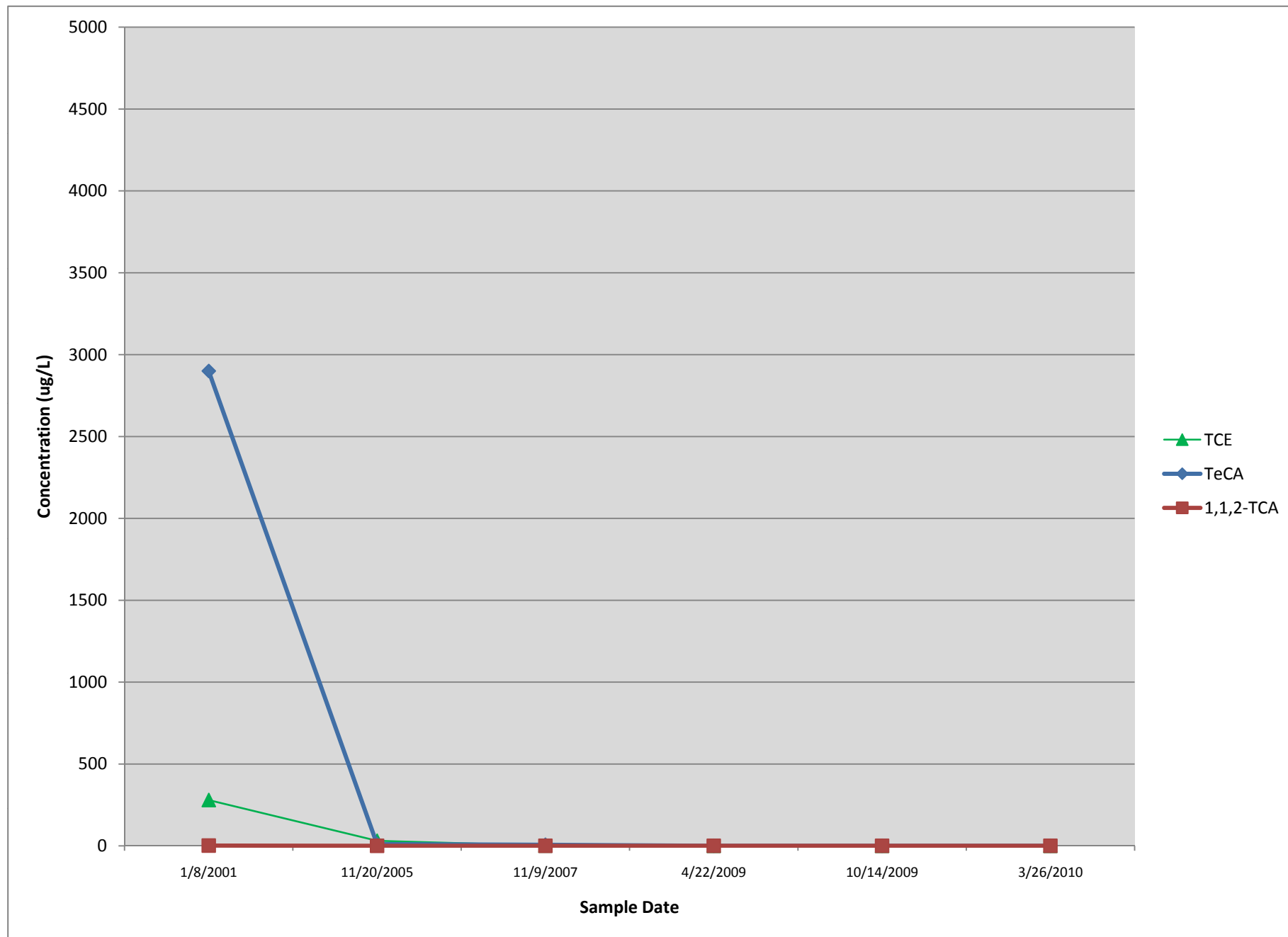
MW-71



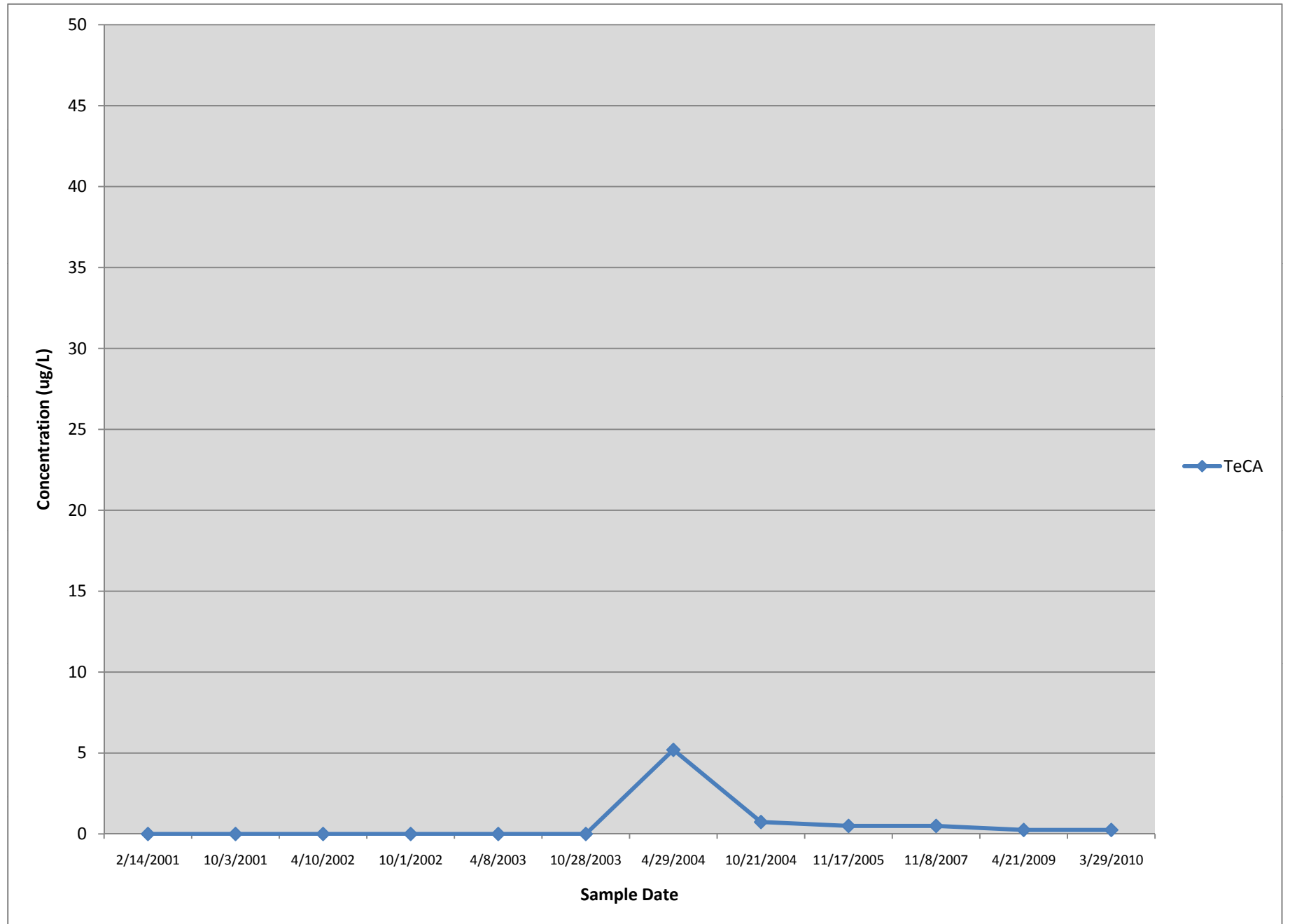
MW-74

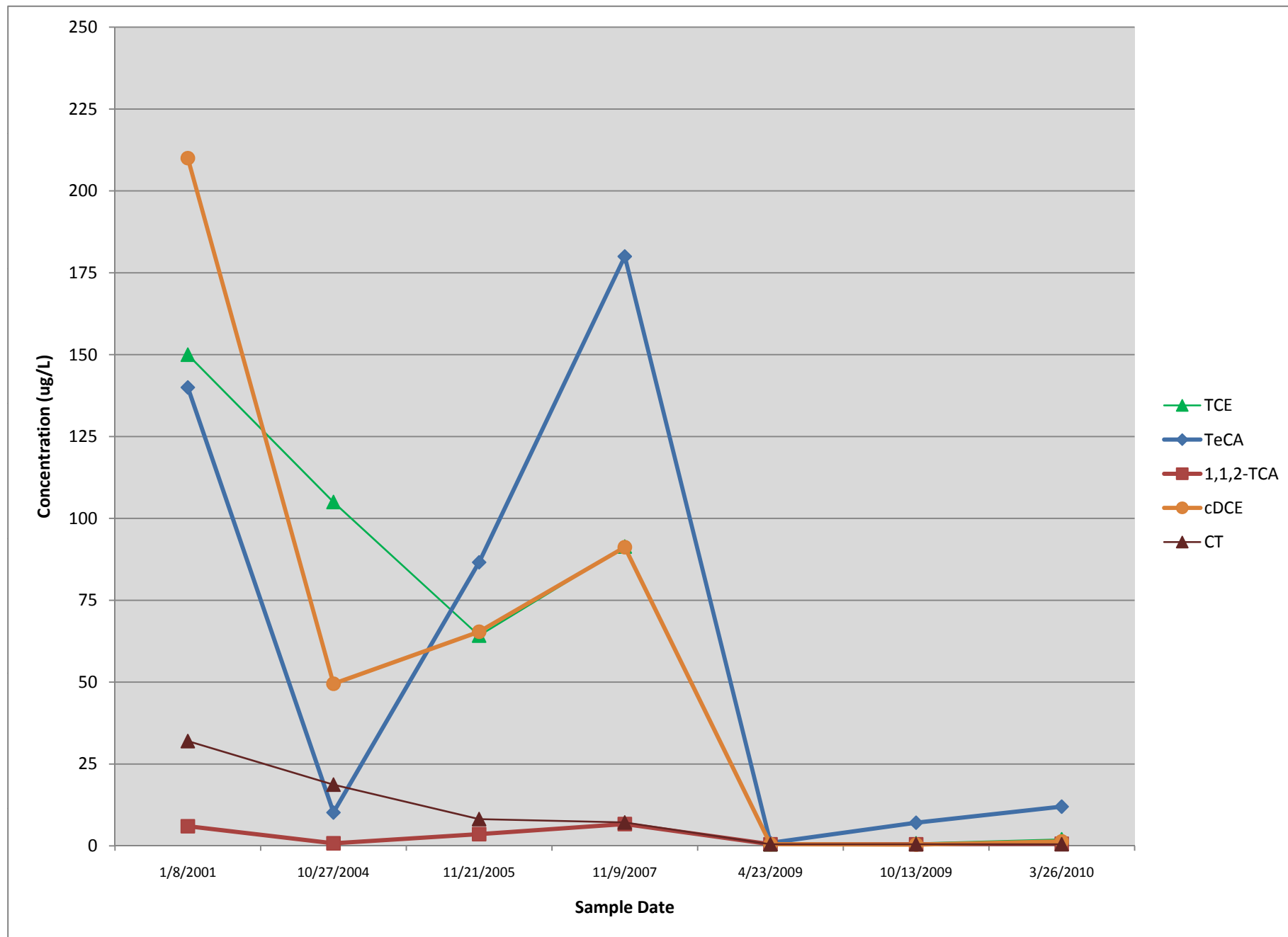


MW-75

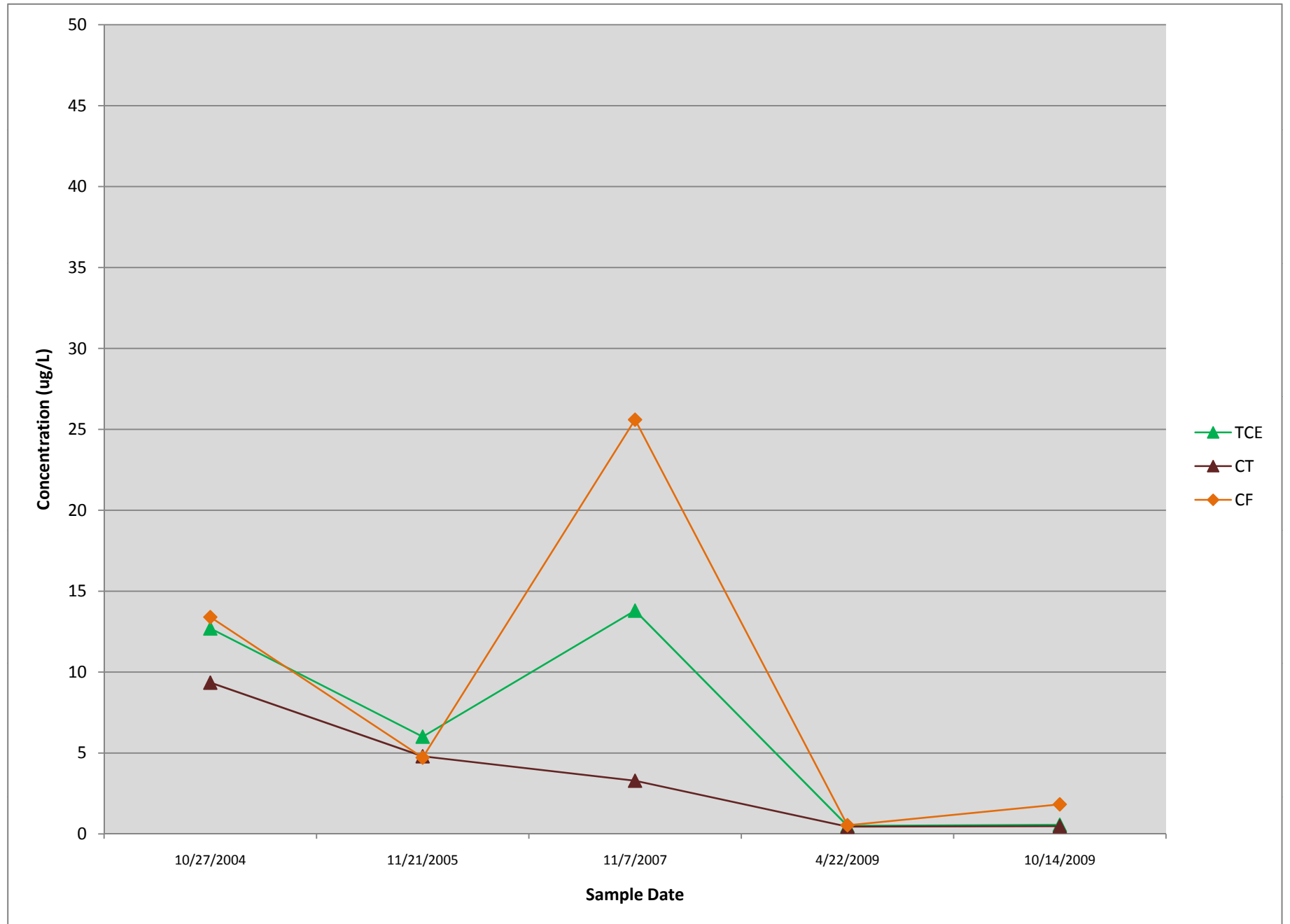


MW-78

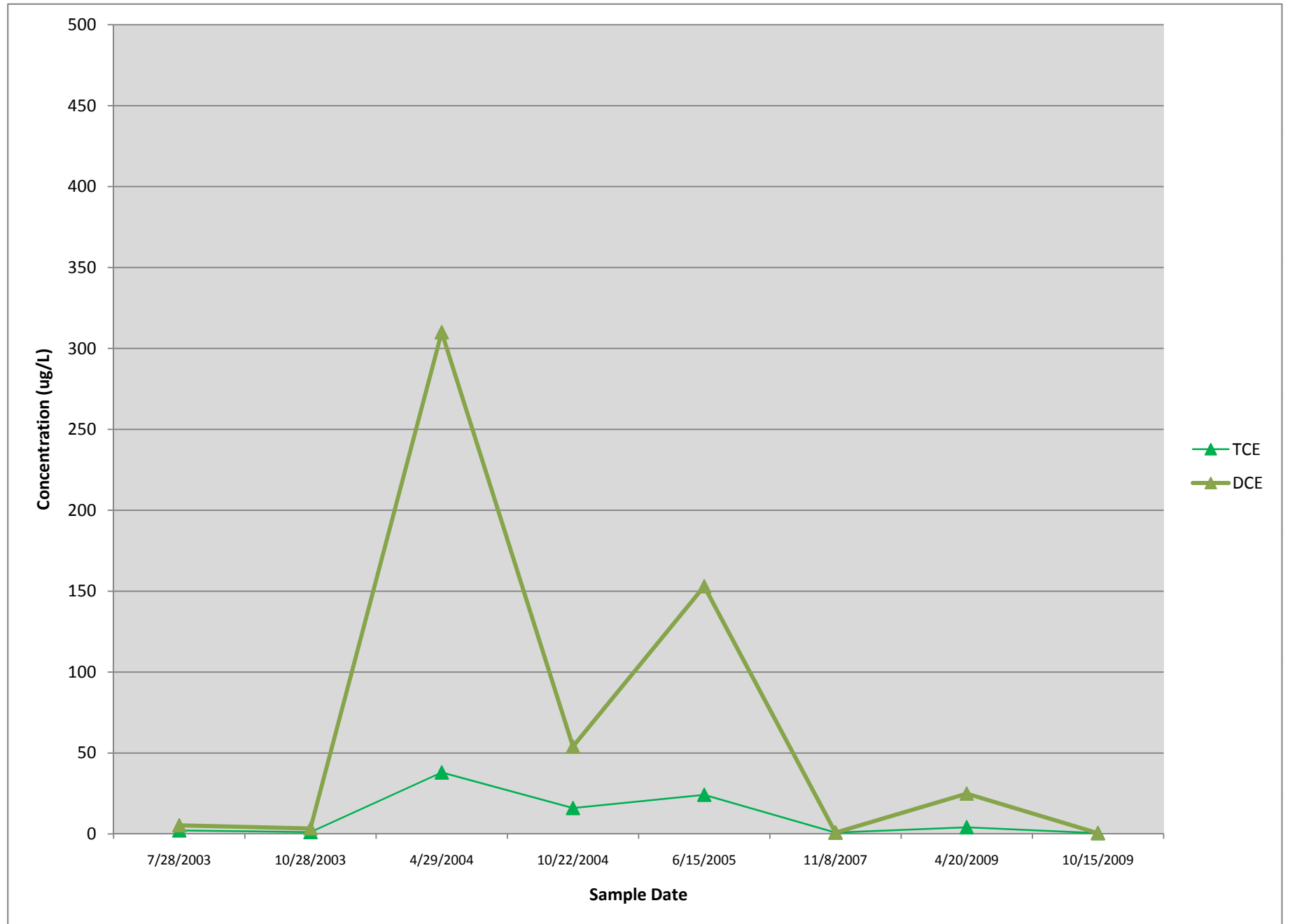




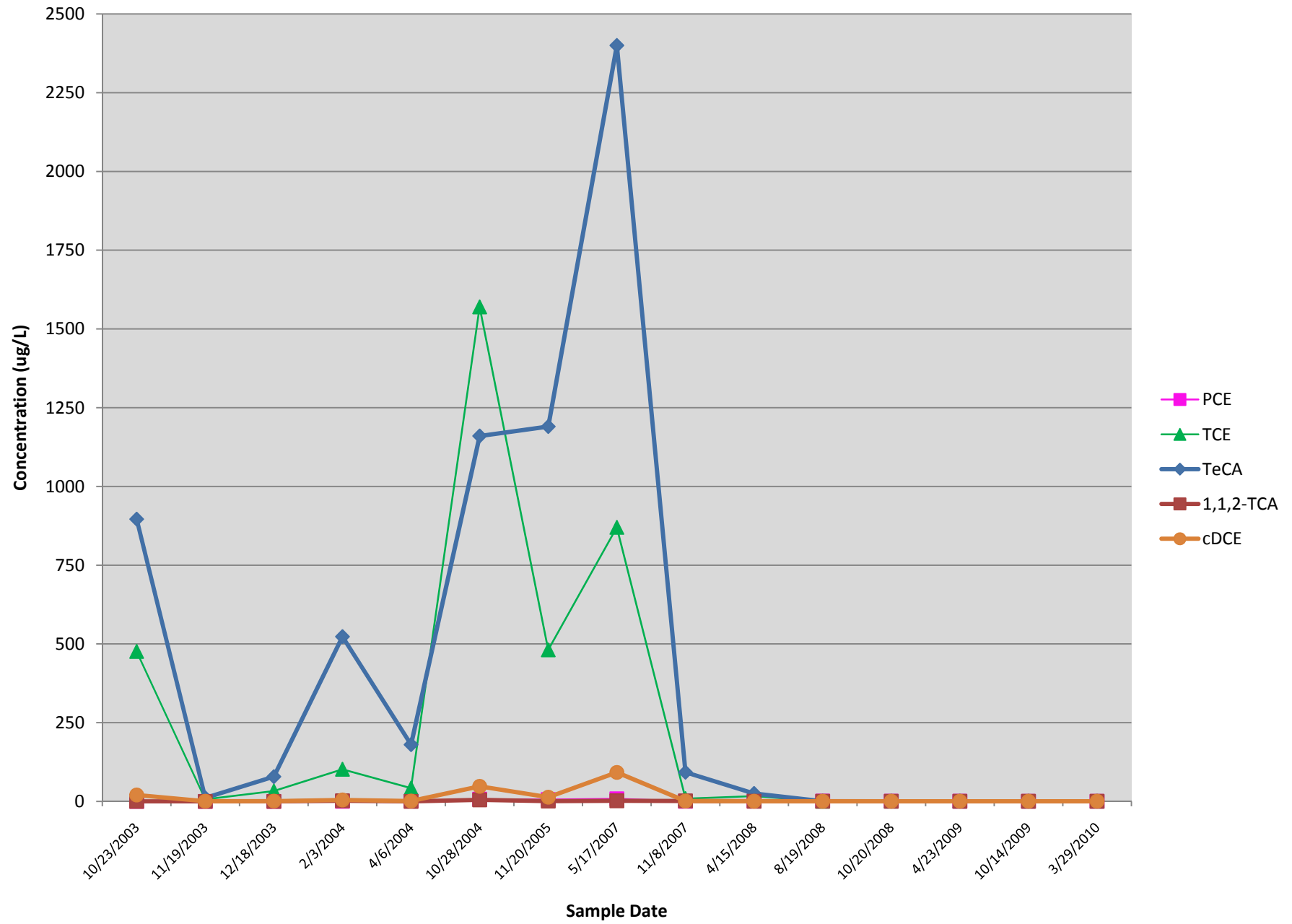
MW-91



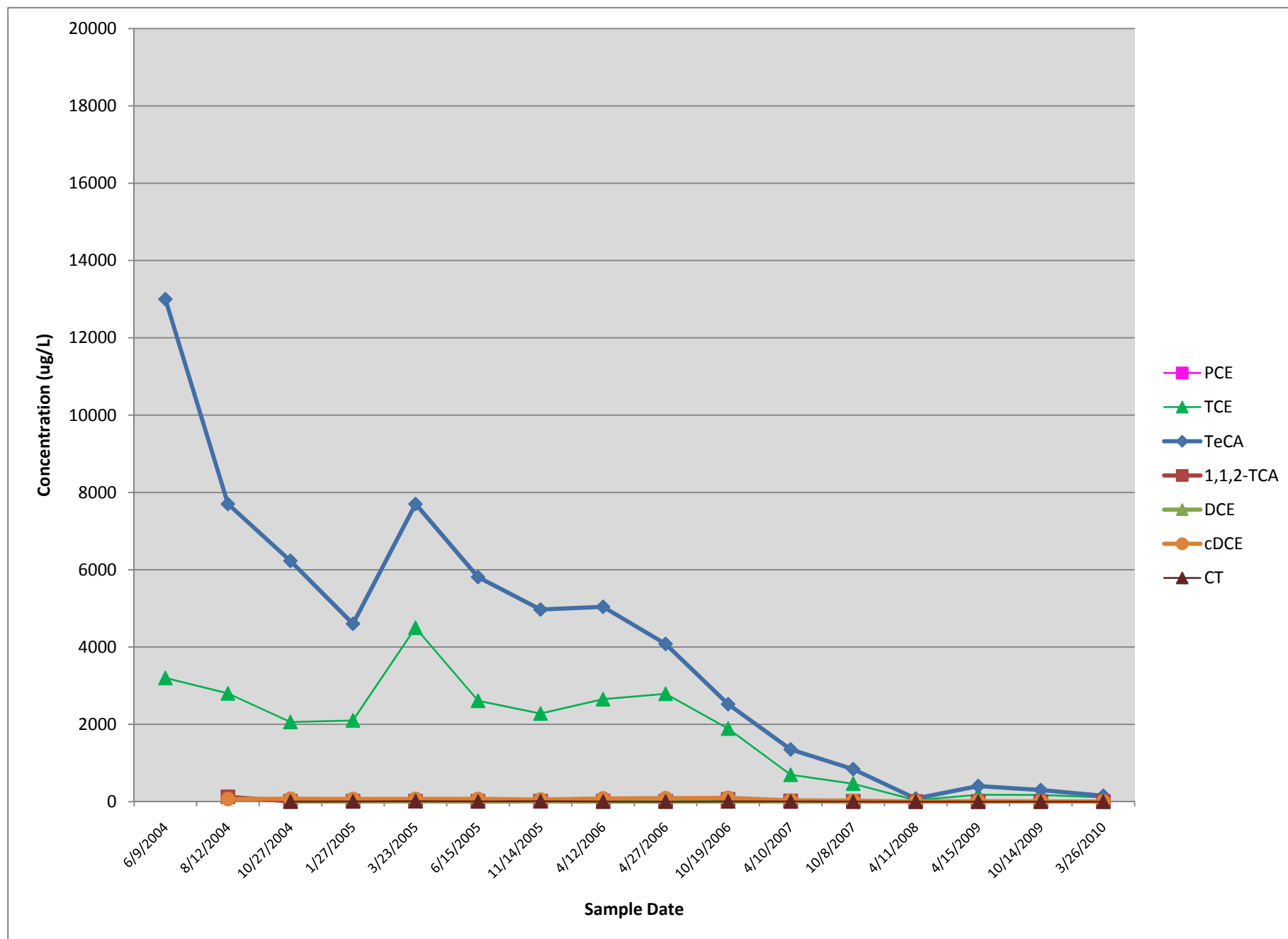
MW-128



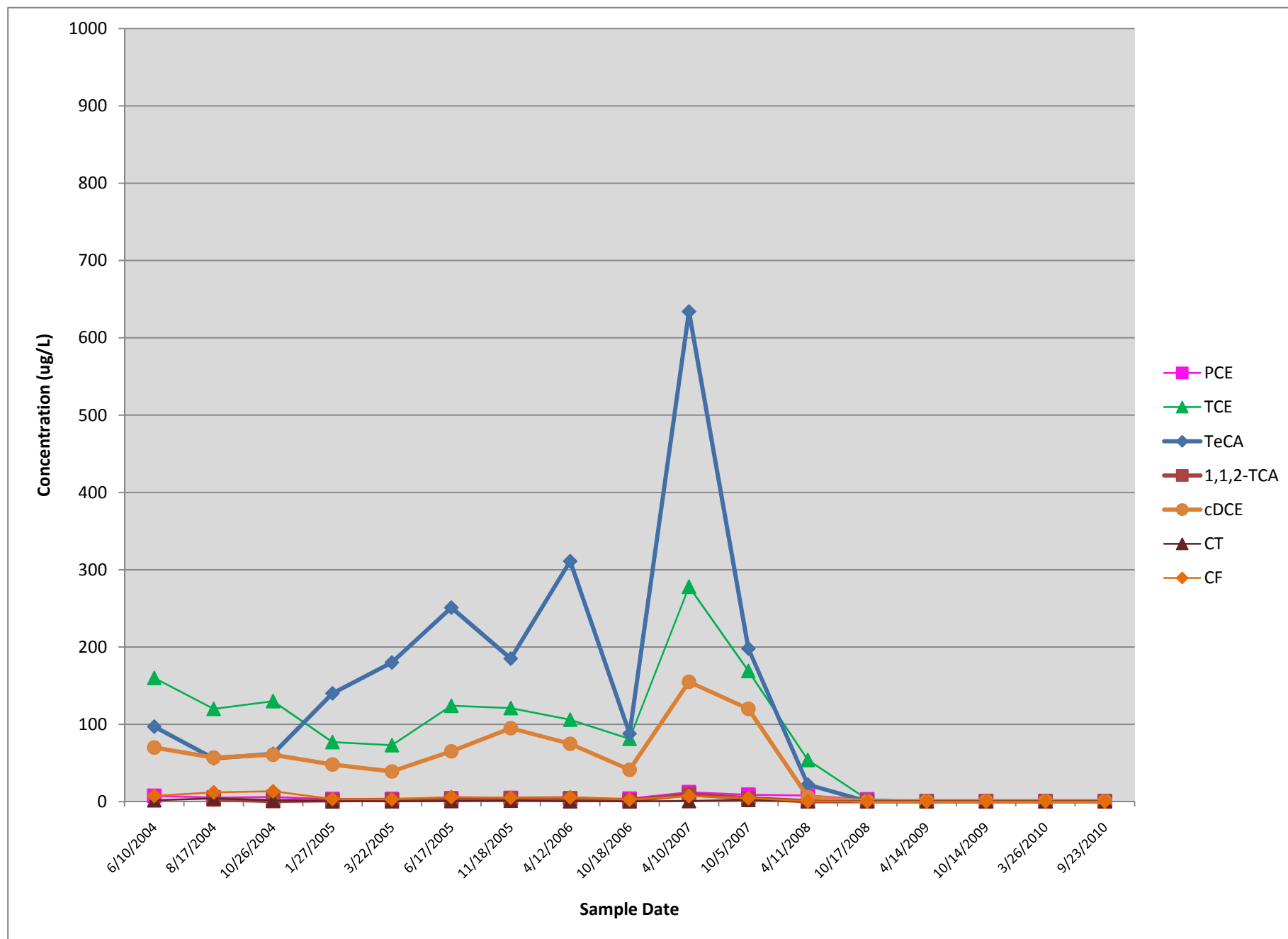
MW-132



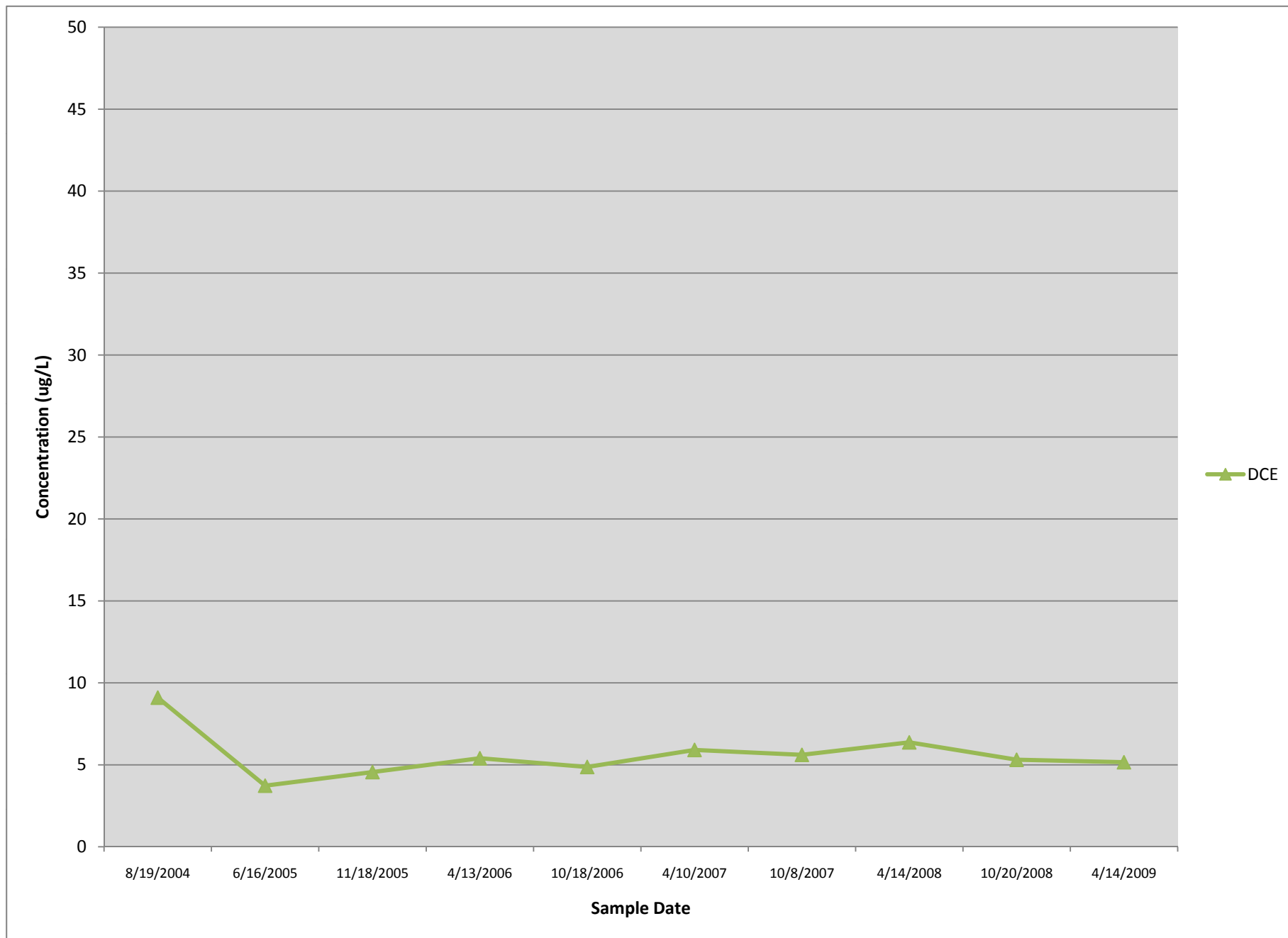
MW-144



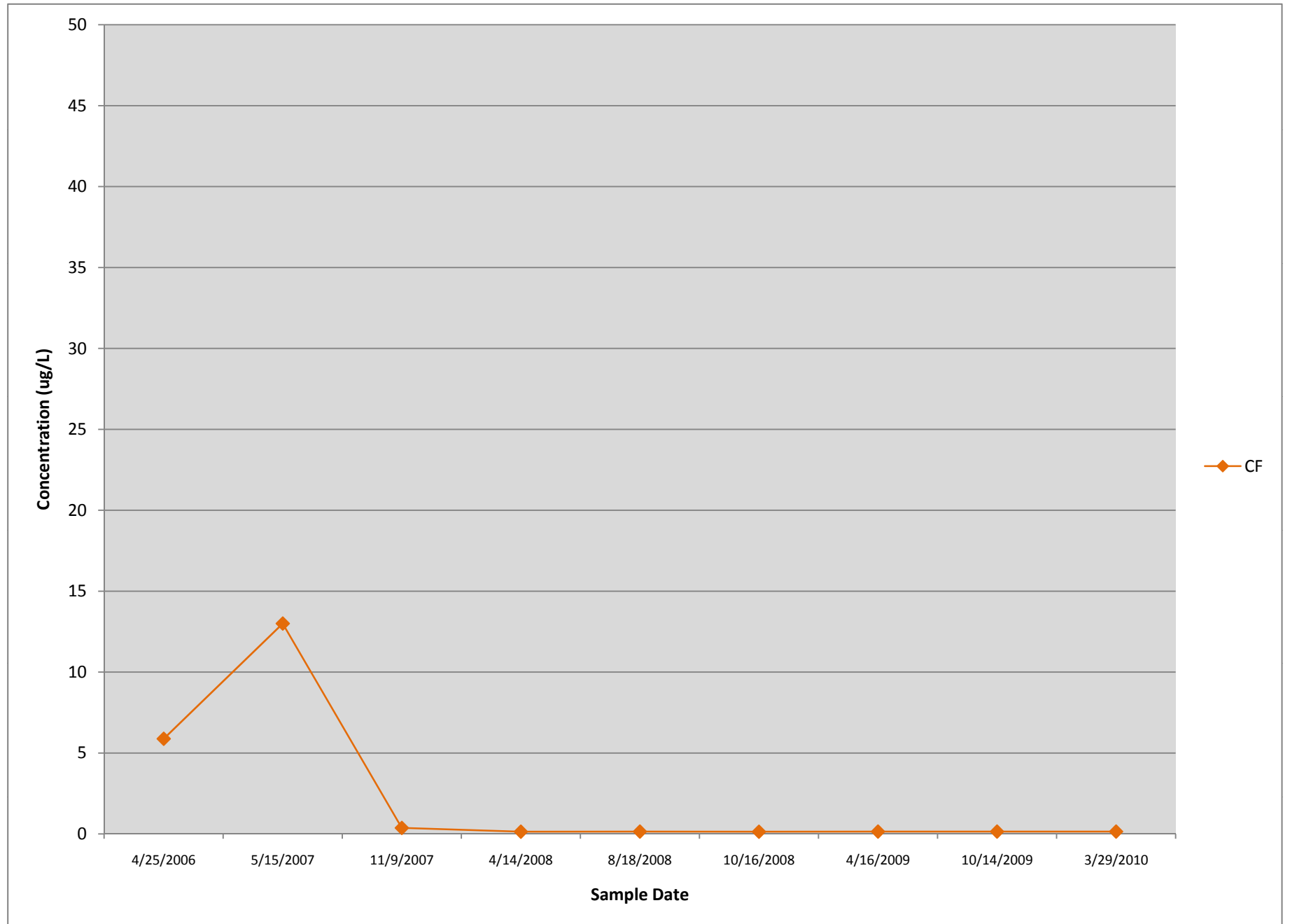
MW-147



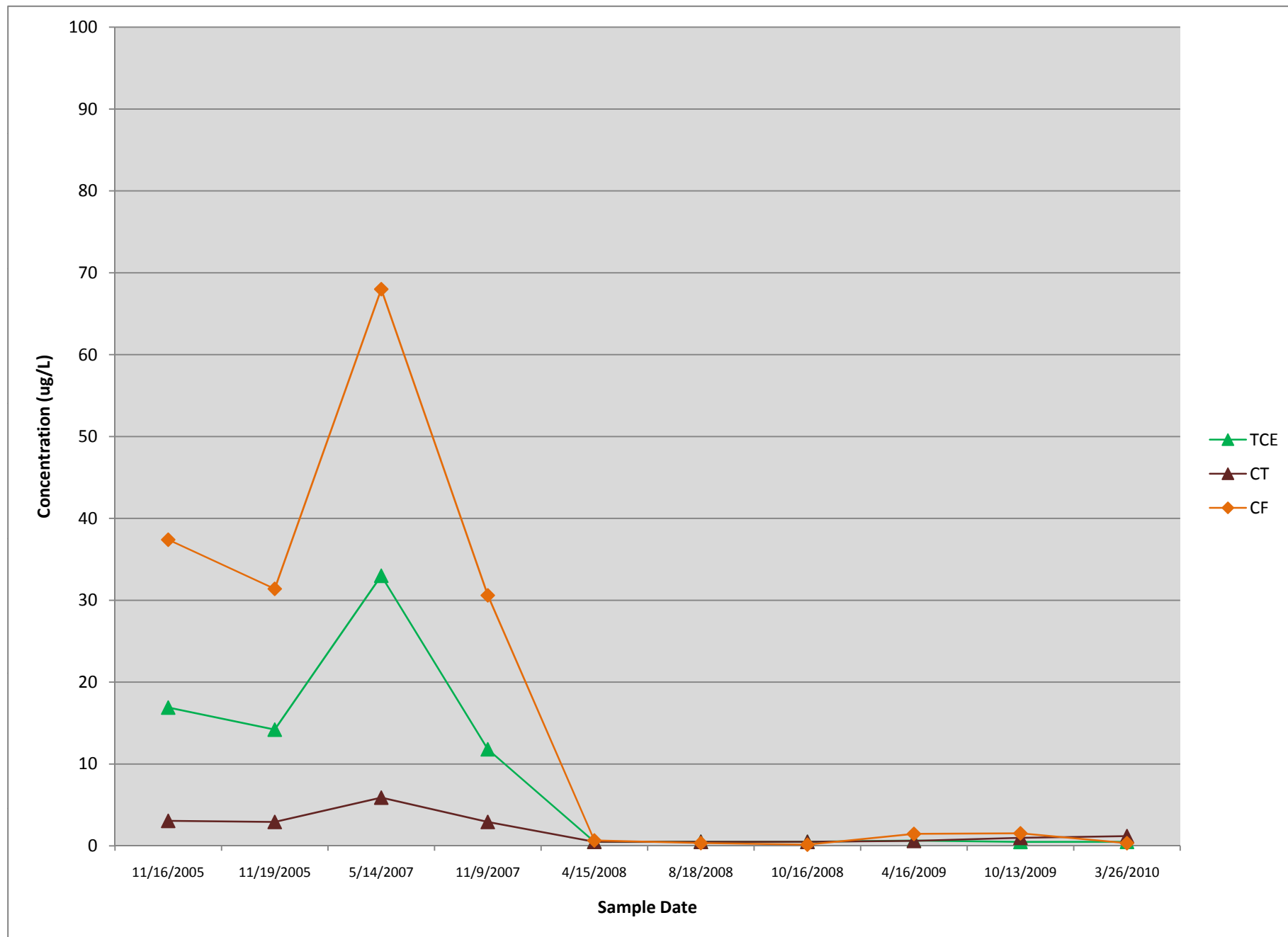
MW-153



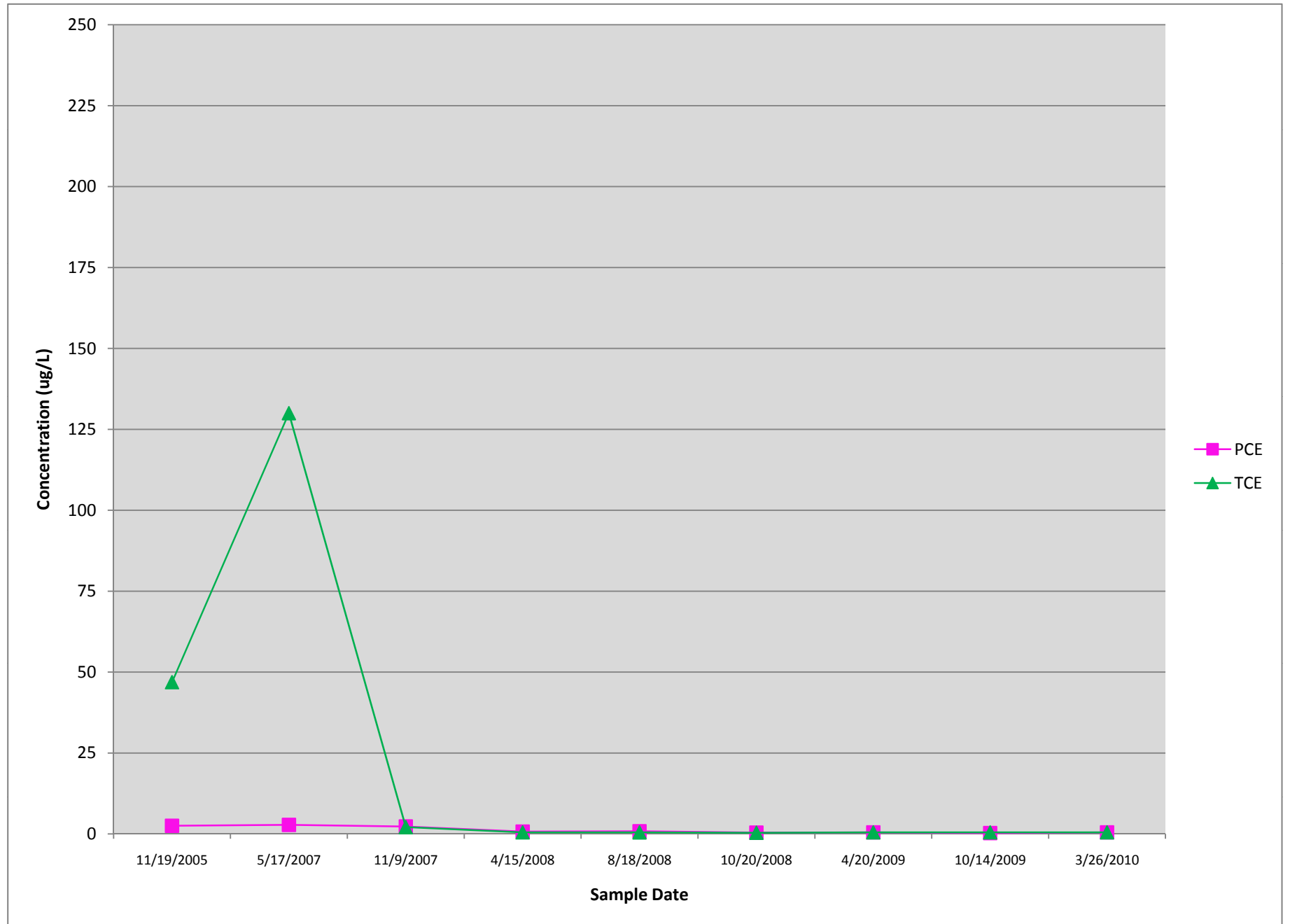
MW-172



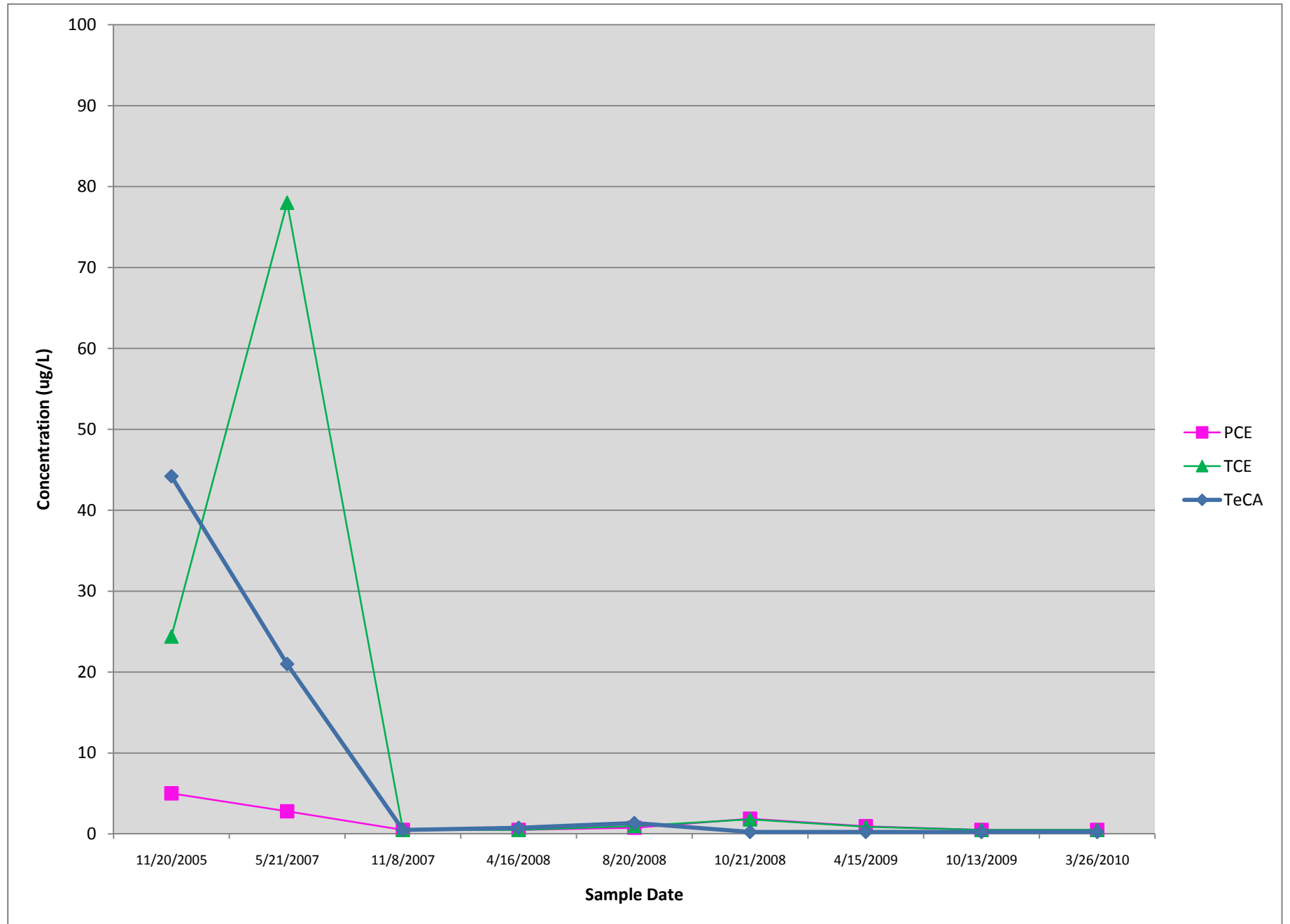
MW-174



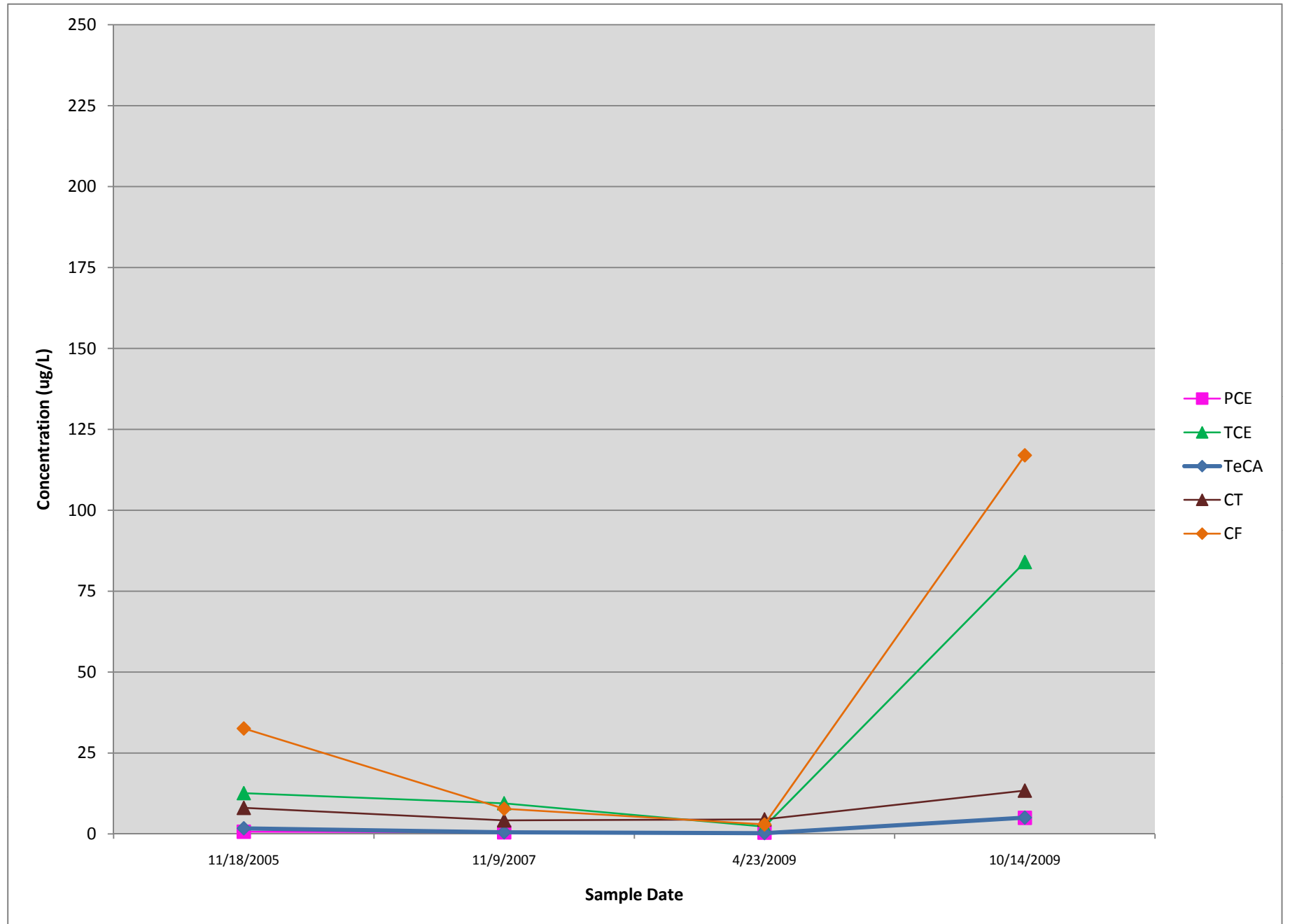
MW-178



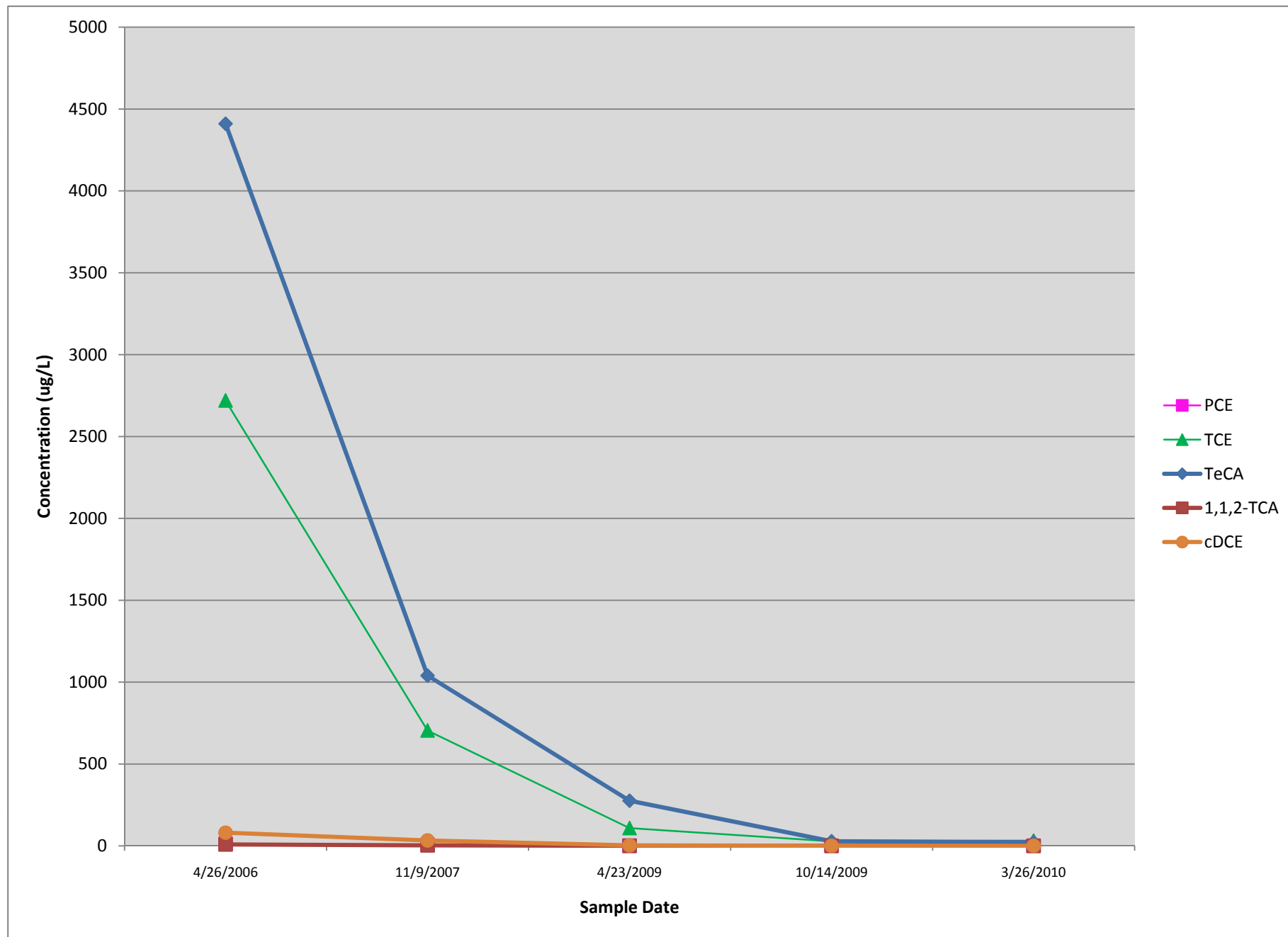
MW-180



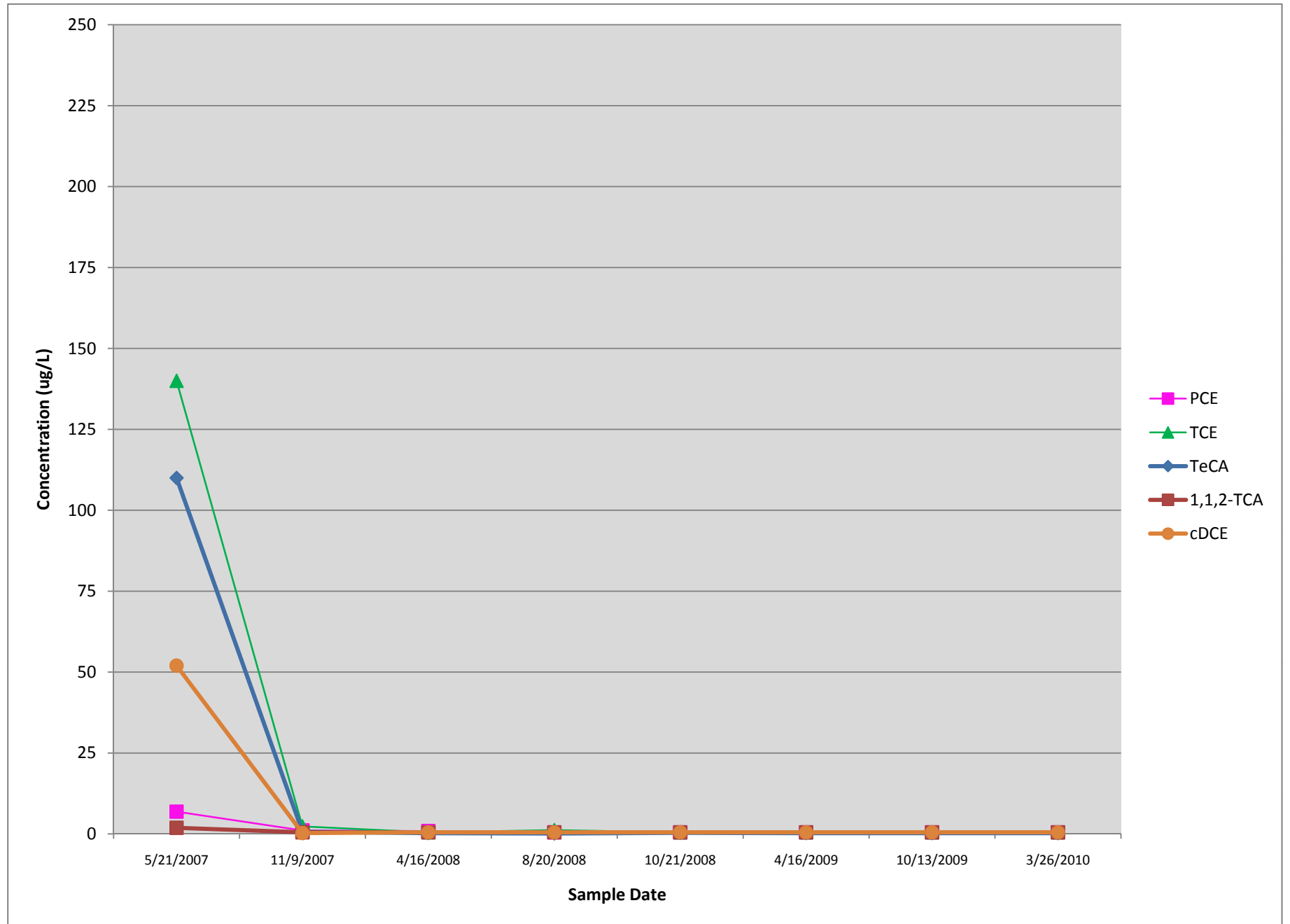
MW-184



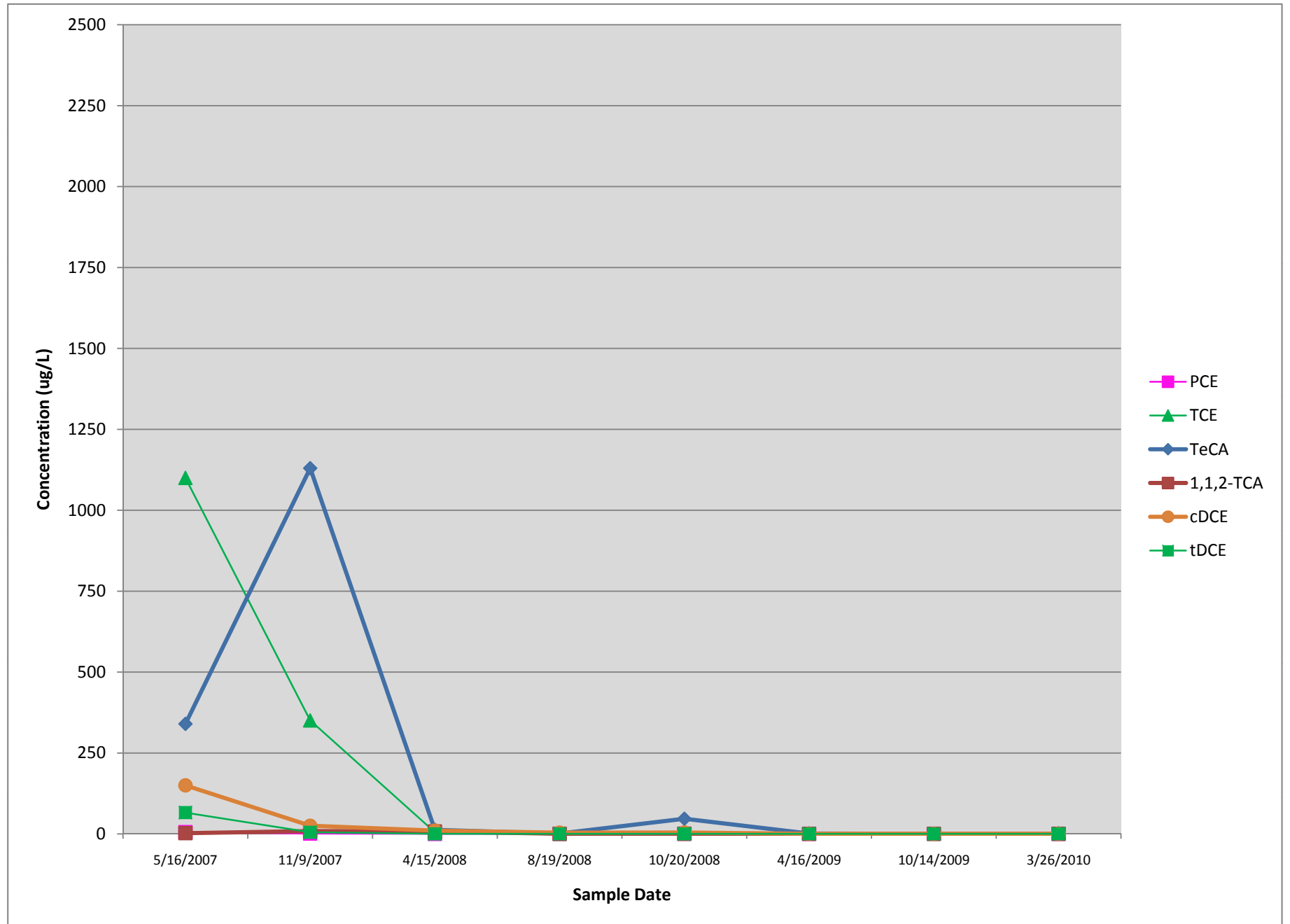
MW-190



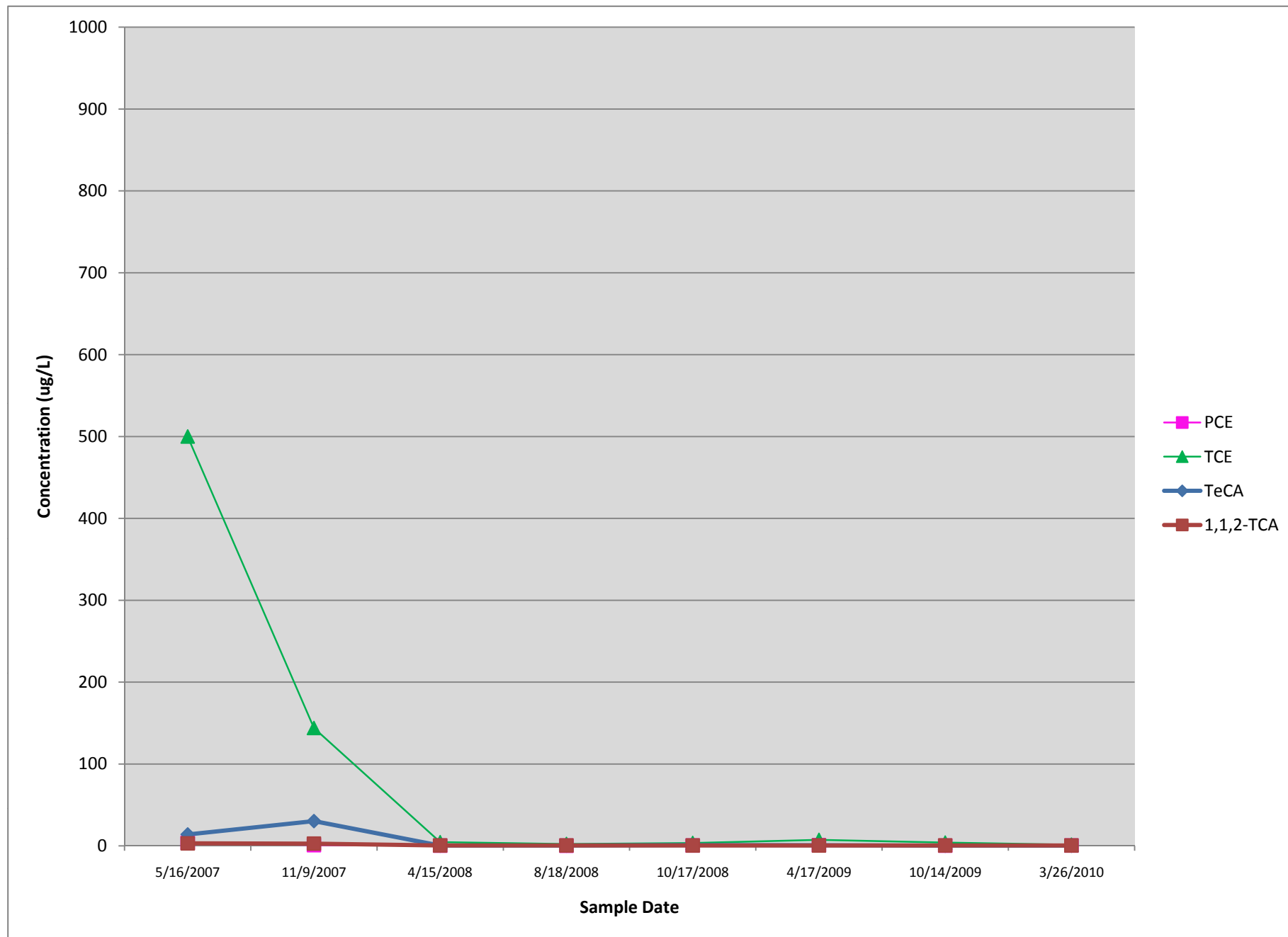
MW-221



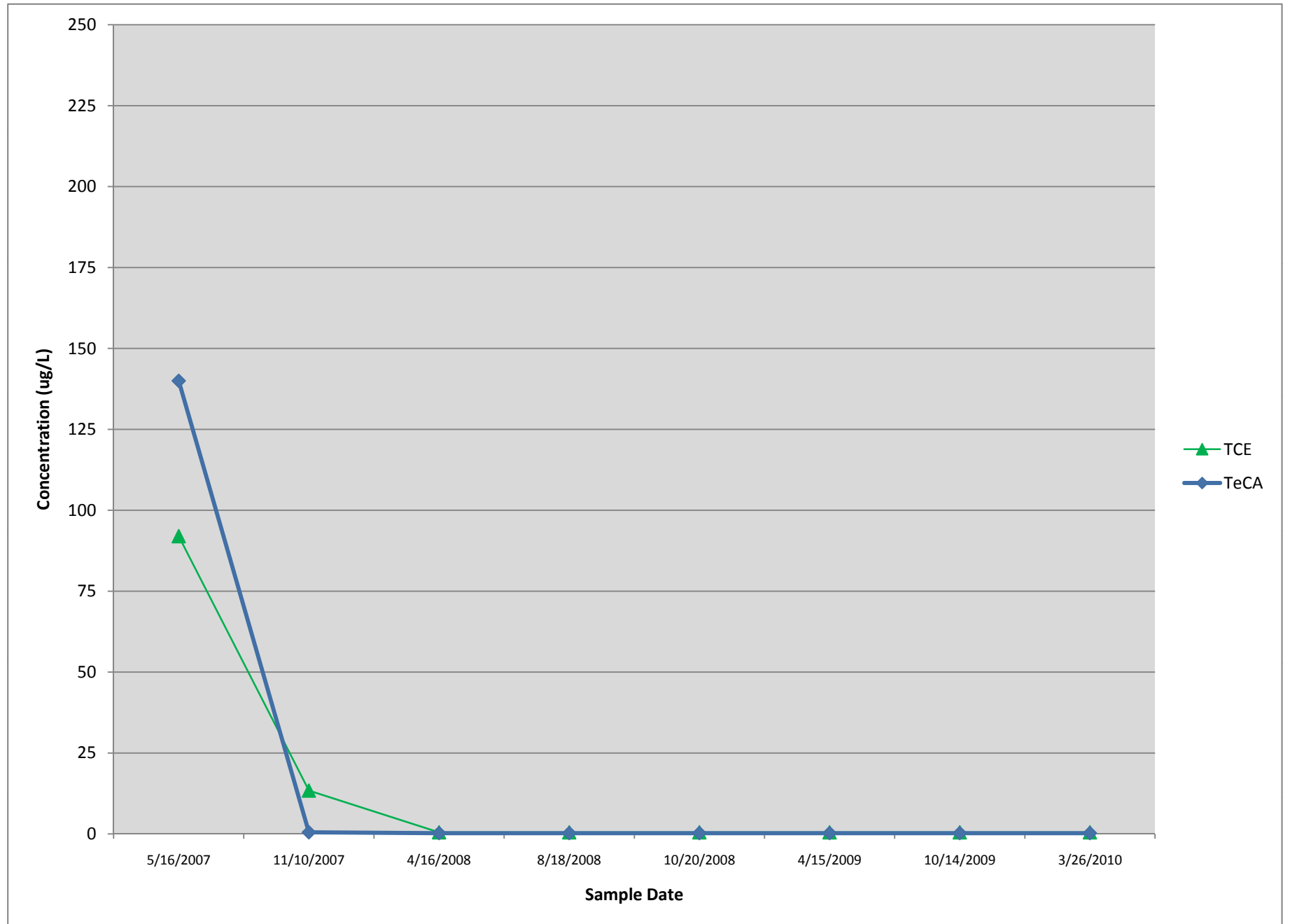
MW-222



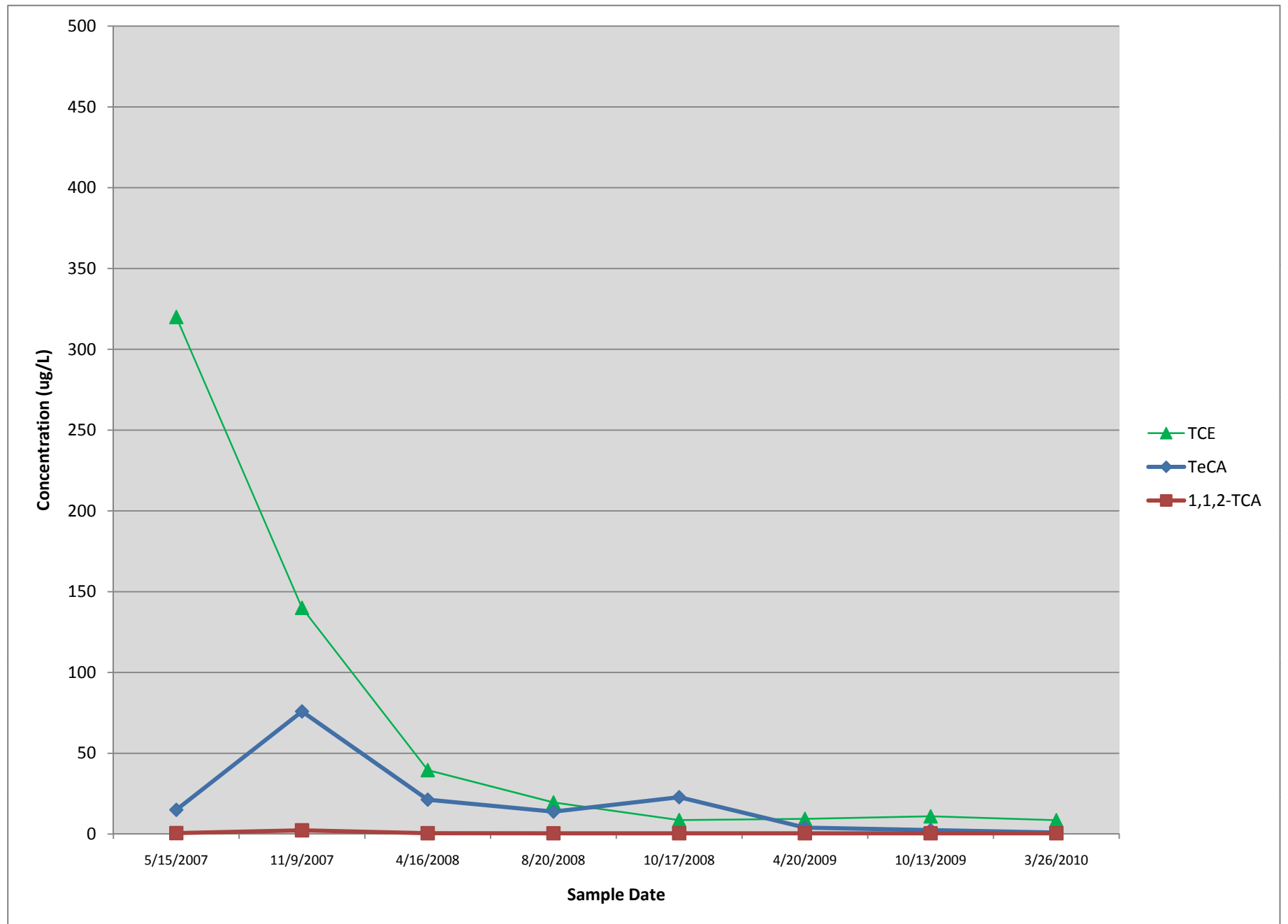
MW-223



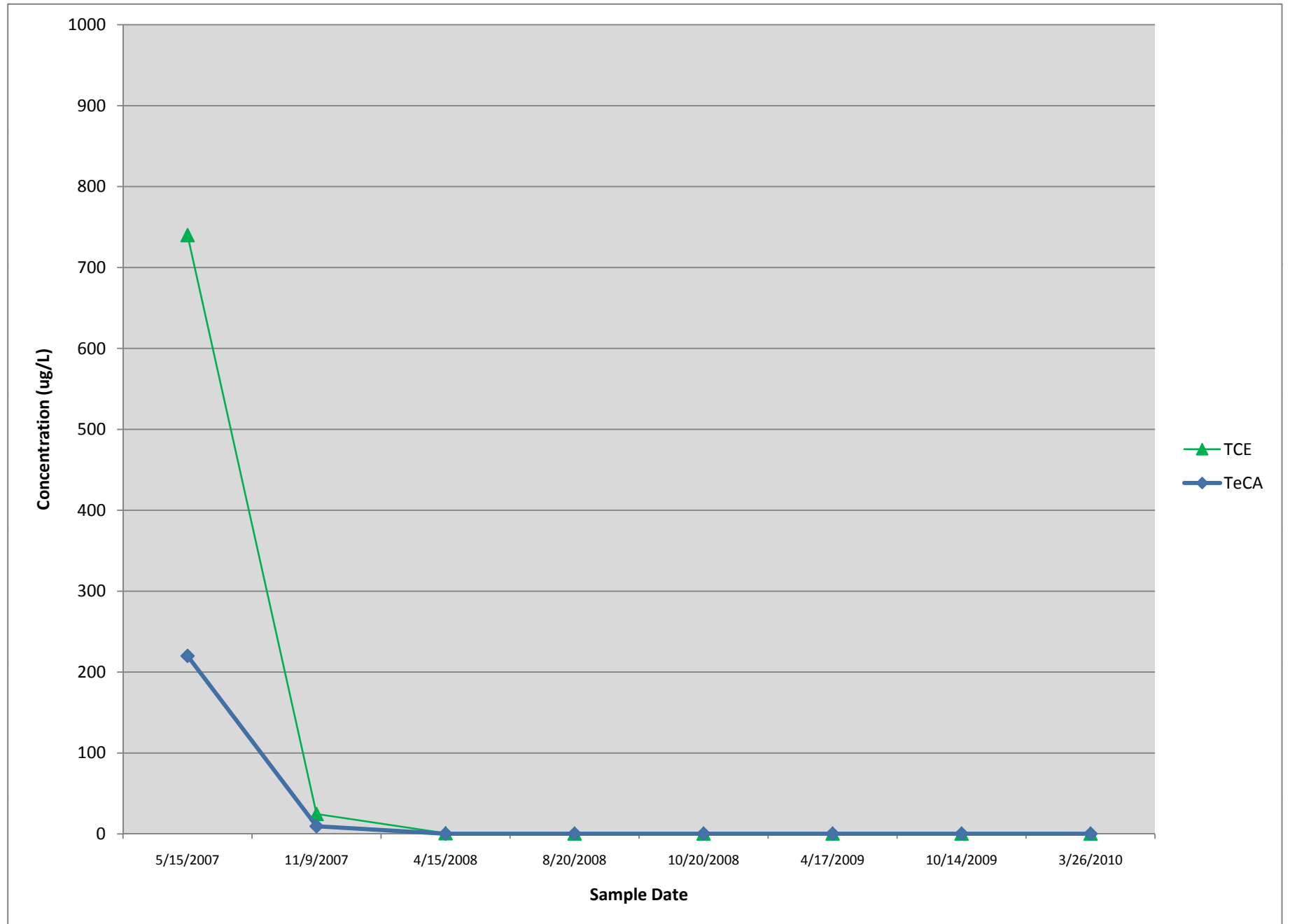
MW-224



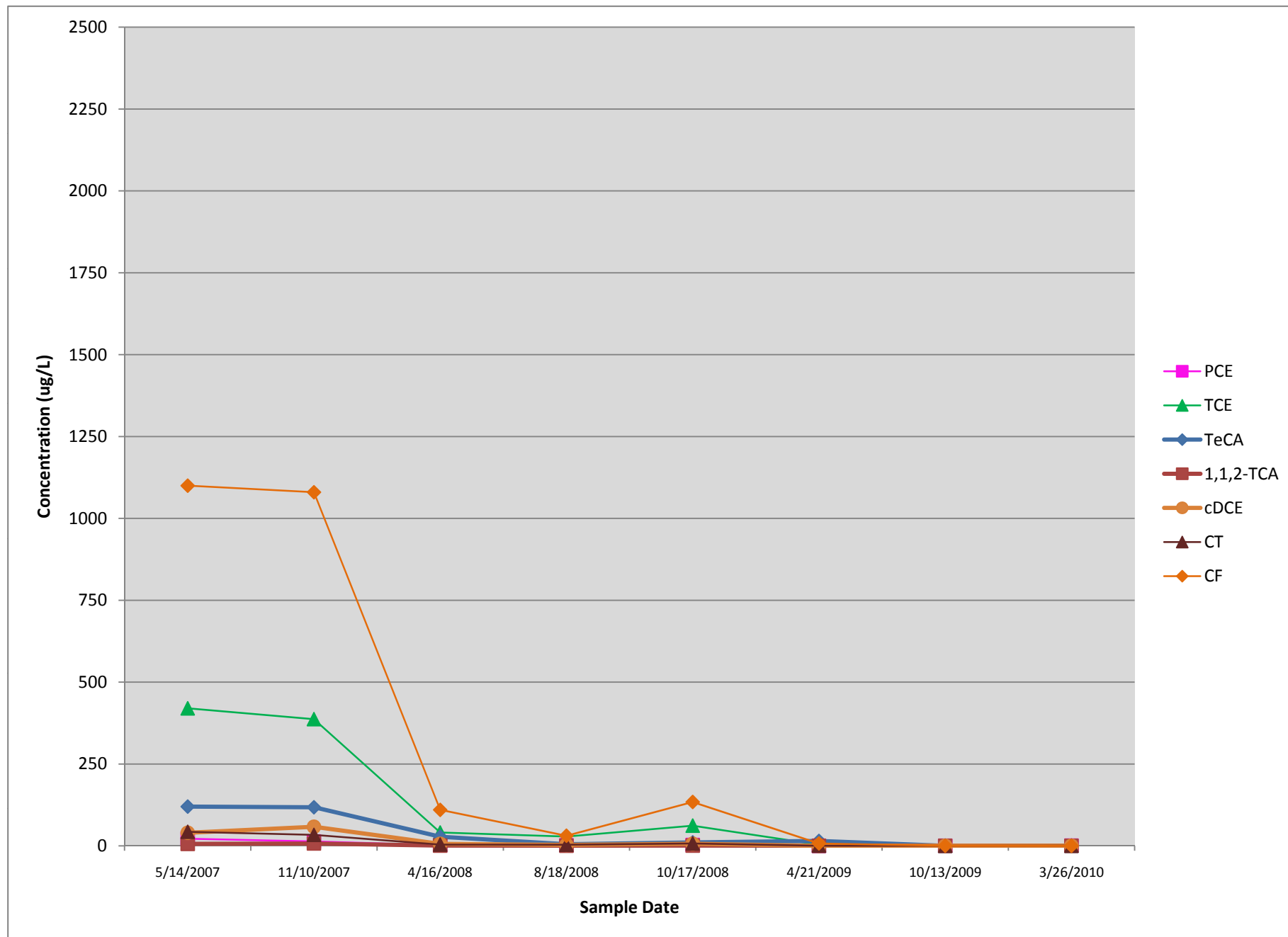
MW-225



MW-226



MW-227



MW-228

